PA PUBLIC UTILITY COMMISSION
APR 20 2013
BUREAU OF TRANSPORTATION & SAFETY
RAIL SAFETY DIVISION

RECEIVED
2013 MAY 17 PM 4: 30
PA.P.U.C.
SECRETARY'S BUREAU

ALL NEW WORK.
INSTALL AND CHECK
AS A WHOLE

REVISIONS

1	APRIL 15, 2013	JMB

NEW CROSSING WARNING SYSTEM DESIGN FOR MERMON AVENUE CROSSING.

DOT • 361-486A
PUC DOCKET • C-2012-2291457
IN SERVICE:
PER:

INDEX		REVISIONS									
		1	2	3	4	5	6	7	8	9	10
1	TITLE, INDEX & REVISIONS	✓									
2	LOCATION PLAN	✓									
3	POWER DISTRIBUTION	✓									
4	TRAIN DETECTION CIRCUITS	✓									
5	GCP 3000 PARAMETERS	✓									
6	FLASHING LIGHT CIRCUITS	✓									
7	GATE CONTROL CIRCUITS										
8	BUNGALOW LAYOUT										
9											
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11											
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13											
14											
15											

0501.1180.001.dgn

MERMON AVENUE - NESQUEHONING, PA.
AUTOMATIC HIGHWAY CROSSING
WARNING DEVICES

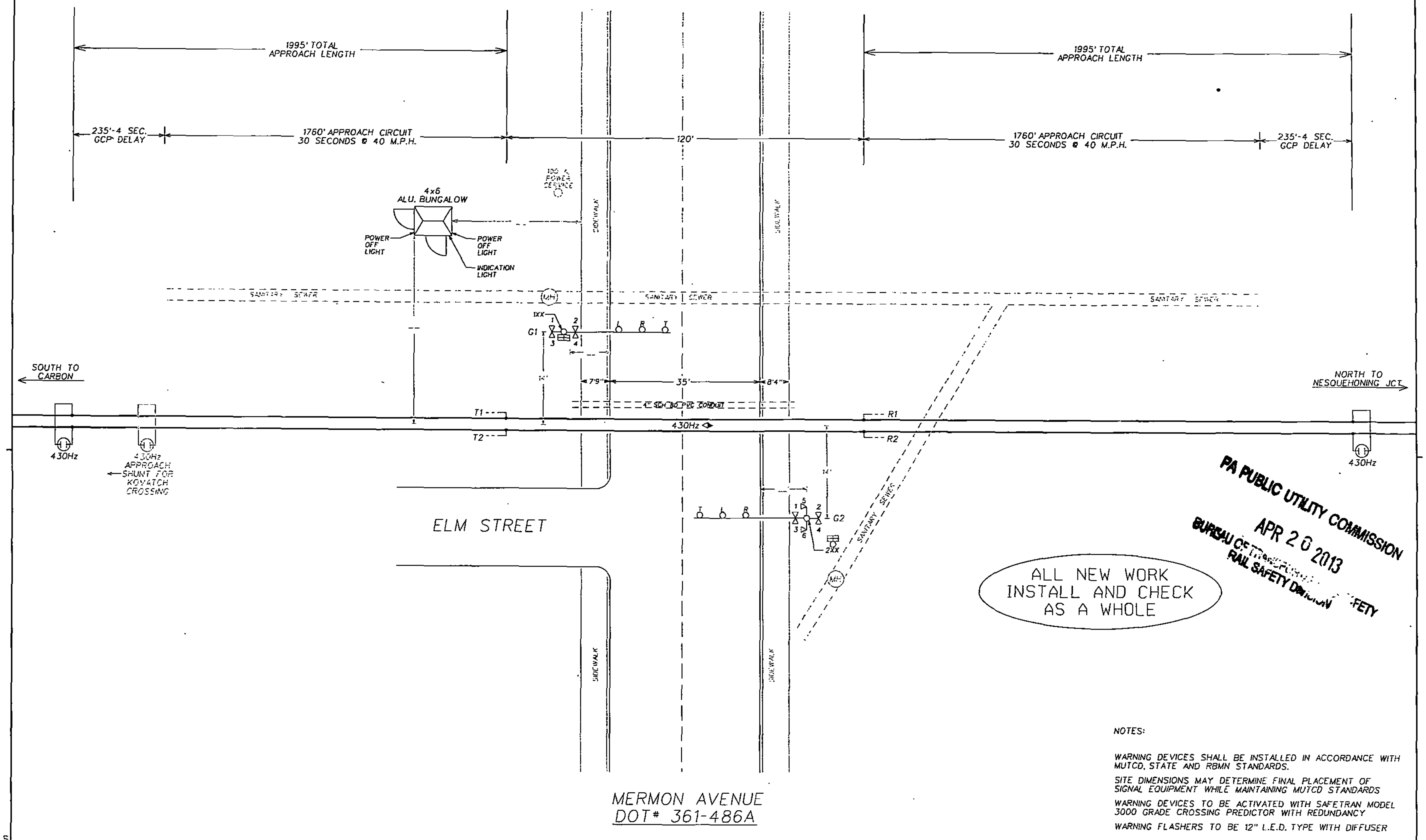
TITLE, INDEX & REVISIONS

LOCATION:	NESQUEHONING, PA
LINE/BRANCH:	MAIN LINE
MILEPOST:	118.0

ISSUE DATE:
APRIL 15, 2013

REV. 1	4-15-13
PLAN:	0501-1180
SHEET	1

"The Road of Anthracite"
The Reading & Northern RR



ALL NEW WORK
INSTALL AND CHECK
AS A WHOLE

PA PUBLIC UTILITY COMMISSION
APR 26 2013
BUREAU OF TRANSPORTATION AND SAFETY
RAIL SAFETY DIVISION

NOTES:

WARNING DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH MUTCD, STATE AND RBMN STANDARDS.

