

RECEIVED-DOCKETING DIV

2012 FEB -1 AM 10:47

**Public Utilities
Commission of Ohio**

PUCO

Memo

To: Docketing Division

From: George Martin, Grade Crossing Planner, Rail Division

Re: In the matter of the authorization of CSX Transportation to install active grade crossing warning devices in Wood County

Date: February 1s, 2012

The Ohio Rail Development Commission (ORDC) has secured funding and approved the plans and estimates for the installation of flashing lights and roadway gates at Hanley Rd/ TR 64, Lake Township, DOT# 228846J, and Ovitt Rd/TR 104, Middleton Township, DOT# 155809C, located in Wood County. The crossings were surveyed on March 9, 2011, under the Commission's hazard elimination program, and were found to warrant the upgrade.

These projects are actual cost and will be paid for with federal funds. As the plans and estimates have already been submitted and approved, staff requests an Entry with completion of the projects in nine months. Construction may commence at once. Staff requests that the following language be incorporated in the Entry:

It is expected that all work necessary for FHWA acceptance of the warning devices will be completed by the in-service due date and that the railroad will be responsible for this work. This work includes, but is not limited to:

Any ancillary work to make the warning devices function as designed and visible to the roadway user, and

MUTCD compliance, including minor roadway work if necessary.

A suggested case coding and heading would be:

PUCO Case No. 12- 0506 -RR-FED In the matter of the authorization of CSX Transportation to install an active grade crossing warning devices in Wood County

C: Legal Department

Please serve the following parties of record

Ms Susan Kirkland

Ohio Rail Development Commission

1980 West Broad St, 2nd Floor

Columbus, Oh 43223

Ms Karen Murphy

CSX Transportation

500 Water St, J-301

Jacksonville, Fl 32202

Toledo Edison/First Energy

46 S Main St

Akron, Oh 44308

Lake Township Trustees

27975 Cummings Rd

Millbury, Oh 43447

Middleton Township Trustees

PO Box 206

Haskins, Oh 43525

**OHIO RAIL DEVELOPMENT COMMISSION
INTER-OFFICE COMMUNICATION**

TO: Rob Marvin, Director of Transportation, PUCO
Leah Thomas-Dalton, Deputy Chief, PUCO

FROM: Susan Kirkland, Manager, Safety Section, ORDC

BY: Tod Darfus, Project Manager, ORDC

SUBJECT: Wood County, CSX Transportation (CSX)
Hanley Road/TR-64, 228 846 J, PID 90714

DATE: January 23, 2012

The Public Utilities Commission of Ohio (PUCO) established a diagnostic survey at the subject location on March 9, 2011. The Ohio Rail Development Commission (ORDC) attended the review. The Diagnostic Team recommended the improvement of warning devices to flashing lights and roadway gates plus cantilevers. A copy of the diagnostic review form is attached.

PE has already been provided by the railroad. ORDC approves the site plans and estimates as provided. Please issue a construction-only order for the project outlined above. This construction authorization is made with the stipulation and understanding that any field work needs prior approval before the work begins. This authorization is made with the stipulation and understanding that an approved estimate may contain entries for items or activities that may be cited and found to be ineligible for federal participation during the project audit.

It is expected that all work necessary for FHWA acceptance of the warning devices will be completed by the in-service due date and that the railroad will be responsible for this work. This work includes, but is not limited to:

- any ancillary work to make warning devices function as designed and visible to the roadway user, and
- MUTCD compliance – including minor roadway work if necessary.

Thank you for your assistance with these matters.

Attachment: Diagnostic Review
Plan & Estimate

c: George Martin, PUCO
T.Darfus (file)



The Public Utilities
Commission of Ohio

Public Utilities Commission of Ohio
Rail Division
180 East Broad Street
Columbus, OH 43215

Diagnostic Review Team Survey

Date: 3/9/11 1030 AM

Location Data

Street or Road Name: HANLEY RD			
Route/Road Number (i.e. Twp., Co., SR or US) TR 64 (Include SLM if State or US route)		AAR-DOT No.: 228846J	
County: WOOD	Township: LAKE	City (In or Near): WALBRIDGE	
Railroad Name: CSX	Railroad Division:	Branch/Line Name:	
Nearest RR Timetable Station: PEMBERTON		RR Milepost: 113.99	

On-Site Review Team

(Include: Name - Organization - Phone Number)

1. GEORGE MALIN PUCO 614-752-9107
2. RICHARD WELLING LAKE TWP TRUSTEE 419-838-6536
3. Karen Mohler - CSX 704
4. Todd DeRamus ORDC 614-374-9298
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Existing Traffic Control Devices

Type of Warning Devices	Installed?		Quantity/Comments
Advance Warning Signs	☒ Yes	☐ No	2
'Stop' Signs	☐ Yes	☒ No	
'Stop Ahead' Signs	☐ Yes	☒ No	
Pavement Markings	☐ Yes	☒ No	
Crossbucks	☒ Yes	☐ No	2 BUCKETS
Number of Tracks Signs	☒ Yes	☐ No	2
Inventory Tags	☒ Yes	☐ No	2
Interconnected Highway Traffic Signal	☐ Yes	☒ No	
Mast-Mounted Flashing Lights	☐ Yes	☒ No	
Cantilever Flashing Lights	☐ Yes	☒ No	Number: Length:
Side Lights	☐ Yes	☒ No	
Automatic Gates	☐ Yes	☒ No	Number: Length:
Bells	☐ Yes	☒ No	
Sidewalk Gate Arms	☐ Yes	☒ No	
'No Turn' Signs	☐ Yes	☒ No	
Illumination	☐ Yes	☒ No	
Is crossing flagged by train crew?	☐ Yes	☒ No	
Other	☒ Yes	☐ No	NO STOPPING ANY TIME

Safety Data (Obtain crash reports, if possible, prior to review)

	Initial Information (from database)	Revised
Number & dates of crashes in previous 5 years	0	
Hazard Ranking	259	Date Run: 2/7/11 327 3/21/11

Railroad Data

Railroad Characteristics	Initial Information (from database)	Revised
Total trains per day	35 (UNDATED)	SAME
< 1 per day		
Day thru trains	20	
Night thru trains	15	
Daytime switching movements		
Nighttime switching movements		
Total number of tracks	2	
Number of main tracks	2	
Number of other tracks		
Maximum train speed	50	25
Typical train speed		
Amtrak		

If non-gated crossing, is clearing sight distance adequate in all quadrants? (See Table 1) ☐ Yes ☒ No E BOUND ON HAZARDOUS TREE LINE

If multiple tracks, can two trains occupy crossing at the same time? ☒ Yes ☐ No

Can one train block the motorists' view of another train at crossing? ☒ Yes (Explain below) ☐ No

Are there other track(s) crossing this same roadway within 100 ft of this crossing? ☐ Yes ☒ No

If yes, Crossing DOT # (if different) _____

If yes, distance _____ (take measurement between track centerlines at closest point along roadway)

Roadway Data

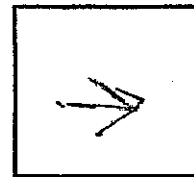
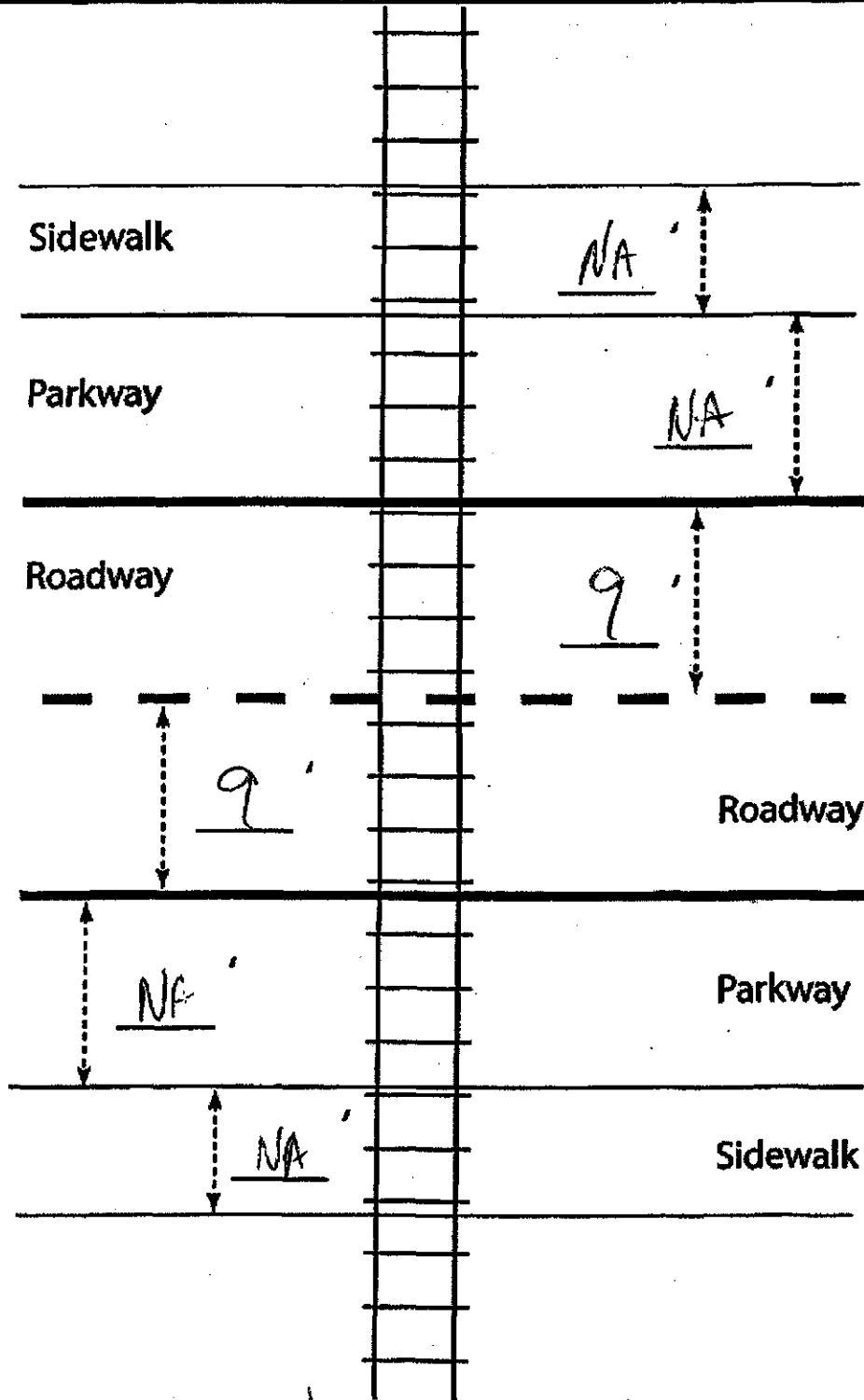
Local Highway Authority:
(Who maintains this roadway?)

