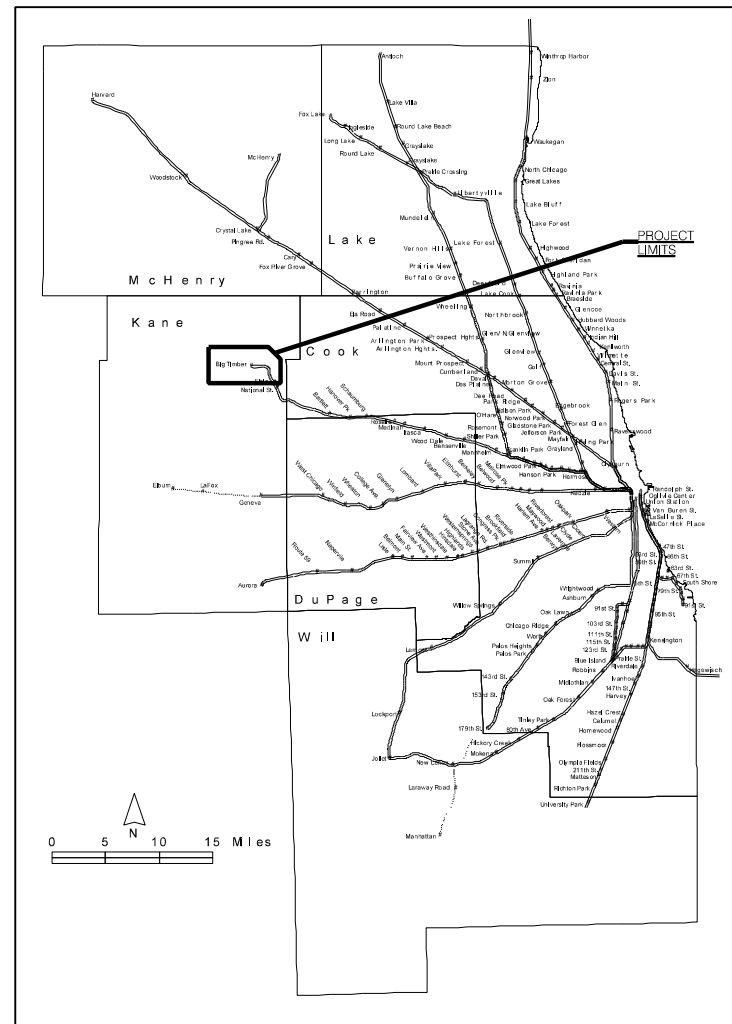


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF PUBLIC & INTERMODAL TRANSPORTATION
CONTRACT NO. 62A43



CONTRACT DRAWINGS

DESIGN, FURNISH MATERIAL AND PROVIDE SUPPORT
 FOR
 MILWAUKEE DISTRICT WEST LINE BIG TIMER SIGNAL SYSTEM



PROJECT LOCATION MAP

PRINT NO.	DRAWING DESCRIPTION
CD-COVER	COVER SHEET
CD-1	ROUTE AND ASPECT CHART - EASTBOUND
CD-2	ROUTE AND ASPECT CHART - WESTBOUND
CD-3	NEW EQUIP. & CABLE REQUIREMENTS
CD-4	TRACK LAYOUT
CD-5	CONSTRUCTION DETAILS
CD-6	CODE CHARTS
	REFERENCE DRAWINGS
	TYPOICAL DRAWINGS

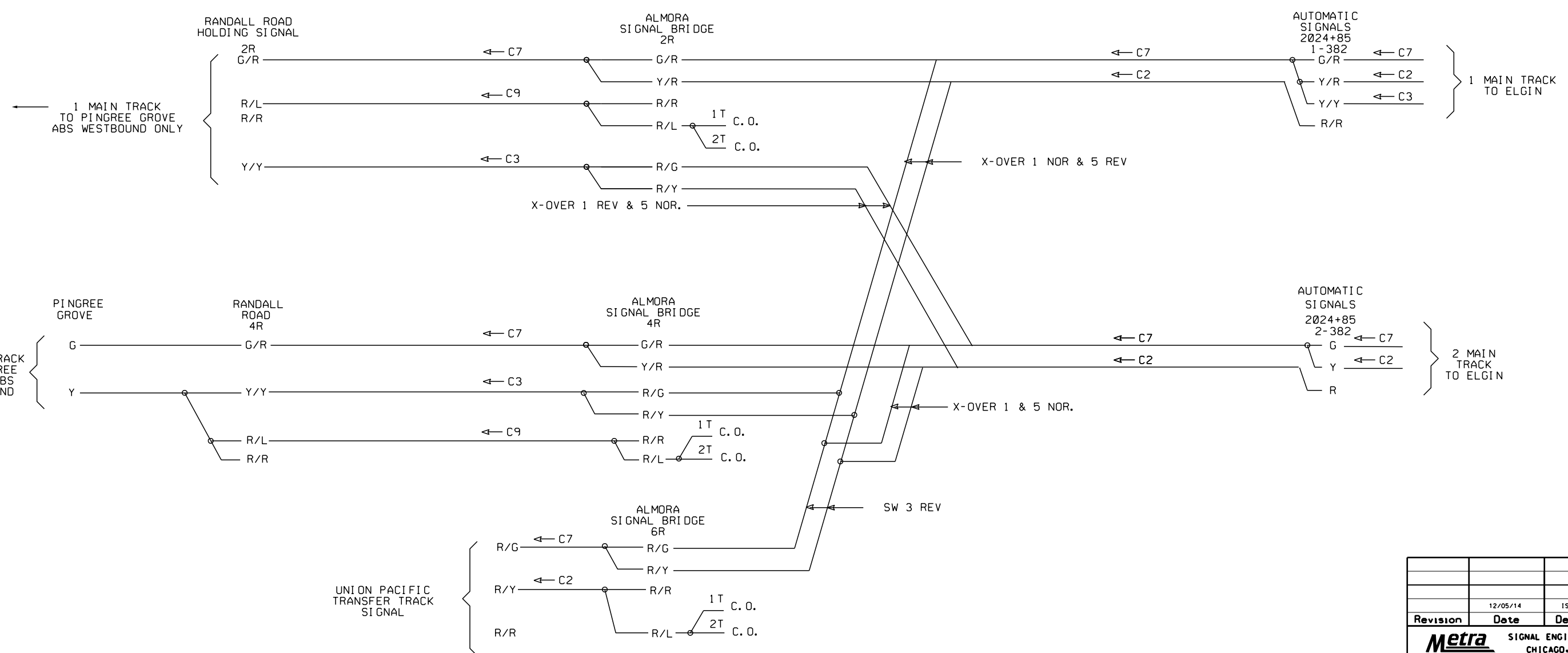
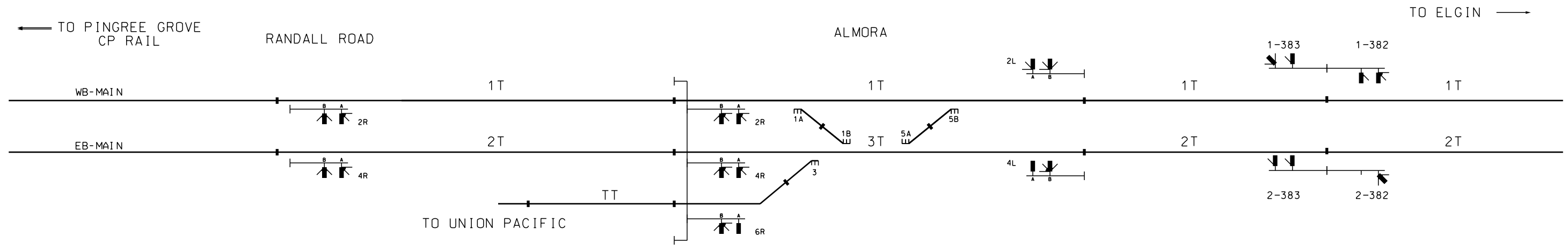
Revision	Date	Description
	12/05/14	ISSUED FOR BID

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 BIG TIMER SIGNAL SYSTEM
 COVER SHEET

REFERENCE	CD-1 THRU CD-6	DATE	12/05/14
DESIGNED	DRAWN	CHECKED	APPROVED
DISTRICT	PRINT NUMBER		
MW/W	CD-COVER		

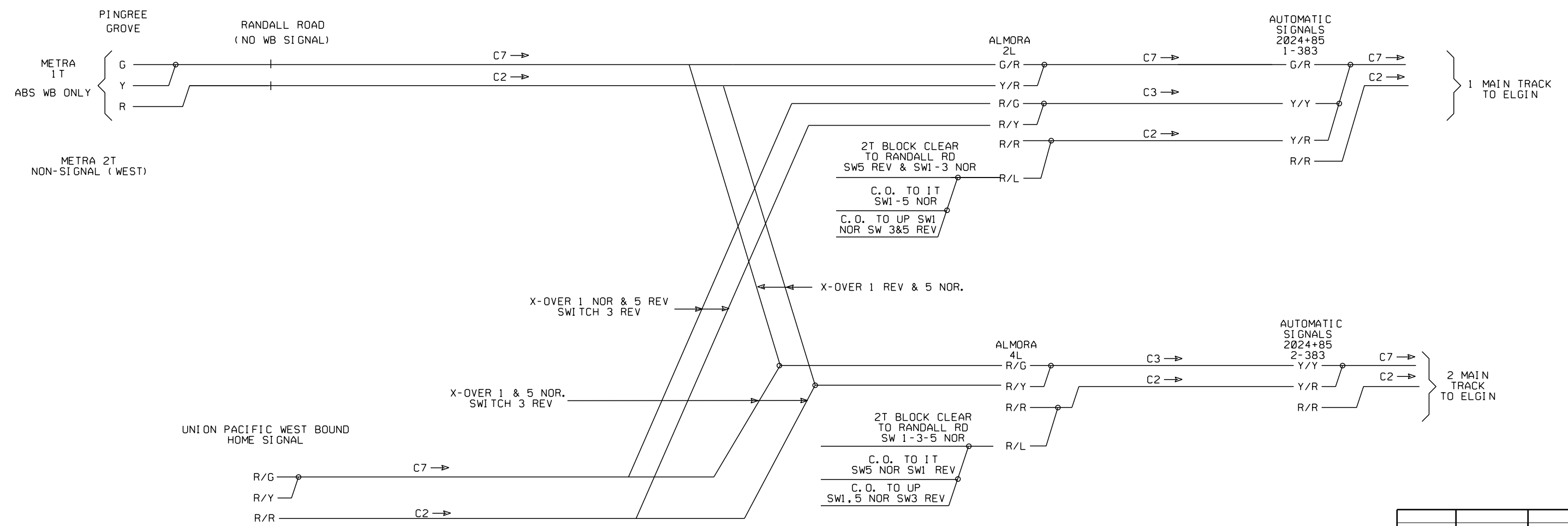
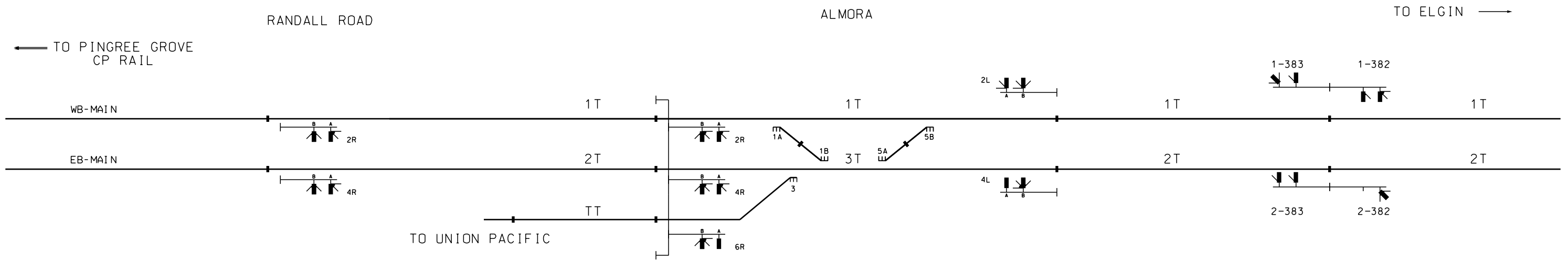
SCALE: NONE



NOTE: 1. C.O. ASPECTS - CALL-ON

EASTBOUND SIGNAL ASPECTS

	12/05/14	ISSUED FOR BID
Revision	Date	Description
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS		
CHICAGO TO ELGIN BIG TIMBER SIGNAL SYSTEM EASTBOUND SIGNAL ASPECTS		
REFERENCE: CD-1_THRU_CD-6	DATE: 11/17/14	
DESIGNED	DRAWN	CHECKED
APPROVED		
DISTRICT	PRINT NUMBER	
MW/W	CD-1	

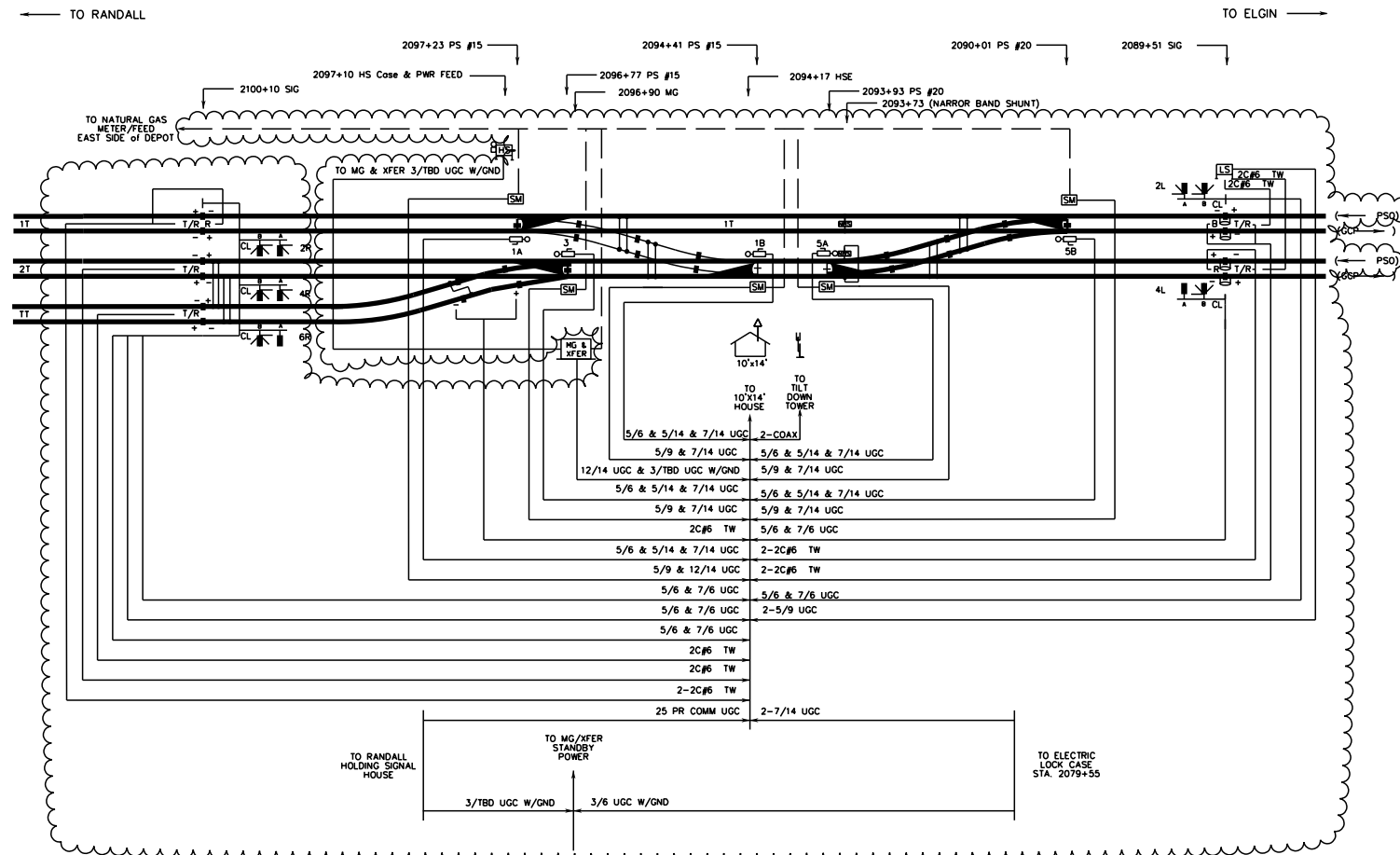


WESTBOUND SIGNAL ASPECTS

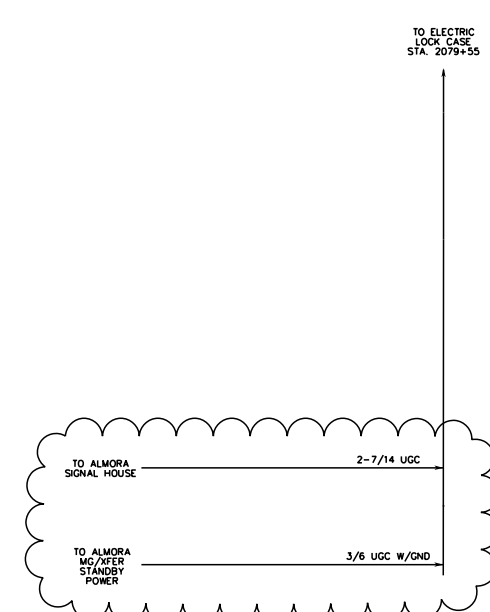
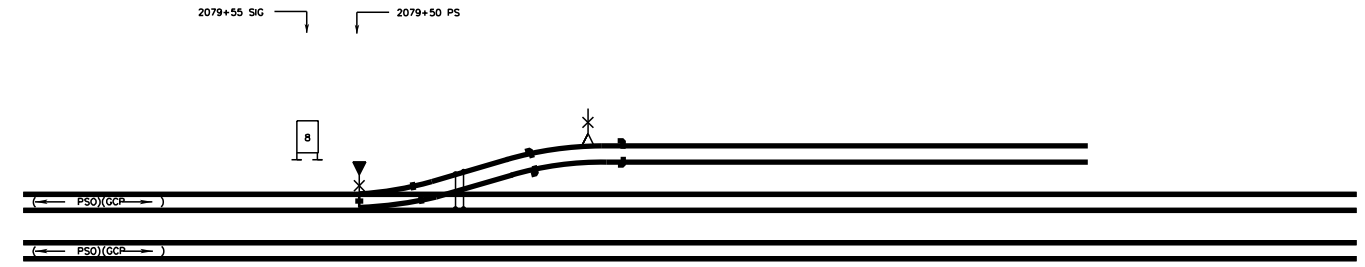
NOTE: 1. C.O. ASPECTS - CALL-ON

	12/05/14	ISSUED FOR BID
Revision	Date	Description
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS		
CHICAGO TO ELGIN BIG TIMBER SIGNAL SYSTEM WESTBOUND SIGNAL ASPECTS		
REFERENCE: CD-1 THRU CD-6	DATE: 11/17/14	
DESIGNED	DRAWN	CHECKED
APPROVED		
DISTRICT	PRINT NUMBER	
MW/W	CD-2	

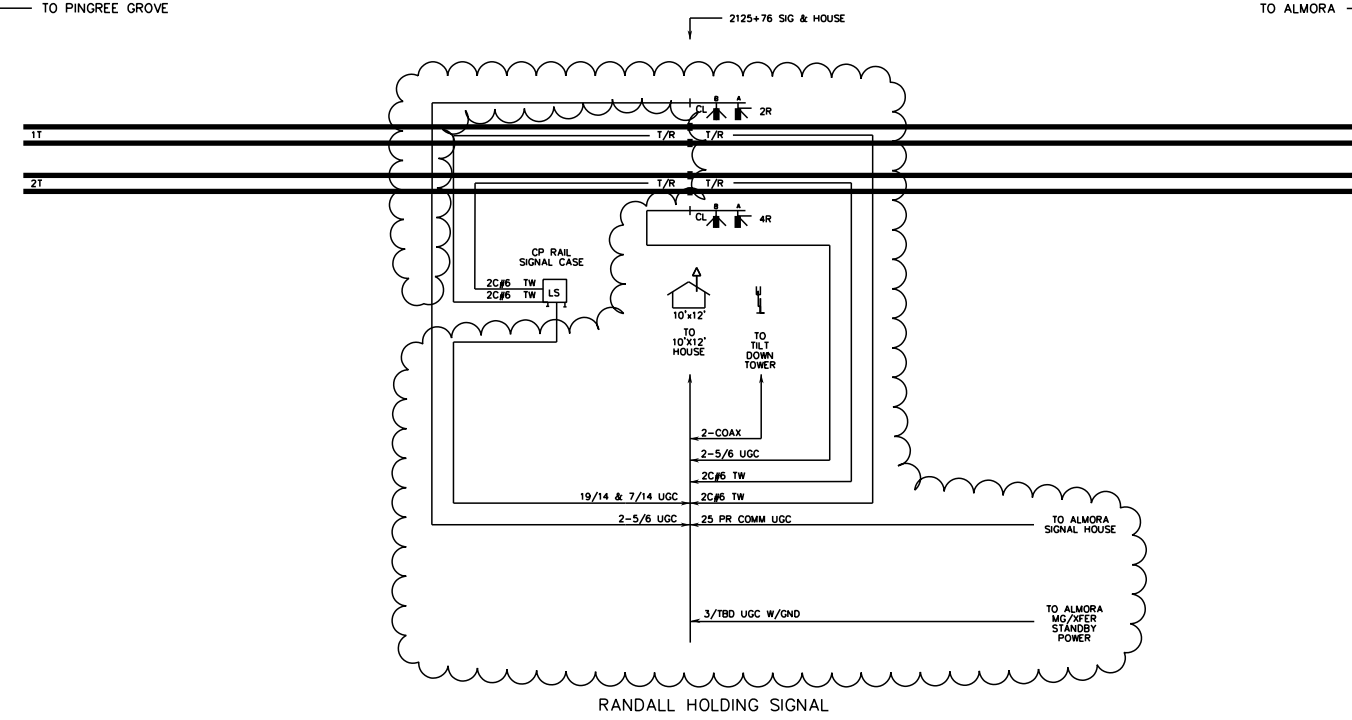
ALMORA



TO RANDALL ← TO ELGIN →



← TO PINGREE GROVE → TO ALMORA →



- NOTES:
- TUNED GCP INS. JT. COUPLER
 - PSO NARROW BAND SHUNT
 - NAT. GAS. HOT AIR SNOW MELTER
 - 60' TILT DOWN TOWER WITH PTC AND ATCS ANTENNAS
 - GPS ANTENNA
 - T/R CODED TRACK CKT. XMTR/REC
 - NAT. GAS PIPE
 - (←) PSO DIRECTION PSO XMTR.
 - (←) GCP DIRECTION GCP XMTR.
 - LS LOW SINGLE SIGNAL CASE
 - HS HIGH SINGLE SIGNAL CASE
 - B 8 WAY SIGNAL CASE

- NOTES:
1. ALL SIGNALS ARE LED COLOR LIGHT TYPE
 2. ALL EQUIPMENT WITHIN CLOUD SHALL BE NEW
 3. POWER FEED AND MOTOR GENERATOR/ATS MAY REQUIRE NEW PER CONTRACT DOCUMENT LOAD REQUIREMENTS.

Revision	Date	Description
	12/05/14	ISSUED FOR BID
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS		
CHICAGO TO ELGIN BIG TIMBER SIGNAL SYSTEM NEW EQUIP & CABLE REQUIREMENTS		
REFERENCE	CD-1_THRU_CD-6	DATE 10/24/14
DESIGNED	DRAWN	CHECKED
DISTRICT	PRINT NUMBER	
MW/W	CD-3	

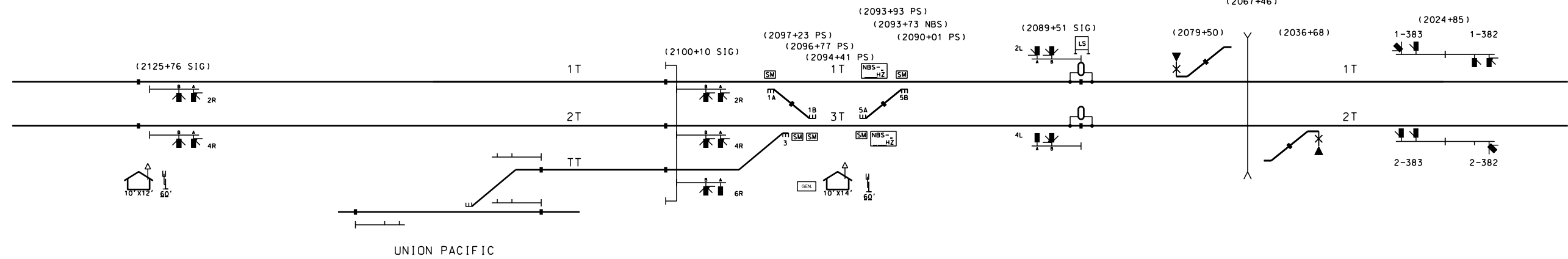
SCALE: NONE



TO PINGREE GROVE RANDALL ROAD

ALMORA

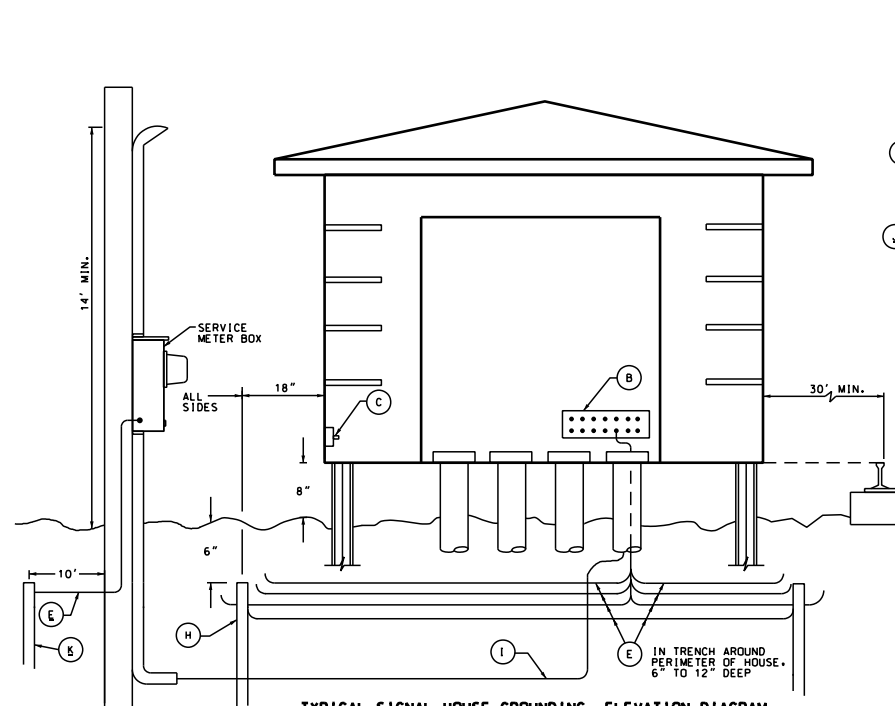
MC LEAN
(2067+46)

TO ELGIN



 TUNED GCP INSULATED JOINT COUPLER
 NBS = NARROW BAND SHUNT

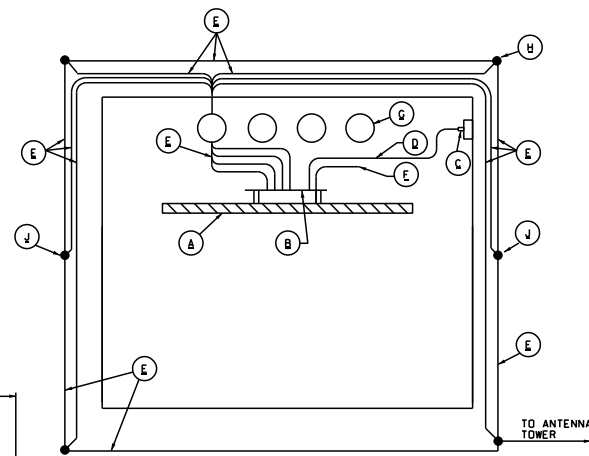
Revision	Date	Description
	12/05/14	ISSUED FOR BID
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS		
CHICAGO TO ELGIN BIG TIMBER SIGNAL SYSTEM TRACK LAYOUT		
REFERENCE	CD-1_THRU_CD-6	DATE 10/24/14
DESIGNED	DRAWN	CHECKED
DISTRICT		PRINT NUMBER
MW/W		CD-4



**TYPICAL SIGNAL HOUSE GROUNDING ELEVATION DIAGRAM
REAR VIEW**

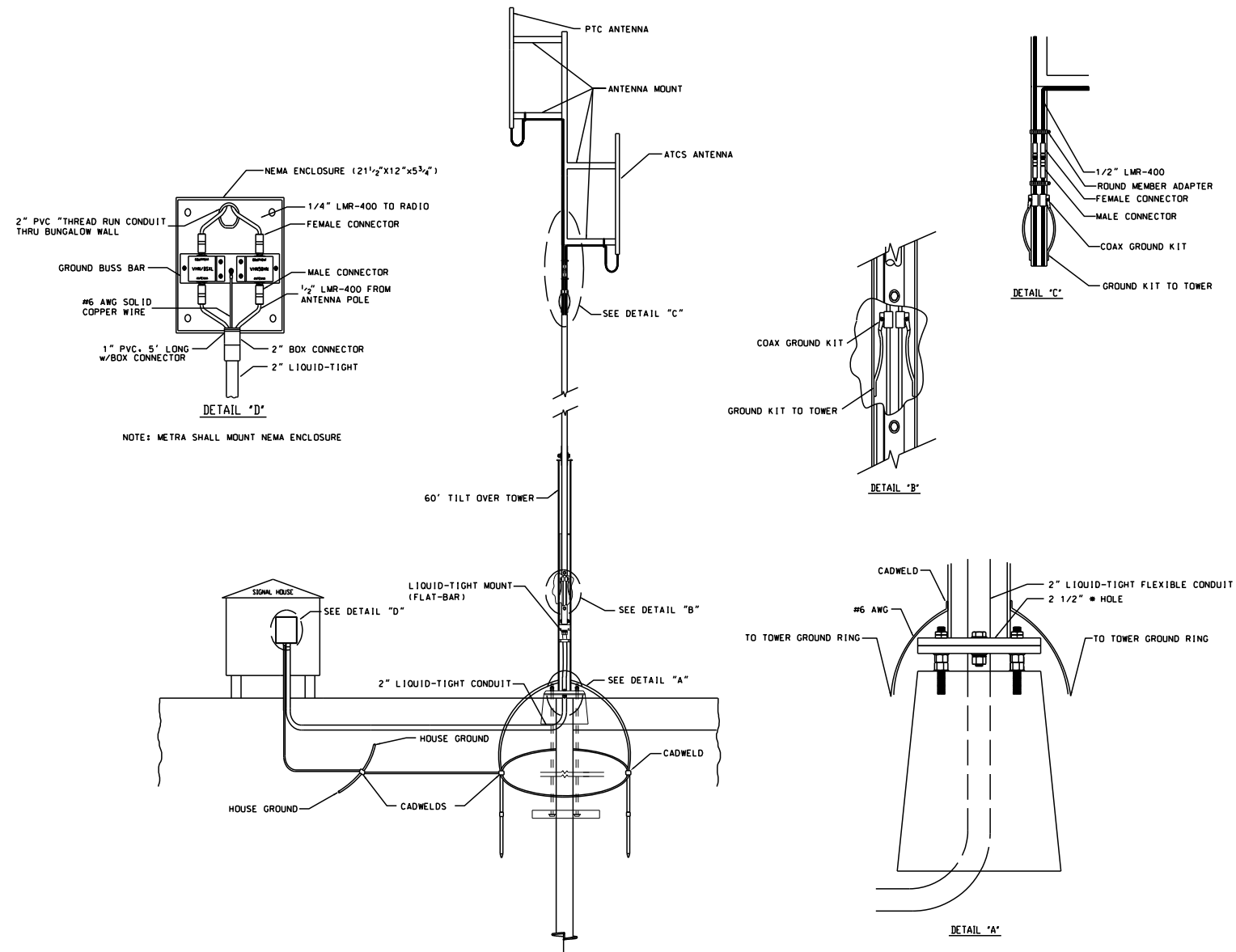
NOTES:

1. AC POWER AND GROUND WIRES TO ENTER HOUSE THROUGH SAME DESIGNATED CABLE ENTRANCE CONDUIT.
2. GROUND WIRES MUST BE KEPT SHORT AND WITHOUT BENDS OR SPLICES.
3. MAXIMUM RESISTANCE TO GROUND SHALL BE 5 OHMS.
4. SIGNAL HOUSES TO BE LOCATED A MINIMUM OF 30 FEET FROM NEAREST RAIL AND ROADWAY UNLESS APPROVED BY THE ENGINEER.
5. SEE ALSO METRA TECHNICAL APPENDIX FOR SIGNAL RELAY HOUSES, SPEC. NO. 0674.
6. SEE ALSO METRA TECHNICAL SPECIFICATIONS, DIVISION III, SECTION 10 FOR POWER TAP MATERIAL REQUIREMENTS.
7. FOR DETAILS OF SERVICE FEED DROP SEE ABOVE RIGHT AND DIVISION III - TECHNICAL SPECIFICATIONS, SECTION 10 PARAGRAPH 2.13



TYPICAL SIGNAL HOUSE GROUNDING DIAGRAM TOP VIEW

- (A) 3/4" A-C PLYWOOD TERMINAL BOARD.
- (B) COPPER PRIME GROUND PLATE. (SEE SPECIFICATIONS FOR MINIMUM AAR TERMINAL REQUIREMENTS).
- (C) INTERNAL HOUSE STRUCTURE GROUND TERMINAL.
- (D) GREEN INSULATED #6 EFTE STRANDED COPPER GROUND WIRE TO EACH CASE GROUND TERMINAL. (WIRED BY SUPPLIER).
- (E) #6 BARE SOFT DRAWN COPPER WIRE FORMING GROUND GRID (PROVIDED BY SUPPLIER/WIRED BY RAILROAD).
- (F) GREEN INSULATED #6 EFTE STRANDED COPPER GROUND WIRE TO AC SERVICE GROUNDED NEUTRAL IN LOAD CENTER (WIRED BY SUPPLIER).
- (G) 4" DIAMETER UNDERGROUND CABLE KNOCKOUTS (SEE NOTE 6).
- (H) (4) 5/8"x10' LONG COPPERWELD GROUND RODS WITH TYPE NT CONNECTORS.
- (I) MINIMUM 3/2 UIC POWER FROM METER SERVICE OR DISTRIBUTION PANEL AT INTERLOCKINGS AND CONTROL POINTS.
- (J) (2) ADDITIONAL 5/8"x10' LONG COPPERWELD GROUND RODS WITH TYPE NT CONNECTORS FOR HOUSE SIDE LONGER THAN 12'.
- (K) 5/8"x10' COPPER BONDED STEEL GROUND ROD.

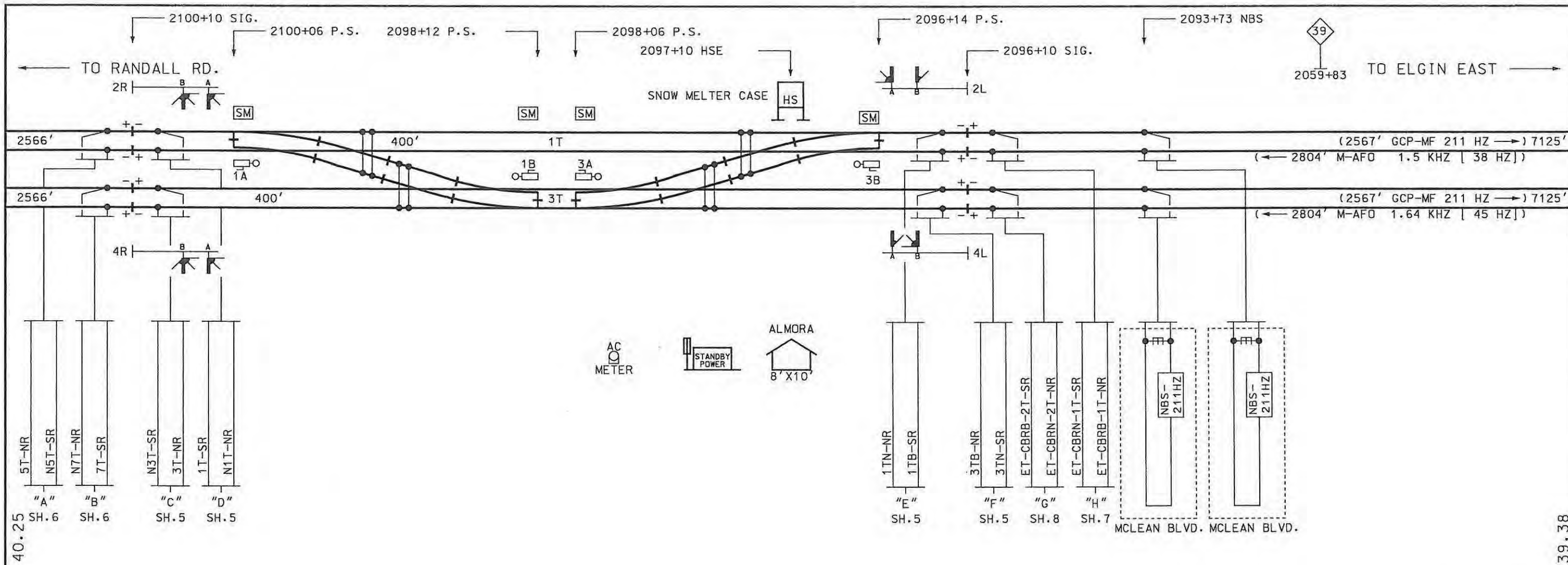


Revision	Date	Description
	12/05/14	ISSUED FOR BID
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS		
CHICAGO TO ELGIN BIG TIMBER SIGNAL SYSTEM CONSTRUCTION DETAILS		
REFERENCE:	CD-1 THRU CD-6	DATE: 12/05/14
DESIGNED:	DRAWN:	CHECKED:
DISTRICT:	PRINT NUMBER	
MW/W	CD-5	

SCALE: NONE

REFERENCE DRAWING INDEX

MP	DESCRIPTION	NUMBER OF DRAWINGS
39.70	ALMORA	80
40.10	RANDALL ROAD INTERFACE	14
41.90	PINGREE GROVE	10
40.25	6R & 8R SIGNAL LOCATION	14
38.32	382-383 SIGNAL LOCATION	6
38.54	ELECTRIC LOCK LOCATION	4
39.14	MCLEAN BOULEVARD	11
39.38	ELECTRIC LOCK SINGLE SPUR	4



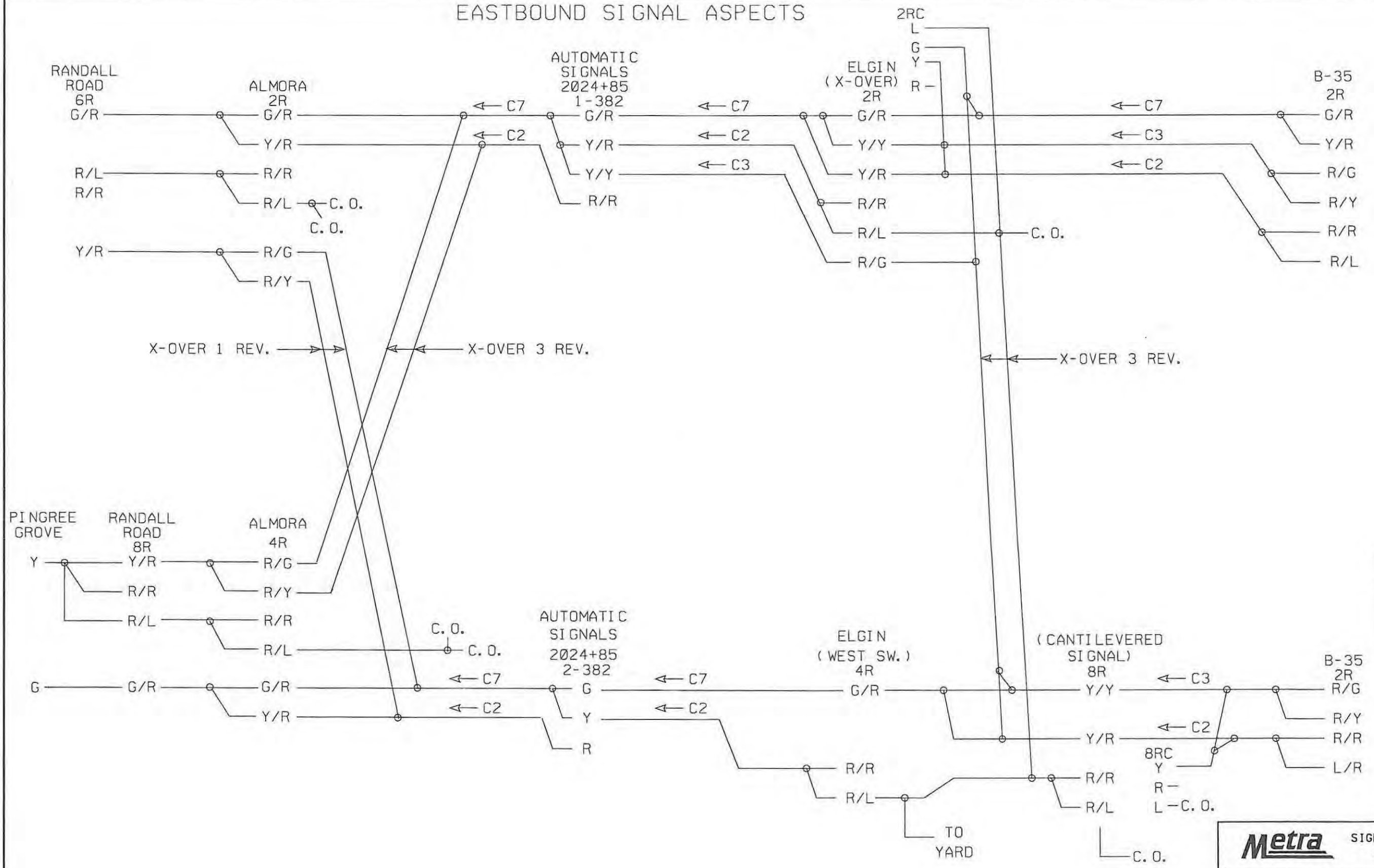
~REVISIONS~
 PB 09/15/09 OK *OK*

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA SIH
 PLAN VIEW

REFERENCE:	39.70 SH.1 THRU 78	DATE:	07/23/02
DESIGNED:	SSC	CHECKED:	<i>SS</i>
DRAWN:	SSC	APPROVED:	<i>WK</i>
DISTRICT:	MW/W	PRINT NUMBER:	39.70 SH.1

EASTBOUND SIGNAL ASPECTS

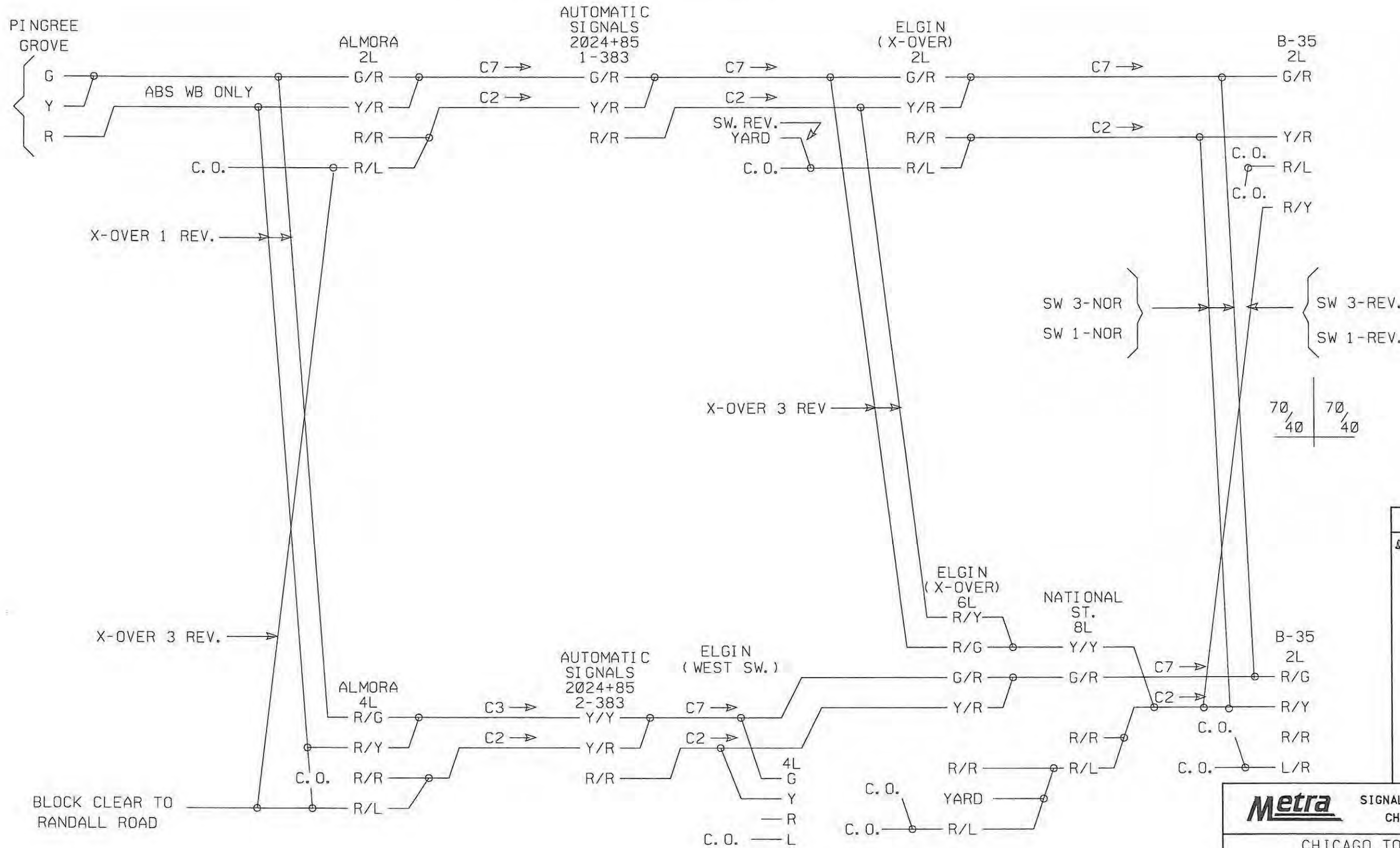


~REVISIONS~
 01/12/00 *AW*

NOTE:
 1.) ALL LUNAR ASPECTS - CALL-ON

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN EASTBOUND TRACK AND CABLE PLAN	
REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>URK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.02

WESTBOUND SIGNAL ASPECTS

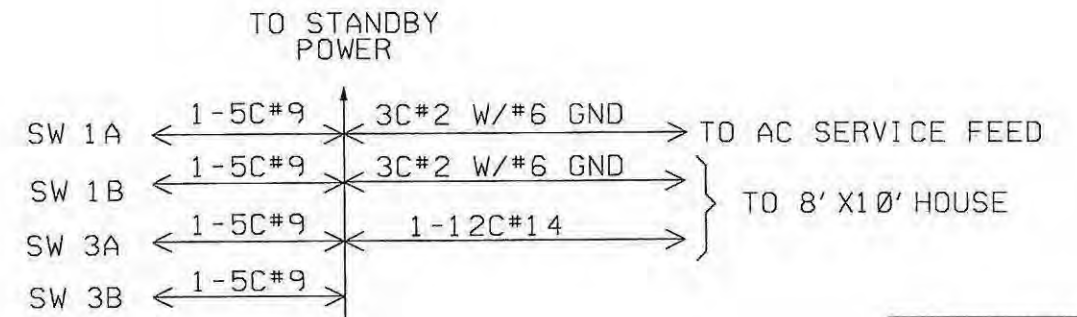
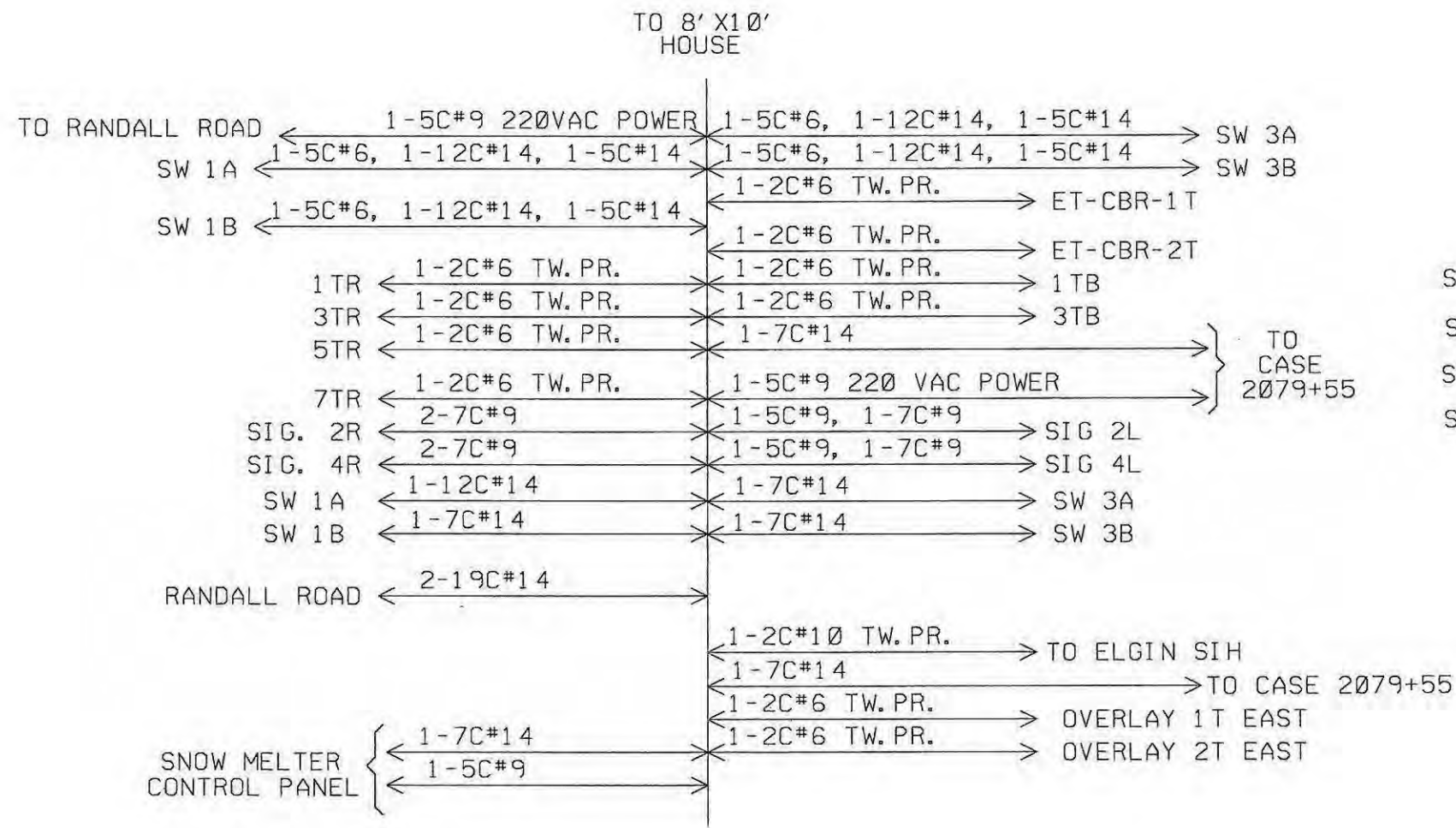


~REVISIONS~

01/12/00	<i>AW</i>
----------	-----------

NOTE:
1.) ALL LUNAR ASPECTS - CALL-ON

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN WESTBOUND ROUTE AND ASPECT CHART	
REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>AWK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.03



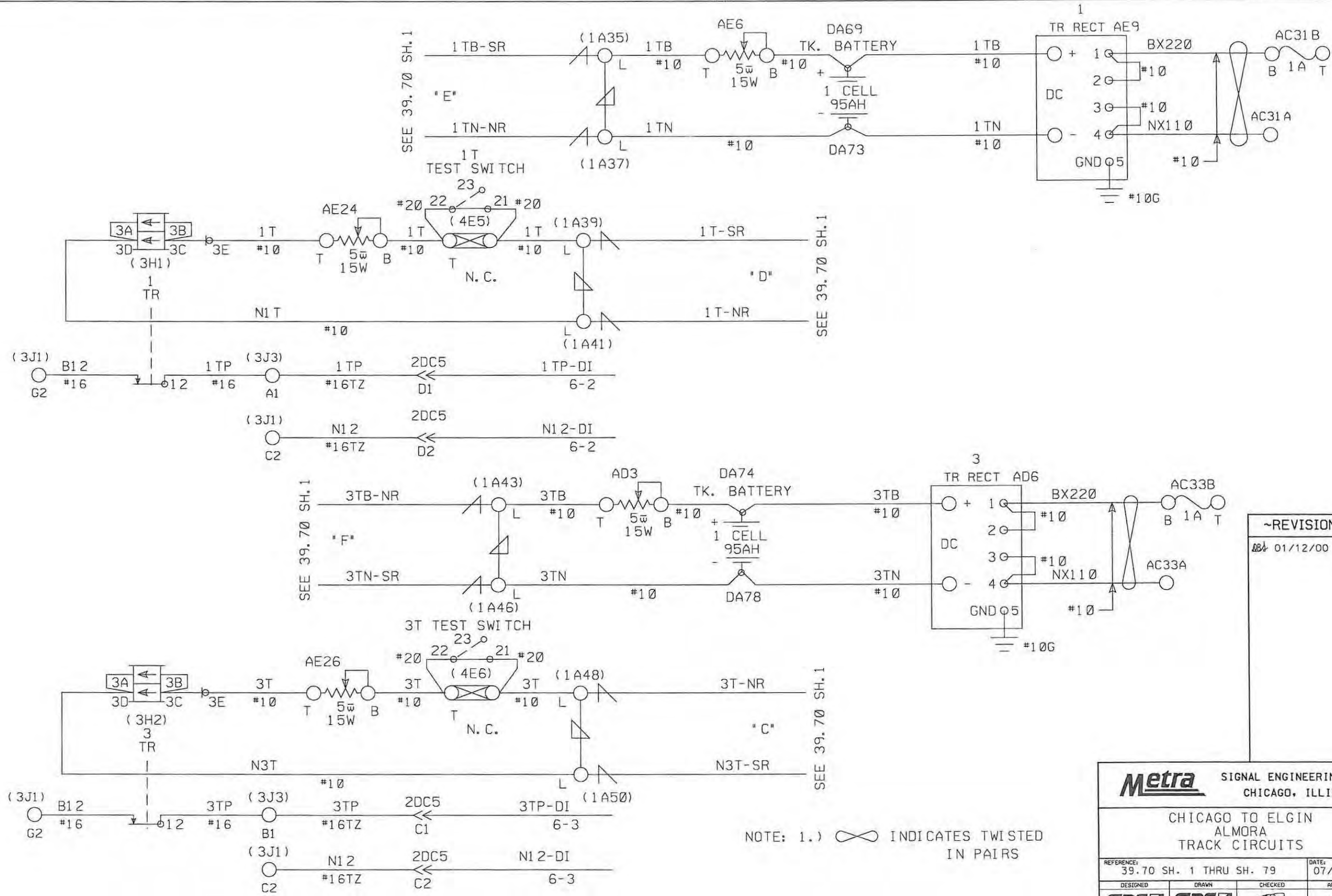
~REVISIONS~

DBA 01/12/00 *DBA*
 PB 09/15/09 OK *DBA*
 MC 05/26/10 OK *DBA*

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA
 CABLE PLAN

REFERENCE: 39.70 SH. 1 THRU SH. 79		DATE: 07/06/94	
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>DBA</i>	<i>WRK</i>
DISTRICT MW/W		PRINT NUMBER 39.70 SH.04	



NOTE: 1.) ∞ INDICATES TWISTED IN PAIRS

~REVISIONS~

DB 01/12/00 *Shu*

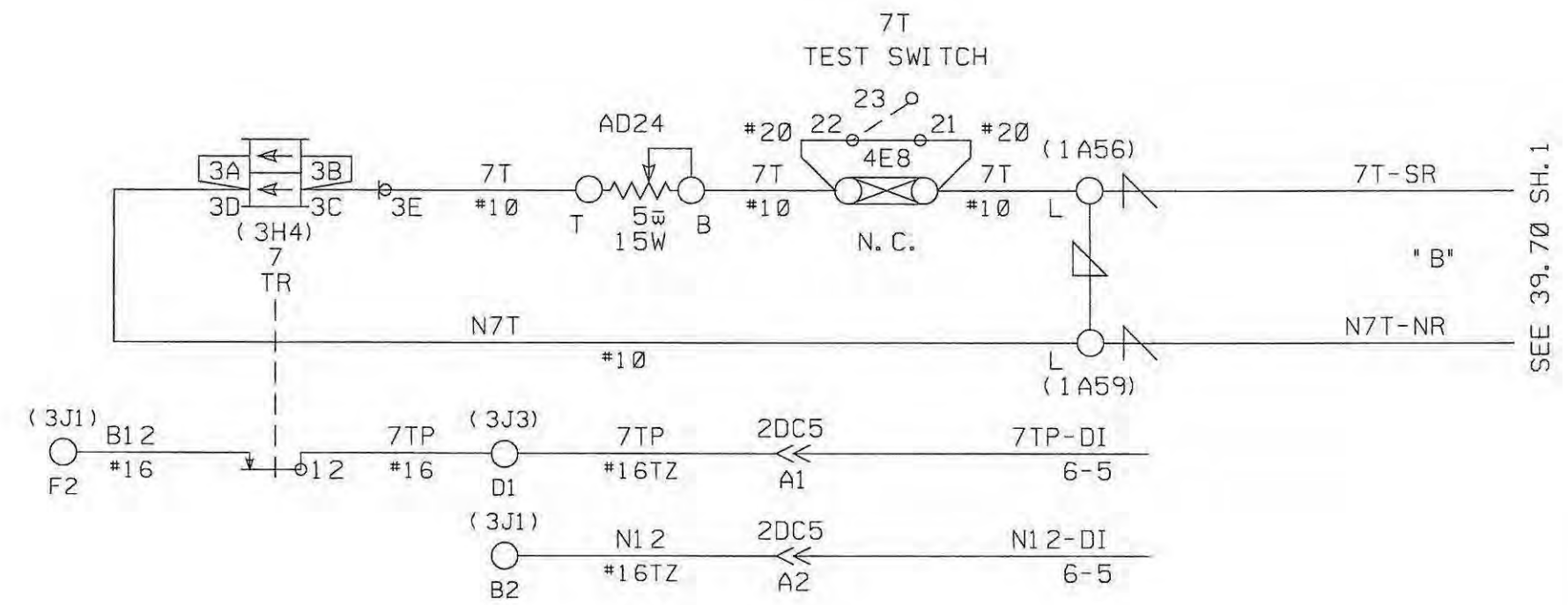
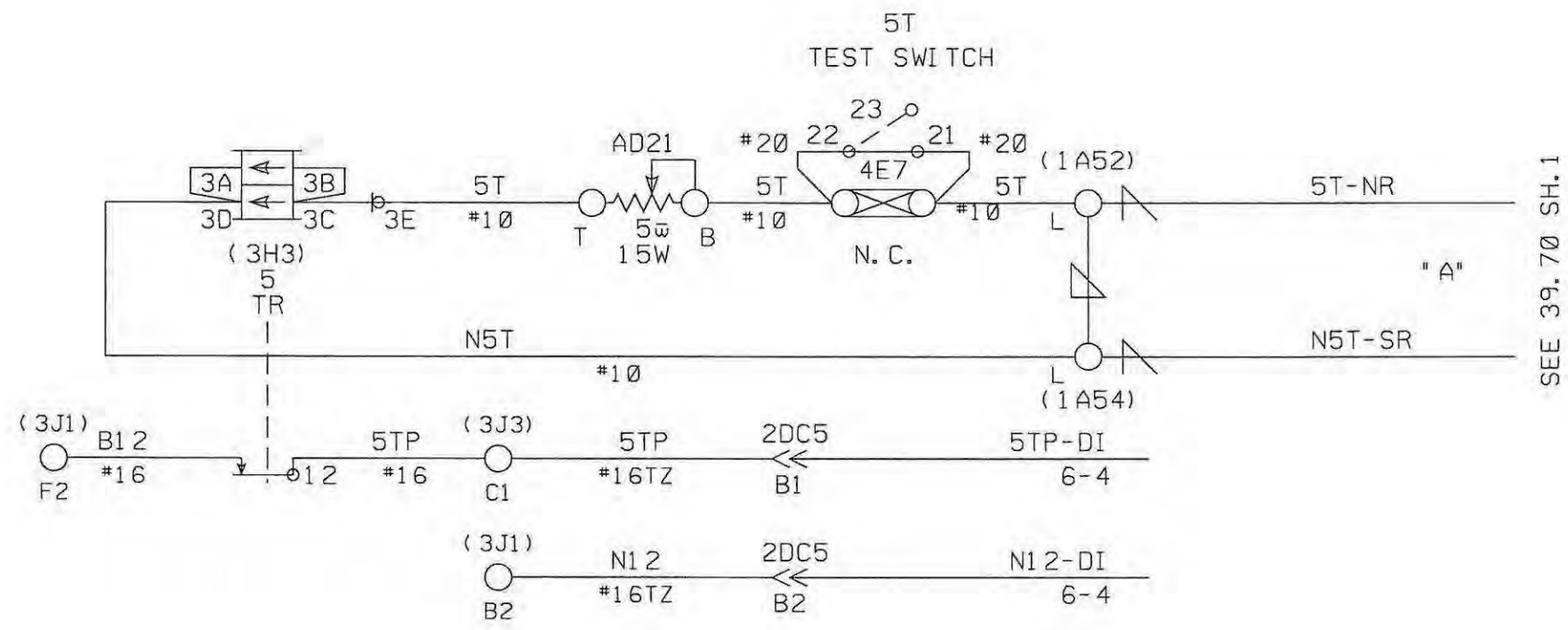
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
TRACK CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>TSB</i>	<i>WRK</i>

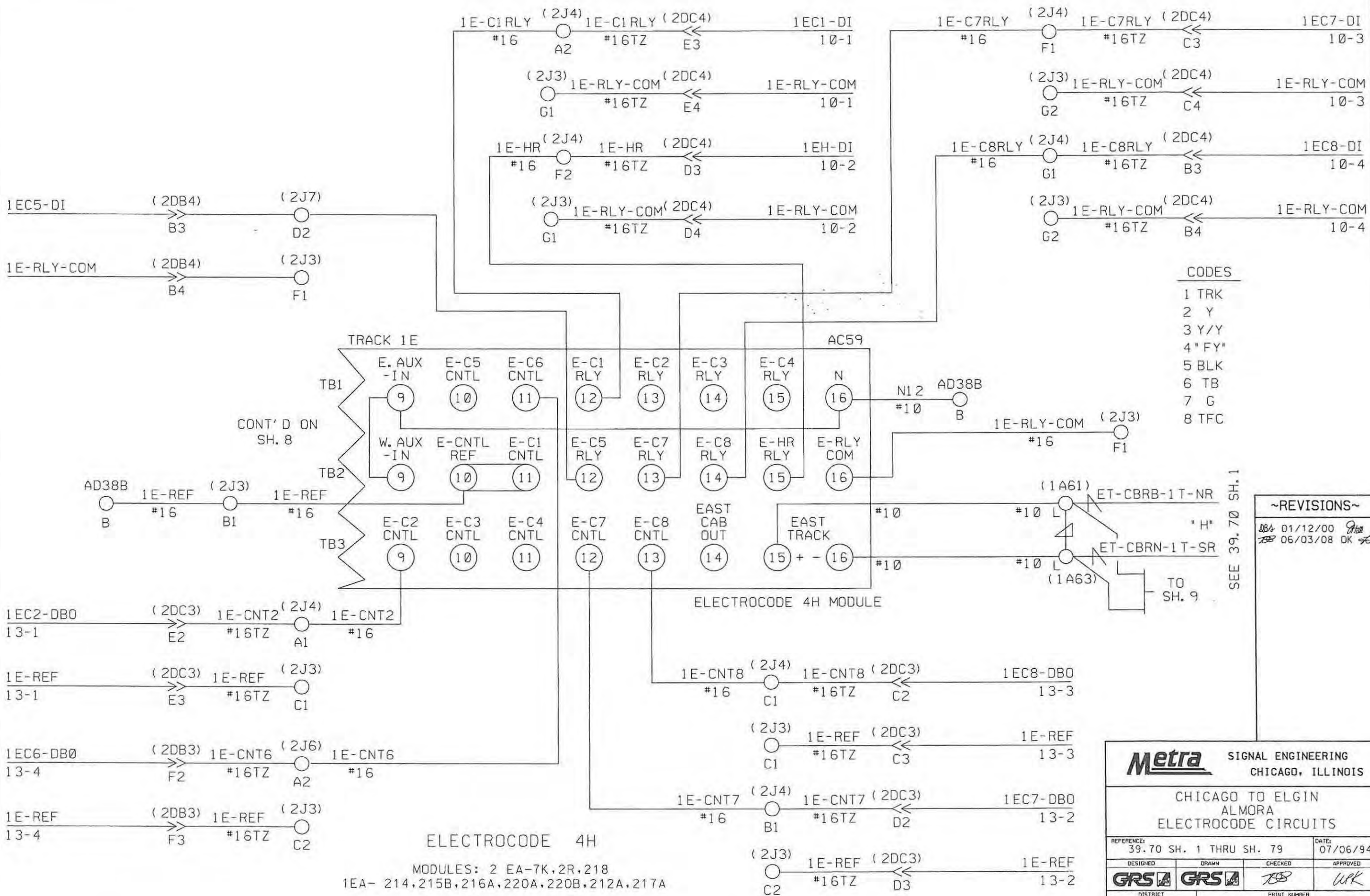
DISTRICT	PRINT NUMBER
MW/W	39.70 SH.05



~REVISIONS~

01/12/00 *File*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA TRACK CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED	DRAWN
CHECKED	APPROVED
DISTRICT	PRINT NUMBER
MW/W	39.70 SH.06



- CODES
- 1 TRK
 - 2 Y
 - 3 Y/Y
 - 4 "FY"
 - 5 BLK
 - 6 TB
 - 7 G
 - 8 TFC

SEE 39.70 SH. 1

~REVISIONS~

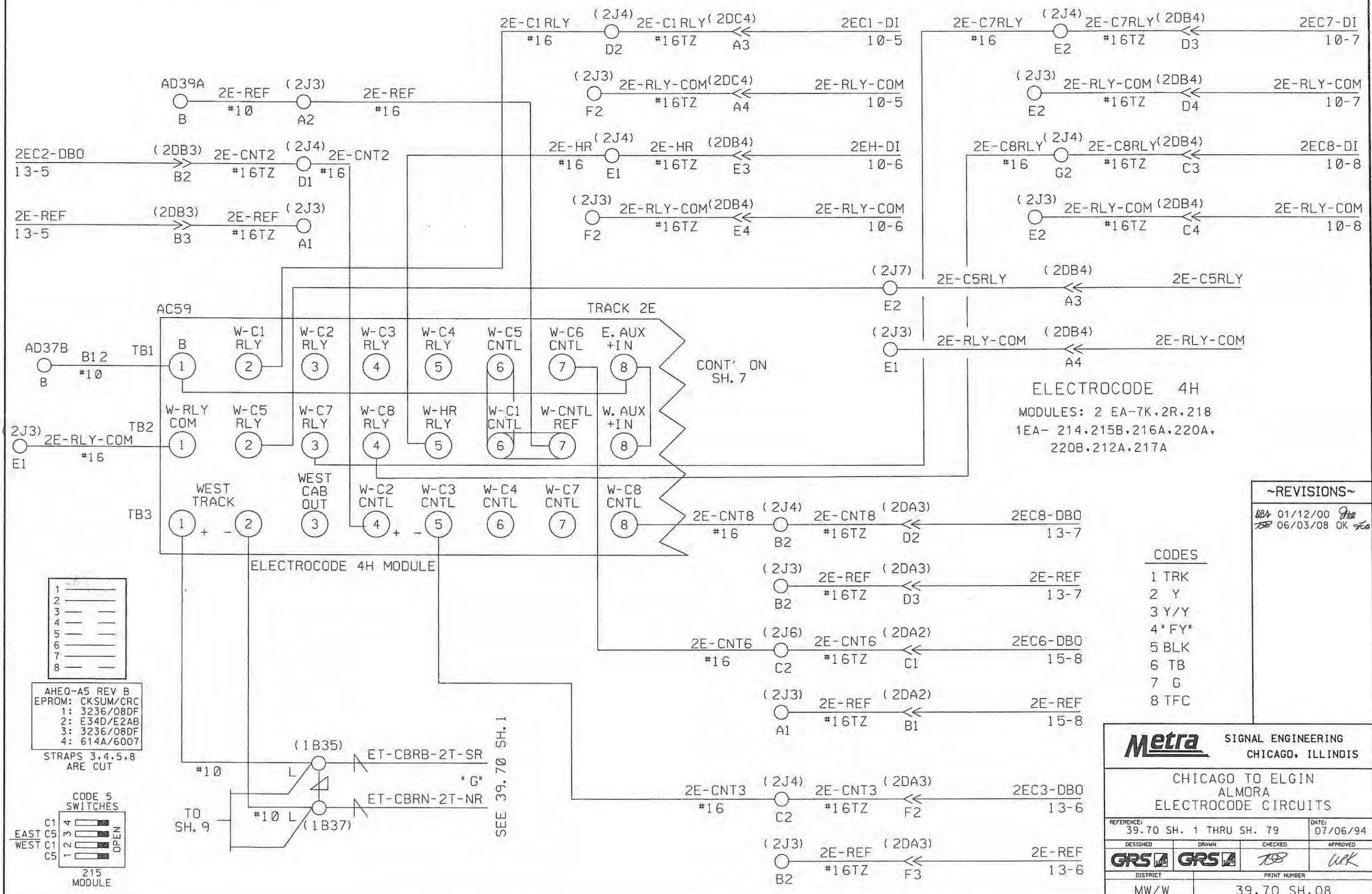
DBA	01/12/00	Ata
DBA	06/03/08	OK fca

ELECTROCODE 4H
 MODULES: 2 EA-7K, 2R, 218
 1EA- 214, 215B, 216A, 220A, 220B, 212A, 217A

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA
 ELECTROCODE CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94		
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>[Signature]</i>	<i>[Signature]</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.07		



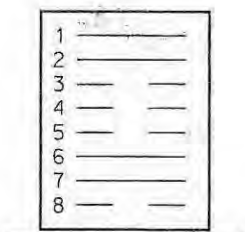
ELECTROCODE 4H
 MODULES: 2 EA-7K, 2R, 218
 1EA- 214, 215B, 216A, 220A,
 220B, 212A, 217A

~REVISIONS~

084	01/12/00	JK
085	06/03/08	OK JK

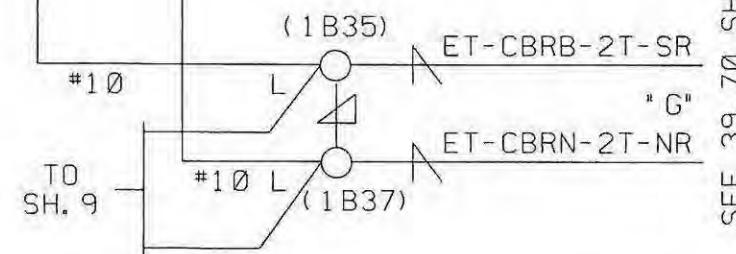
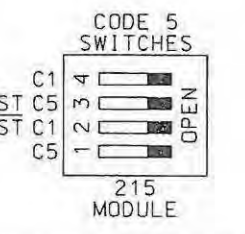
CODES

- 1 TRK
- 2 Y
- 3 Y/Y
- 4 "FY"
- 5 BLK
- 6 TB
- 7 G
- 8 TFC



AHEQ-A5 REV B
 EPROM: CKSUM/CRC
 1: 3236/08DF
 2: E340/E2AB
 3: 3236/08DF
 4: 614A/6007

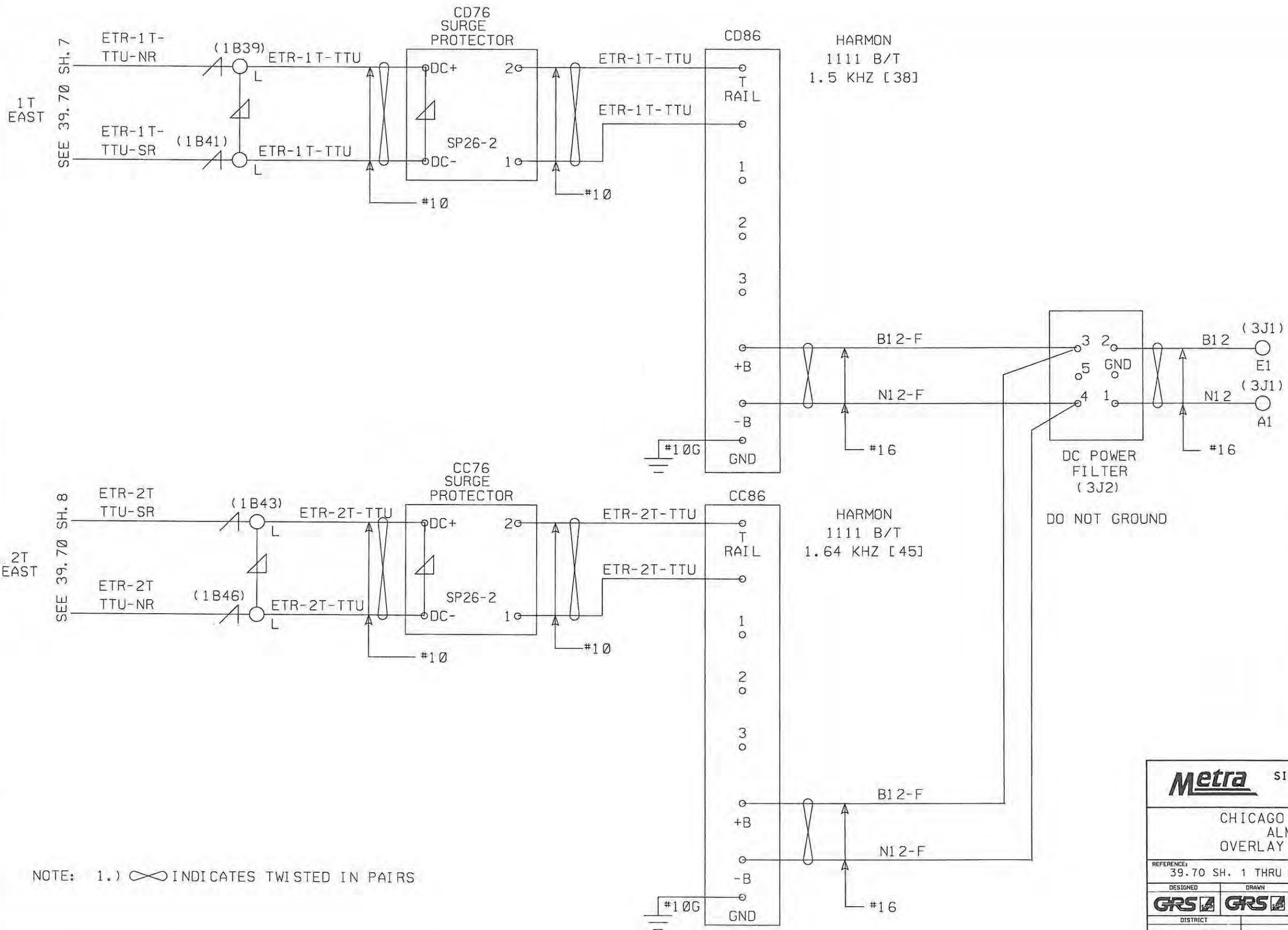
STRAPS 3,4,5,8
 ARE CUT



Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA
 ELECTROCODE CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94		
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>JK</i>	<i>WPK</i>
DISTRICT	PRINT NUMBER		
MW/W	39.70 SH.08		



NOTE: 1.) ∞ INDICATES TWISTED IN PAIRS

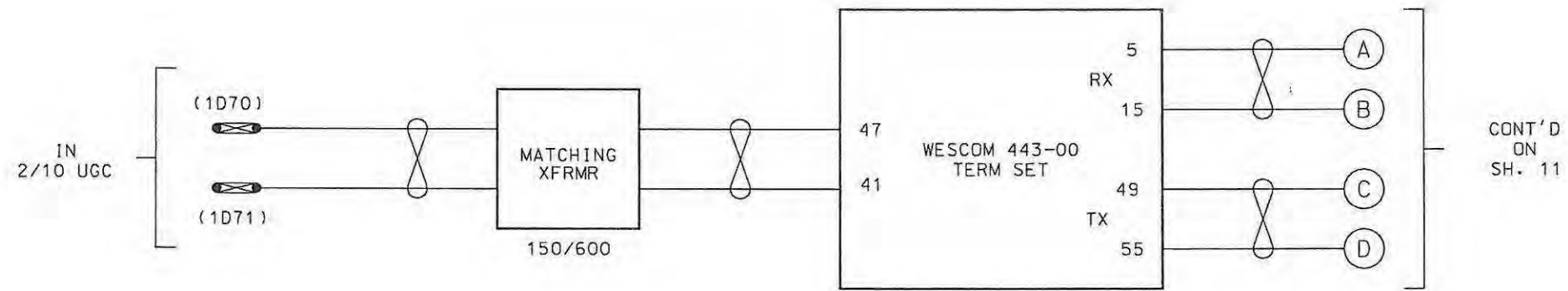
~REVISIONS~

01/12/00

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
OVERLAY CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED JTB	APPROVED WPK
DISTRICT MW/W	PRINT NUMBER 39.70 SH.09



~REVISIONS~

BB	01/12/00	File
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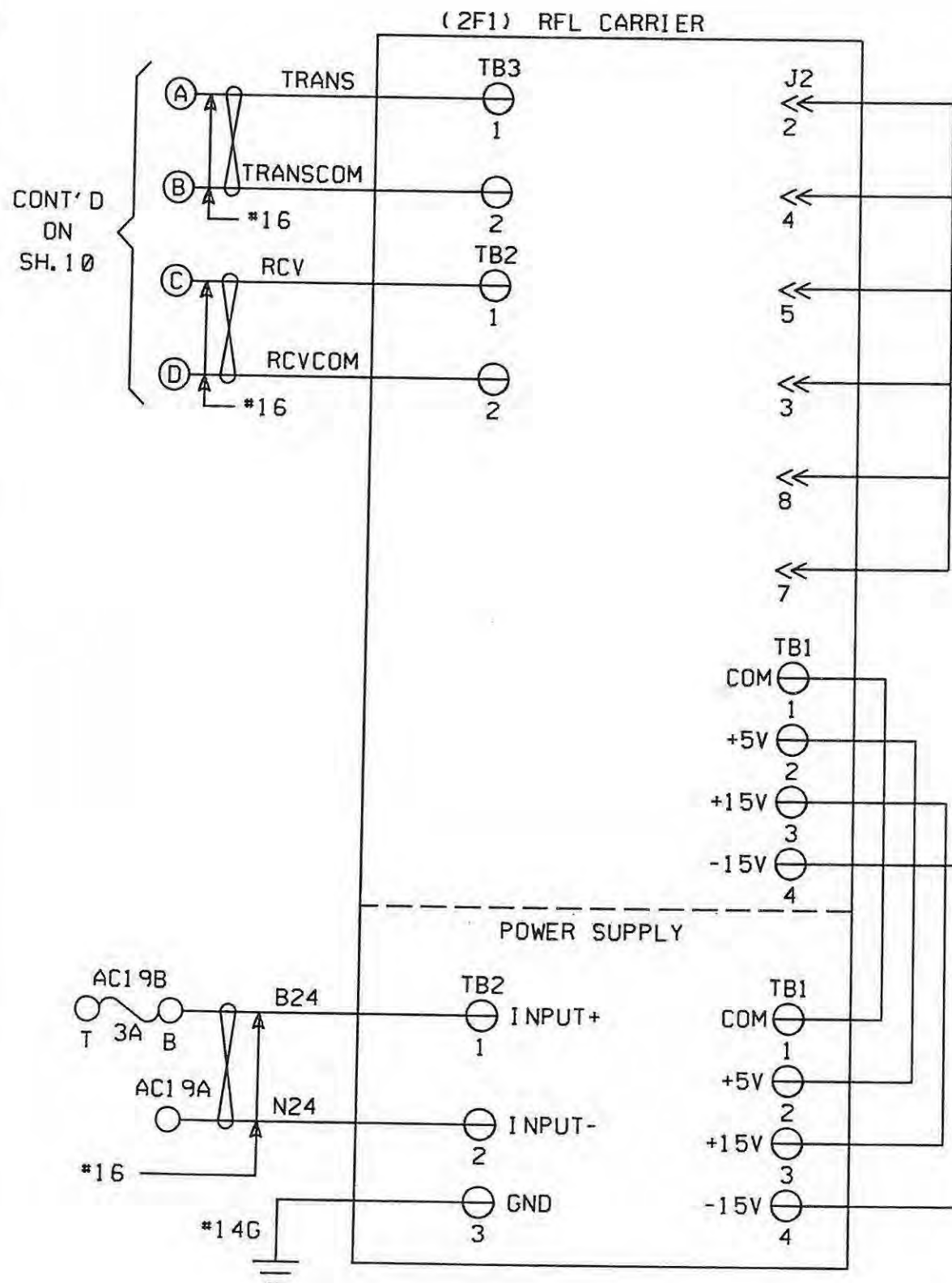
NOTE:

INDICATES TWISTED IN PAIRS

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
CODE SYSTEM

REFERENCE: 39.70 SH. 1 THRU SH. 79		DATE: 07/06/94	
DESIGNED GRS	DRAWN GRS	CHECKED <i>JSB</i>	APPROVED <i>WPK</i>
DISTRICT MW/W		PRINT NUMBER 39.70 SH.10	

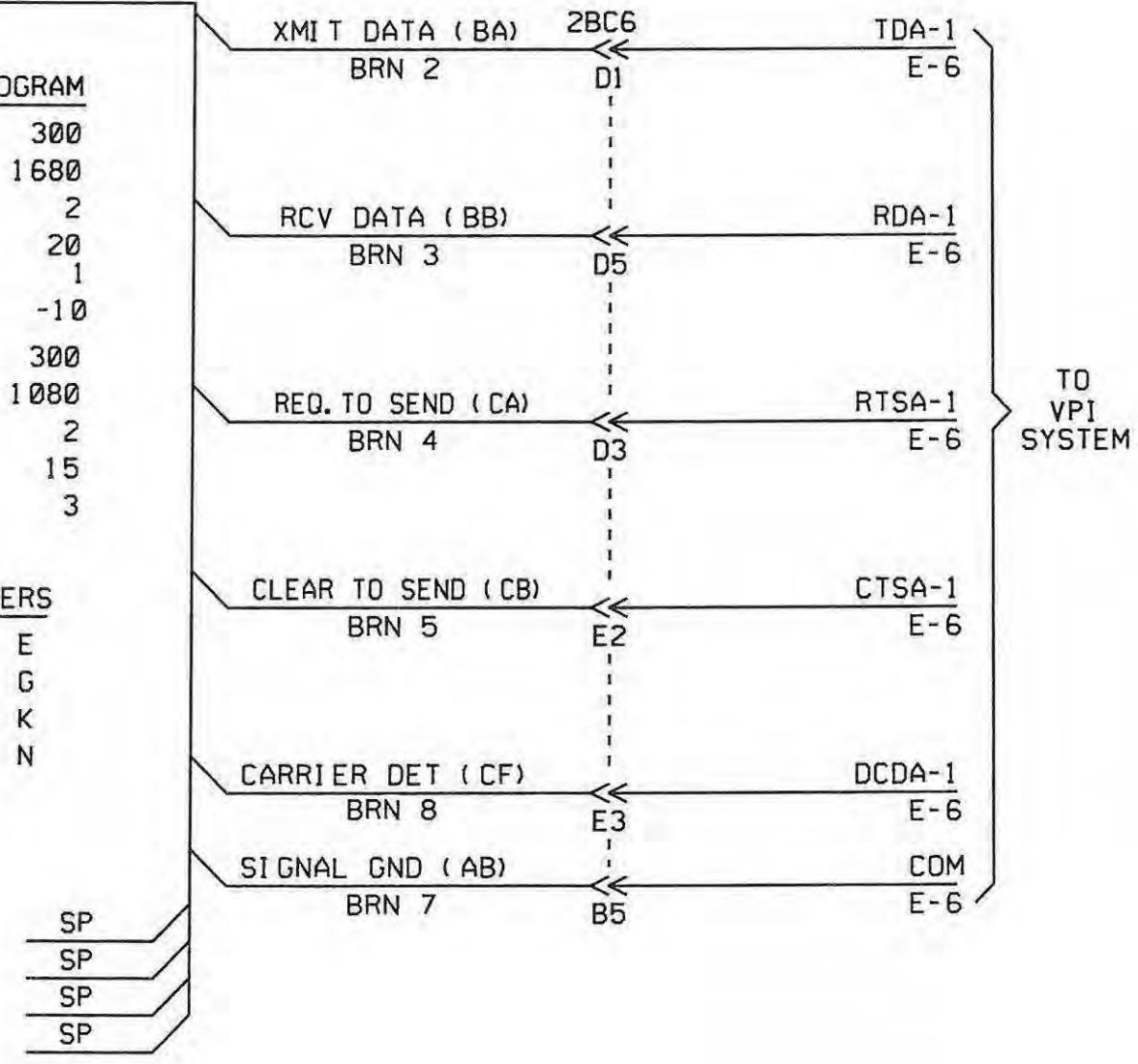


RFL PROGRAM

TXBW	300
TXCF	1680
TXMD	2
CTSD	20
TXMP	1
TXLU	-10
RXBW	300
RXCF	1080
RXMD	2
CDNT	15
RXMP	3

JUNPERS

J3	E
J4	G
J5	K
J6	N



~REVISIONS~

01/12/00	GRS
10/18/13	DK SP

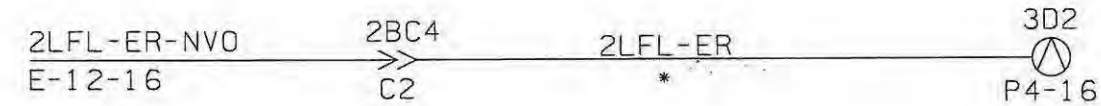
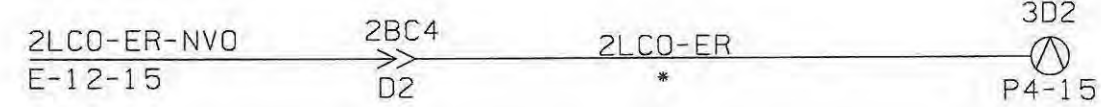
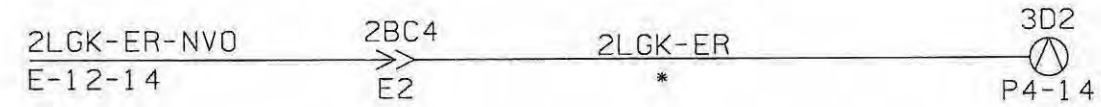
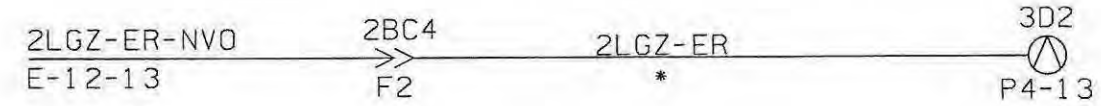
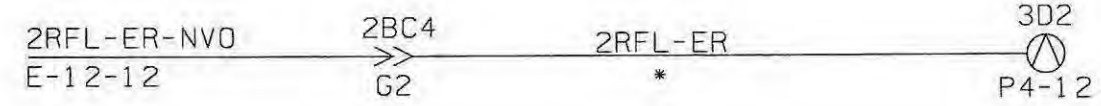
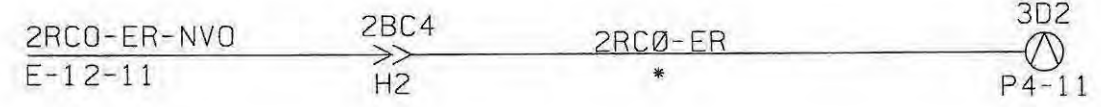
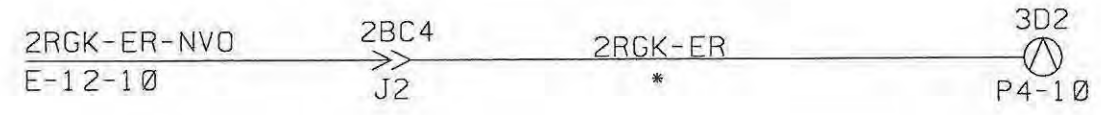
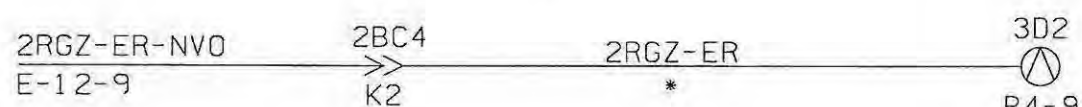
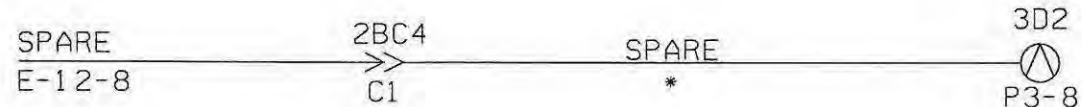
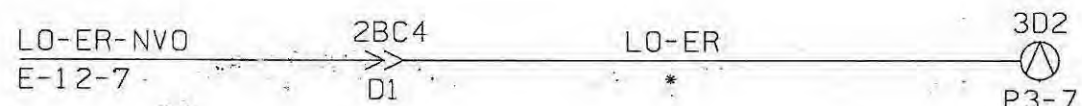
NOTE:
 1.) WIRE SIZE #20 TEFZEL
 UNLESS OTHERWISE NOTED
 2.) * PRE-MADE CABLE 38216-414 GR.1
 3.) ∞ INDICATES TWISTED IN PAIRS

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA
 CODE SYSTEM

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED: GRS	DRAWN: GRS
CHECKED: [Signature]	APPROVED: [Signature]
DISTRICT: MW/W	PRINT NUMBER: 39.70 SH.11

\$\$\$04115\$\$\$



NOTE:
1.) * PRE-MADE CABLE #16TZ

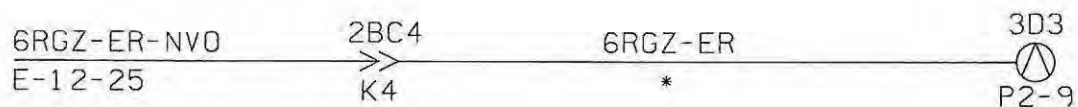
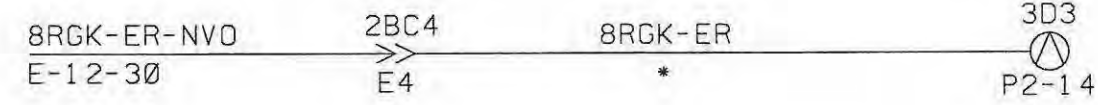
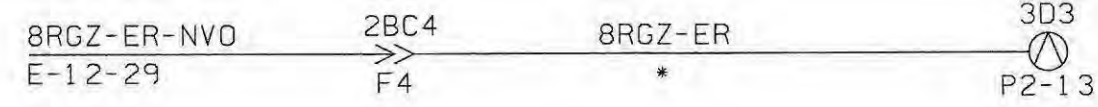
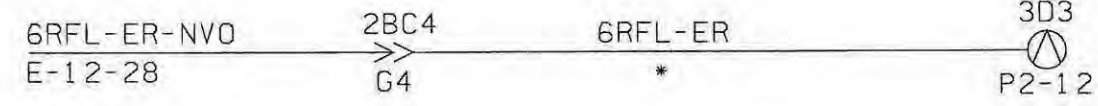
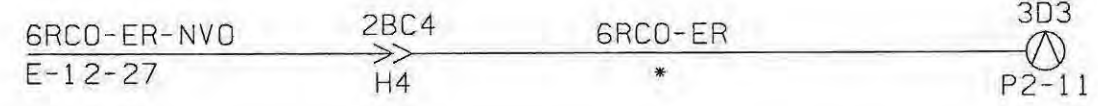
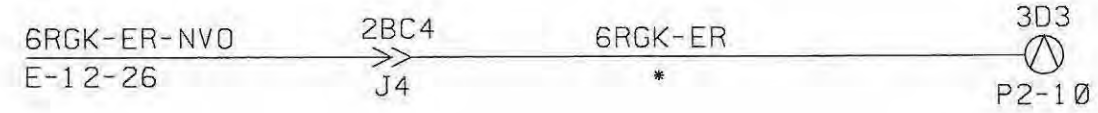
~REVISIONS~

01/12/00 *AW*

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
EVENT-RECORDER CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>WRK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.12



NOTE:
1.) * PRE-MADE CABLE #16 TEFZEL

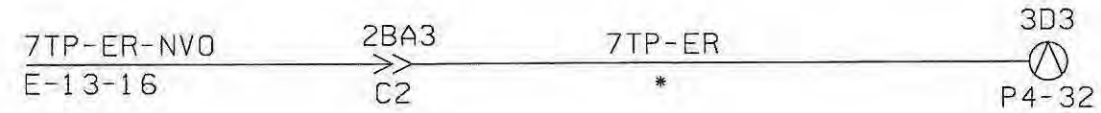
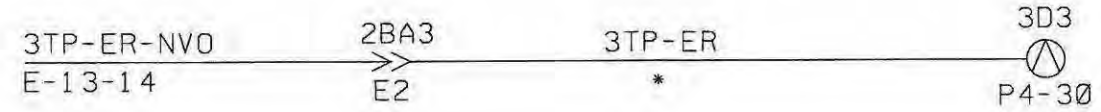
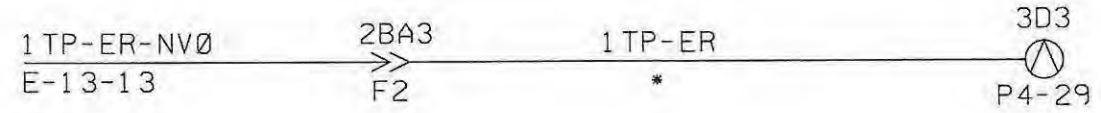
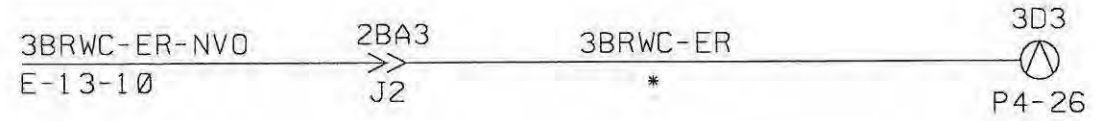
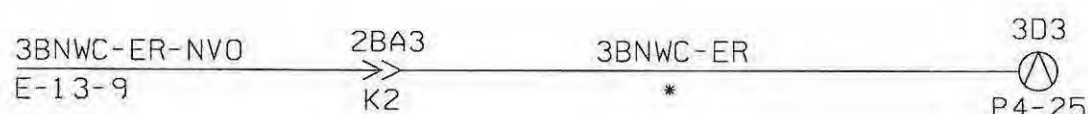
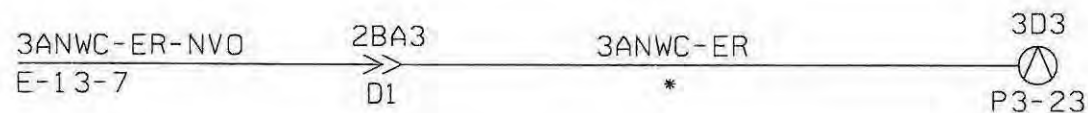
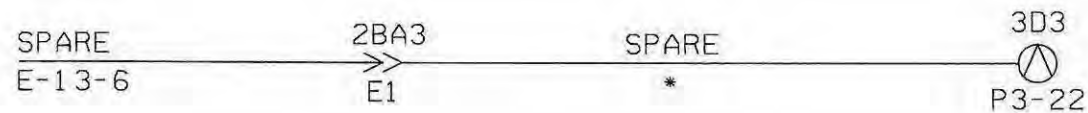
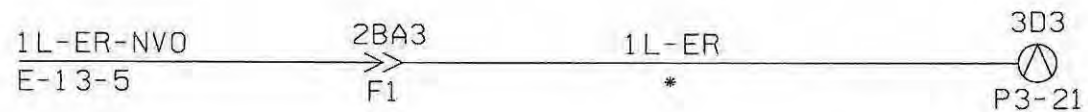
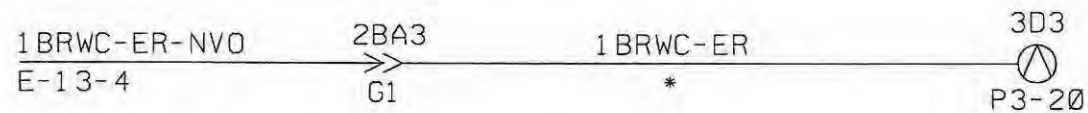
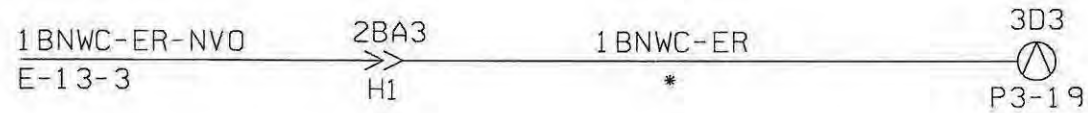
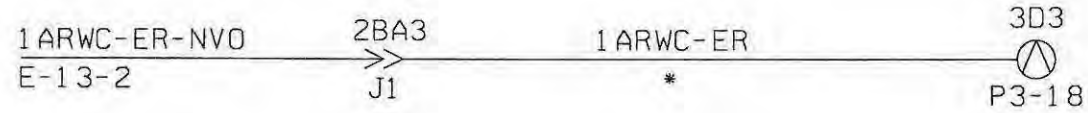
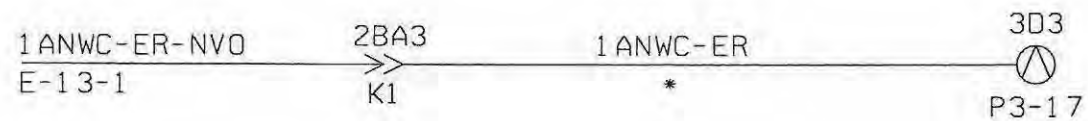
~REVISIONS~

01/12/00

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
EVENT-RECORDER CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.13

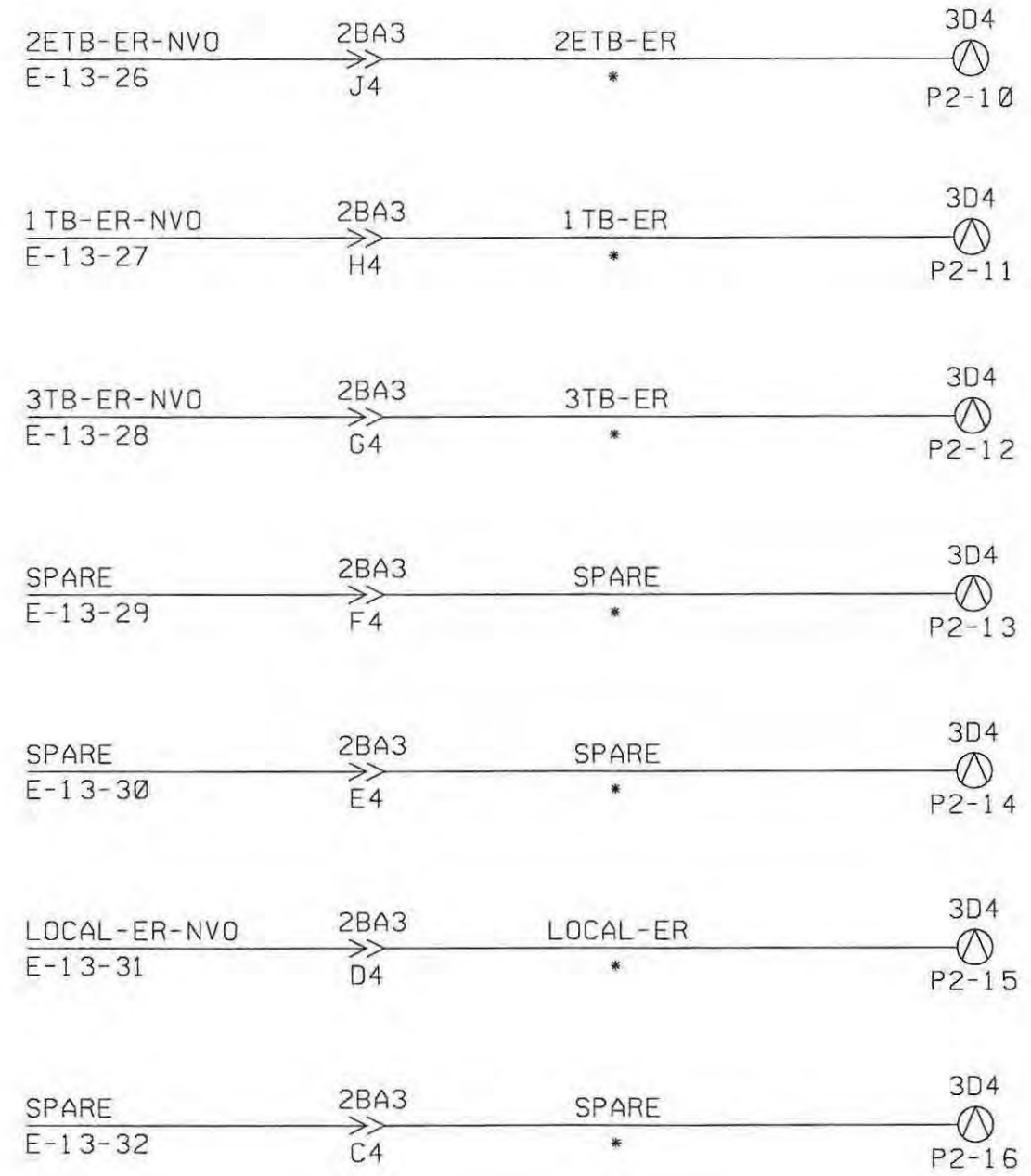
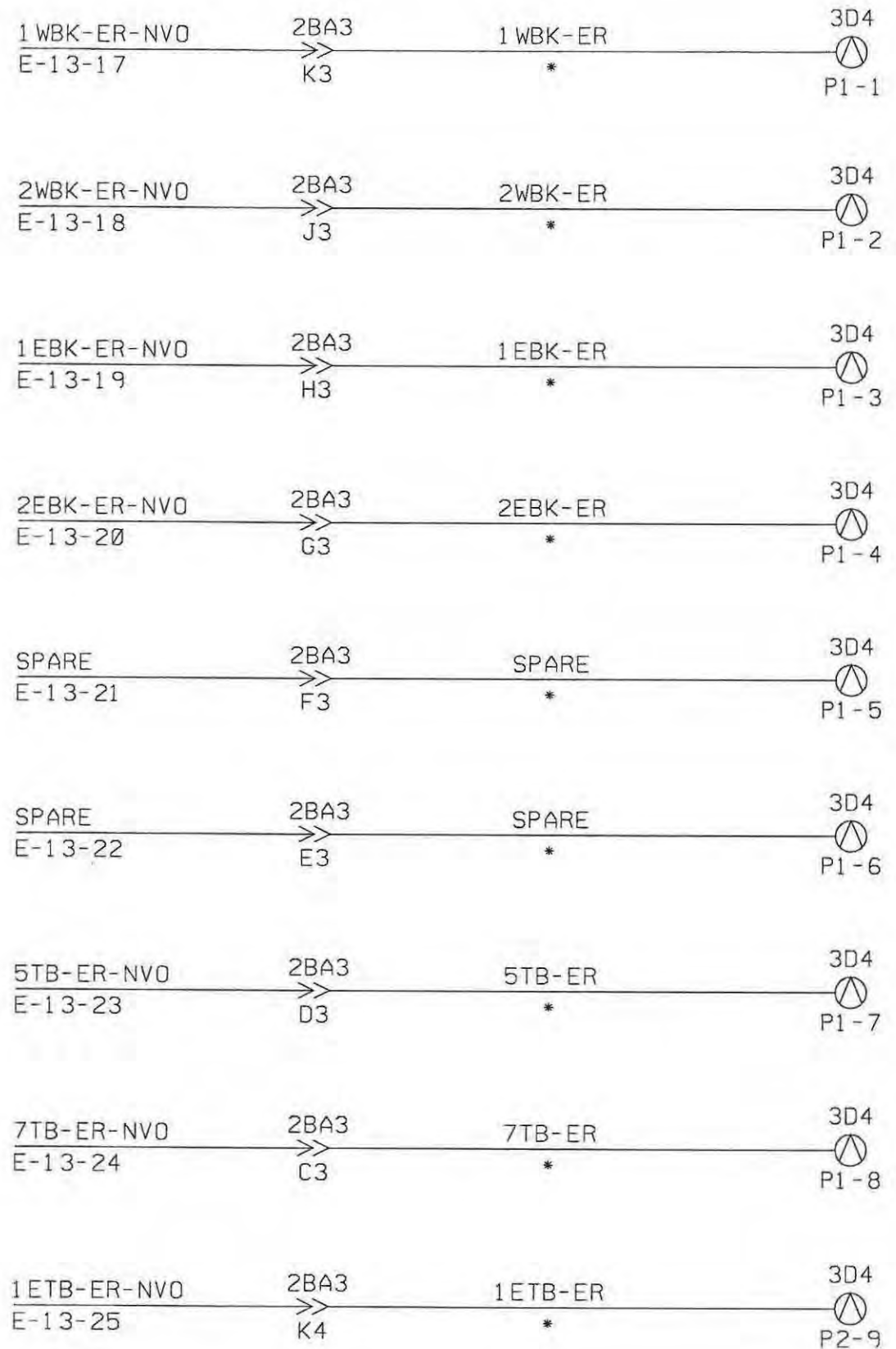


NOTE:
1.) * PRE-MADE CABLE #16TZ

~REVISIONS~
08/01/12/00 *AW*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA EVENT-RECORDER CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>AWK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 14

13-OCT-2000 14:37



~REVISIONS~

01/12/00 *AW*

NOTE:
1.) * PRE-MADE CABLE #16TZ

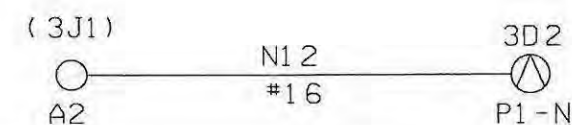
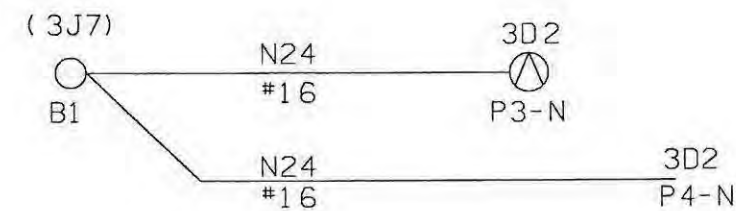
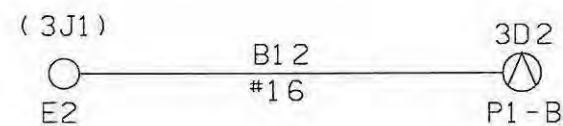
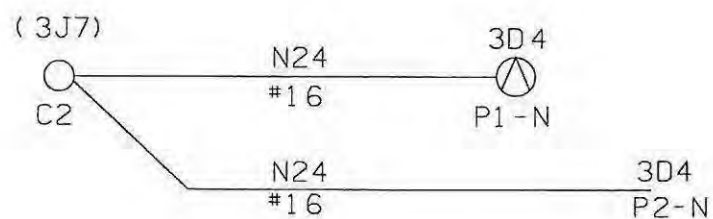
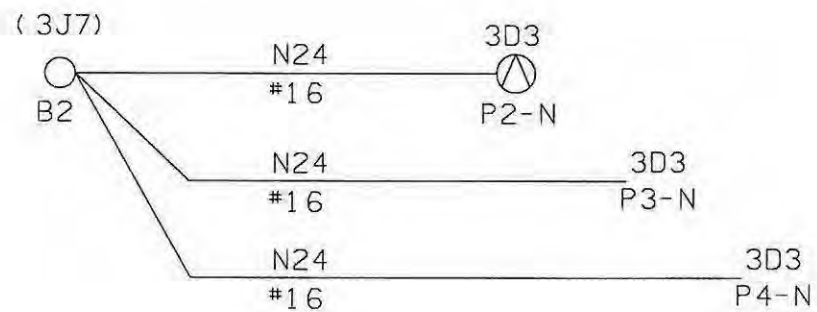
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA EVENT-RECORDER CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>AW</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.15

1	SPARE
2	SPARE
3	SPARE
4	TBL-ER
5	IAK-ER
6	PO-ER
7	LO-ER
8	SPARE
9	2RGZ-ER
10	2RGK-ER
11	2RCO-ER
12	2RFL-ER
13	2LGZ-ER
14	2LGK-ER
15	2LCO-ER
16	2LFL-ER
17	4RGZ-ER
18	4RGK-ER
19	4RCO-ER
20	4RFL-ER
21	4LGZ-ER
22	4LGK-ER
23	4LCO-ER
24	4LFL-ER
25	6RGZ-ER
26	6RGK-ER
27	6RCO-ER
28	6RFL-ER
29	8RGZ-ER
30	8RGK-ER
31	8RCO-ER
32	8RFL-ER

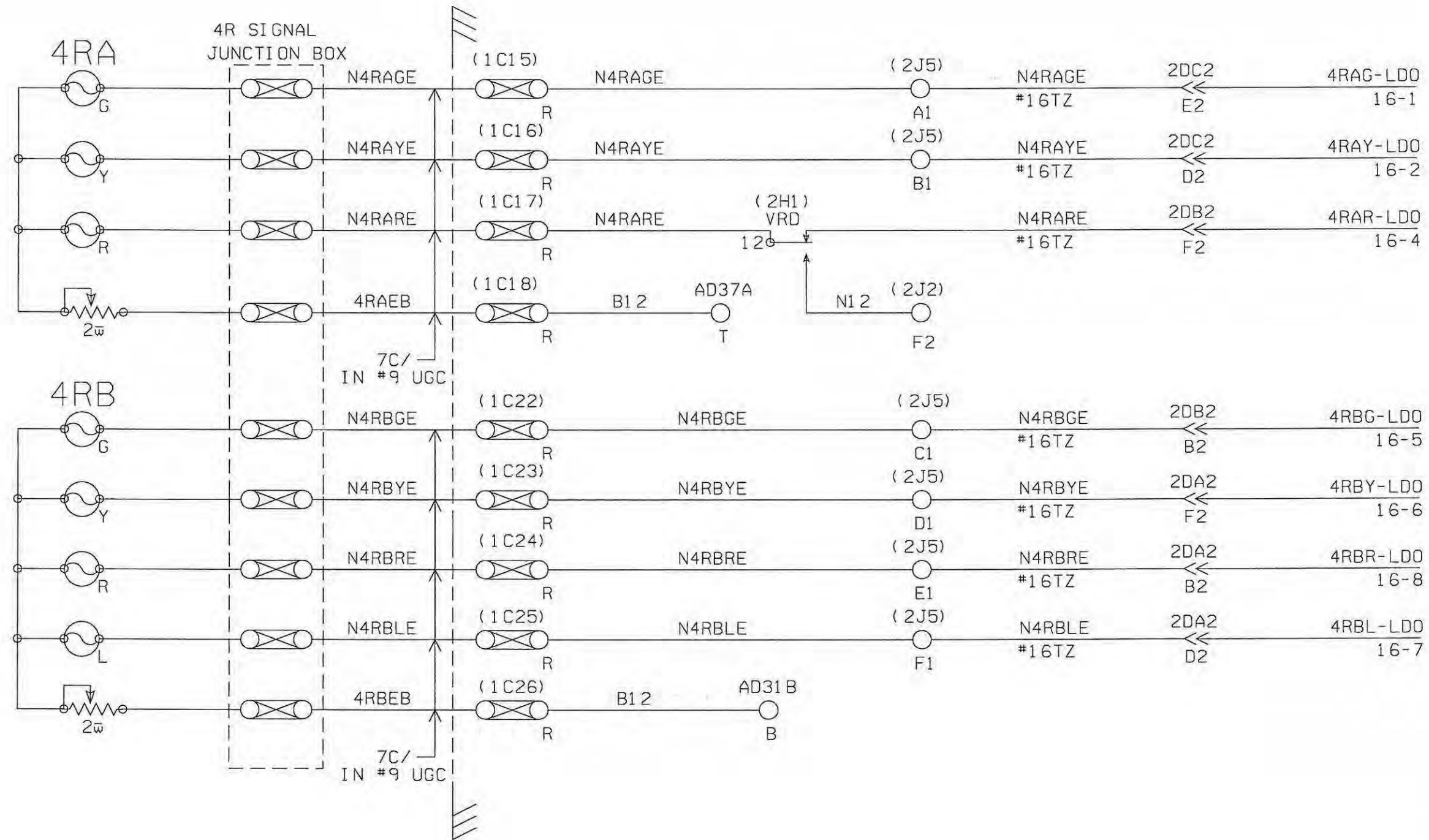
1	1ANWC-ER
2	1ARWC-ER
3	1BNWC-ER
4	1BRWC-ER
5	1L-ER
6	SPARE
7	3ANWC-ER
8	3ARWC-ER
9	3BNWC-ER
10	3BRWC-ER
11	3L-ER
12	SPARE
13	1TP-ER
14	3TP-ER
15	5TP-ER
16	7TP-ER
17	1WBK-ER
18	2WBK-ER
19	1EBK-ER
20	2EBK-ER
21	SPARE
22	SPARE
23	5TB-ER
24	7TB-ER
25	1ETB-ER
26	2ETB-ER
27	1TB-ER
28	3TB-ER
29	SPARE
30	SPARE
31	LOCAL-ER
32	SPARE

~REVISIONS~

08/01/12/00 *AW*



Metra		SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA EVENT-RECORDER CIRCUITS			
REFERENCE: 39.70 SH. 1 THRU SH. 79	DESIGNED GRS	CHECKED <i>AW</i>	DATE: 07/06/94
DRAWN GRS	APPROVED <i>UK</i>	PRINT NUMBER	
DISTRICT MW/W	39.70 SH. 16		



~REVISIONS~

01/12/00 *AW*

NOTE:

1.) ALL WIRES #10 UNLESS OTHERWISE NOTED

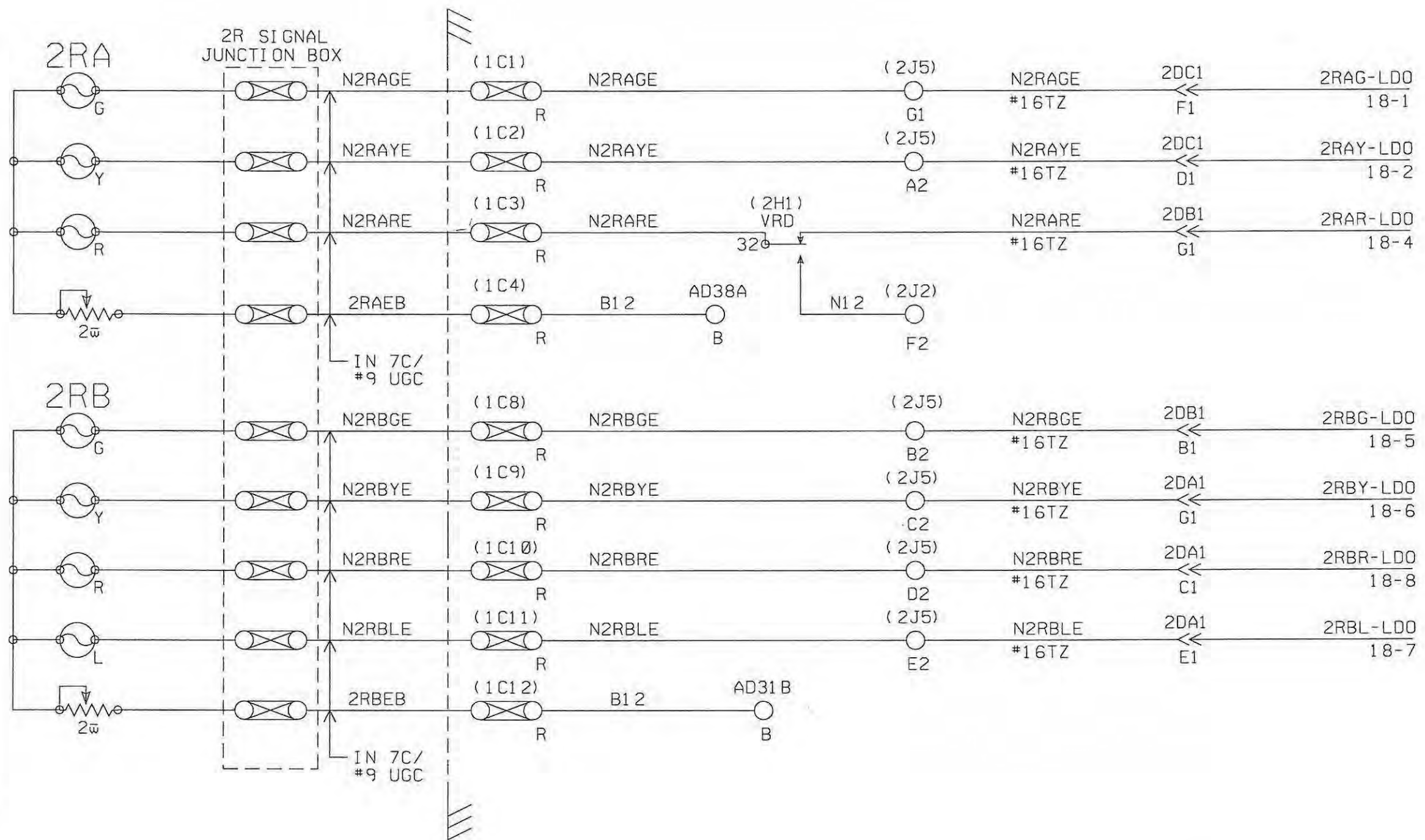
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
SIGNAL LIGHTING CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>AW</i>	<i>URK</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH. 17



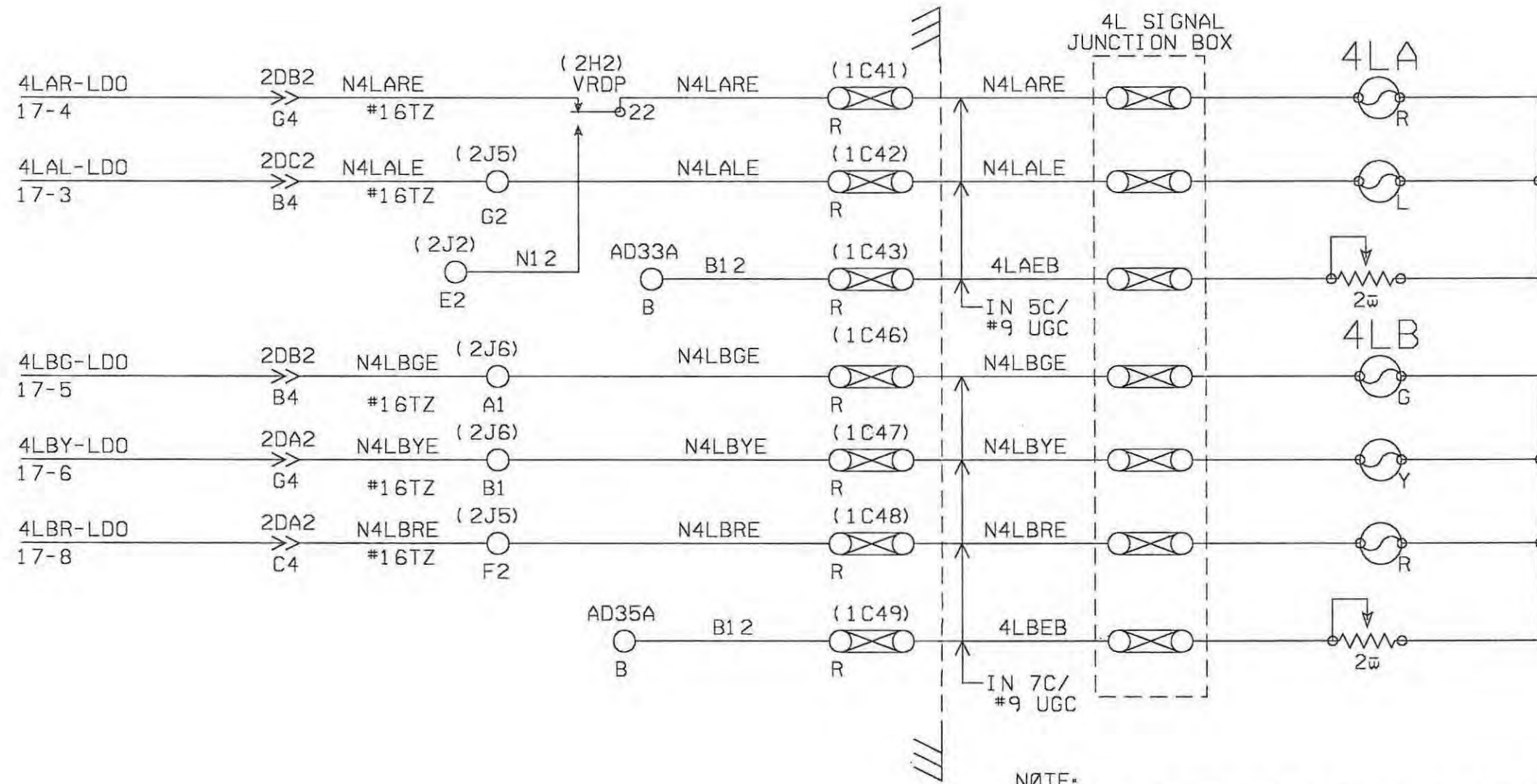
NOTE:
1.) ALL WIRES #10 UNLESS OTHERWISE NOTED

~REVISIONS~	
004	01/12/00 <i>File</i>

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
SIGNAL LIGHTING CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JD</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.18



NOTE:
 1.) ALL WIRES #10 UNLESS OTHERWISE NOTED

~REVISIONS~

SB 01/12/00 *File*

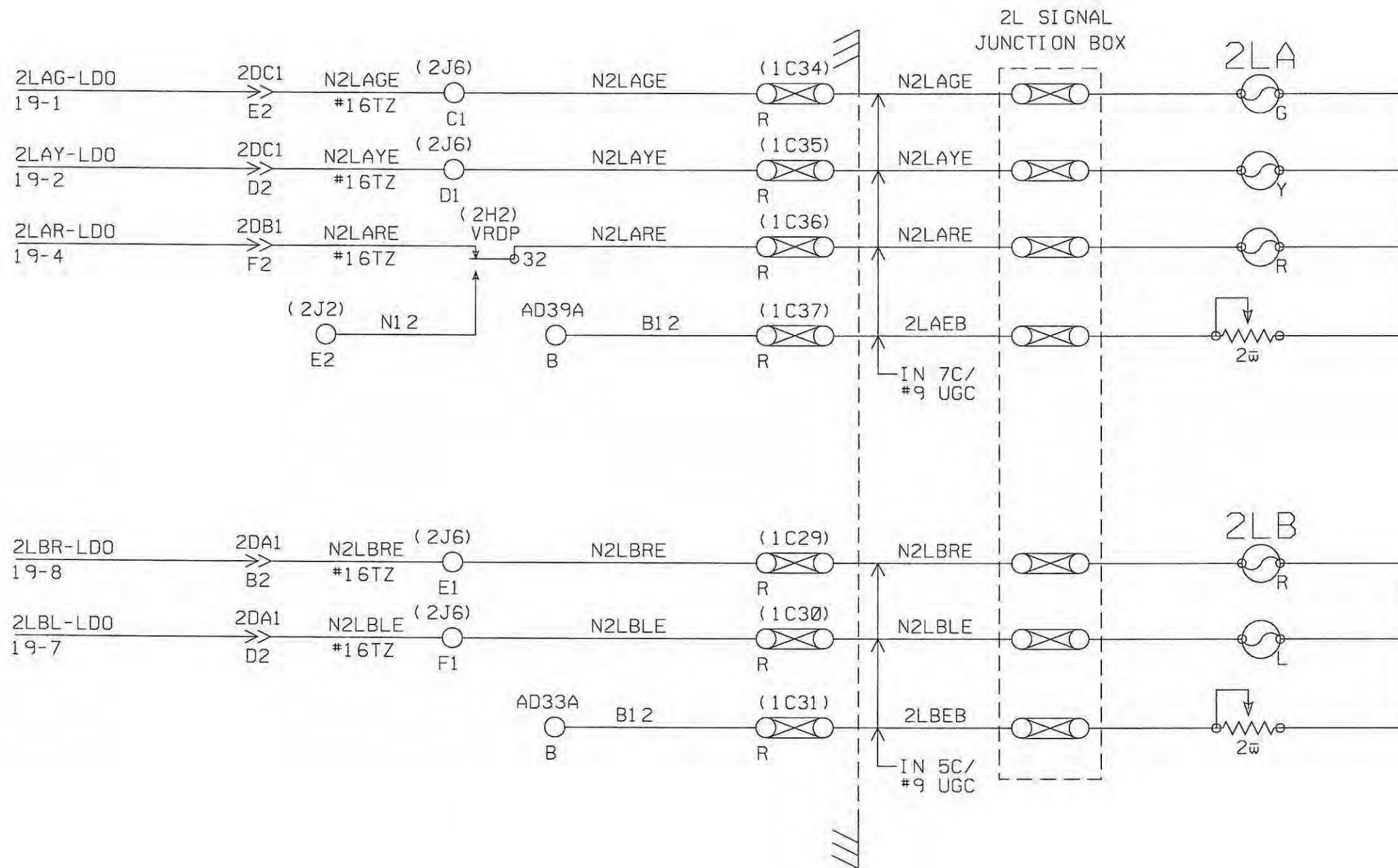
Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA
 SIGNAL LIGHTING CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>AS</i>	<i>WK</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH.19

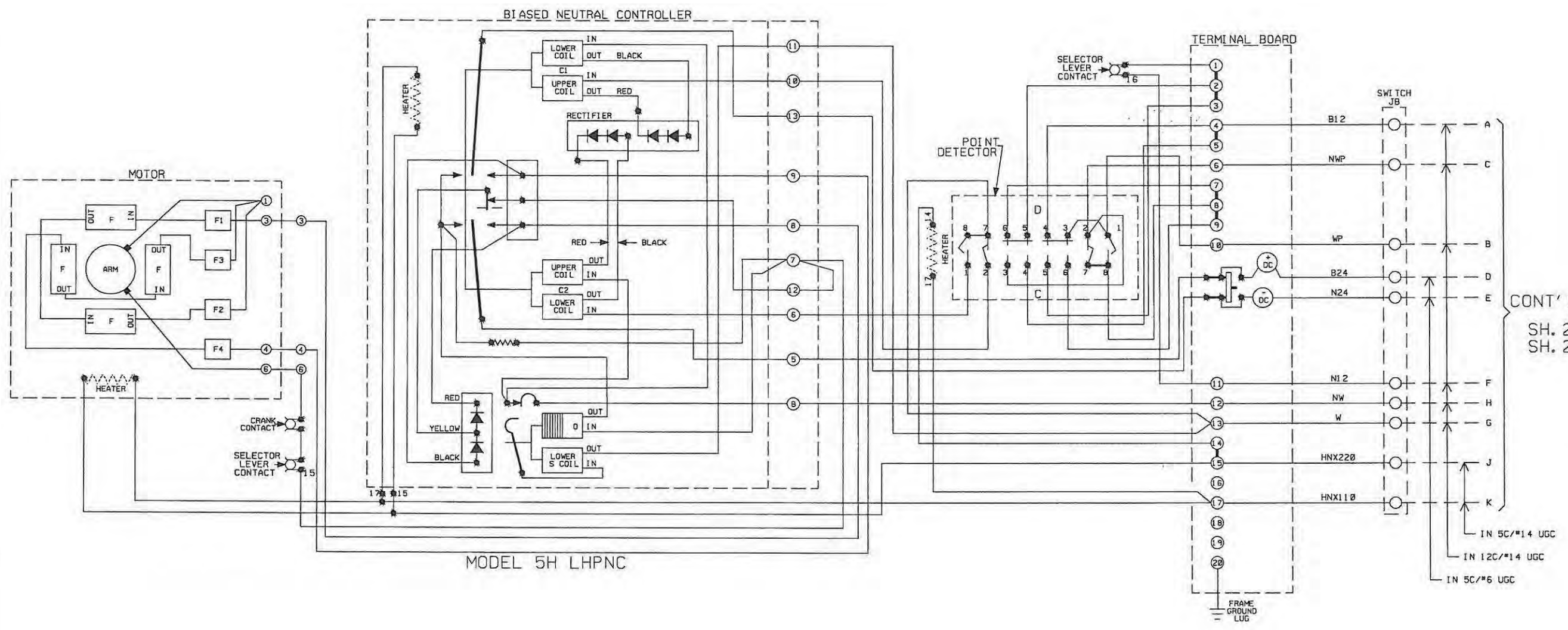


~REVISIONS~

01/12/00 *AW*

NOTE:
1.) ALL WIRES #10 UNLESS OTHERWISE NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA SIGNAL LIGHTING CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>AWK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.20



CONT'D ON
SH. 25
SH. 26

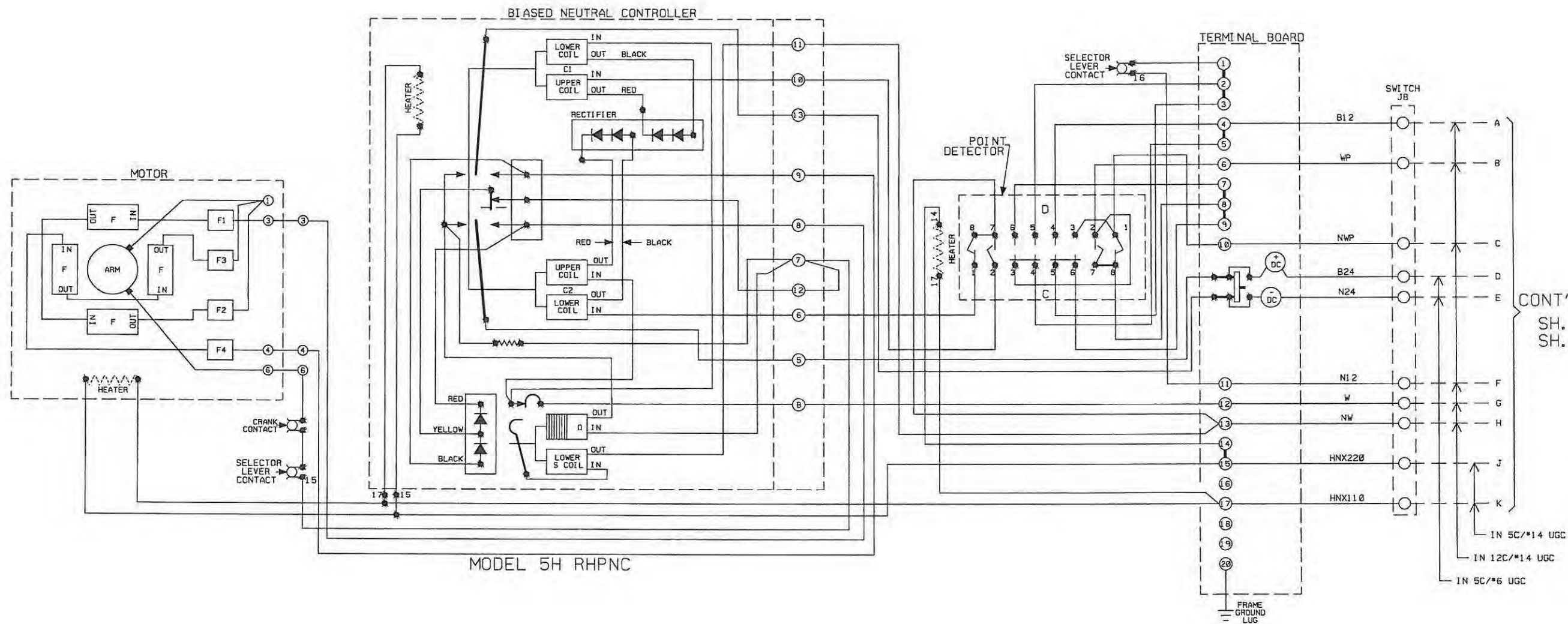
~REVISIONS~

01/12/00	AW
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Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
MODEL 5H LHPNC SWITCH MACHINE

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94		
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	AW	AW
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 21		



CONT'D ON
SH. 23
SH. 24

~REVISIONS~

BB 01/12/00 *File*

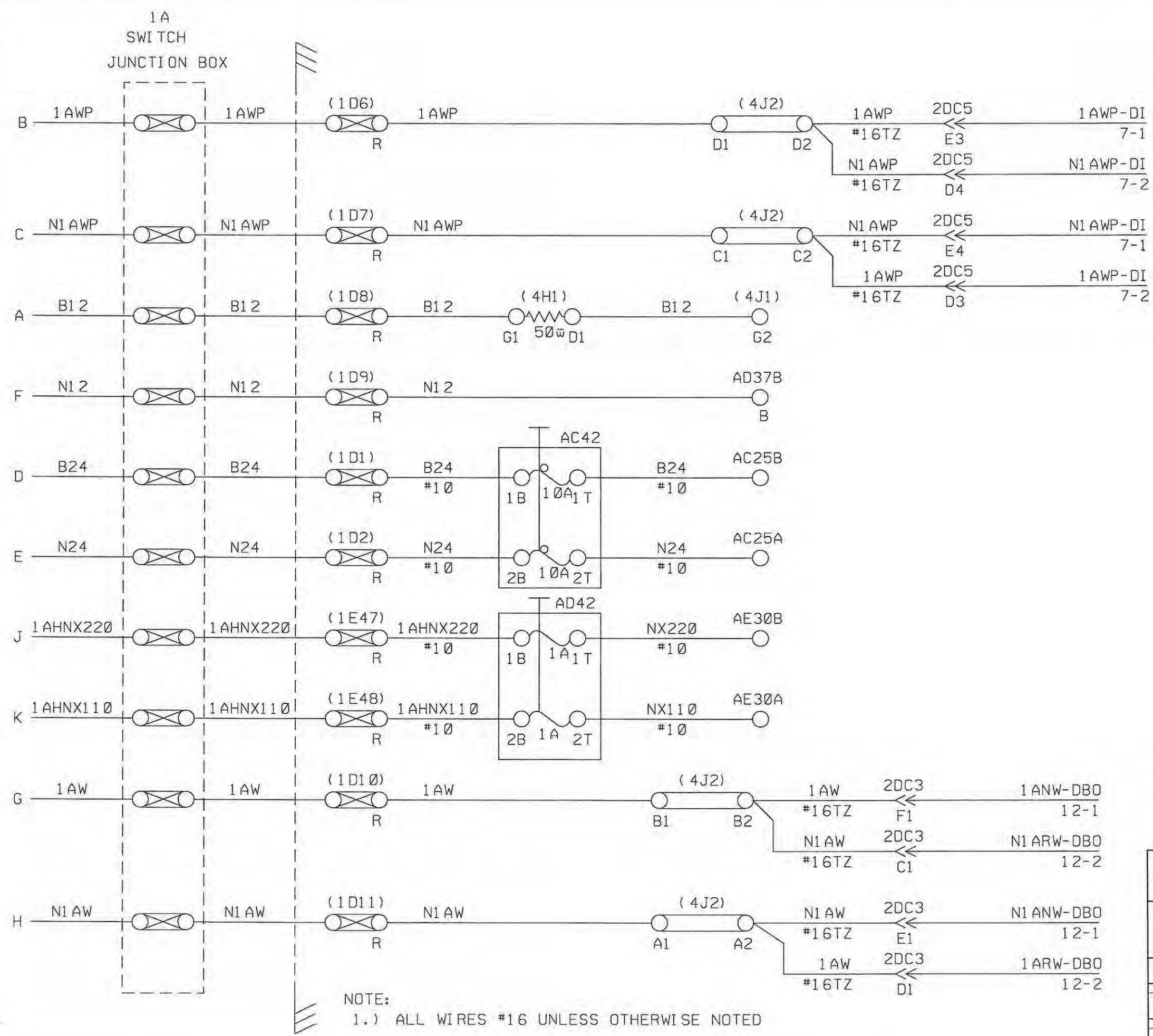
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
MODEL 5H RHPNC SWITCH MACHINE

REFERENCE: 39.70 SH. 1 THRU SH. 79 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>TSB</i>	<i>WPK</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH.22



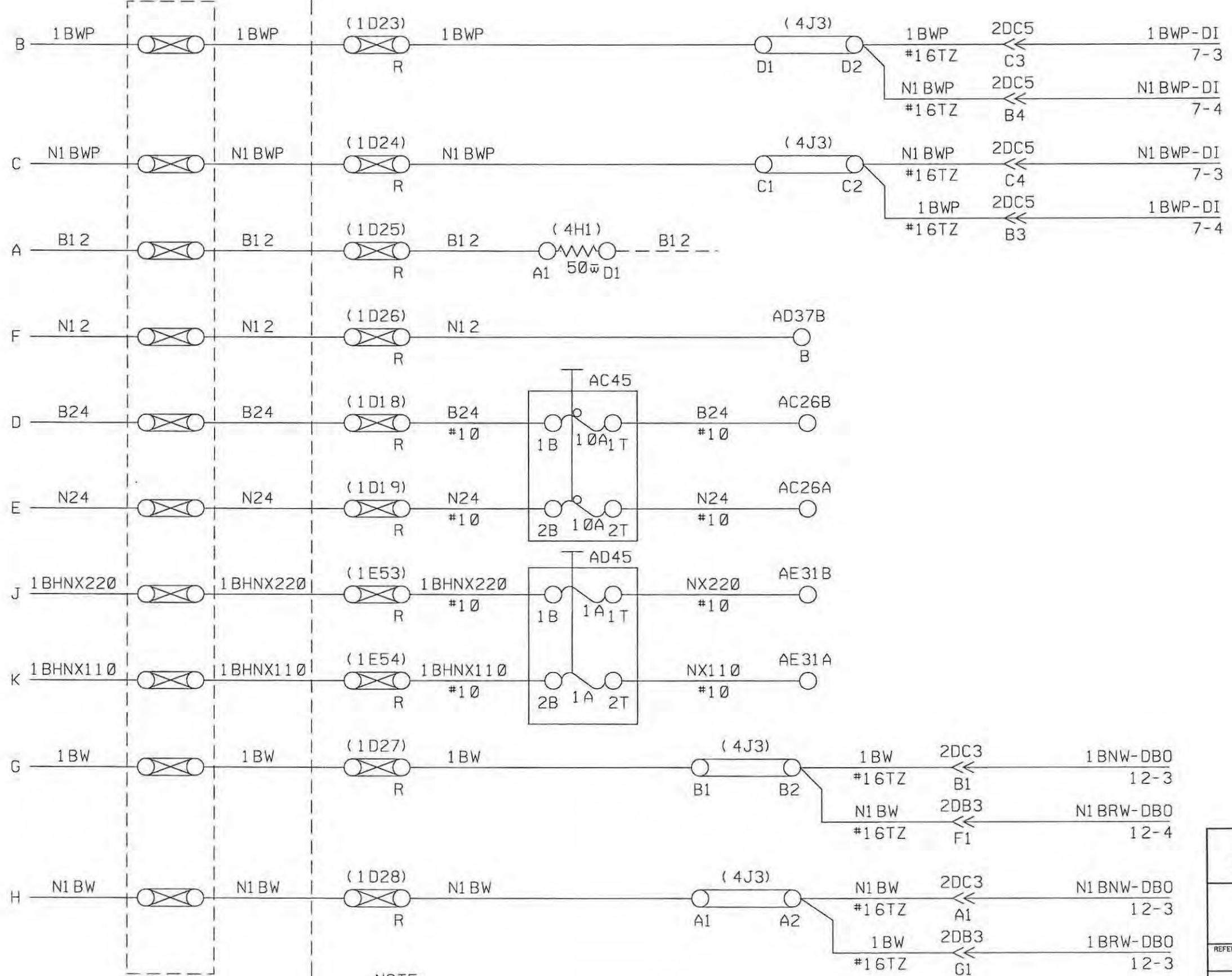
CONT'D
ON
SH. 22

NOTE:
1.) ALL WIRES #16 UNLESS OTHERWISE NOTED

~REVISIONS~
08/01/12/00 *AW*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA SWITCH CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>AWK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.23

1B
SWITCH
JUNCTION BOX



CONT'D
ON
SH. 22

NOTE:
1.) ALL WIRES #16 UNLESS OTHERWISE NOTED

~REVISIONS~

004 01/12/00 *File*

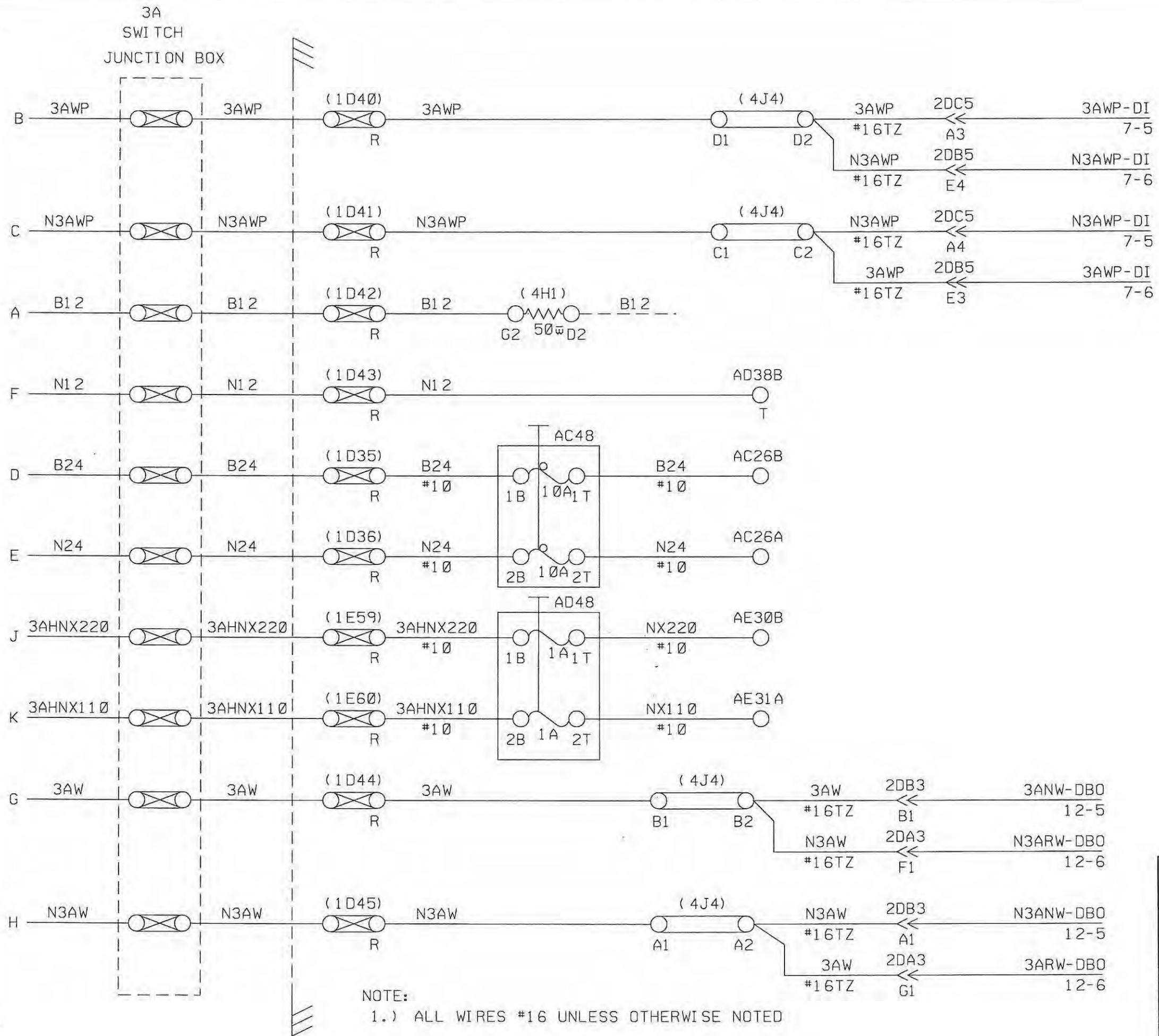
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
SWITCH CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>RB</i>	<i>WK</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH.24



~REVISIONS~

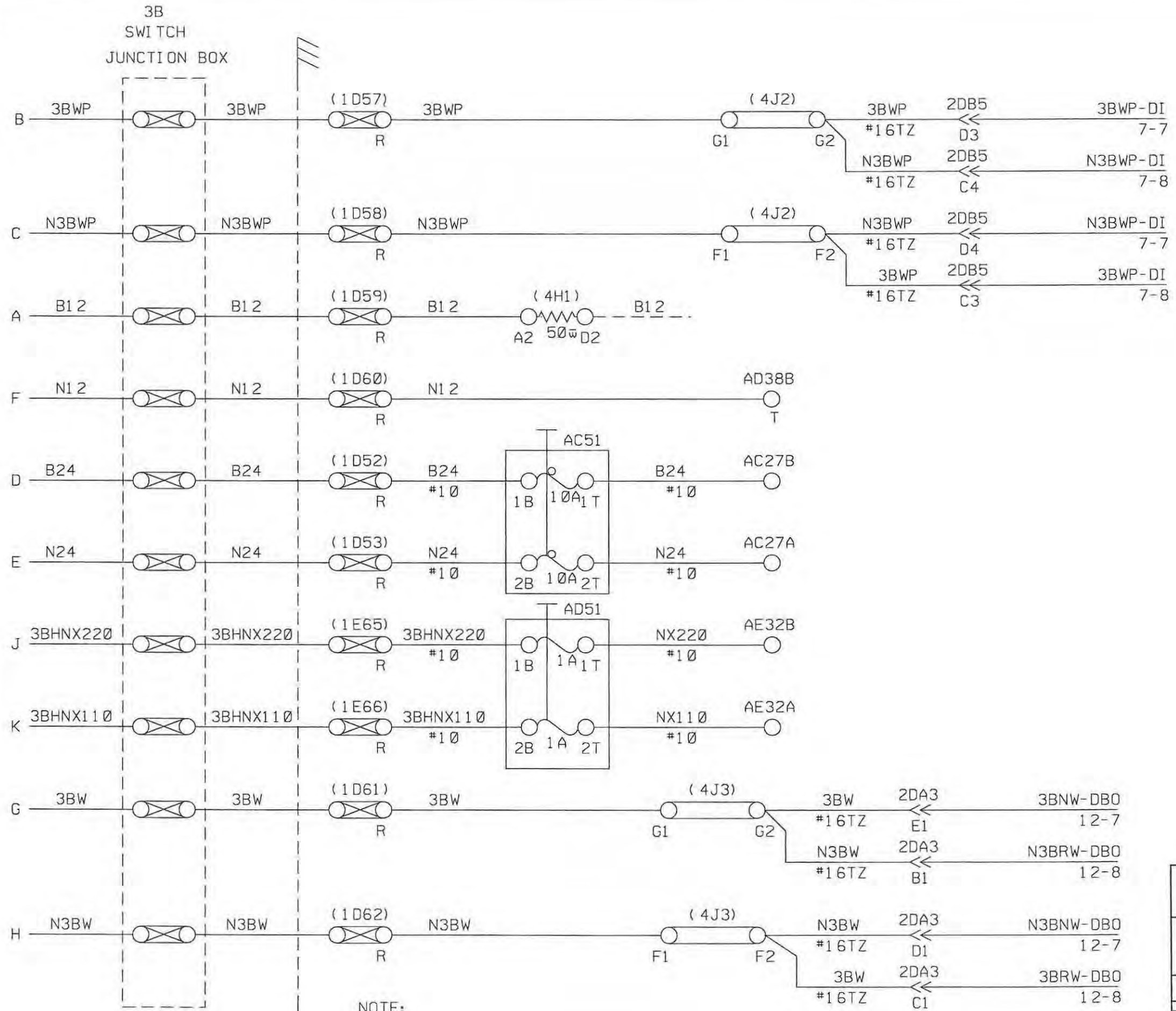
DB 01/12/00 *Jim*

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
SWITCH CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94		
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>TS</i>	<i>WRK</i>
DISTRICT	PRINT NUMBER		
MW/W	39.70 SH. 25		

19-001-2-000 05/97



CONT'D
ON
SH. 21

NOTE:
1.) ALL WIRES #16 UNLESS OTHERWISE NOTED

~REVISIONS~

01/12/00 *AW*

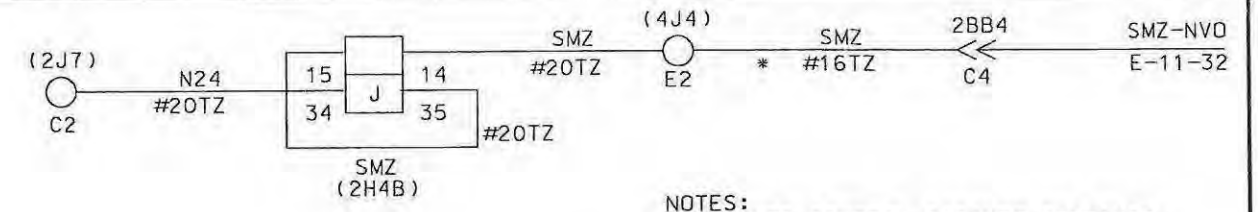
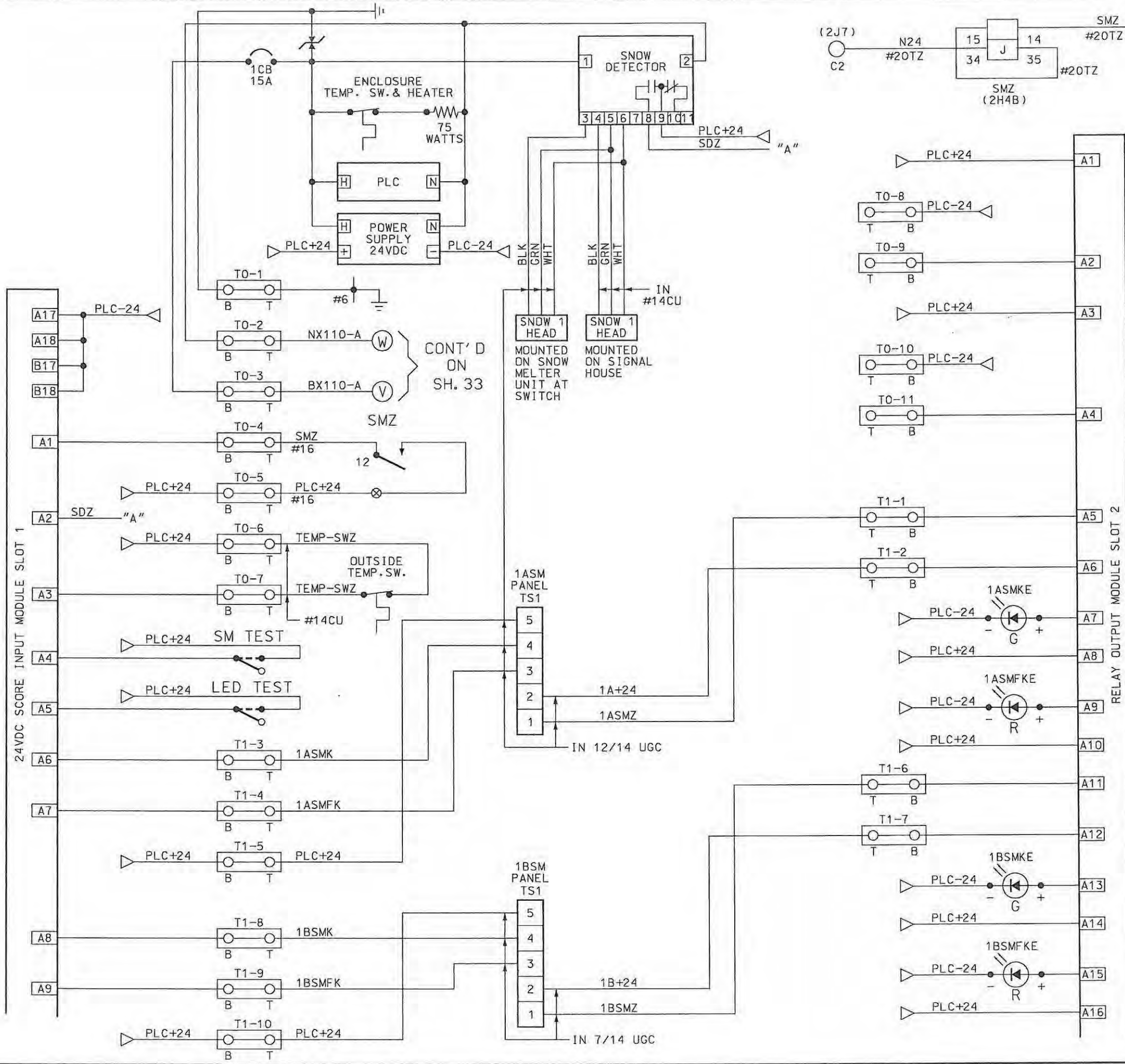
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
SWITCH CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 79 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>AW</i>	<i>AW</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH.26



- NOTES:
- SM BLOWER CONTROL CABINET SETTINGS:
- RUN TIMER SET AT SWITCH 5 (FIVE), POSITION 0 (ZERO) (CENTER).
 - AIR TEMPERATURE SWITCH SET IN THE OVERRIDE POSITION.
 - CONTROL SWITCH SET IN THE REMOTE POSITION.
- SM CONTROL PANEL (IN SIH) SETTINGS:
- MOISTURE SENSOR TIMER SET AT 30 (THIRTY) MINUTES.
 - TEMPERATURE SENSOR SETTING SET AT 38 DEGREES. (THIS SETTING WILL NEED TO BE FIELD TESTED AND VERIFIED THAT IT IS PROPERLY SET).

- WAGO JUMPER (#132282-402)
- INDICATION LEDS ON PLC ENCLOSURE
- CONNECTION POINT ON PLC MODULE
- PREWIRED BUSSED BATTERY

ALL WIRING ON THIS SHEET #18 AWG UNLESS NOTED

* PRE-MADE CABLE

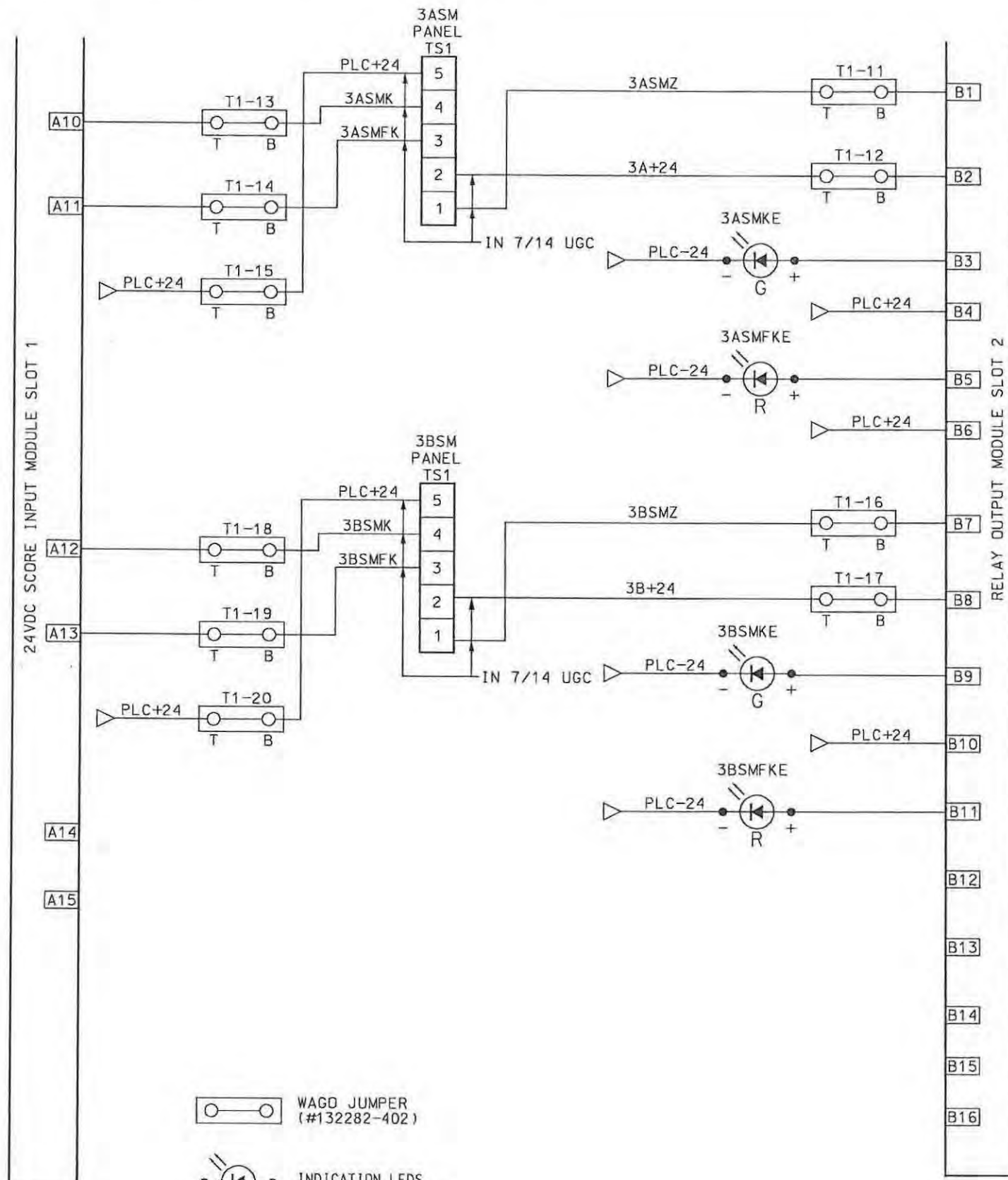
~REVISIONS~

05/26/10	OK	JH
07/07/10	OK	JH

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

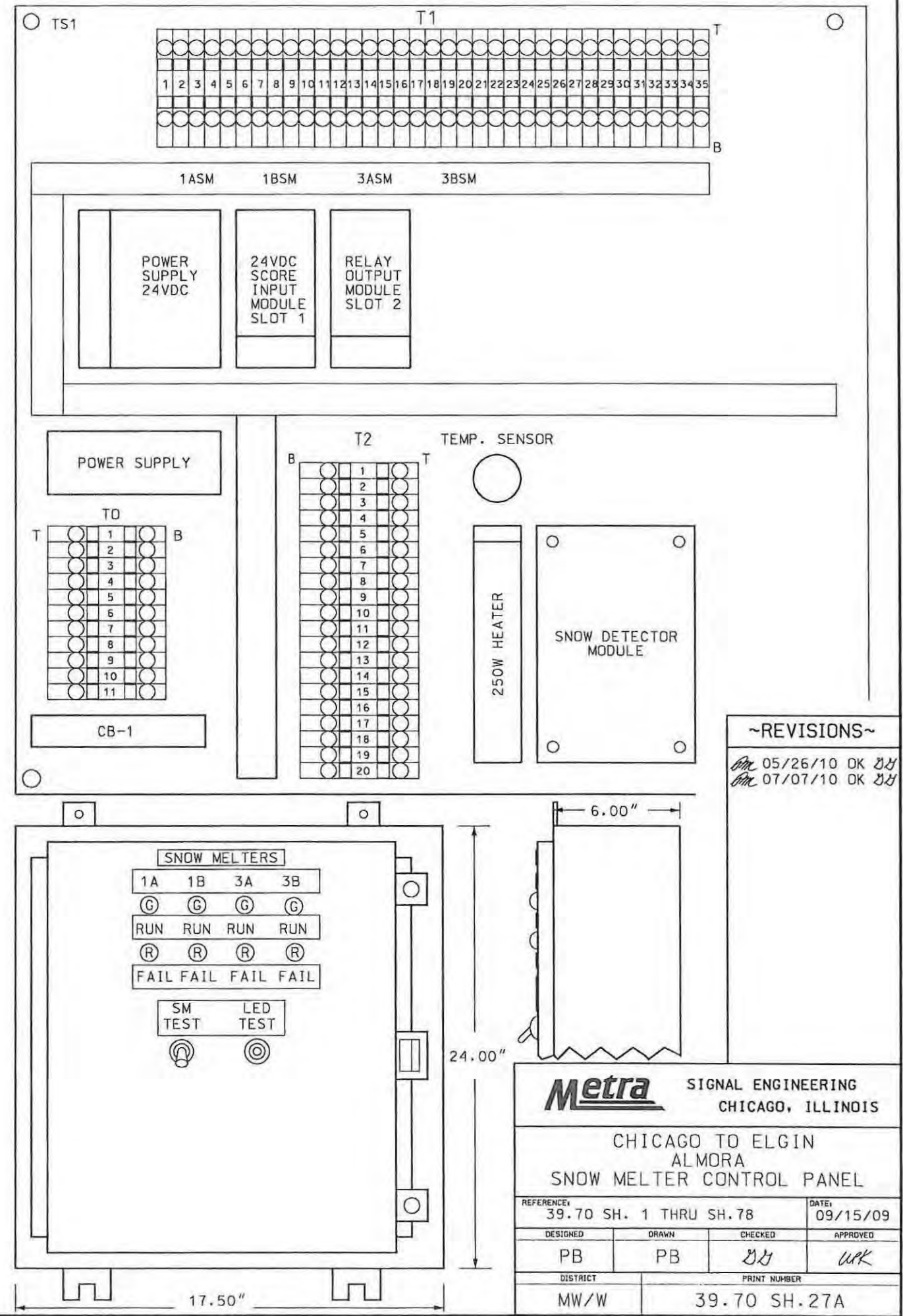
CHICAGO TO ELGIN
ALMORA
SNOW MELTER CONTROLS

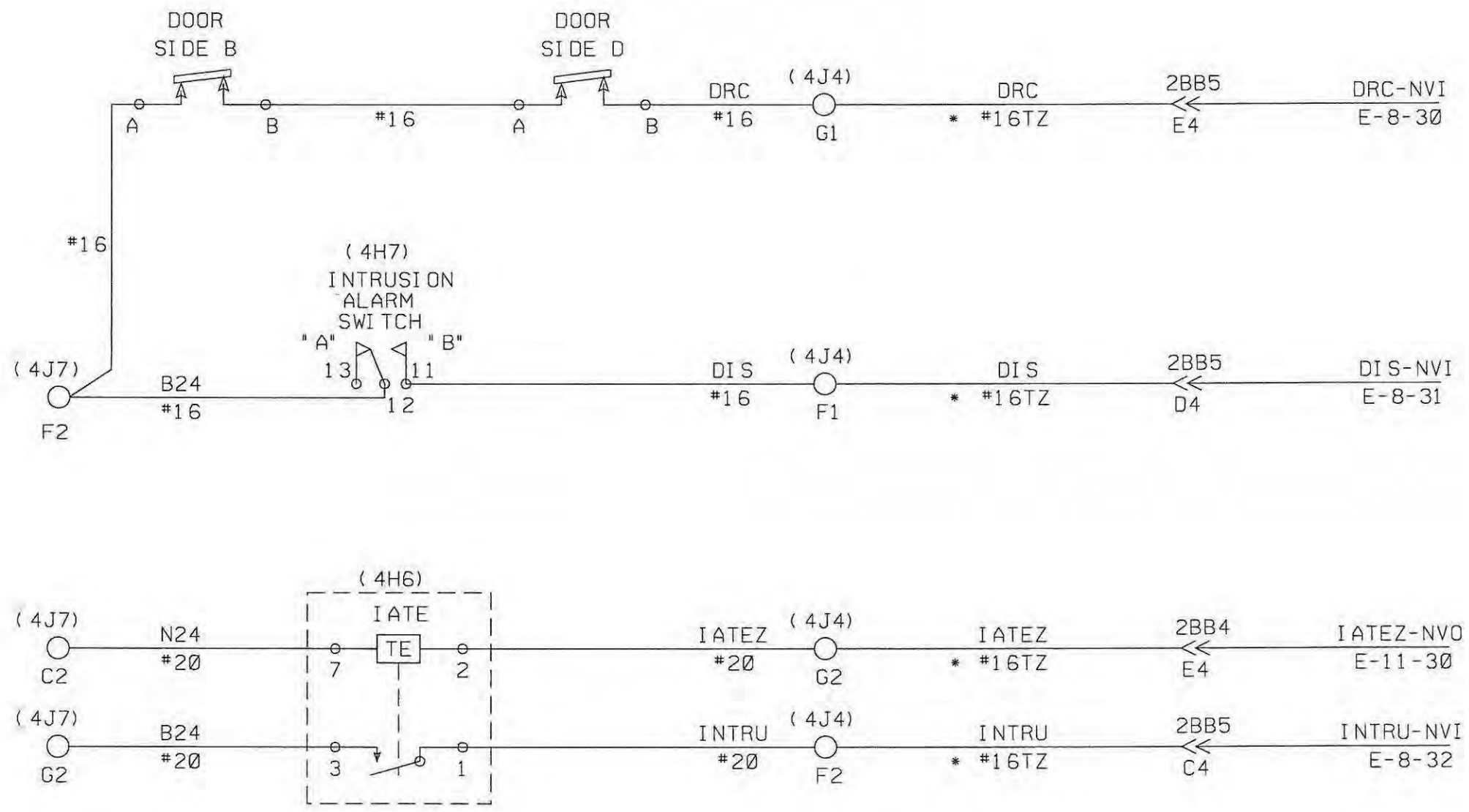
REFERENCE:	39.70 SH.1 THRU SH.78	DATE:	09/15/09
DESIGNED:	PB	DRAWN:	PB
CHECKED:	JH	APPROVED:	WK
DISTRICT:	MW/W	PRINT NUMBER:	39.70 SH.27



- WAGO JUMPER (#132282-402)
- INDICATION LEDS ON PLC ENCLOSURE
- CONNECTION POINT ON PLC MODULE
- PLC+24 PREWIRED BUSSED BATTERY

ALL WIRING ON THIS SHEET #18 AWG UNLESS NOTED



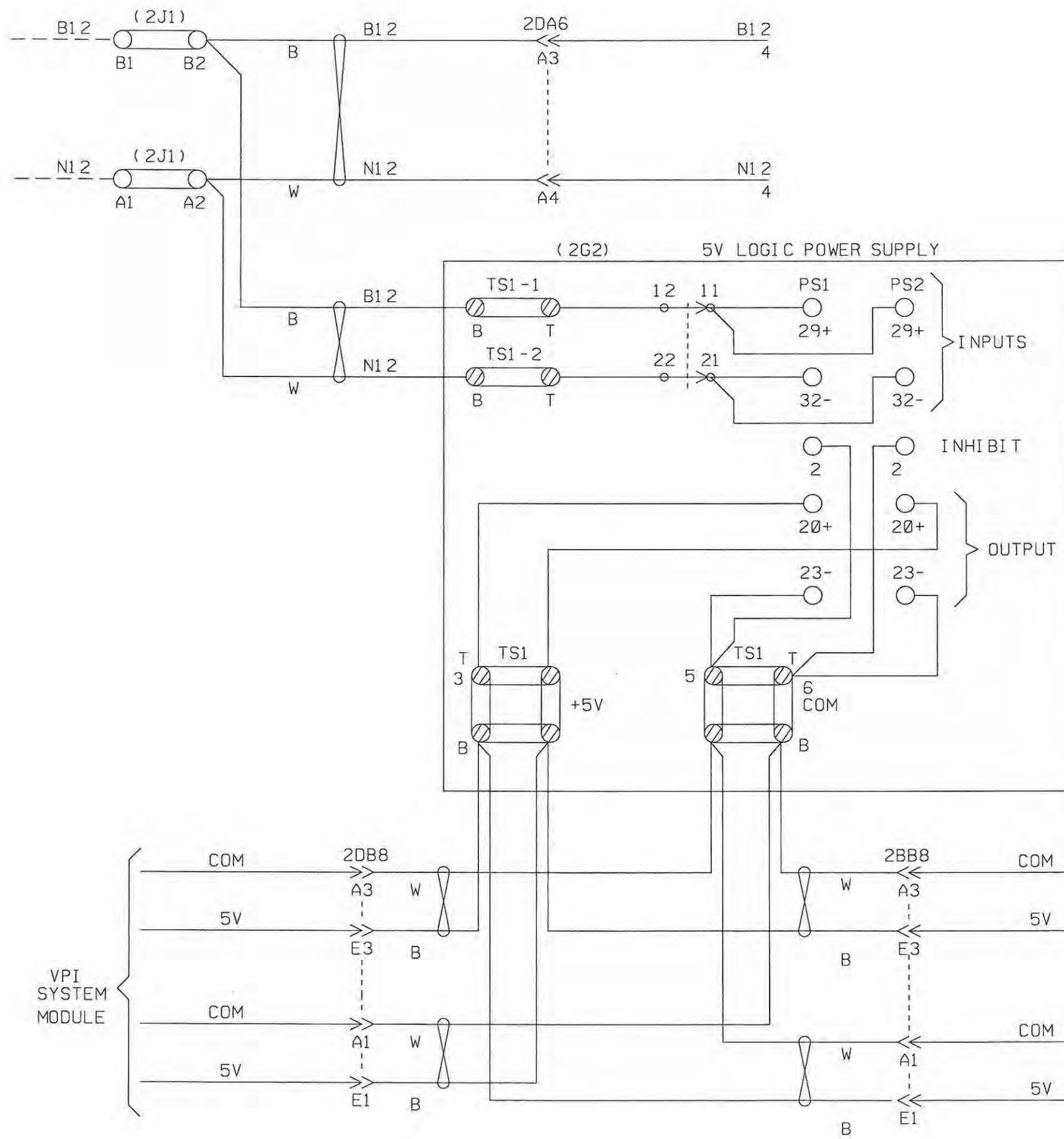



NOTE:
1.) * PRE-MADE CABLE

~REVISIONS~

BB 01/12/00 *ghe*

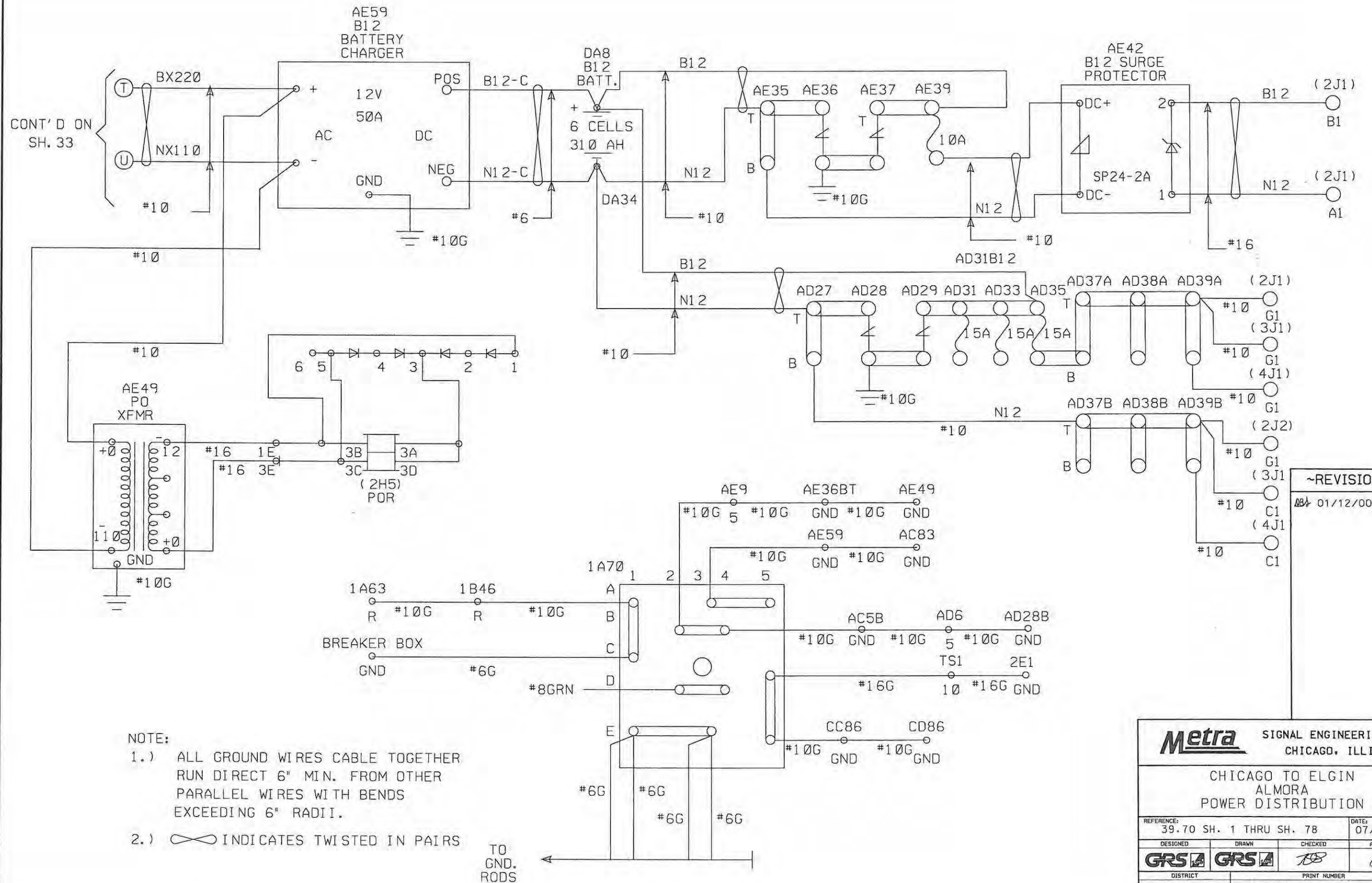
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA INTRUSION ALARM CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>ghe</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.28



- NOTE:
- 1.) ALL WIRE SIZE #16TZ UNLESS OTHERWISE NOTED
 - 2.)  INDICATES TWISTED IN PAIRS

~REVISIONS~
 01/12/00 *File*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA 5V POWER CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.30



- NOTE:
- 1.) ALL GROUND WIRES CABLE TOGETHER RUN DIRECT 6" MIN. FROM OTHER PARALLEL WIRES WITH BENDS EXCEEDING 6" RADII.
 - 2.) ∞ INDICATES TWISTED IN PAIRS

TO GND. RODS

~REVISIONS~

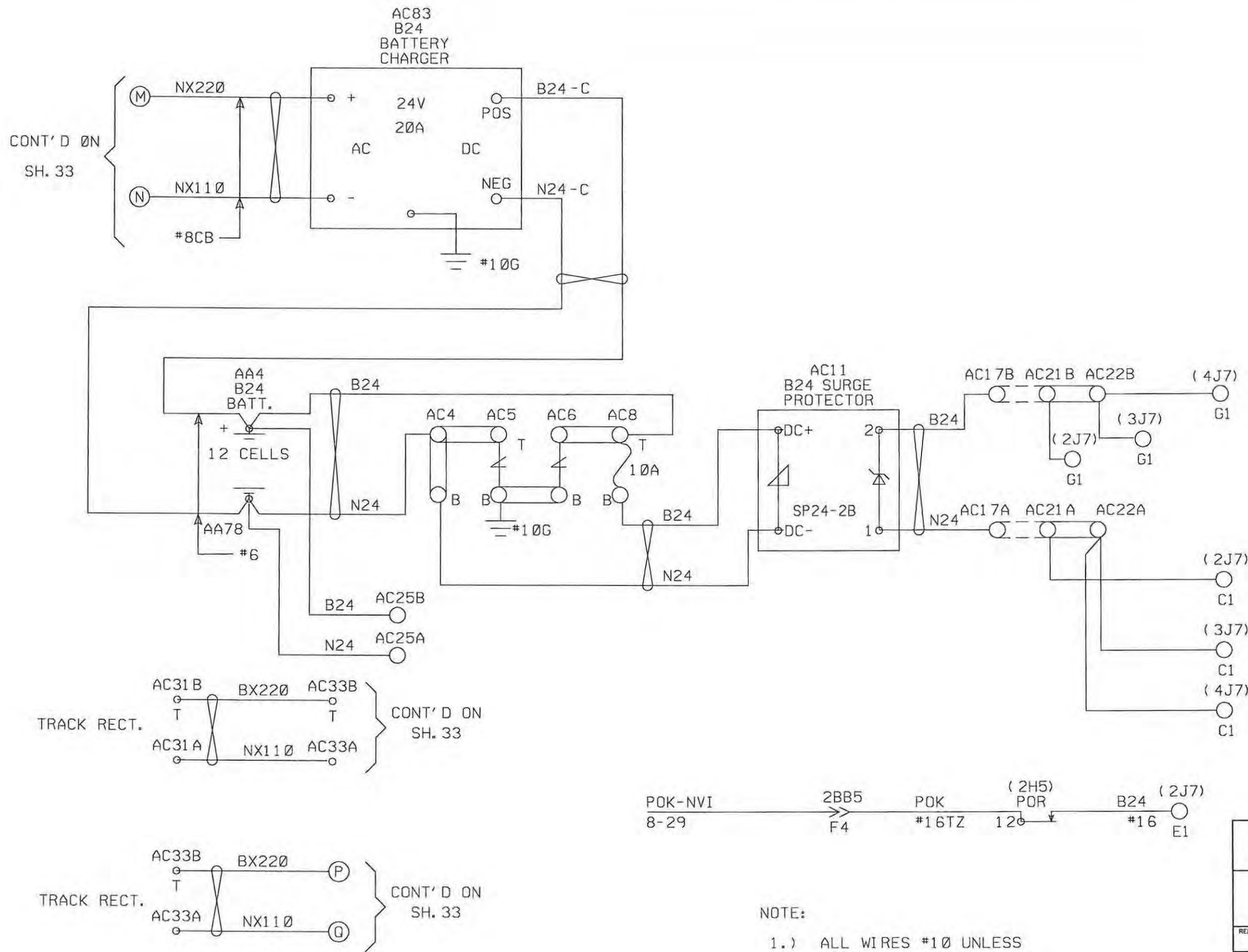
004	01/12/00	AW
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Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
POWER DISTRIBUTION

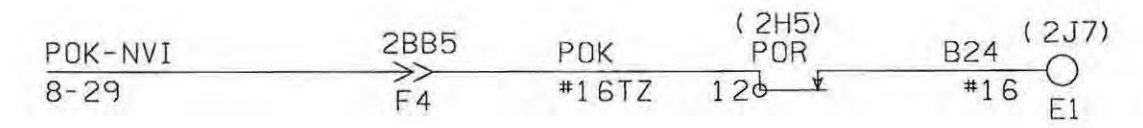
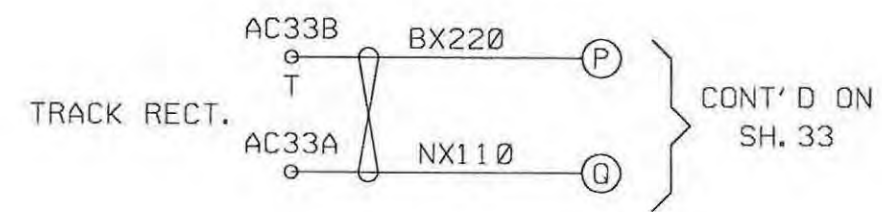
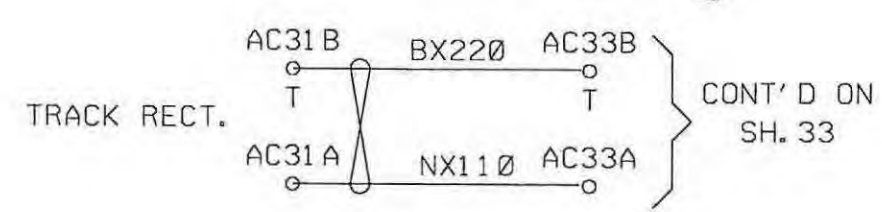
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94		
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>AW</i>	<i>WRK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 31		

17-001-21000-10-17



~REVISIONS~

01/12/00	AK
09/15/09	OK JK
07/07/10	OK JK

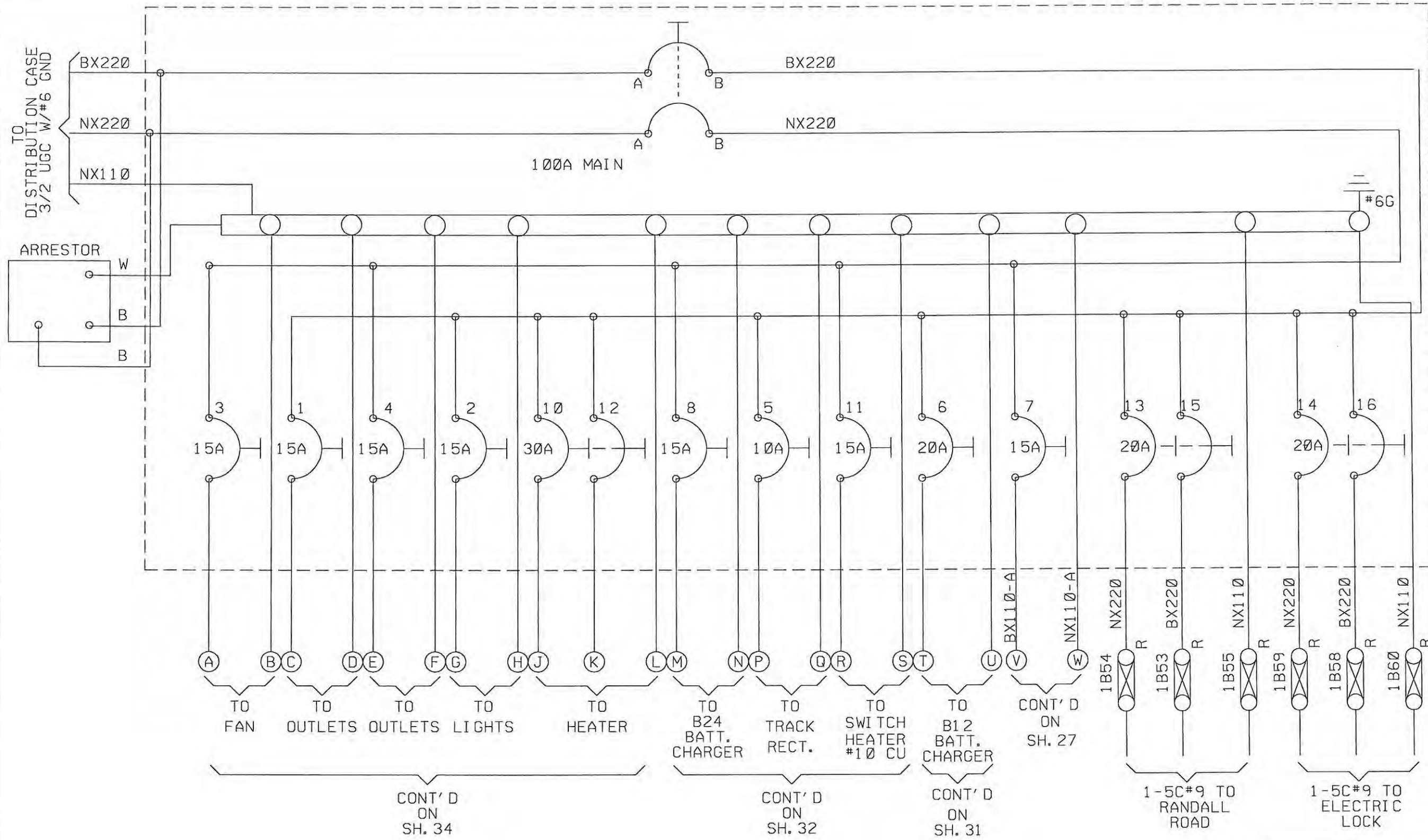


- NOTE:
- 1.) ALL WIRES #10 UNLESS OTHERWISE INDICATED
 - 2.) ∞ INDICATES TWISTED IN PAIRS

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
POWER DISTRIBUTION

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED JK	APPROVED WK
DISTRICT MW/W	PRINT NUMBER 39.70 SH.32



~REVISIONS~

DBA	01/12/00	<i>DBA</i>
PB	09/15/09	OK <i>DBA</i>
AW	07/07/10	OK <i>DBA</i>

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
AC POWER DISTRIBUTION

REFERENCE:	39.70 SH. 1 THRU SH. 78	DATE:	07/06/94
DESIGNED:	DRAWN:	CHECKED:	APPROVED:
<i>GRS</i>	<i>GRS</i>	<i>DBA</i>	<i>AWK</i>
DISTRICT:	PRINT NUMBER:		
MW/W	39.70 SH.33		

35KW 120/240V 1 PHASE
NAT. GAS GENERATOR
(KATOLIGHT)

TO SERVICE FEED
3- 1/0 UGC
W/#6 GND

ASCO
A.T.S. CASE
150AMP 2 POLE
120/240V 1 PHASE

POTTER & BRUMFIELD
KHAU-17D16-12

GENR

"FOR FUTURE WORK"

FACTORY CONNECTED

FUEL SOLENOID

#14CU

150AMP
DISTRIBUTION CASE

JOSLYN
1259-21
LIGHTNING
AND SURGE
ARRESTER

TB2-E(25) TB2-9

NEUTRAL
BLOCK

~REVISIONS~

05/26/10 OK *DH*

TO 8'X10' HSE
3/2 UGC W/#6 GND

TO 1ASM
IN
5/9 UGC

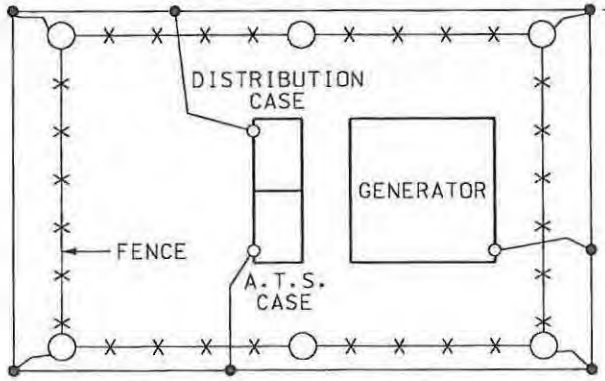
TO 3ASM
IN
5/9 UGC

TO 1BSM
IN
5/9 UGC

TO 3BSM
IN
5/9 UGC

REFERENCE
TYPICAL HOUSE
GROUNDING MATERIAL

10' GND ROD



GROUNDING DETAIL FOR FENCE

Metra

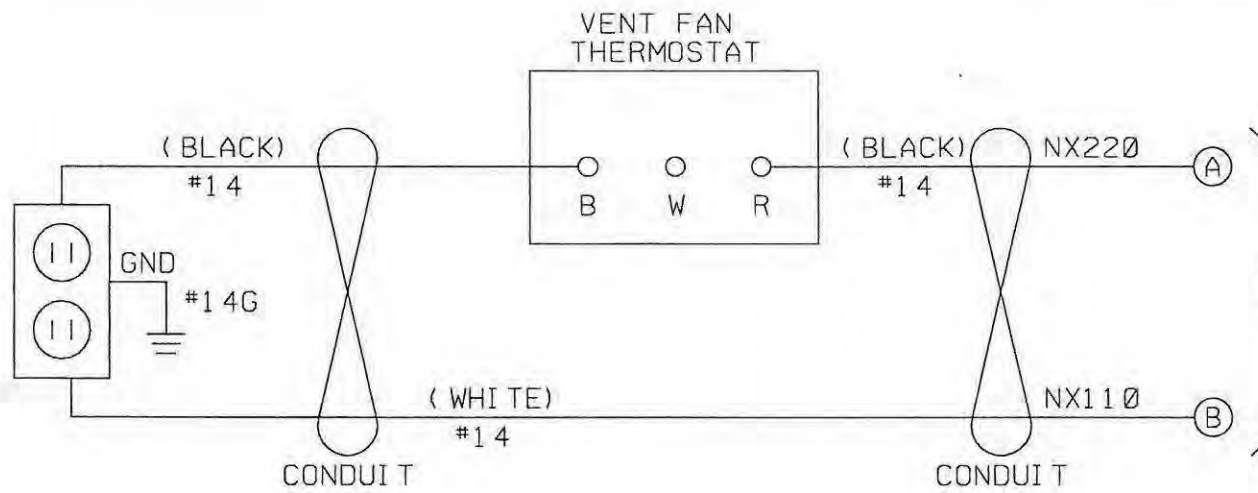
SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO JOLIET
ALMORA
GENERATOR & POWER DISTRIBUTION

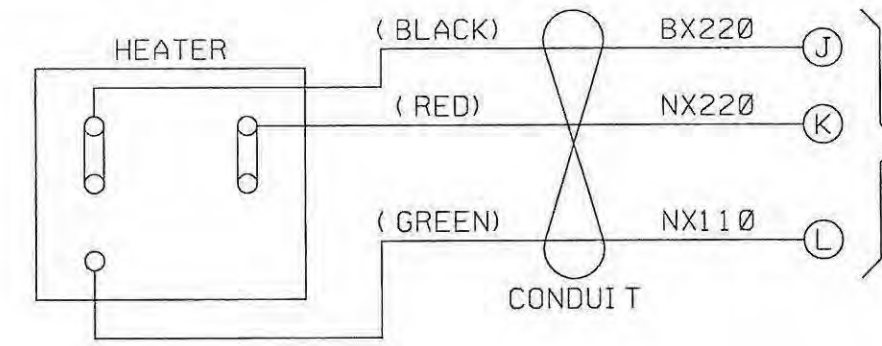
REFERENCE: 39.70 SH.1 THRU SH.79 DATE: 09/15/09