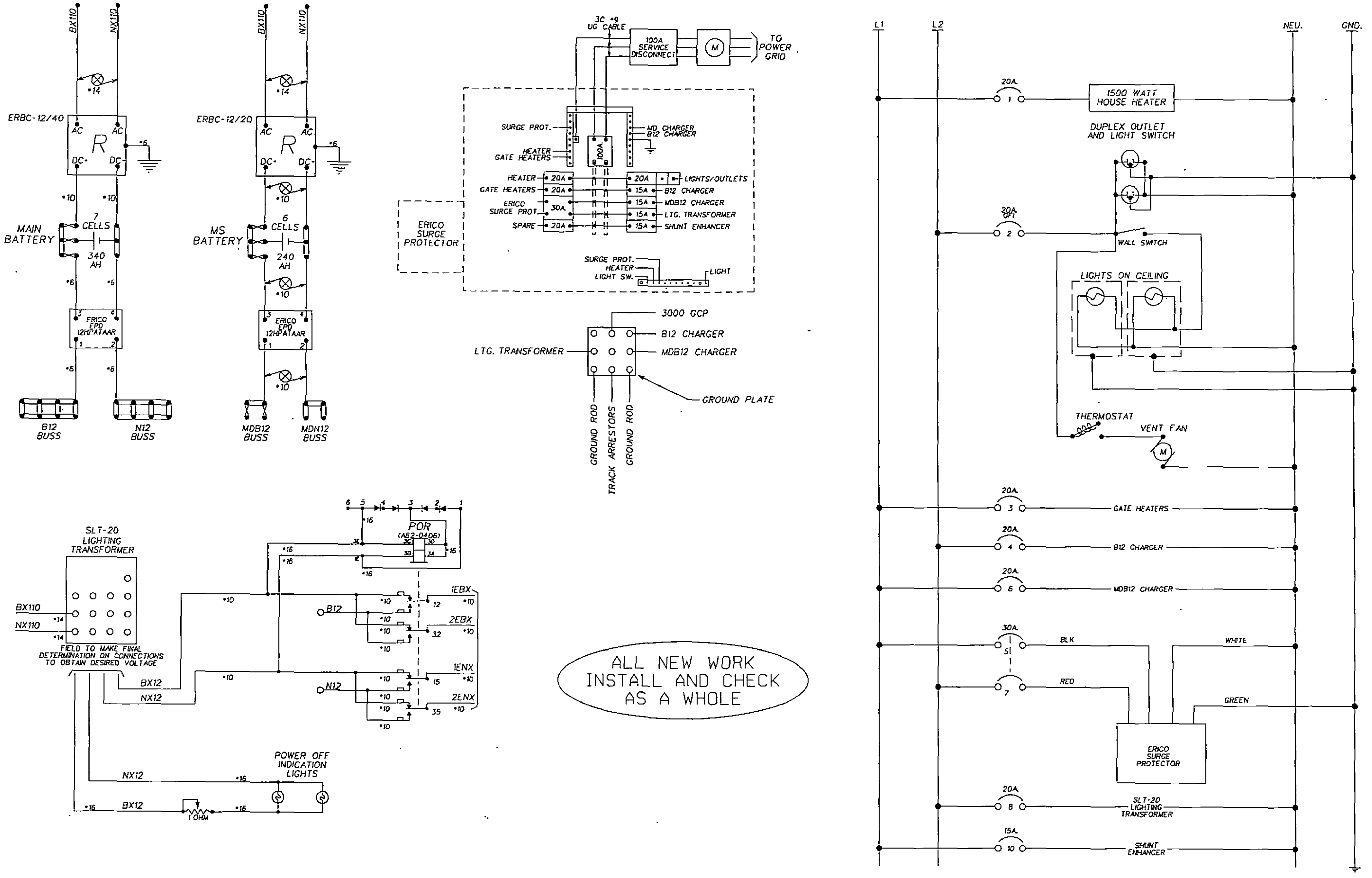
SITE DIMENSIONS MAY DETERMINE FINAL PLACEMENT OF SIGNAL EQUIPMENT WHILE MAINTAINING MUTCD STANDARDS

WARNING DEVICES TO BE ACTIVATED WITH SAFETRAN MODEL 3000 GRADE CROSSING PREDICTOR WITH REDUNDANCY

WARNING FLASHERS TO BE 12" L.E.D. TYPE WITH DIFFUSER

MERMON AVENUE - NESQUEHONING, PA AUTOMATIC HIGHWAY CROSSING WARNING DEVICES	LOCATION PLAN	LOCATION:	NESQUEHONING, PA	ISSUE DATE: APRIL 15, 2013	"The Road of Anthracite" The Reading & Northern RR
		LINE/BRANCH:	MAIN LINE	REV. 1: 4-15-13	
		MILEPOST:	118.0	PLAN: 0501-1180 SHEET: 2	

0501.1180.002.dgn



ALL NEW WORK
INSTALL AND CHECK
AS A WHOLE

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MERMON AVENUE - NESQUEHONING, PA
AUTOMATIC HIGHWAY CROSSING
WARNING DEVICES