LAKE TOWNSHIP

Roadway Characteristics	Initial Information (from database)	Revised
Average daily traffic	271 (2007)	
Highway paved	☒ Yes ☐ No	☒ Yes ☐ No
Roadway Surface: ☒ Blacktop ☐ Gravel ☐ Concrete ☐ Other _____		
Roadway width: 18 ft.		
Number of highway lanes	2	2
Urban or Rural?	RURAL	RURAL
Vehicle Speed: 55 MPH		
School Bus Operation: ☐ No ☒ Yes 4 Amount		
Hazardous Materials Trucks: ☐ No ☒ Yes 170 Amount		
Shoulders: ☒ No ☐ Yes		
Is the shoulder surfaced? ☒ No ☐ Yes		
Is there existing guardrail along roadway in crossing vicinity? ☐ No ☒ Yes		
Is stopping site distance adequate? (See Table 2) ☒ Yes ☐ No If no, deficient approach(es) _____		

Quadrant _____ Curb and Gutter: ☐ Functional (Curb height = 4" or more) ☐ Non-functional (Curb height = Less than 4") ☒ None	Quadrant _____ Curb and Gutter: ☐ Functional (Curb height = 4" or more) ☐ Non-functional (Curb height = Less than 4") ☒ None
Pedestrians: ☒ No ☐ Yes	
Is sidewalk present? ☒ No ☐ Yes	
Is there a nearby intersection that could cause queuing over the crossing? ☒ No ☐ Yes If yes, Distance _____	
Is this intersection signalized? ☒ No ☐ Yes	
Are the signals currently interconnected with the existing crossing warning devices? ☒ No ☐ Yes	
Is it the consensus of the Diagnostic Review Team that this is a potential closure project? ☒ No ☐ Yes Explain reasons:	
Type of Development	
☒ Open Space ☐ Institutional ☐ Industrial ☐ Commercial ☒ Residential	Location of nearby schools: WITHIN 3 MILES
Utility Information	
Is commercial power available? ☐ No ☒ Yes	
Utility Provider (Company Name) <u>TOLEDO Edison</u> Phone Number _____	
Nearest Available Power Source <u>AT XLN 6</u>	
What other utilities are present? _____	
Is there potential utility conflict(s) ☐ Yes ☐ No ☐ Unknown	
Diagnostic Team Recommendations	
	Quadrants Needed
☒ Install/upgrade active devices	
☐ Automatic Flashing Lights (AFLS)	
☐ AFLS / Cants	
☒ AFLS / Gates	
☐ AFLS / Gates / Cants	
☐ Upgrade circuitry	
☐ Sidelights	
☐ Guardrail Needed	
☐ Install/Replace curb	
☐ Other (define)	
Comments:	
☐ Install/upgrade traffic signal preemption	
☐ No improvements needed	
☐ Other (define)	

Field Dimensions

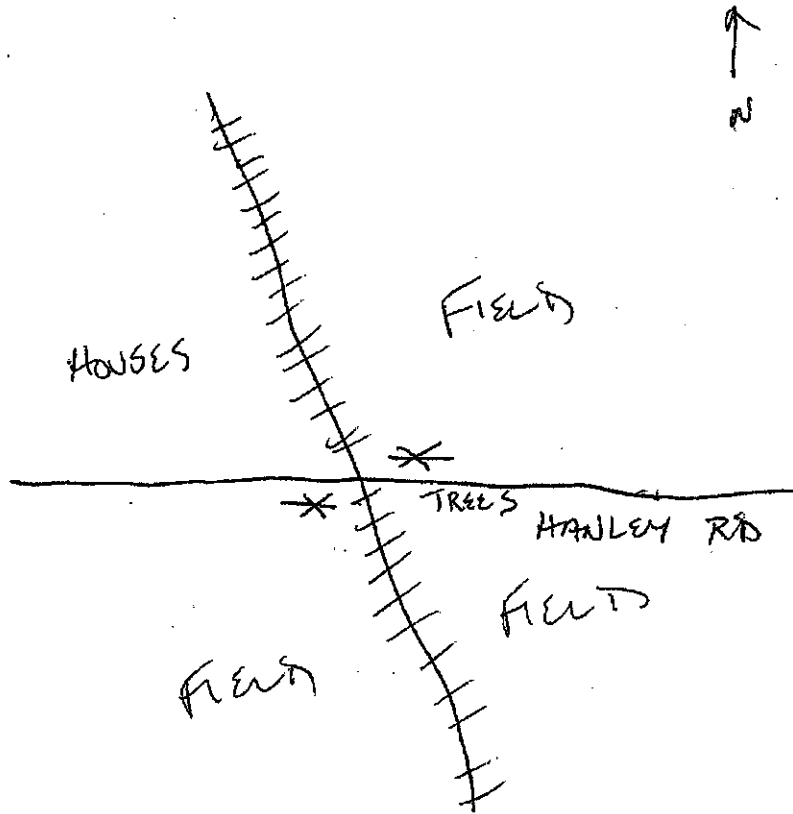


Show North Direction

Crossing Angle ☐ 0-29° ☐ 30-59° ☒ 60-90° Measured in SW Quadrant?

Measurements by: GM

Field Sketch



Crossing Angle ☐ 0-29° ☐ 30-59° ☒ 60-90° Measured in SE Quadrant?

Sketch by: BM

TABLE 1

Clearing Sight Distances

Maximum Authorized Train Speed	Distance (dT) Along Railroad from Crossing (ft)
1 - 10	240
15	360
20	480
25	600
30	720
35	840
40	960
45	1080
50	1200
55	1320
60	1440
65	1560
70	1680
75	1800
80	1920
85	2040
90	2160

Source: R-H Grade Crossing Handbook Table 36 (pp. 132-133)

Notes:

All calculated distances are rounded up to the next higher 5-foot increment.

Distances indicated are for 65-ft double bottom semi-tractor trailers and level single track 90 degree crossings; and may need to be adjusted for multiple tracks, skewed crossings or approaches on grades.

Clearing Sight Distance is to be measured in each vehicle travel direction at non-gated crossings as viewed from a point 25 feet from centerline of nearest track in the center of whichever travel lane is nearest the direction along track being measured.

Table 2

Stopping Sight Distances

Highway Vehicle Speed	Distance (dH) Along Roadway from Crossing (ft)
0	n/a
5	50
10	70
15	105
20	135
25	180
30	225
35	280
40	340
45	410
50	490
55	570
60	660
65	760
70	865

Source: R-H Grade Crossing Handbook Table 36 (pp. 132-133)

Notes:

All calculated distances are rounded up to the next higher 5-foot increment.

Distances indicated are for 65-ft double bottom semi-tractor trailers on dry level pavements.

Stopping Sight Distance is to be measured on each roadway approach to crossing from stop bar.



Karen E. Murphy, P. E.
Project Manager – Public Projects
500 Water Street (S/C J301)
Jacksonville, FL 32202
Tel. 904-359-1650
Karen_Murphy@csx.com

December 22, 2011

Mr. Tod Darfus
Manager, Safety Programs
Ohio Rail Development Commission
1980 West Broad Street, Second Floor
Columbus, OH 43223

Subject: Walbridge, Wood County, OH – Install AFLS&G– TR-64 (Handley Rd.); DOT 228846J;
Milepost CD-113.99; PID 90714; OH0852

Dear Mr. Darfus:

Enclosed for your review and approval are the circuit plans and Signal Force Account Estimate in the amount of \$ 222,733.00 for the above referenced project.

We await receipt of your further advice and /or approval of the project cost and authority to proceed.