DESIGNED	DRAWN	CHECKED	APPROVED
PB	PB	<i>DH</i>	<i>WK</i>

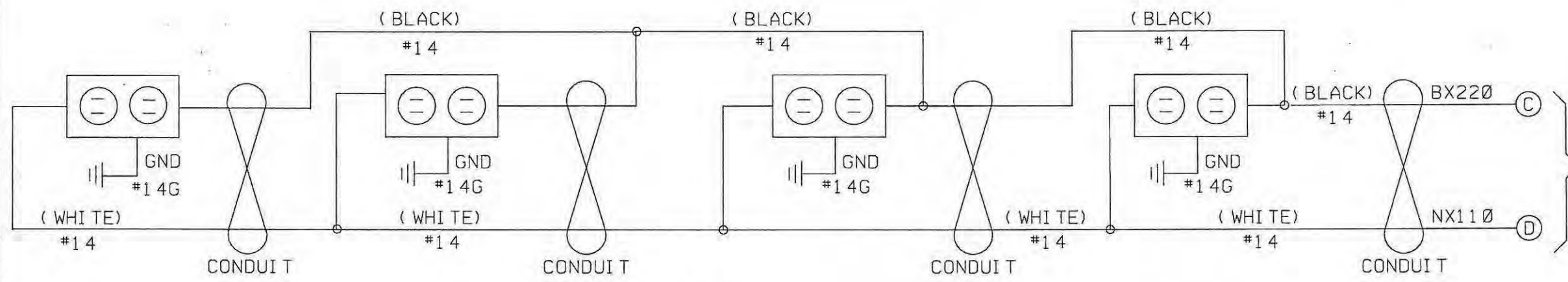
DISTRICT: MW/W PRINT NUMBER: 39.70 SH.33A



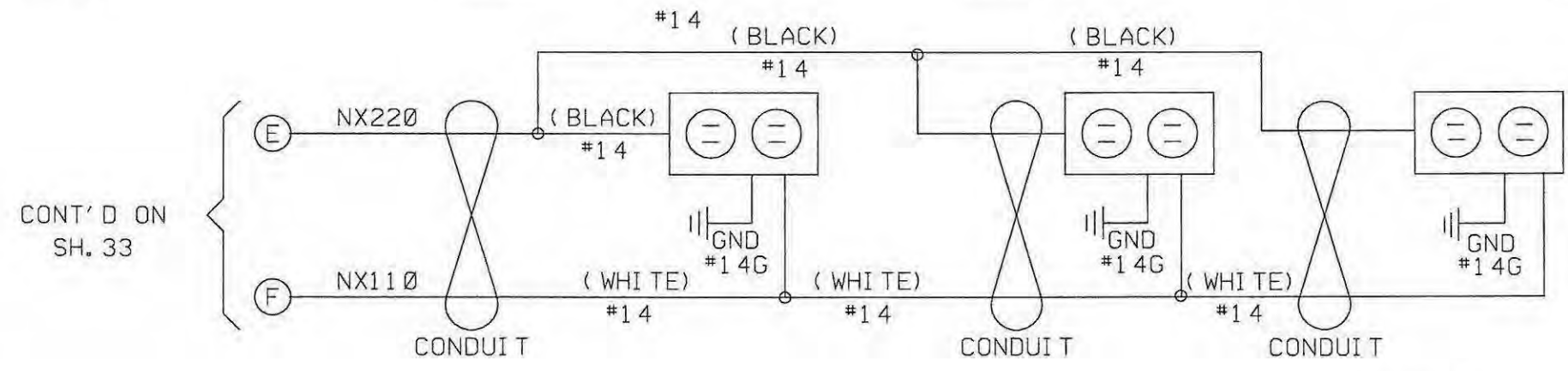
CONT' D ON SH. 33



CONT' D ON SH. 33

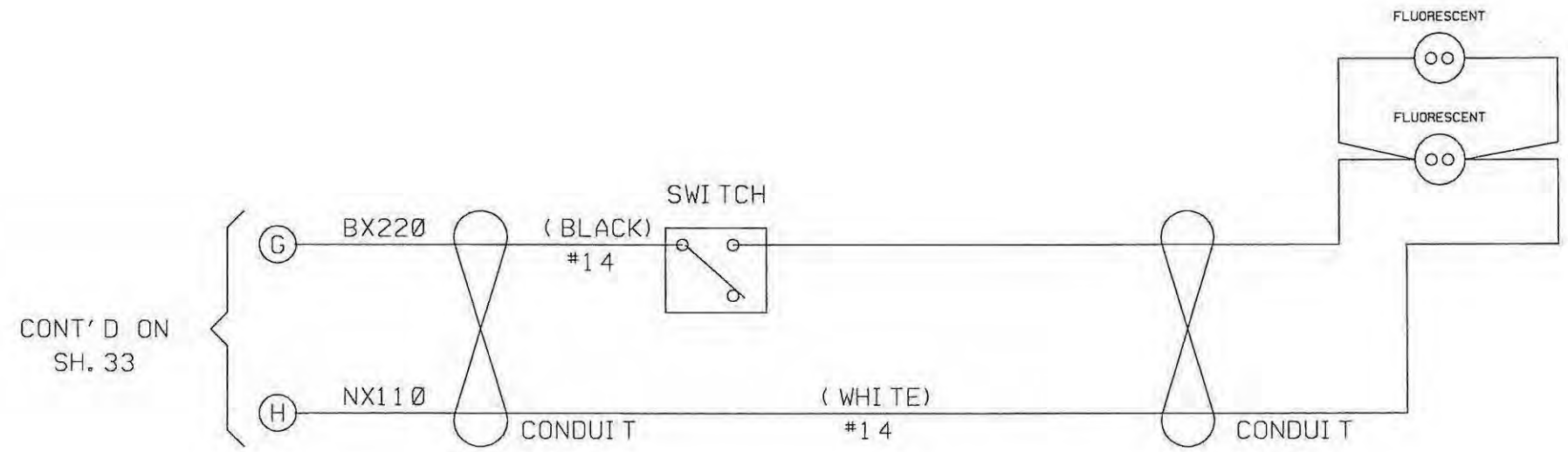


CONT' D ON SH. 33



CONT' D ON SH. 33

NOTE:
1.) INDICATES TWISTED IN PAIRS

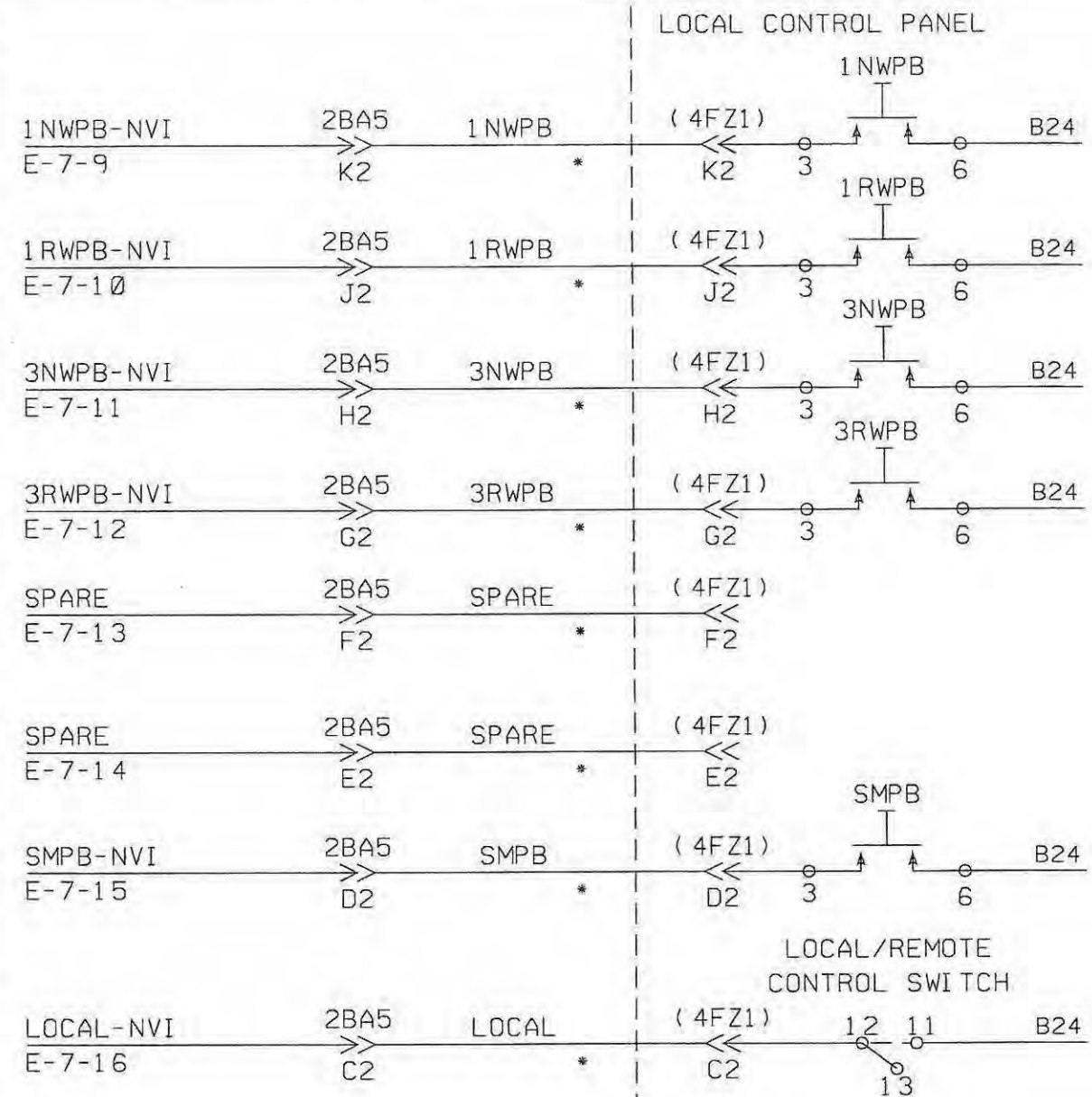
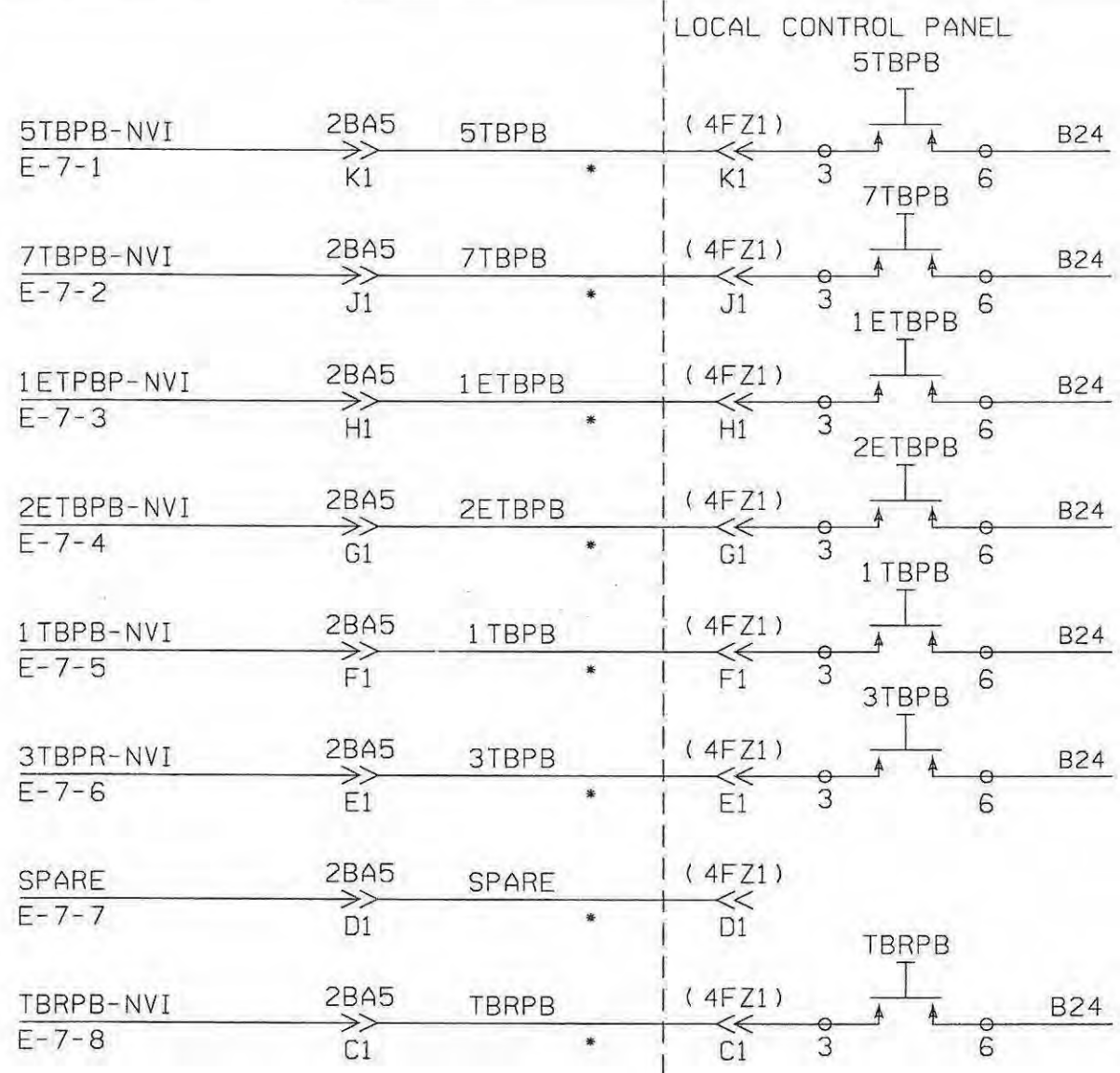


CONT' D ON SH. 33

~REVISIONS~

001 01/12/00 *AW*

Metra		SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA AC POWER DISTRIBUTION			
REFERENCE:	39.70 SH. 1 THRU SH. 78	DATE:	07/06/94
DESIGNED	DRAWN	CHECKED	APPROVED
DISTRICT	PRINT NUMBER		
MW/W	39.70 SH. 34		



NOTE:

- 1.) * PRE - MADE CABLE
- 2.) INTERNAL PANEL WIRING #22 TEFZEL
- 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

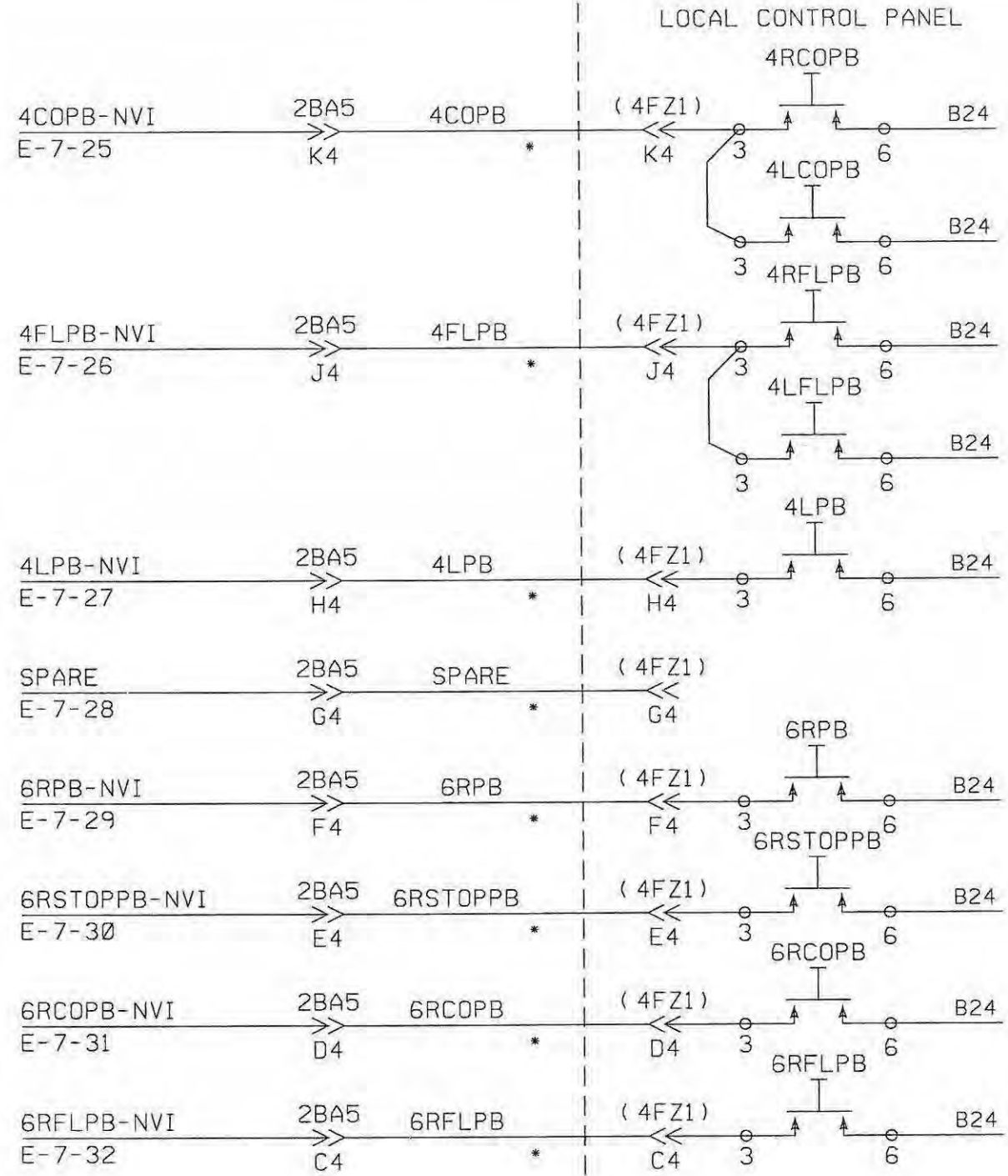
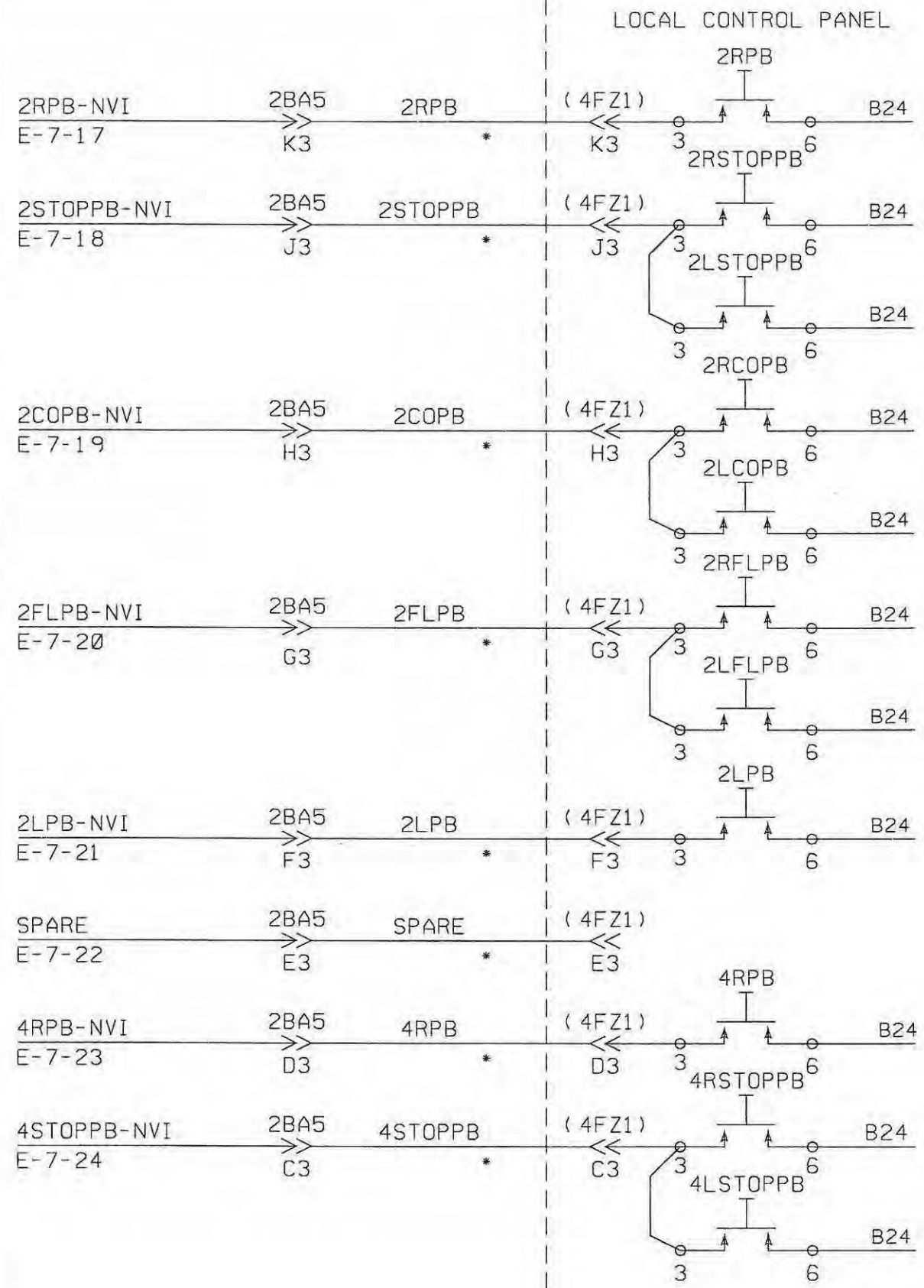
~REVISIONS~

01/12/00 *GA*

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
LOCAL CONTROL PANEL -CONTROLS

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED <i>GRS</i>	DRAWN <i>GRS</i>
CHECKED <i>TS</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.35

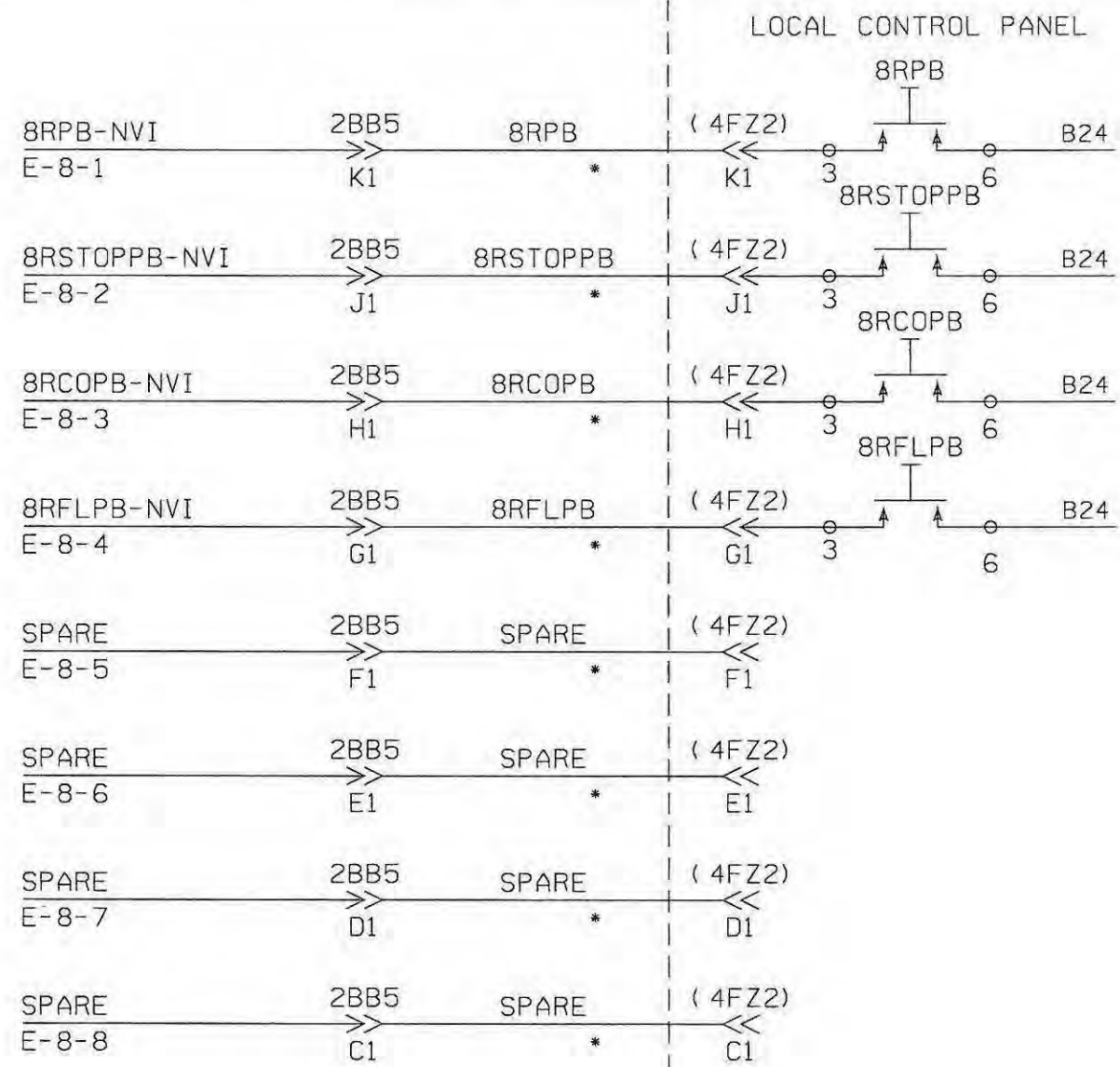


NOTE:
 1.) * PRE - MADE CABLE
 2.) INTERNAL PANEL WIRING #22 TEFZEL
 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

~REVISIONS~
 01/12/00 *AW*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA LOCAL CONTROL PANEL -CONTROLS	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED	DRAWN
CHECKED	APPROVED
DISTRICT	PRINT NUMBER
MW/W	39.70 SH.36

19-001-200-4157



NOTE:

- 1.) * PRE - MADE CABLE
- 2.) INTERNAL PANEL WIRING #22 TEFZEL
- 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

~REVISIONS~

DB 01/12/00 *AW*



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
LOCAL CONTROL PANEL -CONTROLS

REFERENCE: 39.70 SH. 1 THRU SH. 78		DATE: 07/06/94	
DESIGNED <i>GRS</i>	DRAWN <i>GRS</i>	CHECKED <i>AW</i>	APPROVED <i>AW</i>
DISTRICT MW/W		PRINT NUMBER 39.70 SH.37	



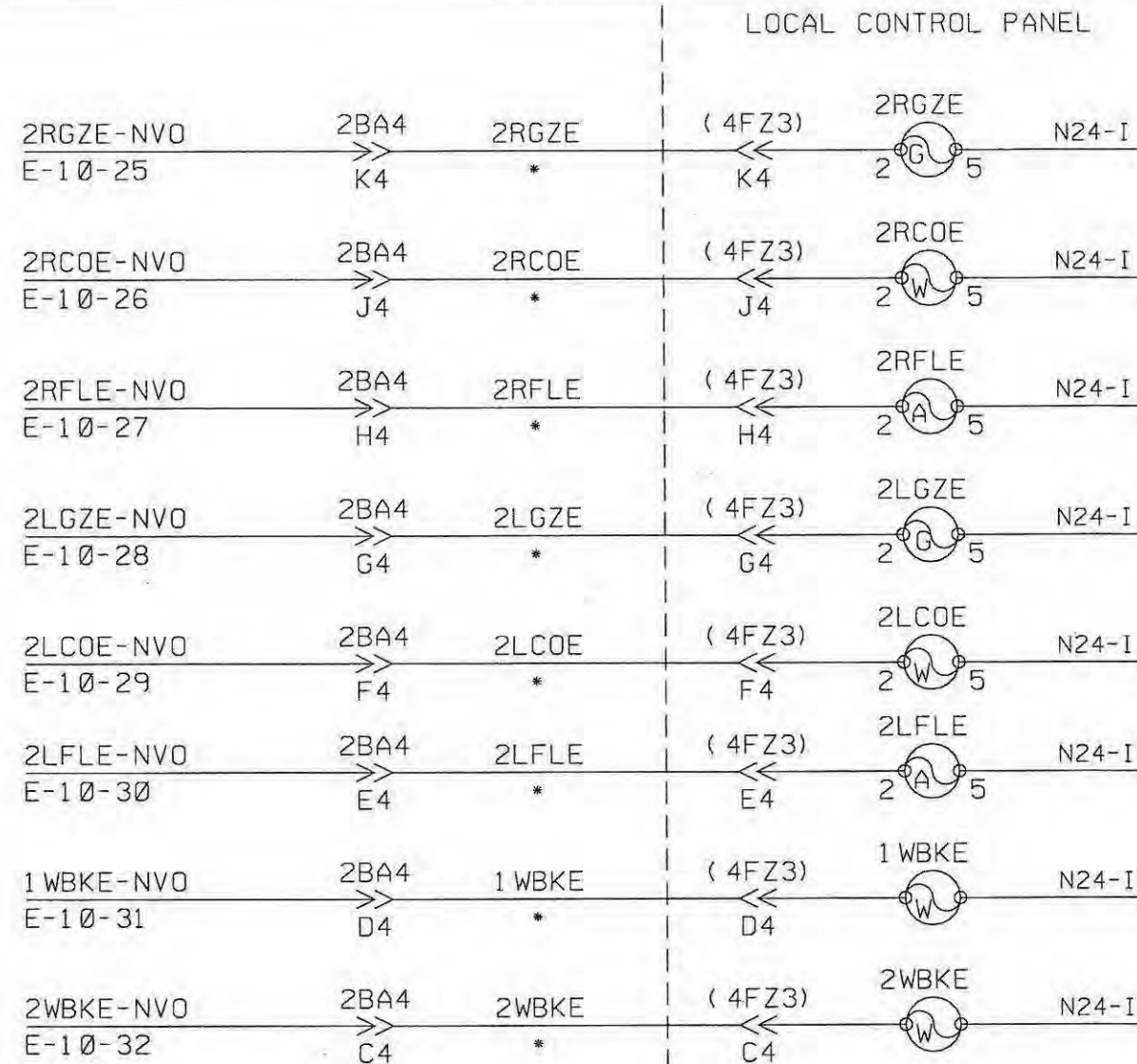
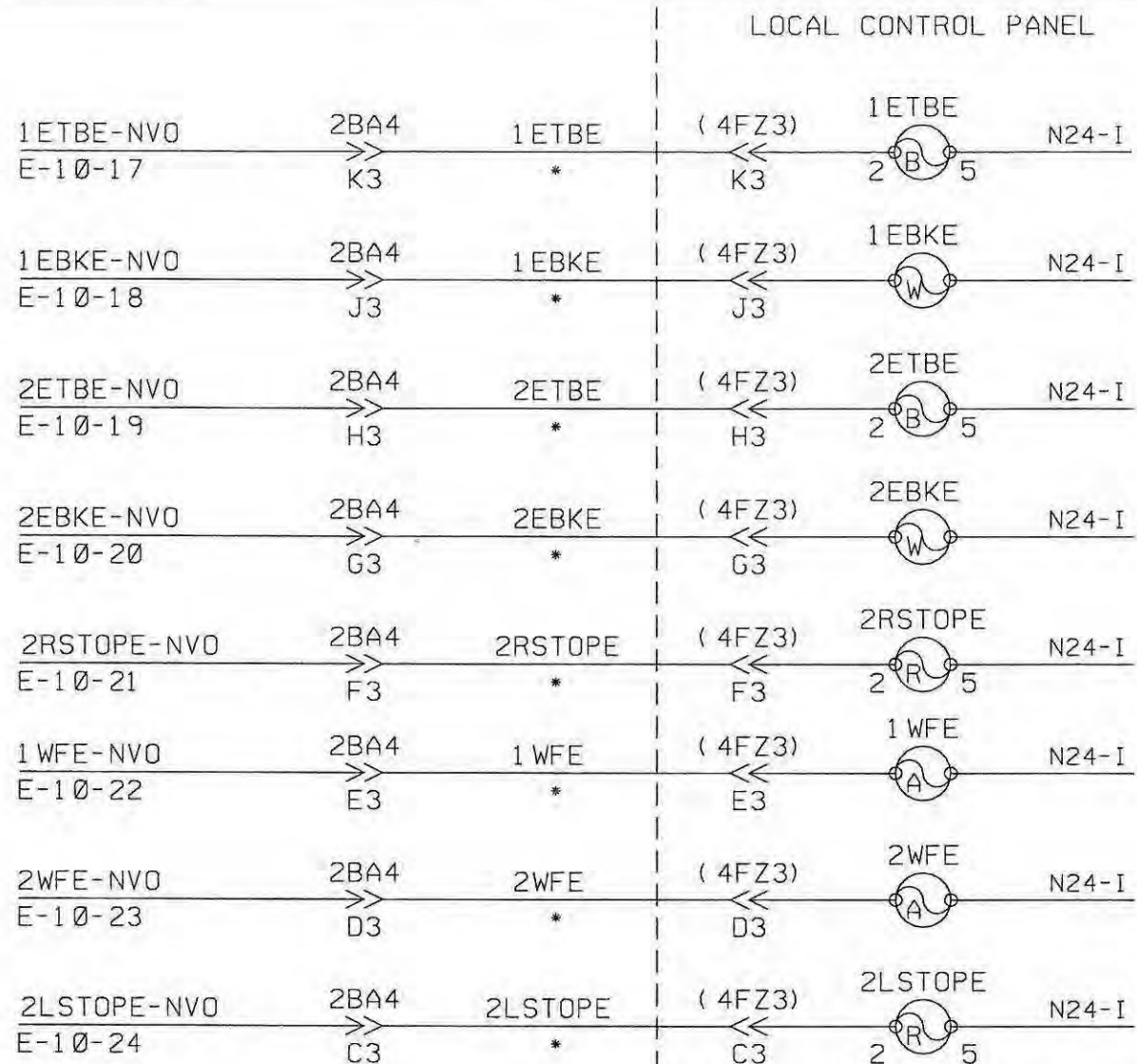
NOTE:

- 1.) * PRE - MADE CABLE
- 2.) INTERNAL PANEL WIRING #22 TEFZEL
- 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

~REVISIONS~

08/01/12/00 *AK*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA LOCAL CONTROL PANEL - IND.	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>TJB</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.38



NOTE:

- 1.) * PRE - MADE CABLE
- 2.) INTERNAL PANEL WIRING #22 TEFZEL
- 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

~REVISIONS~

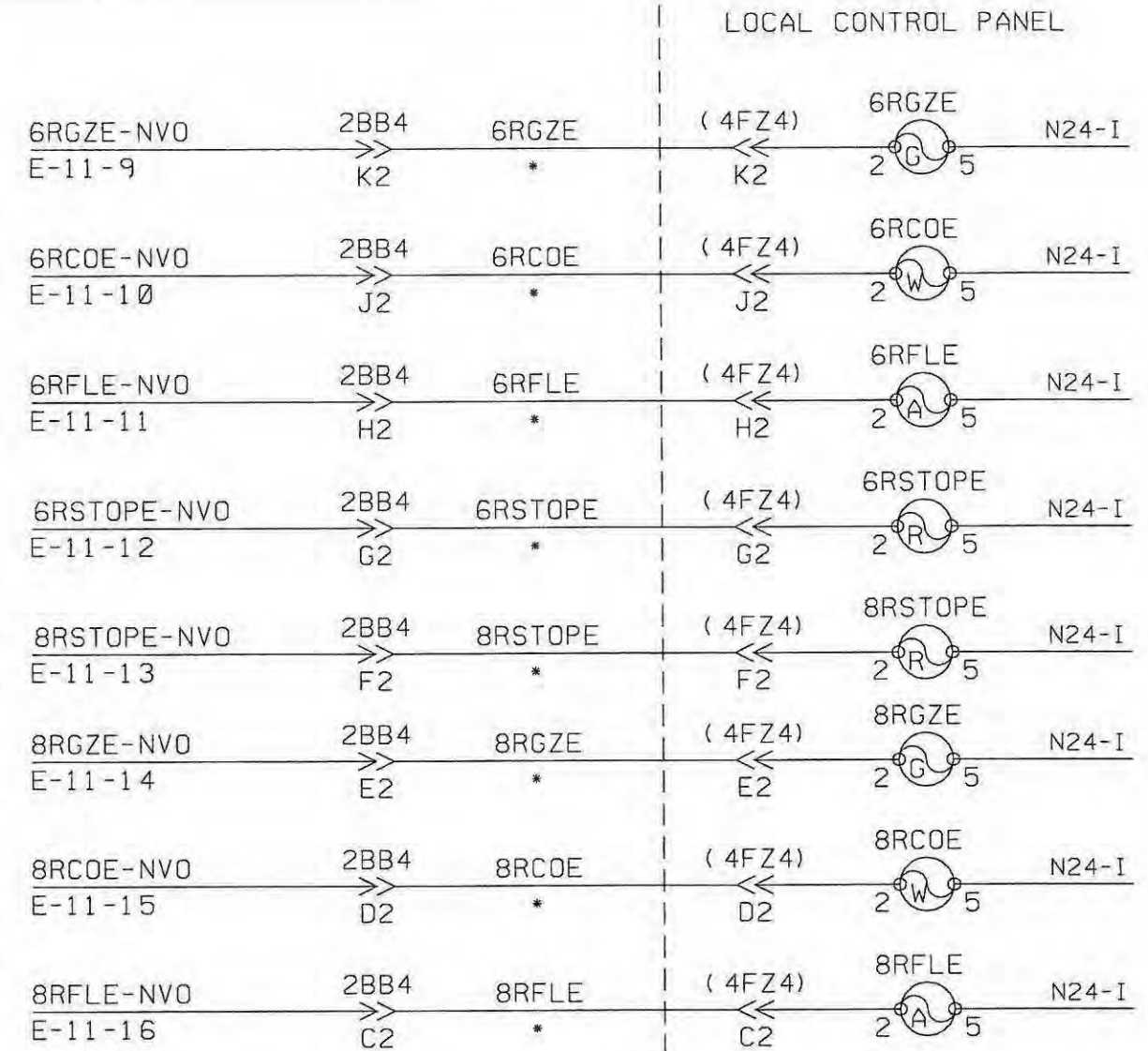
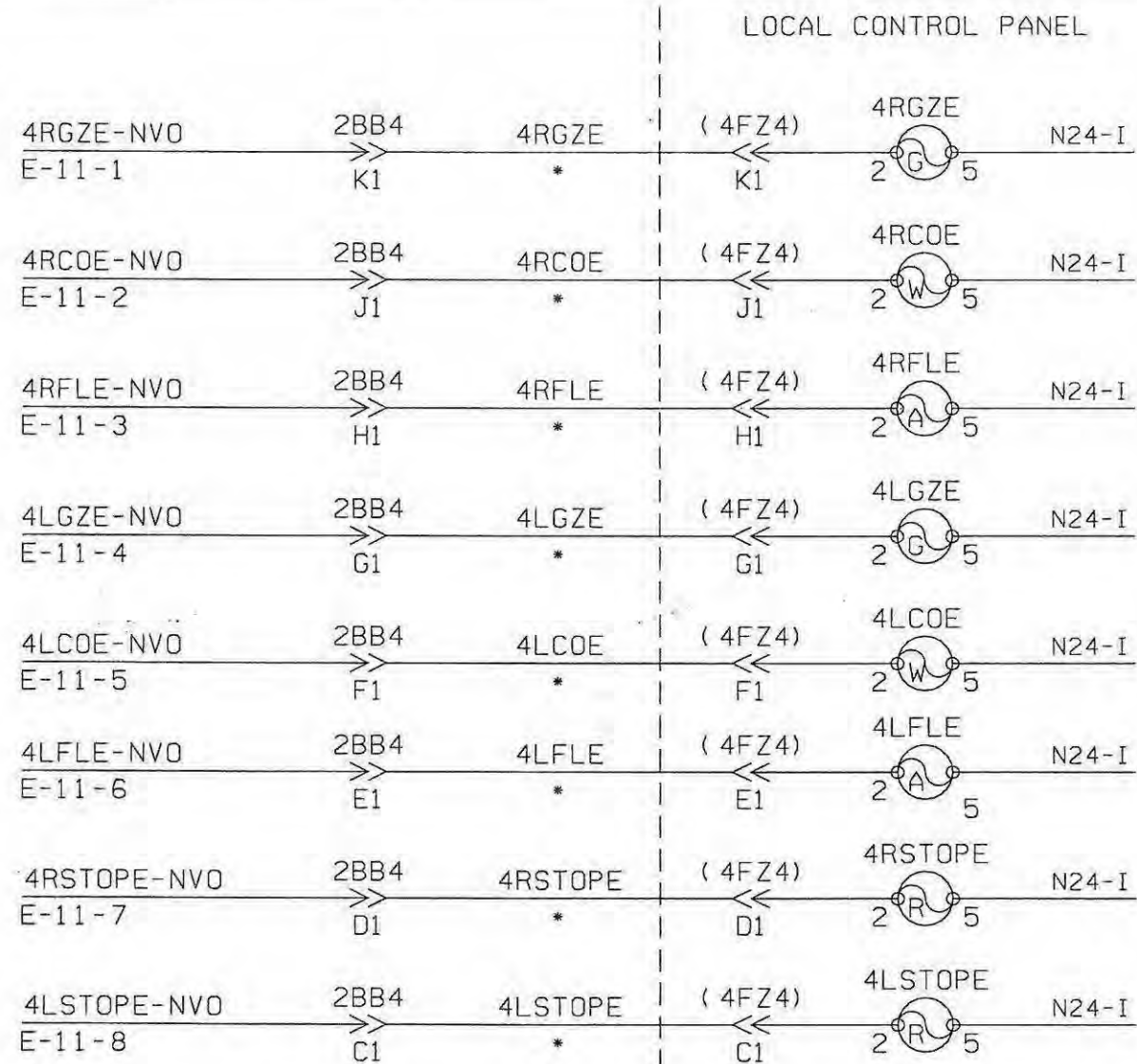
01/12/00 *File*



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
LOCAL CONTROL PANEL - IND.

REFERENCE: 39.70 SH. 1 THRU SH. 78			DATE: 07/06/94
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>File</i>	<i>WK</i>
DISTRICT		PRINT NUMBER	
MW/W		39.70 SH.39	



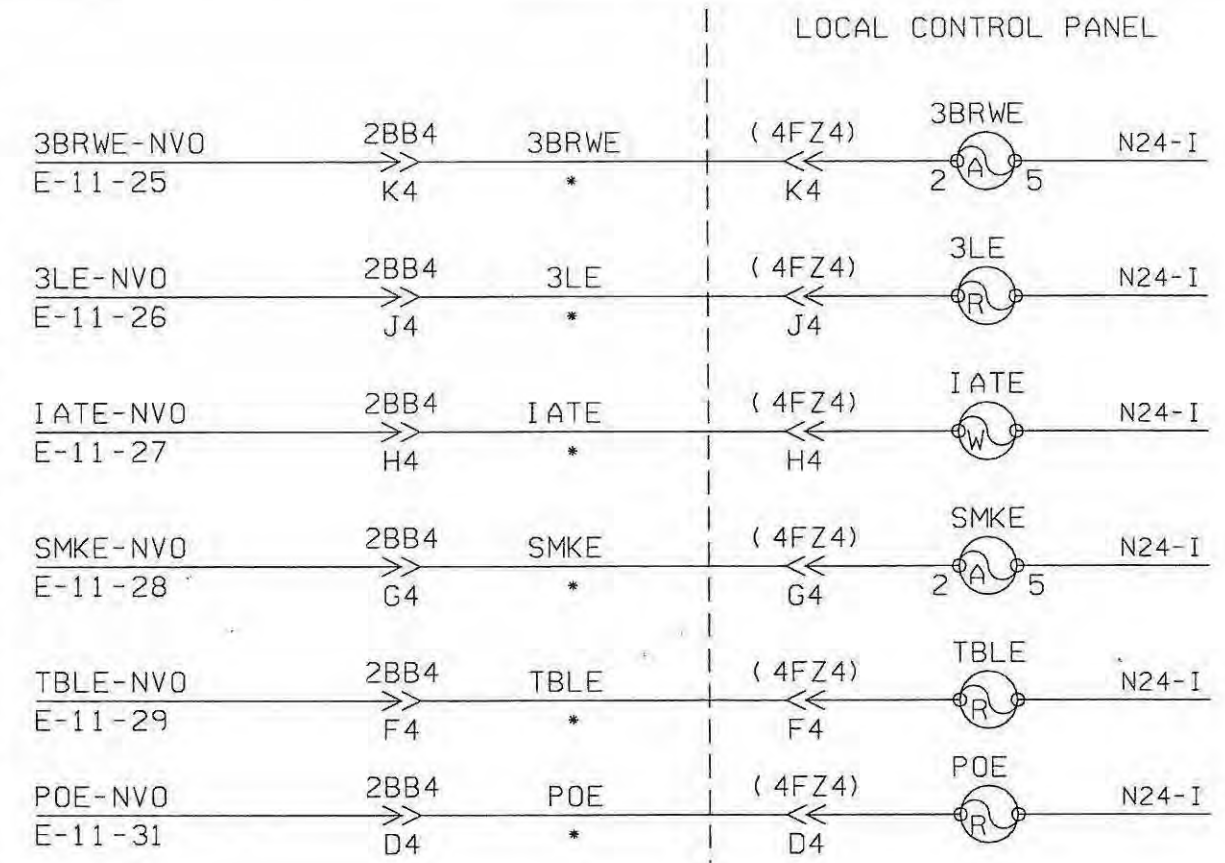
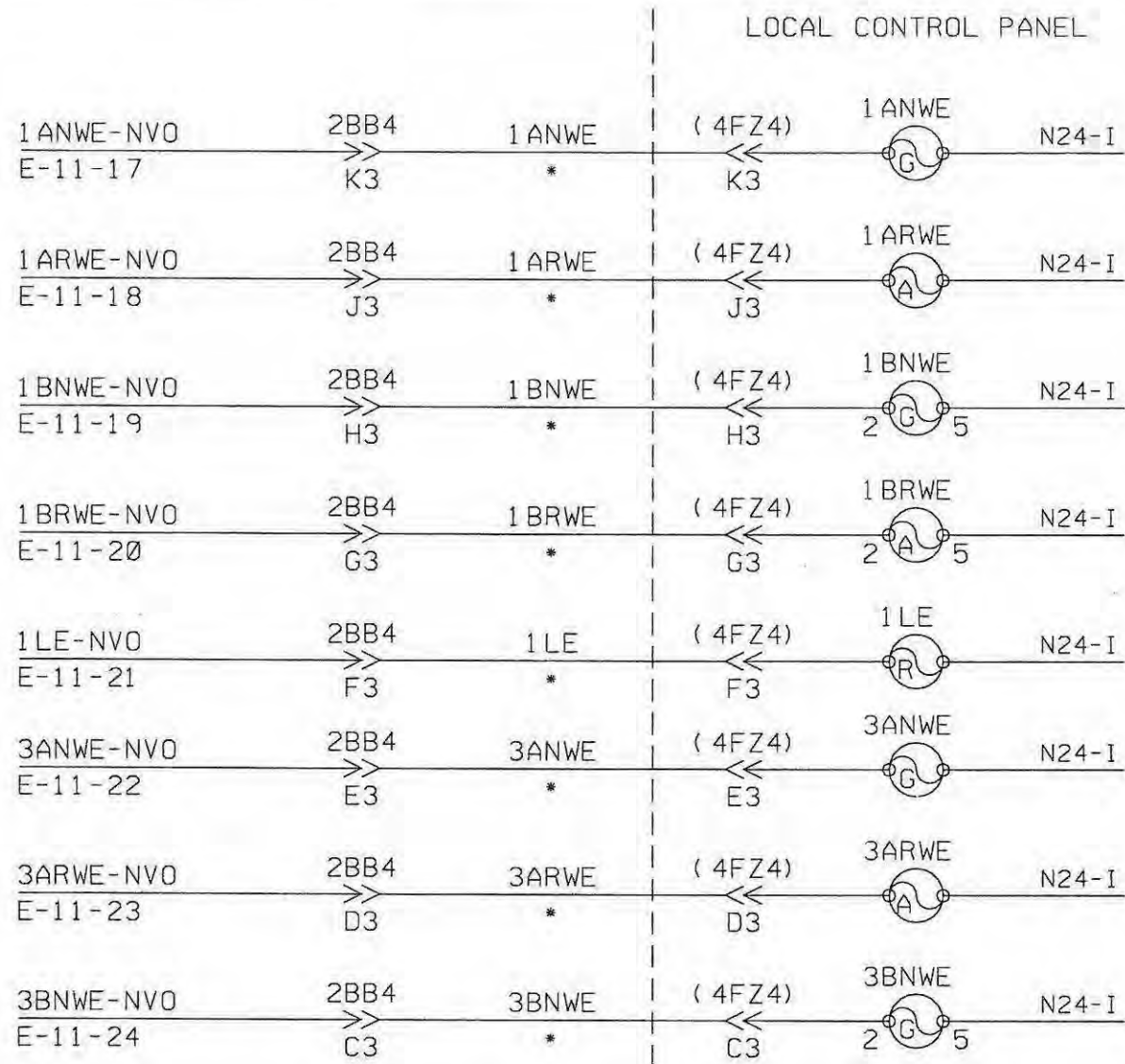
NOTE:

- 1.) * PRE - MADE CABLE
- 2.) INTERNAL PANEL WIRING #22 TEFZEL
- 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

~REVISIONS~

01/12/00 *AW*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA LOCAL CONTROL PANEL - IND.	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>AW</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 40



NOTE:

- 1.) * PRE-MADE CABLE
- 2.) INTERNAL PANEL WIRING #22 TEFZEL
- 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

~REVISIONS~

BB4 01/12/00 *AK*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA LOCAL CONTROL PANEL - IND.	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED 	DRAWN 
CHECKED <i>AK</i>	APPROVED <i>AK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 41

MATERIAL:
 #4 FINISH ALUMINUM WITH
 BLACK LETTERS & TRACK
 1/8" THK. (METAL PHOTO)

TRACK - 1/8" WIDE

LETTERING:
 SMALL - 12PT.
 MEDIUM - 14PT.
 LARGE - 24PT.

○ - INDICATORS - 54605-38
 DRILL 3/8" DIA. HOLE STRAIGHT THROUGH
 LOCKING WASHER ON BACK KNURLED NUT
 ON FRONT

⊙ - PUSHBUTTON - 59365-100
 DRILL 3/8" DIA. HOLE STRAIGHT THROUGH
 LOCKING WASHER ON BACK KNURLED NUT
 ON FRONT

G = GREEN
 R = RED
 W = WHITE
 A = AMBER
 B = BLUE

SWITCH - 58861
 DRILL PER AD 30-46

SWITCH GUARD - 59600-1

SEAL - 35285

TERMINAL STRIP - 29173-97

PARTS LIST: 71186-55 GR.60

~REVISIONS~

01/12/00 *AK*

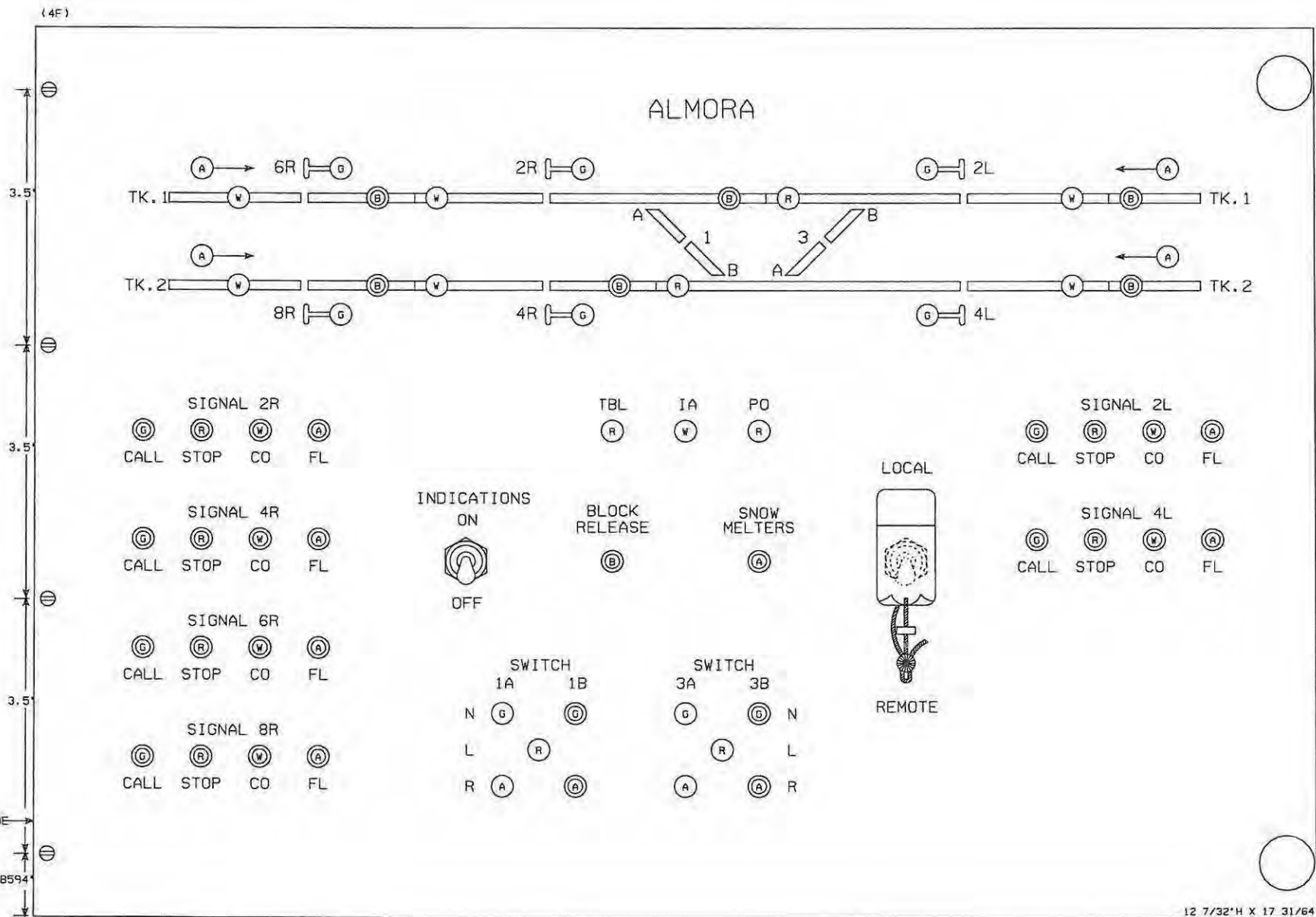
Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA
 LOCAL CONTROL PANEL

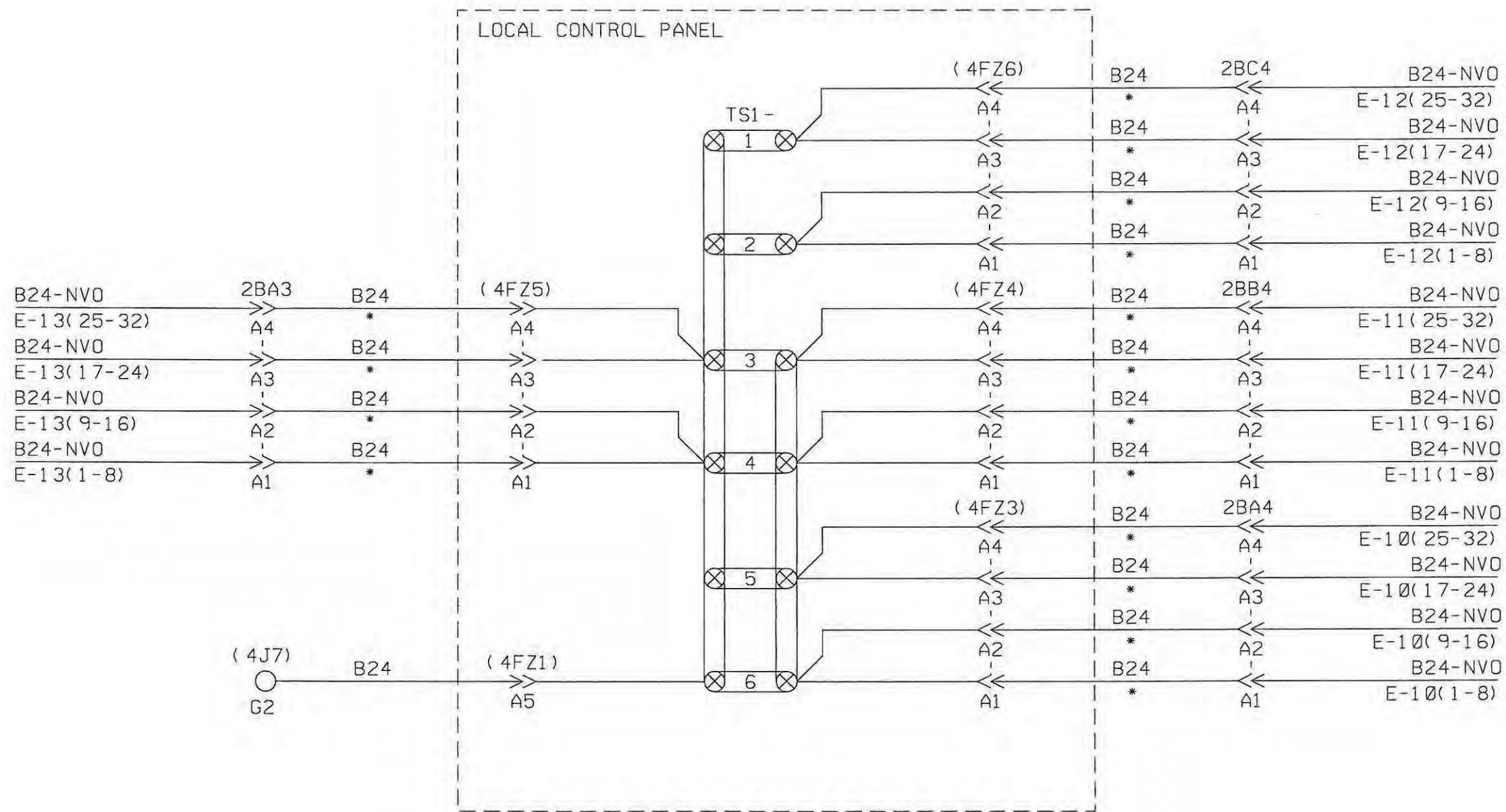
REFERENCE: 39.70 SH. 1 THRU SH. 78 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>AK</i>	<i>WK</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH.42



HINGE THIS SIDE



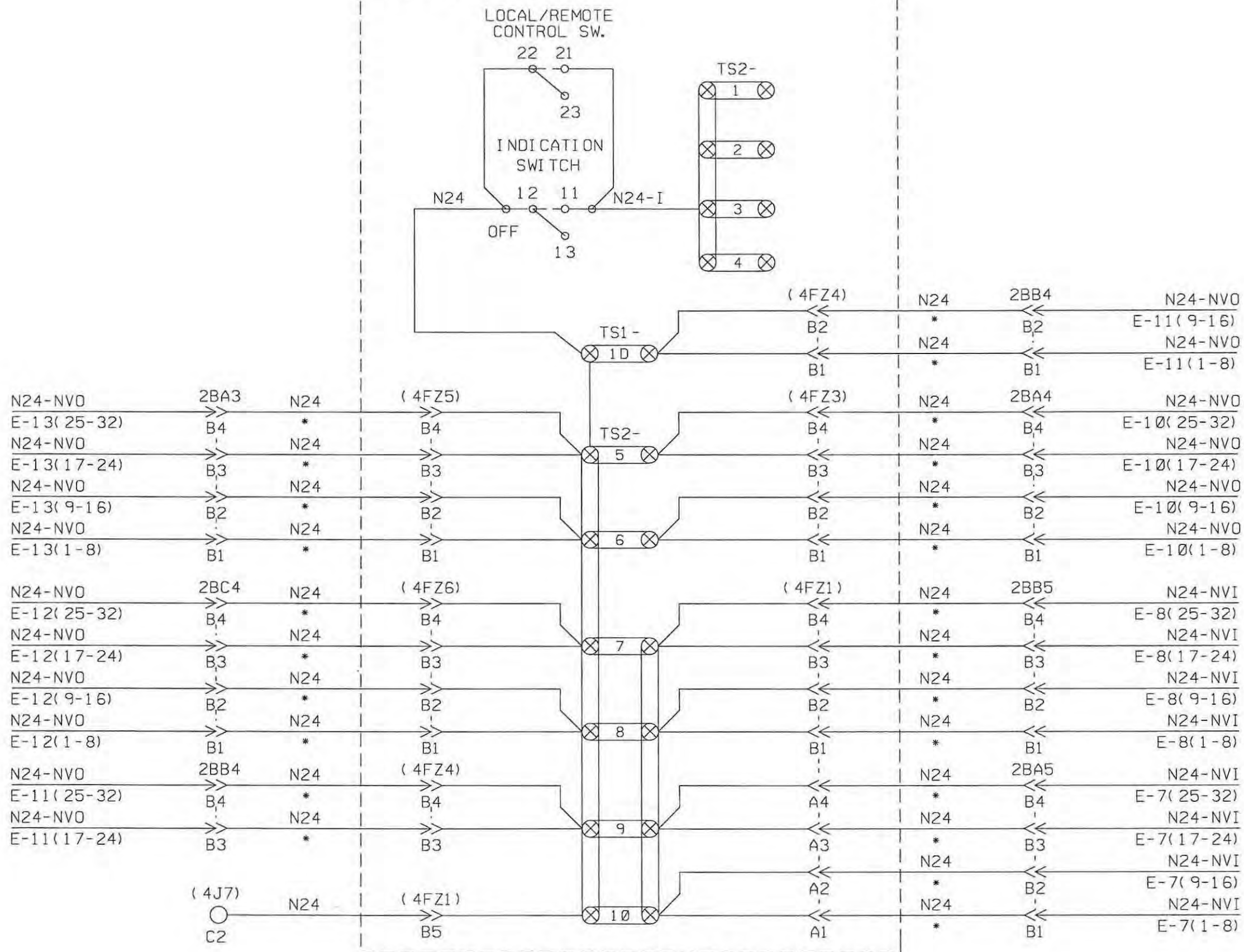
~REVISIONS~

004 01/12/00 *AW*

- NOTE:
- 1.) * PRE-MADE CABLE
 - 2.) INTERNAL PANEL WIRING #22 TEFZEL
 - 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

Metra		SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA LOCAL CONTROL PANEL CIRCUITS			
REFERENCE: 39.70 SH. 1 THRU SH. 78		DATE: 07/06/94	
DESIGNED GRS	DRAWN GRS	CHECKED <i>AW</i>	APPROVED <i>UPK</i>
DISTRICT MW/W		PRINT NUMBER 39.70 SH. 43	

LOCAL CONTROL PANEL



NOTE:

- 1.) * PRE-MADE CABLE
- 2.) INTERNAL PANEL WIRING #22 TEFZEL
- 3.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

~REVISIONS~

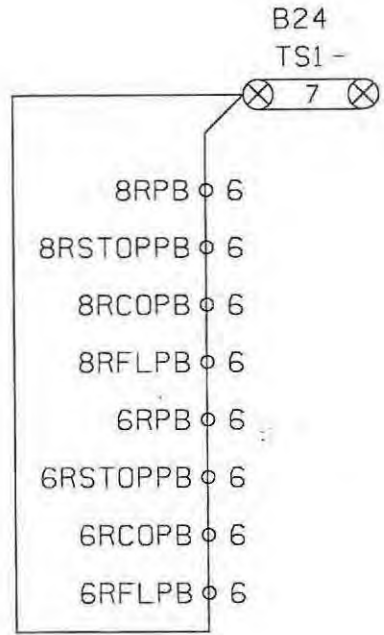
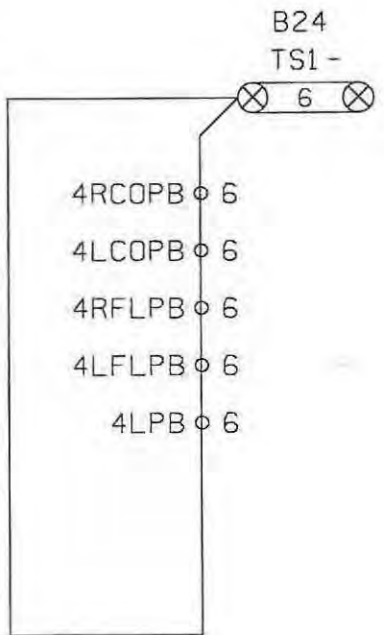
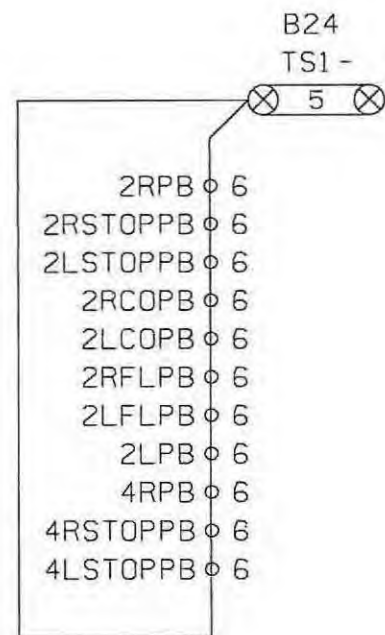
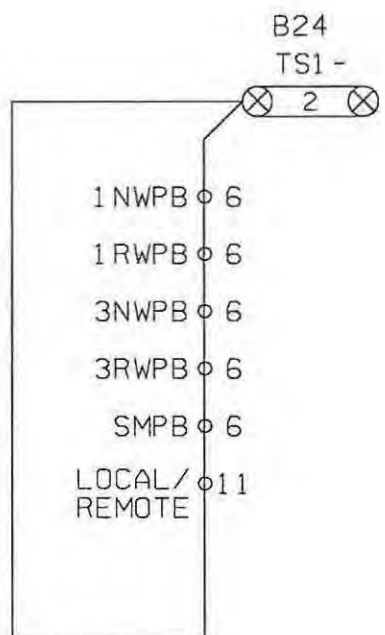
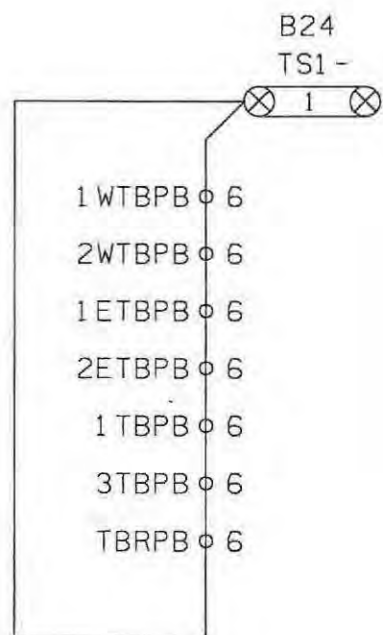
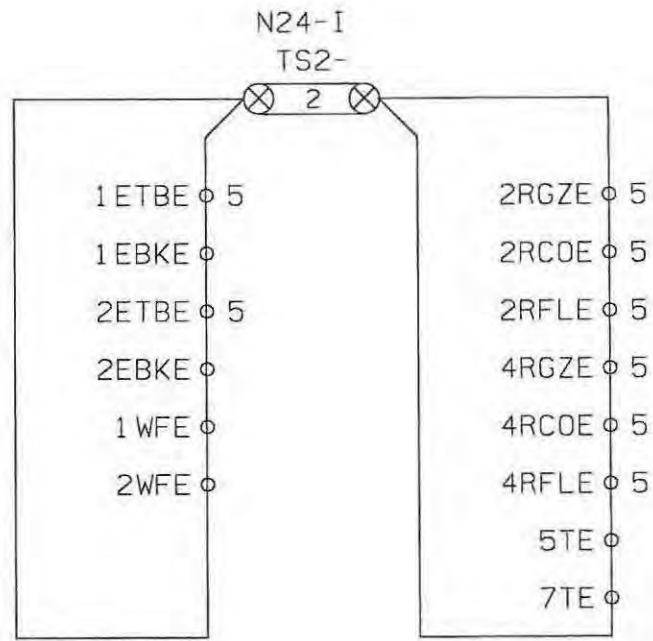
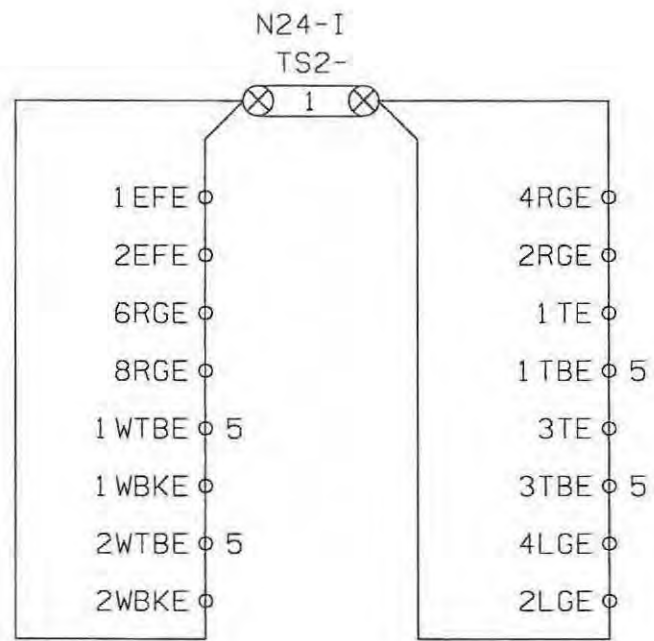
004 01/12/00 *JW*



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
LOCAL CONTROL PANEL CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JW</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.44



~REVISIONS~

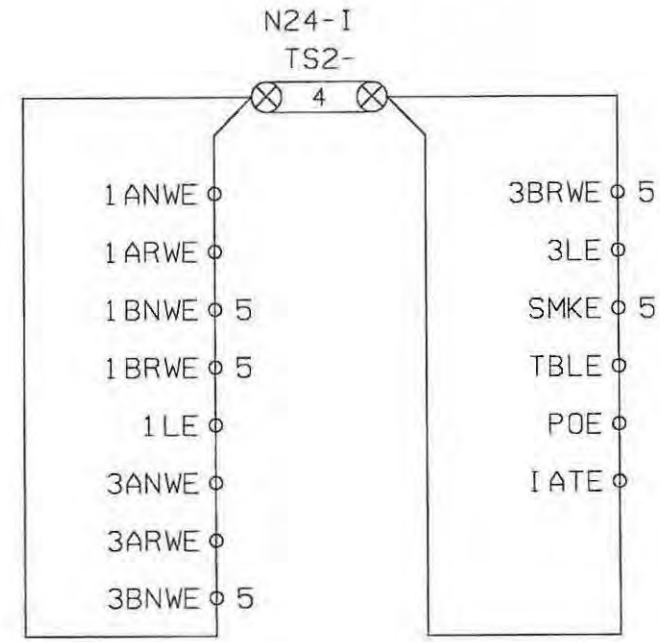
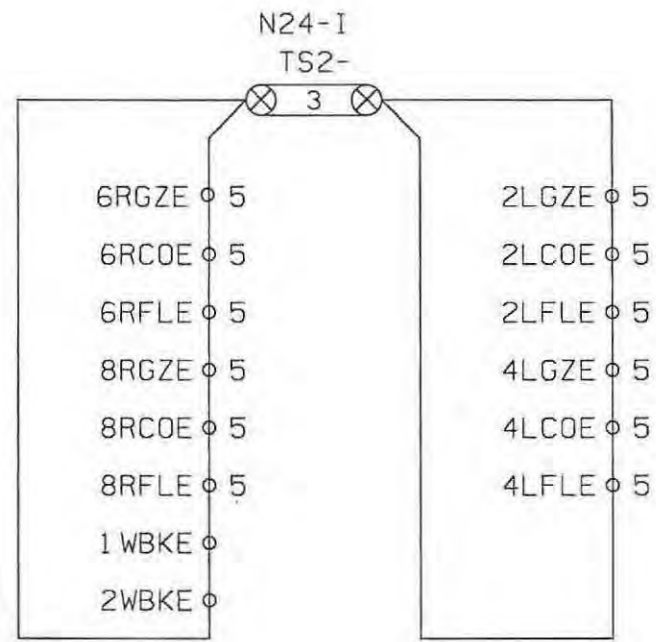
001	01/12/00	AK
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NOTE:
1.) ALL WIRING #22 TEFZEL
UNLESS OTHERWISE NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
CONTROL PANEL - ENERGY LOOPS

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>TB</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 45



~REVISIONS~

01/12/00	File
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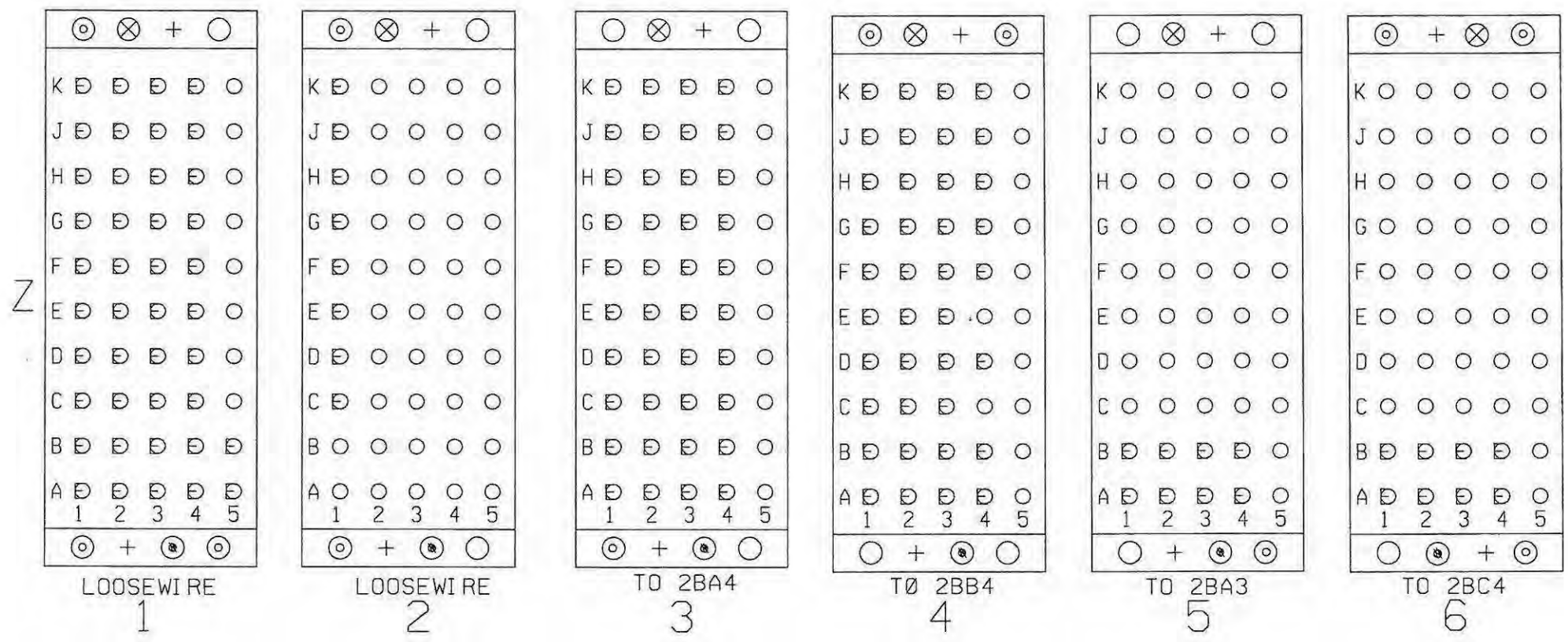
NOTE:
1.) ALL WIRING #22 TEFZEL
UNLESS OTHERWISE NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
CONTROL PANEL - ENERGY LOOPS

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94		
DESIGNED GRS	DRAWN GRS	CHECKED <i>TS</i>	APPROVED <i>WPK</i>
DISTRICT MW/W		PRINT NUMBER 39.70 SH. 46	

4F



REAR VIEW

~REVISIONS~

BB 01/12/00 *File*

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

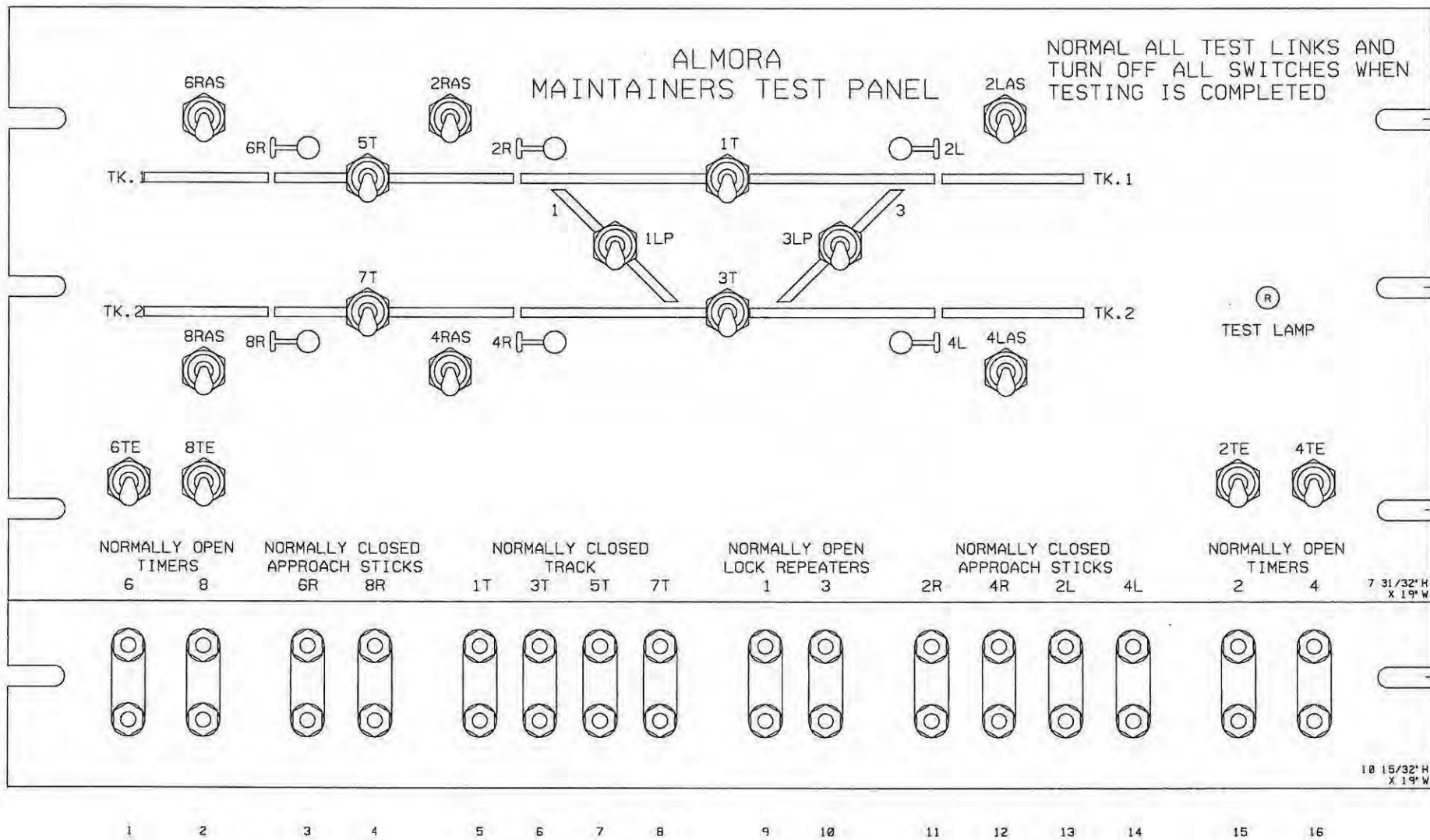
CHICAGO TO ELGIN
ALMORA
CONTROL PANEL - ENERGY LOOPS

REFERENCE: 39.70 SH. 1 THRU SH. 78 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>TS</i>	<i>WRK</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH. 47

(4E)



MATERIAL:
 #4 FINISH ALUMINUM WITH
 BLACK LETTERING & TRACK
 1/16" THICK (METAL PHOTO)
 BACKER PLATE PHENOLIC
 2 1/2" LONGER THAN
 ALUMINUM FRONT

TRACK - 1/8" WIDE

LETTERING:
 SMALL - 14PT.
 MEDIUM - 18PT.
 LARGE - 24PT.

TOGGLE SWITCH - 58861-114
 TO BE MOUNTED WITH KEYWAY ON TOP
 DRILL PER: P-SW1-45

- INDICATORS - 54605-38
 DRILL 3/8" DIA. HOLE STRAIGHT THROUGH
 LOCKING WASHER ON BACK KNURLED NUT
 ON FRONT

TEST POST:
 VOLTAGE POST:
 ASSY: A62-515 (42788-1 GR.2)
 CONNECTOR:
 ASSY: P3-325 (44720-1 GR.2)

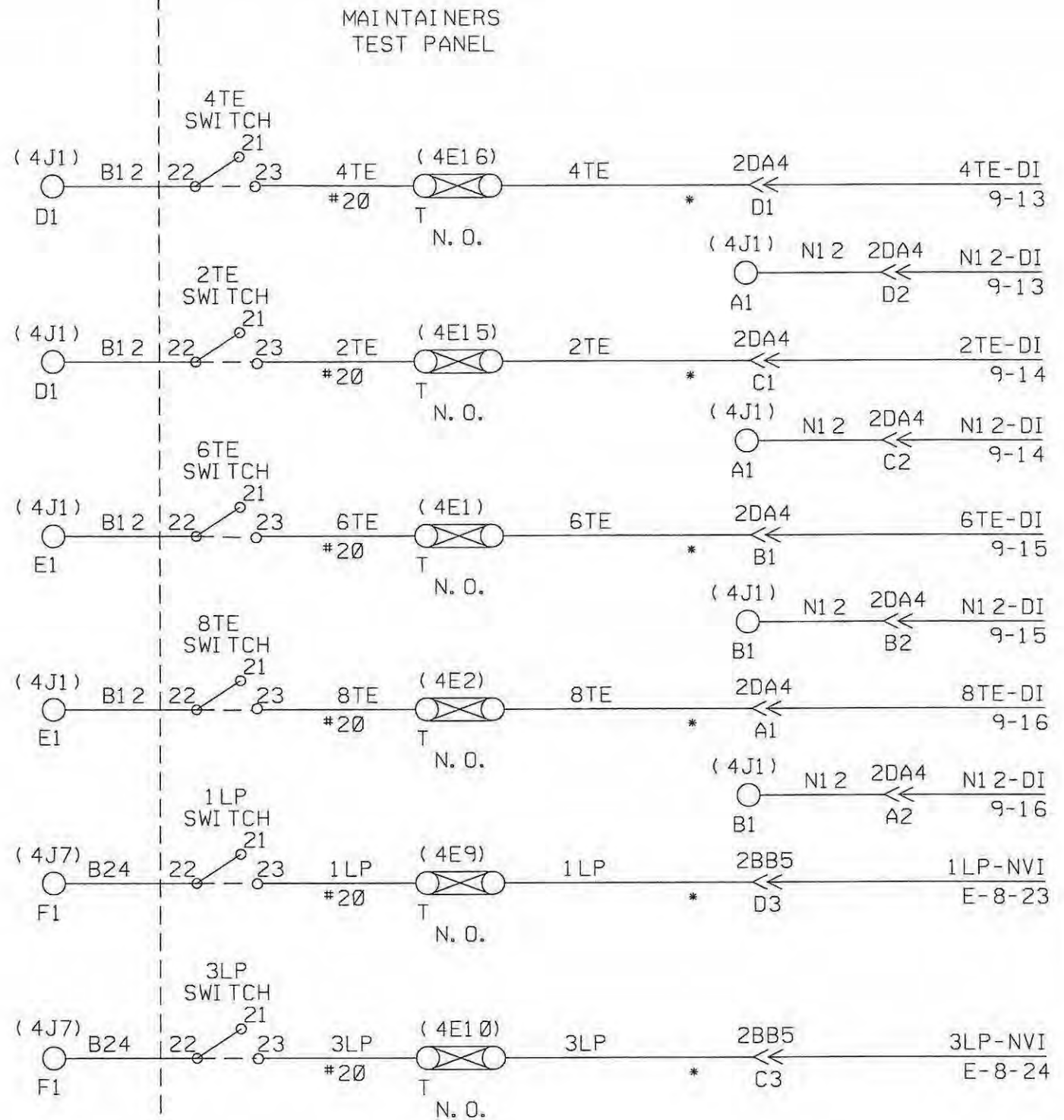
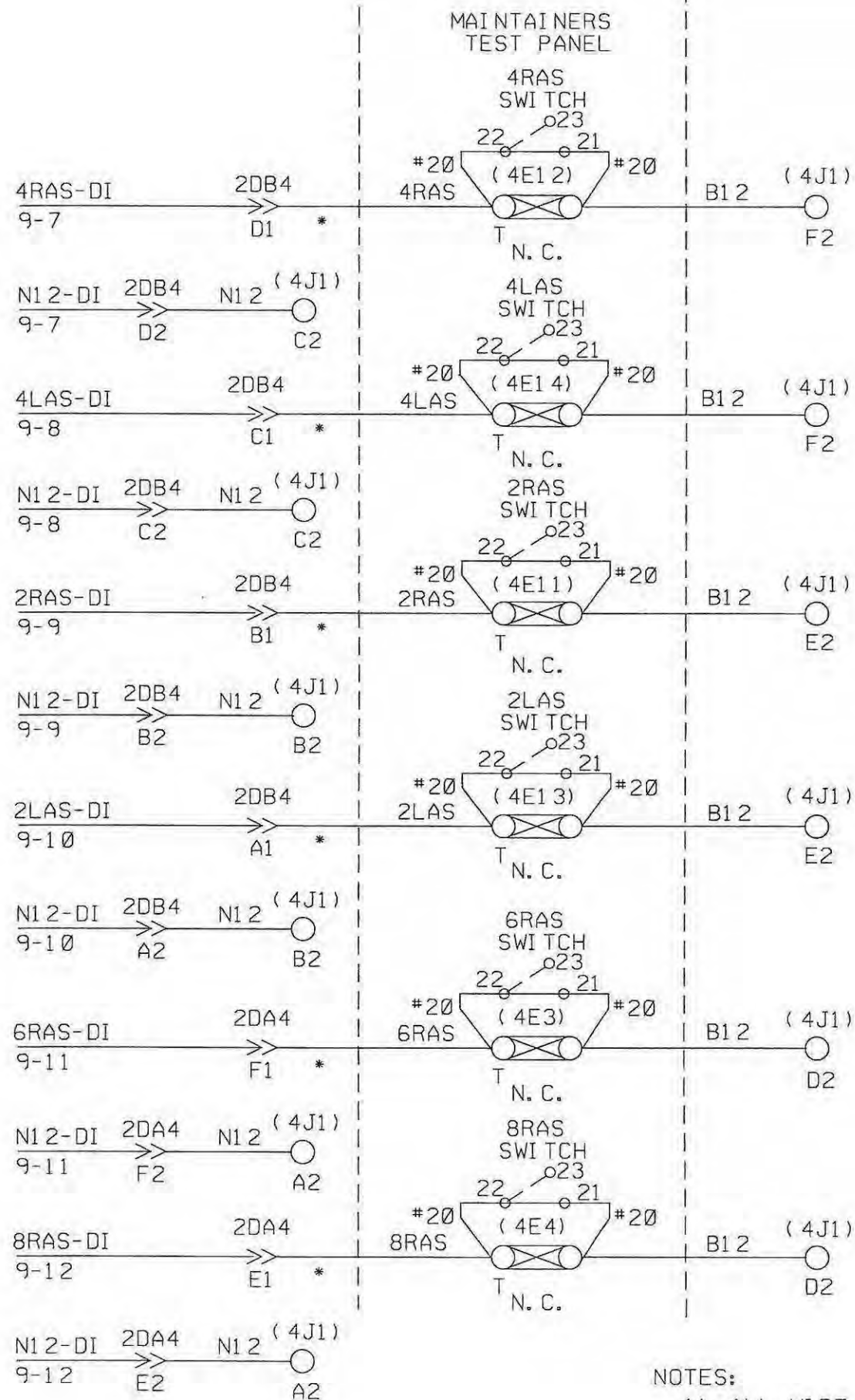
MILL BACK OF PANEL TO
 ACCOMMODATE WELDED NUT

PARTS LIST: 71186-56 GR.60

~REVISIONS~

004 01/12/00 *File*

Metra		SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA MAINTAINERS TEST PANEL			
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94		
DESIGNED GRS	DRAWN GRS	CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.48		



NOTES:

- 1) ALL WIRE #16 TEFZEL UNLESS OTHERWISE NOTED
- 2) * PRE - MADE CABLE

~REVISIONS~

001 01/12/00 *GRS*

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

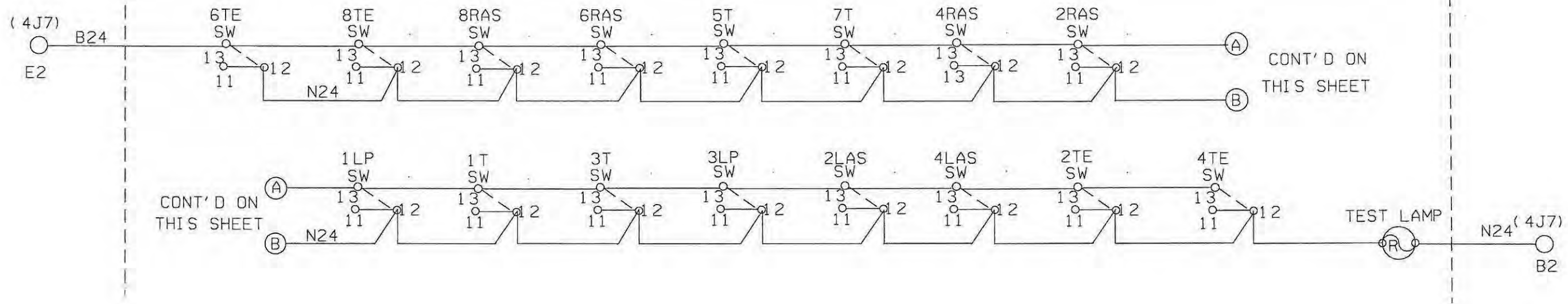
CHICAGO TO ELGIN
ALMORA
MAINTAINERS TEST PANEL-SWITCH

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
---------------------------------------	-------------------

DESIGNED GRS	DRAWN GRS	CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
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DISTRICT MW/W	PRINT NUMBER 39.70 SH. 49
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MAINTAINERS TEST PANEL

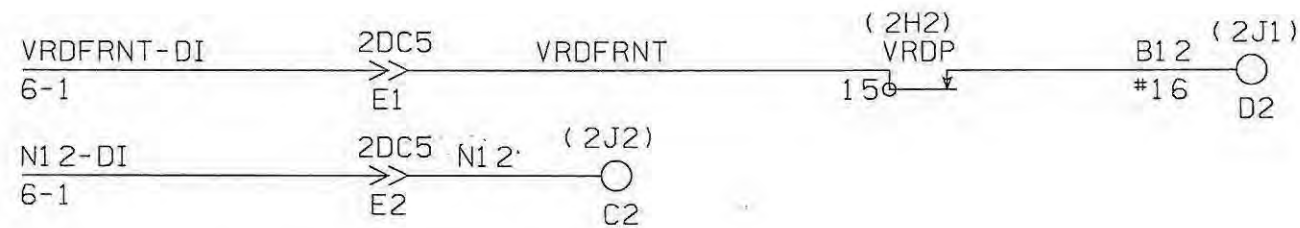
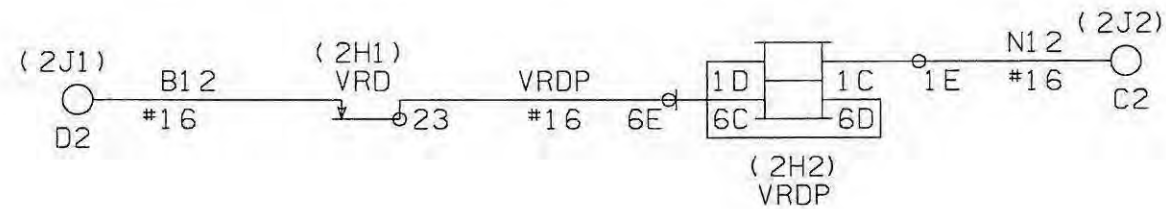
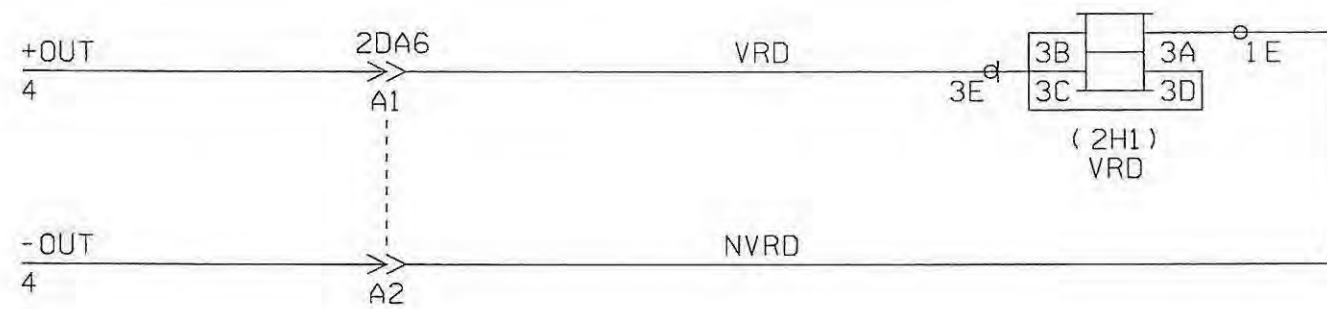


NOTE:
 1.) ALL WIRING #20
 UNLESS OTHERWISE NOTED

~REVISIONS~

001 01/12/00 *AW*

Metra		SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA MAINTAINERS PANEL -TEST PANEL			
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94		
DESIGNED GRS	DRAWN GRS	CHECKED <i>AW</i>	APPROVED <i>UK</i>
DISTRICT MW/W		PRINT NUMBER 39.70 SH.50	



NOTE:
1.)

ALL WIRE SIZE #16 TEFZEL
UNLESS OTHERWISE NOTED

~REVISIONS~

08/01/12/00 *AK*

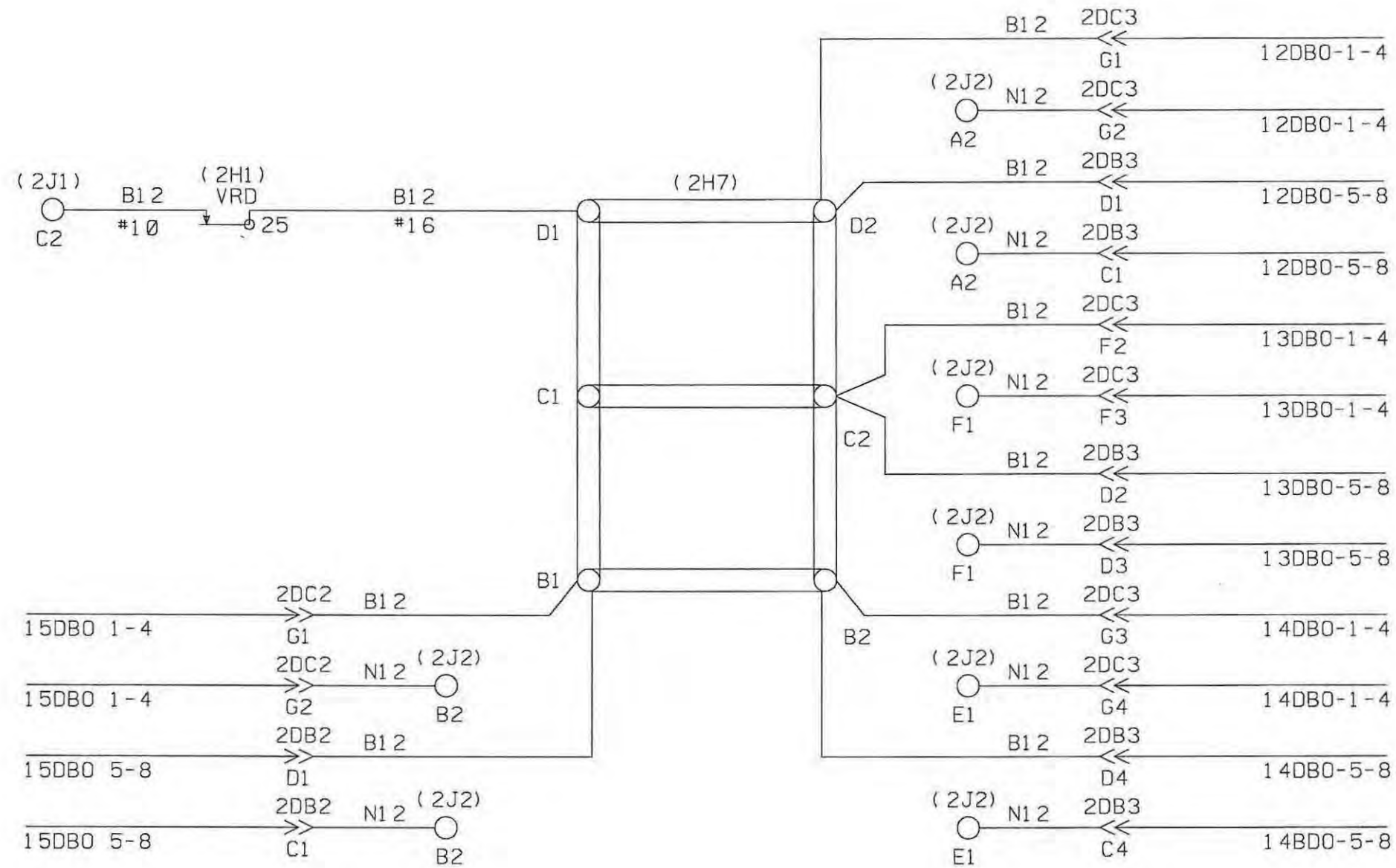
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
VPI CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 78 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>AK</i>	<i>AK</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH.51



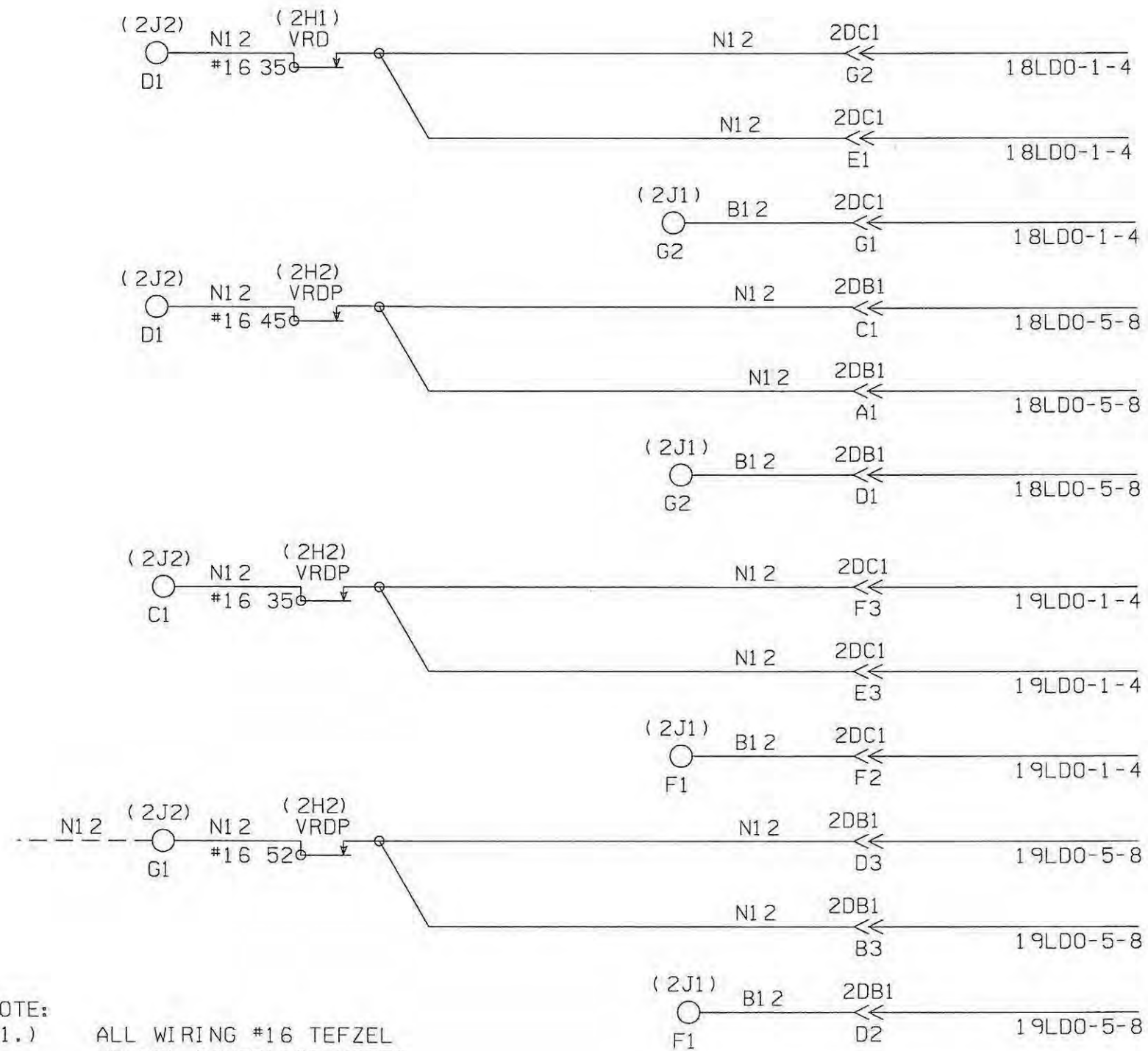
~REVISIONS~
 001 01/12/00 *JK*

NOTE:
 1) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA
 VPI POWER CIRCUITS

REFERENCE:	39.70 SH. 1 THRU SH. 78	DATE:	07/06/94
DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>JK</i>	<i>WPK</i>
DISTRICT	PRINT NUMBER		
MW/W	39.70 SH. 52		

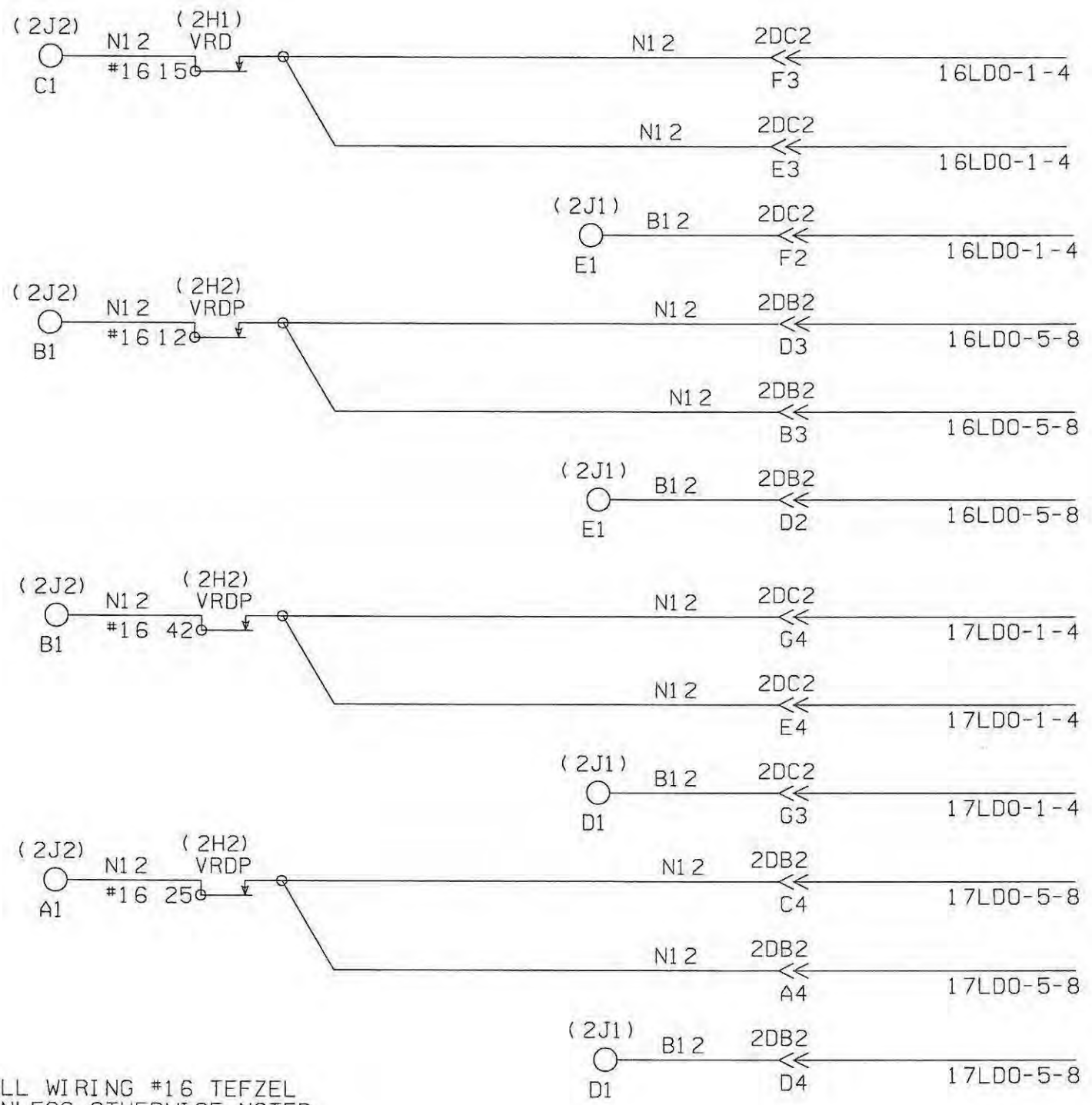


NOTE:
1.) ALL WIRING #16 TEFZEL
UNLESS OTHERWISE NOTED

~REVISIONS~

ABA 01/12/00 *File*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA VPI POWER CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>TSB</i>	APPROVED <i>UKK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.53

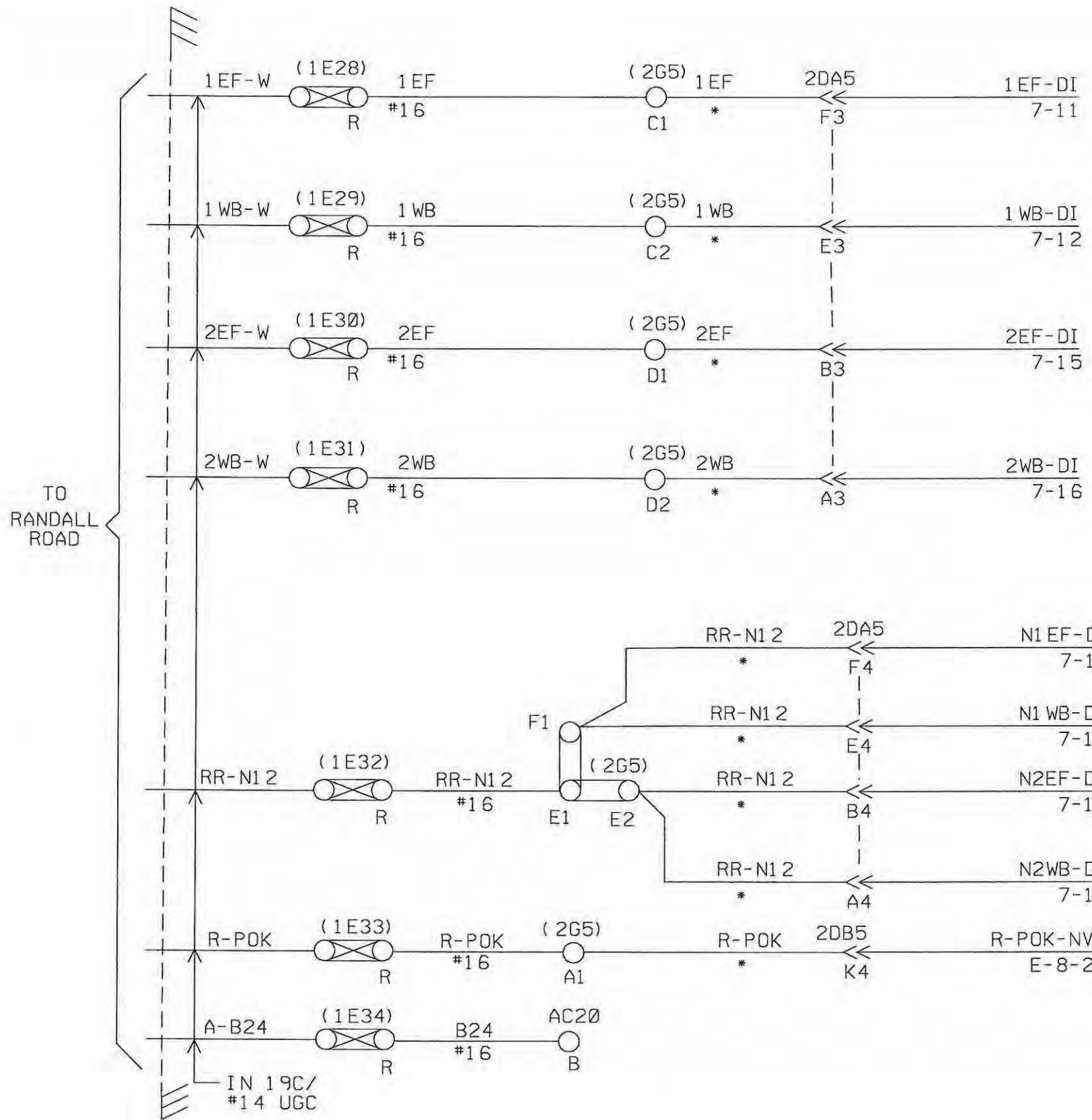


NOTE:
1.) ALL WIRING #16 TEFZEL
UNLESS OTHERWISE NOTED

~REVISIONS~

BB 01/12/00 *AW*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA VPI POWER CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JP</i>	APPROVED <i>UK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.54



~REVISIONS~

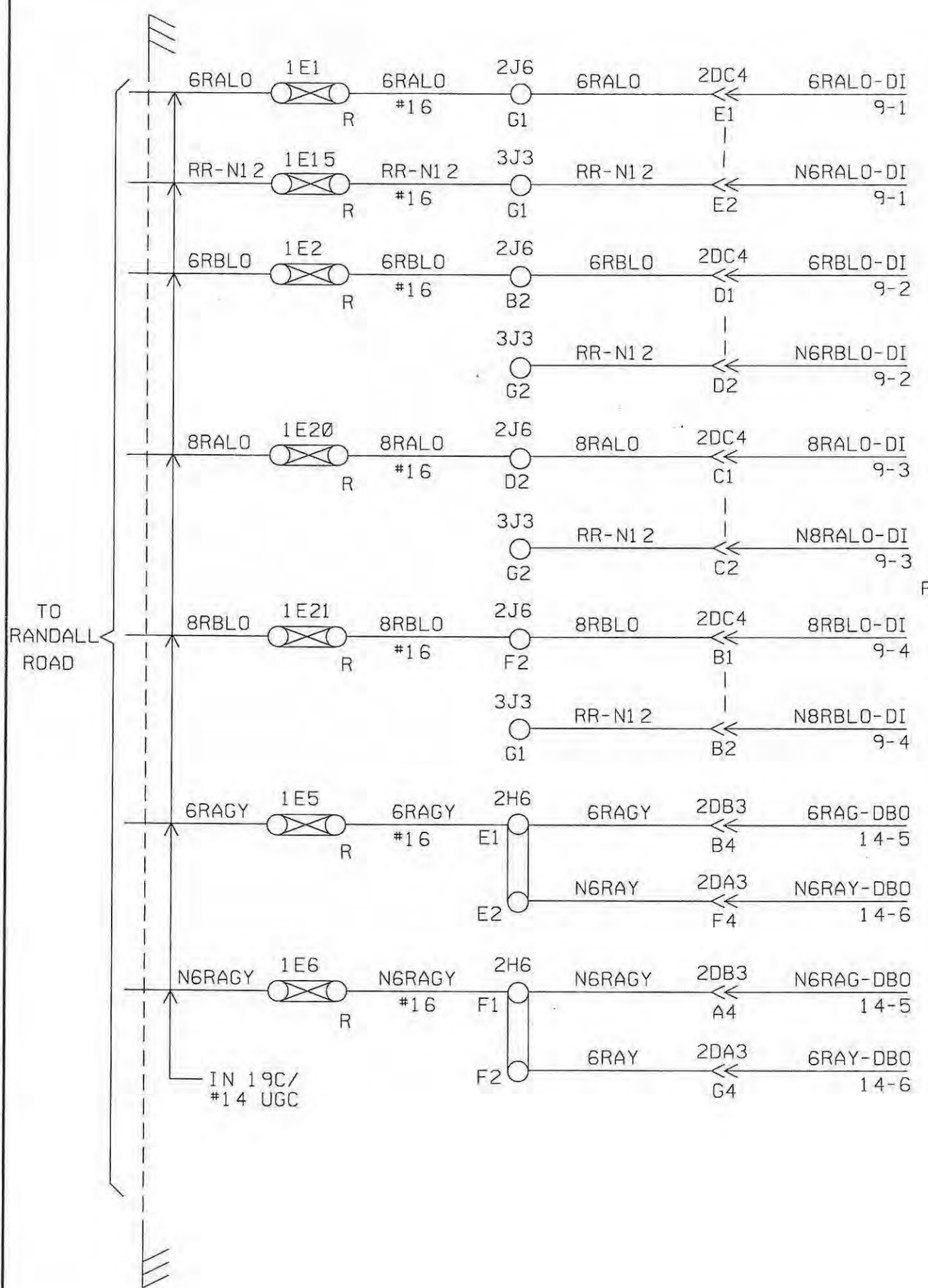
01/12/00	JP
11/02/10	OK JK

- NOTE:
- 1.) * PRE-MADE CABLE
 - 2.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

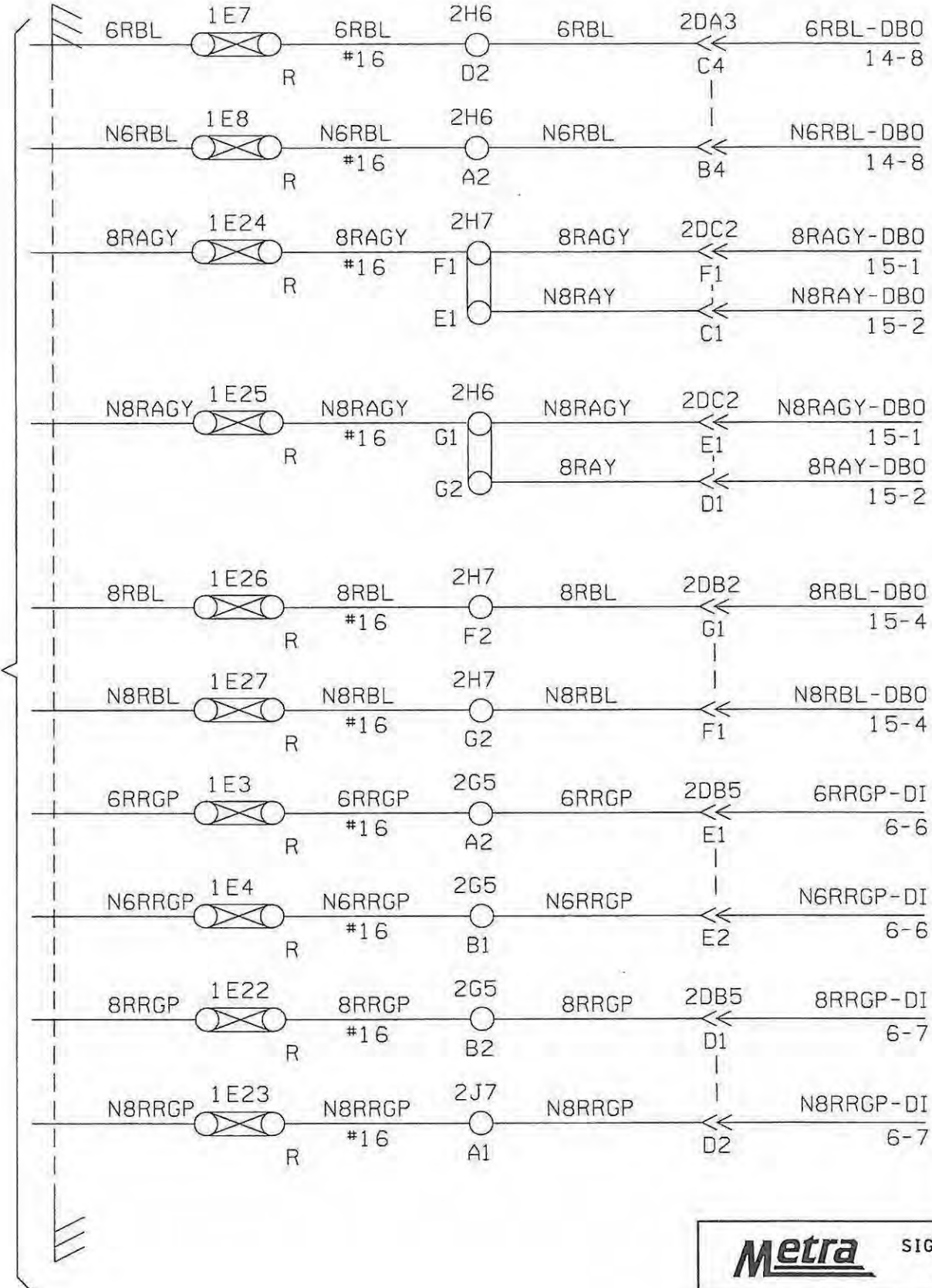
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
VPI LINE CIRCUITS

REFERENCE:	39.70 SH. 1 THRU SH. 78	DATE:	07/06/94
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	JP	WPK
DISTRICT	PRINT NUMBER		
MW/W	39.70 SH.55		



TO RANDALL ROAD



~REVISIONS~

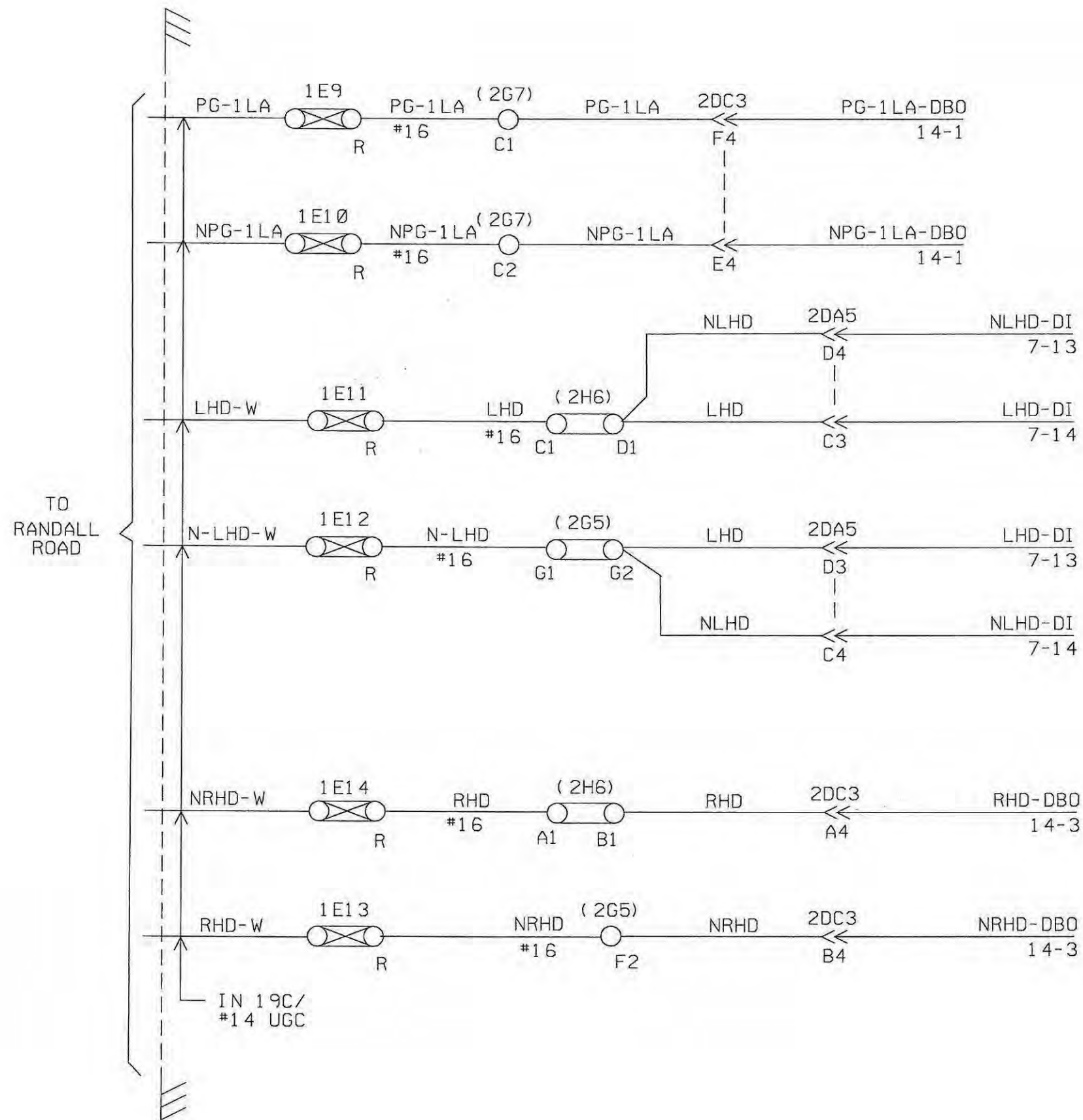
01/12/00	AW
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NOTE:
 1.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 ALMORA
 VPI LINE CIRCUITS

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>AWK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.56



~REVISIONS~

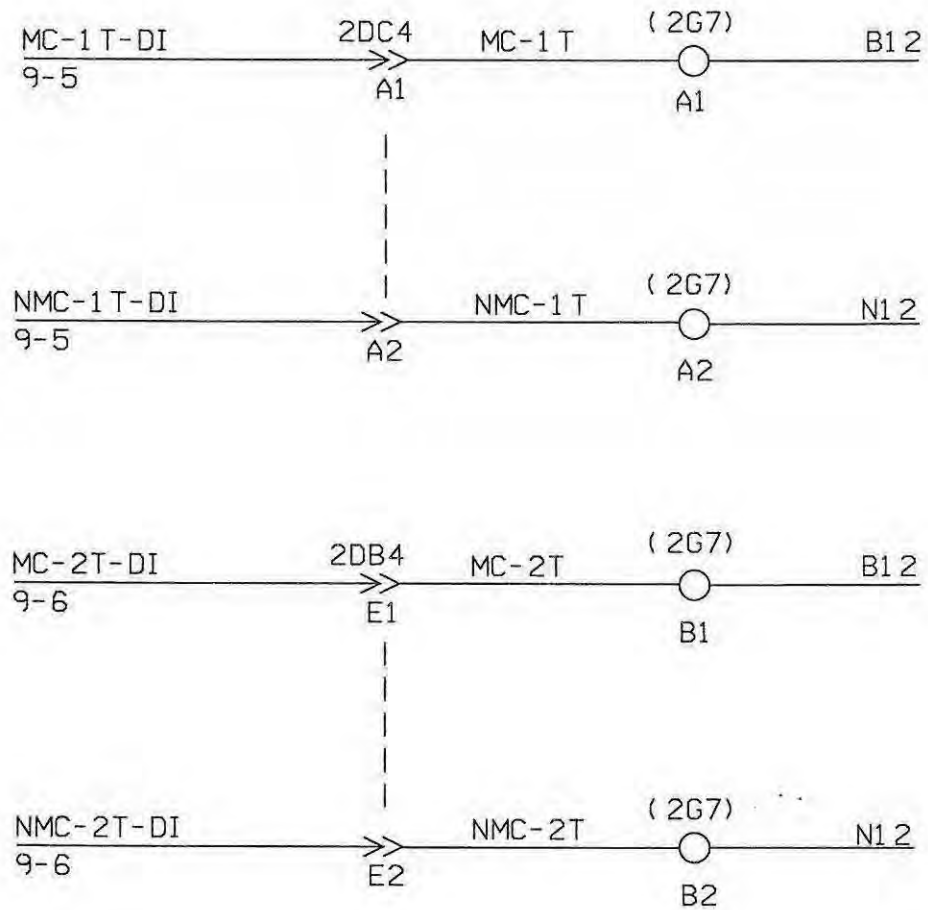
BB	01/12/00	GRS
LP	11/02/10	OK JK

NOTE:
1.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
VPI LINE CIRCUITS

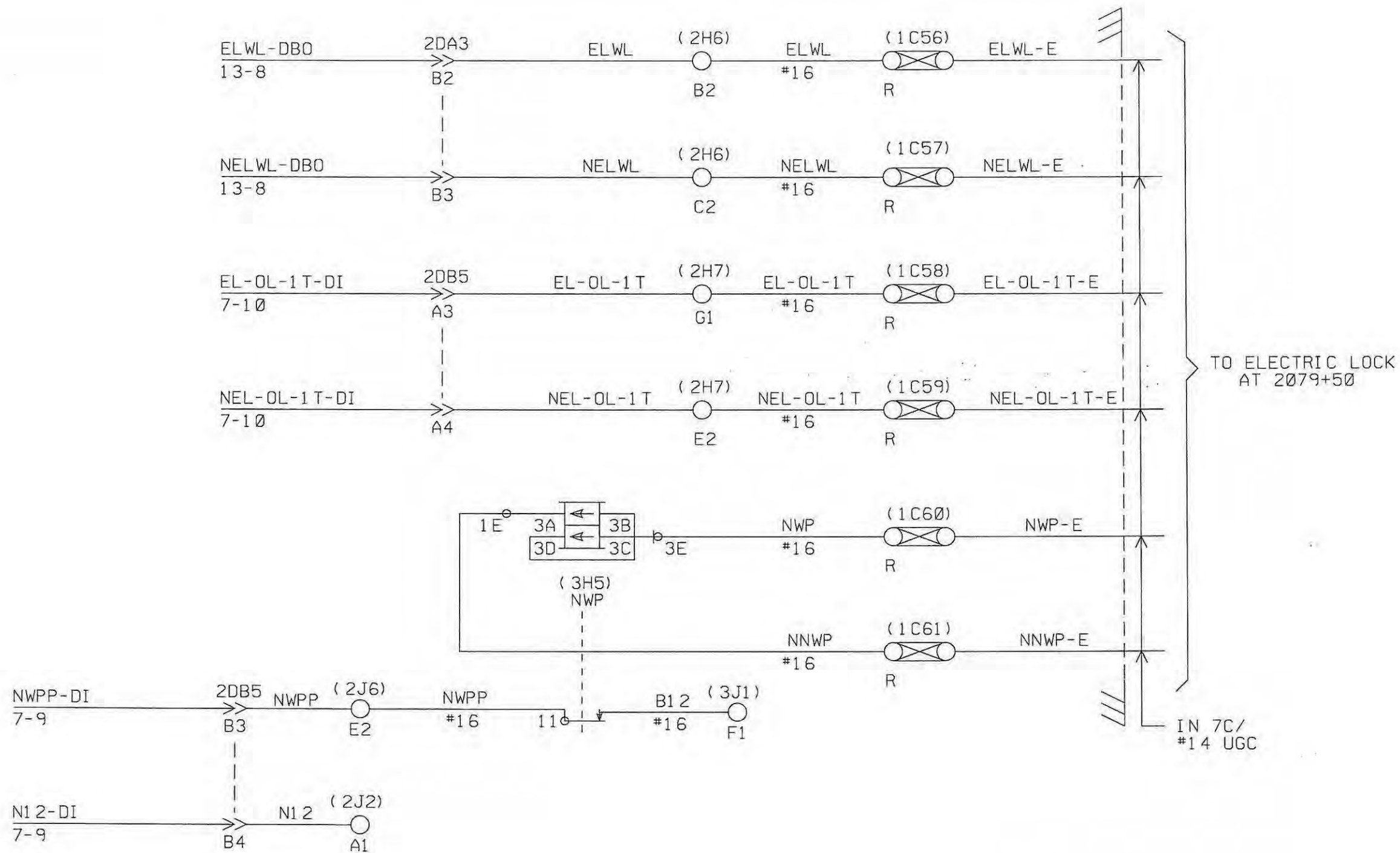
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED JK	APPROVED WPK
DISTRICT MW/W	PRINT NUMBER 39.70 SH.57



NOTE:
 1.) ALL WIRING #16 TEFZEL UNLESS OTHERWISE NOTED

~REVISIONS~	
15	07/23/02 OK WK

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA VPI LINE CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.58



TO ELECTRIC LOCK
AT 2079+50

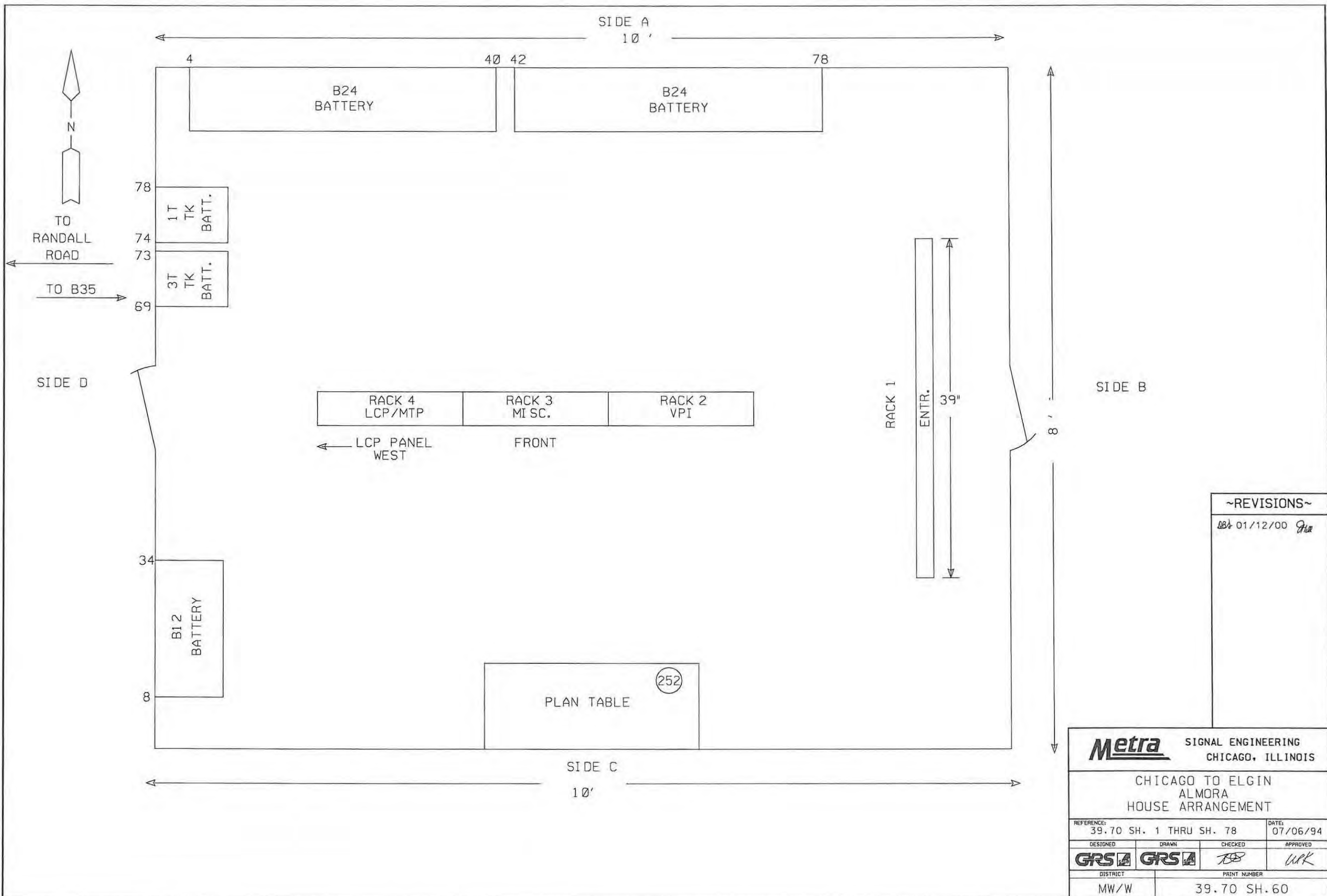
IN 7C/
#14 UGC

NOTE:
1.) ALL WIRING #16 TEFLON UNLESS
OTHERWISE NOTED

~REVISIONS~

01/12/00 *AW*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA LOCK CASE CIRCUITS	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>AW</i>	APPROVED <i>UK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.59



~REVISIONS~

BB 01/12/00 *File*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA HOUSE ARRANGEMENT	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JS</i>	APPROVED <i>WRK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.60

1	I/O	59473-827 GR.1	59473-871 GR.1
2	PD	59473-737 GR.1	
3	CPU	59473-742 GR.7	
4	VRD	59473-740 GR.2	
5			
6	DI	59473-867 GR.1	59473-871 GR.16
7	DI	59473-867 GR.1	59473-871 GR.15
8			
9	DI	59473-867 GR.1	59473-871 GR.14
10	DI	59473-867 GR.3	59473-871 GR.13
11			
12	DBO	59473-747 GR.1	39780-3 GR.1
13	DBO	59473-747 GR.1	39780-3 GR.2
14	DBO	59473-747 GR.1	39780-3 GR.3
15	DBO	59473-747 GR.1	39780-3 GR.4
16	LDO	59473-749 GR.2	39780-3 GR.5
17	LDO	59473-749 GR.2	39780-3 GR.6
18	LDO	59473-749 GR.2	39780-3 GR.7
19	LDO	59473-749 GR.2	39780-3 GR.8
20			
21	TIMER	59473-894 GR.1	

FRONT VIEW
BOARD ASSIGNMENT

VITAL TIMERS
 SIGNAL 2R 3MIN. 00SEC.
 SIGNAL 4R 3MIN. 00SEC.
 SIGNAL 6R 4MIN. 40SEC.
 SIGNAL 8R 4MIN. 40SEC.
 SIGNAL 2L 3MIN. 55SEC.
 SIGNAL 4L 3MIN. 55SEC.

VPI® VITAL SYSTEM SOFTWARE CONFIGURATION DATA	VALUE FROM HHT
INPUT FILE NUMBER:	51607-15300A
CAA FILE NUMBER:	3174600810I
VRS FILE NUMBER:	4002613800
RUN DATE:	020594
RUN TIME:	21:37:20
VSC.VB1:	
RUN DATE:	
RUN TIME:	
VSC.VB2:	
RUN DATE:	
RUN TIME:	

~REVISIONS~
 01/12/00 *AK*
 08/05/09 OK *AK*

70186-24 GR.1

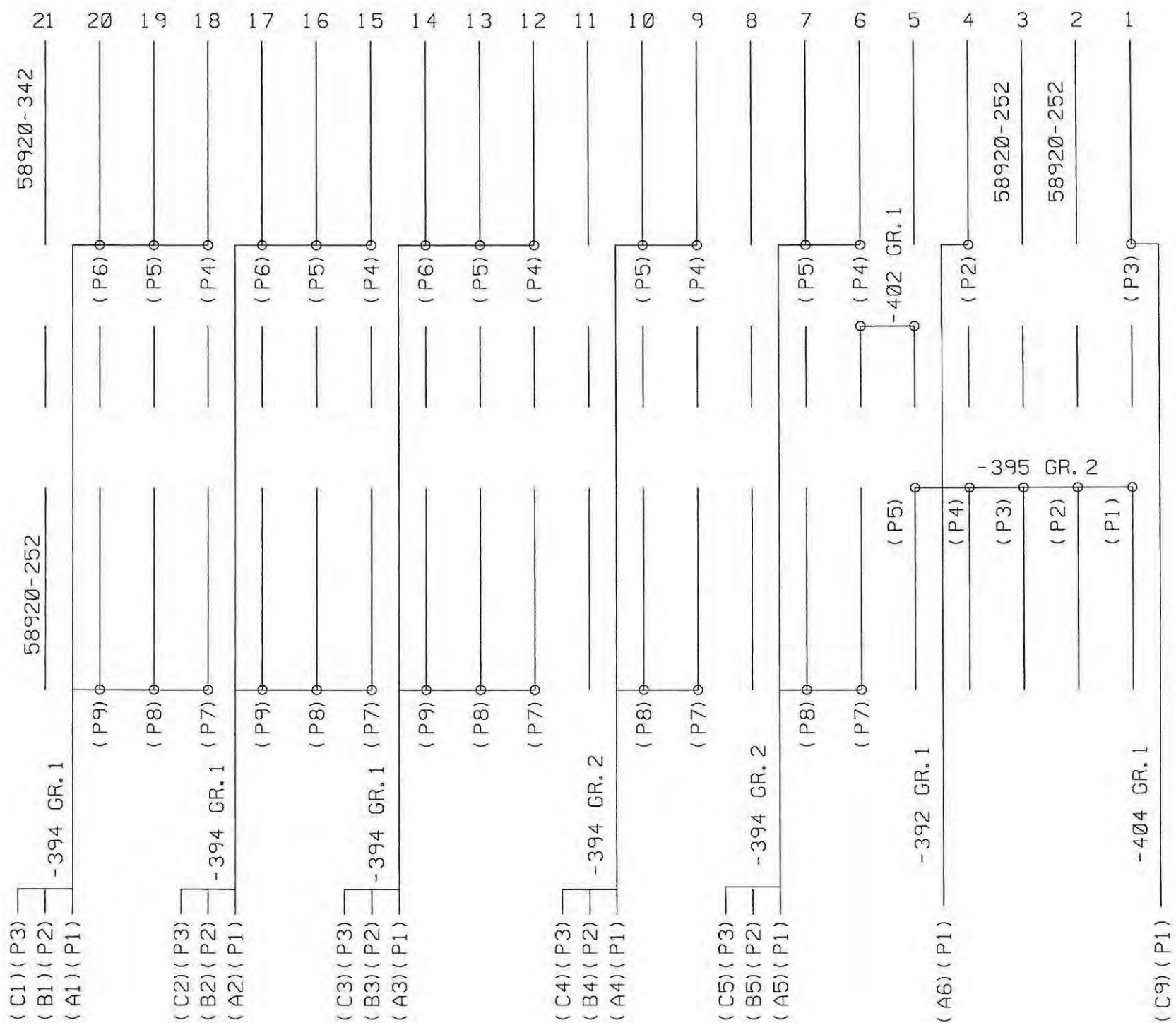
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
VPI PLAN - BOARD ASSIGNMENT

REFERENCE: 39.70 SH. 1 THRU SH. 7B	DATE: 07/06/94
DESIGNED <i>GRS</i>	DRAWN <i>GRS</i>
CHECKED <i>AK</i>	APPROVED <i>AK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.61

REAR VIEW
CABLE DIAGRAM

ALL CABLES ARE
KEY NO. 38216-

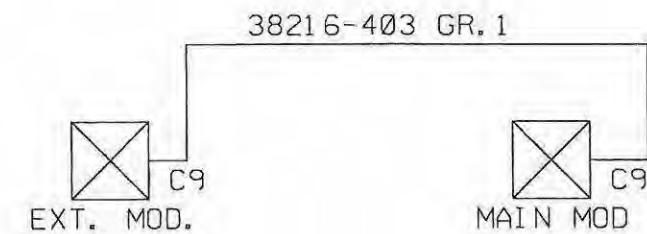
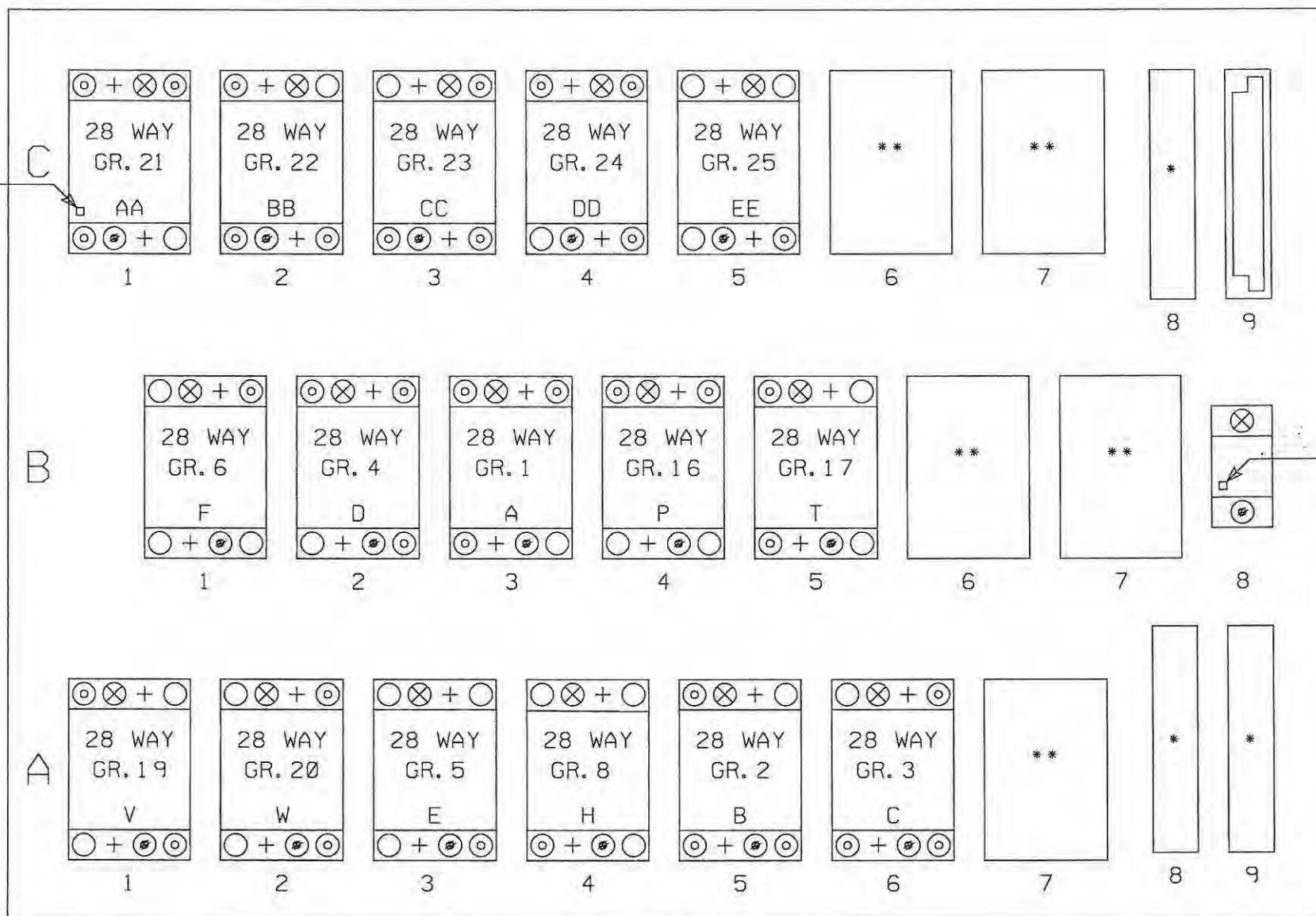


70186-24 GR. 1

~REVISIONS~	
001	01/12/00 <i>JK</i>

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA VPI ARRANGEMENT PLAN - CABLE	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JK</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 62

PIN COORDINATE
A1 (TYPICAL)



PIN
COORDINATE
A1
(TYPICAL)

REAR VIEW
KEYING ARRANGEMENT

- NOTES:
1. ASSEMBLE PER 31038-249.
 2. MODULE COUPLER KEYING ARRANGEMENT SHOWN FOLLOWS ARRANGEMENT PLAN 59591-827
 3. ALL CABLING TO MODULE SHALL BE LONG ENOUGH TO ALLOW REAR DOOR TO FOLD DOWN WITH COUPLERS CONNECTED TO DOOR.
 4. FOR COUPLER DETAILS, REFER TO:
14 WAY - AD61-41
50 WAY - AD61-30
 5. LOOSE WIRE COUPLER TO MATE WITH MODULE COUPLER:
GR. NUMBERS SHOWN ON KEYING ARRANGEMENT.
50WAY - 42758-93
28WAY - 42758-127
14WAY - 42758-130 GR. 1

* EXPANSION BUS COVER
56029-89 W (2) 3604-14 SCREWS

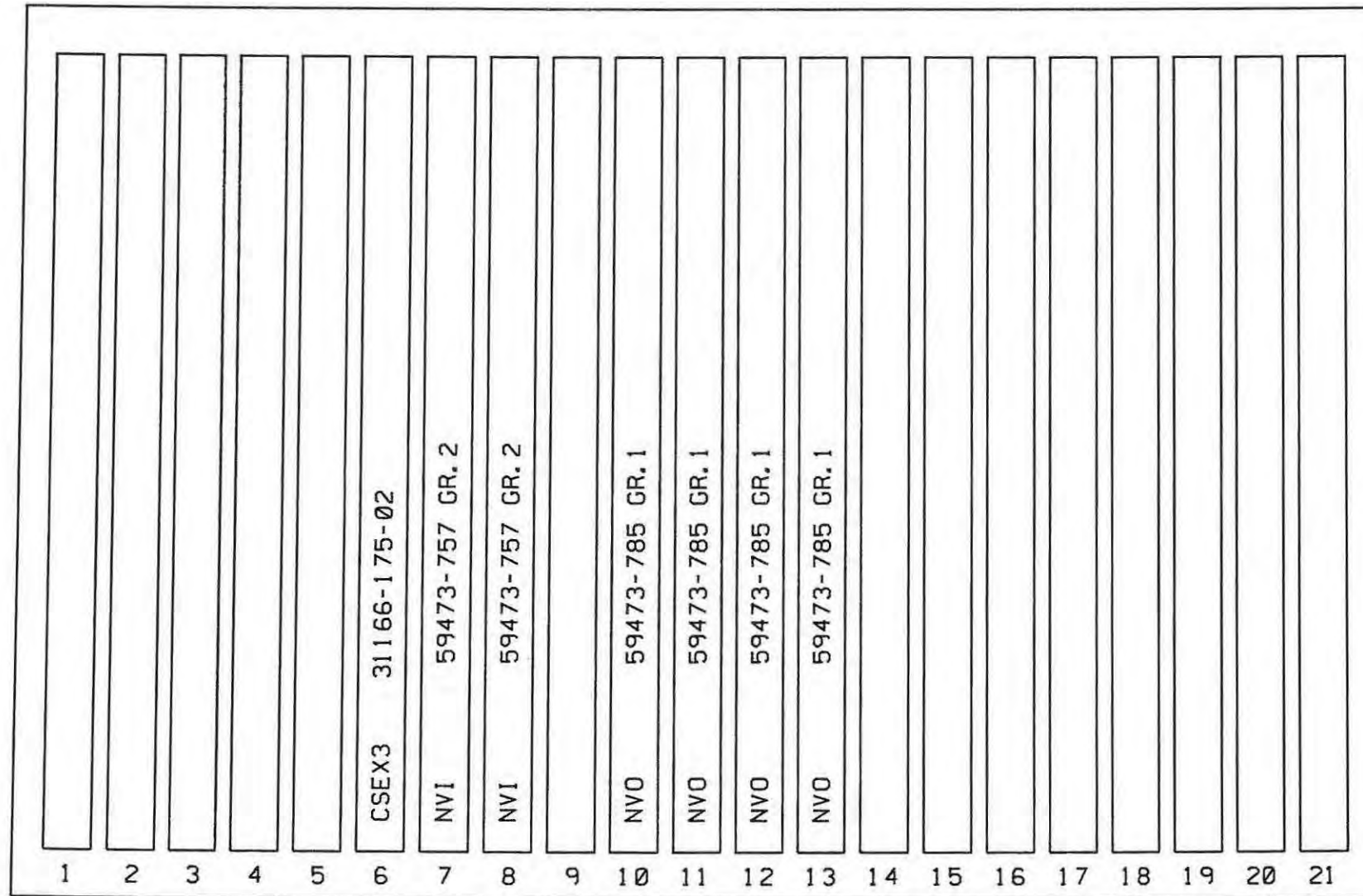
* * COUPLER COVER
56029-88 W (2) 5713-83 RING

~REVISIONS~

001 01/12/00 *File*

70186-24 GR. 1

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA VPI PLAN - REAR VIEW	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>TSP</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 63



FRONT VIEW
BOARD ASSIGNMENT
EXTENDER MODULE

~REVISIONS~

01/12/00	<i>Q</i>
ALSTOM 10/18/13	OK <i>LP</i>

70186-28 GR. 1

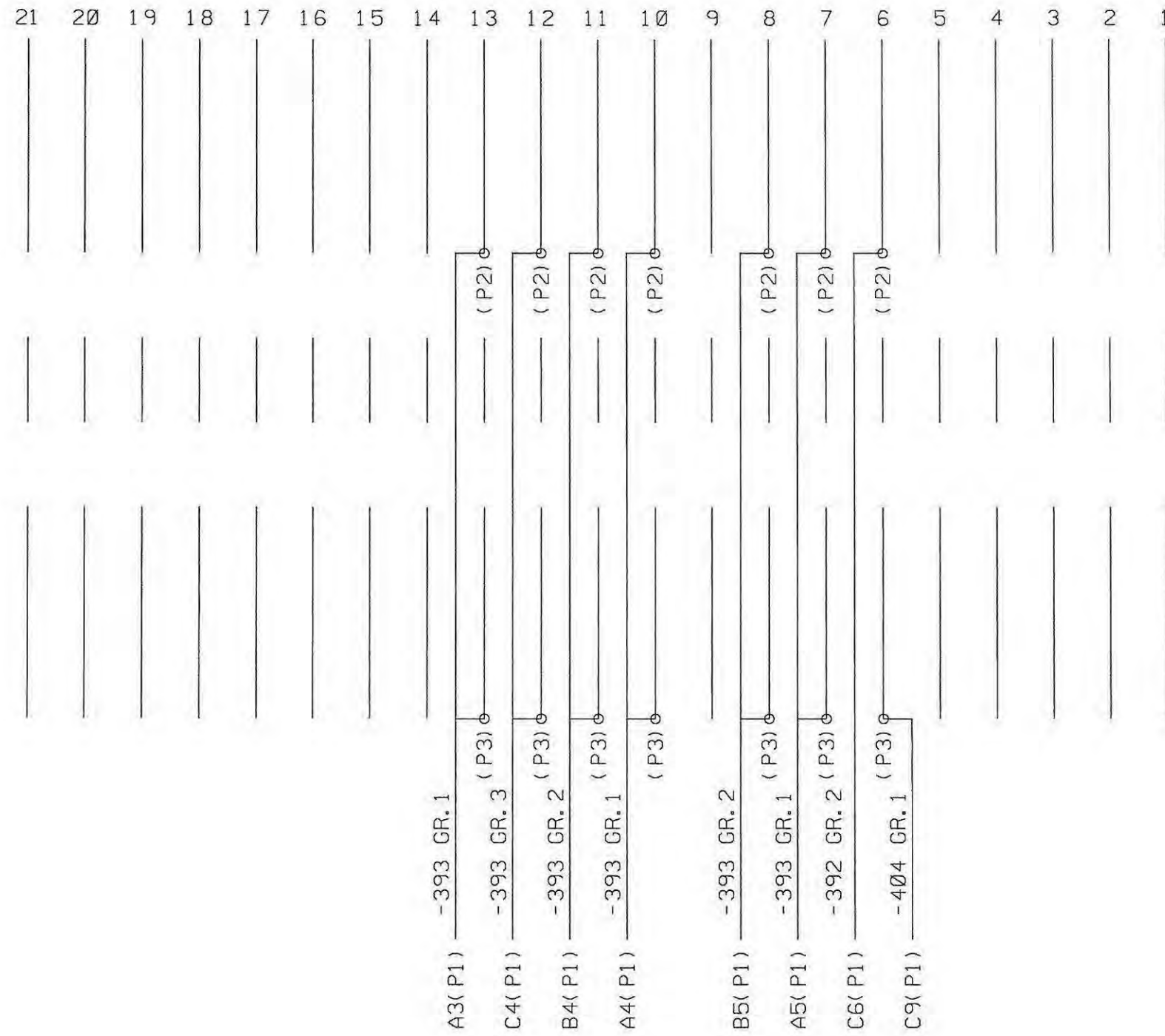
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
VPI EXT MOD PLAN - BRD ASSY

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED <i>GRS</i>	DRAWN <i>GRS</i>
CHECKED <i>JP</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 64

EXTENDER MODULE
 REAR VIEW
 CABLE DIAGRAM

ALL CABLES ARE
 KEY NO. 38216-



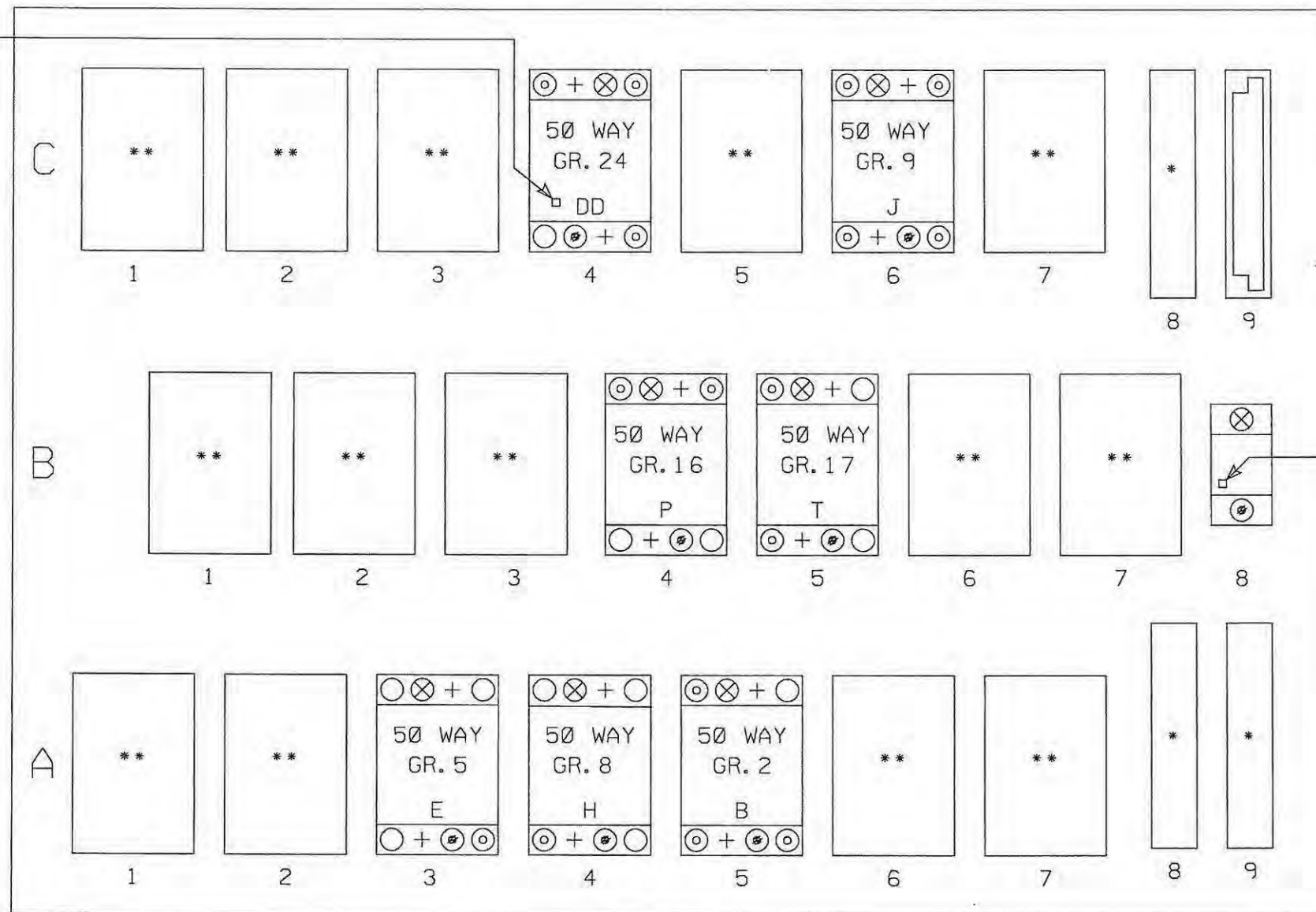
~REVISIONS~

01/12/00	File
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70186-28 GR. 1

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA VPI EXT MOD PLAN - CABLE	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>TS</i>	APPROVED <i>WRK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.65

PIN COORDINATE
A1 (TYPICAL)



PIN
COORDINATE
A1
(TYPICAL)

REAR VIEW
KEYING ARRANGEMENT
EXTENDER MODULE

- NOTES:
1. ASSEMBLE PER 31038-249.
 2. MODULE COUPLER KEYING ARRANGEMENT SHOWN FOLLOWS ARRANGEMENT PLAN 59591-827
 3. ALL CABLING TO MODULE SHALL BE LONG ENOUGH TO ALLOW REAR DOOR TO FOLD DOWN WITH COUPLERS CONNECTED TO DOOR.
 4. FOR COUPLER DETAILS, REFER TO:
14 WAY - AD61-41
50 WAY - AD61-30
 5. LOOSE WIRE COUPLER TO MATE WITH MODULE COUPLER:
GR. NUMBERS SHOWN ON KEYING ARRANGEMENT.
50WAY - 42758-93
28WAY - 42758-127
14WAY - 42758-130 GR.1

* EXPANSION BUS COVER
56029-89 W (2) 3604-14 SCREWS

* * COUPLER COVER
56029-88 W (2) 5713-83 RING

~REVISIONS~

001 01/12/00 *File*

70186-28 GR.1

Metra

SIGNAL ENGINEERING
CHICAGO, ILLINOIS

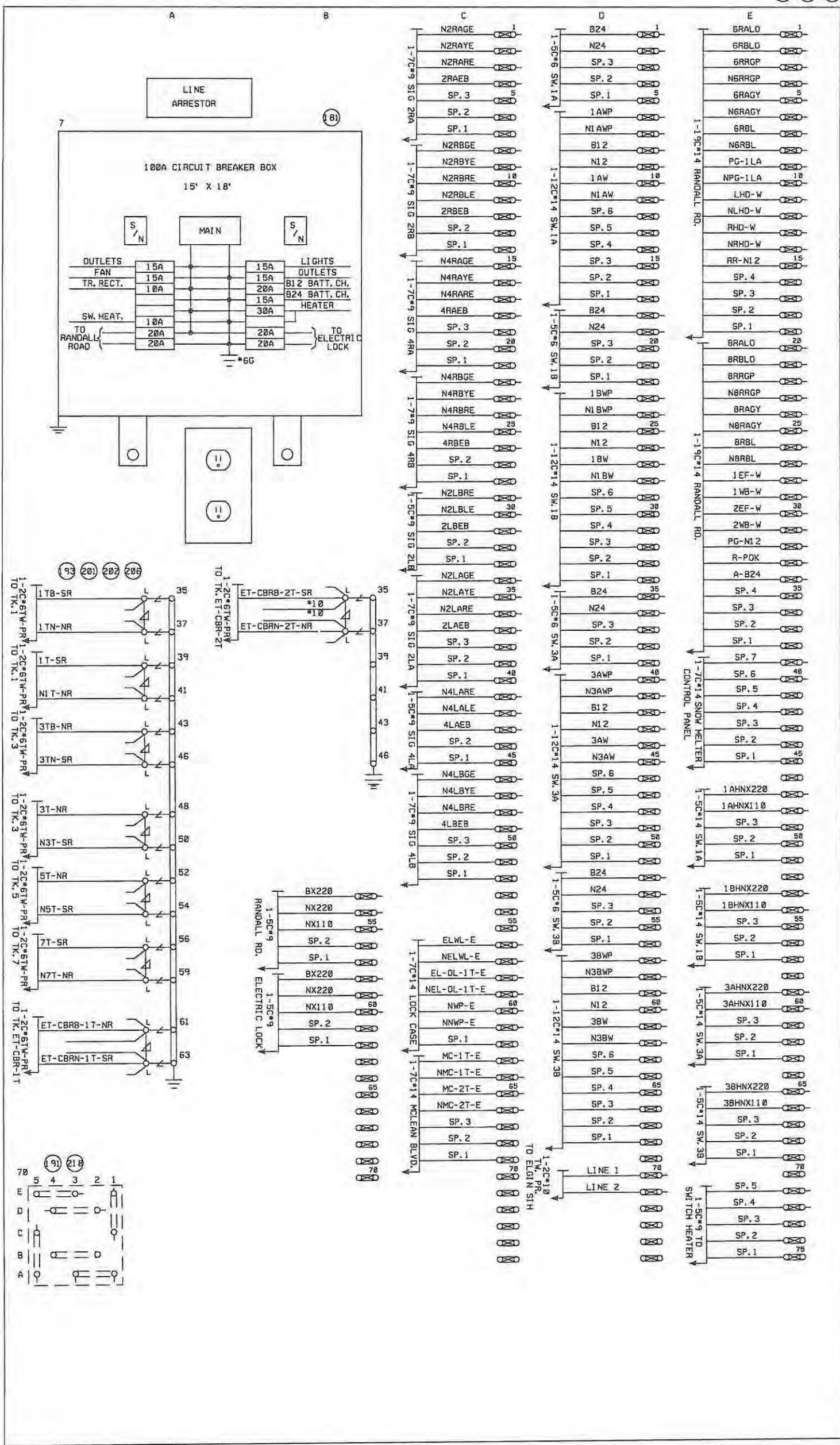
CHICAGO TO ELGIN
ALMORA
VPI EXT MOD PLAN - REAR VIEW

REFERENCE: 39.70 SH. 1 THRU SH. 78 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>JK</i>	<i>WK</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH.66

RACK 1



70186-10 GR. 90

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
ARRANGEMENT PLAN-RACK 1 (ENTR)

REFERENCE: 39.70 SH. 1 THRU SH. 78

DESIGNED: GRS
DRAWN: GRS
CHECKED: GRS
APPROVED: GRS

DISTRICT: MW/W

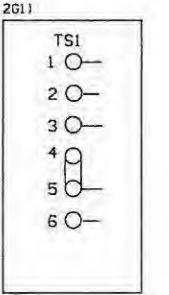
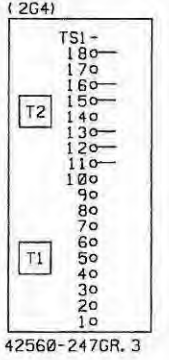
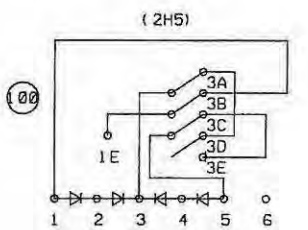
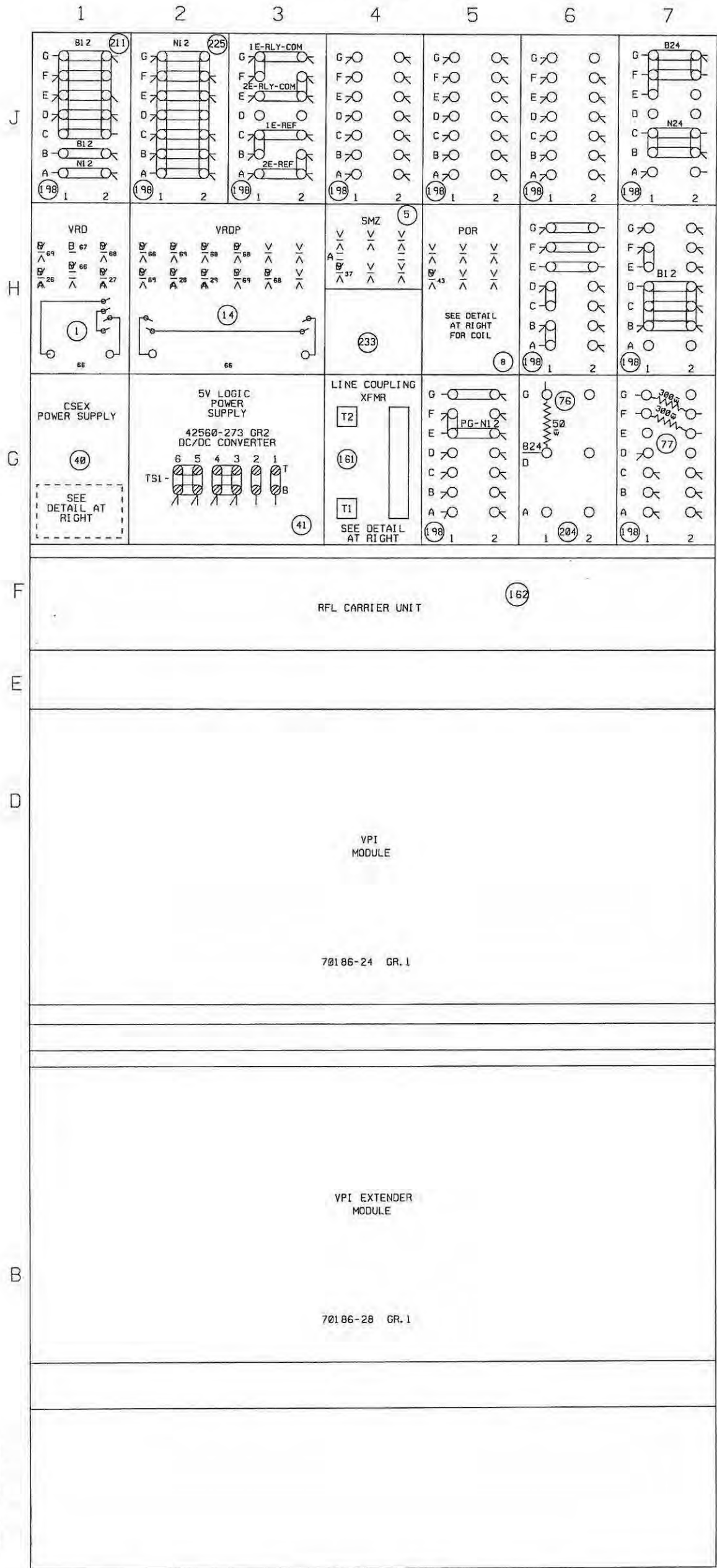
PRINT NUMBER: 39.70 SH. 67

DATE: 07/06/94

DATE: 01/12/00
DATE: 09/15/09
DATE: 07/07/10

~REVISIONS~

RACK 2



FRONT VIEW

70186-10 GR. 90

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
ARRANGEMENT PLAN-RACK 2 (VPI)

REFERENCE: 39.70 SH. 1 THRU SH. 78

DATE: 07/06/94

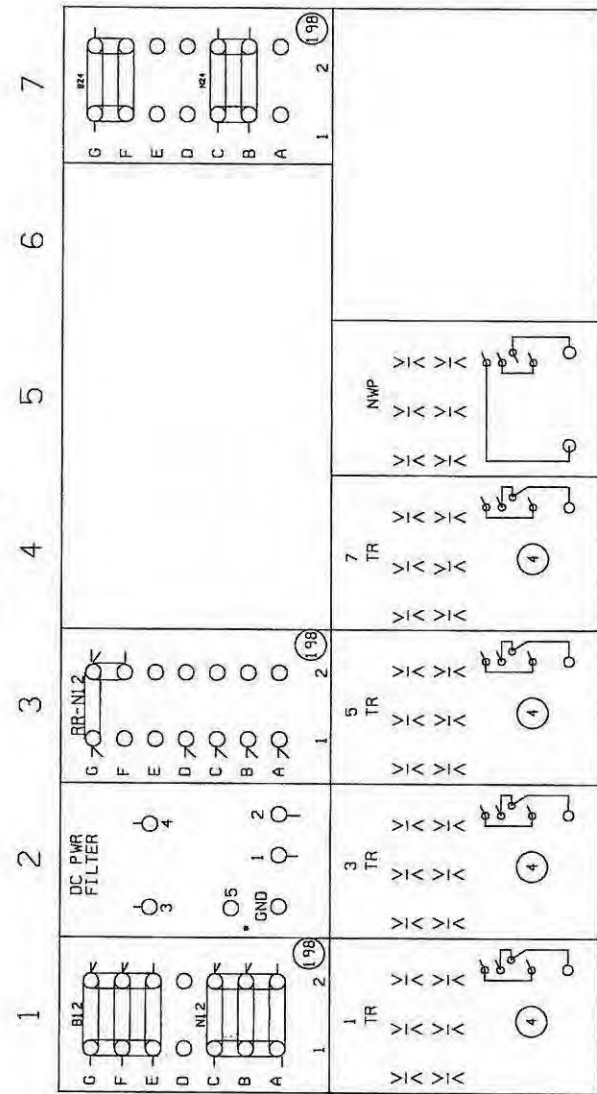
DISTRICT: MW/W

PRINT NUMBER: 39.70 SH. 68

~REVISIONS~
01/12/00

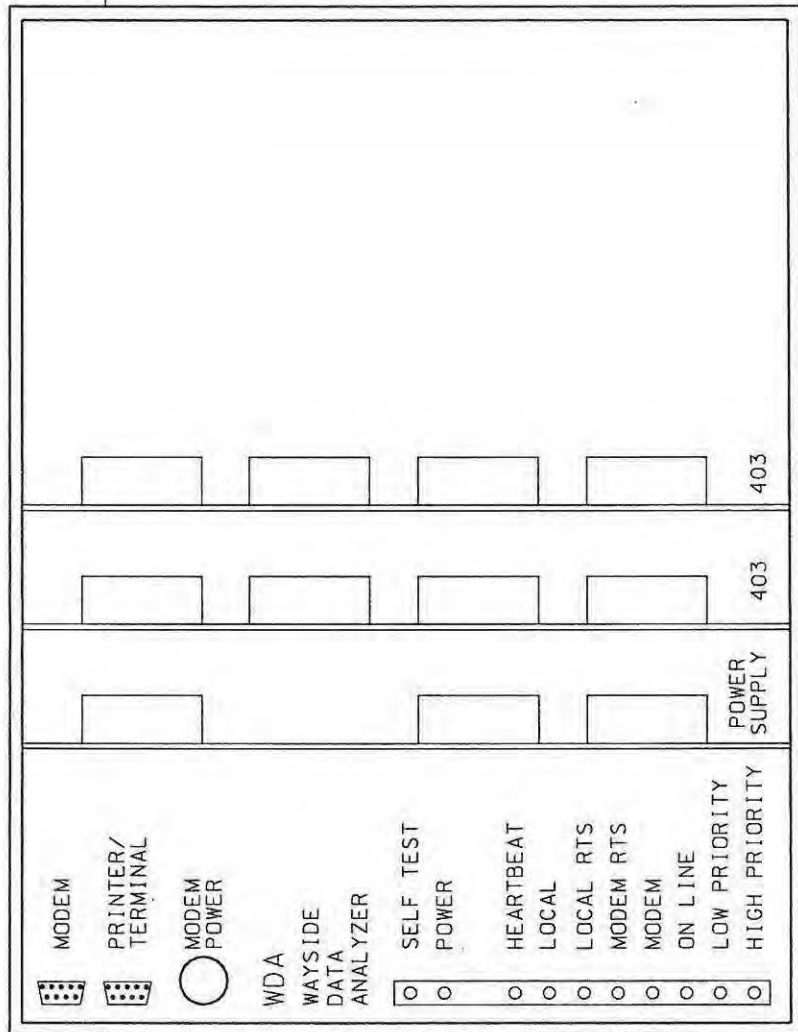
19-001-200-3 11/5/77

RACK 3



NOTE:
 • REMOVE STRAP BETWEEN GND AND #5 TERMINAL ON DC POWER FILTER

J H G F E D C B A

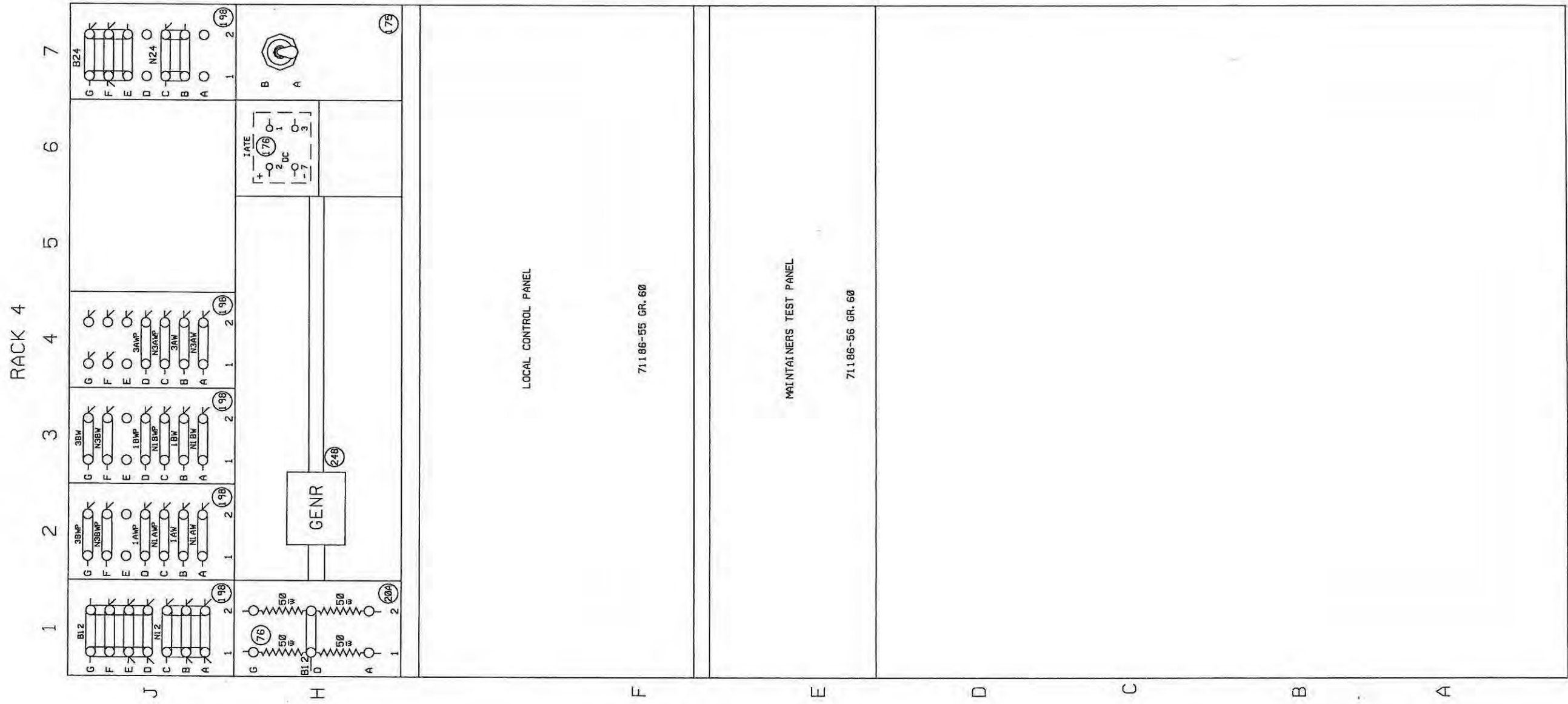


FRONT VIEW

~REVISIONS~
 01/12/00 JH

70186-10 GR. 90

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA ARRANGEMENT PLAN-RACK 3 EVENT	
REFERENCE: 39.70 SH. 1 THRU SH. 79	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JH</i>	APPROVED <i>UK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH. 69

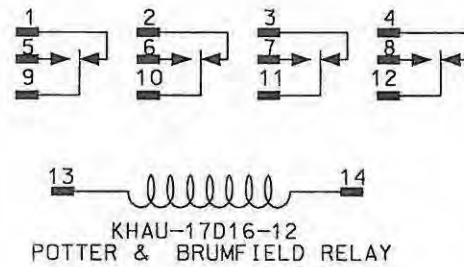
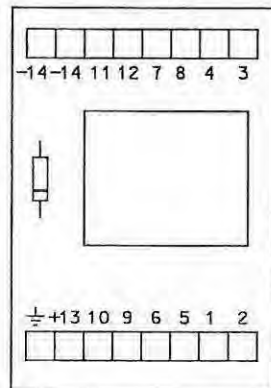


FRONT VIEW

~REVISIONS~

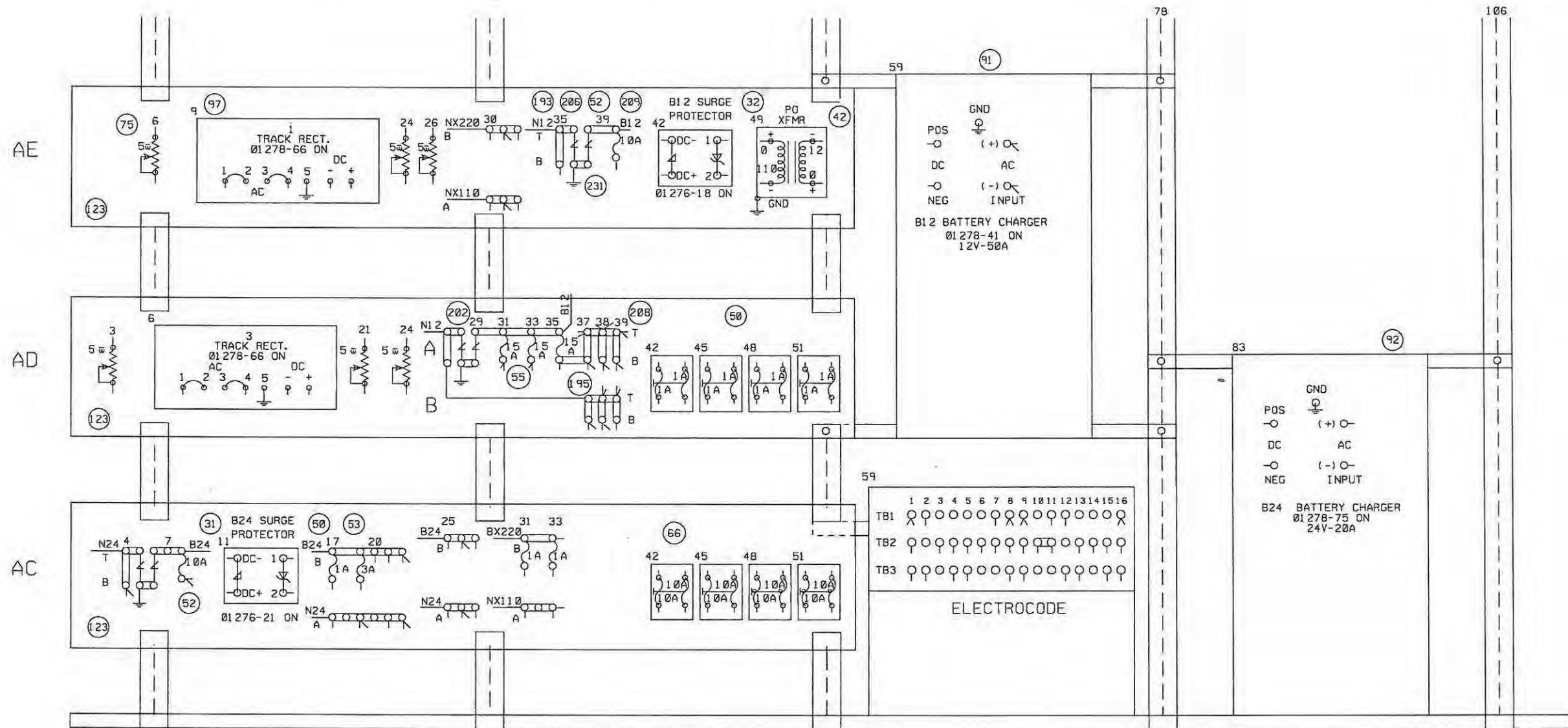
001	01/12/00	JTB
PB	09/15/09	OK 2/2

RAIL MOUNTED RELAY MODULE
(FRONT VIEW)



70816-10 GR. 90

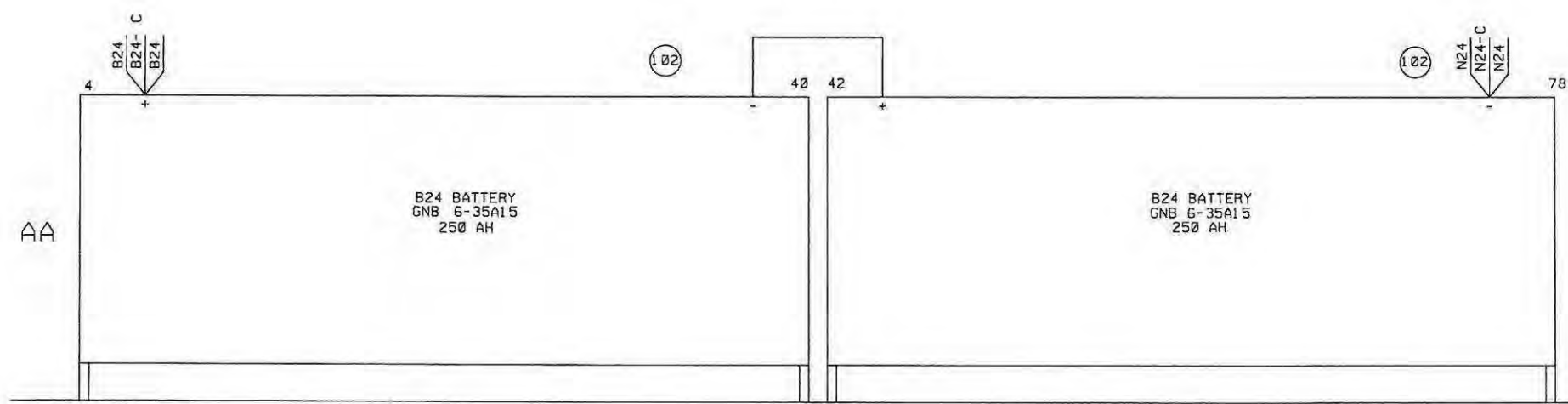
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA ARRANGEMENT PLAN - RACK 4	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JTB</i>	APPROVED <i>WPK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.70



~REVISIONS~

ØØØ 01/12/00 *File*

7Ø186-1Ø GR. 9Ø

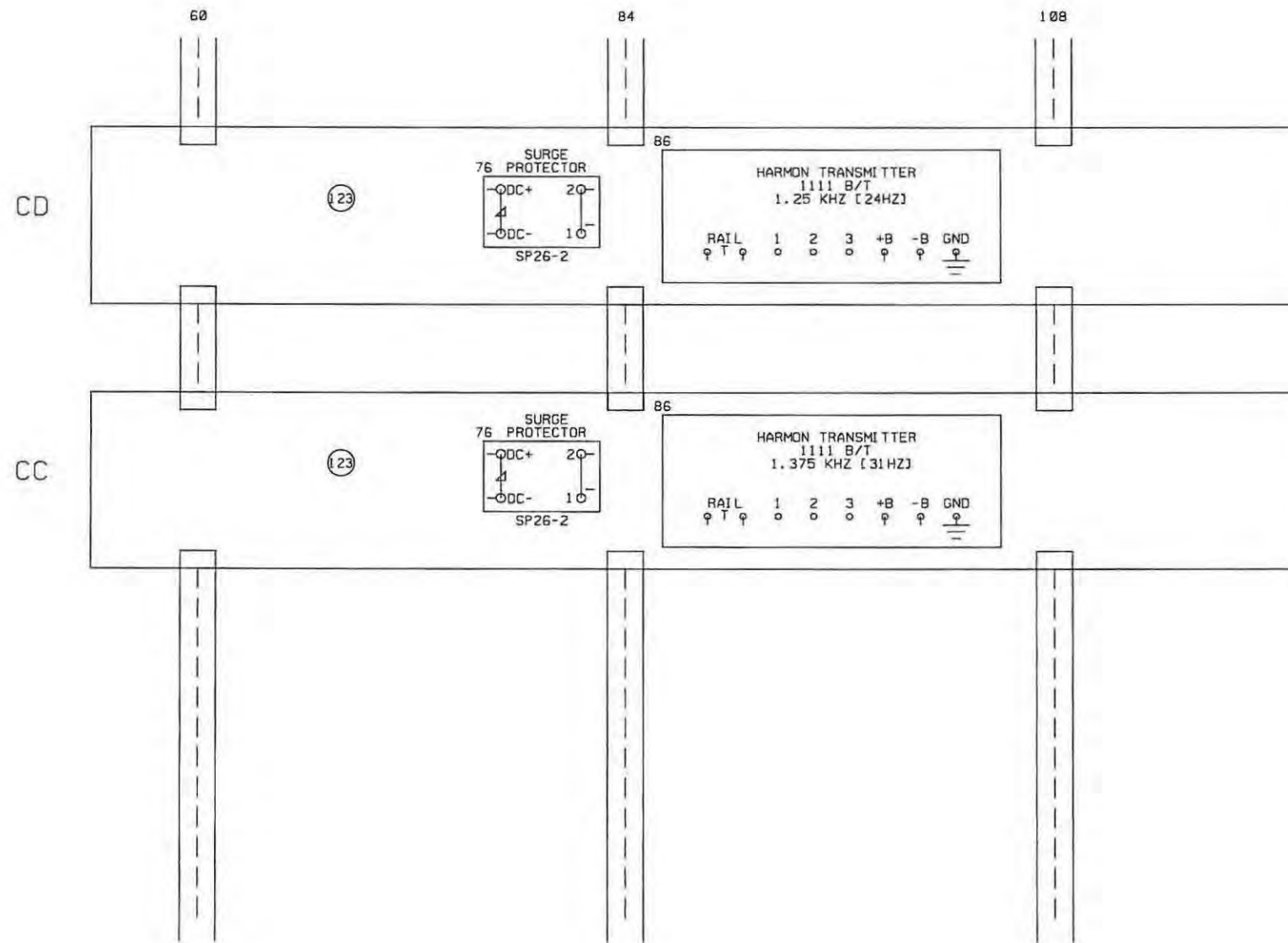


Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
ARRANGEMENT PLAN - SIDE A

REFERENCE: 39.7Ø SH. 1 THRU SH. 78	DATE: Ø7/Ø6/94
DESIGNED <i>GRS</i>	DRAWN <i>GRS</i>
CHECKED <i>JK</i>	APPROVED <i>WRK</i>
DISTRICT MW/W	PRINT NUMBER 39.7Ø SH.71

7300 000-100-61



~REVISIONS~

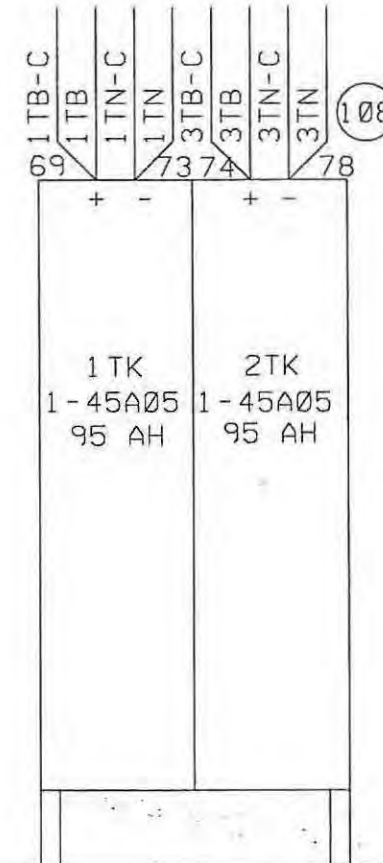
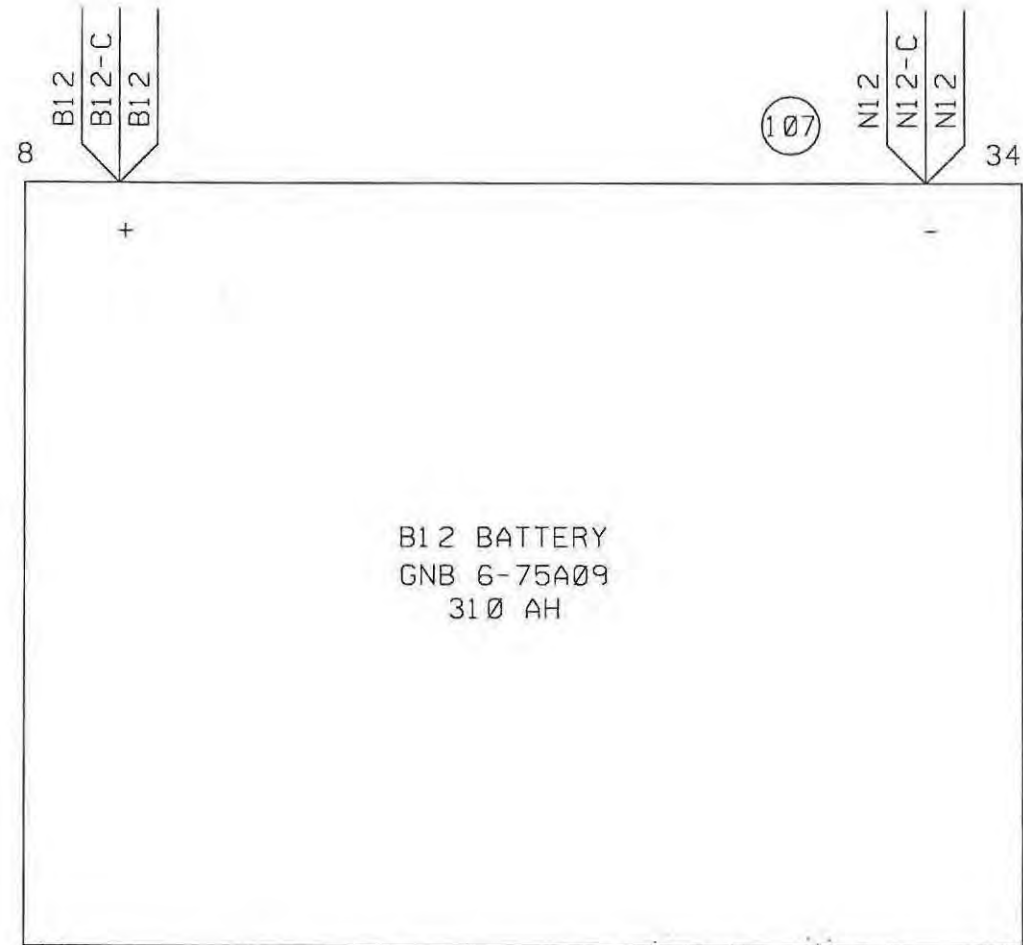
001 01/12/00 *JH*

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
ARRANGEMENT PLAN - SIDE C

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED <i>GRS</i>	DRAWN <i>GRS</i>
CHECKED <i>JH</i>	APPROVED <i>WRK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.72

DA



FLOOR

~REVISIONS~

001 01/12/00 *AW*

70186-10 GR. 90



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

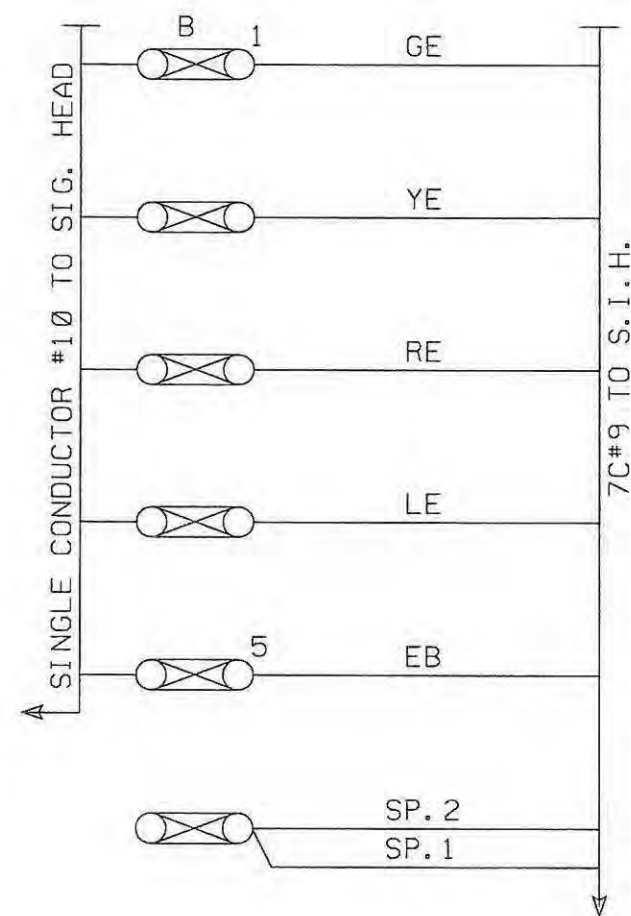
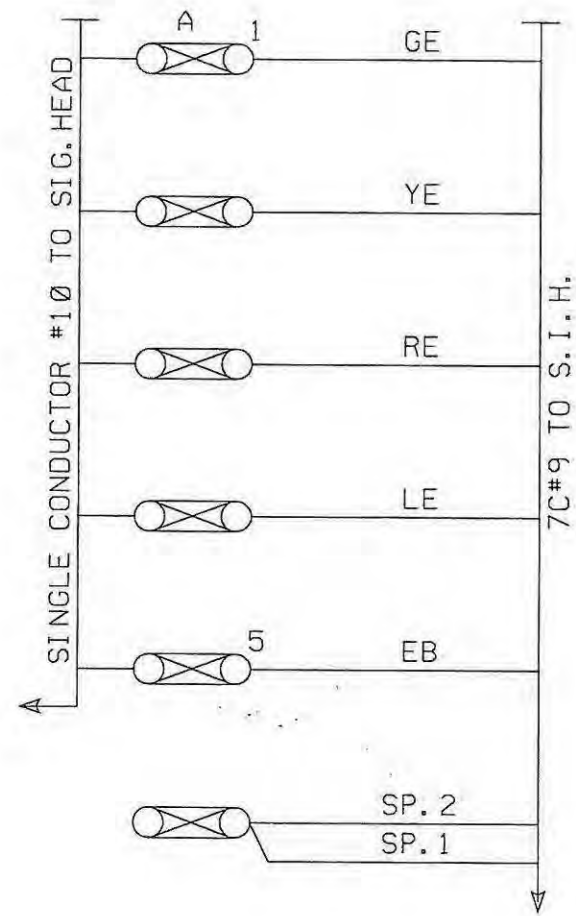
CHICAGO TO ELGIN
ALMORA
ARRANGEMENT PLAN - SIDE D

REFERENCE:	39.70 SH. 1 THRU SH. 78	DATE:	07/06/94
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DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>AW</i>	<i>AW</i>

DISTRICT	PRINT NUMBER
MW/W	39.70 SH.73

SIGNAL JUNCTION BOX



~REVISIONS~

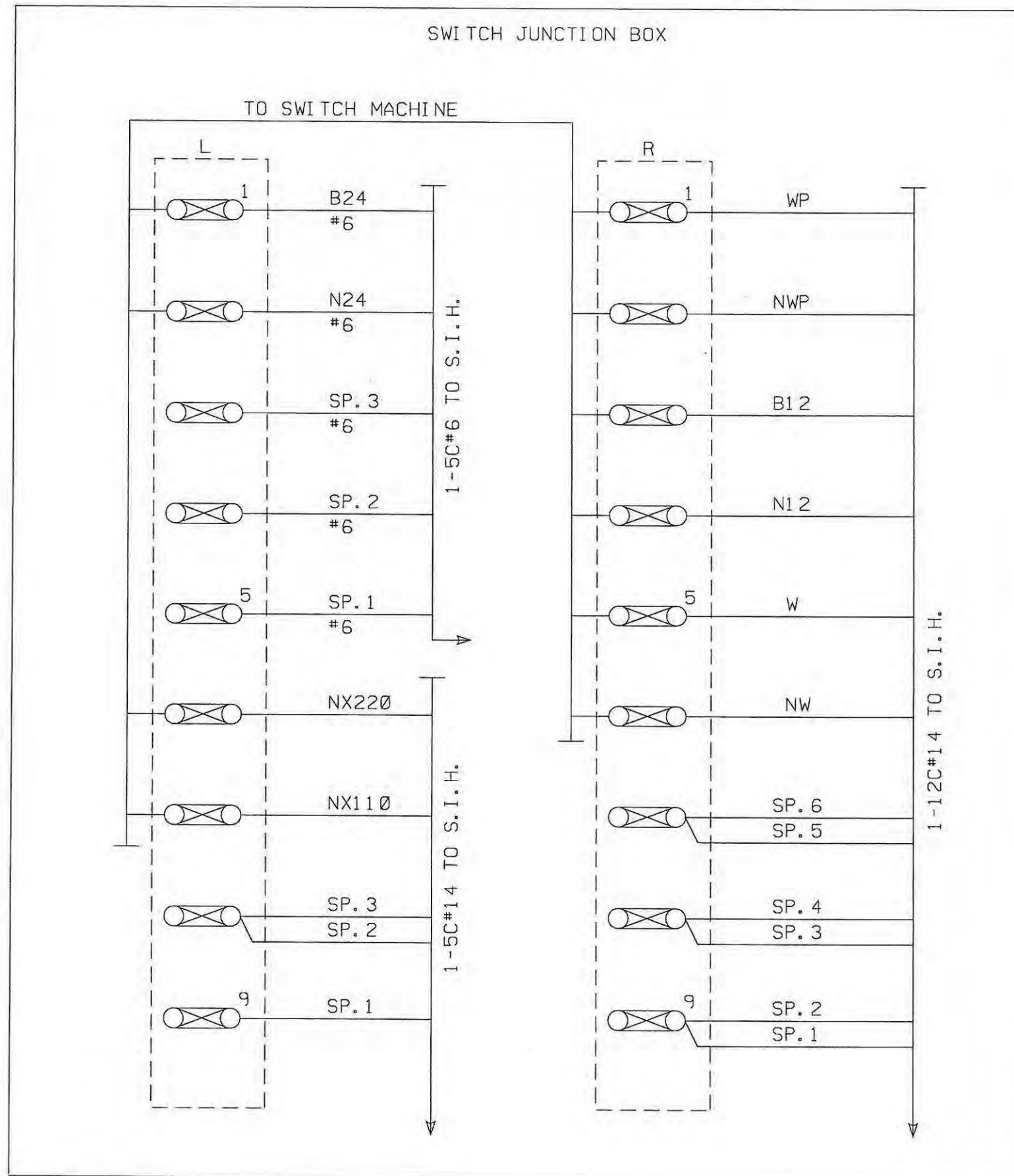
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
SIGNAL JUNCTION BOX TYPICAL

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94		
DESIGNED <i>GRS</i>	DRAWN <i>GRS</i>	CHECKED <i>JP</i>	APPROVED <i>WRK</i>
DISTRICT MW/W		PRINT NUMBER 39.70 SH.74	

4098 0005-1000-01

SWITCH JUNCTION BOX



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
SIGNAL JUNCTION BOX TYPICAL

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.75

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
1	RELAY DC	56001-787 GR. 5	B1N, 4FB, 2F, 1B VRD 100Ω
2	RELAY DC	56001-922 GR. 7	B1BN, 6FB XFER RELAY 500Ω
3	RELAY DC	56002-720 GR. 1	B2BN, 12FB VRD REPEATER 350Ω
4	RELAY DC	56001-922 GR. 10	B1BN, 6FB DC TK RELAY 1Ω
5	RELAY	31500 GR. 4	J/STANDARD DIODE SUPPRESSION
6	RELAY	31500 GR. 5	J/XFER CONT VIDL
7	RELAY	56001-714 GR. 1	B1N, 6FB AC/DC TK RELAY 4Ω
8	RELAY DC	56001-745 GR. 1	B1N, 6FB P. D. RELAY 100Ω X 100Ω
9	RELAY DC	56001-921 GR. 9	B1BN, 4FB, 2F, 1B TRACK 2Ω BR .5Ω
10	RELAY DC	56001-783 GR. 2	VRD REPEATER B1
11	RELAY	56001-762 GR. 2	B1N, 6FB VRD
12	RELAY	56001-780 GR. 1	B1N, SLOW RELEASE
13	RELAY	56001-873 GR. 1	B1N, LO, 4FB, 450/, 12
14	RELAY	56002-703 GR. 1	B2N, 12FB, VRDP
15			
16			
17			
18			
19			
20	PLUGBOARD	59686-5 GR. 4	B1 RELAY KIT
21	PLUGBOARD	59686-5 GR. 5	B1 RELAY KIT CW: ORDER 61435-1 GR. 5
22	PLUGBOARD	59686-7 GR. 6	B2 RELAY KIT CW: ORDER 61435-2 GR. 5
23			
24			
25			
26			
27			
28			
29			
30			
31	SURGE PROTECTOR (FILTER)	01276-21 GR. ON	CSEX POWER, B24
32	SURGE PROTECTOR (FILTER)	01276-18 GR. ON	CSEX POWER, B12
33			
34			
35			
36			
37			
38			
39			
40	POWER SUPPLY	42560-284 GR. 2	CSEX POWER WITH MTG ASSY
41	POWER SUPPLY	42560-273 GR. 2	VPI LOGIC POWER 18 AMP
42	POWER OFF XFMR	53715-154 GR. 1	
43	POWER SUPPLY	42560-273 GR. 1	VPI LOGIC POWER 8 AMP
44			
45			
46			
47			
48			
49			
50	FUSE	54870-1	1A FUSE CSEX

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
51			
52	FUSE	54870-10	10A FUSE
53	FUSE	54870-3	3A FUSE
54	FUSE	54870-6	6A FUSE
55	FUSE	54870-15	15A FUSE
56			
57			
58			
59			
60	CABLE VPI	38216-403 GR. 1	INTERCONNECTING
61			
62			
63			
64			
65	FUSETRON	56449-9	8A FUSETRON SW CONTROL
66	FUSETRON	56449-10	10A FUSETRON SW CONTROL
67			
68			
69			
70			
71			
72			
73			
74			
75	RESISTOR ADJ.	46450-21 GR. 2	5W-15W TKT CIR.
76	RESISTOR	53587-9	50W-10W SNOW MELTER
77	RESISTOR	59723-58	300Ω, 2W, LINE COUP.
78			
79			
80			
81			
82			
83			
84			
85	INTERCOM TELEPHONE	01164-018 ON	
86			
87			
88	PLATE ASSY.	42560-273 GR. 1	VPI 5 VOLT 8 AMP. OUT
89	PLATE ASSY.	42560-273 GR. 2	VPI 5 VOLT 16 AMP. OUT
90	PLATE ASSY.	42560-284 GR. 2	CSEX +24 IN, +5/-5 OUT
91	BATTERY CHARGER	01278-41	12V-50A
92	BATTERY CHARGER	01278-75	24V-20A
93	BATTERY CHARGER	01278-37	20A-12V
94	BATTERY CHARGER	01278-65	8A-24V
95	BATTERY CHARGER	01278-53	20A-28V (B28) (SPECIAL)
96	BATTERY CHARGER	01278-62	50A-24V (B24) (SPECIAL)
97	BATTERY CHARGER	01278-66	2V DC TK
98	BATTERY CHARGER	01278-76	20A-12V AC/DC TK
99	BATTERY CHARGER	01278-77	40A-12V EB B12
100	RECTIFIER COMP	59899-5 GR. 3	POWER OFF

WIRE LIST

*22TZ	80410-067 GR. 1
*20TZ TWPR	65156-129 GR. 1
*20	80559-066 GR. 1
*18TZ	80556-065 GR. 1
*16TZ TWPR	65156-281 GR. 1
*16TZ SHIELDED	80556-067 GR. 1
*16TZ	80556-040 GR. 1
*16 (OKONI TE)	80556-074 GR. 1
*14TZ TWPR	65156-175 GR. 1
*14K	80551-018 GR. 1
*14G	80551-071 GR. 1
*10	80483-006 GR. 1
*10 (OKONI TE)	80556-027 GR. 1
*10G	80545-036 GR. 1
*6	80457-014 GR. 1

LEGEND FOR TERMINALS:

- TEST LINK, ENTRANCE RACK 205
- FASTON BLOCK TERMINAL 199
- PLUG COUPLER PIN
- AAR POST
- STRAPPED AAR POST
- RFL SCREW TERMINAL
- DATA LOGGER TERMINAL

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
MATERIAL REFERENCE CHART

REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94		
DESIGNED GRS	DRAWN GRS	CHECKED <i>JK</i>	APPROVED <i>WRK</i>
DISTRICT MW/W		PRINT NUMBER 39.70 SH.76	

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
101	RECTIFIER COMPLETE	54728-62 GR.1	DIODE USED IN LO RELAY
102	BATTERY	45A13	B24
103	BATTERY	45A15	B12
104	BATTERY	35A15	B24
105	BATTERY	35A07	TRK
106	BATTERY	75A13	B12
107	BATTERY	75A09	EB, B24, AC/DC TK
108	BATTERY	45A05	B28
109	BATTERY	35A09	B12
110	BATTERY	35A05	B12
111	BATTERY	75A05	B12
112	BATTERY	45A07	B12
113	TRAY, BTRY	20161-14	3' 7" LG. X 11.50 FIRE RETARDANT
114	TRAY, BTRY	20161-13	7' 7" LG. X 11.50 FIRE RETARDANT
115	TRAY, BTRY	20161-12	5' 7" LG. X 11.50 FIRE RETARDANT
116			
117	SWITCH, DISCONNECT (DUAL)	58863-0 GR.0	SW. CKT
118			
119			
120	ENT. BOARDS	18149-23	19' FIRE RETARDANT MT. BD
121			
122	ENT. BOARDS	56886-629	23' FIRE RETARDANT BOARD
123	SIDE BOARDS	22868-37	5' 8" FIRE RET. SIDE BD.
124	SIDE BOARDS	22868-38	7' 8" FIRE RET. SIDE BD.
125	BRACKET	20167	LOWER BRACKET (FOR SIDE BOS)
126	BRACKET	20167-1	UPPER BRACKET (FOR SIDE BOS)
127	CARRIER ASSY.	30935-80 GR.1	RFL SERIES 6385
128	CARRIER ASSY.	30935-80 GR.15	RFL
129	SIDE BOARD	22868-39	3' 8" FIRE RET BD
130			
131			
132	SWING FRAME (FRNT)	31919-70 GR.1	6 BI SPACES
133	CABLE SUPPORT	41825-637	
134			
135			
136	BOARD, BTRY. COVER	22762-17	5' 8" LG. X 11.50 FIRE RETARDANT
137	BOARD, BTRY. COVER	22762-19	3' 8" LG. X 11.50 FIRE RETARDANT
138	BOARD, BTRY. COVER	22762-18	7' 8" LG. X 11.50 FIRE RETARDANT
139			
140	SUPPORT BAR	41825-716	FOR BREAKER BOX
141	CABLE SUPPRT	41824-72 GR.1	FOR 20' RACKS
142	BAR COMPLETE	17494-28 GR.8	FOR 20' RACKS FRONT MTD. EQUIP.
143			
144	GENRAKODE	29359-15 GR.8	
145	MO FILTER, MTG ASSY.	42560-278 GR.1	MOTION DETECTOR FILTER
146			
147			
148			
149			
150	ELECTRO CODE MODULE		

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
151	ELECTRO CODE		
152	DATA LOGGER		PRIMARY SYSTEM
153	EVENT RECORDER	01164-820 GRON	
154	INPUT BOARDS		
155	INPUT BOARDS		
156	INPUT BOARDS		
157	PLEXIGLASS	56604-136 GR.1	
158	ISOMJX		I/O
159	LINE CONTROL PANEL	55999-911 GR.1	2 PROTECTERS PER PANEL
160	LINE CONTROL PANEL	55999-911 GR.2	4 PROTECTERS PER PANEL
161	LINE COUPLING XFMR	42560-247 GR.3	600 WIMP. - 2 CCTS
162	RFL CARRIER ASSEMBLY	30935-81 GR. 7	RFL
163	RFL CARRIER ASSEMBLY	30935-85 GR.1	RFL
164	RFL CARRIER ASSEMBLY	30935-85 GR.2	RFL
165			
166	DETECTOR, PROXIMITY	29015-1	SWITCH - DOOR
167	DETECTOR, PROXIMITY	29015-2	ACTUATOR - DOOR
168	SCREW #10-32 X 1/2	03610-116	INTRUSION SWITCH/ACTUATOR MTG.
169	NUT #10-32 ELASTIC STOP	42333-47	INTRUSION SWITCH/ACTUATOR MTG.
170	FIRE CONTROL PNL	01164-807 GR.ON	MAIN BOX 2 OR 4 WIRE
171	FIRE CONTROL PNL	01164-836 GR.ON	SMOKE DETECTOR 4 WIRE
172	FIRE CONTROL PNL	01164-817 GR.ON	HEAT DETECTOR
173	FIRE CONTROL PNL	56779-6	BELL
174	FIRE CONTROL PNL	56172-2	DOOR SWITCH
175	FIRE CONTROL PNL	42560-110 GR. 1	INTRUSION ALARM SW. RK. MTD. BI POS.
176	FIRE CONTROL PNL	01113-008 GR.ON	TIMER/INTRUSION REED RELAY
177			
178			
179	FAN THERMOSTAT SW.	2386-14	OVERRIDE SWITCH
180	FAN THERMOSTAT	46318-15	
181	BREAKER BOX	0930-22 GR.ON	100 AMP SERVICE
182	CIRCUIT BREAKER	51943-91	15A 1 POLE 120/240
183	CIRCUIT BREAKER	51943-79	20A 1 POLE 120/240
184	CIRCUIT BREAKER	51943-112	MAIN 100A 2 POLE 120/240
185	CIRCUIT BREAKER	51943-95	30A 1 POLE 120/240
186			
187			
188			
189			
190			
191	BLOCK COMPLETE	46048-22 GR.9	USE ASSY. PER REFERENCE 21B
192	1" TERMINAL BLOCK	46048-21 GR.4	TWO POST TERM. BLOCK 1" C-C MTG.
193	BLOCK COMPLETE	46048-22 GR.8	TWO POST BLOCK/ARRESTORS BD. MTD.
194	BOARD ASSY.	59681-1 GR.1	35WAY TERM BLK/B2 SPACE RK. MTD.
195	BLOCK COMP.	56140-17	12WAY TERM BLK/ENT-EQUIP. BD. MTD.
196	BLOCK	47508-200	TERM. BL./GND PL. 2 3/8" C-C BD. MTD.
197	TERMINAL BLOCK	5971-44	3 POST BLOCK/ARRESTORS BOARD MTD.
198	BOARD ASSY.	59681-4 GR.1	14 POST TERM. RK. MTD. BI POS
199	TERMINAL COMP.	29407-1 GR.3	64 WAY FASTON (.250) RK. MTD. BI POS
200	MOUNTING ASSY.	45456-9 GR.4	FUSE BLK. 4 FUSES RK. MTD.