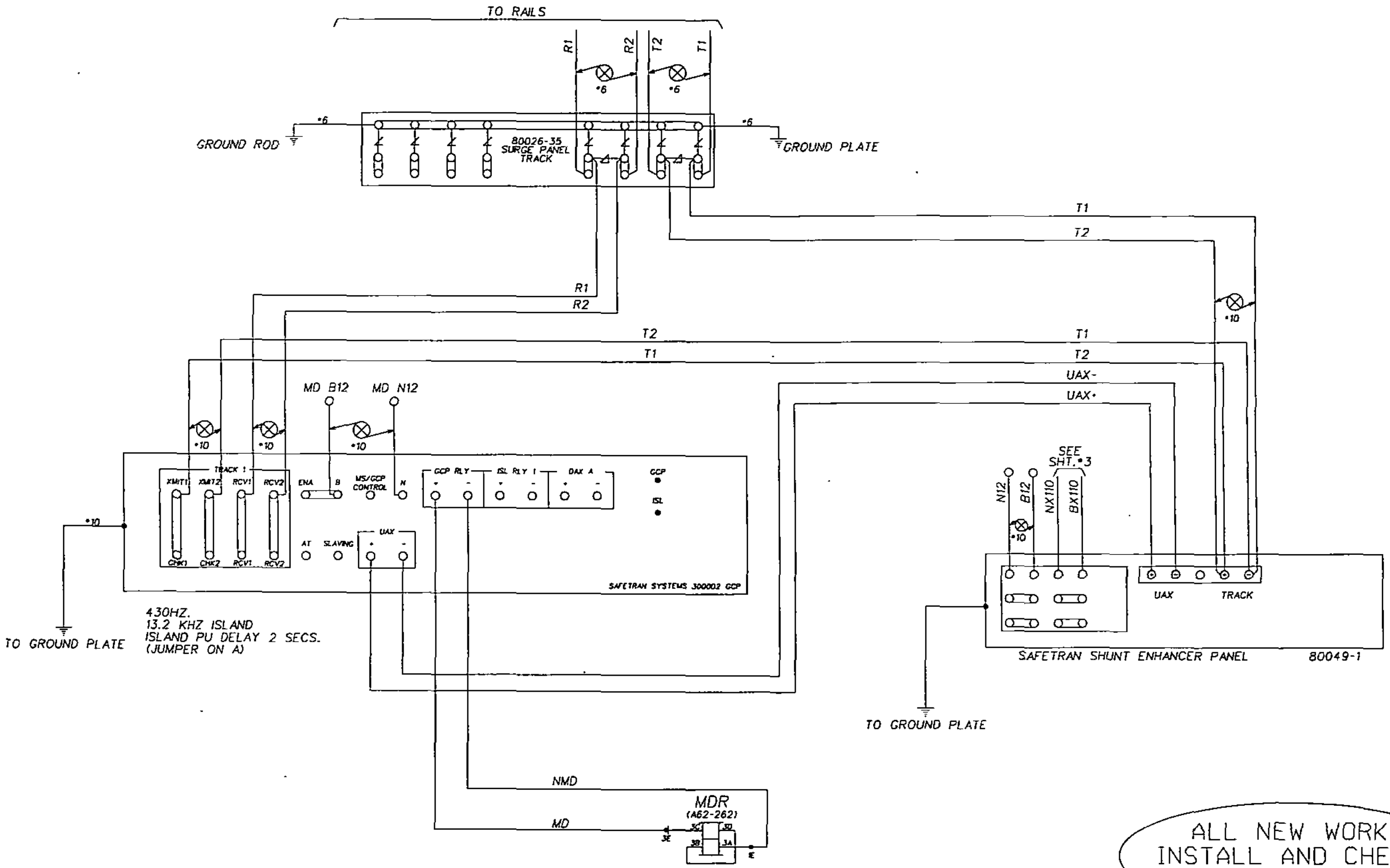
POWER DISTRIBUTION

LOCATION:	NESQUEHONING, PA
LINE/BRANCH:	MAIN LINE
MILEPOST:	118.0

ISSUE DATE:
APRIL 15, 2013

REV. 1	4-15-13
PLAN:	0501-1180
SHEET	3

"The Road of Anthracite"
The Reading & Northern RR



NOTES: ALL WIRING TO BE •16
UNLESS OTHERWISE NOTED

ALL NEW WORK
INSTALL AND CHECK
AS A WHOLE

MERMON AVENUE - NESQUEHONING, PA
AUTOMATIC HIGHWAY CROSSING
WARNING DEVICES

TRAIN DETECTION CIRCUITS

LOCATION:	NESQUEHONING, PA
LINE/BRANCH:	MAIN LINE
MILEPOST:	118.0

ISSUE DATE:
APRIL 15, 2013

REV. 1	4-15-13
PLAN:	0501-1180
SHEET	4

"The Road of Anthracite"
The Reading & Northern RR

3000 GCP APPLICATION HISTORY CARD
(For Units equipped with Processor Module 80014, 80044, or 80214)

Equipment: 3000☐ 3000D2☐ 3000D2L☐ 3000ND☐ 3000ND2☐ 3008☐ 3008D2☐ DATE INSTALLED:____________
Unit/Serial No:____________________ Crossing No:__________ Island Frequency: T1:________ kHz T2:________ kHz
Crossing Name:____________________ City/Town:____________________ State:____________