If I can be of further assistance, please do not hesitate to call.

Very truly yours,

A handwritten signature in cursive script that reads "Karen E. Murphy".

Karen E. Murphy, P.E.
Project Manager, Public Projects

Cc: Jill Henry
Leah Dalton
Susan Kirkland
Susan Arduini
George Martin

CSX TRANSPORTATION, INC.
FORCE ACCOUNT ESTIMATE

Page 1

ACCT. CODE : 709 - OH0852

ESTIMATE SUBJECT TO REVISION AFTER:	7/2/2012	DOT NO.: 228846J
CITY: Walbridge	COUNTY: Wood	STATE: OH
DESCRIPTION: Install automatically controlled flashing lights and gates with GCP4000 to TR-64 (Handley Road)		
DIVISION: Appalachian	SUB-DIV: Pemberville	MILE POST: CD-113.99
AGENCY PROJECT NUMBER: PID 90714		

PRELIMINARY ENGINEERING:

200 Labor (Non Contract)	\$	-
200 Additive 31.34%	\$	-
230 Expenses	\$	-
212 Contracted & Administrative Engineering Services	\$	4,200
Subtotal	\$	4,200

CONSTRUCTION ENGINEERING/INSPECTION:

200 Labor (Non Contract)	\$	-
200 Additive 31.34%	\$	-
230 Expenses	\$	-
212 Contracted & Administrative Engineering Services	\$	3,700
Subtotal	\$	3,700

FLAGGING SERVICE: (Contract Labor)

070 Labor (Conductor-Flagman)	\$	-
050 Labor (Foreman/Inspector)	\$	-
070 Additive 73.76% (Transportation Department)	\$	-
050 Additive 97.95% (Engineering Department)	\$	-
230 Per Diem (Engineering Department)	\$	-
230 Expenses	\$	-
Subtotal	\$	-

<u>SIGNAL & COMMUNICATIONS WORK:</u>	(Details Attached)	\$	190,509
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<u>TRACK WORK:</u>	(Details Attached)	\$	-
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ACCOUNTING & BILLING:

040 Labor	\$	2,500
040 Additive 63.03%	\$	1,576
Subtotal	\$	4,076

PROJECT SUBTOTAL

900 <u>CONTINGENCIES:</u>	10.00%	\$	20,248
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GRAND TOTAL	*****	\$	222,733
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DIVISION OF COST:

Agency	100.00%	\$	222,733
Railroad		\$	-
TOTAL	*****	\$	222,733

NOTE: Estimate is based on FULL CROSSING CLOSURE during work by Railroad Forces.

This estimate has been prepared based on site conditions, anticipated work duration periods, material prices, labor rates, manpower and resource availability, and other factors known as of the date prepared. The actual cost for CSXT work may differ based upon the agency's requirements, their contractor's work procedures, and/or other conditions that become apparent once construction commences or during the progress of the work

Office of Assistant Chief Engineer Public Projects--Jacksonville, Florida

Estimated prepared by:

Deb Baldino

Approved by:

CSXT Public Project Group

DATE: 1/4/2012

REVISED:

DATE:

Form Revised 03-02-2010-LLS

Project Summary Sheet

**CSX TRANSPORTATION, INC.
FORCE ACCOUNT ESTIMATE**

Page 1 of 3

ACCT. CODE : 709 - OH0852
Pub EB - OH EB3 (OH)

ESTIMATE SUBJECT TO REVISION AFTER:		7/2/2012	DOT NO.: 228846J
CITY: Walbridge	COUNTY: Wood	STATE: OH	
DESCRIPTION: Install automatically controlled flashing lights and gates with GCP4000 to TR-84 (Handley Road)			
DIVISION: Appalachian	SUB-DIV: Pemberville	MILEPOST: CD-113.99	
DRAWING NO.: CD11399.H01	DRAWING DATE: 12/16/2011		
AGENCY PROJECT NUMBER: PID 90714			

PRELIMINARY ENGINEERING:

200	Labor (Non Contract)	0	Days @	\$ 270.00	\$ -
200	Additive 31.34%				\$ -
230	Expenses				\$ -
212	Contracted & Administrative Engineering Services				\$ 4,200
	Subtotal				\$ 4,200

CONSTRUCTION ENGINEERING/INSPECTION:

200	Labor (Non Contract)	0	Days @	\$ 270.00	\$ -
200	Additive 31.34%				\$ -
230	Expenses				\$ -
212	Contracted & Administrative Engineering Services				\$ 3,700
	Subtotal				\$ 3,700

FLAGGING SERVICE: (Contract Labor)

70	Labor (Conductor-Flagman)	0	Days @	\$ 350.00	\$ -
50	Labor (Foreman/Inspector)	0	Days @	\$ 336.00	\$ -
70	Additive 73.76% (Transportation Department)				\$ -
50	Additive 97.95% (Engineering Department)				\$ -
230	Expenses (Engineering Department)	0	Days @	\$ 75.00	\$ -
230	Expenses (Transportation Department)	0	Days @	\$ 45.00	\$ -
	Subtotal				\$ -

COMMUNICATIONS WORK:

Temporary (Details Attached)	\$ -
Permanent (Details Attached)	\$ -
Subtotal	\$ -

TRACK: LABOR

50	Traffic Control	0	MAN-HRS	\$ 24.00	\$ -
50	Remove Existing Crossing	0	MAN-HRS	\$ 24.00	\$ -
50	Renew Cross Ties	0	MAN-HRS	\$ 24.00	\$ -
50	Renew Rail	0	MAN-HRS	\$ 24.00	\$ -
50	Install OTM	0	MAN-HRS	\$ 24.00	\$ -
50	Install Field Welds	0	MAN-HRS	\$ 24.00	\$ -
50	Install Geo-Textile Fabric	0	MAN-HRS	\$ 24.00	\$ -
50	Install Sub-Drains	0	MAN-HRS	\$ 24.00	\$ -
50	Install Ballast	0	MAN-HRS	\$ 24.00	\$ -
50	Line and Surface	0	MAN-HRS	\$ 24.00	\$ -
50	Install Crossing Materials	0	MAN-HRS	\$ 24.00	\$ -
50	Install Bituminous Pavement	0	MAN-HRS	\$ 24.00	\$ -
50		0	MAN-HRS	\$ 24.00	\$ -
50		0	MAN-HRS	\$ 24.00	\$ -
50		0	MAN-HRS	\$ 24.00	\$ -

**CSX TRANSPORTATION, INC.
FORCE ACCOUNT ESTIMATE**

Page 2 of 3

ACCT. CODE : 709 - OH0852
Pub EB - OH EB3 (OH)

50	Clean-Up		0	MAN-HRS	\$ 24.00	\$ -
50	Additive	97.95%				\$ -
230	Per Diem		0	MAN-DAY	\$ 90.00	\$ -
	Subtotal					\$ -

TRACK: MATERIAL

220	Cross Ties, Main Line		0	EA	\$ 39.00	\$ -
220	Cross tie - pre-plated		0	EA	\$ 83.50	\$ -
220	Cross-tie - Borate		0	EA	\$ 56.00	\$ -
220	Crossties, 10' Length		0	EA	\$ 46.00	\$ -
220	Tie plates		0	EA	\$ 10.51	\$ -
220	Rail, 136RE, New		0	LF	\$ 21.00	\$ -
220	Misc. OTM		1	LOT	\$ -	\$ -
210	Geo-Textile Fabric		0	RL	\$ 930.00	\$ -
210	Sub-Drains		0	LF	\$ 6.00	\$ -
220	Ballast - Car load		0	NT	\$ 12.00	\$ -
220	Ballast - Trucked in		0	NT	\$ 45.00	\$ -
220	Field Welds		0	EA	\$ 100.00	\$ -
			0		\$ -	\$ -
			0		\$ -	\$ -
210	Concrete Full Width		0	TF	\$ 250.00	\$ -
210	Concrete/Rubber Xing (CSX)		0	TF	\$ 200.00	\$ -
210	Rubber Crossing, Full Depth		0	TF	\$ 325.00	\$ -
210	Timber/Asphalt Crossing (CSX Standard)		0	TF	\$ 42.00	\$ -
210	Bituminous Material		0	NT		\$ -
210	Sales Tax on Material	0.00%				\$ -
210	Material Handling	5.00%				\$ -
	Subtotal					\$ -

CONTRACT:

215	Asphalt Paving (In Place)		0	NT		\$ -
241	Disposal of Waste Materials		0	TF	\$ 15.00	\$ -
215	Maintenance of Traffic		0	DAY	\$ 350.00	\$ -
	Subtotal					\$ -

241 EQUIPMENT RENTAL:

Subtotal						\$ -
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50 WORK TRAIN:

			0	DAY	\$ 2,100.00	\$ -
Subtotal						\$ -

SALVAGE:

228	Rail		0	NT	\$ 65.00	\$ -
228	OTM		0	NT	\$ 75.00	\$ -
Subtotal						\$ -

SIGNAL WORK:

210	Material - Field & Consumables					\$ 78,994
210	Material - Sales Tax					\$ -
220	Material - Shop					\$ -
60	Construction Labor (97 man-days)					\$ 26,396
65	Shop Labor (7 man-days)					\$ 1,470
230	Per Diem (97 man-days)					\$ 12,610
200	RR Engineering, Preliminary					\$ 4,542
200	RR Engineering, Construction					\$ 3,959