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ALMORA MATERIAL REFERENCE CHART	
REFERENCE: 39.70 SH. 1 THRU SH. 78	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JP</i>	APPROVED <i>WRK</i>
DISTRICT MW/W	PRINT NUMBER 39.70 SH.77

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
201	ARRESTER	56937-21	HEAVY DUTY EQUALIZER
202	ARRESTER	56937-32	HEAVY DUTY TRACK
203	MOUNTING ASSY.	45456-9 GR. 2	FUSE BLK. 2 FUSES STR. RK. MTD. B1 POS
204	HARDWARE	45456-18 GR. 6	TERM BLOCK 4 RESISTORS
205	CONNECTOR COMP.	44720-1 GR. 2	TEST LINK 1' USED WITH REF. 220
206	CONNECTOR	4906-135	2 3/8 C-C MTG. ARRESTOR
207	PLATE COMP.	56604-75 GR. 1	GND PLATE 6' (6-REF 196)
208	CONNECTOR	4906-125	1' C-C MTG.
209	CONNECTOR	4906-141	2' C-C MTG.
210	ARRESTER AC LINE	58745-27	2 POLE 3 WIRE (ASSOC. W/BREAKER BOX)
211	HARDWARE	4906-21	1 1/8" CONNECTOR 14 WAY BLK (VERTIC)
212	HARDWARE	58277-0 GR. 1	GND POST
213	POST COMP.	42788-1 GR. 2	1E KIT FOR REF. 21, 22
214	CLIP COMP.	18493-0 GR. 1	ENT. RK. MTG. KEYWAY
215	SCREW	29757-39	1/4-20 X 1 1/2" LG.
216	WASHER	01250-29 GR. ON	
217	WASHER	1225-2	
218	PLATE	17337-4	6' GROUND PLATE
219	NUT	42333-48	
220	NUT (TEST)	42843-14	USE WITH REF. 205
221	NUT (HALF)	42839-5	
222	NUT (FULL)	42843-1	
223	SCREW, WOOD	01307-13 GR. ON	*10 RD. HD. 1 3/4" LG.
224	SCREW, WOOD	01307-11 GR. ON	*10 RD. HD. 1 1/4" LG.
225	CONNECTOR	4906-6	1 1/4" CONNECTOR 14WAY BLK (HORIZ)
226	CONNECTOR (SLIDE)	43507-15	1 1/4" CENTER
227	NUT (INSULATED)	56482-0	TERM. POST
228	POST COMP.	42788-1 GR. 1	3E KIT FOR REF. 21, 22
229	SCREW, WOOD	01307-9 GR. ON	*10 RD. HD. *LG.
230	FUSE BLOCK	58862-3	WITH DISCONNECT
231	BLOCK COMP.	50037-4 GR. 2	FUSE (BOARD MTD.)
232	MOUNTING ASSEMBLY	42560-279 GR. 1	TIMER (TRANS. ASSY.)
233	MOUNTING ASSEMBLY	42560-28 GR. 1	B1 SIZE PLATE (2-J RELAY)
234	MOUNTING ASSEMBLY	42560-54 GR. 1	B2 SIZE PLATE (4-J RELAY)
235			
236	ARRESTOR	56937-23	HEAVY DUTY
237	OPERATOR CONTROL PANEL	59367-10	SHELL (MODULE)
238	OPERATOR CONTROL PANEL	58921-74	PLUG, WIRE WRAP (MODULE)
239	OPERATOR CONTROL PANEL	8885-171	STUD (MALE) ⊗
240	OPERATOR CONTROL PANEL	8885-172	STUD (FEMALE) ⊙
241	OPERATOR CONTROL PANEL	8885-196	STUD (MALE) ○
242	OPERATOR CONTROL PANEL	8885-197	STUD (FEMALE) ⊗
243	SCREW, WOOD	01307-10 GR. ON	*10 RD. HD. 1" LG.
244	CONNECTOR COMP. 50 WAY	42758-93 GR. 12	LCP POWER
245			
246	ARRESTER	56937-23	B12, N12, B24, B24
247	ARRESTER	56937-28	COMMUNICATION
248	POTTER & BRUMFIELD RELAY		KHAU-17D16-12
249			
250			

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
251	TABLE	61450-146	PLAN TABLE
252	TABLE	61450-147	13' X 30' PLAN TABLE
253			
254			
255			
256			
257			
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260			
261			
262			
263			
264			
265			
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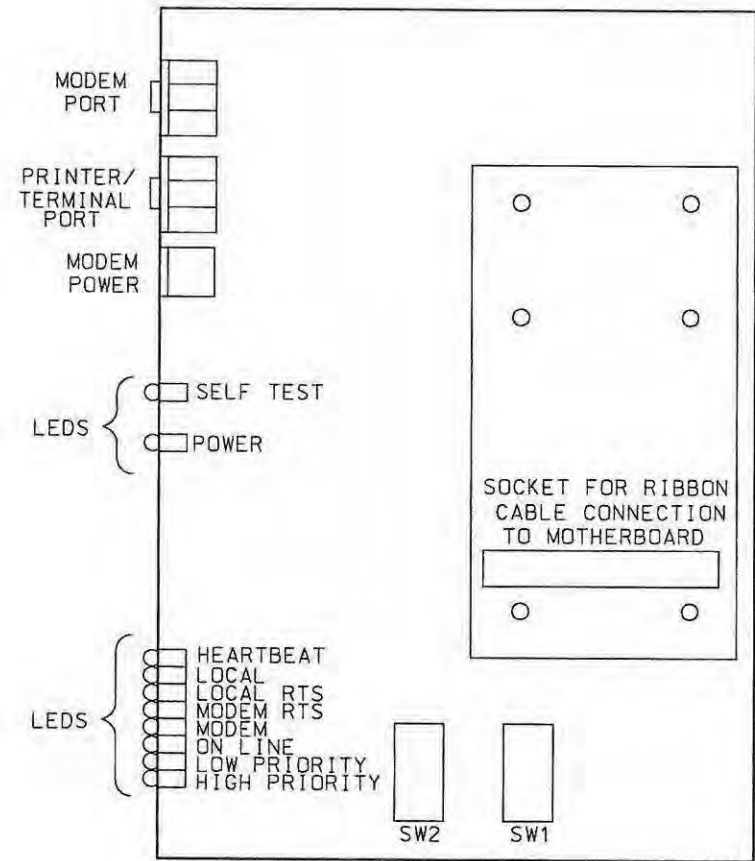
~REVISIONS~

PB 09/15/09 OK DJ

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

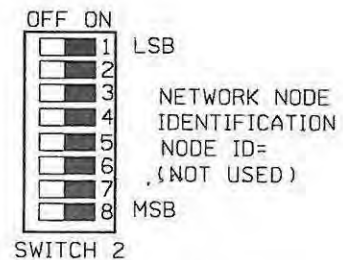
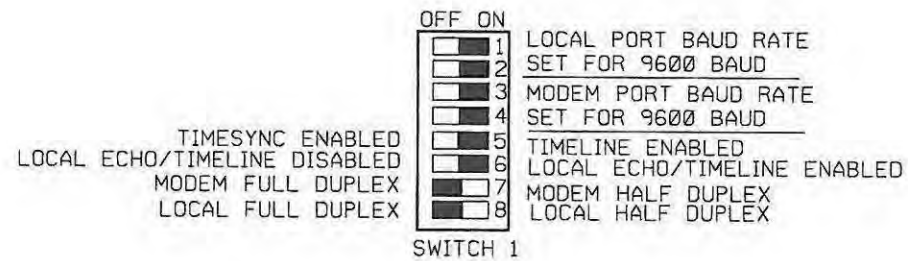
CHICAGO TO ELGIN
ALMORA
MATERIAL REFERENCE CHART

REFERENCE:	39.70 SH. 1 THRU SH. 78	DATE:	07/06/94
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	TSP	WPK
DISTRICT	PRINT NUMBER		
MW/W	39.70 SH. 78		

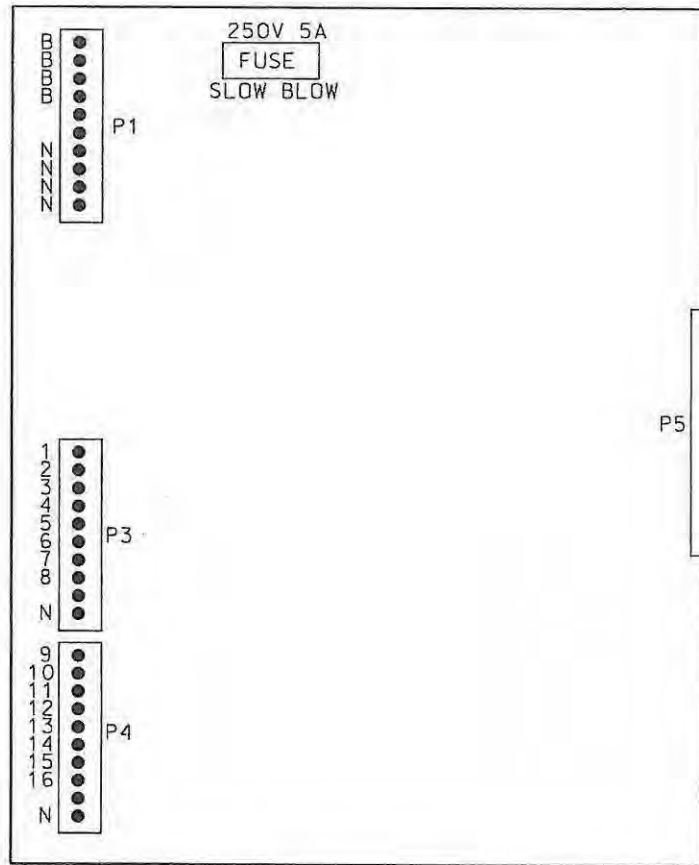


WDA PROCESSOR MODULE
3D1

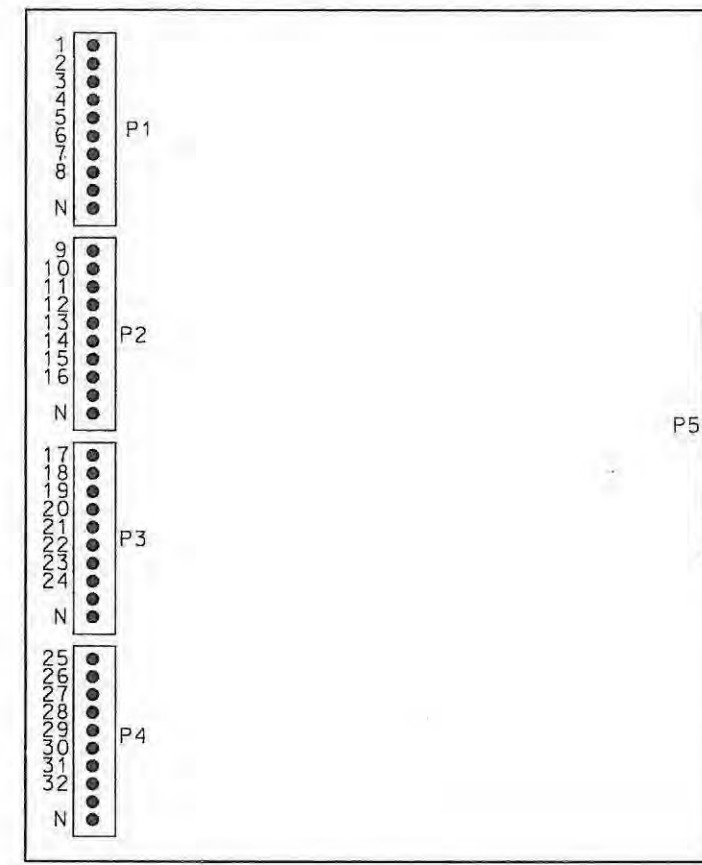
EXEC. SOFTWARE = REV. H
82B4
D150



DIP SWITCH SETTINGS ON
WDA PROCESSOR MODULE



WDA 401 MODULE - POWER SUPPLY
3D2



WDA 403 MODULE - 32 INPUT
3D3 & 3D4

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ALMORA
WDA MODULE DETAIL

REFERENCE: 39.70 SH. 1 THRU SH. 79 DATE: 01/12/00

DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	GRS	WPK

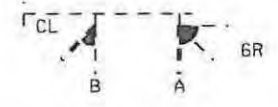
DISTRICT	PRINT NUMBER
MW/W	39.70 SH.79

PLAN MUST NOT BE MODIFIED WITHOUT APPROVAL OF SIGNAL AND COMMUNICATION SUPERVISOR

2125+75

TO SABULA JCT. ←

→ TO RANDALL ROAD



1WT

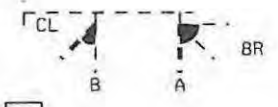
EC B

5T

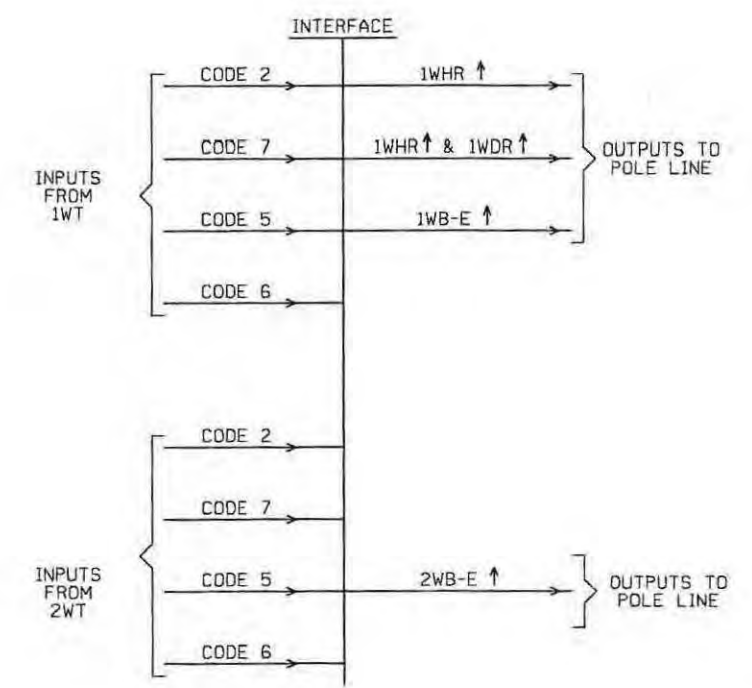
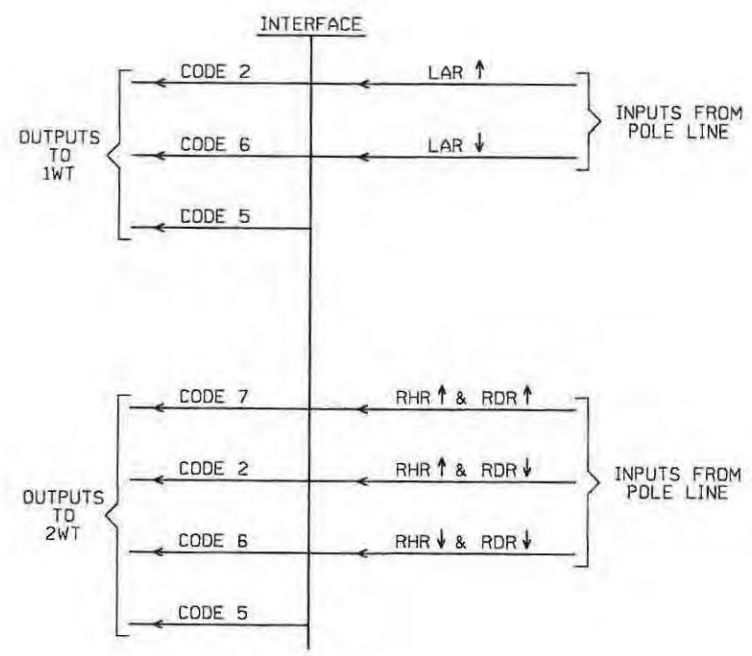
2WT

EC B

7T



H
INTERFACE CASE



- NOTES:
- ⊗ - TEST TERMINAL
 - △ - EQUALIZER
 - ∠ - LINE ARRESTER
 - ⌋ - HEAVY DUTY ARRESTER
 - ⊕ - TWISTED WIRE
2 TURNS PER FOOT
- ALL WIRES #16 AWG UNLESS OTHERWISE NOTED

ALL NEW

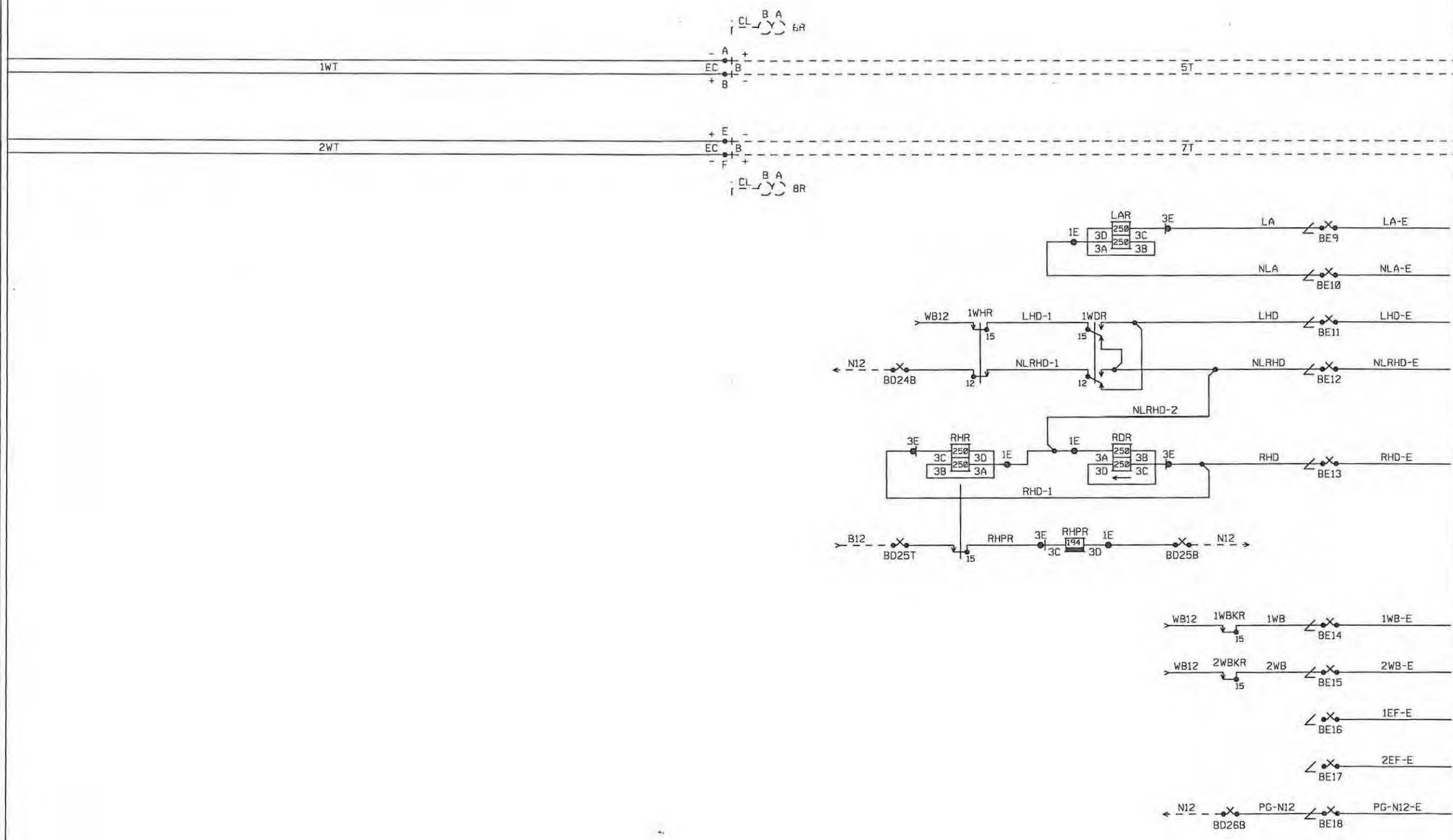
DAKOTA, MINNESOTA & EASTERN SOUTH
ELECTROCODE TO LINE INTERFACE CHARTS
RANDALL ROAD INTERFACE

DESIGNED 05-24-10
DAVIS TO PINEGEE GROVE
TCS/LRK SEQ. 6

SUBDIVISION CH

MP 40.10

SH 01 OF 06



ALL NEW

DAKOTA, MINNESOTA & EASTERN SOUTH

POLELINE CIRCUITS
RANDALL ROAD INTERFACE

DESIGNED 05-04-10
DAVIS TO PINGREE GROVE
TCS/LRK SEQ.

SUBDIVISION CH	MP 40.10	SH 02 OF 06
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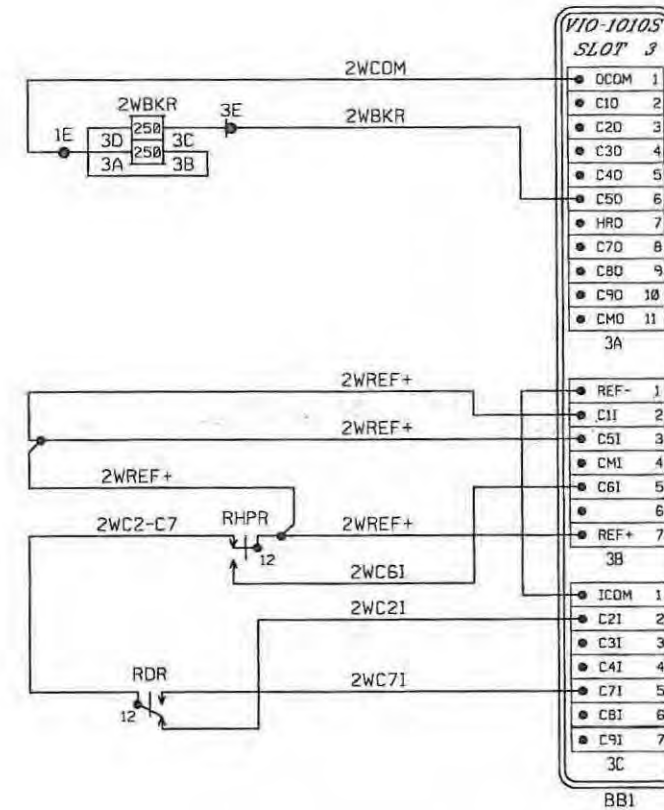
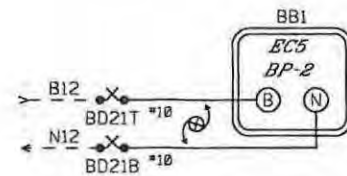
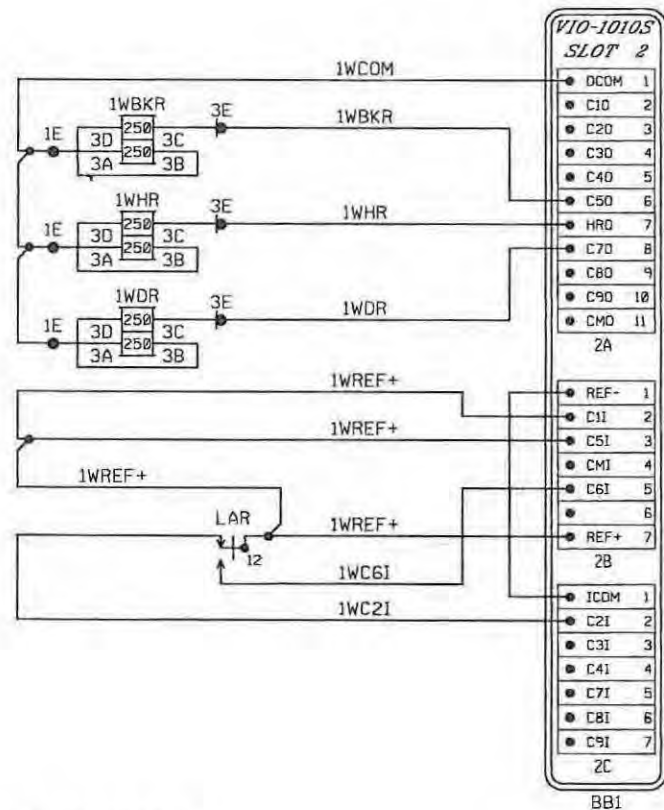
TRACK 1W/2W ELECTROCODE 5 END BOX

PROGRAM '5-S4HQ-A5'

CHASSIS ID

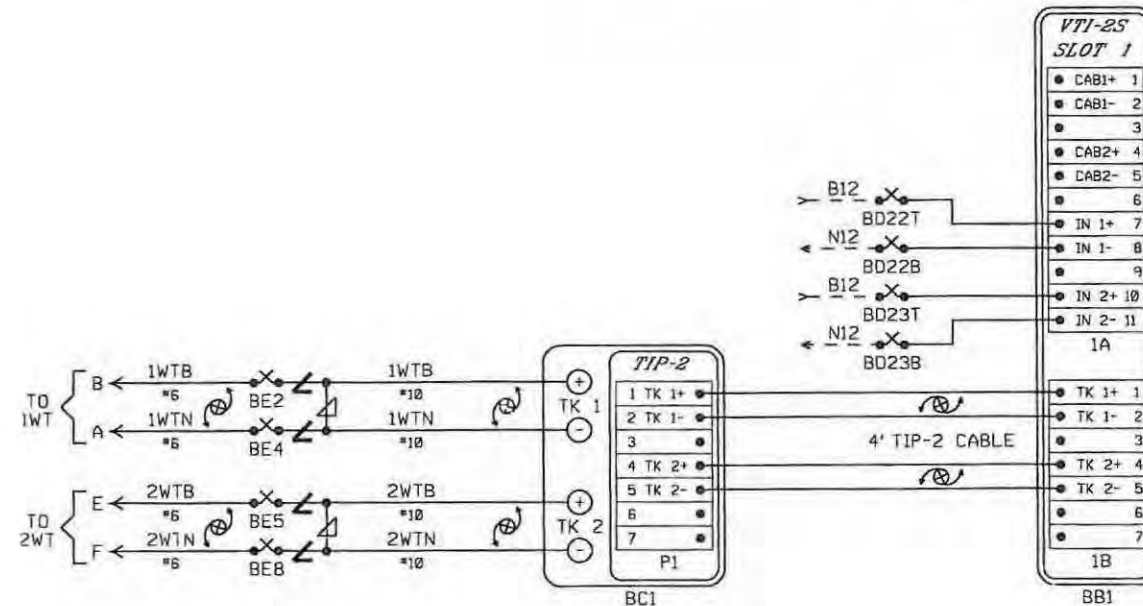


● NOT PUNCHED = ON
○ PUNCHED = OFF



SYSTEM CONFIGURATION

LC5	SW1	FALSE
RC5	SW2	FALSE
NOT USED	SW3	N/A
NOT USED	SW4	N/A
NOT USED	SW5	N/A
NOT USED	SW6	N/A
NOT USED	SW7	N/A
NOT USED	SW8	N/A
NOT USED	SW9	N/A
NOT USED	SW10	N/A
NOT USED	SW11	N/A
NOT USED	SW12	N/A
NOT USED	SW13	N/A
NOT USED	SW14	N/A
NOT USED	SW15	N/A
NOT USED	SW16	N/A
NOT USED	SW17	N/A
NOT USED	SW18	N/A
NOT USED	SW19	N/A
NOT USED	SW20	N/A
NOT USED	SW21	N/A
NOT USED	SW22	N/A
NOT USED	SW23	N/A
NOT USED	SW24	N/A
NOT USED	SW25	N/A
NOT USED	SW26	N/A
NOT USED	SW27	N/A
NOT USED	SW28	N/A
NOT USED	SW29	N/A
NOT USED	SW30	N/A
NOT USED	SW31	N/A
NOT USED	SW32	N/A



DAKOTA, MINNESOTA & EASTERN SOUTH

ALL NEW

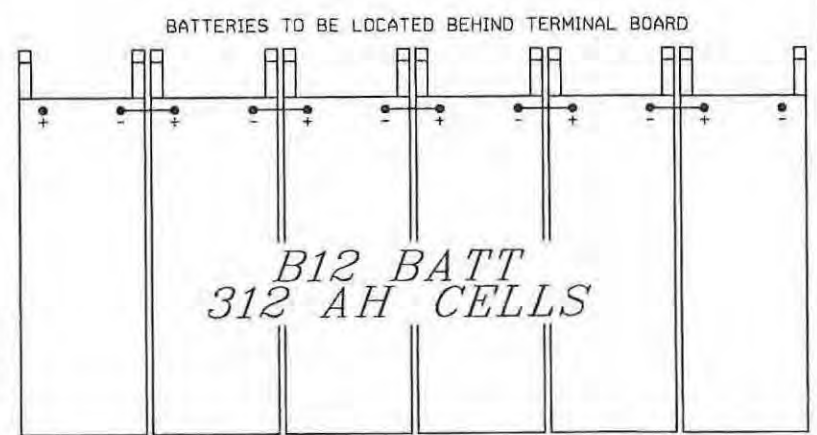
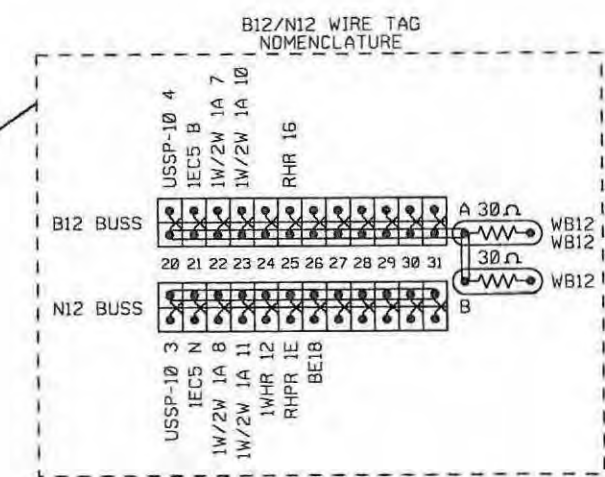
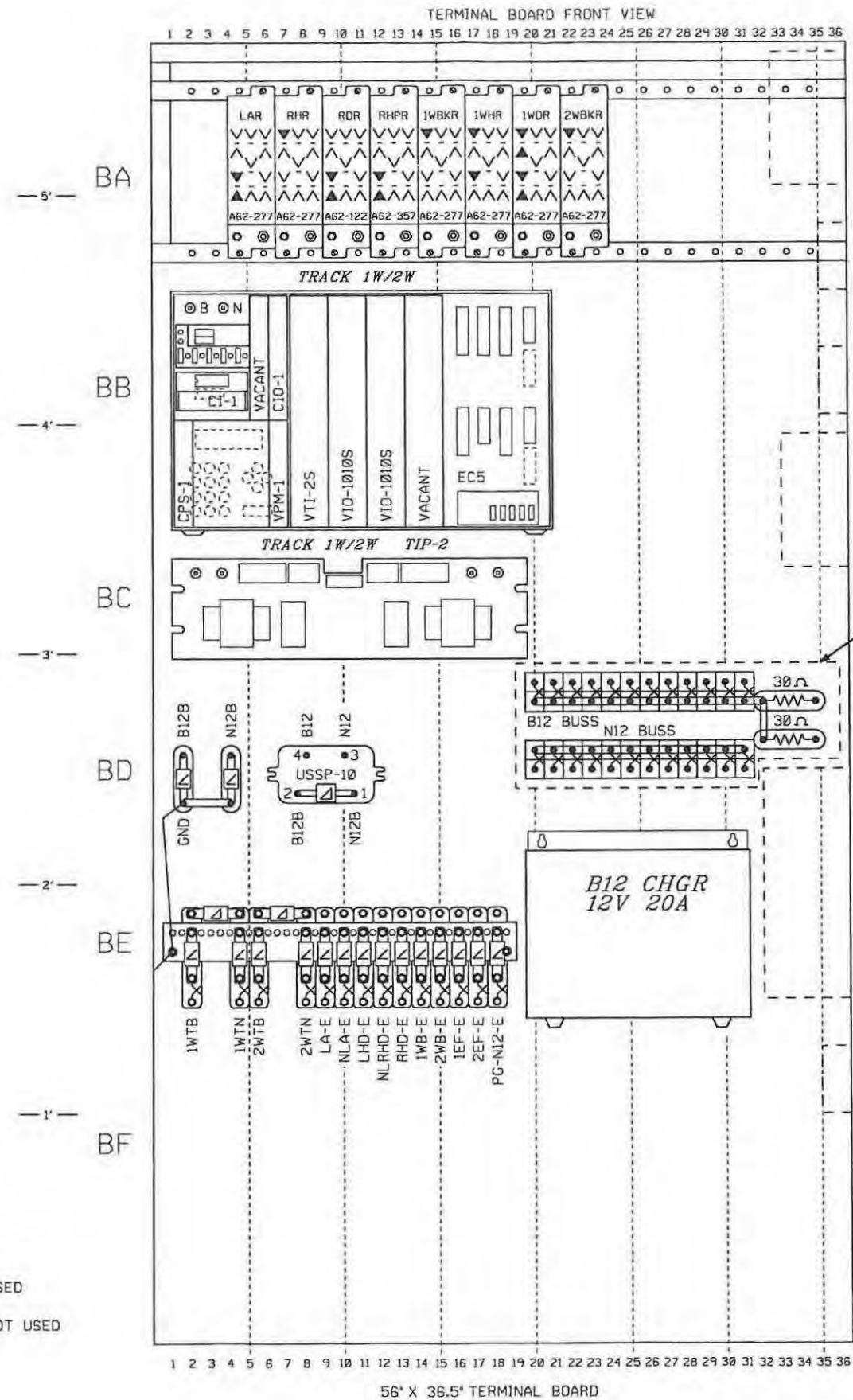
EC5 INTERFACE CIRCUITS
RANDALL ROAD INTERFACE

DESIGNED 05-04-10
DAVIS TO PINGREE GROVE
TCS/LRK SED

SUBDIVISION CH

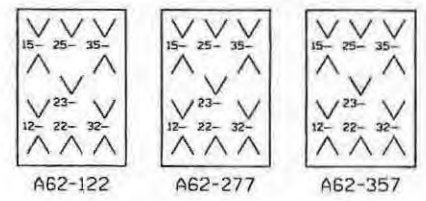
MP 40.10

SH 03 OF 06



RELAY CROSS REFERENCE

GRS	SAFETRAN
A62-122	400502
A62-277	400004
A62-357	400211



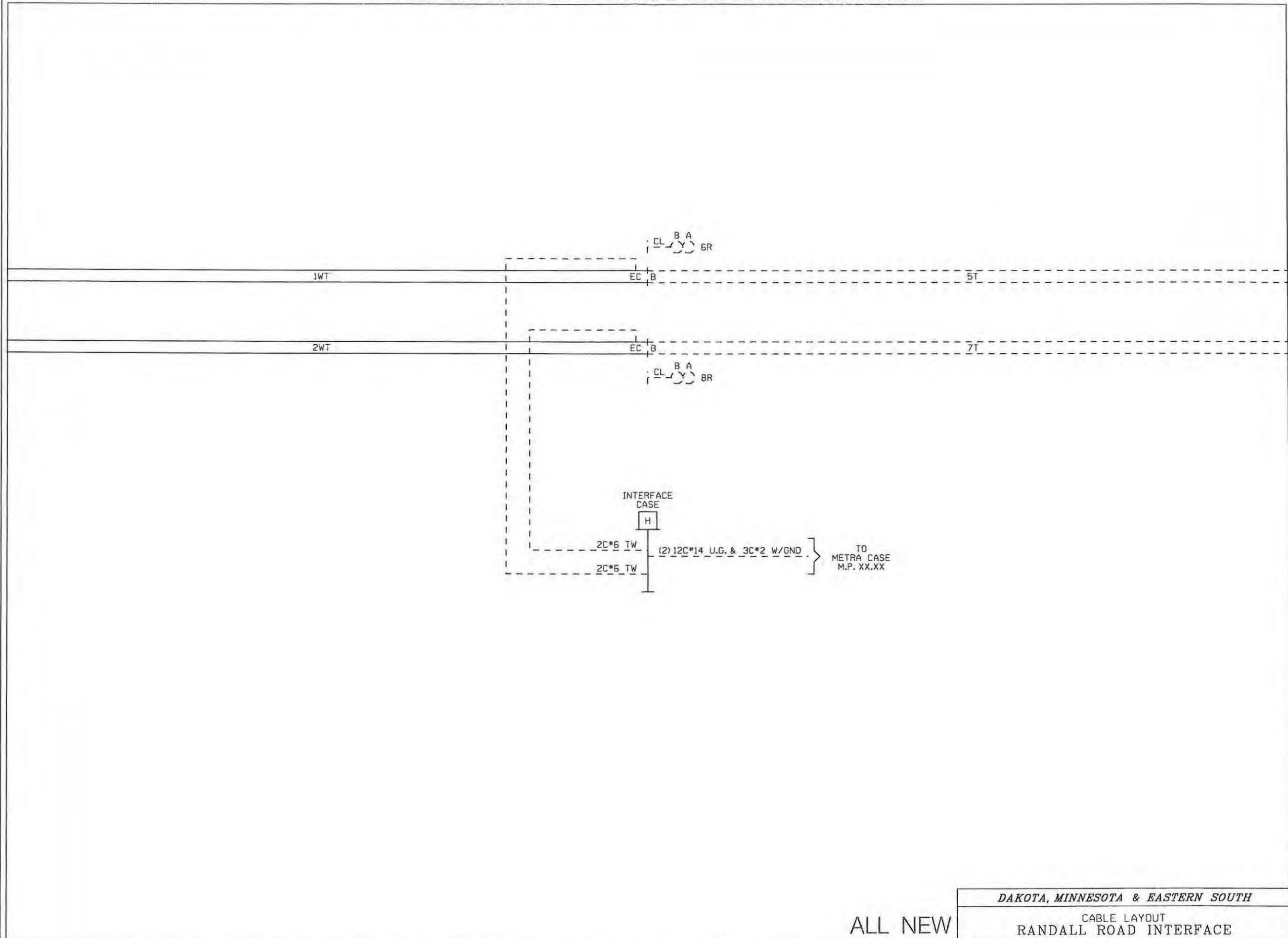
▼ = CONTACT USED
 √ = CONTACT NOT USED

ALL NEW

DAKOTA, MINNESOTA & EASTERN SOUTH
 TERMINAL BOARD LAYOUT (FRONT)
 RANDALL ROAD INTERFACE

DESIGNED 05-04-10
 DAVIS TO PINGREE GROVE
 TCS/LRK SEQ.*

SUBDIVISION CH MP 40.10 SH 05 OF 06



ALL NEW

DAKOTA, MINNESOTA & EASTERN SOUTH

CABLE LAYOUT
RANDALL ROAD INTERFACE

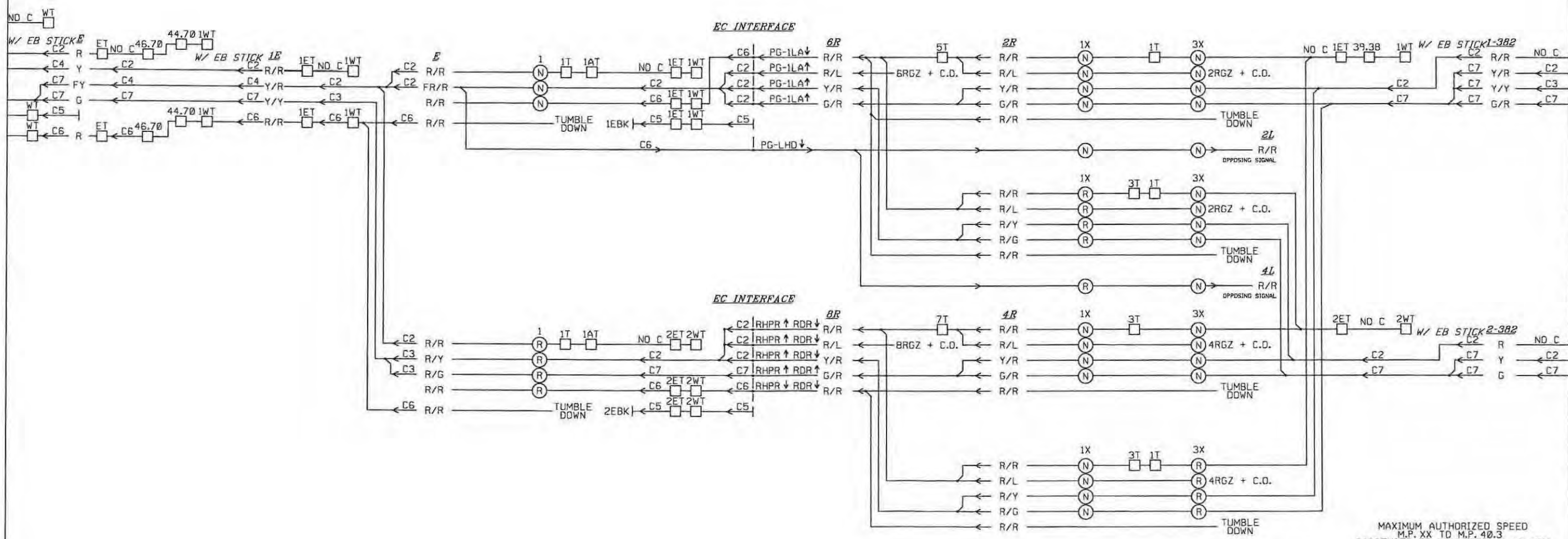
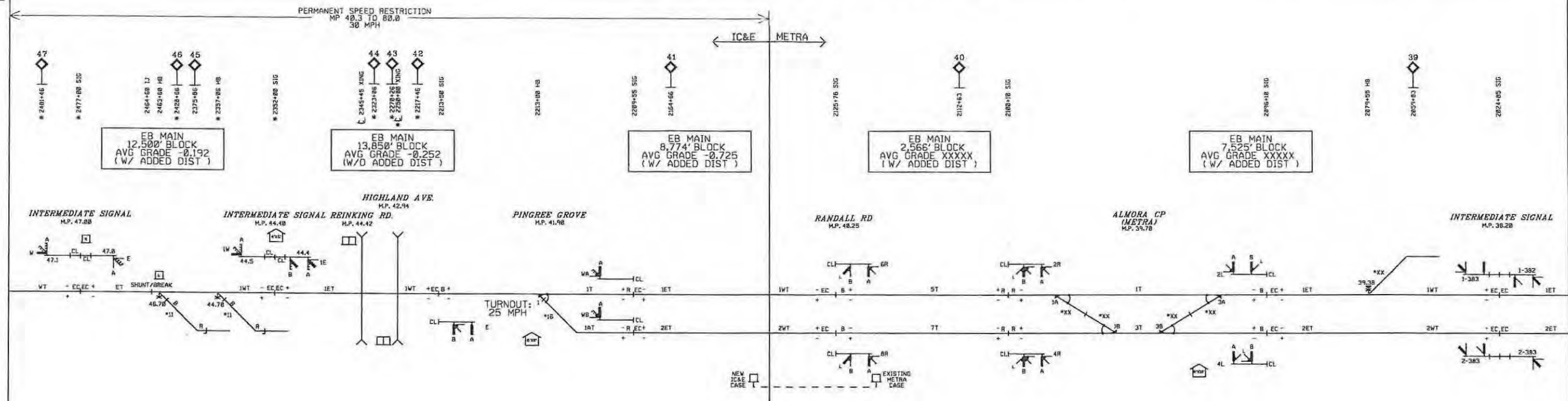
DESIGNED 05-04-10
DAVIS TO PINGREE GROVE
TCS/LRK SED.*

SUBDIVISION CH

MP 40.10

SH 06 OF 06

NOTATIONS



MAXIMUM AUTHORIZED SPEED
 M.P. XX TO M.P. 40.3
 PASSENGER 70 MPH FREIGHT 40 MPH
 MP 40.3 TO M.P. 141.5
 40 MPH

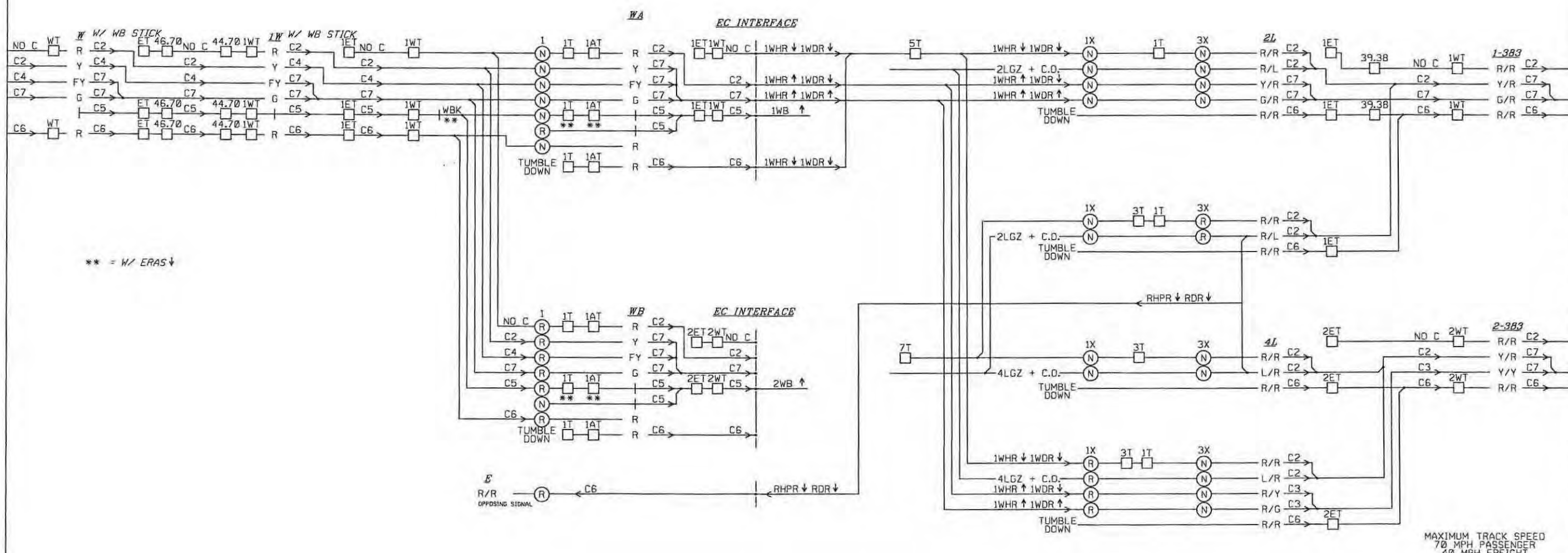
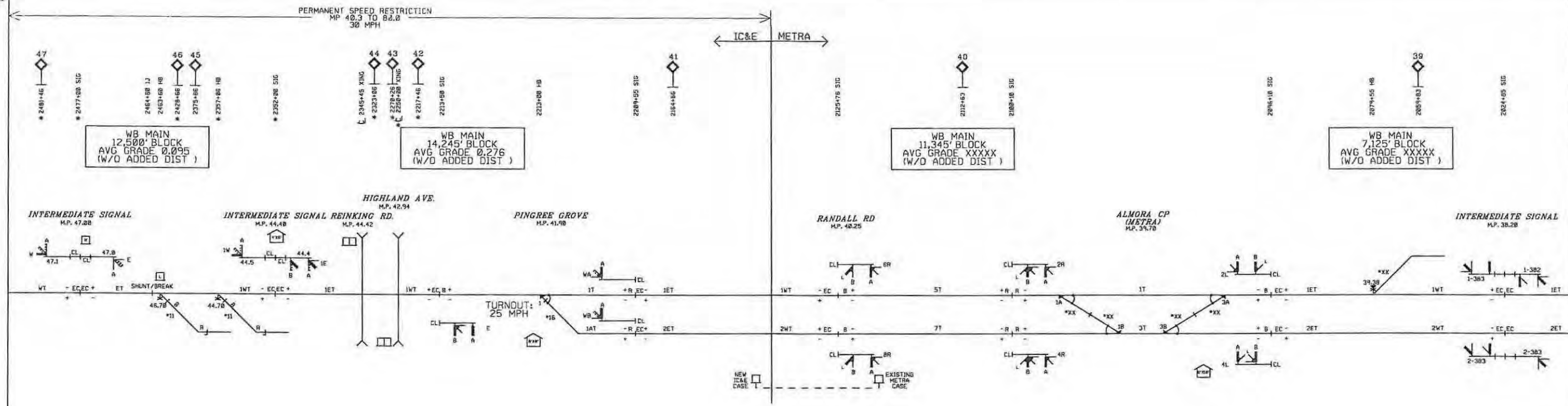
- INDICATES SHUNT DOWN, SWITCH OPEN, ETC.
- INDICATES SHUNT, SWITCH, ETC. RESTORED

* = ESTIMATED STATIONING

PHASE 1

PLAN MUST NOT BE MODIFIED WITHOUT APPROVAL OF SIGNAL AND COMMUNICATION SUPERVISOR

REVISIONS



** = W/ ERAS ↓

MAXIMUM TRACK SPEED
70 MPH PASSENGER
40 MPH FREIGHT

INDICATES SHUNT DOWN,
SWITCH OPEN, ETC.
 INDICATES SHUNT,
SWITCH, ETC. RESTORED

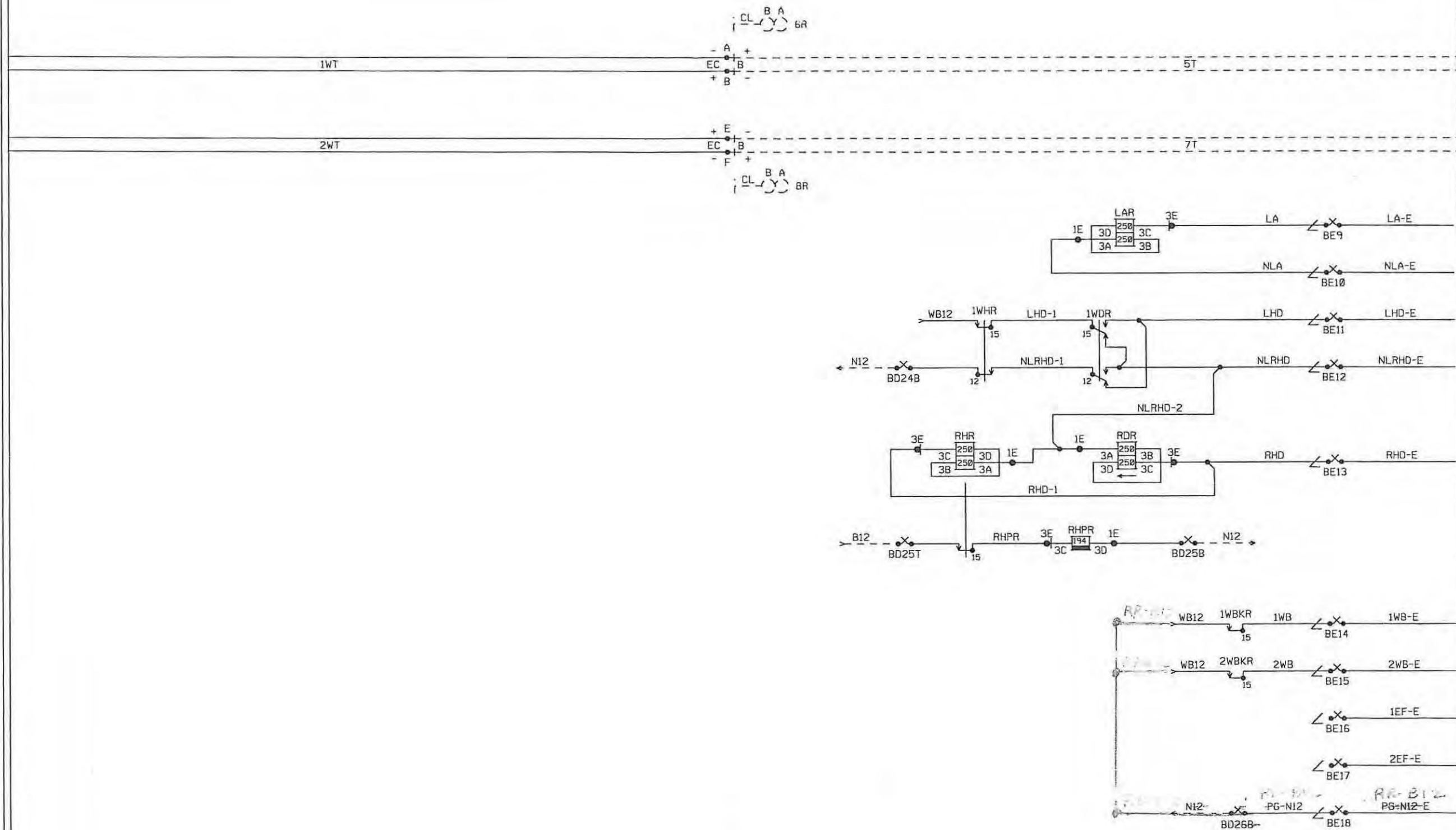
* = ESTIMATED STATIONING

PHASE 1

DAKOTA, MINNESOTA & EASTERN SOUTH

WESTBOUND ASPECT CHART
DAVIS TO PINGREE GROVE

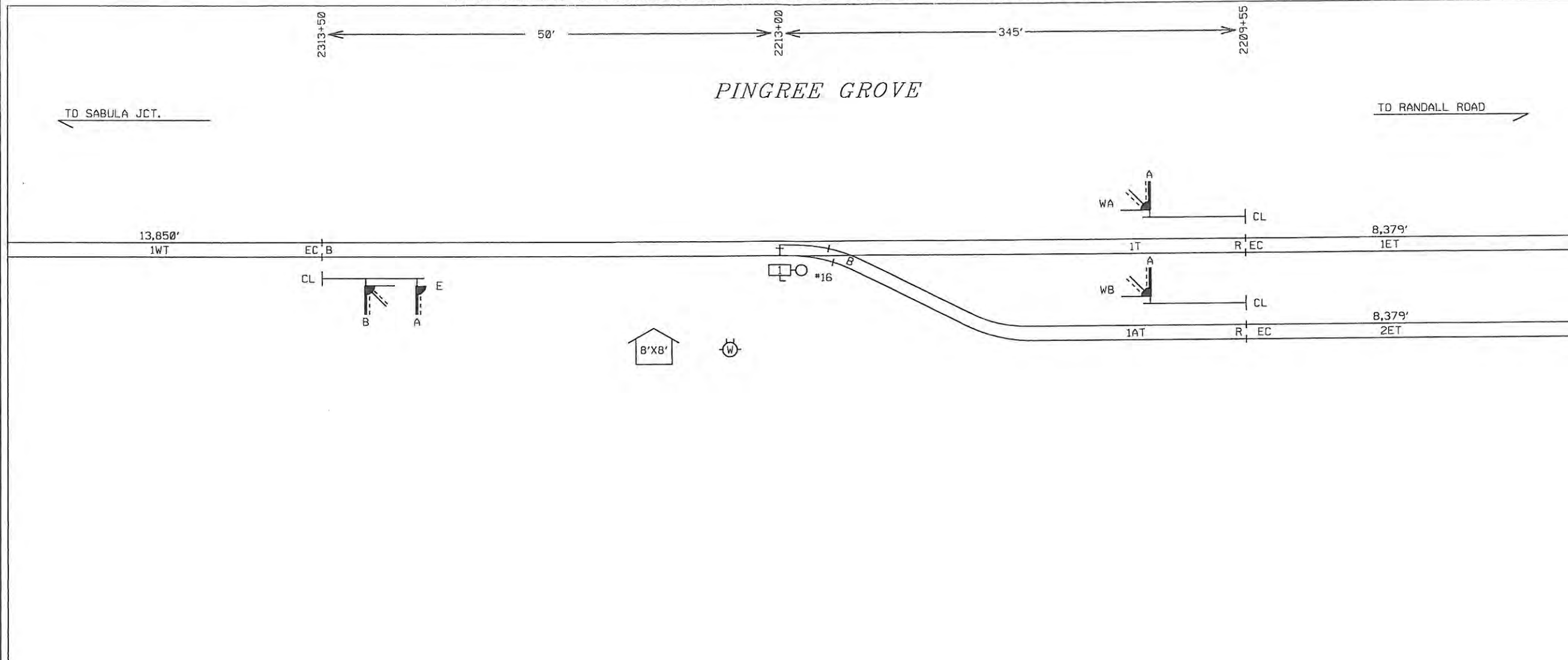
SUBDIVISION CH MP 038 TO MP 047 SH 02 OF 02



ALL NEW

DAKOTA, MINNESOTA & EASTERN SOUTH		
POLELINE CIRCUITS RANDALL ROAD INTERFACE		
DESIGNED 05-04-10 DAVIS TO PINGREE GROVE TCS/Lrk	SUBDIVISION CH	MP 40.10
		SH 02 OF 06

PLAN MUST NOT BE MODIFIED WITHOUT APPROVAL OF SIGNAL AND COMMUNICATION SUPERVISOR



SETUP INFORMATION			
DIAGNOSTIC		GENISYS	
DIAGNOSTIC PORT SETUP		TRANSMIT DELAY VALVE (MS)	50
BAUD	9600	TRANSMIT CUTOFF VALVE	20
PARITY	NONE	SYNCHRONIZE PORTS TIME (MS)	100
DATA BITS	8	REMOTE #1 SEND DATE/TIME UPDATES	0
UNIT ADDRESS	01	REMOTE #1 MODULE TYPE	ASYNC RS232 9600
NUMBER INDICATION WORDS	1	REMOTE #2 SEND DATE/TIME UPDATES	0
INDICATION DELAY (SEC)	3.0	REMOTE #2 MODULE TYPE	ASYNC RS232 9600
NUMBER LCP IO MODULES	03	MEMORY LOG QUEUES I/O	45
LINE STOP BITS	01	MEMORY LOG QUEUES RECORDER	45
LINE BAUD	9600	MEMORY LOG QUEUES ERROR	10
LINE PARITY	NONE		
CONSTANT INDICATION	0		
PORT A CODE LINE	0		
POLL TIMEOUT	25 SEC		
EQUATION STABILITY COUNT	05		

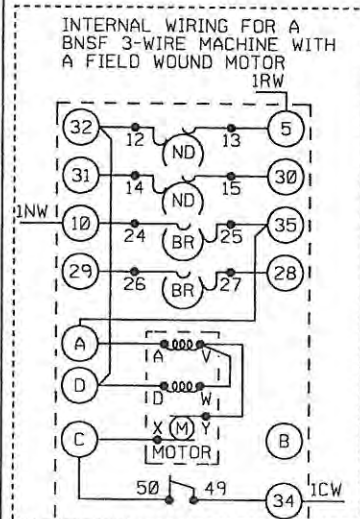
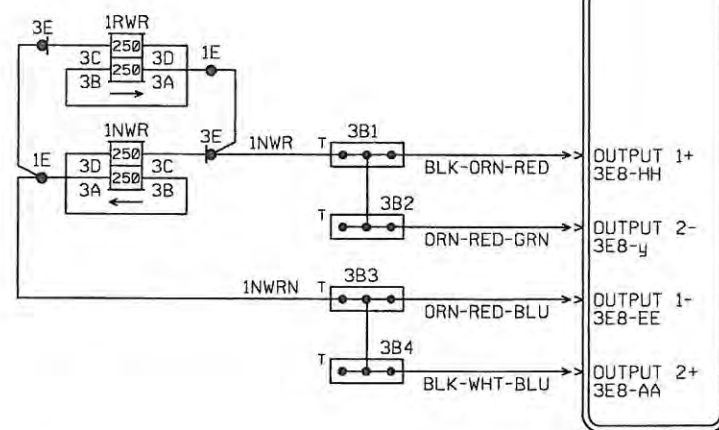
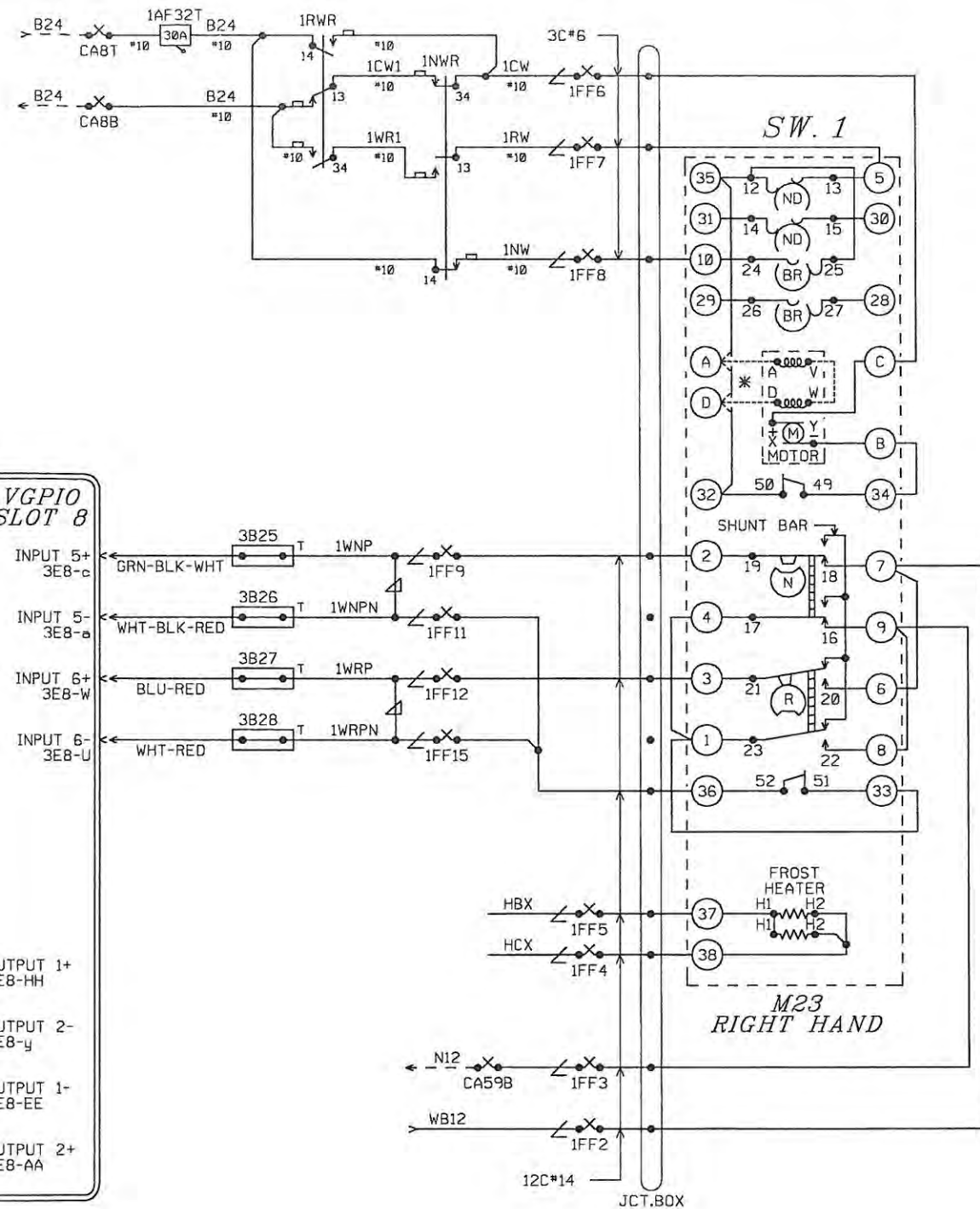
- NOTES:
- TEST TERMINAL
 - EQUALIZER
 - LINE ARRESTER
 - HEAVY DUTY ARRESTER
 - TWISTED WIRE
2 TURNS PER FOOT
 - BREAKER
 - WAGO TERMINAL BLOCK
- ALL WIRES #16 AWG UNLESS OTHERWISE NOTED

ALL NEW

DAKOTA, MINNESOTA & EASTERN SOUTH
TRACK LAYOUT
PINGREE GROVE

DESIGNED 05-04-10
DAVIS TO PINGREE GROVE
TCS/Lrk SEQ.

SUBDIVISION CH MP 41.90 SH 01 OF 23



- NOTES:
- 1) WITH SWITCH IN NORMAL POSITION, SET INDICATION CAMS SO CONTACTS 19 & 17 ARE CLOSED (DOWN) AND CONTACTS 21 & 23 ARE SHUNTED BY SHUNT BAR.
 - 2) CONTACTS 49-50 AND 51-52 OPEN WHEN SELECTOR LEVER IS PLACED IN HAND THROW.
 - 3) RIGHT HAND SWITCH MACHINE WITH RIGHT HAND POINT NORMALLY CLOSED.
 - 4) *WIRING FOR MOTOR:
 - A. PERMANENT MAGNET MOTOR
NO WIRES ON A OR D, JUMPER 32 TO 35.
 - B. IF RETROFITTED WITH FIELD WOUND MOTOR OR A FIVE WIRE MACHINE WITH FIELD WOUND MOTOR,
JUMPER 32 TO D AND A TO 35.
 - C. IF BNSF 3-WIRE FIELD WOUND MOTOR MACHINE SEE ALTERNATE DIAGRAM.

ALL NEW

DAKOTA, MINNESOTA & EASTERN SOUTH			
1 SWITCH PINGREE GROVE			
DESIGNED 05-04-10 DAVIS TO PINGREE GROVE TCS/LRK	SUBDIVISION CH	MP 41.90	SH 07 OF 23

2217+28 M.P.

2213+25 SIG.

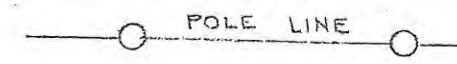
2213+00 P.S. #16
M.S. 41.90

2209+55 SIGS.



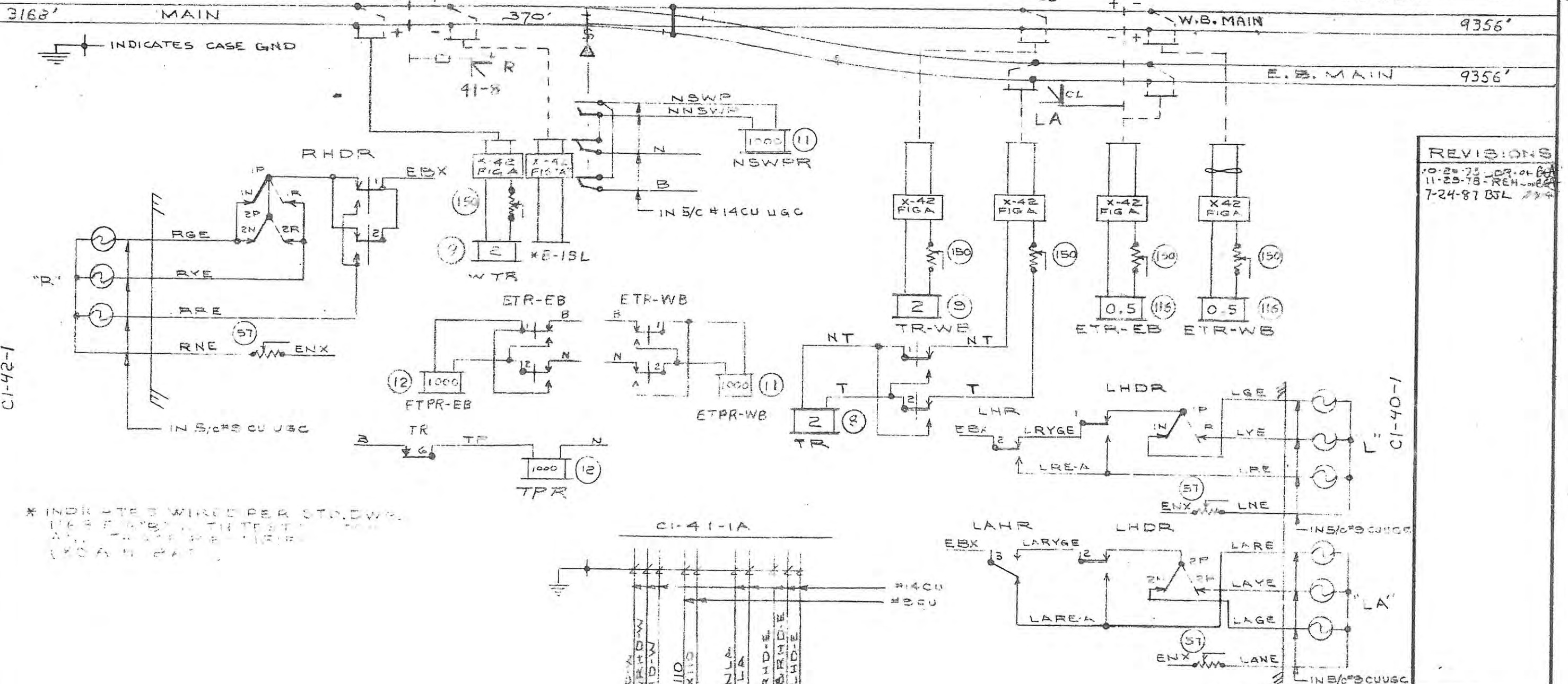
PINGREE GROVE

PUSH BUTTONS FOR CLEARING SIGNALS MOUNTED IN TELEPHONE BOOTH.



TO HAMPSHIRE
3162'

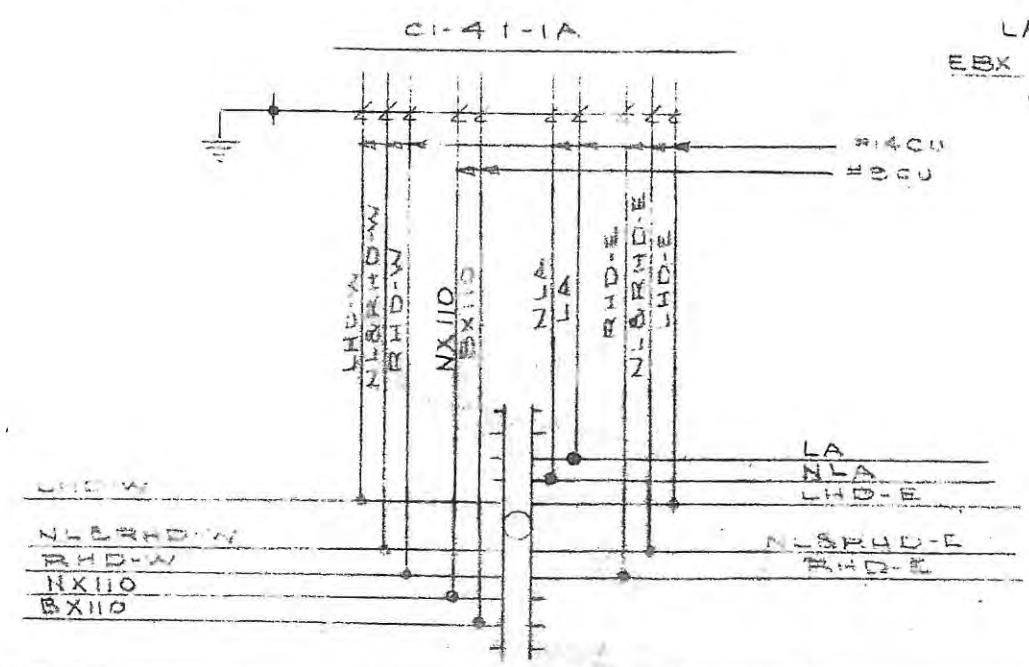
TO ELGIN
9356'



CI-42-1

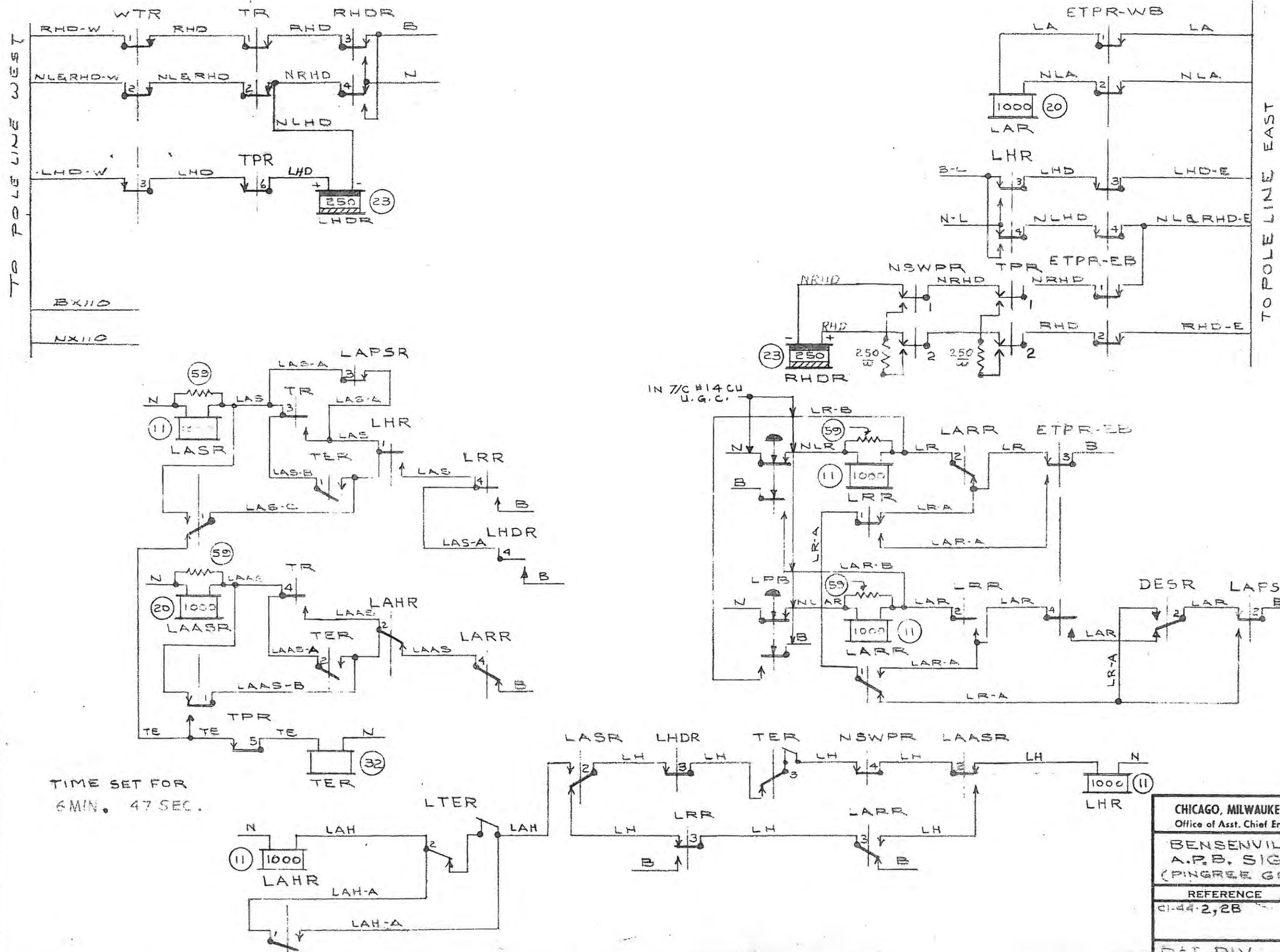
CI-40-1

* INDICATE WIRE PER STD. DWG.
FOR EACH TEST
ALL WIRE TO BE
LACATED BY



REVISIONS	
10-28-75	DR. J. H. ...
11-29-78	REH. ...
7-24-87	BJS. ...

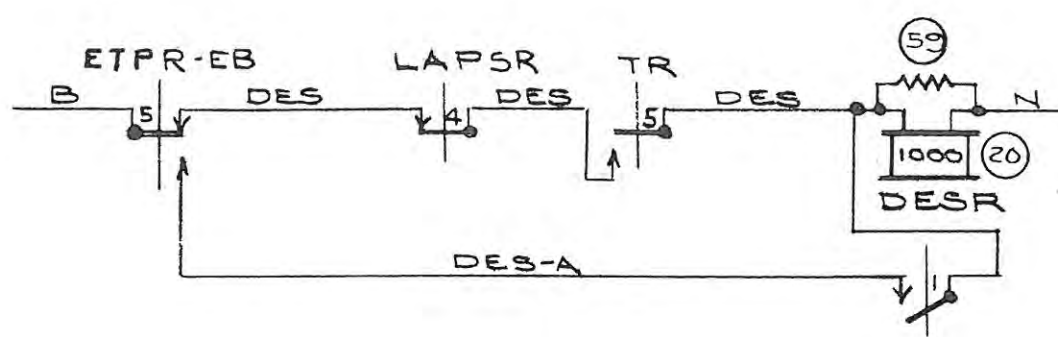
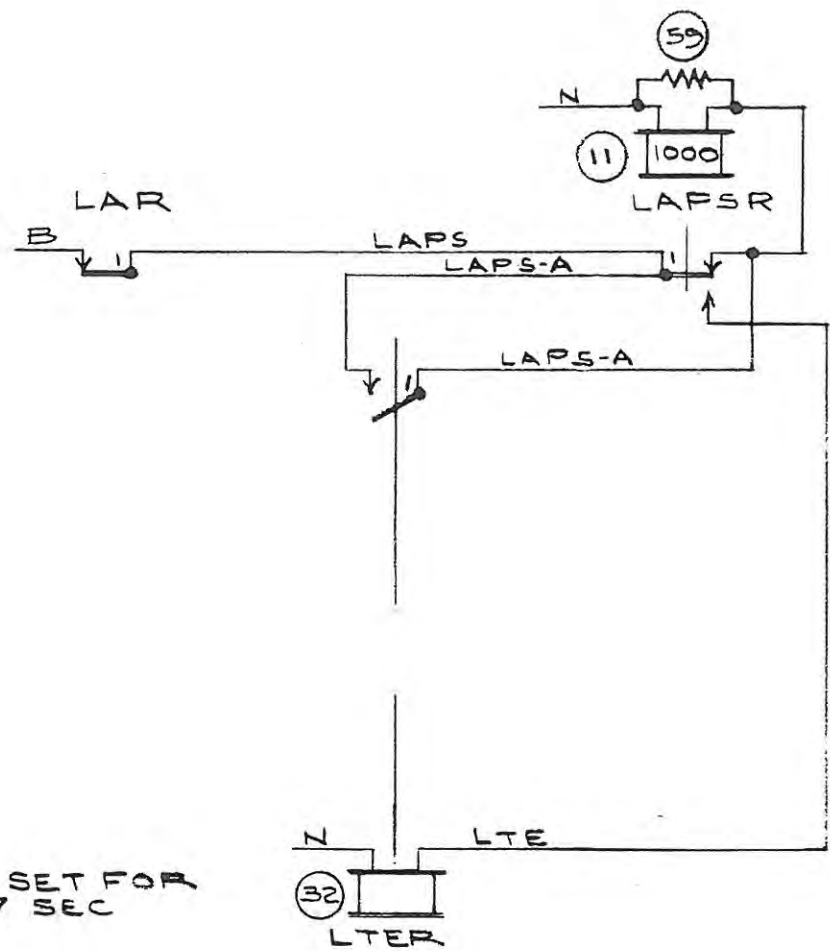
CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD				
Office of Asst. Chief Engineer - Signals & Communications				
BENSENVILLE TO SABULVA A.P.B. SIGNAL CIRCUITS (PINGREE GROVE HEAD BLOCK)				
REFERENCE	DATE 6-20-75			
CI-44-2A, 2B	DESIGNED	DRAWN	CHECKED	CORRECT
	REH	REH	<i>[Signature]</i>	<i>[Signature]</i>
D&I. DIV.	CI-41-1			



REVISIONS			
10-20-78	JDR	OLE	
11-20-78	JDR	ORL	
7-24-87	BJL		
11-13-87	JFM		

TIME SET FOR
6 MIN. 47 SEC.

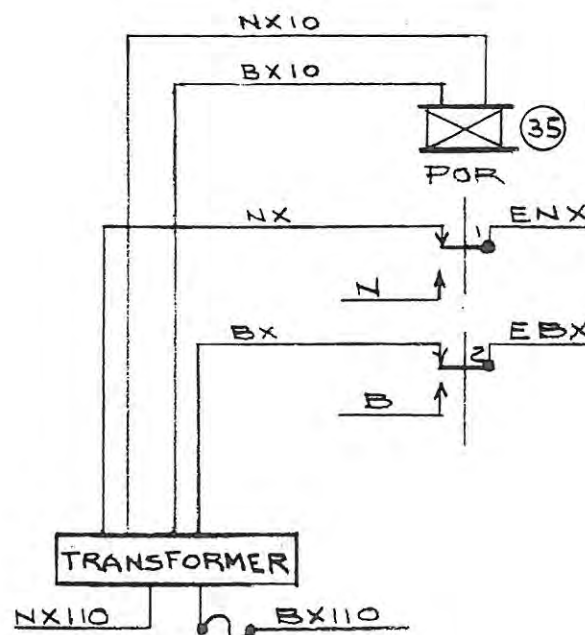
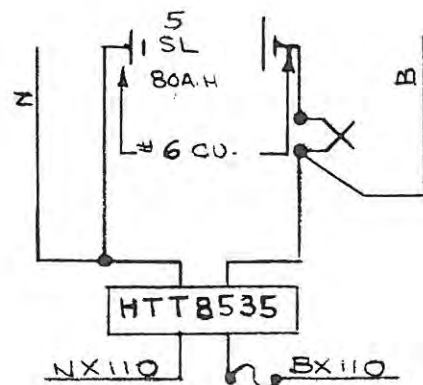
CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD Office of Asst. Chief Engineer - Signals & Communications			
BENSENVILLE TO SABULA A.P.B. SIGNAL CIRCUITS (PINEGROVE GROVE HEADBLOCK)			
REFERENCE	DATE	6-20-78	
CI-44-2,2B	DESIGNED	DRAWN	CHECKED
	REH	REH	WPK
D.&I. DIV.	CI-41-1A		



REVISIONS

7-24-87 BSL DMM

TIME SET FOR
7 SEC



CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD				
Office of Asst. Chief Engineer - Signals & Communications				
BENSENVILLE TO SABULA				
A.P.B. SIGNAL CIRCUITS				
(PINGREE GROVE HEADBLOCK)				
REFERENCE	DATE 6-20-78			
CI-44-2,2A	DESIGNED	DRAWN	CHECKED	CORRECT
	REN	REH	WPK	WPK
D.&I. DIV.		CI-41-1B		

2244. +93 CS

POLE LINE

2148'

*B-2P *B-2P

MAIN

3168'

← TO PINGREE GROVE

TO ELGIN →

* INDICATES WIRED PER STD TO TRACK RECTIFIER WITH AUTO. SWITCH. (1000 AH BATT)

REVISIONS
11-14-57 MTS OK
7-17-57 RAMP
2-13-64 LRK
10-18-78 JDR
5-9-89 GJ
7-22-87 JL DMK

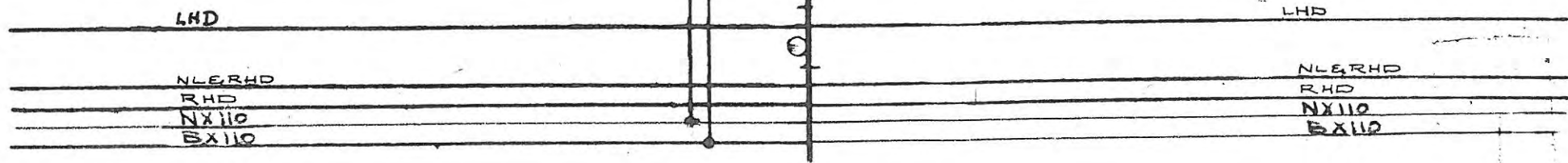
CI-42-2

CI-41-1

TO TRACK RECTIFIERS

CASE GND.

2/C # 9CU. SERVICE ENTRANCE CABLE



CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD
Office of Asst. Chief Engineer — Signals & Communications

BENSENVILLE TO SABULA
AUTOMATIC SIGNAL CIRCUITS

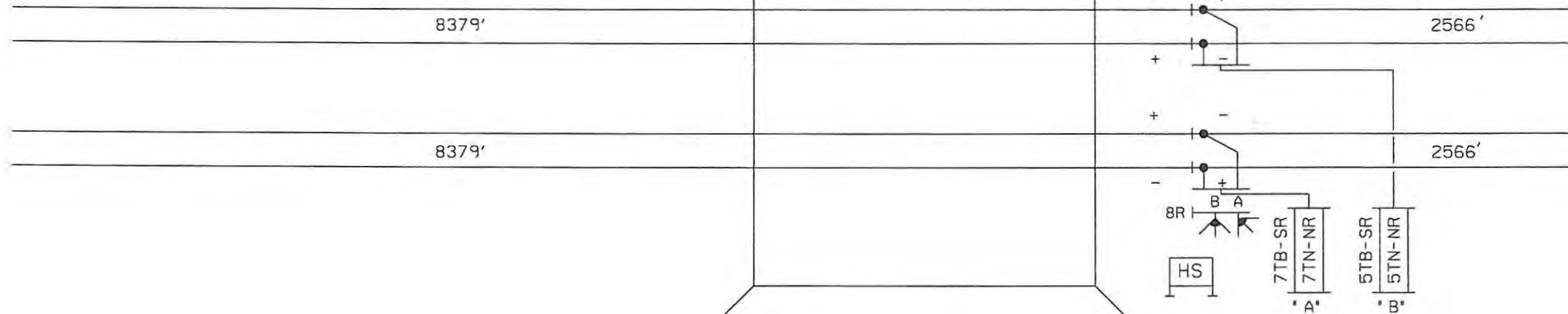
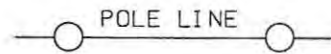
REFERENCES: DATE 9-4-56

DESIGNED	DRAWN	CHECKED	CORRECT
MTS	MTS	WJK	WJK

DE&I DIV. CI-42-1

C1-41-1 C.P.

← TO RANDALL ROAD



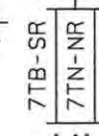
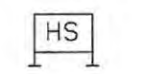
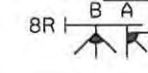
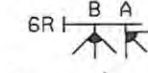
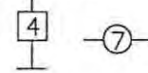
2125+76 SIG.

40

2112+63

TO BIG TIMBER ROAD →

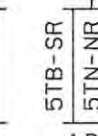
C. P. CASE



* A' SH. 2



* B' SH. 2



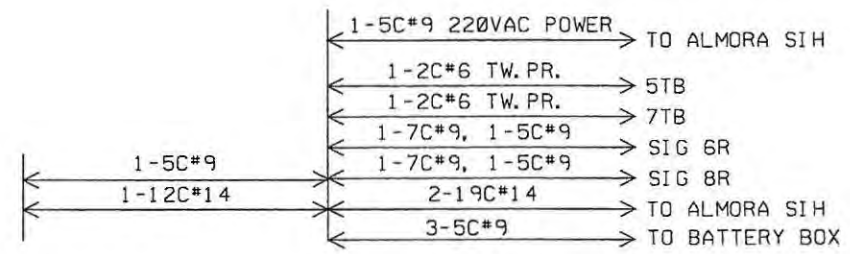
* B' SH. 2



39.70

~REVISIONS~

BY 10/24/00 OK UK



Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS

CHICAGO TO ELGIN
6R & 8R SIGNAL LOCATION
TRACK AND CABLE PLAN

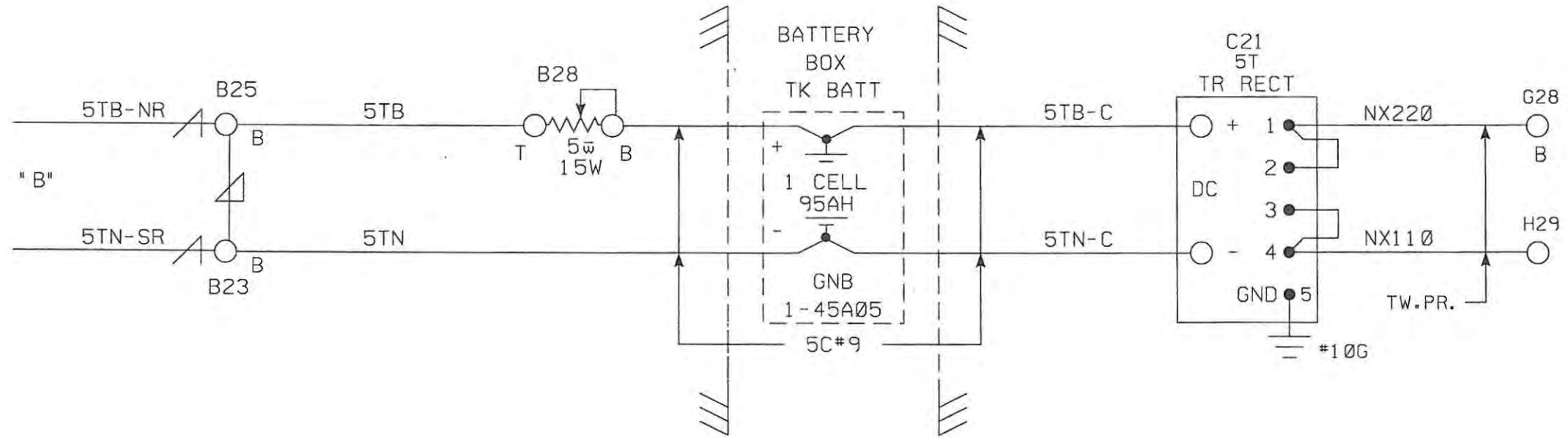
REFERENCE: 40.25 SH.1 THRU SH.14 DATE: 07/06/94

DESIGNED: GRS DRAWN: GRS CHECKED: [Signature] APPROVED: UK

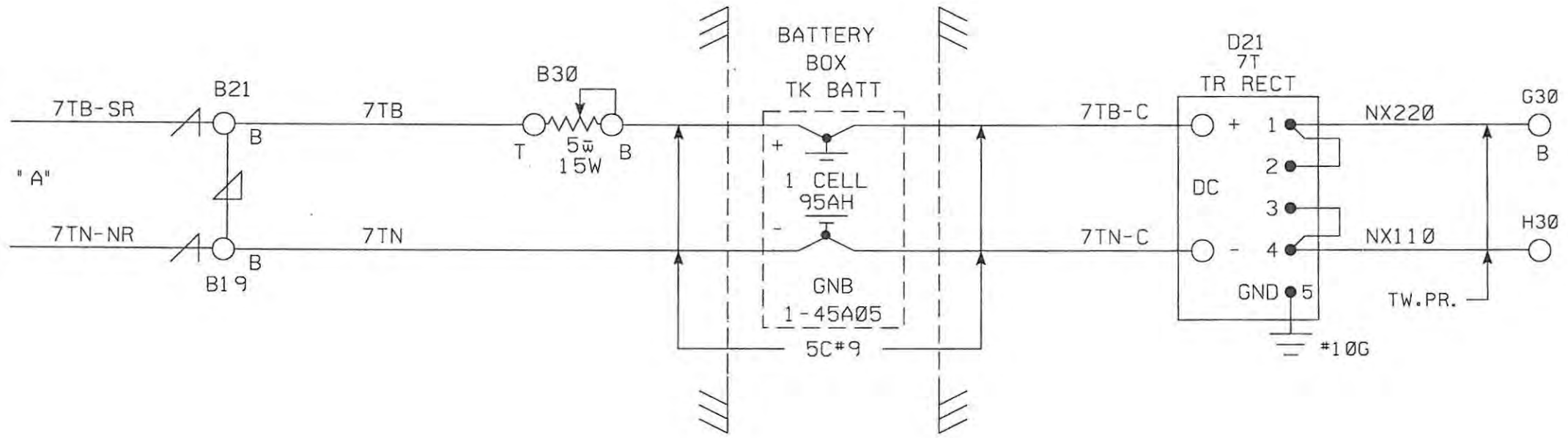
DISTRICT: MW/W PRINT NUMBER: 40.25 SH.1

27-001-0000 1/03/97

SEE 40.25 SH. 01



SEE 40.25 SH. 01

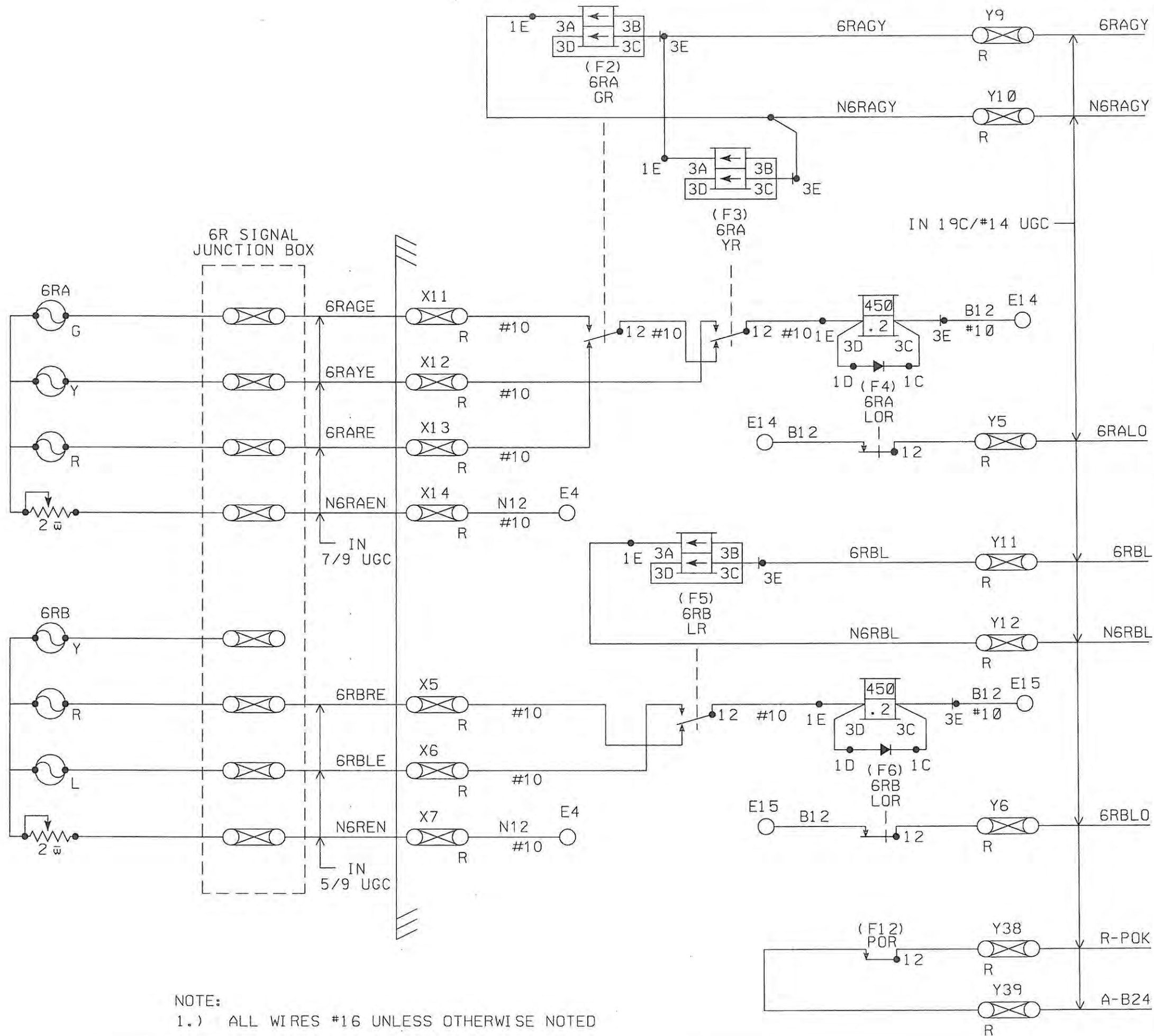


NOTE:
1.) ALL WIRING #10
UNLESS OTHERWISE NOTED

~REVISIONS~

10/24/00 OK UK

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 6R & 8R SIGNAL LOCATION TRACK CIRCUITS	
REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED TB	APPROVED UK
DISTRICT MW/W	PRINT NUMBER 40.25 SH.2



TO
ALMORA

~REVISIONS~

BY 10/24/00 OK WK

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

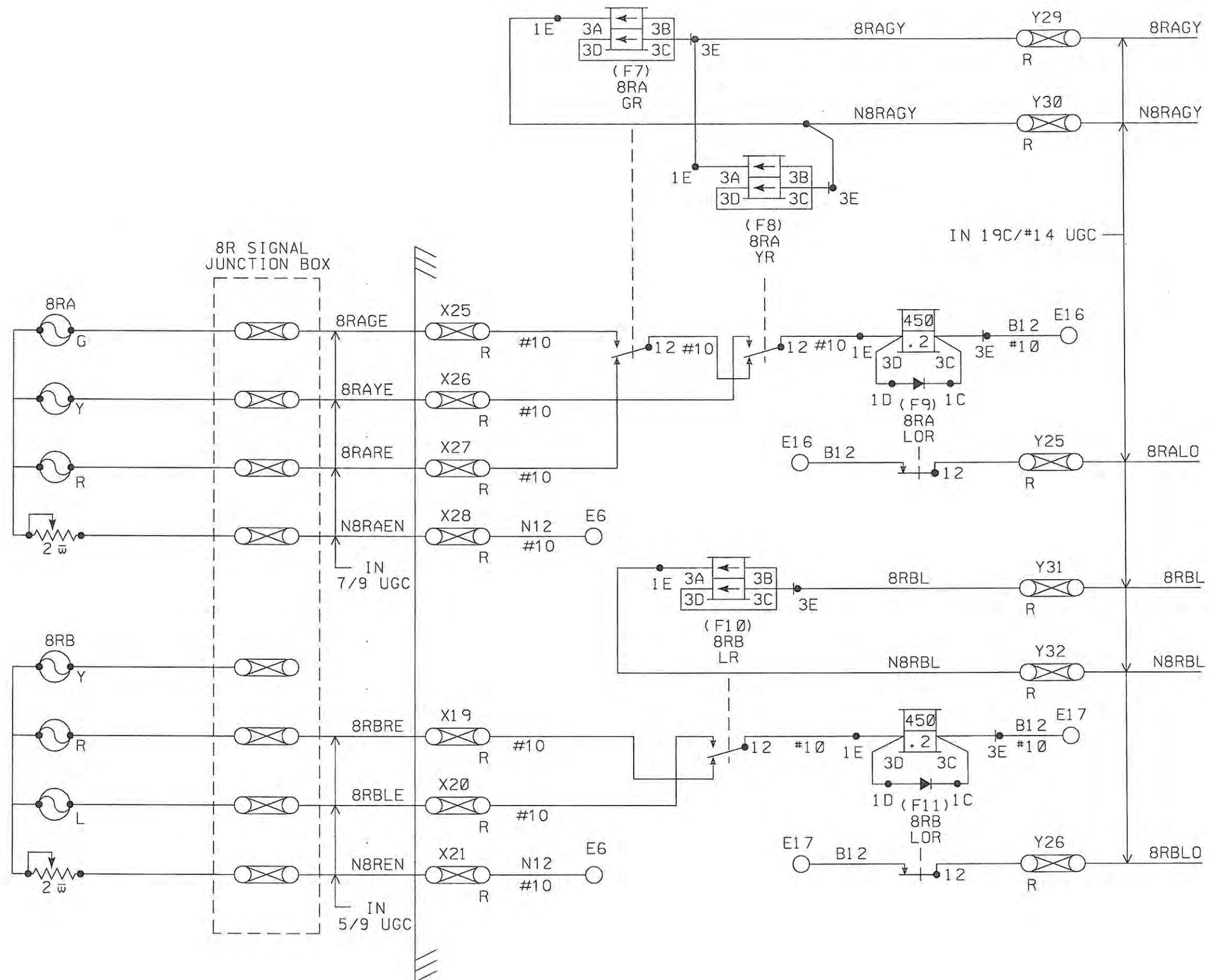
CHICAGO TO ELGIN
6R & 8R SIGNAL LOCATION
SIGNAL LIGHTING CIRCUITS

REFERENCE: 40.25 SH.1 THRU SH.14 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	TB	WK

DISTRICT	PRINT NUMBER
MW/W	40.25 SH.3

NOTE:
1.) ALL WIRES #16 UNLESS OTHERWISE NOTED



NOTE:
 1.) ALL WIRES #16 UNLESS OTHERWISE NOTED

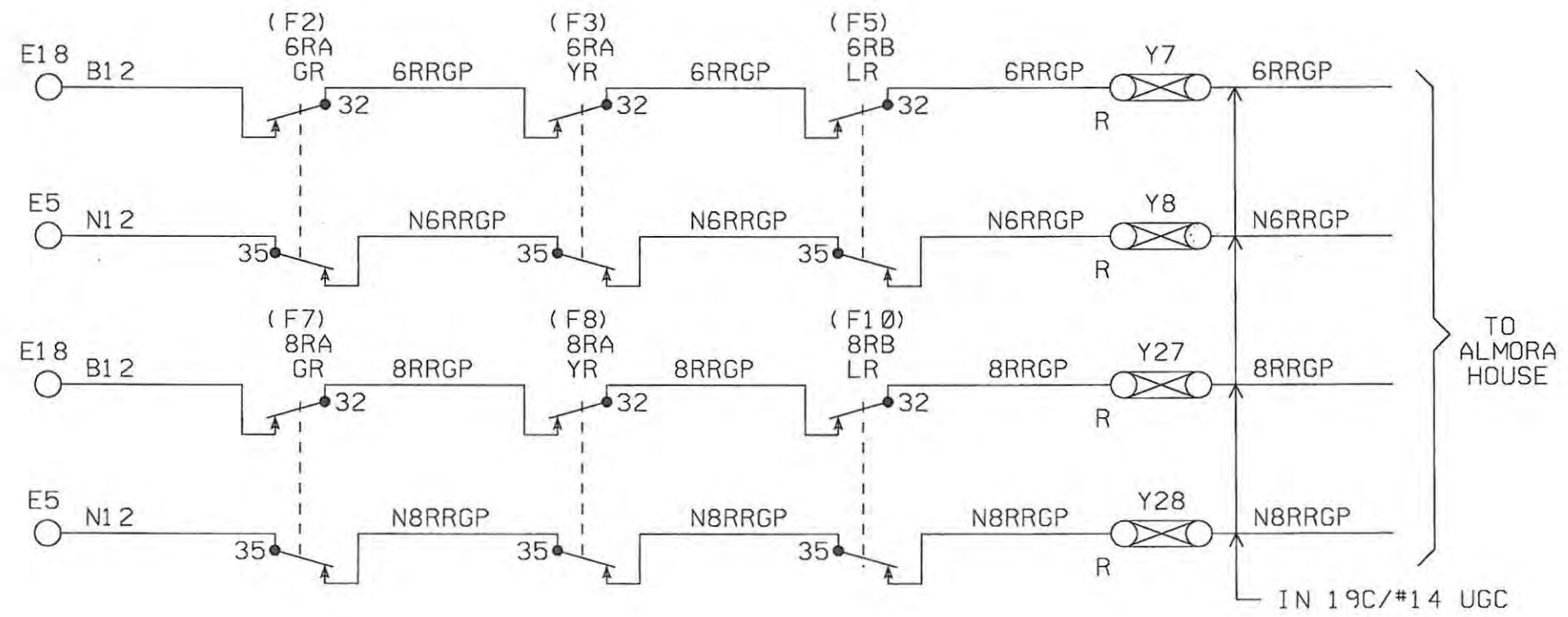
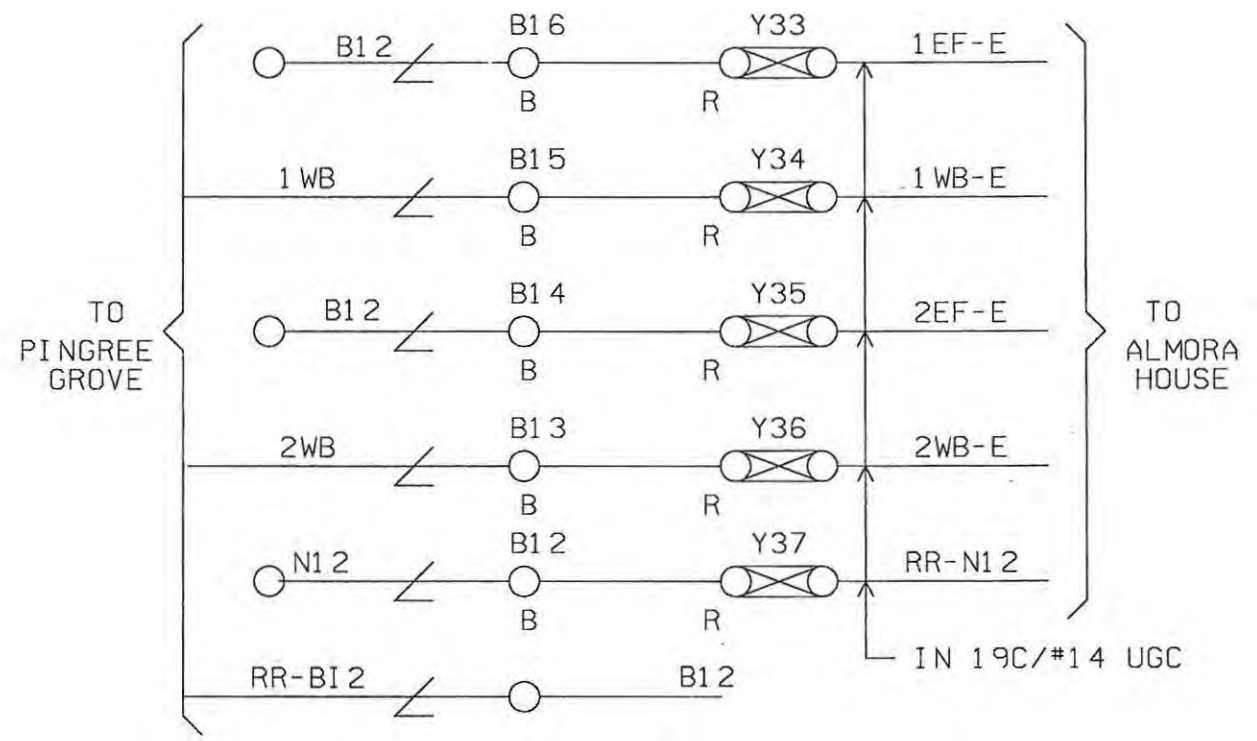
~REVISIONS~
 10/24/00 OK WK

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 6R & 8R SIGNAL LOCATION
 SIGNAL LIGHTING CIRCUITS

REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED WK	APPROVED WK
DISTRICT MW/W	PRINT NUMBER 40.25 SH.4

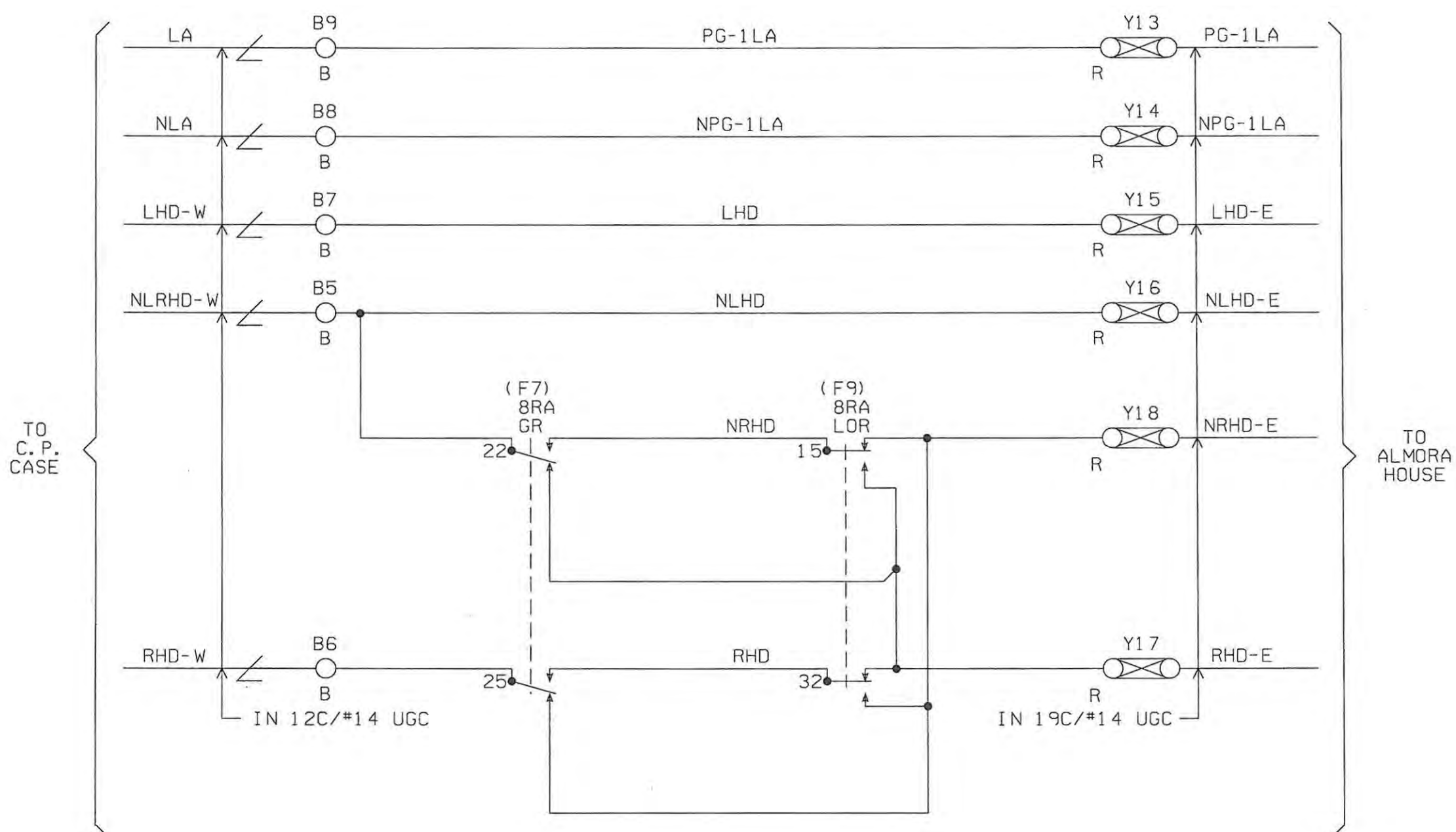
7-001-2000 10/27



NOTE:
1.) ALL WIRES #16 UNLESS OTHERWISE NOTED

~REVISIONS~	
10/24/00	OK UK
11/02/10	OK JK

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 6R & 8R SIGNAL LOCATION LINE CIRCUITS	
REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED: GRS	DRAWN: GRS
CHECKED: JP	APPROVED: UK
DISTRICT: MW/W	PRINT NUMBER: 40.25 SH.5

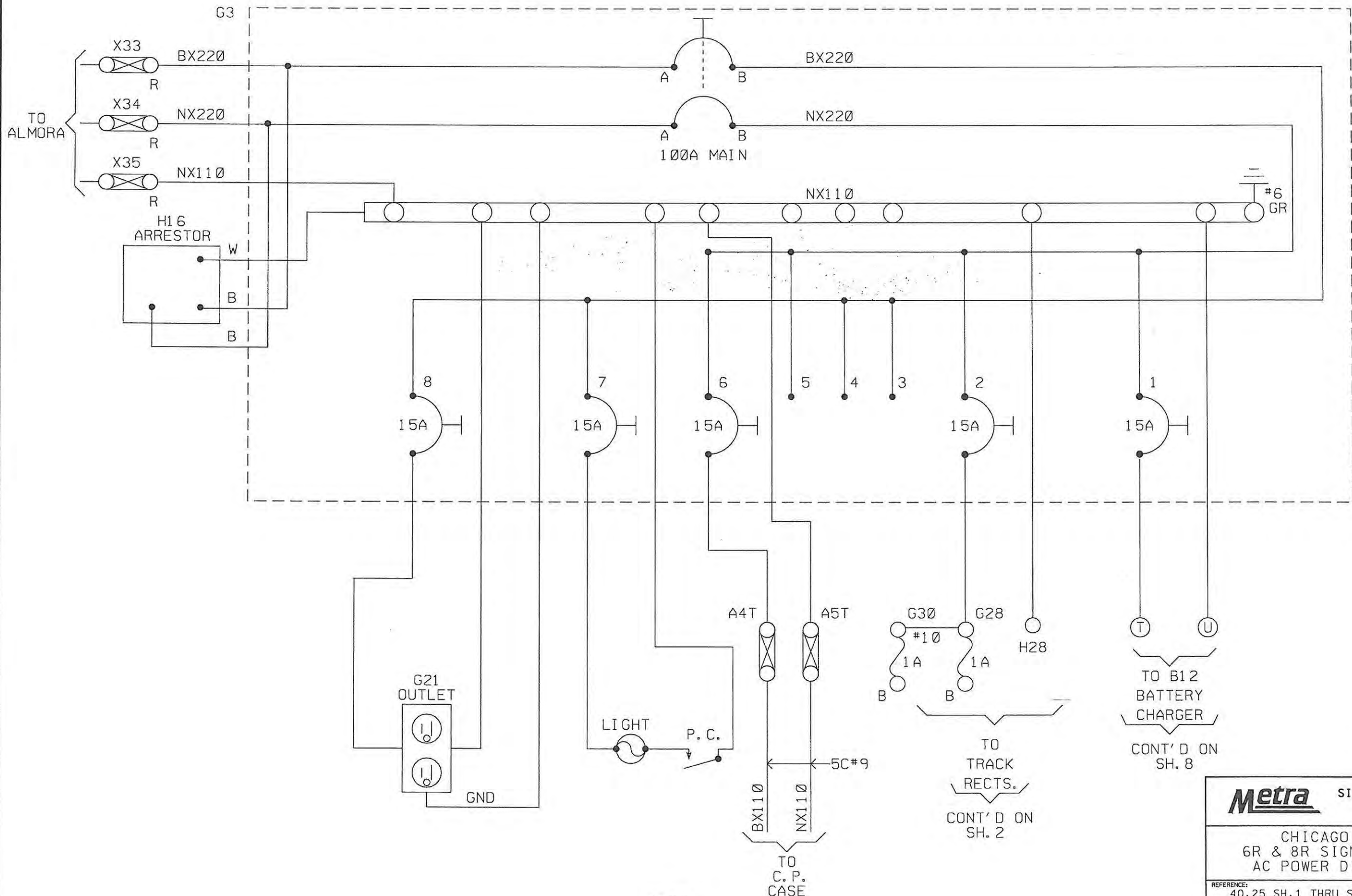


NOTE:
 1.) ALL WIRES #16 UNLESS OTHERWISE NOTED

~REVISIONS~

BY 10/24/00 OK WK

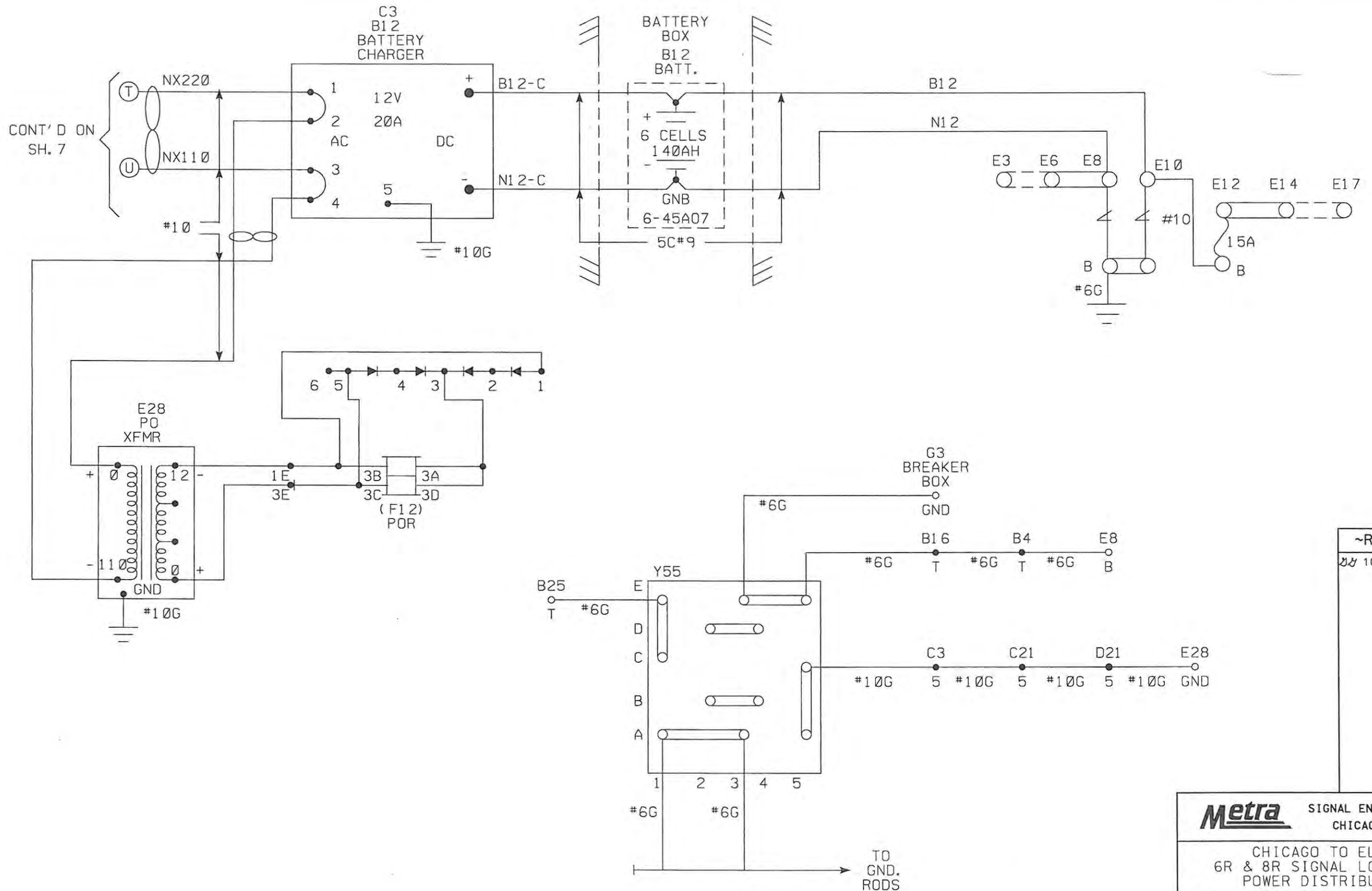
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 6R & 8R SIGNAL LOCATION LINE CIRCUITS	
REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>TB</i>	APPROVED <i>WK</i>
DISTRICT MW/W	PRINT NUMBER 40.25 SH.6



~REVISIONS~
 BY 10/24/00 OK WK

NOTE:
 1.) ALL WIRES #10 UNLESS OTHERWISE NOTED.

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 6R & 8R SIGNAL LOCATION AC POWER DISTRIBUTION	
REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED TB	APPROVED WK
DISTRICT MW/W	PRINT NUMBER 40.25 SH.7



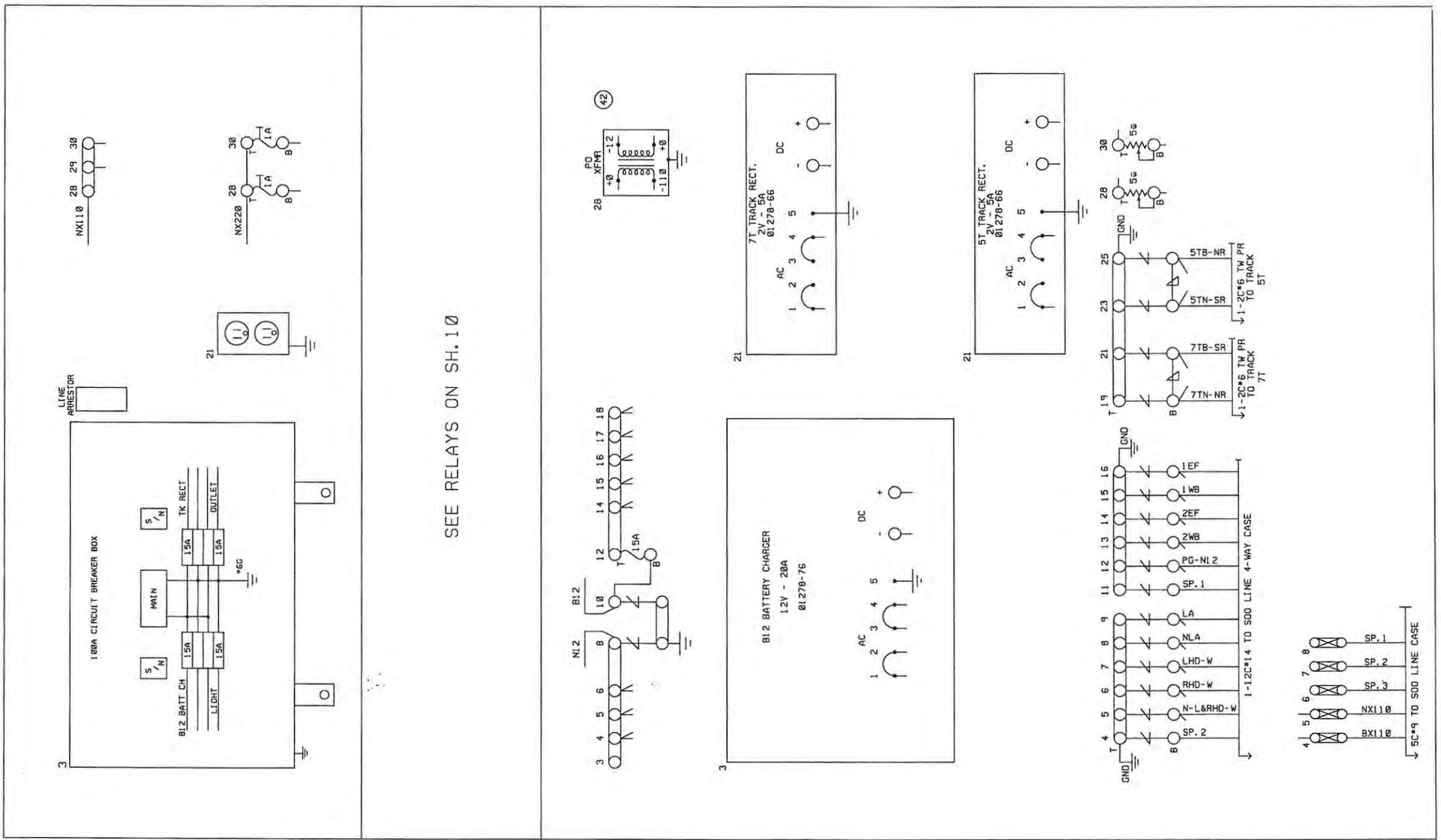
~REVISIONS~
 08 10/24/00 OK WK

NOTE:
 1.) ALL WIRES #16 UNLESS OTHERWISE NOTED
 2.) ∞ INDICATES TWISTED IN PAIRS

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 6R & 8R SIGNAL LOCATION POWER DISTRIBUTION	
REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED TB	APPROVED WK
DISTRICT MW/W	PRINT NUMBER 40.25 SH.8

ZC901 0002-100-27

1 2 3 4 5 6 7 8 9 10 11 12 13 14



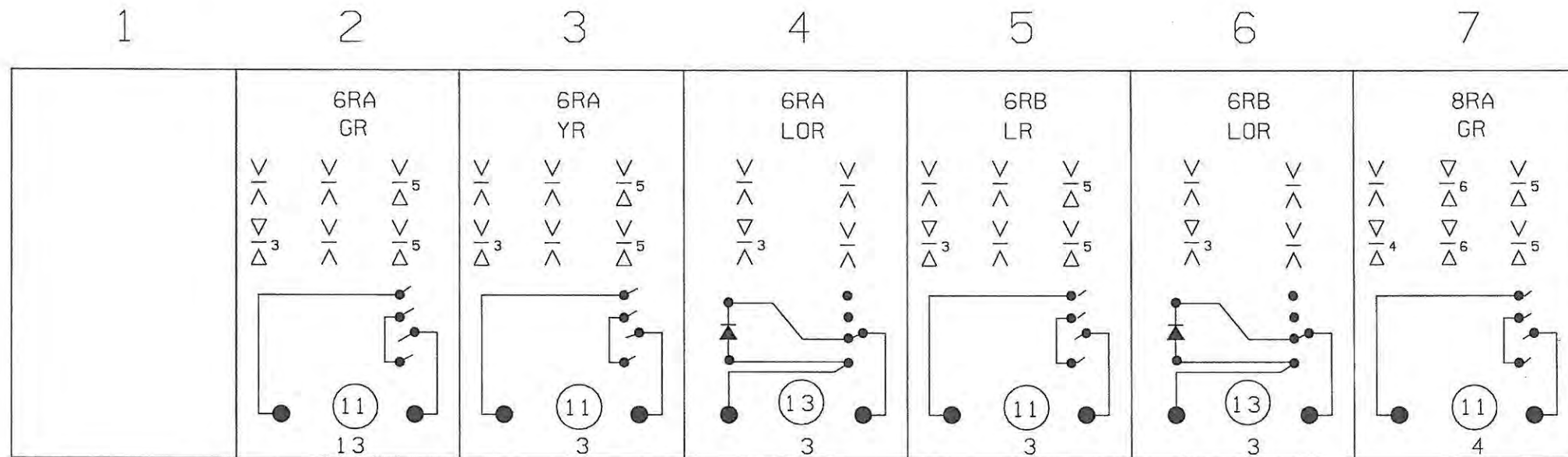
SEE RELAYS ON SH. 10

70186-18 GR. 56

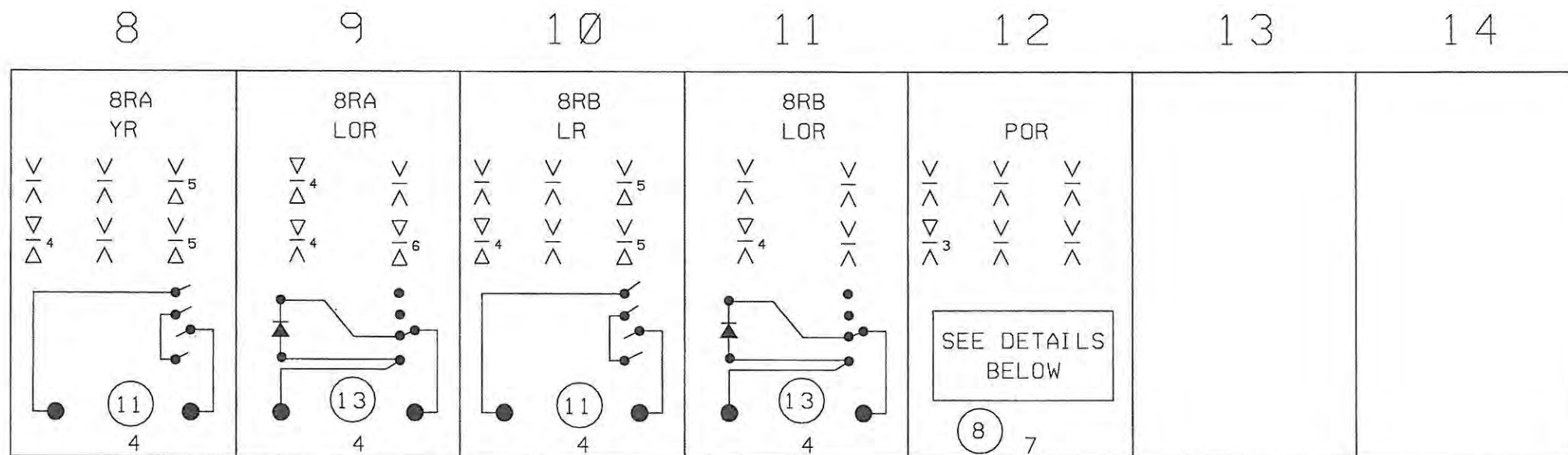
~REVISIONS~
 02 10/24/00 OK WK

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 6R & 8R SIGNAL LOCATION FRONT CASE DETAIL	
REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>JB</i>	APPROVED <i>WK</i>
DISTRICT MW/W	PRINT NUMBER 40.25 SH.9

F

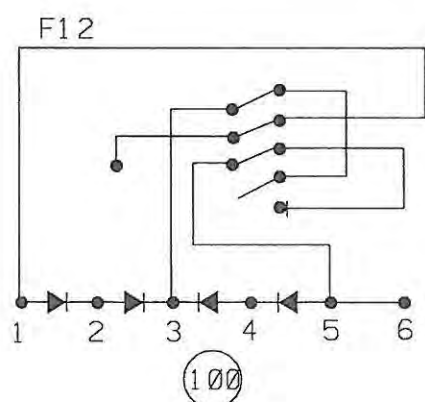


F



~REVISIONS~
BY 10/24/00 DK WJK

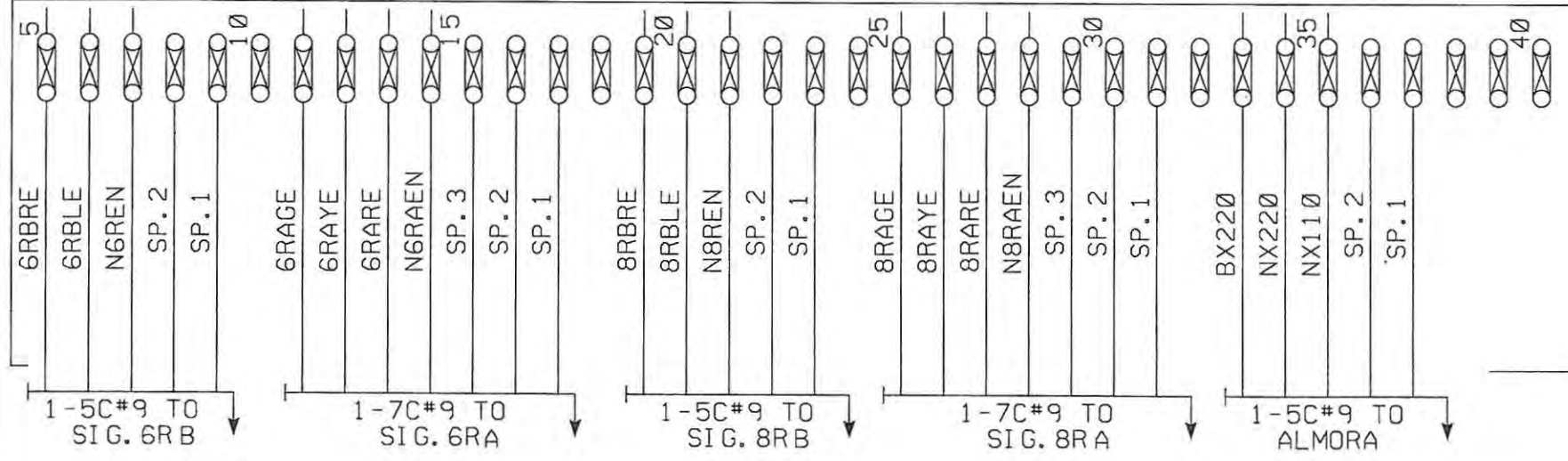
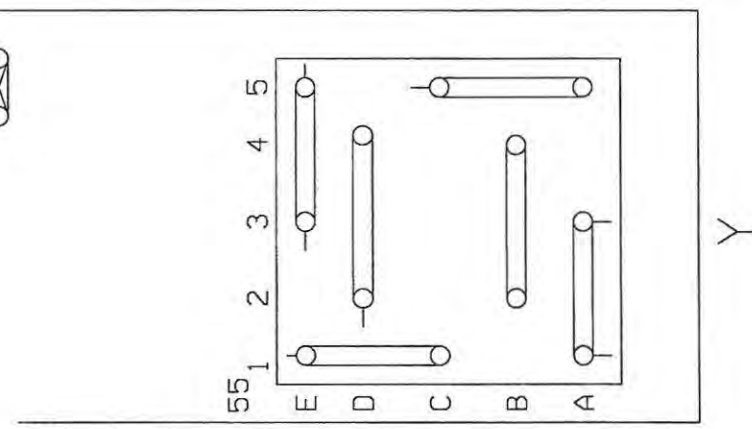
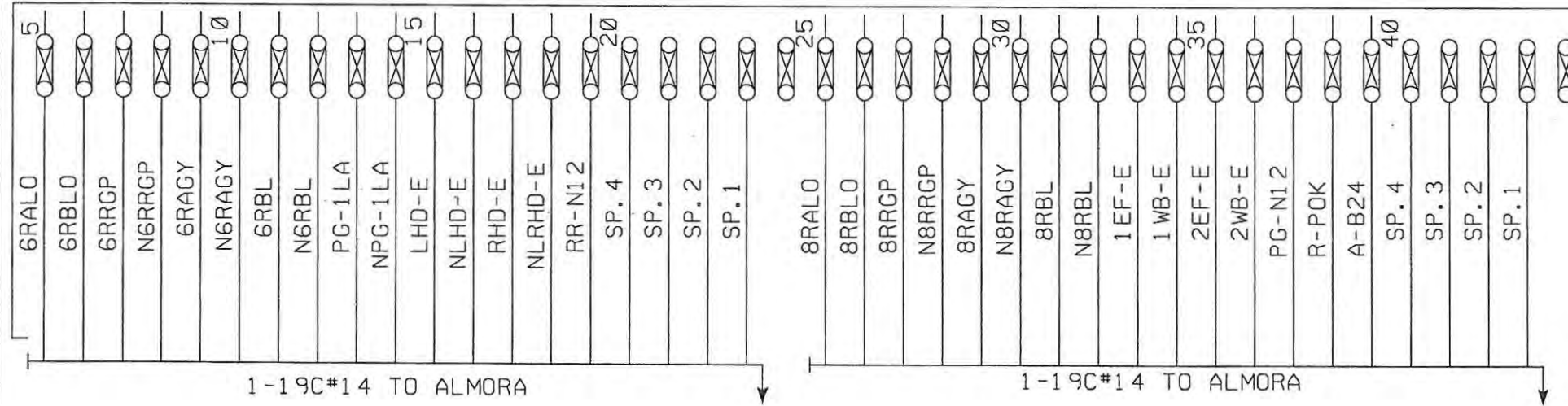
70186-18 GR. 56



Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
6R & 8R SIGNAL LOCATION
FRONT CASE DETAIL

REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED WJK	APPROVED WJK
DISTRICT MW/W	PRINT NUMBER 40.25 SH.10



~REVISIONS~

BY	10/24/00	OK	WK
----	----------	----	----

70186-18 GR. 56

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 6R & 8R SIGNAL LOCATION REAR TERMINAL BOARDS	
REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>[Signature]</i>	APPROVED <i>WK</i>
DISTRICT MW/W	PRINT NUMBER 40.25 SH.11








REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
1	RELAY DC	56001-707 GR. 5	B1N, 4FB, 2F, 1B VRD 100w
2	RELAY DC	56001-922 GR. 7	B1BN, 6FB XFER RELAY 500w
3	RELAY DC	56002-720 GR. 1	B2BN, 12FB VRD REPEATER 350w
4	RELAY DC	56001-922 GR. 10	B1BN, 6FB DC TK RELAY 1w
5	RELAY	31500 GR. 4	J/STANDARD DIODE SUPPRESSION
6	RELAY	31500 GR. 5	J/XFER CDNT VIOL
7	RELAY	56001-714 GR. 1	B1N, 6FB AC/DC TK RELAY 4w
8	RELAY DC	56001-745 GR. 1	B1N, 6FB P.O. RELAY 100x 100w
9	RELAY DC	56001-921 GR. 9	B1BN, 4FB, 2F, 1B TRACK 2w 0R .5w
10	RELAY DC	56001-703 GR. 2	VRD REPEATER B1
11	RELAY	56001-762 GR. 2	B1N, 6FB VRD
12	RELAY	56001-700 GR. 1	B1N, SLOW RELEASE
13	RELAY	56001-873 GR. 1	B1N, LO, 4FB, 450/.12
14	RELAY	56002-703 GR. 1	B2N, 12FB, VRD
15			
16			
17			
18			
19			
20	PLUGBOARD	59606-5 GR. 4	B1 RELAY KIT
21	PLUGBOARD	59606-5 GR. 5	B1 RELAY KIT CW ORDER 61435-1 GR. 5
22	PLUGBOARD	59606-7 GR. 6	B2 RELAY KIT CW ORDER 61435-2 GR. 5
23			
24			
25			
26			
27			
28			
29			
30			
31	SURGE PROTECTOR (FILTER)	01276-21 GR. ON	CSEX POWER, B24
32	SURGE PROTECTOR (FILTER)	01276-18 GR. ON	CSEX POWER, B12
33			
34			
35			
36			
37			
38			
39			
40	POWER SUPPLY	42560-204 GR. 2	CSEX POWER WITH MTG ASSY
41	POWER SUPPLY	42560-273 GR. 2	VPI LOGIC POWER 18 AMP
42	POWER OFF XFMR	53715-154 GR. 1	
43	POWER SUPPLY	42560-273 GR. 1	VPI LOGIC POWER 8 AMP
44			
45			
46			
47			
48			
49			
50	FUSE	54870-1	1A FUSE CSEX

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
51			
52	FUSE	54870-10	10A FUSE
53	FUSE	54870-3	3A FUSE
54	FUSE	54870-6	6A FUSE
55	FUSE	54870-15	15A FUSE
56			
57			
58			
59			
60	CABLE VPI	38216-403 GR. 1	INTERCONNECTING
61			
62			
63			
64			
65	FUSETRON	56449-9	8A FUSETRON SW CONTROL
66	FUSETRON	56449-10	10A FUSETRON SW CONTROL
67			
68			
69			
70			
71			
72			
73			
74			
75	RESISTOR ADJ.	46450-21 GR. 2	5W-15W TKT CIR.
76	RESISTOR	53587-9	50W-10W SNOW MELTER
77	RESISTOR	59723-58	300w, 2W, LINE COUP.
78			
79			
80			
81			
82			
83			
84			
85	INTERCOM TELEPHONE	01164-818, ON	
86			
87			
88	PLATE ASSY.	42560-273 GR. 1	VPI 5 VOLT 8 AMP. OUT
89	PLATE ASSY.	42560-273 GR. 2	VPI 5 VOLT 16 AMP. OUT
90	PLATE ASSY.	42560-204 GR. 2	CSEX +24 IN, +5/-5 OUT
91	BATTERY CHARGER	01278-41	12V-50A
92	BATTERY CHARGER	01278-75	24V-20A
93	BATTERY CHARGER	01278-37	20A-12V
94	BATTERY CHARGER	01278-65	8A-24V
95	BATTERY CHARGER	01278-53	20A-28V (B28) (SPECIAL)
96	BATTERY CHARGER	01278-62	50A-24V (B24) (SPECIAL)
97	BATTERY CHARGER	01278-66	2V DC TK
98	BATTERY CHARGER	01278-76	20A-12V AC/DC TK
99	BATTERY CHARGER	01278-77	40A-12V EB B12
100	RECTIFIER COMP	59899-5 GR. 3	POWER OFF

WIRE LIST

*22TZ	80410-067 GR. 1
*20TZ TWPR	65156-129 GR. 1
*20	80559-065 GR. 1
*18TZ	80556-065 GR. 1
*16TZ TWPR	65156-281 GR. 1
SHIELDED	
*16TZ	80556-067 GR. 1
*16K	80556-040 GR. 1
*16 (OKONITE)	80556-074 GR. 1
*14TZ TWPR	65156-175 GR. 1
*14K	80551-018 GR. 1
*14G	80551-071 GR. 1
*10	80483-006 GR. 1
*10 (OKONITE)	80556-027 GR. 1
*10G	80545-036 GR. 1
*6	80457-014 GR. 1

LEGEND FOR TERMINALS:

-  TEST LINK, ENTRANCE RACK 205
-  FASTON BLOCK TERMINAL 199
-  PLUG COUPLER PIN
-  AAR POST
-  STRAPPED AAR POST
-  RFL SCREW TERMINAL
-  DATA LOGGER TERMINAL

~REVISIONS~

By 10/24/00 OK WK

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
6R & 8R SIGNAL LOCATION
MATERIAL REFERENCE CHART

REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>TS</i>	APPROVED <i>WK</i>
DISTRICT MW/W	PRINT NUMBER 40.25 SH.12

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
101	RECTIFIER COMPLETE	54728-62 GR.1	DIODE USED IN LO RELAY
102	BATTERY	45A13	B24
103	BATTERY	45A15	B12
104	BATTERY	35A15	B24
105	BATTERY	35A07	TRK
106	BATTERY	75A13	B12
107	BATTERY	75A09	EB, B24, AC/DC TK
108	BATTERY	45A05	B28
109	BATTERY	35A09	B12
110	BATTERY	35A05	B12
111	BATTERY	75A05	B12
112	BATTERY	45A07	B12
113	TRAY, BTRY	20161-14	3' 7' LG. X 11.5D FIRE RETARDANT
114	TRAY, BTRY	20161-13	7' 7' LG. X 11.5D FIRE RETARDANT
115	TRAY, BTRY	20161-12	5' 7' LG. X 11.5D FIRE RETARDANT
116			
117	SWITCH, DISCONNECT (DUAL)	58863-0 GR.0	SW. CKT
118			
119			
120	ENT. BOARDS	18149-23	19' FIRE RETARDANT MT. BD
121			
122	ENT. BOARDS	56886-629	23' FIRE RETARDANT BOARD
123	SIDE BOARDS	22868-37	5' 8' FIRE RET. SIDE BD.
124	SIDE BOARDS	22868-38	7' 8' FIRE RET. SIDE BD
125	BRACKET	20167	LOWER BRACKET (FOR SIDE BDS)
126	BRACKET	20167-1	UPPER BRACKET (FOR SIDE BDS)
127	CARRIER ASSY.	30935-80 GR.1	RFL SERIES 6385
128	CARRIER ASSY.	30935-80 GR.16	RFL
129	SIDE BOARD	22868-39	3' 8' FIRE RET BD
130			
131			
132	SWING FRAME (FRNT)	31919-70 GR.1	6 BI SPACES
133	CABLE SUPPORT	41825-637	
134			
135			
136	BOARD, BTRY. COVER	22762-17	5' 8' LG. X 11.5D FIRE RETARDANT
137	BOARD, BTRY. COVER	22762-19	3' 8' LG. X 11.5D FIRE RETARDANT
138	BOARD, BTRY. COVER	22762-18	7' 8' LG. X 11.5D FIRE RETARDANT
139			
140	SUPPORT BAR	41825-716	FOR BREAKER BOX
141	CABLE SUPPORT	41824-72 GR.1	FOR 20' RACKS
142	BAR COMPLETE	17494-28 GR.8	FOR 20' RACKS FRONT MTD. EQUIP.
143			
144	GENRAKODE	29359-15 GR.8	
145	MO FILTER, MTG ASSY.	42560-278 GR.1	MOTION DETECTOR FILTER
146			
147			
148			
149			
150	ELECTRO CODE MODULE		

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
151	ELECTRO CODE		
152	DATA LOGGER		PRIMARY SYSTEM
153	EVENT RECORDER	01164-820 GRON	
154	INPUT BOARDS		
155	INPUT BOARDS		
156	INPUT BOARDS		
157	PLEXIGLASS	56604-136 GR.1	
158	ISOMIX		I/O
159	LINE CONTROL PANEL	55999-911 GR.1	2 PROTECTERS PER PANEL
160	LINE CONTROL PANEL	55999-911 GR.2	4 PROTECTERS PER PANEL
161	LINE COUPLING XFMR	42560-247 GR.3	600 @IMP. - 2 CCTS
162	RFL CARRIER ASSEMBLY	30935-81 GR.7	RFL
163	RFL CARRIER ASSEMBLY	30935-85 GR.1	RFL
164	RFL CARRIER ASSEMBLY	30935-85 GR.2	RFL
165			
166	DETECTOR, PROXIMITY	29015-1	SWITCH - DOOR
167	DETECTOR, PROXIMITY	29015-2	ACTUATOR - DOOR
168	SCREW #10-32 X 1/2	03610-116	INTRUSION SWITCH/ACTUATOR MTG.
169	NUT #10-32 ELASTIC STOP	42333-47	INTRUSION SWITCH/ACTUATOR MTG.
170	FIRE CONTROL PNL	01164-807 GR.ON	MAIN BOX 2 OR 4 WIRE
171	FIRE CONTROL PNL	01164-836 GR.ON	SMOKE DETECTOR 4 WIRE
172	FIRE CONTROL PNL	01164-817 GR.ON	HEAT DETECTOR
173	FIRE CONTROL PNL	56779-6	BELL
174	FIRE CONTROL PNL	56172-2	DOOR SWITCH
175	FIRE CONTROL PNL	42560-110 GR.1	INTRUSION ALARM SW. RK. MTD. BI POS.
176	FIRE CONTROL PNL	01113-008 GR.ON	TIMER/INTRUSION(REED RELAY)
177			
178			
179	FAN THERMOSTAT SW.	2386-14	OVERRIDE SWITCH
180	FAN THERMOSTAT	46318-15	
181	BREAKER BOX	0930-22 GR.ON	100 AMP SERVICE
182	CIRCUIT BREAKER	51943-91	15A 1 POLE 120/240
183	CIRCUIT BREAKER	51943-79	20A 1 POLE 120/240
184	CIRCUIT BREAKER	51943-112	MAIN 100A 2 POLE 120/240
185	CIRCUIT BREAKER	51943-95	30A 1-POLE 120/240
186			
187			
188			
189			
190			
191	BLOCK COMPLETE	46048-22 GR.9	USE ASSY. PER REFERENCE 218
192	1" TERMINAL BLOCK	46048-21 GR.4	TWO POST TERM. BLOCK 1" C-C MTG.
193	BLOCK COMPLETE	46048-22 GR.8	TWO POST BLOCK/ARRESTORS BD. MTD.
194	BOARD ASSY.	59681-1 GR.1	35WAY TERM BLK/B2 SPACE RK. MTD.
195	BLOCK COMP.	56140-17	12WAY TERM BLK/ENT-EQUIP. BD. MTD
196	BLOCK	47508-200	TERM. BL./GND PL. 2 3/8" C-C BD. MTD.
197	TERMINAL BLOCK	5971-44	3 POST BLOCK/ARRESTORS BOARD MTD.
198	BOARD ASSY.	59681-4 GR.1	14 POST TERM. RK. MTD. BI POS
199	TERMINAL COMP.	29407-1 GR.3	64 WAY FASTON(.250) RK. MTD. BI POS
200	MOUNTING ASSY.	45456-9 GR.4	FUSE BLK. 4 FUSES RK. MTD.

~REVISIONS~

BY 10/24/00 OK WK

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
6R & 8R SIGNAL LOCATION
MATERIAL REFERENCE CHART

REFERENCE: 40.25 SH.1 THRU SH.14 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED

DISTRICT	PRINT NUMBER
MW/W	40.25 SH.13

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
201	ARRESTER	56937-21	HEAVY DUTY EQUALIZER
202	ARRESTER	56937-32	HEAVY DUTY TRACK
203	MOUNTING ASSY.	45456-9 GR. 2	FUSE BLK. 2 FUSES STR. RK. MTD. B1 POS
204	HARDWARE	45456-18 GR. 6	TERM BLOCK 4 RESISTORS
205	CONNECTOR COMP.	44720-1 GR. 2	TEST LINK 1' USED WITH REF. 220
206	CONNECTOR	4906-135	2 3/8 C-C MTG. ARRESTOR
207	PLATE COMP.	56604-75 GR. 1	GND PLATE 6' (6-REF 196)
208	CONNECTOR	4906-125	1' C-C MTG.
209	CONNECTOR	4906-141	2' C-C MTG.
210	ARRESTER AC LINE	58745-27	2 POLE 3 WIRE (ASSOC. W/BREAKER BOX)
211	HARDWARE	4906-21	1 1/8" CONNECTOR 14 WAY BLK (VERTIC)
212	HARDWARE	58277-0 GR. 1	GND POST
213	POST COMP.	42788-1 GR. 2	1E KIT FOR REF. 21, 22
214	CLIP COMP.	18493-0 GR. 1	ENT. RK. MTG. KEYWAY
215	SCREW	29757-39	1/4-20 X 1 1/2" LG.
216	WASHER	01250-29 GR. ON	
217	WASHER	1225-2	
218	PLATE	17337-4	6" GROUND PLATE
219	NUT	42333-48	
220	NUT (TEST)	42843-14	USE WITH REF. 205
221	NUT (HALF)	42839-5	
222	NUT (FULL)	42843-1	
223	SCREW, WOOD	01307-13 GR. ON	*10 RD. HD. 1 3/4" LG.
224	SCREW, WOOD	01307-11 GR. ON	*10 RD. HD. 1 1/4" LG.
225	CONNECTOR	4906-6	1 1/4" CONNECTOR 14WAY BLK (HORI Z)
226	CONNECTOR (SLIDE)	43587-15	1 1/4 CENTER
227	NUT (INSULATED)	56482-0	TERM. POST
228	POST COMP.	42788-1 GR. 1	3E KIT FOR REF. 21, 22
229	SCREW, WOOD	01307-9 GR. ON	*10 RD. HD. *LG.
230	FUSE BLOCK	58862-3	WITH DISCONNECT
231	BLOCK COMP.	50037-4 GR. 2	FUSE (BOARD MTD.)
232	MOUNTING ASSEMBLY	42560-279 GR. 1	TIMER (TRANS. ASSY.)
233	MOUNTING ASSEMBLY	42560-28 GR. 1	B1 SIZE PLATE (2-J RELAY)
234	MOUNTING ASSEMBLY	42560-54 GR. 1	B2 SIZE PLATE (4-J RELAY)
235			
236	ARRESTOR	56937-23	HEAVY DUTY
237	OPERATOR CONTROL PANEL	59367-10	SHELL (MODULE)
238	OPERATOR CONTROL PANEL	58921-74	PLUG, WIRE WRAP (MODULE)
239	OPERATOR CONTROL PANEL	8885-171	STUD (MALE) ⊗
240	OPERATOR CONTROL PANEL	8885-172	STUD (FEMALE) ⊙
241	OPERATOR CONTROL PANEL	8885-196	STUD (MALE) ○
242	OPERATOR CONTROL PANEL	8885-197	STUD (FEMALE) ⊗
243	SCREW, WOOD	01307-10 GR. ON	*10 RD. HD. 1" LG.
244	CONNECTOR COMP. 50 WAY	42758-93 GR. 12	LCP POWER
245			
246	ARRESTER	56937-23	B12, N12, B24, B24
247	ARRESTER	56937-28	COMMUNICATION
248			
249			
250			

REF. NO.	DESCRIPTION	DRAWING NO.	REMARKS
251	TABLE	61450-146	PLAN TABLE
252	TABLE	61450-147	13' X 30' PLAN TABLE
253			
254			
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~REVISIONS~	
25	10/24/00 OK UK

Metra		SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 6R & 8R SIGNAL LOCATION MATERIAL REFERENCE CHART			
REFERENCE: 40.25 SH.1 THRU SH.14	DATE: 07/06/94		
DESIGNED GRS	DRAWN GRS	CHECKED <i>TS</i>	APPROVED <i>UK</i>
DISTRICT MW/W	PRINT NUMBER 40.25 SH.14		

2-DWG-2000-146

SHEET	LOCATION	DESCRIPTION
INDEX 1	AUTOMATIC SIGNAL	INDEX.
1	AUTOMATIC SIGNAL	TRACK PLAN
2	AUTOMATIC SIGNAL	CABLE PLAN
3	AUTOMATIC SIGNAL	ELECTROCODE CIRCUITS
4	AUTOMATIC SIGNAL	ELECTROCODE CIRCUITS
5	AUTOMATIC SIGNAL	ELECTROCODE CIRCUITS
6	AUTOMATIC SIGNAL	AC POWER DISTRIBUTION
7	AUTOMATIC SIGNAL	POWER DISTRIBUTION
8	AUTOMATIC SIGNAL	CASE DETAIL - FRONT LEFT SIDE
9	AUTOMATIC SIGNAL	CASE DETAIL - FRONT RIGHT SIDE
10	AUTOMATIC SIGNAL	REAR TERMINAL BOARDS
11	AUTOMATIC SIGNAL	SIGNAL JUNCTION BOX
12	AUTOMATIC SIGNAL	MATERIAL REFERENCE CHART
13	AUTOMATIC SIGNAL	MATERIAL REFERENCE CHART
14	AUTOMATIC SIGNAL	MATERIAL REFERENCE CHART

~REVISIONS~

BY 10/24/00 OK WK

Metra		SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN 382-383 SIGNAL LOCATION INDEX			
REFERENCE: 38.32 SH.1 THRU SH.14		DATE: 07/06/94	
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	<i>TB</i>	<i>WK</i>
DISTRICT MW/W		PRINT NUMBER 38.32 INDEX	

← TO ALMORA

TO ELGIN EAST →

← ① ⑤ ⑧ ① ② →

← ① ⑧ ① ⑤ ⑦ →

1T 7125'

8825'

← ① ⑤ ⑦ ① ⑧ →

← ① ② ① ⑤ ⑧ →

2T 7125'

8825'

2024 ±85 SIG.

2008±01

1-383

1-382



AC METER

HD

7

2-383

2-382

#6

#6

WT-CBRN-1T-NR
WT-CBRB-1T-SR
WT-CBRN-2T-NR
WT-CBRB-2T-SR
"A" "B"

ET-CBRN-2T-SR
ET-CBRB-2T-NR
ET-CBRN-1T-SR
ET-CBRB-1T-NR
"C" "D"

38.54

37.65

~REVISIONS~

10/24/00 OK WK
07/23/02 OK WK
10/16/08 OK Feb

TO CASE

WEST TO 38.54

7/14 UGC

3-1/6 UGC

TO AC SERVICE



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

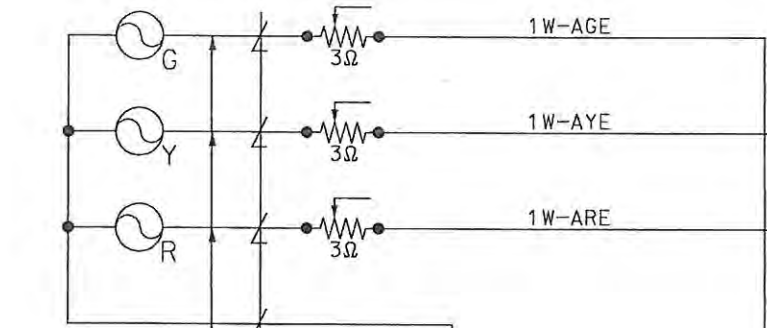
CHICAGO TO ELGIN
382-383 SIGNAL LOCATION
TRACK PLAN

REFERENCE: 38.32 SH.1 THRU SH.5 DATE: 07/06/94

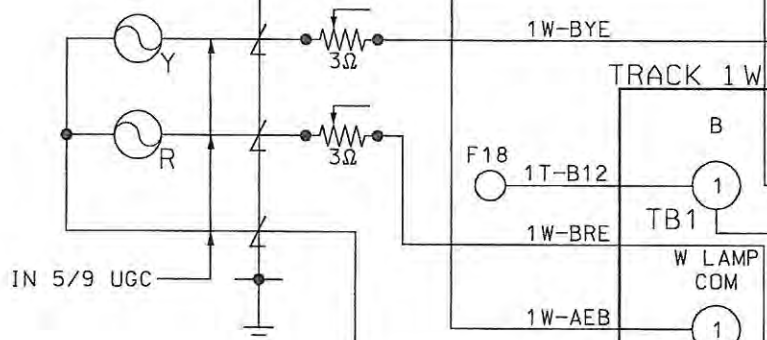
DESIGNED: GRS DRAWN: GRS CHECKED: TSP APPROVED: WK

DISTRICT: MW/W PRINT NUMBER: 38.32 SH.1

1-383A SIG.

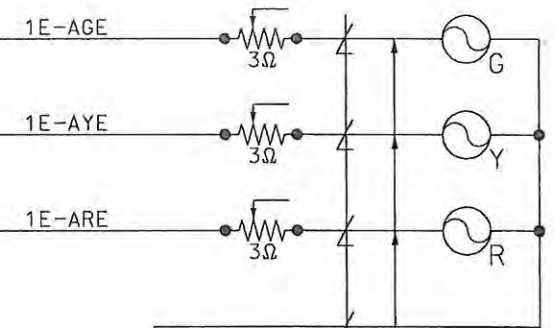


1-383B SIG.

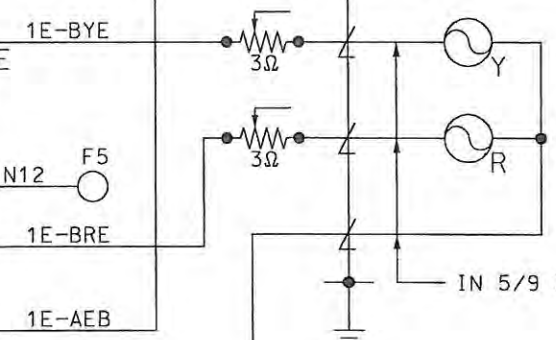


IN 5/9 UGC

1-382A SIG.

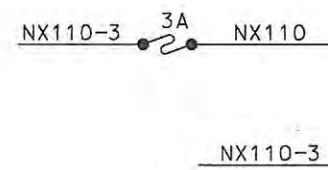
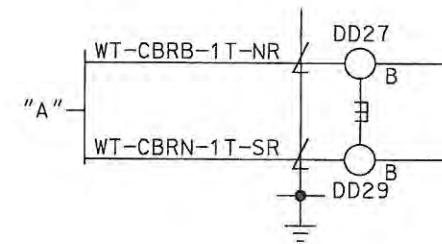
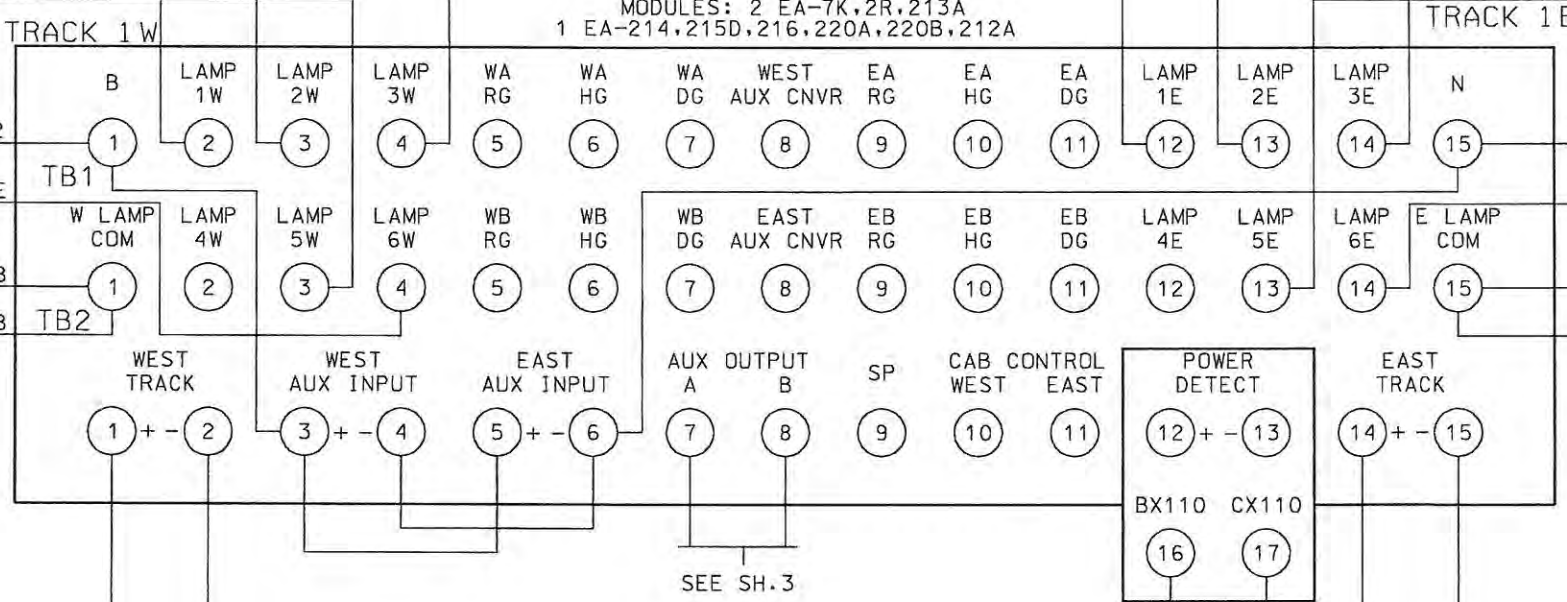


1-382B SIG.



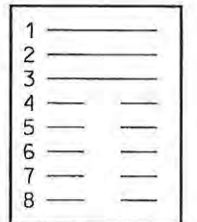
IN 5/9 UGC

ELECTRO CODE 4
 MODULES: 2 EA-7K, 2R, 213A
 1 EA-214, 215D, 216, 220A, 220B, 212A



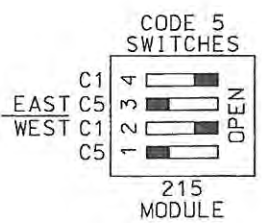
~REVISIONS~

08	10/24/00	OK	WK
06	06/03/08	OK	FEB
08	08/27/08	OK	FEB
10	10/16/08	OK	FEB



AHQ-A5 REV F
 EPROM: CKSUM/CRC
 1: 2CB5/FA2B
 2: F3B6/464B
 3: 2CB5/FA2B
 4: 4C49/4C4A

STRAPS 4,5,6,7,8 ARE CUT



ELECTRO CODE ASPECTS

- 1 - TRACK
- 2 - YELLOW
- 3 - YELLOW/YELLOW
- 4 - FLASHING YELLOW
- 5 - BLOCK (ANNUNCIATOR)
- 6 - TUMBLE DOWN
- 7 - GREEN
- 8 - TRAFFIC

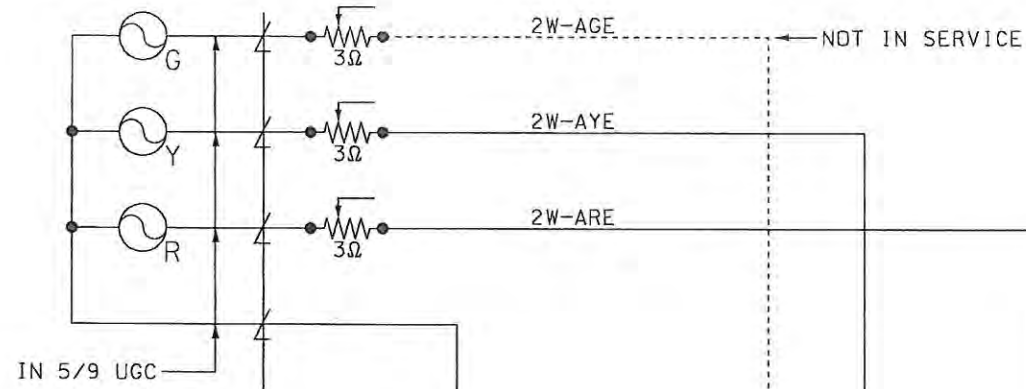
Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 382-383 SIGNAL LOCATION
 TK.1 ELECTROCODE CIRCUITS

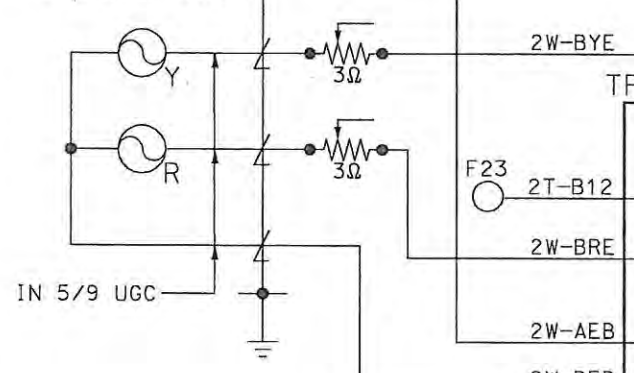
REFERENCE: 38.32 SH.1 THRU SH.5	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED TSP	APPROVED WK
DISTRICT MW/W	PRINT NUMBER 38.32 SH.2

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

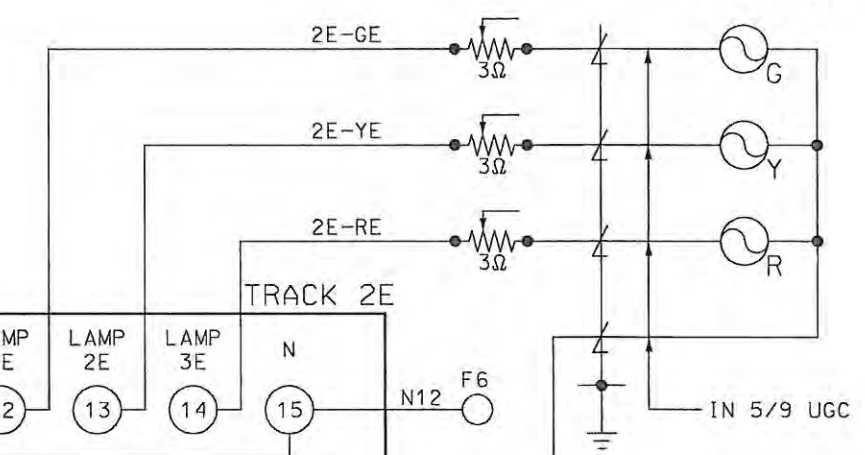
2-383A SIG.



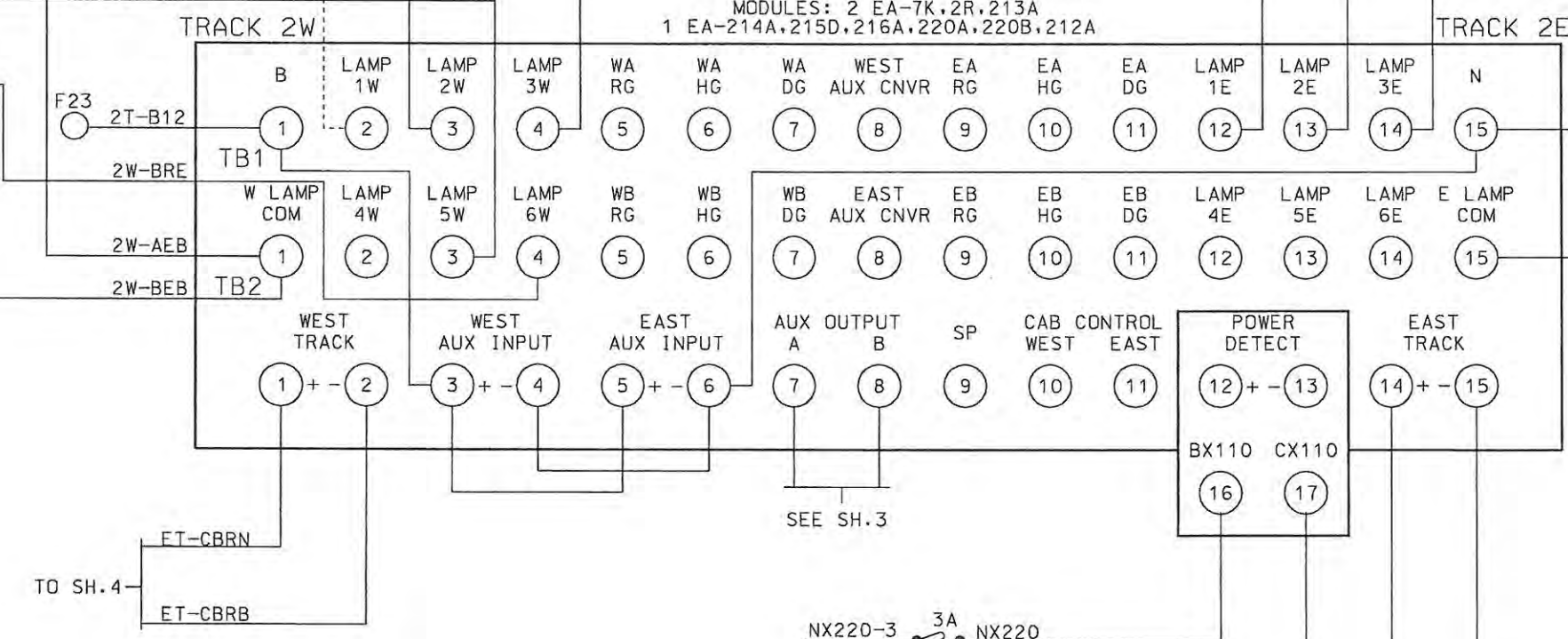
2-383B SIG.



2-382 SIG.