PROGRAMMING HISTORY

■ press PROGRAM key	Initial Programmed Value Date:________	Program Change Date:________	Program Change Date:________
NUMBER OF TRACKS (Transceiver Modules)	1☐ 2☐	1☐ 2☐	1☐ 2☐
C10 FREQUENCY (MS/GCP)	T1:________ Hz T2:________ Hz	T1:________ Hz T2:________ Hz	T1:________ Hz T2:________ Hz
UNIDIRECTIONAL/BIDIRECTIONAL	*T1: UNI☐ BI☐* T2: UNI☐ BI☐	*T1: UNI☐ BI☐* T2: UNI☐ BI☐	*T1: UNI☐ BI☐* T2: UNI☐ BI☐
XMIT LEVEL	T1: MAX☐ MED☐ T2: MAX☐ MED☐	T1: MAX☐ MED☐ T2: MAX☐ MED☐	T1: MAX☐ MED☐ T2: MAX☐ MED☐
WARNING TIME SELECTED	T1:________ Sec. T2:________ Sec.	T1:________ Sec. T2:________ Sec.	T1:________ Sec. T2:________ Sec.
APPROACH DISTANCE → SELECTED	T1:________ Ft. T2:________ Ft.	T1:________ Ft. T2:________ Ft.	T1:________ Ft. T2:________ Ft.
→ COMPUTED	T1:________ Ft. T2:________ Ft.	T1:________ Ft. T2:________ Ft.	T1:________ Ft. T2:________ Ft.
UAX1 PICKUP DELAY (UAX) (0-OFF)	________ Sec.	________ Sec.	________ Sec.
ENA/UAX2 DELAY (0-ENA)	________ Sec.	________ Sec.	________ Sec.
ISLAND DISTANCE (Between transmit & receive track wire connections)	T1:________ Ft. T2:________ Ft.	T1:________ Ft. T2:________ Ft.	T1:________ Ft. T2:________ Ft.
NUMBER OF DAX'S (For 3000ND and 3000ND2 units, set to 0)	0☐ 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐	0☐ 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐	0☐ 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐
DAX A TRACK ASSIGNMENT	T1:☐ T2:☐	T1:☐ T2:☐	T1:☐ T2:☐
DAX A DISTANCE (0-PREEMPT)	________ Ft.	________ Ft.	________ Ft.
DAX A WARNING TIME	________ Sec.	________ Sec.	________ Sec.
DAX B TRACK ASSIGNMENT	T1:☐ T2:☐	T1:☐ T2:☐	T1:☐ T2:☐
DAX B DISTANCE (0-PREEMPT)	________ Ft.	________ Ft.	________ Ft.
DAX B WARNING TIME	________ Sec.	________ Sec.	________ Sec.
DAX C TRACK ASSIGNMENT	T1:☐ T2:☐	T1:☐ T2:☐	T1:☐ T2:☐
DAX C DISTANCE (0-PREEMPT)	________ Ft.	________ Ft.	________ Ft.
DAX C WARNING TIME	________ Sec.	________ Sec.	________ Sec.
DAX D TRACK ASSIGNMENT	T1:☐ T2:☐	T1:☐ T2:☐	T1:☐ T2:☐
DAX D DISTANCE (0-PREEMPT)	________ Ft.	________ Ft.	________ Ft.
DAX D WARNING TIME	________ Sec.	________ Sec.	________ Sec.
C20 DAX E TRACK ASSIGNMENT	T1:☐ T2:☐	T1:☐ T2:☐	T1:☐ T2:☐
C20 DAX E DISTANCE (0-PREEMPT)	________ Ft.	________ Ft.	________ Ft.
C20 DAX E WARNING TIME	________ Sec.	________ Sec.	________ Sec.
C20 DAX F TRACK ASSIGNMENT	T1:☐ T2:☐	T1:☐ T2:☐	T1:☐ T2:☐
C20 DAX F DISTANCE (0-PREEMPT)	________ Ft.	________ Ft.	________ Ft.
C20 DAX F WARNING TIME	________ Sec.	________ Sec.	________ Sec.
C20 DAX G TRACK ASSIGNMENT	T1:☐ T2:☐	T1:☐ T2:☐	T1:☐ T2:☐
C20 DAX G DISTANCE (0-PREEMPT)	________ Ft.	________ Ft.	________ Ft.
C20 DAX G WARNING TIME	________ Sec.	________ Sec.	________ Sec.
C20 DAX H TRACK ASSIGNMENT	T1:☐ T2:☐	T1:☐ T2:☐	T1:☐ T2:☐
C20 DAX H DISTANCE (0-PREEMPT)	________ Ft.	________ Ft.	________ Ft.
C20 DAX H WARNING TIME	________ Sec.	________ Sec.	________ Sec.
SLAVING MASTER/SLAVE	MASTER:☐ SLAVE:☐	MASTER:☐ SLAVE:☐	MASTER:☐ SLAVE:☐
PASSWORD ENABLED	DISABLED:☐ ENABLED:☐	DISABLED:☐ ENABLED:☐	DISABLED:☐ ENABLED:☐
RECORDER INSTALLED	NOT INSTALLED:☐ *INSTALLED:*☐ EXTERNAL NODE•_____	NOT INSTALLED:☐ *INSTALLED:*☐ EXTERNAL NODE•_____	NOT INSTALLED:☐ *INSTALLED:*☐ EXTERNAL NODE•_____
RS-232-C BAUD RATE	________ bps	________ bps	________ bps
RS-232-C DATA BITS	7:☐ 8:☐	7:☐ 8:☐	7:☐ 8:☐
RS-232-C STOP BITS	1:☐ 2:☐	1:☐ 2:☐	1:☐ 2:☐
RS-232-C PARITY	NONE:☐ ODD:☐ EVEN:☐ SPACE:☐ MARK:☐	NONE:☐ ODD:☐ EVEN:☐ SPACE:☐ MARK:☐	NONE:☐ ODD:☐ EVEN:☐ SPACE:☐ MARK:☐
DATE (eg. THU 03 APR 1997)	________	________	________
TIME (eg. 11:25:43 AM)	________	________	________
DAYLIGHT SAVINGS	*ON:*☐ *OFF:*☐	*ON:*☐ *OFF:*☐	*ON:*☐ *OFF:*☐

C10 Dual Frequency operation available only in Dual-Frequency 3000 GCP's equipped with 80214 processors
C20 Applicable to 3008 and 3008D2 8-DAX GCP's only

EXPANDED PROGRAMMING HISTORY (Function Mode)