**CSX TRANSPORTATION, INC.
FORCE ACCOUNT ESTIMATE**

Page 3 of 3

ACCT. CODE : 709 - OH0852
Pub EB - OH EB3 (OH)

60	Additives to Construction Labor			\$	24,525
65	Additives to Shop Labor			\$	1,303
200	Additives to Engineering			\$	2,664
241	Equipment Expense (21 work days)			\$	13,650
241	Waste Management (21 work days)			\$	505
212	Contract Engineering			\$	11,451
211	Freight			\$	5,940
216	AC Power Service			\$	2,500
228	Salvage			\$	-
900	Other			\$	-
	Subtotal			\$	190,509

ACCOUNTING & BILLING:

40	Labor		12.5 Days @	\$ 200.00	\$	2,500
40	Additive	63.03%			\$	1,576
	Subtotal				\$	4,076

PROJECT SUBTOTAL:

900	<u>CONTINGENCIES:</u>	10.00%			\$	202,485
					\$	20,248

GRAND TOTAL ***** **\$ 222,733**

DIVISION OF COST:

Agency	<u>100.00%</u>	\$	222,733
Railroad	<u>0.00%</u>	\$	-
TOTAL *****		\$	222,733

NOTE: Estimate is based on FULL CROSSING CLOSURE during work by Railroad Forces.

This estimate has been prepared based on site conditions, anticipated work duration periods, material prices, labor rates, manpower and resource availability, and other factors known as of the date prepared. The actual cost for CSXT work may differ based upon the agency's requirements, their contractor's work procedures, and/or other conditions that become apparent once construction commences or during the progress of the work

Office of Assistant Chief Engineer Public Projects--Jacksonville, Florida

Estimated prepared by: Deb Baldino

Approved by:

CSXT Public Project Group

DATE: 1/4/2012

REVISED:

DATE:

Form Revised 05-05-2011-LLS

ACCT. CODE : 709 - OH0852
Pub EB - OH EB3 (OH)

ESTIMATE SUBJECT TO REVISION AFTER: 7/2/12 DOT NO.: 228846J
CITY: Walbridge COUNTY: Wood STATE: OH
DESCRIPTION: Install automatically controlled flashing lights and gates with GCP4000 to TR-64 (Handley Road)
DIVISION: Appalachian SUB-DIV: Pemberbville MILEPOST: CD-113.99
DRAWING NO.: CD11399.H01 DRAWING DATE: 12/16/2011
AGENCY PROJECT NUMBER: PID :

Amount		
Task	Task Desc	Total
40	Labor General Office	\$4,076
50	Labor Roadway	
60	Labor Signal	\$50,921
65	Labor Signal1	\$2,773
70	Labor Transportation	
200	Labor NonContract	\$11,165
210	Invoice Material	
	Material - Field & Consu	\$78,994
211	Invoice Freight	\$5,940
212	Invoice Contract Eng	\$19,351
215	Invoice Misc	
216	Invoice Utilities	\$2,500
220	Material New	
	Material - Shop	
228	Scrap Credit	
230	ExpenseRpts	\$12,610
241	Invoice Rental	\$14,155
900	Other	
900	Contingencies	\$20,248
	Material New	
Grand Total		\$222,733

Estimate No. 119501
CSX Transportation

TR-64 (Hanley Rd.)- Install automatically controlled flashers & gates with GCP4000
Walbridge, OH

DOT: 228846J

OP: OH0852

CSX Project: OH2011074

Summary

Material	\$ 78,994
Sales Tax	\$ 0
Labor:	
Construction Labor (97 man-days).....	\$ 26,396
Shop Labor (7 man-days).....	\$ 1,470
Subsistence (97 man-days).....	\$ 12,610
Railroad Engineering, Preliminary	\$ 4,542
Railroad Engineering, Construction	\$ 3,959
Additives to Construction Labor	\$ 24,525
Additives to Shop Labor	\$ 1,303
Additives to Track Labor	\$ 0
Additives to Engineering	\$ 2,664
Equipment Expenses (21 work days).....	\$ 13,650
Waste Management (21 work days).....	\$ 504
Contract Engineering	\$ 11,451
Freight	\$ 5,940
Poleline Removal	\$ 0
AC Power Service	\$ 2,500
Salvage	\$ 0

TOTAL ESTIMATE COST	\$ 190,509
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Date: 01/04/2012

Estimated By: Steve Spence

NOTE: This estimate should be considered void one year from date of estimate.

Shop Material List for CSX Project: OH2011074 (Effective: 01/04/2012)
Install FLS&G, 6x6 House w/GCP-4000
WALBRIDGE, OH - CD 113.99

Catalog Num	Cond	Unit Price	Qty	Cost	Description
020-0003386	1	6781.00	1	6781.00	HOUSE 6X6L ALUM INCLUDES 5 SHELFs, FARADAY CLOSET, 240V
020-0017120	1	11.52	6	69.12	BLOCK TERMINAL 12 POST SINGLE STRIP AAR 14.1.6 WITH 1 AAR
020-0017125	1	3.54	6	21.24	BLOCK TERMINAL 2 POST AAR 14.1.8 WITH 1 AAR 14.1.11
020-0018234	1	37.58	1	37.58	CABLE CONVERTER PROTOCOL/MEDIA WAYSIDE ACCESS
020-0021965	1	8.96	1	8.96	EXTRACTOR DWG 59688-4 TERMINAL GRS CAT P3-308 REF
020-0022651	1	55.89	1	55.89	PLUGBOARD KIT TYPE B1 OR ST1 RELAY ASSEMBLY WITH 12 EACH
020-0022701	1	68.00	23	1564.00	ARRESTER LPC 15012-1 0-30V DC OR 0-24V AC RATED AT 15 AMP
020-0025595	1	20.72	1	20.72	WRENCH DWG 55393-3 GR1 "E" TERMINAL POST NUT GRS CAT
020-0053360	1	24.60	3	73.80	CHARGER BATTERY ELC 12/20 S 20 AMP 10-19.9 VDC ROTARY SW
020-0053510	1	233.11	1	233.11	KIT 240V AC EMERGENCY GENERATOR CABLE AND
020-0055602	1	11.39	1	11.39	RELAY POTTER BRUMFIELD KHAU17D12-12V 160 OHMS
020-0056514	1	9.32	4	37.28	SOCKET RELAY POTTER & BRUMFIELD 27E166 NEWARK
020-0064060	1	16.12	2	32.24	PLATE MOUNTING FOR 2 TYPE KHAU RELAY SOCKETS ON GRS B1
020-0660077	1	597.41	1	597.41	ARRESTER GE 9L10KAC213 FOR 240 VOLT SINGLE PHASE 3 WIRE
020-0770060	1	13.44	12	161.28	ARRESTER US&S N451552-0201 TRACK SERIES RED LABEL USGA
020-0770105	1	22.40	4	89.60	ARRESTER HARMON 202217-000 AGE-1 TRACK AIR GAP EQUALIZER
020-1940055	1	14.22	1	14.22	CONTAINER CIRCUIT PRINT 24" SCHEDULE 20 4" PVC PIPE WITH
020-2503073	1	1017.33	1	1017.33	MODULE SAFETRAN VHF COMMUNICATOR (A80276-3) USED
020-2503079	1	453.00	2	906.00	MODULE SAFETRAN GROUND FAULT DETECTOR (A80297-2) USED WITH
020-2503090	1	1030.04	1	1030.04	CONVERTER PROTOCOL/MEDIA WAYSIDE ACCESS GATEWAY (WAG)
020-2503200	1	745.74	1	745.74	KIT SAFETRAN GCP-4000 ILOD PKG. FOR USE WITH SEAR-III
020-2503220	1	13498.20	1	13498.20	PREDICTOR SAFETRAN GCP-4000 2-TRACK DUAL CASE W/RECORDER
020-2901190	1	11.39	3	34.17	RELAY POTTER BRUMFIELD KHAU17A12-120 3900 OHMS
020-3430130	1	365.31	1	365.31	RELAY SAFETRAN 400023 500 OHMS CONTACTS 6FB HEAVY DUTY
020-3652615	1	38.13	1	38.13	RESISTOR ADJUSTABLE 0.340 TO 3.00 OHMS 2.24A 15W SAFETRAN

Shop Material List for CSX Project: OH2011074 (Effective: 01/04/2012)
Install FLS&G, 6x6 House w/GCP-4000
WALBRIDGE, OH - CD 113.99

Catalog Num	Cond	Unit Price	Qty	Cost Description
020-4200100	1	6.04	2	12.08 CONNECTOR BUS 1" CENTERS 1/2" X 36" 18 GAGE PUNCHED 1/4" X
020-4200340	1	1.65	12	19.80 LINK TEST ASSEMBLY 1" CENTERS COMPLETE WITH INSULATED
020-4200350	1	2.04	14	28.56 LINK TEST ASSEMBLY 2-3/8" CENTERS COMPLETE WITH
020-4200880	1	0.53	2	1.06 CONNECTOR TERMINAL 2-3/8" CENTERS AAR 14.1.15-4 NICKEL
020-4201045	1	0.15	300	45.00 NUT HEX CLAMP (FLAT NUT) AAR 14.1.11-7 14-24 NS-2 THD FLAT
020-8000067	1	14.61	2	29.22 LOCK AMERICAN H10SIGRA CSX SIGNAL PADLOCK WITH BLACK
022-8005160	1	563.90	1	563.90 KIT CDMA AND VHF RADIO MATERIAL FOR USE WITH CSX
Total Cost: \$				28,143.38