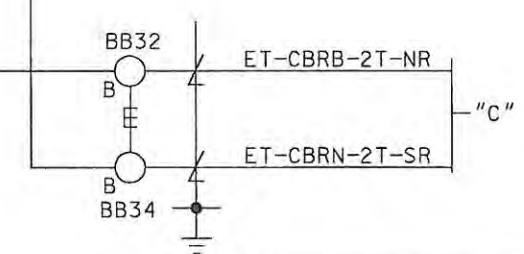
ELECTRO CODE 4
 MODULES: 2 EA-7K, 2R, 213A
 1 EA-214A, 215D, 216A, 220A, 220B, 212A



TO SH. 4
 ET-CBRN
 ET-CBRB

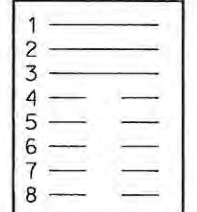
NX220-3 3A NX220

NX110-3

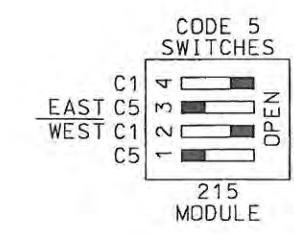


~REVISIONS~

04	10/24/00	OK	WK
05	06/03/08	OK	Feb
06	08/27/08	OK	Feb
07	10/16/08	OK	Feb



AHDQ-A5 REV F
 EPROM: CKSUM/CRC
 1: 2CB5/FA2B
 2: F3B6/464B
 3: 2CB5/FA2B
 4: 4C49/4C4A
 STRAPS 4,5,6,7,8
 ARE CUT



- ELECTRO CODE ASPECTS
- 1 - TRACK
 - 2 - YELLOW
 - 3 - YELLOW/YELLOW
 - 4 - FLASHING YELLOW
 - 5 - BLOCK (ANNUNCIATOR)
 - 6 - TUMBLE DOWN
 - 7 - GREEN
 - 8 - TRAFFIC

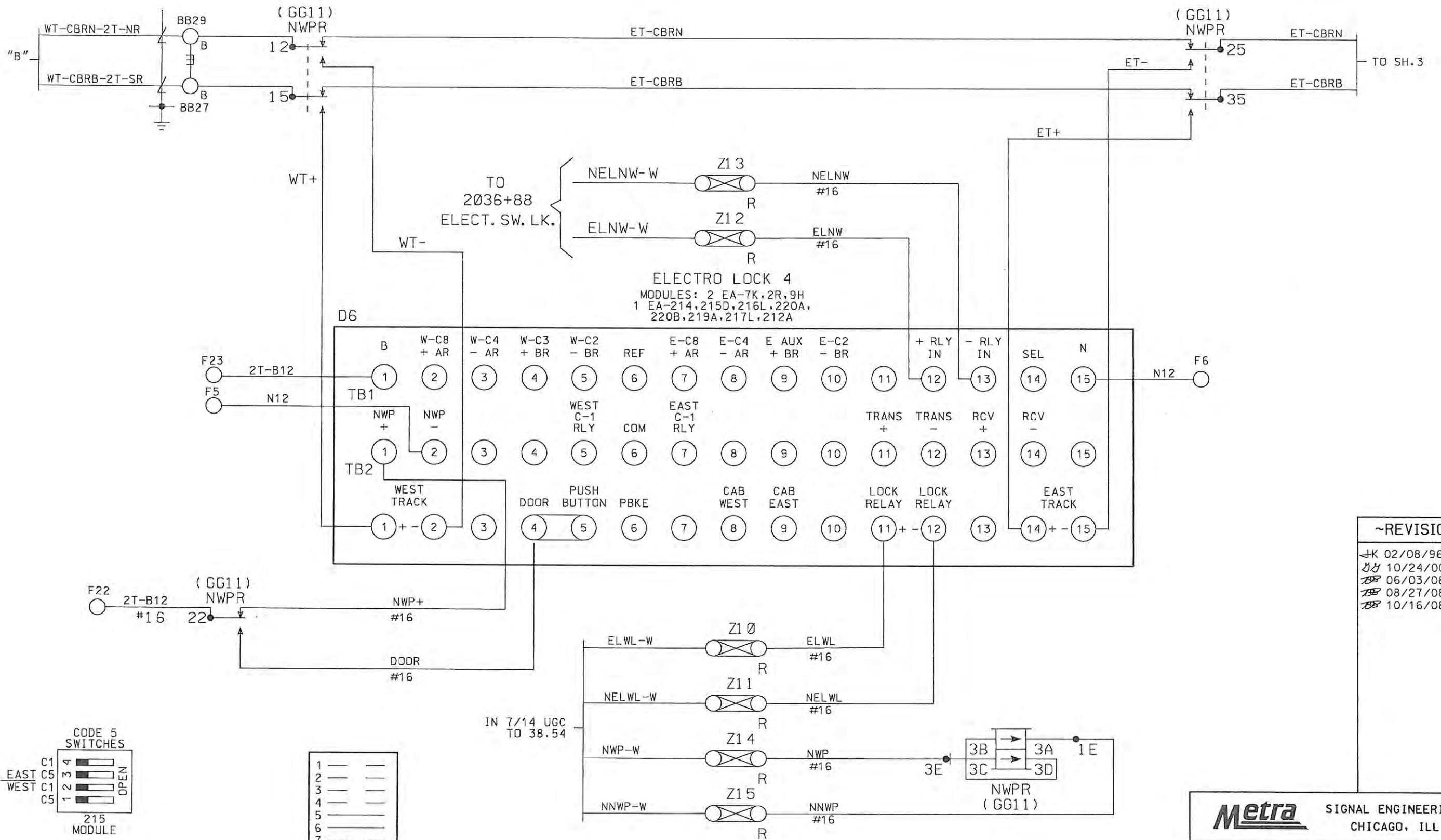
Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO ELGIN
 382-383 SIGNAL LOCATION
 TK.2 ELECTROCODE CIRCUITS

REFERENCE: 38.32 SH.1 THRU SH.5 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	Feb	WK
DISTRICT	PRINT NUMBER		
MW/W	38.32 SH.3		

NOTE:
 1.) ALL WIRES #10 UNLESS
 OTHERWISE NOTED



~REVISIONS~

JK	02/08/96	OK	<i>JK</i>
JK	10/24/00	OK	<i>JK</i>
JK	06/03/08	OK	<i>JK</i>
JK	08/27/08	OK	<i>JK</i>
JK	10/16/08	OK	<i>JK</i>

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
382-383 SIGNAL LOCATION
ELECTROCODE CIRCUITS

REFERENCE: 38.32 SH.1 THRU SH.5	DATE: 07/06/94		
DESIGNED	DRAWN	CHECKED	APPROVED
<i>JK</i>	<i>JK</i>	<i>JK</i>	<i>JK</i>
DISTRICT MW/W	PRINT NUMBER 38.32 SH.4		

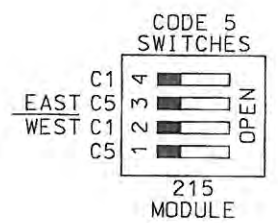
NOTE:
1.) ALL WIRES #10 UNLESS OTHERWISE NOTED

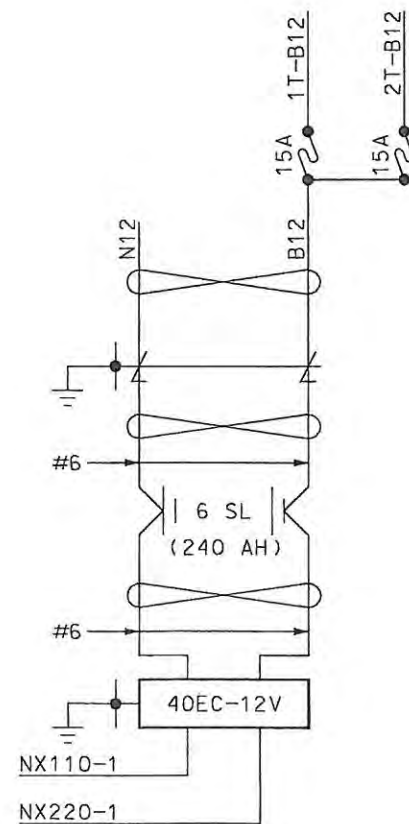
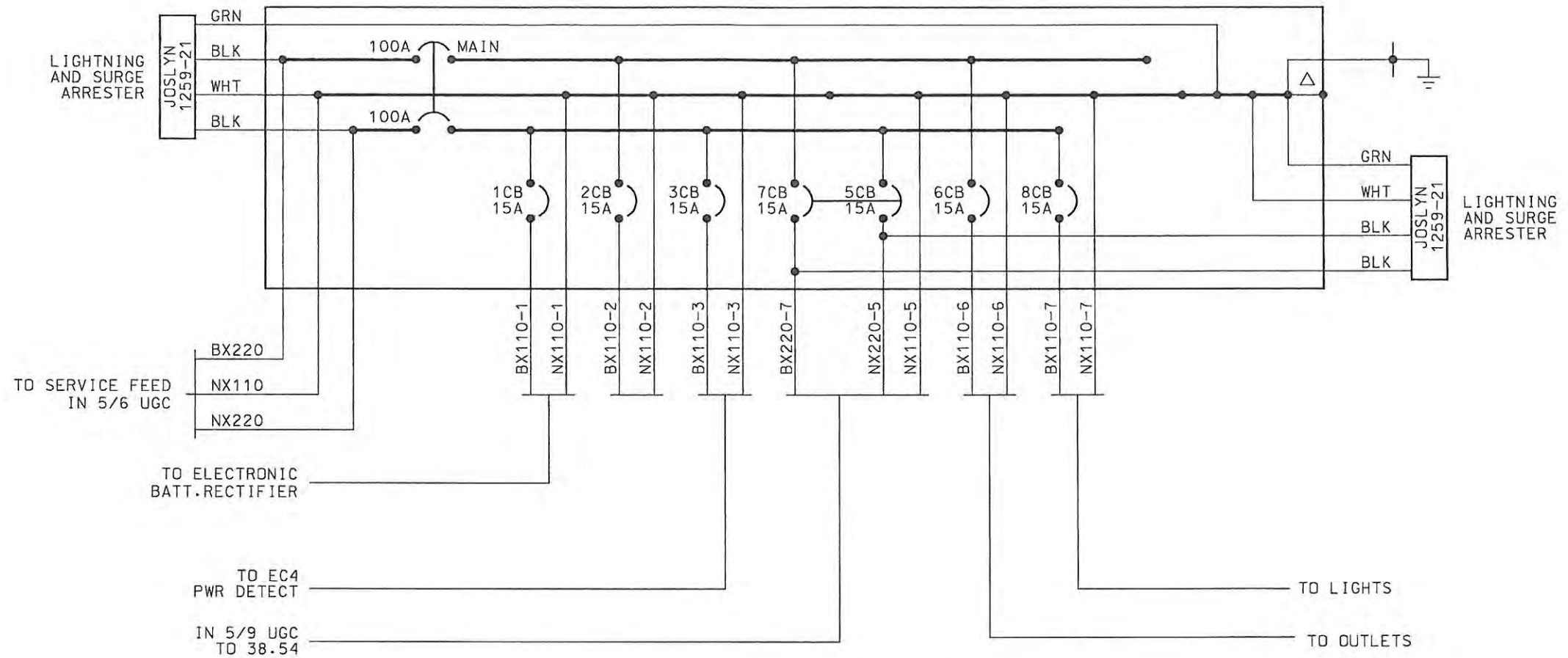
LMMQ-A5 REV C
EPROM: CKSUM/CRC
1: F136/6EB7
2: 249D/49AF
3: F136/6EB7
4: 98CE/OADE

STRAPS 1,2,3,4,7,8 ARE CUT
CONFIGURATION D,R,A,A,B,B,A

219A MODULE
TIME LOCKING SET TO 5 MIN.0 SEC.

3	2	1	6	8	3	2	1	6	8
MINUTES					SECONDS				





~REVISIONS~

10/24/00	OK	WK
10/16/08	OK	WK

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
382-383 SIGNAL LOCATION
AC POWER DISTRIBUTION

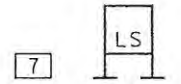
REFERENCE: 38.32 SH.1 THRU SH.5	DATE: 07/06/94		
DESIGNED GRS	DRAWN GRS	CHECKED <i>TSB</i>	APPROVED <i>WK</i>
DISTRICT MW/W		PRINT NUMBER 38.32 SH.5	

← TO ALMORA

TO ELGIN →

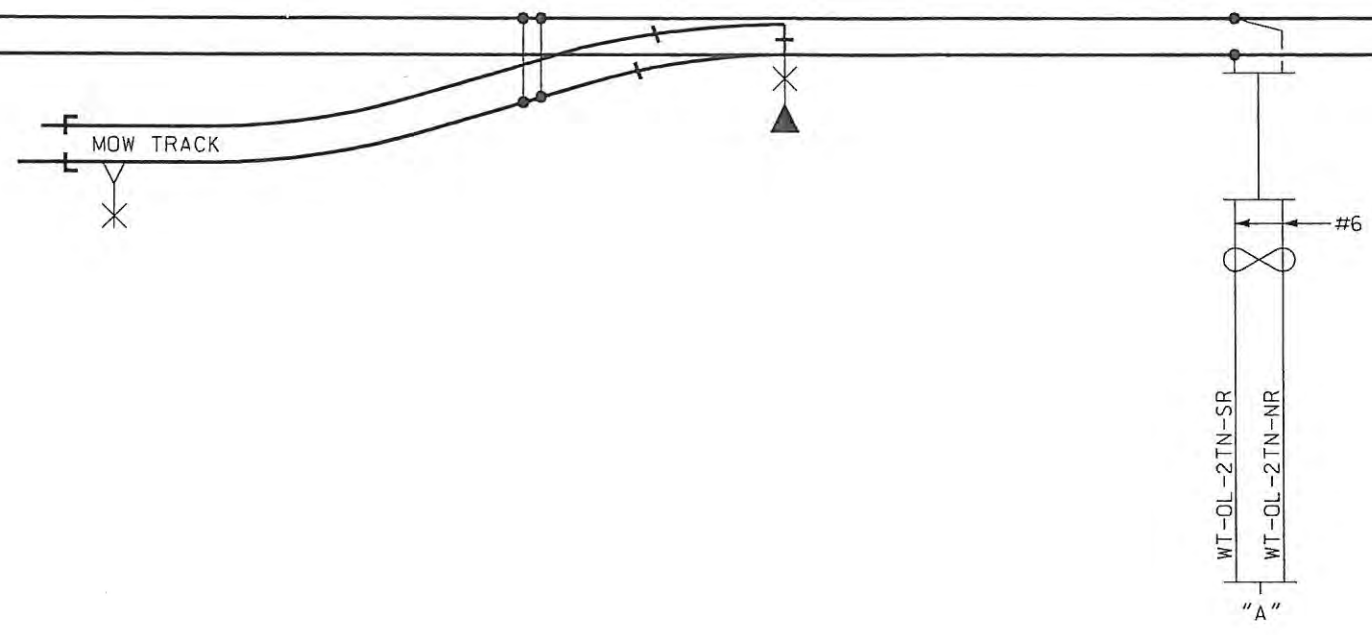
2036+68 P.S.

2035+93 C.S.



1T

2T

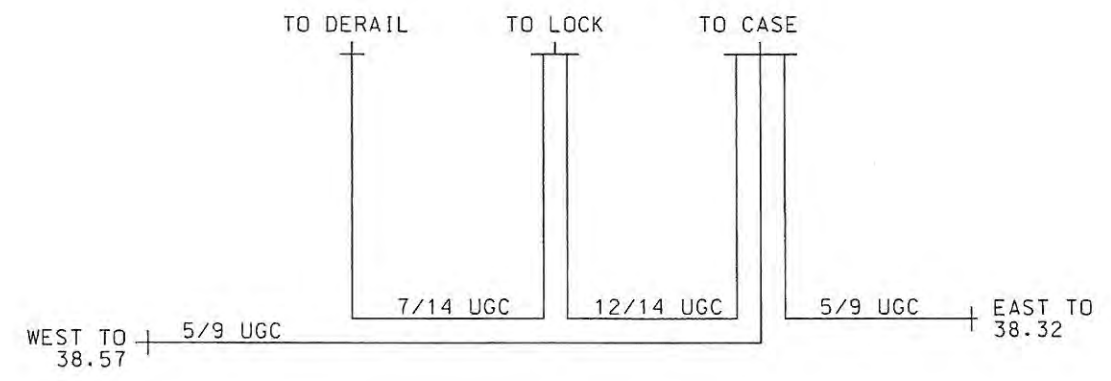


38.57

38.32

~REVISIONS~

28	10/24/00	OK	WJK
18	10/16/08	OK	JCB



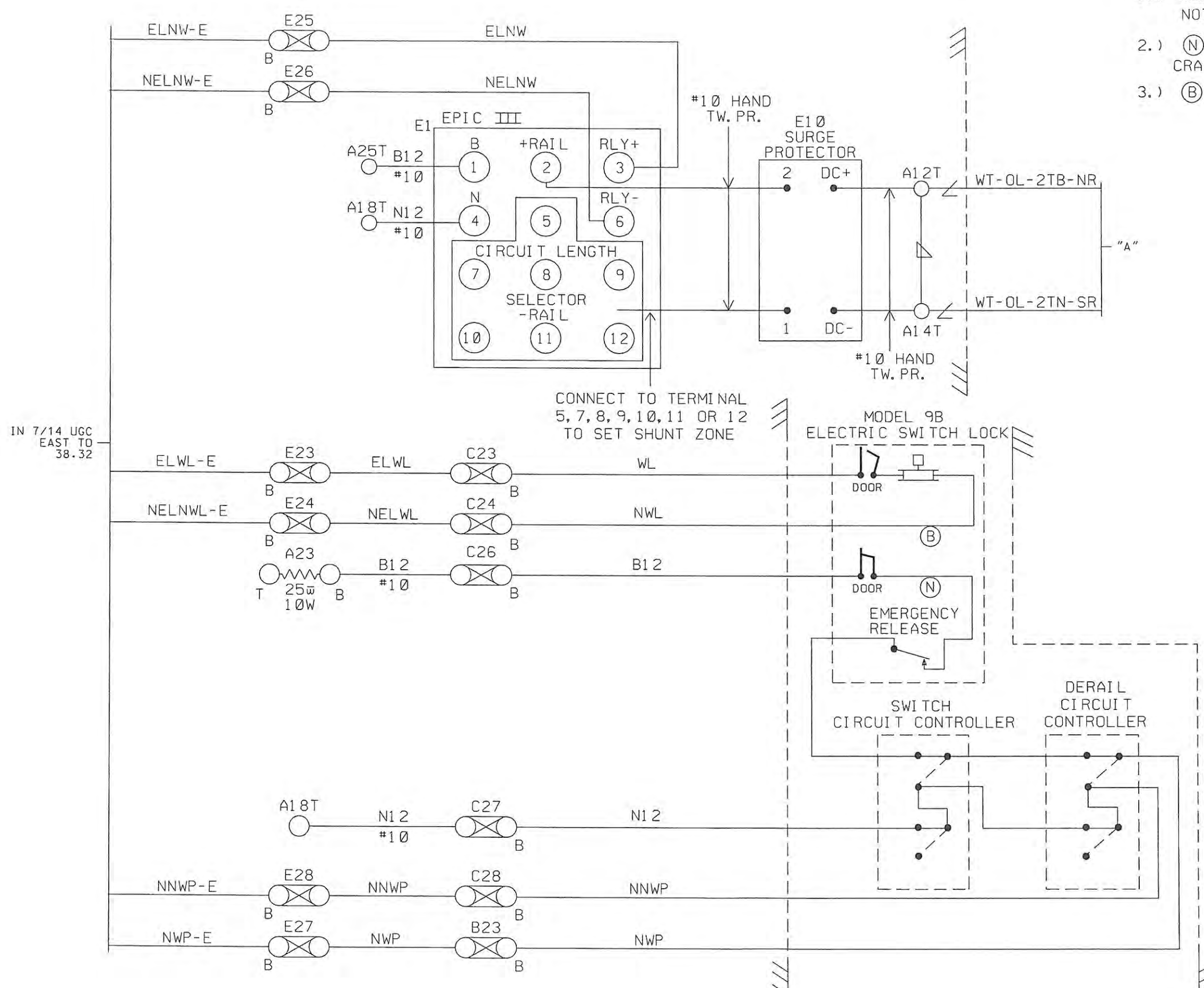
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ELECTRIC LOCK LOCATION
INDEX, TRACK & CABLE PLAN

REFERENCE: 38.54 SH.1 TRHU SH.3	DATE: 07/06/94		
DESIGNED GRS	DRAWN GRS	CHECKED <i>JCB</i>	APPROVED <i>WJK</i>
DISTRICT MW/W		PRINT NUMBER 38.54 SH.1	

NOTES:

- 1.) ALL WIRES #16 UNLESS OTHERWISE NOTED.
- 2.) (N) = CONTACT IS CLOSED WHEN CRANK IS IN NORMAL POSITION.
- 3.) (B) = CONTACT IS CLOSED WHEN CRANK IS IN THE PRELIMINARY UNLOCK POSITION.



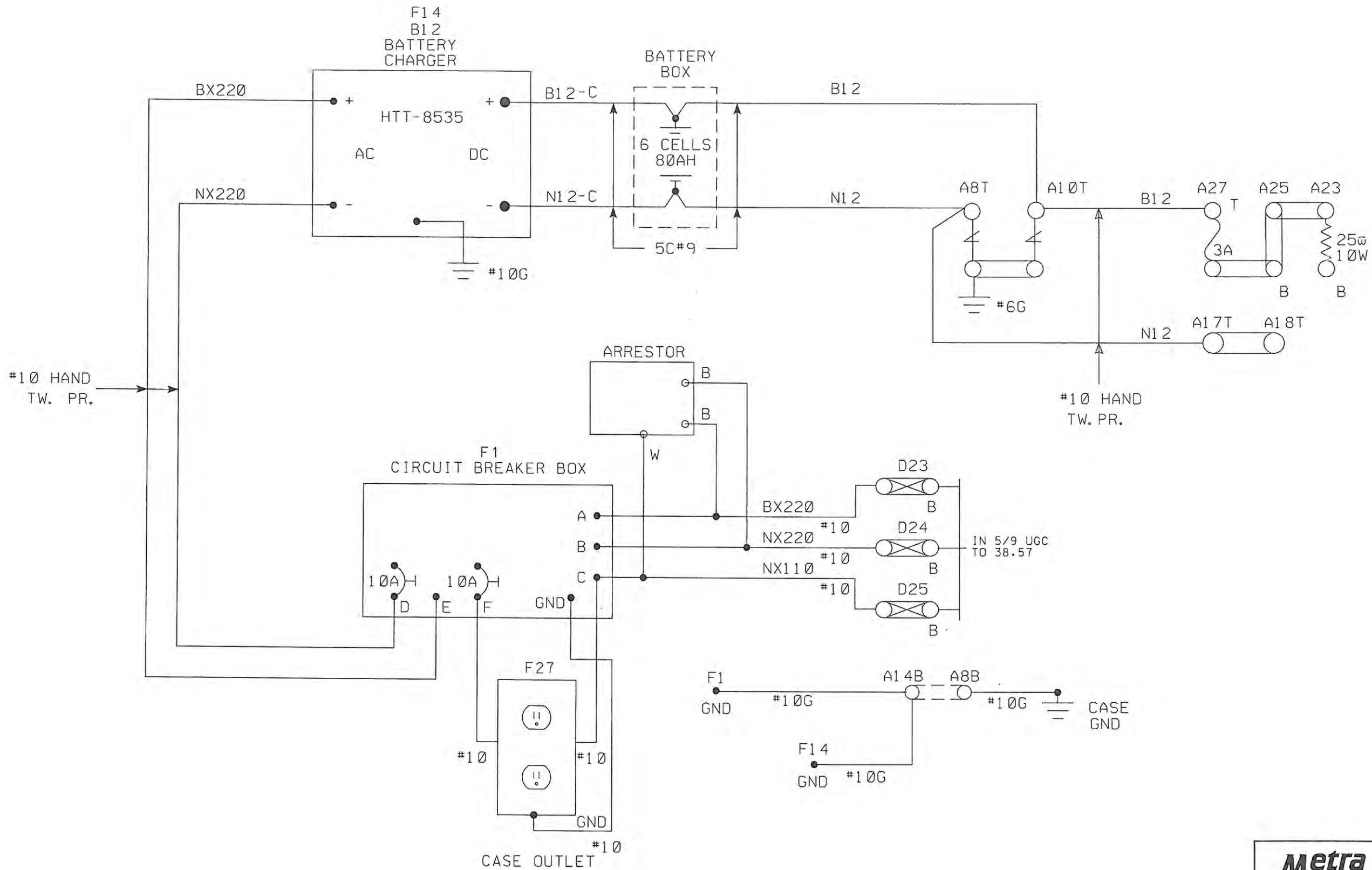
~REVISIONS~

JK	10/24/00	OK	WK
JK	08/27/08	OK	JK
JK	10/16/08	OK	JK

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ELECTRIC LOCK LOCATION
SWITCH LOCK CIRCUIT

REFERENCE: 38.54 SH.1 TRHU SH.3	DATE: 07/06/94		
DESIGNED GRS	DRAWN GRS	CHECKED JK	APPROVED WK
DISTRICT MW/W	PRINT NUMBER 38.54 SH.2		



~REVISIONS~

10/24/00	OK	WK
10/16/08	OK	FB

NOTE:
1.) ALL WIRES #16 UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ELECTRIC LOCK LOCATION SWITCH LOCK CIRCUIT	
REFERENCE: 38.54 SH.1 TRHU SH.3	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED FB	APPROVED WK
DISTRICT MW/W	PRINT NUMBER 38.54 SH.3

2041+19 NBS

2040+33 C.S.

TO ALMORA ←

TO ELGIN EAST →

(← 2567' GCP-MF 211 HZ)

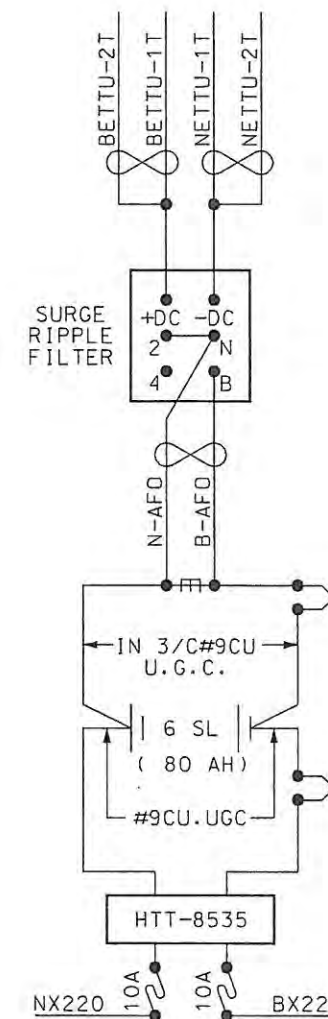
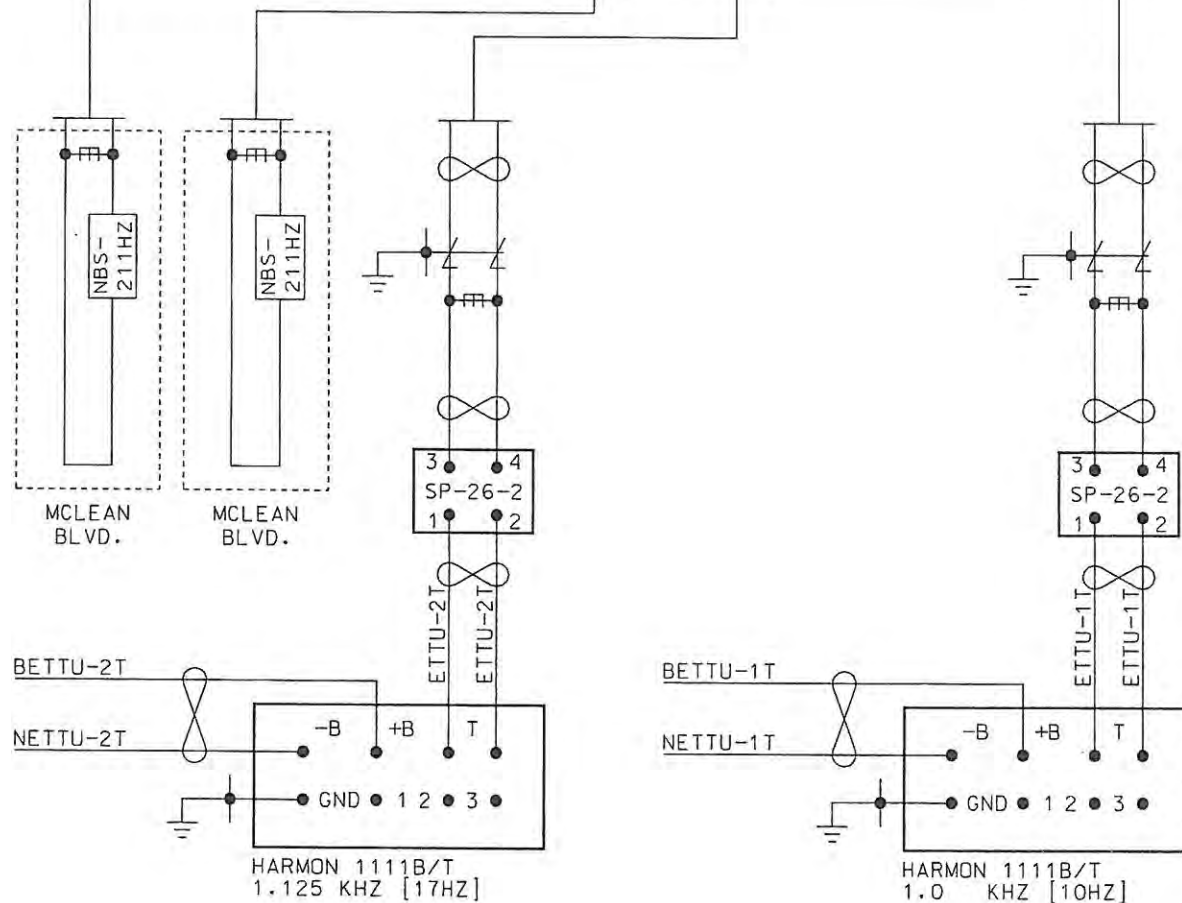
(2653' M-AFO 1.0 KHZ [10 HZ] →)

1T 7125'

(← 2567' GCP-MF 211 HZ)

(2653' M-AFO 1.125 KHZ [17 HZ] →)

2T 7125'



39.14

38.54

NOTES:

INDICATES LEADS TWISTED IN PAIRS

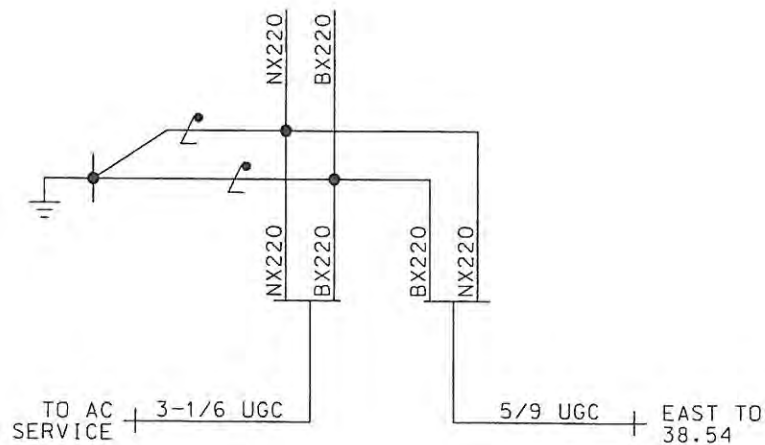
INDICATES CASE GND.

INDICATES RACO 701-2 POWER LINE PROTECTOR

INDICATES RACO 700-5 EQUALIZER

(← 2567' GCP-MF 211 HZ)
(← 2653' AFO-IF 1.0 KHZ [10 HZ])

↑ FREQUENCY
↑ LENGTH OF CIRCUIT
↑ DIRECTION TO TRANSMITTER



~REVISIONS~

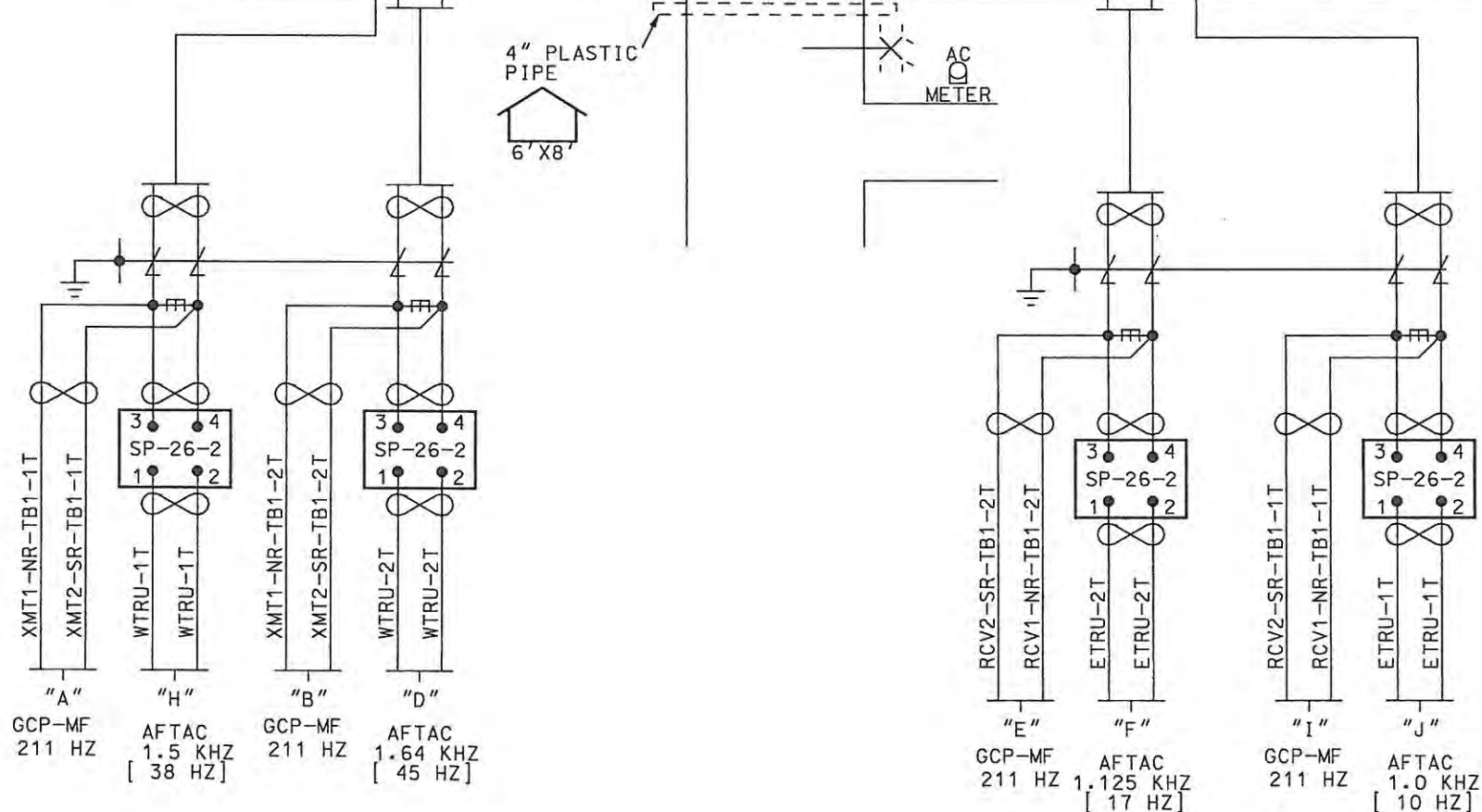
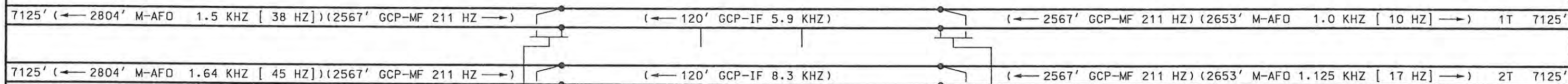
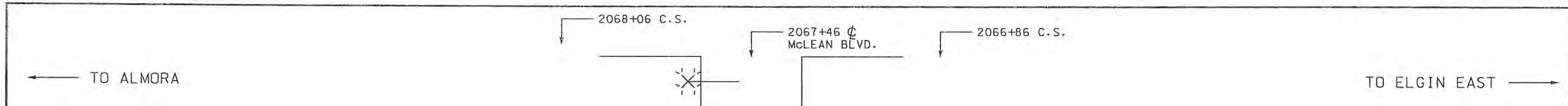
10/16/08 OK

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
2040+33 C.S.
PLAN VIEW AND TRANSMITTERS

REFERENCE:			DATE: 07/23/02
DESIGNED SSC	DRAWN SSC	CHECKED <i>OK</i>	APPROVED <i>OK</i>
DISTRICT MW/W		PRINT NUMBER 38.57	

9/26/11 2040+33-1 38.54

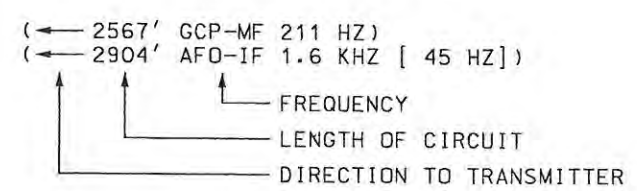


39.38

38.57

NOTES:

- INDICATES LEADS TWISTED IN PAIRS.
- PRIME GROUND
- INDICATES RACD 700-5 EQUALIZER
- INDICATES AUTOMATIC GATE PER FHWA MUTCD WITH SIDELIGHTS ON BOTH SIGNAL AND PEDESTRIAN BELL ON SOUTH SIGNAL.
- INDICATES LEADS TO BE WELDED ON RAIL AS CLOSE TOGETHER AS POSSIBLE.



EW & WW APPROACH - 1T & 2T AT 50 MPH	
MIN. WARNING TIME	= 25 SEC *
REACTION TIME	= 5 SEC
RESPONSE TIME	= 5 SEC
APPROACH LENGTH	= 2567 FT.
* IDOT SIMULTANEOUS PREEMPT = 25 SEC	

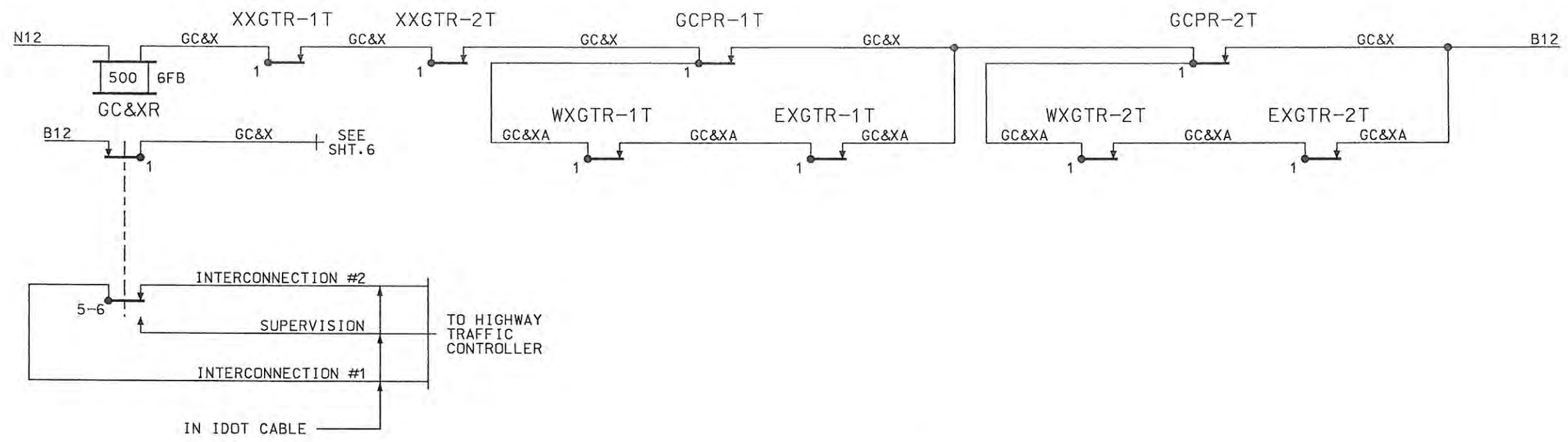
~REVISIONS~

DOT# 372-246Y

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
PLAN VIEW

REFERENCE:	39.14 SH.1 THRU 11	DATE:	07/23/02
DESIGNED	SSC	CHECKED	WJ
DRAWN	SSC	APPROVED	WK
DISTRICT	MW/W	PRINT NUMBER	39.14 SH.1

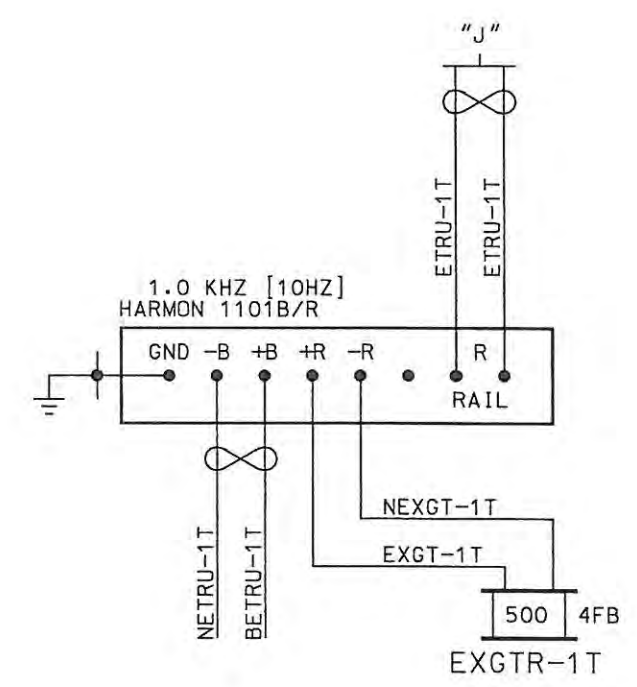
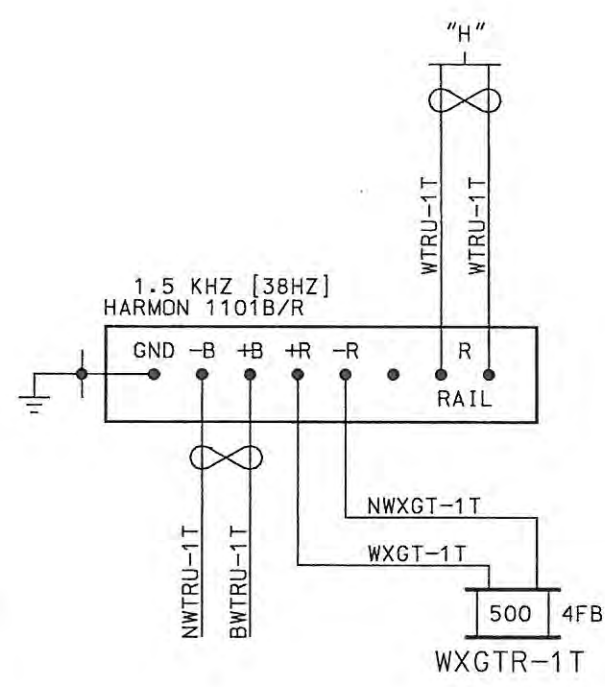
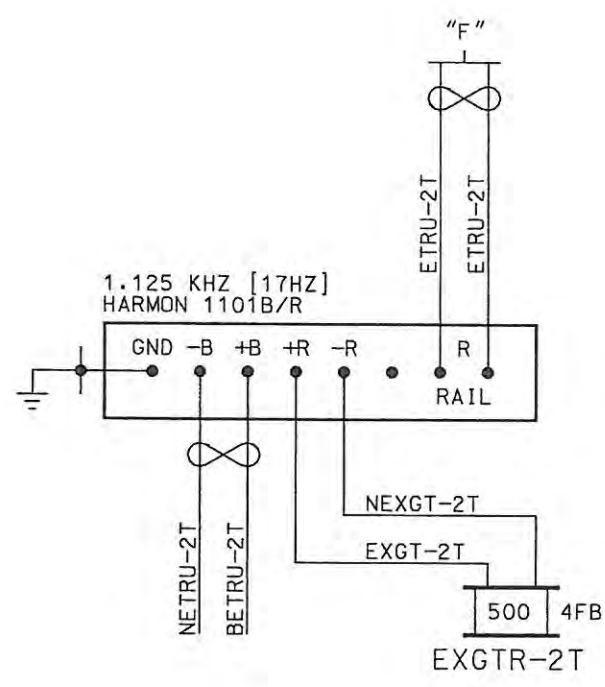
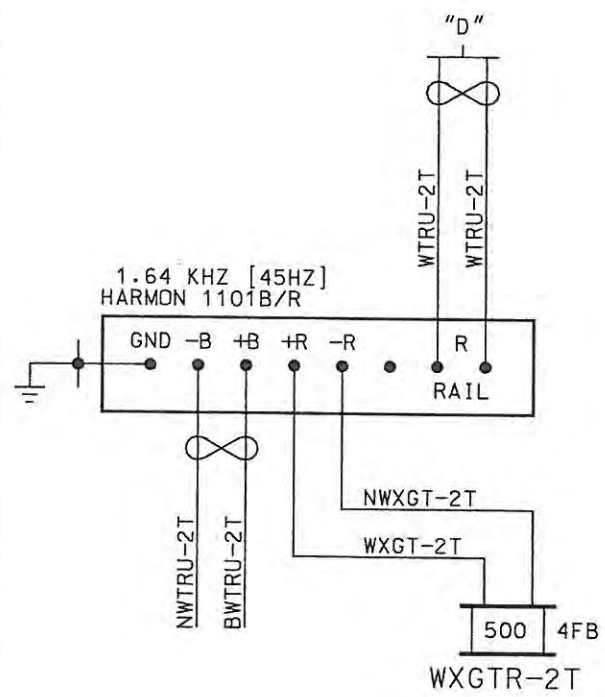


~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
GC&X AND MCO CIRCUITS

REFERENCE: 39.14 SH.1 THRU 11			DATE: 07/23/02
DESIGNED SSC	DRAWN SSC	CHECKED <i>TS</i>	APPROVED <i>UK</i>
DISTRICT MW/W		PRINT NUMBER 39.14 SH.2	



~REVISIONS~

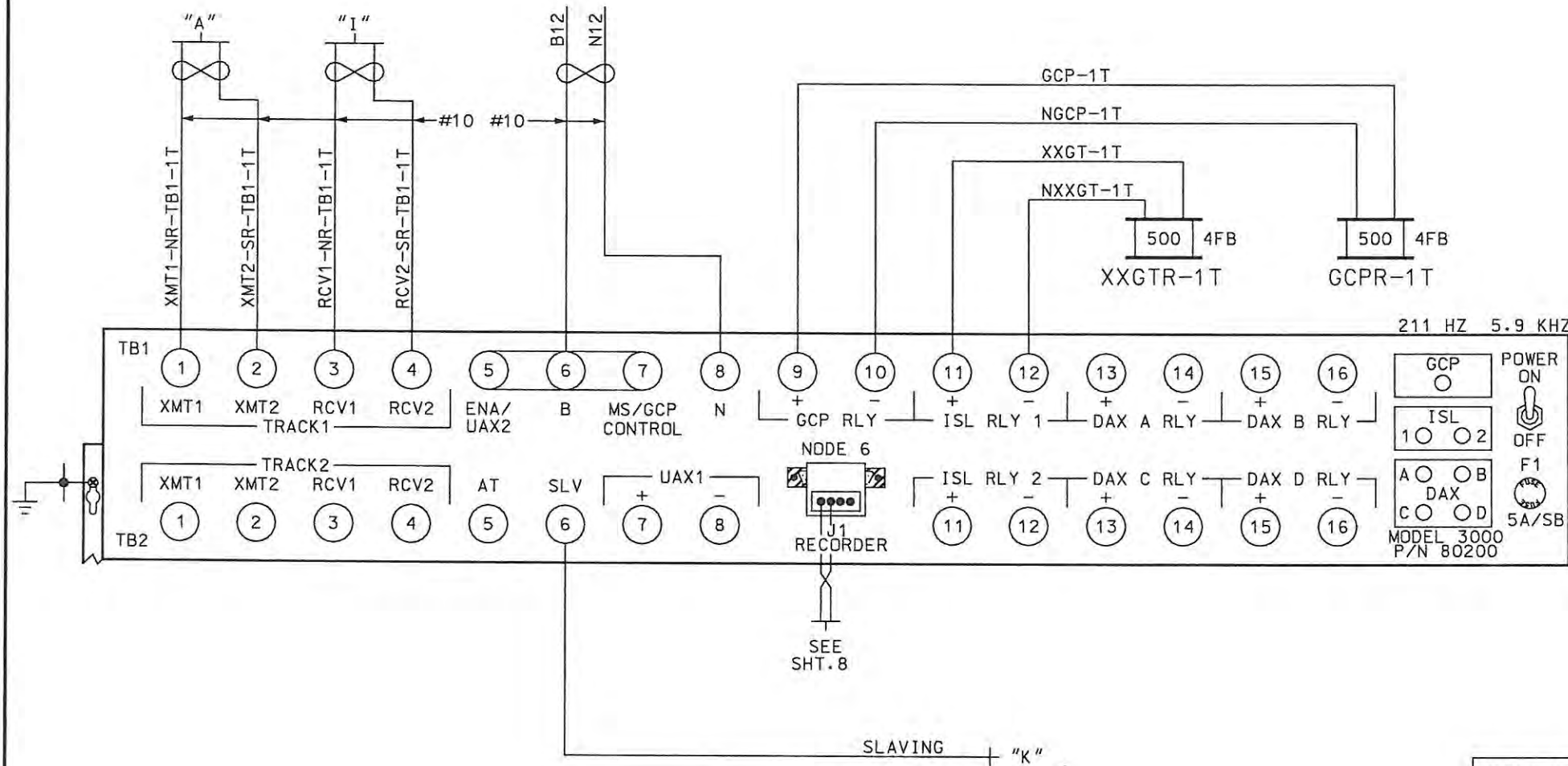
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
AFTAC RECEIVERS

REFERENCE: 39.14 SH.1 THRU 11			DATE: 07/23/02
DESIGNED: SSC	DRAWN: SSC	CHECKED: <i>SSC</i>	APPROVED: <i>WPK</i>
DISTRICT: MW/W		PRINT NUMBER: 39.14 SH.3	

GCP1T
GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

NUMBER OF TRACKS	1	
FREQUENCY	T1: 211 HZ	T2: N/A
UNIDIRECTIONAL/BIDIRECTIONAL	T1: BI	T2: N/A
XMIT LEVEL - MED/HI	T1: HI	T2: N/A
PREDICTOR/MOTION SENSOR	T1: GCP	T2: N/A
WARNING TIME SELECTED	T1: 35 SEC	T2: N/A
APPROACH DISTANCE	T1: 2561 FT	T2: N/A
UAX PICKUP DELAY (UAX1)	0 SEC.	
ENA/UAX2 DELAY	N/A SEC.	
ISLAND DISTANCE	T1: 120 FT	T2: N/A
NUMBER OF DAX'S	0	
DAX A TRK/DIST/WARNING TIME	N/A	N/A FT N/A SEC.
DAX B TRK/DIST/WARNING TIME	N/A	N/A FT N/A SEC.
DAX C TRK/DIST/WARNING TIME	N/A	N/A FT N/A SEC.
DAX D TRK/DIST/WARNING TIME	N/A	N/A FT N/A SEC.
SLAVING MASTER/SLAVE	MASTER	
PASSWORD DISABLED/ENABLED	DISABLED	
RECORDER INSTALLED/NOT INSTALLED	INSTALLED	
SWITCH TO MS	T1: 60 EZ	T2: N/A EZ
TRANSFER DELAY MS TO GCP	T1: 30 SEC. T2:N/A SEC.	
PRIME PREDICTION OFFSET	T1: 0 FT T2: N/A FT	
PICKUP DELAY PRIME	15 SEC.	
PICKUP DELAY DAX A	N/A SEC.	
PICKUP DELAY DAX B	N/A SEC.	
PICKUP DELAY DAX C	N/A SEC.	
PICKUP DELAY DAX D	N/A SEC.	
ENHANCED DETECT MODE	ON	
BACK TO BACK	NO	
STATION STOP TIMER	10 SEC.	
T1 # OF TRACK WIRES 4/6	4	
T2 # OF TRACK WIRES 4/6	N/A	
LOW EX ADJUSTMENT	0	
LOW EZ DETECTION	T1: OFF	T2: OFF
LOW EZ DETECTION TIMER	T1:N/A MIN. T2:N/A MIN.	
POSITIVE START (0 = OFF)	T1: OFF EZ T2: OFF EZ	
POSITIVE START TIMEOUT (0 = NONE)	T1:N/A MIN. T2:N/A MIN.	
SET AT OPERATION	NORMAL	
DIAGNOSTIC MESSAGES	ON	
DAX MESSAGES	OFF	
ADVANCE PREEMPT TIMER	OFF SEC.	
MOTION SENSING LEVEL	T1: 50 %	T2:N/A %



MODEL 3000 GCP MODULE ASSEMBLIES

80211 ISLAND 1	80212 TRANSCIVER 1	80213 RELAY DRIVE	80214 PROCESSOR	80255 REC. INTR.	80016(1) DAX (NOT USED)	80016(2) DAX (NOT USED)	80020/80019 INTERFACE
80211 (NOT USED)	80012 (NOT USED)	80013 (NOT USED)	80214 (NOT USED)	80255 (NOT USED)	80016(1) (NOT USED)	80016(2) (NOT USED)	80020/80019 (NOT USED)

~REVISIONS~

07/23/02 OK WK

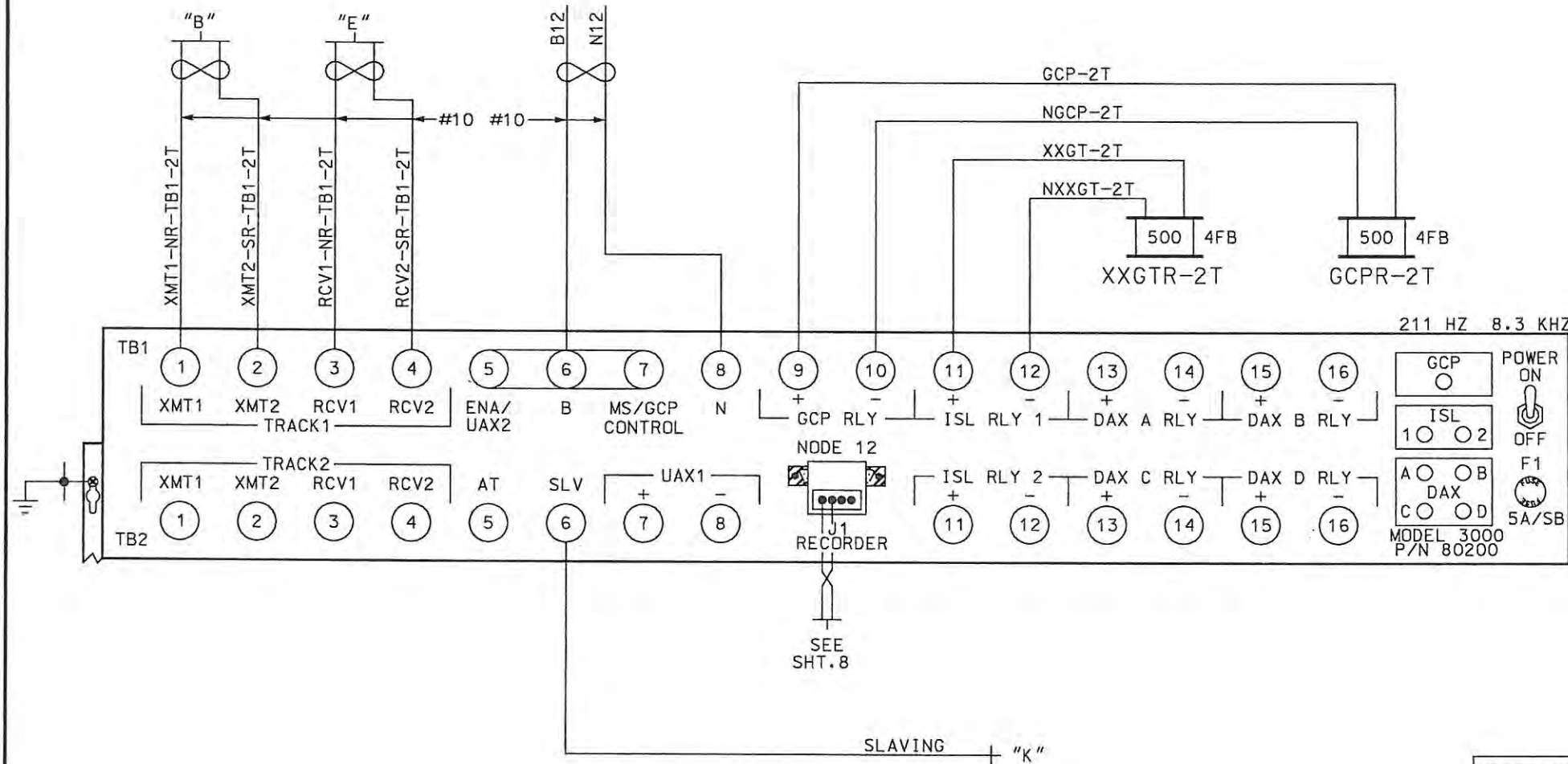
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
GCP-1T

REFERENCE:	39.14 SH.1 THRU 11			DATE:	03/03/00
DESIGNED	DRAWN	CHECKED	APPROVED		
SSC	SSC	WK	WK		
DISTRICT	PRINT NUMBER				
MW/W	39.14 SH.4				

GCP2T
GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

NUMBER OF TRACKS	1	
FREQUENCY	T1: 211 HZ	T2: N/A
UNIDIRECTIONAL/BIDIRECTIONAL	T1: BI	T2: N/A
XMIT LEVEL - MED/HI	T1: HI	T2: N/A
PREDICTOR/MOTION SENSOR	T1: GCP	T2: N/A
WARNING TIME SELECTED	T1: 35 SEC	T2: N/A
APPROACH DISTANCE	T1: 2567 FT	T2: N/A
UAX PICKUP DELAY (UAX1)	0 SEC.	
ENA/UAX2 DELAY	N/A SEC.	
ISLAND DISTANCE	T1: 120 FT	T2: N/A
NUMBER OF DAX'S	0	
DAX A TRK/DIST/WARNING TIME	N/A	N/A FT N/A SEC.
DAX B TRK/DIST/WARNING TIME	N/A	N/A FT N/A SEC.
DAX C TRK/DIST/WARNING TIME	N/A	N/A FT N/A SEC.
DAX D TRK/DIST/WARNING TIME	N/A	N/A FT N/A SEC.
SLAVING MASTER/SLAVE	SLAVE	
PASSWORD DISABLED/ENABLED	DISABLED	
RECORDER INSTALLED/NOT INSTALLED	INSTALLED	
SWITCH TO MS	T1: 60 EZ	T2: N/A EZ
TRANSFER DELAY MS TO GCP	T1: 30 SEC.	T2: N/A SEC.
PRIME PREDICTION OFFSET	T1: 0 FT	T2: N/A FT
PICKUP DELAY PRIME	15 SEC.	
PICKUP DELAY DAX A	N/A SEC.	
PICKUP DELAY DAX B	N/A SEC.	
PICKUP DELAY DAX C	N/A SEC.	
PICKUP DELAY DAX D	N/A SEC.	
ENHANCED DETECT MODE	ON	
BACK TO BACK	NO	
STATION STOP TIMER	10 SEC.	
T1 # OF TRACK WIRES 4/6	4	
T2 # OF TRACK WIRES 4/6	N/A	
LOW EX ADJUSTMENT	0	
LOW EZ DETECTION	T1: OFF	T2: OFF
LOW EZ DETECTION TIMER	T1: N/A MIN.	T2: N/A MIN.
POSITIVE START (0 = OFF)	T1: OFF EZ	T2: OFF EZ
POSITIVE START TIMEOUT (0 = NONE)	T1: N/A MIN.	T2: N/A MIN.
SET AT OPERATION	NORMAL	
DIAGNOSTIC MESSAGES	ON	
DAX MESSAGES	OFF	
ADVANCE PREEMPT TIMER	OFF SEC.	
MOTION SENSING LEVEL	T1: 50 %	T2: N/A %



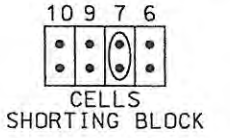
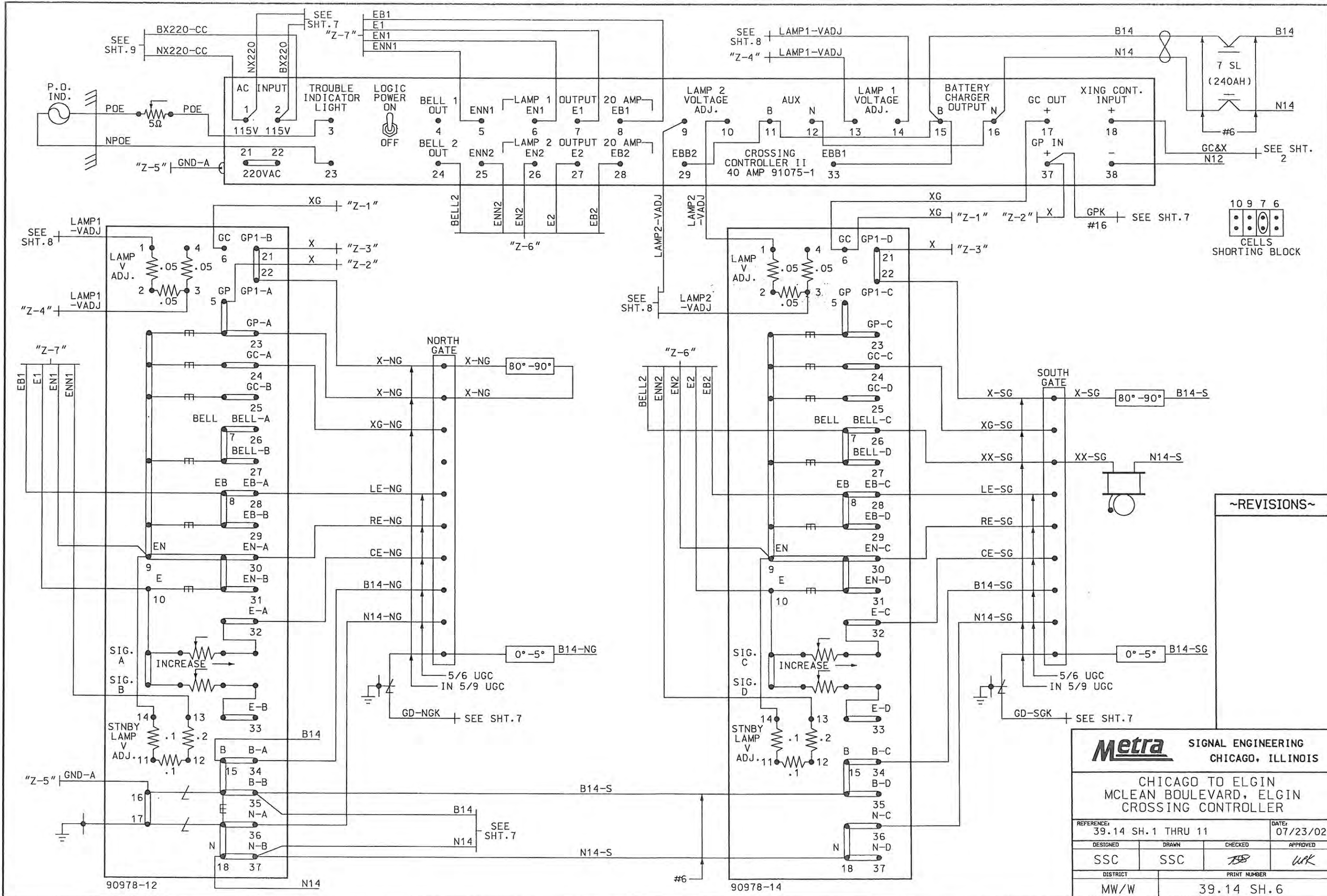
~REVISIONS~
07/23/02 OK WK

80211 ISLAND 1
80211 (NOT USED)
80012 TRANSCIEIVER 1
80012 (NOT USED)
80013 RELAY DRIVE
80214 PROCESSOR
80255 REC. INTR.
80016(1)DAX(NOT USED)
80016(2)DAX(NOT USED)
80020/80019 INTERFACE

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
GCP-2T

REFERENCE: 39.14 SH.1 THRU 11	DATE: 03/03/00		
DESIGNED: SSC	DRAWN: SSC	CHECKED: <i>SSC</i>	APPROVED: <i>WK</i>
DISTRICT: MW/W	PRINT NUMBER: 39.14 SH.5		

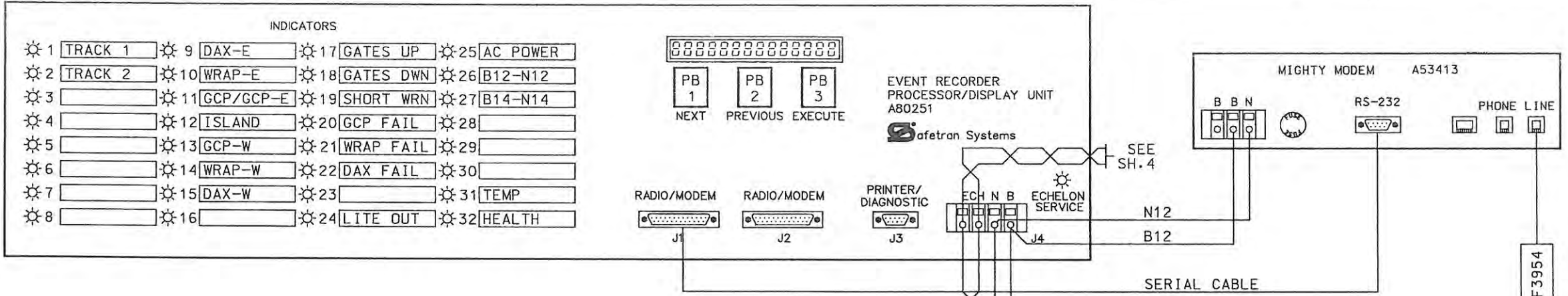


~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
CROSSING CONTROLLER

REFERENCE: 39.14 SH.1 THRU 11	DATE: 07/23/02
DESIGNED SSC	DRAWN SSC
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
DISTRICT MW/W	PRINT NUMBER 39.14 SH.6



SEA/R PROGRAMMING CHART
CUSTOM FUNCTIONS

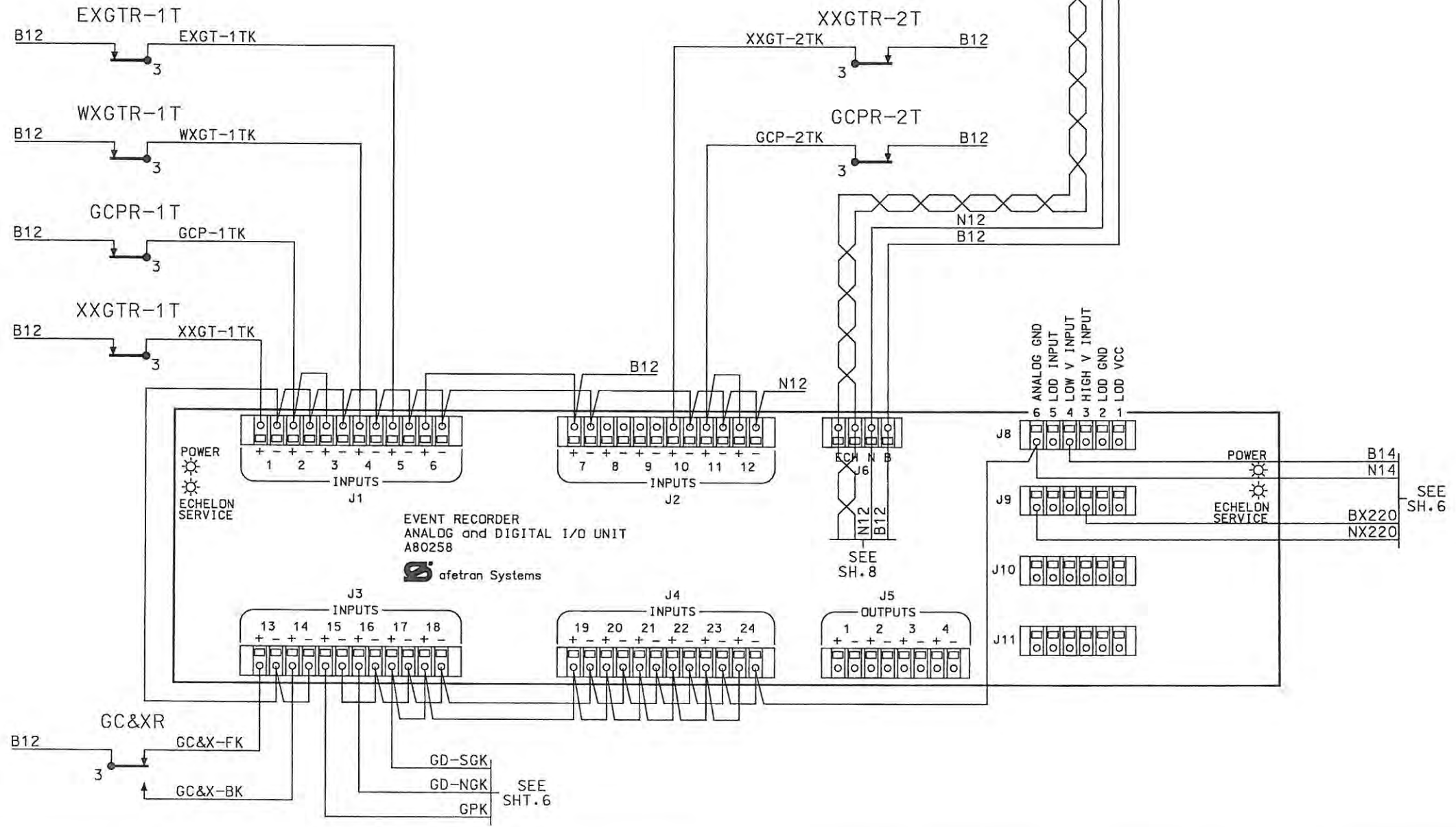
FUNCTION	ON/OFF
1 TRACK.ENA	ON
2 TRACK.ENA	ON
3 TRACK.ENA	OFF
4 TRACK.ENA	OFF
5 TRACK.ENA	OFF
6 TRACK.ENA	OFF
GATEALM.ENA	ON
WRNTIME.ENA	ON
GCPFAIL.ENA	ON
HOLDDWN.ENA	OFF
LOD1.ENA	ON
LOD2.ENA	ON
LOD3.ENA	OFF
LOD4.ENA	OFF
ACPOWER.ENA	ON
B12/N12.ENA	ON
B14/N14.ENA	ON
B/N.ENA	OFF
MASTER	N/A
SLAVE	N/A

CUSTOM TIMERS

NAME	TIME
GATENOT.DN TMR	20 SEC.
WRN-1T.TIMER	25 SEC.
WRN-2T.TIMER	25 SEC.
WRN-3T.TIMER	0 SEC.
WRN-4T.TIMER	0 SEC.
WRN-5T.TIMER	0 SEC.
WRN-6T.TIMER	0 SEC.

NODE ASSIGNMENT

NODE 4	DIGITAL BOARD #1
NODE 5	ANALOG BOARD #1
NODE 6	GCP TRK #1
NODE 7	(NOT USED)
NODE 9	DIGITAL BOARD #2
NODE 10	ANALOG BOARD #2
NODE 12	GCP TRK #2
NODE 13	(NOT USED)



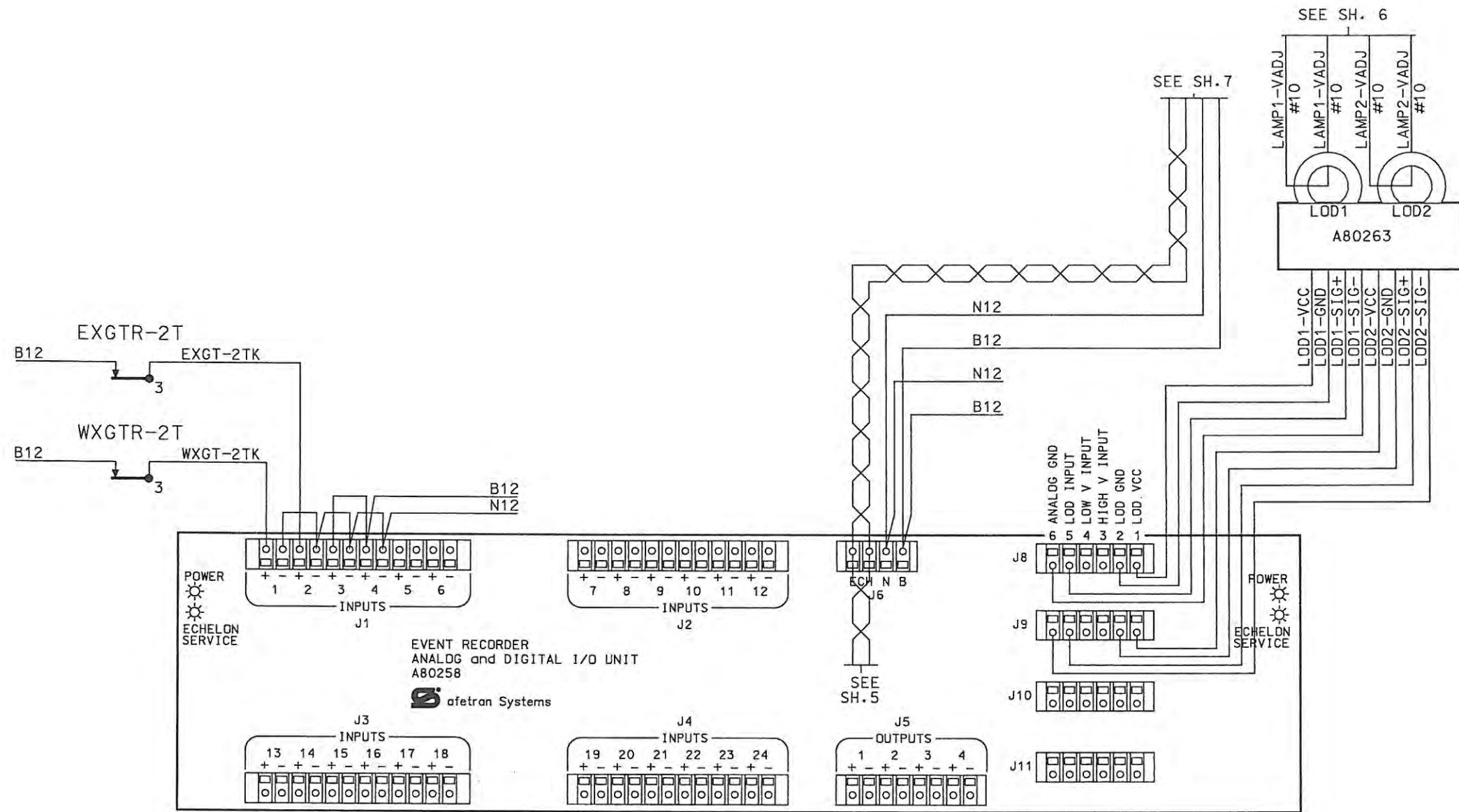
ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
DATA RECORDER

REFERENCE: 39.14 SH.1 THRU 11	DATE: 07/23/02
DESIGNED: SSC	DRAWN: SSC
CHECKED: <i>SSC</i>	APPROVED: <i>UK</i>
DISTRICT: MW/W	PRINT NUMBER: 39.14 SH.7

~REVISIONS~



SEE SH. 6

SEE SH. 7

SEE SH. 5

POWER
ECHOLON SERVICE

POWER
ECHOLON SERVICE

EVENT RECORDER
ANALOG and DIGITAL I/O UNIT
A80258
Safetran Systems

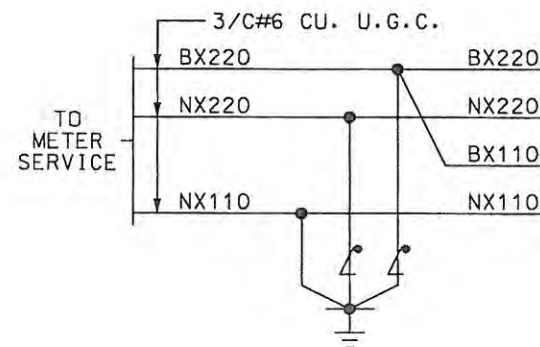
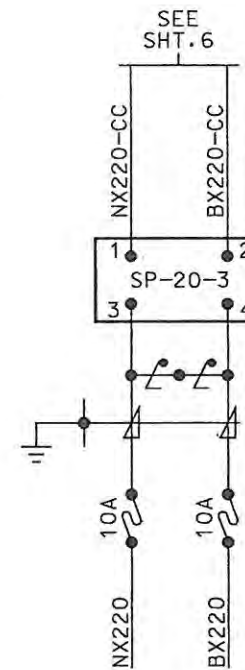
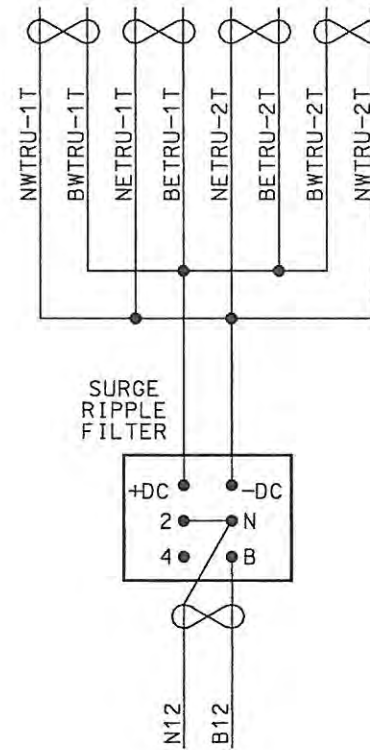
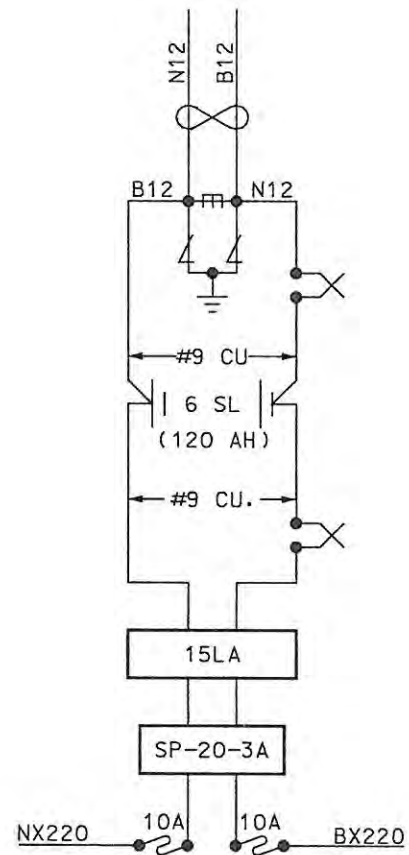
~REVISIONS~

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
DATA RECORDER

REFERENCE: 39.14 SH.1 THRU 11	DATE: 07/23/02
DESIGNED SSC	DRAWN SSC
CHECKED <i>SS</i>	APPROVED <i>WK</i>
DISTRICT MW/W	PRINT NUMBER 39.14 SH.8



NOTES:



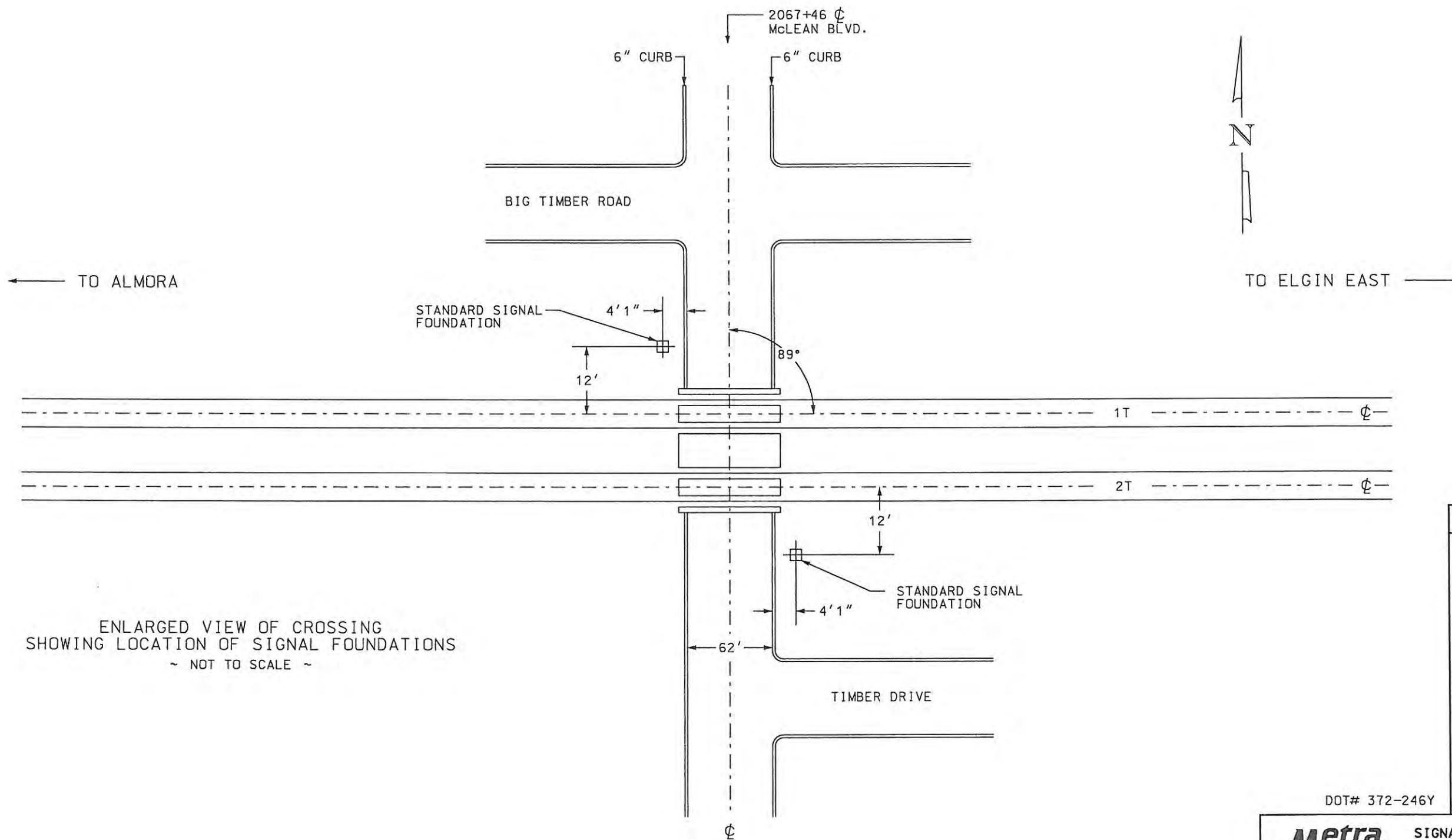
INDICATES RACO 701-2
POWER LINE PROTECTOR

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
POWER DISTRIBUTION

REFERENCE: 39.14 SH.1 THRU 11			DATE: 07/23/02
DESIGNED SSC	DRAWN SSC	CHECKED <i>SSC</i>	APPROVED <i>WPK</i>
DISTRICT MW/W		PRINT NUMBER 39.14 SH.9	



ENLARGED VIEW OF CROSSING
SHOWING LOCATION OF SIGNAL FOUNDATIONS
~ NOT TO SCALE ~

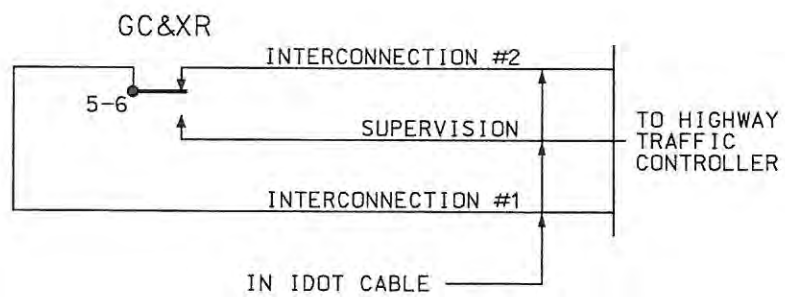
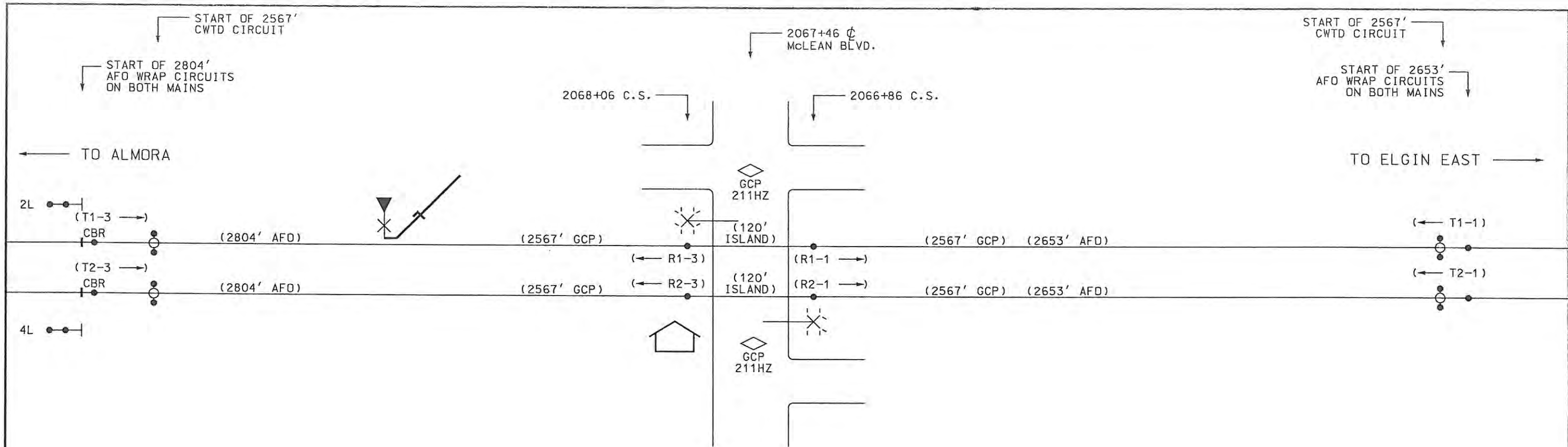
~REVISIONS~

DOT# 372-246Y

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
ENLARGED VIEW

REFERENCE: 39.14 SH.1 THRU 11			DATE: 07/23/02
DESIGNED SSC	DRAWN SSC	CHECKED <i>TS</i>	APPROVED <i>UPK</i>
DISTRICT MW/W		PRINT NUMBER 39.14 SH.10	



NOTES:

- NARROW BAND SHUNT
- BIDIRECTIONAL APPLICATION
- SINGLE DIRECTION APPLICATION
- GCP SAFETLAN GCP
- *** HZ OPERATION FREQUENCY
- CWT D CONSTANT WARNING TIME DEVICE
- AFD AUDIO FREQUENCY OVERLAY
- (T) AFTAC TRANSMITTER
- (R) AFTAC RECEIVER

EW & WW APPROACH - 1T & 2T AT 50 MPH	
MIN. WARNING TIME	= 25 SEC *
REACTION TIME	= 5 SEC
RESPONSE TIME	= 5 SEC
APPROACH LENGTH	= 2567 FT.
* IDOT SIMULTANEOUS PREEMPT = 25 SEC	

~REVISIONS~

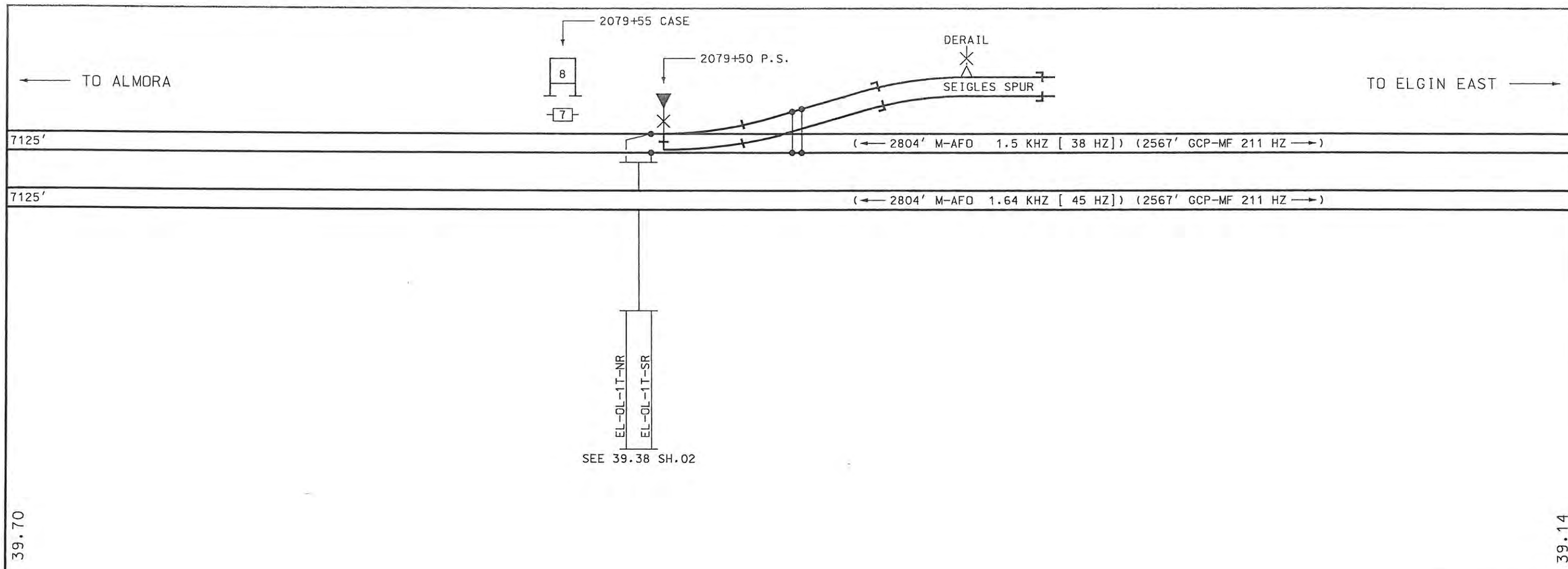
07/23/02 OK WK

DOT# 372-246Y

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

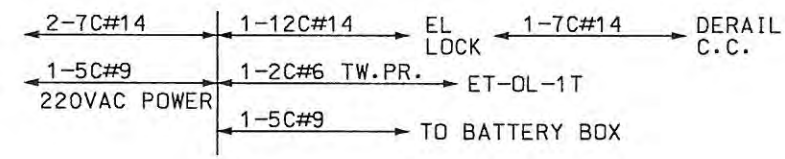
CHICAGO TO ELGIN
MCLEAN BOULEVARD, ELGIN
EXHIBIT

REFERENCE:	39.14 SH.1 THRU 11	DATE:	03/03/00
DESIGNED	DRAWN	CHECKED	APPROVED
SSC	SSC	TSB	WK
DISTRICT	PRINT NUMBER		
MW/W	39.14 SH.11		



39.70

39.14



~REVISIONS~

SHEET	LOCATION	DESCRIPTION
1	SEIGLES SPUR	INDEX, TRACK AND CABLE PLAN
2	SEIGLES SPUR	SWITCH LOCK CIRCUIT
3	SEIGLES SPUR	POWER DISTRIBUTION
4	SEIGLES SPUR	ARRANGEMENT PLAN

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ELECTRIC LOCK SEIGLES SPUR
INDEX, TRACK AND CABLE PLAN

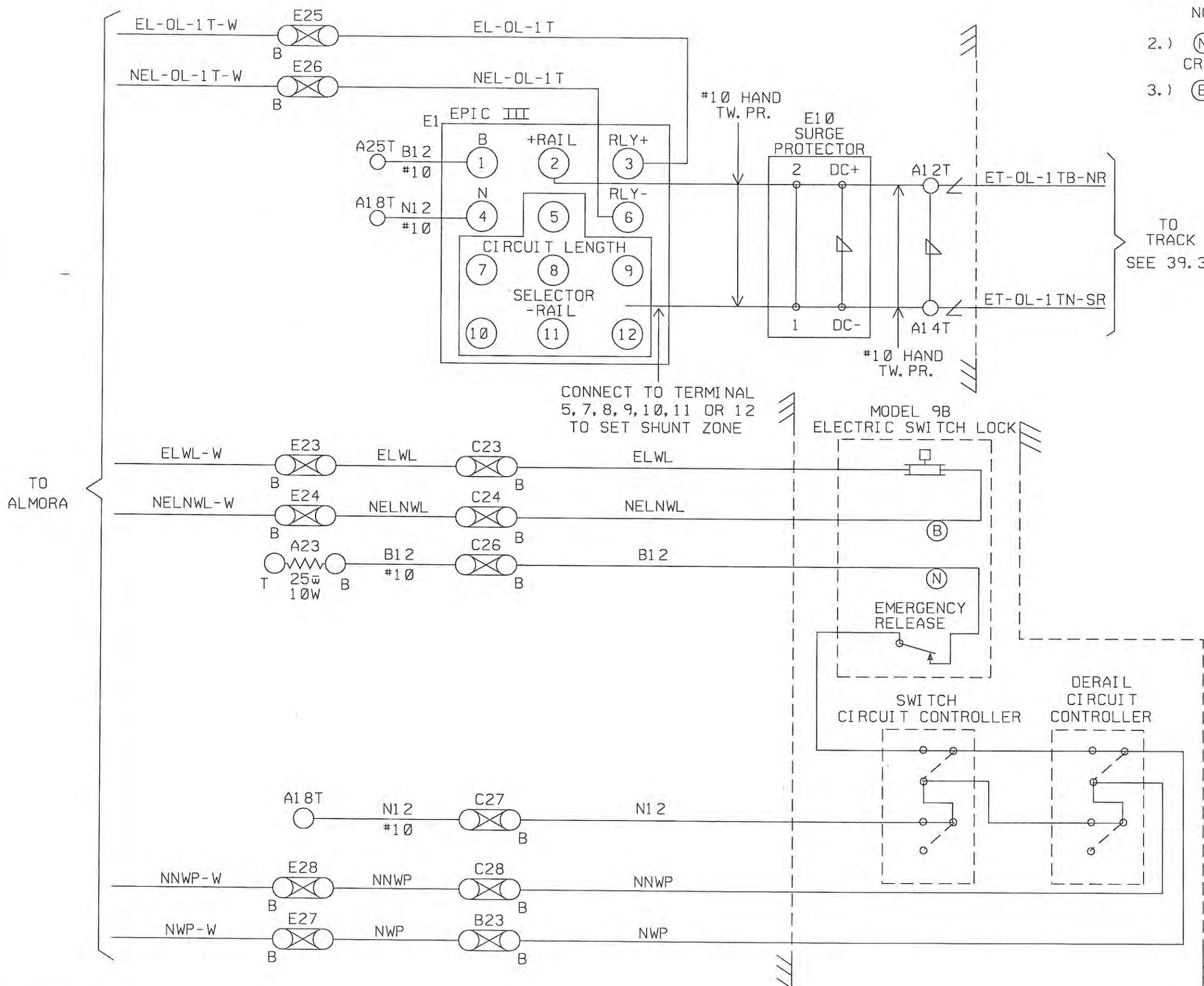
REFERENCE: 39.38 SH.01 THRU SH.07 DATE: 07/23/02

DESIGNED	DRAWN	CHECKED	APPROVED
SSC	SSC	<i>[Signature]</i>	<i>URK</i>

DISTRICT	PRINT NUMBER
MW/W	39.38 SH. 1

NOTES:

- 1.) ALL WIRES #16 UNLESS OTHERWISE NOTED.
- 2.) (N) = CONTACT IS CLOSED WHEN CRANK IS IN NORMAL POSITION.
- 3.) (B) = CONTACT IS CLOSED WHEN CRANK IS IN PRELIMINARY UNLOCK POSITION

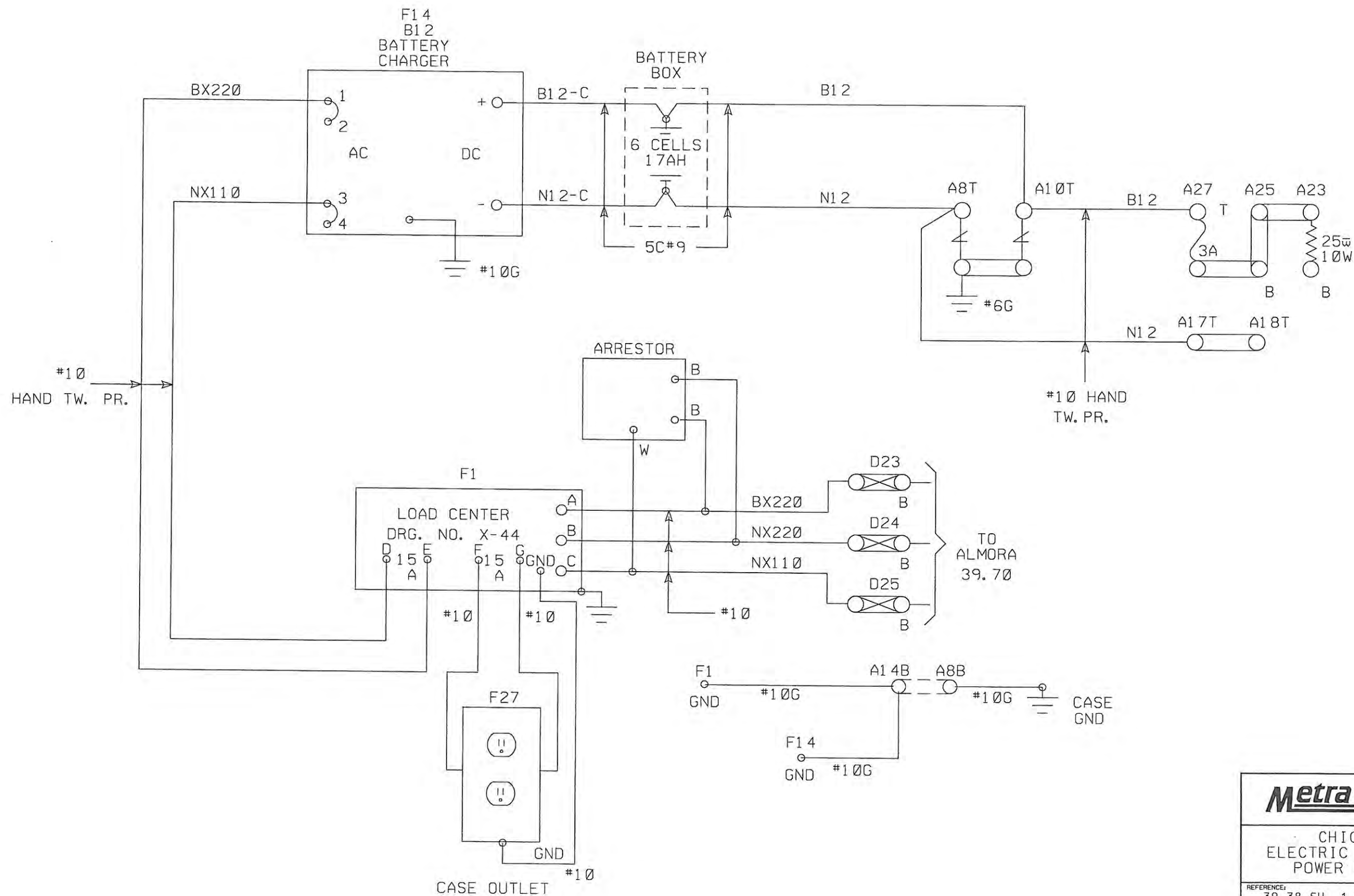


TO TRACK
SEE 39.38 SH. 01

CONNECT TO TERMINAL
5, 7, 8, 9, 10, 11 OR 12
TO SET SHUNT ZONE

~REVISIONS~
BB 01/12/00 *Alu*

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO ELGIN ELECTRIC LOCK SEIGLES SPUR SWITCH LOCK CIRCUIT	
REFERENCE: 39.38 SH. 1 THRU SH. 4	DATE: 07/06/94
DESIGNED GRS	DRAWN GRS
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
DISTRICT MW/W	PRINT NUMBER 39.38 SH.02



~REVISIONS~

08/01/12/00 *File*

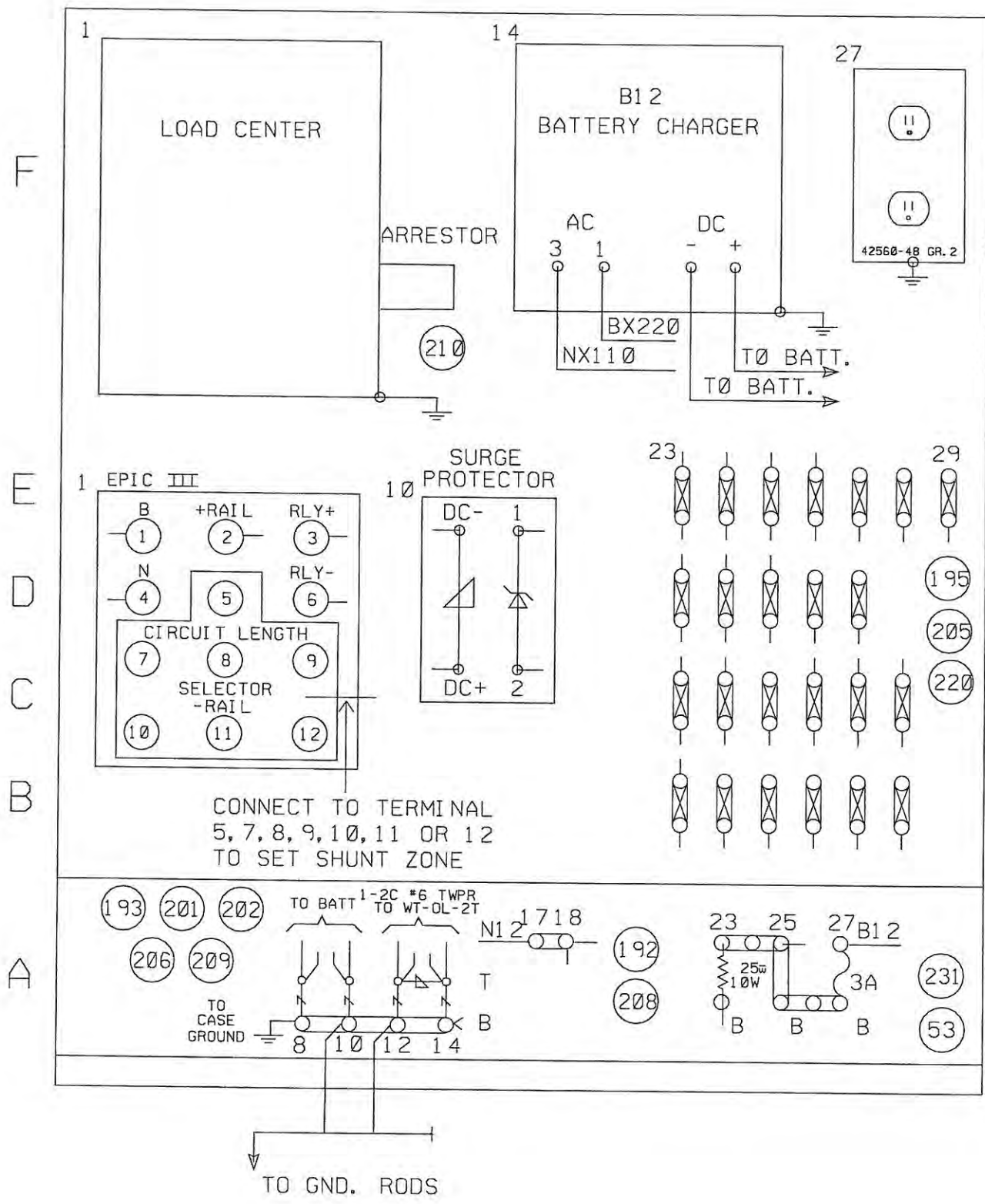
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ELECTRIC LOCK SEIGLES SPUR
POWER DISTRIBUTION

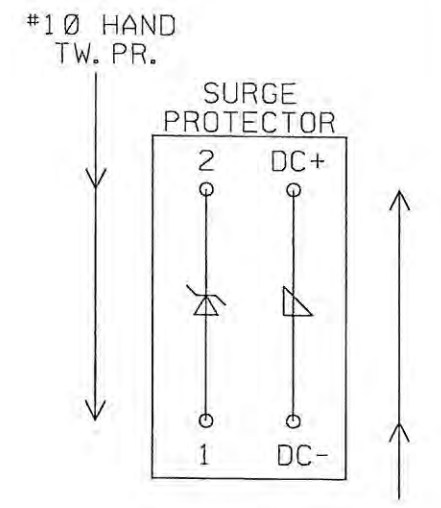
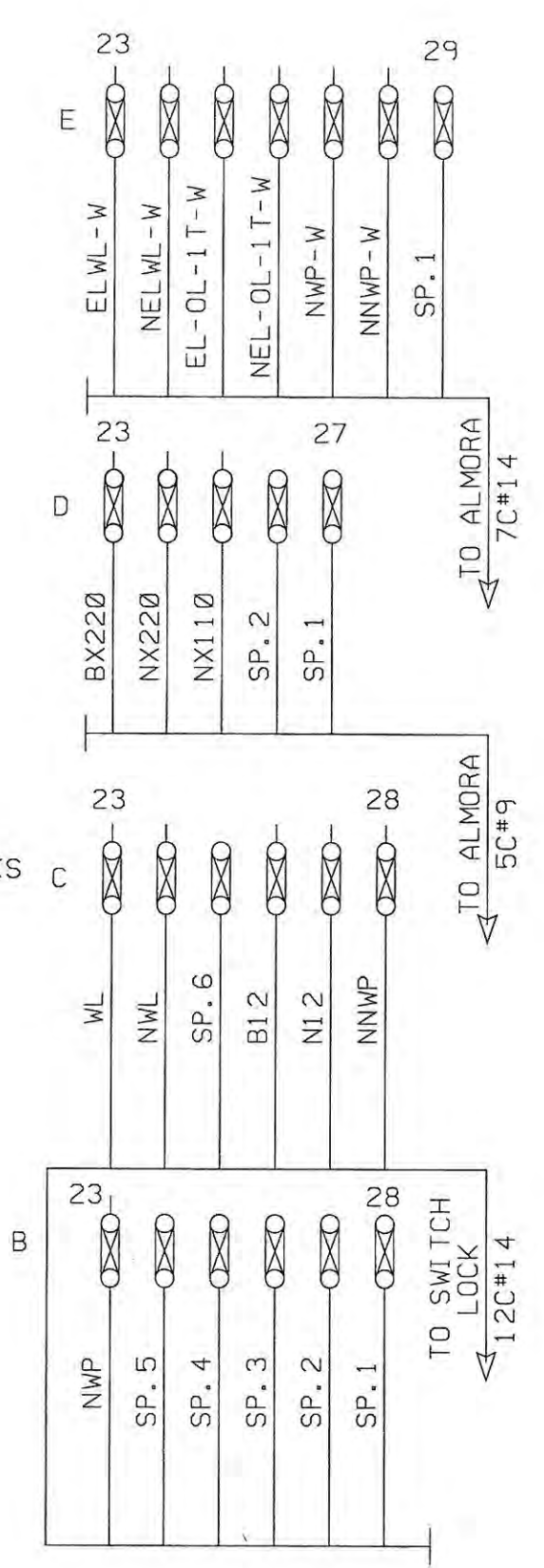
REFERENCE: 39.38 SH. 1 THRU SH. 4 DATE: 07/06/94

DESIGNED	DRAWN	CHECKED	APPROVED
<i>GRS</i>	<i>GRS</i>	<i>JK</i>	<i>WRK</i>

DISTRICT	PRINT NUMBER
MW/W	39.38 SH.03



SEE DETAIL AT RIGHT FOR TESTLINKS



~REVISIONS~

01/12/00	File
----------	------

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO ELGIN
ELECTRIC LOCK SEIGLES SPUR
POWER DISTRIBUTION

REFERENCE: 39.38 SH. 1 THRU SH. 4	DATE: 07/06/94		
DESIGNED	DRAWN	CHECKED	APPROVED
GRS	GRS	JK	WRK
DISTRICT	PRINT NUMBER		
MW/W	39.38 SH.04		

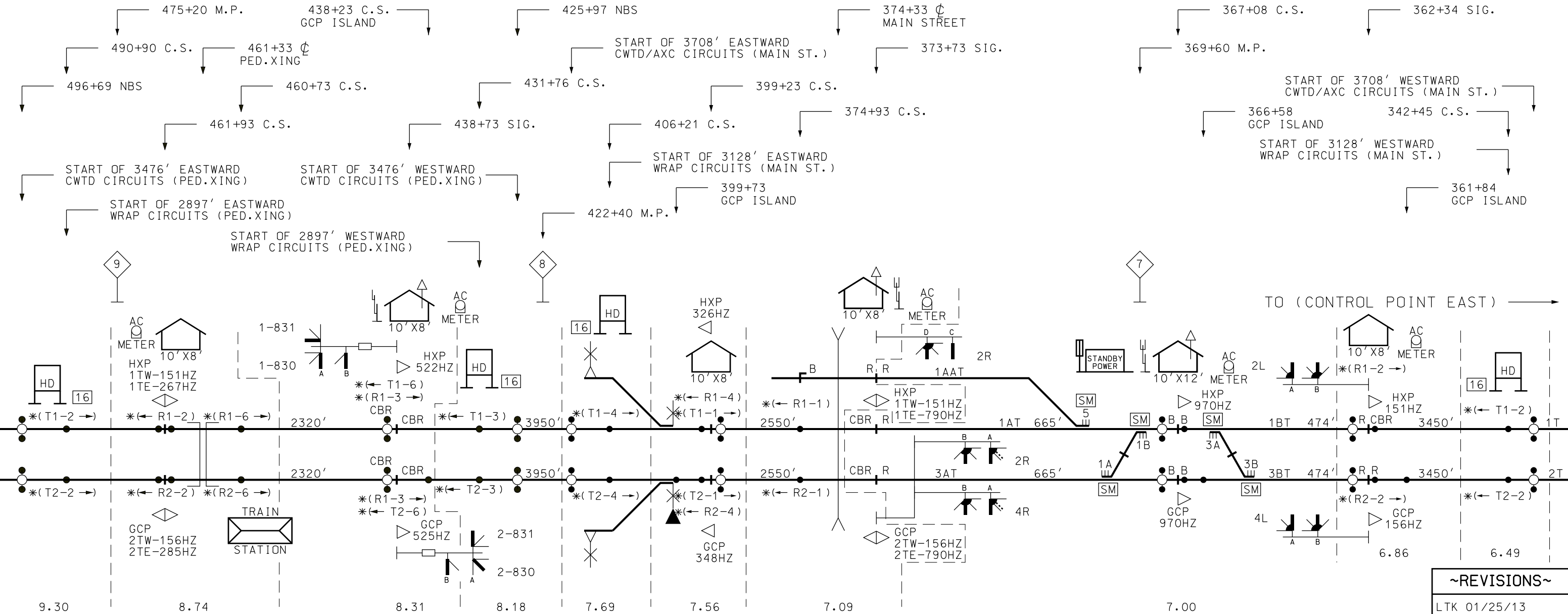
P201 0002-1004-1



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

TYPICALS

APRIL 22, 2013



EW & WW APPROACH - 1T & 2T AT 79 MPH	
MIN. WARNING TIME	= 20 SEC
WIDE XING TIME	= 0 SEC
REACTION TIME	= 5 SEC
RESPONSE TIME	= 5 SEC
APPROACH LENGTH	= 3476 FT.

EW & WW APPROACH - 1T & 2T AT 79 MPH	
MIN. WARNING TIME	= 20 SEC
WIDE XING TIME	= 2 SEC
REACTION TIME	= 5 SEC
RESPONSE TIME	= 5 SEC
APPROACH LENGTH	= 3708 FT.

- NOTES:
- PTC GPS ANTENNA
 - TILT DOWN TOWER WITH ANTENNAS
 - NARROW BAND SHUNT
 - SEMI-BIDIRECTIONAL APPLICATION
 - SAFETRAN GCP CROSSING PREDICTOR OPERATING FREQUENCY *** HZ
 - HARMON CROSSING PROCESSOR OPERATING FREQUENCY *** HZ
 - CONSTANT WARNING TIME DEVICE
 - PSO 4000 TRANSMITTER *
 - PSO 4000 RECEIVER *

NOTE FOR APPLICATION DESIGN CONTRACTOR

SCOPE: ALL CONTACTS TO BE NUMBERED AND REPEATER RELAYS ADDED AS REQUIRED. (NO PARALLEL REPEATERS)

NUMBER OF RELAY CONTACTS ARE TO BE SHOWN AT THE COIL.

RELAY TABULATION SHEETS ARE REQUIRED.

RACK TO RACK TERMINALS TO BE APPROPRIATELY NUMBERED & DETAILED.

MAXIMUM SIGNAL UGC CABLE REEL - 3000'

~REVISIONS~
LTK 01/25/13

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) PROJECT LIMITS MP 6.49 TO MP 9.30	
REFERENCE:	DATE: 05/13/11
DESIGNED	DRAWN
Metra	Metra
CHECKED	APPROVED
Metra	Metra
DISTRICT	PRINT NUMBER
TYP	TYPICALS

← TO (CONTROL POINT WEST)

TO (CONTROL POINT EAST) →

(1989' PSO 1.25 KHZ [ADDR C] →)

(← 2569' HXP-MF 151 HZ)

3450' 1T

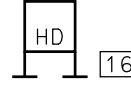
(1989' PSO 1.375 KHZ [ADDR A] →)

(← 2569' GCP-MF 156 HZ)

3450' 2T

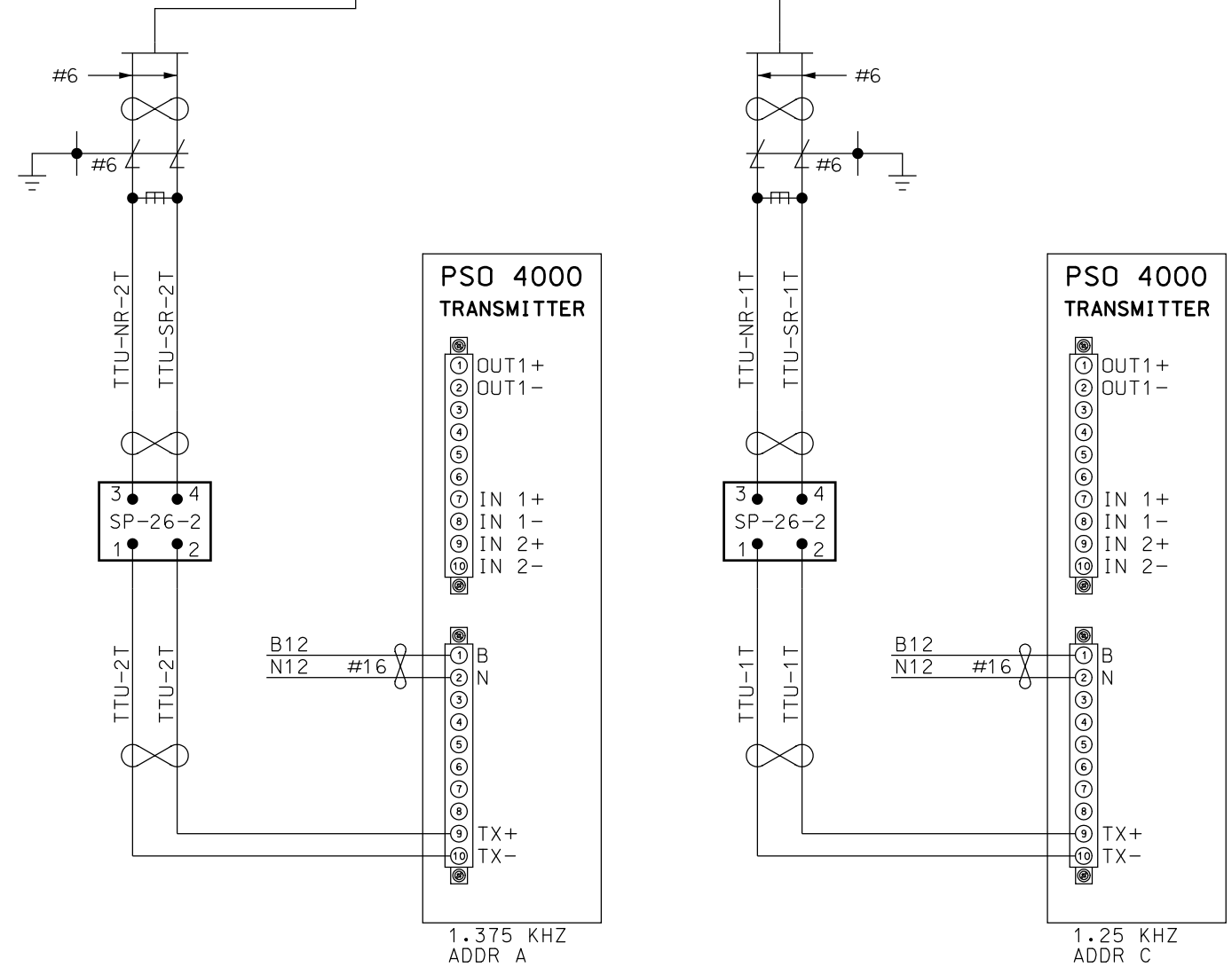
342+45 C.S.

336+65
(SHUNT) 151 HZ TK1
(SHUNT) 156 HZ TK2
MAIN STREET



6.86

(LOCATION EAST)



~REVISIONS~

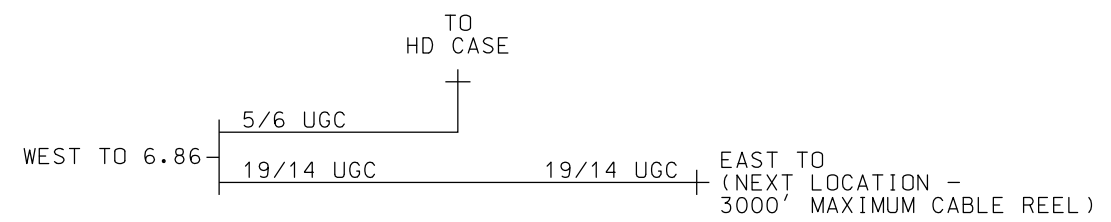
LTK 01/25/13

TWISTED PAIR

PRIME GROUND

(← 2895' HXP-MF 285 HZ)
↑ FREQUENCY
↑ LENGTH OF CIRCUIT
↑ DIRECTION TO TRANSMITTER

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

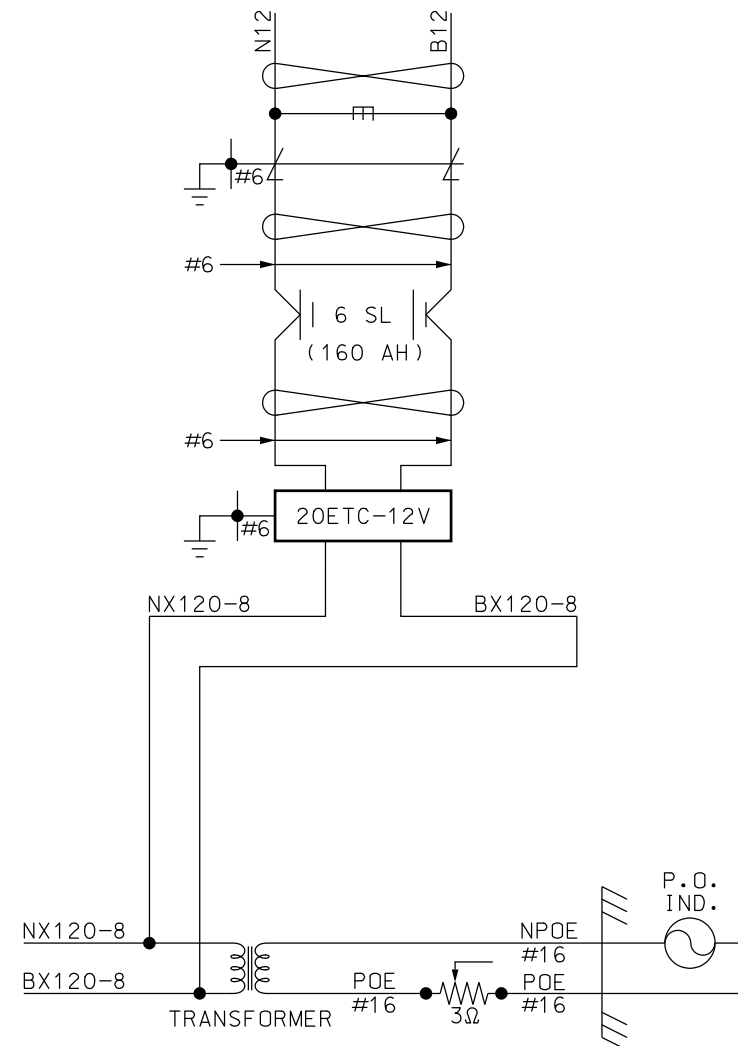
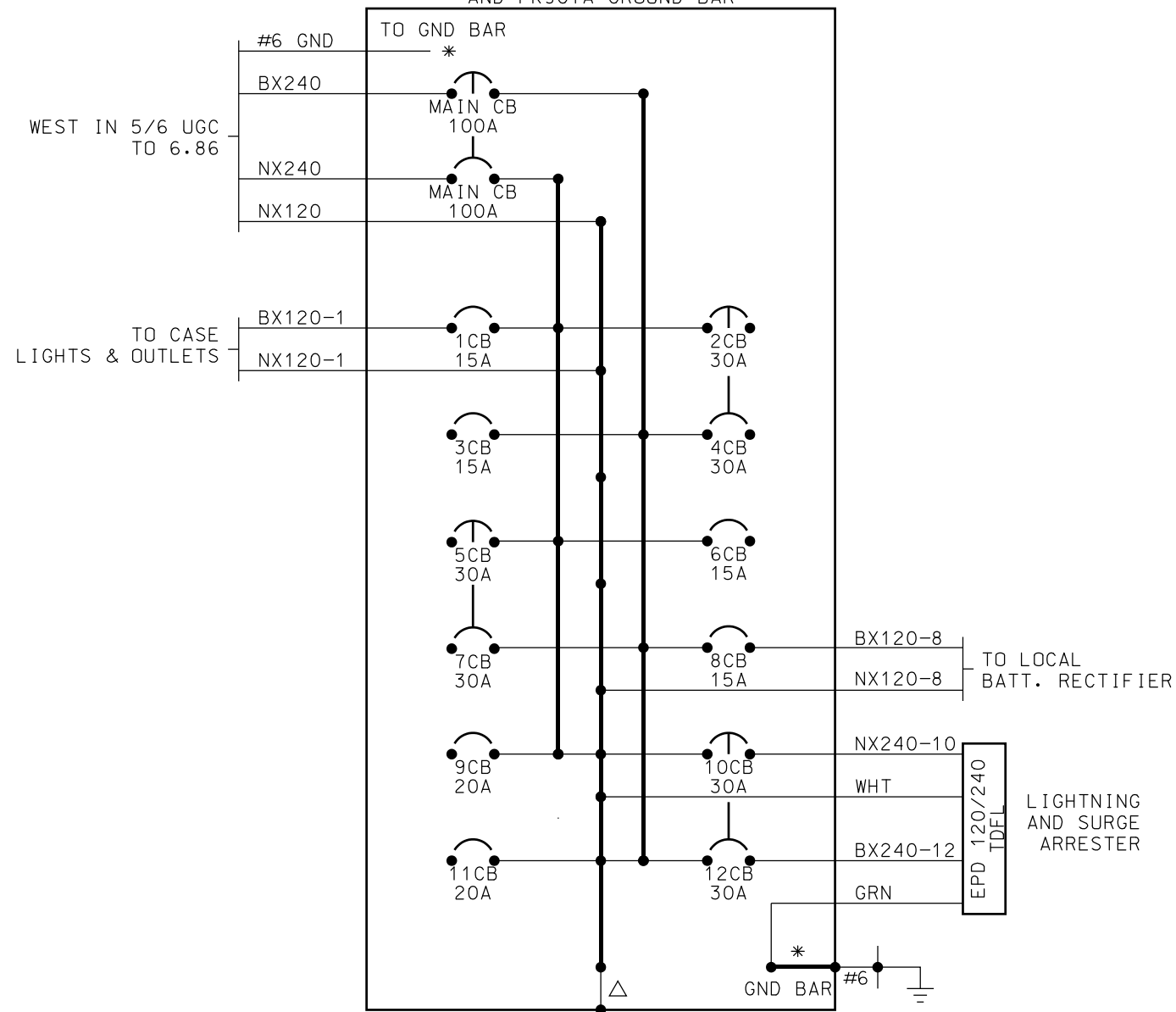


Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PSO 4000 CUT-SECTION
PLAN VIEW

REFERENCE: 6.49 SH.1 & SH.2		DATE: 05/13/11	
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 6.49 SH.1	

"SQUARE D" Q0112M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



~REVISIONS~

LTK 03/22/13

NOTES:

ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETFE TO PRIME GROUND.

△ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.

ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.

RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.

* METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.

ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PSO 4000 CUT-SECTION
POWER DISTRIBUTION

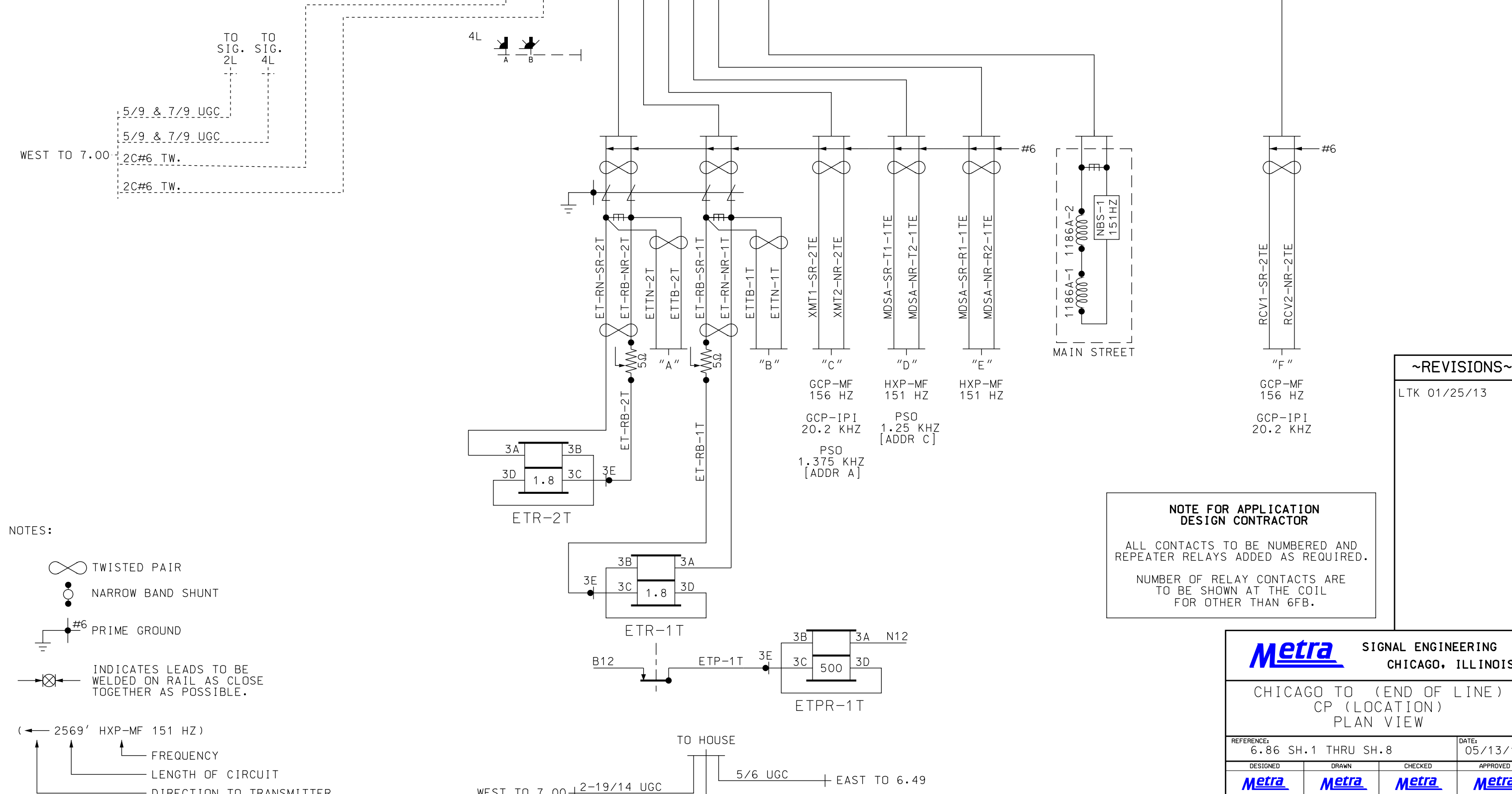
REFERENCE: 6.49 SH.1 & SH.2	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 6.49 SH.2

← TO (CONTROL POINT WEST)

TO (CONTROL POINT EAST) →

474' 1BT (← 474' HXP-MF 970 HZ) (← 2569' HXP-MF 151 HZ) (1989' PSO 1.25 KHZ [ADDR C] →) 3450' 1T

474' 3BT (← 474' GCP-MF 970 HZ) (← 2569' GCP-MF 156 HZ) (1989' PSO 1.375 KHZ [ADDR A] →) 3450' 2T



- NOTES:
- TWISTED PAIR
 - NARROW BAND SHUNT
 - #6 PRIME GROUND
 - INDICATES LEADS TO BE WELDED ON RAIL AS CLOSE TOGETHER AS POSSIBLE.

(← 2569' HXP-MF 151 HZ)

↑ FREQUENCY

↑ LENGTH OF CIRCUIT

↑ DIRECTION TO TRANSMITTER

NOTE FOR APPLICATION DESIGN CONTRACTOR

ALL CONTACTS TO BE NUMBERED AND REPEATER RELAYS ADDED AS REQUIRED.

NUMBER OF RELAY CONTACTS ARE TO BE SHOWN AT THE COIL FOR OTHER THAN 6FB.

~REVISIONS~

LTK 01/25/13

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE) CP (LOCATION) PLAN VIEW

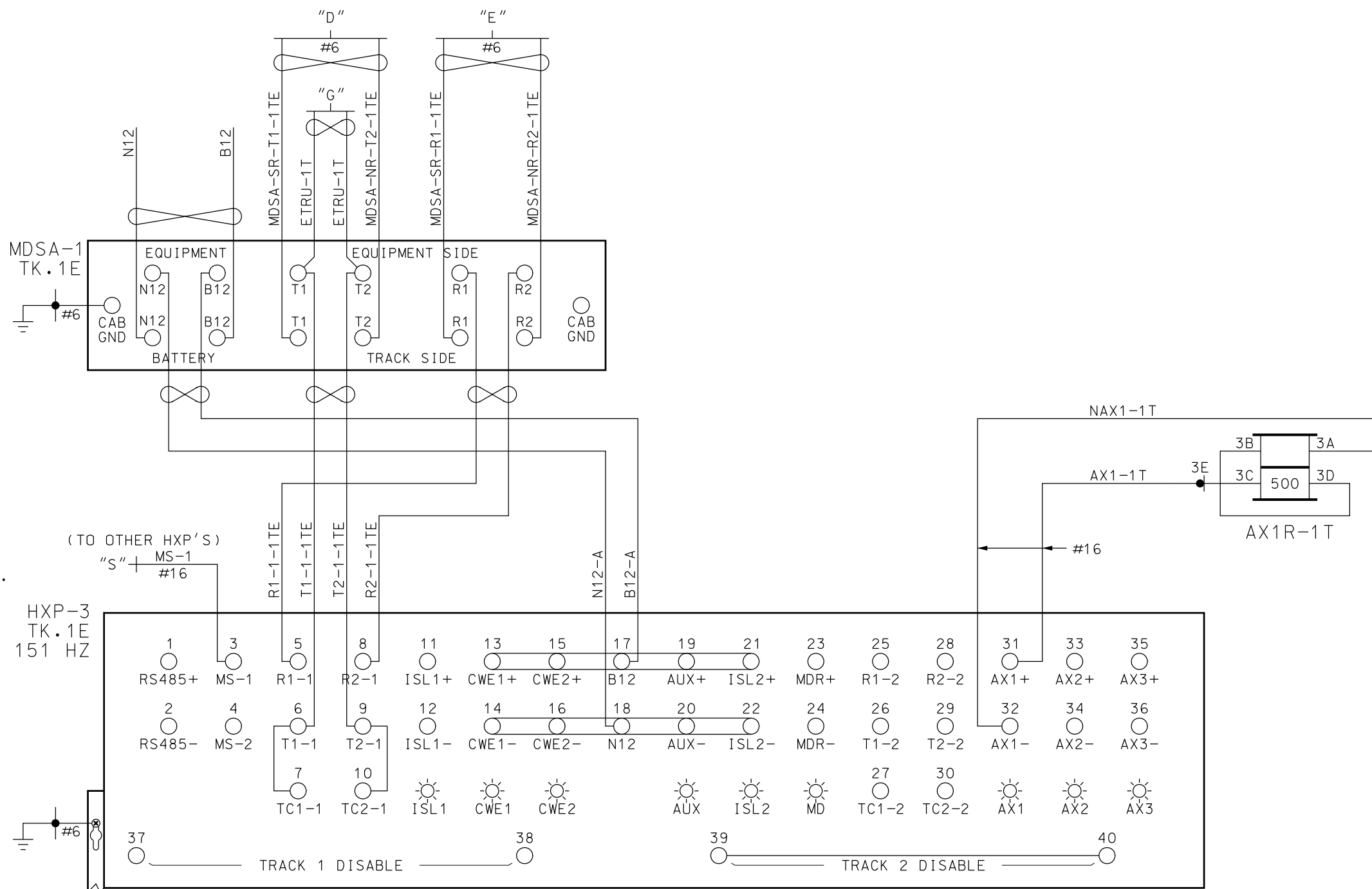
REFERENCE: 6.86 SH.1 THRU SH.8	DATE: 05/13/11
DESIGNED: Metra	DRAWN: Metra
CHECKED: Metra	APPROVED: Metra
DISTRICT: TYP	PRINT NUMBER: 6.86 SH.1

ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

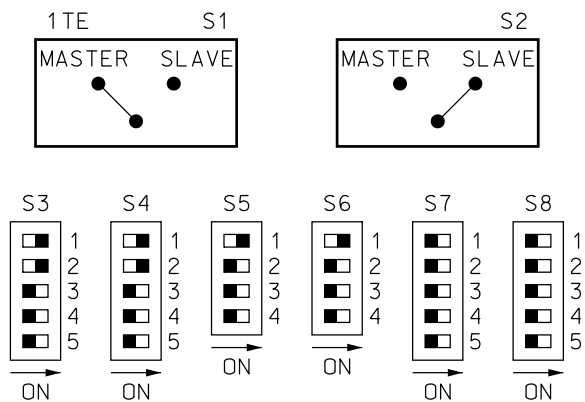
TK.1 = TK.1E
 TK.2 = DISABLED

ADJUST SEL
 APPROACH LENGTH:
 TK.1 - 3000'
 WARNING TIME:
 TK.1 - 27 SEC.
 MD RESTART:
 TK.1 - 0

- OPTIONS
1. TK-ENA:
 TK.1 - UP
 TK.2 - dn
 2. TK FO
 TK.1 - STRAP
 3. CW/MD
 TK.1 - C
 4. UNI-BI
 TK.1 - b
 6. CWEWT
 TK.1 - 80
 7. LOS
 TK.1 - 16
 8. IJ-LOS
 TK.1 - 5
 11. AX 1
 TK-ASN - 1T
 OF-TK1 - 474'
 WT - 27 SEC
 MD-RST - FIELD ADJ.
 CW/MD -
 CJ-LOS - 0
 PJ-DET - 15
 POS-ST - dn
 12. AX 2
 TK-ASN -
 OF-TK1 -
 WT -
 MD-RST -
 CW/MD -
 CJ-LOS - 0
 PJ-DET - 15
 POS-ST - dn
 13. AX 3
 TK-ASN -
 OF-TK1 -
 WT -
 MD-RST -
 CW/MD -
 CJ-LOS - 0
 PJ-DET - 15
 POS-ST - dn



17. MDR-AX - n
18. MD-TMR
 TK.1 - 10
19. MIN-WT - 0
20. FS-DET - 0
21. POS-ST - 0
47. ATO-RX - dn
48. PF-ENA - UP



HXP-3 MODULE SETUP

RMM MODULE	SIM MODULE	TRM MODULE	RSI MODULE	RYD MODULE	TRM MODULE	RSI MODULE	CPU MODULE	AXD MODULE
------------	------------	------------	------------	------------	------------	------------	------------	------------

RSI MODULE SLOT 4 & 7
 FREQ. 8.0 KHZ
 LOS JUMPER = 0
 FAULT JUMPER = 0
 * FIRST SLOT AT LEFT END OF BAY

~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

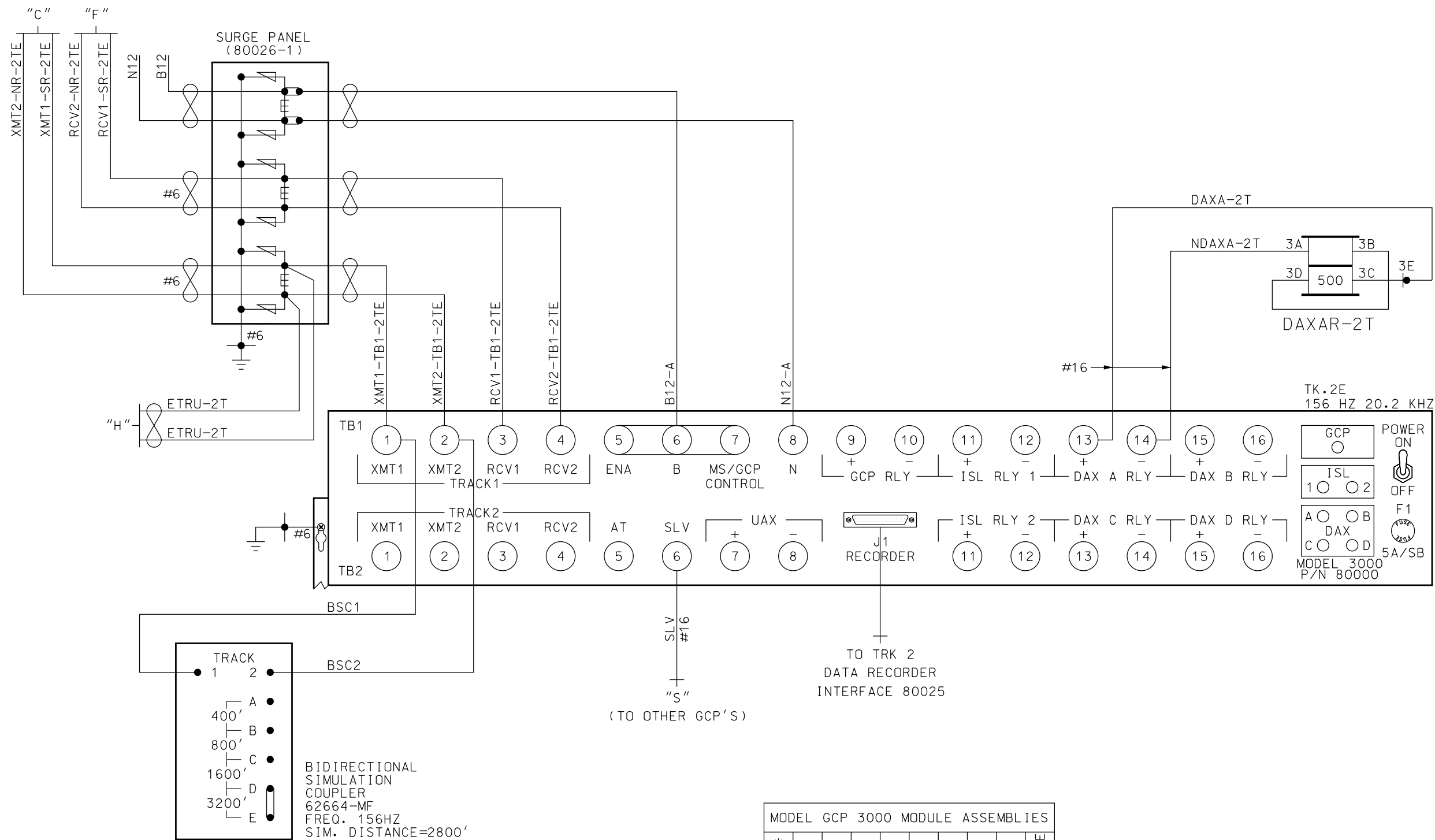
CHICAGO TO (END OF LINE)
 CP (LOCATION)
 HXP-3 TRACK 1

REFERENCE: 6.86 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	6.86 SH.2

ALL WIRING ON THIS SHEET
 TO BE #10 AWG UNLESS NOTED



~REVISIONS~

MODEL GCP 3000 MODULE ASSEMBLIES	
80011	ISLAND 1
*	EMPTY SLOT
80012	TRANSCEIVER 1
80012	TRANSCEIVER 2
80013	RELAY DRIVE
80214	PROCESSOR
80015	REC. MODULE
80016	(1) DAX
80016	(2) DAX
80020/80019	INTERFACE

* FIRST SLOT AT LEFT END OF BAY

ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
GCP 3000 - TK.2

REFERENCE: 6.86 SH.1 THRU SH.8	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 6.86 SH.3

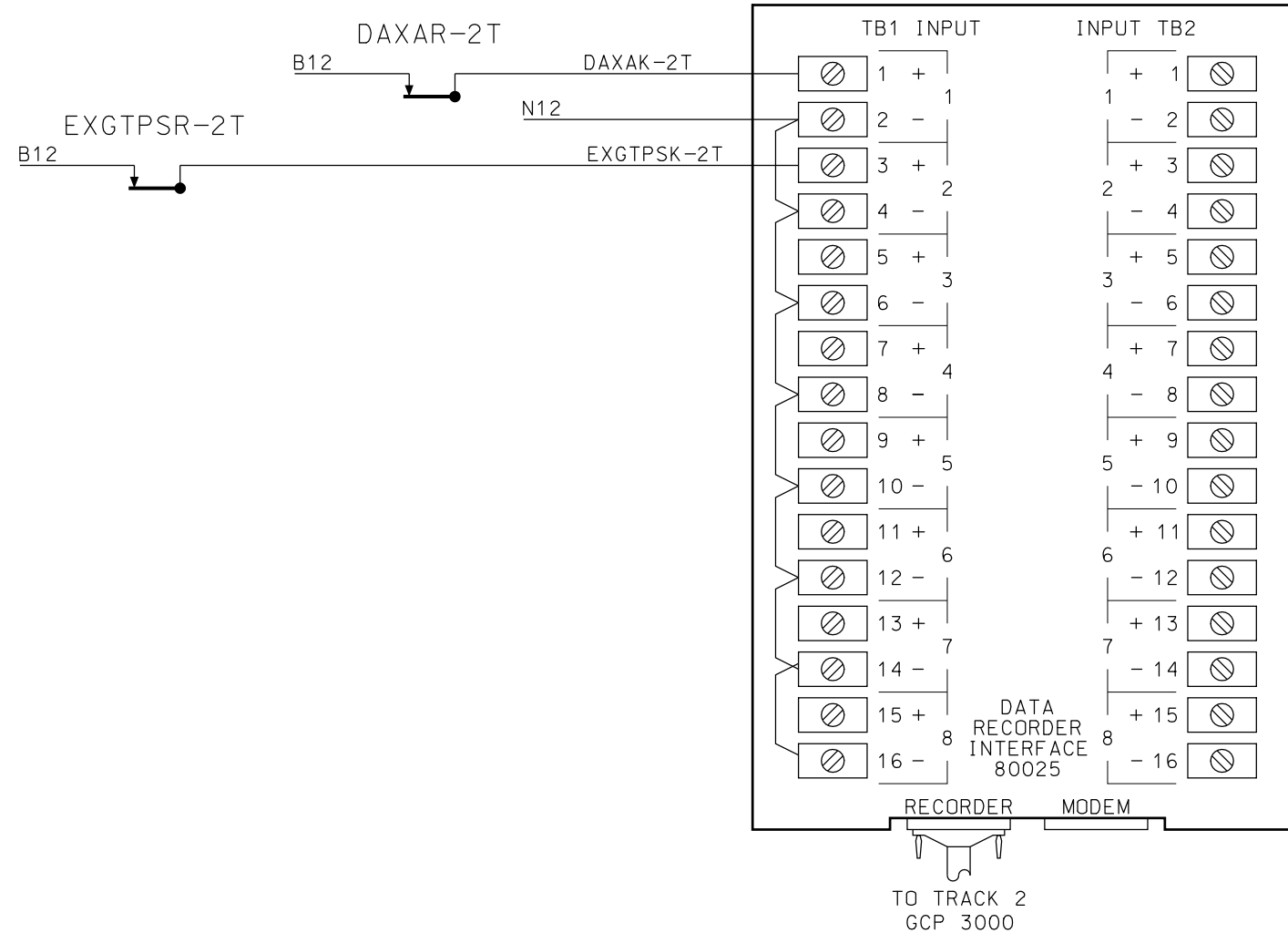
GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

1-80025 DATA RECORDER INTERFACE UNIT

TK.2E

GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

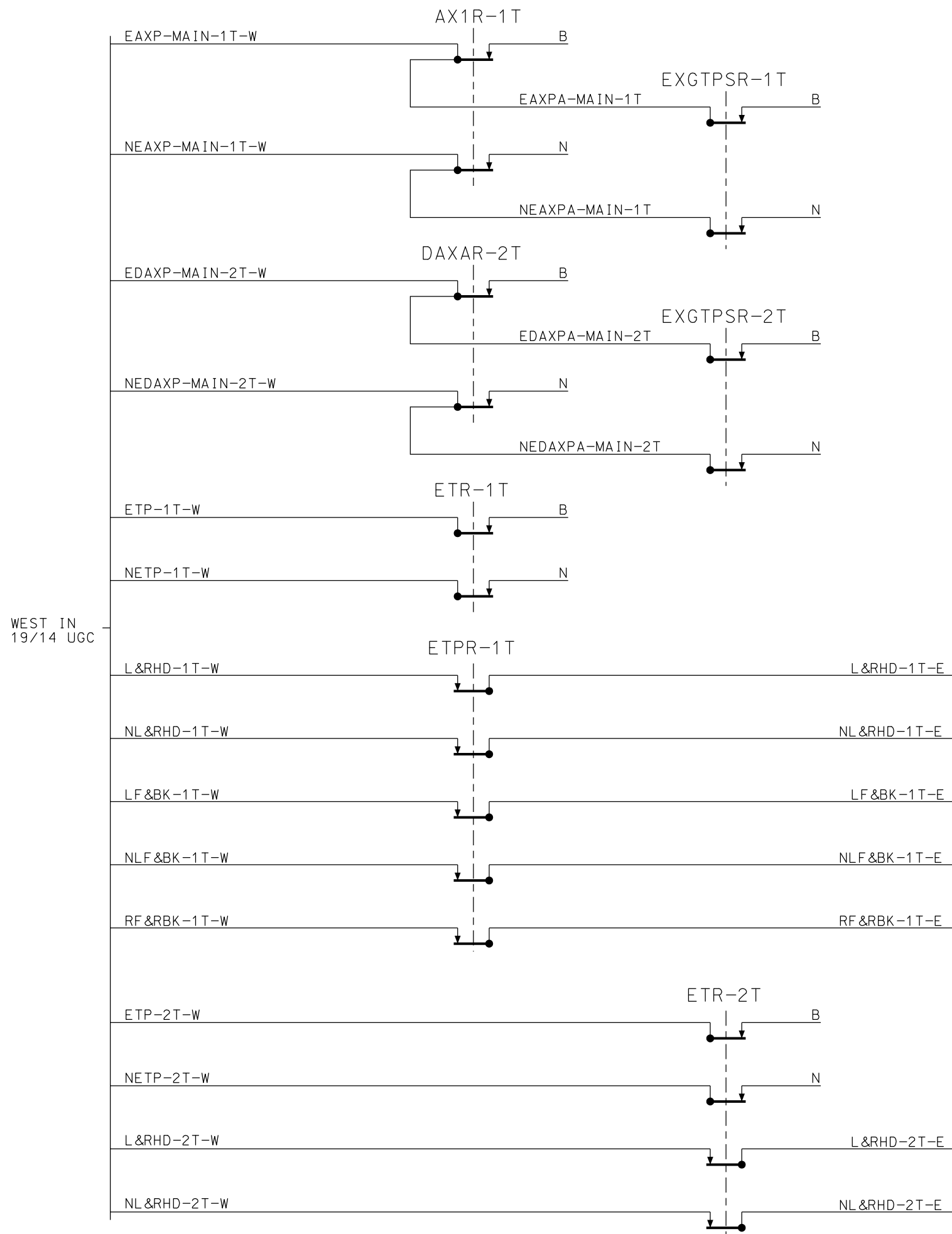
NUMBER OF TRACKS	1	
FREQUENCY	T1: 156 HZ	T2: HZ
UNIDIRECTIONAL/BIDIRECTIONAL	T1: BI	T2: BI
XMIT LEVEL - MED/HI	T1: MED	T2: MED
PREDICTOR/MOTION SENSOR	T1: GCP	T2: GCP
WARNING TIME SELECTED	T1: 27 SEC	T2: SEC
APPROACH DISTANCE	T1: 2569 FT	T2: FT
UAX PICKUP DELAY (UAX1)	SEC.	
ENA/UAX2 DELAY	SEC.	
ISLAND DISTANCE	T1: 50 FT	T2:
NUMBER OF DAX'S	1	
DAX A TRK/DIST/WARNING TIME	1	474 FT 27 SEC.
DAX B TRK/DIST/WARNING TIME		FT SEC.
DAX C TRK/DIST/WARNING TIME		FT SEC.
DAX D TRK/DIST/WARNING TIME		FT SEC.
SLAVING MASTER/SLAVE	MASTER	
PASSWORD DISABLED/ENABLED	DISABLED	
RECORDER INSTALLED/NOT INSTALLED	NOT INSTALLED	
SWITCH TO MS	T1: EZ	T2: EZ
TRANSFER DELAY MS TO GCP	T1: SEC.	T2: SEC.
PRIME PREDICTION OFFSET	T1: FT	T2: FT
PICKUP DELAY PRIME	SEC.	
PICKUP DELAY DAX A	SEC.	
PICKUP DELAY DAX B	SEC.	
PICKUP DELAY DAX C	SEC.	
PICKUP DELAY DAX D	SEC.	
ENHANCED DETECT MODE	OFF	
BACK TO BACK	OFF	
STATION STOP TIMER	10 SEC.	
T1 # OF TRACK WIRES 4/6	4	
T2 # OF TRACK WIRES 4/6	4	
LOW EX ADJUSTMENT	0	
LOW EZ DETECTION	T1:	T2:
LOW EZ DETECTION TIMER	T1: MIN.	T2: MIN.
POSITIVE START (0 = OFF)	T1: EZ	T2: EZ
POSITIVE START TIMEOUT (0 = NONE)	T1: MIN.	T2: MIN.
SET AT OPERATION	NORMAL	
DIAGNOSTIC MESSAGES		
DAX MESSAGES		
ADVANCE PREEMPT TIMER	SEC.	



~REVISIONS~

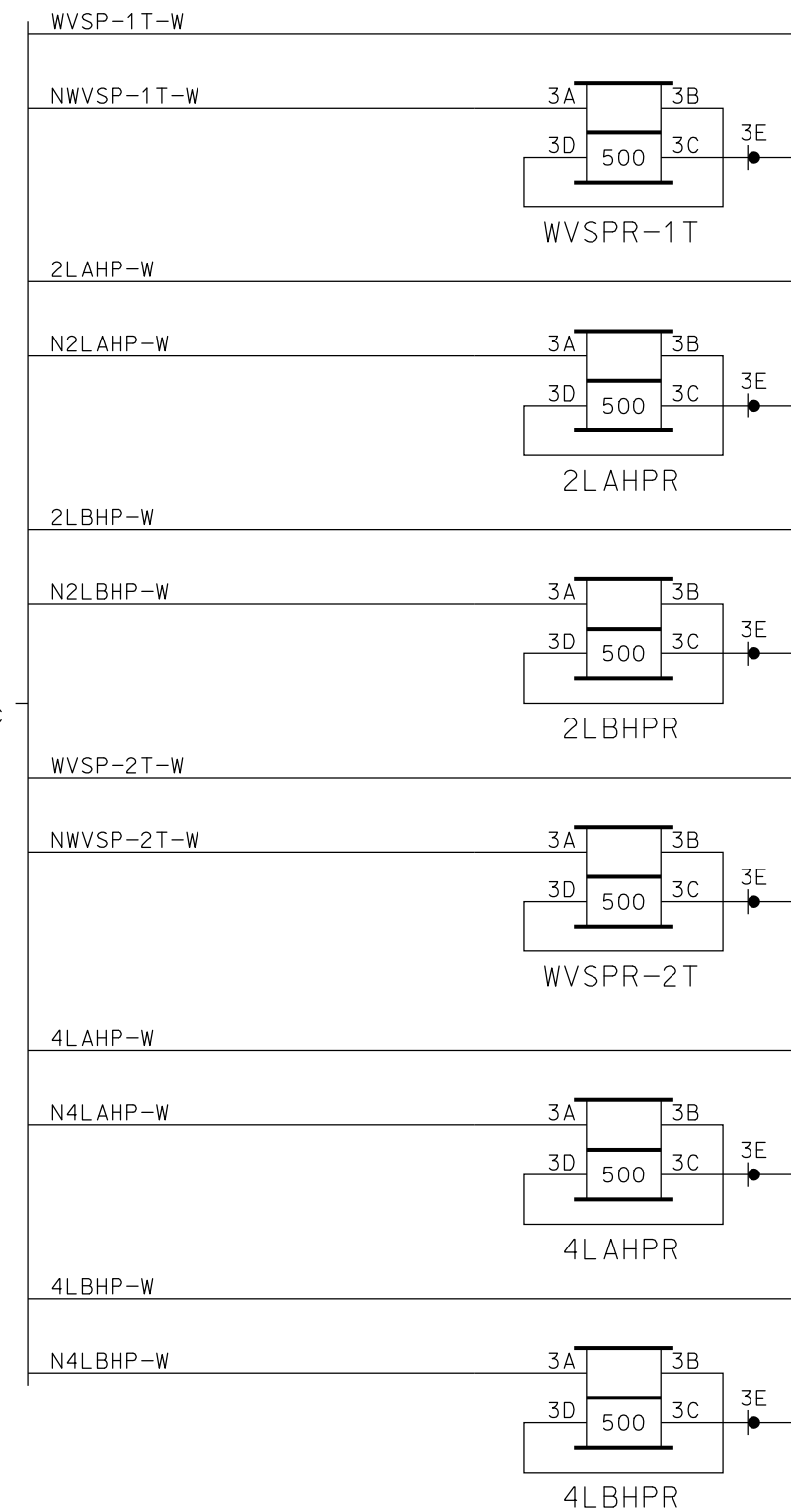
LTK 03/22/13

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) CP (LOCATION) GCP PROGRAMMING PARAMETERS & 80025 RECORDER	
REFERENCE: 6.86 SH.1 THRU SH.8	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 6.86 SH.4



WEST IN
19/14 UGC

EAST TO
NEXT LOCATION



~REVISIONS~



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

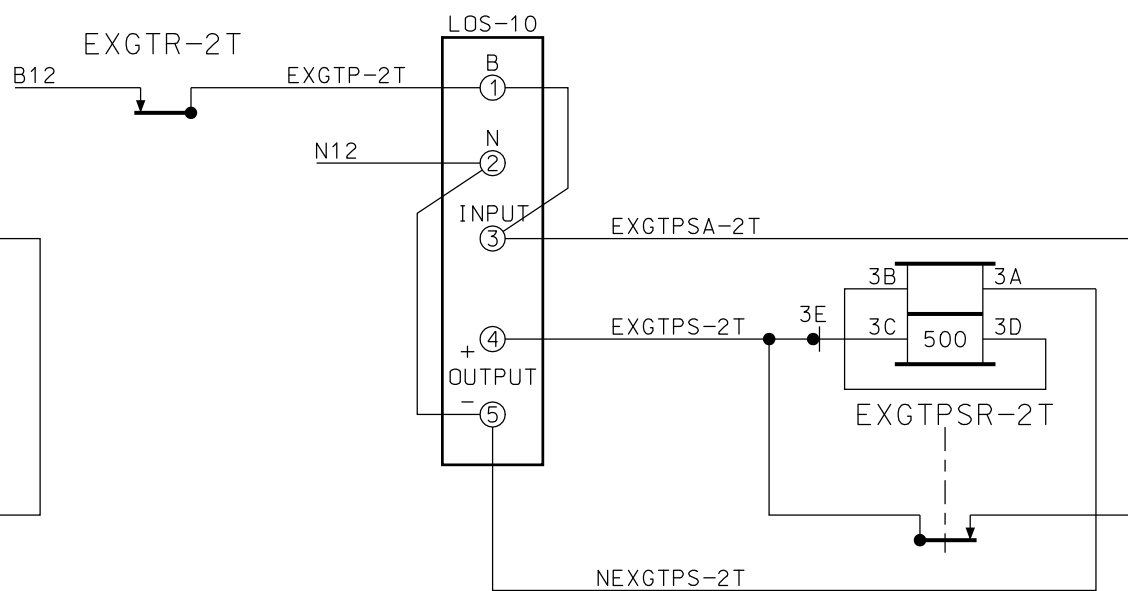
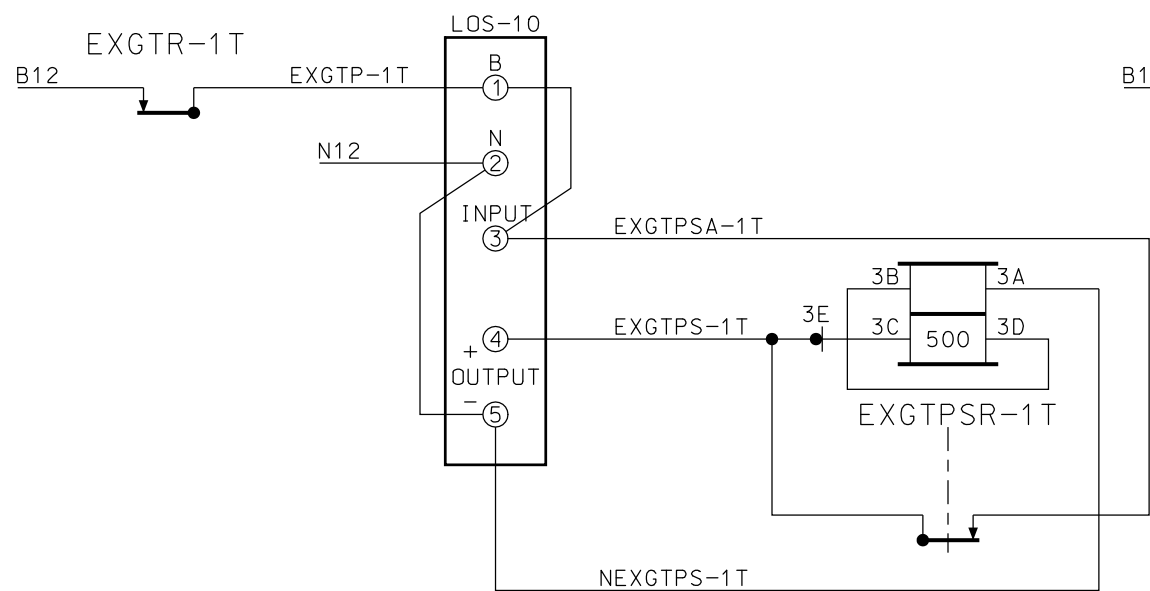
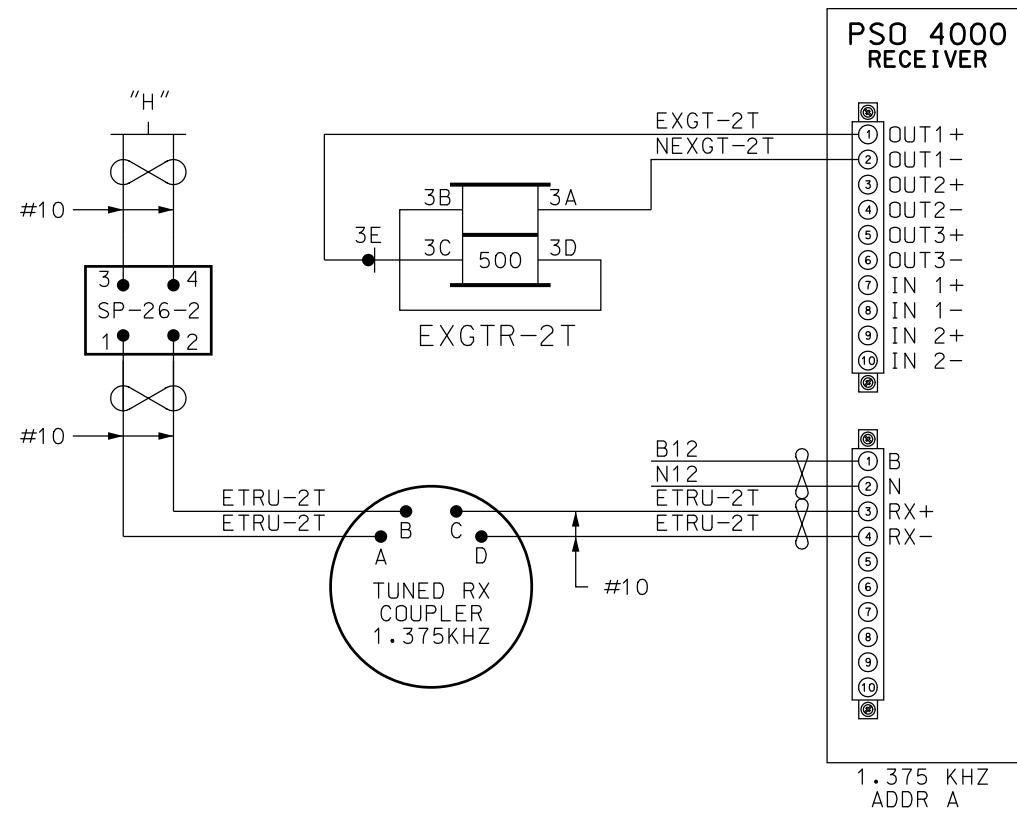
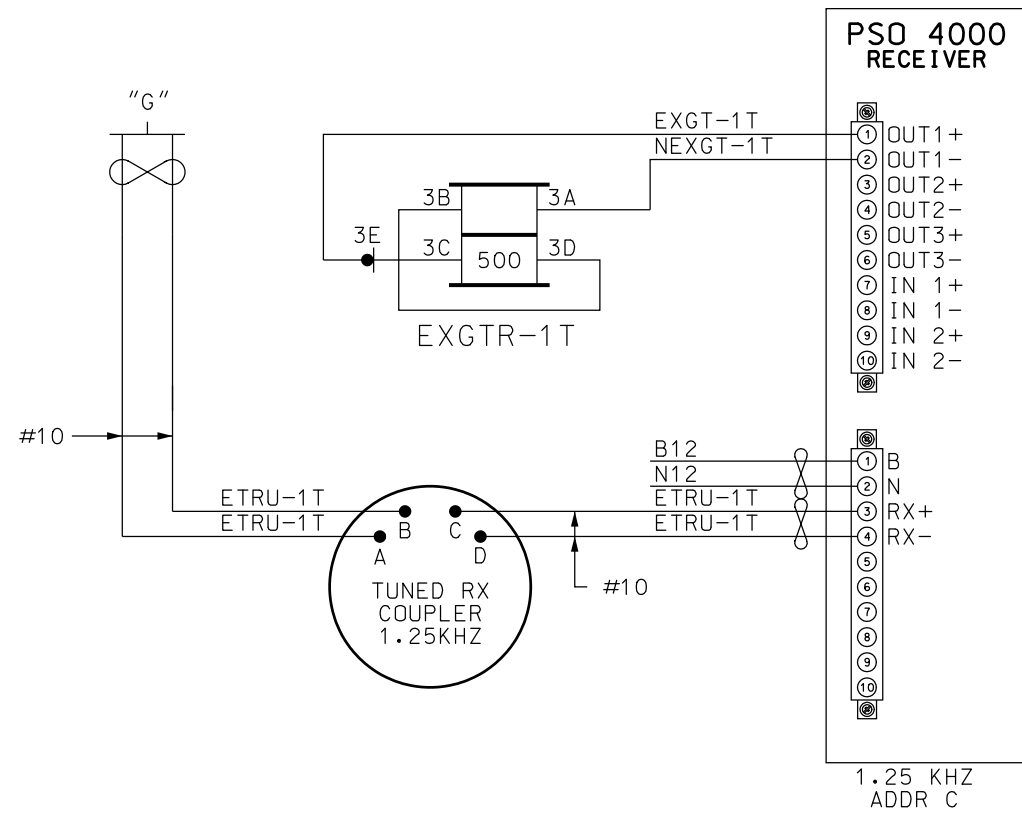
CHICAGO TO (END OF LINE)
CP (LOCATION)
LINE CIRCUITS

REFERENCE: 6.86 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
--------------------------	-----------------------	-------------------------	--------------------------

DISTRICT TYP	PRINT NUMBER 6.86 SH.5
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~

LTK 01/25/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

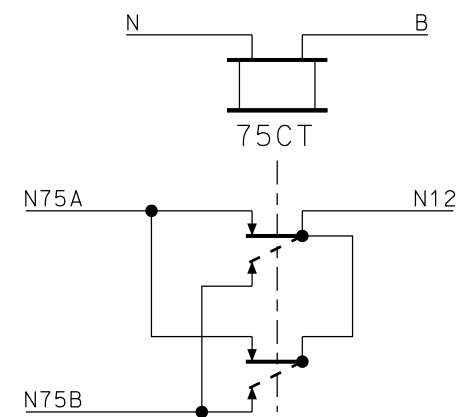
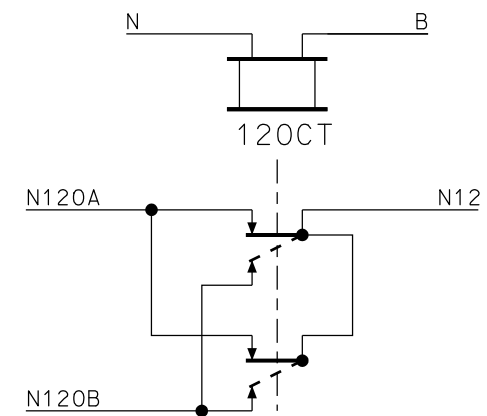
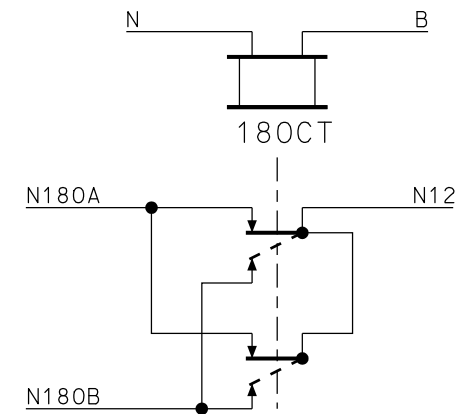
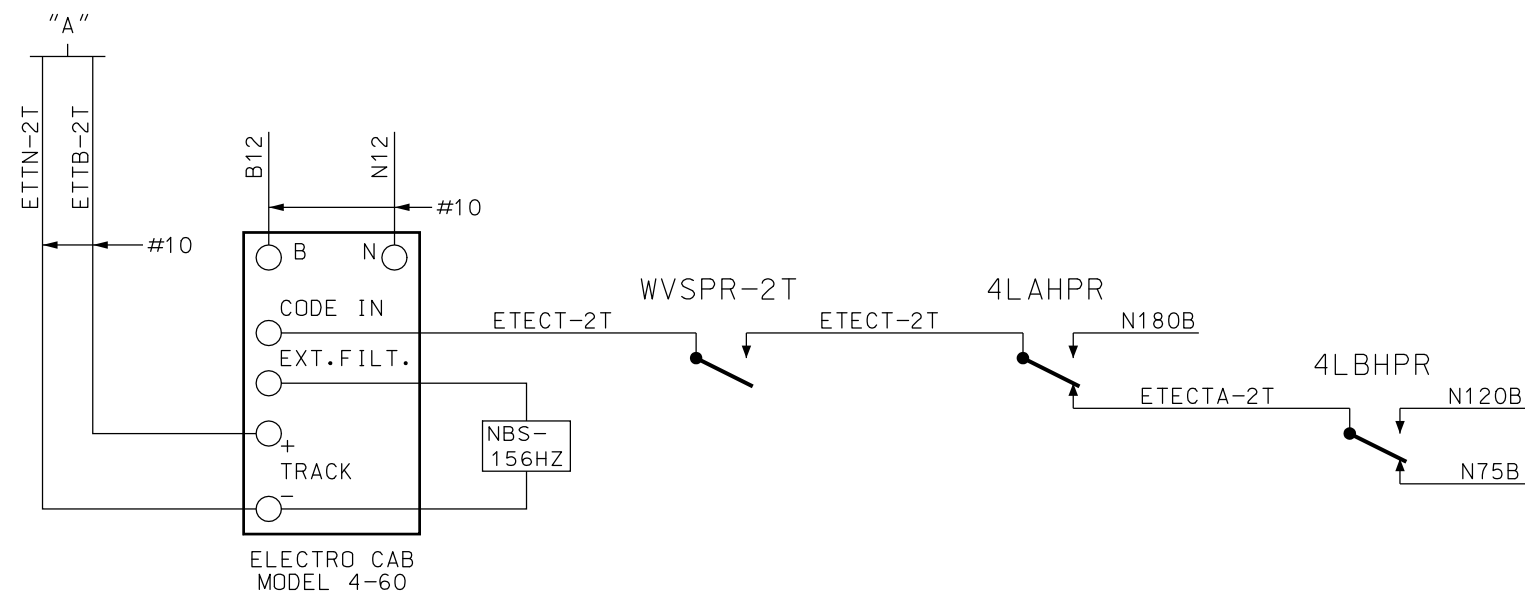
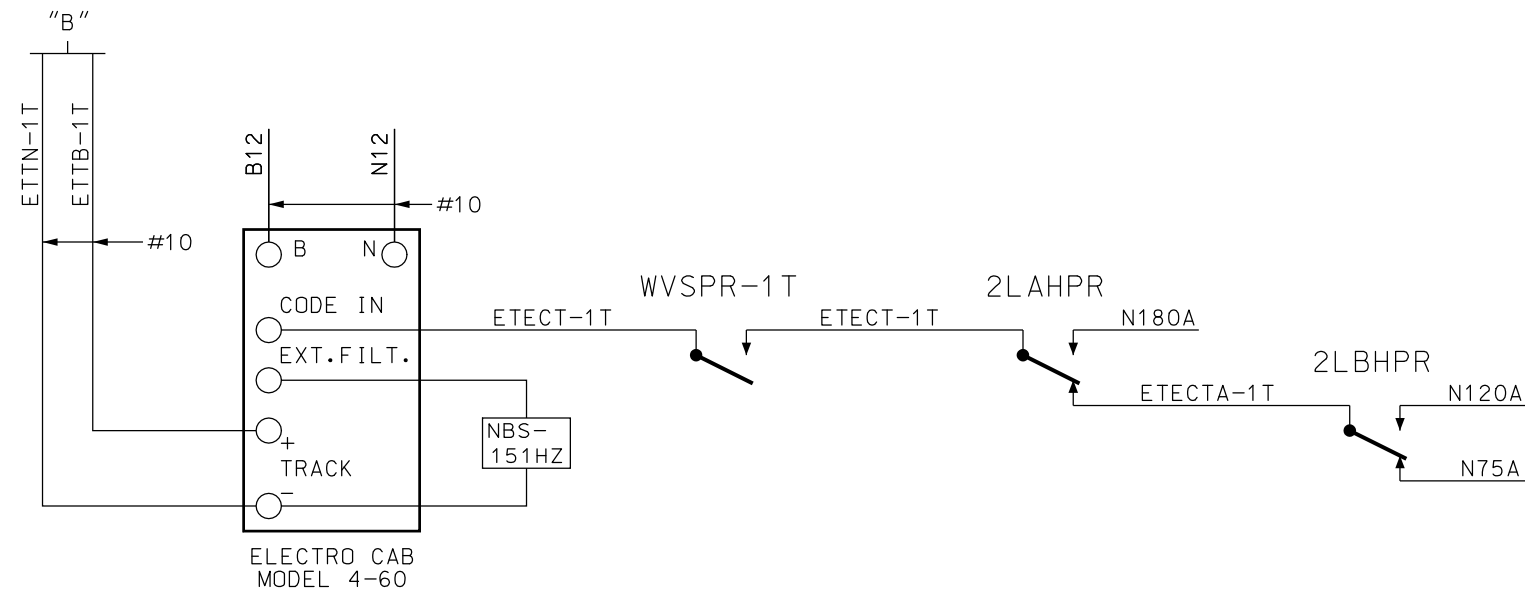
CHICAGO TO (END OF LINE)
CP (LOCATION)
PSO 4000 & LOS CIRCUITS

REFERENCE: 6.86 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	6.86 SH.6

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
CAB CIRCUITS

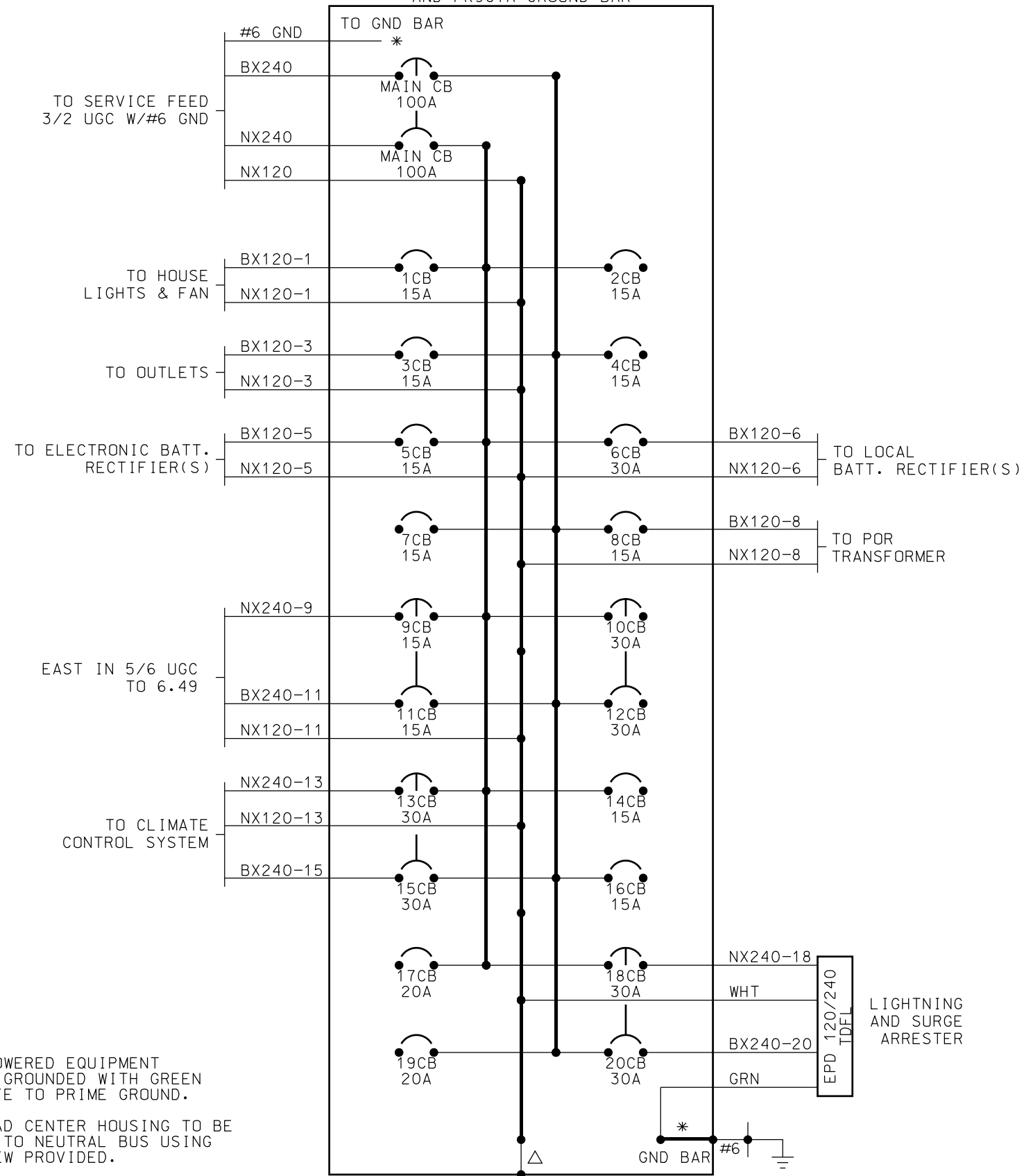
REFERENCE: 6.86 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
<i>Metra</i>	<i>Metra</i>	<i>Metra</i>	<i>Metra</i>

DISTRICT	PRINT NUMBER
TYP	6.86 SH.7

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

"SQUARE D" Q0120M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



NOTES:

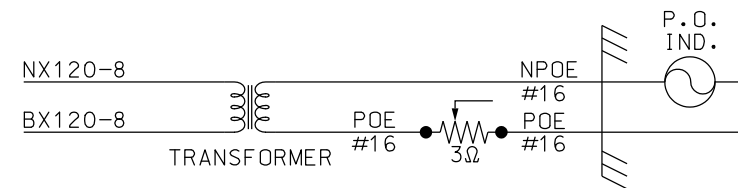
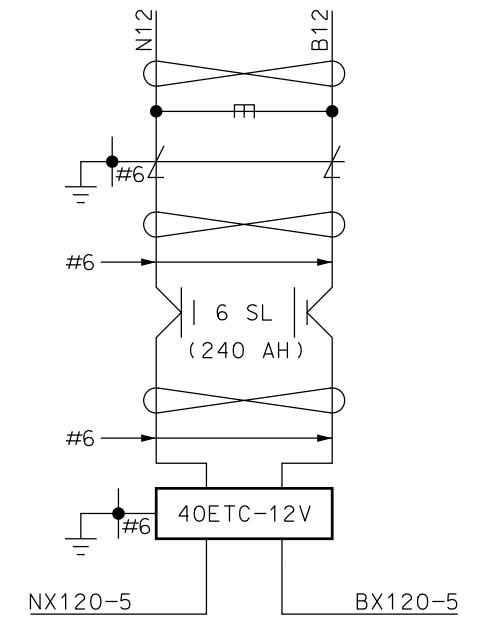
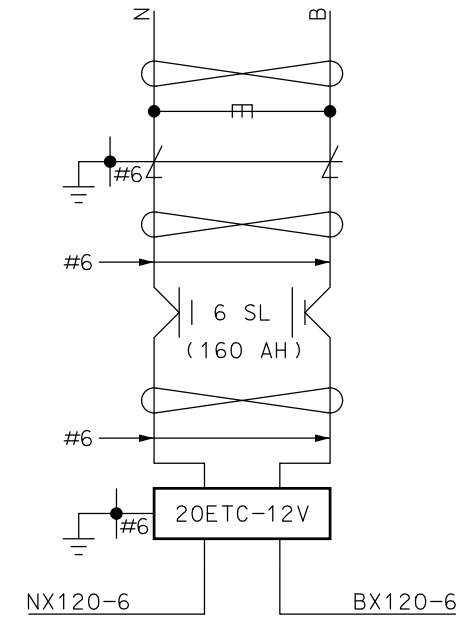
ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETFE TO PRIME GROUND.

△ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.

ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.

RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.

* METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.



~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
POWER DISTRIBUTION

REFERENCE: 6.86 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	6.86 SH.8

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

CP (LOCATION)

~REVISIONS~



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED

DISTRICT	PRINT NUMBER
TYP	7.00 COVER

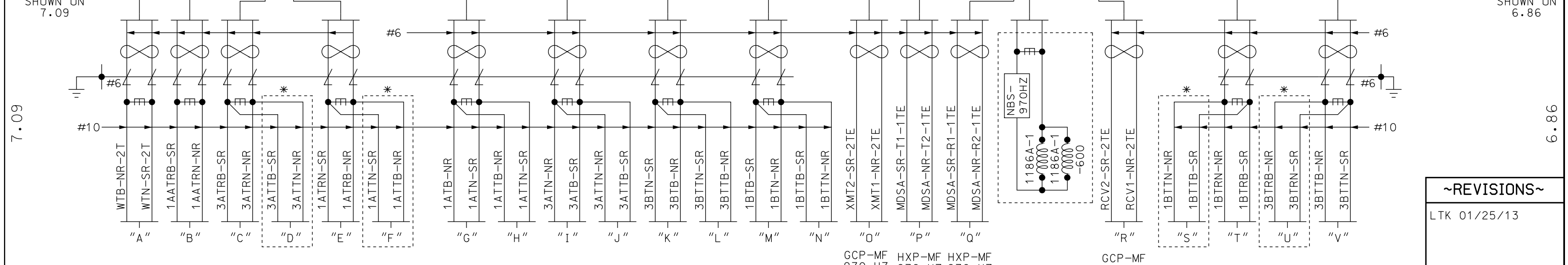
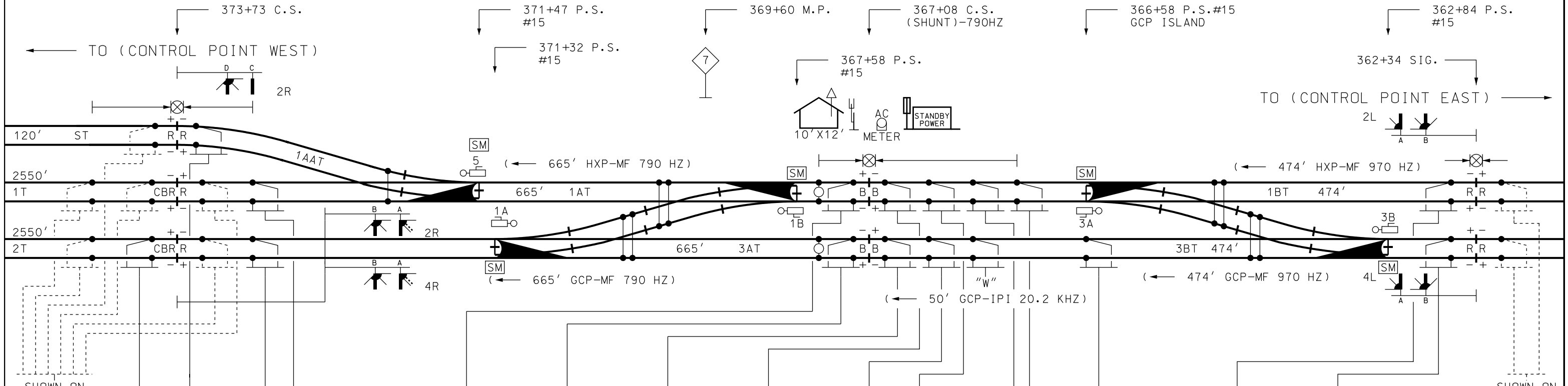
CP (LOCATION)

SH.NO.	DESCRIPTION	PLAN DATED
INDEX	INDEX SHEET	
1	PLAN VIEW	
2	ELECTRO CODE 4H-TK.1	
3	ELECTRO CODE 4H-TK.2	
4	TRAFFIC CIRCUITS-TK.1	
5	TRAFFIC CIRCUITS-TK.2	
6	ROUTE & ASPECT CHART (EASTWARD)	
7	ROUTE & ASPECT CHART (WESTWARD)	
8	CABLE PLAN	
9	HXP-3 TK.1	
10	GCP3000 TK.2	
11	80025 RECORDER	
12	LINE CIRCUITS	
13	LOSS OF SHUNTS - REPEATERS	
14	TRACK RELAYS & CAB CIRCUITS	
15	TRACK BATTERY & CAB CIRCUITS	
16	CAB CONTROL CIRCUITS	
17	CAB STICK CIRCUITS	
18	TRAFFIC CIRCUITS	
19	ENTRY & EXIT ROUTE RELAYS	
20	ENTRY & EXIT ROUTE RELAYS	
21	SIGNAL 2R "H" NETWORK	
22	SIGNAL 4R "H" NETWORK	
23	SIGNAL 2 & 4 "H" NETWORK	
24	SIGNAL 2 & 4 "H" NETWORK	
25	SIGNAL 2L "H" NETWORK	
26	SIGNAL 4L "H" NETWORK	
27	DIRECTIONAL STICKS	
28	SIGNAL 2L & 2R TIME LOCKING	
29	SIGNAL 4L & 4R TIME LOCKING	
30	SECTION LOCKING	
31	SIGNAL 2R & 4R LIGHTING CIRCUITS	
32	SIGNAL 2L & 4L LIGHTING CIRCUITS	
33	SWITCH 1 LOCKING	
34	SWITCH 3 & 5 LOCKING & INDICATION	
35	1A SWITCH CONTROL & INDICATION	
36	1B SWITCH CONTROL & INDICATION	
37	3A SWITCH CONTROL & INDICATION	

SH.NO.	DESCRIPTION	PLAN DATED
38	3A SWITCH CONTROL & INDICATION	
39	3B SWITCH CONTROL & INDICATION	
40	3B SWITCH CONTROL & INDICATION	
41	5 SWITCH CONTROL & INDICATION	
42	5 SWITCH CONTROL & INDICATION	
43	FUTURE PTC	
44	FUTURE PTC	
45	FUTURE PTC	
46	CODE CHART	
47	LOCAL CONTROL PANEL	
48	MAINTAINER TEST PANEL	
49	RADIO TRANSFER CIRCUITS	
50	RADIO/MODEM CONFIGURATION	
51	NORMAL/STANDBY DATA COMM.	
52	NORMAL/STANDBY TRANSFER CIRCUITS	
53	LOCAL PANEL TRANSFER CIRCUITS	
54	SIGNAL REQUEST	
55	SWITCH REQUEST	
56	TRACK BLOCKING	
57	LOCAL CONTROL PANEL CIRCUITS	
58	LOCAL CONTROL PANEL CIRCUITS	
59	LOCAL CONTROL PANEL CIRCUITS	
60	LOCAL CONTROL PANEL CIRCUITS	
61	EVENT RECORDER	
62	EVENT RECORDER	
63	EVENT RECORDER	
64	INDICATIONS	
65	INDICATIONS	
66	INDICATIONS	
67	INTRUSION ALARM	
68	SM TYPICAL CIRCUIT LAYOUT	
69	SM TYPICAL CIRCUIT LAYOUT	
70	GENERATOR & POWER DISTRIBUTION	
71	HOUSE POWER DISTRIBUTION	
72	HOUSE POWER DISTRIBUTION	
73	MICROPROCESSOR TRAFFIC	
74	SOFTWARE CONFIGURATION DATA	
75	HOUSE PLAN	

~REVISIONS~

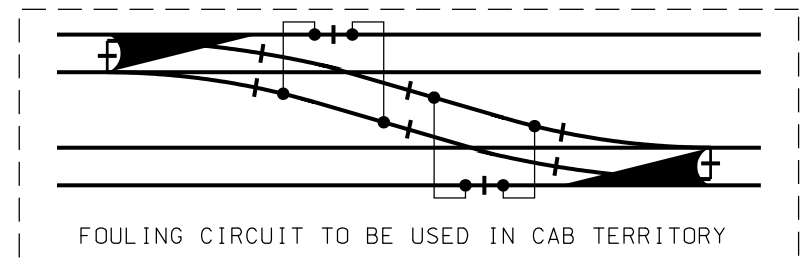
Metra		SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) CP (LOCATION) INDEX SHEET			
REFERENCE: 7.00 SH.1 THRU SH.75			DATE: 05/13/11
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.INDEX	



NOTES:

* TRACK LEADS D,F,S AND U USED IN CAB SIGNAL TERRITORY ONLY

- GPS ANTENNA
- TILT DOWN TOWER WITH PTC AND ATCS ANTENNAS
- TWISTED PAIR
- PRIME GROUND
- INDICATES LEADS TO BE WELDED ON RAIL AS CLOSE TOGETHER AS POSSIBLE.

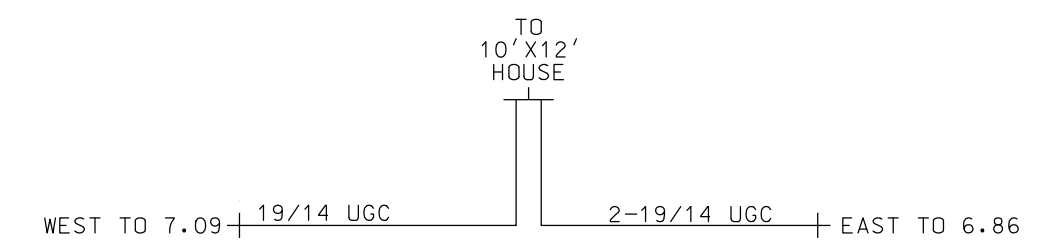


← 665' HXP-MF 790 HZ

← FREQUENCY

← LENGTH OF CIRCUIT

← DIRECTION TO TRANSMITTER



~REVISIONS~

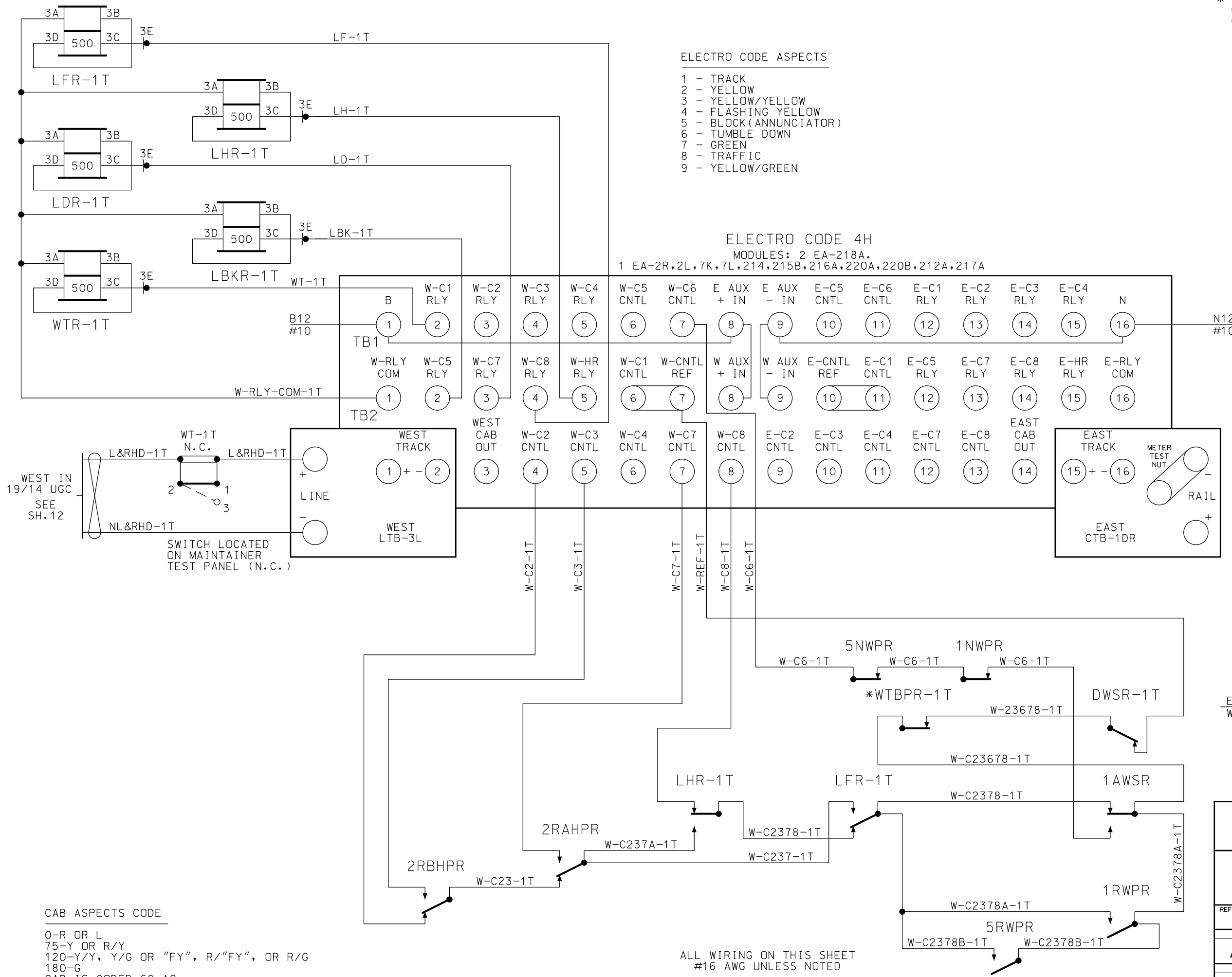
LTK 01/25/13

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE) CP (LOCATION) PLAN VIEW

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED: Metra	DRAWN: Metra
CHECKED: Metra	APPROVED: Metra
DISTRICT: TYP	PRINT NUMBER: 7.00 SH.1

* TRACK BLOCK USED ONLY WHEN ADJACENT CONTROL POINT / INTERLOCKING IS NOT CONTROLLED BY THE SAME OPERATOR.