■ press PROGRAM key	Initial Programmed Value Date:________	Program Change Date:________	Program Change Date:________
SWITCH TO MS (Enter EZ value)	T1:________ EZ T2:________ EZ	T1:________ EZ T2:________ EZ	T1:________ EZ T2:________ EZ
TRANSFER DELAY MS TO GCP (0-OFF)	T1:________ Sec. T2:________ Sec.	T1:________ Sec. T2:________ Sec.	T1:________ Sec. T2:________ Sec.
C70 TRANSFER MS TO GCP PRIME (when PRIME PREDICTION OFFSET is on)	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐
C70 TRANSFER MS TO GCP DAX A	T1:☐ T2:☐ ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
C70 TRANSFER MS TO GCP DAX B	T1:☐ T2:☐ ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
C70 TRANSFER MS TO GCP DAX C	T1:☐ T2:☐ ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
C70 TRANSFER MS TO GCP DAX D	T1:☐ T2:☐ ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
C70 TRANSFER MS TO GCP DAX E	T1:☐ T2:☐ ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
C70 TRANSFER MS TO GCP DAX F	T1:☐ T2:☐ ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
C70 TRANSFER MS TO GCP DAX G	*T1:☐ T2:☐ ON:☐ OFF:☐*	*ON:☐ OFF:☐*	*ON:☐ OFF:☐*
C70 TRANSFER MS TO GCP DAX H	T1:☐ T2:☐ ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
PRIME PREDICTION OFFSET (0-OFF)	T1:________ Ft. T2:________ Ft.	T1:________ Ft. T2:________ Ft.	T1:________ Ft. T2:________ Ft.
PICKUP DELAY PRIME	________ Sec.	________ Sec.	________ Sec.
PICKUP DELAY DAX A	________ Sec.	________ Sec.	________ Sec.
PICKUP DELAY DAX B	________ Sec.	________ Sec.	________ Sec.
PICKUP DELAY DAX C	________ Sec.	________ Sec.	________ Sec.
PICKUP DELAY DAX D	________ Sec.	________ Sec.	________ Sec.
C20 *PICKUP* DELAY DAX E	________ Sec.	________ Sec.	________ Sec.
C20 PICKUP DELAY DAX F	________ Sec.	________ Sec.	________ Sec.
C20 PICKUP DELAY DAX G	________ Sec.	________ Sec.	________ Sec.
C20 PICKUP DELAY DAX H	________ Sec.	________ Sec.	________ Sec.
COMPENSATION VALUE	*T1:*________ T2:________	*T1:*________ T2:________	*T1:*________ T2:________
C30 SPEED LIMITING	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐
C30 *ENHANCED DETECTION* (ED)	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐
C30 BACK TO BACK T1 AND T2 (When ED is on)	NO:☐ YES:☐	NO:☐ YES:☐	NO:☐ YES:☐
C30 STATION STOP TIMER	T1:________ Sec. T2:________ Sec.	T1:________ Sec. T2:________ Sec.	T1:________ Sec. T2:________ Sec.
NUMBER OF TRACK WIRES	T1: 4:☐ 6:☐ T2: 4:☐ 6:☐	T1: 4:☐ 6:☐ T2: 4:☐ 6:☐	T1: 4:☐ 6:☐ T2: 4:☐ 6:☐
C30 LOW EX ADJUSTMENT	T1:________ T2:________	T1:________ T2:________	T1:________ T2:________
C40 LOW EZ DETECTION	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐	T1: ON:☐ OFF:☐ T2: ON:☐ OFF:☐
C40 LOW EZ DETECTION TIMER (When low EZ detection is on)	T1:________ Min. T2:________ Min.	T1:________ Min. T2:________ Min.	T1:________ Min. T2:________ Min.
C40 POSITIVE START (0-OFF) (Enter EZ value)	T1:________ EZ T2:________ EZ	T1:________ EZ T2:________ EZ	T1:________ EZ T2:________ EZ
C40 POSITIVE START TIMEOUT (0-NONE) (When positive start is on)	T1:________ Min. T2:________ Min.	T1:________ Min. T2:________ Min.	T1:________ Min. T2:________ Min.
C40 SET AT OPERATION	*NORMAL:*☐ DIAGNOSTIC:☐	*NORMAL:*☐ DIAGNOSTIC:☐	*NORMAL:*☐ DIAGNOSTIC:☐
C5,60 DIAGNOSTIC MESSAGES	ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
C5,60 DAX MESSAGES	ON:☐ OFF:☐	ON:☐ OFF:☐	ON:☐ OFF:☐
C50 ADVANCE PREEMPT TIMER	________ Sec.	________ Sec.	________ Sec.
C70 MOTION SENSING LEVEL (0-NORMAL)	T1:________ % T2:________ %	T1:________ % T2:________ %	T1:________ % T2:________ %

C30 Applicable only to 3000 GCP's equipped with 80044 or 80214 processors.
C40 Applicable only to 3000 GCP's equipped with *80214 processors with A01C revision and later*
C50 Applicable only to 3000 GCP's equipped with 80214 processors with A01E revision and later
C60 Applicable only when a SEAR node has been programmed into the GCP from a SEAR
C70 Applicable only to 3000 GCP's equipped with 80214 processors with A01H revision and later

ALL NEW WORK
INSTALL AND CHECK
AS A WHOLE

CALIBRATION HISTORY

CALIBRATION DATE:

80012 DC VOLTAGE READINGS AFTER CALIBRATION		CALIBRATION HISTORY		LINEARIZATION HISTORY						
		EZ/EX VALUES (TRACK UNOCCUPIED)		HARDWIRE SHUNT AT TERMINATION SHUNT			HARDWIRE SHUNT AT 50 PERCENT POINT OF TRACK			
T1	T2	EZ	EX	EZ VALUE	EX VALUE	$\frac{EZ}{2}$ VALUE	NO LINEARIZATION		LINEARIZATION COMPLETE	
Z1-	Z1-						EZ	EX	STEP • -	EZ
Z2-	Z2-									
EAST/NORTH	TRACK *1									
WEST/SOUTH	TRACK *1									
EAST/NORTH	TRACK *2									
WEST/SOUTH	TRACK *2									

CALIBRATION DATE:

80012 DC VOLTAGE READINGS AFTER CALIBRATION		CALIBRATION HISTORY		LINEARIZATION HISTORY						
		EZ/EX VALUES (TRACK UNOCCUPIED)		HARDWIRE SHUNT AT TERMINATION SHUNT			HARDWIRE SHUNT AT 50 PERCENT POINT OF TRACK			
T1	T2	EZ	EX	EZ VALUE	EX VALUE	$\frac{EZ}{2}$ VALUE	NO LINEARIZATION		LINEARIZATION COMPLETE	
Z1-	Z1-						EZ	EX	STEP • -	EZ
Z2-	Z2-									
EAST/NORTH	TRACK *1									
WEST/SOUTH	TRACK *1									
EAST/NORTH	TRACK *2									
WEST/SOUTH	TRACK *2									

CALIBRATION DATE:

80012 DC VOLTAGE READINGS AFTER CALIBRATION		CALIBRATION HISTORY		LINEARIZATION HISTORY						
		EZ/EX VALUES (TRACK UNOCCUPIED)		HARDWIRE SHUNT AT TERMINATION SHUNT			HARDWIRE SHUNT AT 50 PERCENT POINT OF TRACK			
T1	T2	EZ	EX	EZ VALUE	EX VALUE	$\frac{EZ}{2}$ VALUE	NO LINEARIZATION		LINEARIZATION COMPLETE	
Z1-	Z1-						EZ	EX	STEP • -	EZ
Z2-	Z2-									
EAST/NORTH	TRACK *1									
WEST/SOUTH	TRACK *1									
EAST/NORTH	TRACK *2									
WEST/SOUTH	TRACK *2									

CALIBRATION DATE:

80012 DC VOLTAGE READINGS AFTER CALIBRATION		CALIBRATION HISTORY		LINEARIZATION HISTORY						
		EZ/EX VALUES (TRACK UNOCCUPIED)		HARDWIRE SHUNT AT TERMINATION SHUNT			HARDWIRE SHUNT AT 50 PERCENT POINT OF TRACK			
T1	T2	EZ	EX	EZ VALUE	EX VALUE	$\frac{EZ}{2}$ VALUE	NO LINEARIZATION		LINEARIZATION COMPLETE	
Z1-	Z1-						EZ	EX	STEP • -	EZ
Z2-	Z2-									
EAST/NORTH	TRACK *1									
WEST/SOUTH	TRACK *1									
EAST/NORTH	TRACK *2									
WEST/SOUTH	TRACK *2									

CALIBRATION DATE:

80012 DC VOLTAGE READINGS AFTER CALIBRATION		CALIBRATION HISTORY		LINEARIZATION HISTORY						
		EZ/EX VALUES (TRACK UNOCCUPIED)		HARDWIRE SHUNT AT TERMINATION SHUNT			HARDWIRE SHUNT AT 50 PERCENT POINT OF TRACK			
T1	T2	EZ	EX	EZ VALUE	EX VALUE	$\frac{EZ}{2}$ VALUE	NO LINEARIZATION		LINEARIZATION COMPLETE	
Z1-	Z1-						EZ	EX	STEP • -	EZ
Z2-	Z2-									
EAST/NORTH	TRACK *1									
WEST/SOUTH	TRACK *1									
EAST/NORTH	TRACK *2									
WEST/SOUTH	TRACK *2									

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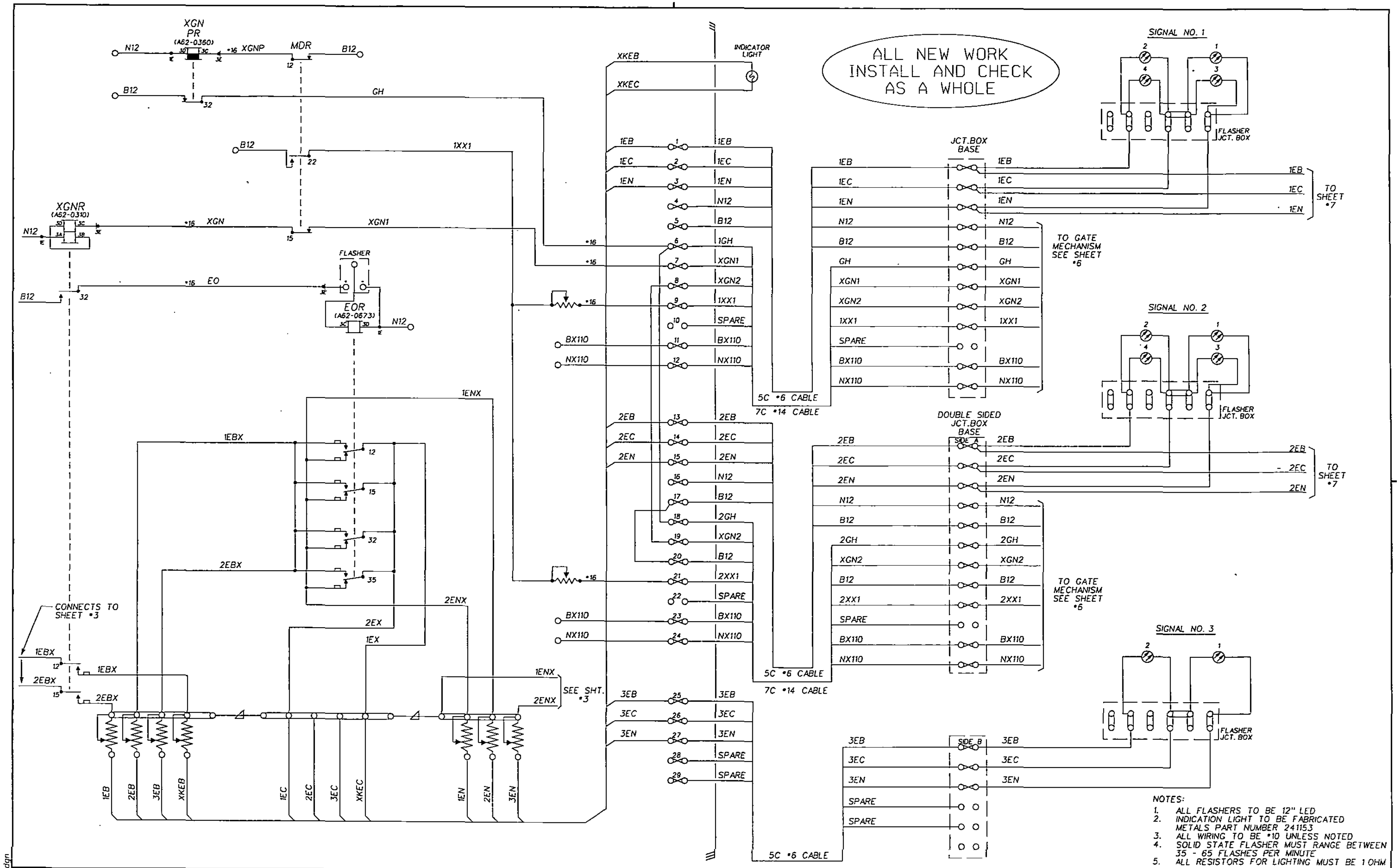
MERMON AVENUE - NESQUEHONING, PA AUTOMATIC HIGHWAY CROSSING WARNING DEVICES	GCP 3000 PARAMETERS	LOCATION:	NESQUEHONING, PA	ISSUE DATE: APRIL 15, 2013	The Road of Anthracite The Reading & Northern RR
		LINE/BRANCH:	MAIN LINE	REV. 1: 4-15-13	
		MILEPOST:	118.0	PLAN: 0501-1180 SHEET: 5	



ALL NEW WORK
INSTALL AND CHECK
AS A WHOLE

NOTES:

1. ALL FLASHERS TO BE 12" LED
2. INDICATION LIGHT TO BE FABRICATED METALS PART NUMBER 241153
3. ALL WIRING TO BE •10 UNLESS NOTED
4. SOLID STATE FLASHER MUST RANGE BETWEEN 35 - 65 FLASHES PER MINUTE
5. ALL RESISTORS FOR LIGHTING MUST BE 1 OHM

MERMON AVENUE - NESQUEHONING, PA
AUTOMATIC HIGHWAY CROSSING
WARNING DEVICES

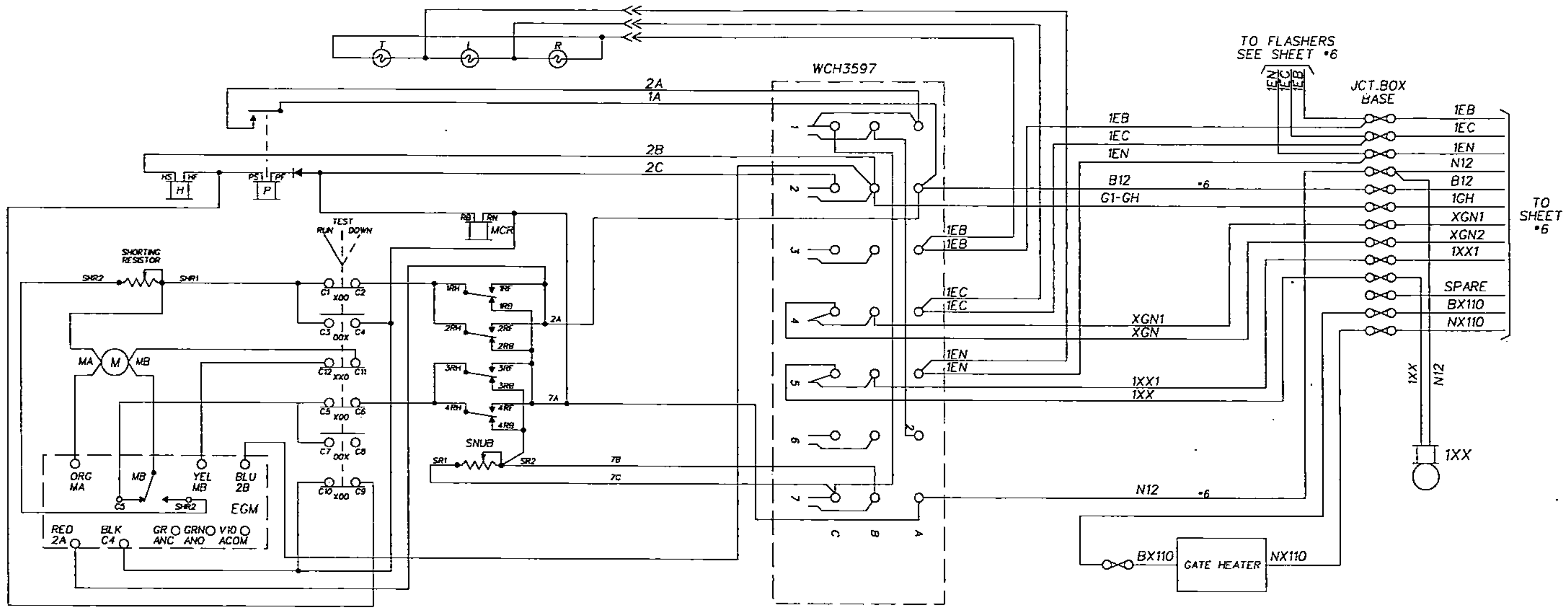
FLASHING LIGHT & GATE CIRCUITS

LOCATION:	NESQUEHONING, PA
LINE/BRANCH:	MAIN LINE
MILEPOST:	118.0

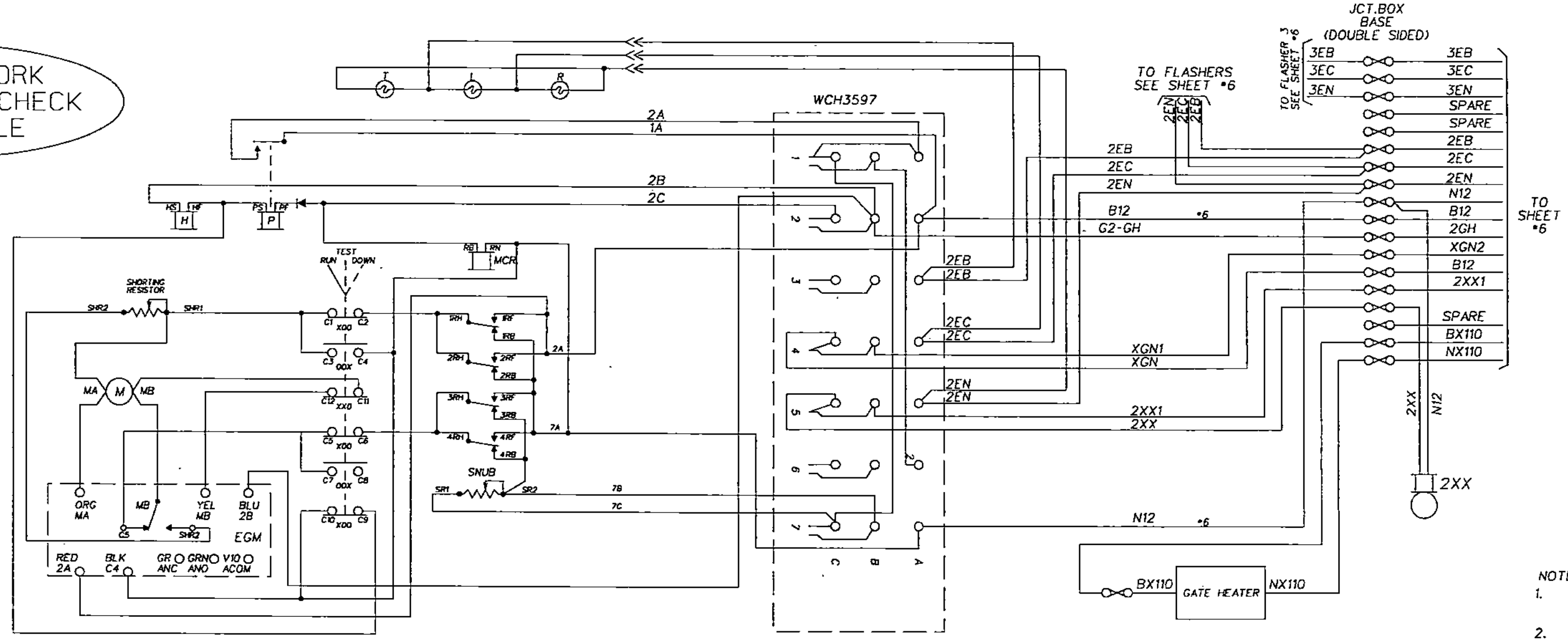
ISSUE DATE:	APRIL 15, 2013
REV. 1	4-15-13
PLAN:	0501-1180
SHEET	6