Field Material List for CSX Project: OH2011074 (Effective: 01/04/2012)
Install FLS&G, 6x6 House w/GCP-4000
WALBRIDGE, OH - CD 113.99

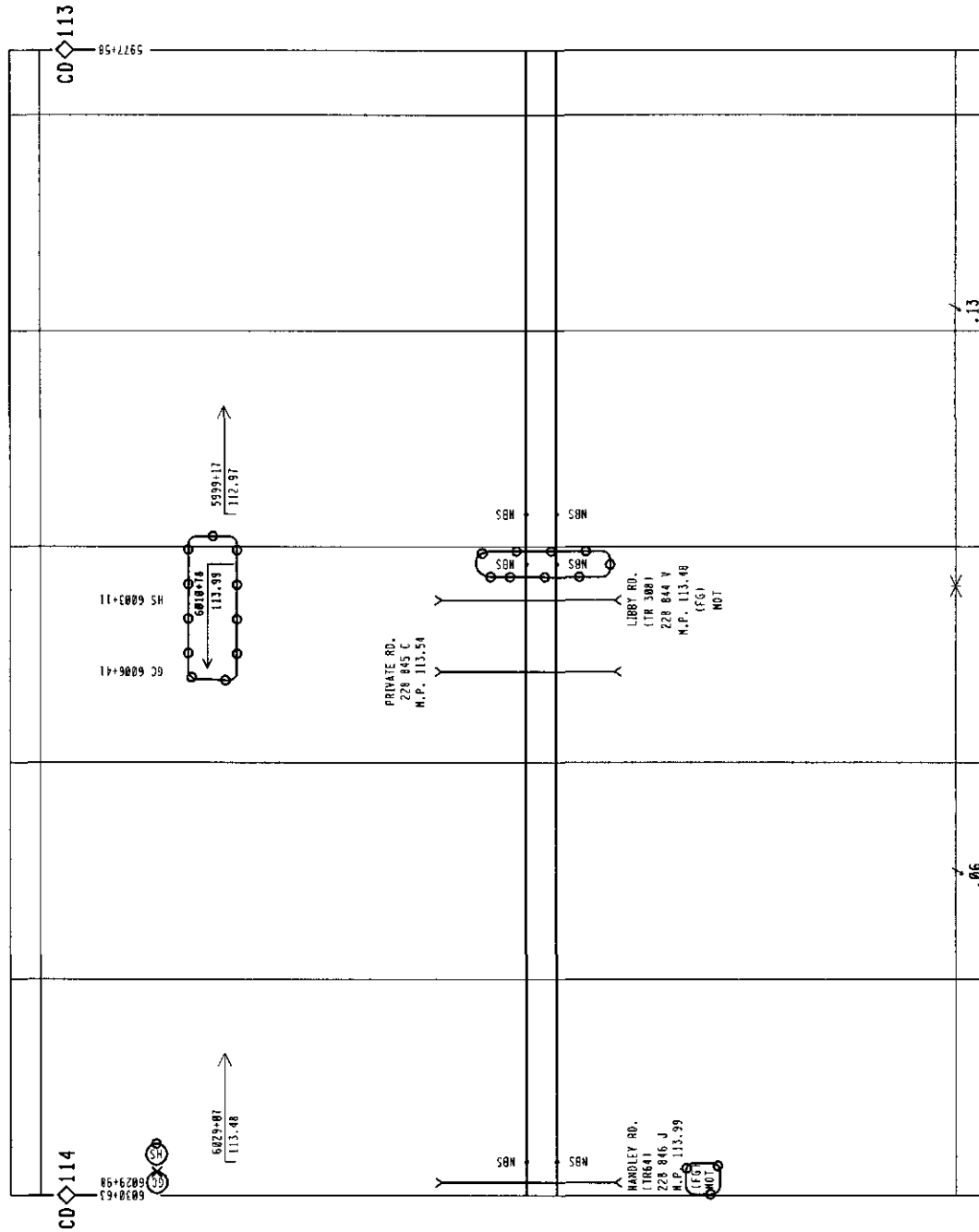
Catalog Num	Cond	Unit Price	Qty	Cost	Description
020-0010449	1	31.57	2	63.14	BOX, 9 INCH DIA. "FLOWER POT" ENCLOSURE WITH HD
020-0013908	1	6.90	350	2415.00	CABLE UG COMPOSITE 19 CONDUCTOR INCLUDES 13
020-0017605	1	0.33	1000	330.00	WIRE CASE 10 AWG FLEX CSX SPEC SS796 OKONITE P/N
020-0017630	1	0.15	1000	150.00	WIRE CASE NO 16 AWG FLEX CSX SPEC SS796 FURN 1000 FT SPOOL
020-0022651	1	55.89	8	447.12	PLUGBOARD KIT TYPE B1 OR ST1 RELAY ASSEMBLY WITH 12 EACH
020-0025145	1	343.27	12	4119.24	SHUNT ENCLOSURE INTERRAIL P/N IRS-SE8A WAYSIDE MOUNT
020-0028610	1	0.23	100	23.00	TERMINAL RING PANDUIT PN12-14HDR-D YELLOW NYLON HVY
020-0052475	1	11.20	4	44.80	ARM EXTENSION 10-1/2" ALUM WITH 3/8" DIAMETER MOUNTING
020-0053066	1	3.94	32	126.08	BOND WEB OF RAIL TRACK CONNECTOR 3/16" DIA X 1" TAB
020-0053220	1	2.44	150	366.00	CABLE POWER UG 3 COND NO 6 AWG, SHOW LENGTH ON EACH
020-0054075	1	1006.88	2	2013.76	GATE GARD NORMAL MOVEMENT COMPLETE WITH SHEAR PIN AND
020-0054260	1	78.29	1	78.29	MARKER SL5H-1015 WRITE-ON WIRE BRADY 1 IN W X 1-1/2 IN
020-0055421	1	18.61	6	111.66	BRACKET SIGN 4" OR 5" MAST W/1/2" U-BOLT FOR ALL SIGNS
020-0056028	1	230.98	8	1847.84	SHUNT SAFETRAN 8A077 DUAL WIDE BAND
020-0056181	1	46.37	2	92.74	SIGN MULTIPLE TRACK "2 TRACKS" COMPLETE WITH 2 EACH
020-0056421	1	18.61	4	74.44	BRACKET SIGN 4" OR 5" MAST FOR ALL SIGNS REQUIRING 5/8"
020-0056674	1	4832.80	2	9665.60	SIGNAL 0220-L GCWD GATE ASSY DWG SS222 INCLS 18 FBRGL ARM
020-0056873	1	728.22	4	2912.88	TIMER LOSS OF SHUNT LOS-15 PLUS, 15 SECOND GETS P/N
020-0057275	1	1.17	450	526.50	WIRE UG TRACK TWISTED PAIR NO. 6 AWG SOLID CONDUCTOR
020-0064053	1	22.12	8	176.96	MOUNTING ASSY 58570-13 GR2 SHELF GRS A62-501 FOR SHELF
020-1040322	1	162.40	30	4872.00	BATTERY SAFT SPL165, 165 AH POCKET PLATE NICKEL CADMIUM
020-1040540	1	31.36	4	125.44	TRAY BATTERY FIBER CO 82687-1-P 12" WIDTH 24" LONG
020-1040550	1	45.92	1	45.92	TRAY BATTERY FIBER CO 82687-3-P 12" WIDTH 38"
020-1150750	1	0.83	200	166.00	BOND STRAND 3/16" DIA 7 STRANDS OF 19 STR EACH 6 WITH
020-1153550	1	2.74	8	21.92	CLIP TRACK WIRE RETAINER UNIVERSAL RAIL BASE WRAP

Field Material List for CSX Project: OH2011074 (Effective: 01/04/2012)
Install FLS&G, 6x6 House w/GCP-4000
WALBRIDGE, OH - CD 113.99