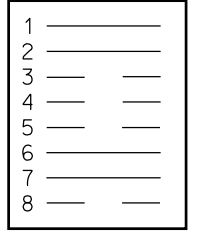
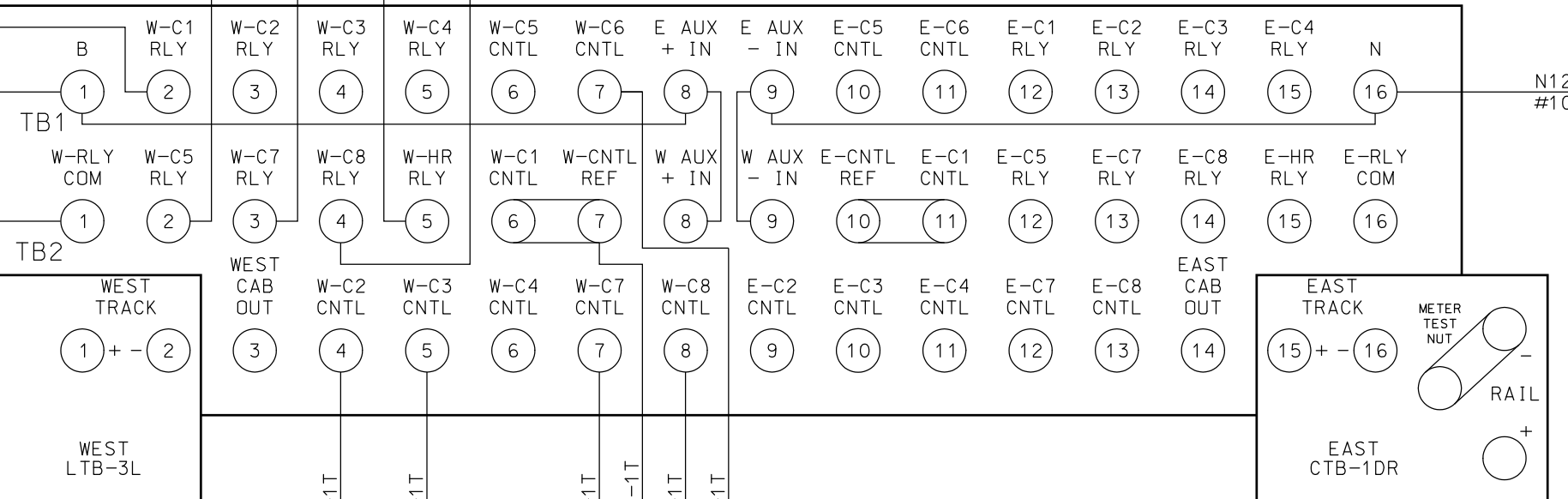


ELECTRO CODE ASPECTS

- 1 - TRACK
- 2 - YELLOW
- 3 - YELLOW/YELLOW
- 4 - FLASHING YELLOW
- 5 - BLOCK (ANNUNCIATOR)
- 6 - TUMBLE DOWN
- 7 - GREEN
- 8 - TRAFFIC
- 9 - YELLOW/GREEN

ELECTRO CODE 4H

MODULES: 2 EA-218A.
1 EA-2R, 2L, 7K, 7L, 214, 215B, 216A, 220A, 220B, 212A, 217A



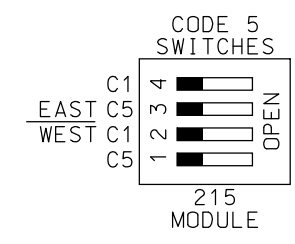
PROGRAM AHEQ-A5
STRAPS 3, 4, 5, 8 ARE CUT

CHECKSUMS
1 3236/08DF
2 E34D/E2AB
3 3236/08DF
4 614A/6007

IN CAB TERRITORY
USE PROGRAM AHEQ-C4

~REVISIONS~

LTK 03/22/13

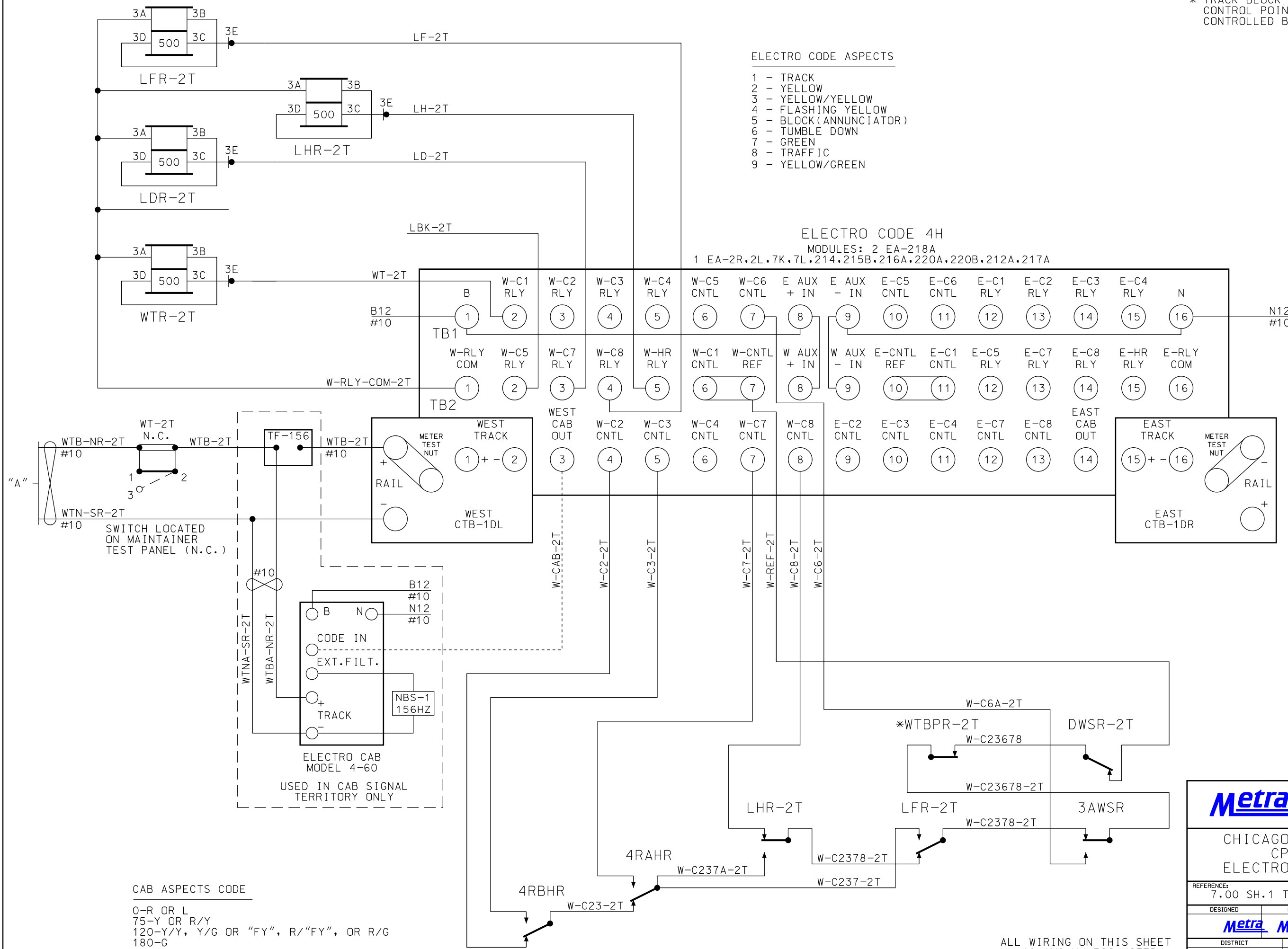


CAB ASPECTS CODE
0-R OR L
75-Y OR R/Y
120-Y/Y, Y/G OR "FY", R/"FY", OR R/G
180-G
CAB IS CODED 60-AC

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) ELECTRO CODE 4H - TK.1			
REFERENCE:	7.00 SH.1 THRU SH.75	DATE:	05/13/11
DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra
DISTRICT	PRINT NUMBER		
TYP	7.00 SH.2		

* TRACK BLOCK USED ONLY WHEN ADJACENT CONTROL POINT / INTERLOCKING IS NOT CONTROLLED BY THE SAME OPERATOR.



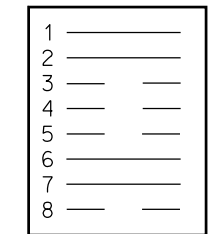
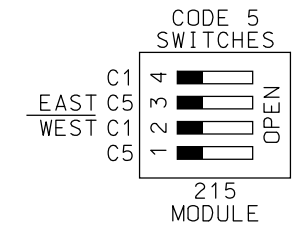
ELECTRO CODE ASPECTS

- 1 - TRACK
- 2 - YELLOW
- 3 - YELLOW/YELLOW
- 4 - FLASHING YELLOW
- 5 - BLOCK (ANNUNCIATOR)
- 6 - TUMBLE DOWN
- 7 - GREEN
- 8 - TRAFFIC
- 9 - YELLOW/GREEN

ELECTRO CODE 4H

MODULES: 2 EA-218A

1 EA-2R, 2L, 7K, 7L, 214, 215B, 216A, 220A, 220B, 212A, 217A



PROGRAM AHEQ-A5
STRAPS 3,4,5,8 ARE CUT

- CHECKSUMS**
- 1 3236/08DF
 - 2 E34D/E2AB
 - 3 3236/08DF
 - 4 614A/6007

IN CAB TERRITORY
USE PROGRAM AHEQ-C4

~REVISIONS~

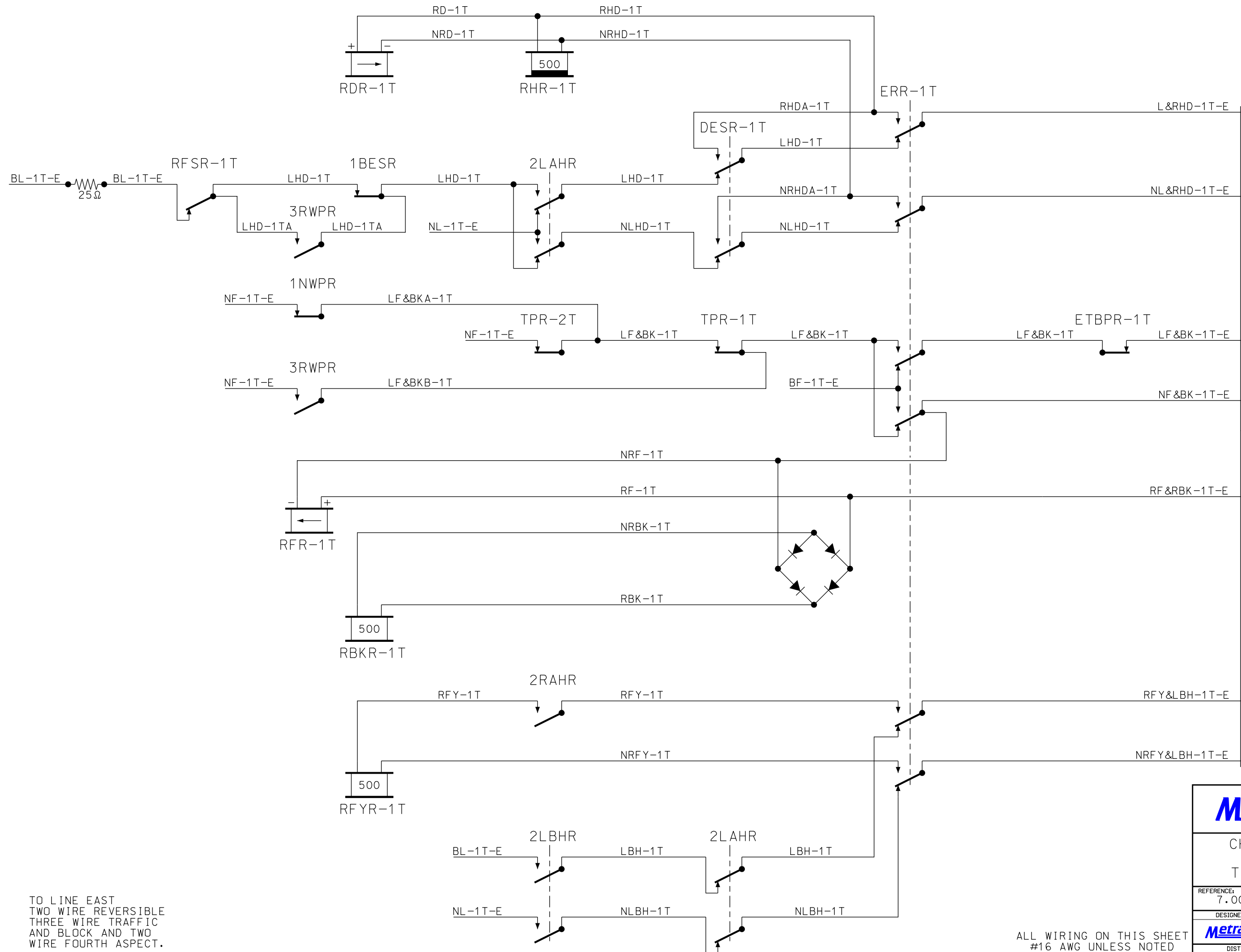
LTK 01/25/13

CAB ASPECTS CODE

- 0-R OR L
- 75-Y OR R/Y
- 120-Y/Y, Y/G OR "FY", R/"FY", OR R/G
- 180-G
- CAB IS CODED 60HZ-AC

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) ELECTRO CODE 4H - TK.2			
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT	PRINT NUMBER		
TYP	7.00 SH.3		



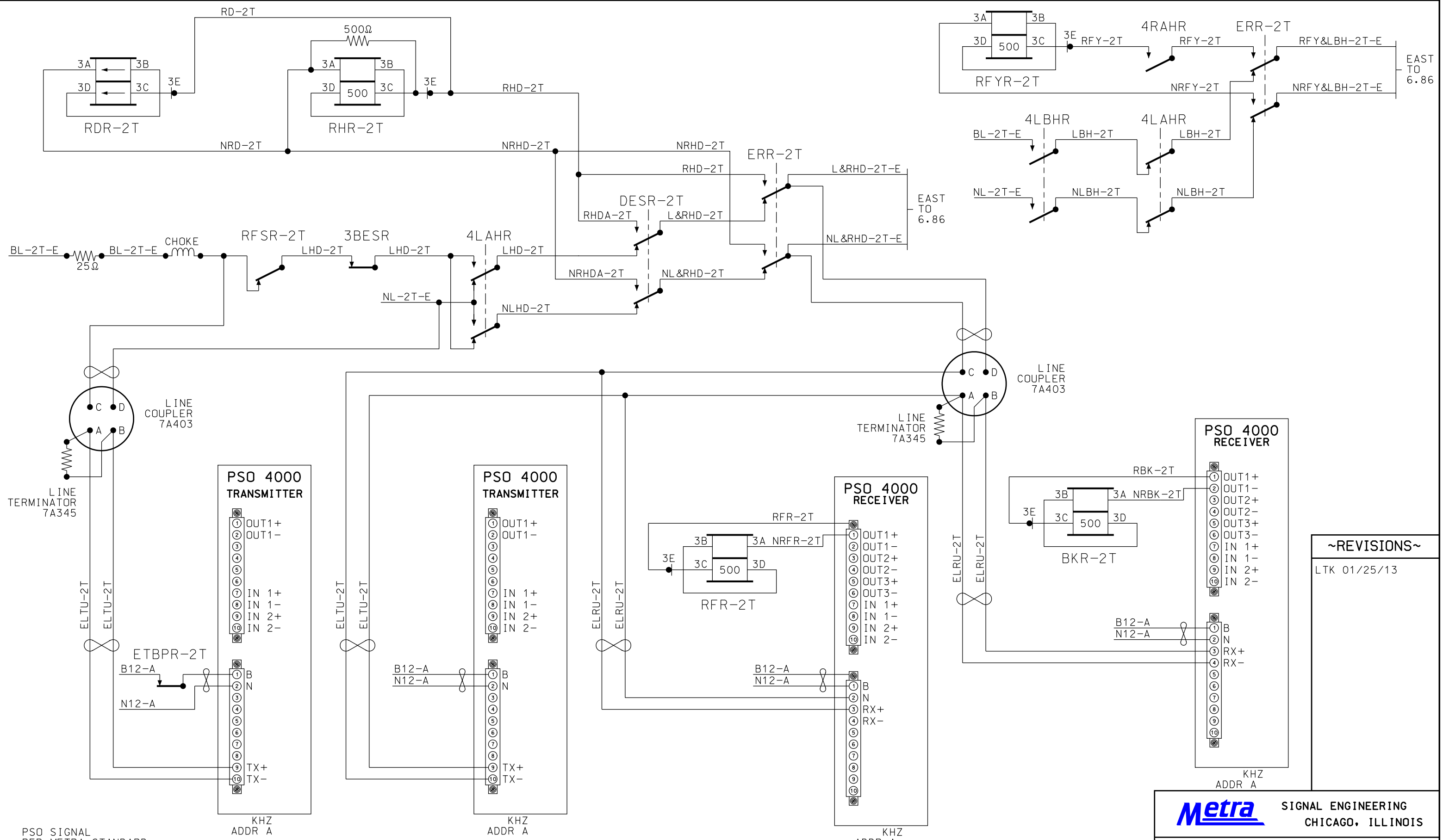
EAST TO 6.86

~REVISIONS~

TO LINE EAST
TWO WIRE REVERSIBLE
THREE WIRE TRAFFIC
AND BLOCK AND TWO
WIRE FOURTH ASPECT.

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) TRAFFIC CIRCUITS - TK.1			
REFERENCE:	7.00 SH.1 THRU SH.75	DATE:	05/13/11
DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra
DISTRICT	PRINT NUMBER		
TYP	7.00 SH.4		



PSO SIGNAL PER METRA STANDARD FREQUENCIES.

TO LINE EAST TWO WIRE REVERSIBLE WITH PSO TRAFFIC & BLOCK AND TWO WIRE FOURTH ASPECT (WHERE REQUIRED)

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

~REVISIONS~

LTK 01/25/13

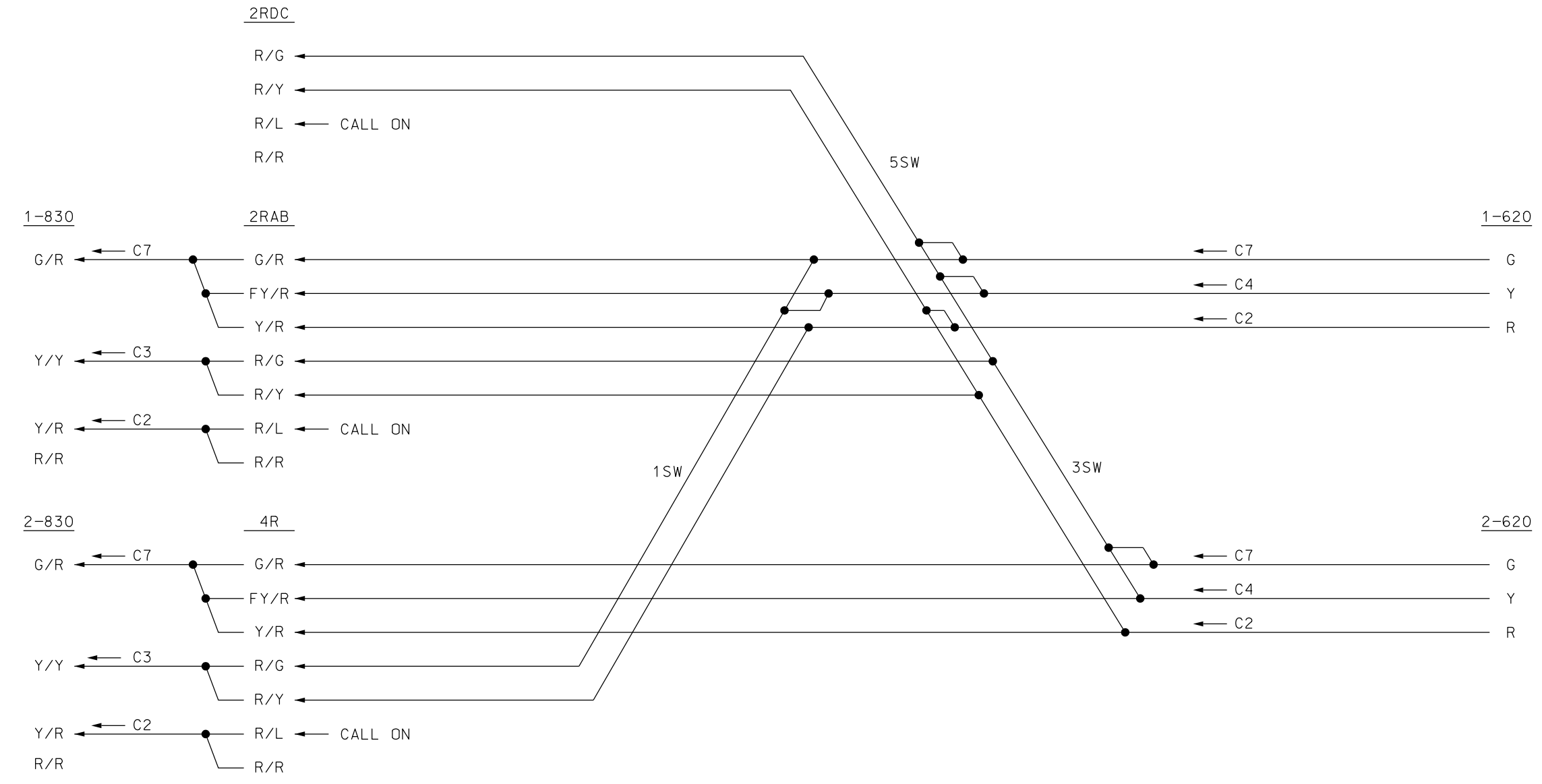
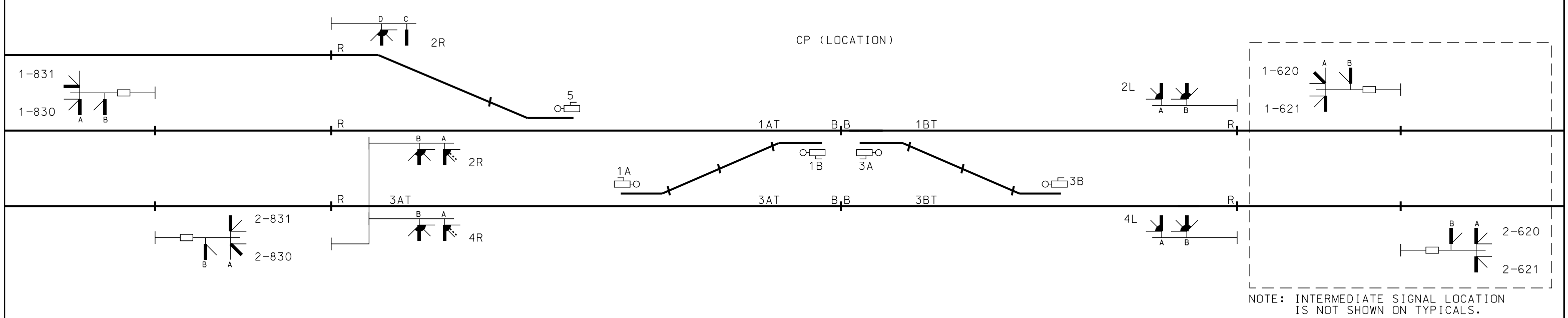
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE) CP (LOCATION) TRAFFIC CIRCUITS-TK.2

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED: Metra	DRAWN: Metra	CHECKED: Metra	APPROVED: Metra
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DISTRICT: TYP	PRINT NUMBER: 7.00 SH.5
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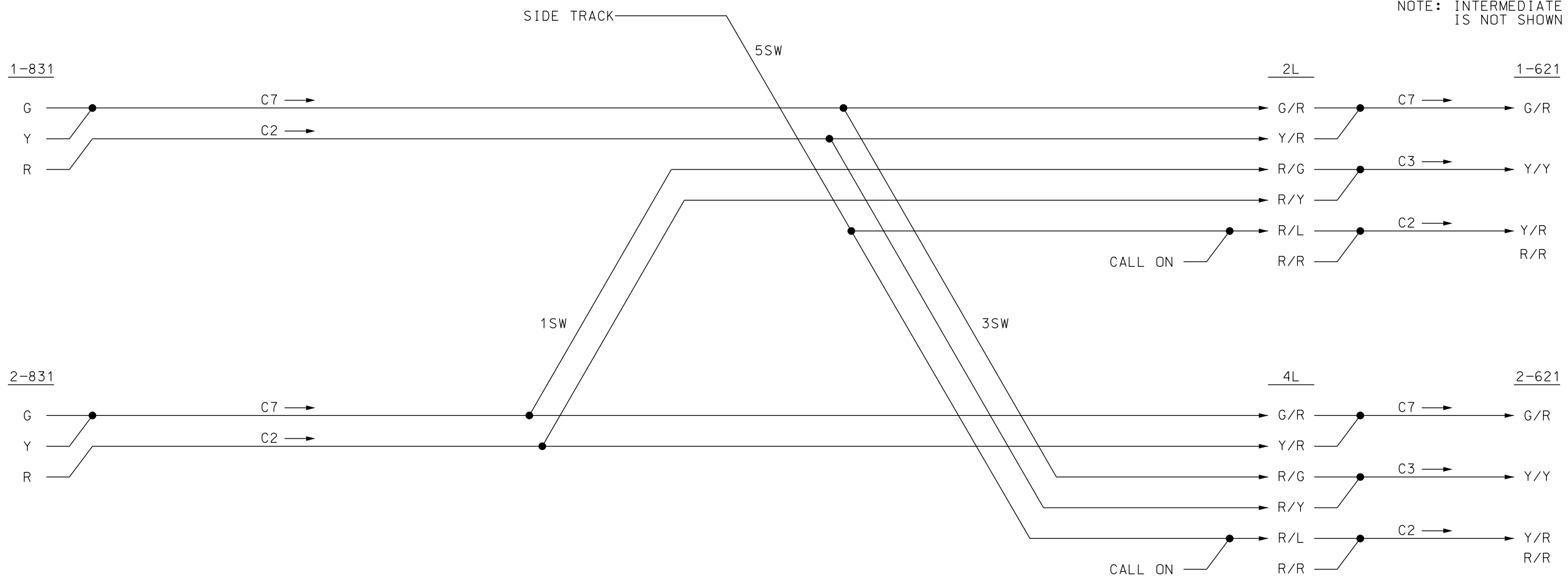
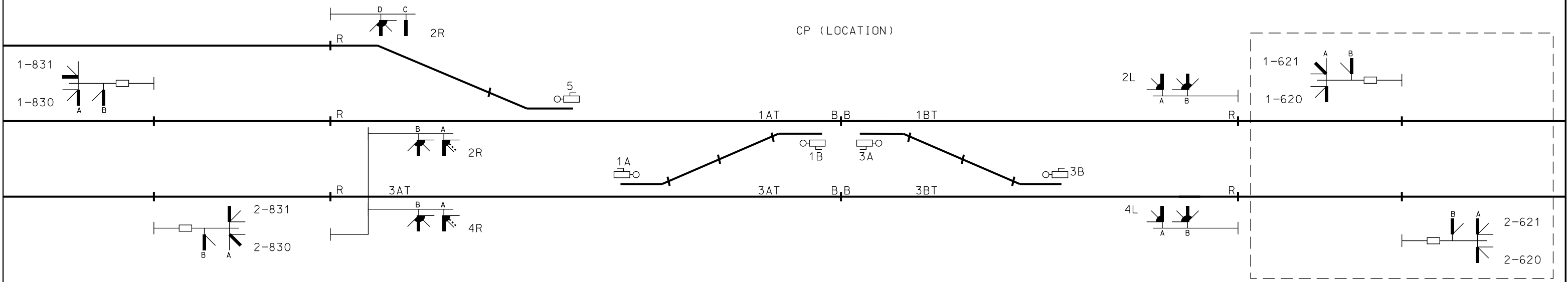


~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
ROUTE & ASPECT EASTWARD

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.6	



~REVISIONS~

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Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
ROUTE & ASPECT WESTWARD

REFERENCE: 7.00 SH.1 THRU SH.75		DATE: 05/13/11	
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.7	

373+73 C.S.

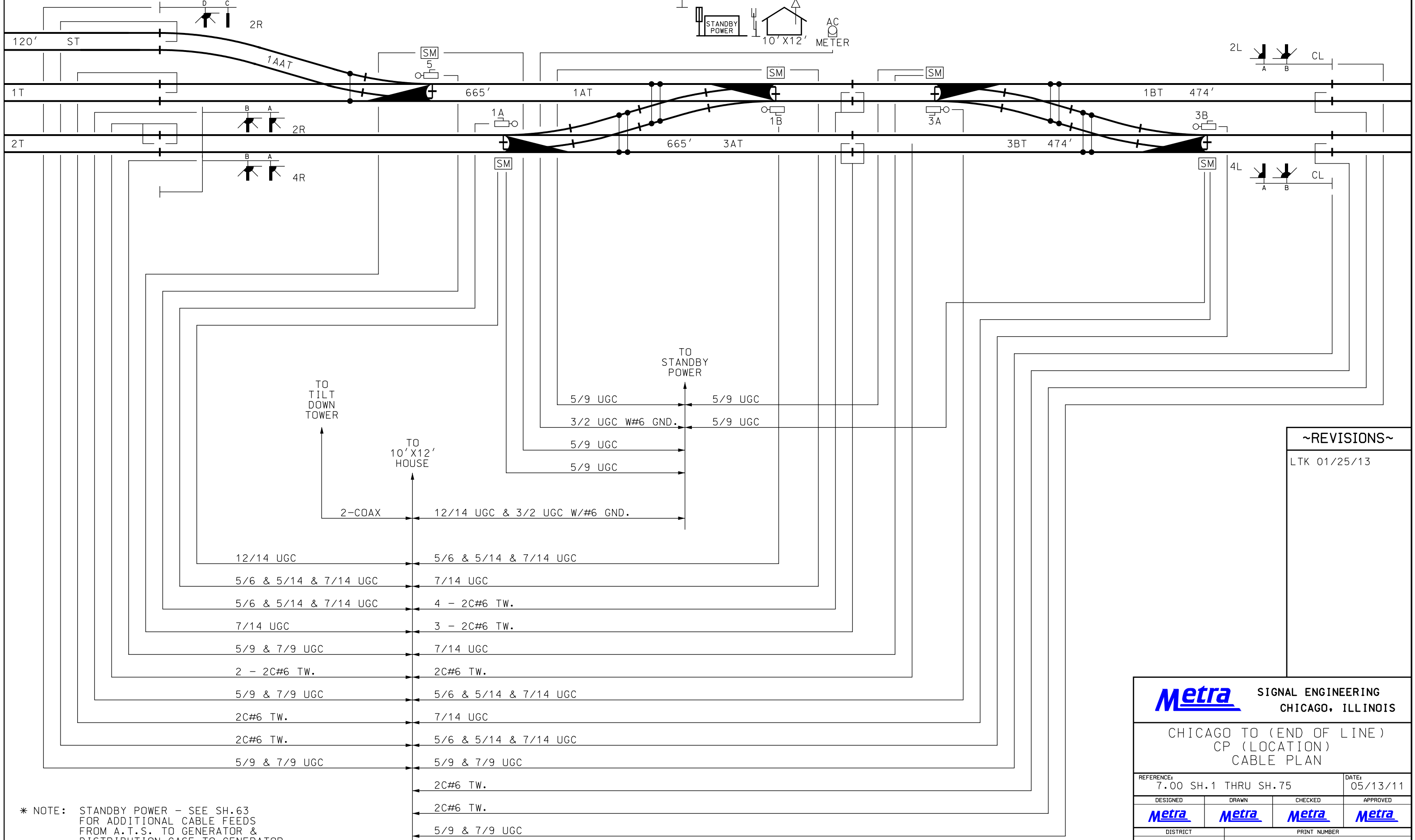
369+60 M.P.

367+08 C.S.

362+34 SIG.

TO (CONTROL POINT WEST)

TO (CONTROL POINT EAST)



~REVISIONS~

LTK 01/25/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
CABLE PLAN

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.8
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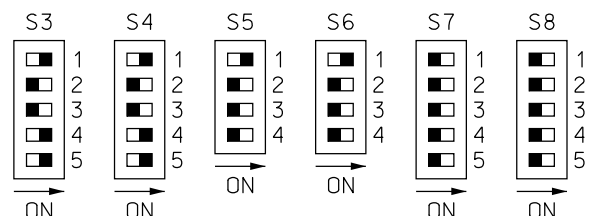
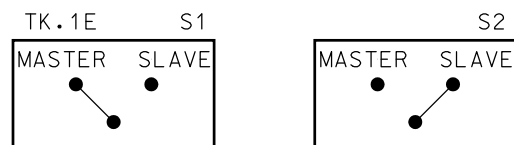
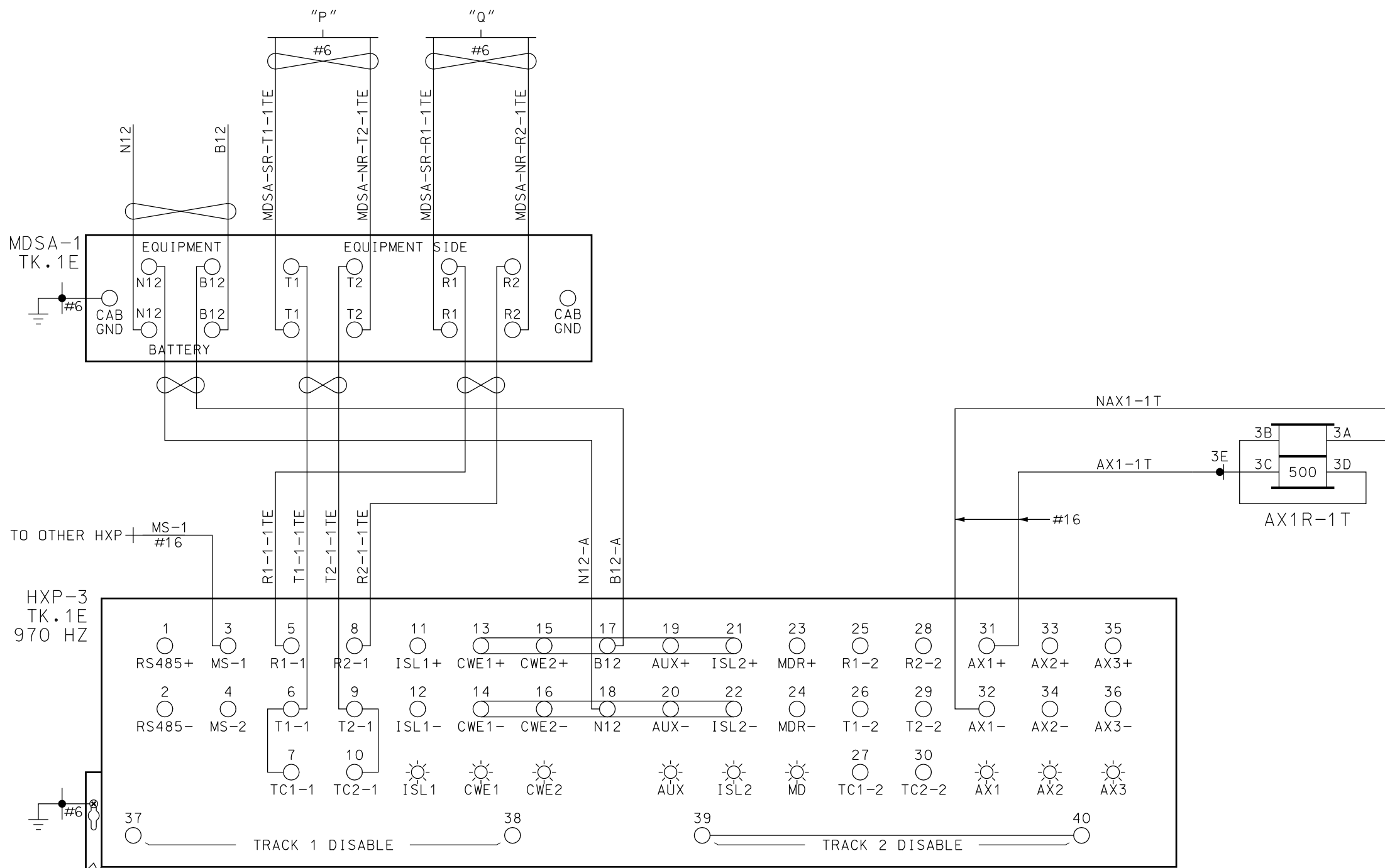
* NOTE: STANDBY POWER - SEE SH.63
FOR ADDITIONAL CABLE FEEDS
FROM A.T.S. TO GENERATOR &
DISTRIBUTION CASE TO GENERATOR.

TK.1 = TK.1E
 TK.2 = DISABLED

ADJUST SEL
 APPROACH LENGTH:
 TK.1 - 700'
 WARNING TIME:
 TK.1 - 27 SEC.
 MD RESTART:
 TK.1 - 0

- OPTIONS
- TK-ENA:
TK.1 - UP
TK.2 - dn
 - TK FO
TK.1 - STRAP
 - CW/MD
TK.1 - C
 - UNI-BI
TK.1 - b
 - CWEWT
TK.1 - 80
 - LOS
TK.1 - 16
 - IJ-LOS
TK.1 - 5
 - AX 1
TK-ASN - 1T
OF-TK1 - 665'
WT - 27
MD-RST -
CW/MD - C
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn
 - AX 2
TK-ASN - NA
OF-TK1 - NA
WT -
MD-RST -
CW/MD -
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn
 - AX 3
TK-ASN - NA
OF-TK1 - NA
WT -
MD-RST -
CW/MD -
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn

- MDR-AX - n
- MD-TMR
TK.1 - 10
- MIN-WT - 0
- FS-DET - 0
- POS-ST - 0
- ATO-RX - dn
- PF-ENA - UP



HXP-3 MODULE SETUP

RMM MODULE *	SIM MODULE	TRM MODULE	RSI MODULE	RYD MODULE	TRM MODULE	RSI MODULE	CPU MODULE	AXD MODULE
--------------	------------	------------	------------	------------	------------	------------	------------	------------

RSI MODULE SLOT 4 & 7
 FREQ. 8.0 KHZ
 LOS JUMPER = 0
 FAULT JUMPER = 0
 * FIRST SLOT AT LEFT END OF BAY

~REVISIONS~

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 CP (LOCATION)
 HXP-3 TK.1

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.9	

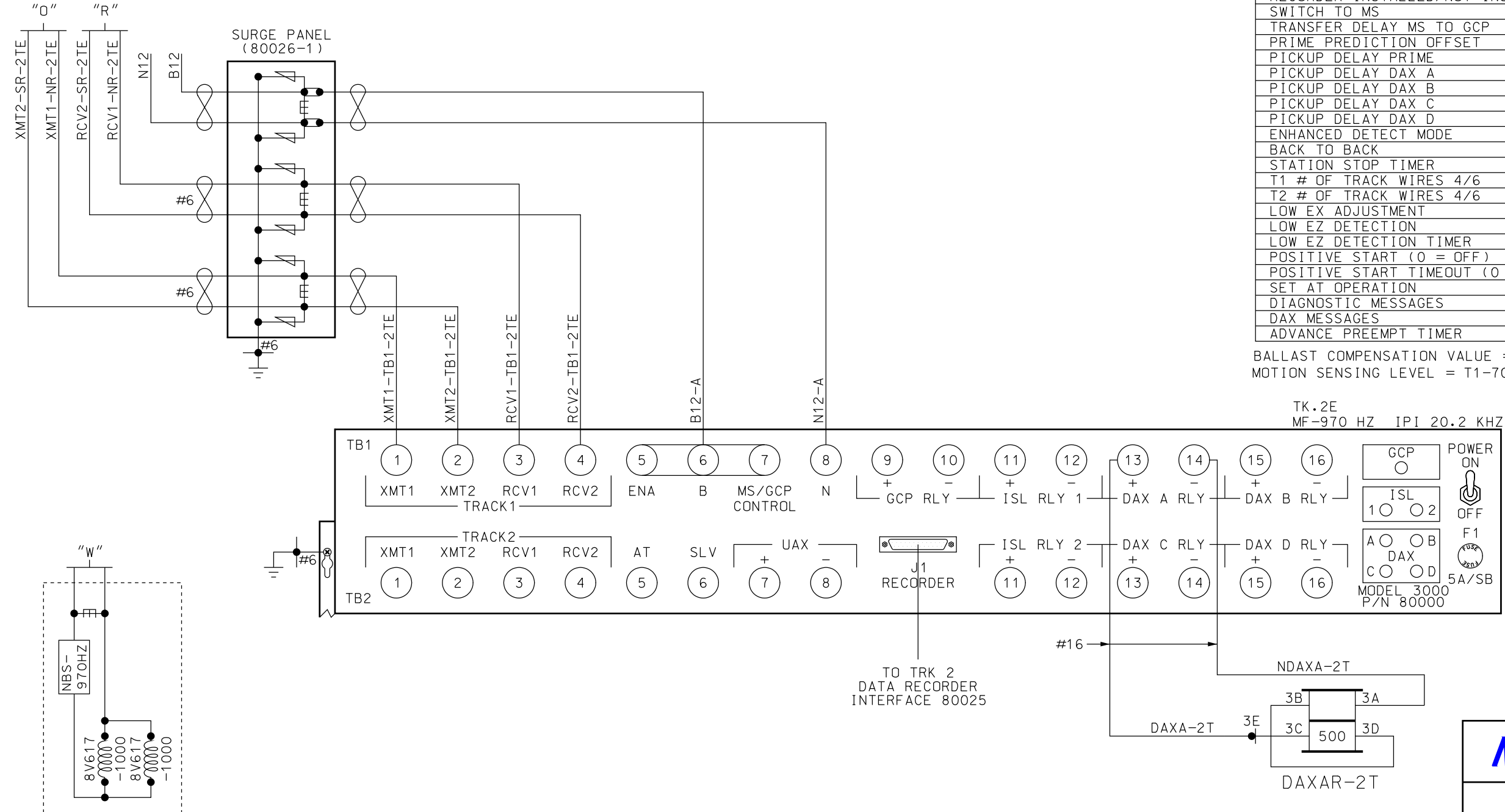
ALL WIRING ON THIS SHEET
 TO BE #10 AWG UNLESS NOTED

MODEL GCP 3000 MODULE ASSEMBLIES							
80011	ISLAND 1						
*	EMPTY SLOT						
80012	TRANSCEIVER 1						
80012	TRANSCEIVER 2						
80013	RELAY DRIVE						
80214	PROCESSOR						
80015	REC. MODULE						
80016	(1) DAX						
80016	(2) DAX						
80020/80019	INTERFACE						

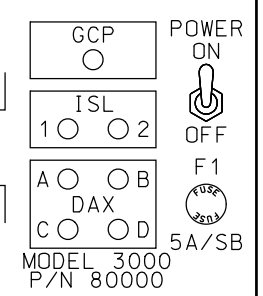
* FIRST SLOT AT LEFT END OF BAY

TK.2E GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS			
NUMBER OF TRACKS	1		
FREQUENCY	T1: 970 HZ	T2:	HZ
UNIDIRECTIONAL/BIDIRECTIONAL	T1: BI	T2:	BI
XMIT LEVEL - MED/HI	T1: MED	T2:	MED
PREDICTOR/MOTION SENSOR	T1: GCP	T2:	GCP
WARNING TIME SELECTED	T1: 27 SEC	T2:	SEC
APPROACH DISTANCE	T1: 487 FT	T2:	FT
UAX PICKUP DELAY (UAX1)	SEC.		
ENA/UAX2 DELAY	SEC.		
ISLAND DISTANCE	T1: 50 FT	T2:	
NUMBER OF DAX'S	1		
DAX A	TRK/DIST/WARNING TIME	1	665 FT 27 SEC.
DAX B	TRK/DIST/WARNING TIME		FT SEC.
DAX C	TRK/DIST/WARNING TIME		FT SEC.
DAX D	TRK/DIST/WARNING TIME		FT SEC.
SLAVING MASTER/SLAVE	MASTER		
PASSWORD DISABLED/ENABLED	DISABLED		
RECORDER INSTALLED/NOT INSTALLED	NOT INSTALLED		
SWITCH TO MS	T1: EZ	T2:	EZ
TRANSFER DELAY MS TO GCP	T1: SEC.	T2:	SEC.
PRIME PREDICTION OFFSET	T1: FT	T2:	FT
PICKUP DELAY PRIME	SEC.		
PICKUP DELAY DAX A	SEC.		
PICKUP DELAY DAX B	SEC.		
PICKUP DELAY DAX C	SEC.		
PICKUP DELAY DAX D	SEC.		
ENHANCED DETECT MODE	OFF		
BACK TO BACK	OFF		
STATION STOP TIMER	10 SEC.		
T1 # OF TRACK WIRES 4/6	4		
T2 # OF TRACK WIRES 4/6			
LOW EX ADJUSTMENT	0		
LOW EZ DETECTION	T1:	T2:	
LOW EZ DETECTION TIMER	T1: MIN.	T2:	MIN.
POSITIVE START (0 = OFF)	T1: EZ	T2:	EZ
POSITIVE START TIMEOUT (0 = NONE)	T1: MIN.	T2:	MIN.
SET AT OPERATION	NORMAL		
DIAGNOSTIC MESSAGES			
DAX MESSAGES			
ADVANCE PREEMPT TIMER	SEC.		

BALLAST COMPENSATION VALUE = 1300
MOTION SENSING LEVEL = T1-70%



TK.2E
MF-970 HZ IPI 20.2 KHZ



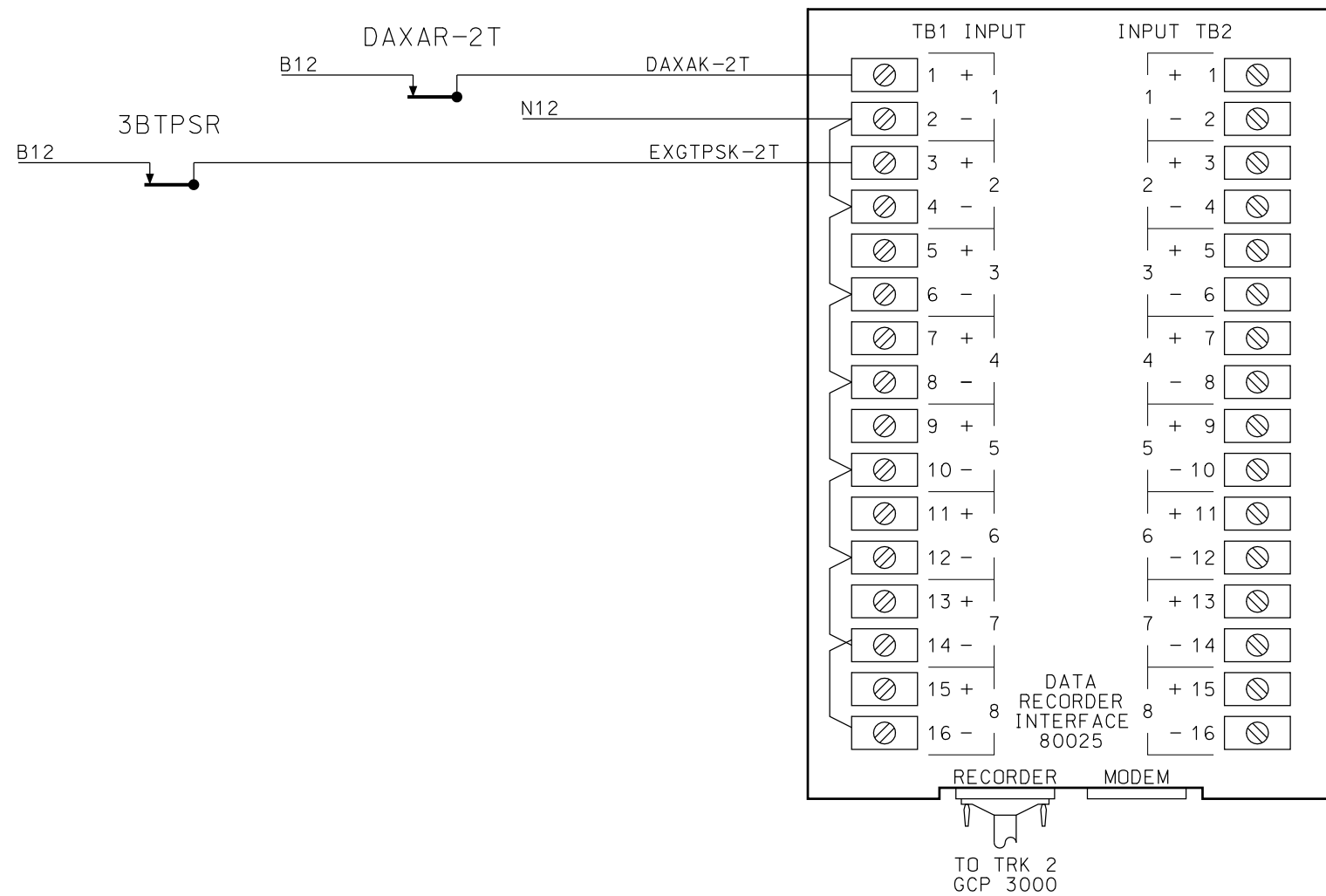
~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
GCP 3000 TK.2

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.10

1 - 80025 DATA RECORDER INTERFACE UNIT



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

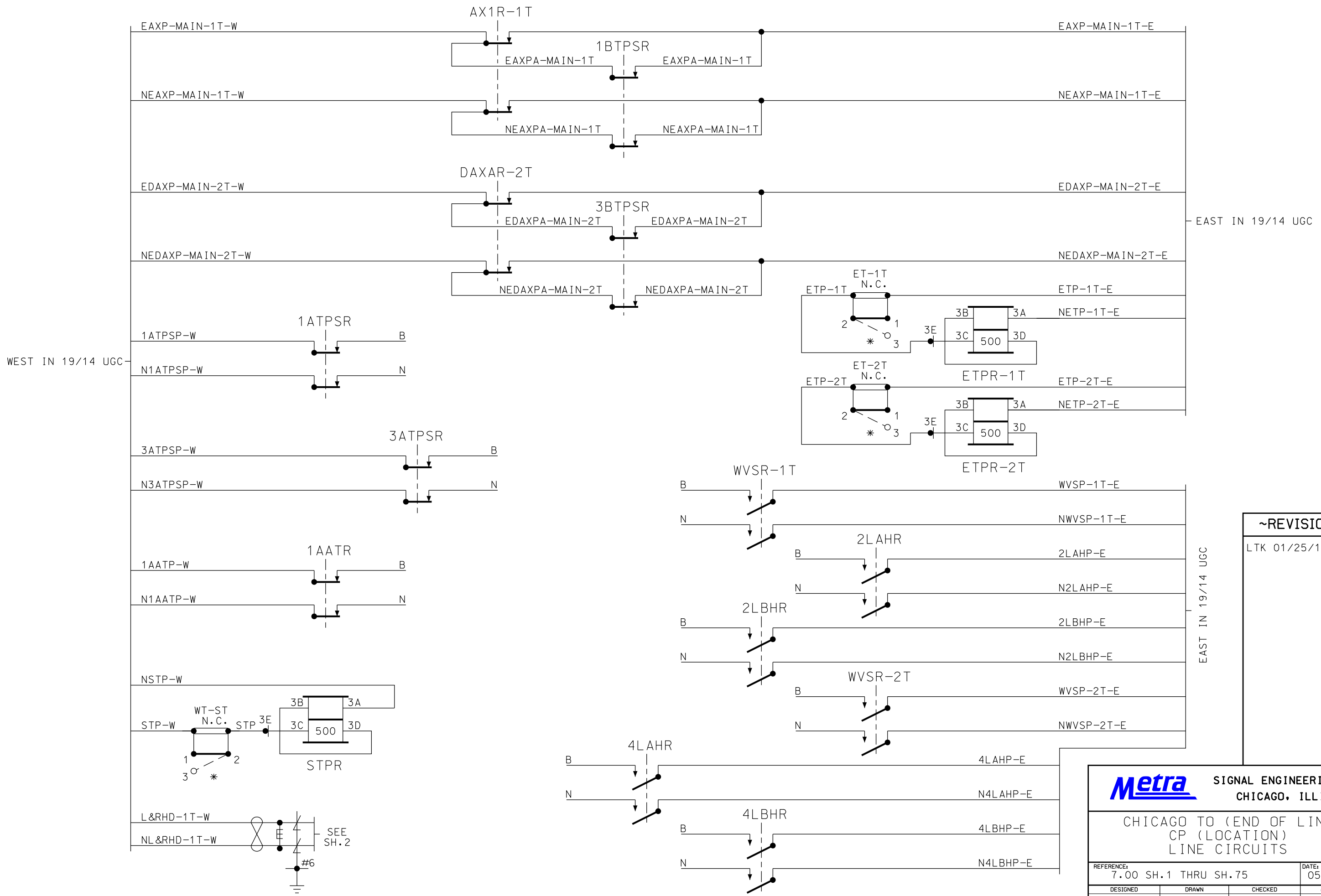
CHICAGO TO (END OF LINE)
CP (LOCATION)
80025 RECORDER

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.11
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



* SWITCH LOCATED ON MAINTAINER TEST PANEL (N.C.)

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

~REVISIONS~

LTK 01/25/13

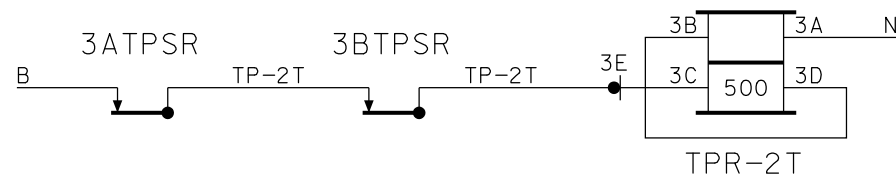
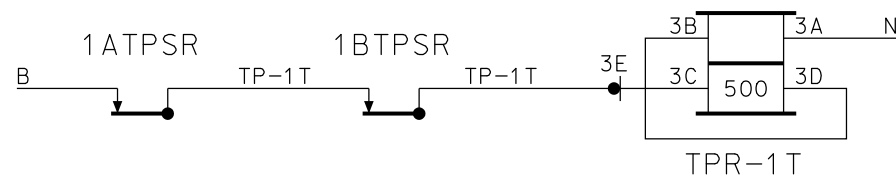
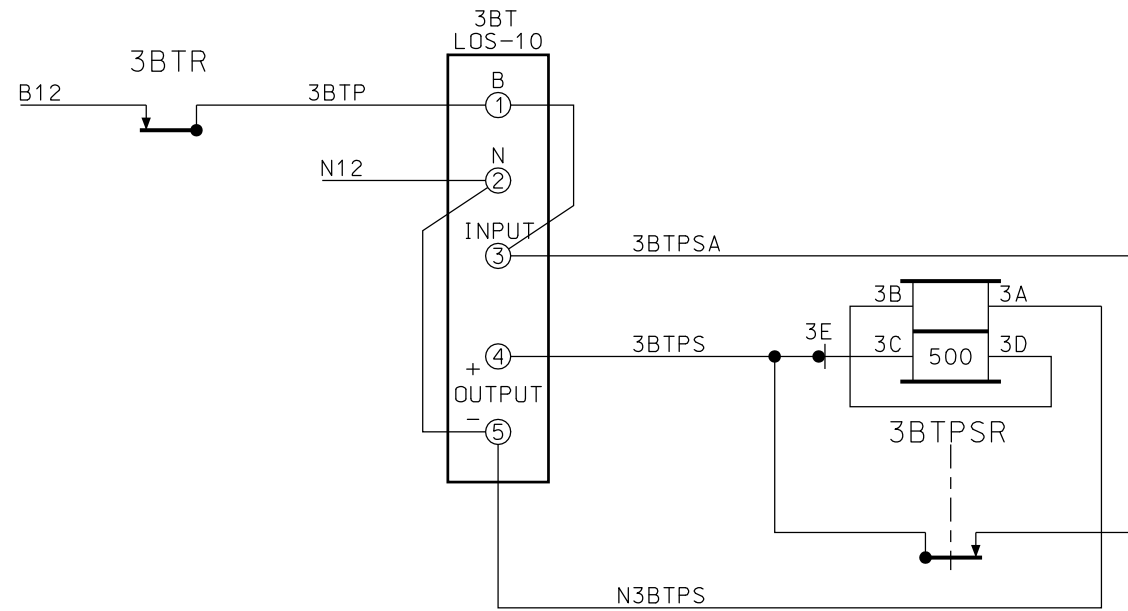
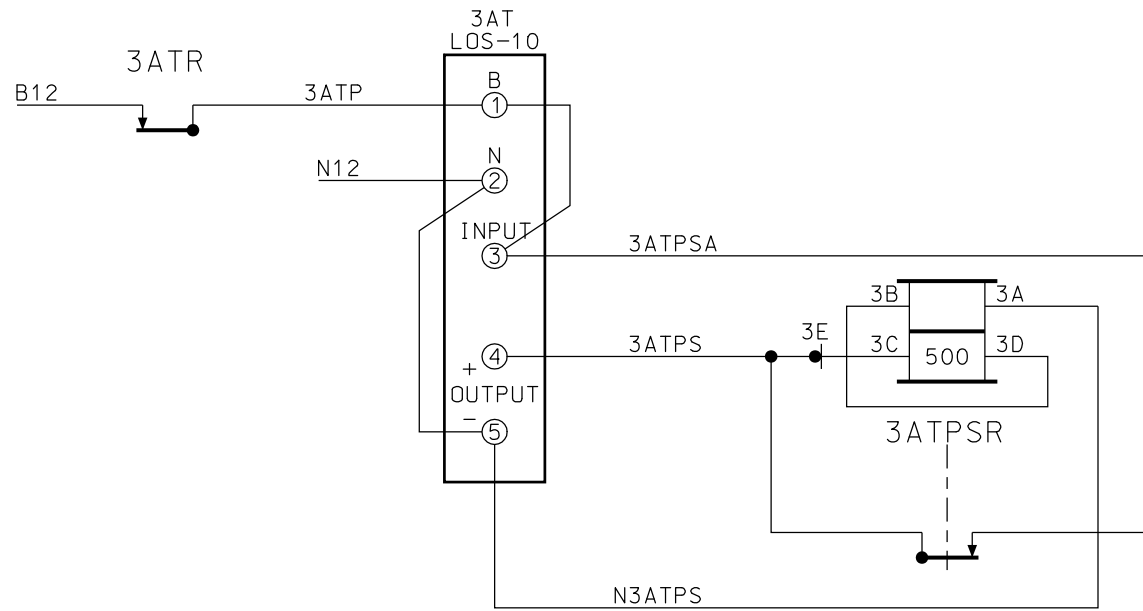
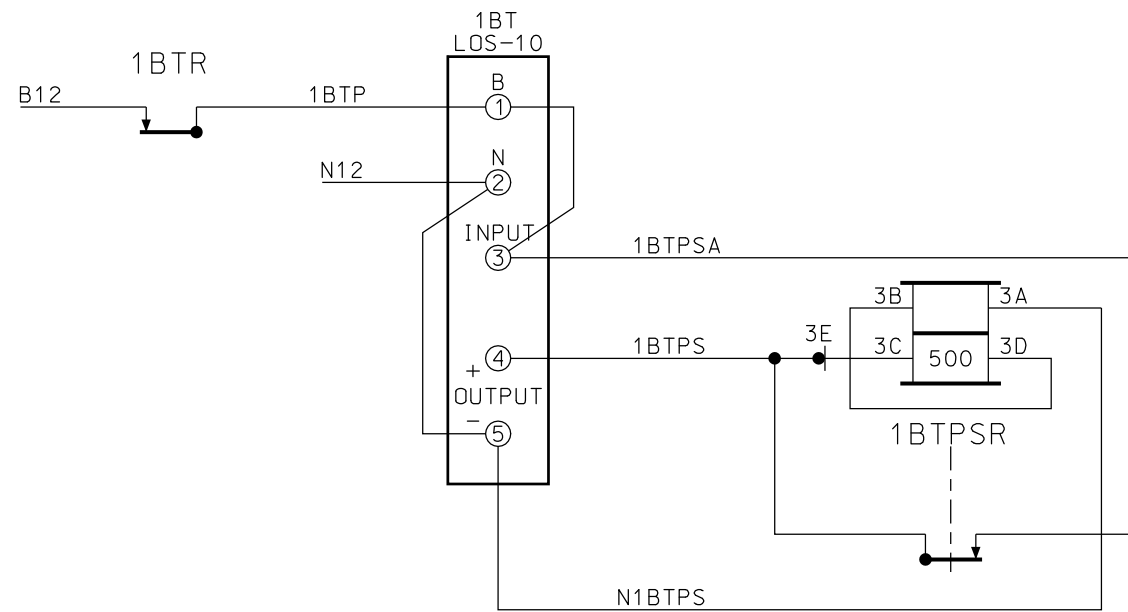
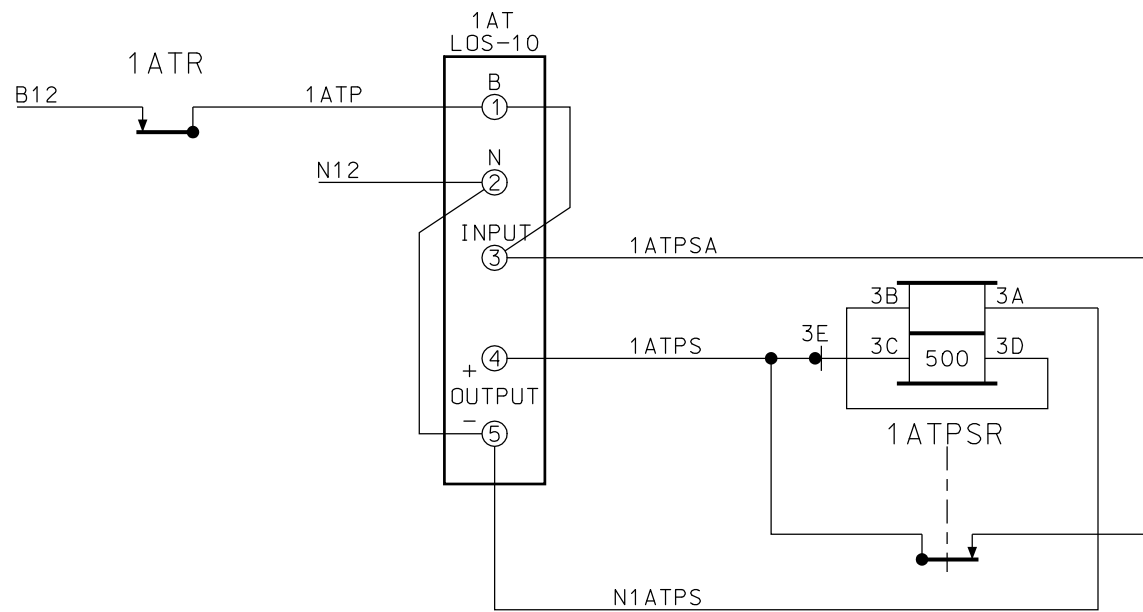
Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE) CP (LOCATION) LINE CIRCUITS

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.00 SH.12



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

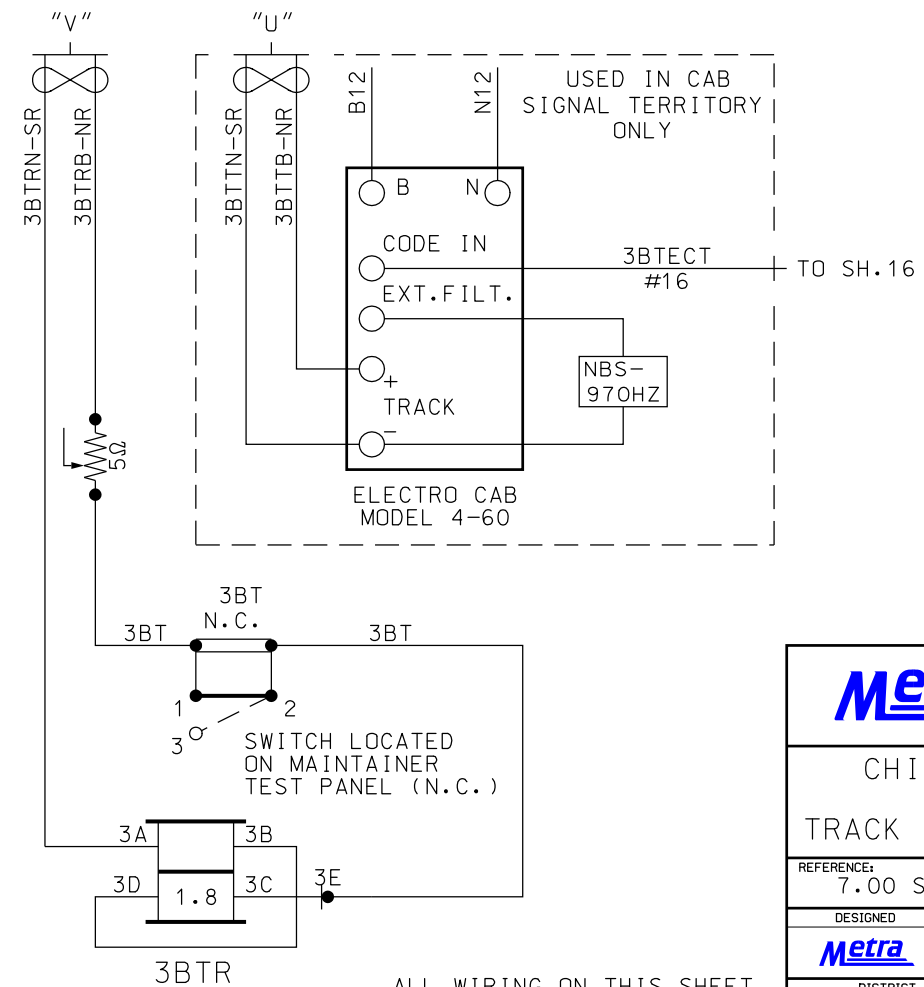
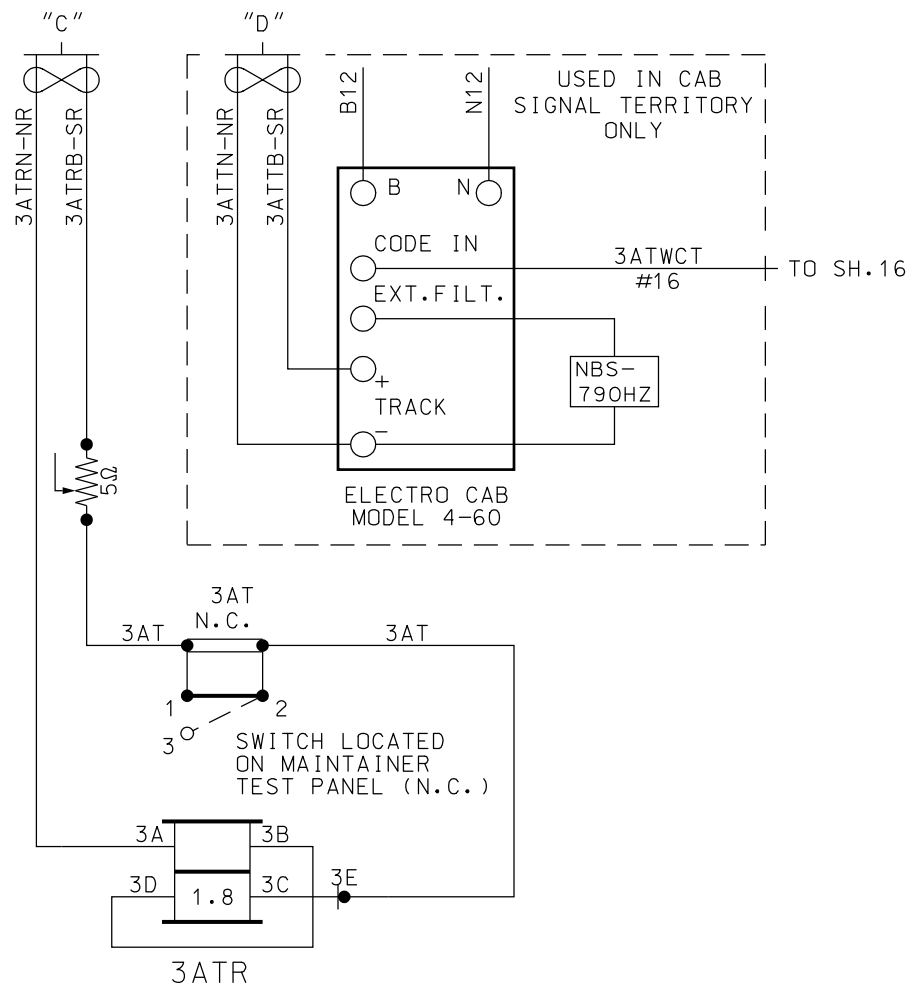
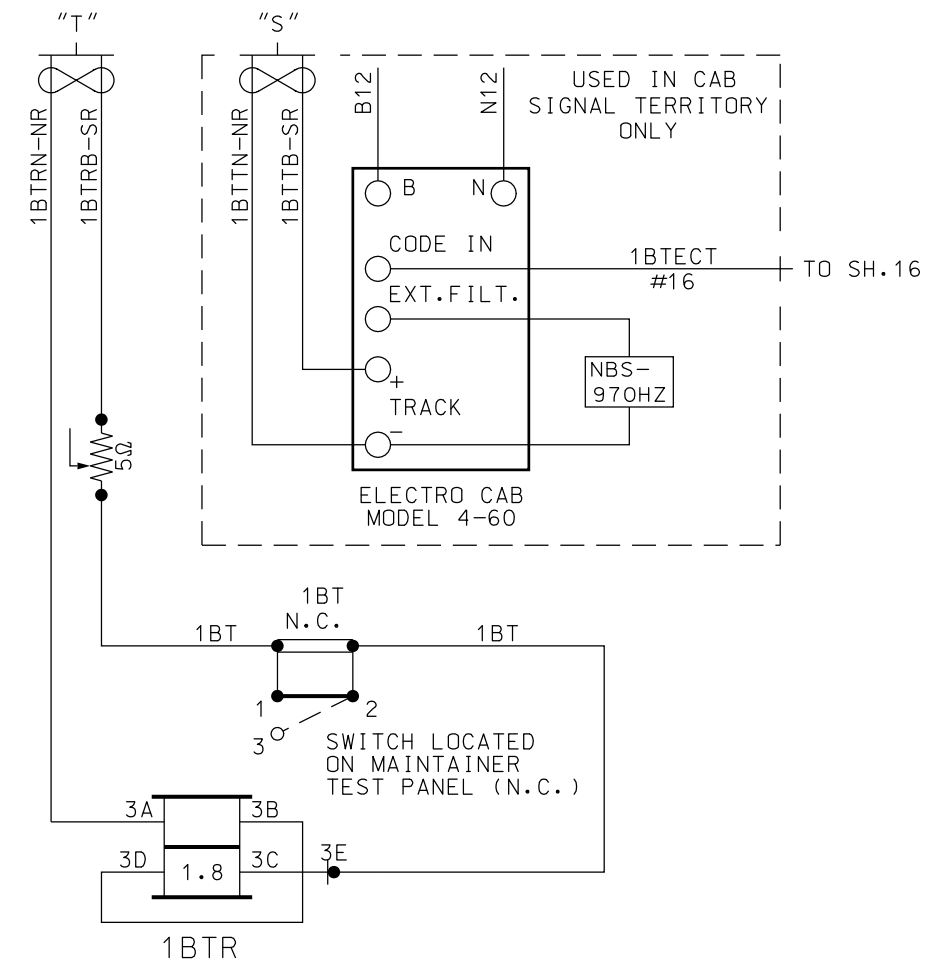
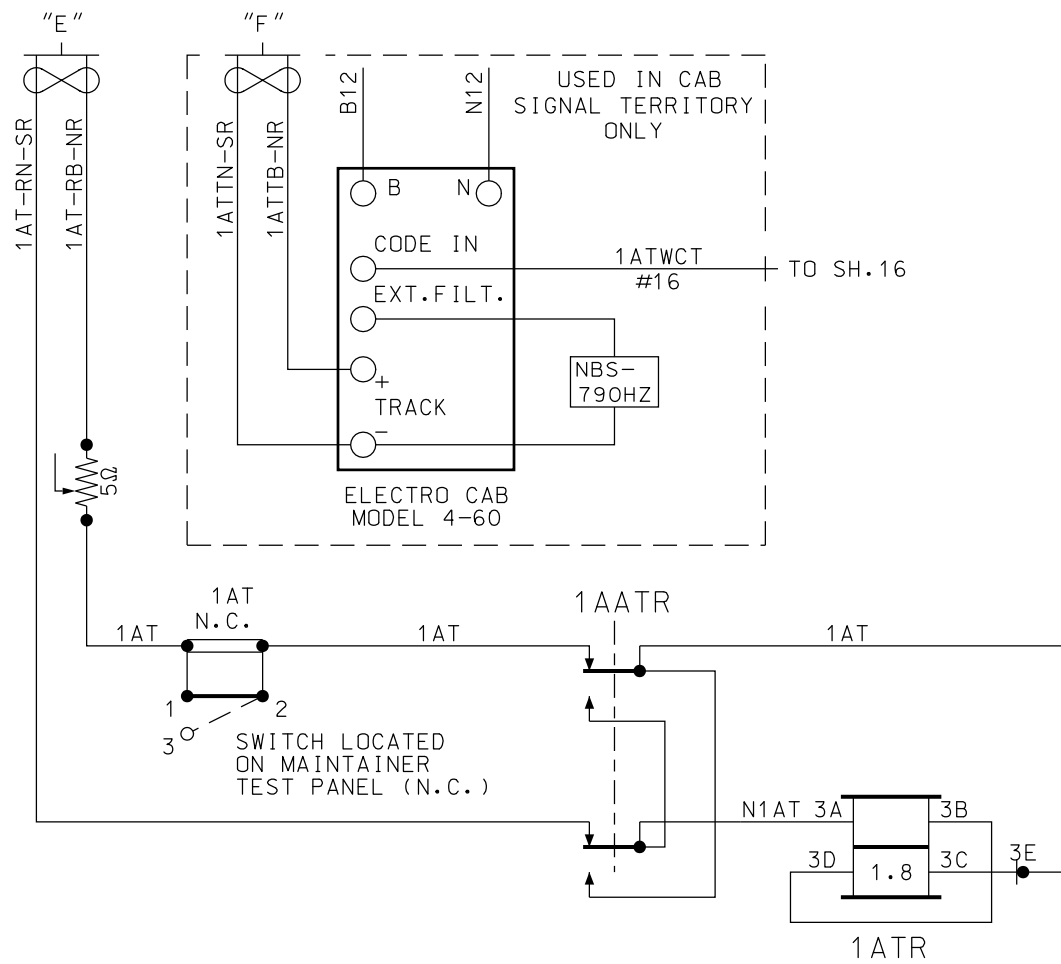
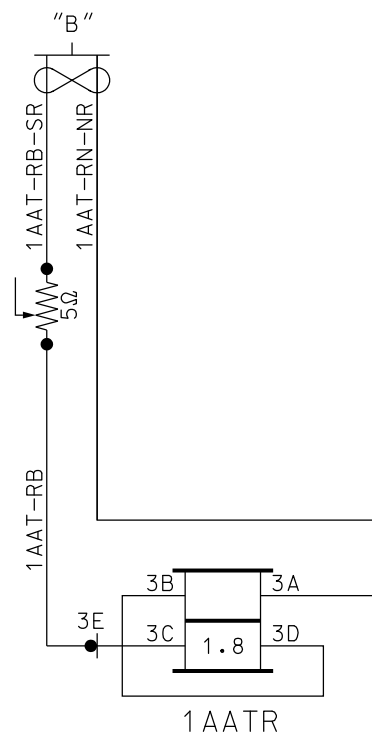
CHICAGO TO (END OF LINE)
CP (LOCATION)
LOSS OF SHUNT & REPEATERS

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.13
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

~REVISIONS~

Metra

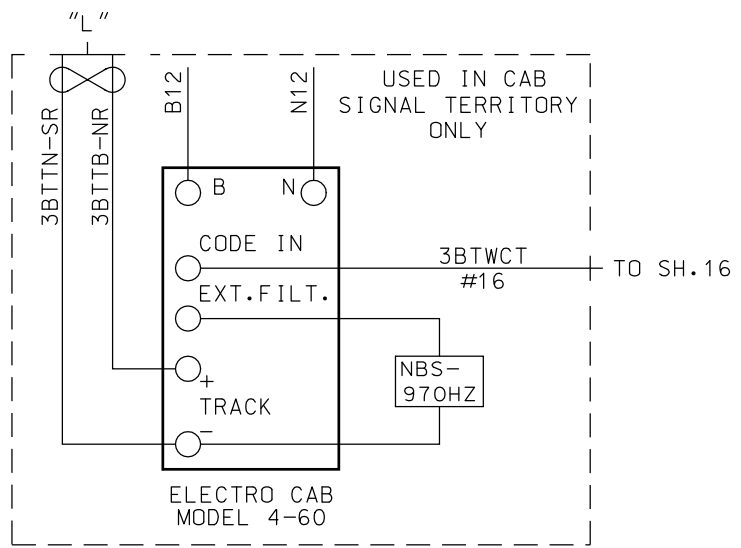
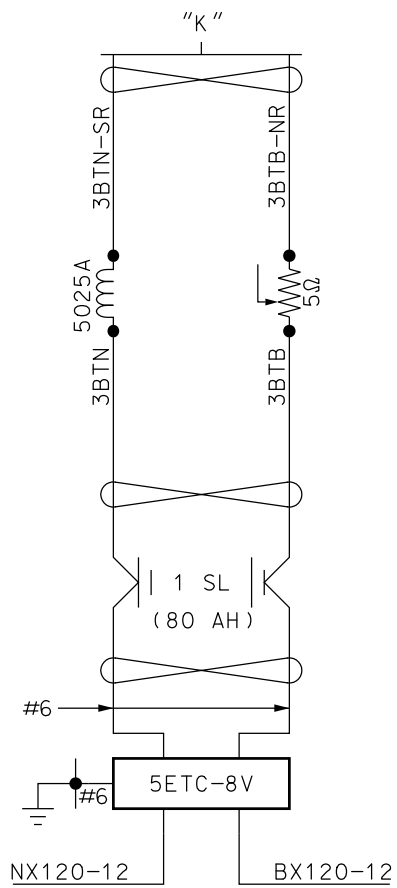
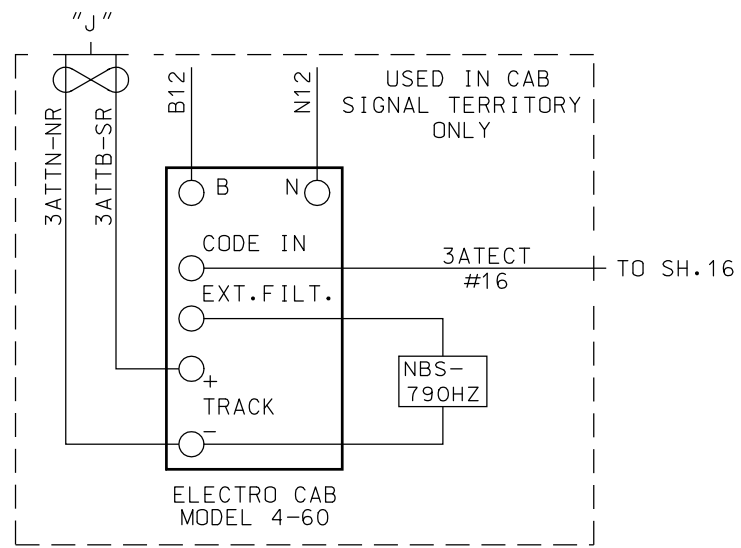
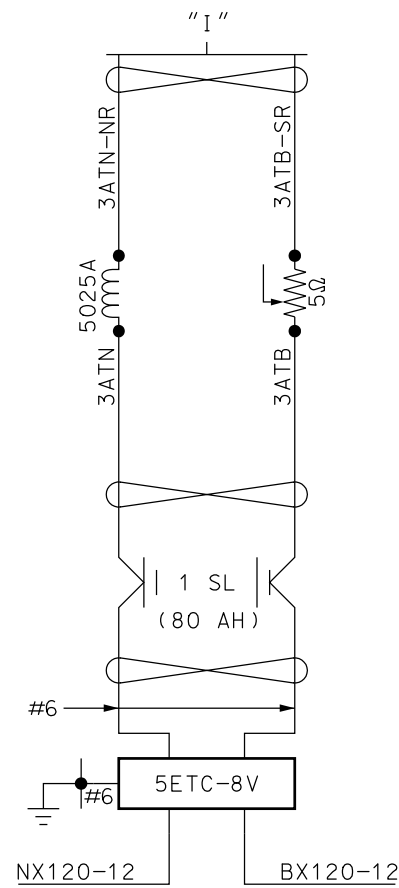
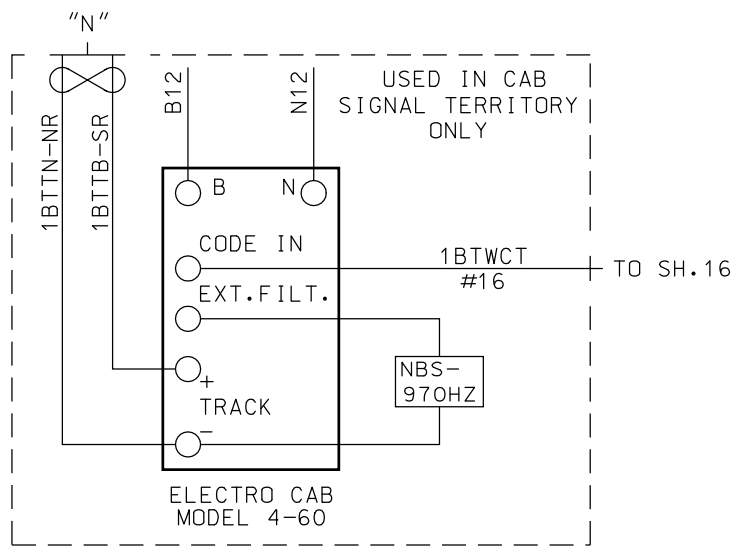
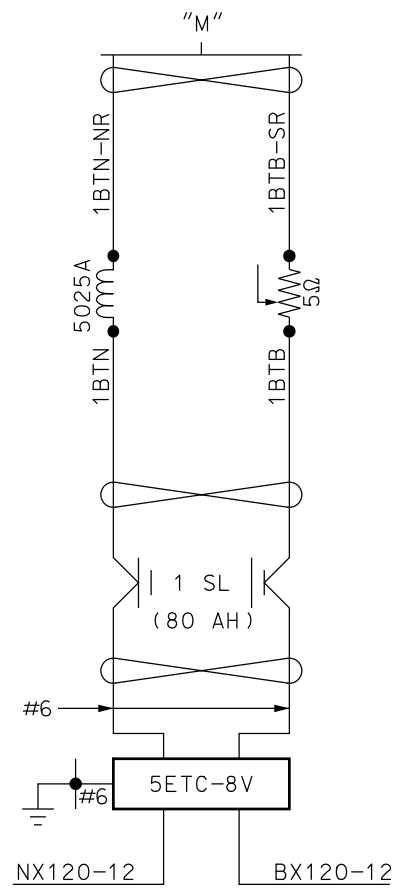
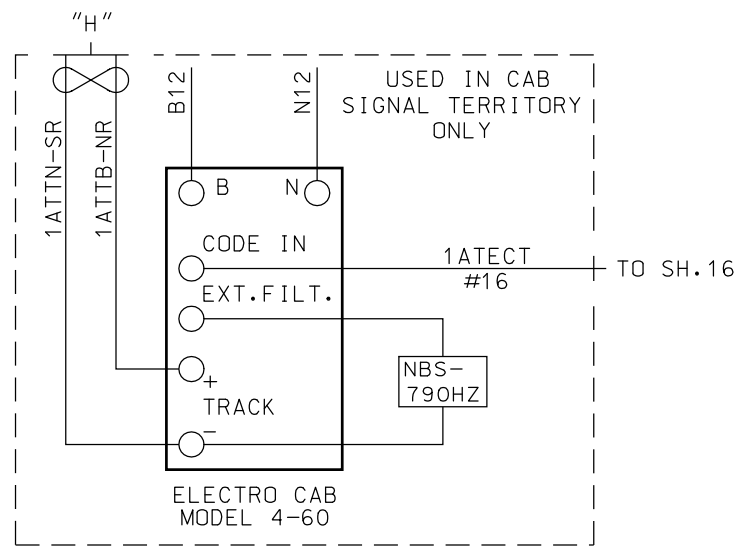
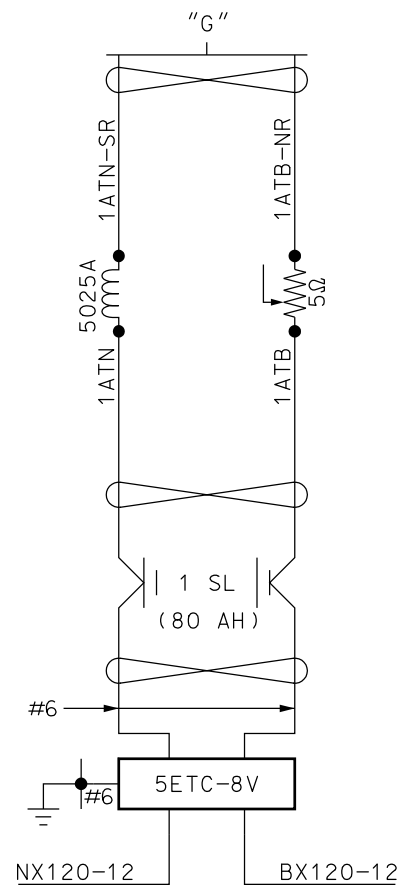
SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
TRACK RELAYS AND CAB CIRCUITS

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.14
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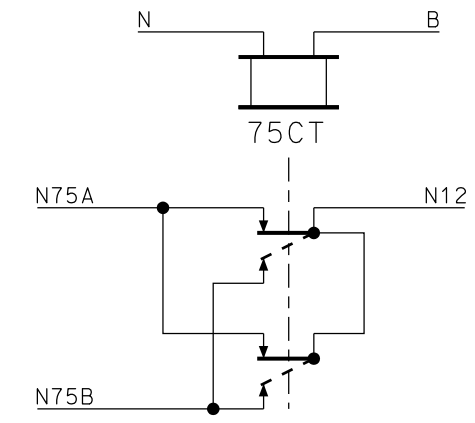
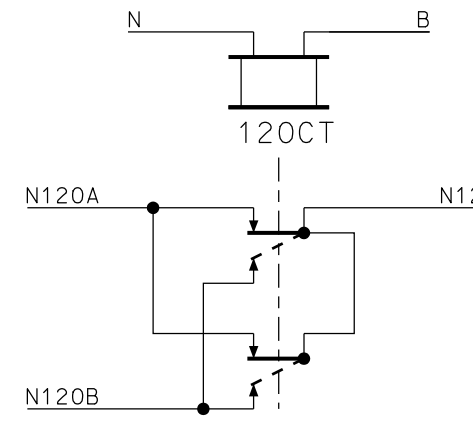
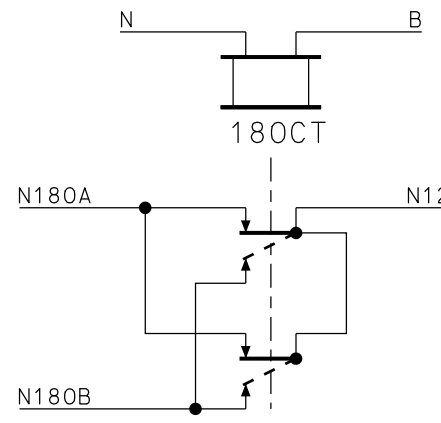


~REVISIONS~	
LTK 03/22/13	

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) TRACK BATTERY & CAB CIRCUITS			
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.15	

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

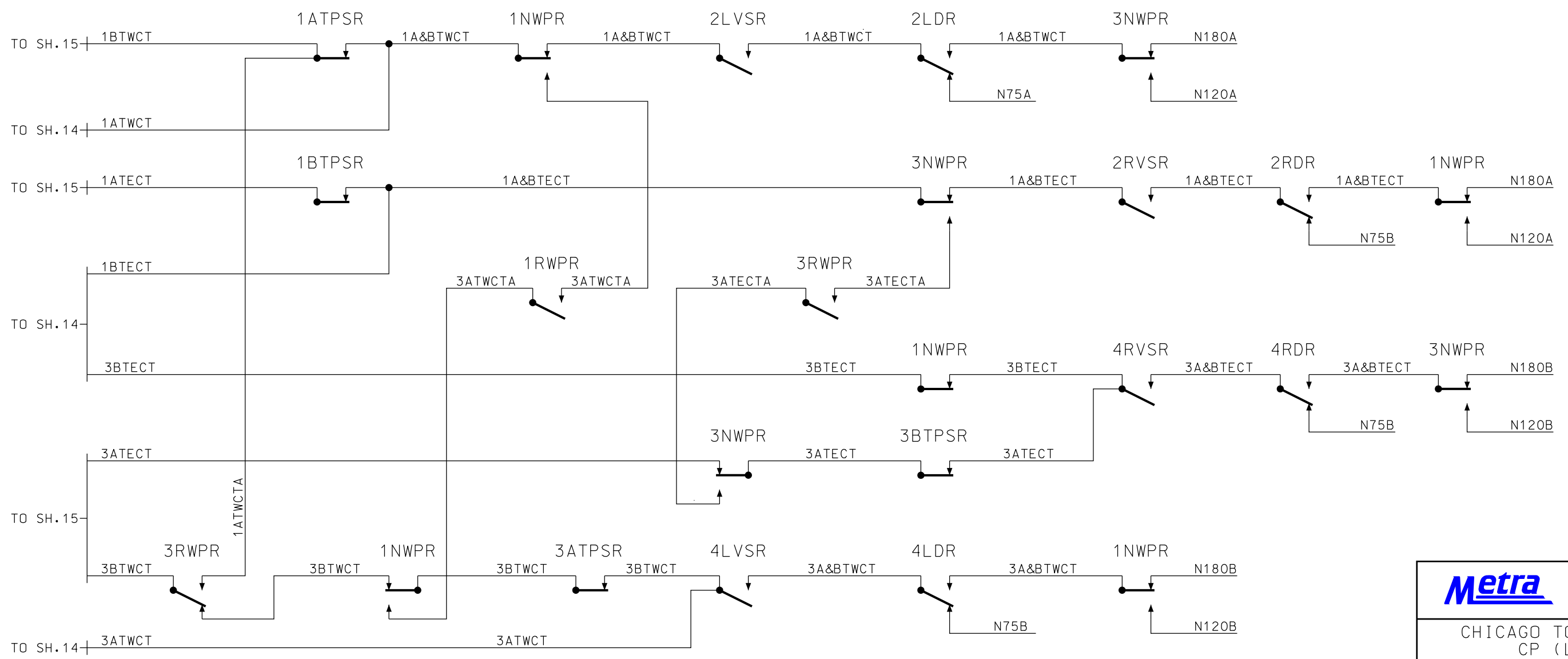
IF CAB IS NOT USED,
RECTIFIER & BATTERY
SHALL BE SHOWN WITH
POWER DISTRIBUTION.



USED IN CAB SIGNAL TERRITORY ONLY

WAYSIDE & CAB ASPECTS FOR REFERENCE			
HOME	CAB	APPROACH	CAB
G/R	180	G/R	180
FY/R	120	G/R	180
Y/R	75	FY/R	120
*	120	Y/G	120
R/G	120	Y/Y	120
R/FY	120	Y/Y	120
R/Y	75	Y/Y	120
R/L	0	Y/R	75
R/R	0	Y/R	75

* USED ONLY WITH 3 ARM SIGNALS



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

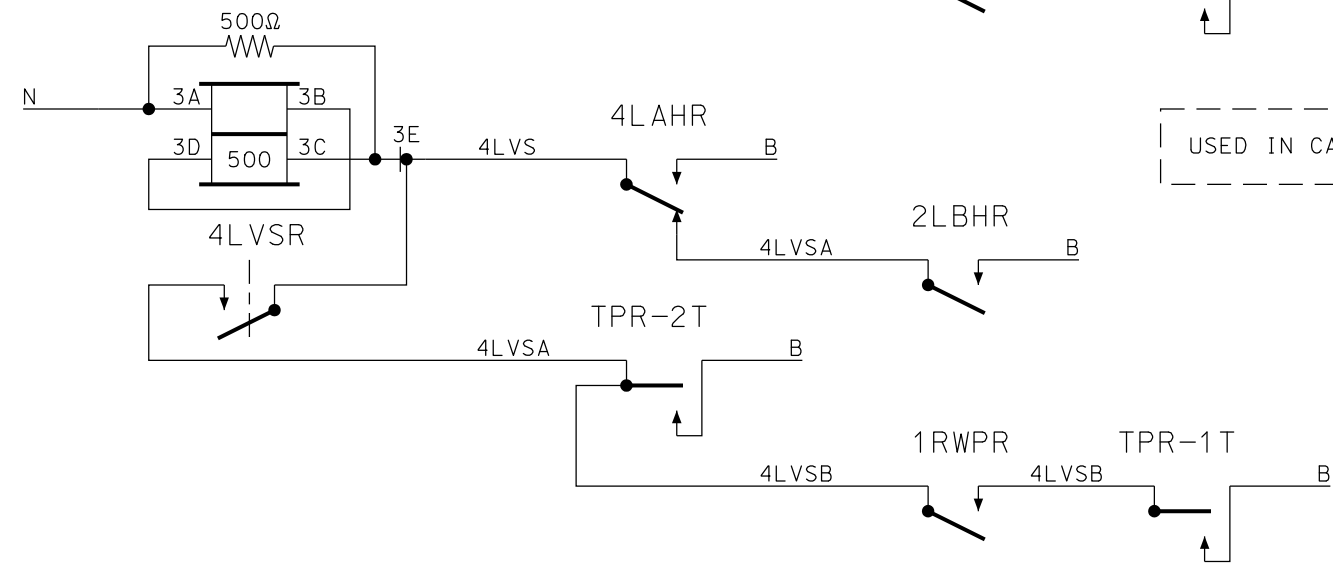
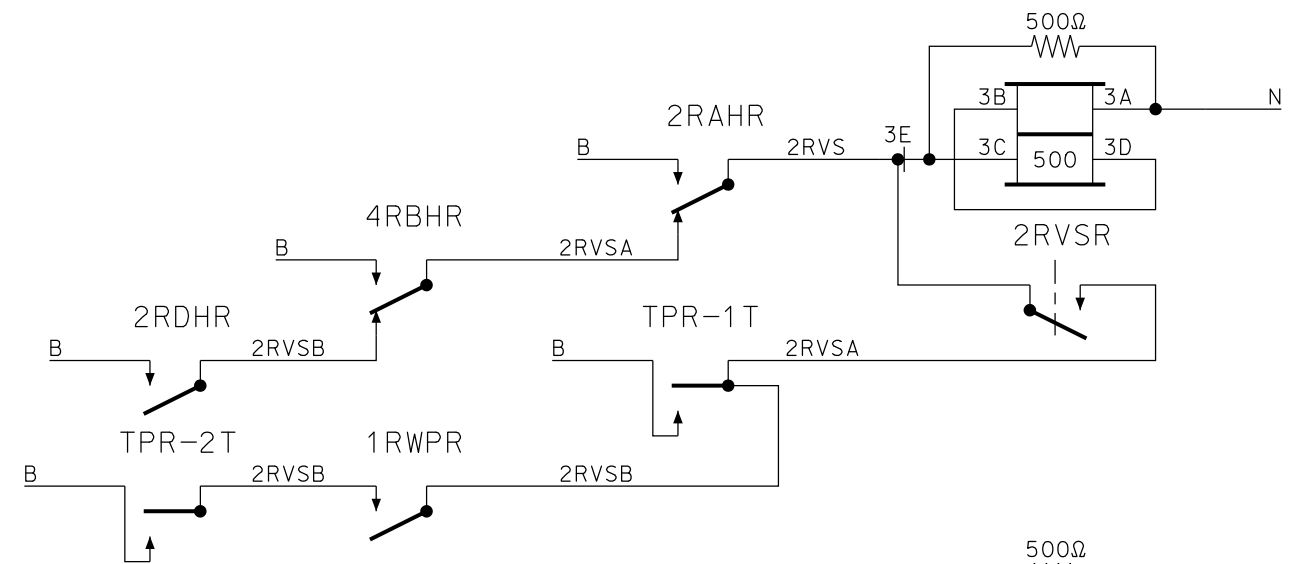
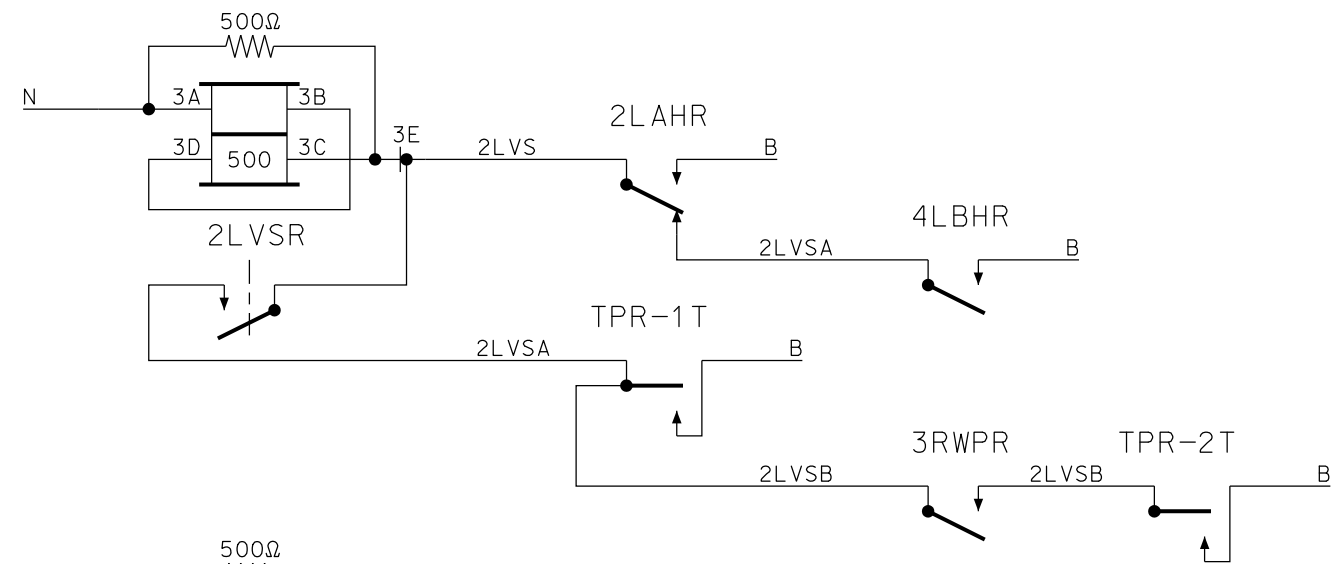
CHICAGO TO (END OF LINE)
CP (LOCATION)
CAB CONTROL CIRCUITS

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

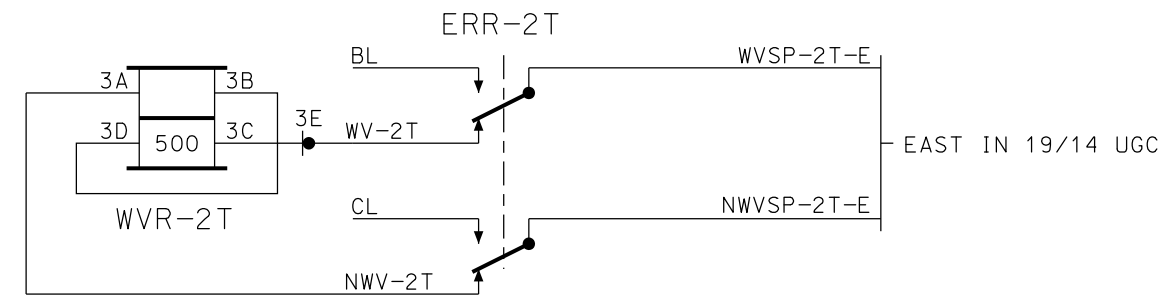
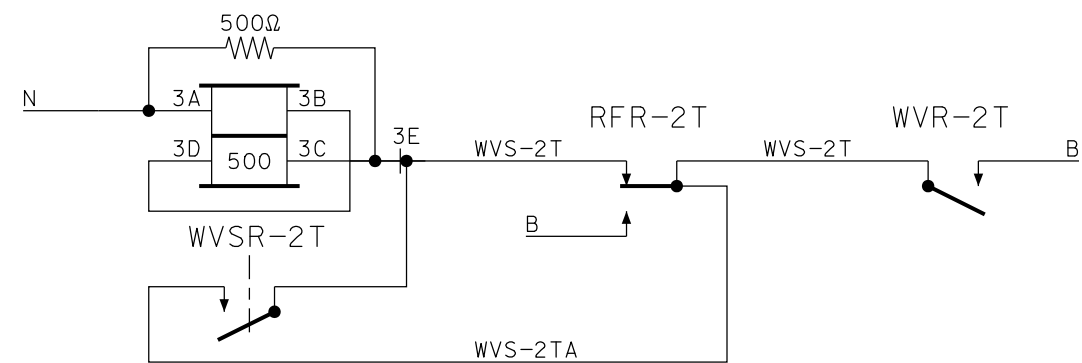
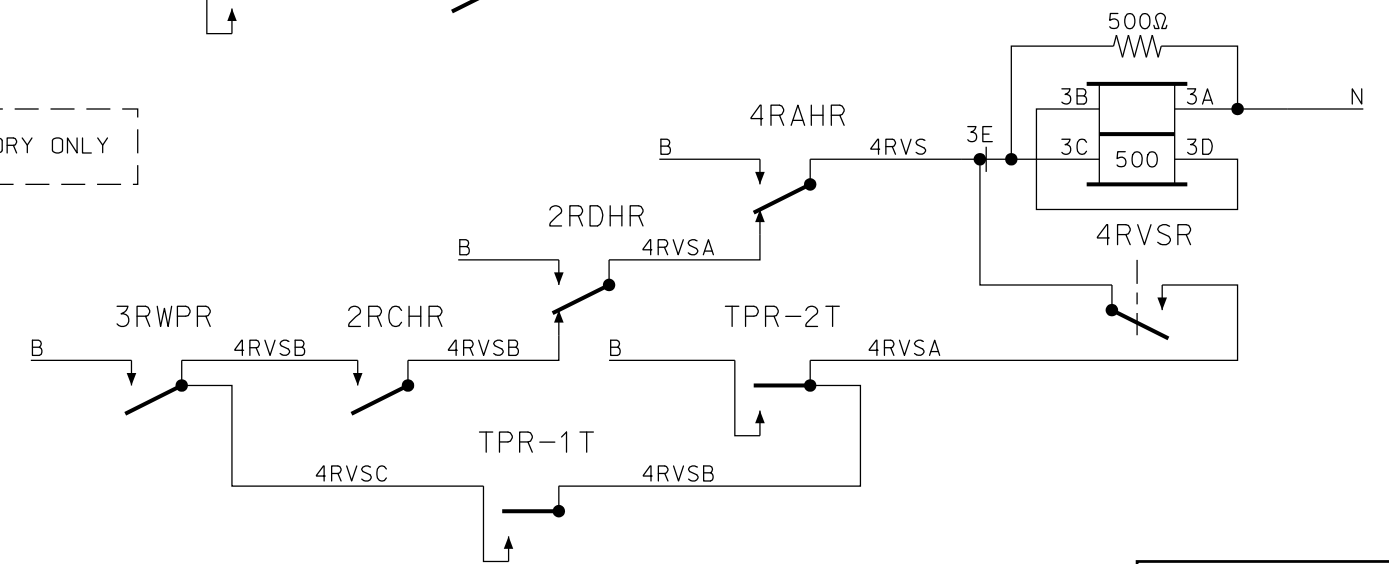
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.16
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



USED IN CAB SIGNAL TERRITORY ONLY



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

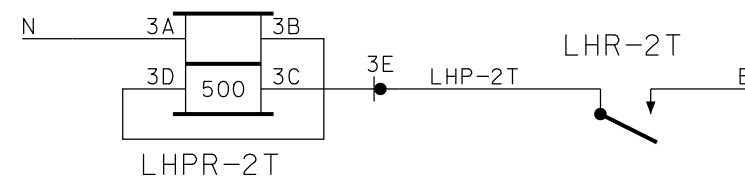
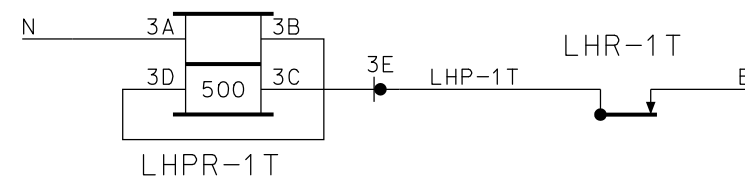
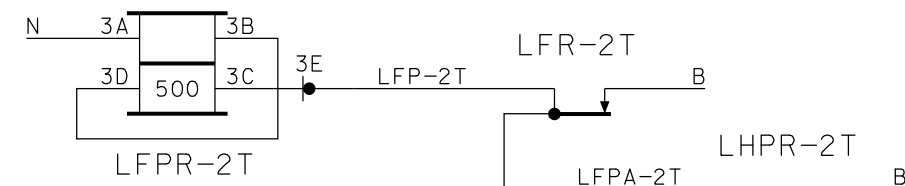
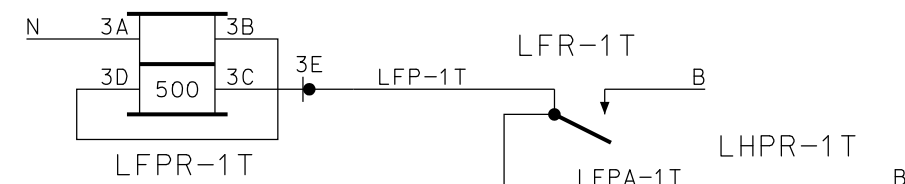
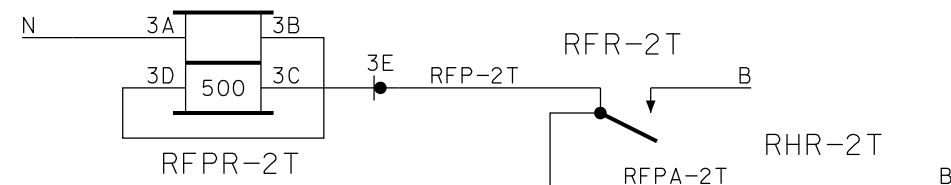
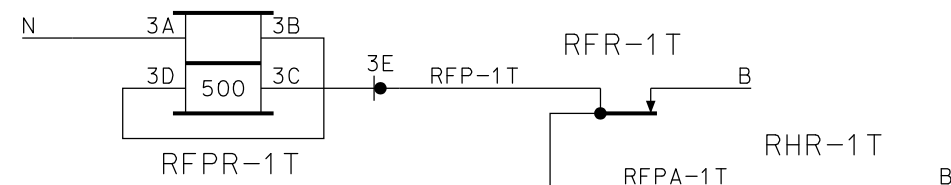
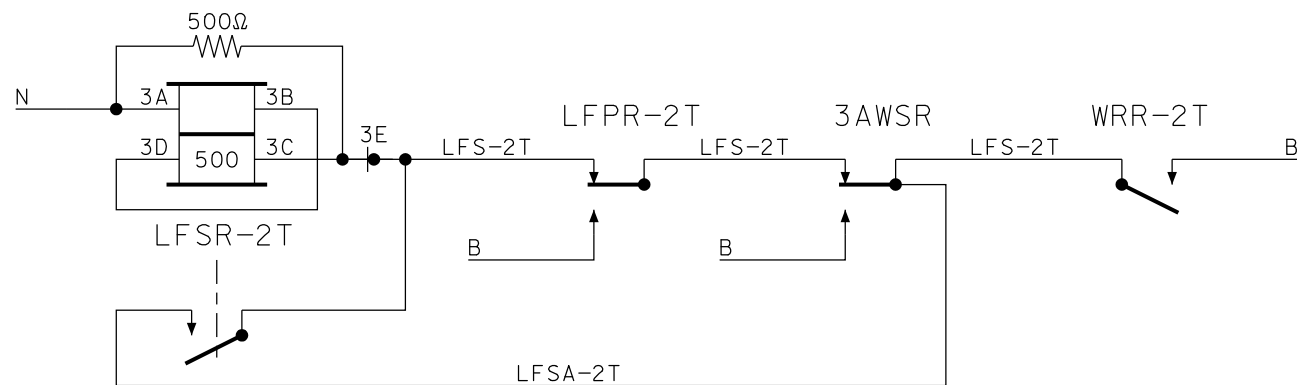
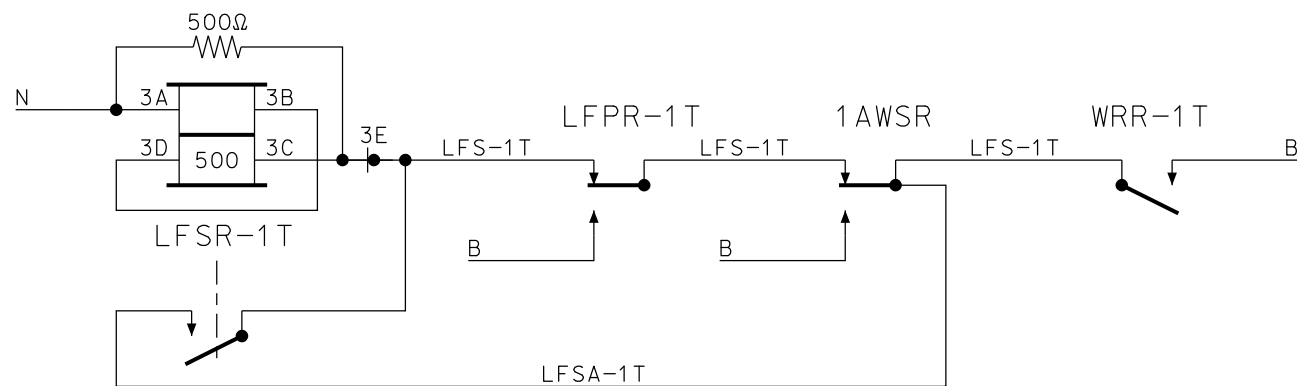
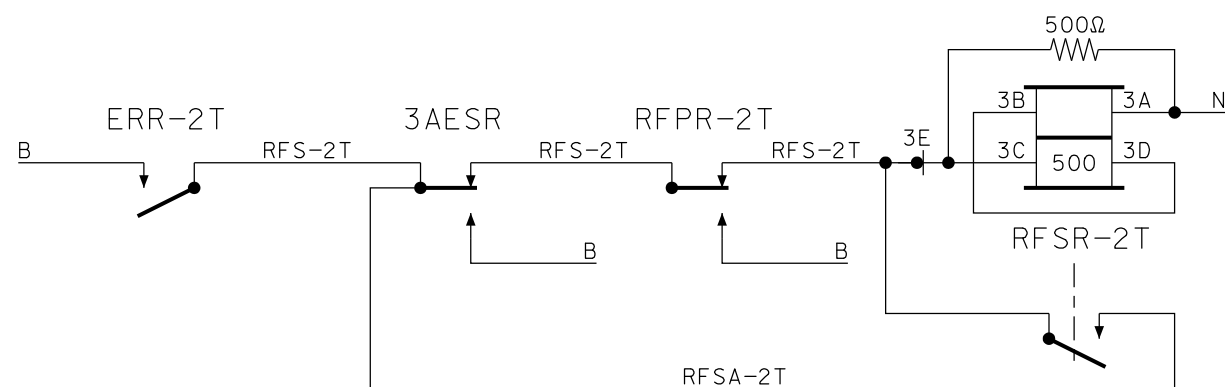
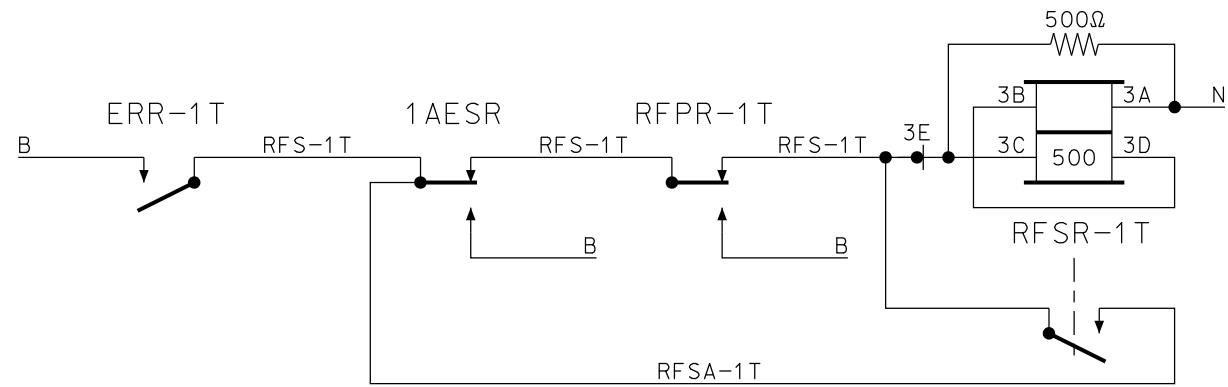
CHICAGO TO (END OF LINE)
CP (LOCATION)
CAB STICK CIRCUITS

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.17
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

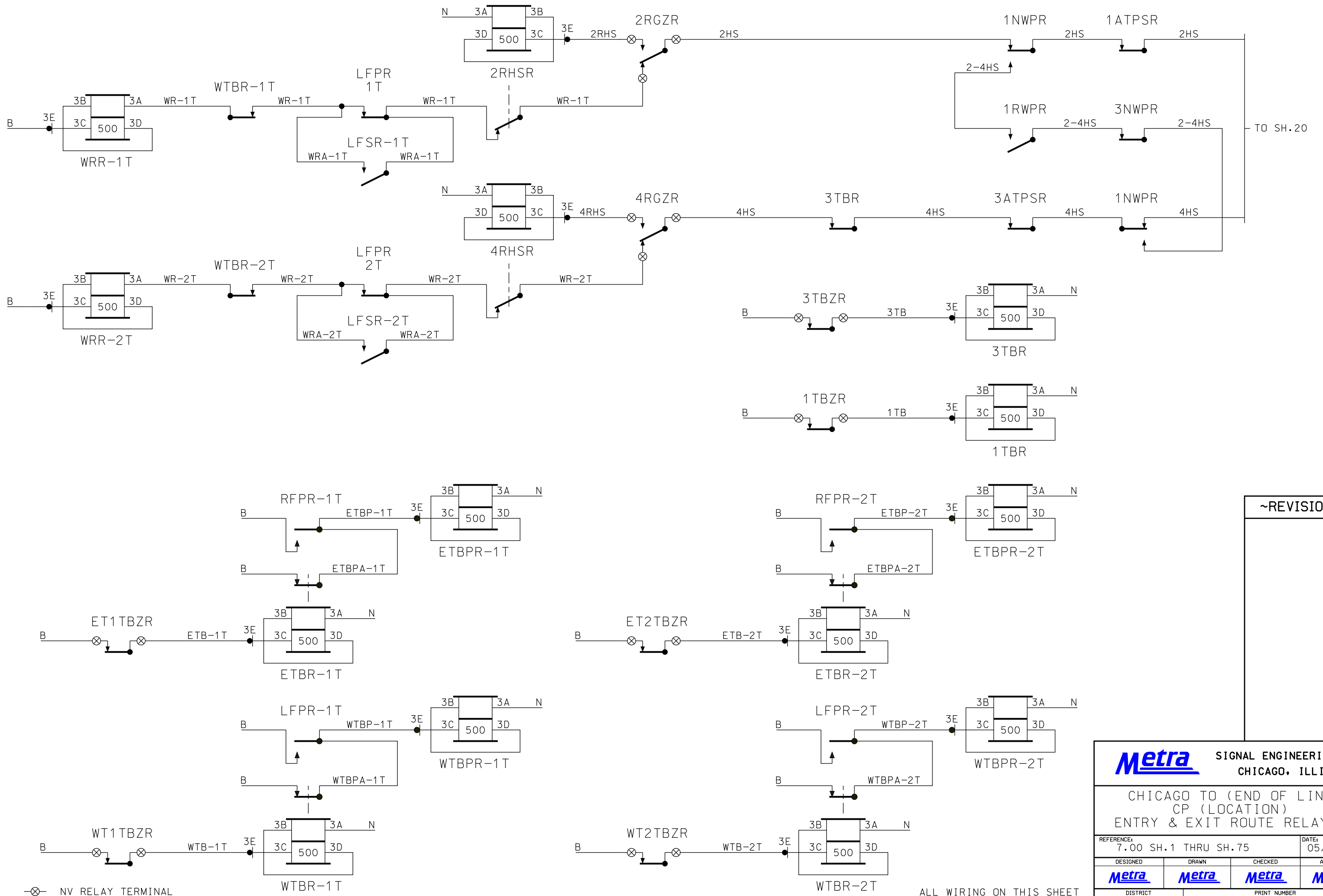
CHICAGO TO (END OF LINE)
CP (LOCATION)
TRAFFIC CIRCUITS

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.18
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~

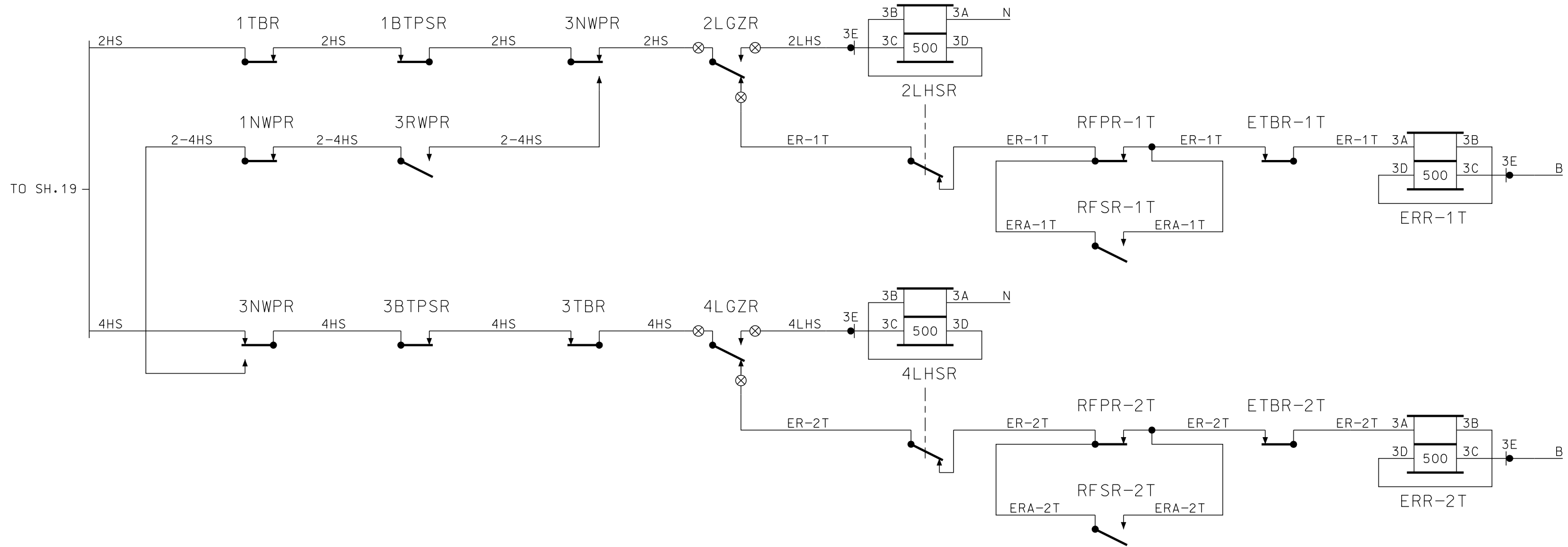
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Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
ENTRY & EXIT ROUTE RELAYS

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.19		

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



⊗ NV RELAY TERMINAL

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

~REVISIONS~

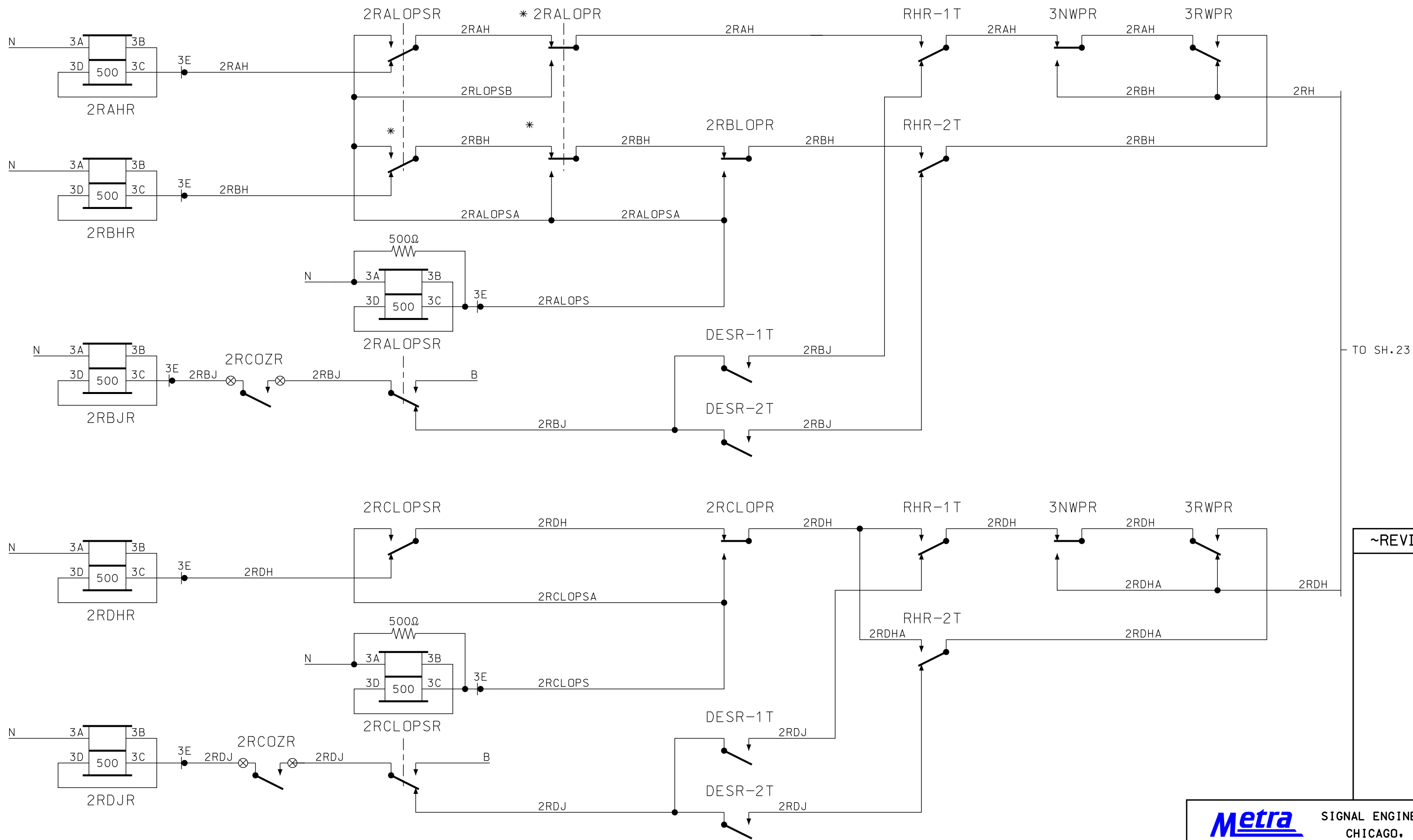
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
ENTRY & EXIT ROUTE RELAYS

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.20
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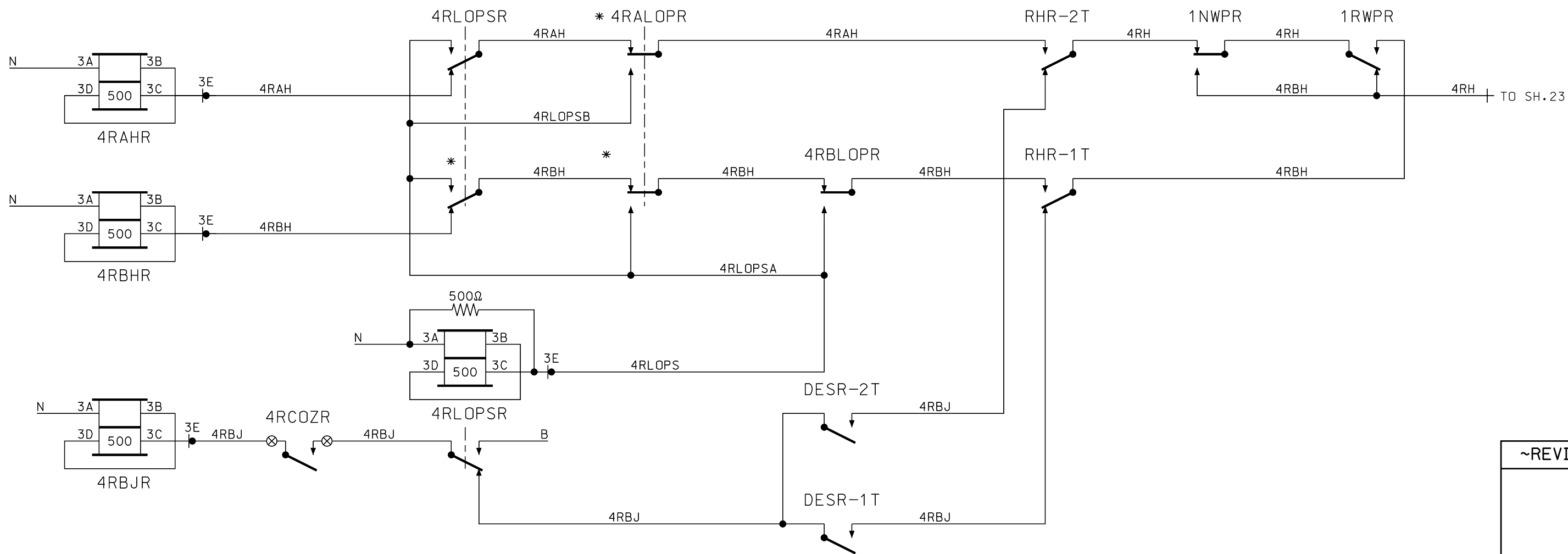
NOTE: * SOLID STATE INTERLOCKERS WILL DROP TO THE NEXT MOST RESTRICTIVE ASPECT, LO LAMP ON OPERATOR'S PANEL STILL FURNISHED.

⊗ CONNECTION TO NV RACK

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) SIG. 2R "H" NETWORK			
REFERENCE:	7.00 SH.1 THRU SH.75	DATE:	05/13/11
DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra
DISTRICT	PRINT NUMBER		
TYP	7.00 SH.21		



NOTE: * SOLID STATE INTERLOCKERS WILL DROP TO THE NEXT MOST RESTRICTIVE ASPECT, LO LAMP ON OPERATOR'S PANEL STILL FURNISHED.

⊗ CONNECTION TO NV RACK

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

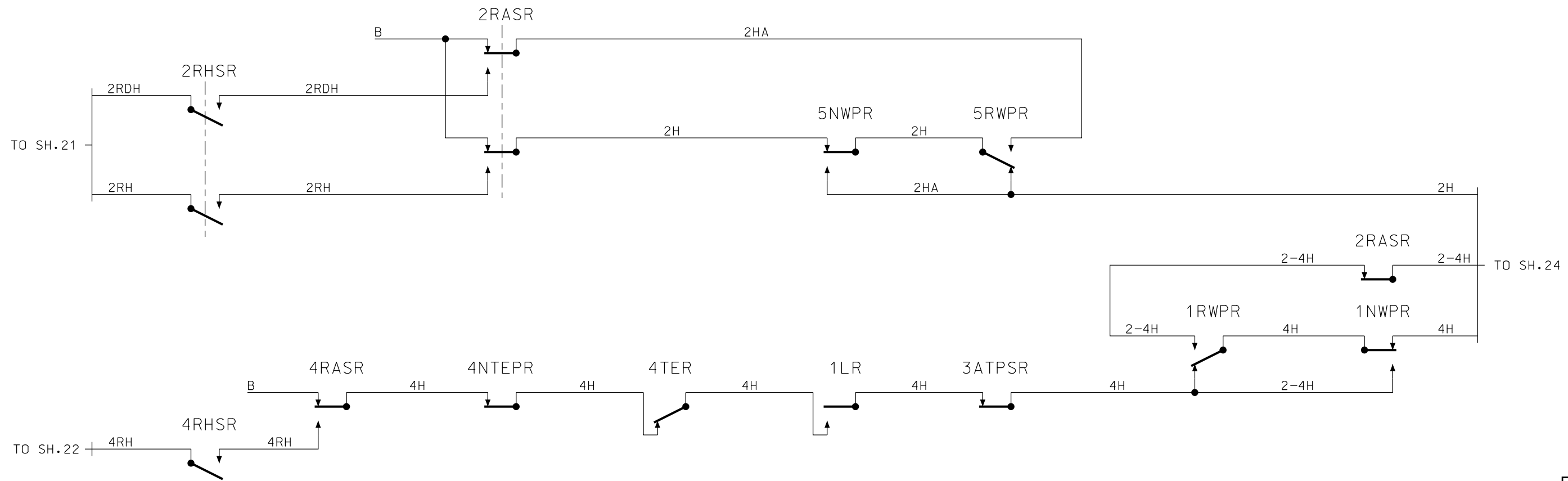
CHICAGO TO (END OF LINE)
CP (LOCATION)
SIG. 4R "H" NETWORK

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.22
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

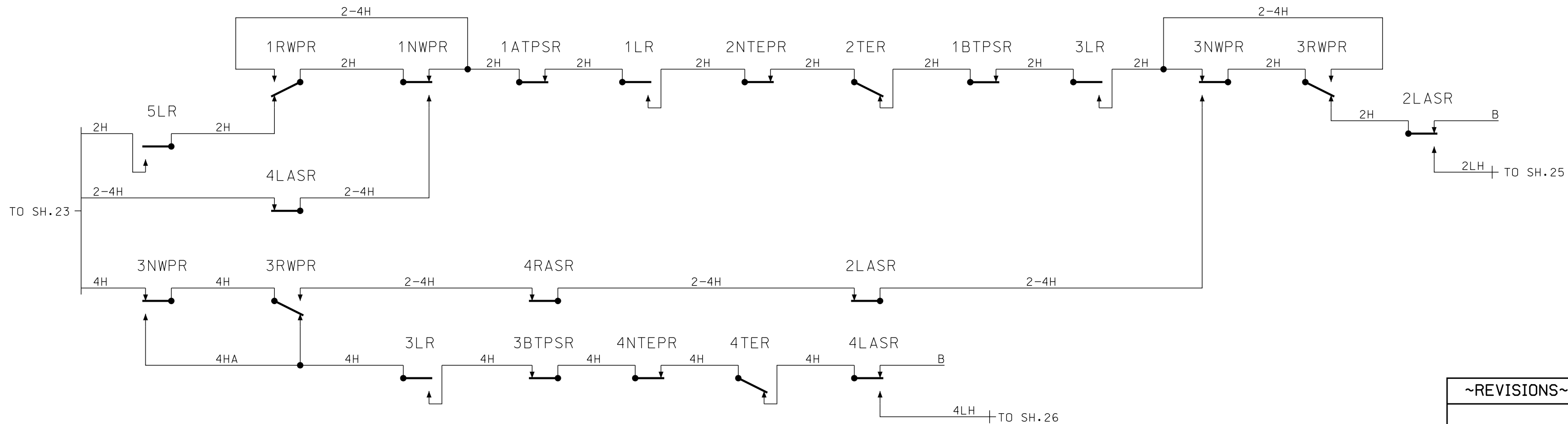


~REVISIONS~

NOTE: * SOLID STATE INTERLOCKERS
WILL DROP TO THE NEXT
MOST RESTRICTIVE ASPECT.
LO LAMP ON OPERATOR'S PANEL
STILL FURNISHED.

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) CP (LOCATION) SIG. 2 AND 4 "H" NETWORK	
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.23

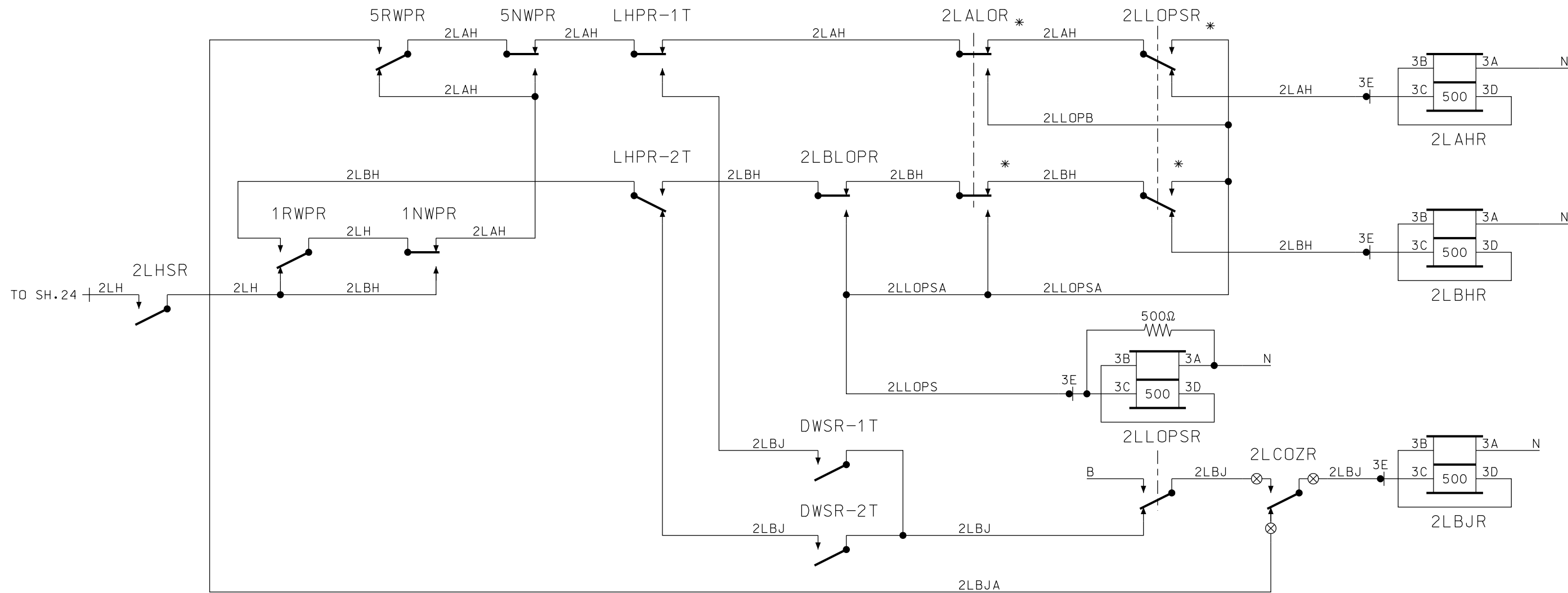


~REVISIONS~	

NOTE: * SOLID STATE INTERLOCKERS WILL DROP TO THE NEXT MOST RESTRICTIVE ASPECT, LO LAMP ON OPERATOR'S PANEL STILL FURNISHED.

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) CP (LOCATION) SIG. 2 AND 4 "H" NETWORK	
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.24



NOTE: * SOLID STATE INTERLOCKERS WILL DROP TO THE NEXT MOST RESTRICTIVE ASPECT, LO LAMP STILL FURNISHED ON OPERATOR'S PANEL.

⊗ CONNECTION TO NV RACK

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

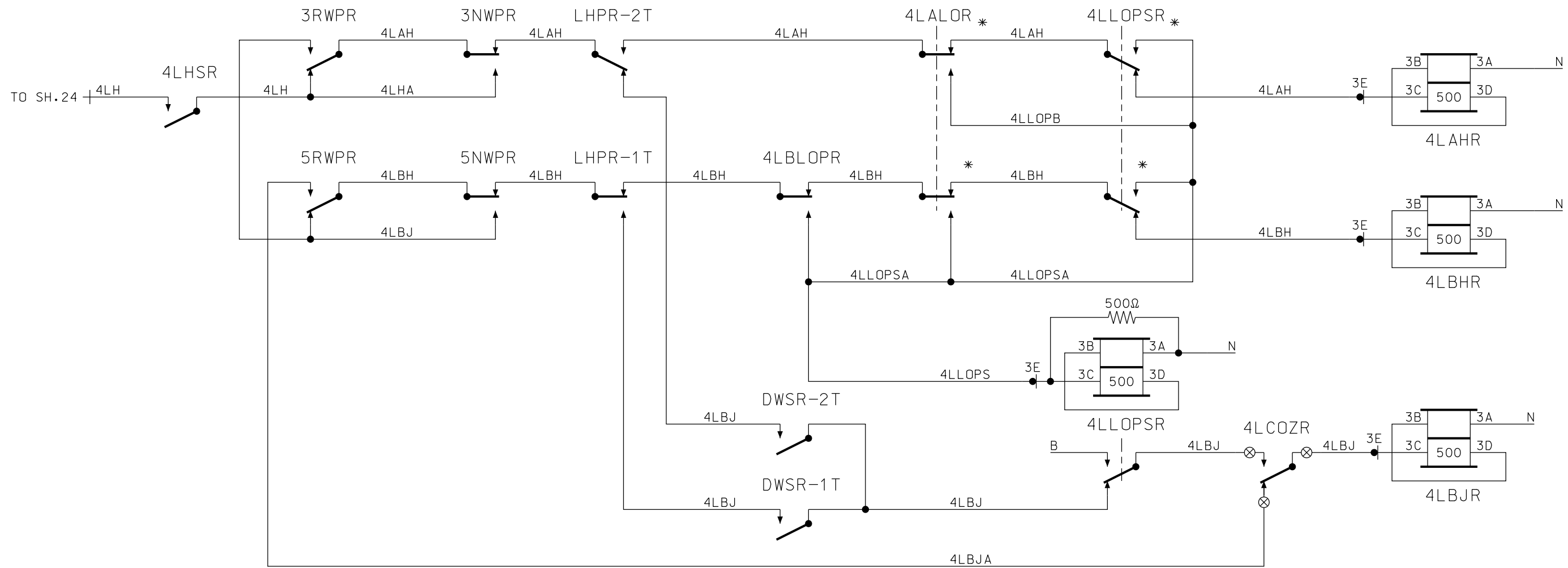
CHICAGO TO (END OF LINE)
CP (LOCATION)
SIGNAL 2L "H" NETWORK

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.25
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~

NOTE: * SOLID STATE INTERLOCKERS
WILL DROP TO THE NEXT
MOST RESTRICTIVE ASPECT,
LO LAMP ON OPERATOR'S PANEL
STILL FURNISHED.

⊗ CONNECTION TO NV RACK

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

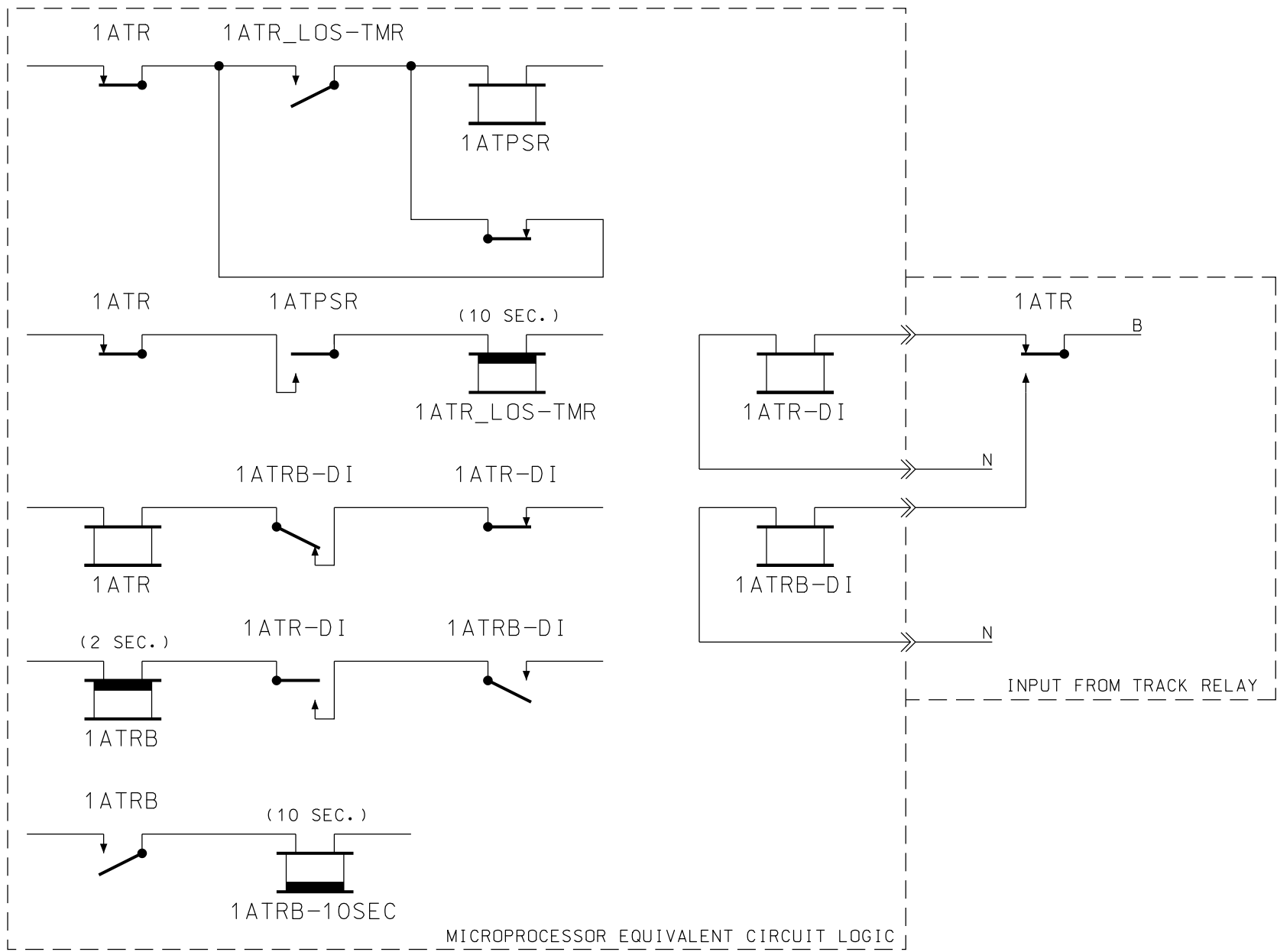
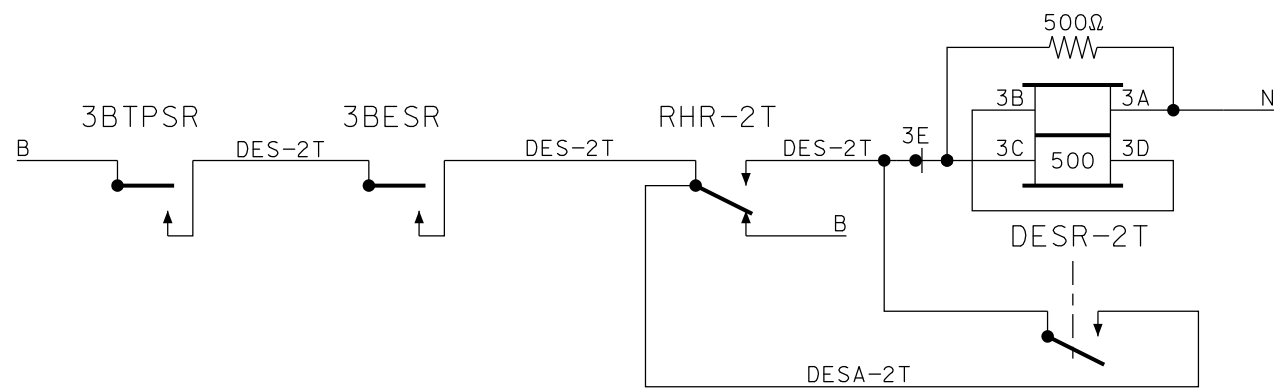
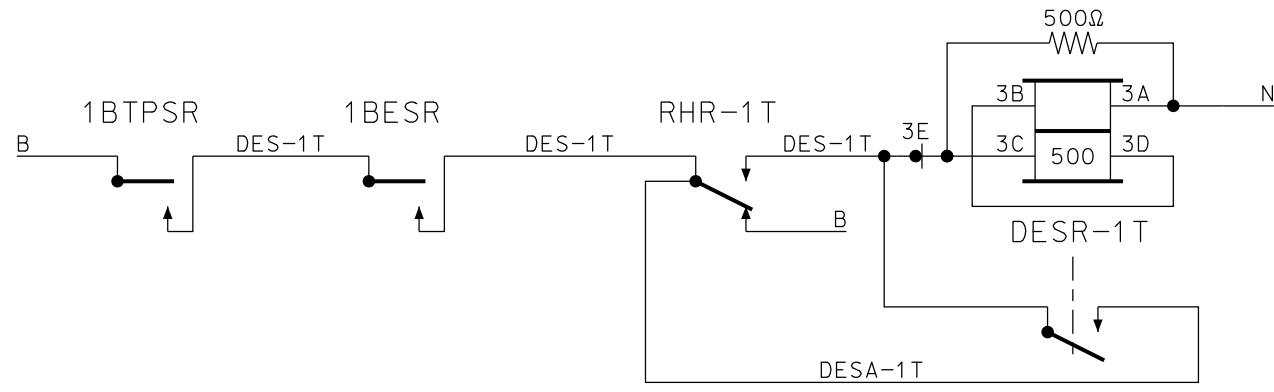
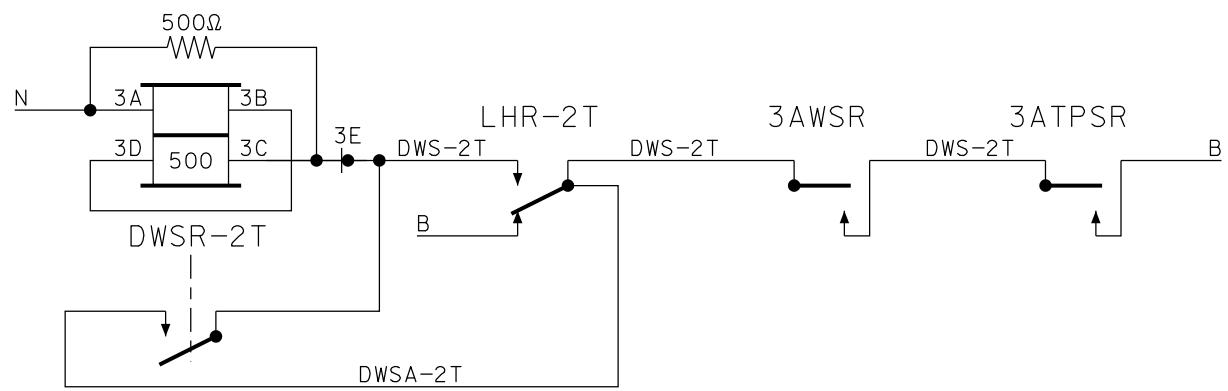
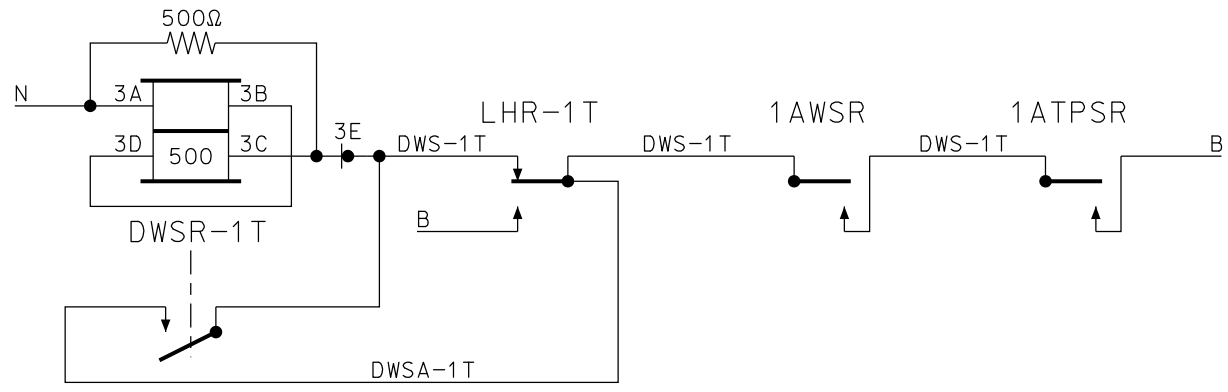
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
SIGNAL 4L "H" NETWORK

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.26
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NOTES:

THE INPUT CIRCUITS AND EQUIVALENT CIRCUIT LOGIC SHALL BE USED FOR ALL MICROPROCESSOR BASED CONTROL POINTS AND INTERLOCKINGS IN CONJUNCTION WITH THE TIME LOCKING EQUIVALENT CIRCUIT LOGIC AS SHOWN FOR 2R SIGNAL ON SHEET 28.

THESE INPUTS AND EQUIVALENT CIRCUIT LOGIC SHALL BE DUPLICATED FOR ALL TRACK CIRCUITS WITHIN THE CONTROL POINT OR INTERLOCKING LIMITS.

~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

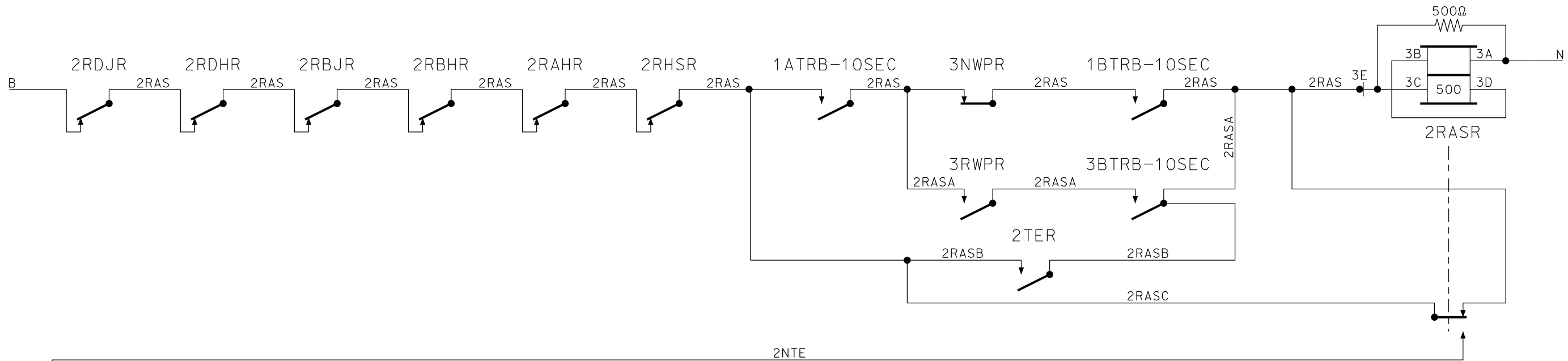
CHICAGO TO (END OF LINE)
CP (LOCATION)
DIRECTIONAL STICKS

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

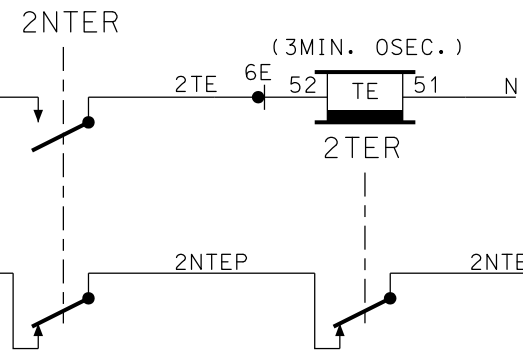
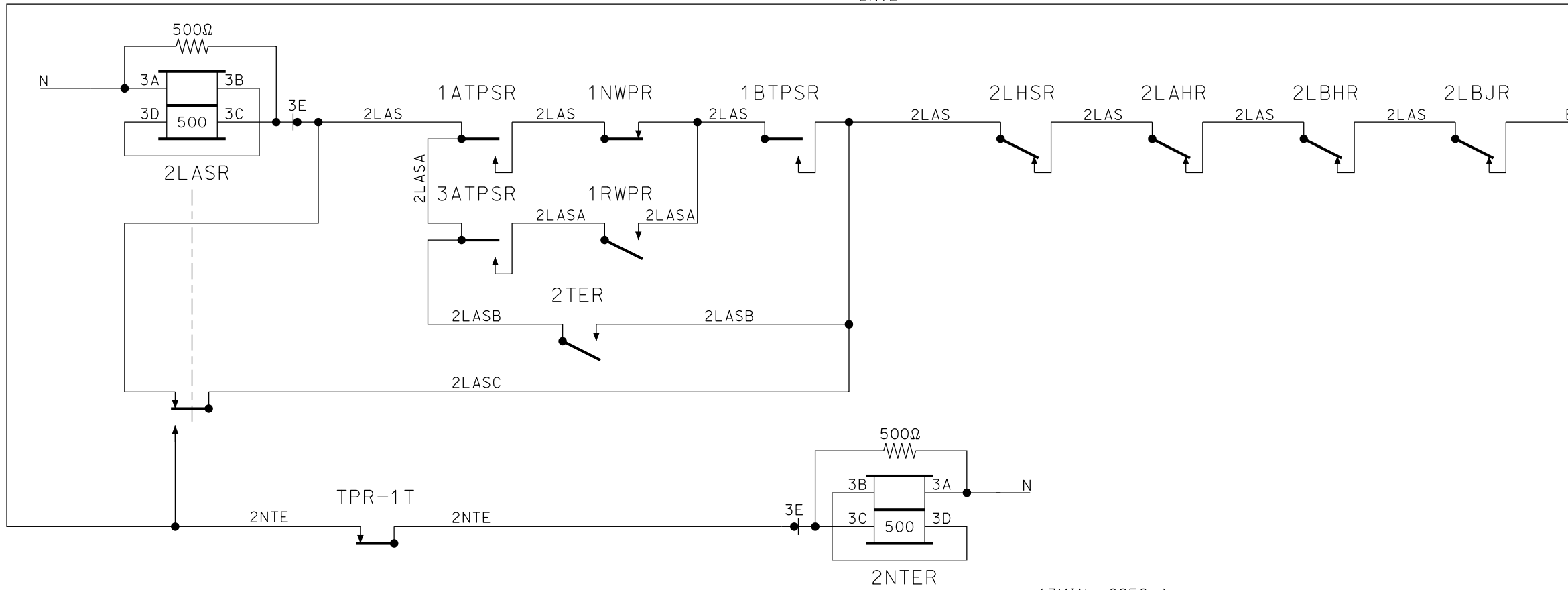
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.27
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



2NTE



NOTES:

MINIMUM MAIN LINE TIME SHALL BE 3 MINUTES - 0 SECONDS.

RELAY BASED CONTROL POINTS AND INTERLOCKINGS SHALL USE TIME LOCKING CIRCUITRY AS SHOWN FOR 2L SIGNAL.

MICROPROCESSOR BASED CONTROL POINTS AND INTERLOCKINGS SHALL USE TIME LOCKING EQUIVALENT CIRCUIT LOGIC AS SHOWN FOR 2R SIGNAL.

SEE SHEET 27 FOR ADDITIONAL EQUIVALENT CIRCUIT LOGIC.

~REVISIONS~

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Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

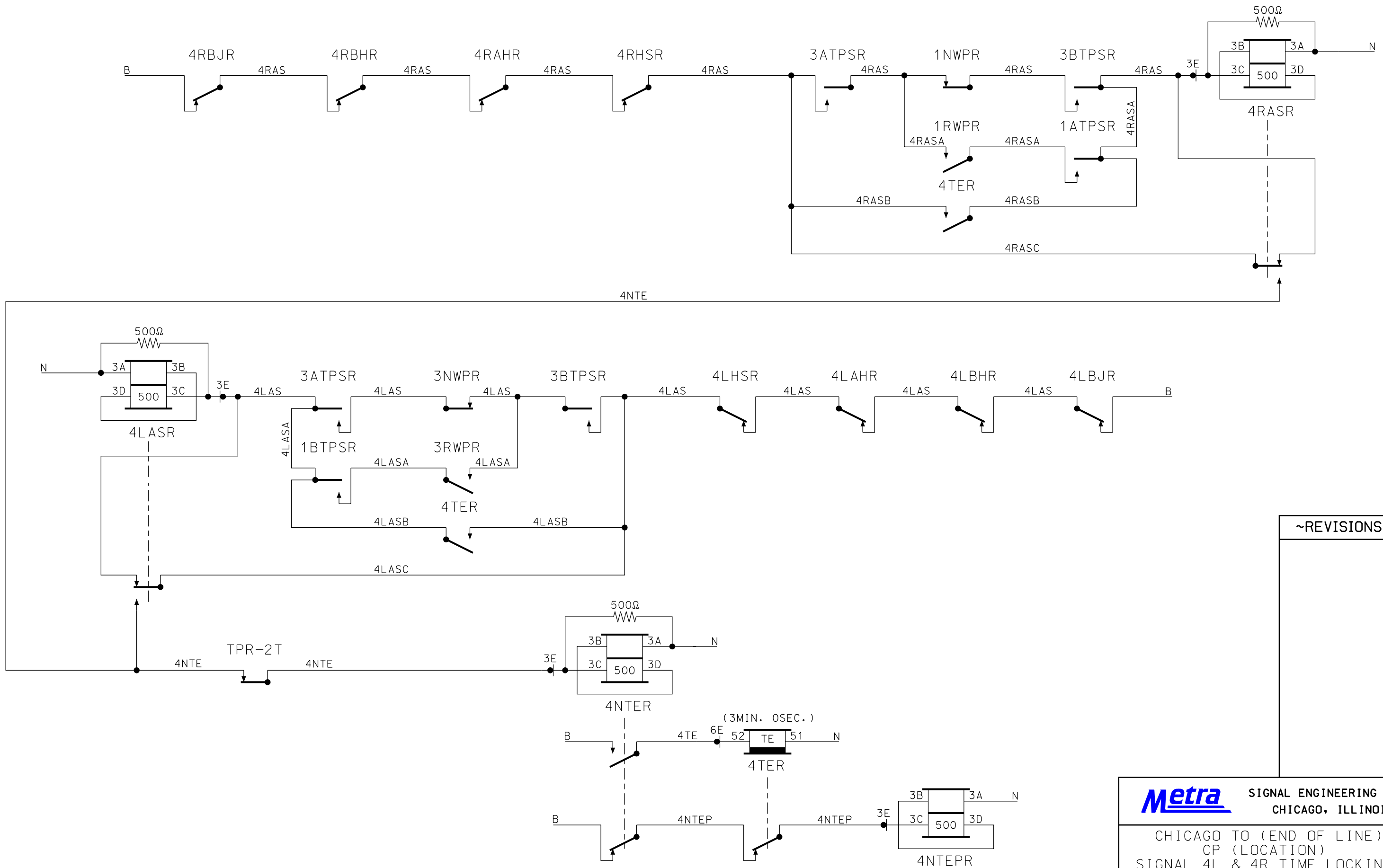
CHICAGO TO (END OF LINE)
CP (LOCATION)
SIGNAL 2L & 2R TIME LOCKING

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.28
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ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED



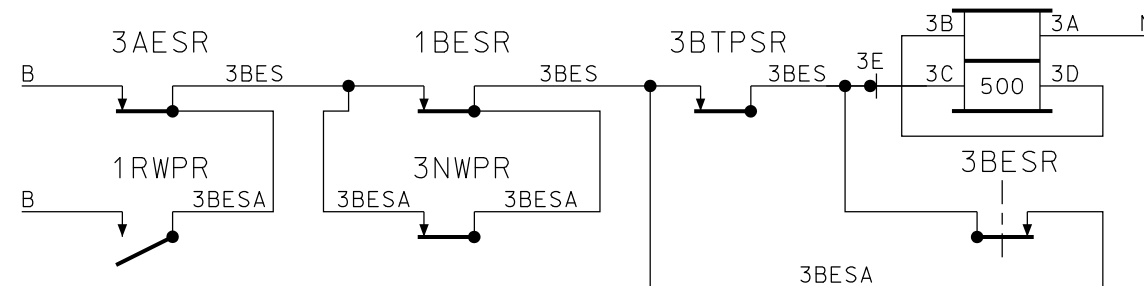
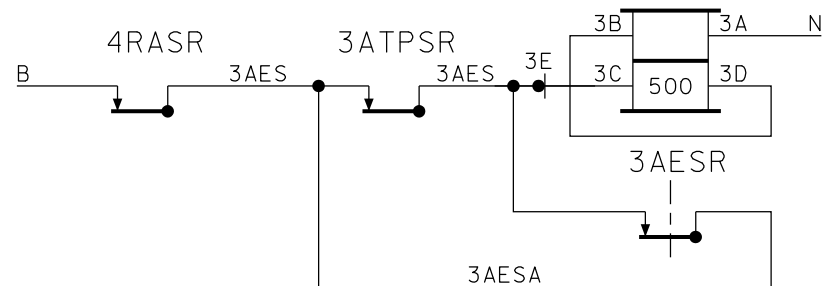
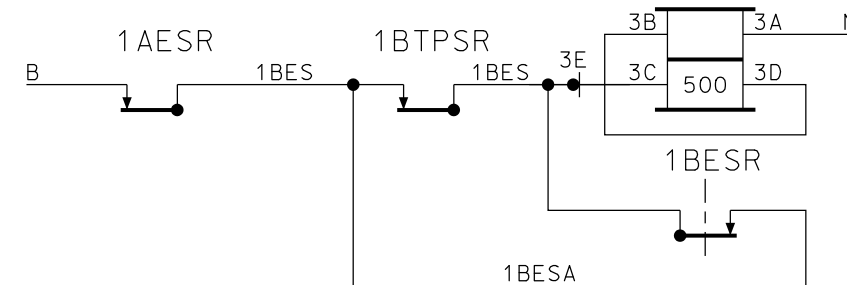
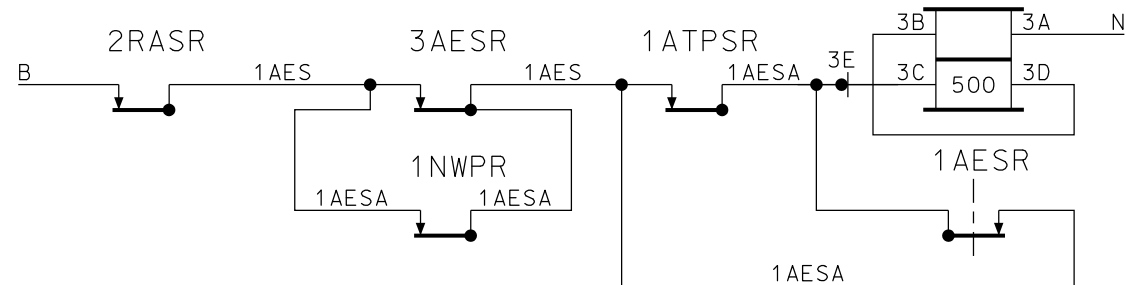
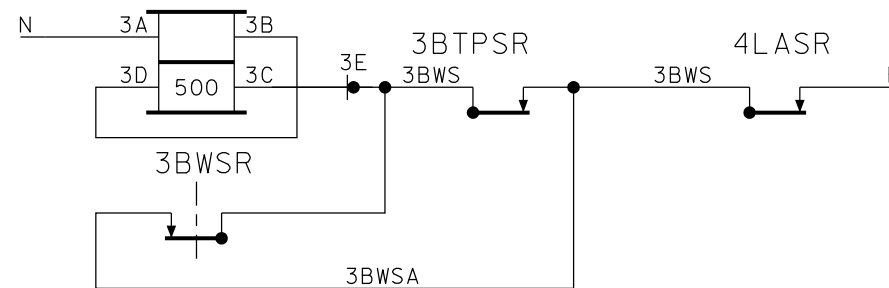
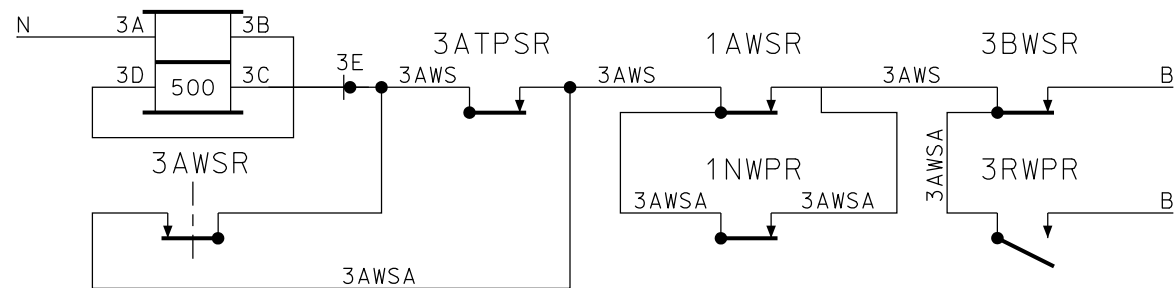
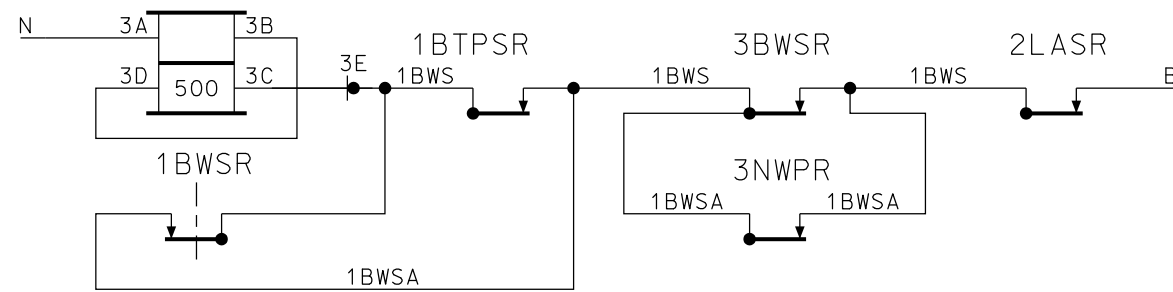
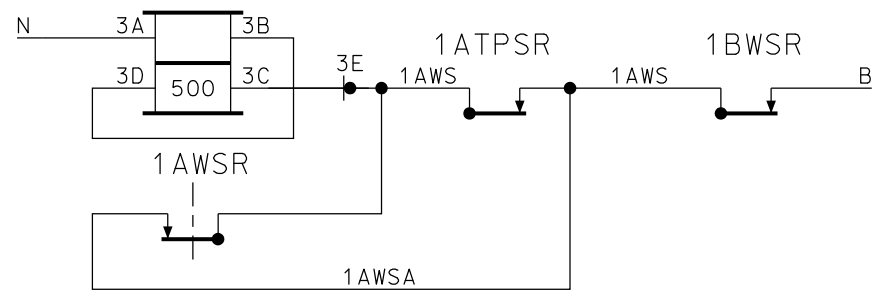
~REVISIONS~

NOTE:

MINIMUM MAIN LINE TIME SHALL BE 3 MINUTES - 0 SECONDS.

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) SIGNAL 4L & 4R TIME LOCKING			
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.29		



~REVISIONS~

NOTE:
SECTIONAL LOCKING AND SECTIONAL
RELEASING ALWAYS USED UNLESS
OTHERWISE SPECIFIED.

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

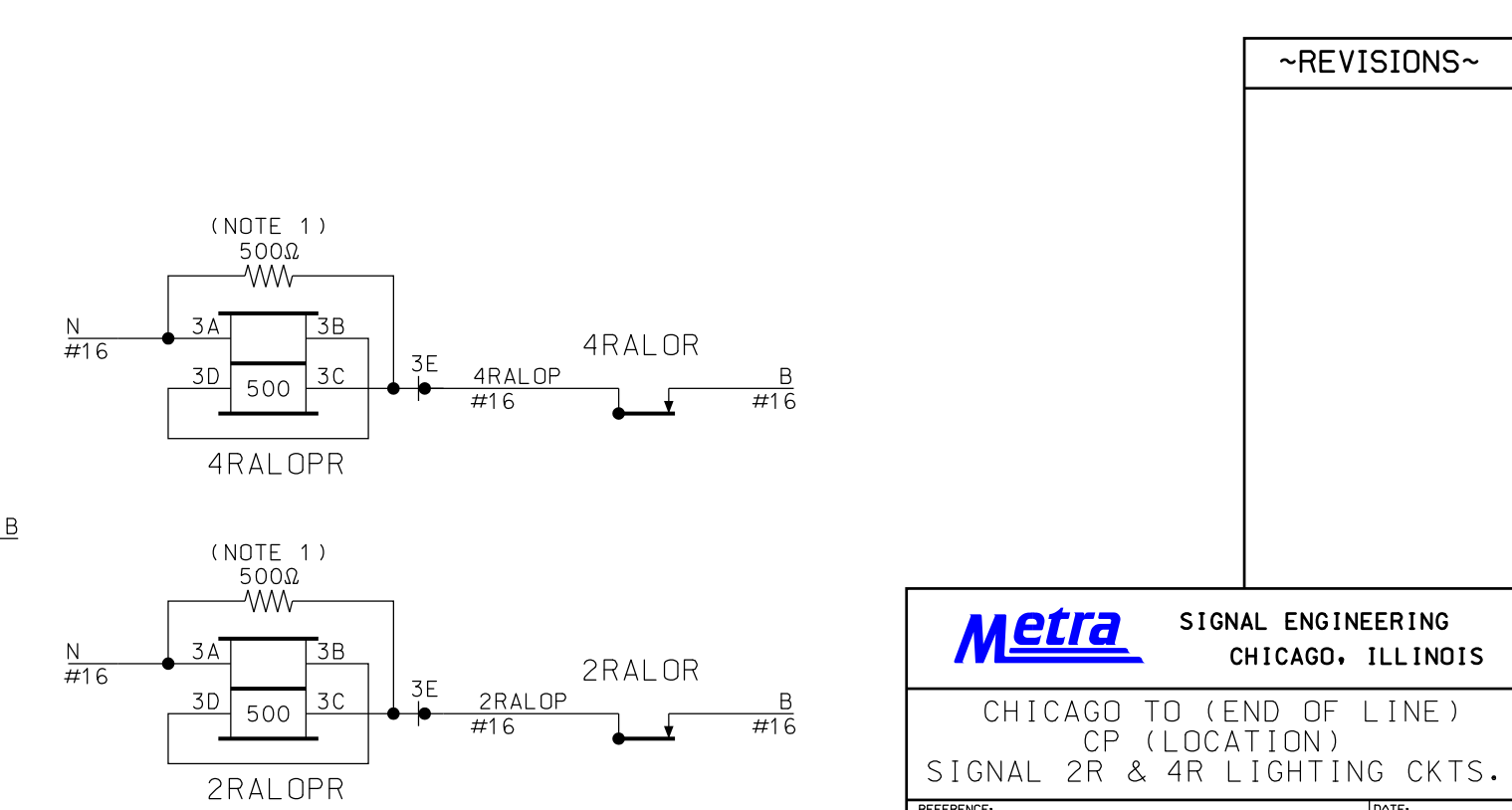
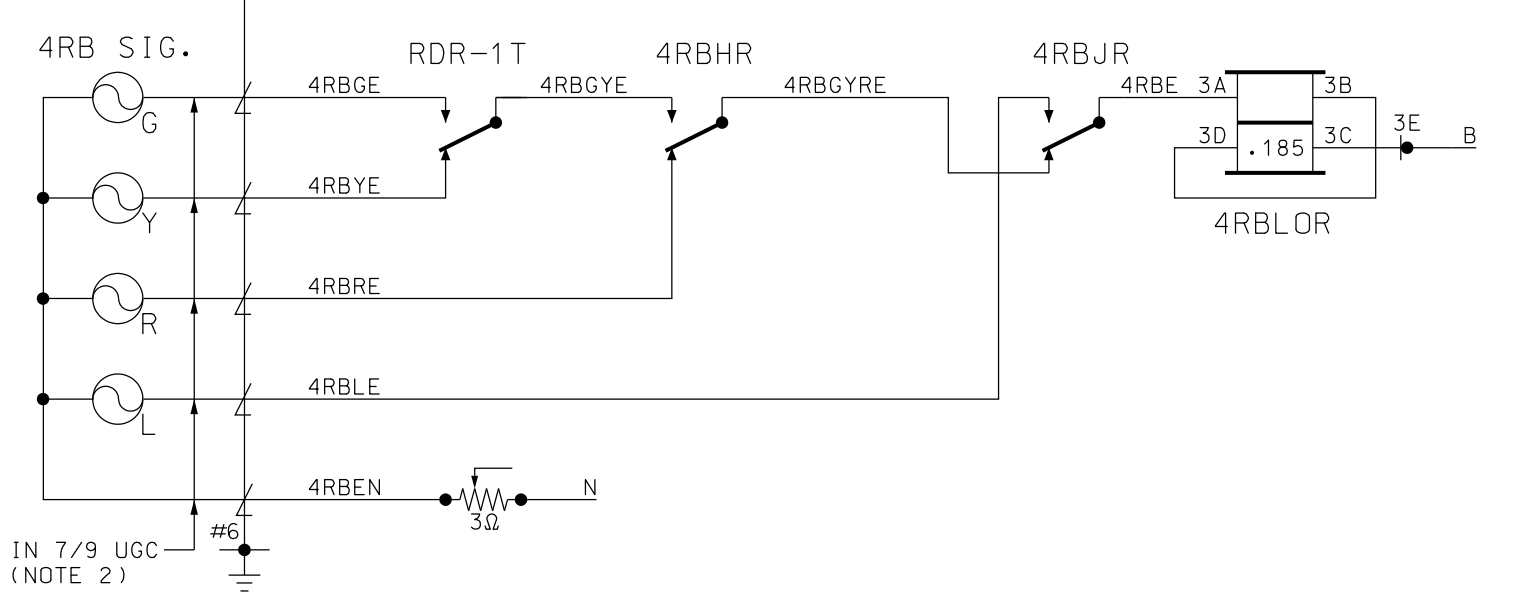
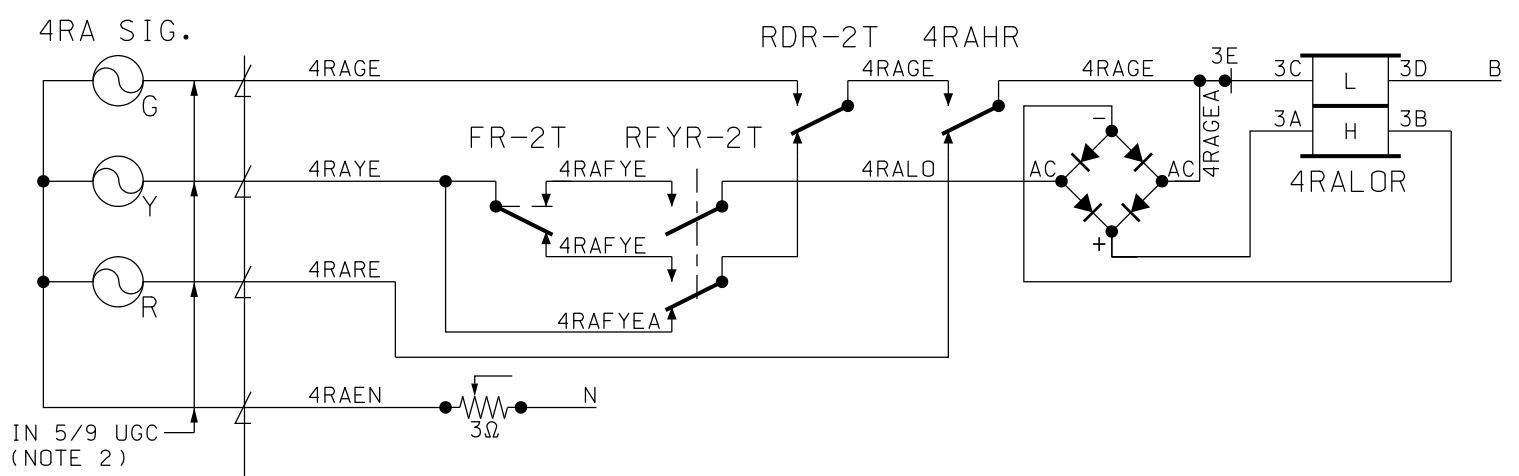
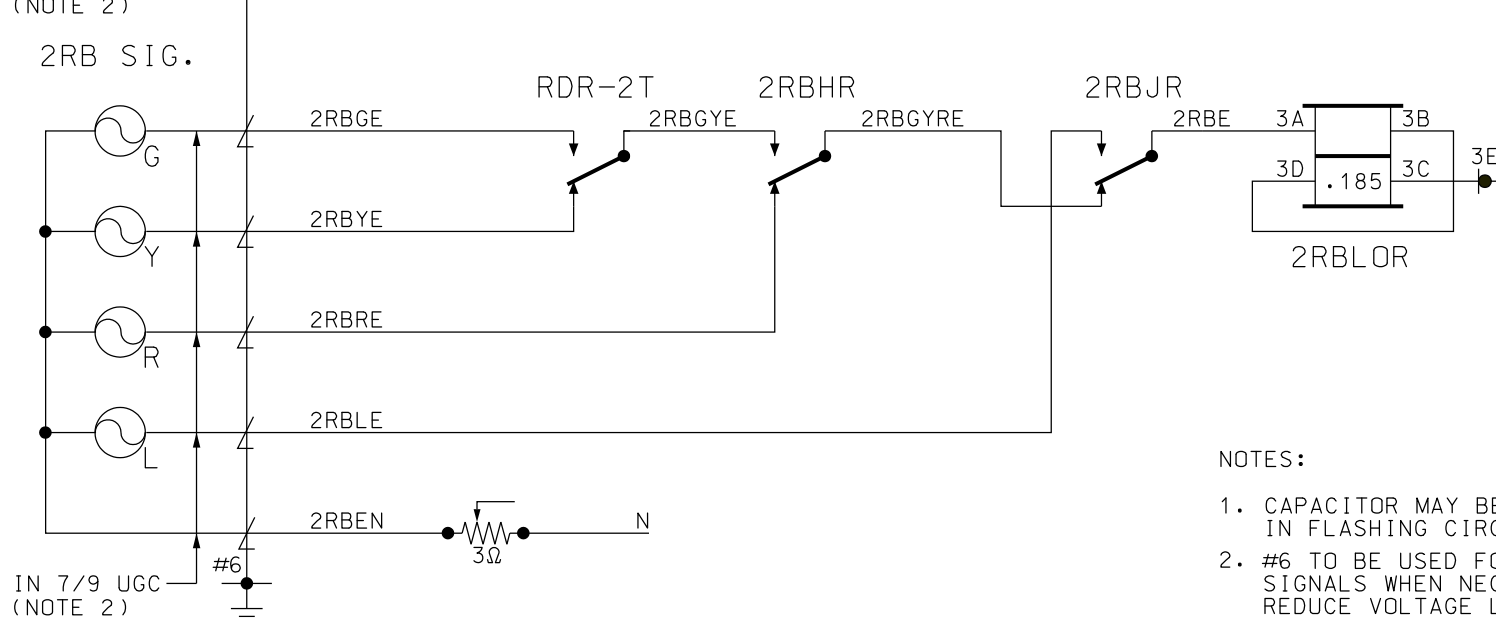
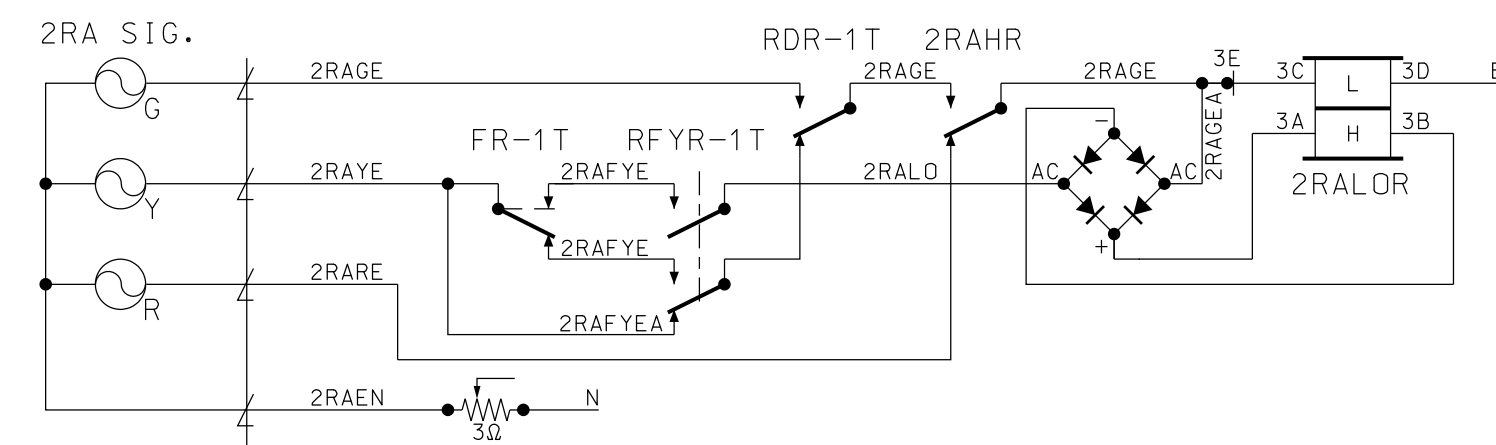
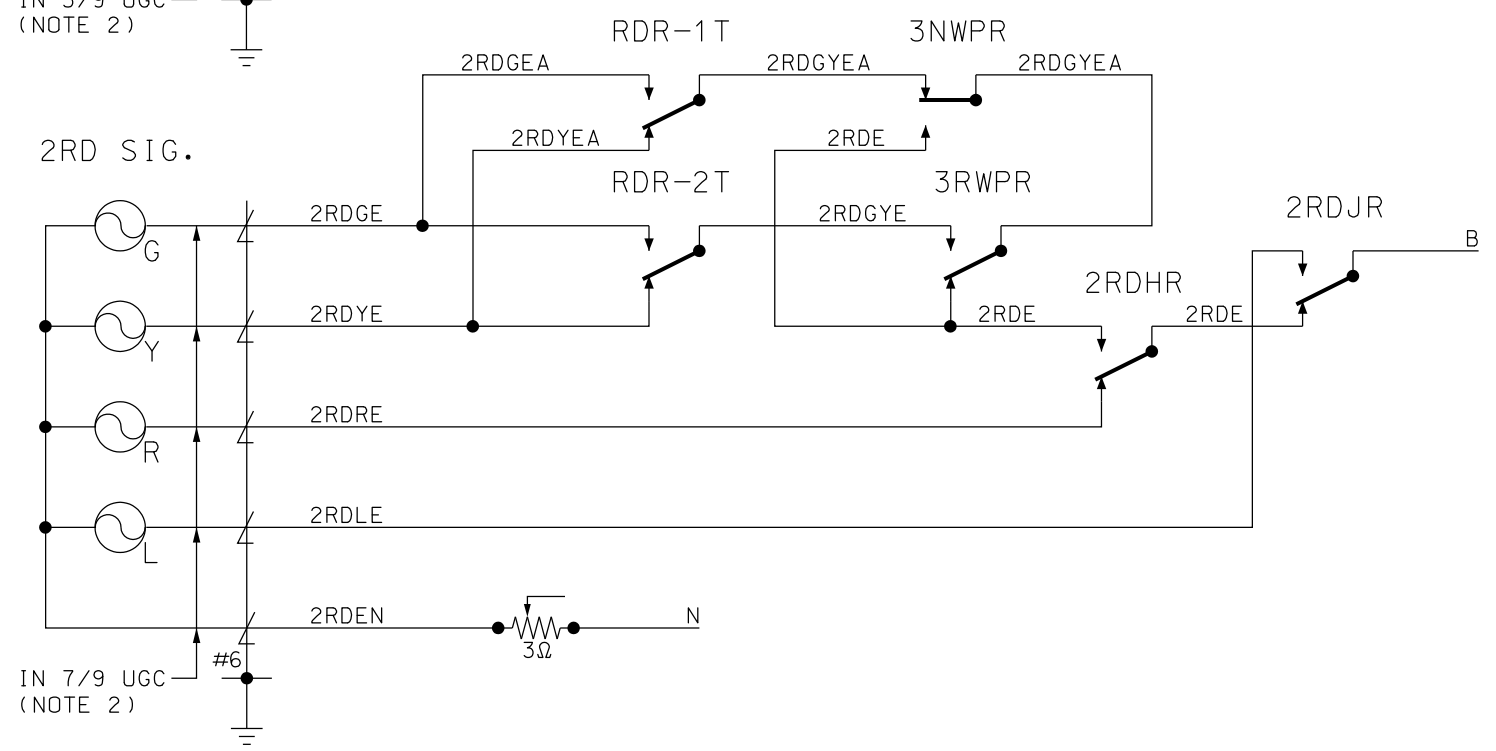
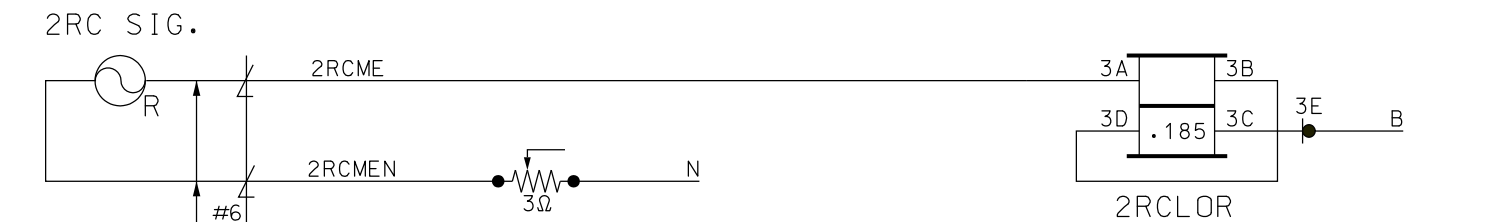
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
SECTION LOCKING

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.30
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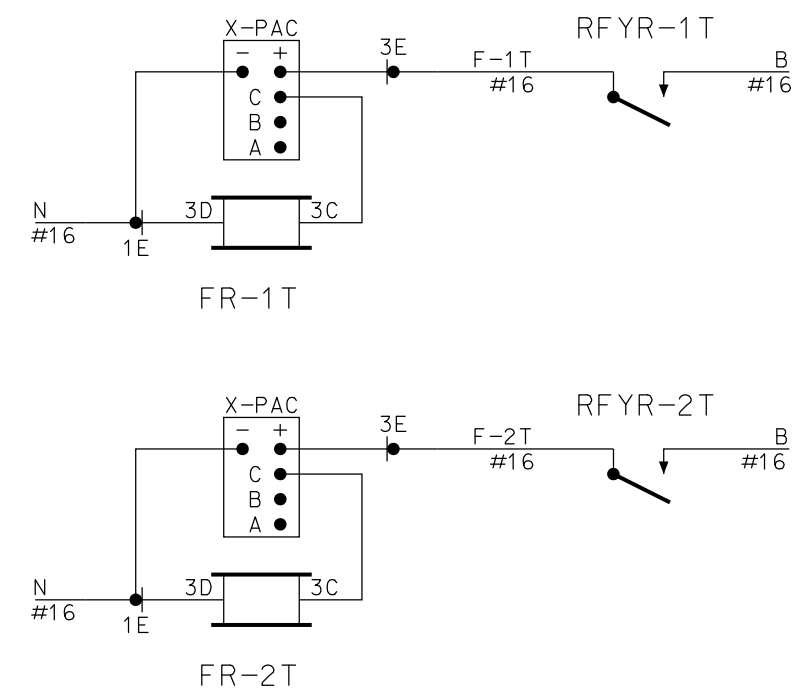
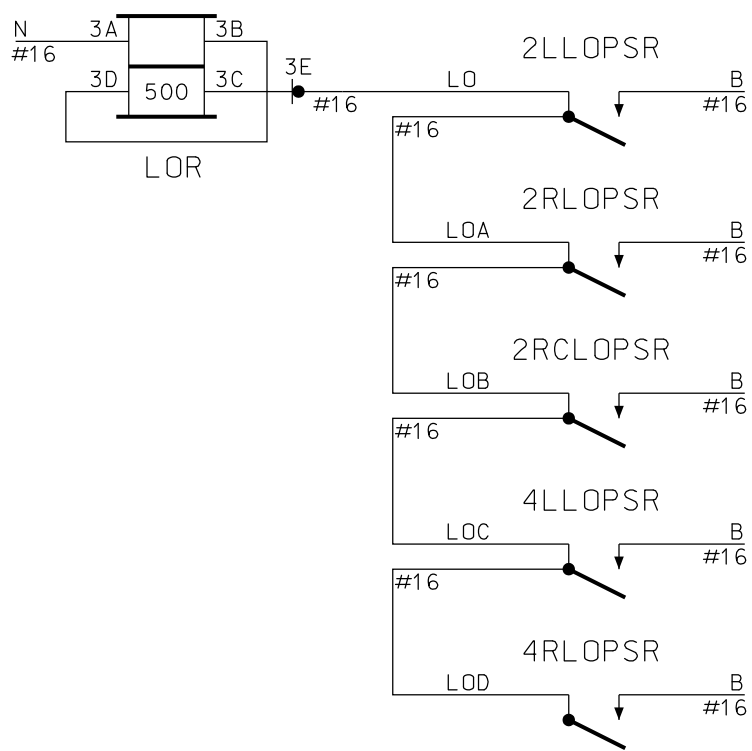
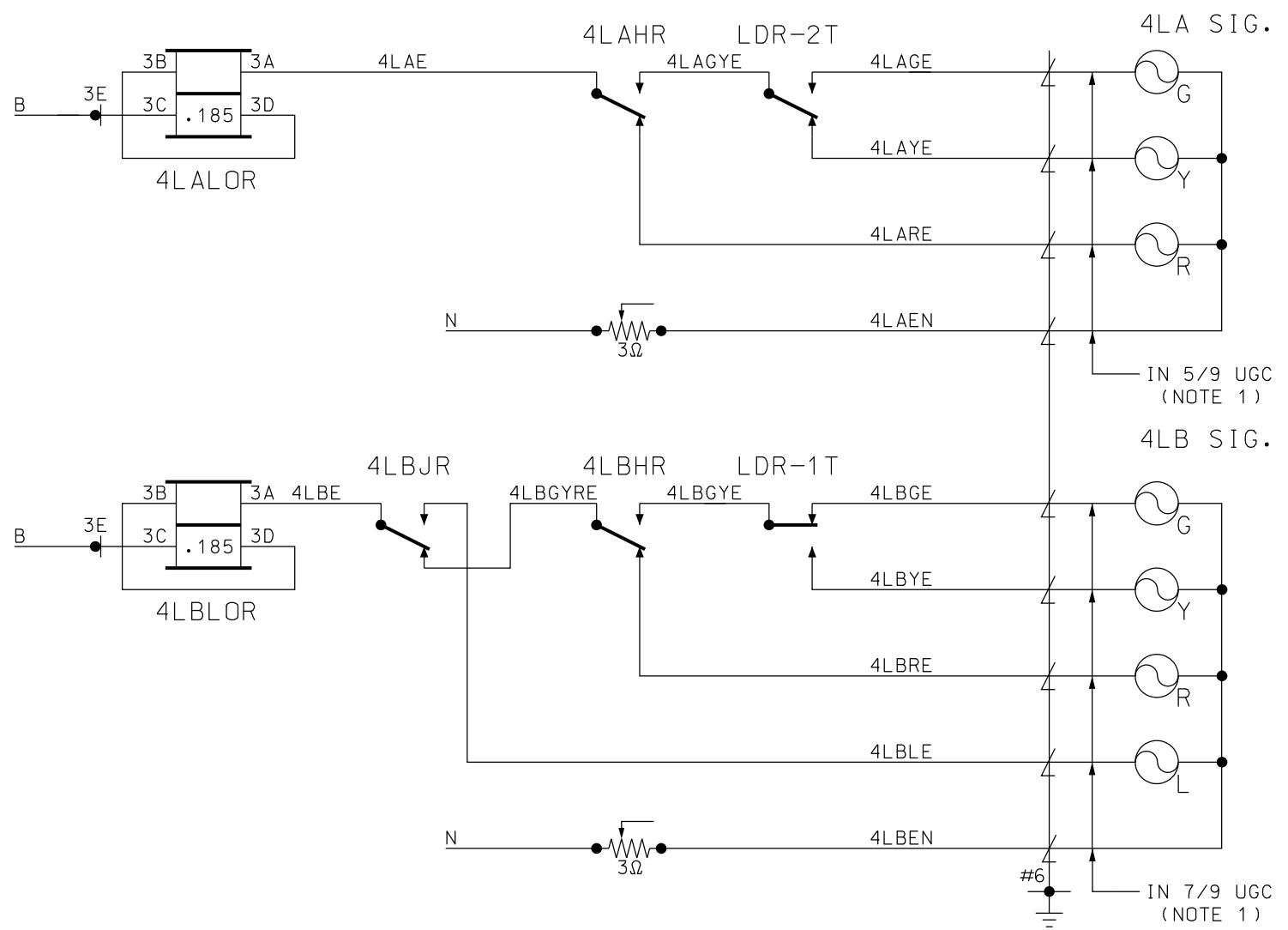
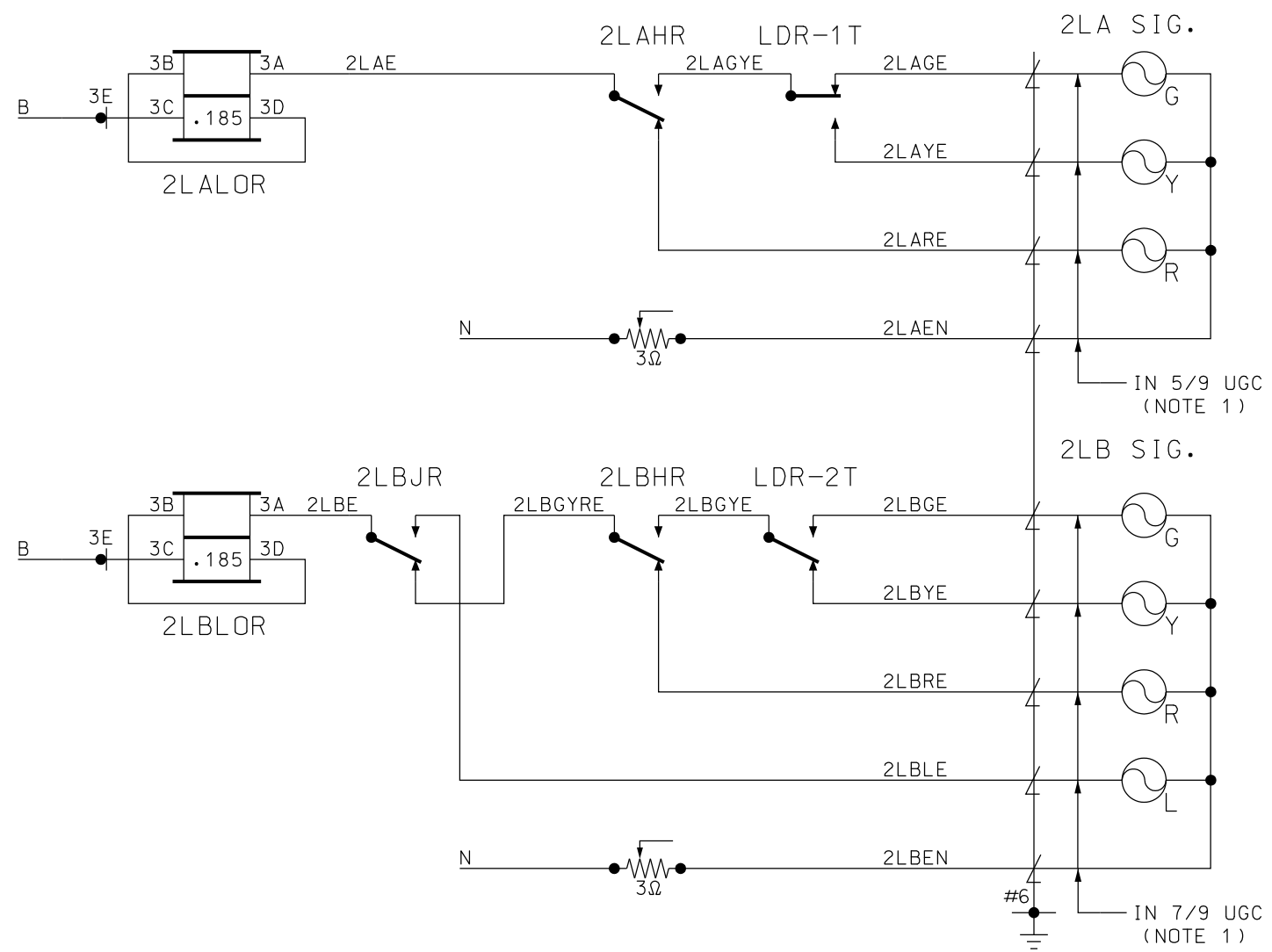


- NOTES:
- CAPACITOR MAY BE NEEDED IN FLASHING CIRCUITS.
 - #6 TO BE USED FOR LIGHTING SIGNALS WHEN NECESSARY TO REDUCE VOLTAGE LOSS.

ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) SIGNAL 2R & 4R LIGHTING CKTS.			
REFERENCE: 7.00 SH.1 THRU SH.75	DESIGNED Metra		DATE: 05/13/11
DRAWN Metra	CHECKED Metra	APPROVED Metra	
DISTRICT TYP	PRINT NUMBER 7.00 SH.31		



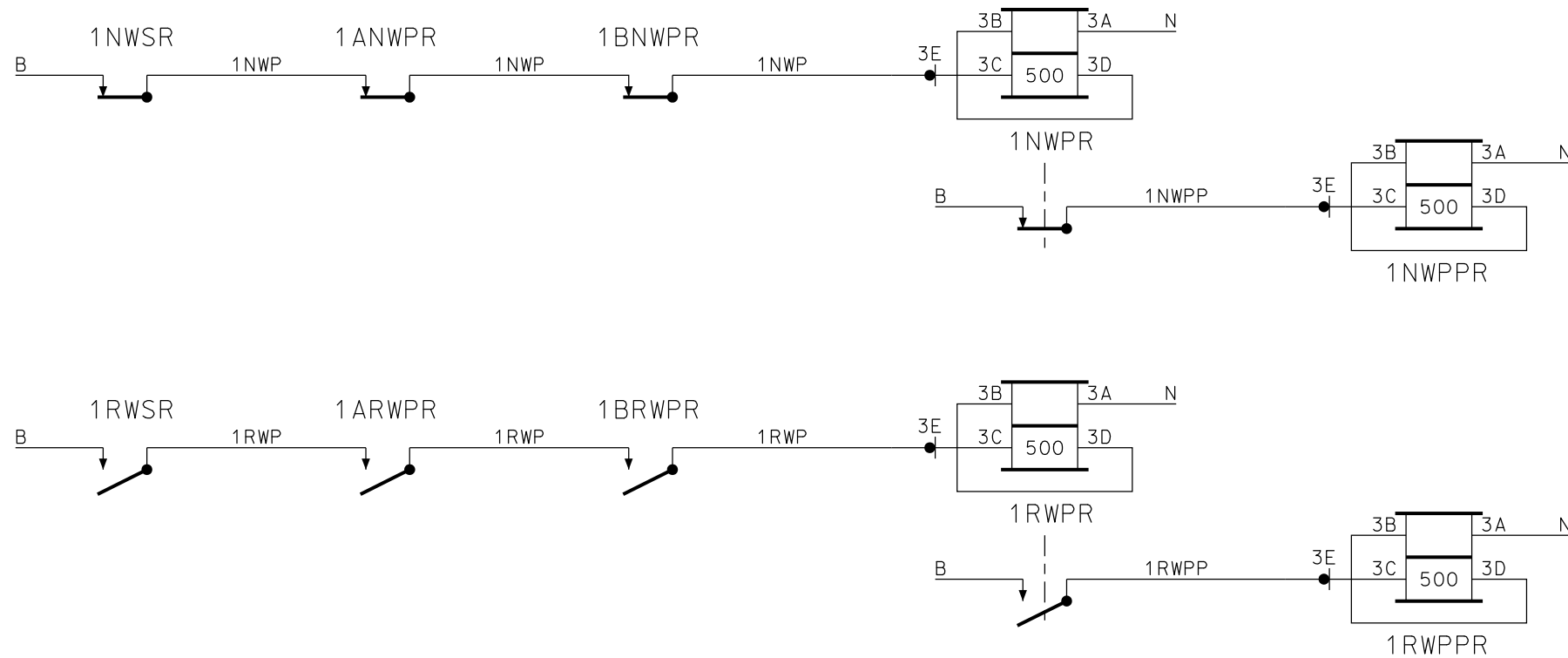
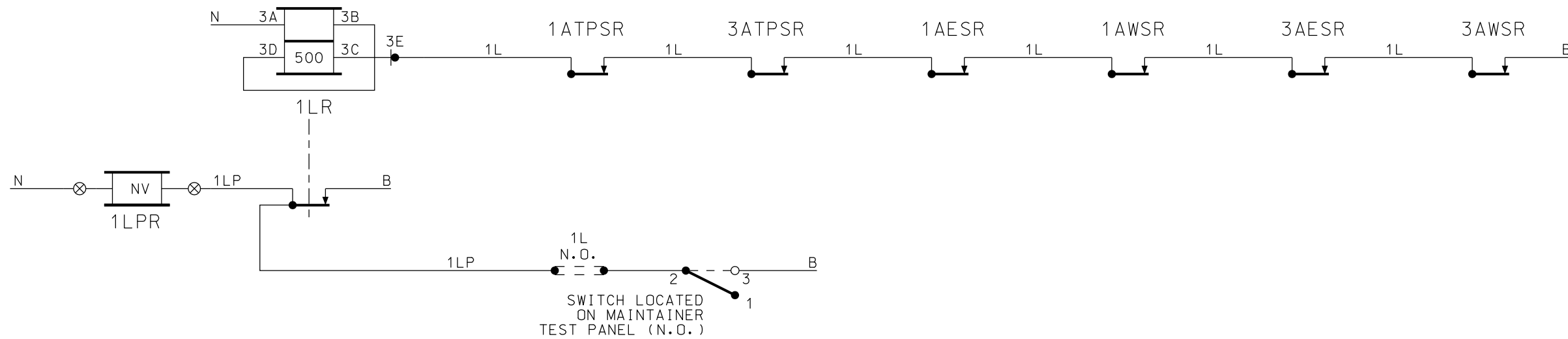
X-PAC TERMINAL CONNECTIONS
 TAB C FOR 12-16V
 TAB B FOR 10-12V
 TAB A FOR 8-10V

NOTES:
 1. #6 TO BE USED FOR LIGHTING SIGNALS WHEN NECESSARY TO REDUCE VOLTAGE LOSS.

ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) SIGNAL 2L & 4L LIGHTING CKTS.			
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.32		



~REVISIONS~

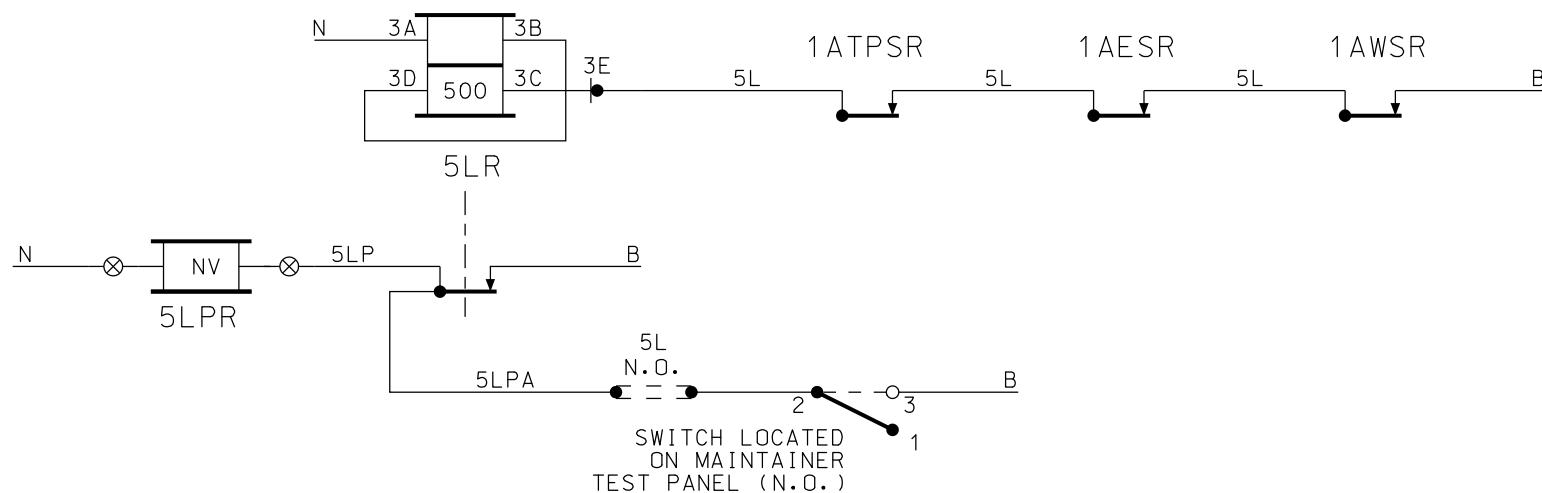
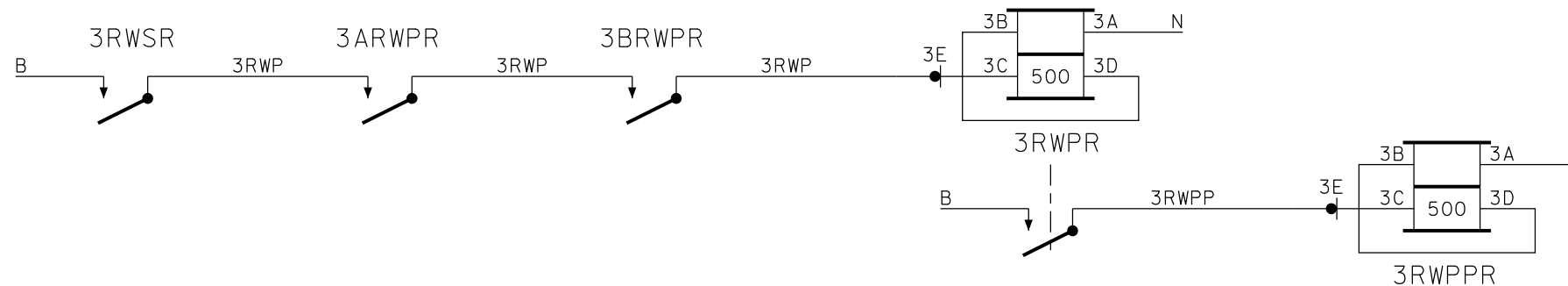
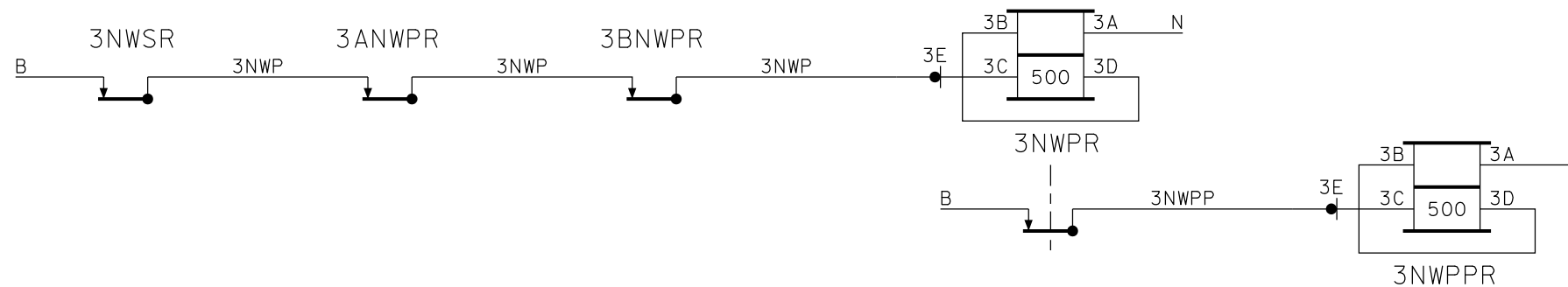
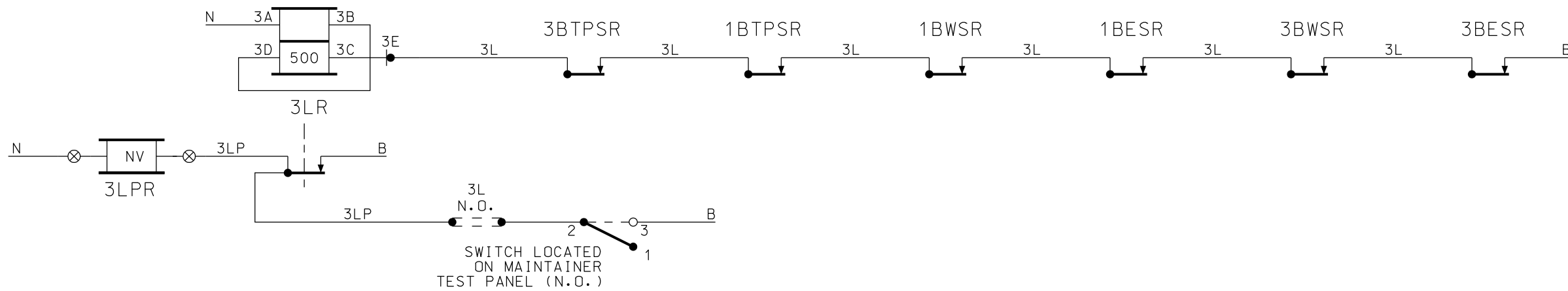
⊗ = CONNECTIONS TO NV RACK

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
1 SWITCH LOCKING & INDICATION

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.33	



⊗ = CONNECTIONS TO NV RACK

~REVISIONS~	

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

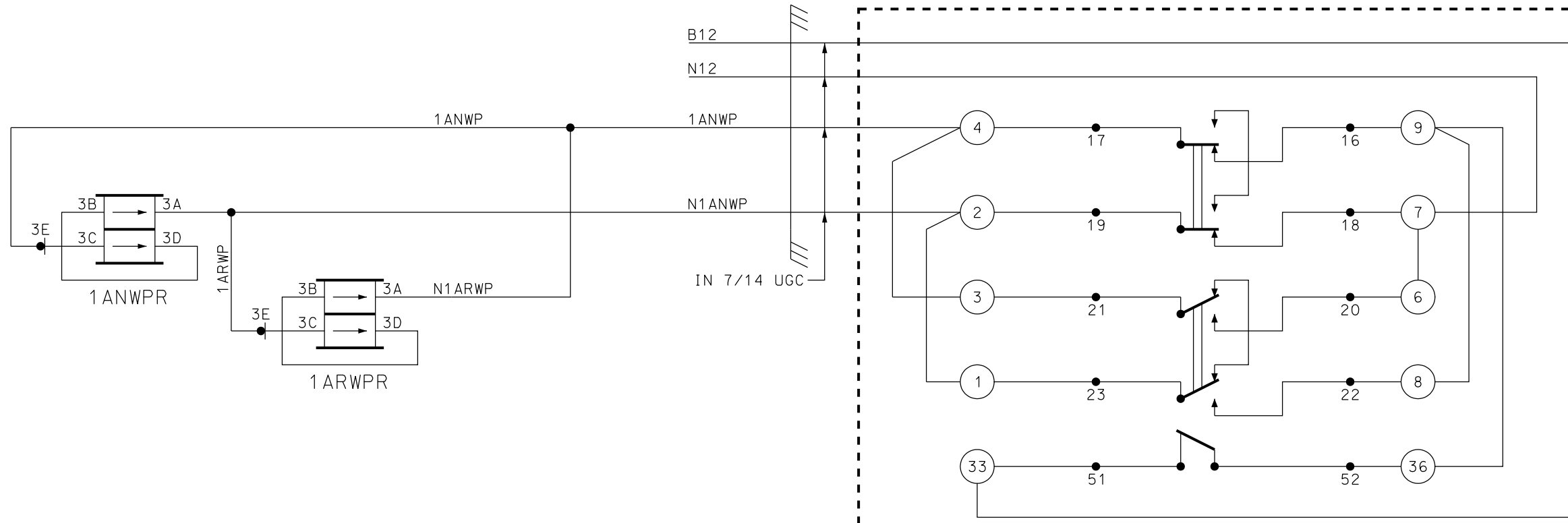
CHICAGO TO (END OF LINE)
CP (LOCATION)
3 & 5 SW. LOCKING & INDICATION

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

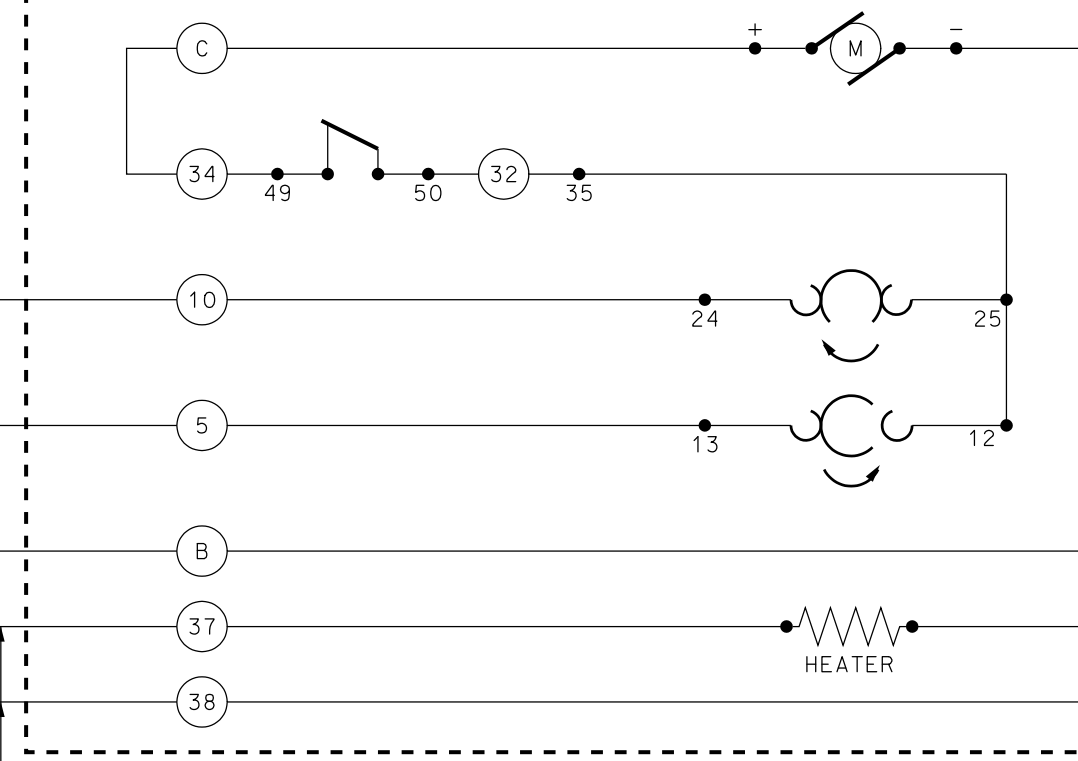
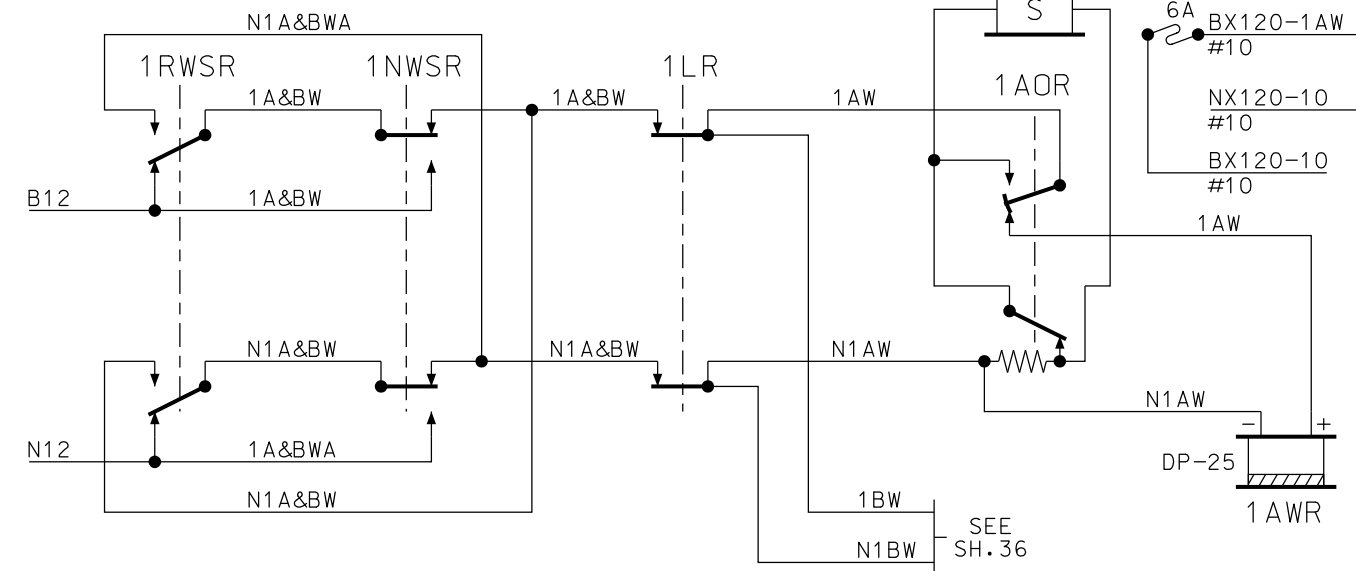
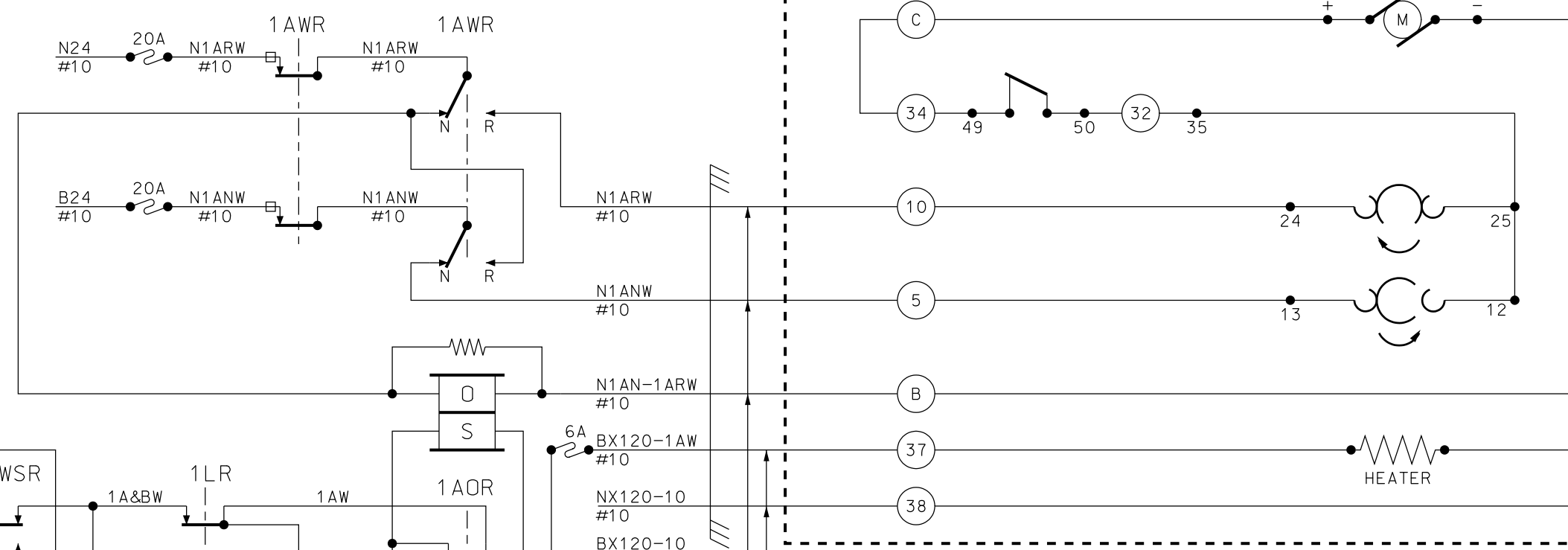
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.34
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



ANSALDO
M23B LH



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

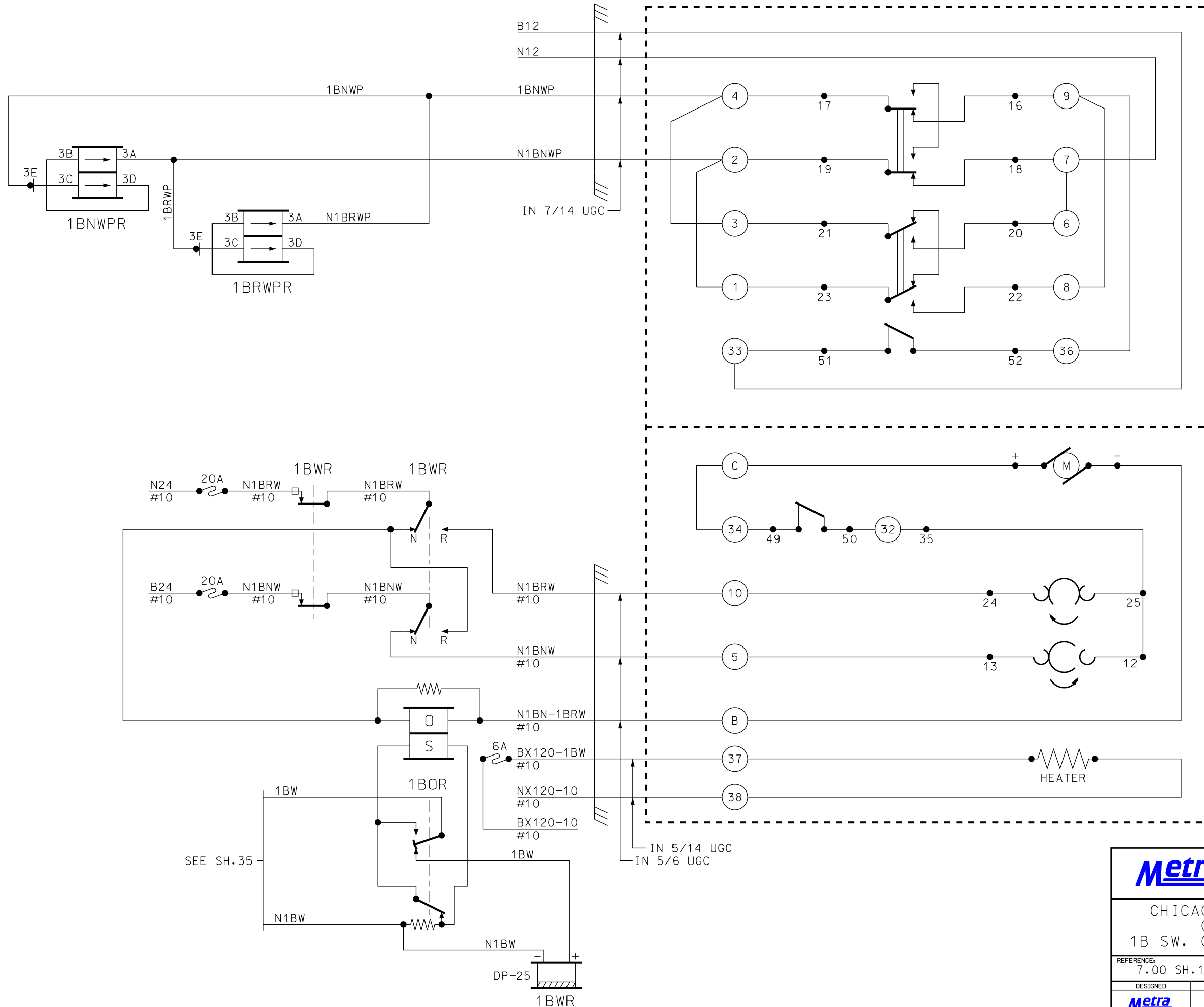
CHICAGO TO (END OF LINE)
CP (LOCATION)
1A SW. CONTROL & INDICATION

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.35
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



ANSALDO
M23B LH

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
1B SW. CONTROL & INDICATION

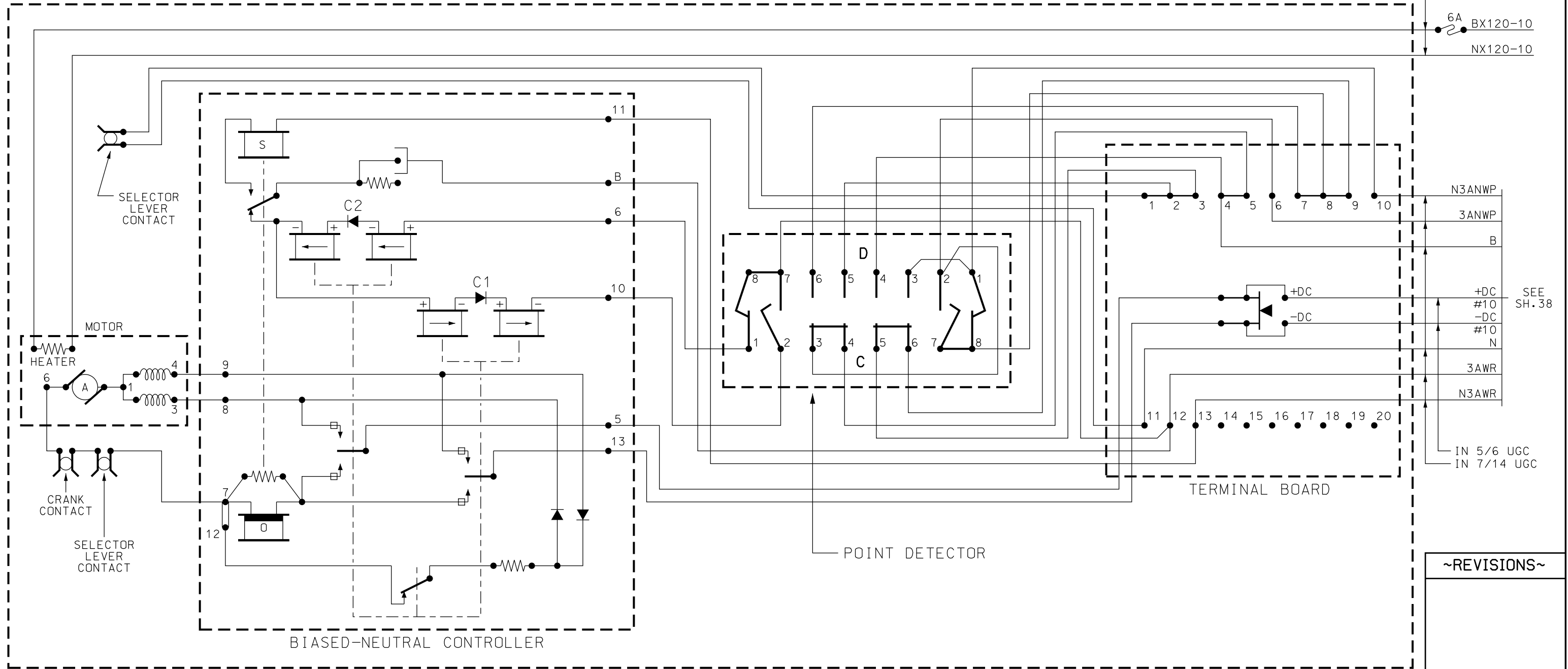
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.36
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

MODEL 5H - RIGHT HAND-POINT NORMALLY CLOSED



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

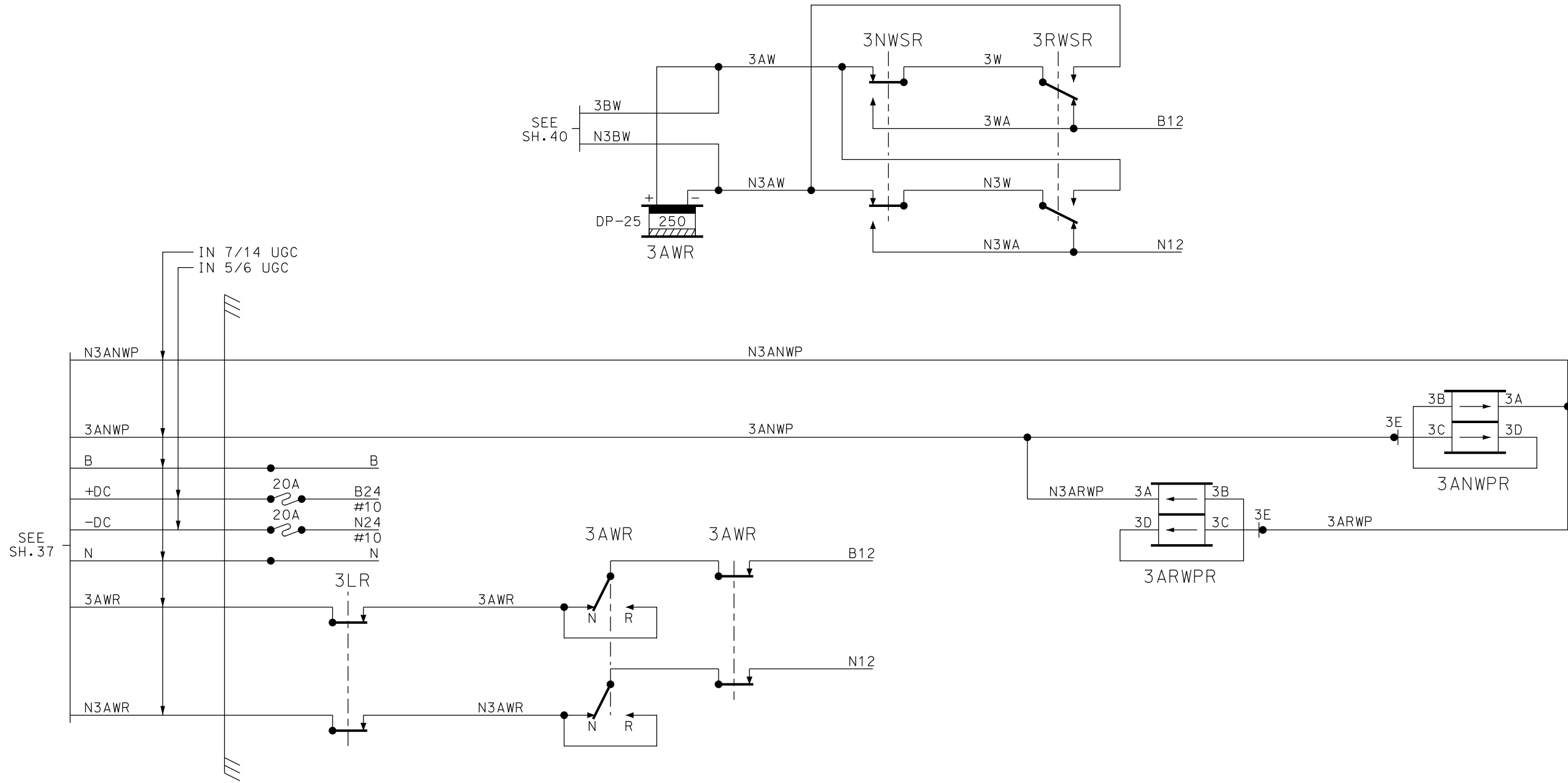
CHICAGO TO (END OF LINE)
CP (LOCATION)
3A SW. CONTROL & INDICATION

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.00 SH.37

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~	

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
3A SW. CONTROL & INDICATION

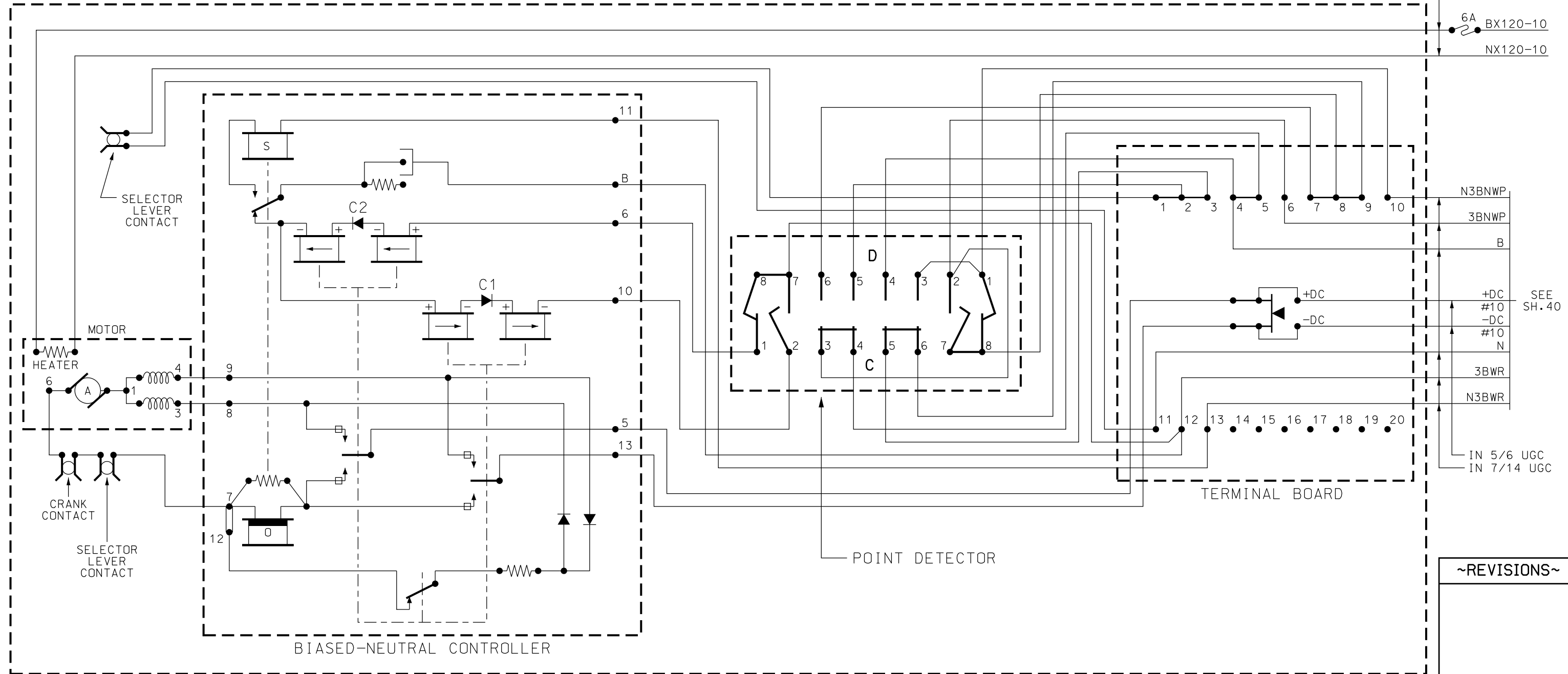
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.38
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

MODEL 5H - RIGHT HAND-POINT NORMALLY CLOSED



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

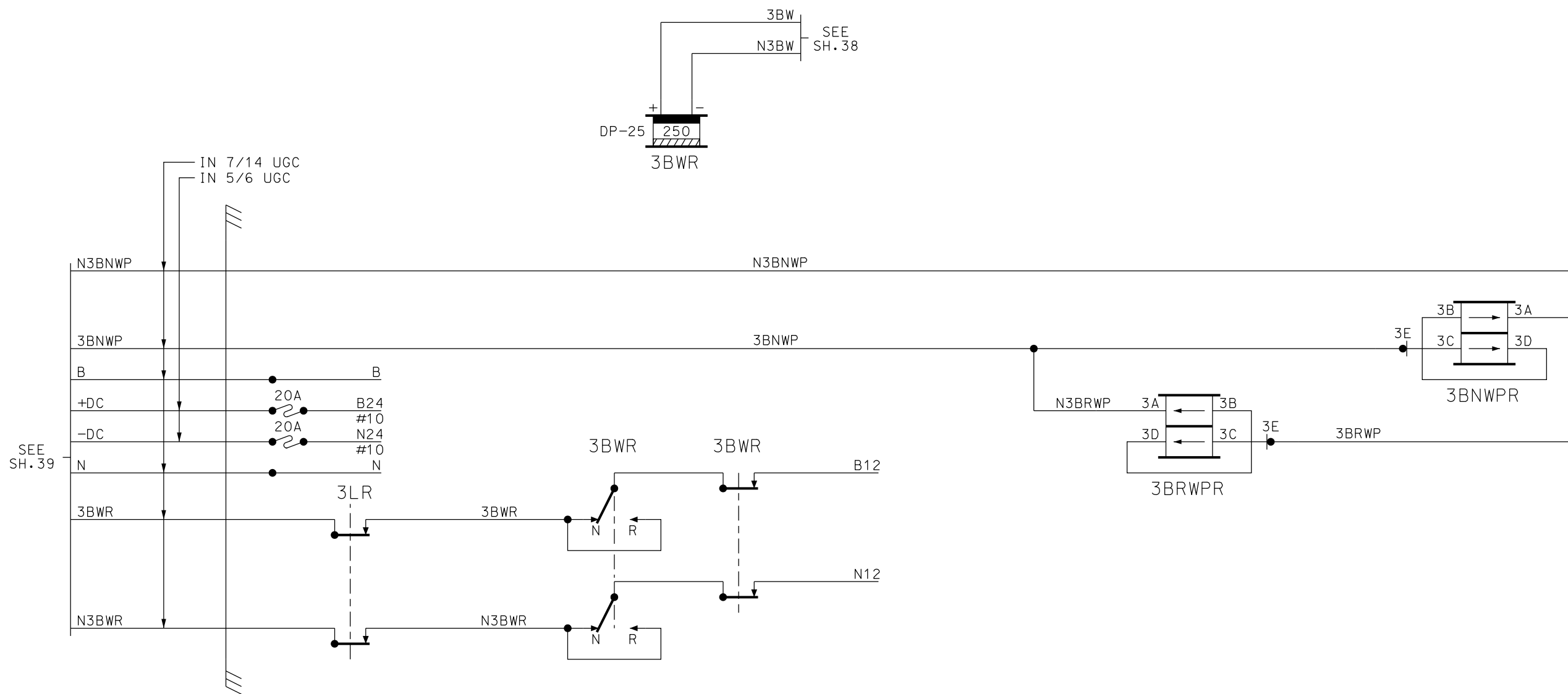
CHICAGO TO (END OF LINE)
CP (LOCATION)
3B SW. CONTROL & INDICATION

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.00 SH.39

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



SEE SH. 39

SEE SH. 38

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

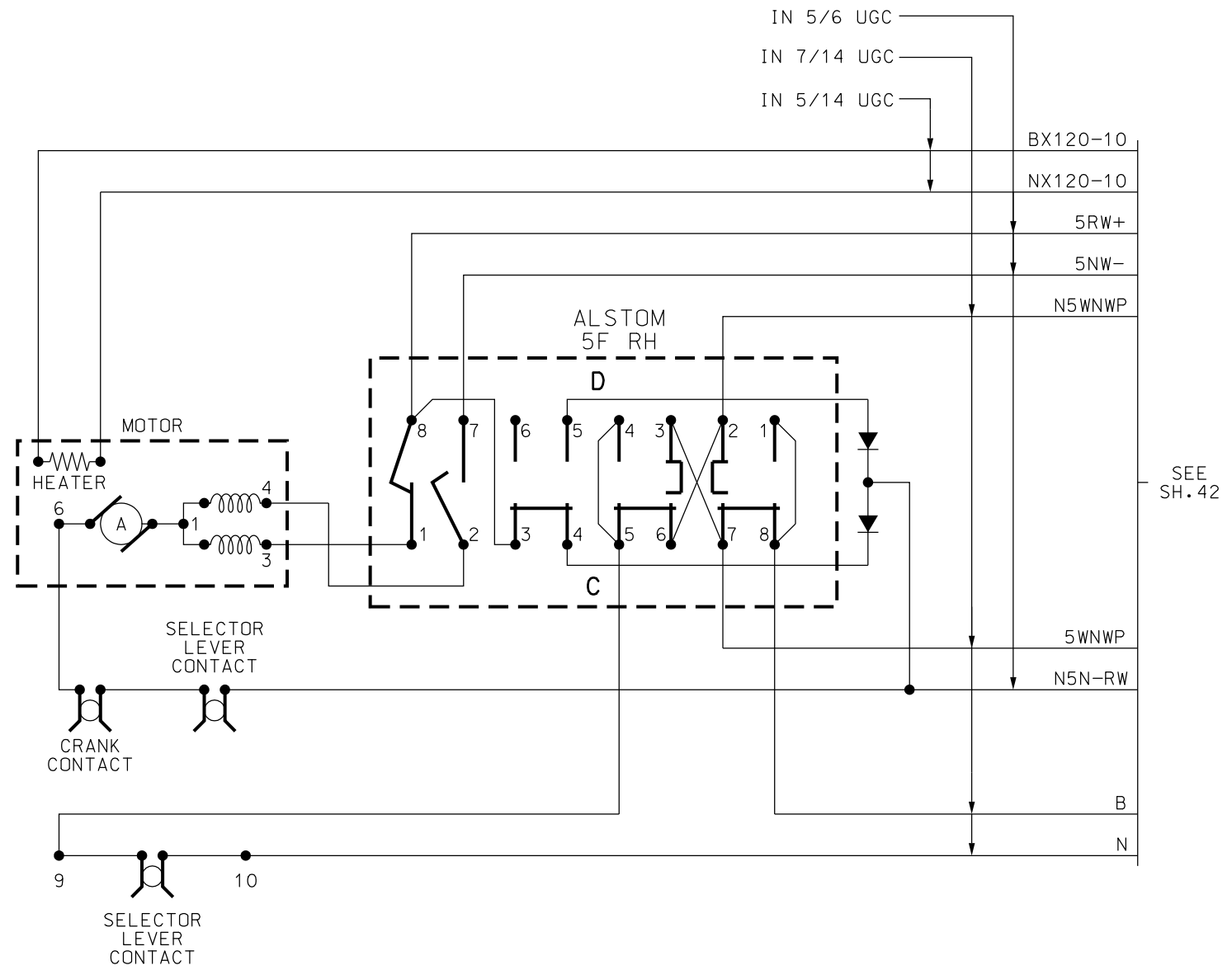
CHICAGO TO (END OF LINE)
CP (LOCATION)
3B SW. CONTROL & INDICATION

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.40
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~

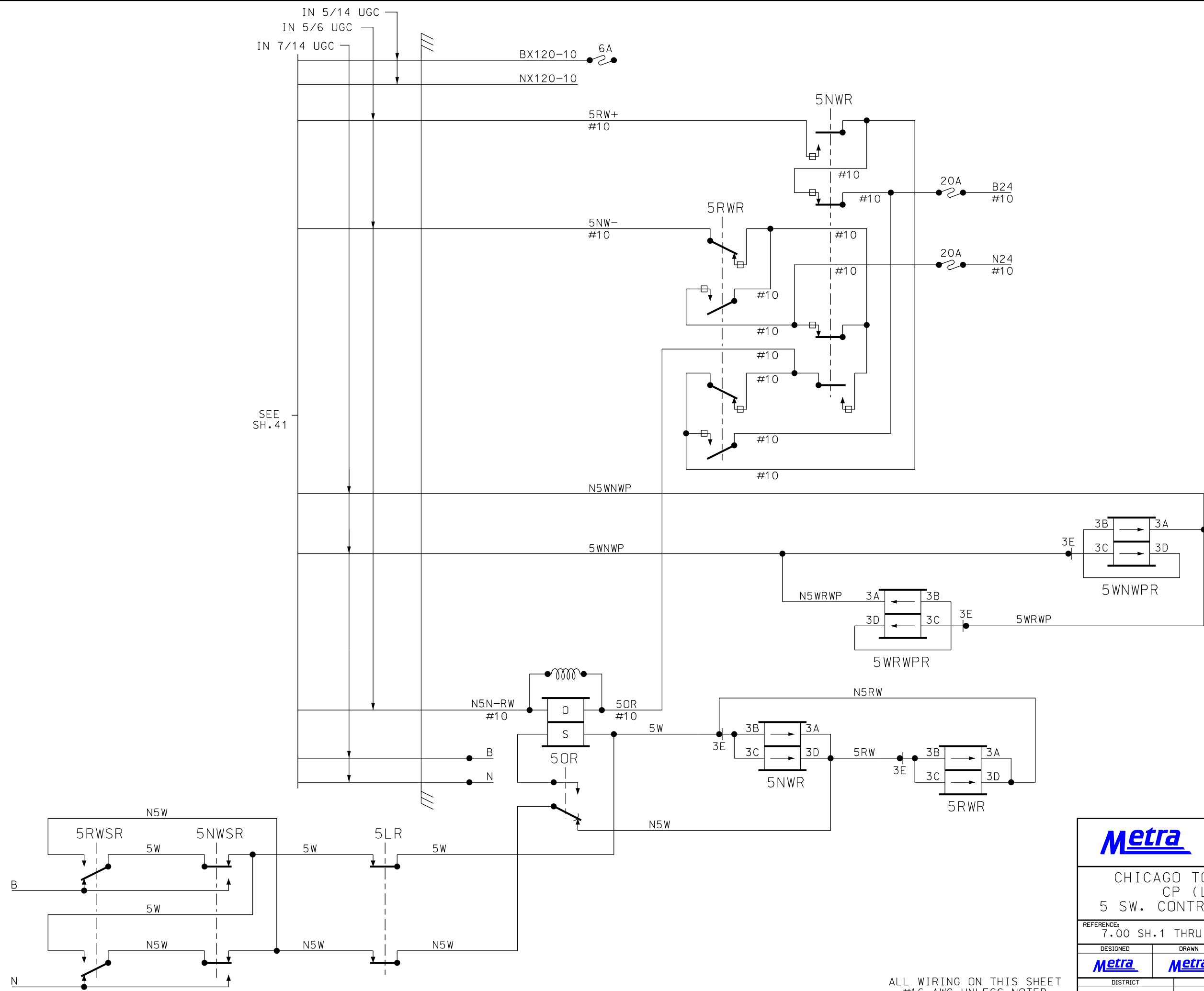
Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 CP (LOCATION)
 5 SW. CONTROL & INDICATION

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.00 SH.41



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
5 SW. CONTROL & INDICATION

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.42
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

FUTURE PTC

~REVISIONS~



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
FUTURE PTC

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED

DISTRICT	PRINT NUMBER
TYP	7.00 SH.43

FUTURE PTC

~REVISIONS~



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
FUTURE PTC

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED 	DRAWN 	CHECKED 	APPROVED
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DISTRICT TYP	PRINT NUMBER 7.00 SH.44
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FUTURE PTC

~REVISIONS~



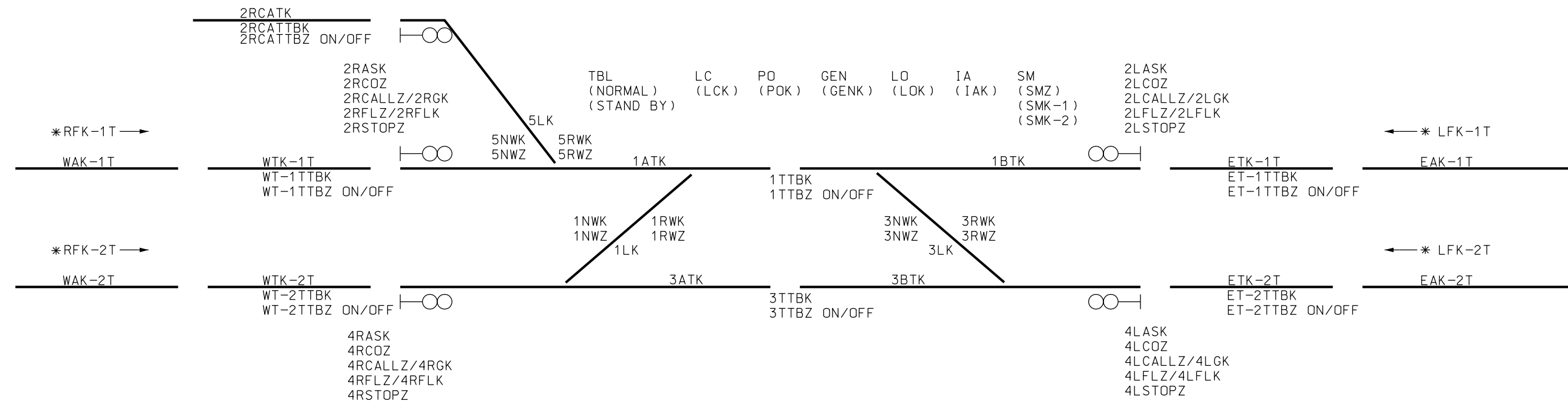
SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
FUTURE PTC

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED 	DRAWN 	CHECKED 	APPROVED
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DISTRICT TYP	PRINT NUMBER 7.00 SH.45
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INDICATION WORD							
0	1	2	3	4	5	6	7
1BTK	3BTK	1ATK	3ATK	1TTBK	3TTBK	ET-1TTBK	WT-1TTBK
ET-2TTBK	WT-2TTBK	2RCATBK	1NWK	1RWK	3NWK	3RWK	5NWK
5RWK	1LK	3LK	5LK	2RGK	2RFLK	2LGK	2LFLK
4RGK	4RFLK	4LGK	4LFLK	WTK-1T	WAK-1T	LFK-1T *	2RCATK
	ETK-1T	EAK-1T	RFK-1T *	WTK-2T	WAK-2T	LFK-2T *	ETK-2T
EAK-2T	RFK-2T *	NORMAL	STAND BY	LCK	IAK	POK	LOK
4RASK	4LASK	2RASK	2LASK	SMK-1	SMK-2	GENK	SP
SP	SP	SP	SP	SP	SP	SP	SP

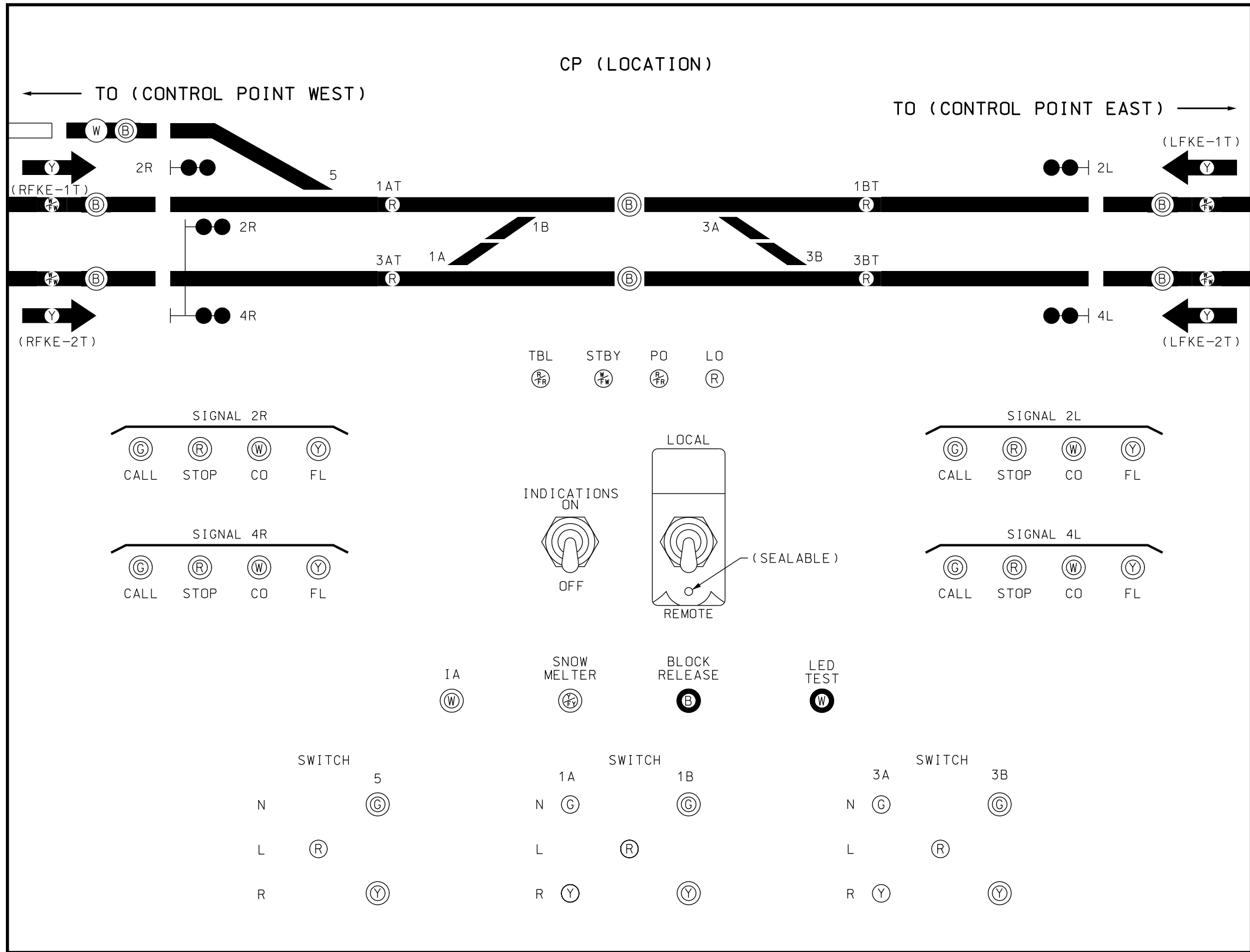
CONTROL WORD							
0	1	2	3	4	5	6	7
1NWK	1RWZ	3NWK	3RWZ	5NWK	5RWZ	2R CALLZ	2R STOPZ
2RCOZ	2RFLZ	2L CALLZ	2L STOPZ	2LCOZ	2LFLZ	4R CALLZ	4R STOPZ
4RCOZ	4RFLZ	4L CALLZ	4L STOPZ	4LCOZ	4LFLZ	1TTBZ ON	1TTBZ OFF
3TTBZ ON	3TTBZ OFF	ET-1TTBZ ON	ET-1TTBZ OFF	WT-1TTBZ ON	WT-1TTBZ OFF	ET-2TTBZ ON	ET-2TTBZ OFF
WT-2TTBZ ON	WT-2TTBZ OFF	2RCAT TBZ ON	2RCAT TBZ OFF	SMZ	SP	SP	SP
SP	SP	SP	SP	SP	SP	SP	SP

CCF	
SMK-1	SMK-2
OFF	OFF = OFF
ON	OFF = REQUEST
ON	ON = RUN
OFF	ON = FAIL

* ONLY TRANSMITTED WHEN NEXT LOCATION IS NOT CONTROLLED FROM CCF

~REVISIONS~
LTK 04/22/13

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) CODE CHART			
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.46	



MATERIAL:
#4 FINISH ALUMINUM WITH
BLACK LETTERS & TRACK
1/8" THK. (METAL PHOTO ETCHED)

TRACK - 1/8" WIDE.

LETTERING:
MEDIUM - 14 PT.
LARGE - 24 PT.

⊙ ILLUMINATED
PUSH BUTTON
(CAP COLOR AS SHOWN)

⊙ NON-ILLUMINATED
PUSH BUTTON
(CAP COLOR AS SHOWN)

○ LAMP BEZEL COLORS
W - WHITE
G - GREEN
Y - YELLOW
R - RED
B - BLUE

TOGGLE SWITCH

SEALABLE COVER

() PANEL NOTE ONLY
(NOT TO ETCH)

~REVISIONS~

LTK 01/25/13

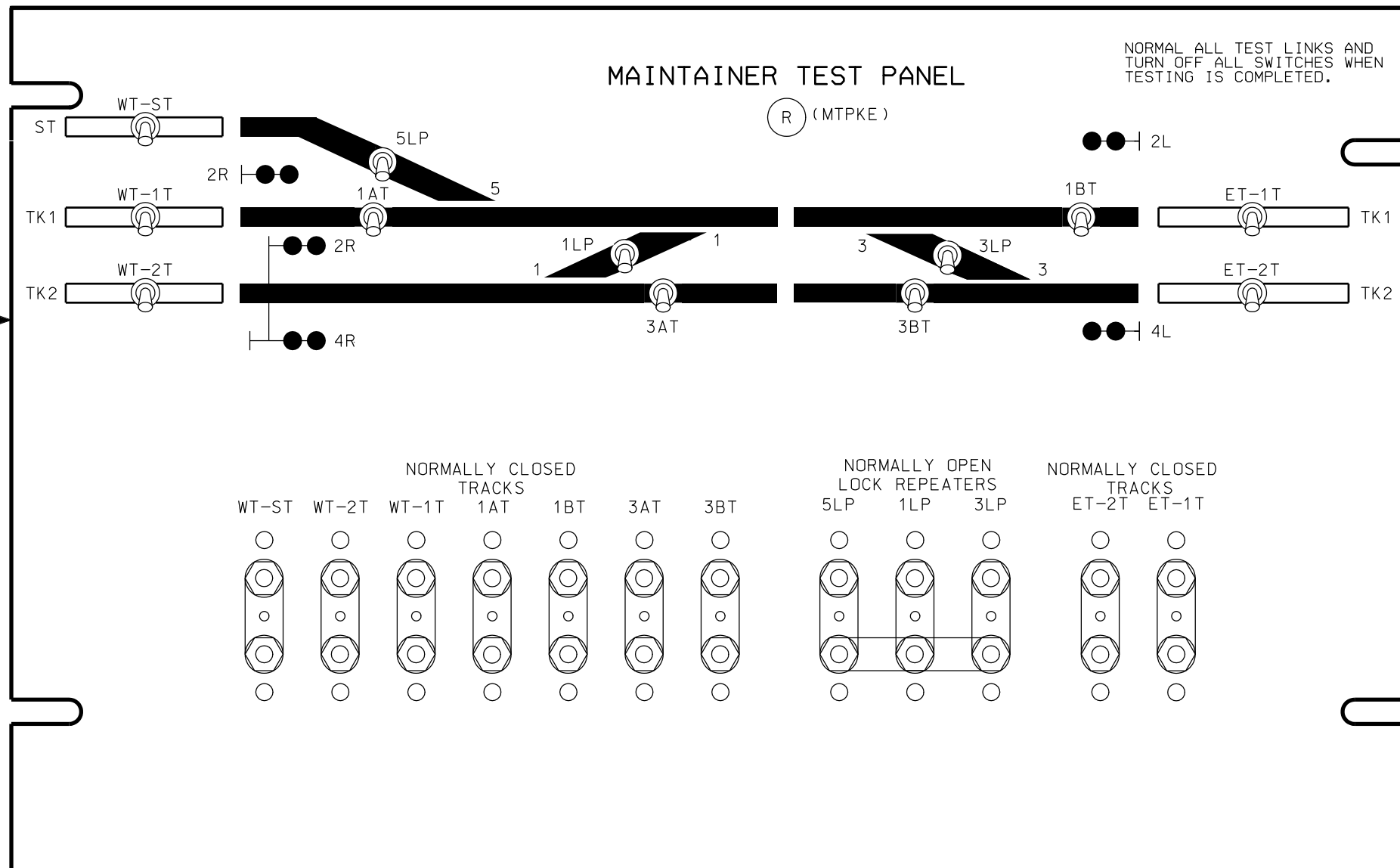
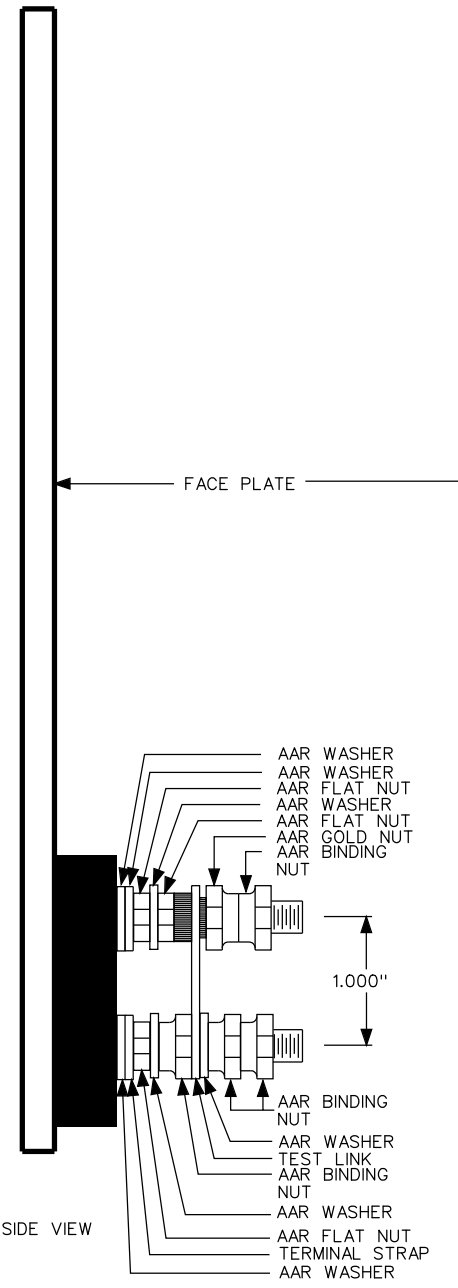
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
LOCAL CONTROL PANEL

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.47
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PANEL 1/8" ANODIZED ALUMINUM

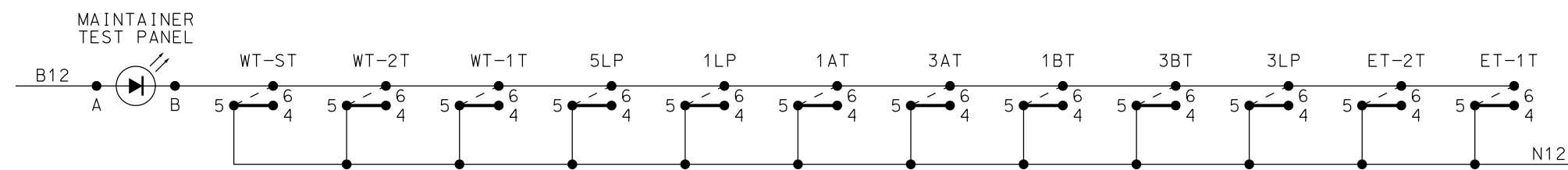
ALL TOGGLE SWITCHES ARE DOUBLE POLE DOUBLE THROW LOCKING. (NOT AUTO RETURN)

ALL TERMINALS ARE A.A.R. TWO POST WITH INVENSYS 024620-1X TEST LINK.

PANEL TO BE LOCATED DIRECTLY UNDER LOCAL CONTROL PANEL.

~REVISIONS~

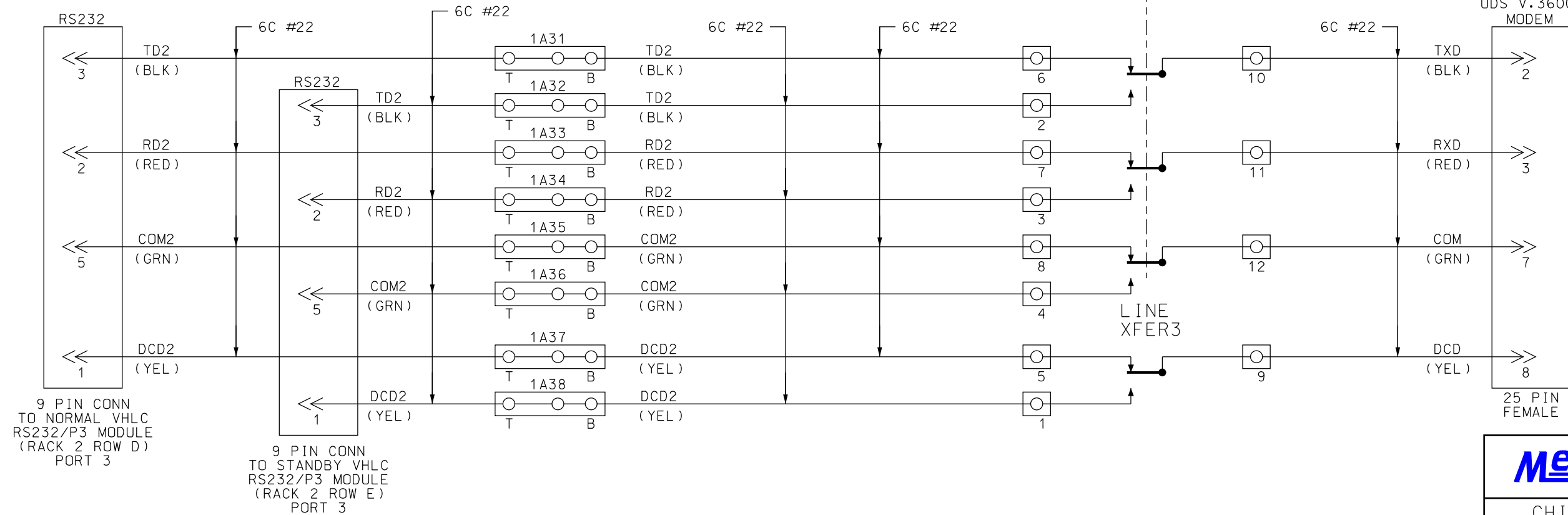
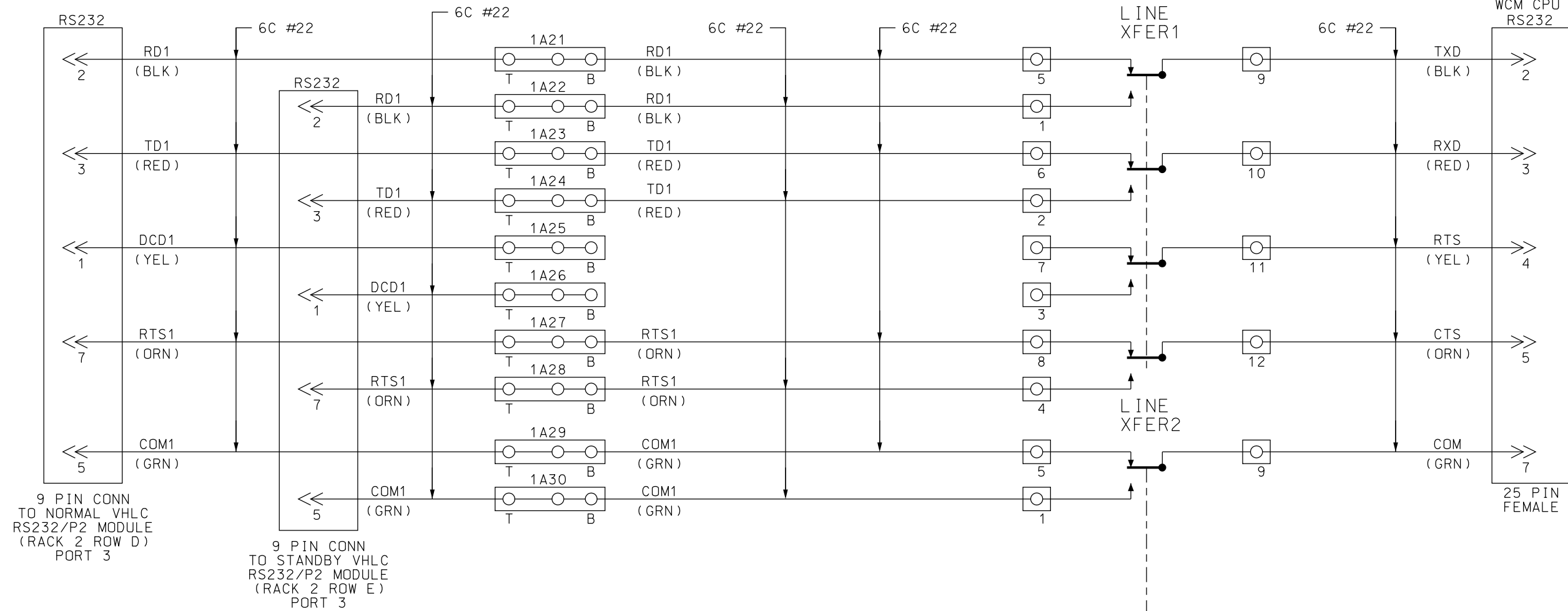
LTK 03/22/13



AAR TERMINAL POST WITH 1" SPACING BETWEEN TERMINALS

* FOR APPROACH TRACKS BREAK LINE CIRCUITS ON SHEET 12 AND EC ON SHEETS 2 & 3

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) CP (LOCATION) MAINTAINER TEST PANEL	
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.48

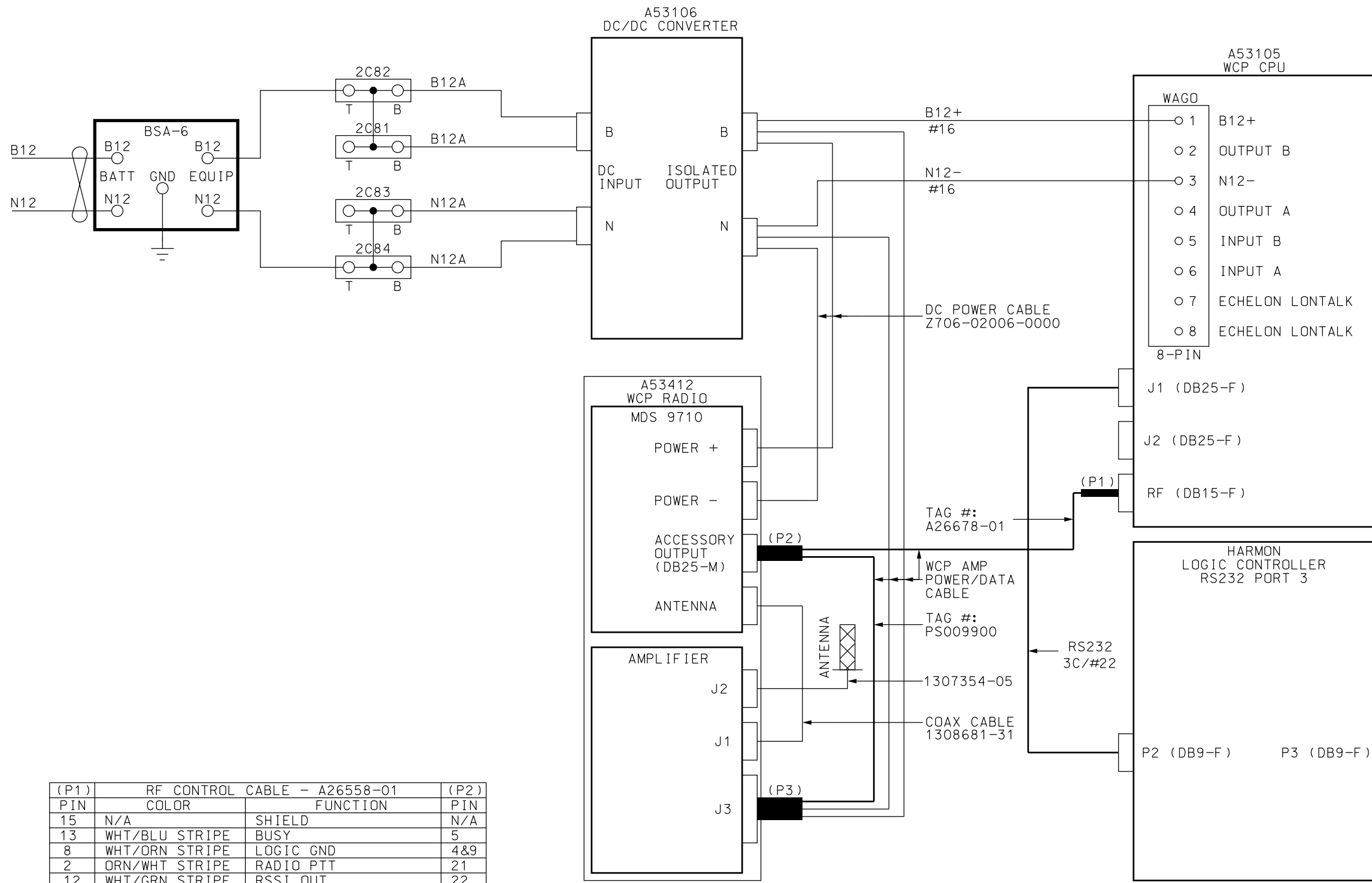


~REVISIONS~	

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

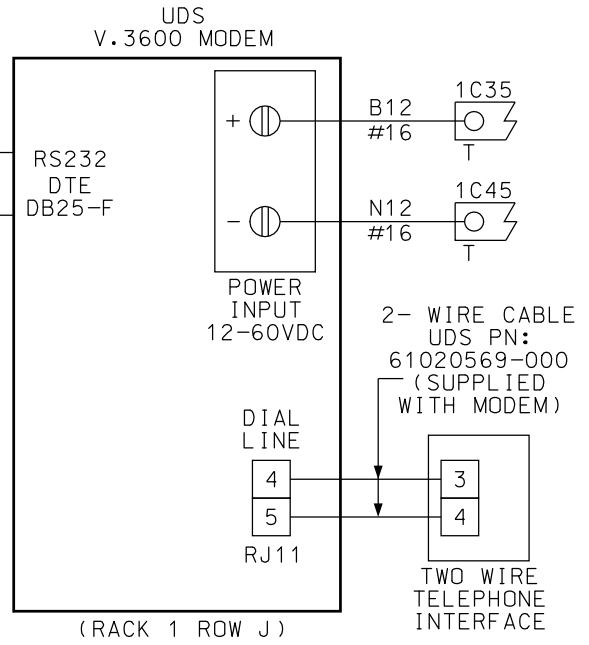
CHICAGO TO (END OF LINE)
CP (LOCATION)
RADIO TRANSFER CIRCUITS

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.49



WCP CPU CONNECTOR PINOUTS
15 PIN

PIN	FUNCTION
1	CHANNEL ACTIVE
2	RADIO PUSH TO TALK OUT
3	TX AUDIO
4	ANALOG GROUND
5	RX AUDIO
7	RESET
8	DIGITAL GROUND
9	SB 9600 BUS(+)
10	SB 9600 BUS(-)
11	ANALOG GROUND
12	RSSI
13	SB 9600 BUS BUSY
14	STATUS
15	DIGITAL GROUND



(P1)	RF CONTROL CABLE - A26558-01		(P2)
PIN	COLOR	FUNCTION	PIN
15	N/A	SHIELD	N/A
13	WHT/BLU STRIPE	BUSY	5
8	WHT/ORN STRIPE	LOGIC GND	4&9
2	ORN/WHT STRIPE	RADIO PTT	21
12	WHT/GRN STRIPE	RSSI OUT	22
7	GRN/WHT STRIPE	RADIO RESET	17
9	WHT/BRN STRIPE	BUS +	6
10	BRN/WHT STRIPE	BUS -	18
3	WHT/GRY STRIPE	TX AUDIO IN	24
4	GRY/WHT STRIPE	AUDIO GND	N/A
5	RED/BLU STRIPE	DETECT RX AUDIO OUT	25
11	BLU/RED STRIPE	AUDIO GND	10

~REVISIONS~

LTK 01/25/13

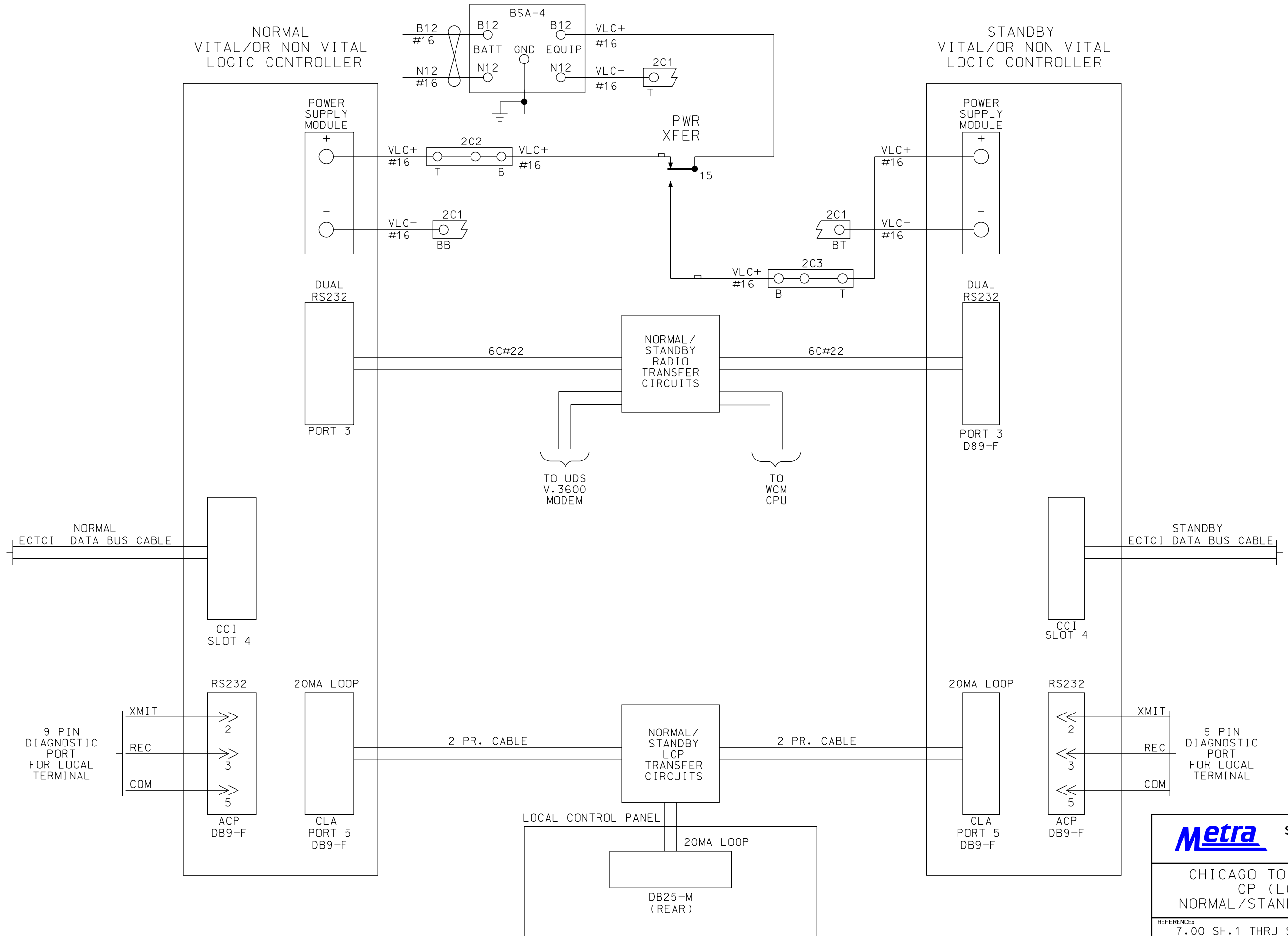
MODEM SETUP
FACTORY SETTING - SETUP #2
FOLLOWING CHANGES:
1. FORCED ANSWER
2. XON/XOFF PASS THROUGH ENABLED
3. 1200 BAUD
4. CD TO NORMAL
5. AT COMMANDS DISABLED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
RADIO/MODEM CONFIGURATION

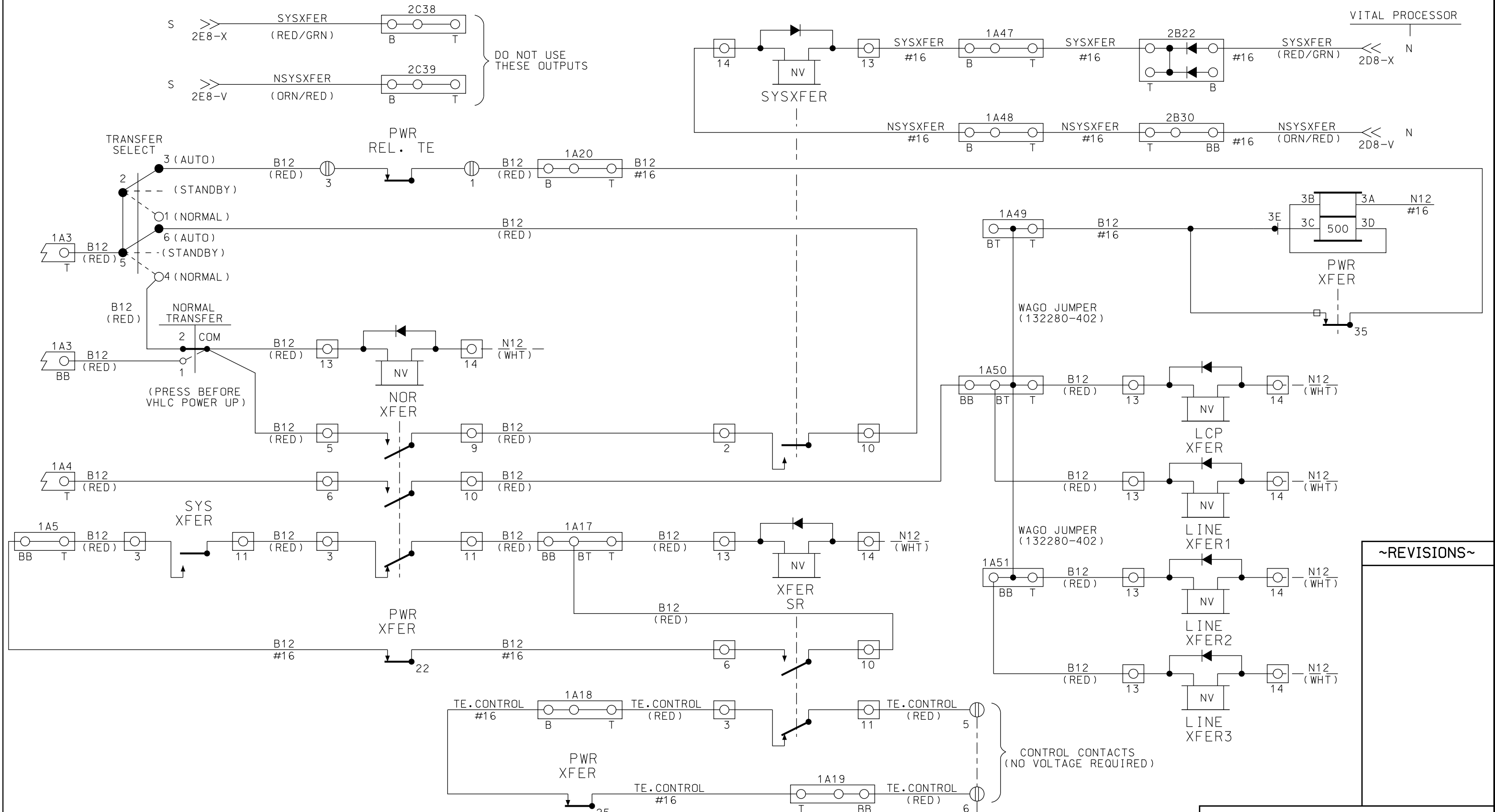
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.50	

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

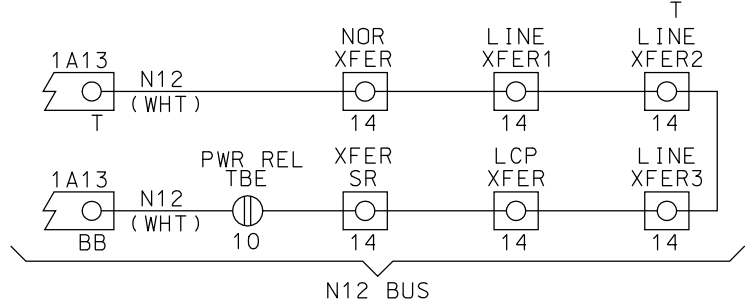
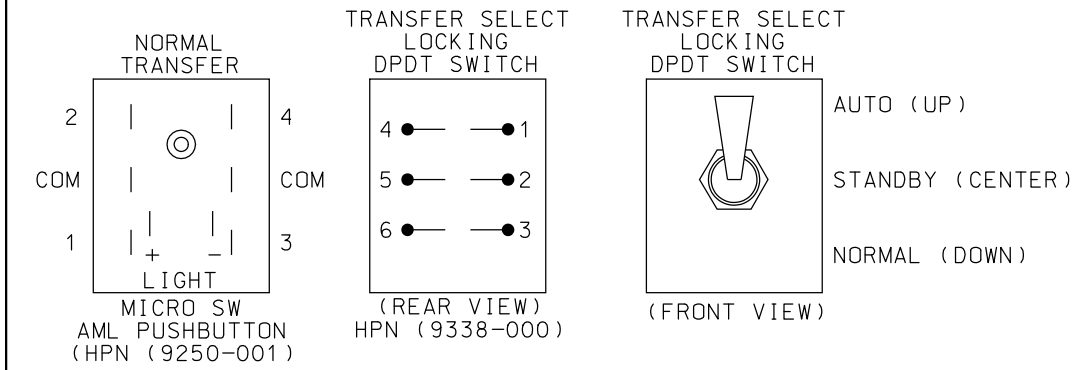


~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) NORMAL/STANDBY DATA COMM.			
REFERENCE: 7.00 SH.1 THRU SH.75			DATE: 05/13/11
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.51	



~REVISIONS~



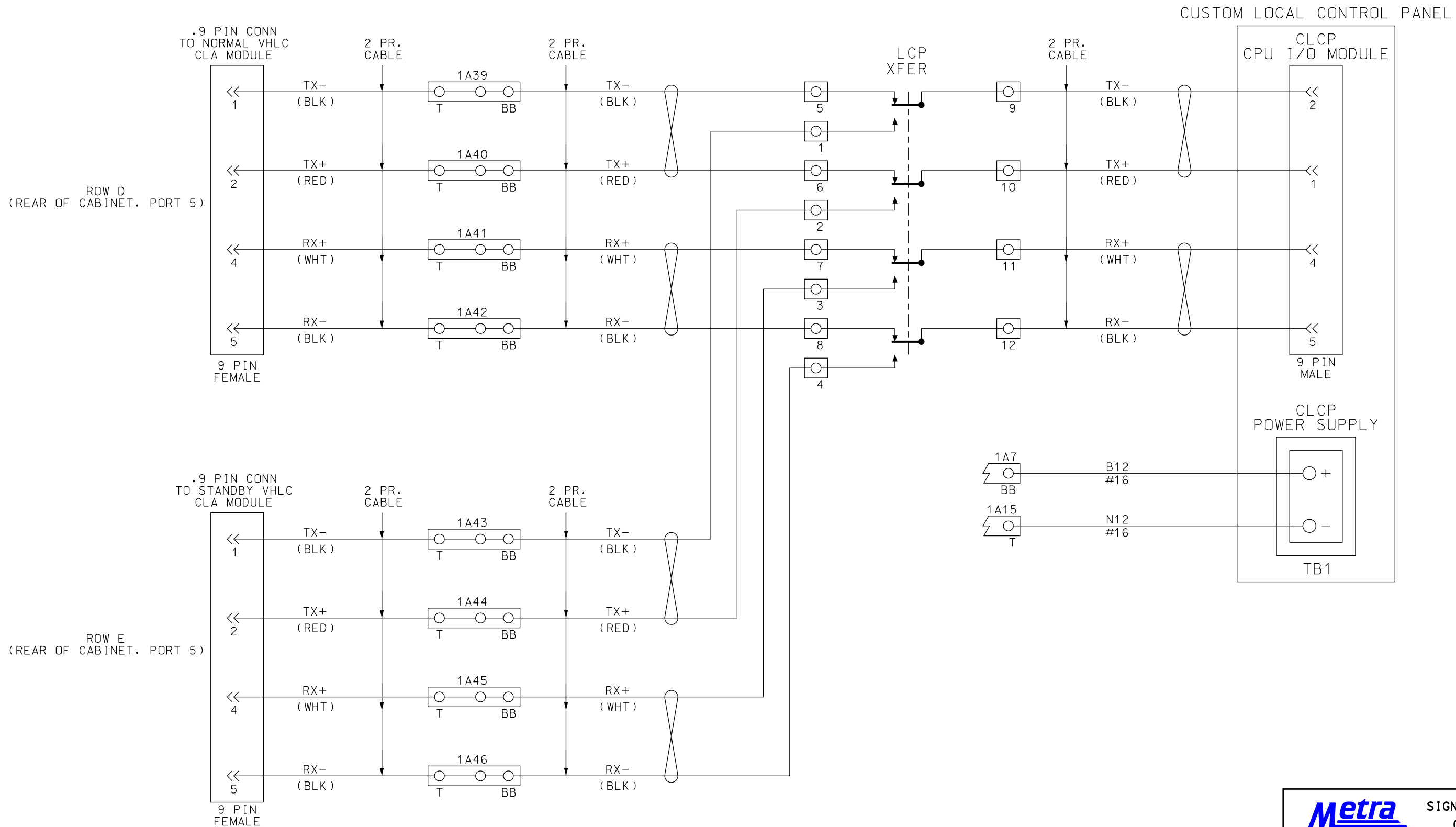
- NOTES:
- ALL WIRE TO BE #22 AWG UNLESS NOTED.
 - N12 INDICATES N12 BUS ON MAINTAINER TEST PANEL.

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
NORMAL/STANDBY TRANSFER CKTS.

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra
DISTRICT	PRINT NUMBER		
TYP	7.00 SH.52		

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

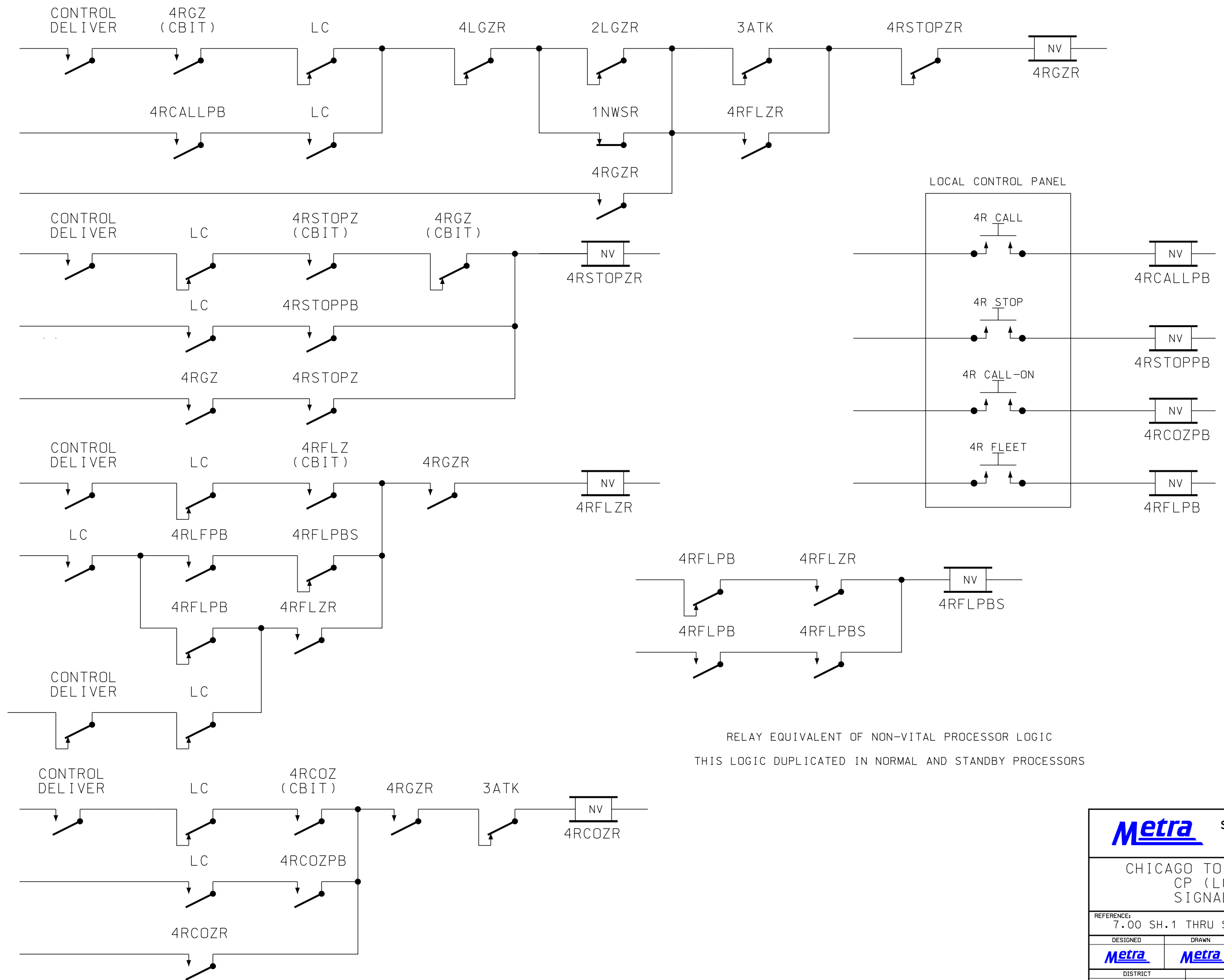


NOTE:

1. ALL WIRE #22 AWG TWO PAIR CABLE.

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) CP (LOCATION) LOCAL PANEL TRANSFER CIRCUITS	
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.53

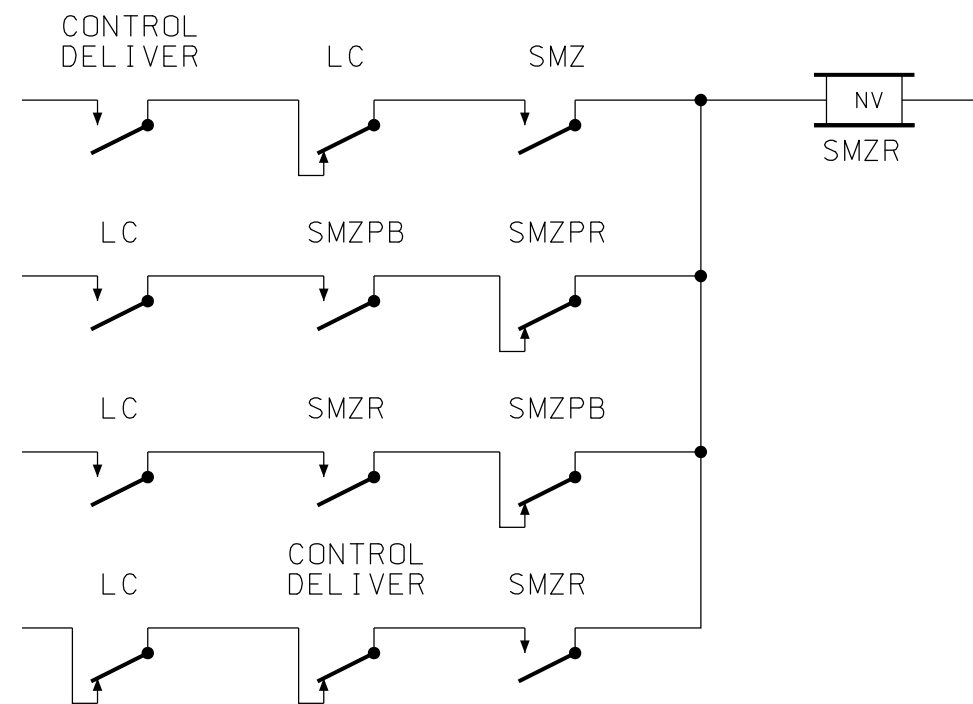
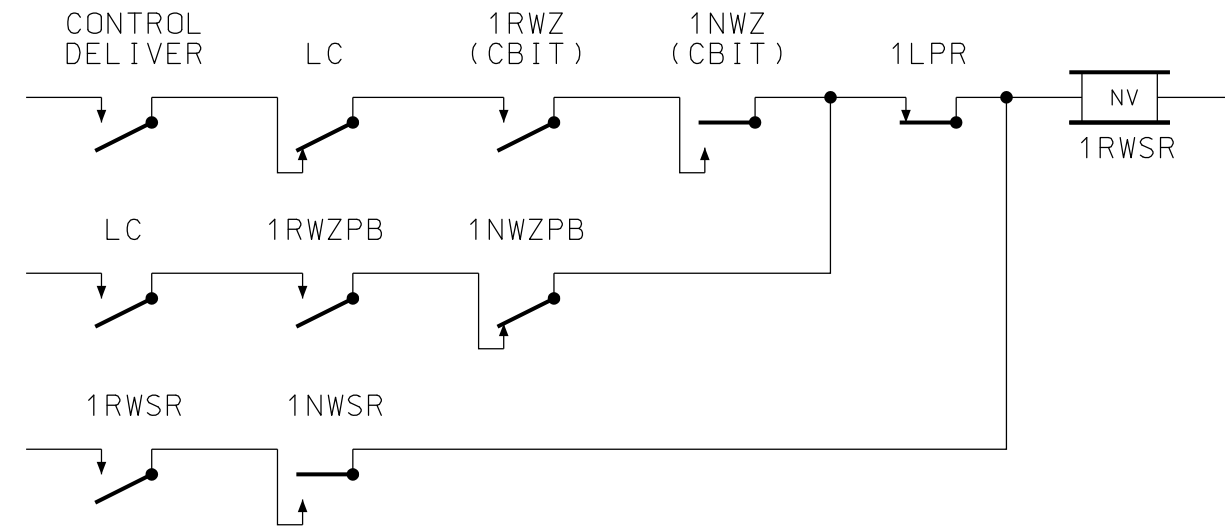
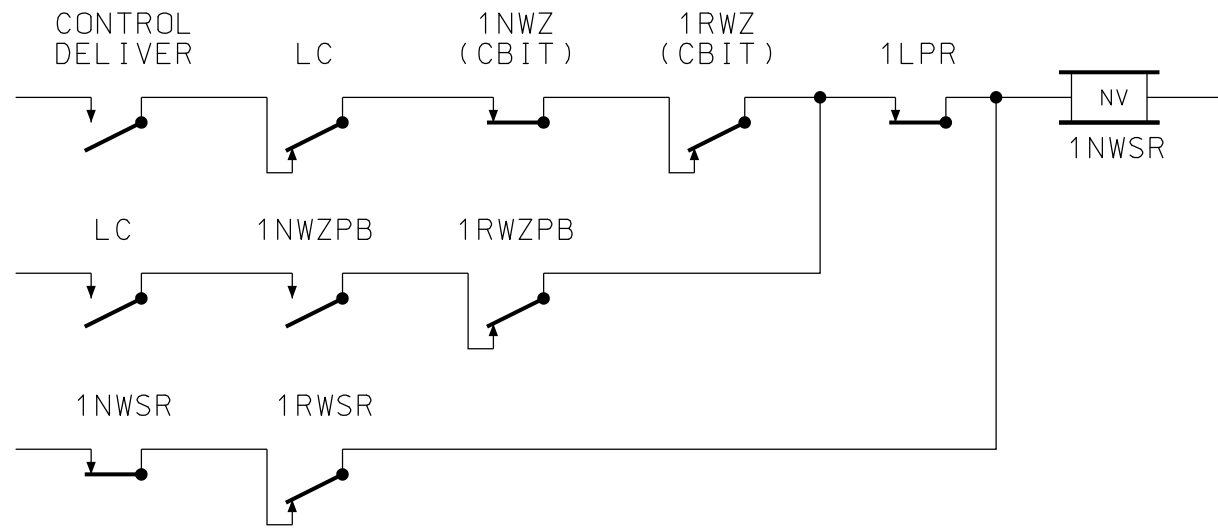


RELAY EQUIVALENT OF NON-VITAL PROCESSOR LOGIC
 THIS LOGIC DUPLICATED IN NORMAL AND STANDBY PROCESSORS

~REVISIONS~

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Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) SIGNAL REQUEST			
REFERENCE: 7.00 SH.1 THRU SH.75			DATE: 05/13/11
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.54	



~REVISIONS~

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Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

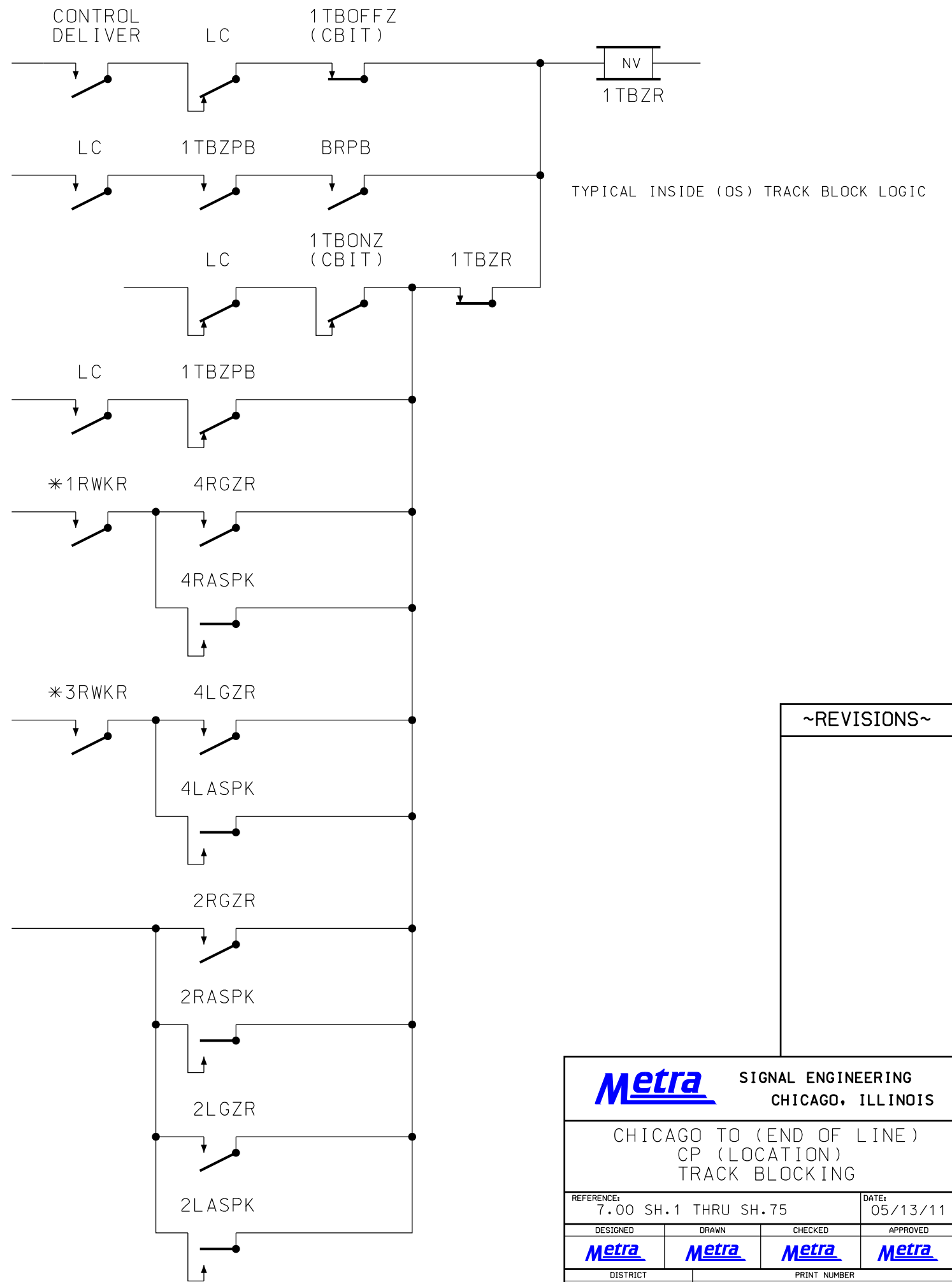
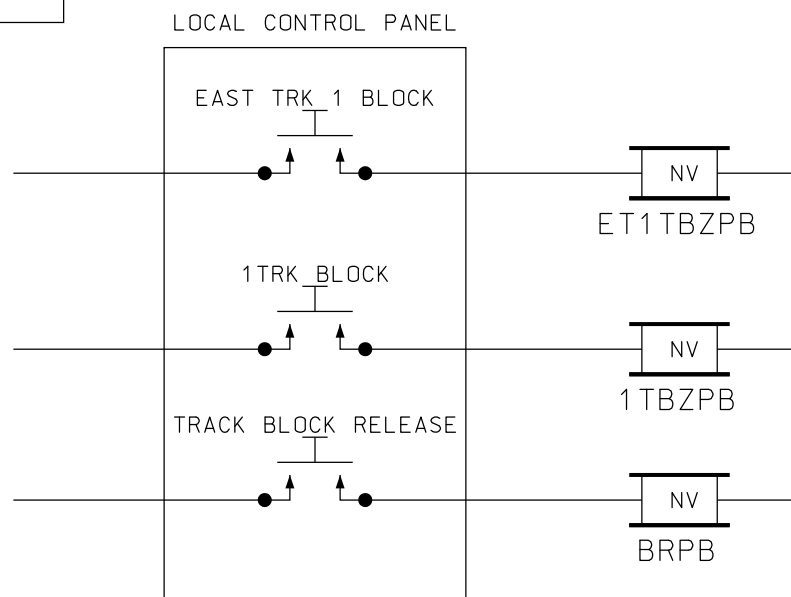
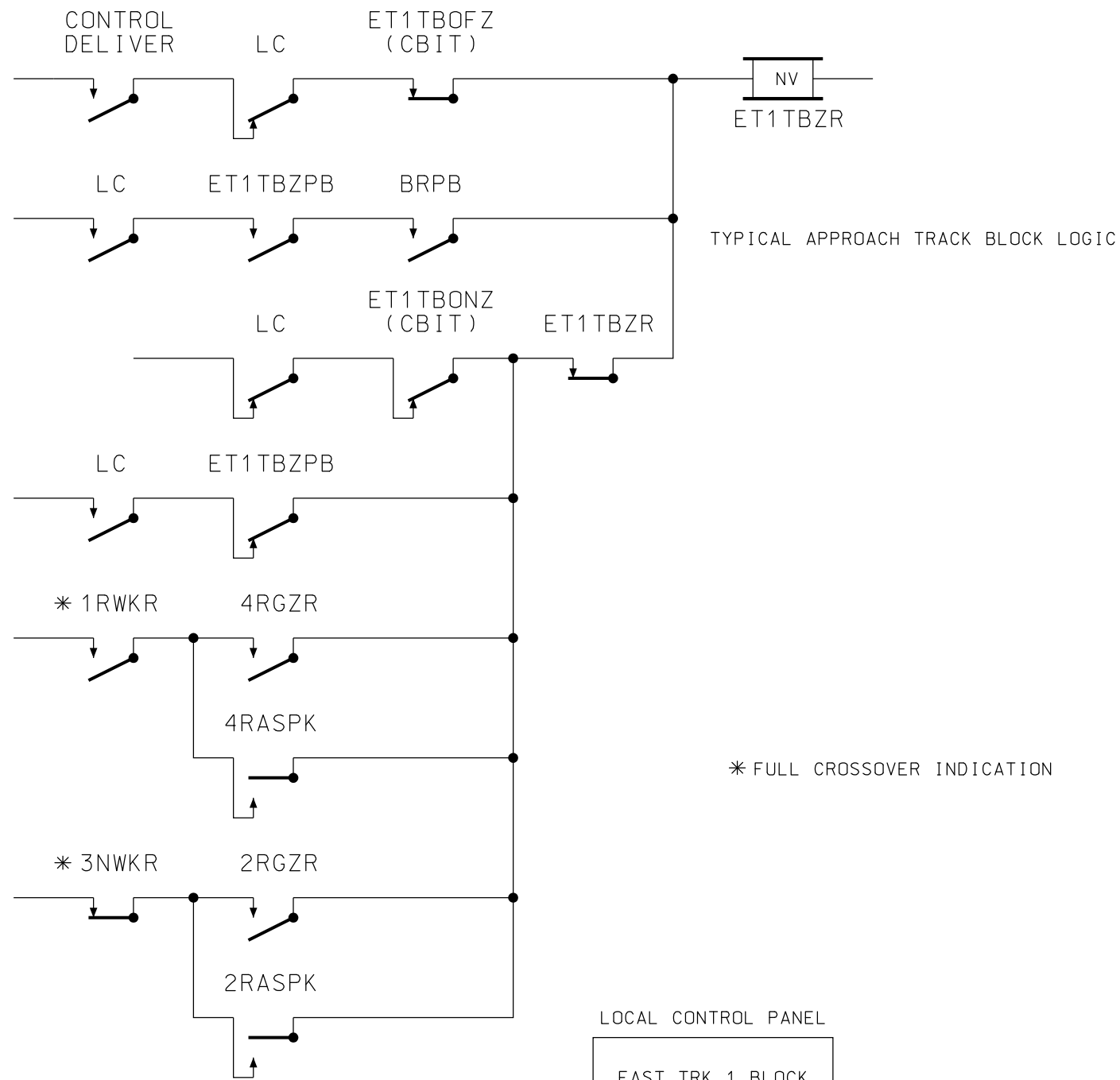
CHICAGO TO (END OF LINE)
CP (LOCATION)
SWITCH REQUEST

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.55
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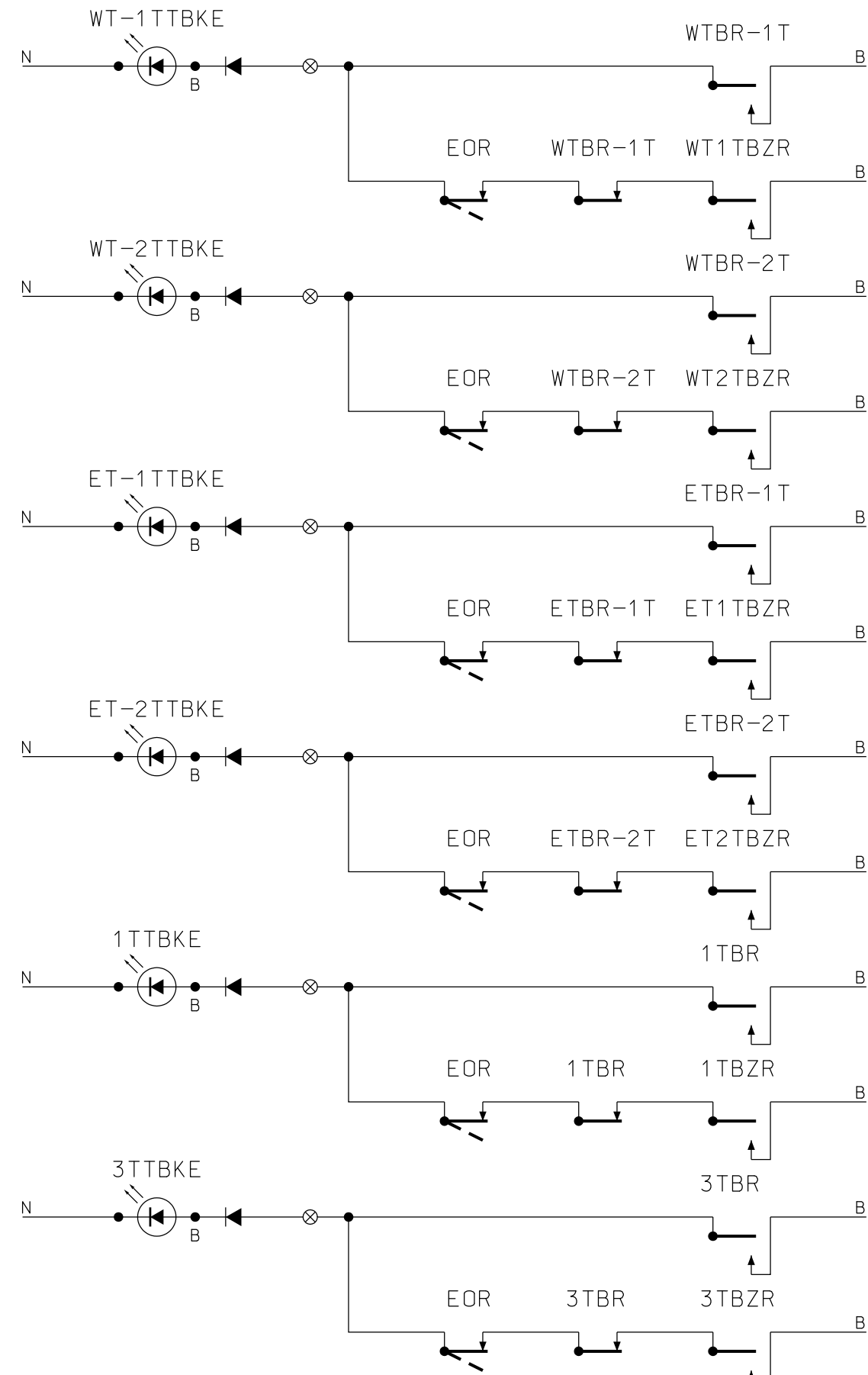
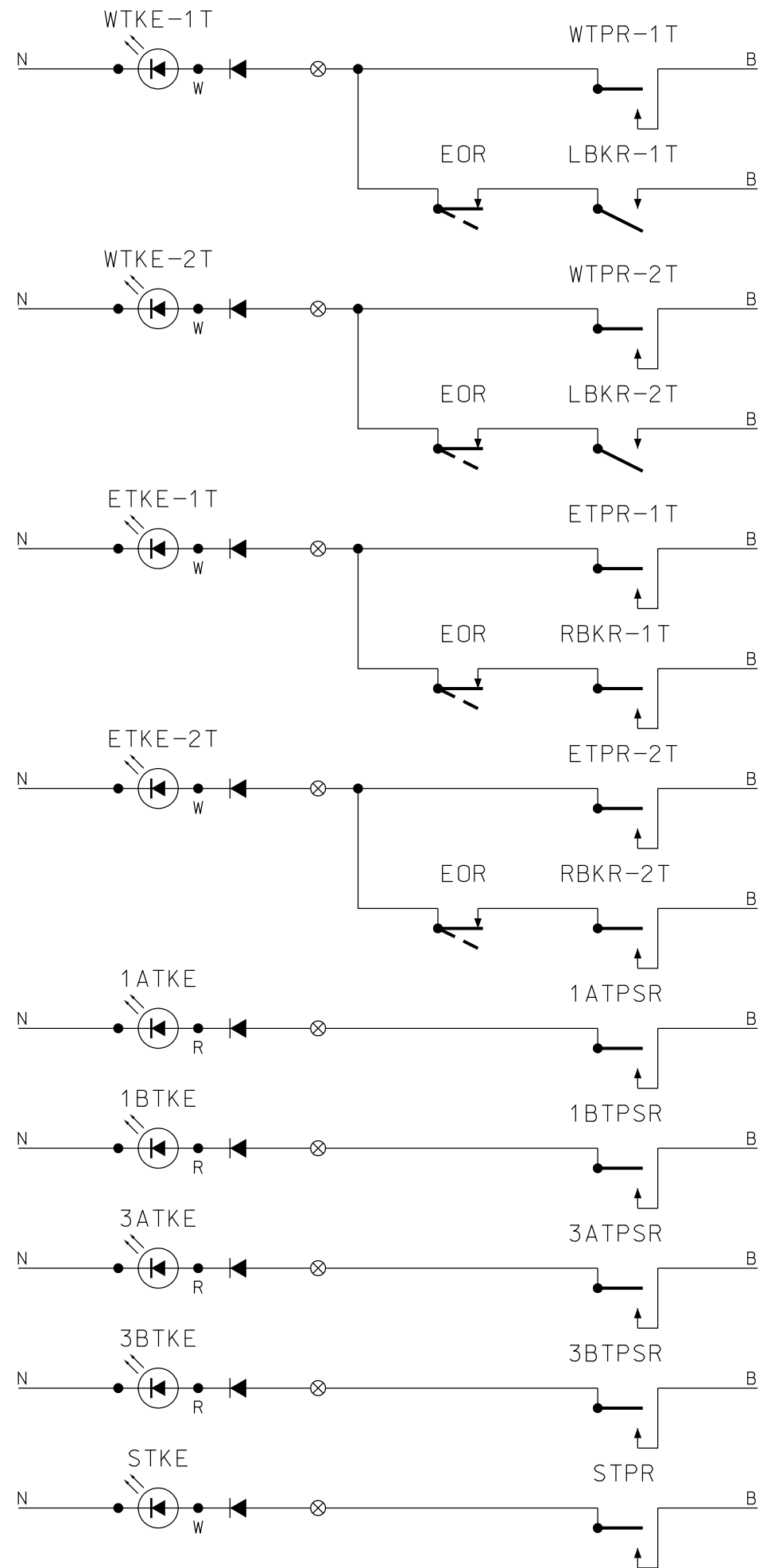
RELAY EQUIVALENT OF NON-VITAL PROCESSOR LOGIC
THIS LOGIC DUPLICATED IN NORMAL AND STANDBY PROCESSORS

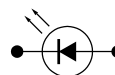



~REVISIONS~

RELAY EQUIVALENT OF NON-VITAL PROCESSOR LOGIC
THIS LOGIC DUPLICATED IN NORMAL AND STANDBY PROCESSORS

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) TRACK BLOCKING			
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.56		

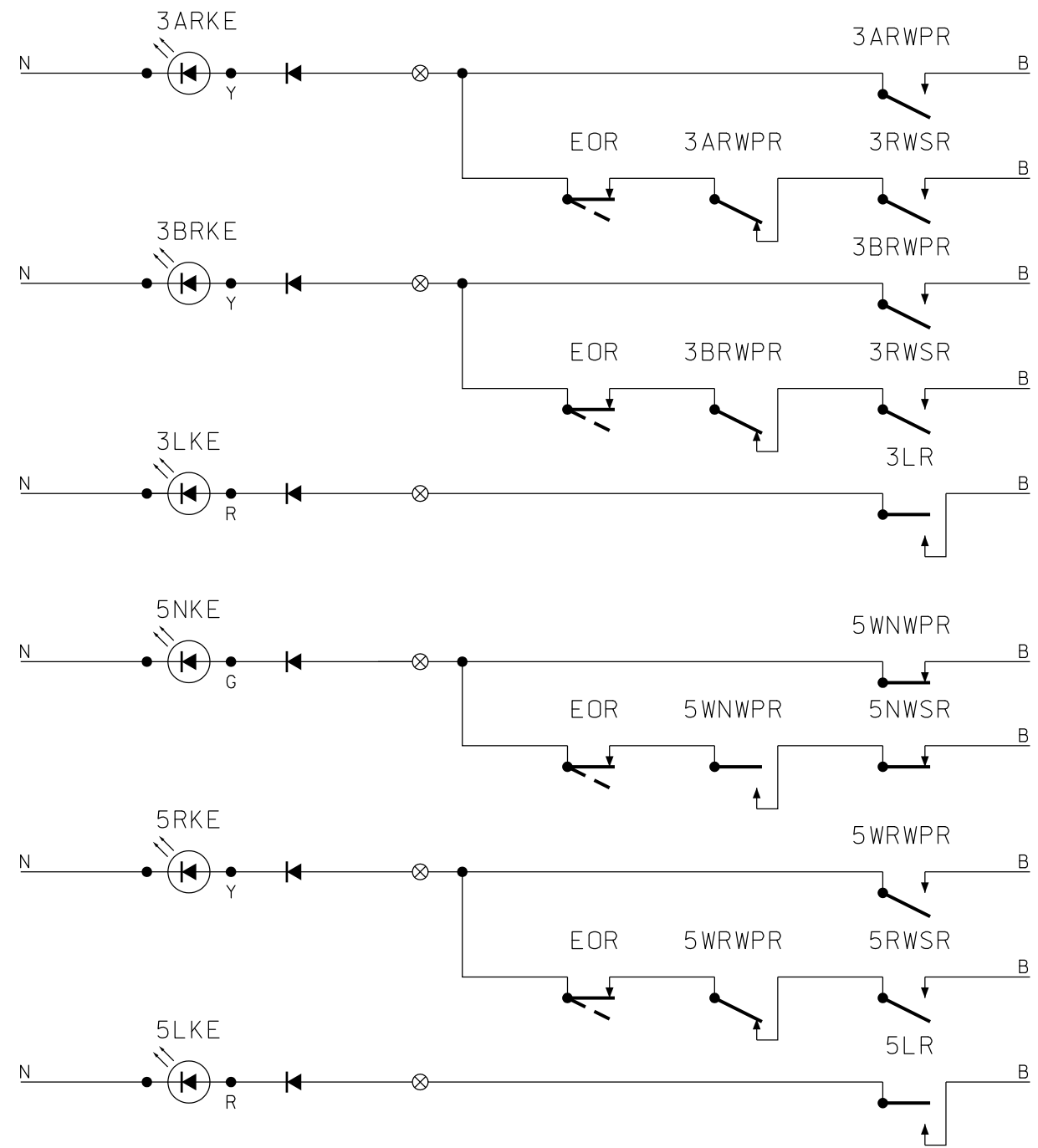
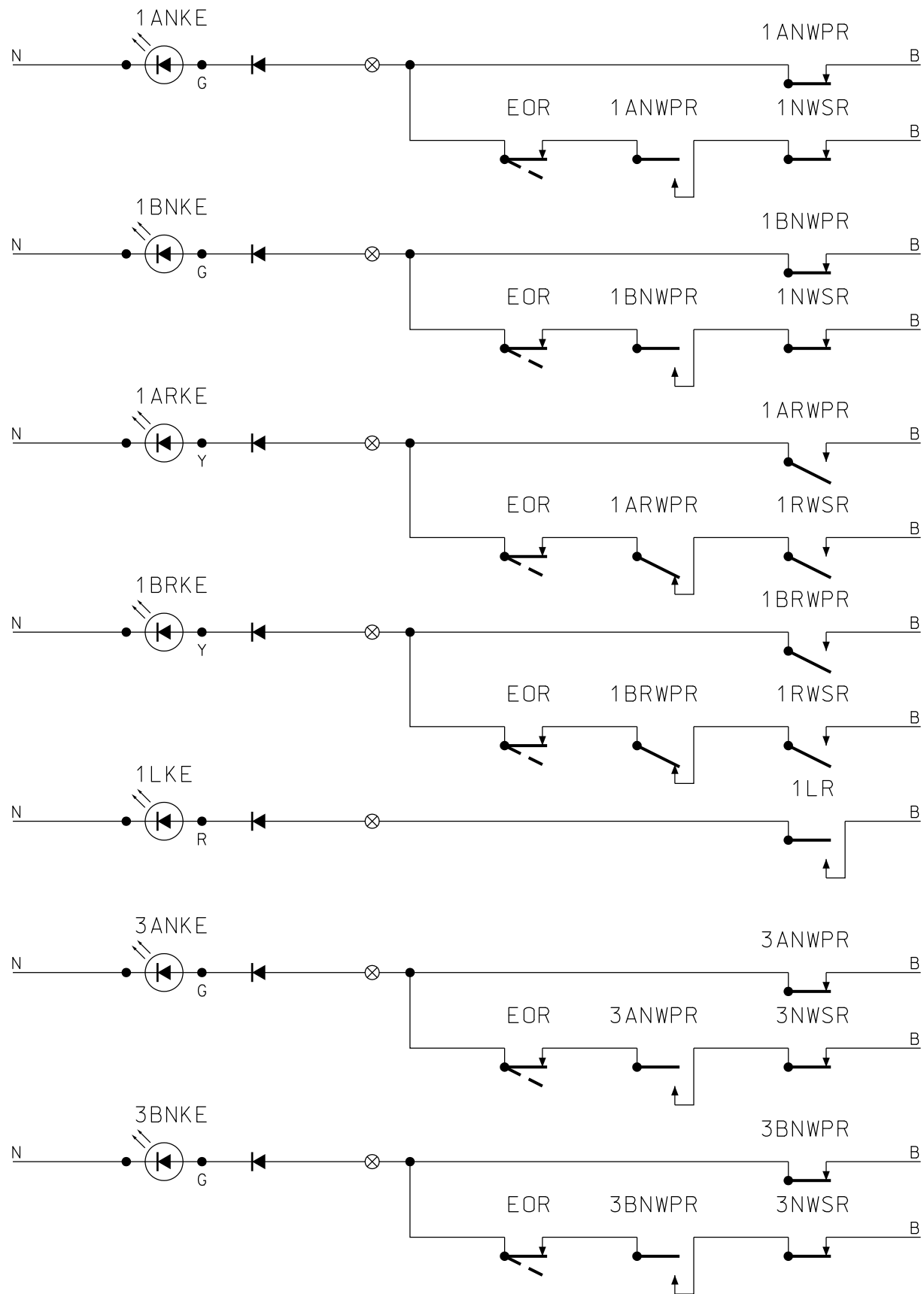


 - LOCAL CONTROL PANEL LAMP - WHEN APPROVED, LEDS MAY BE SUBSTITUTED FOR LAMPS.
 - CONNECTION TO NV RACK

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) CP (LOCATION) LOCAL CONTROL PANEL	
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.57



- LOCAL CONTROL PANEL LAMP - WHEN APPROVED, LEDS MAY BE SUBSTITUTED FOR LAMPS.

- CONNECTION TO NV RACK

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

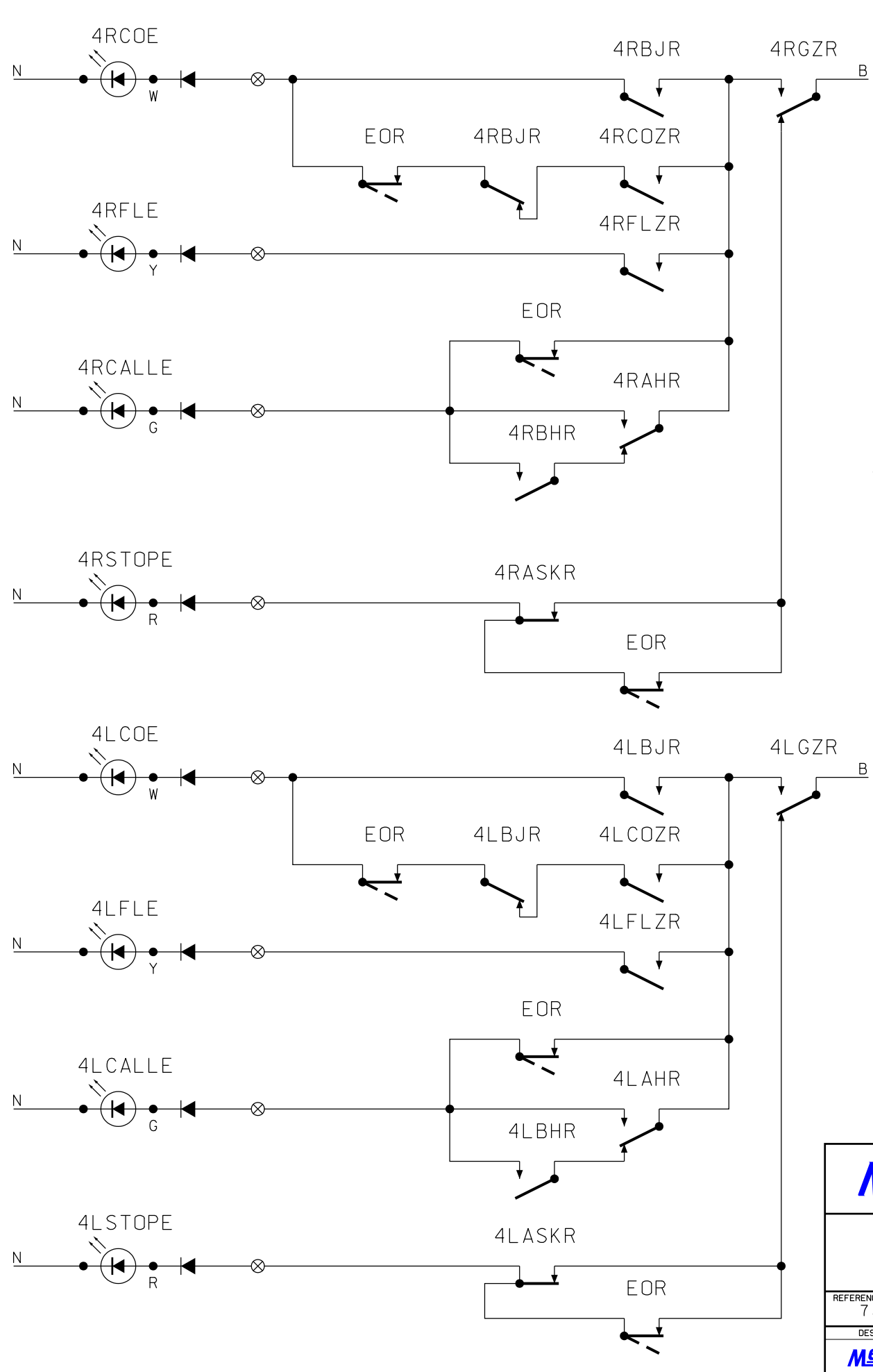
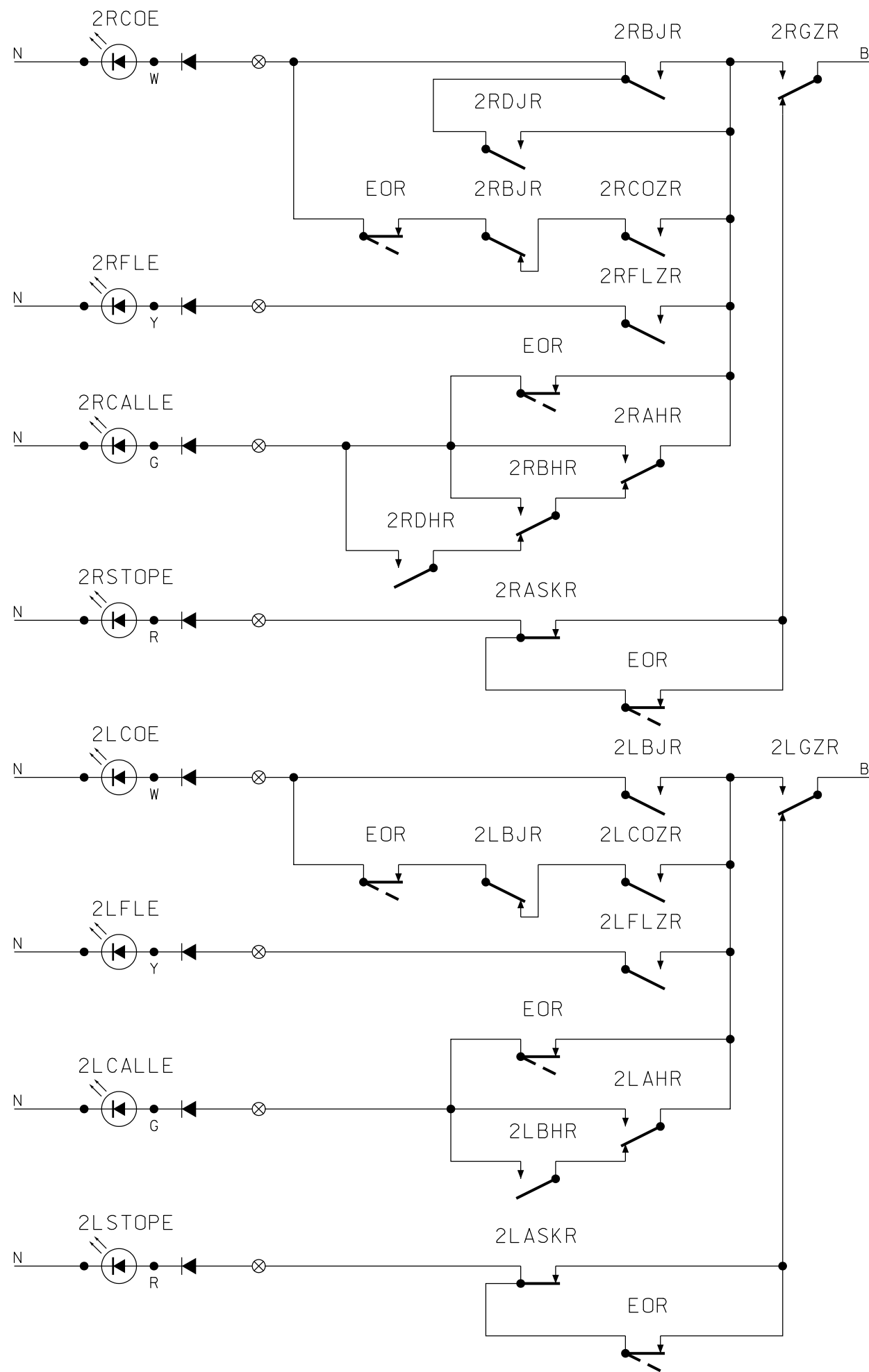
CHICAGO TO (END OF LINE)
CP (LOCATION)
LOCAL CONTROL PANEL

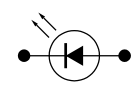

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

DISTRICT TYP	PRINT NUMBER 7.00 SH.58
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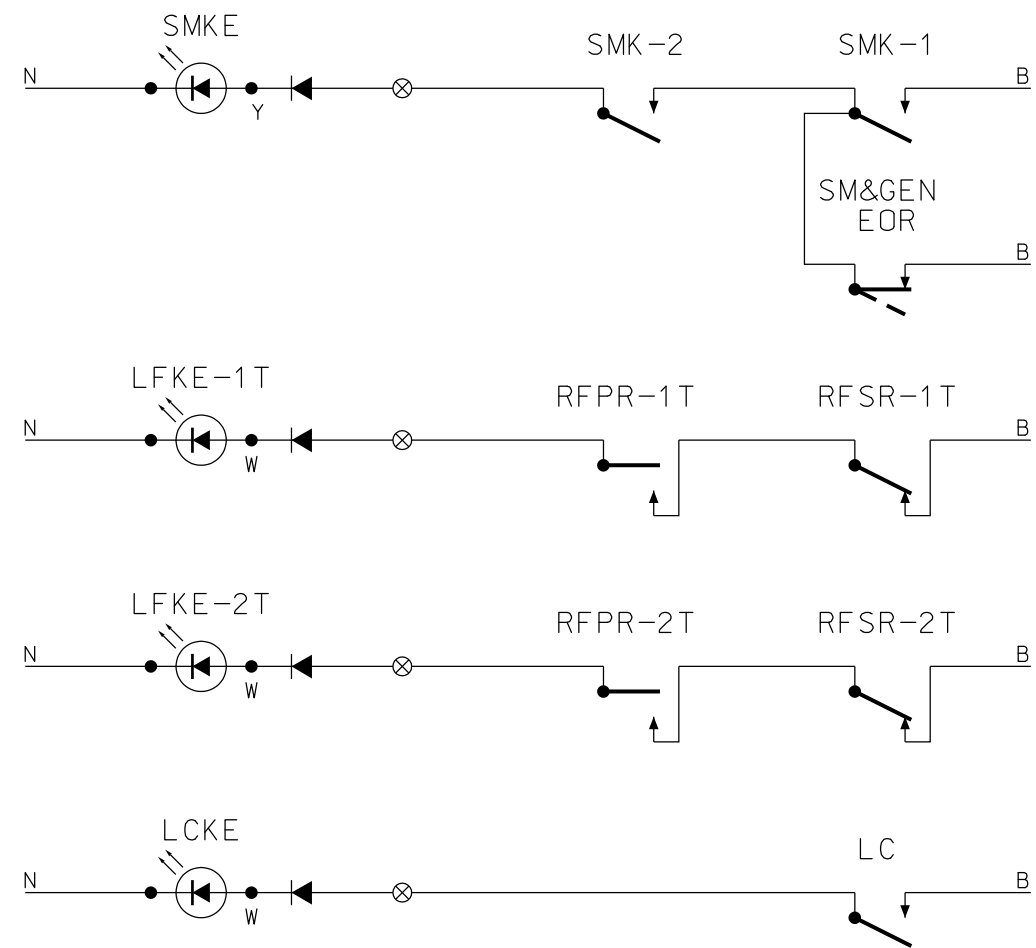
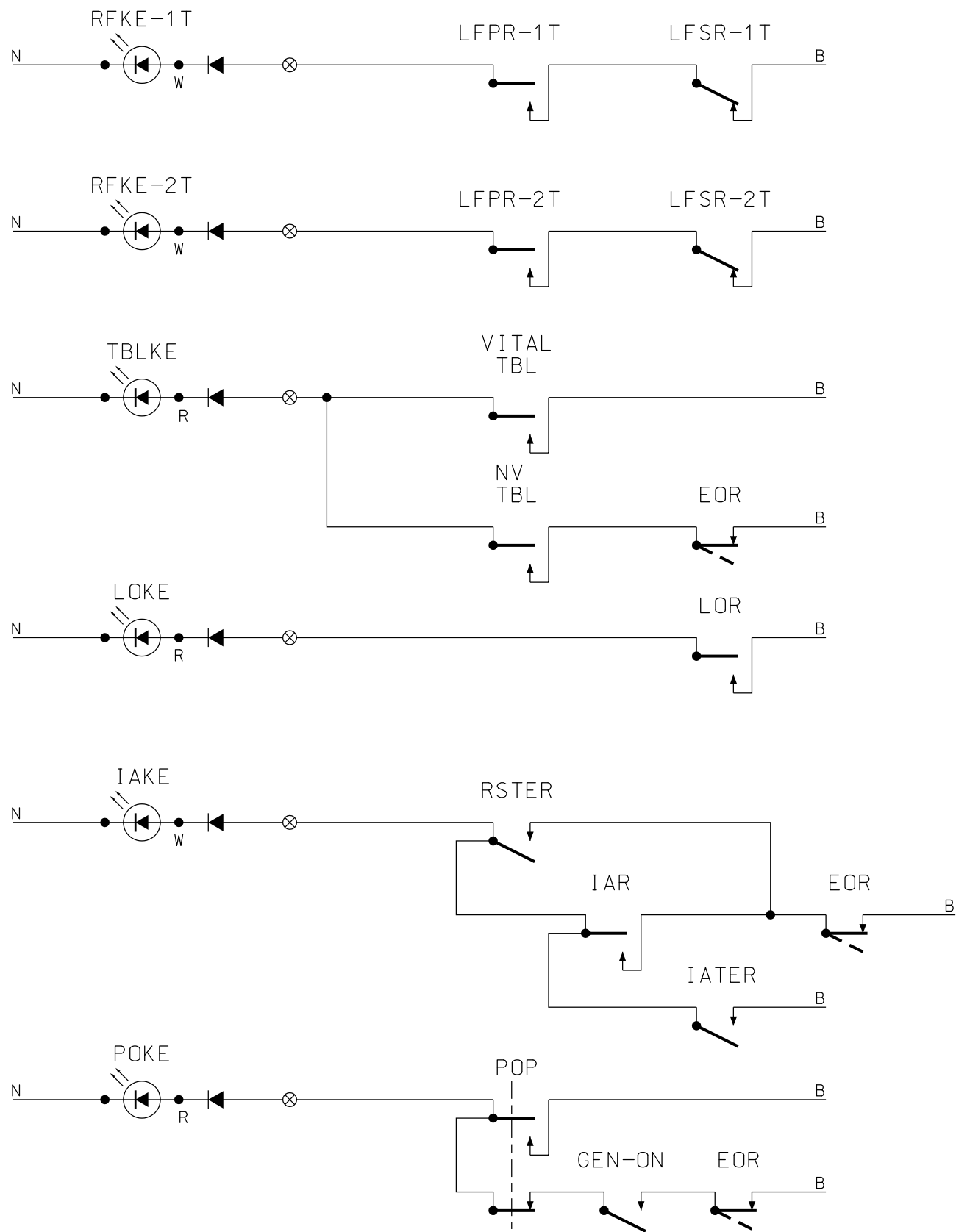
 - LOCAL CONTROL PANEL LAMP - WHEN APPROVED, LEDES MAY BE SUBSTITUTED FOR LAMPS.
 - CONNECTION TO NV RACK

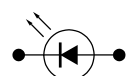

~REVISIONS~

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Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) LOCAL CONTROL PANEL			
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.59		

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



 - LOCAL CONTROL PANEL LAMP - WHEN APPROVED, LEDS MAY BE SUBSTITUTED FOR LAMPS.
 - CONNECTION TO NV RACK

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
LOCAL CONTROL PANEL

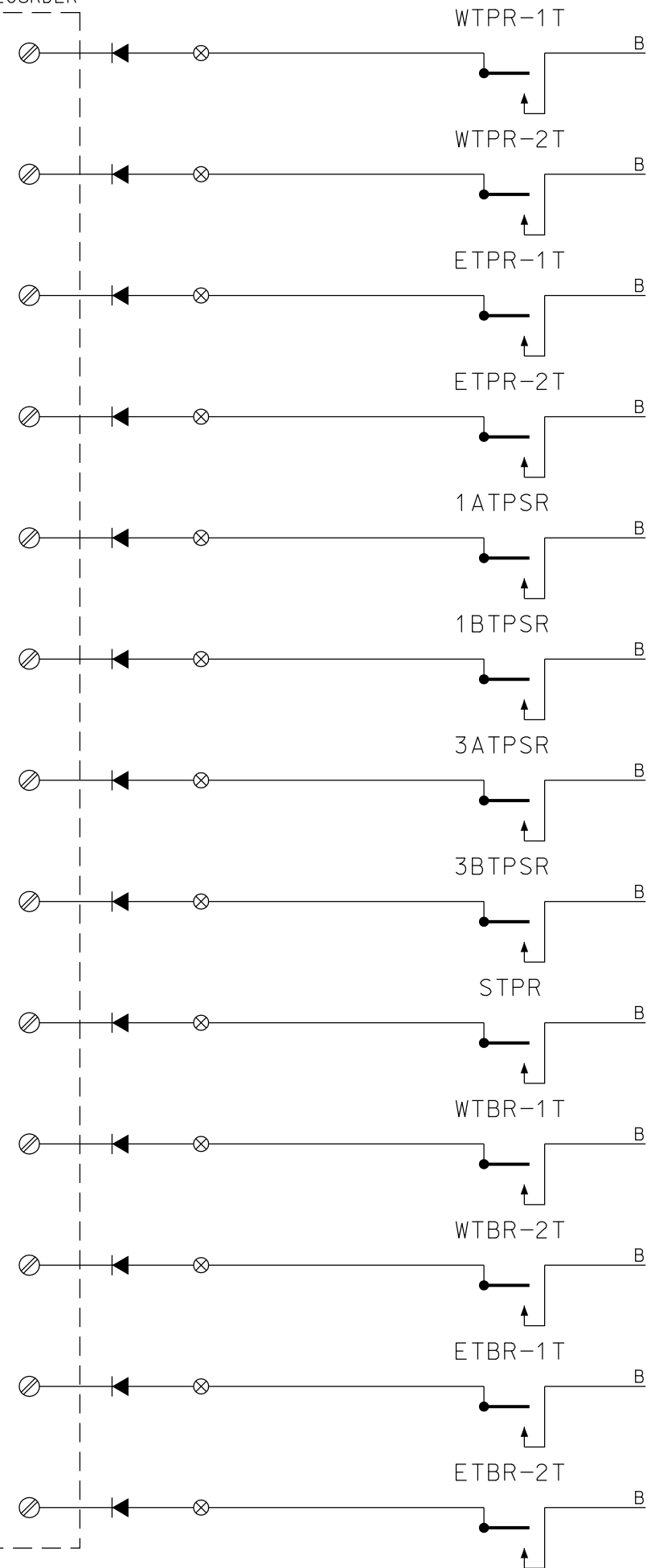
REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.60
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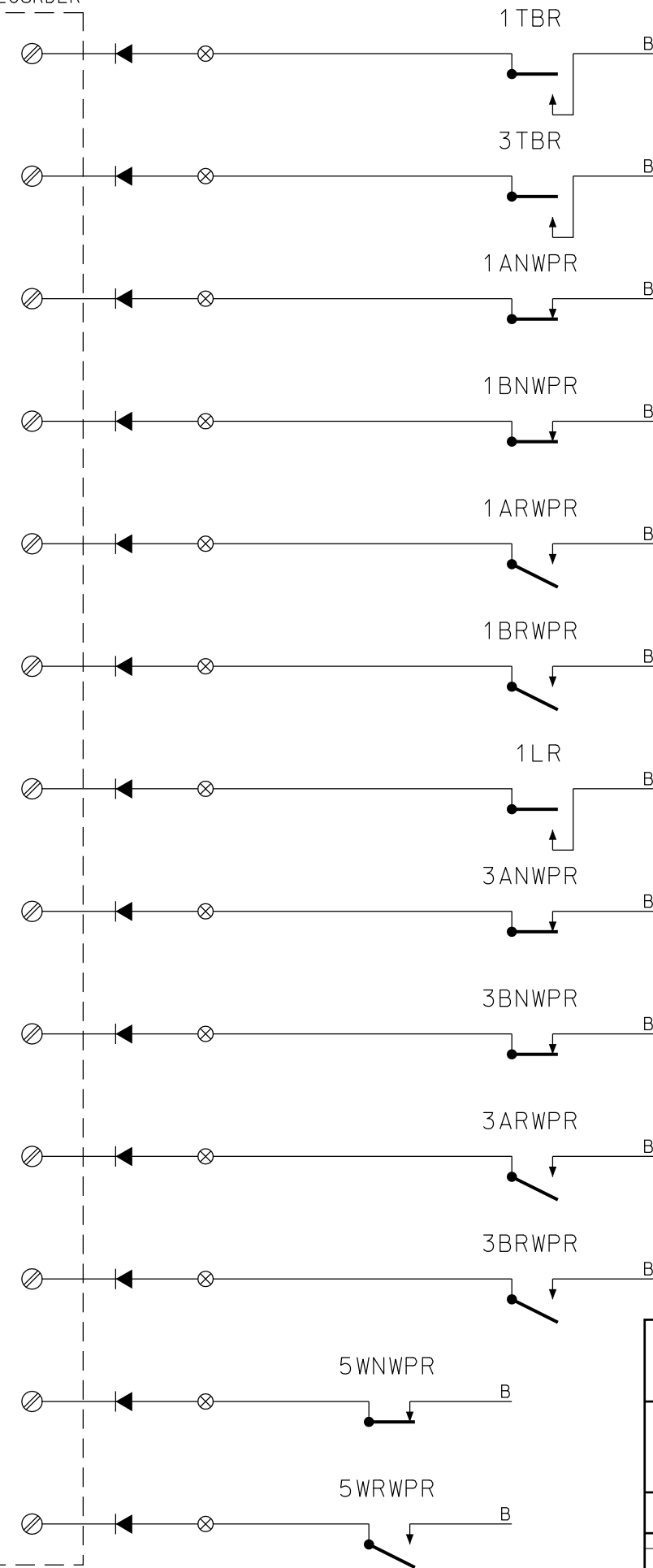
ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

EXTERNAL
RECORDER



⊘ - EVENT RECORDER TERMINAL
⊗ - CONNECTION TO NV RACK

EXTERNAL
RECORDER



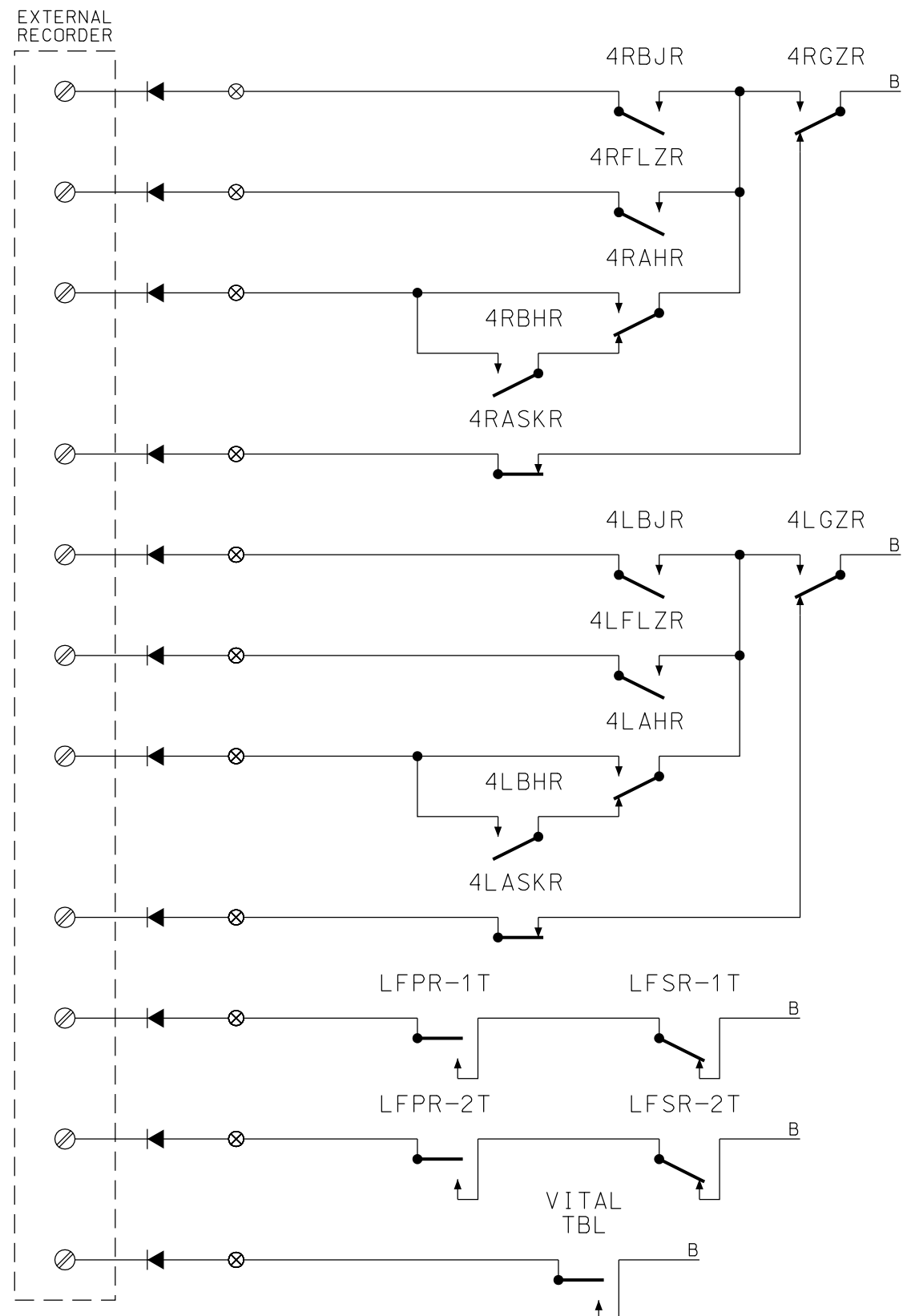
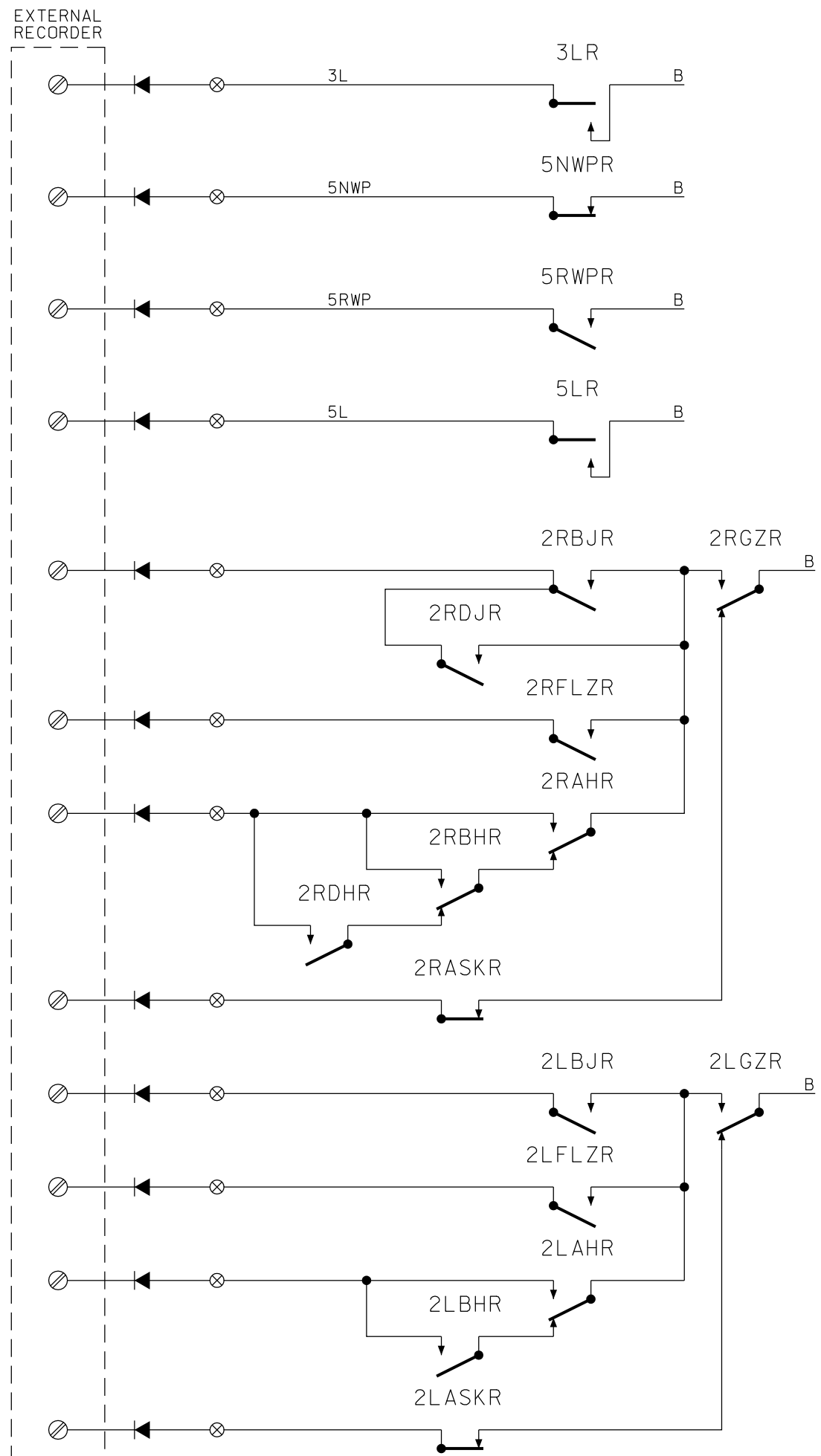
~REVISIONS~



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
EVENT RECORDER

REFERENCE: 7.00 SH.1 THRU SH.75			DATE: 05/13/11
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.61	

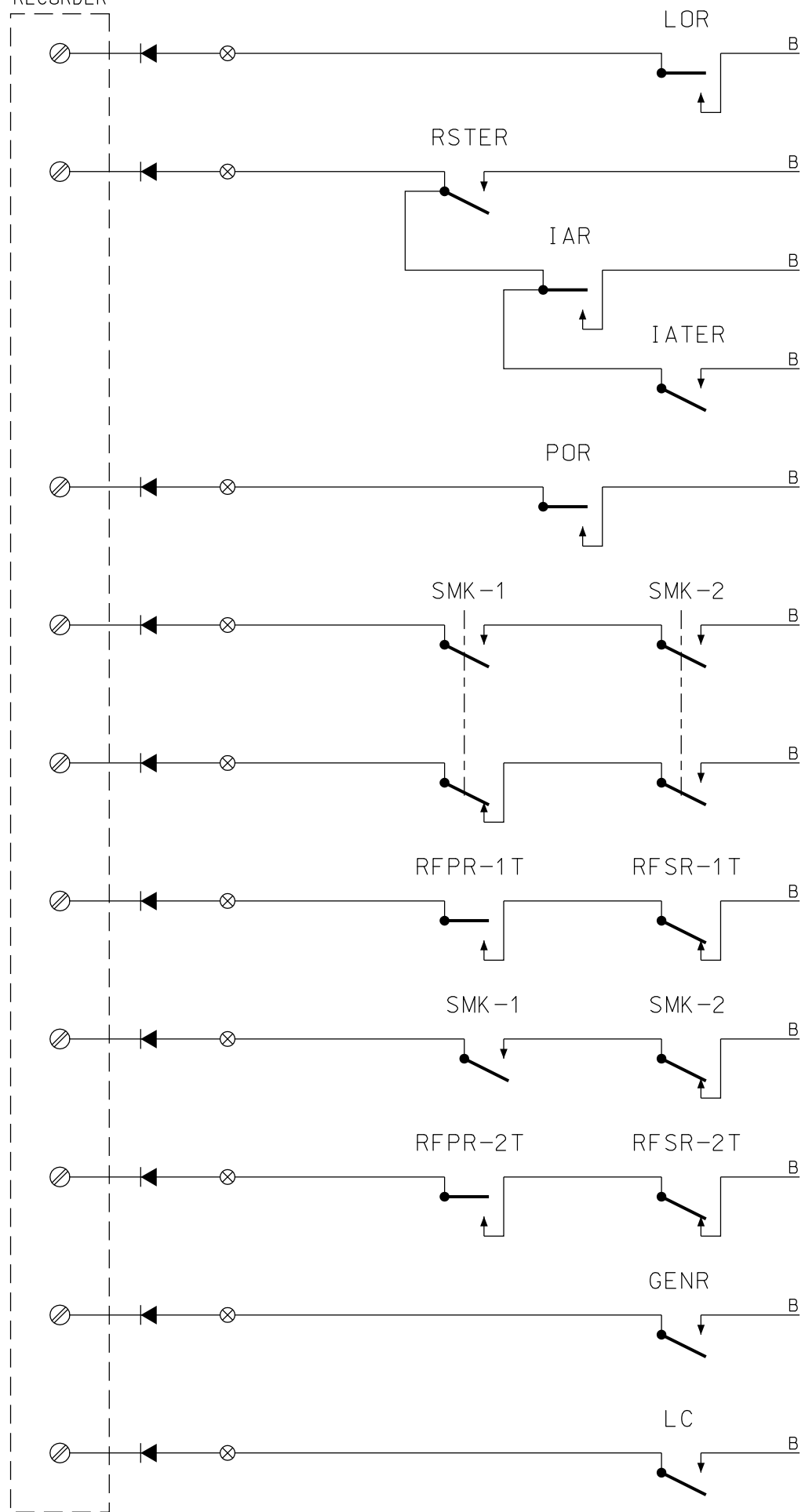


⊗ - EVENT RECORDER TERMINAL
 ⊗ - CONNECTION TO NV RACK

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) EVENT RECORDER			
REFERENCE: 7.00 SH.1 THRU SH.75		DATE: 05/13/11	
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.62	

EXTERNAL
RECORDER



~REVISIONS~

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

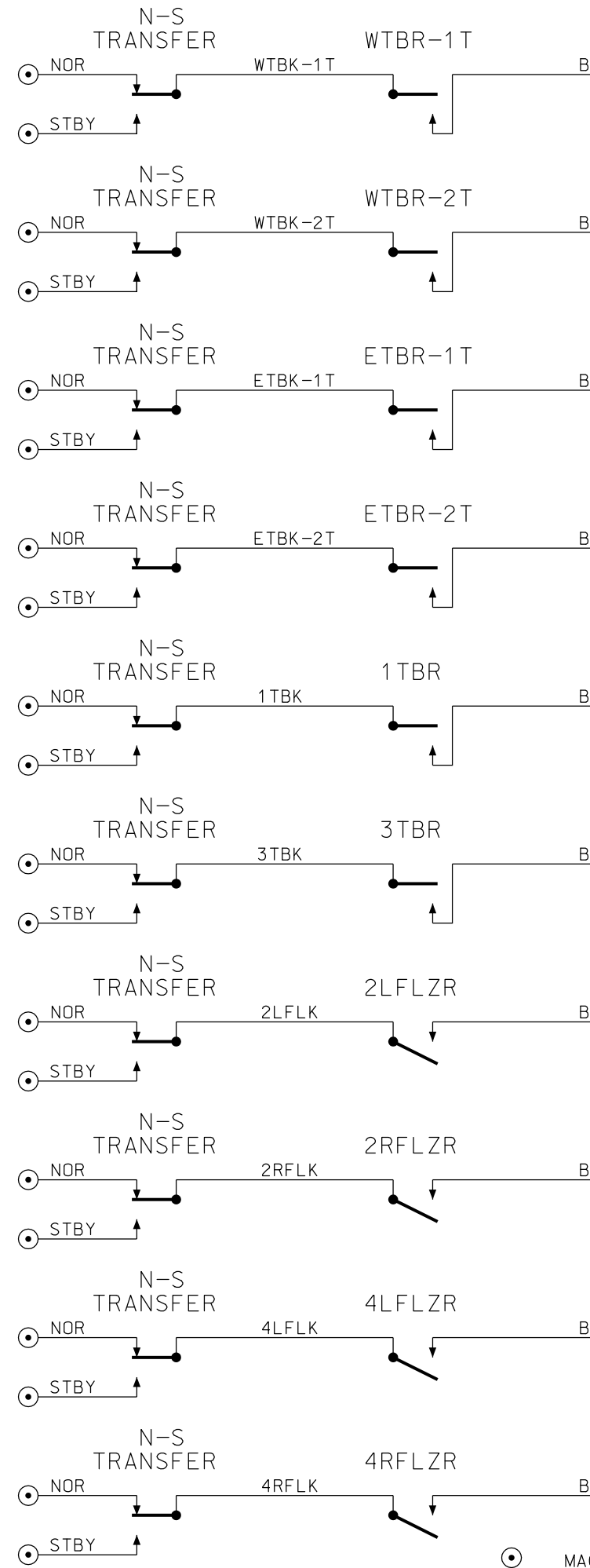
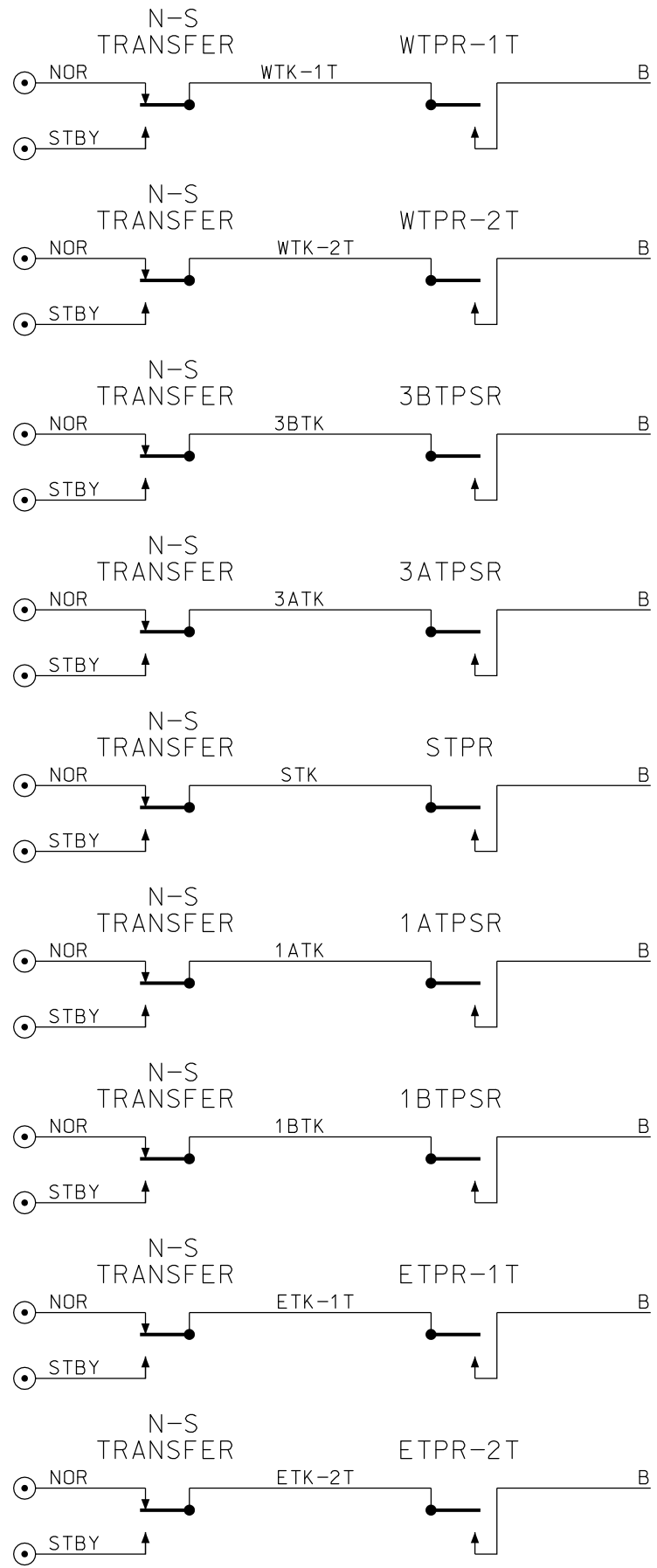
CHICAGO TO (END OF LINE)
CP (LOCATION)
EVENT RECORDER

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.63
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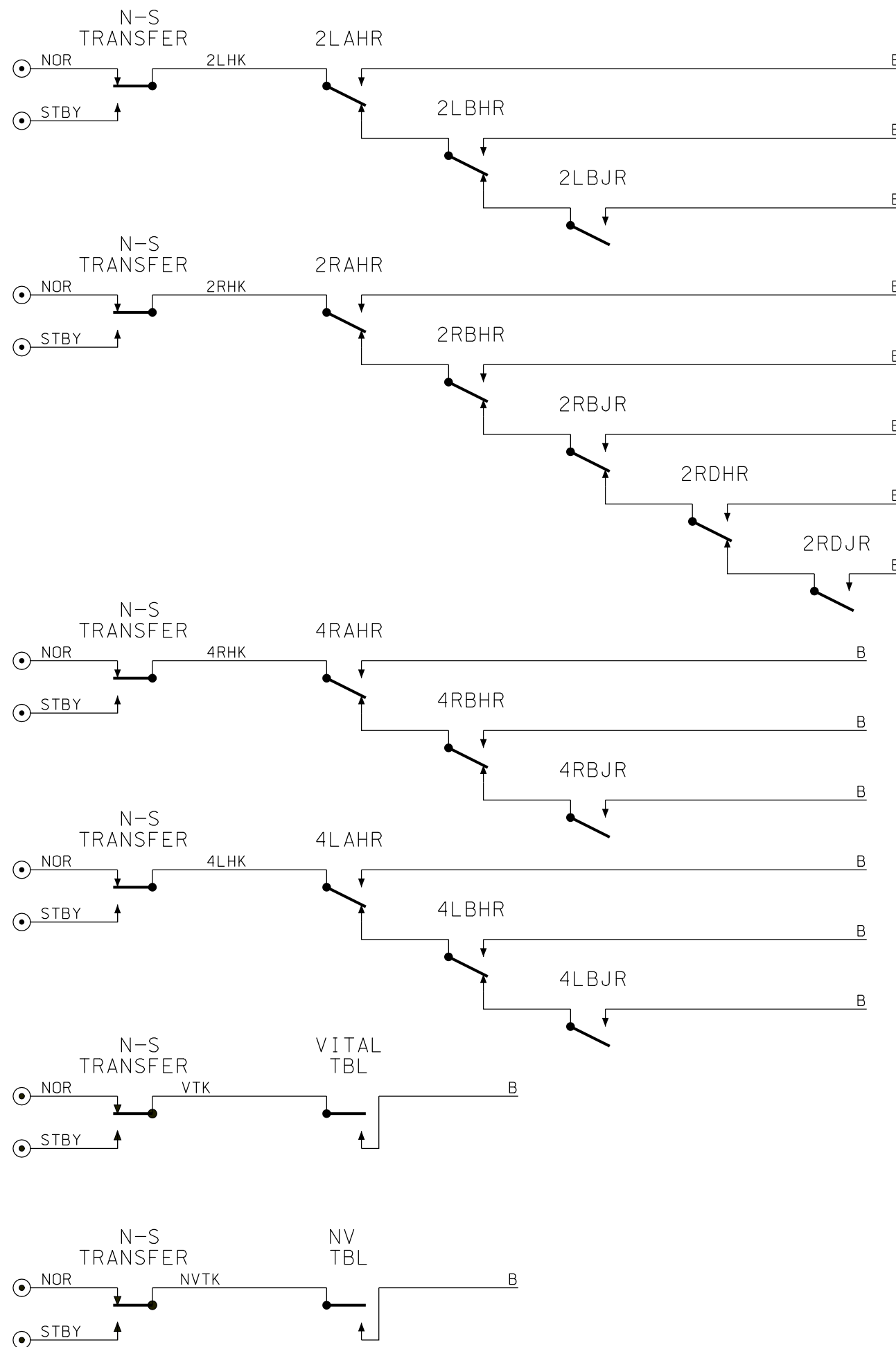
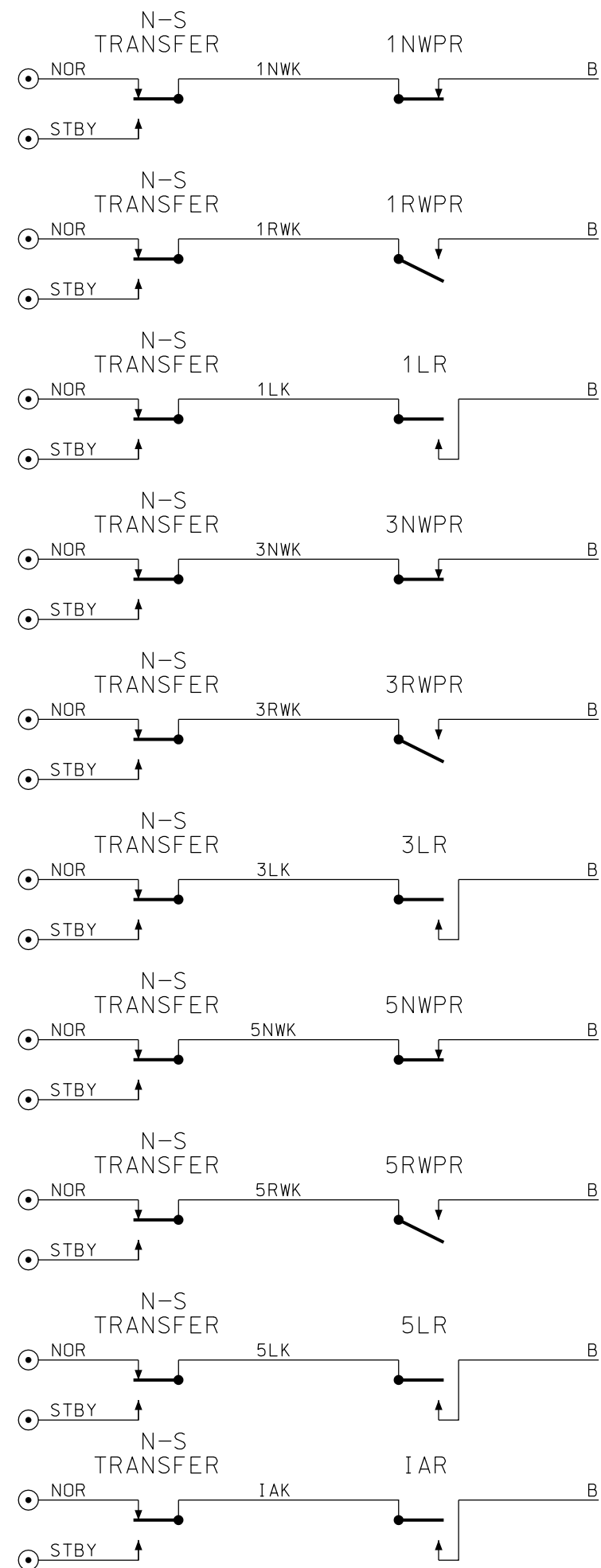
- ⊗ - EVENT RECORDER TERMINAL
- ⊗ - CONNECTION TO NV RACK



⊙ MACHINE OUTPUT TERM
ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS		CHICAGO TO (END OF LINE) CP (LOCATION) INDICATIONS	
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11	DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra	DISTRICT TYP	PRINT NUMBER 7.00 SH.64



* CONTROL MACHINE VOLTAGE AS SPECIFIED

⊙ MACHINE INPUT TERM

~REVISIONS~

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Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

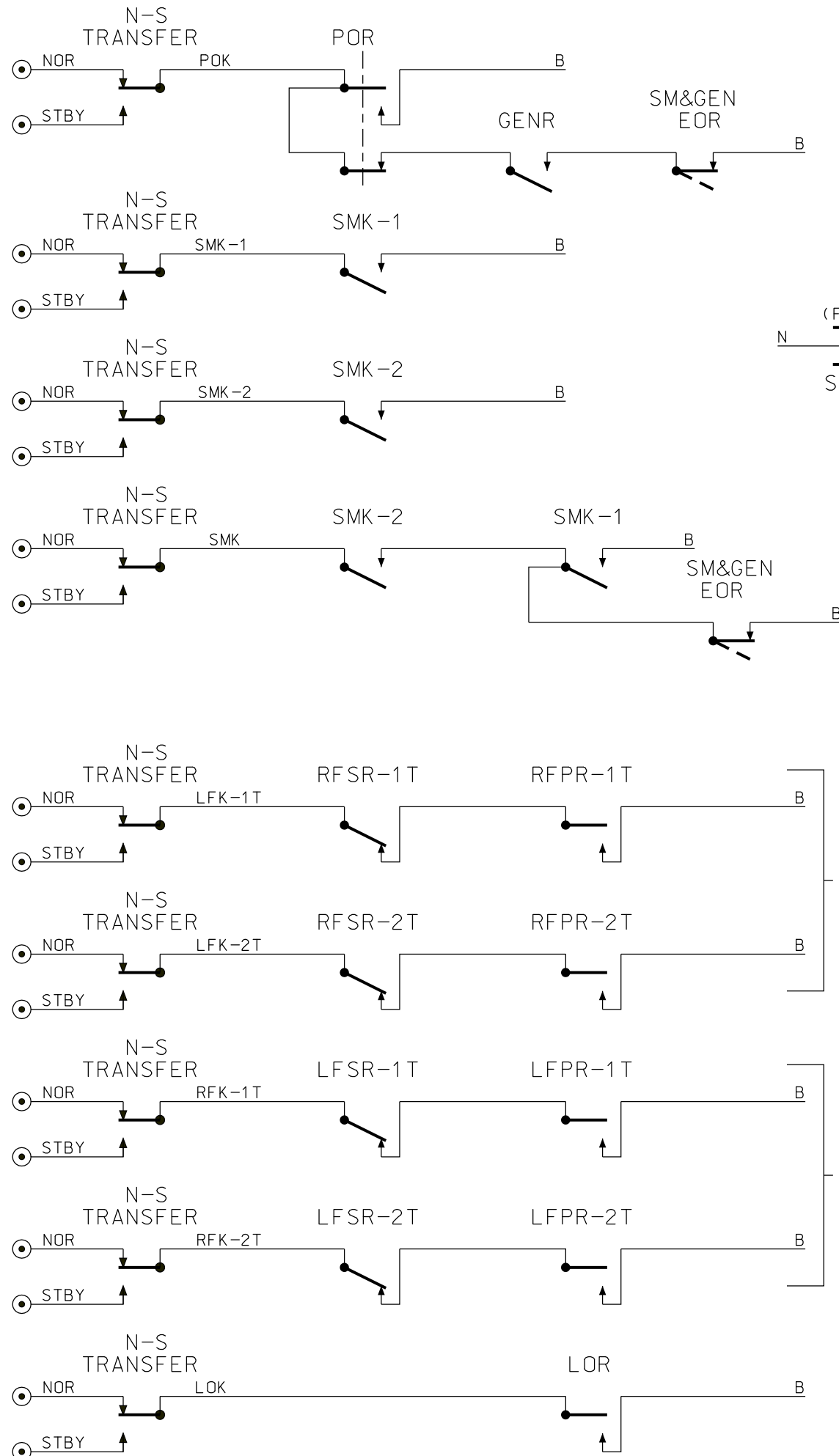
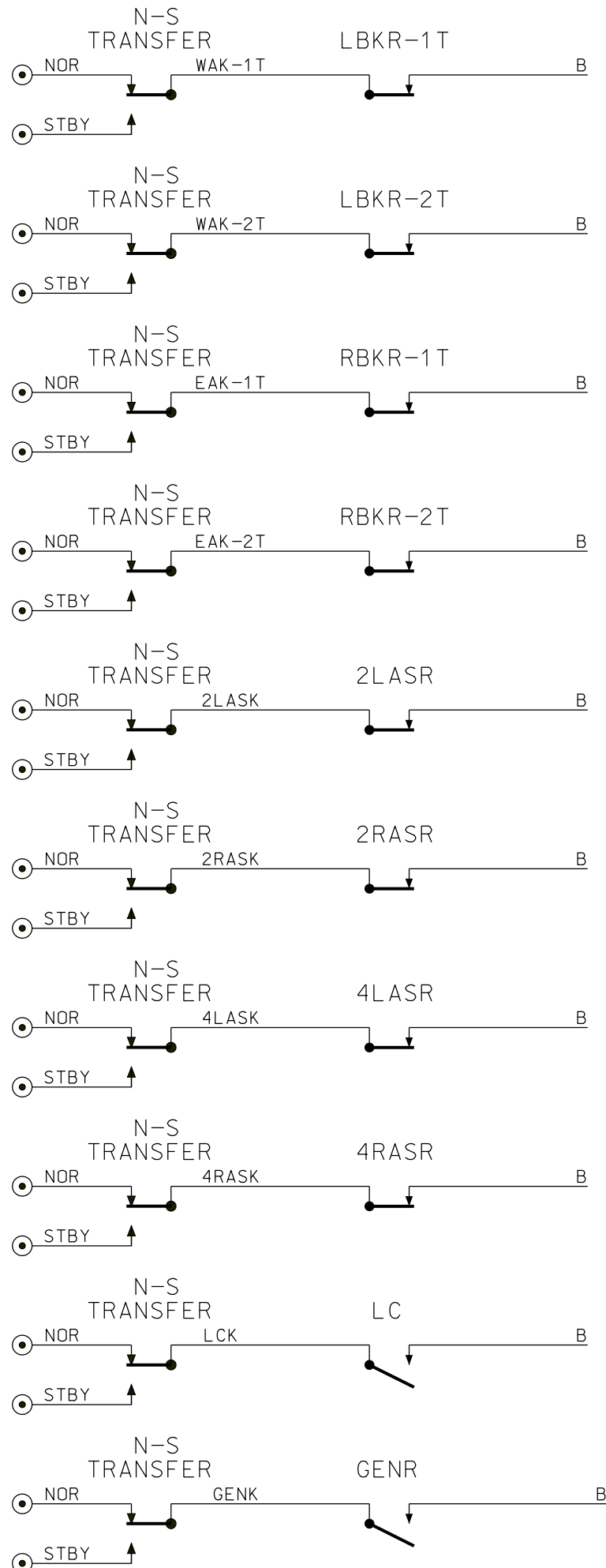
CHICAGO TO (END OF LINE)
CP (LOCATION)
INDICATIONS

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

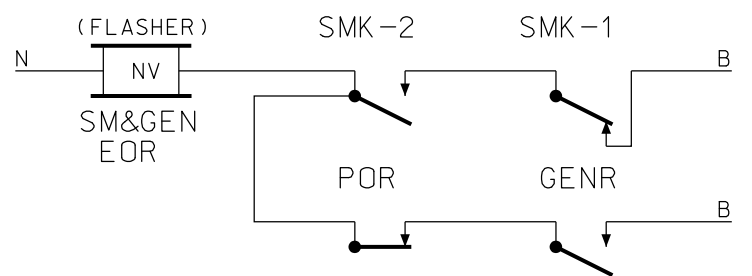
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.65
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



CCF	
SMK-1	SMK-2
OFF	OFF = OFF
ON	OFF = REQUEST
OFF	ON = RUN
ON	ON = FAIL



ONLY USED WHEN NEXT LOCATION IS NOT CONTROLLED FROM CCF

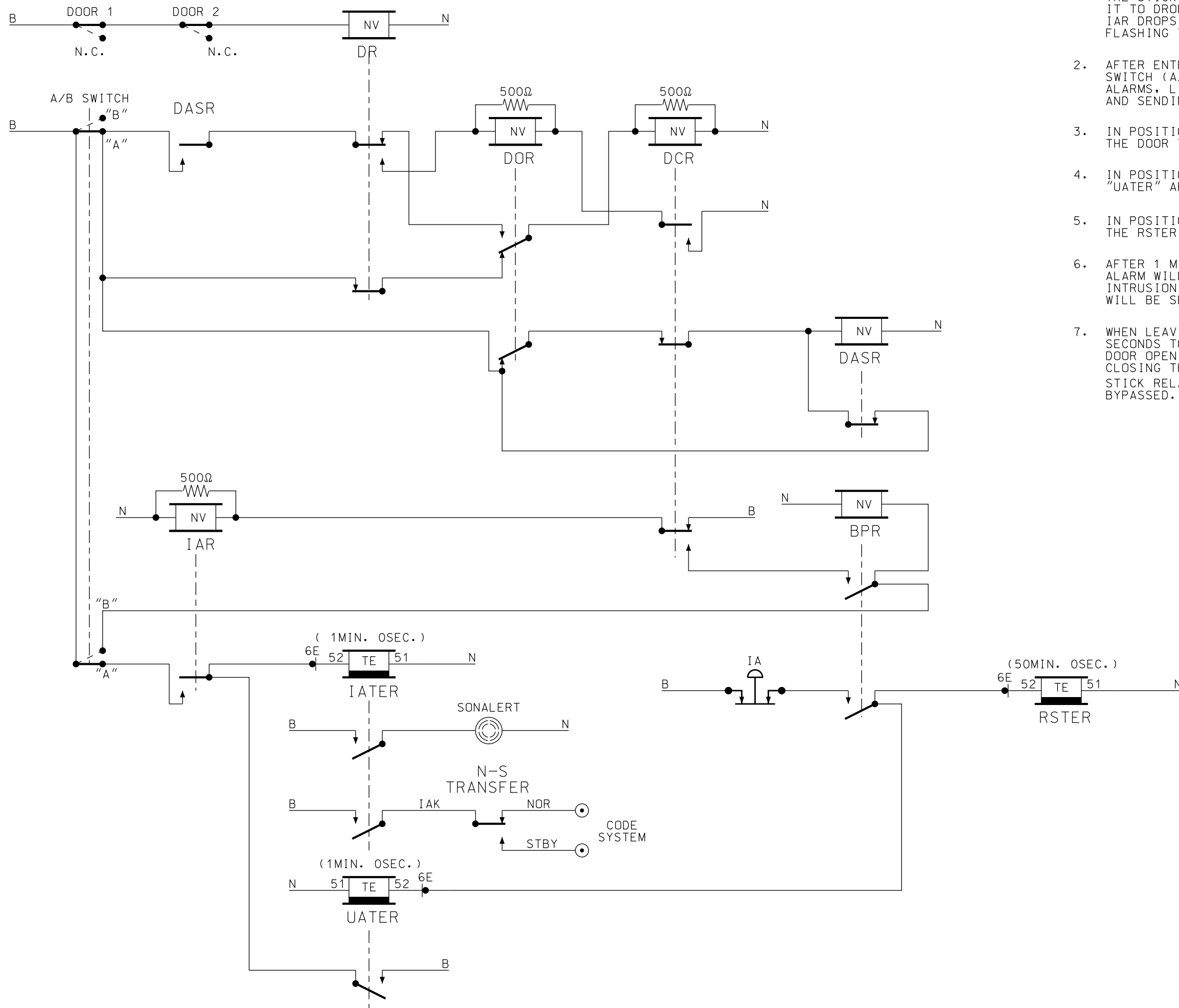
ONLY USED WHEN NEXT LOCATION IS NOT CONTROLLED FROM CCF

~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) INDICATIONS			
REFERENCE: 7.00 SH.1 THRU SH.75		DATE: 05/13/11	
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.66	

⊙ MACHINE INPUT TERM

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED



- OPERATION:
1. OPENING ANY DOOR CAUSES RELAY "DR" TO DROP. THIS REMOVES THE STICK PATH FROM THE DOOR CLOSED RELAY "DCR" AND CAUSES IT TO DROP THE INTRUSION ALARM RELAY "IAR". IAR DROPS STARTING THE 60 SECOND TIMER "IATER" AND FLASHING THE LAMP ON THE LOCAL CONTROL PANEL.
 2. AFTER ENTERING, THERE ARE 60 SECONDS TO PUT THE "ARM/BYPASS" SWITCH (A/B) INTO THE "B" POSITION BEFORE THE SONALERT ALARMS, LIGHTING THE LIGHT STEADY ON THE LOCAL CONTROL PANEL AND SENDING AN ALARM ON THE CODE SYSTEM.
 3. IN POSITION "B" THE BYPASS RELAY "BPR" IS PICKED ALLOWING THE DOOR TO BE OPENED AND CLOSED AT WILL.
 4. IN POSITION "B", THE RESET TIMER "RSTER" AND UNARMED TIMER "UATER" ARE STARTED WITH THE BPR.
 5. IN POSITION "B" WHEN THE DOOR HAS BEEN OPEN 50 MINUTES, THE RSTER WILL FLASH THE INTRUSION ALARM LAMP.
 6. AFTER 1 MINUTE WITHOUT A RESET VIA THE IA PUSH BUTTON, THE ALARM WILL SOUND WHEN THE UN-ARMED TIMER "UATER" AND THE INTRUSION ALARM TIMER "IATER" EXPIRE. THE INTRUSION ALARM WILL BE SENT TO THE OFFICE.
 7. WHEN LEAVING, THE A/B SWITCH IS PUT TO "A". THIS ALLOWS 60 SECONDS TO EXIT BY OPENING THE DOOR ONCE AND PICKING THE DOOR OPEN RELAY "DOR", OR IF THE DOOR IS OPEN, BY JUST CLOSING THE DOOR AND ARMING THE SYSTEM. THE DOOR ALARM STICK RELAY "DASR" PREVENTS FURTHER DOOR COUNTS UNTIL BYPASSED.