"The Road of Anthracite"
The Reading & Northern RR

0501.1180.006.dgn



GATE #1



GATE #2

ALL NEW WORK
INSTALL AND CHECK
AS A WHOLE

NOTES:

1. BELLS TO BE ELECTRONIC VERSION BY WCH (WCH-0777)
2. GATE MECHANISMS TO BE WESTERN CULLEN HAYES 3597

MERMON AVENUE - NESQUEHONING, PA
AUTOMATIC HIGHWAY CROSSING WARNING DEVICES

GATE MECHANISM CIRCUITS

LOCATION:	NESQUEHONING, PA
LINE/BRANCH:	MAIN LINE
MILEPOST:	118.0

ISSUE DATE:	APRIL 15, 2013
REV. 1	4-15-13
PLAN:	0501-1180
SHEET	7

"The Road of Anthracite"
The Reading & Northern RR

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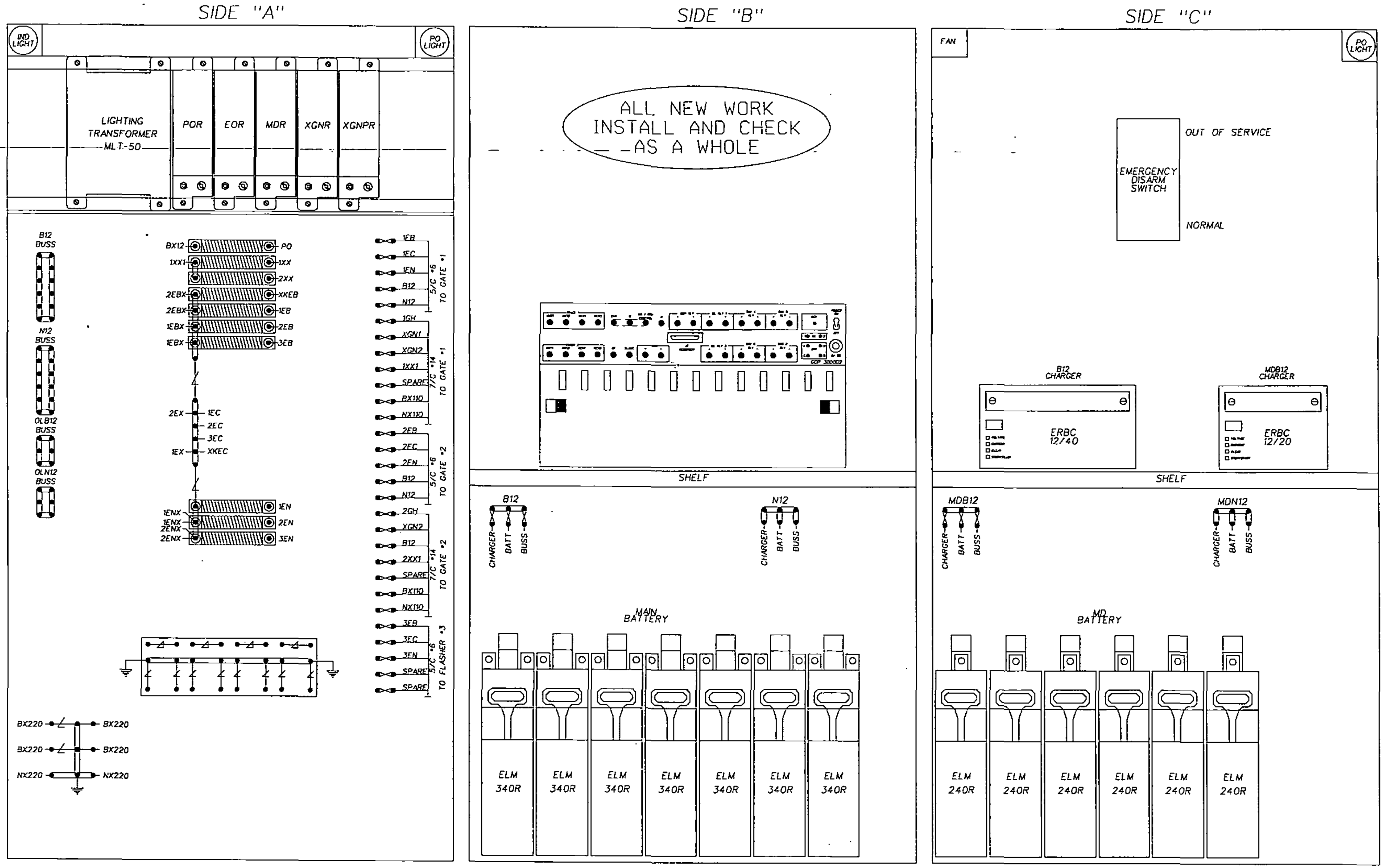

0501.1180.008.dgn

MERMON AVENUE - NESQUEHONING, PA
AUTOMATIC HIGHWAY CROSSING
WARNING SYSTEM

BUNGALOW LAYOUT

LOCATION:	NESQUEHONING, PA
LINE/BRANCH:	MAIN LINE
MILEPOST:	118.0

ISSUE DATE:
APRIL 15, 2013

REV. 1	4-15-13
PLAN	0501-1180
SHEET	8

"The Road of Anthracite"
The Reading & Northern RR