Catalog Num	Cond	Unit Price	Qty	Cost Description
020-1360014	1	1011.52	1	1011.52 PACKAGE FOREMANS CARE FOR ALUMINUM TYPICAL BOM FOR USE
020-1360016	1	21.18	1	21.18 PACKAGE SAFETY & SECURMENT WITH 1 EA CAUTION TAG 1 EA
020-1360103	1	1376.43	1	1376.43 LAYOUT METER SERVICE WITH 25' POLE CSX DWG SS351 SH 2 ITEMS
020-2500620	1	306.84	4	1227.36 SHUNT SAFETRAN 62775-211 NARROW BAND 211HZ
020-2503077	1	356.16	1	356.16 MODULE SAFETRAN ELECTRONIC BELL AND SENSOR UNIT
020-2530300	1	190.40	2	380.80 REACTOR TRACK BATTERY MODEL 5025A GETS P/N 250141-001
020-3430105	1	377.73	4	1510.92 RELAY SAFETRAN 400003 900 OHMS CONTACTS 4FB-2F-1B CSX
020-3430150	1	453.28	4	1813.12 RELAY SAFETRAN 400510 2.0 OHMS CONTACTS 4FB-2F-1B CSX
020-3901895	1	92.68	2	185.36 TIP FLEX HWY CROSSING GATE 24 IN LONG RED & WHITE STRIPES
020-3930010	1	3.70	2	7.40 KIT GATE ARM WARNING STICKER KIT INCLUDES 1-EA 5"X3"
020-4200340	1	1.65	29	47.85 LINK TEST ASSEMBLY 1" CENTERS COMPLETE WITH INSULATED
020-4200900	1	0.27	6	1.62 CONNECTOR SHEATHING AMP 329860 FOR NO. 14 WIRE
020-4201042	1	0.10	40	4.00 NUT HEX BINDING (RSA NUT) AAR 14.1.11-6 14-24 NS-2 THD CONE
020-4201043	1	0.11	250	27.50 NUT HEX CLAMP (FLAT NUT) AAR 14.1.11-7 14-24 NS-2 THD FLAT
020-4201044	1	0.11	200	22.00 WASHER AAR 14.1.11 ROUND COPPER NICKEL PLATED FOR AAR
020-4251190	1	0.14	100	14.00 TERMINAL RING PANDUIT PV10-14RD YELLOW VINYL SIZE
020-9999991	1	100.00	1	100.00 BLOCKING AND BRACING FOR PROJECTS BURCO DIST
250-0001827	1	13.76	1	13.76 BREAKER CIRCUIT SQ D QO235
250-1680406	1	0.48	200	96.00 CONDUIT LIQUID TIGHT 3/4" FLEXIBLE GREY PVC CARLON P/N
250-1680408	1	1.08	200	216.00 CONDUIT LIQUID TIGHT 3/4" NON-METALLIC ORANGE PVC
360-0006100	1	35.07	1	35.07 STOOL STEP WOOD 14"X 20" SIGNAL MAINTAINERS CSXT
360-0800145	1	4.72	1	4.72 BROOM WAREHOUSE CORN HVY DUTY ID300
Total Cost: \$				39,289.1

Consumables List for CSX Project: OH2011074 (Effective: 01/04/2012)
Install FLS&G, 6x6 House w/GCP-4000
WALBRIDGE, OH - CD 113.99

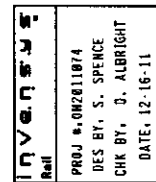
Catalog Num	Cond	Unit Price	Qty	Cost Description
N/A		500.00	1	500.00 CELLULAR MODEM RAVEN AIR LINK COMMUNICATION
N/A		50.00	125	6250.00 FILL MATERIAL, 1 CUBIC YARD
N/A		800.00	1	800.00 WALKWAY ROCK, 10 CUBIC YARDS
020-0017605	1	0.29	350	101.50 WIRE CASE 10 AWG FLEX CSX SPEC SS796 OKONITE
020-0017607	1	0.68	500	340.00 WIRE CASE TW PR NO 10 AWG FLEX CSX SPEC SS796 TWIST 2
020-0017625	1	0.42	150	63.00 WIRE CASE TW PR NO 14 AWG FLEX CSX SPEC SS796 TWIST 2
020-0017630	1	0.13	200	26.00 WIRE CASE NO 16 AWG FLEX CSX SPEC SS796 FURN 1000 FT SPOOL
020-0017635	1	0.80	130	104.00 WIRE SIGNAL DEL 018 NO 6 COPPER STRANDED SINGLE
020-0028610	1	0.22	100	22.00 TERMINAL RING AMP 35628 YELLOW PLASTI-BOND HVY DUTY
020-1710045	1	2.25	250	562.50 CONDUIT SDR 13.5 4" POLYETHYLENE TRENCHLESS
020-2060072	1	750.00	2	1500.00 FOUNDATION HELICAL SCREW-IN ASSEMBLY 7' X 10" COMPLETE
020-2060074	1	588.00	2	1176.00 EXTENSION 10" X 3' USE WITH XING GATE AND SIGNAL MAST
020-3261970	1	9.41	2	18.82 DECAL ASSY 2" BLACK PRESSURE SENSITIVE VINYL PRE-MASKED
020-4200880	1	0.53	2	1.06 CONNECTOR TERMINAL 2-3/8" CENTERS AAR 14.1.15-4 NICKEL
020-4200892	1	0.44	27	11.88 CONNECTOR TERMINAL 1" CENTERS AAR 14.1.15-3 NICKEL PLATED
020-4251190	1	0.13	120	15.60 TERMINAL RING AMP 35627 BLACK PLASTI-BOND WIRE SIZE 10-12
020-4251290	1	0.49	30	14.70 TERMINAL WIRE AMP 322051 BLUE WIRE SIZE NO 6 AWG 1/4" STUD
020-4251295	1	0.49	6	2.94 TERMINAL WIRE AMP 322007 BLUE WIRE SIZE NO 6 AWG 3/8" STUD
020-9999992	1	50.00	1	50.00 HOUSE, SIGNAL HANDLING CHARGE, BURCO DISTRIBUTION
450-0019212	1	0.02	100	2.00 SCREW 10 X 1" SHT METAL PAN HD TYPE A COARSE THREAD
Total Cost: \$				11,562



Rail
 PROJ # 0H2011074
 DES BY, S. SPENCE
 CHK BY, D. ALDRIGHT
 DATE, 12-16-11

- - - - - IN
 * * * * * OUT

HORIZONTAL SCALE				M.P. CO-114 TO CO-113			
1 INCH = 500 FEET				TRACK PLAN			
				BUCKETE SIX TO TURNPIKE			
DESIGNED	DRAWN	CHECKED	DATE	DESIGNED	DRAWN	CHECKED	DATE
SHE/ALB	SHE/ALB	SHE/ALB	12-15-11	SHE/ALB	SHE/ALB	SHE/ALB	12-15-11
SHEET				SHEET			
FILE				FILE			
001300				001300			



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INDEX CONTENTS

S/N NO.		REVISION NO.								
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501	TRACK AND SIGNAL PLAN									
601	MINIMUM PROGRAM STEPS REPORT ONE-99									
601	POWER DISTRIBUTION									
601	DETECTION DEVICE CONSIST ONE-99									
602	DETECTION CIRCUITRY ONE-99									
603	DETECTION CIRCUITRY ONE-99									
604	CROSSING WARNING DEVICE GATE CIRCUITRY									
605	CROSSING WARNING DEVICE LIGHT CIRCUITRY									
606	CROSSING WARNING DEVICE CIRCUITRY									
607	SEAR II: CONFIGURATION & FUNCTIONS									

☒ = PLANS SENT TO FIELD (DISTRIBUTED)
☒ = PLANS AS-IN-SERVICE (UP TO DATE)

NEW WORK

PROJ. NO. 042811074 DES BY: S. SPENCE CHK BY: D. ALBRIGHT DATE: 12-16-11

☐ = NOTE

40086GP-101
 REV. 03-31-06

DESIGN DATE	REV. NO.
12-16-11	1

REVISIONS

REV. NO.	PROJECT NO.	DESIGN DATE	IN SERVICE DATE	REVISION DATE
1	042811074	12-16-11		

TO BE COMPLETED
 ON A.I.S.



RAIL TRANSPORT GROUP ENGINEERING
 COMMUNICATIONS AND SIGNALS

TR 64 (HAWLEY RD.) 228846J

INDEX AND REVISIONS
 WALBRIDGE, OH M.P. CD-113.99

DESIGNED	DIGITIZED	CHECKED	DATE
JRC/SWS	JRC/PWH	JRC/DWA	12-16-11
DRAWING	SHEET NO.	FILE	SHEET
-----	-----	COL1399	101

Minimum Program Steps Report

Location and SIN

DOT Number: 228846J
 Milepost Number: 10113.98
 Site Name: TR-64 (HANLEY RD.)

SIN: 71254202716 *

* Parameter is part of office check number calculation.

MCF and Template Selection

MCF Name: GCP-T6X-02-1.mcf
 MCF Revision: 021
 MCFCRC: 5076E435

Template = 1A+6 Trk B1 *

* Parameter is part of office check number calculation.