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

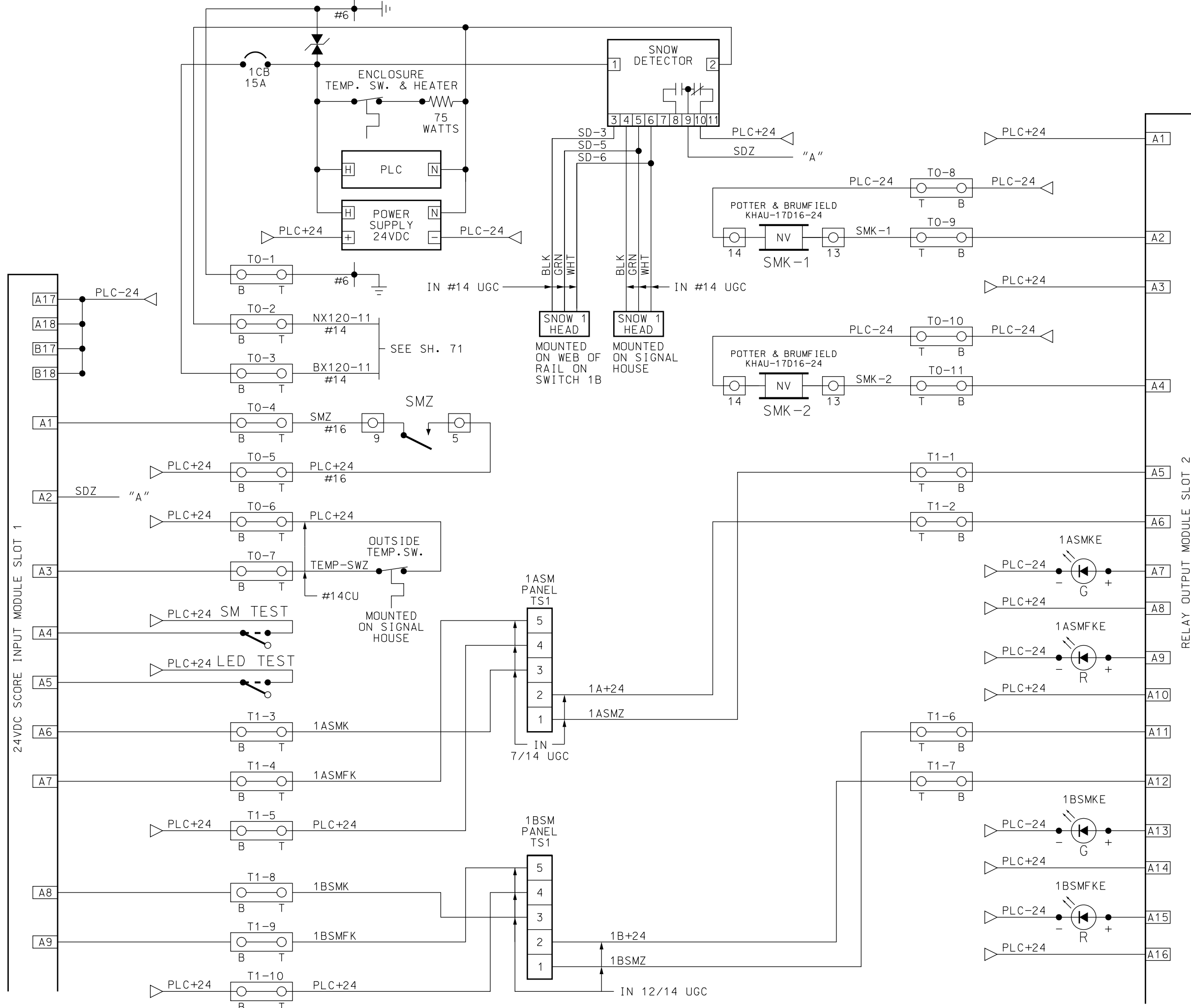
CHICAGO TO (END OF LINE)
CP (LOCATION)
INTRUSION ALARM

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.00 SH.67
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED




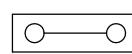
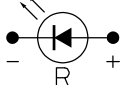

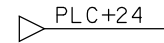
NOTES:

SM BLOWER CONTROL CABINET SETTINGS:

- RUN TIMER SET AT 0(ZERO).
- RUN TIMER PULSE MODE SET AT OFF.
- CONTROL SWITCH SET IN THE AUTO POSITION.

SM CONTROL PANEL (IN SIH) SETTINGS:

- MOISTURE SENSOR TIMER SET AT 30 (THIRTY) MINUTES.
- TEMPERATURE SENSOR SETTINGS SET AT 38 DEGREES. (THIS SETTING WILL NEED TO BE FIELD TESTED AND VERIFIED THAT IT IS PROPERLY SET).

-  TERMINAL LOCATION P & B NON VITAL RELAY
-  WAGO JUMPER (#132282-402)
-  INDICATION LEDS ON PLC ENCLOSURE
-  CONNECTION POINT ON PLC MODULE
-  PREWIRED BUSSED BATTERY

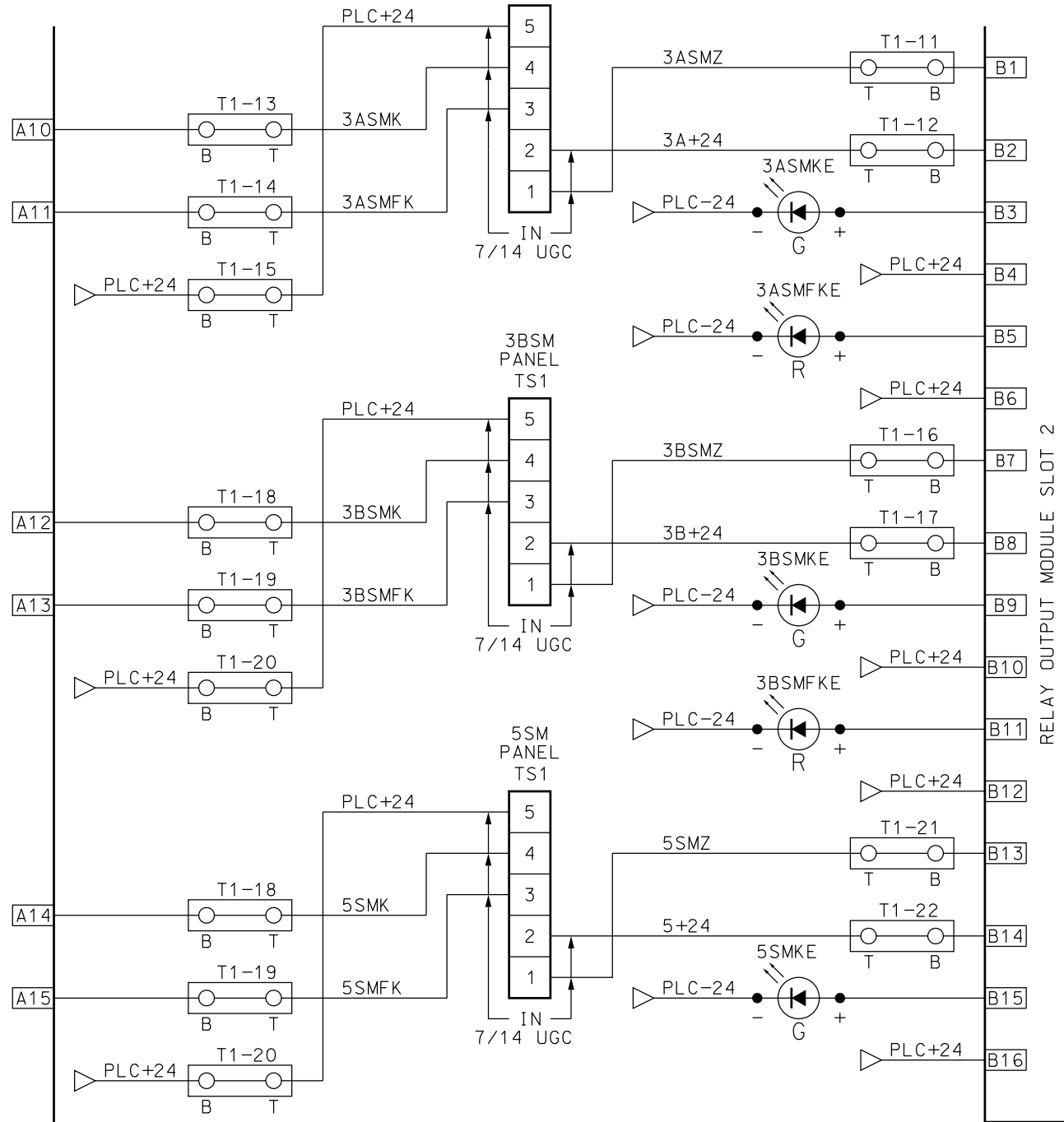
ALL WIRING ON THIS SHEET #18 AWG UNLESS NOTED

~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO (TO END OF LINE) CP (LOCATION) SNOW MELTER CONTROLS	
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.68

24VDC SCORE INPUT MODULE SLOT 1



WAGO JUMPER (#132282-402)

INDICATION LEDS ON PLC ENCLOSURE

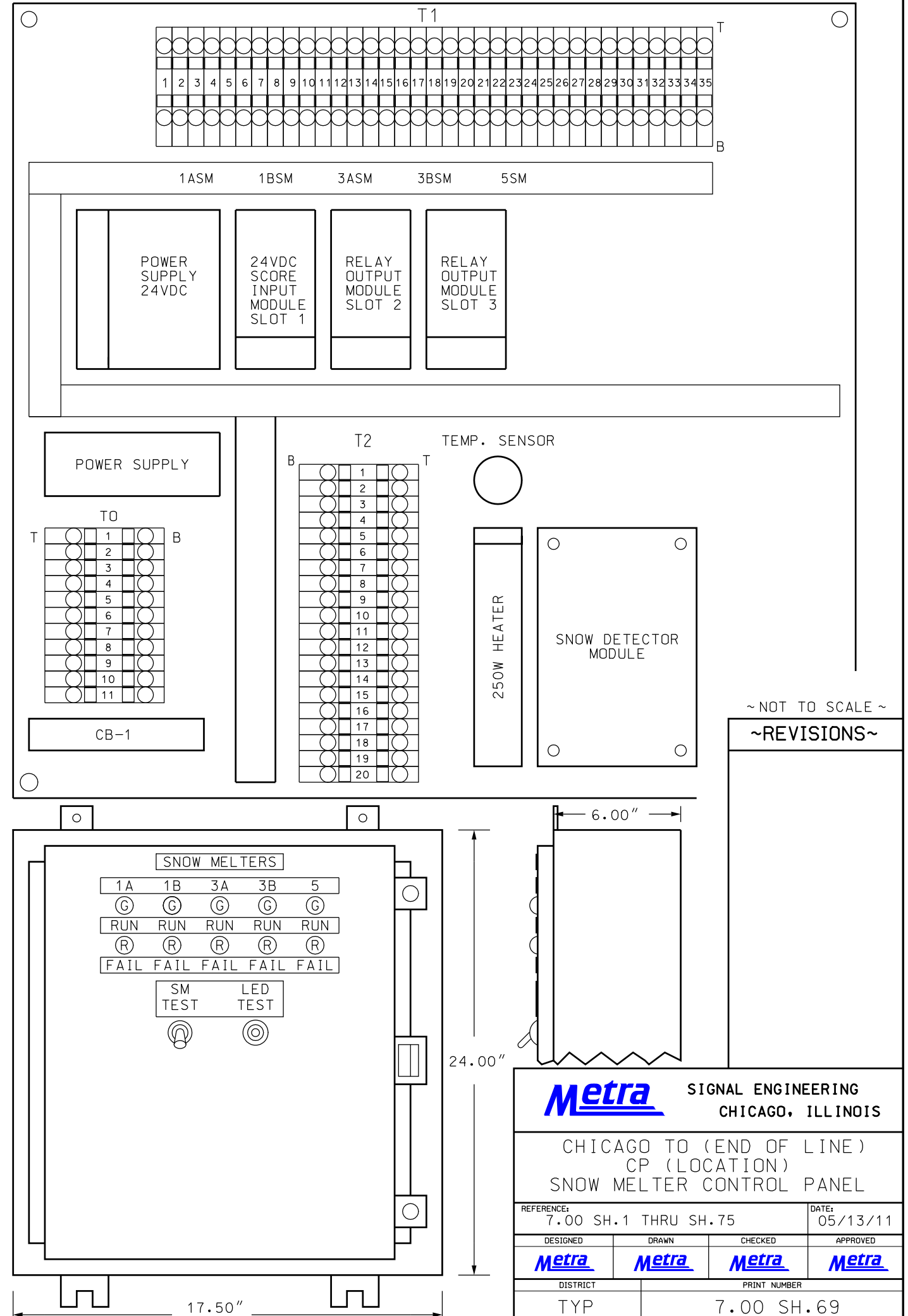
CONNECTION POINT ON PLC MODULE

PREWIRED BUSSED BATTERY

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

RELAY OUTPUT MODULE SLOT 2

RELAY OUTPUT MODULE SLOT 3



~ NOT TO SCALE ~
~ REVISIONS ~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
SNOW MELTER CONTROL PANEL

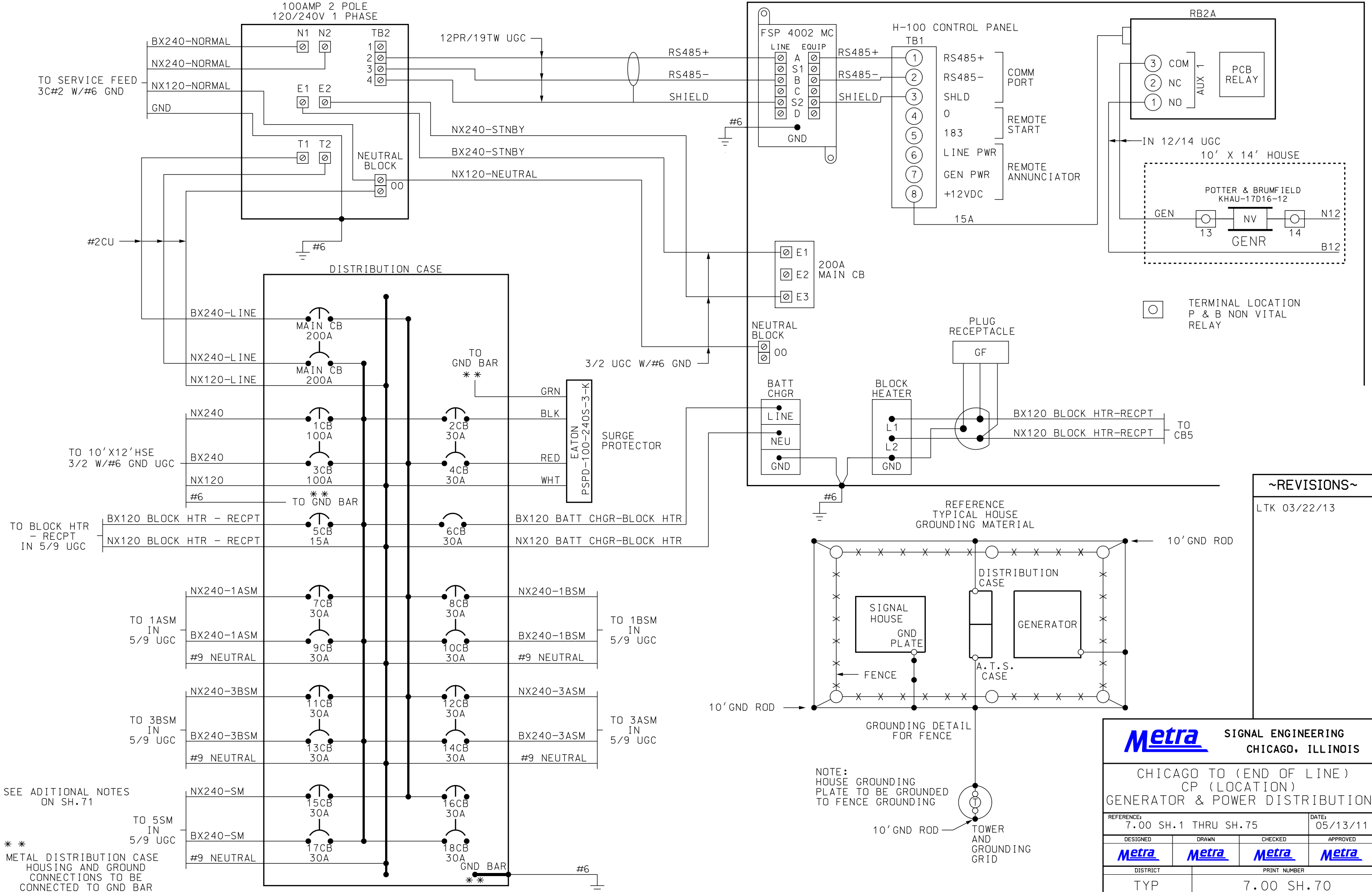
REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.00 SH.69

GENERAC HTS
AUTOMATIC TRANSFER SWITCH
100AMP 2 POLE
120/240V 1 PHASE

20KW 120/240V 1 PHASE
NATURAL GAS GENERATOR
(GENERAC)



~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
GENERATOR & POWER DISTRIBUTION

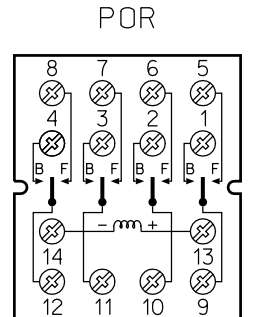
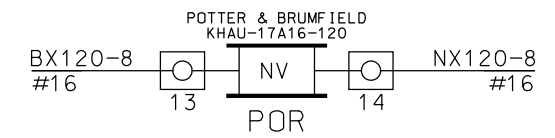
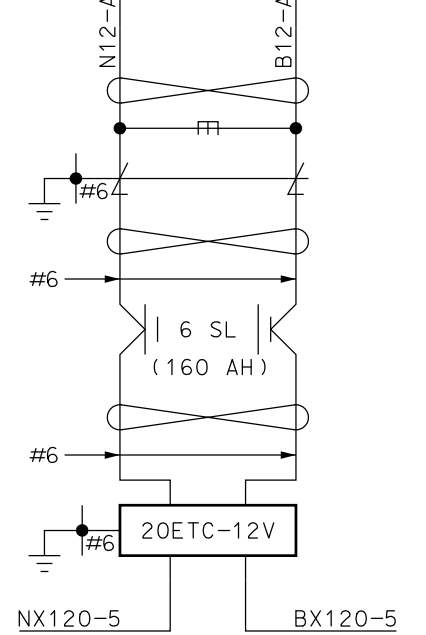
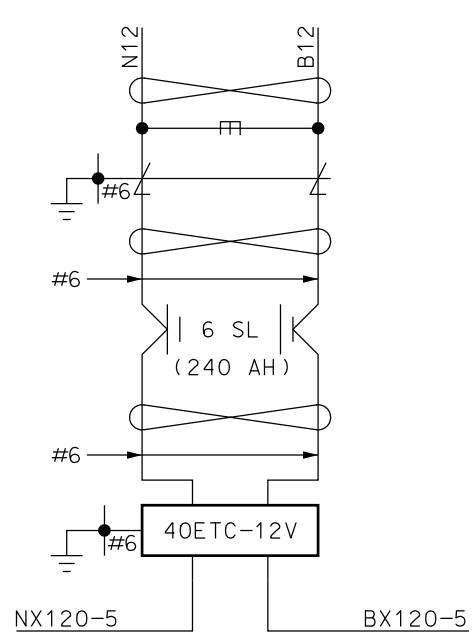
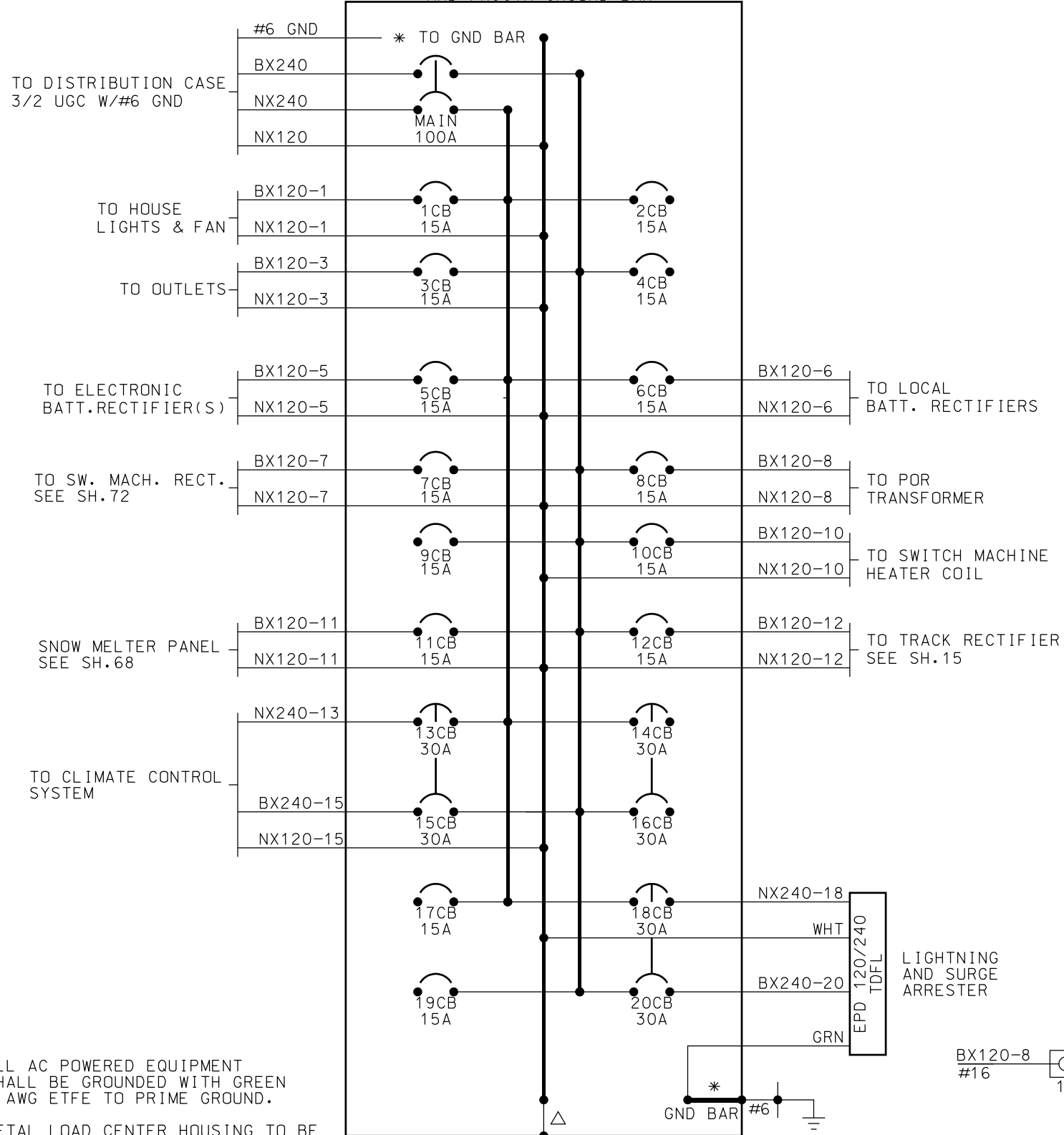
REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.00 SH.70

SEE ADITIONAL NOTES
ON SH.71

**
METAL DISTRIBUTION CASE
HOUSING AND GROUND
CONNECTIONS TO BE
CONNECTED TO GND BAR

NOTE:
HOUSE GROUNDING
PLATE TO BE GROUND TO
FENCE GROUNDING

"SQUARE D" Q0120M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



- NOTES:
- ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETHE TO PRIME GROUND.
 - △ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.
 - ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.
 - RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.
 - TERMINAL LOCATION P & B NON VITAL RELAY
 - ALL CABLE SIZES SHOWN ARE MINIMUM
 - * METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.

~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

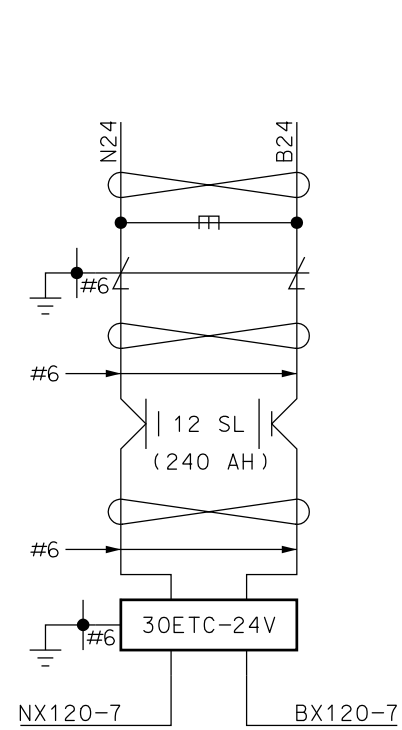
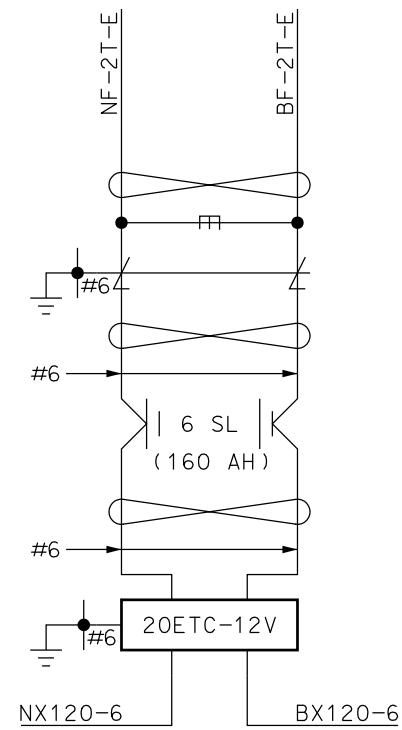
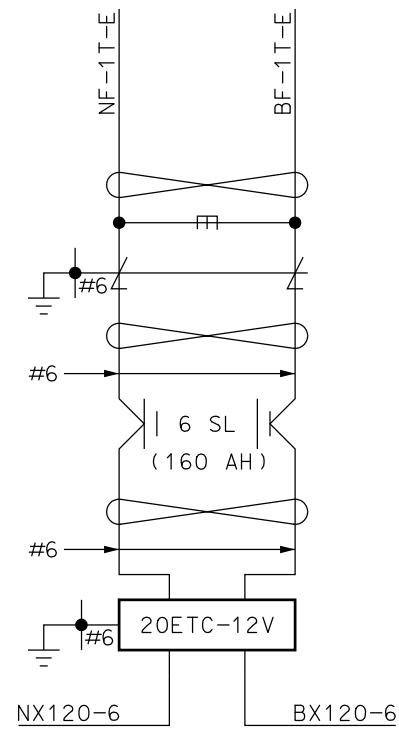
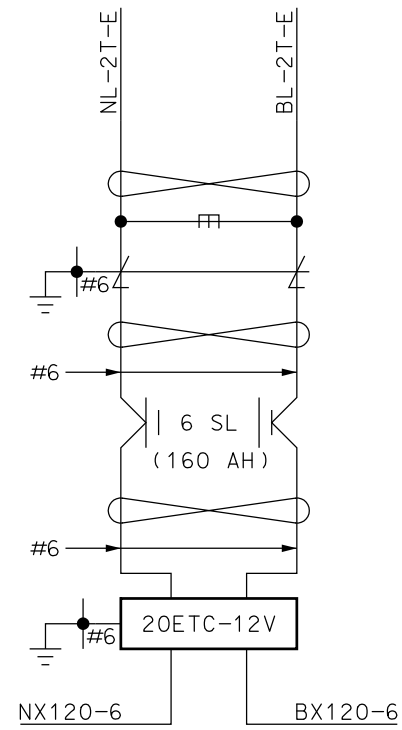
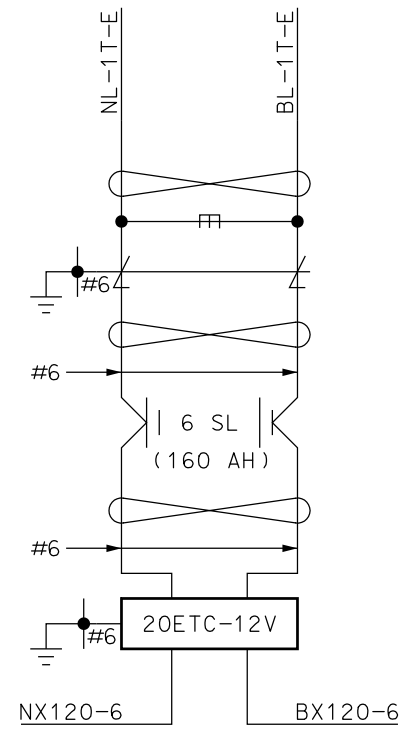
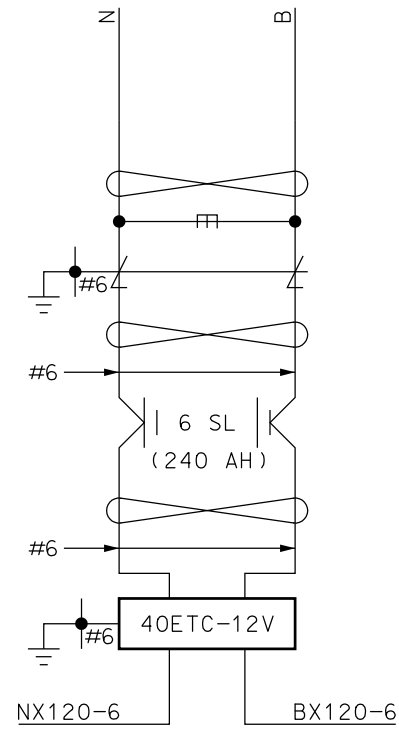
CHICAGO TO (END OF LINE)
CP (LOCATION)
HOUSE POWER DISTRIBUTION

REFERENCE: 12.04 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.00 SH.71

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED



~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
HOUSE POWER DISTRIBUTION

REFERENCE: 7.00 SH.1 THRU SH.75	DATE: 05/13/11
------------------------------------	-------------------

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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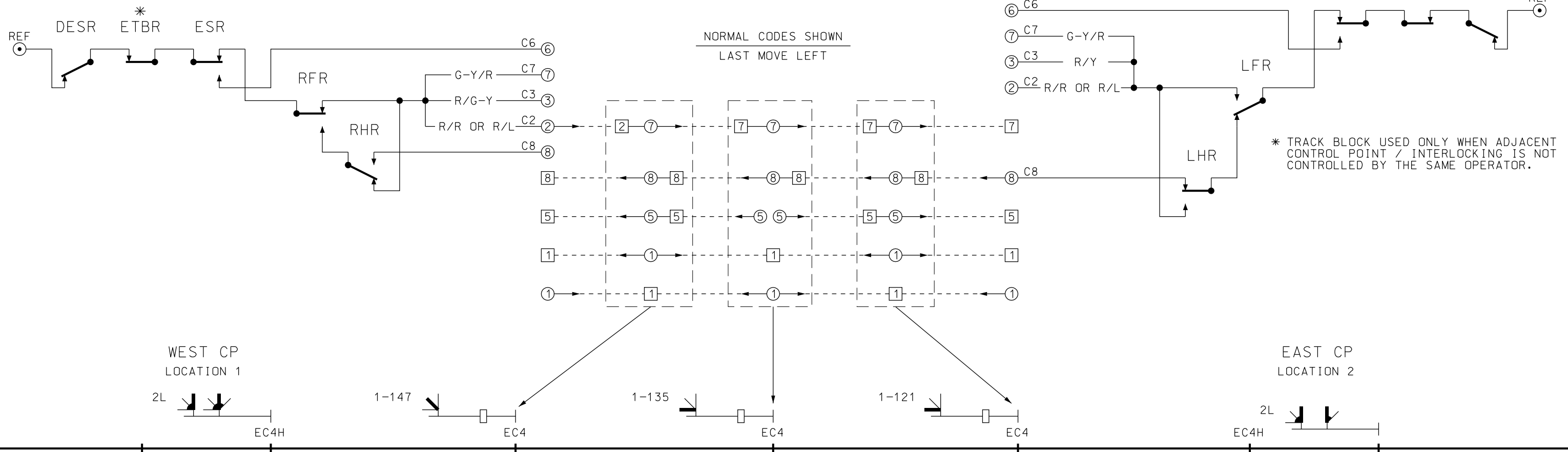
DISTRICT TYP	PRINT NUMBER 7.00 SH.72
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ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

OUTPUT (CODE GENERATION)

MICROPROCESSOR TRACK WITH
FIELD TRAFFIC BETWEEN CONTROL POINTS.

OUTPUT (CODE GENERATION)



NORMAL CODES SHOWN
LAST MOVE LEFT

WEST CP
LOCATION 1

EAST CP
LOCATION 2

ELECTRO CODE ASPECTS

- 1 - TRACK
- 2 - YELLOW
- 3 - YELLOW/YELLOW
- 4 - FLASHING YELLOW
- 5 - BLOCK (ANNUNCIATOR)
- 6 - TUMBLE DOWN
- 7 - GREEN
- 8 - TRAFFIC
- 9 - YELLOW/GREEN (3 HEADED SIGNAL)

NOTES:

- - INDICATES SEND
- - INDICATES RECEIVE

~REVISIONS~

≡ CONTRACTOR INFORMATION ONLY ≡
DO NOT DUPLICATE

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) CP (LOCATION) MICROPROCESSOR TRAFFIC			
REFERENCE: 7.00 SH.1 THRU SH.75		DATE: 05/13/11	
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.00 SH.73	

VPI® VITAL APPLICATION SOFTWARE CONFIGURATION DATA	VALUE
VITAL APPLICATION PROGRAM NUMBER:	51631-842-00
VITAL APPLICATION PROGRAM REVISION LEVEL:	D
VITAL APPLICATION PROGRAM REVISION DATE AND TIME:	12/17/09 14:49:53
VITAL APPLICATION PROGRAM BASE SIGNATURE:	451E1677
VITAL APPLICATION PROGRAM SOFTWARE REVISION ID:	12
VITAL APPLICATION PROGRAM SOFTWARE SITE ID:	0111
VITAL PROCESSOR (CPU/PD) U19 PROM PART NUMBER:	51631-842-01
VITAL PROCESSOR (CPU/PD) U19 PROM CHECKSUM:	4064
VITAL PROCESSOR (CPU/PD) U19 PROM CRC:	8B1D
VITAL PROCESSOR (CPU/PD) U18 PROM PART NUMBER:	51631-842-02
VITAL PROCESSOR (CPU/PD) U18 PROM CHECKSUM:	7375
VITAL PROCESSOR (CPU/PD) U18 PROM CRC:	C5EB
VITAL SERIAL CONTROLLER 1 (VSC1) U18 PROM PART NUMBER:	51631-842-07
VITAL SERIAL CONTROLLER 1 (VSC1) U18 PROM CHECKSUM:	0944
VITAL SERIAL CONTROLLER 1 (VSC1) U18 PROM CRC:	1D5B
VITAL SERIAL CONTROLLER 2 (VSC2) U18 PROM PART NUMBER:	51631-842-08
VITAL SERIAL CONTROLLER 2 (VSC2) U18 PROM CHECKSUM:	43F6
VITAL SERIAL CONTROLLER 2 (VSC2) U18 PROM CRC:	0F9E
VITAL SERIAL CONTROLLER 3 (VSC3) U18 PROM PART NUMBER:	51631-842-09
VITAL SERIAL CONTROLLER 3 (VSC3) U18 PROM CHECKSUM:	82F3
VITAL SERIAL CONTROLLER 3 (VSC3) U18 PROM CRC:	244C

VPI® NON-VITAL SYSTEM SOFTWARE CONFIGURATION DATA	VALUE
NON-VITAL PROGRAM NUMBER:	33031-852-00
NON-VITAL PROGRAM REVISION LEVEL:	E
NON-VITAL PROGRAM REVISION DATE AND TIME:	1/26/10 11:50
NON-VITAL PROGRAM ROM CHECKSUM:	FF10
NON-VITAL PROCESSOR (CSEX3) U60 PROM PART NUMBER:	33031-852-01
NON-VITAL PROCESSOR (CSEX3) U60 PROM CHECKSUM:	6A20
NON-VITAL PROCESSOR (CSEX3) U60 PROM CRC:	AEF7
NON-VITAL PROCESSOR (CSEX3) U53 PROM PART NUMBER:	33031-852-02
NON-VITAL PROCESSOR (CSEX3) U53 PROM CHECKSUM:	8E94
NON-VITAL PROCESSOR (CSEX3) U53 PROM CRC:	1BF5

GENRAKODE IITM SOFTWARE CONFIGURATION DATA	VALUE
'A' PGK CPU PROGRAM NAME:	AHEQ_A.PGK
'A' PGK CPU COMPILE DATE:	3/7/2006
'A' PGK CPU COMPILE TIME:	15:10:12
'A' PGK CPU APPLICATION CHECKSUM:	BA7C
'A' PGK CPU APPLICATION FILE CRC:	E688
'A' PGK CPU APPLICATION LOGIC CRC:	7DBF
'A' PGK CPU SYSTEM CRC:	189B
'A' PGK CPU SITE ID:	100
'A' PGK CPU APPLICATION ID:	CPIB2
'A' PGK CPU REVISION LEVEL:	1

VPI® VITAL SYSTEM SOFTWARE CONFIGURATION DATA	VALUE
SYSTEM PROGRAM NUMBER:	40025-366-00
SYSTEM PROGRAM REVISION LEVEL:	A
SYSTEM PROGRAM SIGNATURE:	A19EB31A
VITAL PROCESSOR (CPU/PD) U16 PROM PART NUMBER:	40025-366-01
VITAL PROCESSOR (CPU/PD) U16 PROM CHECKSUM:	E89A
VITAL PROCESSOR (CPU/PD) U16 PROM CRC:	0141
VITAL PROCESSOR (CPU/PD) U17 PROM PART NUMBER:	40025-366-02
VITAL PROCESSOR (CPU/PD) U17 PROM CHECKSUM:	0301
VITAL PROCESSOR (CPU/PD) U17 PROM CRC:	541B
VITAL SERIAL CONTROLLER 1 (VSC1) U16 PROM PART NUMBER:	40025-399-01 A
VITAL SERIAL CONTROLLER 1 (VSC1) U16 PROM CHECKSUM:	56A1
VITAL SERIAL CONTROLLER 1 (VSC1) U16 PROM CRC:	12CE
VITAL SERIAL CONTROLLER 2 (VSC2) U16 PROM PART NUMBER:	40025-348-01 A
VITAL SERIAL CONTROLLER 2 (VSC2) U16 PROM CHECKSUM:	4554
VITAL SERIAL CONTROLLER 2 (VSC2) U16 PROM CRC:	6B71
VITAL SERIAL CONTROLLER 3 (VSC3) U16 PROM PART NUMBER:	40025-399-01 A
VITAL SERIAL CONTROLLER 3 (VSC3) U16 PROM CHECKSUM:	56A1
VITAL SERIAL CONTROLLER 3 (VSC3) U16 PROM CRC:	12CE

~REVISIONS~



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
SOFTWARE CONFIGURATION DATA

REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED

DISTRICT	PRINT NUMBER
TYP	7.00 SH.74

NOTE: MANUFACTURER'S SOFTWARE CONFIGURATION DATA SHALL BE SHOWN IN TABULATION FORM OR IN EQUIPMENT SPECIFIC MODULE DETAIL.

HOUSE PLAN

(PLAN TO BE COMPLETED BY SIGNAL DESIGNER)

~REVISIONS~



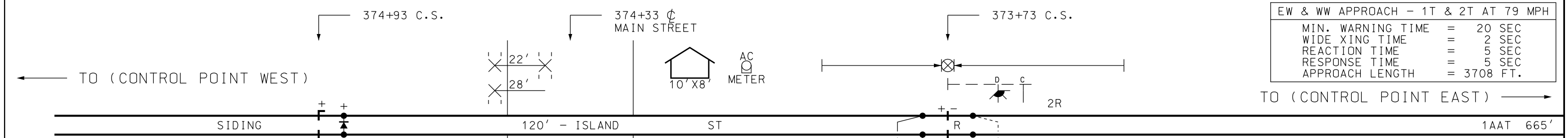
SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
CP (LOCATION)
HOUSE PLAN

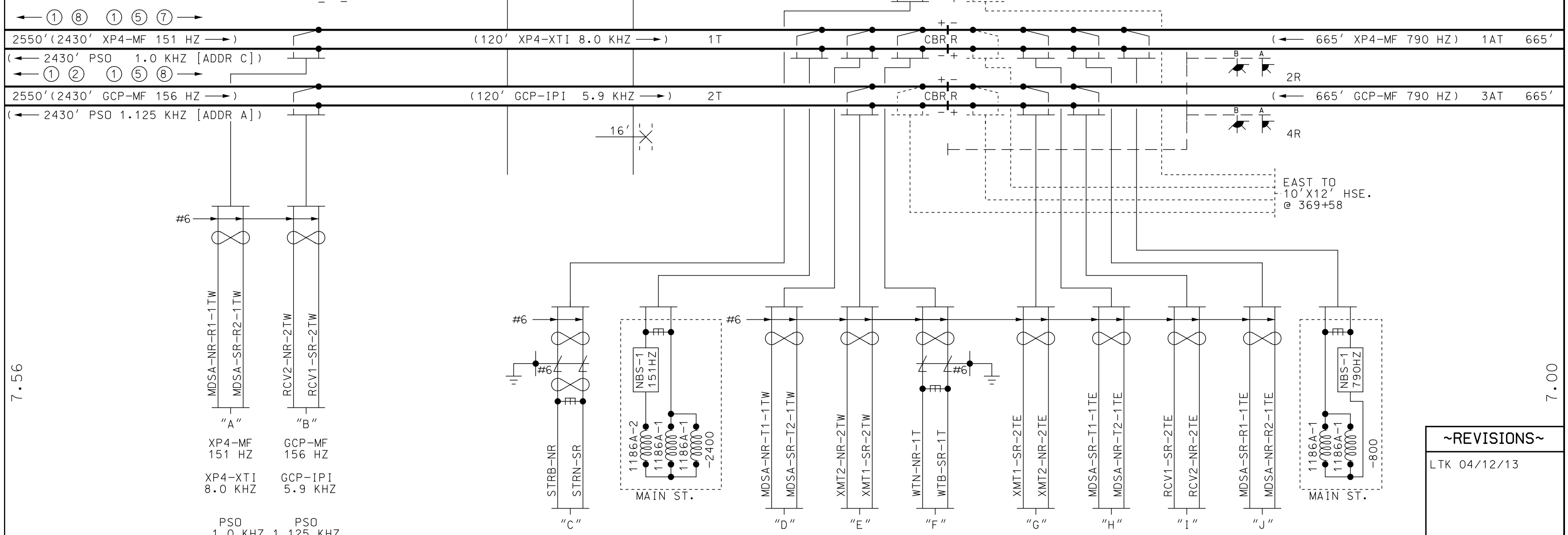
REFERENCE: 7.00 SH.1 THRU SH.75 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED

DISTRICT	PRINT NUMBER
TYP	7.00 SH.75



EW & WW APPROACH - 1T & 2T AT 79 MPH	
MIN. WARNING TIME	= 20 SEC
WIDE XING TIME	= 2 SEC
REACTION TIME	= 5 SEC
RESPONSE TIME	= 5 SEC
APPROACH LENGTH	= 3708 FT.

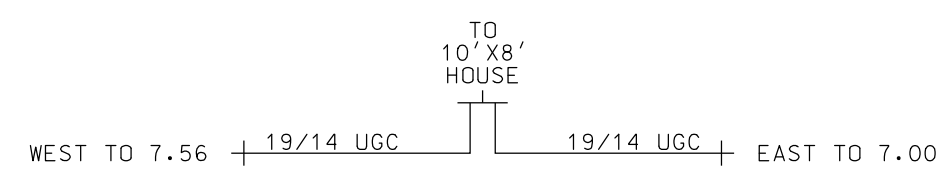
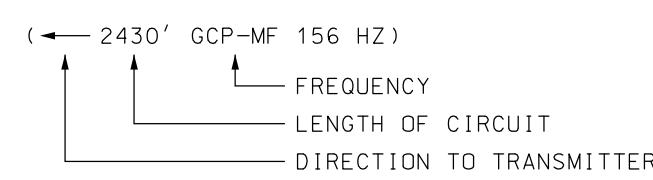


7.56

7.00

NOTES:

- INDICATES LEADS TO BE WELDED ON RAIL AS CLOSE TOGETHER AS POSSIBLE.
- TWISTED PAIR
- PRIME GROUND
- INDICATES CANTILEVER SUPPORTED FLASHING LIGHT SIGNAL PER FHWA MUTCD WITH PEDESTRIAN BELL ON NORTH SIGNAL.
- INDICATES AUTOMATIC GATE PER FHWA MUTCD WITH PEDESTRIAN BELL ON SOUTH SIGNAL.



~REVISIONS~

LTK 04/12/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
MAIN STREET, (CITY)
PLAN VIEW

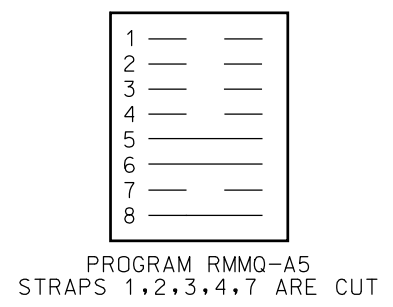
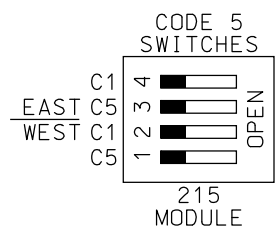
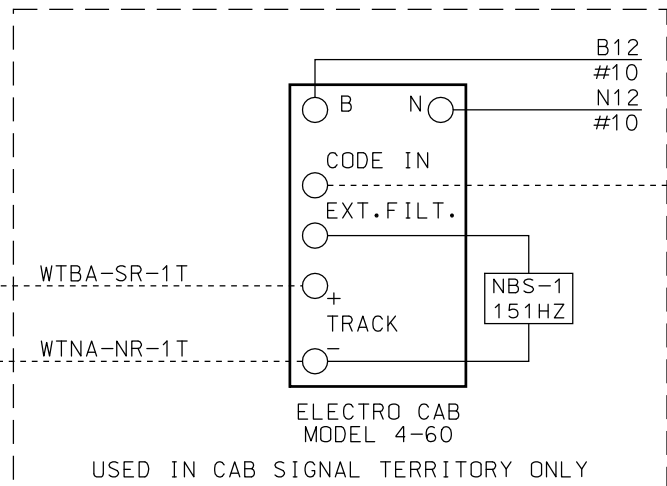
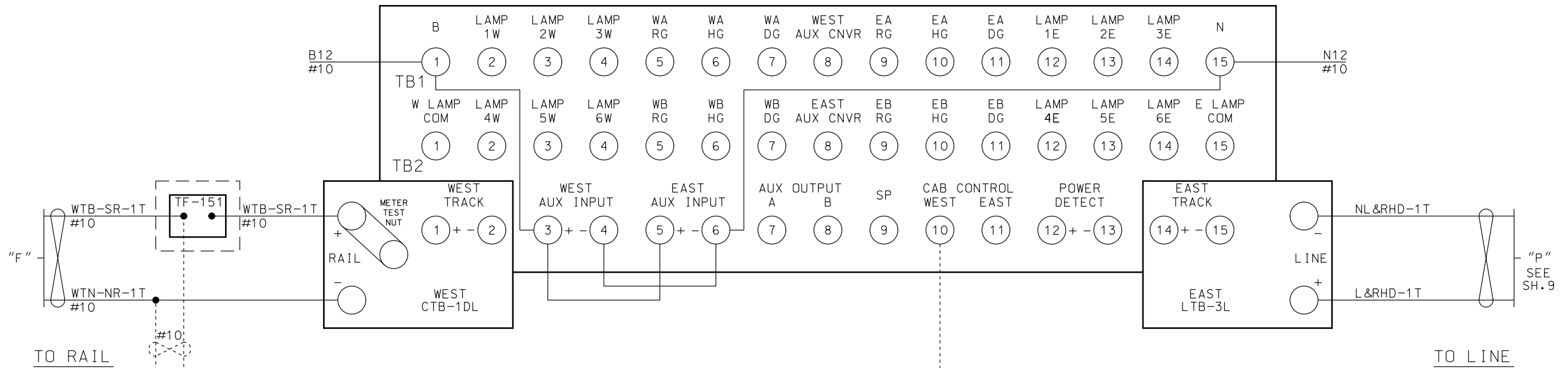
REFERENCE:	7.09 SH.1 THRU SH.14	DATE:	05/13/11
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DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.09 SH.1

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

ELECTRO CODE 4R
 MODULES: 1 EA-2L,7L,9L,2R,7K,9H,
 1 EA-214,215D,216A,230A,230B



- CHECK SUMS
 1 - C709/2E0A
 2 - F3B6/464B
 3 - C709/2E0A
 4 - 4C49/4C4A

- ELECTRO CODE ASPECTS
 1 - TRACK
 2 - YELLOW
 3 - YELLOW/YELLOW
 4 - FLASHING YELLOW
 5 - BLOCK (ANNUNCIATOR)
 6 - TUMBLE DOWN
 7 - GREEN
 8 - TRAFFIC
 9 - YELLOW/GREEN

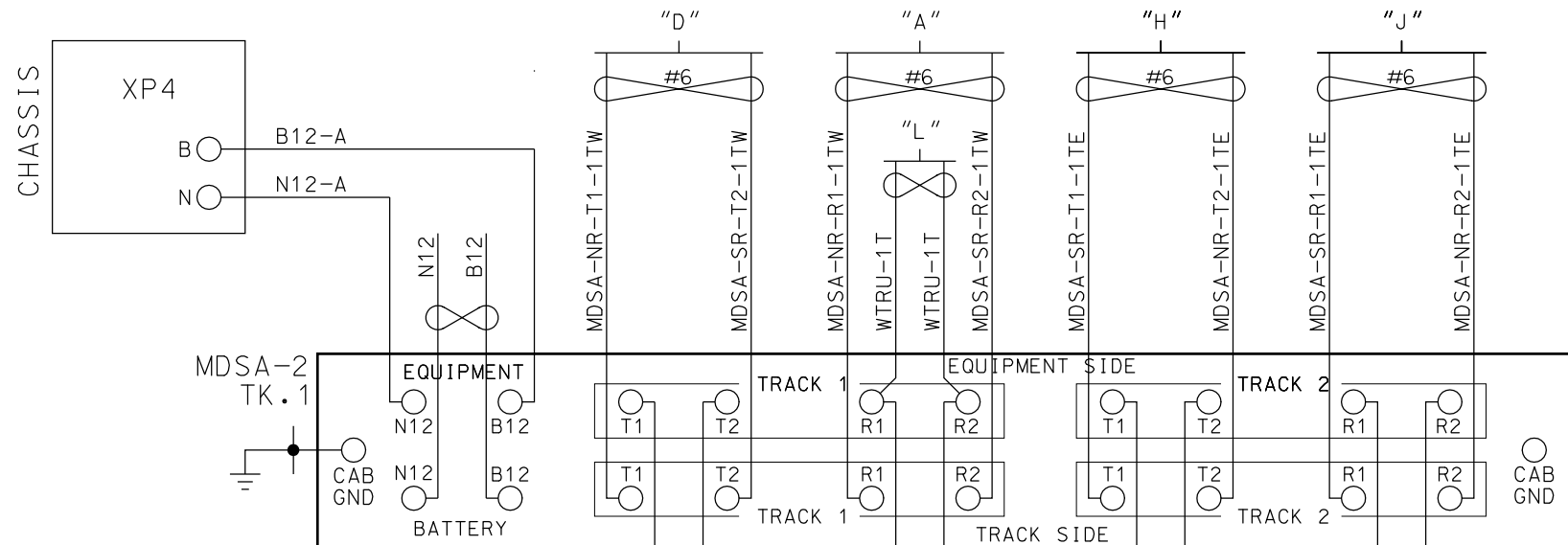
~REVISIONS~

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 MAIN STREET, (CITY)
 ELECTROCODE 4R TK.1

REFERENCE: 7.09 SH.1 THRU SH.14	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 7.09 SH.2	

ALL WIRING ON THIS SHEET
 #16 AWG UNLESS NOTED



CHASSIS ID SETUP

PROGRAM/APPLICATION NAME
spencerxp4 shadowC71D

REVISION OR VERSION:
CHECK SUM F307 CRC C71D

CHASSIS ID DIP PACK
CHASSIS ID No. (000-255) : 000
ID No. IN BINARY: 0000 0000

DIP POSITION

XP4 TRACK SETUP

BASIC SETUP - TRACK 1

FREQUENCY	151HZ
MASTER/SLAVE	MASTER
RX ADJUST	
TCA	*
DIRECTION MODE	BI
LIA	*
ADVANCED APPROACH	*
NBS COMP RX	*
TRK ISLAND ASSIGN	N/A
APPROACH LENGTH	2430
AUTO RX	*

ADVANCED SETUP - TRACK 1

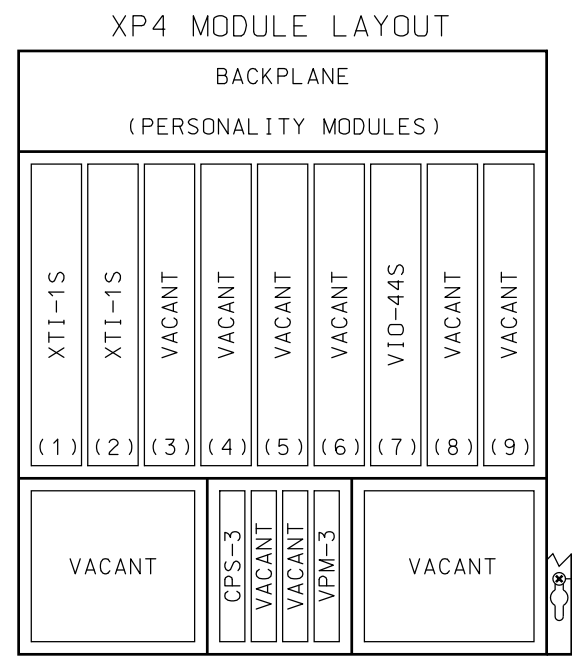
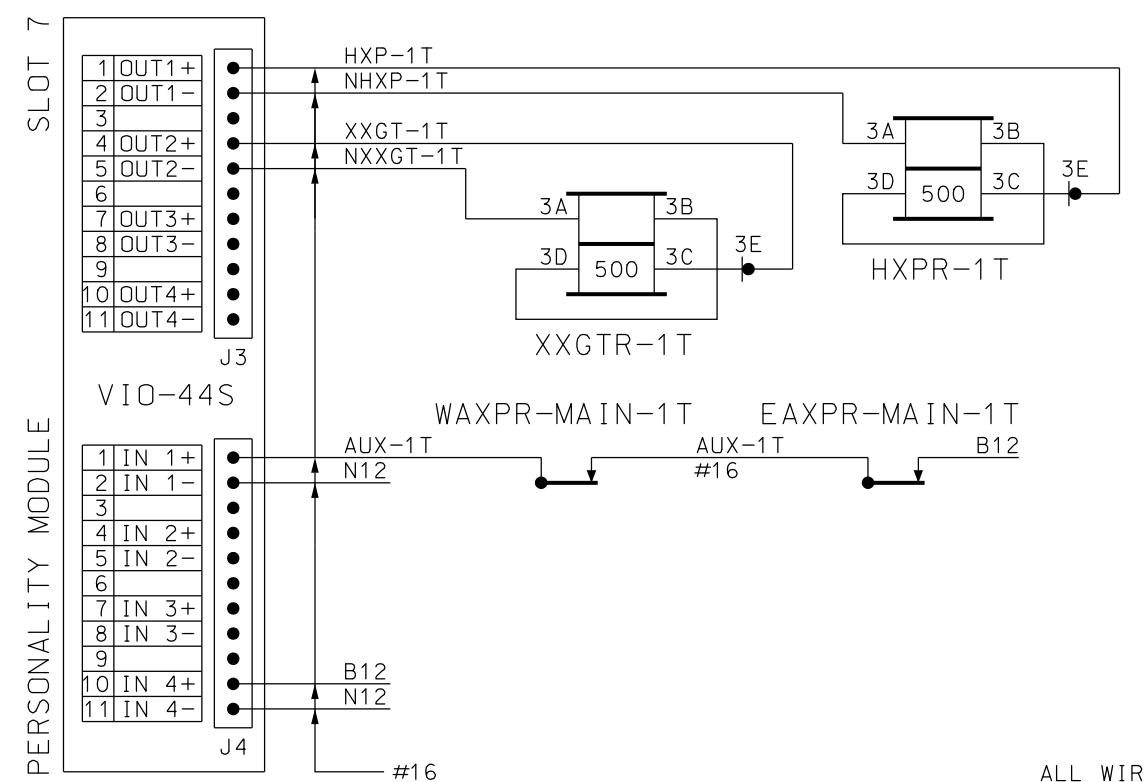
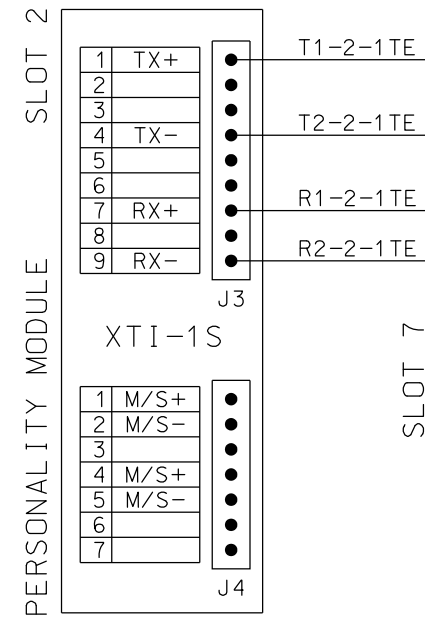
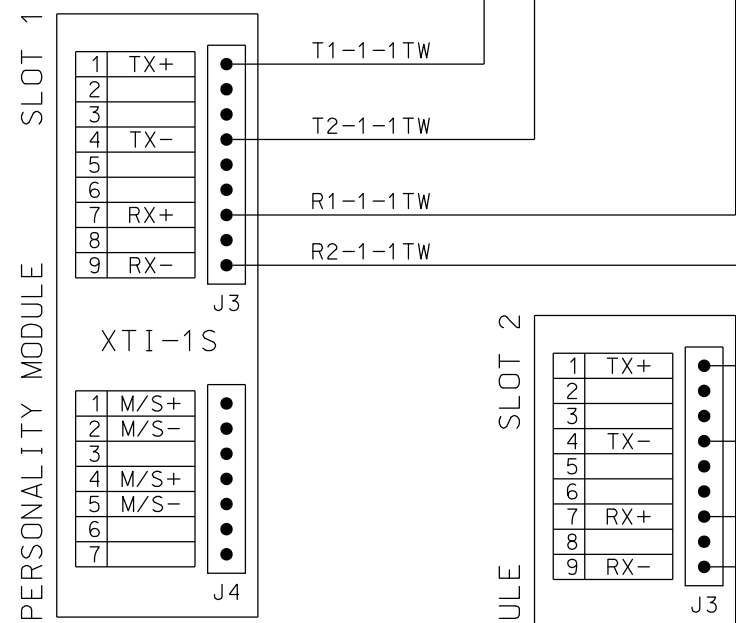
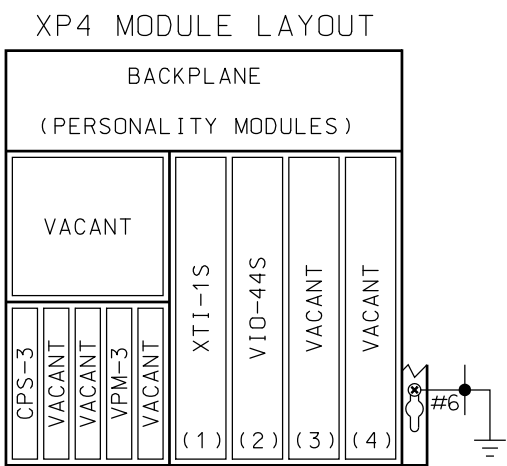
MOTION DET TIMER	MDEN	ENABLED
	MDTT	10
FALSE SHUNT	FSRX	DISABLED
	FST	N/A
	AREN	DISABLED
APPROACH RELEASE	ARRX	N/A
	ART	N/A
LOS TIME		16
1J-LOSS TIME		5
NRML SHRT VRYSHRT		*

XP4 MDR SETUP - TRACK 1

MDR		MDR1
WARNING TIME		
CW/MD		CW
AP TIME		
CWE-WT		N/A
AUX RCVR DLY		N/A
TRACK		TK1
TRACK ASSIGNED		ASSIGNED
OFFSET DISTANCE		0
MD RESTART		0
SUDDEN SHUNT ZONE	DISABLED	
POSITIVE START	PSEN	DISABLED
	PSRX	0
	PST	0
POST JOINT DETECTION	PJEN	DISABLED
	PJRX	15
	PJDT	15

XP4 ISLAND SETUP - TRACK 1

ISLAND		ISLAND 1
ENABLED/DISABLED		ENABLED
FREQUENCY		8.0KHZ
ISLAND LOS		2
FAULT DELAY		1



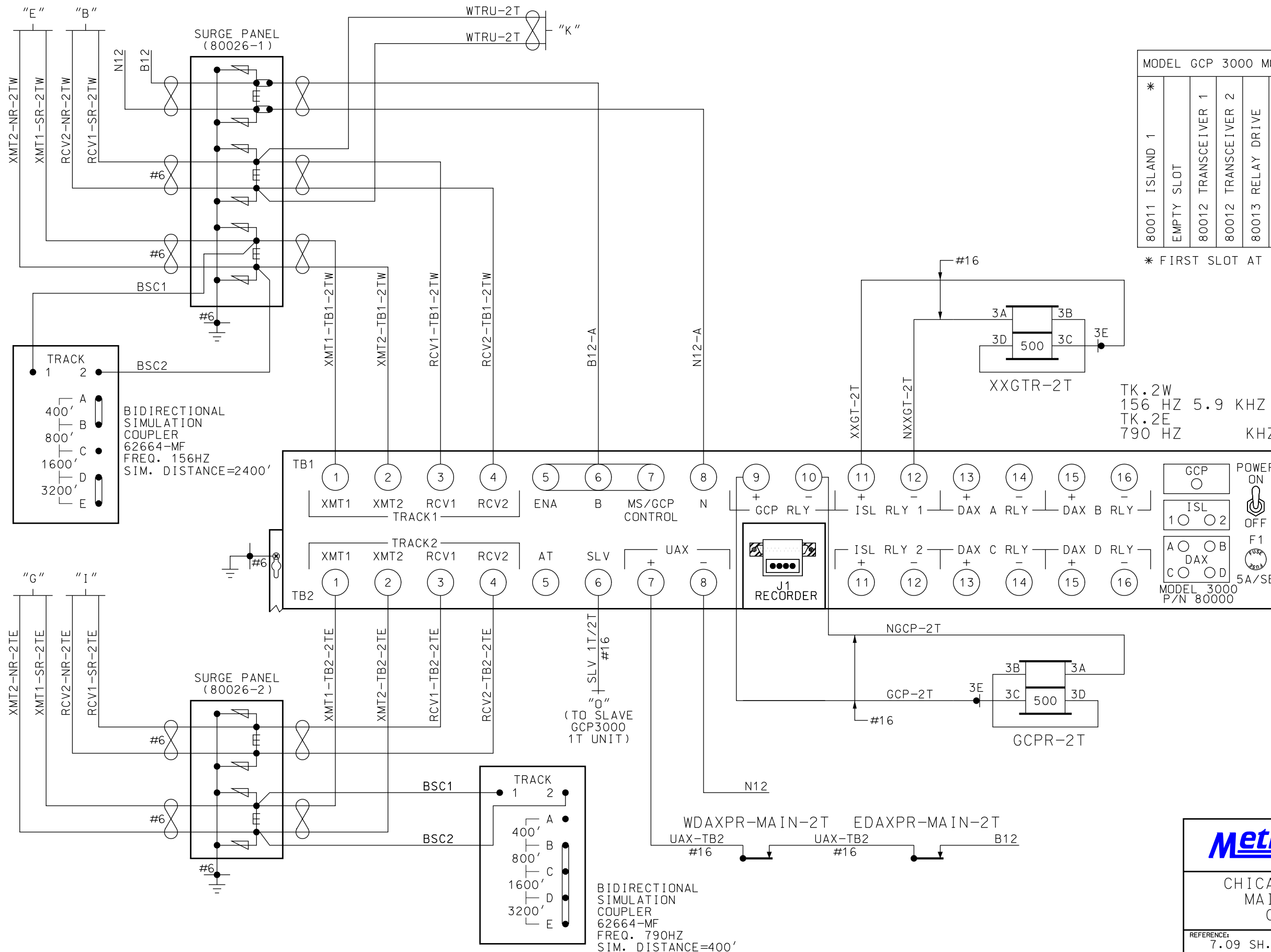
~REVISIONS~

ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

SIGNAL ENGINEERING
CHICAGO, ILLINOIS

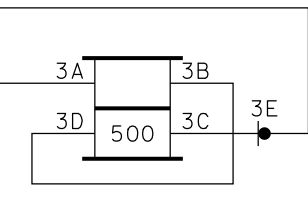
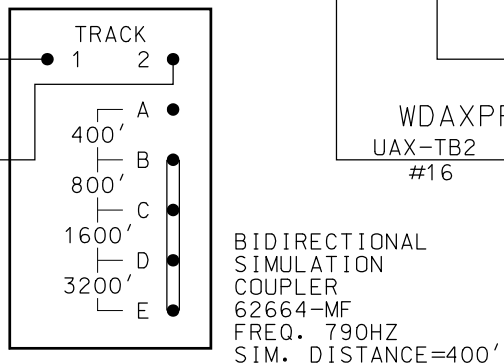
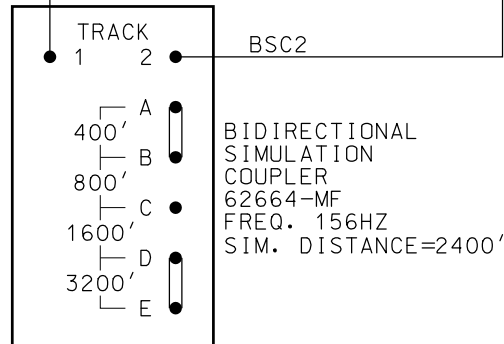
CHICAGO TO (END OF LINE)
MAIN STREET, (CITY)
XP4 PROGRAMMING
PARAMETERS-TK.1

REFERENCE:	7.09 SH.1 THRU SH.14	DATE:	05/13/11
DESIGNED	DRAWN	CHECKED	APPROVED
DISTRICT	PRINT NUMBER		
TYP	7.09 SH.3		

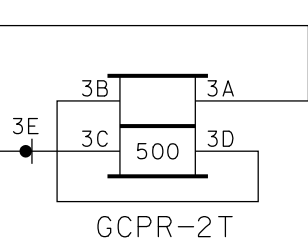
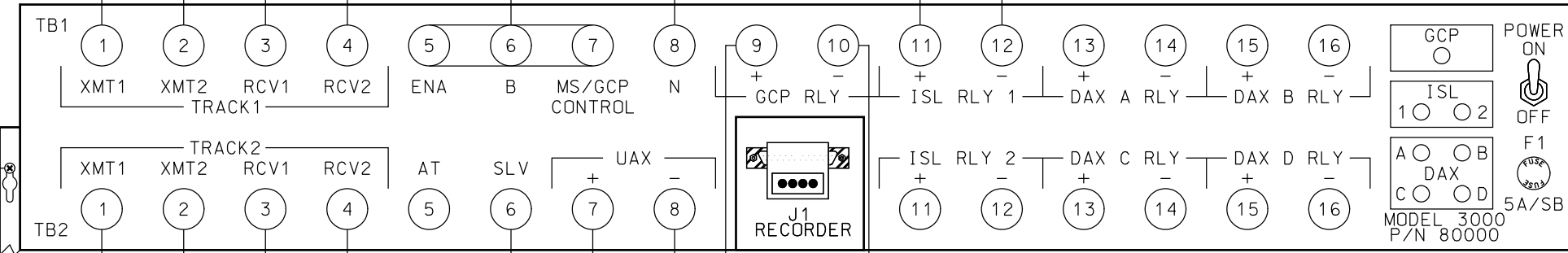


MODEL GCP 3000 MODULE ASSEMBLIES	
* 80011 ISLAND 1	
EMPTY SLOT	
80012 TRANSCIVER 1	
80012 TRANSCIVER 2	
80013 RELAY DRIVE	
80214 PROCESSOR	
80015 REC. MODULE	
EMPTY SLOT	
EMPTY SLOT	
80020/80019 INTERFACE	

* FIRST SLOT AT LEFT END OF BAY



TK.2W
156 HZ 5.9 KHZ
TK.2E
790 HZ KHZ



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
MAIN STREET, (CITY)
GCP 3000 - TK.2

REFERENCE: 7.09 SH.1 THRU SH.14 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.09 SH.4

GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

TK.2

GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

NUMBER OF TRACKS	2	
FREQUENCY	T1: 156 HZ	T2: 790 HZ
UNIDIRECTIONAL/BIDIRECTIONAL	T1: BI	T2: BI
XMIT LEVEL - MED/HI	T1: MED	T2: MED
PREDICTOR/MOTION SENSOR	T1: GCP	T2: GCP
WARNING TIME SELECTED	T1: 27 SEC	T2: 27 SEC
APPROACH DISTANCE	T1: 2415 FT	T2: 408 FT
UAX PICKUP DELAY (UAX1)	SEC.	
ENA/UAX2 DELAY	SEC.	
ISLAND DISTANCE	T1: 120 FT	T2:
NUMBER OF DAX'S		
DAX A TRK/DIST/WARNING TIME	FT	SEC.
DAX B TRK/DIST/WARNING TIME	FT	SEC.
DAX C TRK/DIST/WARNING TIME	FT	SEC.
DAX D TRK/DIST/WARNING TIME	FT	SEC.
SLAVING MASTER/SLAVE	MASTER	
PASSWORD DISABLED/ENABLED	DISABLED	
RECORDER INSTALLED/NOT INSTALLED	NOT INSTALLED	
SWITCH TO MS	T1: EZ	T2: EZ
TRANSFER DELAY MS TO GCP	T1: SEC.	T2: SEC.
PRIME PREDICTION OFFSET	T1: FT	T2: FT
PICKUP DELAY PRIME	SEC.	
PICKUP DELAY DAX A	SEC.	
PICKUP DELAY DAX B	SEC.	
PICKUP DELAY DAX C	SEC.	
PICKUP DELAY DAX D	SEC.	
ENHANCED DETECT MODE	OFF	
BACK TO BACK	OFF	
STATION STOP TIMER	10 SEC.	
T1 # OF TRACK WIRES 4/6	4	
T2 # OF TRACK WIRES 4/6	4	
LOW EX ADJUSTMENT	0	
LOW EZ DETECTION	T1:	T2:
LOW EZ DETECTION TIMER	T1: MIN.	T2: MIN.
POSITIVE START (0 = OFF)	T1: EZ	T2: EZ
POSITIVE START TIMEOUT (0 = NONE)	T1: MIN.	T2: MIN.
SET AT OPERATION	NORMAL	
DIAGNOSTIC MESSAGES		
DAX MESSAGES		
ADVANCE PREEMPT TIMER	SEC.	

~REVISIONS~



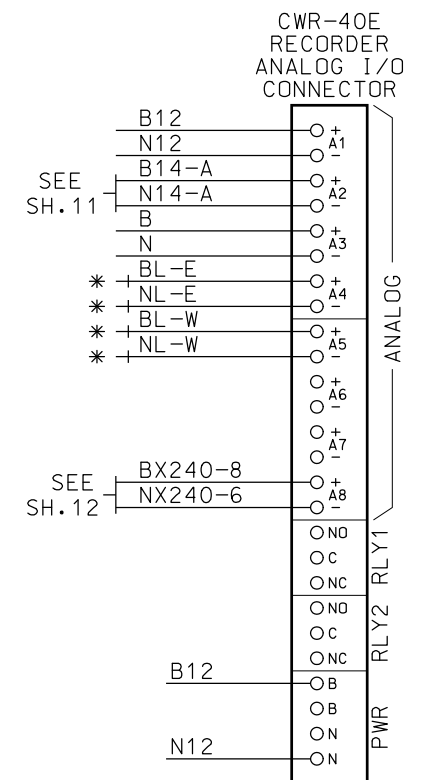
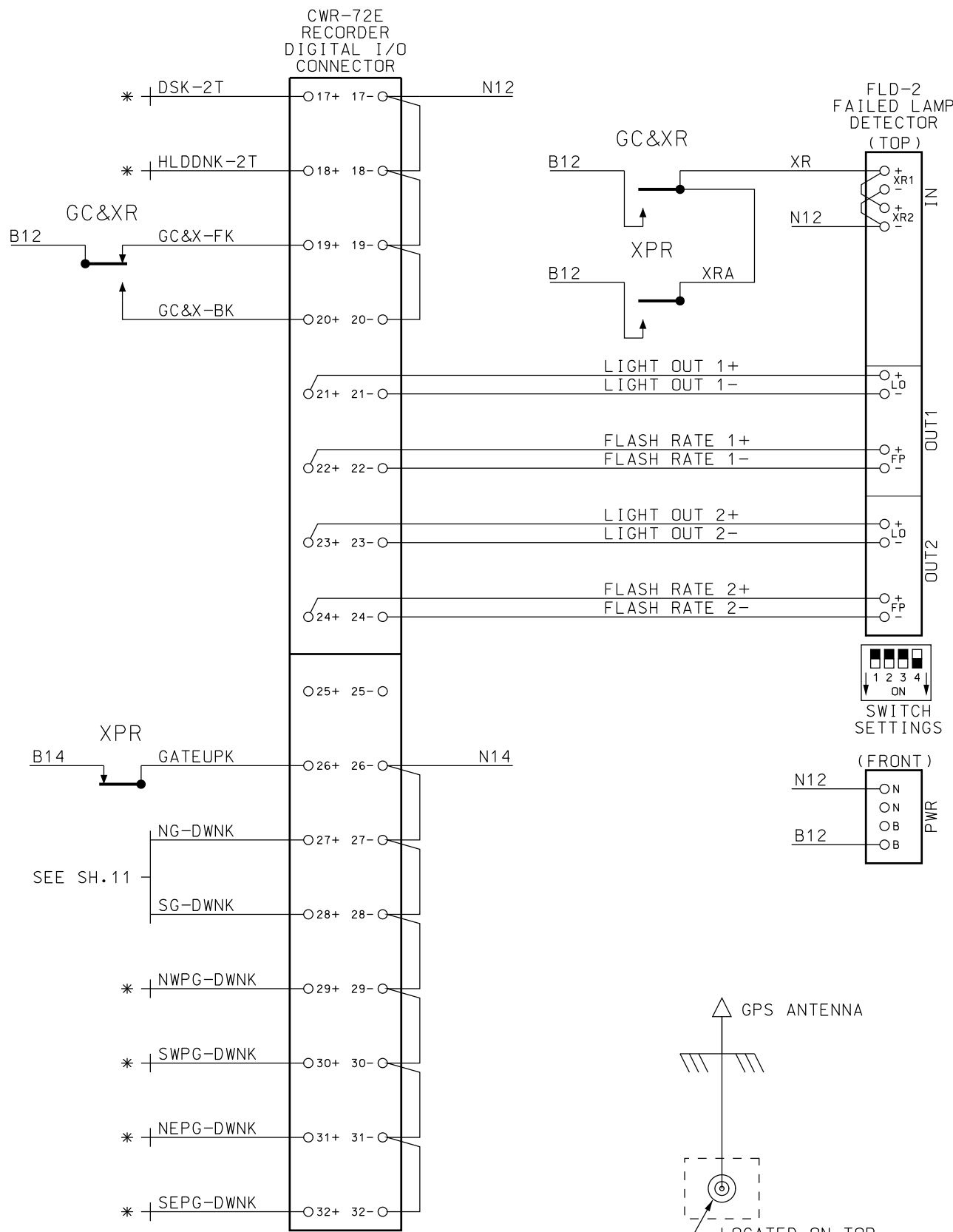
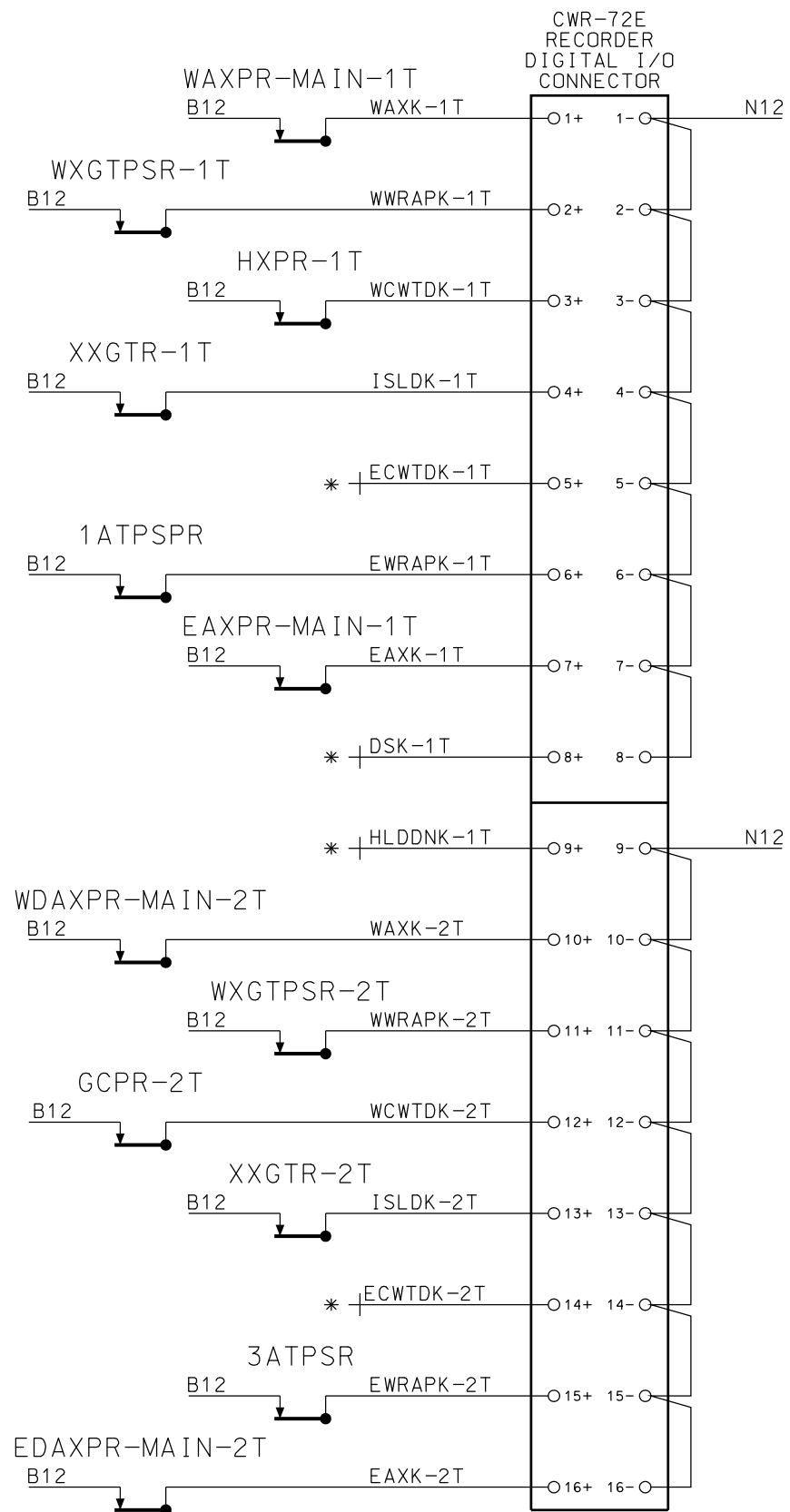
SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
MAIN STREET, (CITY)
GCP PROGRAMMING PARAMETERS

REFERENCE: 7.09 SH.1 THRU SH.14 DATE: 05/13/11

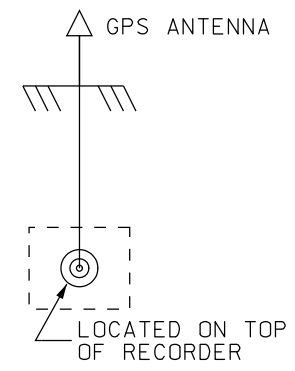
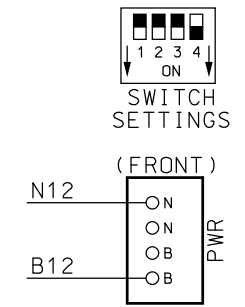
DESIGNED	DRAWN	CHECKED	APPROVED

DISTRICT	PRINT NUMBER
TYP	7.09 SH.5



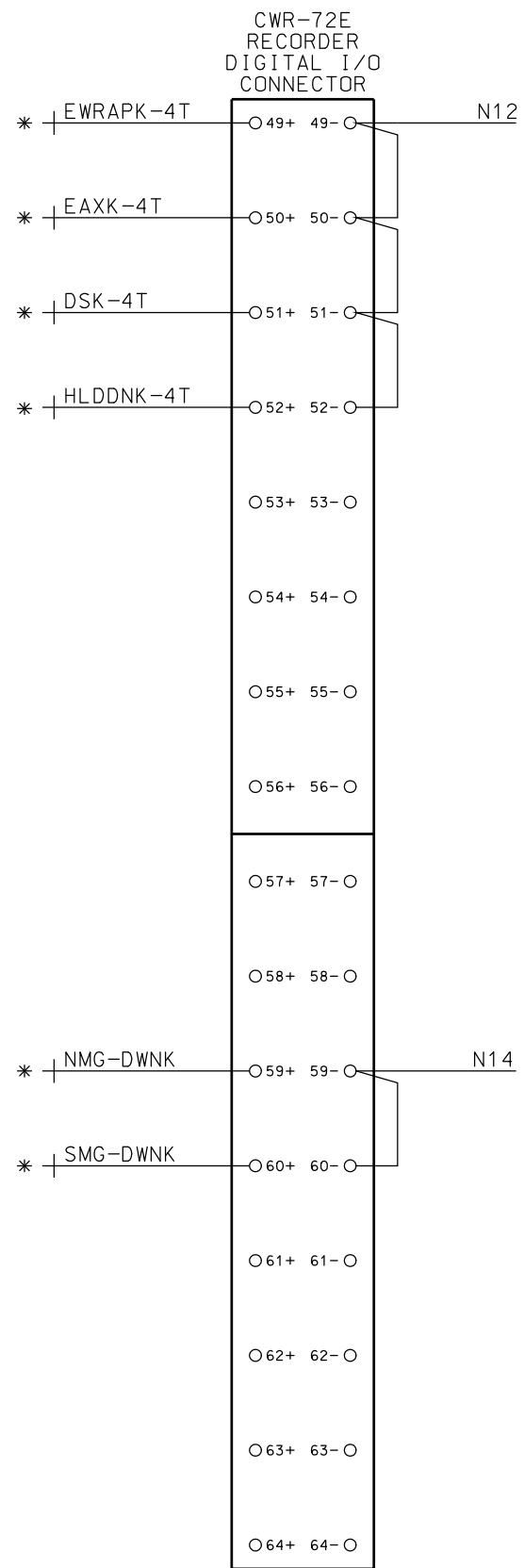
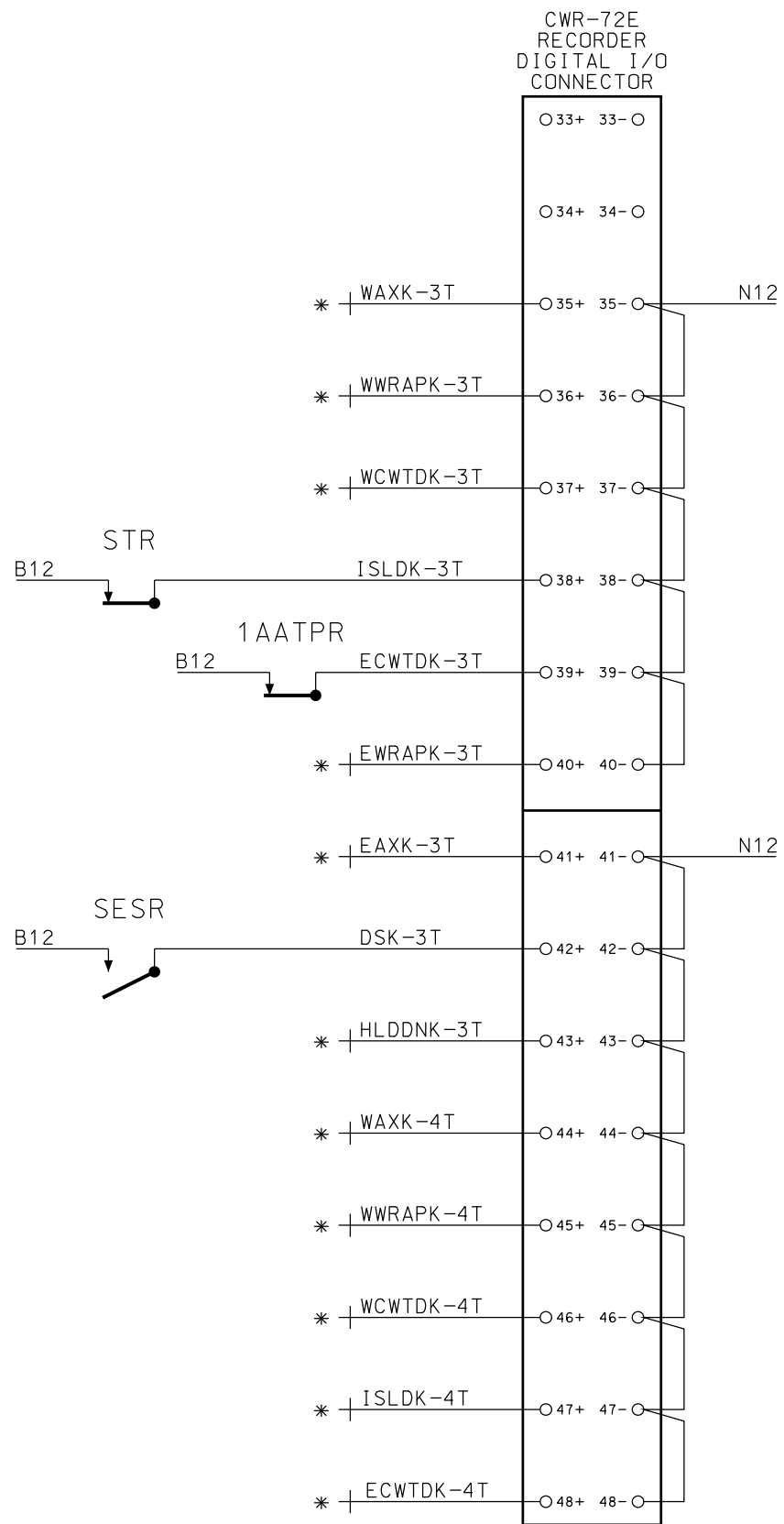
* EVENT RECORDER INPUT NOT USED AT THIS LOCATION

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED



~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) MAIN STREET, (CITY) EVENT RECORDER	
REFERENCE: 7.09 SH.1 THRU SH.14	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.09 SH.6



* EVENT RECORDER INPUT NOT USED AT THIS LOCATION

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

~REVISIONS~

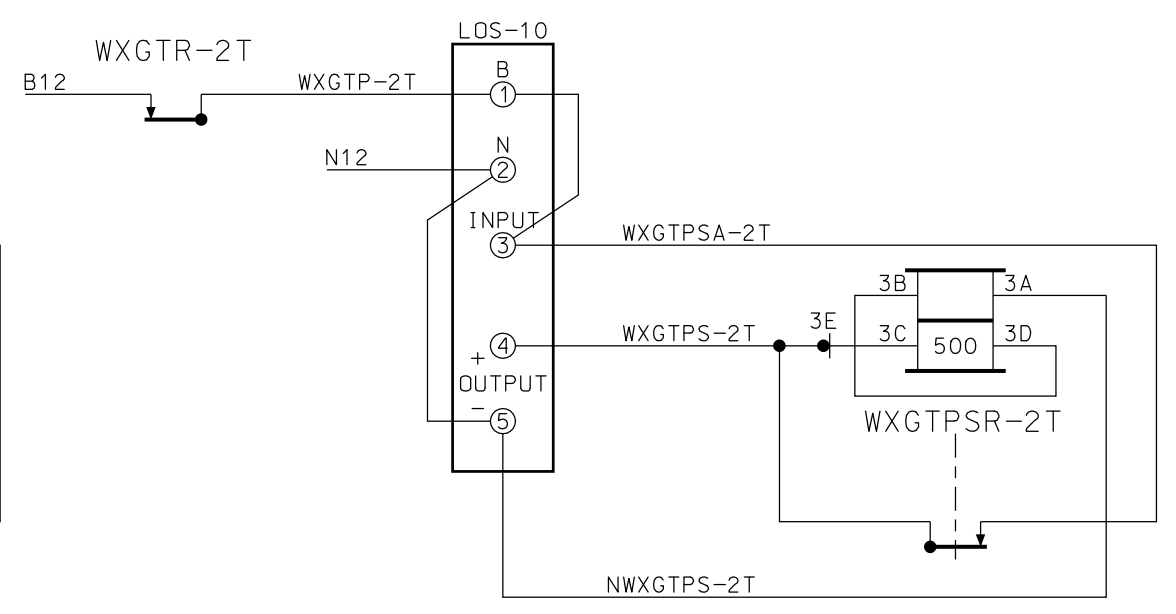
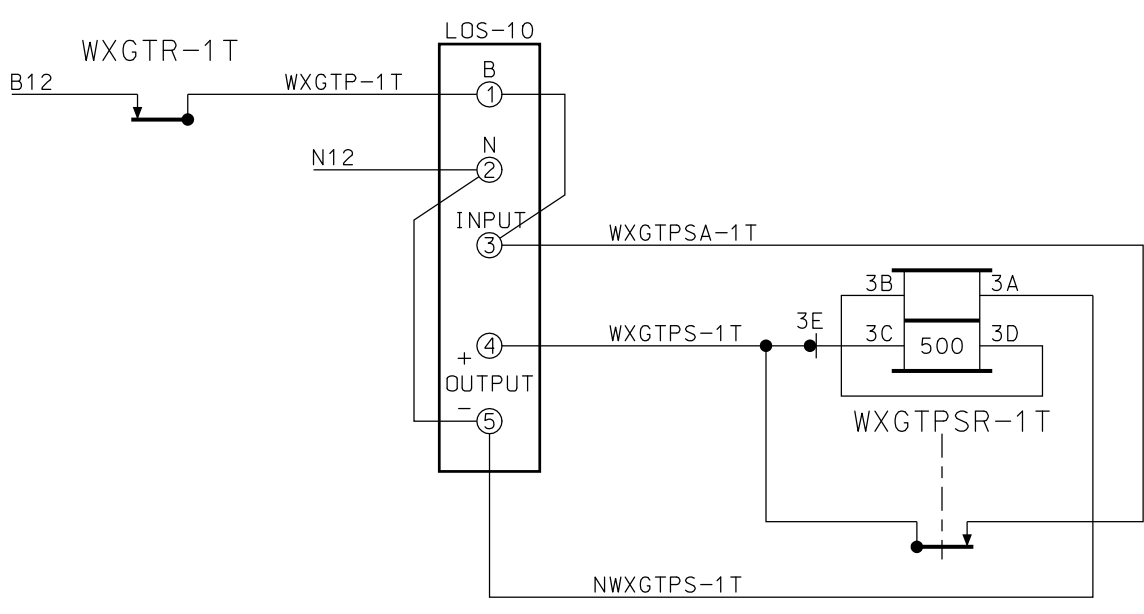
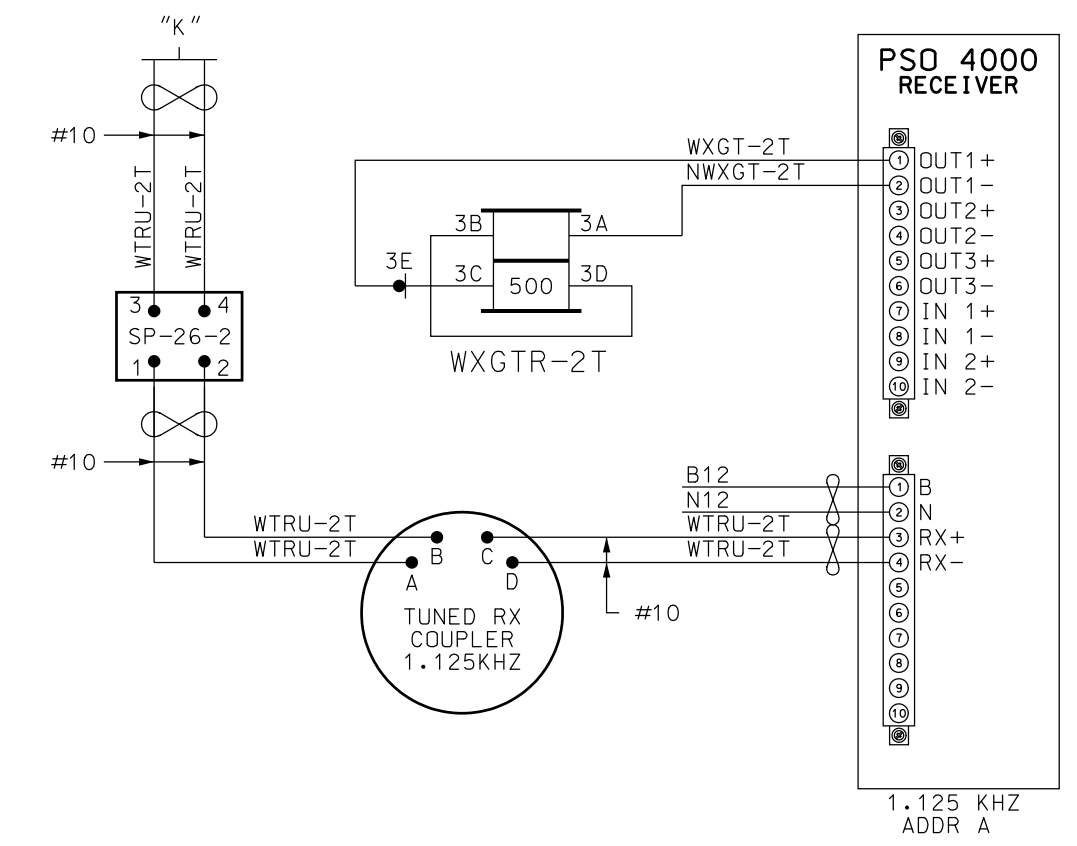
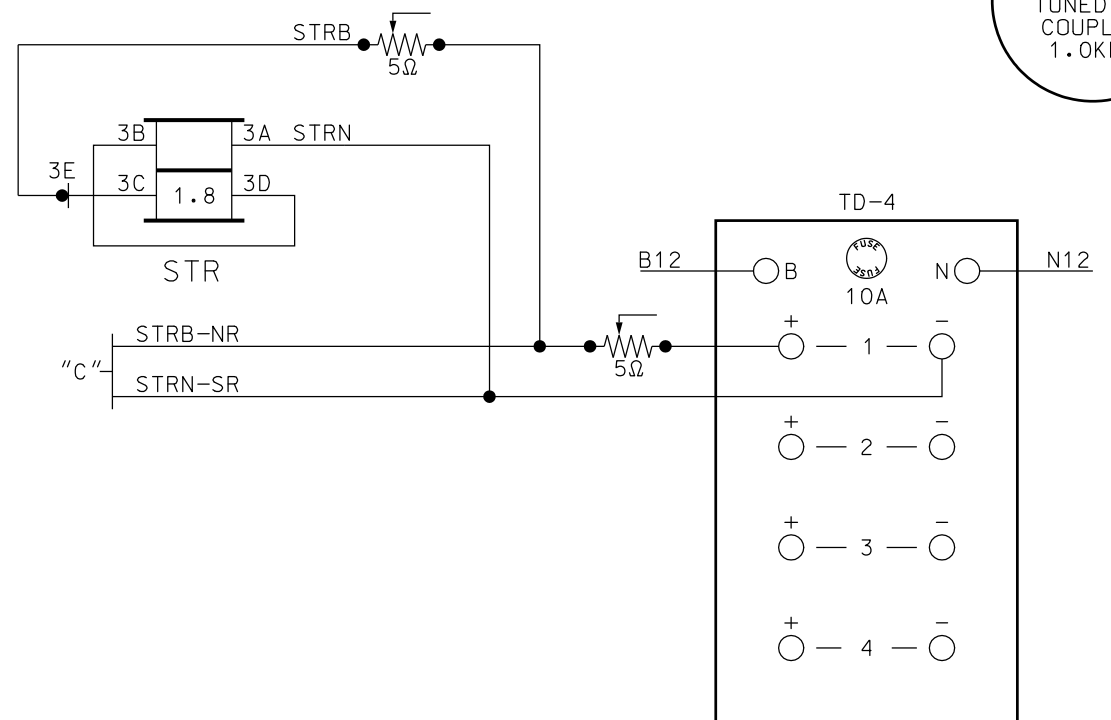
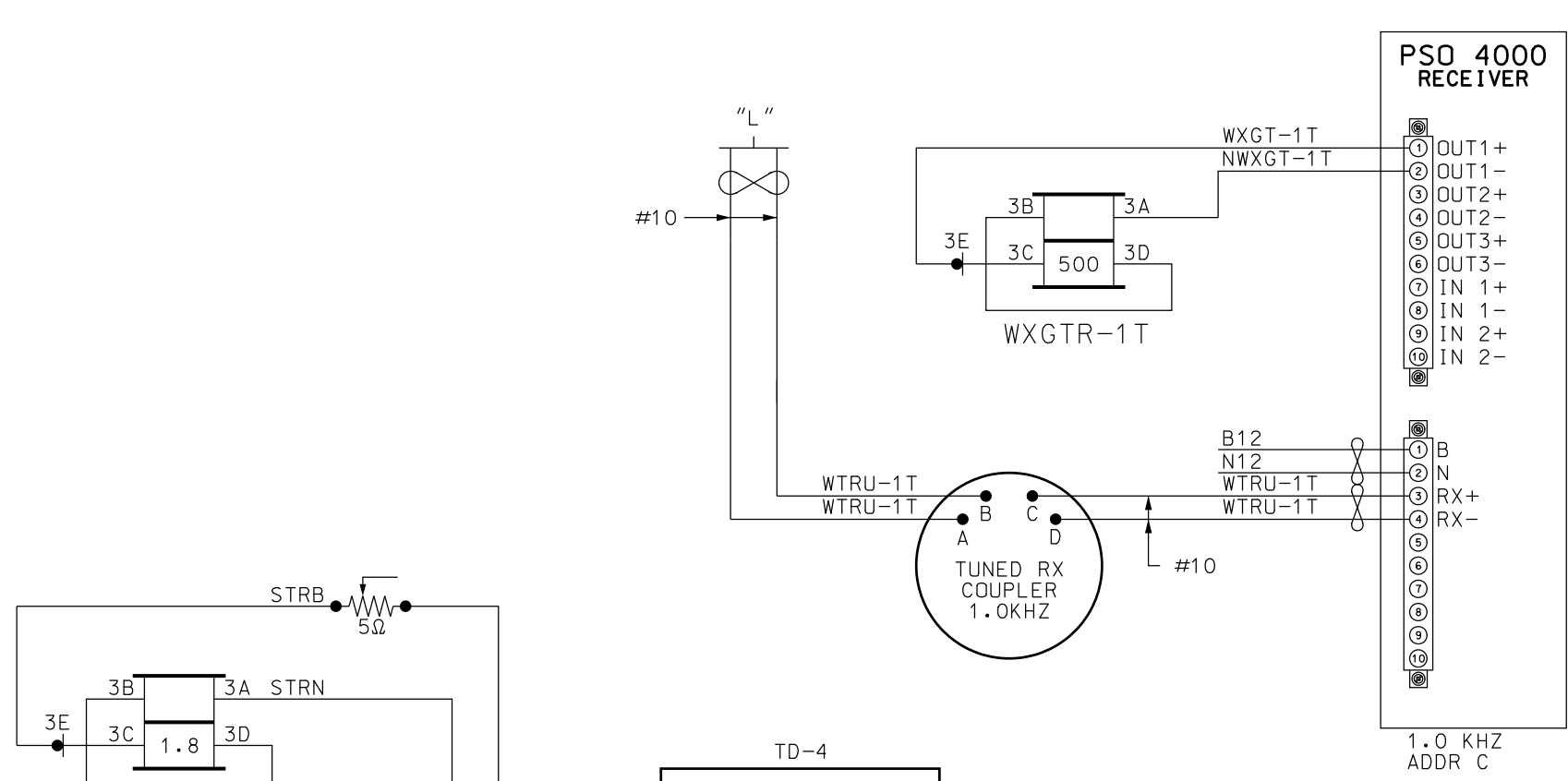
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
MAIN STREET, (CITY)
EVENT RECORDER

REFERENCE: 7.09 SH.1 THRU SH.14 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.09 SH.7



~REVISIONS~

LTK 03/22/13

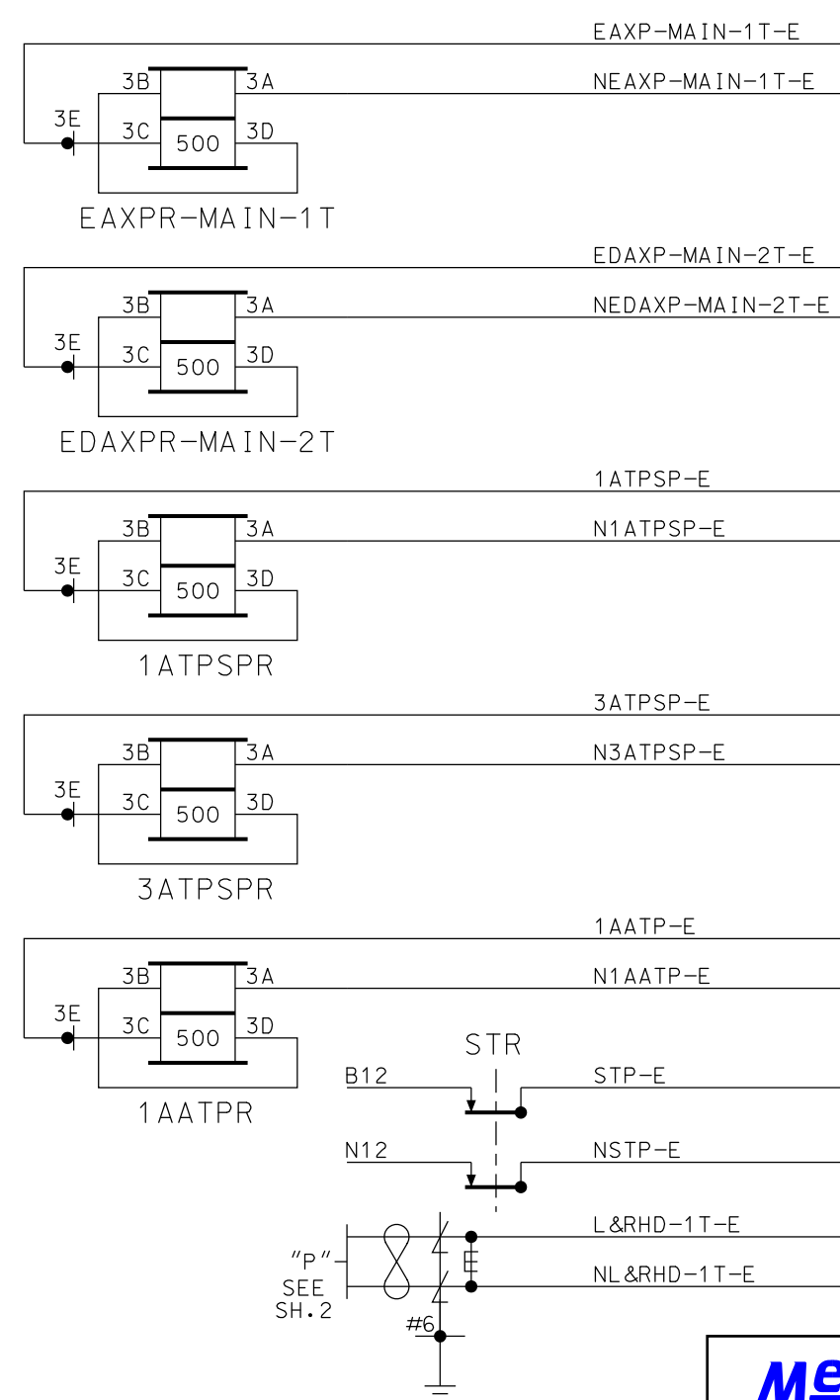
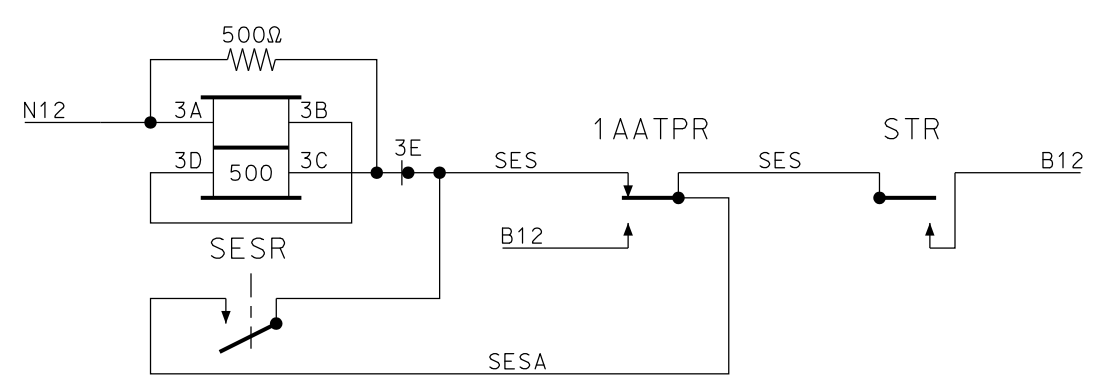
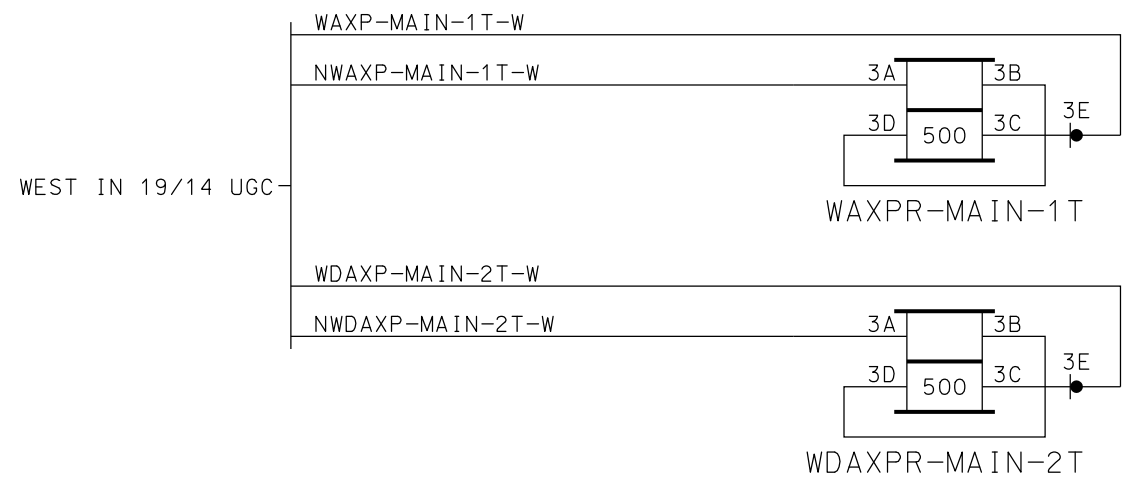
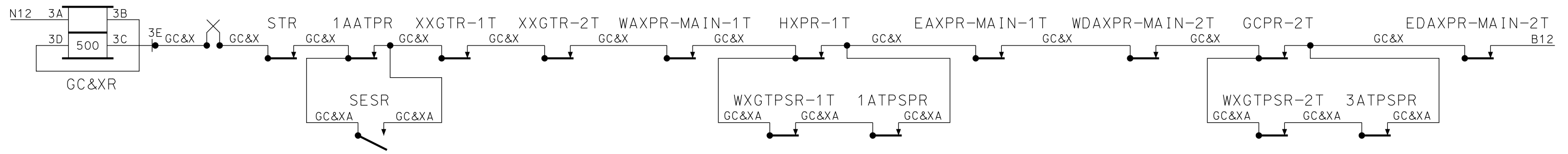
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
MAIN STREET, (CITY)
TD-4 & PSD 4000-LOSS OF SHUNT

REFERENCE: 7.09 SH.1 THRU SH.14 DATE: 05/13/11

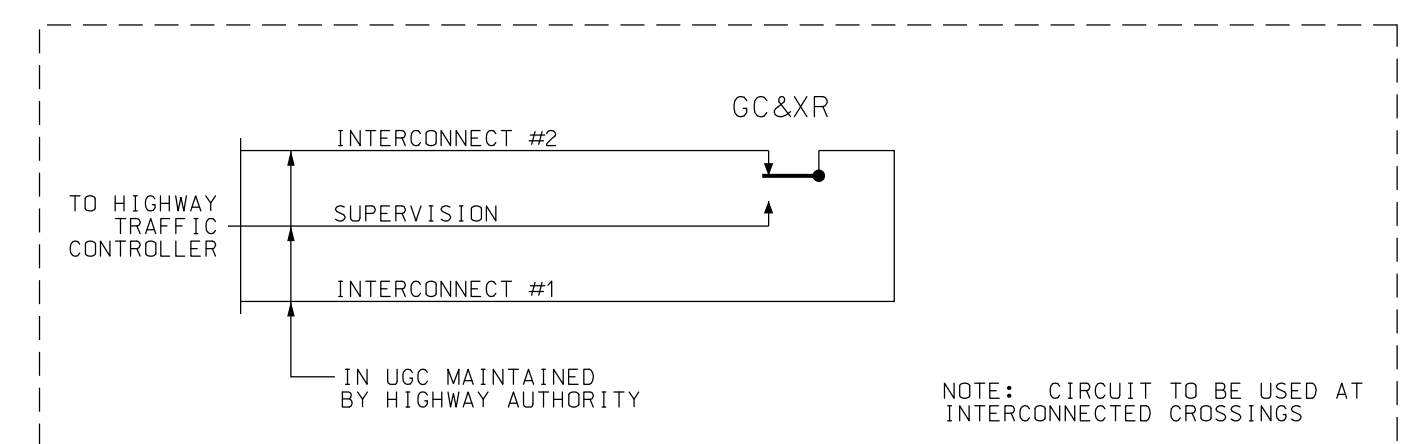
DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra
DISTRICT	PRINT NUMBER		
TYP	7.09 SH.8		

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



EAST IN 19/14 UGC

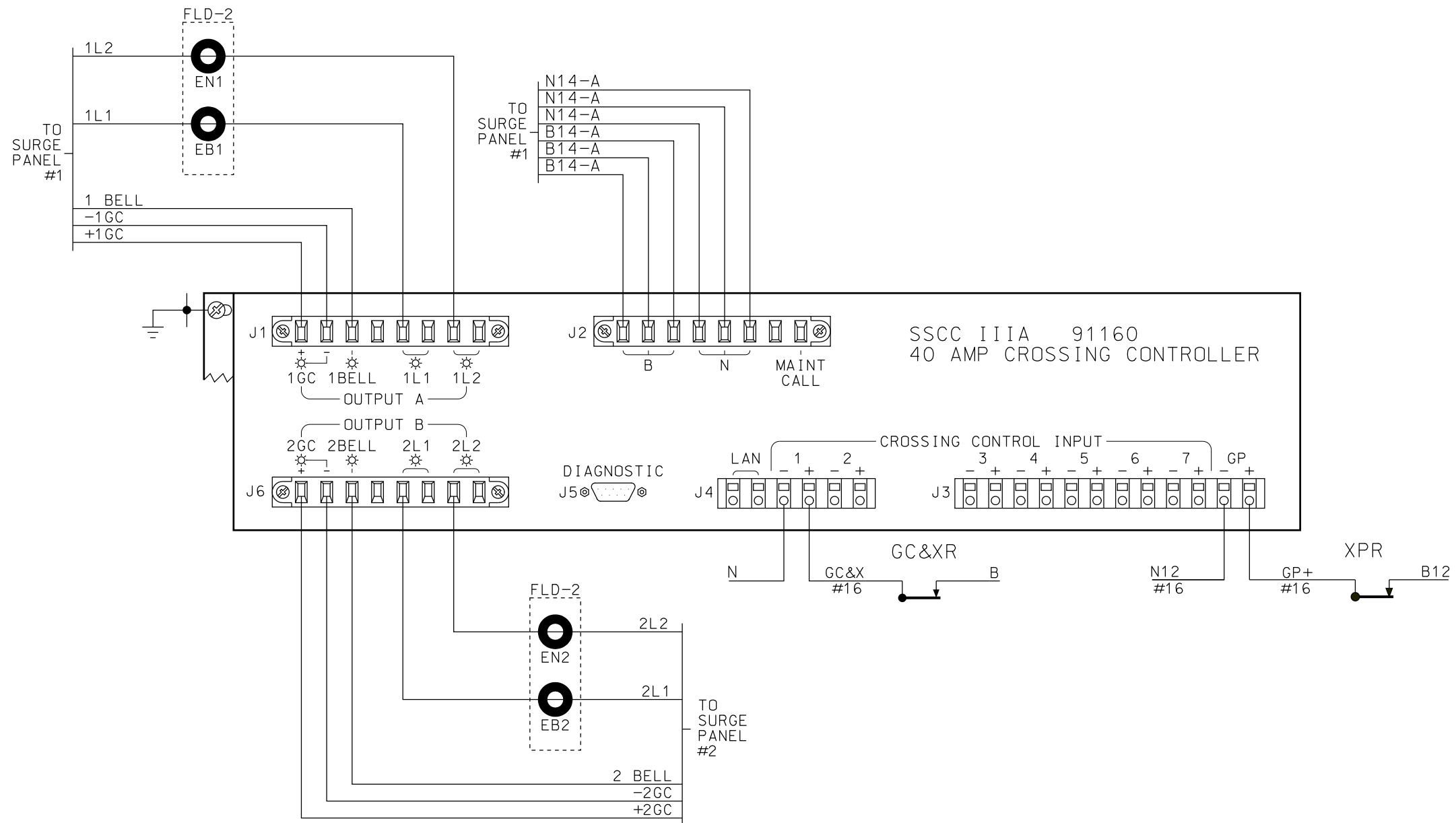
~REVISIONS~



NOTE: CIRCUIT TO BE USED AT INTERCONNECTED CROSSINGS

ALL WIRING ON THIS SHEET #16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) MAIN STREET, (CITY) LINE CIRCUITS & GC&XR	
REFERENCE: 7.09 SH.1 THRU SH.14	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.09 SH.9



PROGRAM FLASH RATE: 55 PER MIN
 PROGRAM 1GC DELAY: 3 SEC
 PROGRAM 2GC DELAY: 3 SEC
 PROGRAM BELL-ON GATE RISING: YES
 PROGRAM ENABLED INPUTS: 1 THRU 1
 PROGRAM ENABLED OUTPUTS: A AND B
 PROGRAM LOW BATTERY: DISABLED

~REVISIONS~

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

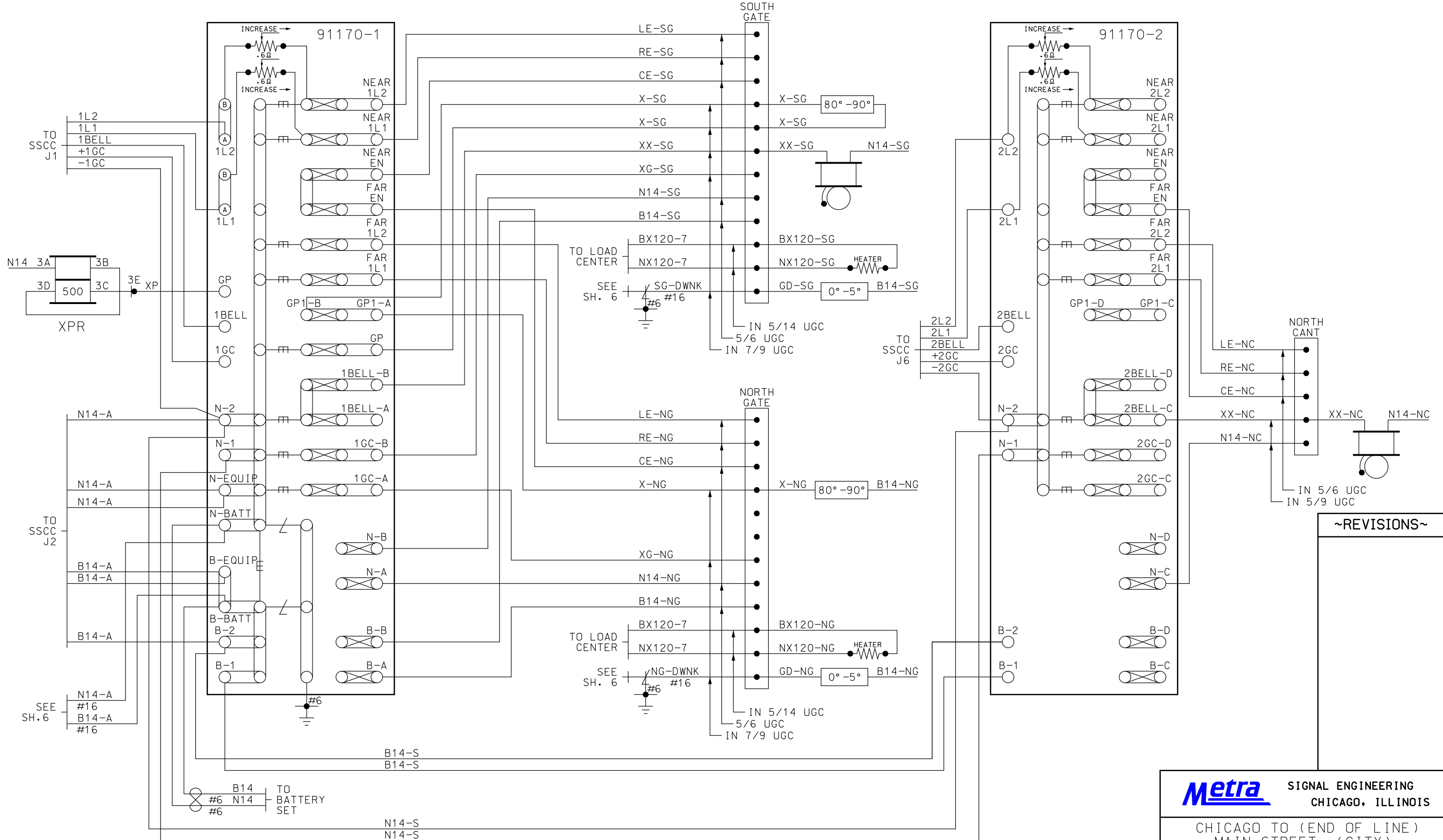
CHICAGO TO (END OF LINE)
 MAIN STREET, (CITY)
 CROSSING CONTROLLER

REFERENCE: 7.09 SH.1 THRU SH.14 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.09 SH.10

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

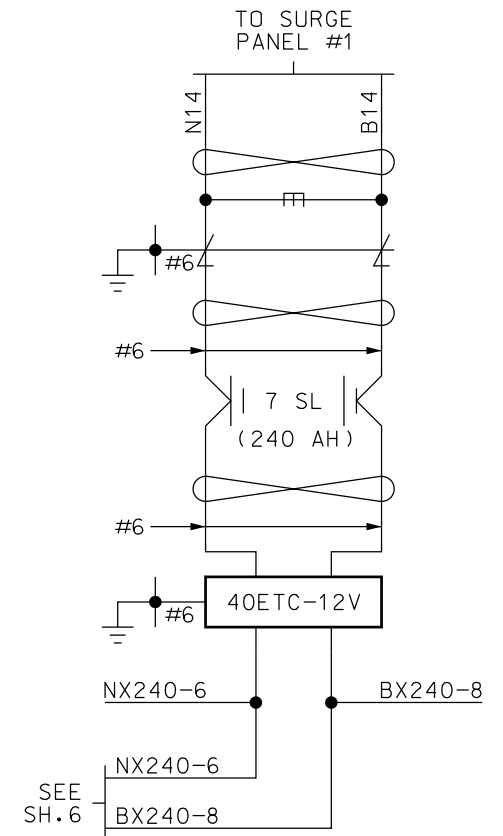
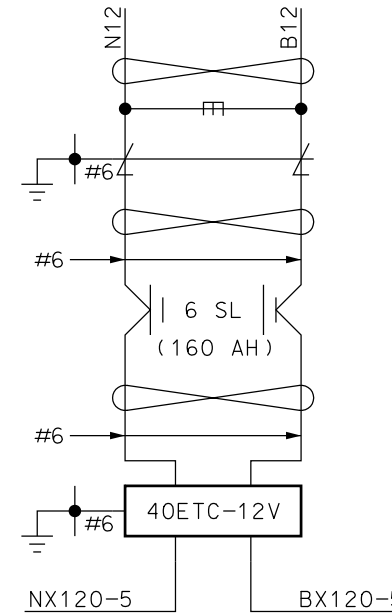
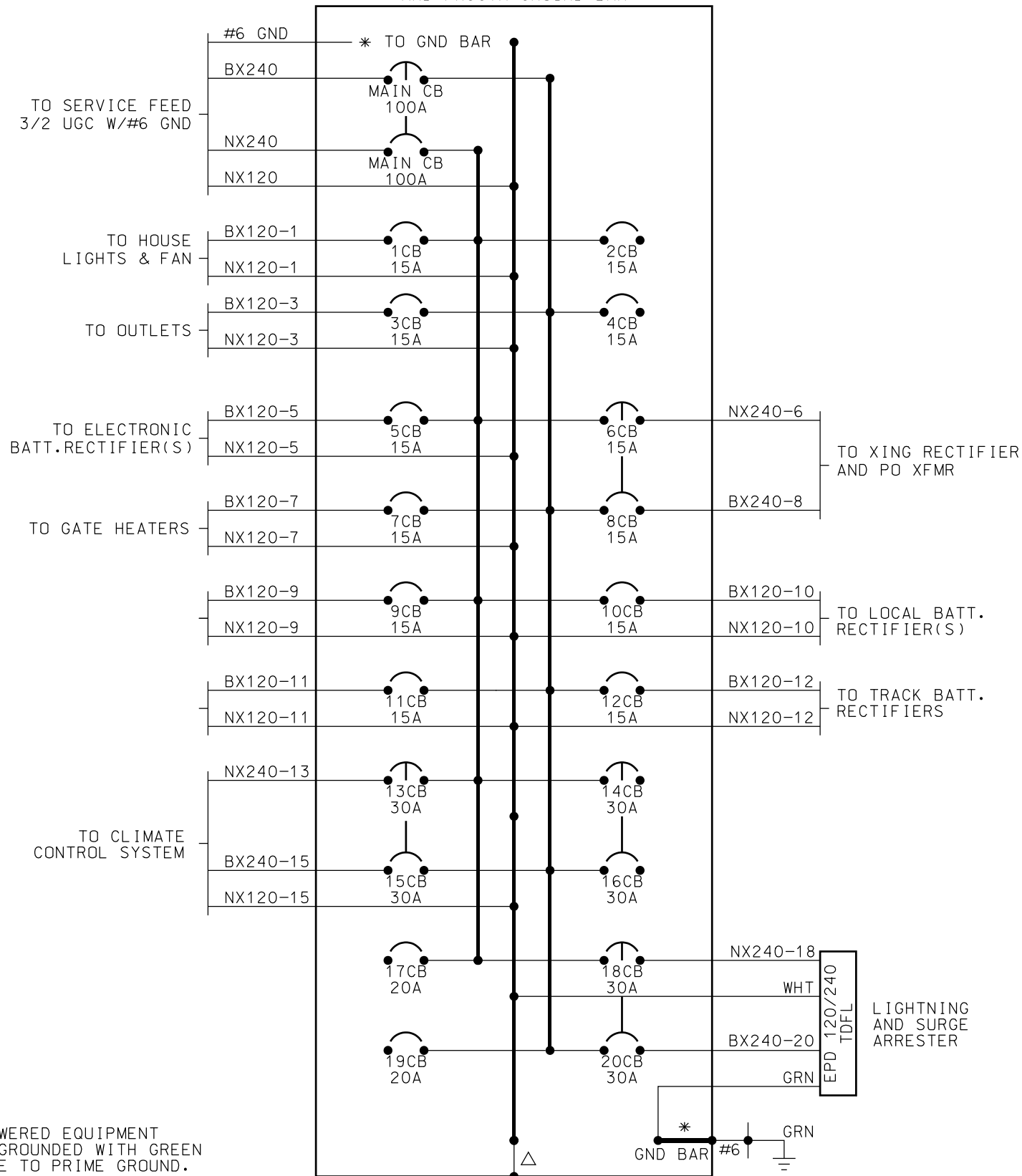


~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) MAIN STREET, (CITY) LIGHTING / SURGE PANELS			
REFERENCE:	7.09 SH.1 THRU SH.14		DATE:
			05/13/11
DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra
DISTRICT	PRINT NUMBER		
TYP	7.09 SH.11		

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

"SQUARE D" Q0120M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



NOTES:

ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETFE TO PRIME GROUND.

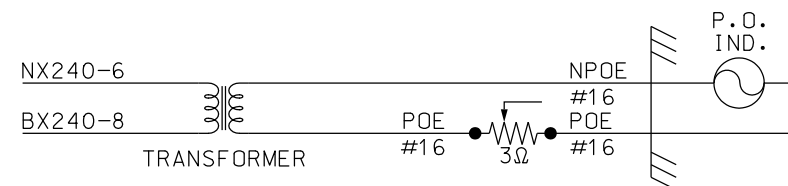
△ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.

ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.

RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.

* METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.

LIGHTNING AND SURGE ARRESTER



ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

~REVISIONS~

LTK 03/22/13

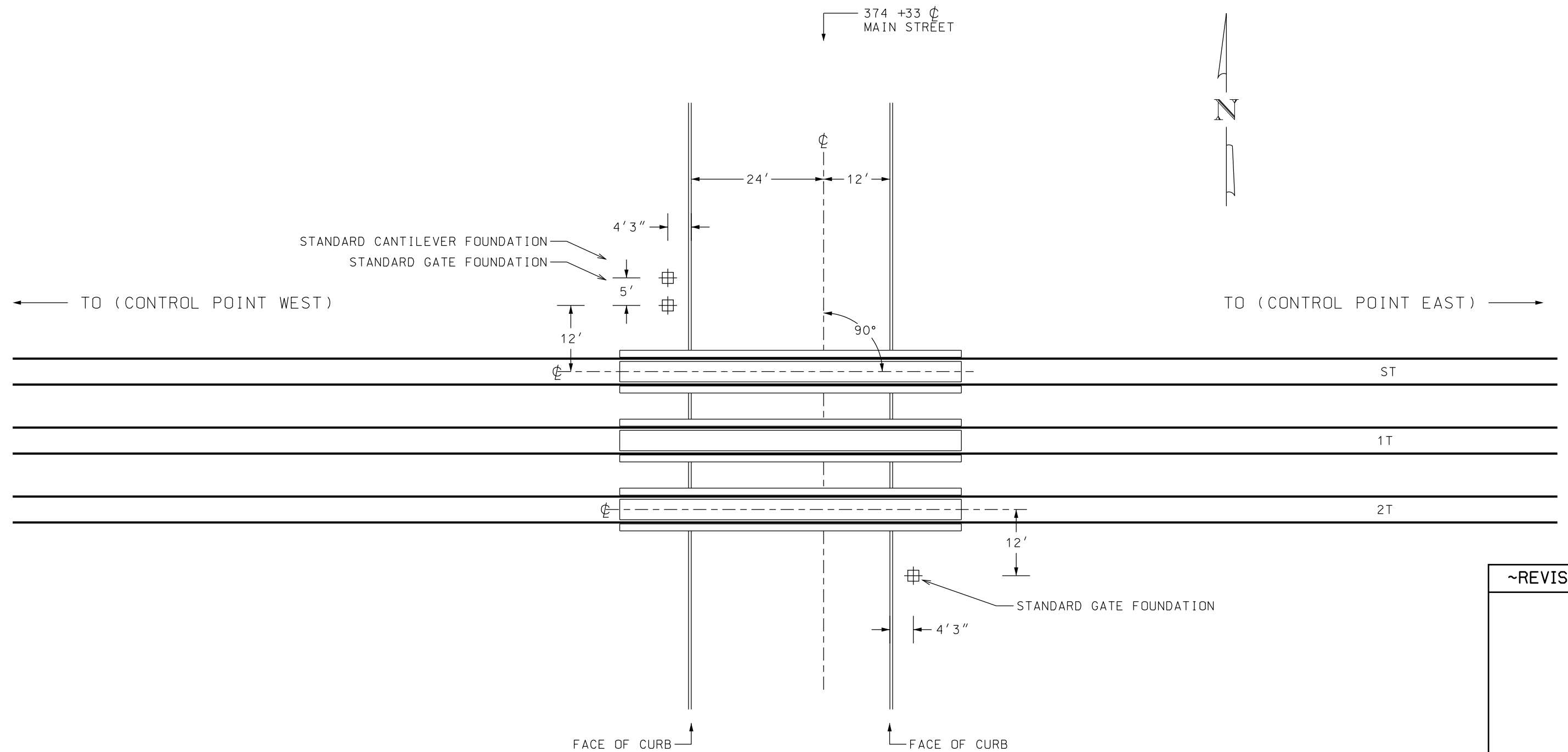
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
MAIN STREET, (CITY)
POWER DISTRIBUTION

REFERENCE: 7.09 SH.1 THRU SH.14 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.09 SH.12
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ENLARGED VIEW OF CROSSING
 SHOWING LOCATION OF SIGNAL FOUNDATIONS
 ~ NOT TO SCALE ~

RELAY HOUSE TO BE LOCATED A MINIMUM OF
 30 FEET FROM THE EDGE OF THE NEAREST TRAFFIC LANE
 AND AN ADEQUATE DISTANCE FROM TRACK IN ORDER TO
 REDUCE OBSTRUCTION TO MOTORIST'S SIGHT DISTANCE.

~REVISIONS~

DOT # 000-000X

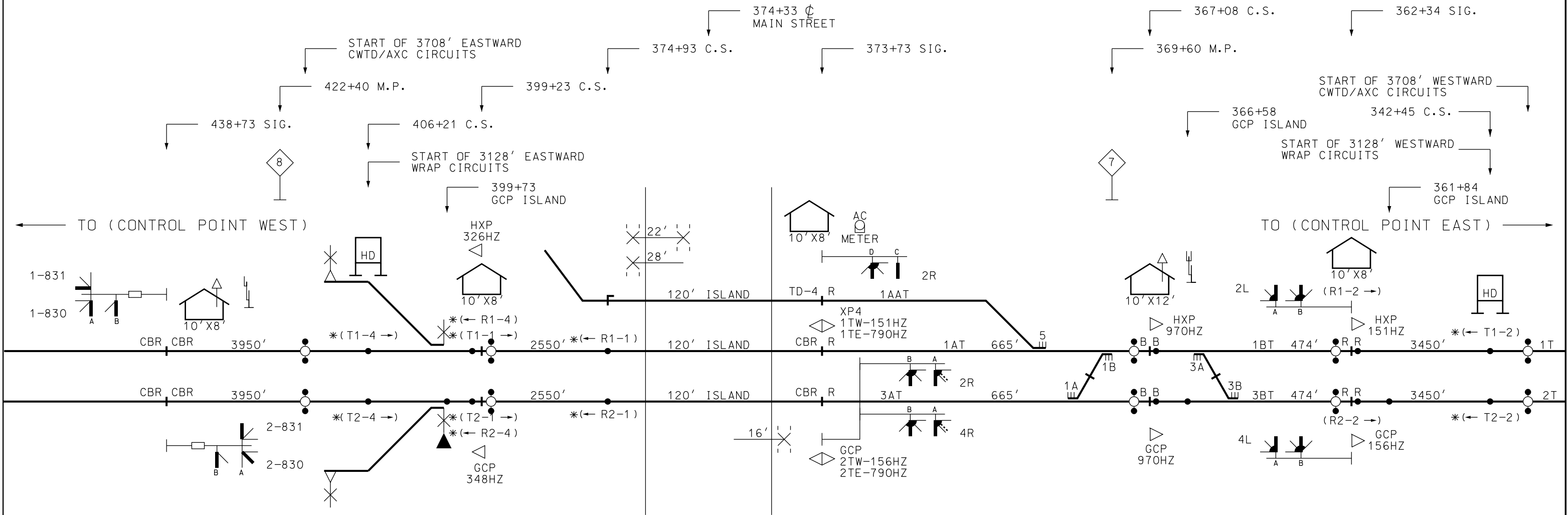
Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 MAIN STREET, (CITY)
 ENLARGED VIEW

REFERENCE: 7.09 SH.1 THRU SH.14	DATE: 05/13/11
------------------------------------	-------------------

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 7.09 SH.13
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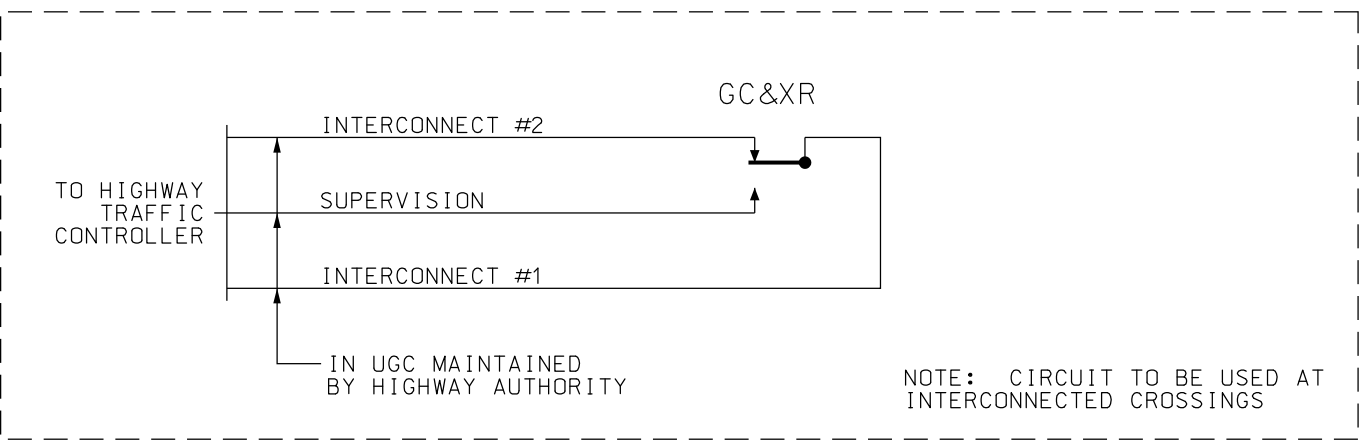
EW & WW APPROACH - 1T & 2T AT 79 MPH	
MIN. WARNING TIME	= 20 SEC
WIDE XING TIME	= 2 SEC
REACTION TIME	= 5 SEC
RESPONSE TIME	= 5 SEC
APPROACH LENGTH	= 3708 FT.

~REVISIONS~

LTK 03/22/13

NOTES:

-  NARROW BAND SHUNT
-  SEMI-BIDIRECTIONAL APPLICATION
- GCP
*** HZ SAFETRAN GCP CROSSING PREDICTOR
OPERATING FREQUENCY
- HXP
*** HZ HARMON CROSSING PROCESSOR
OPERATING FREQUENCY
- CWTD CONSTANT WARNING TIME DEVICE
- * (T) PSO 4000 TRANSMITTER
- * (R) PSO 4000 RECEIVER

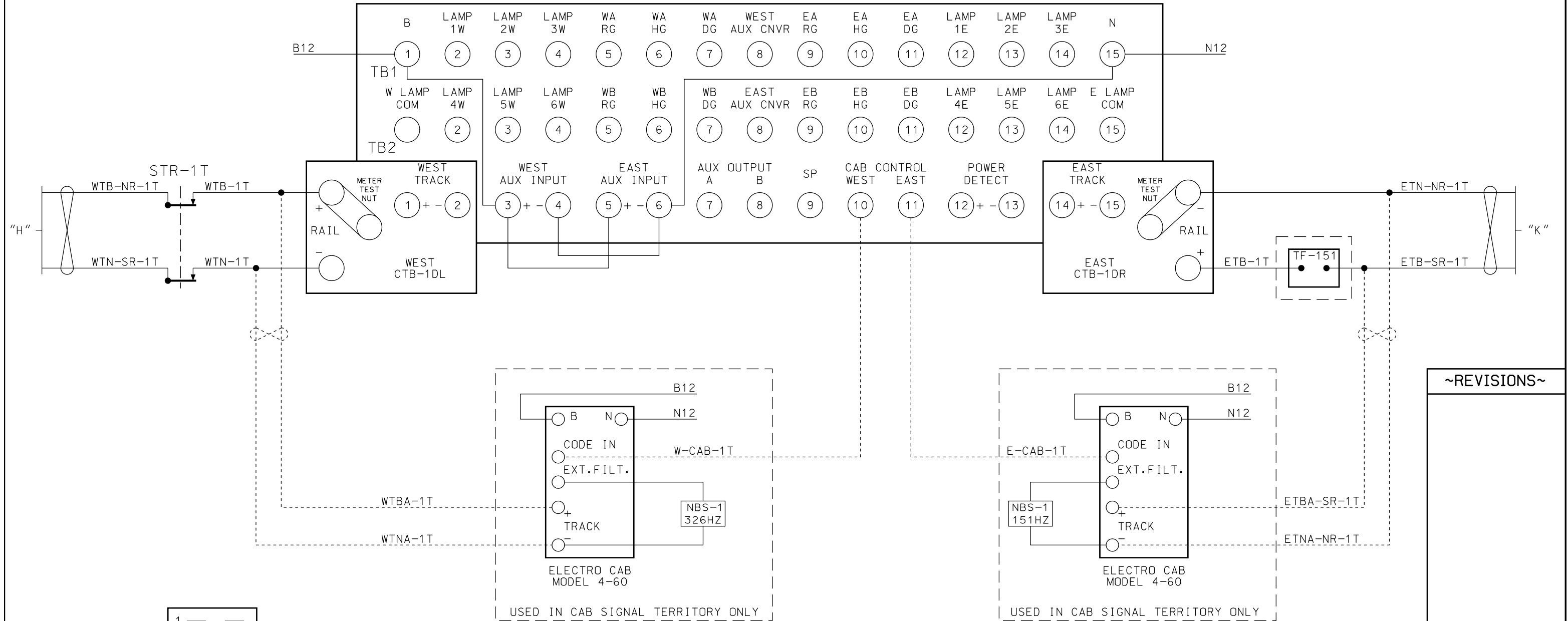


NOTE: CIRCUIT TO BE USED AT INTERCONNECTED CROSSINGS

DOT# 000-000X

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) MAIN STREET, (CITY) EXHIBIT	
REFERENCE: 7.09 SH.1 THRU SH.14	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.09 SH.14

ELECTRO CODE 4R
 MODULES: 2 EA-7K, 2R
 1 EA-214, 215B, 216A, 230A, 230B

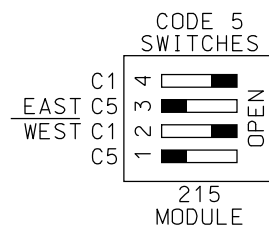


- 1 —
- 2 —
- 3 —
- 4 —
- 5 —
- 6 —
- 7 —
- 8 —

PROGRAM RMMQ-C4
 STRAPS 1,2,3,4,7 ARE CUT

CHECK SUMS

- 1 - C709/2E0A
- 2 - F3B6/464B
- 3 - C709/2E0A
- 4 - 4C49/4C4A



~REVISIONS~

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 ELECTRO CODE 4R
 ELECTRO CODE 4R TK.1

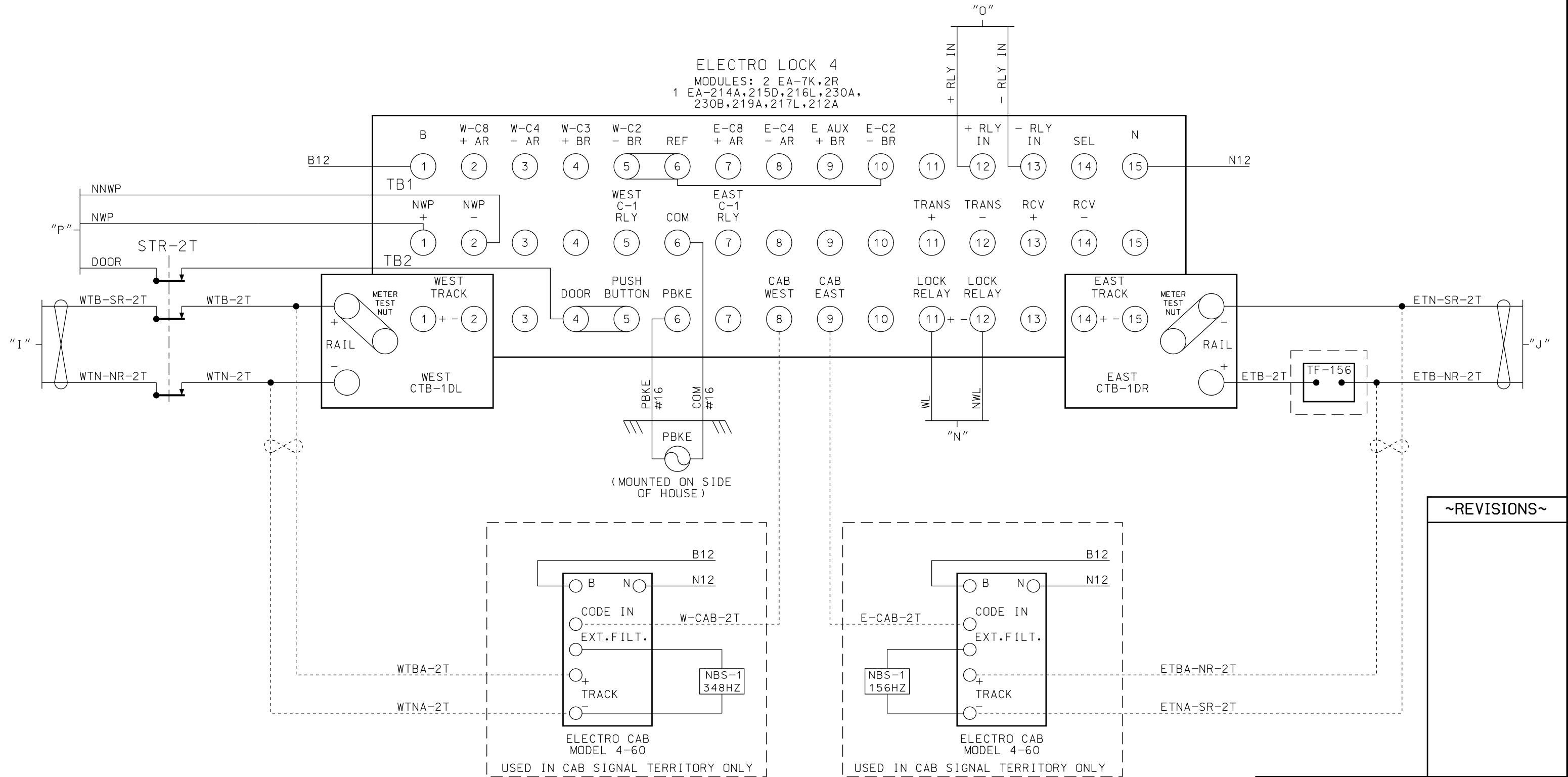
REFERENCE: 7.56 SH.1 THRU SH.9 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

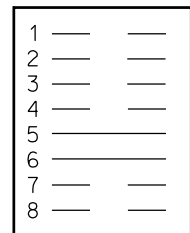
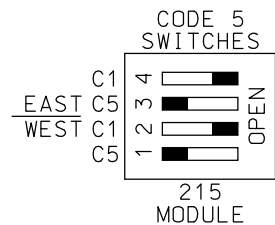
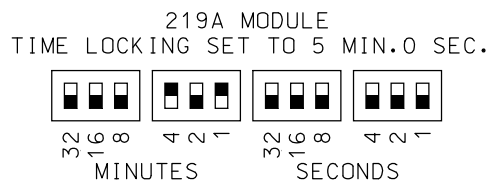
DISTRICT	PRINT NUMBER
TYP	7.56 SH.2

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

ELECTRO LOCK 4
 MODULES: 2 EA-7K, 2R
 1 EA-214A, 215D, 216L, 230A,
 230B, 219A, 217L, 212A



~REVISIONS~



PROGRAM LMMQ-C4
 STRAPS 1,2,3,4,7,8 ARE CUT
 CONFIGURATION D,R,A,A,B,B,A

CHECK SUMS
 1 - F136/6EB7
 2 - 249D/49AF
 3 - F136/6EB7
 4 - 98CE/OADE

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 ELECTRO CODE 4R
 ELECTRO LOCK 4 TK.2

REFERENCE: 7.56 SH.1 THRU SH.9 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.56 SH.3

TK.1 = TK.1W
TK.2 = DISABLED

ADJUST SEL

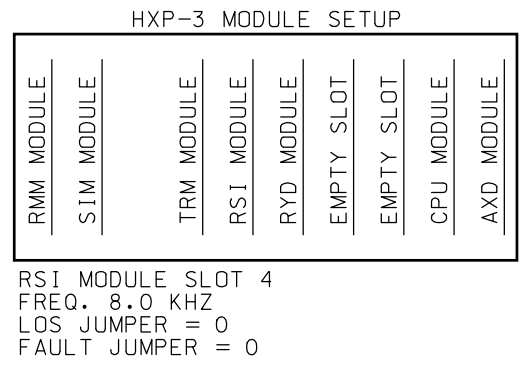
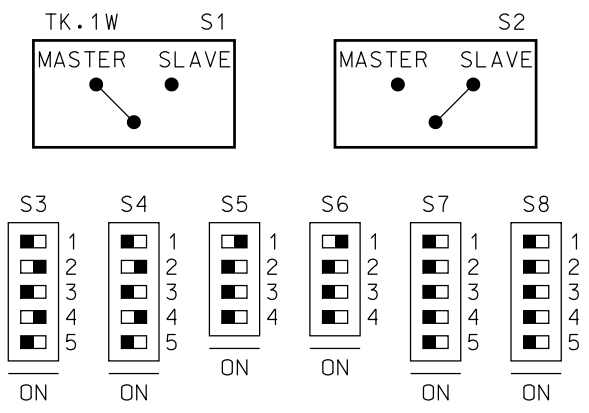
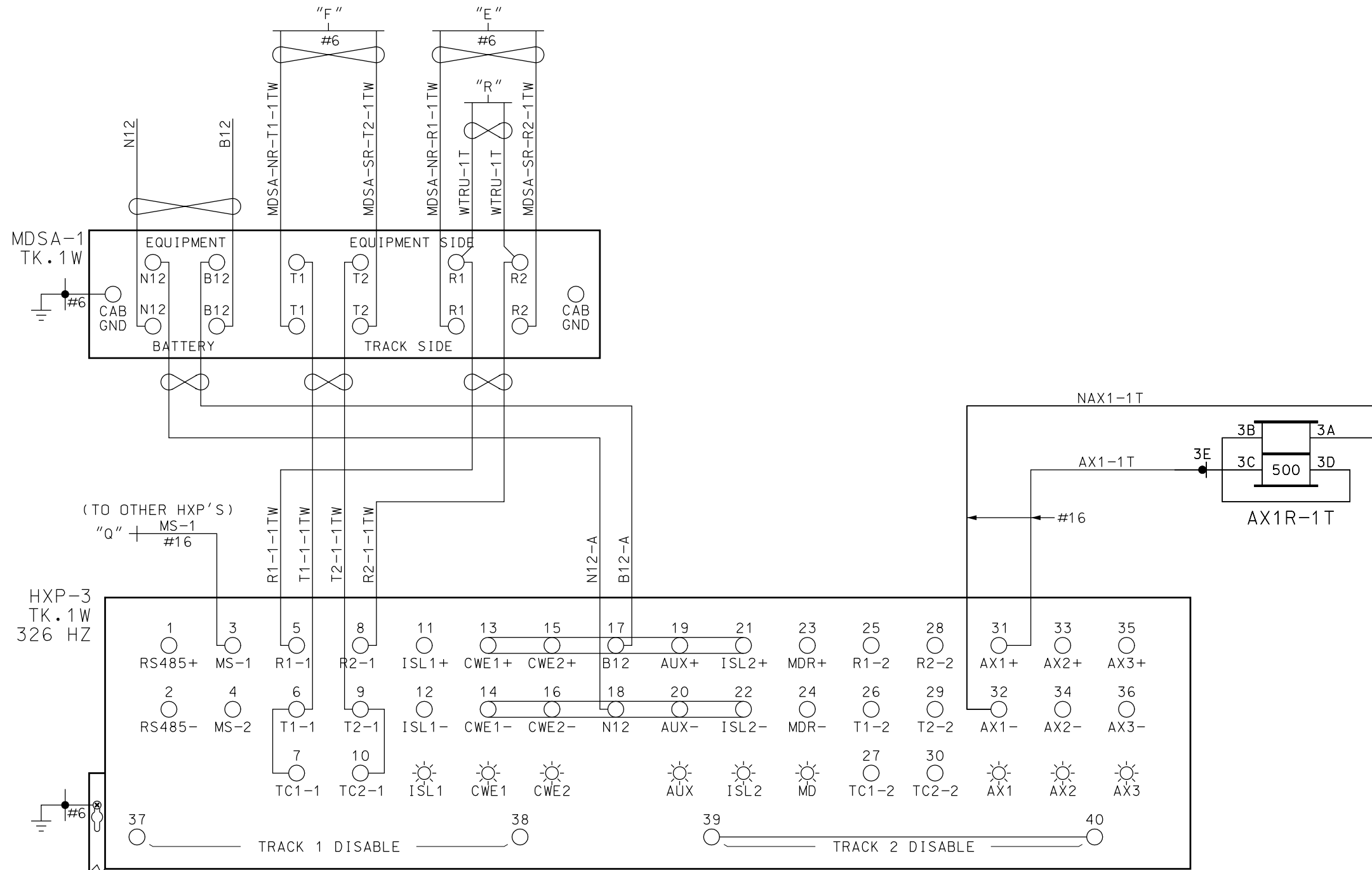
APPROACH LENGTH:
TK.1 - 1500'

WARNING TIME:
TK.1 - 27 SEC.

MD RESTART:
TK.1 - 0

OPTIONS

1. TK-ENA:
TK.1 - UP
TK.2 - dn
2. TK FO
TK.1 - STRAP
3. CW/MD
TK.1 - C
4. UNI-BI
TK.1 - B
6. CWEWT
TK.1 - 80
7. LOS
TK.1 - 16
8. IJ-LOS
TK.1 - 5
11. AX 1
TK-ASN - 1T
OF-TK1 - 2430'
WT - 27
MD-RST -
CW/MD - C
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn
12. AX 2
TK-ASN - NA
OF-TK1 - NA
WT -
MD-RST -
CW/MD -
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn
13. AX 3
TK-ASN - NA
OF-TK1 - NA
WT -
MD-RST -
CW/MD -
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn
17. MDR-AX - n
18. MD-TMR
TK.1 - 10
19. MIN-WT - 0
20. FS-DET - 0
21. POS-ST - 0
47. AUTO-RX - dn
48. PF-ENA - UP



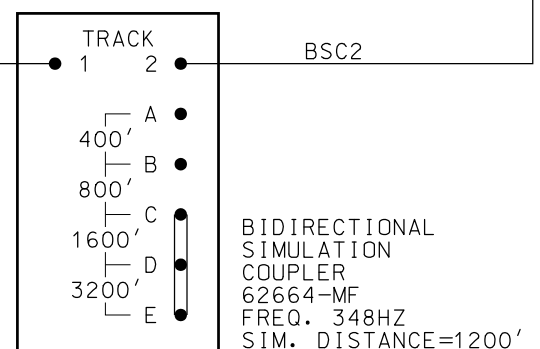
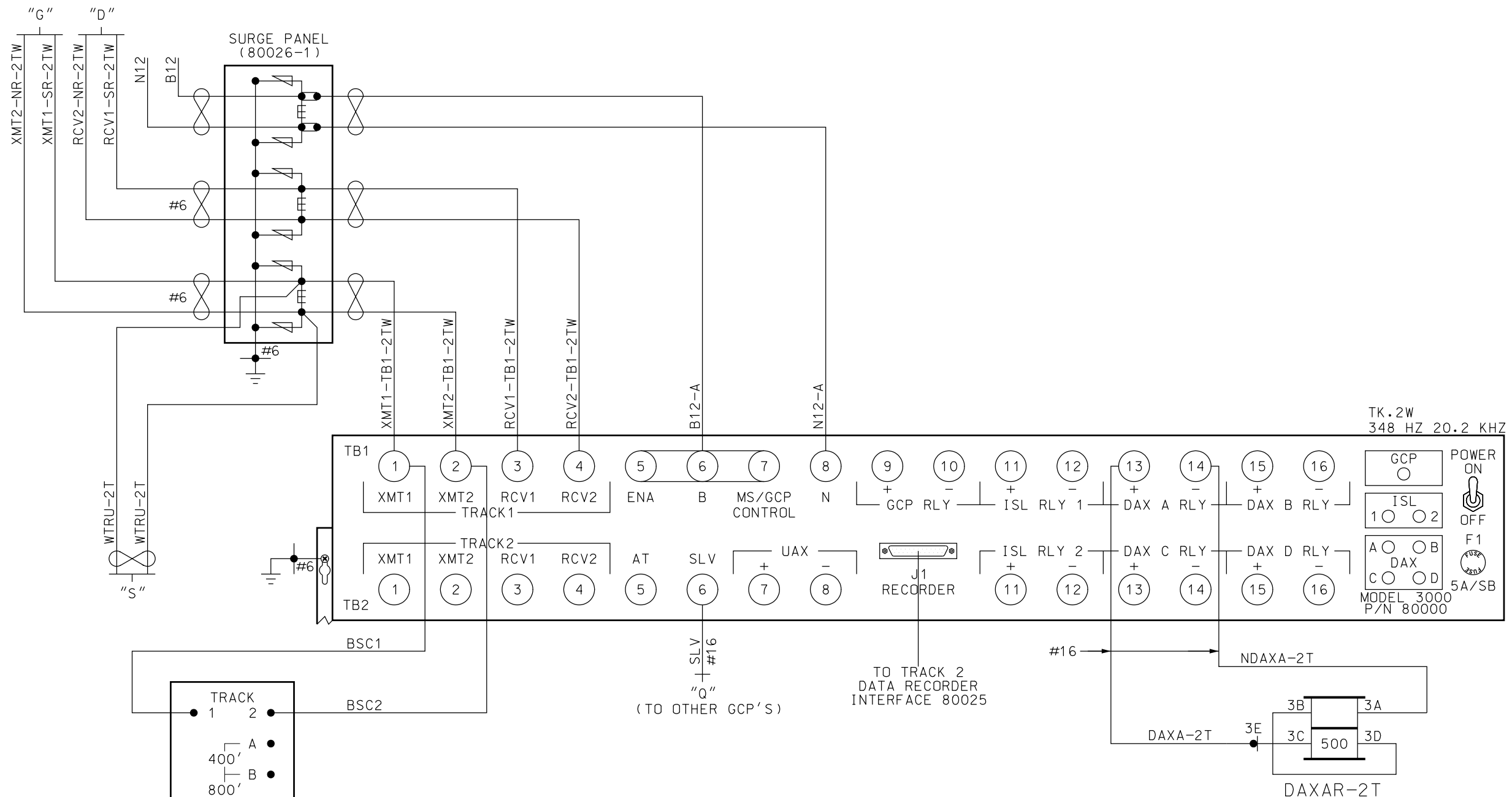
~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
ELECTRO CODE 4R
HXP-3 TK.1

REFERENCE: 7.56 SH.1 THRU SH.9	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.56 SH.4		

ALL WIRING ON THIS SHEET
TO BE #10 AWG UNLESS NOTED



MODEL GCP 3000 MODULE ASSEMBLIES

80011	ISLAND 1
80012	EMPTY SLOT
80013	TRANSCEIVER 1
80014	TRANSCEIVER 2
80015	RELAY DRIVE
80016	PROCESSOR
80017	REC. MODULE
80018	(1) DAX
80019	(2) DAX
80020	80019 INTERFACE

* FIRST SLOT AT LEFT END OF BAY

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
ELECTRO CODE 4R
GCP 3000 - TK.2

REFERENCE: 7.56 SH.1 THRU SH.9 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.56 SH.5

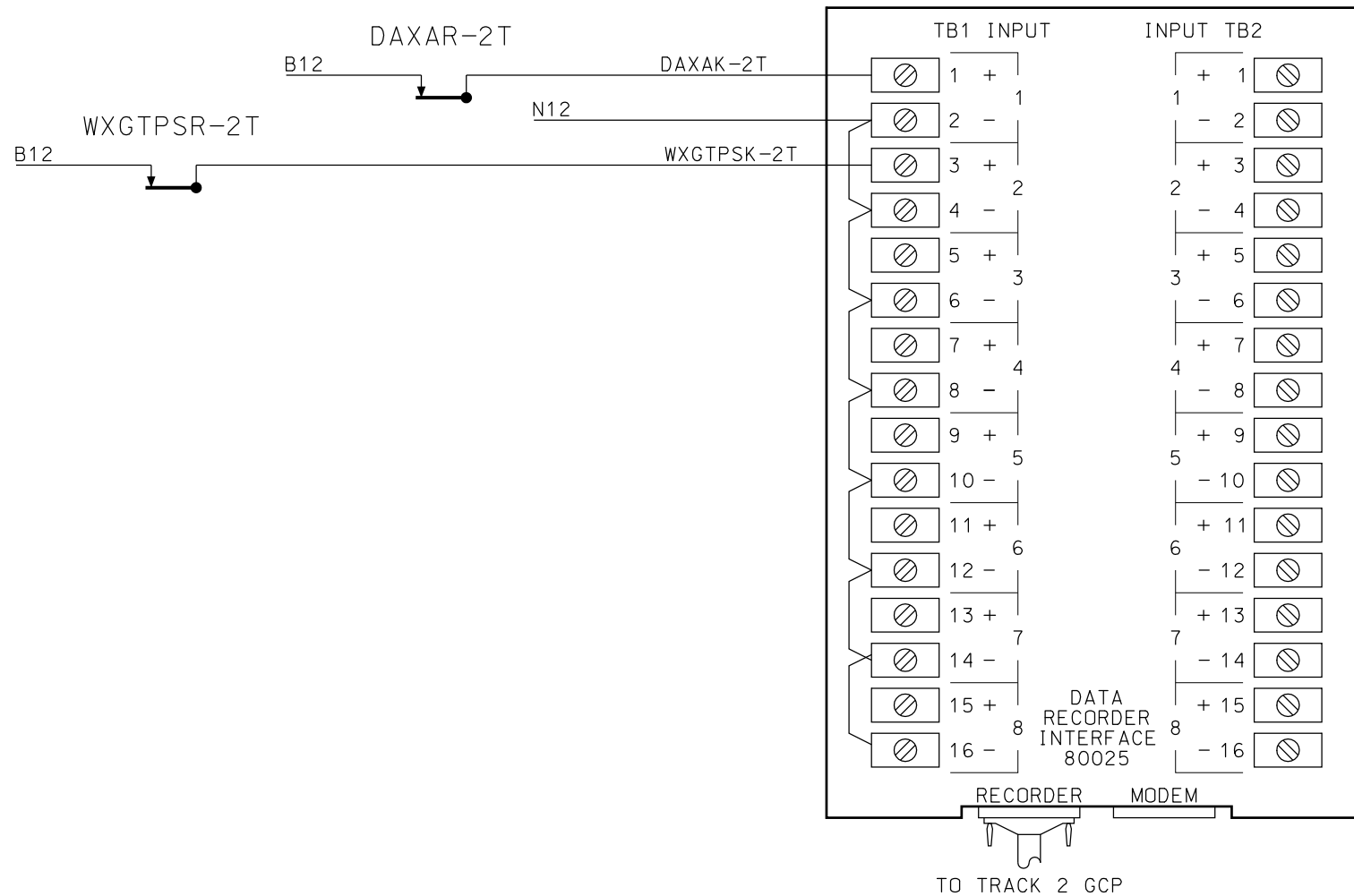
GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

TK.2W

GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

NUMBER OF TRACKS	1	
FREQUENCY	T1: 348 HZ	T2: HZ
UNIDIRECTIONAL/BIDIRECTIONAL	T1: BI	T2: BI
XMIT LEVEL - MED/HI	T1: MED	T2: MED
PREDICTOR/MOTION SENSOR	T1: GCP	T2: GCP
WARNING TIME SELECTED	T1: 27 SEC	T2: SEC
APPROACH DISTANCE	T1: 1239 FT	T2: FT
UAX PICKUP DELAY (UAX1)	SEC.	
ENA/UAX2 DELAY	SEC.	
ISLAND DISTANCE	T1: 50 FT	T2:
NUMBER OF DAX'S	1	
DAX A TRK/DIST/WARNING TIME	2	2480 FT 27 SEC.
DAX B TRK/DIST/WARNING TIME		FT SEC.
DAX C TRK/DIST/WARNING TIME		FT SEC.
DAX D TRK/DIST/WARNING TIME		FT SEC.
SLAVING MASTER/SLAVE	MASTER	
PASSWORD DISABLED/ENABLED	DISABLED	
RECORDER INSTALLED/NOT INSTALLED	NOT INSTALLED	
SWITCH TO MS	T1: EZ	T2: EZ
TRANSFER DELAY MS TO GCP	T1: SEC.	T2: SEC.
PRIME PREDICTION OFFSET	T1: FT	T2: FT
PICKUP DELAY PRIME	SEC.	
PICKUP DELAY DAX A	SEC.	
PICKUP DELAY DAX B	SEC.	
PICKUP DELAY DAX C	SEC.	
PICKUP DELAY DAX D	SEC.	
ENHANCED DETECT MODE	OFF	
BACK TO BACK	OFF	
STATION STOP TIMER	10 SEC.	
T1 # OF TRACK WIRES 4/6	4	
T2 # OF TRACK WIRES 4/6	4	
LOW EX ADJUSTMENT	0	
LOW EZ DETECTION	T1:	T2:
LOW EZ DETECTION TIMER	T1: MIN.	T2: MIN.
POSITIVE START (0 = OFF)	T1: EZ	T2: EZ
POSITIVE START TIMEOUT (0 = NONE)	T1: MIN.	T2: MIN.
SET AT OPERATION	NORMAL	
DIAGNOSTIC MESSAGES		
DAX MESSAGES		
ADVANCE PREEMPT TIMER	SEC.	

1 - 80025 DATA RECORDER INTERFACE UNIT



~REVISIONS~



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

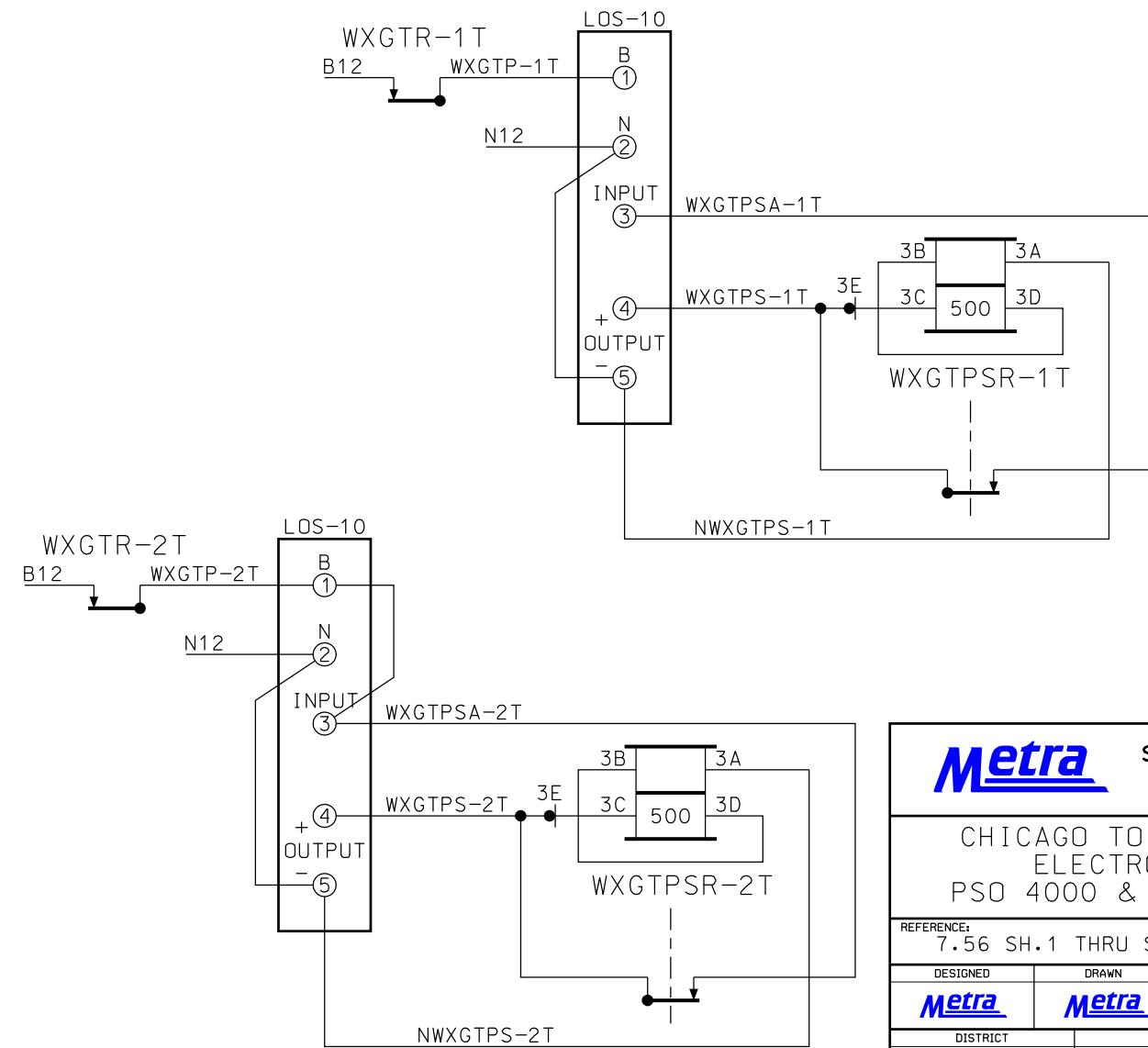
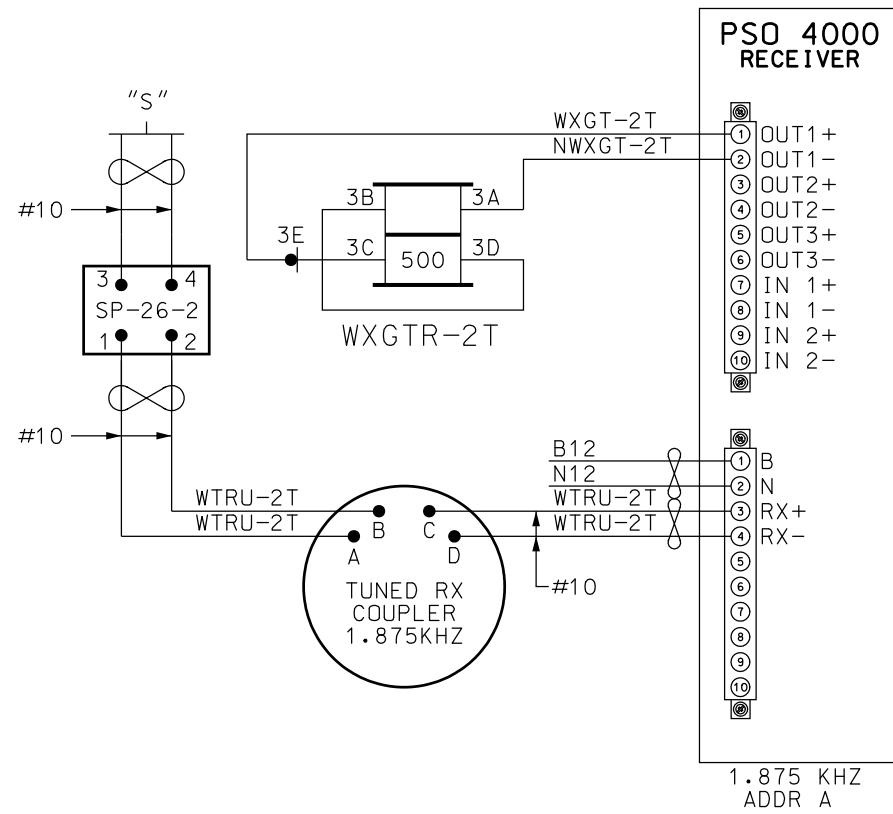
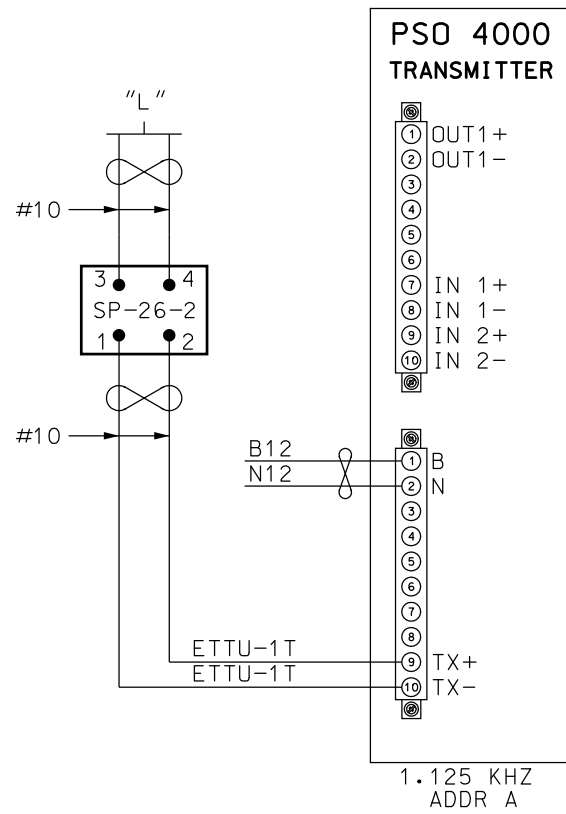
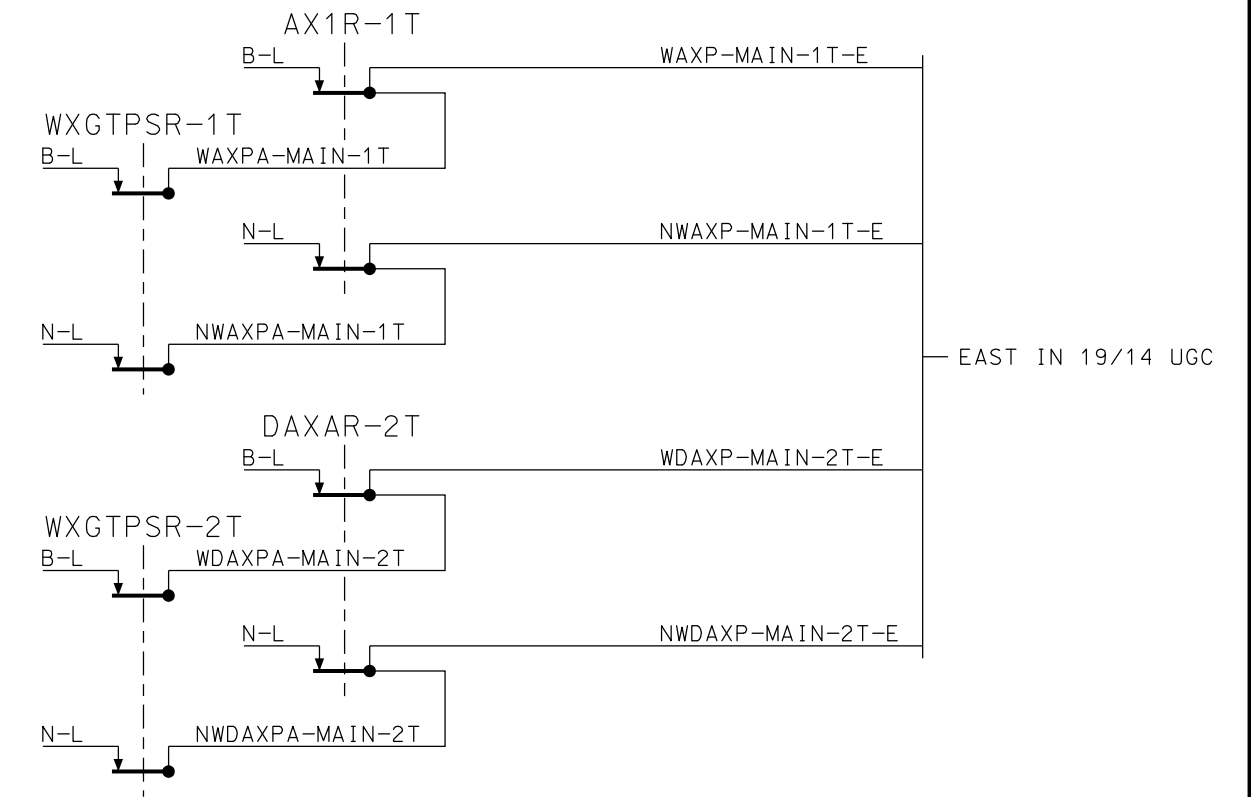
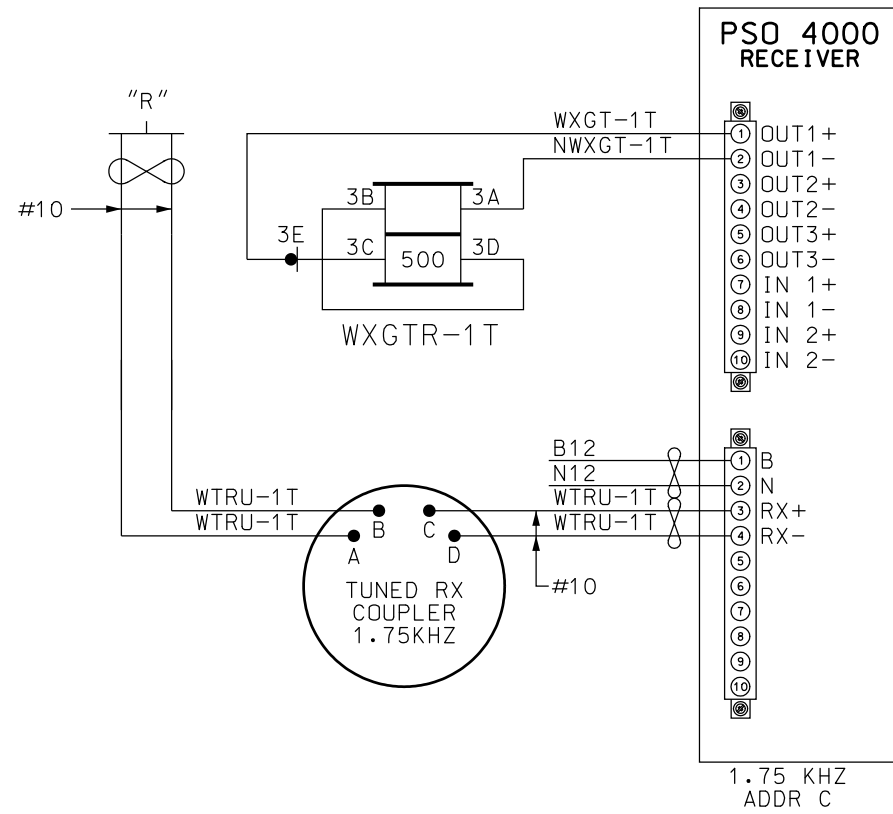
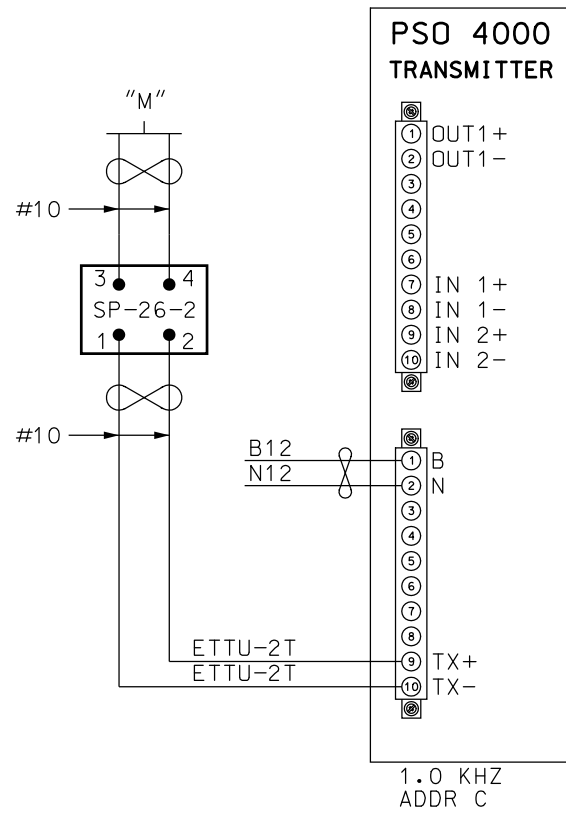
CHICAGO TO (END OF LINE)
ELECTRO CODE 4R
GCP PROGRAMMING PARAMETERS
& 80025 RECORDERS

REFERENCE: 7.56 SH.1 THRU SH.9 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED

DISTRICT	PRINT NUMBER
TYP	7.56 SH.6

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~

LTK 01/25/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

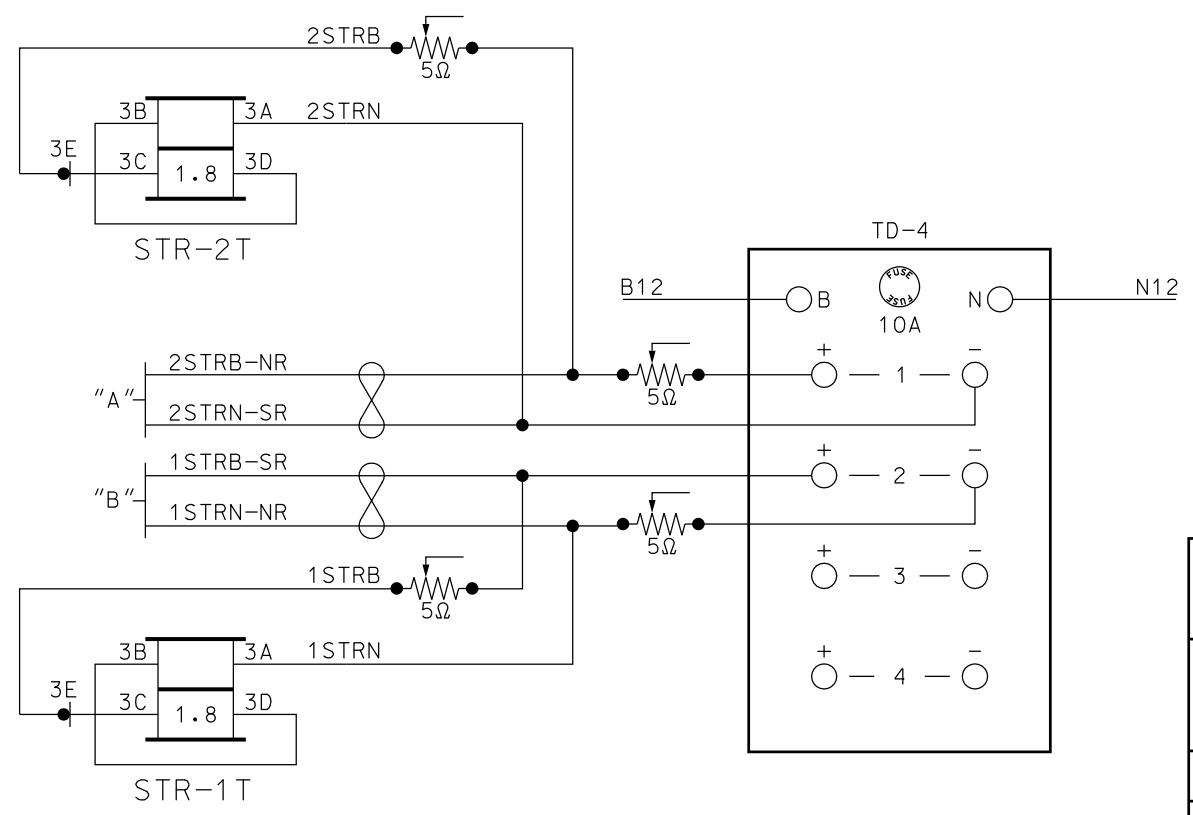
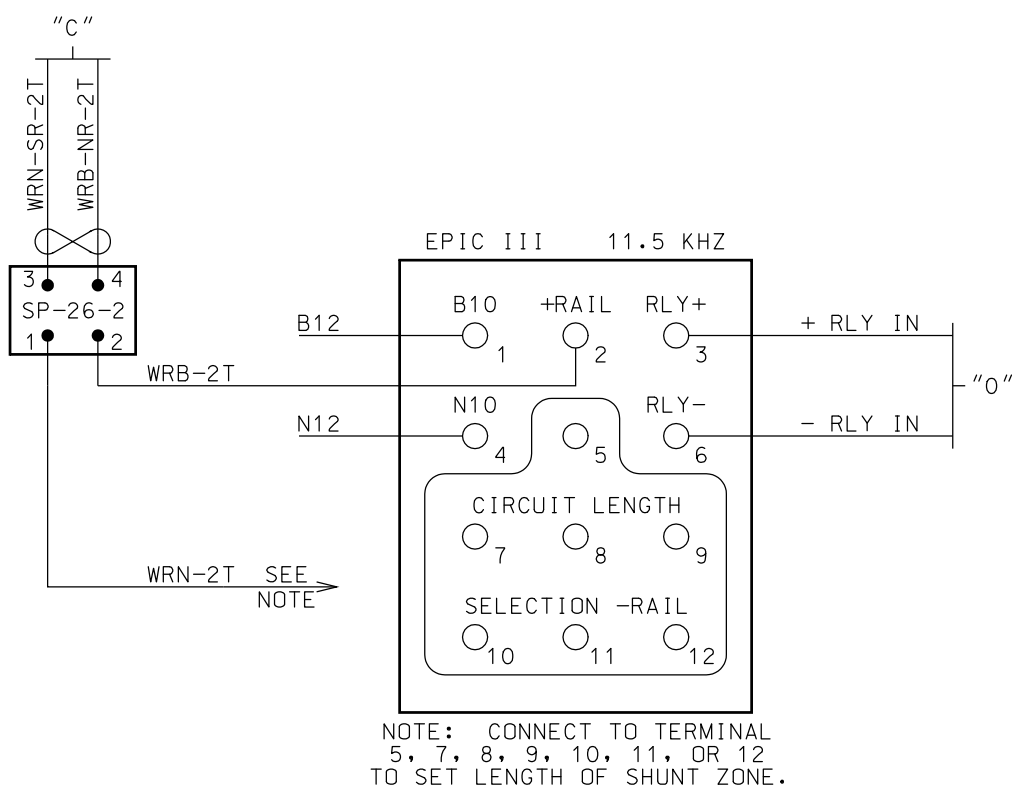
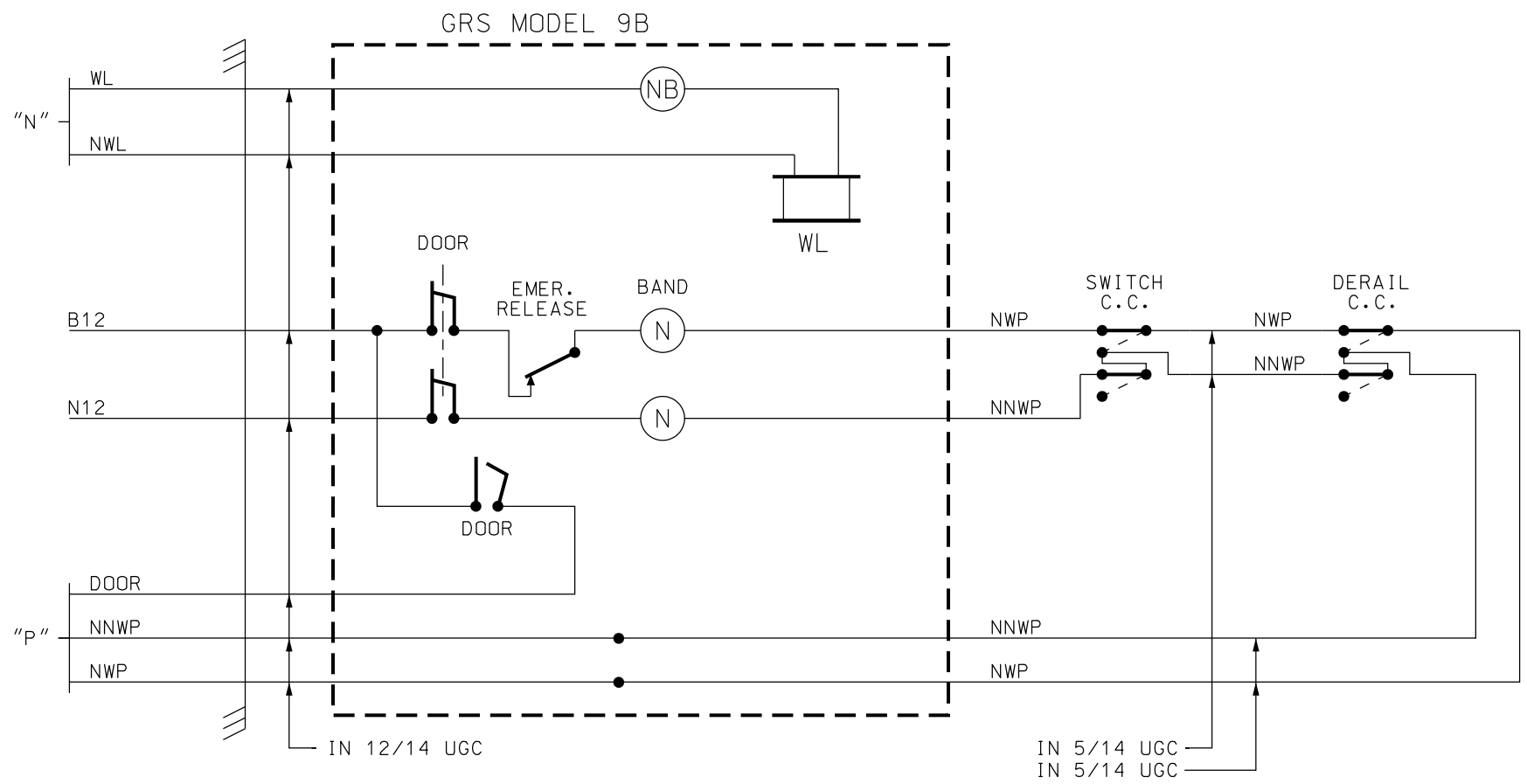
CHICAGO TO (END OF LINE)
ELECTRO CODE 4R
PSO 4000 & LINE CIRCUITS

REFERENCE: 7.56 SH.1 THRU SH.9 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.56 SH.7

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

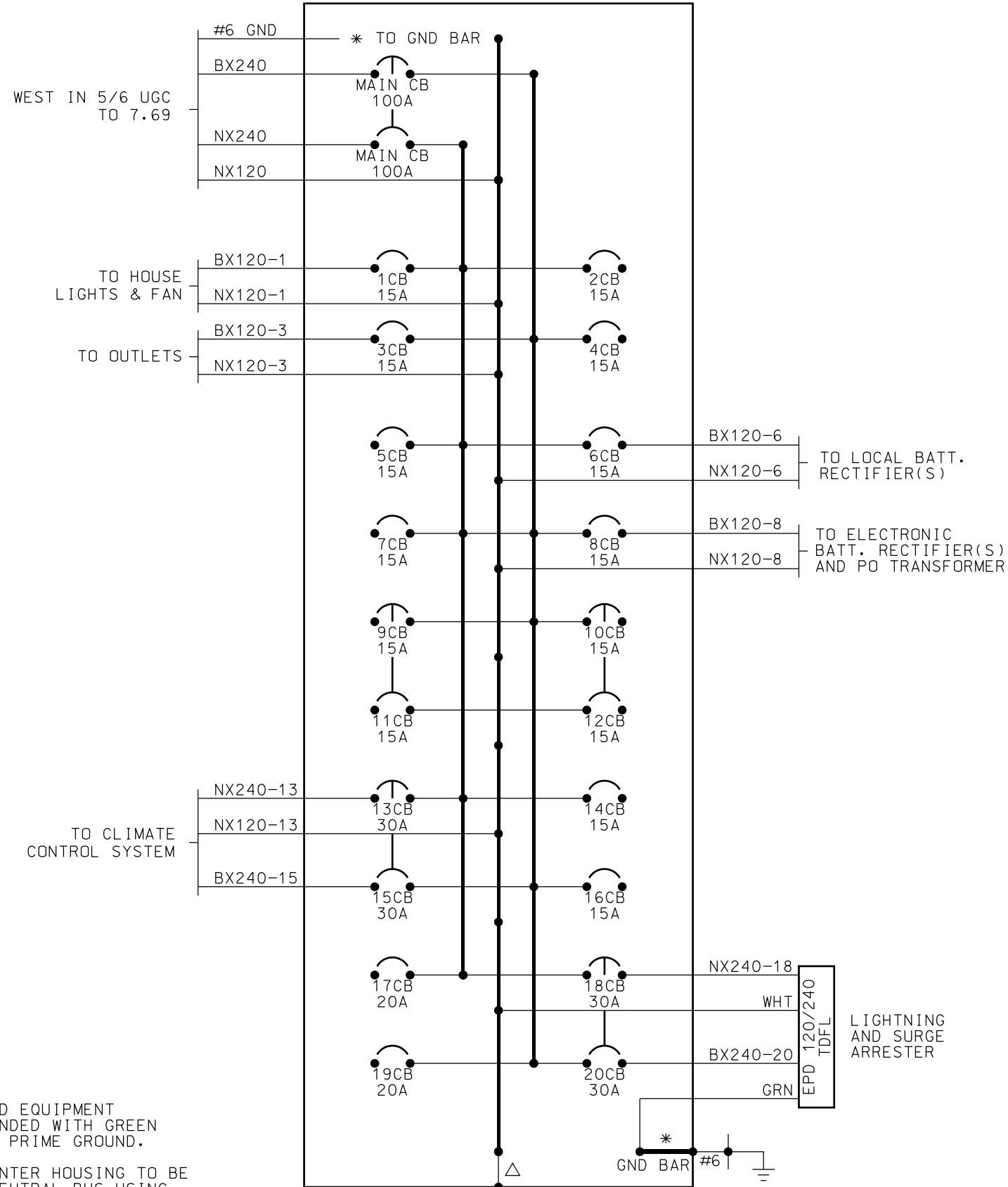


~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) ELECTRO CODE 4R SWITCH LOCK CIRCUITS			
REFERENCE: 7.56 SH.1 THRU SH.9	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.56 SH.8		

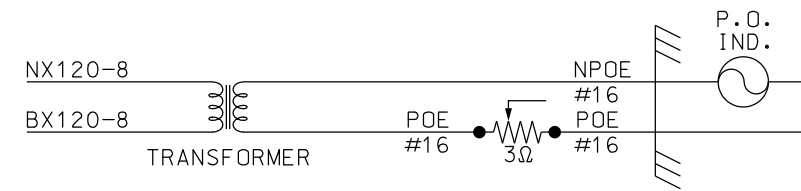
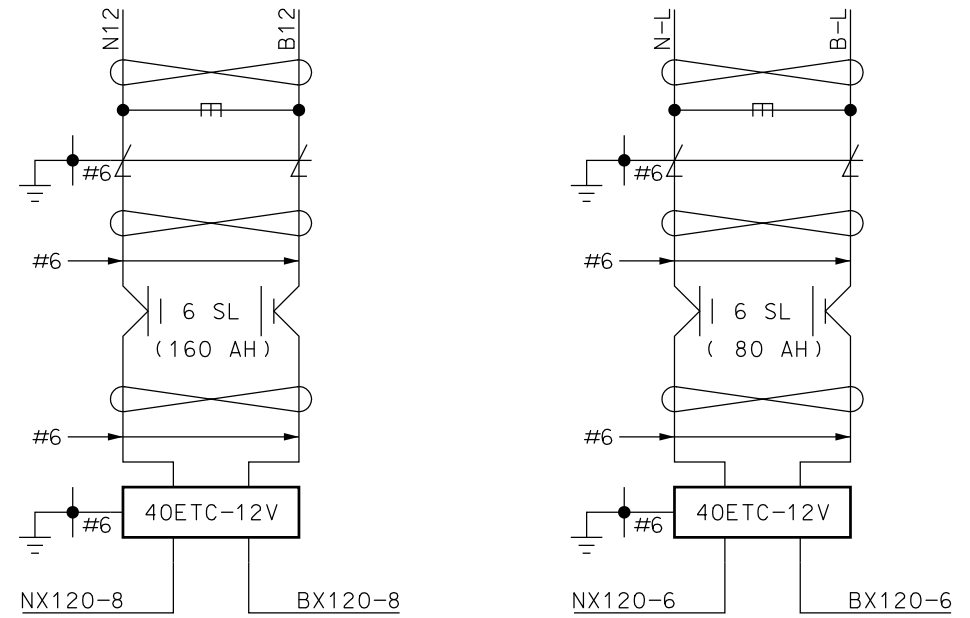
ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

"SQUARE D" Q0120M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



NOTES:

- ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETFE TO PRIME GROUND.
- △ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.
- ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.
- RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.
- * METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.



~REVISIONS~

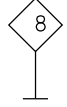
LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

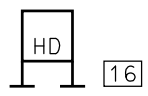
CHICAGO TO (END OF LINE)
ELECTRO CODE 4R LOCATION
POWER DISTRIBUTION

REFERENCE: 7.56 SH.1 THRU SH.9	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 7.56 SH.9

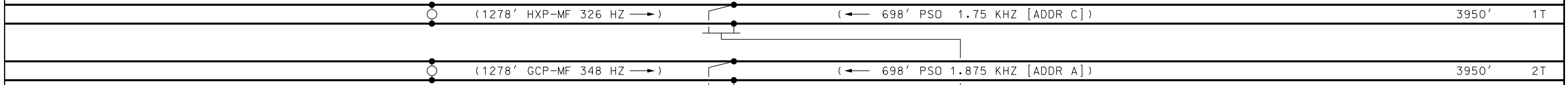
ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

422+40 M.P.


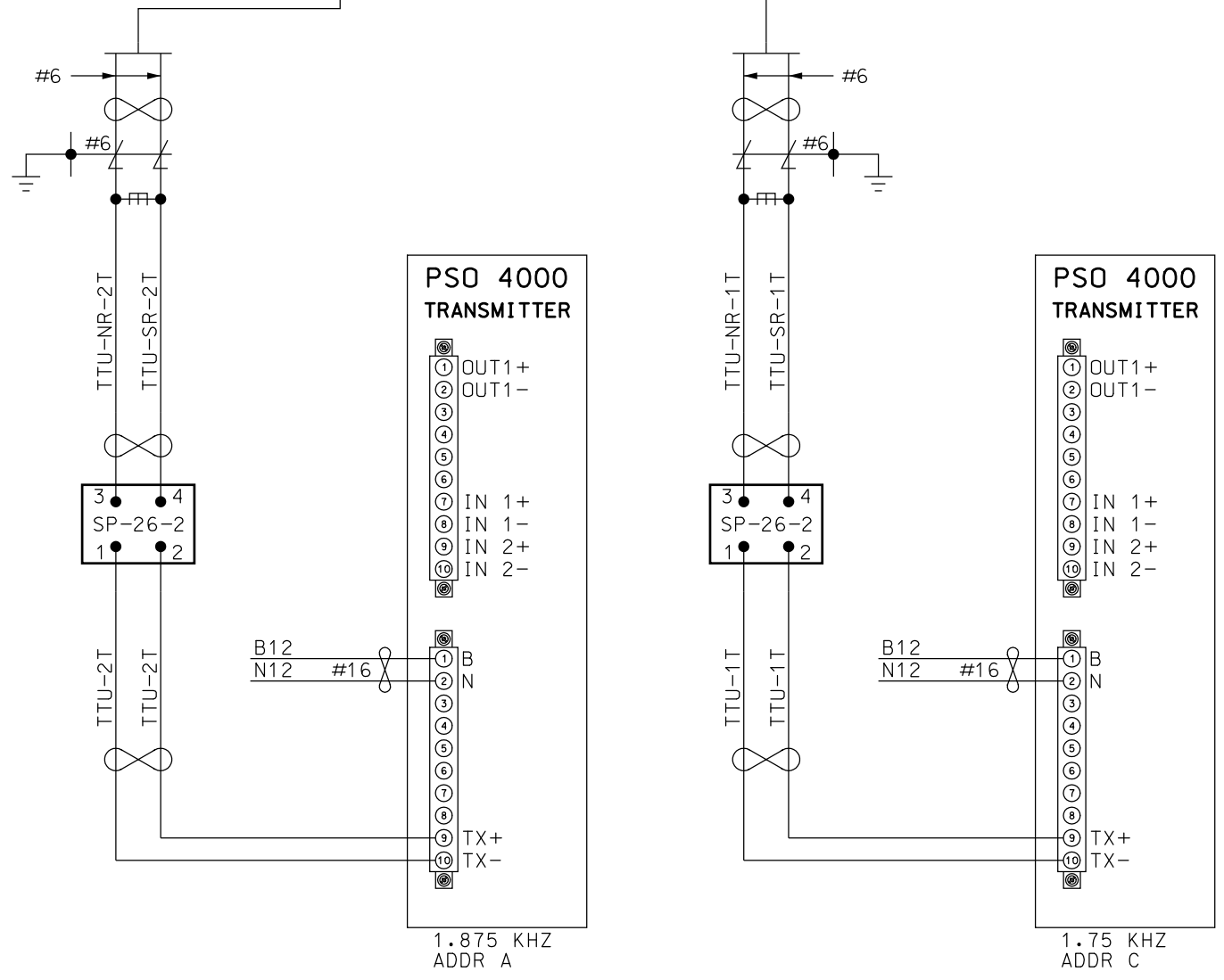
412+01
 (NBS-2)326HZ TK1
 (NBS-2)348HZ TK2
 MAIN ST

406+21 C.S.


TO (CONTROL POINT EAST) →





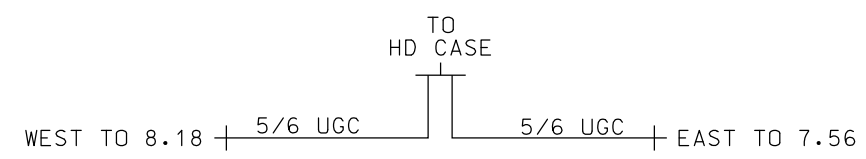
← TO (CONTROL POINT WEST)



8.18

7.56

NOTES:
 PRIME GROUND
 TWISTED PAIR
 (← 1278' HXP-MF 326 HZ)
 ↑ FREQUENCY
 → LENGTH OF CIRCUIT
 → DIRECTION TO TRANSMITTER



~REVISIONS~

LTK 01/25/13

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 PSO 4000 LOCATION
 PLAN VIEW

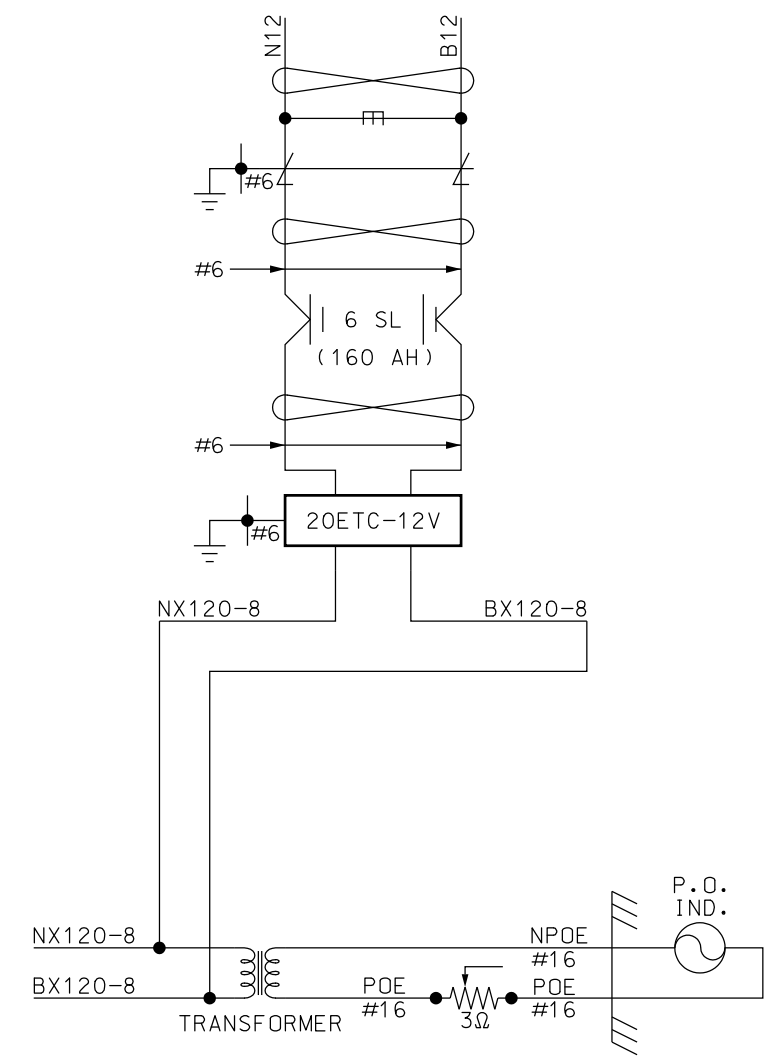
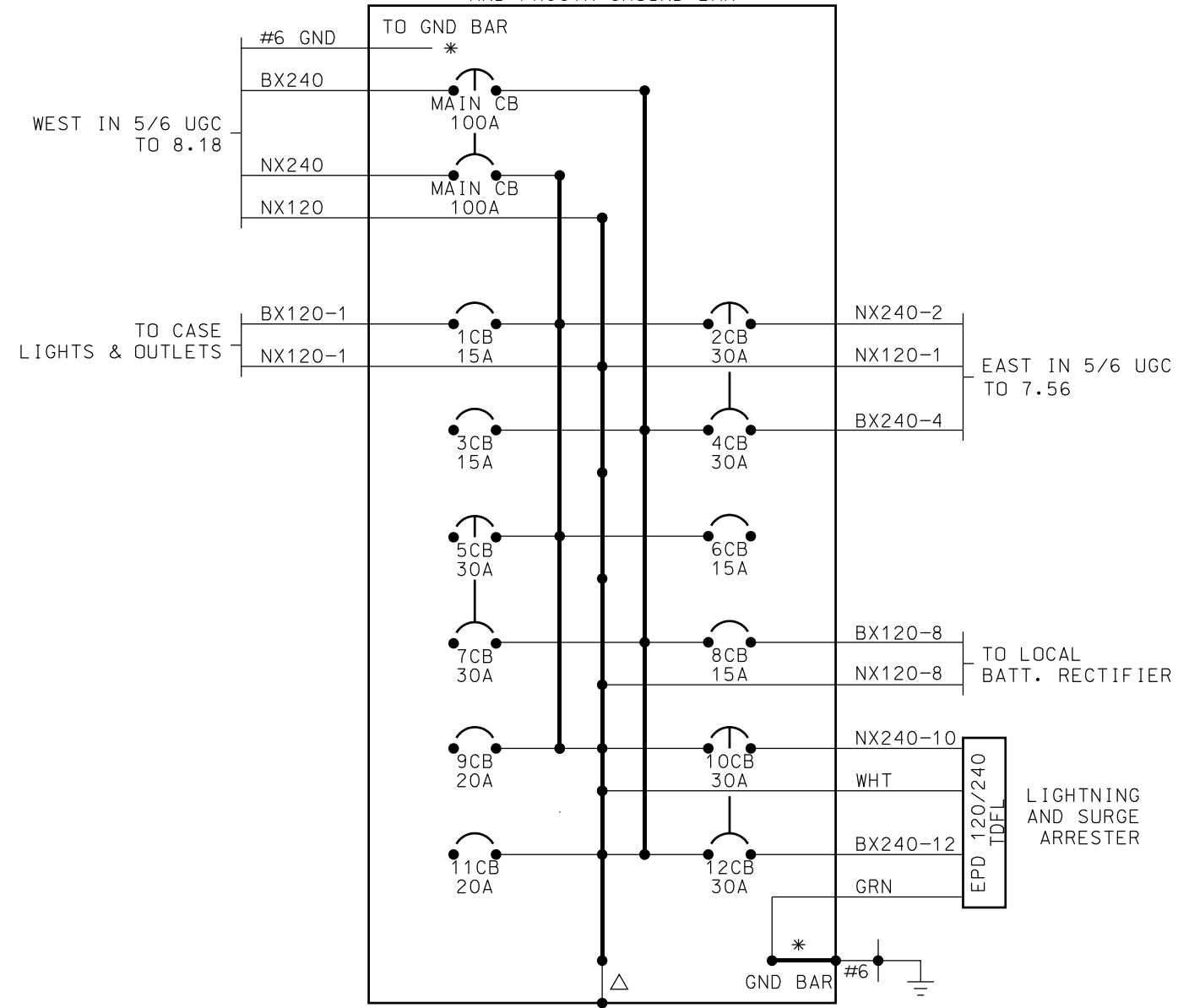
REFERENCE: 7.69 SH.1 & SH.2 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.69 SH.1

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

"SQUARE D" Q0112M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



- NOTES:
- ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETFE TO PRIME GROUND.
 - △ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.
ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.
RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.
 - * METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.

~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

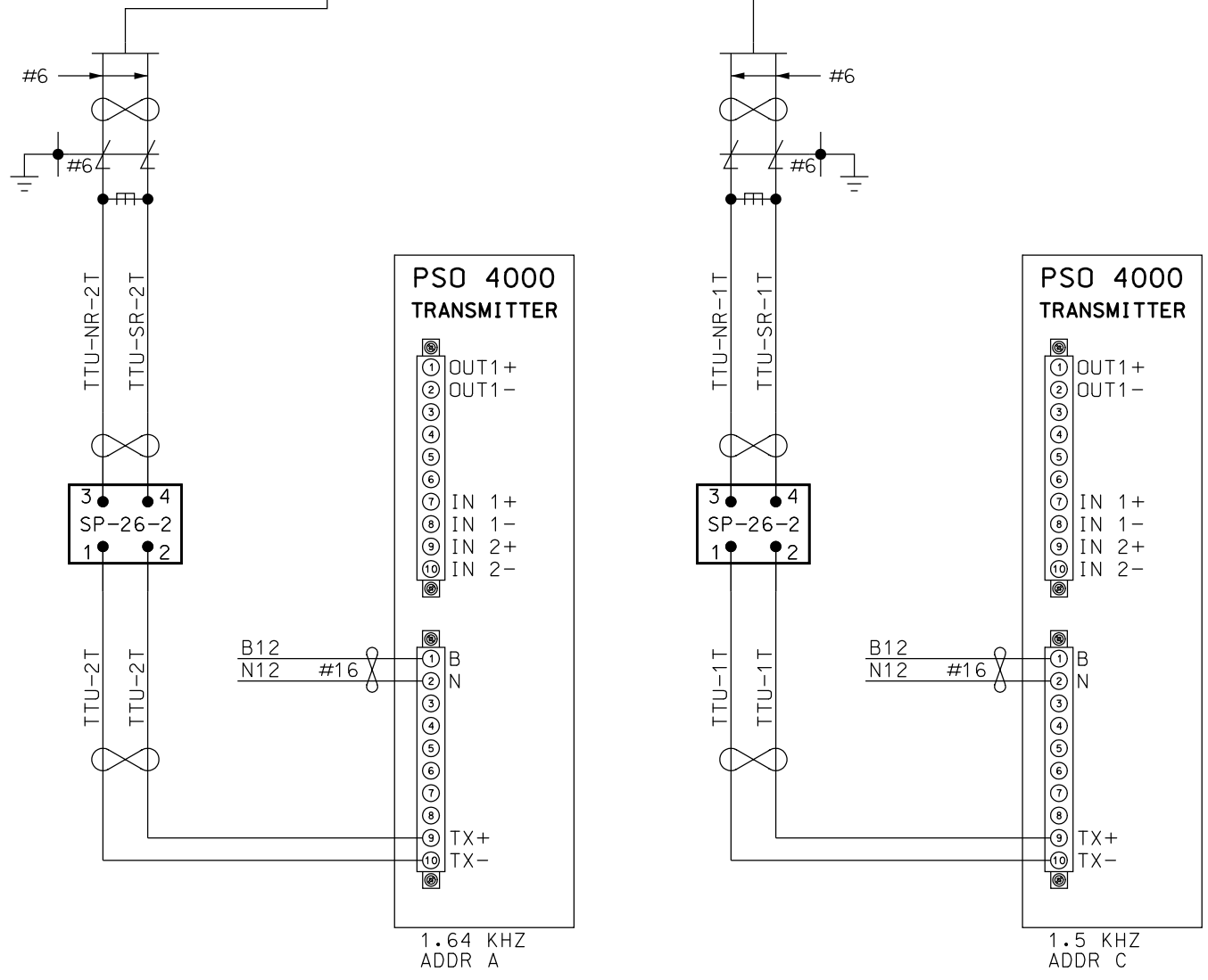
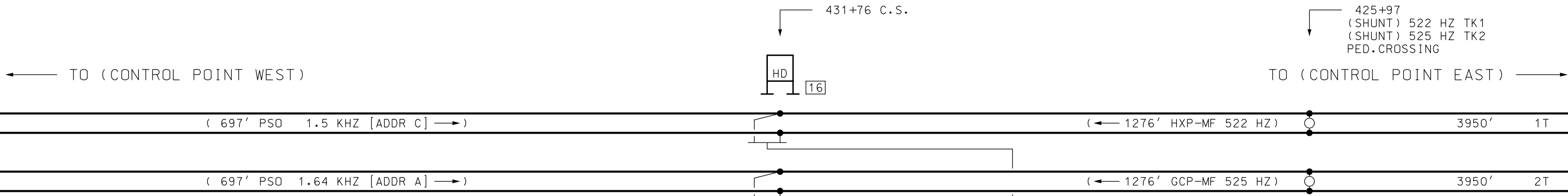
CHICAGO TO (END OF LINE)
CP (LOCATION)
POWER DISTRIBUTION

REFERENCE: 7.69 SH.1 & SH.2 DATE: 05/22/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	7.69 SH.2

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

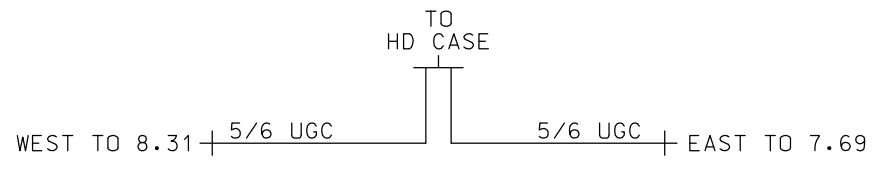
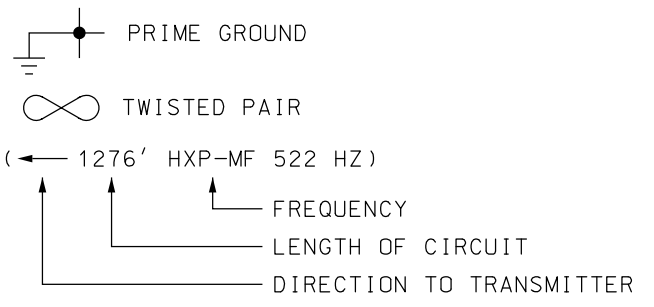


8.31

7.69

~REVISIONS~

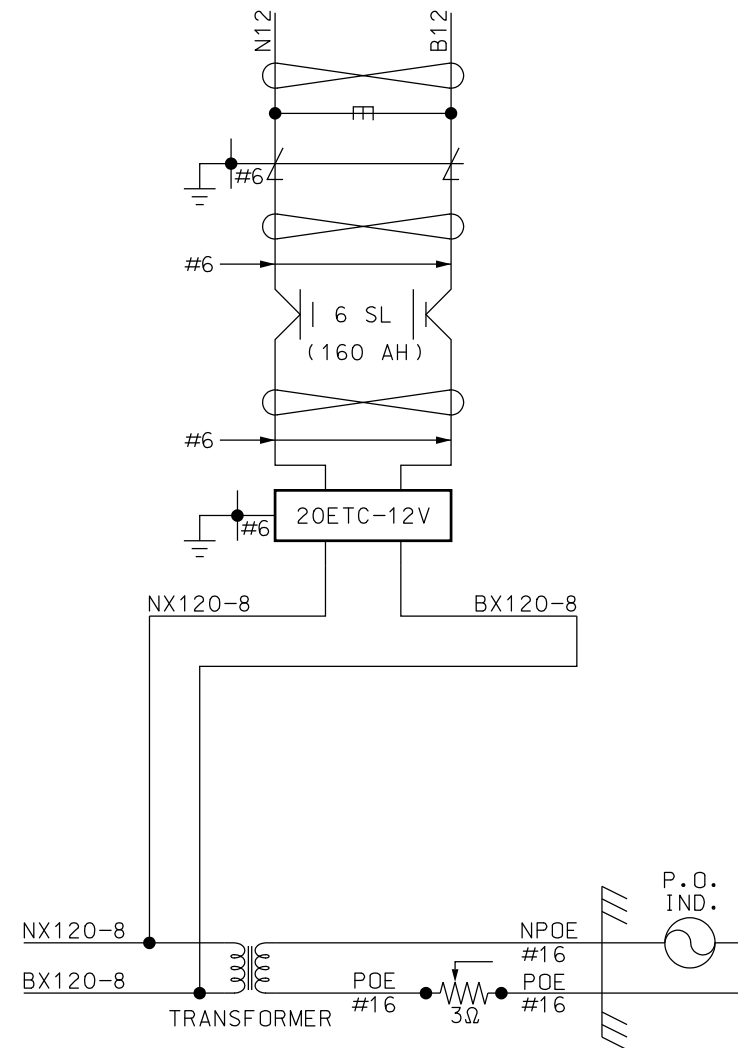
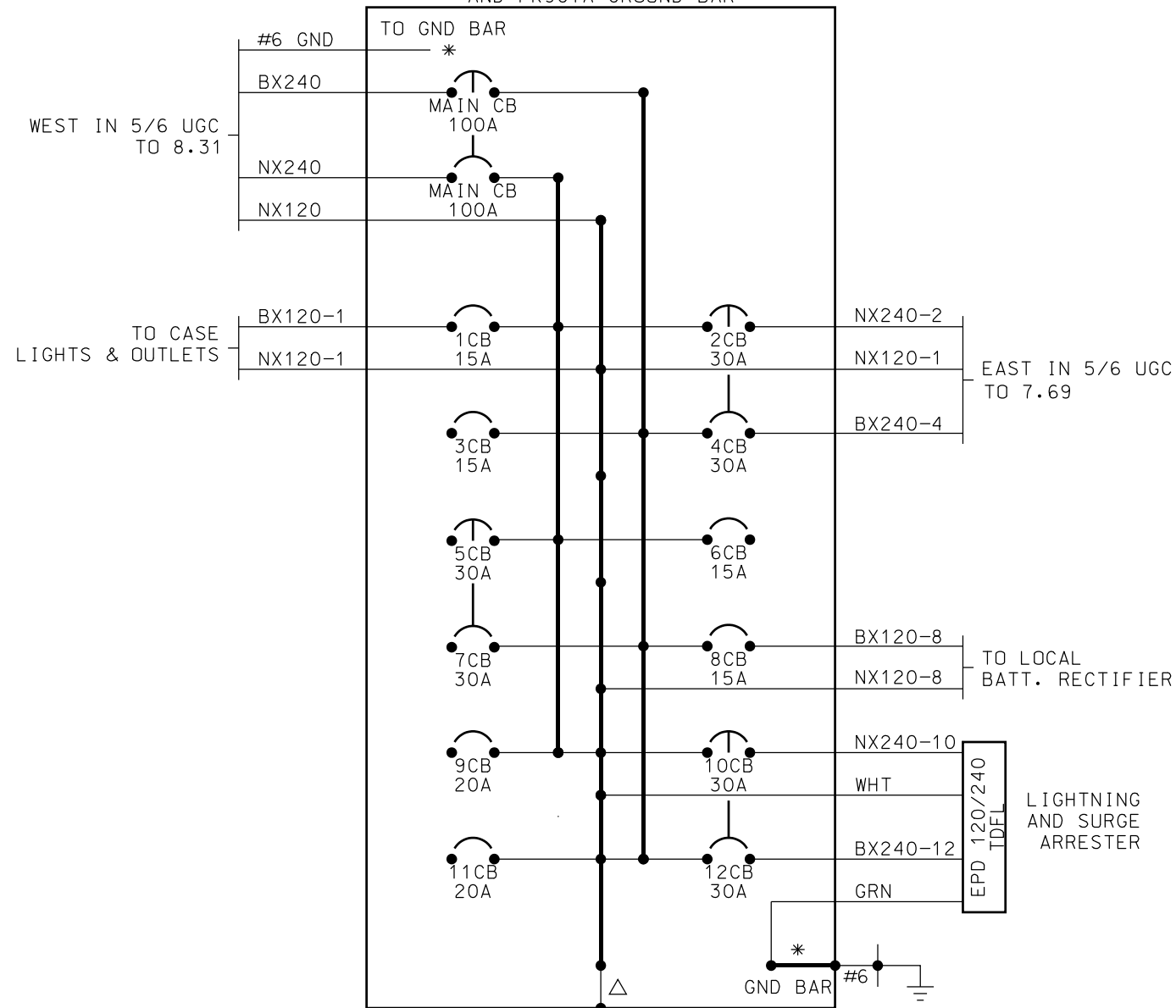
LTK 01/25/13



ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) PSO 4000 CUT-SECTION PLAN VIEW	
REFERENCE: 8.18 SH.1 & SH.2	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 8.18 SH.1

"SQUARE D" Q0112M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



~REVISIONS~

LTK 03/22/13

NOTES:

ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETFE TO PRIME GROUND.

△ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.

ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.

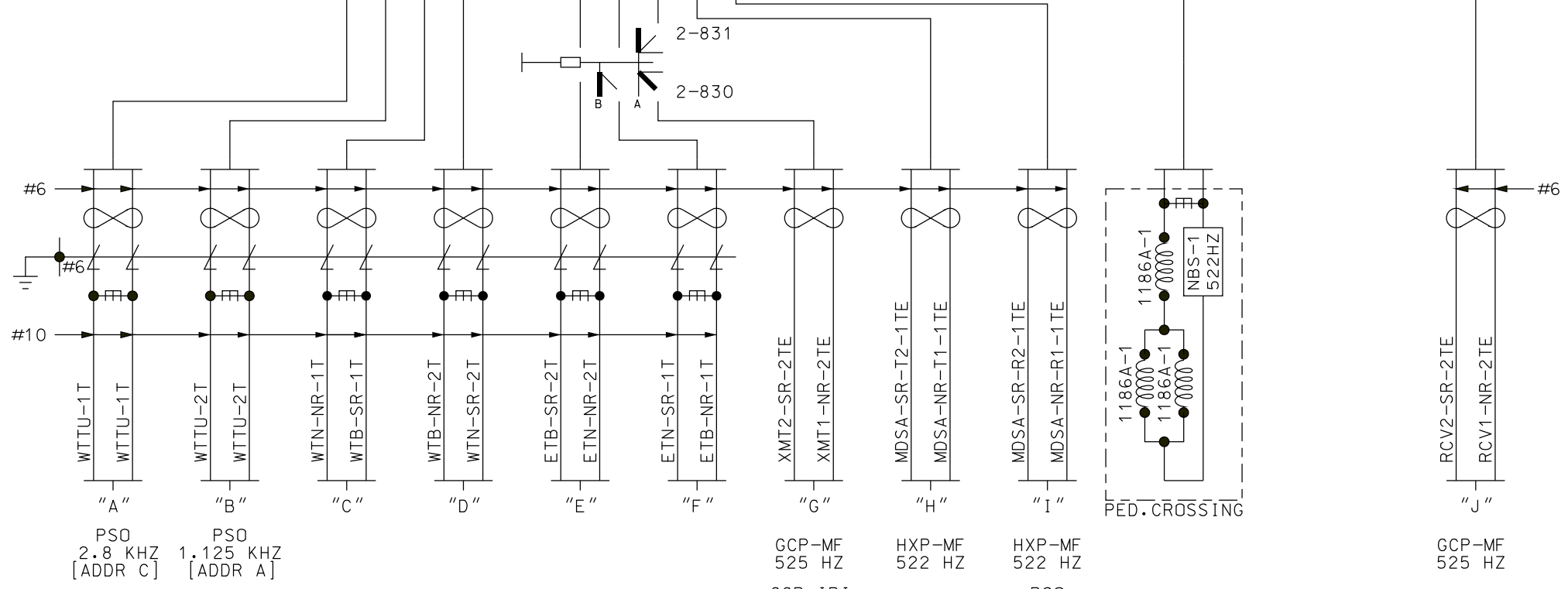
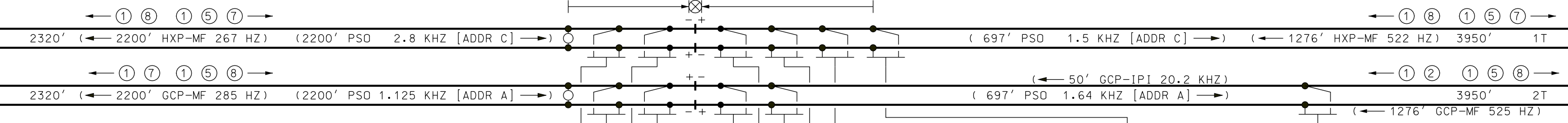
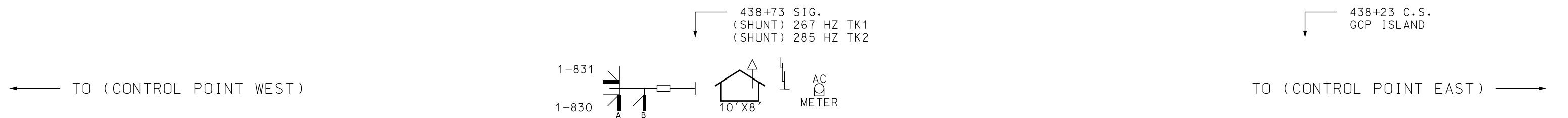
RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.

ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PSO 4000 CUT-SECTION
POWER DISTRIBUTION

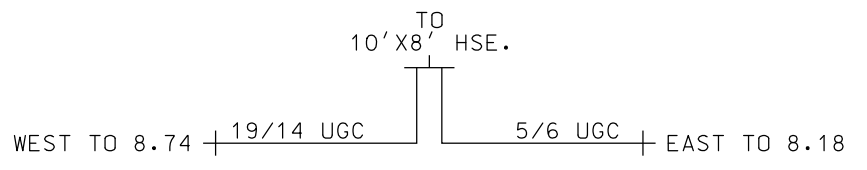
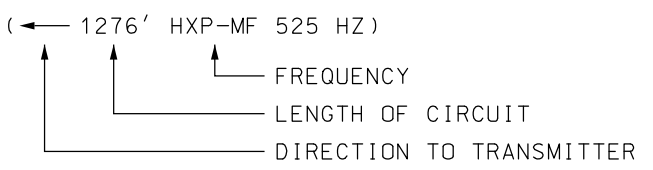
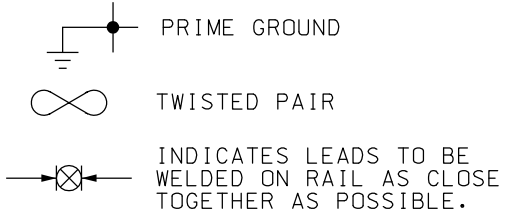
REFERENCE: 8.18 SH.1 & SH.2	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 8.18 SH.2	



8.74

8.18

- NOTES:
- ELECTRO CODE ASPECTS
- 1 - TRACK
 - 2 - YELLOW
 - 3 - YELLOW/YELLOW
 - 4 - FLASHING YELLOW
 - 5 - BLOCK (ANNUNCIATOR)
 - 6 - TUMBLE DOWN
 - 7 - GREEN
 - 8 - TRAFFIC
 - 9 - YELLOW/GREEN



~REVISIONS~

LTK 01/25/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

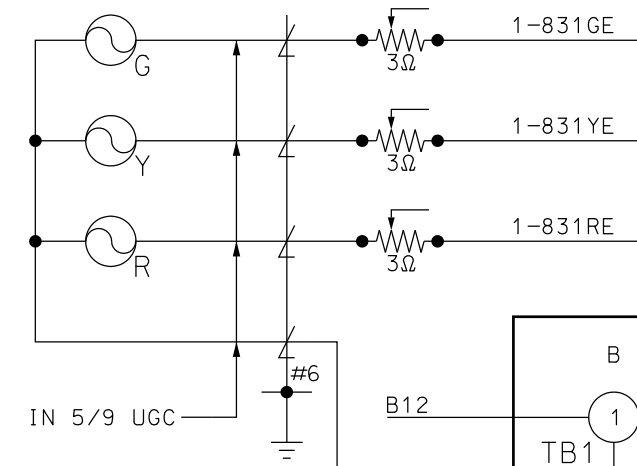
CHICAGO TO (END OF LINE)
830-831 SIGNAL LOCATION
PLAN VIEW

REFERENCE: 8.31 SH.1 THRU SH.8	DATE: 05/13/11
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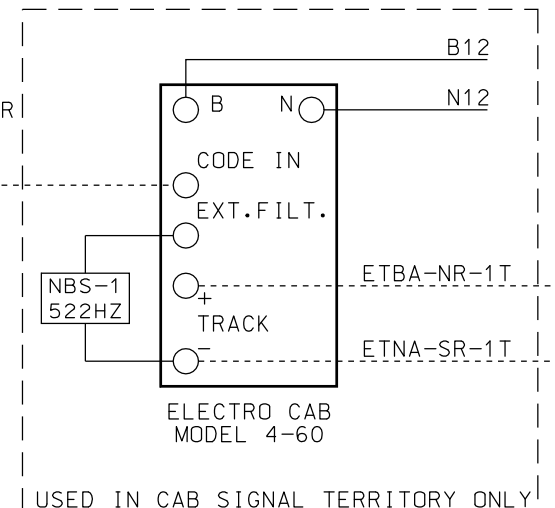
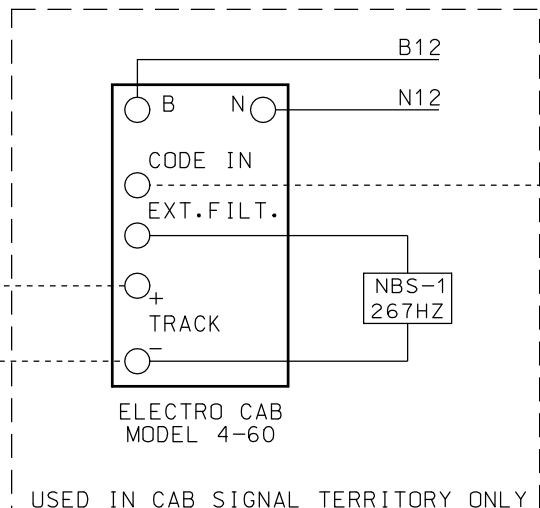
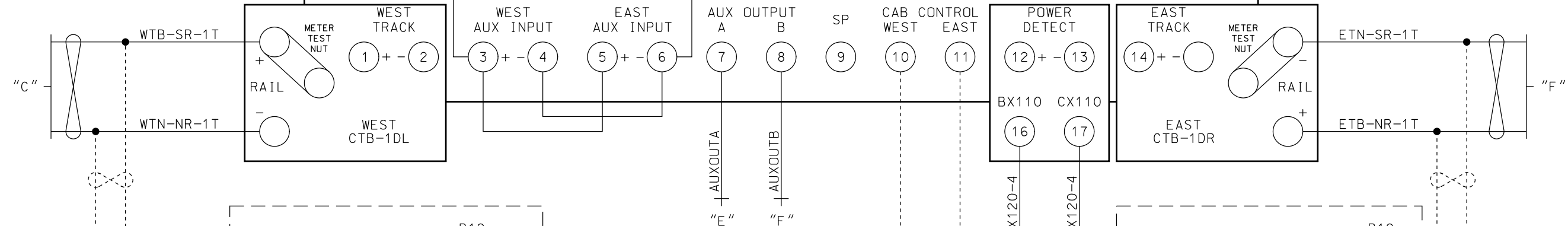
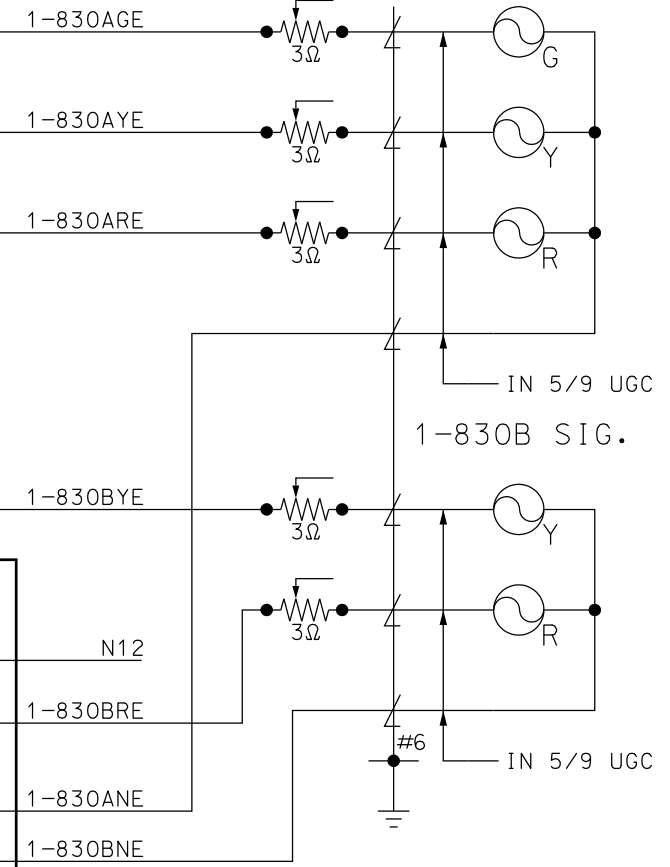
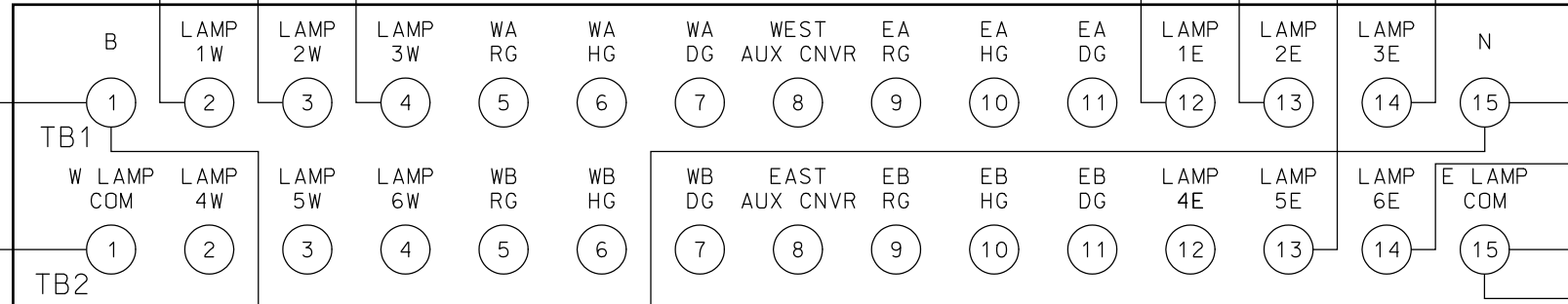
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 8.31 SH.1
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1-831 SIG.

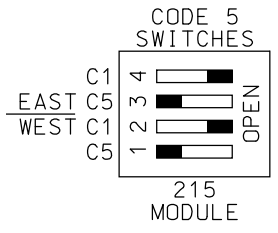


ELECTRO CODE 4
 MODULES: 2 EA-7K, 2R, 213A, 212A
 1 EA-214, 215B, 216A, 240A, 240B



- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____

CHECK SUMS
 1 - 3236/08DF
 2 - E34D/E2AB
 3 - 3236/08DF
 4 - 614A/6007



~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 830-831 SIGNAL LOCATION
 ELECTROCODE 4 TK.1

REFERENCE: 8.31 SH.1 THRU SH.8 DATE: 05/13/11

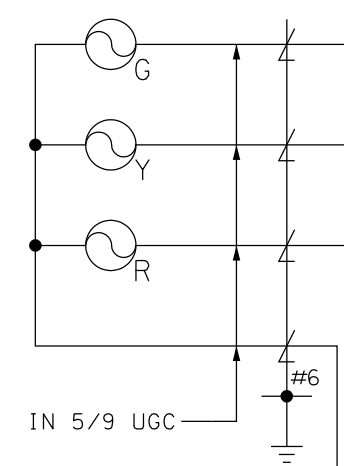
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 8.31 SH.2
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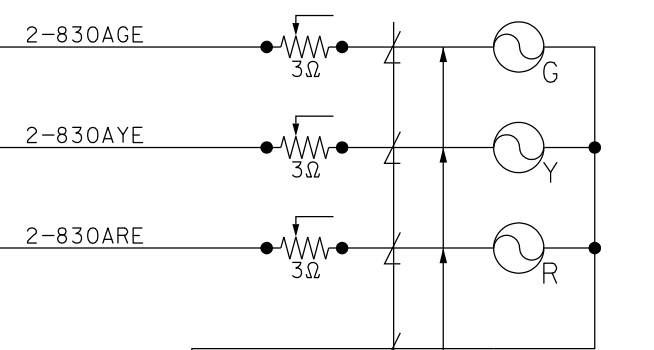
PROGRAM AHDQ-C4
 STRAPS 4,5,6,7 & 8 ARE CUT

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

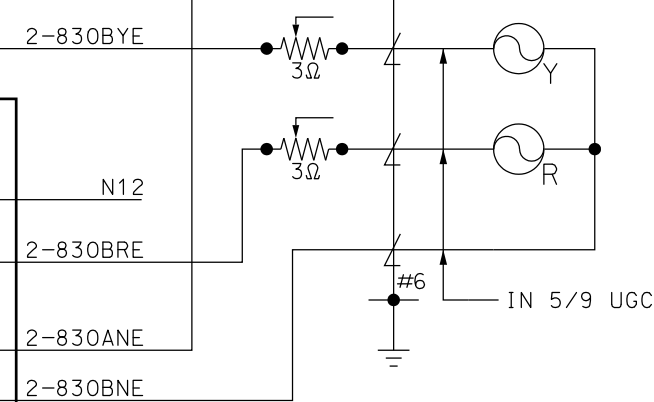
2-831 SIG.



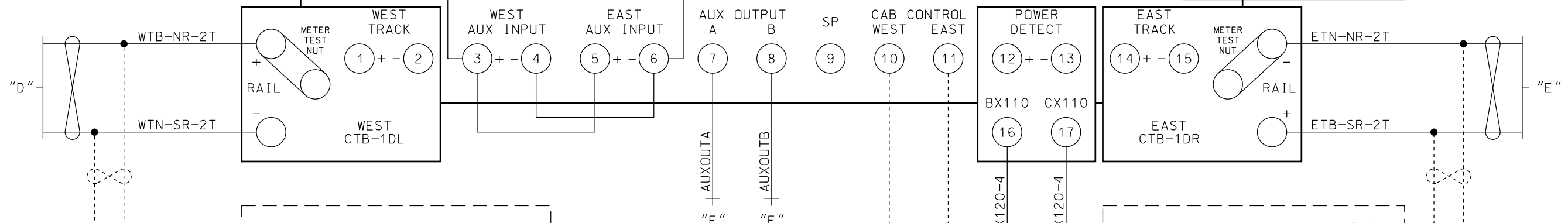
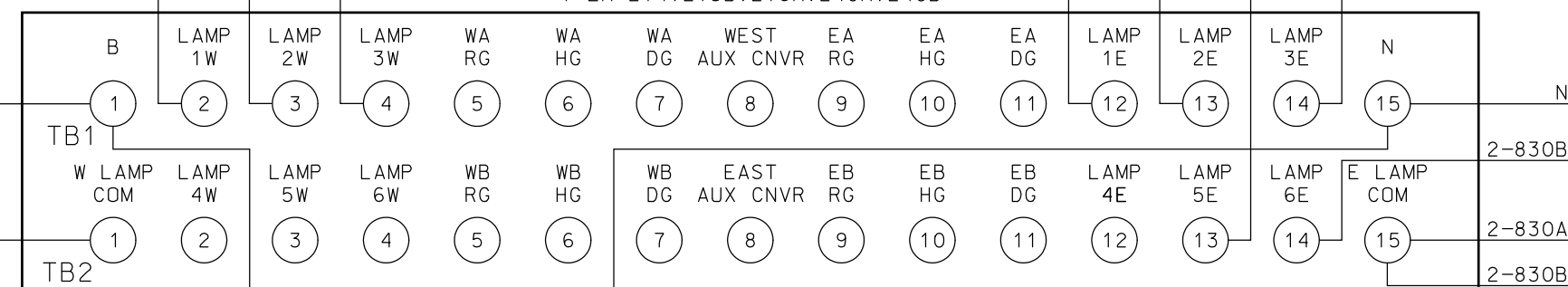
2-830A SIG.



2-830B SIG.

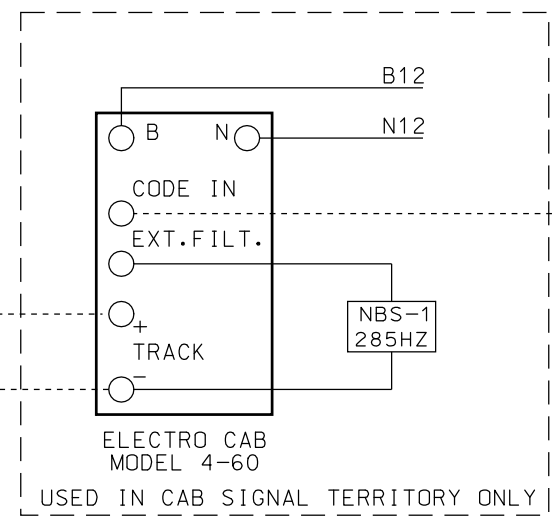


ELECTRO CODE 4
 MODULES: 2 EA-7K, 2R, 213A, 212A
 1 EA-214, 215B, 216A, 240A, 240B

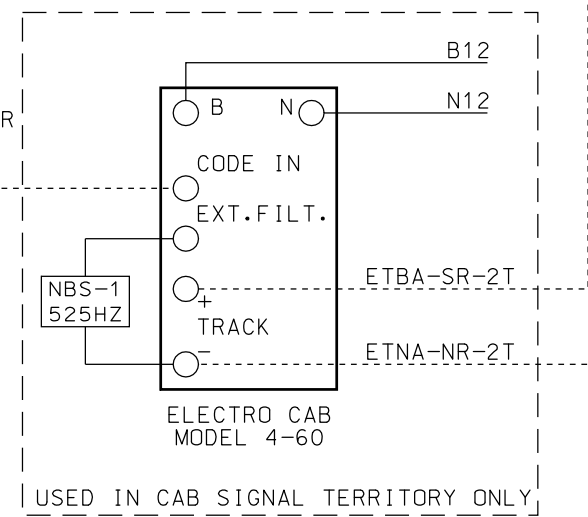


~REVISIONS~

LTK 03/22/13



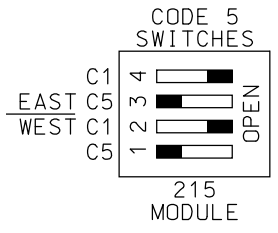
USED IN CAB SIGNAL TERRITORY ONLY



USED IN CAB SIGNAL TERRITORY ONLY

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____

CHECK SUMS
 1 - 3236/08DF
 2 - E34D/E2AB
 3 - 3236/08DF
 4 - 614A/6007



Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 830-831 SIGNAL LOCATION
 ELECTROCODE 4 TK.2

REFERENCE: 8.31 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED: **Metra** DRAWN: **Metra** CHECKED: **Metra** APPROVED: **Metra**

DISTRICT: TYP PRINT NUMBER: 8.31 SH.3

PROGRAM AHDQ-C4
 STRAPS 4,5,6,7 & 8 ARE CUT

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

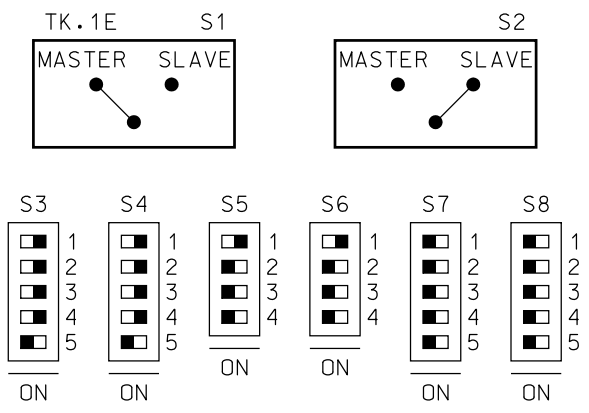
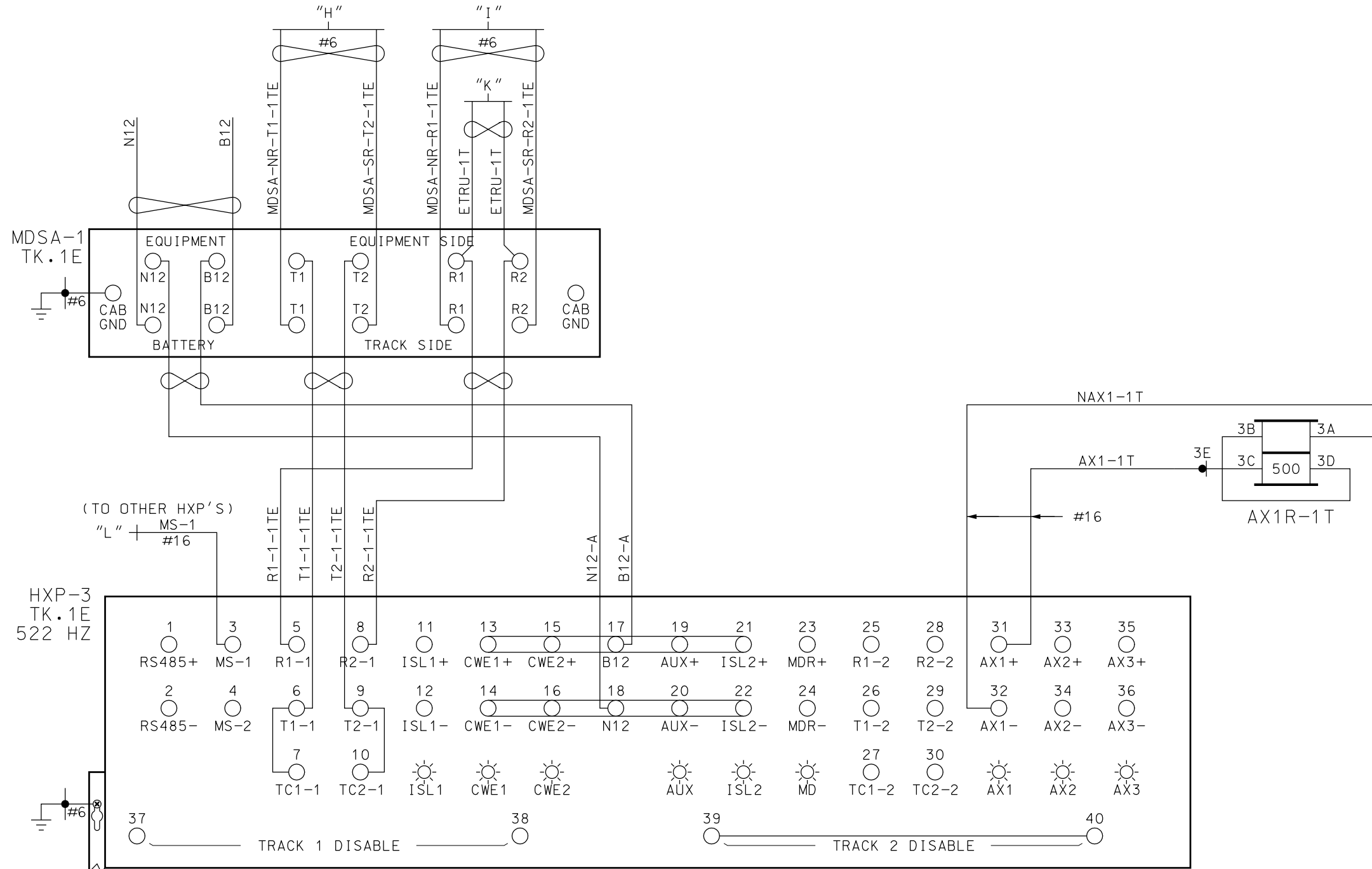
TK.1 = TK.1E
 TK.2 = DISABLED

ADJUST SEL

APPROACH LENGTH:
 TK.1 - 1276'
 WARNING TIME:
 TK.1 - 25 SEC.
 MD RESTART:
 TK.1 - 0

OPTIONS

1. TK-ENA:
 TK.1 - UP
 TK.2 - dn
2. TK FO
 TK.1 - STRAP
3. CW/MD
 TK.1 - C
4. UNI-BI
 TK.1 - B
6. CWEWT
 TK.1 - 80
7. LOS
 TK.1 - 16
8. IJ-LOS
 TK.1 - 5
11. AX 1
 TK-ASN - 1T
 OF-TK1 - 2200
 WT - 25
 MD-RST -
 CW/MD - C
 CJ-LOS - 0
 PJ-DET - 15
 POS-ST - dn
12. AX 2
 TK-ASN - NA
 OF-TK1 - NA
 WT -
 MD-RST -
 CW/MD -
 CJ-LOS - 0
 PJ-DET - 15
 POS-ST - dn
13. AX 3
 TK-ASN - NA
 OF-TK1 - NA
 WT -
 MD-RST -
 CW/MD -
 CJ-LOS - 0
 PJ-DET - 15
 POS-ST - dn
17. MDR-AX - n
18. MD-TMR
 TK.1 - 10
19. MIN-WT - 0
20. FS-DET - 0
21. POS-ST - 0
47. PF-ENA-VP - 0
48. PF-ENA - UP



HXP-3 MODULE SETUP

RMM MODULE	SIM MODULE	TRM MODULE	RSI MODULE	RYD MODULE	EMPTY SLOT	EMPTY SLOT	CPU MODULE	AXD MODULE
------------	------------	------------	------------	------------	------------	------------	------------	------------

RSI MODULE SLOT 4
 FREQ. 8.0 KHZ
 LOS JUMPER = 0
 FAULT JUMPER = 0

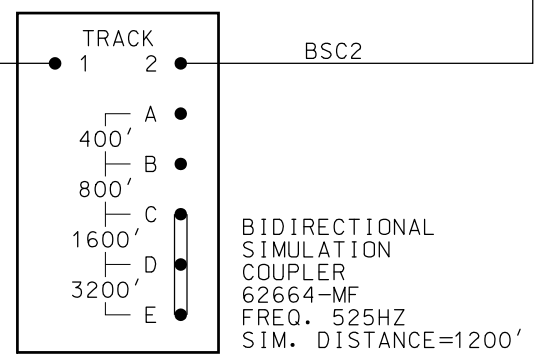
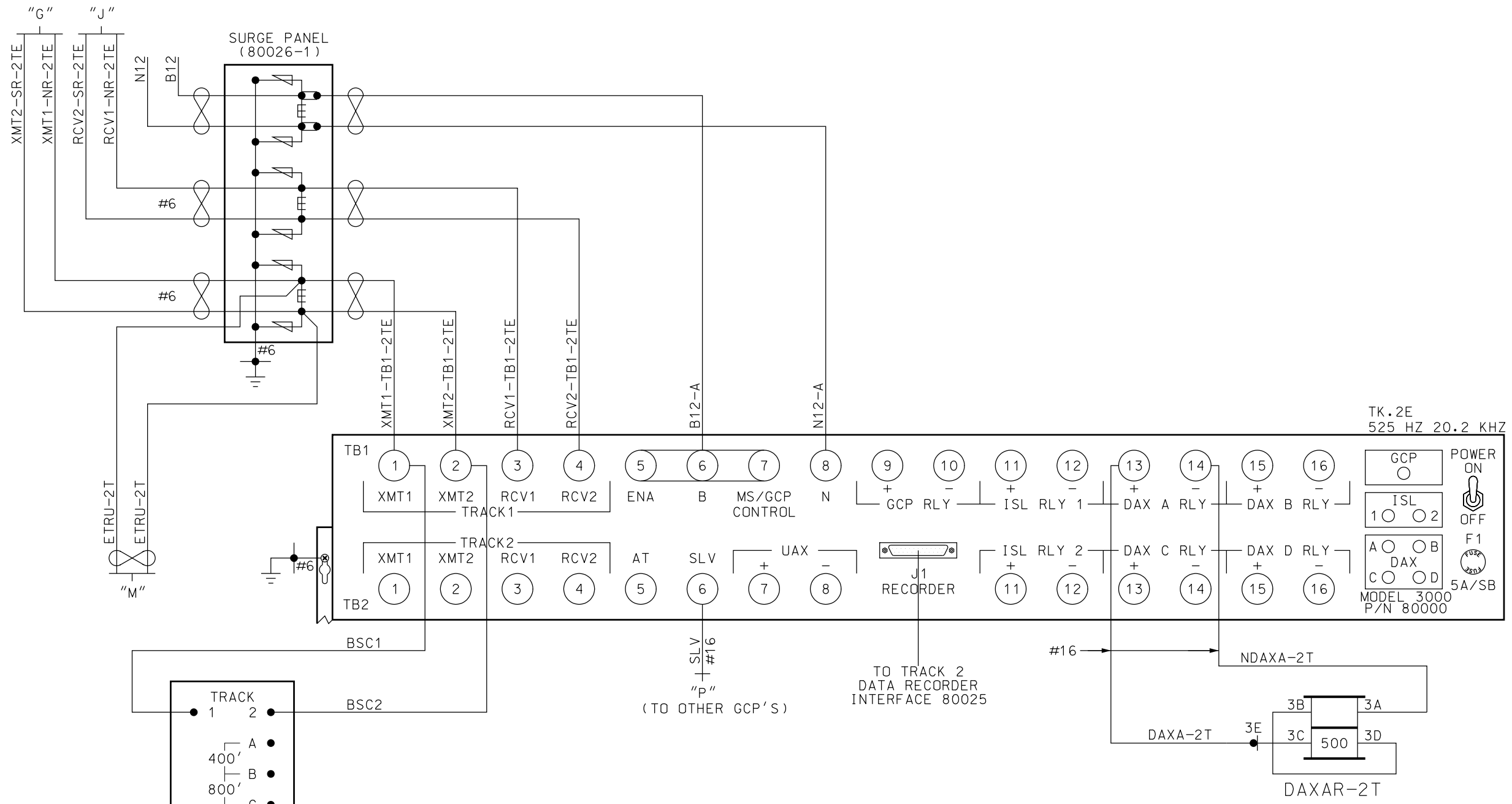
~REVISIONS~

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 830-831 SIGNAL LOCATION
 HXP-3 TK.1

REFERENCE: 8.31 SH.1 THRU SH.8	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 8.31 SH.4		

ALL WIRING ON THIS SHEET
 TO BE #10 AWG UNLESS NOTED



MODEL GCP 3000 MODULE ASSEMBLIES	
80011 ISLAND 1	*
EMPTY SLOT	
80012 TRANSCIEIVER 1	
80012 TRANSCIEIVER 2	
80013 RELAY DRIVE	
80214 PROCESSOR	
80015 REC. MODULE	
80016 DAX	
EMPTY SLOT	
80020/80019 INTERFACE	

* FIRST SLOT AT LEFT END OF BAY

~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
830-831 SIGNAL LOCATION
GCP 3000 - TK.2

REFERENCE: 8.31 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	8.31 SH.5

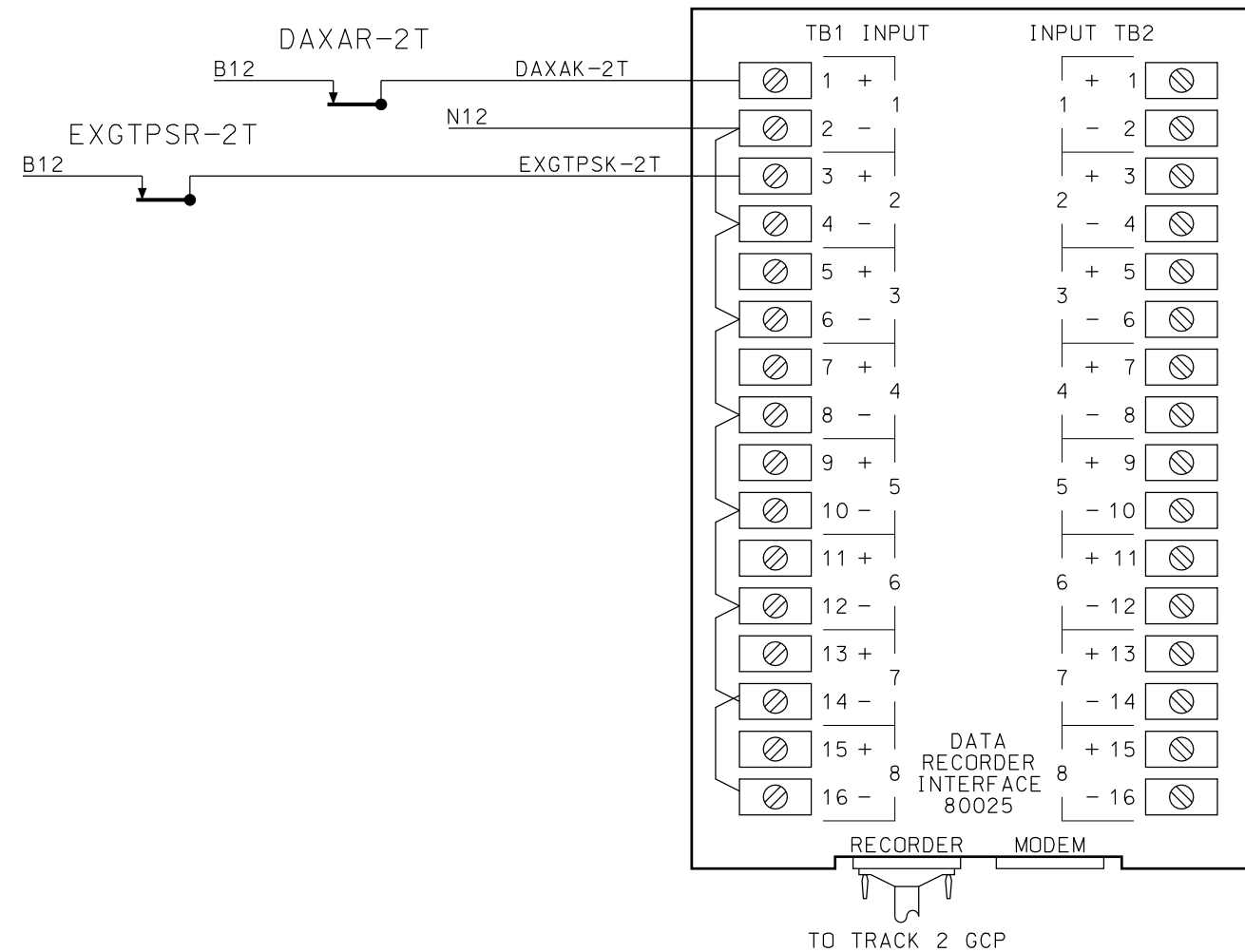
GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

1-80025 DATA RECORDER INTERFACE UNIT

TK.2E

GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

NUMBER OF TRACKS	1	
FREQUENCY	T1: 525 HZ	T2: HZ
UNIDIRECTIONAL/BIDIRECTIONAL	T1: BI	T2: BI
XMIT LEVEL - MED/HI	T1: MED	T2: MED
PREDICTOR/MOTION SENSOR	T1: GCP	T2: GCP
WARNING TIME SELECTED	T1: 25 SEC	T2: SEC
APPROACH DISTANCE	T1: 1276 FT	T2: FT
UAX PICKUP DELAY (UAX1)	SEC.	
ENA/UAX2 DELAY	SEC.	
ISLAND DISTANCE	T1: 50 FT	T2:
NUMBER OF DAX'S	1	
DAX A TRK/DIST/WARNING TIME	1	2200 FT 25 SEC.
DAX B TRK/DIST/WARNING TIME		FT SEC.
DAX C TRK/DIST/WARNING TIME		FT SEC.
DAX D TRK/DIST/WARNING TIME		FT SEC.
SLAVING MASTER/SLAVE	MASTER	
PASSWORD DISABLED/ENABLED	DISABLED	
RECORDER INSTALLED/NOT INSTALLED	NOT INSTALLED	
SWITCH TO MS	T1: EZ	T2: EZ
TRANSFER DELAY MS TO GCP	T1: SEC.	T2: SEC.
PRIME PREDICTION OFFSET	T1: FT	T2: FT
PICKUP DELAY PRIME	SEC.	
PICKUP DELAY DAX A	SEC.	
PICKUP DELAY DAX B	SEC.	
PICKUP DELAY DAX C	SEC.	
PICKUP DELAY DAX D	SEC.	
ENHANCED DETECT MODE	OFF	
BACK TO BACK	OFF	
STATION STOP TIMER	10 SEC.	
T1 # OF TRACK WIRES 4/6	4	
T2 # OF TRACK WIRES 4/6	4	
LOW EX ADJUSTMENT	0	
LOW EZ DETECTION	T1:	T2:
LOW EZ DETECTION TIMER	T1: MIN.	T2: MIN.
POSITIVE START (0 = OFF)	T1: EZ	T2: EZ
POSITIVE START TIMEOUT (0 = NONE)	T1: MIN.	T2: MIN.
SET AT OPERATION	NORMAL	
DIAGNOSTIC MESSAGES		
DAX MESSAGES		
ADVANCE PREEMPT TIMER	SEC.	



~REVISIONS~

LTK 03/22/13



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

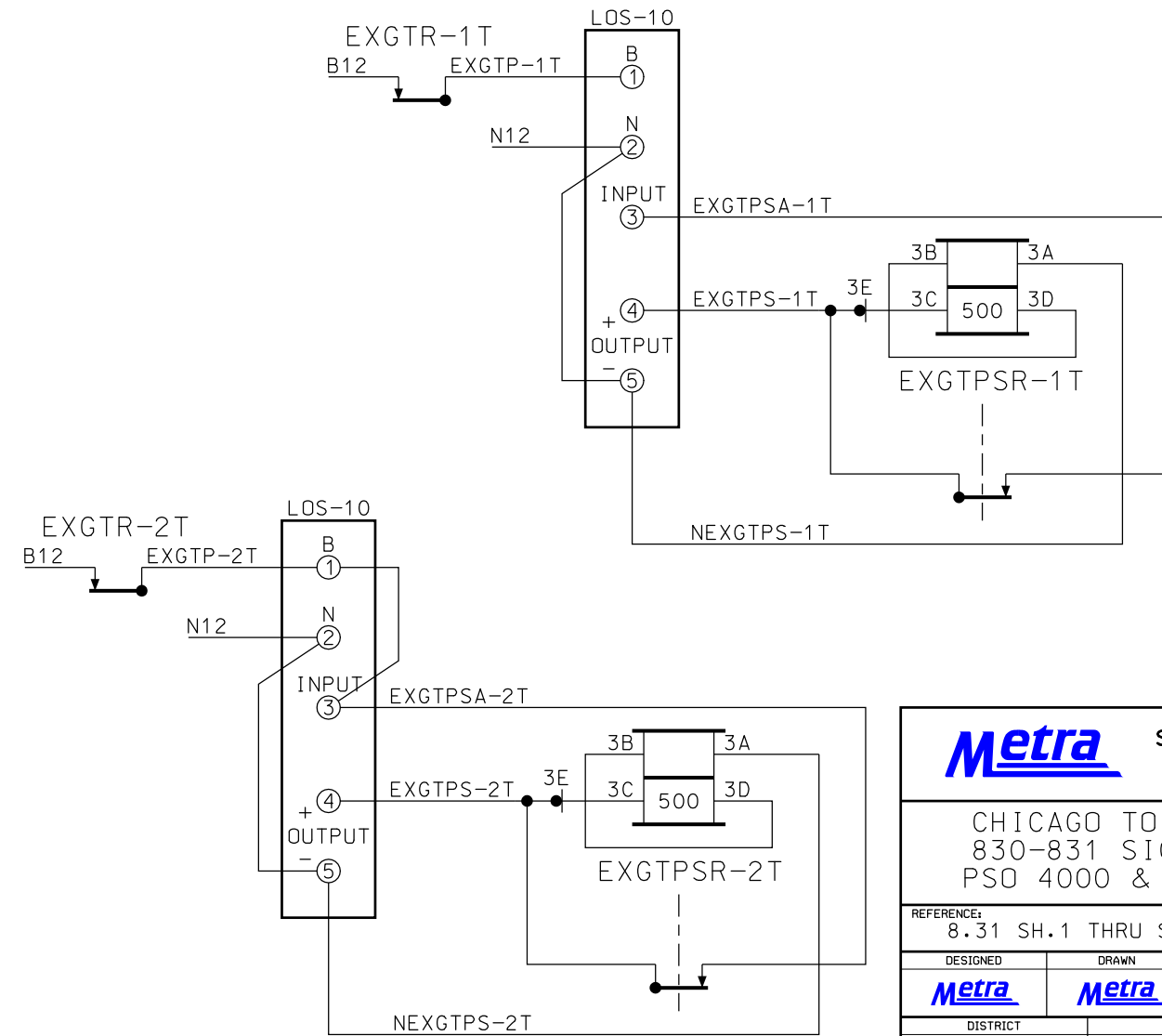
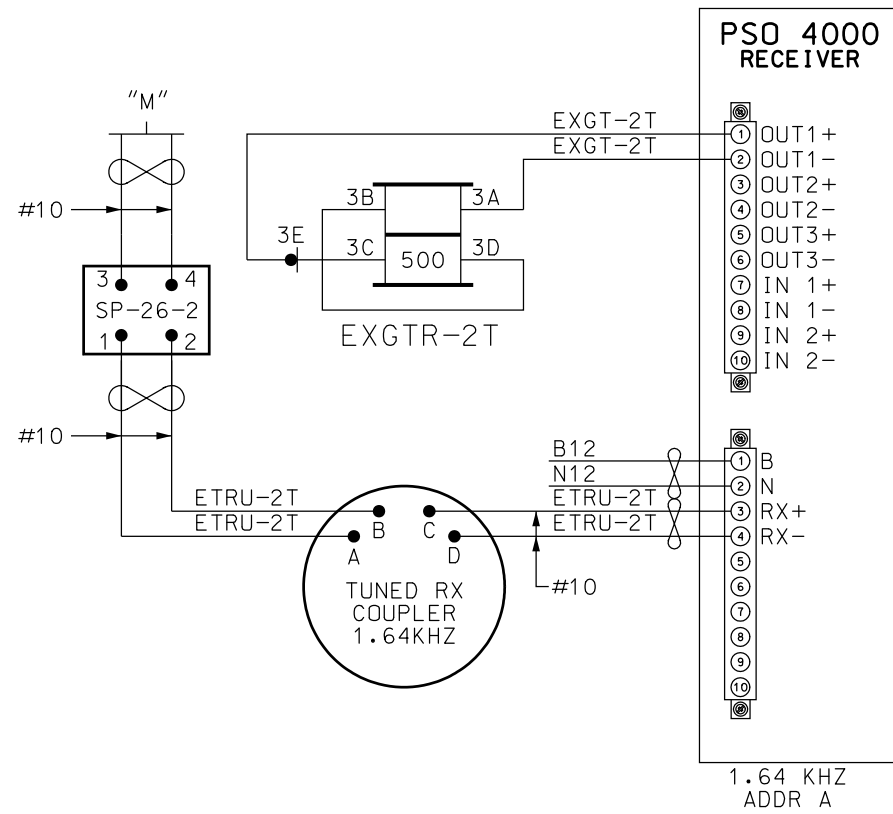
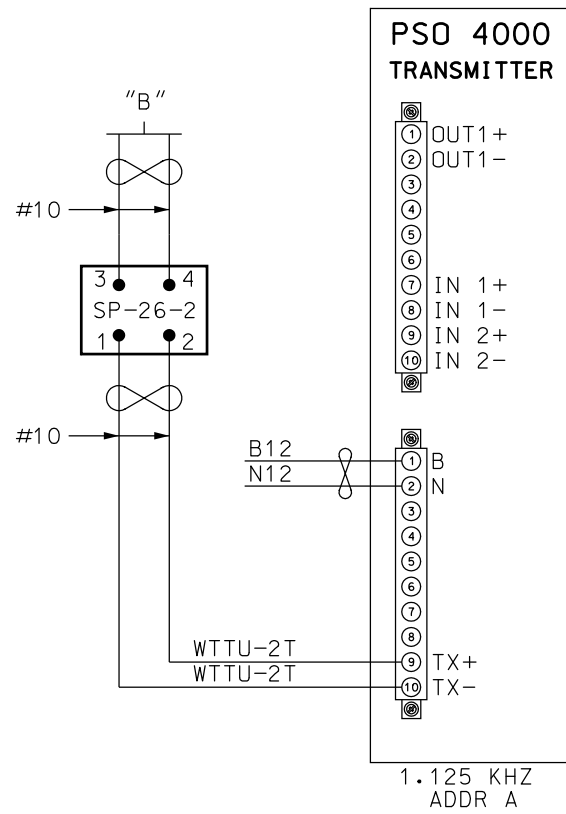
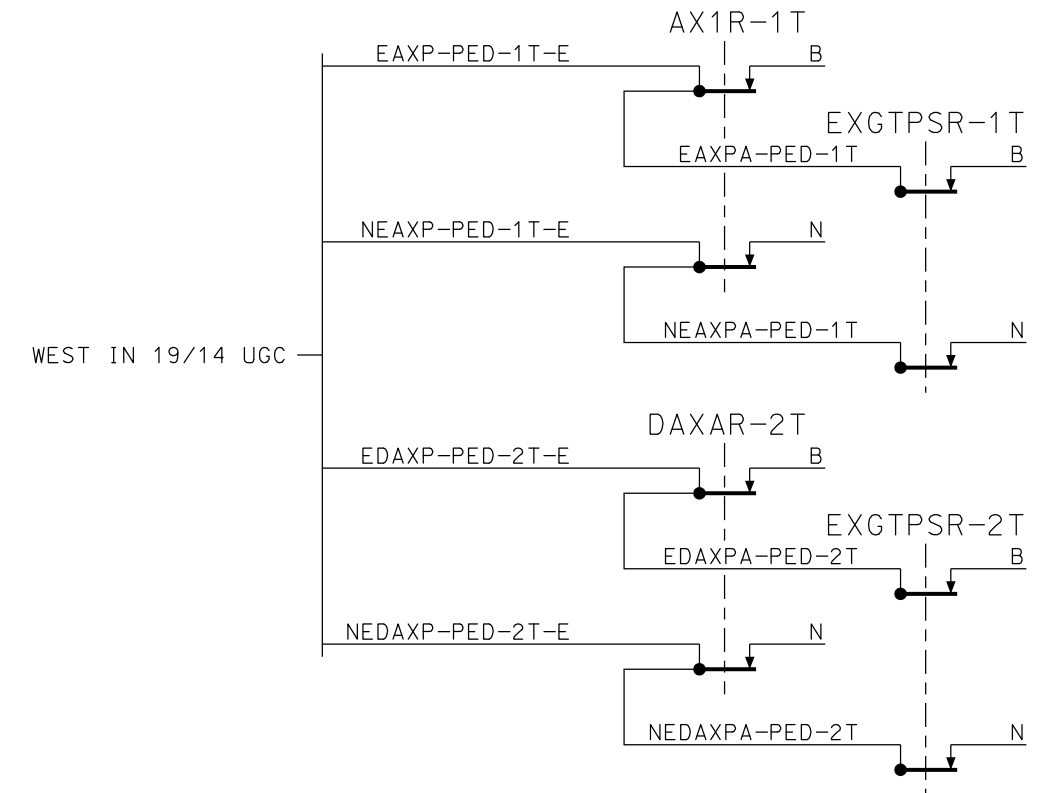
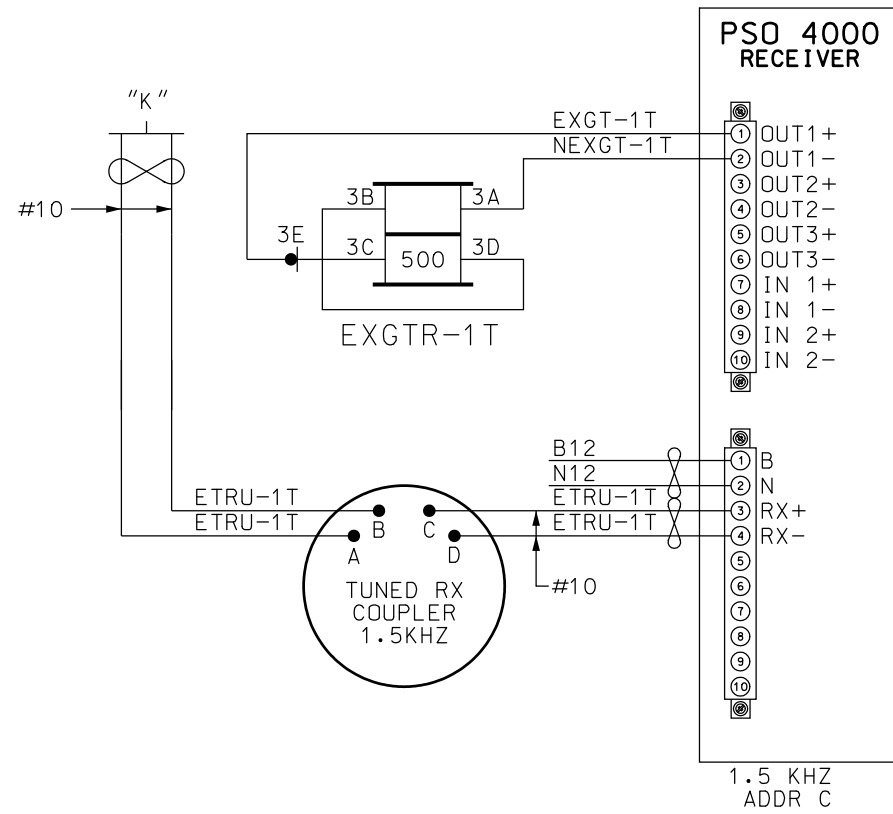
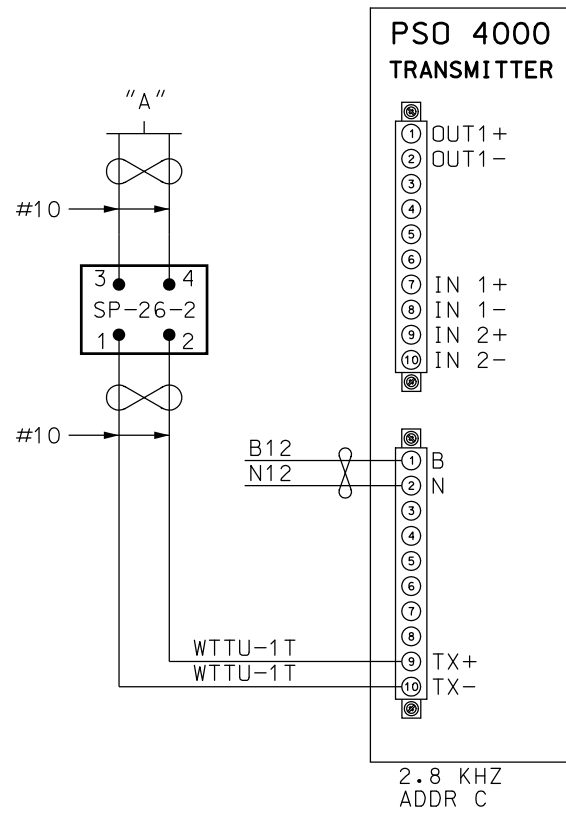
CHICAGO TO (END OF LINE)
830-831 SIGNAL LOCATION
GCP PROGRAMMING PARAMETERS
& 80025 RECORDER

REFERENCE: 8.31 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	8.31 SH.6

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



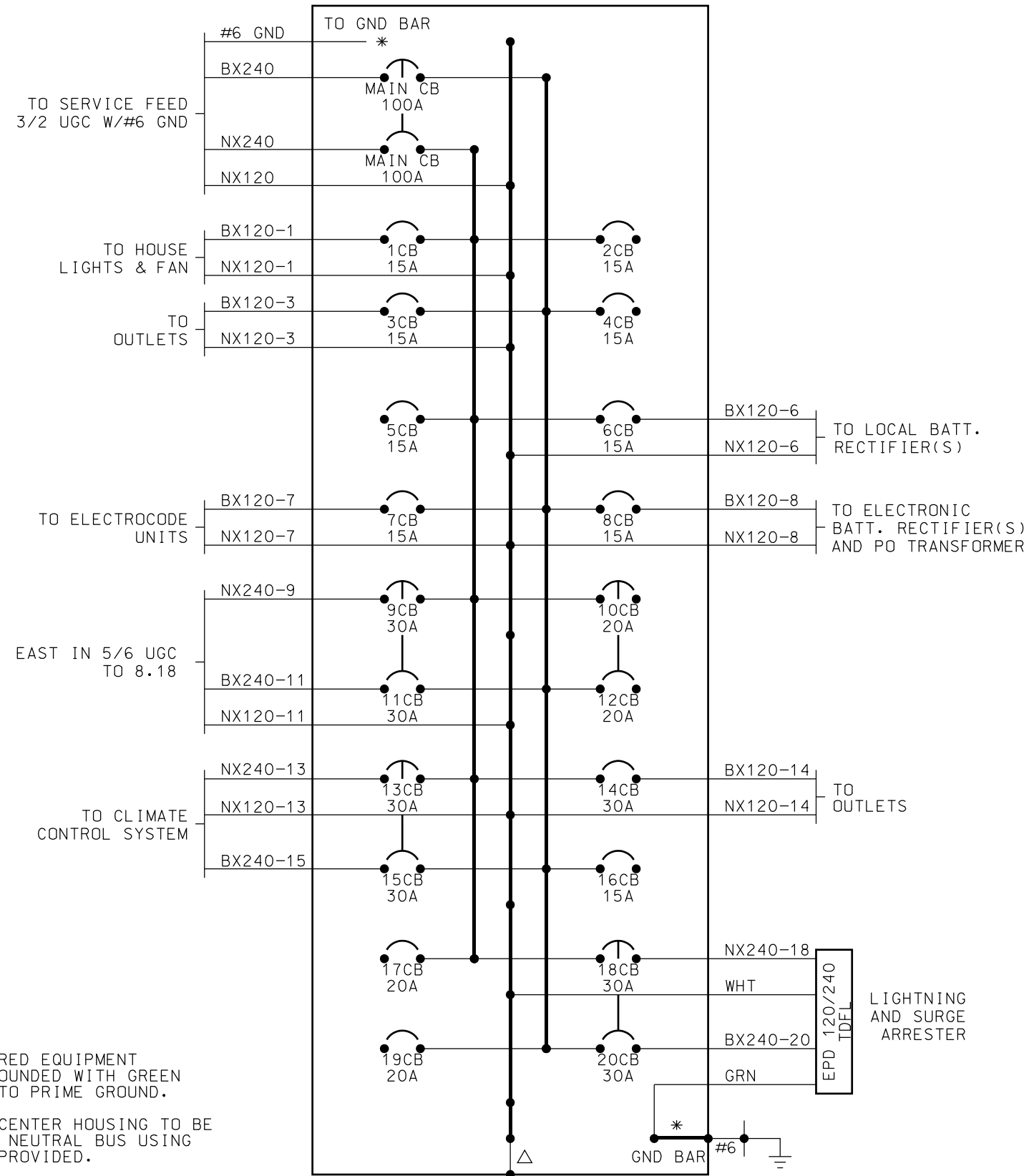
~REVISIONS~

LTK 01/25/13

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) 830-831 SIGNAL LOCATION PSO 4000 & LINE CIRCUITS			
REFERENCE: 8.31 SH.1 THRU SH.8	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 8.31 SH.7		

"SQUARE D" Q0120M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



NOTES:

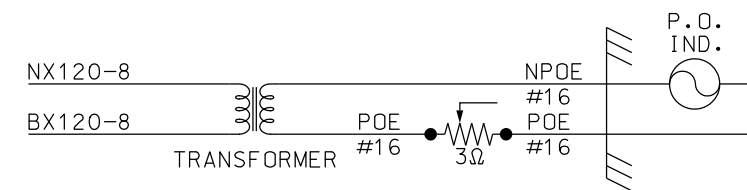
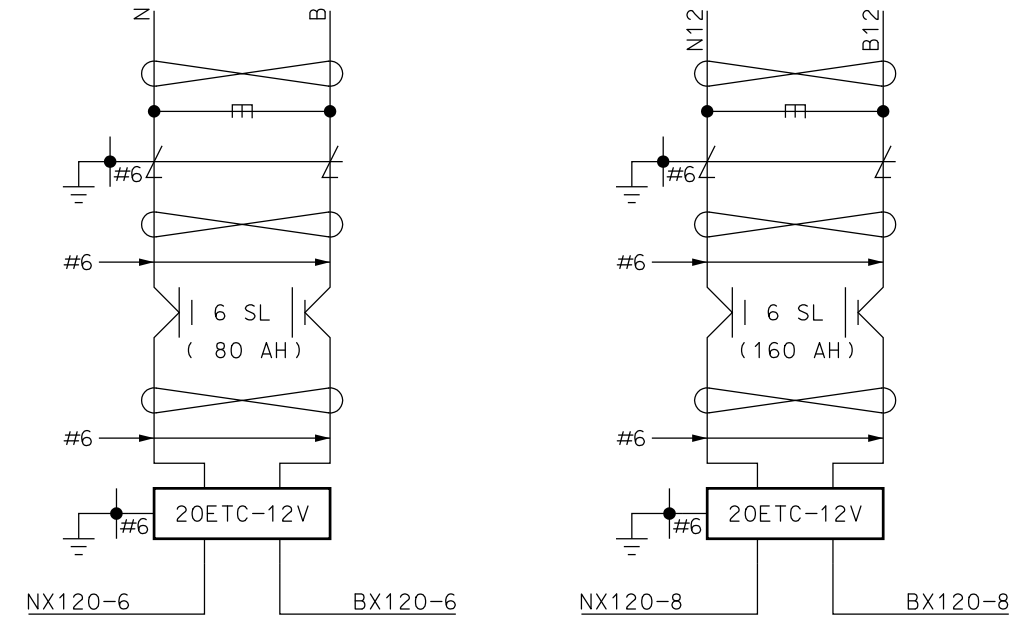
ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETFE TO PRIME GROUND.

△ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.

ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.

RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.

* METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.



~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

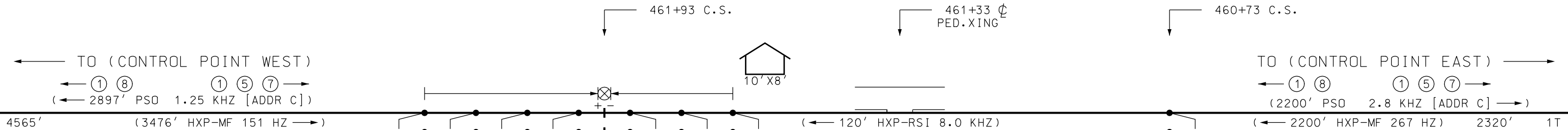
CHICAGO TO (END OF LINE)
830-831 SIGNAL LOCATION
POWER DISTRIBUTION

REFERENCE: 8.31 SH.1 THRU SH.8 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

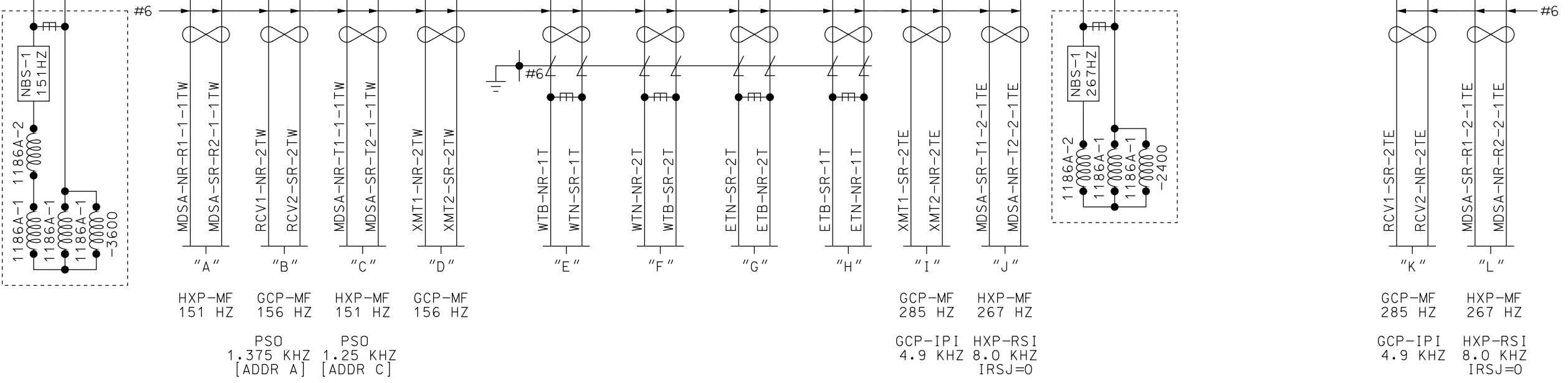
DISTRICT	PRINT NUMBER
TYP	8.31 SH.8

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED



EW & WW APPROACH - 1T & 2T AT 79 MPH	
MIN. WARNING TIME	= 20 SEC
WIDE XING TIME	= 0 SEC
REACTION TIME	= 5 SEC
RESPONSE TIME	= 5 SEC
APPROACH LENGTH	= 3476 FT.

9.30



8.31

- NOTES:
- PRIME GROUND
 - INDICATES LEADS TO BE WELDED ON RAIL AS CLOSE TOGETHER AS POSSIBLE.
 - TWISTED PAIR
 - INDICATES PEDESTRIAN CROSSING FLASHING LIGHT SIGNAL WITH BELL ON WEST SIGNAL.

~REVISIONS~

LTK 01/25/13

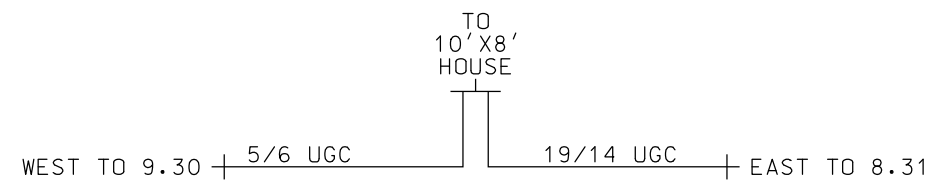
Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
PLAN VIEW

REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11
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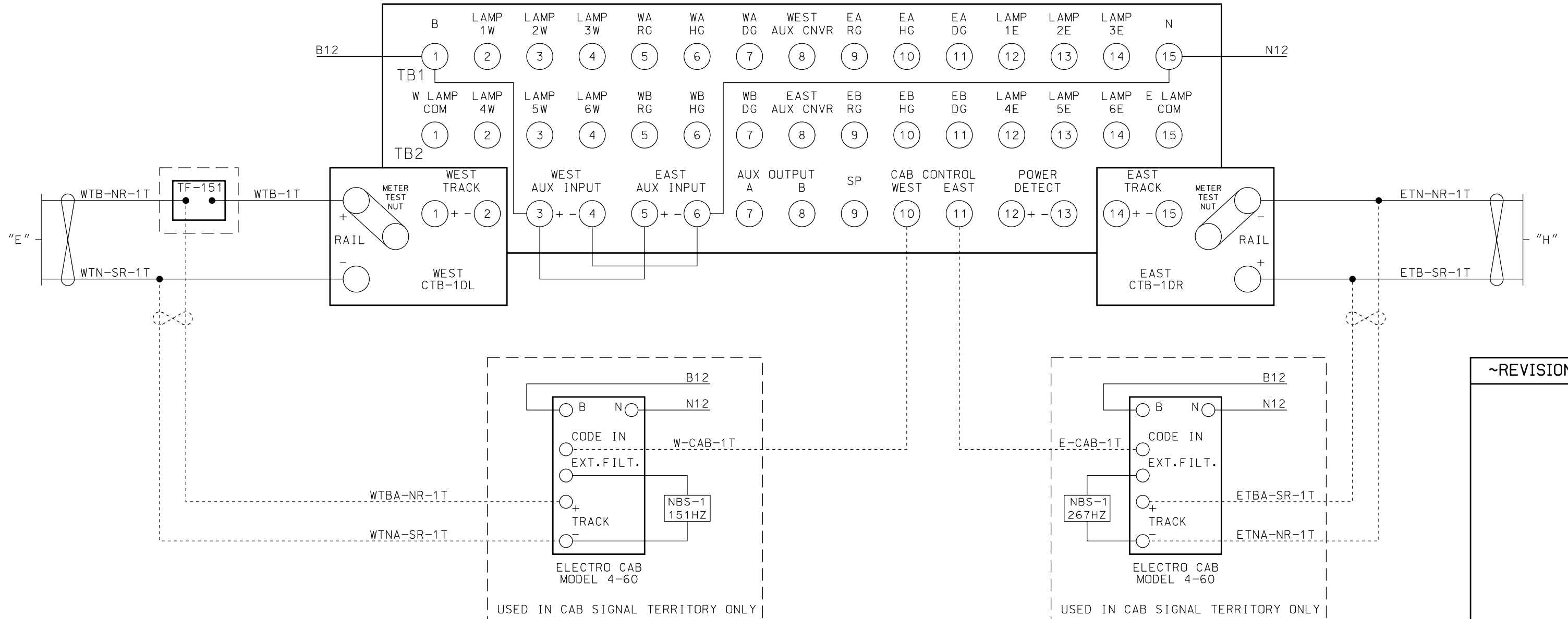
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 8.74 SH.1
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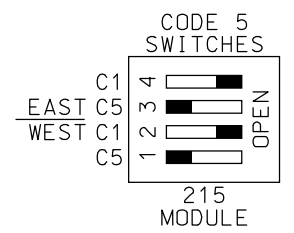
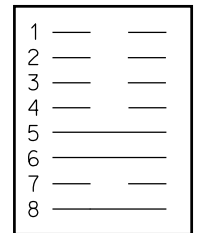


ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

ELECTRO CODE 4R
 MODULES: 2 EA-7K,2R
 1 EA-214,215B,216A,230A,230B



~REVISIONS~



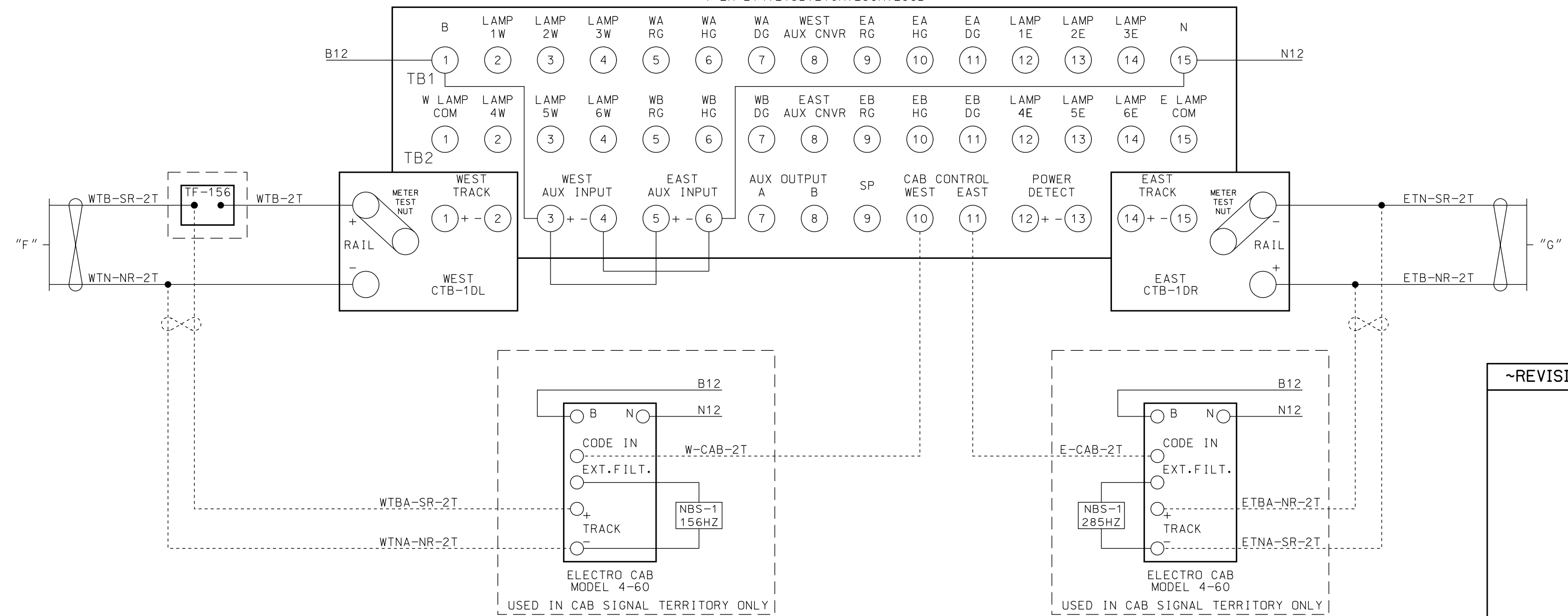
- CHECK SUMS
 1 - C709/2E0A
 2 - F3B6/4C4B
 3 - C709/2E0A
 4 - 4C49/4C4A

PROGRAM RMMQ-C4
 STRAPS 1,2,3,4,7 ARE CUT

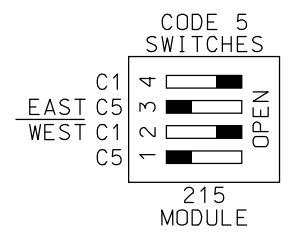
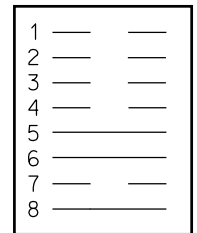
ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) PEDESTRIAN CROSSING ELECTRO CODE REPEATER TRACK 1			
REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 8.74 SH.2		

ELECTRO CODE 4R
 MODULES: 2 EA-7K,2R
 1 EA-214,215B,216A,230A,230B



~REVISIONS~



- CHECK SUMS
 1 - C709/2E0A
 2 - F3B6/4C4B
 3 - C709/2E0A
 4 - 4C49/4C4A

PROGRAM RMMQ-C4
 STRAPS 1,2,3,4,7 ARE CUT

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

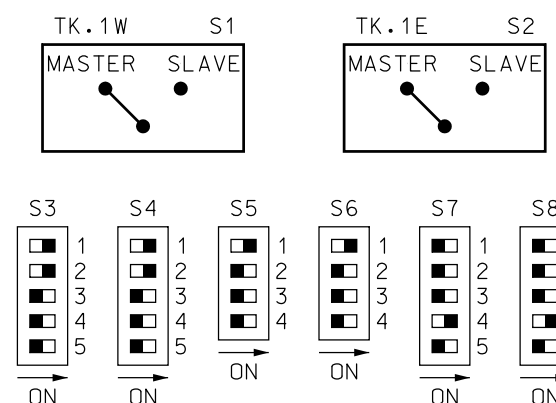
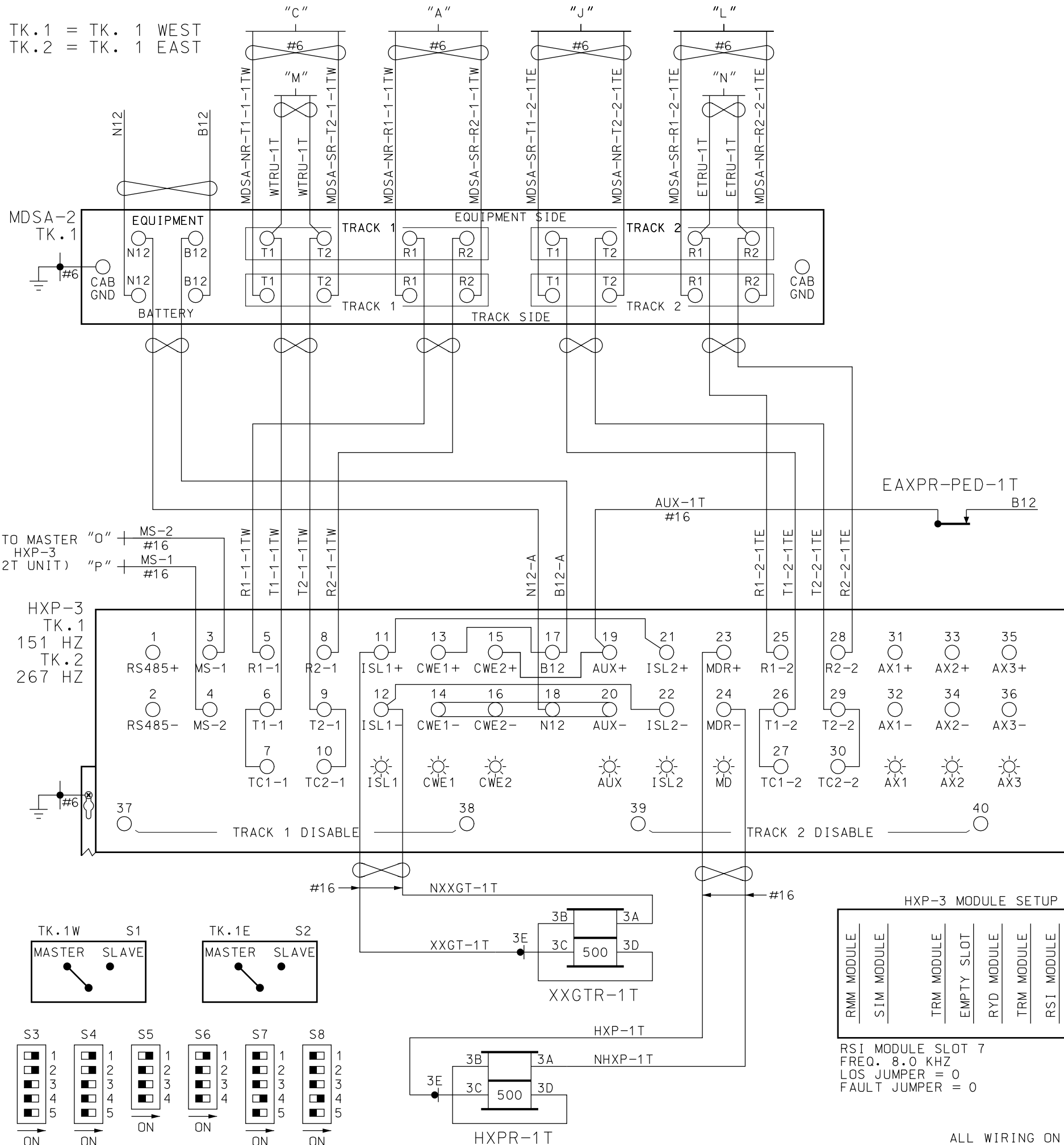
CHICAGO TO (END OF LINE)
 PEDESTRIAN CROSSING
 ELECTRO CODE REPEATER TRACK 2

REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 8.74 SH.3	

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

ADJUST SEL
 APPROACH LENGTH:
 TK.1 - 3476'
 TK.2 - 2200'
 WARNING TIME:
 TK.1 - 25 SEC.
 TK.2 - 25 SEC.
 MD RESTART:
 TK.1 - 0
 TK.2 - 0

- OPTIONS
- TK-ENA:
TK.1 - UP
TK.2 - UP
 - TK FO
TK.1 - STRAP
TK.2 - STRAP
 - CW/MD
TK.1 - C
TK.2 - C
 - UNI-BI
TK.1 - b
TK.2 - b
 - CWEWT
TK.1 - 80
TK.2 - 80
 - LOS
TK.1 - 16
TK.2 - 16
 - IJ-LOS
TK.1 - 5
TK.2 - 5
 - AX 1
TK-ASN -
OF-TK -
WT -
MD-RST -
CW/MD -
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn
 - AX 2
TK-ASN -
OF-TK -
WT -
MD-RST -
CW/MD -
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn
 - AX 3
TK-ASN -
OF-TK -
WT -
MD-RST -
CW/MD -
CJ-LOS - 0
PJ-DET - 15
POS-ST - dn
 - MDR-AX - n
 - MD-TMR
TK.1 - 10
TK.2 - 10
 - MIN-WT - 0
 - FS-DET - 0
 - POS-ST - 0
 - ATO-RX - dn
 - PF-ENA - UP



HXP-3 MODULE SETUP

RMM MODULE	SIM MODULE	TRM MODULE	EMPTY SLOT	RYD MODULE	TRM MODULE	RSI MODULE	CPU MODULE	AXD MODULE
------------	------------	------------	------------	------------	------------	------------	------------	------------

RSI MODULE SLOT 7
 FREQ. 8.0 KHZ
 LOS JUMPER = 0
 FAULT JUMPER = 0

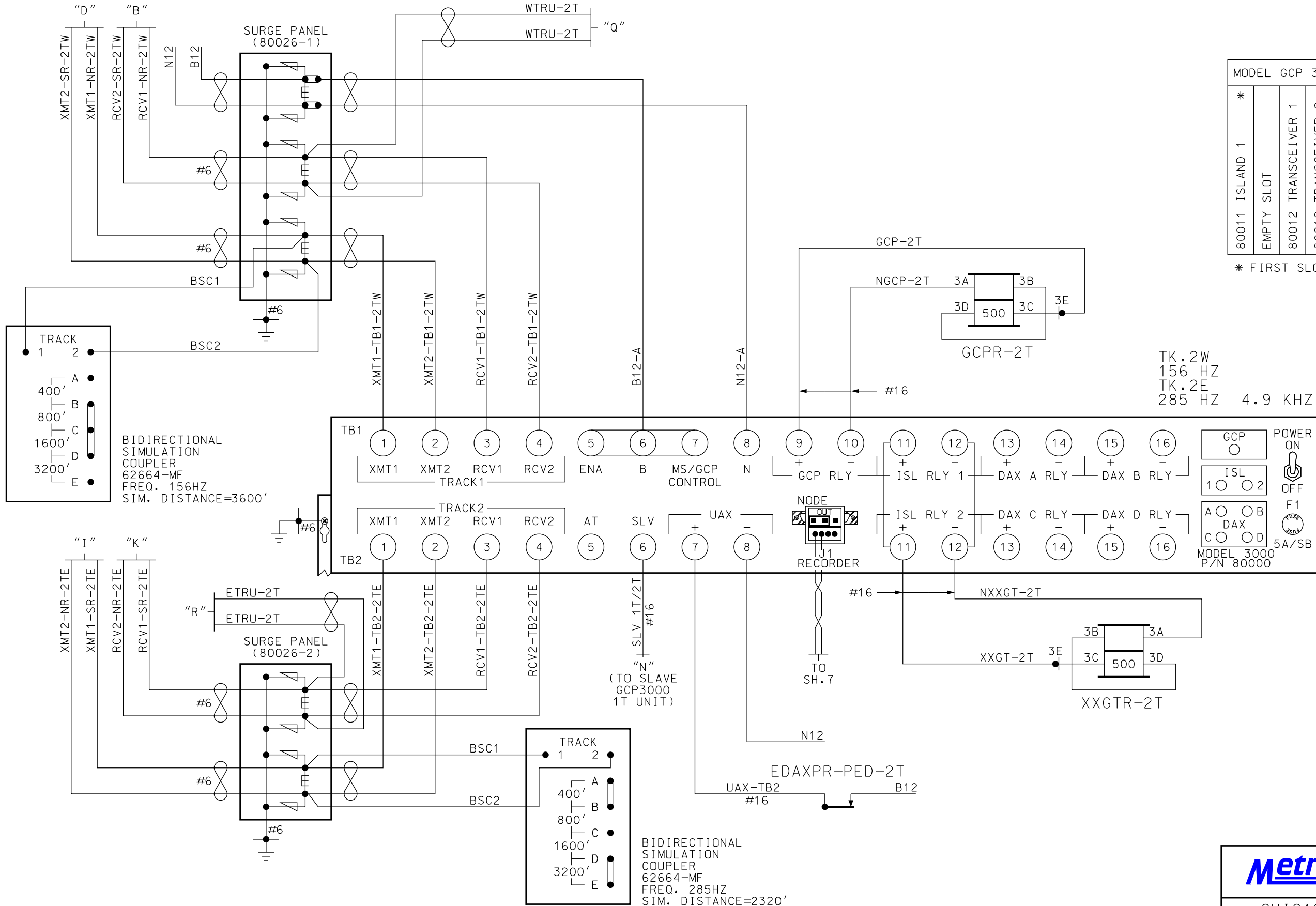
ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED

~REVISIONS~

Metra SIGNAL ENGINEERING
 CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
 PEDESTRIAN CROSSING
 HXP-3 TRACK 1

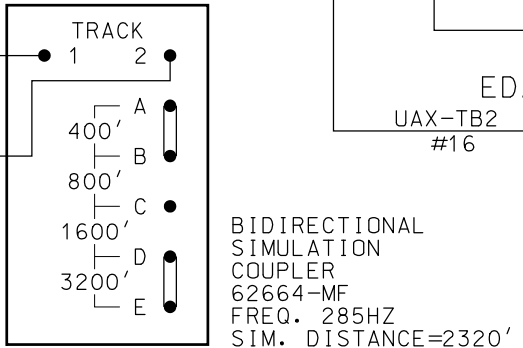
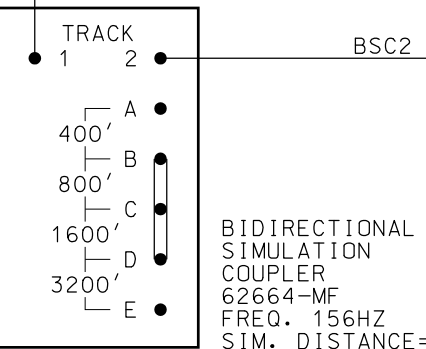
REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11		
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 8.74 SH.4	



MODEL GCP 3000 MODULE ASSEMBLIES									
80011	ISLAND 1	*							
	EMPTY SLOT								
80012	TRANSCEIVER 1								
80012	TRANSCEIVER 2								
80013	RELAY DRIVE								
80214	PROCESSOR								
80015	REC. MODULE								
	EMPTY SLOT								
	EMPTY SLOT								
80020/80019	INTERFACE								

* FIRST SLOT AT LEFT END OF BAY

TK.2W
156 HZ
TK.2E
285 HZ 4.9 KHZ



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
GCP 3000 - TRACK 2

REFERENCE: 8.74 SH.1 THRU SH.16 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	8.74 SH.5

022585-1X HEAVY DUTY SAFETRAN CLEARVIEW LIGHTNING ARRESTERS

ALL WIRING ON THIS SHEET #10 AWG UNLESS NOTED

GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

TK.2
GCP 3000 PROGRAMMING SYSTEM APPLICATION PARAMETERS

NUMBER OF TRACKS	2	
FREQUENCY	T1: 156 HZ	T2: 285 HZ
UNIDIRECTIONAL/BIDIRECTIONAL	T1: BI	T2: BI
XMIT LEVEL - MED/HI	T1: MAX	T2: MAX
PREDICTOR/MOTION SENSOR	T1: GCP	T2: GCP
WARNING TIME SELECTED	T1: 25 SEC	T2: 25 SEC
APPROACH DISTANCE	T1: 3476 FT	T2: 2200 FT
UAX PICKUP DELAY (UAX1)	SEC.	
ENA/UAX2 DELAY	SEC.	
ISLAND DISTANCE	T1: 120 FT	T2:
NUMBER OF DAX'S		
DAX A TRK/DIST/WARNING TIME	FT	SEC.
DAX B TRK/DIST/WARNING TIME	FT	SEC.
DAX C TRK/DIST/WARNING TIME	FT	SEC.
DAX D TRK/DIST/WARNING TIME	FT	SEC.
SLAVING MASTER/SLAVE	MASTER	
PASSWORD DISABLED/ENABLED	DISABLED	
RECORDER INSTALLED/NOT INSTALLED	NOT INSTALLED	
SWITCH TO MS	T1: EZ	T2: EZ
TRANSFER DELAY MS TO GCP	T1: SEC.	T2: SEC.
PRIME PREDICTION OFFSET	T1: FT	T2: FT
PICKUP DELAY PRIME	SEC.	
PICKUP DELAY DAX A	SEC.	
PICKUP DELAY DAX B	SEC.	
PICKUP DELAY DAX C	SEC.	
PICKUP DELAY DAX D	SEC.	
ENHANCED DETECT MODE	OFF	
BACK TO BACK	OFF	
STATION STOP TIMER	10 SEC.	
T1 # OF TRACK WIRES 4/6	4	
T2 # OF TRACK WIRES 4/6	4	
LOW EX ADJUSTMENT	0	
LOW EZ DETECTION	T1:	T2:
LOW EZ DETECTION TIMER	T1: MIN.	T2: MIN.
POSITIVE START (0 = OFF)	T1: EZ	T2: EZ
POSITIVE START TIMEOUT (0 = NONE)	T1: MIN.	T2: MIN.
SET AT OPERATION	NORMAL	
DIAGNOSTIC MESSAGES		
DAX MESSAGES		
ADVANCE PREEMPT TIMER	SEC.	

~REVISIONS~



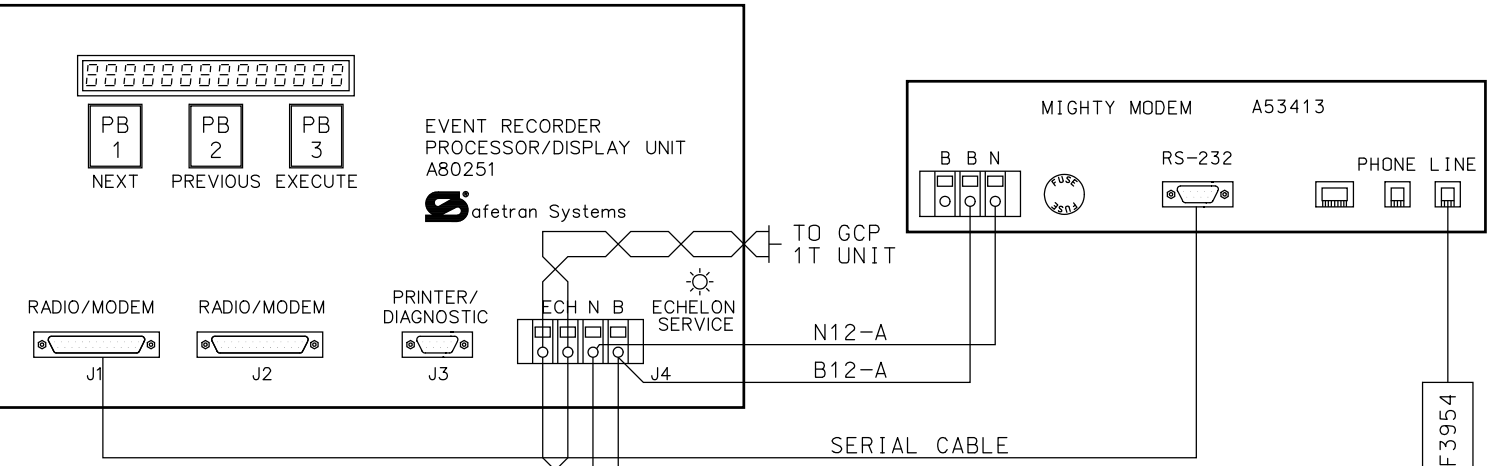
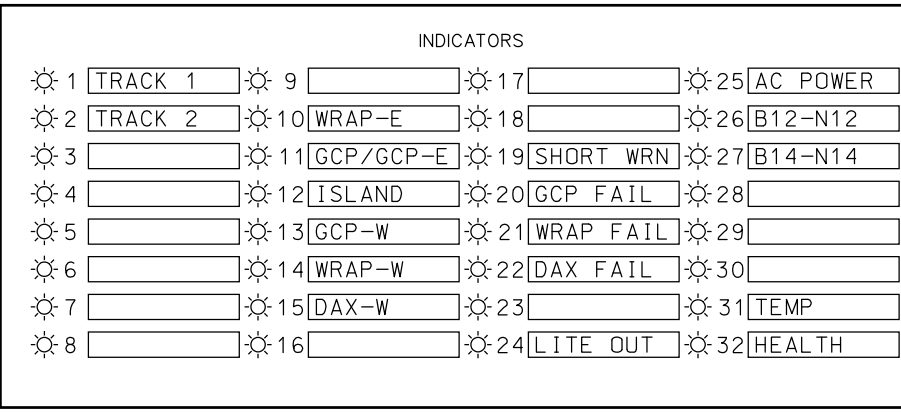
SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
GCP PROGRAMMING PARAMETERS

REFERENCE: 8.74 SH.1 THRU SH.16 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED

DISTRICT	PRINT NUMBER
TYP	8.74 SH.6



SEA/R PROGRAMMING CHART
CUSTOM FUNCTIONS

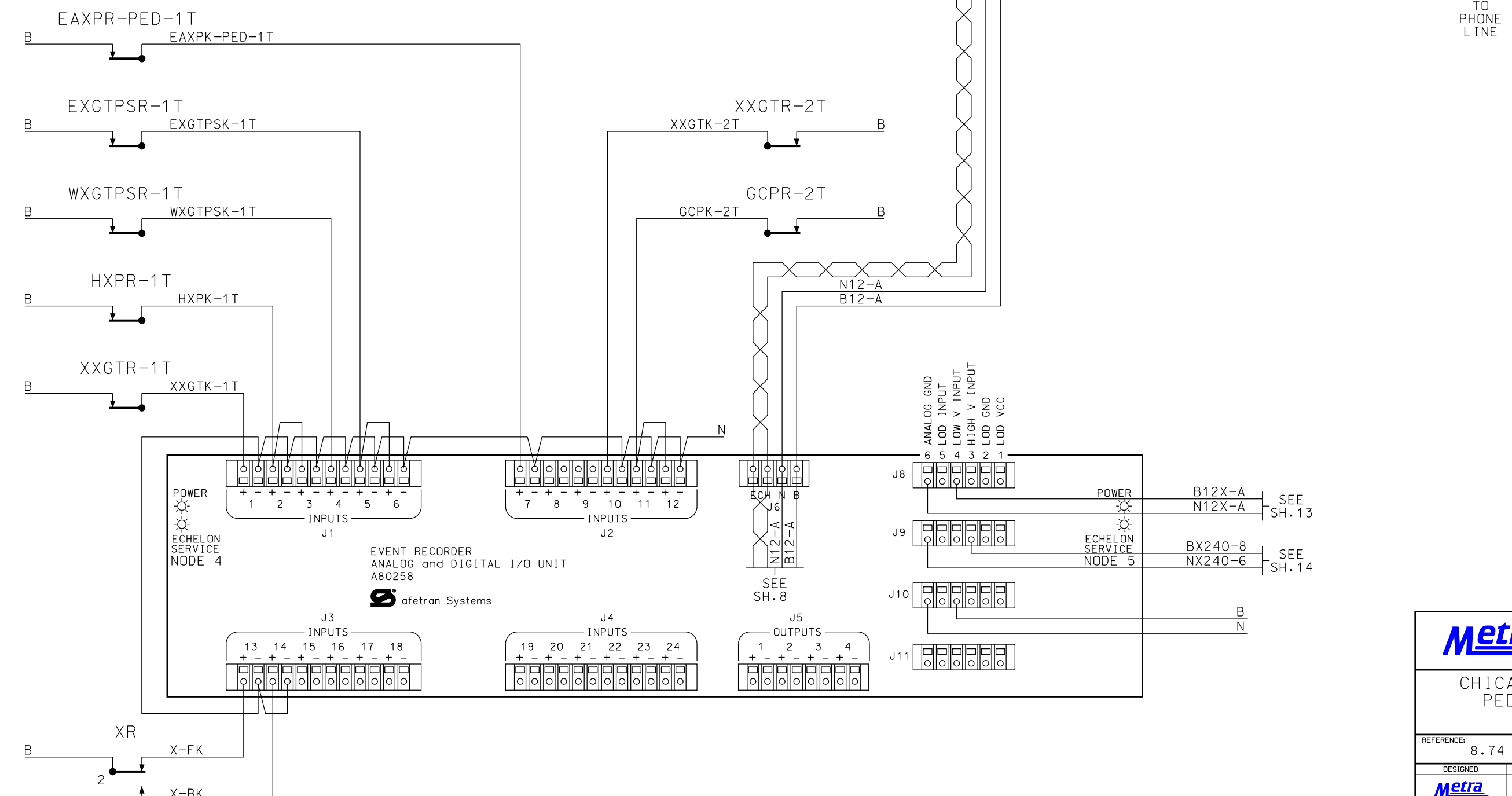
FUNCTION	ON/OFF
1 TRACK.ENA	ON
2 TRACK.ENA	ON
3 TRACK.ENA	OFF
4 TRACK.ENA	OFF
5 TRACK.ENA	OFF
6 TRACK.ENA	OFF
GATEALM.ENA	OFF
WRNTIME.ENA	ON
GCPFAIL.ENA	ON
HOLDDWN.ENA	OFF
LOD1.ENA	ON
LOD2.ENA	OFF
LOD3.ENA	OFF
LOD4.ENA	OFF
ACPOWER.ENA	ON
B12/N12.ENA	ON
B14/N14.ENA	ON
B/N.ENA	ON
MASTER	N/A
SLAVE	N/A

CUSTOM TIMERS

NAME	TIME
GATENOT.DN TMR	0 SEC.
WRN-1T.TIMER	20 SEC.
WRN-2T.TIMER	20 SEC.
WRN-3T.TIMER	0 SEC.
WRN-4T.TIMER	0 SEC.
WRN-5T.TIMER	0 SEC.
WRN-6T.TIMER	0 SEC.

NODE ASSIGNMENT

NODE	ASSIGNMENT
NODE 4	DIGITAL BOARD #1
NODE 5	ANALOG BOARD #1
NODE 6	GCP TRK #1
NODE 7	(NOT USED)
NODE 9	DIGITAL BOARD #2
NODE 10	ANALOG BOARD #2
NODE 12	GCP TRK #2
NODE 13	(NOT USED)



~REVISIONS~

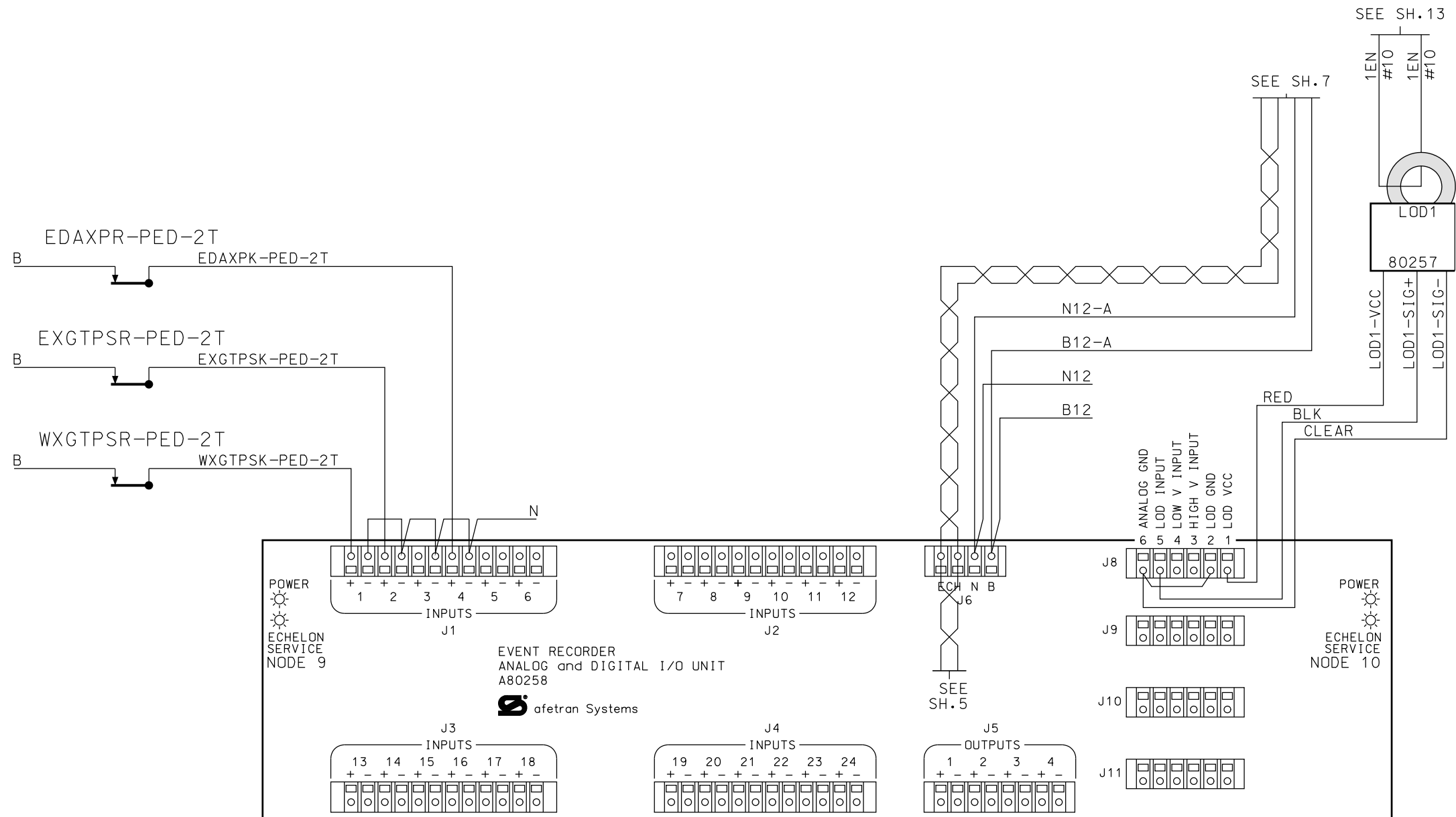
NO.	DESCRIPTION

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
DATA RECORDER

REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 8.74 SH.7

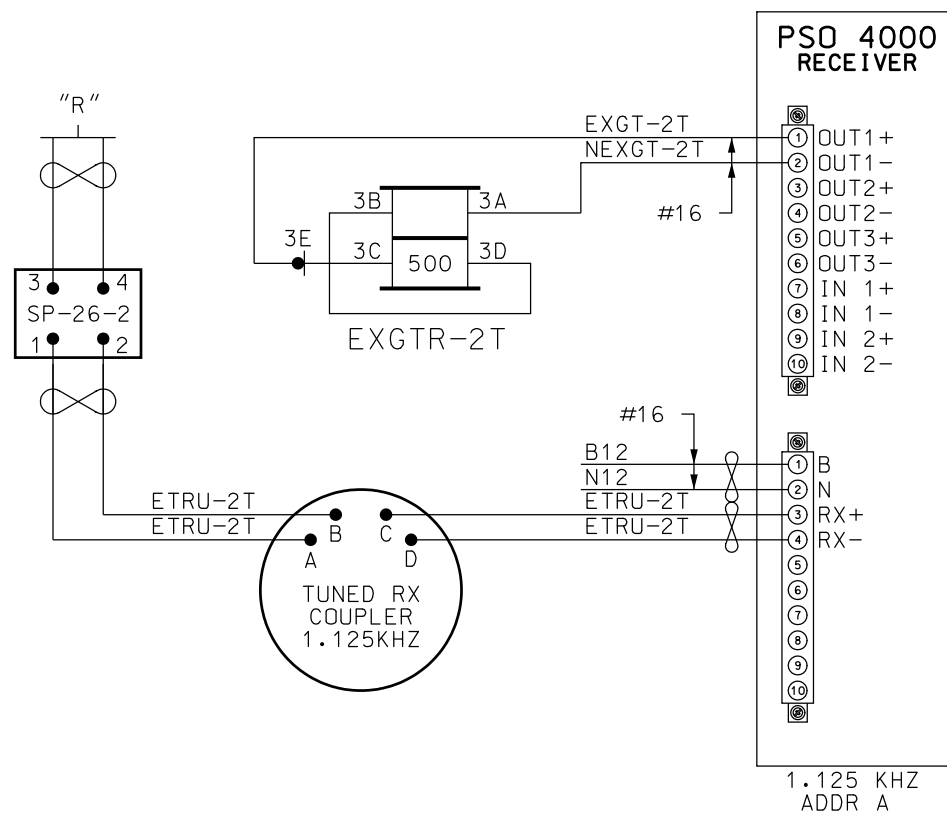
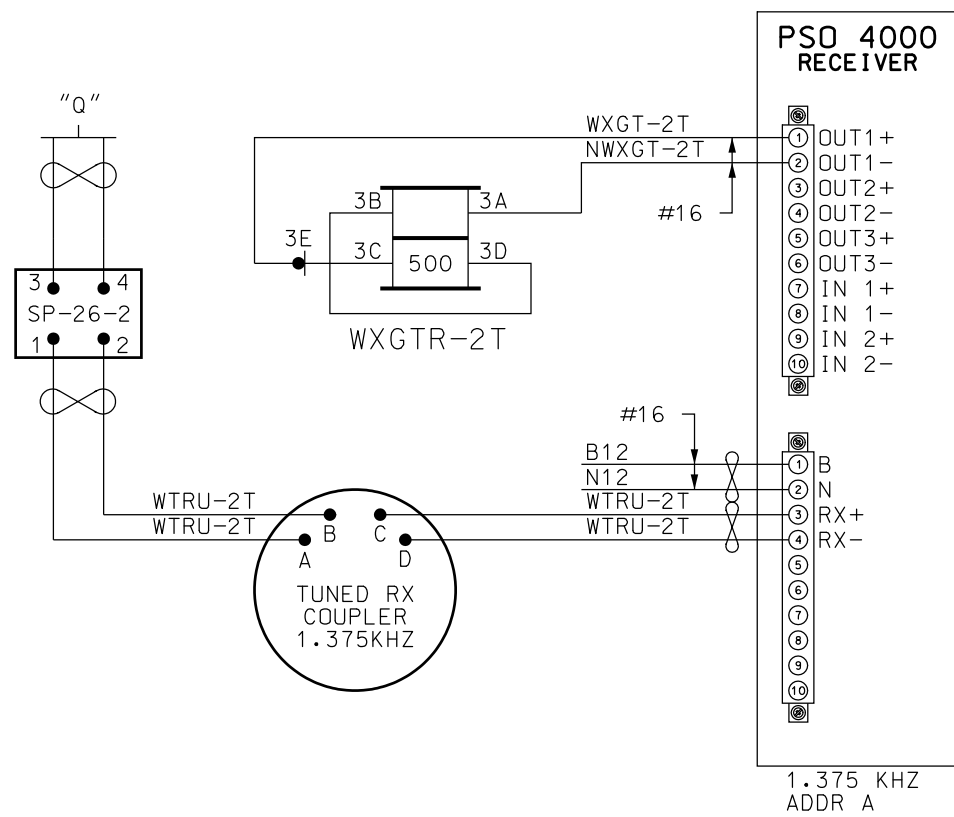
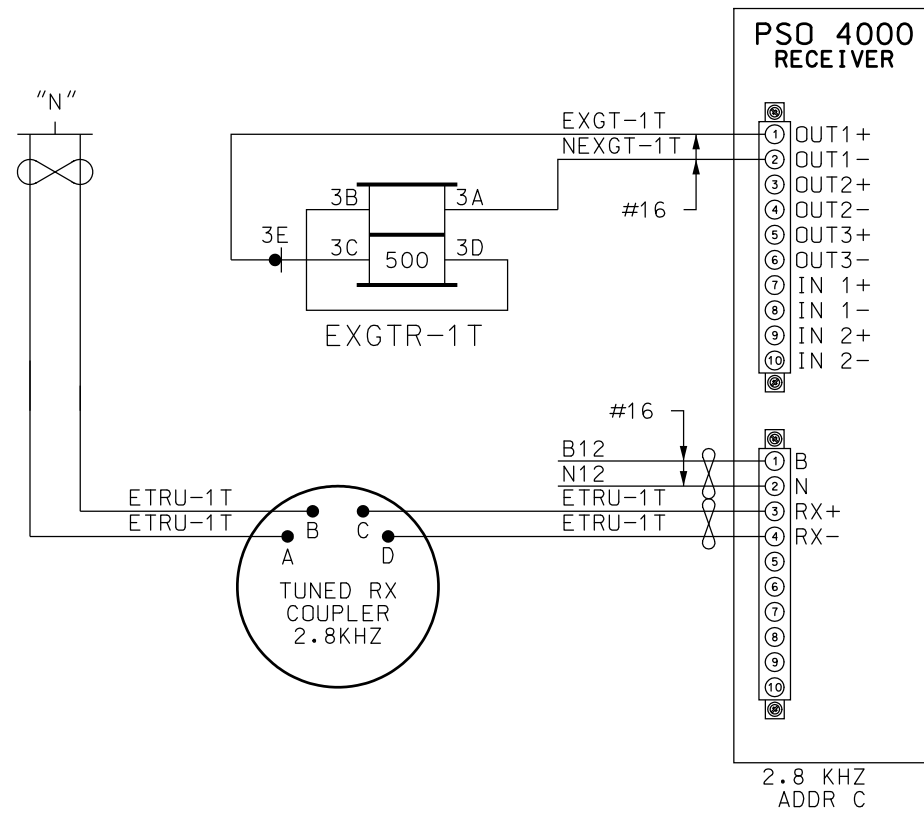
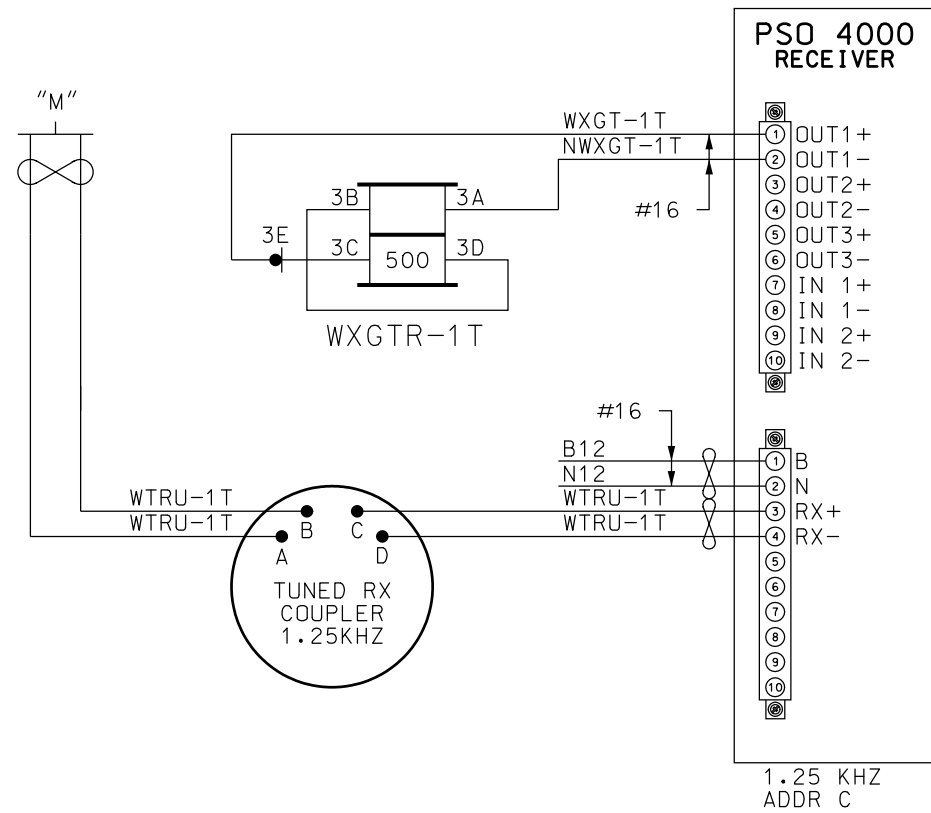
ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) PEDESTRIAN CROSSING DATA RECORDER	
REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 8.74 SH.8

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED



~REVISIONS~

LTK 01/25/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

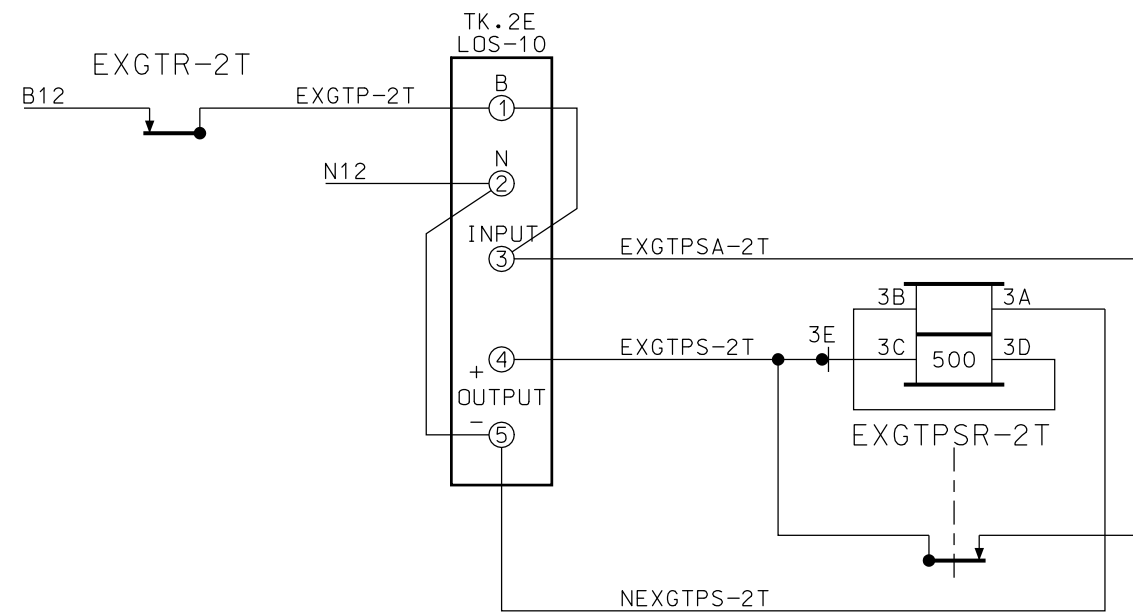
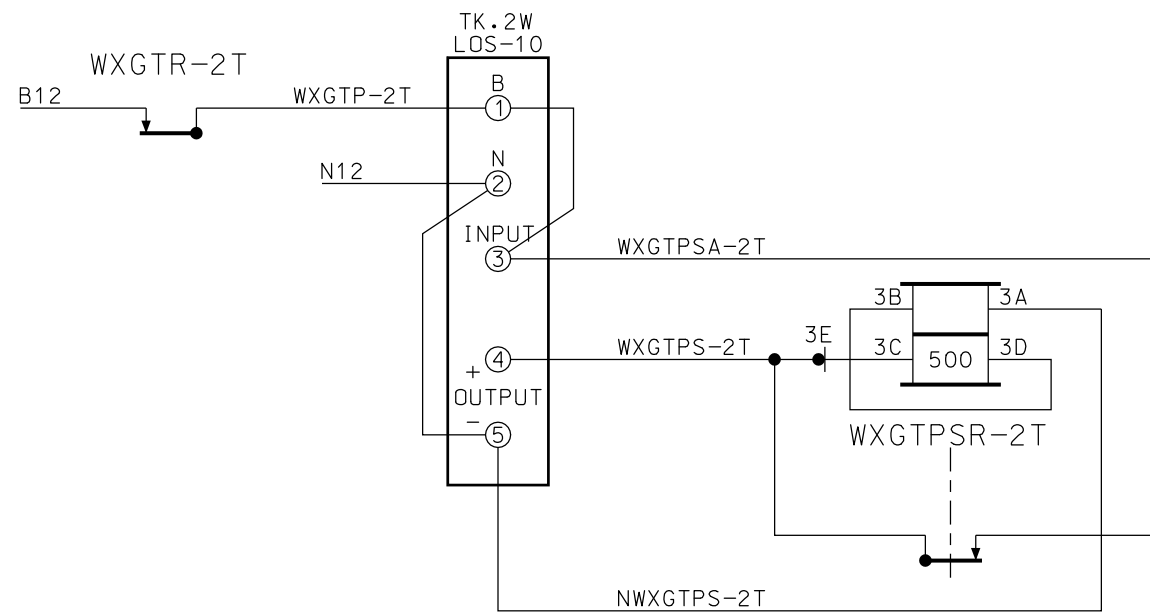
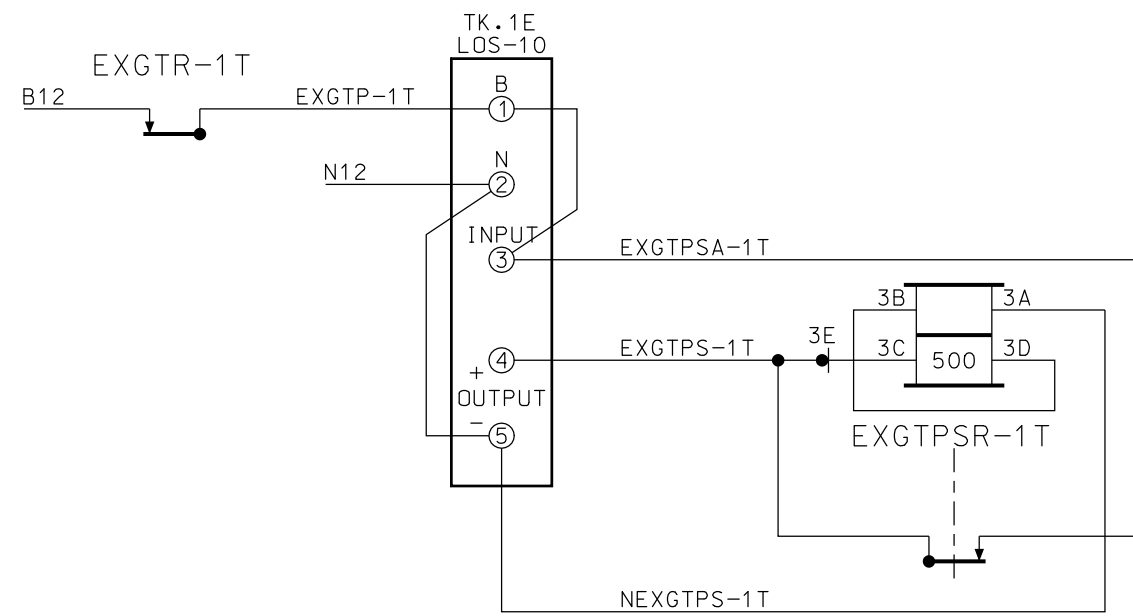
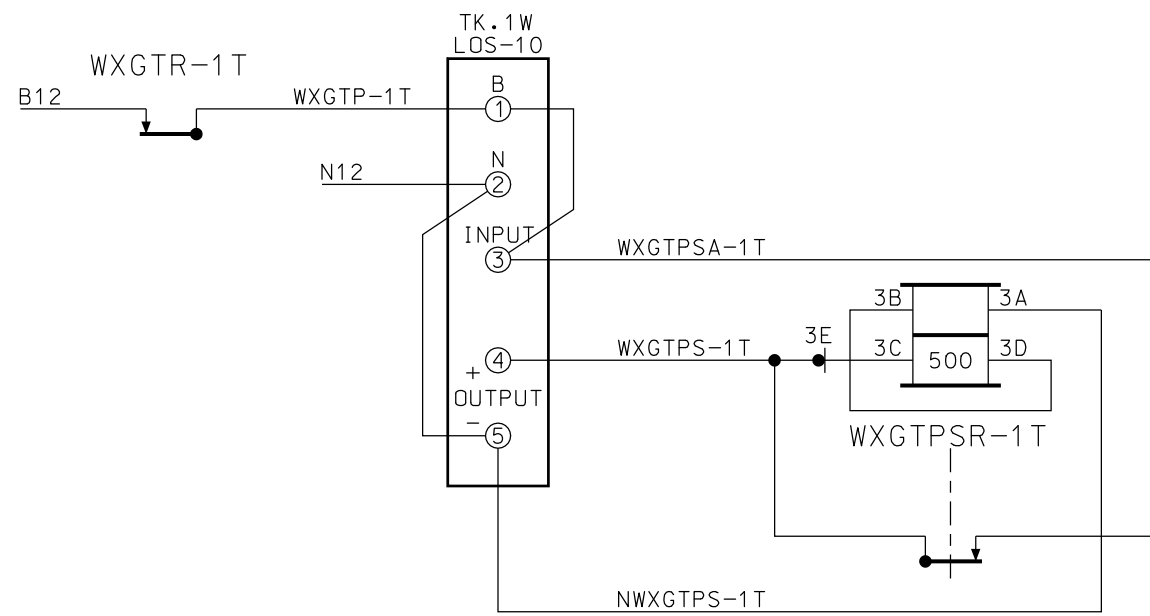
CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
PSO 4000

REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 8.74 SH.9
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ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED



~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

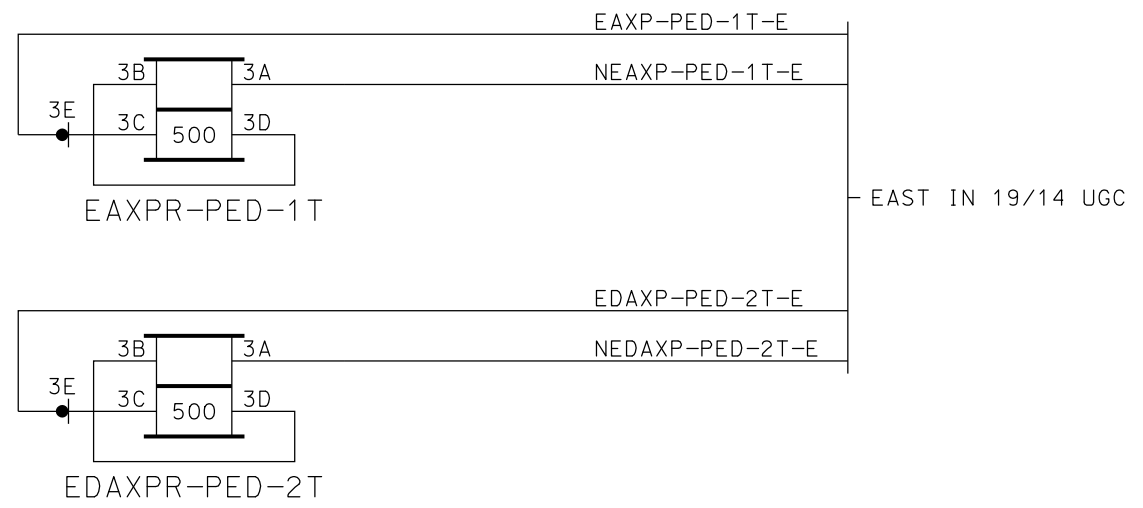
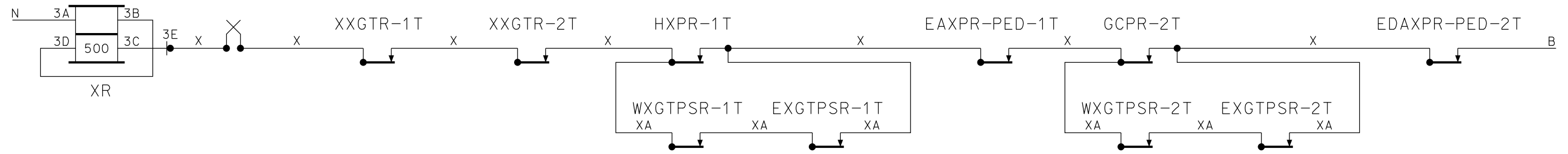
CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
LOSS OF SHUNT

REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 8.74 SH.10
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ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

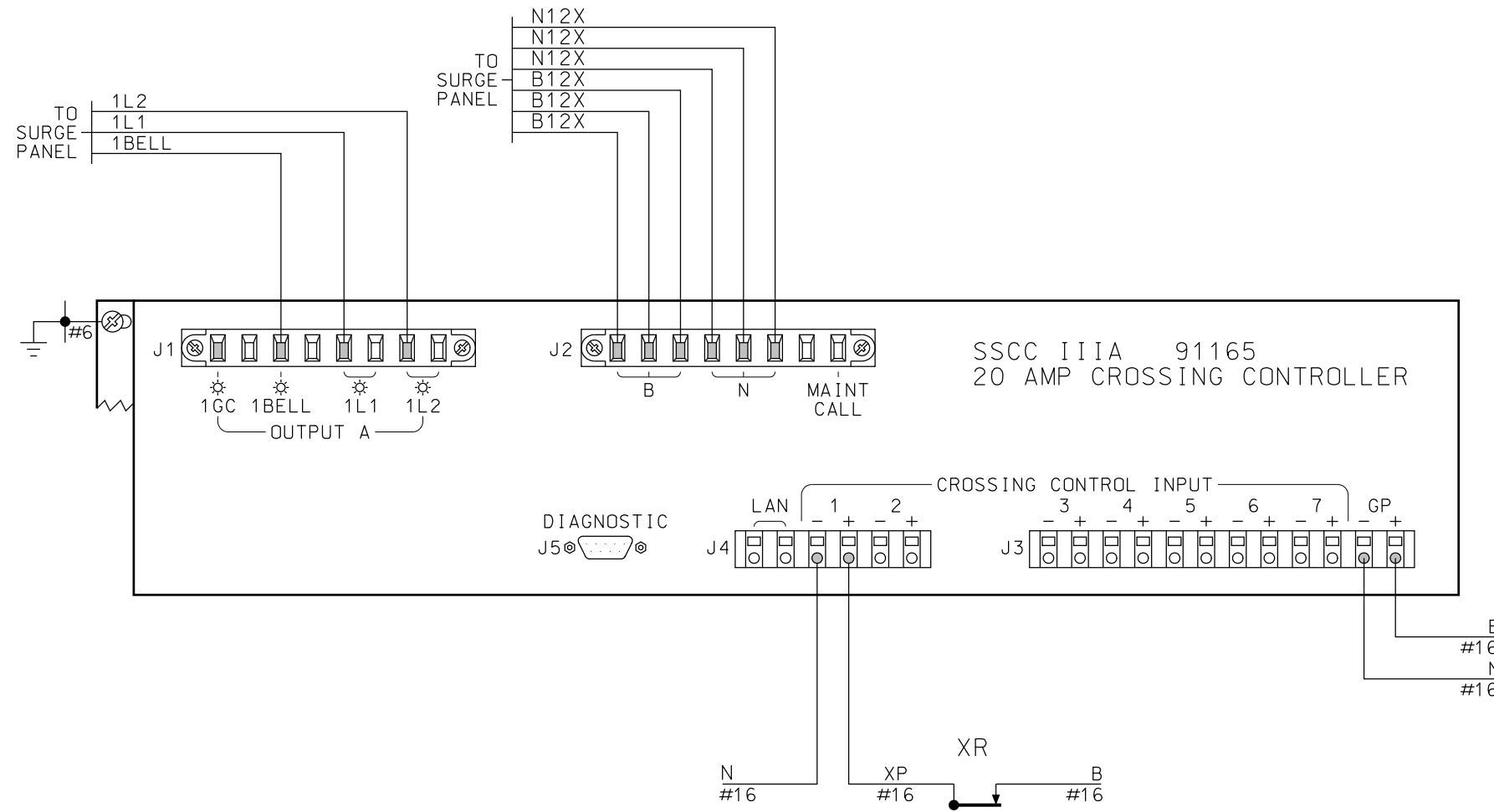


~REVISIONS~

SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) PEDESTRIAN CROSSING LINE CIRCUITS & XR			
REFERENCE:	8.74 SH.1 THRU SH.16	DATE:	05/13/11
DESIGNED	DRAWN	CHECKED	APPROVED
DISTRICT	PRINT NUMBER		
TYP	8.74 SH.11		

ALL WIRING ON THIS SHEET
#16 AWG UNLESS NOTED

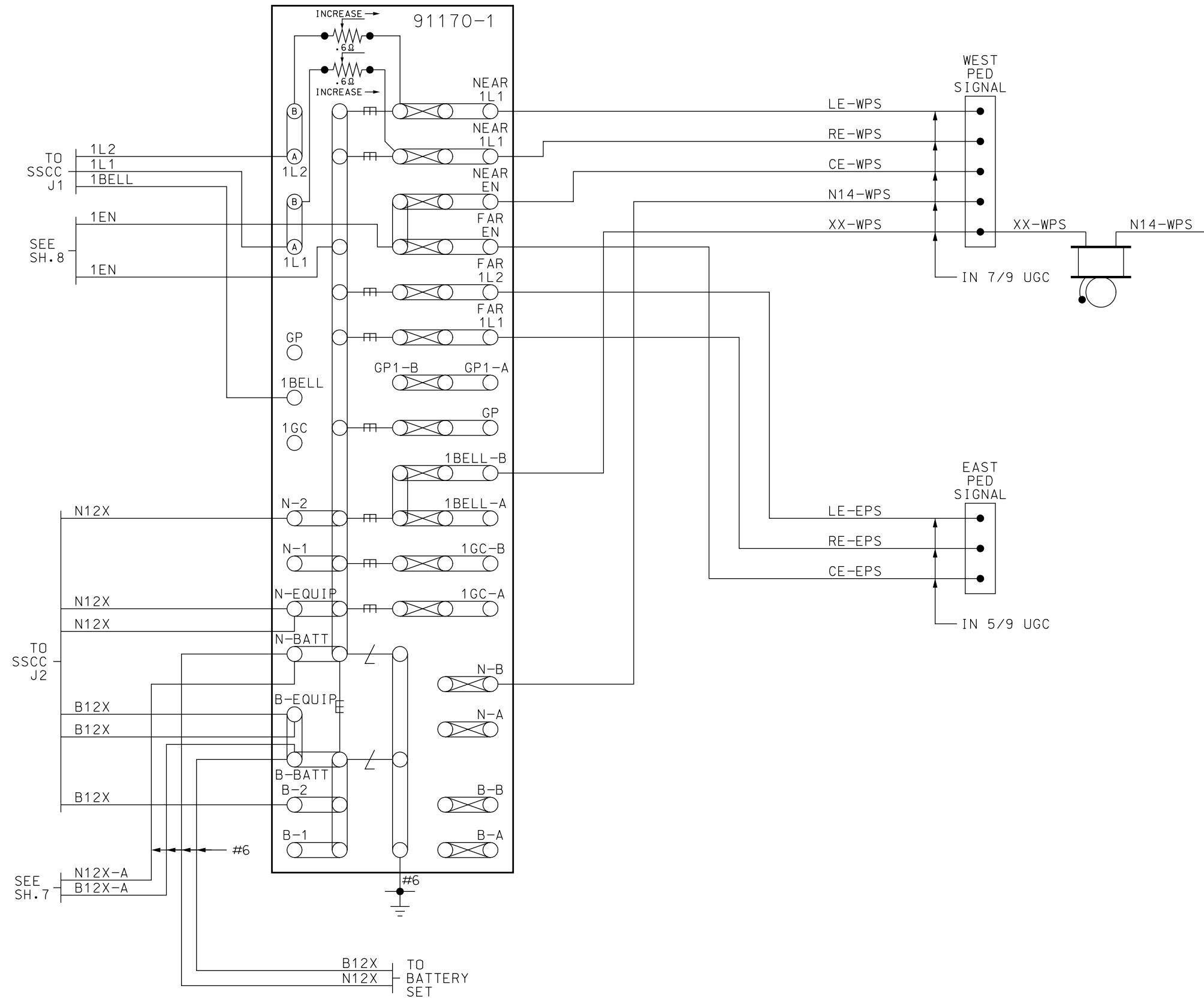
PROGRAM FLASH RATE: 55 PER MIN
 PROGRAM 1GC DELAY: 3 SEC
 PROGRAM ENABLED INPUTS: 1 THRU 1
 PROGRAM ENABLED OUTPUTS: A
 PROGRAM LOW BATTERY: DISABLED



~REVISIONS~	

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS	
CHICAGO TO (END OF LINE) PEDESTRIAN CROSSING CROSSING CONTROLLER	
REFERENCE: 8.74 SH.1 THRU SH.16	DATE: 05/13/11
DESIGNED Metra	DRAWN Metra
CHECKED Metra	APPROVED Metra
DISTRICT TYP	PRINT NUMBER 8.74 SH.12

ALL WIRING ON THIS SHEET
 #10 AWG UNLESS NOTED



~REVISIONS~

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
LIGHTING / SURGE PANEL

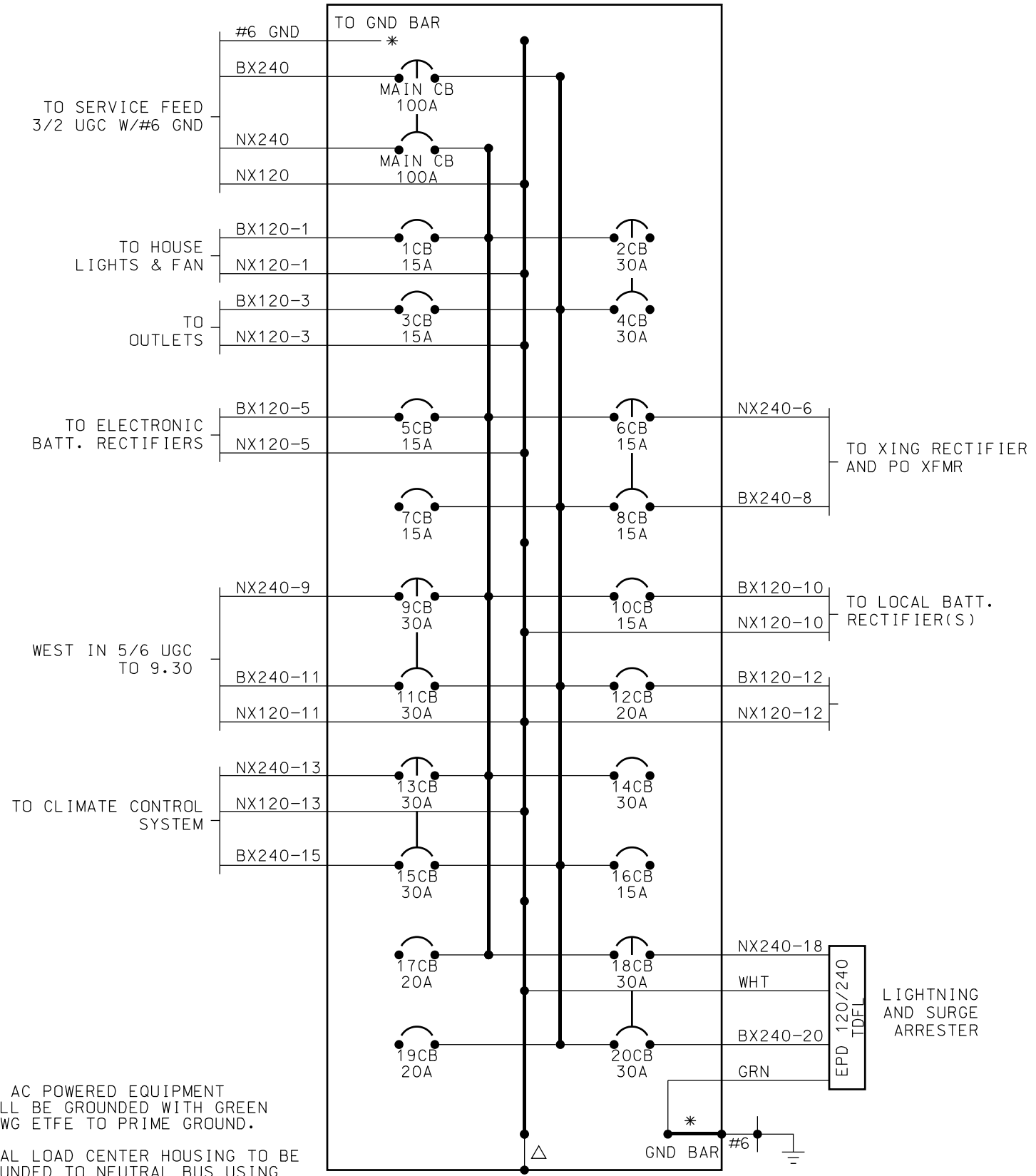
REFERENCE: 8.74 SH.1 THRU SH.16 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

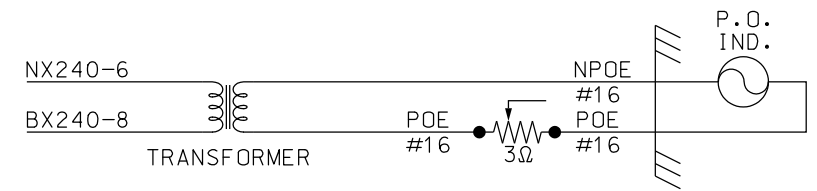
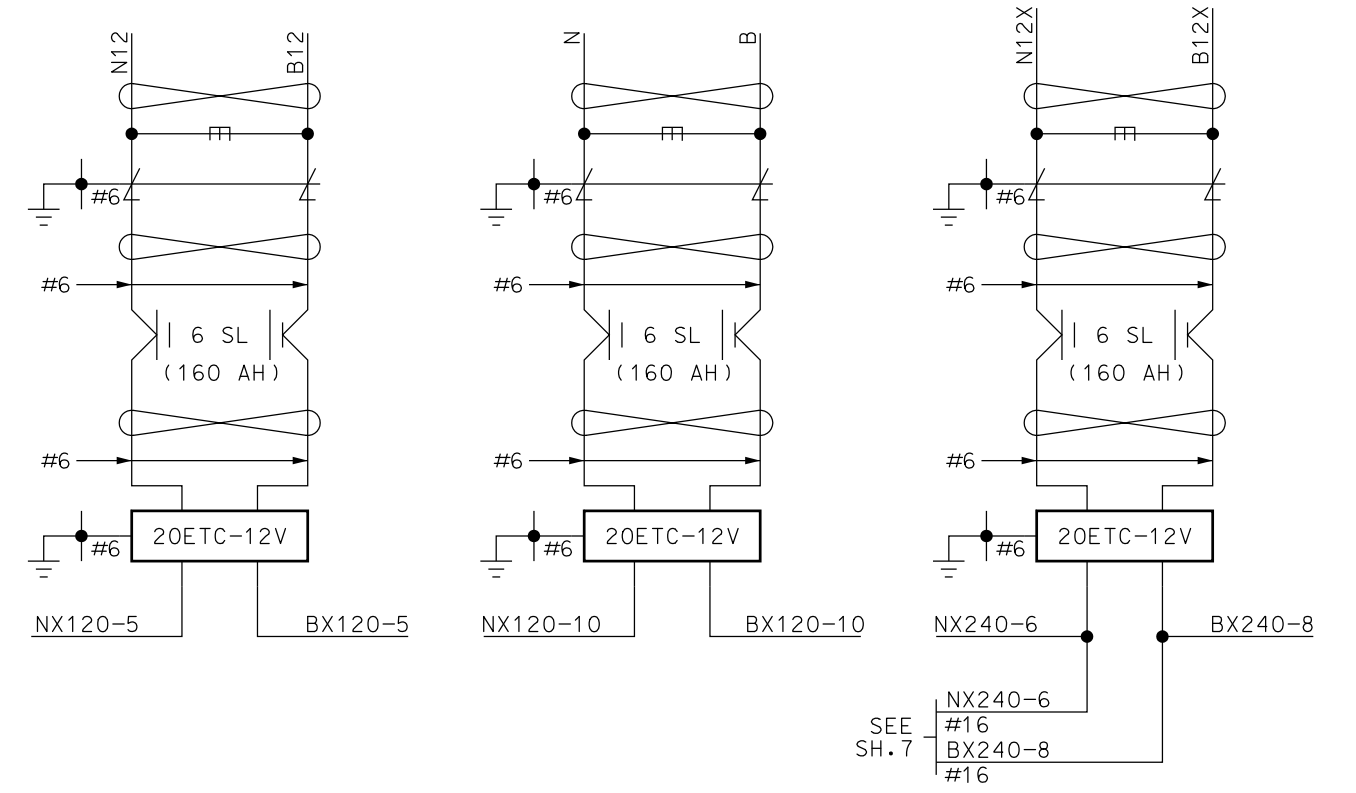
DISTRICT	PRINT NUMBER
TYP	8.74 SH.13

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

"SQUARE D" Q0120M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTA GROUND BAR



- NOTES:
- ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETFE TO PRIME GROUND.
 - △ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.
 - ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.
 - RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.
 - * METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.



~REVISIONS~	
LTK 03/22/13	

Metra SIGNAL ENGINEERING CHICAGO, ILLINOIS			
CHICAGO TO (END OF LINE) PEDESTRIAN CROSSING POWER DISTRIBUTION			
REFERENCE:	8.74 SH.1 THRU SH.16		DATE:
DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra
DISTRICT	PRINT NUMBER		
TYP	8.74 SH.14		

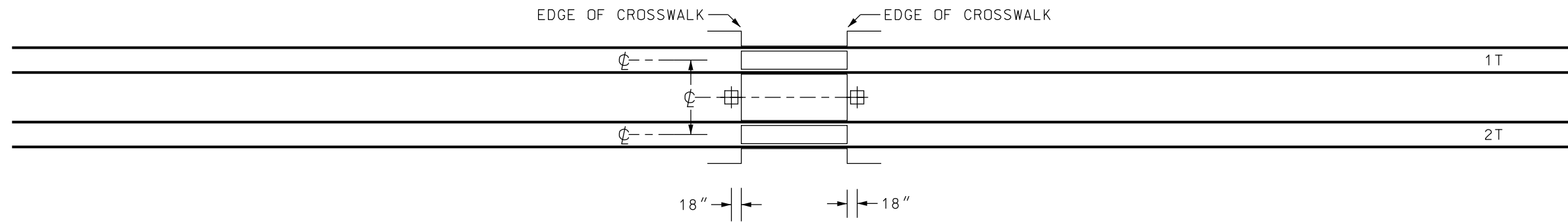
ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

461+33 ⌀
PED. CROSSING



← TO CONTROL POINT (WEST)

TO CONTROL POINT (EAST) →



ENLARGED VIEW OF PEDESTRIAN CROSSINGS
SHOWING LOCATION OF SIGNAL FOUNDATIONS
~ NOT TO SCALE ~

~REVISIONS~

⊕ STANDARD PEDESTRIAN
FLASHER FOUNDATION



SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
ENLARGED VIEW

REFERENCE: 8.74 SH.1 THRU SH.16 DATE: 05/13/11

DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 8.74 SH.15
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START OF 2897' EASTWARD AFO WRAP CIRCUITS ON BOTH MAINS

START OF 3476' EASTWARD CWTd CIRCUITS ON BOTH MAINS

475+20 MP

461+33 ϕ PED. XING

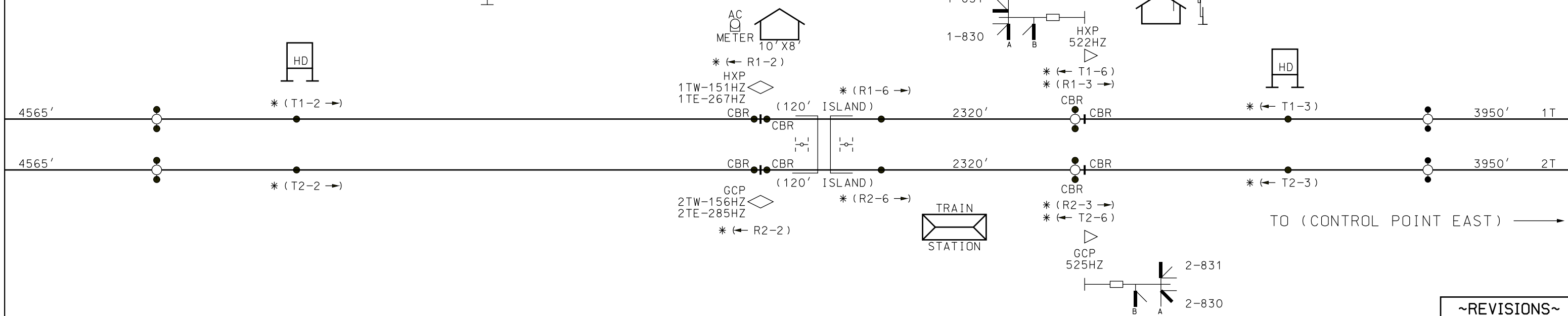
460+73 C.S.

461+93 C.S.

438+73 SIG.

START OF 2897' WESTWARD AFO WRAP CIRCUITS ON BOTH MAINS

← TO (CONTROL POINT WEST)



EW & WW APPROACH - 1T & 2T AT 79 MPH	
MIN. WARNING TIME	= 20 SEC
WIDE XING TIME	= 0 SEC
REACTION TIME	= 5 SEC
RESPONSE TIME	= 5 SEC
APPROACH LENGTH	= 3476 FT.

- NOTES:
- NARROW BAND SHUNT
 - SEMI-BIDIRECTIONAL APPLICATION
 - GCP3000 *** HZ SAFETRAN GRADE CROSSING PREDICTOR
 - CWTd CONSTANT WARNING TIME DEVICE
 - * (T) PSD 4000 AFTAC TRANSMITTER
 - * (R) PSD 4000 AFTAC RECEIVER

~REVISIONS~

LTK 01/25/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PEDESTRIAN CROSSING
EXHIBIT

REFERENCE: 8.74 SH.1 THRU SH.16		DATE: 05/13/11	
DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
DISTRICT TYP		PRINT NUMBER 8.74 SH.16	

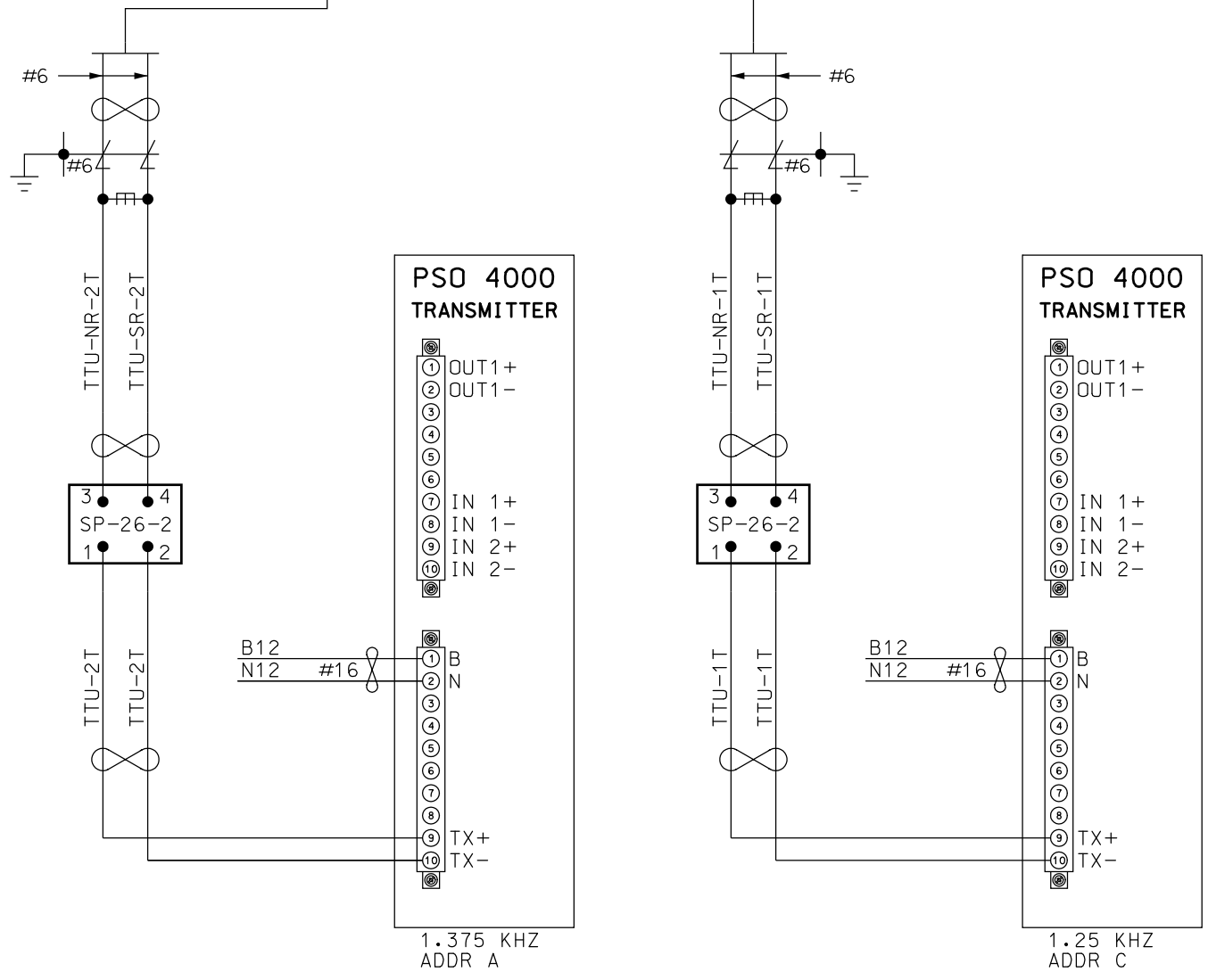
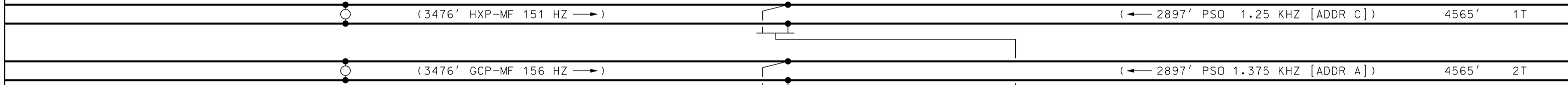
496+69
(SHUNT) 114HZ
PED. CROSSING

490+90 C.S.

← TO (CONTROL POINT WEST)

TO (CONTROL POINT EAST) →

LOCATION WEST



NOTES:

PRIME GROUND

TWISTED PAIR

(← 3476' HXP-MF 151 HZ)

↑ FREQUENCY

↑ LENGTH OF CIRCUIT

↑ DIRECTION TO TRANSMITTER

TO HD CASE

5/6 UGC

EAST TO 8.74

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED

~REVISIONS~

LTK 01/25/13

8.74

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

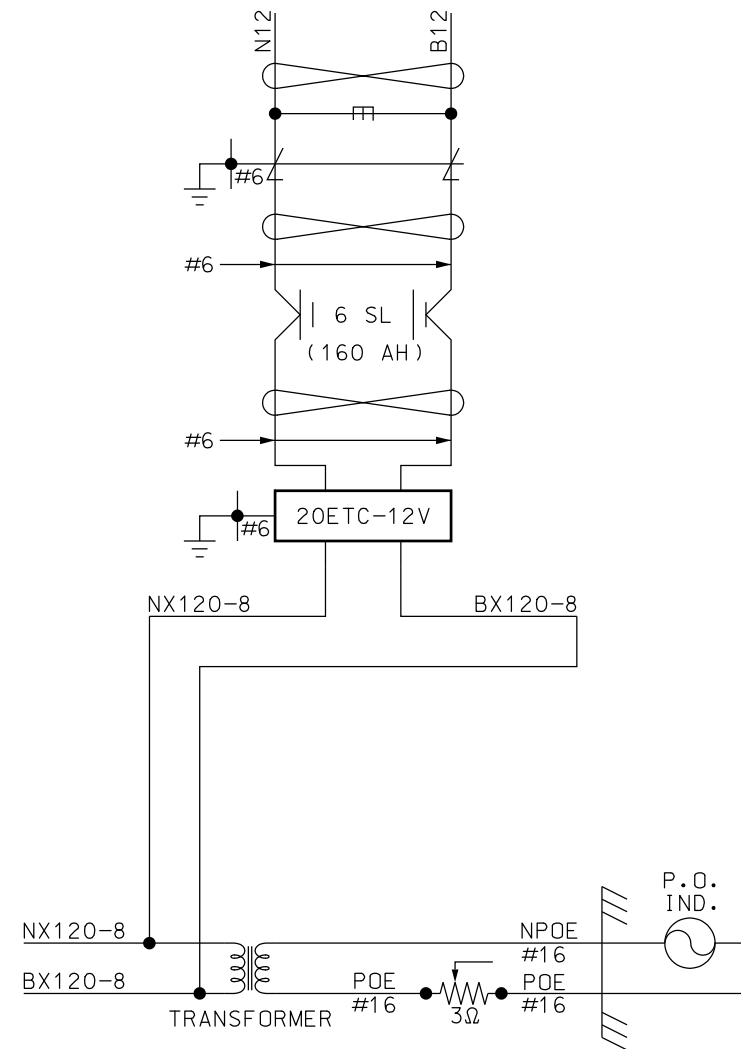
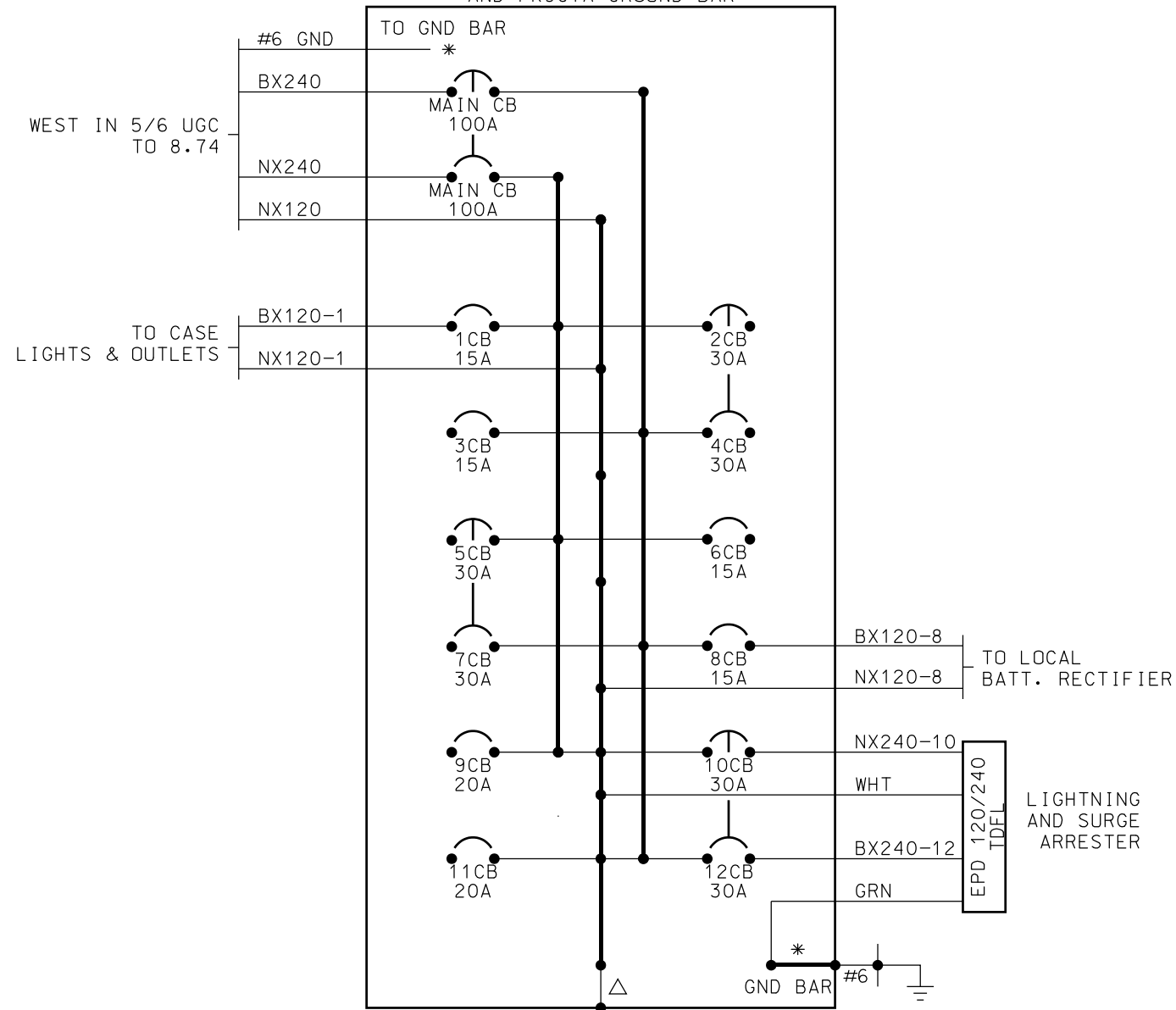
CHICAGO TO (END OF LINE)
PSO 4000 CUT-SECTION
PLAN VIEW

REFERENCE: 9.30 SH.1 & SH.2	DATE: 05/13/11
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DESIGNED Metra	DRAWN Metra	CHECKED Metra	APPROVED Metra
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DISTRICT TYP	PRINT NUMBER 9.30 SH.1
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"SQUARE D" Q0112M100C LOAD CENTER
WITH Q0C20U100S COVER
AND PK9GTGTA GROUND BAR



NOTES:

ALL AC POWERED EQUIPMENT SHALL BE GROUNDED WITH GREEN 6 AWG ETE TO PRIME GROUND.

△ METAL LOAD CENTER HOUSING TO BE GROUNDED TO NEUTRAL BUS USING LONG SCREW PROVIDED.

ONE WIRE TO EACH CB. A MAXIMUM OF TWO MAY BE USED IF NECESSARY.

RUN ALL LOAD CENTER WIRES THROUGH INSULATED GROMMETS.

* METAL LOAD CENTER HOUSING AND GROUND CONNECTIONS TO BE CONNECTED TO GND BAR.

~REVISIONS~

LTK 03/22/13

Metra SIGNAL ENGINEERING
CHICAGO, ILLINOIS

CHICAGO TO (END OF LINE)
PSD 4000 CUT-SECTION
POWER DISTRIBUTION

REFERENCE: 9.30 SH.1 & SH.2 DATE: 05/13/11

DESIGNED	DRAWN	CHECKED	APPROVED
Metra	Metra	Metra	Metra

DISTRICT	PRINT NUMBER
TYP	9.30 SH.2

ALL WIRING ON THIS SHEET
#10 AWG UNLESS NOTED