Minimum Program Steps

TEMPLATE, module configuration

Track 2/R10 1 Slot = Track *

TEMPLATE, track 1-B1, Island

Track 1, GCP Frequency = 211 Hz
 Track 1, Approach Distance = 2860 ft
 Track 1, Prime Warning Time = 31 sec
 Track 1, GCP Transmit Level = Medium (Set in Field)
 Track 1, Isl Frequency = 8.3 kHz

TEMPLATE, track 2-B1, Island

Track 2, GCP Frequency = 211 Hz
 Track 2, Approach Distance = 2860 ft
 Track 2, Prime Warning Time = 31 sec
 Track 2, GCP Transmit Level = Medium (Set in Field)
 Track 2, Isl Frequency = 10.0 kHz

TEMPLATE, SSCC

SSCC-1 Number of GPs = 1 *
 SSCC-2 Number of GPs = 1 *
 SSCC-2 Number of GPs = 1 *
 SSCC 1, Lamp Neutral Test = Off (Set in Field)
 SSCC 2, Lamp Neutral Test = Off (Set in Field)

TEMPLATE, 00S

00S Control = Display00S IP *
 T2 00S Control = 00S Input 1 *

TEMPLATE, IP assignment SSCC

IN 7.2 = Not Used *
 IN 8.2 = Out of Service IP 1 *
 IN 8.4 = GD 2.1 *
 IN 8.5 = GP 2.1 *

GCP, track 1

Track 1, Island Distance = 120 ft *

GCP, track 1 enhanced det

Track 1, Inbound PS Sensitivity = Off *

Track 1, Trailing Switch Logic = Off *

GCP, track 2

Track 2, Island Distance = 120 ft *

GCP, track 2 enhanced det

Track 2, Inbound PS Sensitivity = Off *

Track 2, Trailing Switch Logic = Off *

ADVANCED, site options

Daylight Savings = 0n *

SSCC, 1

SSCC-1 Gate Delay = 5 sec *

SSCC 1, Flash Rate = 55 *

SSCC, 2

SSCC-2 Gate Delay = 5 sec *

SSCC 2, Flash Rate = 55 *

SEAR

DI 1 = Gnd Flt Tester 1 *

DI 2 = Gnd Flt Tester 2 *

RI 1 = Ground Fault Test *

RI 2 = AC Control *

SEAR, slot 7-8 inputs

IN 7.1 = ISS 1 *

IN 8.1 = ISS 2 *

IN 8.3 = POK 2 *

* Parameter is part of office check number calculation.

Check Numbers

Office Check No. (DT 4.6.B), 4E5CE683
 Office Check Number, 4E5CE683
 Config. Check Number, 1C999CE2
 (Based on MCF Revision 021)

Parameters not part of office check number calculation

Track 1, GCP Frequency = 211 Hz

Track 1, Approach Distance = 2860 ft

Track 1, Prime Warning Time = 31 sec

Track 1, GCP Transmit Level = Medium (Set in Field)

Track 1, Isl Frequency = 8.3 kHz

Track 2, GCP Frequency = 211 Hz

Track 2, Approach Distance = 2860 ft

Track 2, Prime Warning Time = 31 sec

Track 2, GCP Transmit Level = Medium (Set in Field)

Track 2, Isl Frequency = 10.0 kHz

SSCC 1, Lamp Neutral Test = Off (Set in Field)

SSCC 2, Lamp Neutral Test = Off (Set in Field)

NEW WORK

PROJ #042811074
DES BY, S. SPENCE
CHK BY, D. ALDRIGHT
DATE, 12-16-11

RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS

TR 64 (HANLEY RD.) 228846J

MINIMUM PROGRAM STEPS REPORT CMI-99

VALDIBIDGE, OH M.P. CD-113.98

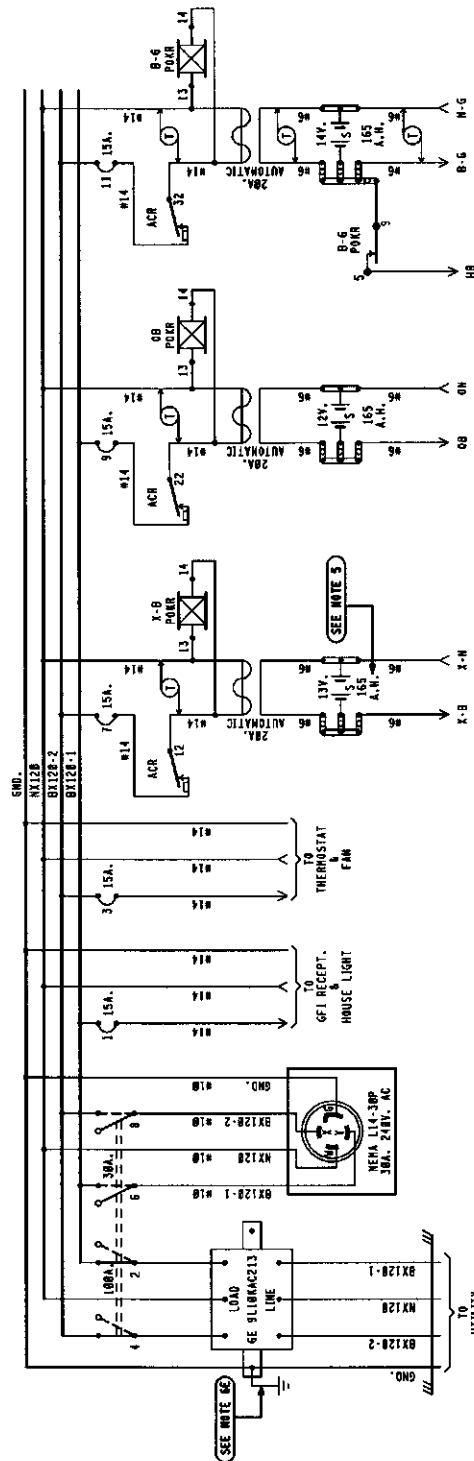
DESIGNED	DIGITIZED	CHECKED	DATE
JRC/SNS	JRC/RNM		12-16-11
DRAWING	SHEET NO	FILE	SHEET
.....	.....	CD11399	001

4086GCP-P81
 REV. 86-3E-89

DESIGN DATE	REV. NO.	1
12-16-11		

TCP ROW

ACR	X-B POWER	MCR	9-6 POWER
12 B	9 F 11 F M66	9 F 11 F M41	9 F 11 F M66
15 F	10 F 12 F C48	10 F 12 F C48	10 F 12 F C48
22 B	18 F 12 F C48	18 F 12 F C48	18 F 12 F C48
25 B			
32 B			
35 B			



(BX120-1 | BX120-2)
10.0 AMPS 14.0 AMPS
MAXIMUM LOAD
CALCULATED PER S5360

NOTES:

- 1 - REFERENCES ARE PER SCMS-13.
- 2 - ARRESTERS ARE PER S5342.
- 3 - SHELF RELAY PLACEMENT ON CONDUIT CHART HAS NO SIGNIFICANCE.
- 4 - PLUG-IN RELAYS ARE VIEWED FROM THE FRONT OF RACK.
- 5 - BATTERY A.M. CAPACITY SHOWN IS THE MINIMUM REQUIREMENT.
- 6 - WIRING
 - A - FEED TO ALL BUSES, LIGHT CIRCUITS, MOTOR CIRCUITS TO BE #10 FLEX.
 - B - 120-VOLT FEED FROM ENTRANCE TO POWER BUS TO BE #10 FLEX.
 - C - ALL TRAIL WIRE TO BE #10 FLEX.
 - D - ALL OTHERS TO BE #15 FLEX UNLESS NOTED.
 - E - GROUND WIRE NOT NECESSARY WHEN GE ARRESTER IS MOUNTED ON GROUND PLANE OR METAL ENCLOSURE MOUNTED DIRECTLY TO RUMBLEW METAL STRUCTURAL MEMBER.
 - F - CIRCUIT INTERRUPTERS 2 & 4 ARE MECHANICALLY INTERLOCKED WITH CIRCUIT INTERRUPTERS 6 & 8.

NEW YORK

Proj # 042011874
DES BY: S. SPENCE
CHK BY: D. ALDRIGHT
DATE: 12-16-11

6' X 6' RELAY HOUSE W/FARADAY SHIELD

DESIGNED	DIGITIZED	CHECKED	DATE
BY: S. SPENCE	BY: S. SPENCE	BY: S. SPENCE	12-16-11
TR 64 (HAWLEY RD.)	228846J		
POWER DISTRIBUTION			
VALHOLM, OH M.P. CO-113.99			
DESIGNED	DIGITIZED	CHECKED	DATE
BY: S. SPENCE	BY: S. SPENCE	BY: S. SPENCE	12-16-11
TR 64 (HAWLEY RD.)	228846J		
DESIGNED	DIGITIZED	CHECKED	DATE
BY: S. SPENCE	BY: S. SPENCE	BY: S. SPENCE	12-16-11
TR 64 (HAWLEY RD.)	228846J		

205 B

205 A

GGP 4888 APPLICATION NOTES:

1. THE GRADE CROSSING PREDICTOR (GCP) IS A MODULAR MICROPROCESSOR CONTROLLED SYSTEM THAT IS DEPLOYED TO CONTINUALLY MONITOR THE APPROACHES TO RAILROAD GRADE CROSSINGS AND TO CONTROL THE LAMPS, GATES AND BELLS ASSOCIATED WITH THESE CROSSINGS. WHEN EQUIPPED WITH THE SEAR III MODULE THE GCP 4888 WILL RECORD EVENTS AND REPORT ALARMS WHEN CONNECTED TO AN OFFICE SYSTEM.

2. THE GCP 4888 GCP (4888) IS A TWO TRACK REDUNDANT UNIT CAPABLE OF DRIVING A INDEPENDENT FLASHER AND GATE SIGNALS AND RECORDING EVENTS AND REPORTING ALARMS. THIS 4888S INCLUDES THE FOLLOWING MODULES:

SLOT	MODULE	FUNCTION	PART NO.
M1	CPU-III	MAIN	488483
M2	TRACK-1	MAIN	488418
M3	TRACK-2	MAIN	488418
M4	CPU-III	STANDBY	488483
M5	TRACK-1	STANDBY	488418
M6	TRACK-2	STANDBY	488418
M7	SSCC-III	A SIGNAL	488485
M8	SSCC-III	B SIGNAL	488485
M9	TRANSFER UNIT	TRANSFER UNIT	488468
M10	SEAR III	RECORDER	488418

3. EACH TRACK MODULE HAS TWO PROGRAMMABLE JUMPS AND TWO PROGRAMMABLE OUTPUTS.

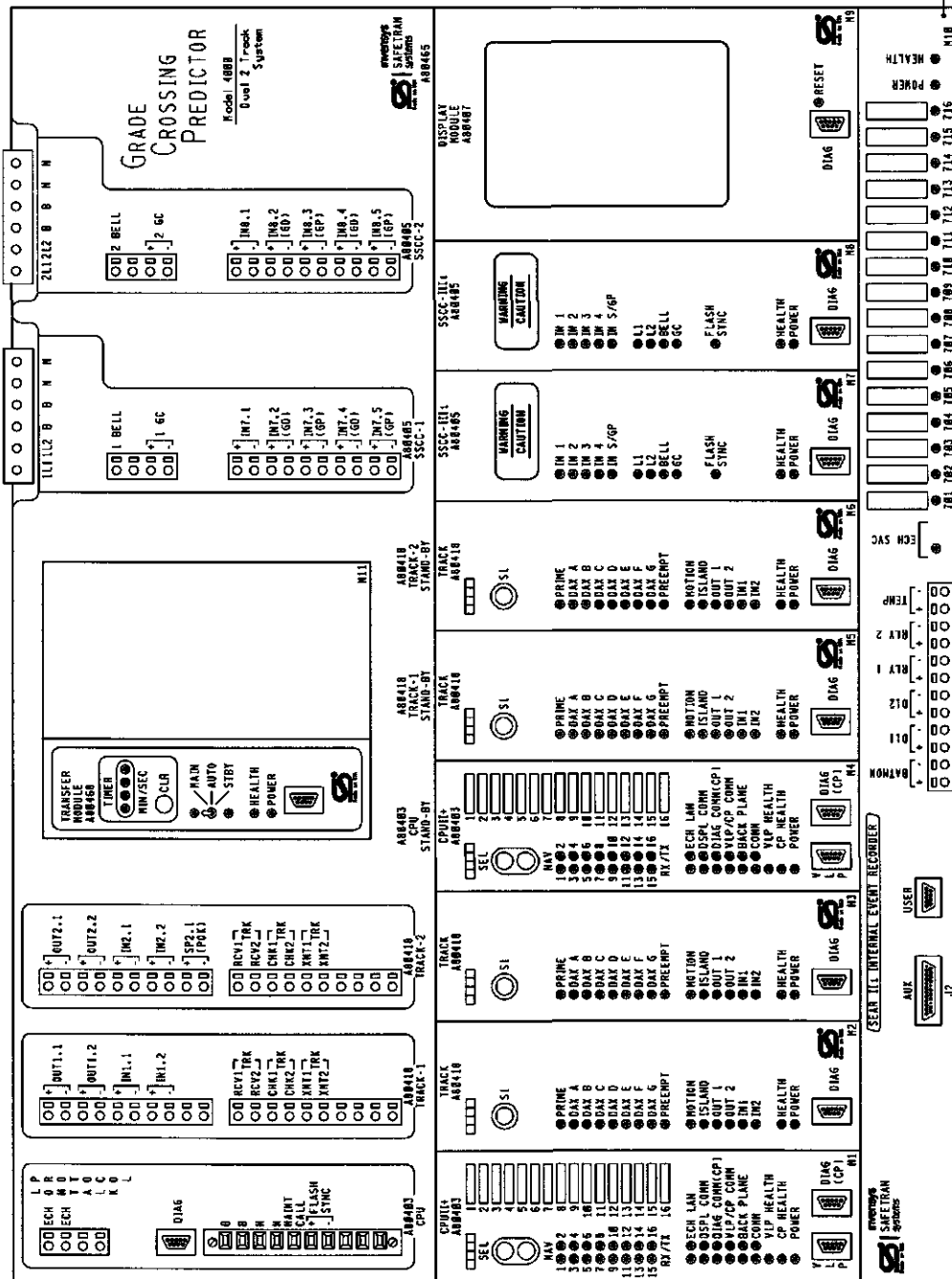
4. THE SEAR III INTERNAL EVENT RECORDER HAS INPUTS FOR ONE BATTERY MONITOR, TWO NON-VOLATILE INPUTS AND TWO PROGRAMMABLE RELAY UNITS (RELAY/UNIT).

5. LOCATED ON THE FRONT OF EACH MODULE THERE ARE LED LIGHTS TO INDICATE THE ACTIVITY OF CERTAIN FUNCTIONS OCCURRING INSIDE THE GCP.

6. BETWEEN SLOT 1 & 2 THERE IS A CHASSIS IDENTIFICATION CHIP (CIC) SOCKET AND AN ECU CONNECTOR (DB-25 FEMALE).

7. UPON THE FAILURE OF A MODULE IN SLOTS M1-M3 THE AUTOMATIC TRANSFER UNIT SWITCHES TO THE STANDBY MODULES IN SLOTS M4-M6.

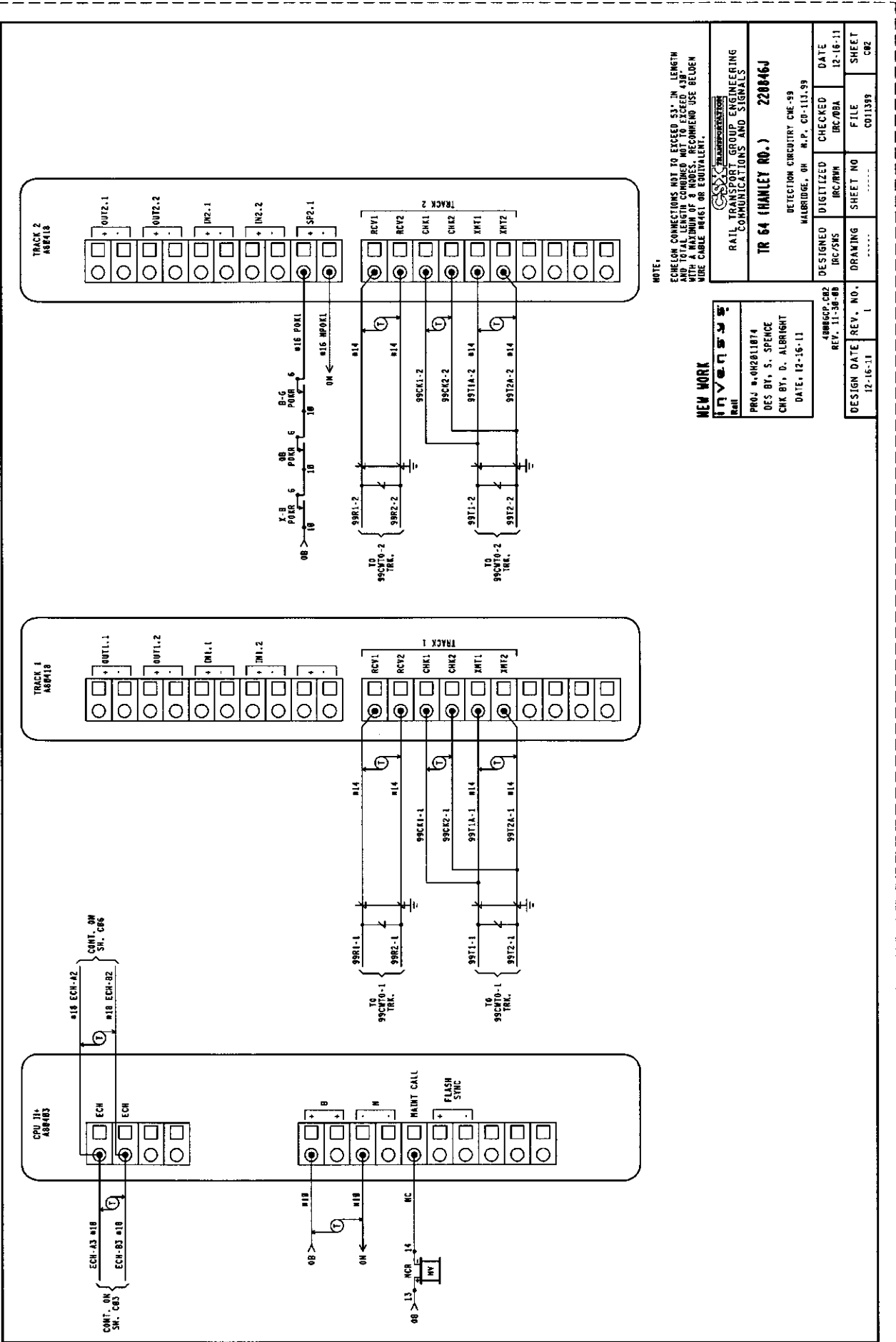
8. THE GCP 4888 GCP (4888) MAY USE RIO MODULES IN SLOTS M3 AND M6.



NEW WORK
 PROJ. # 00201074
 DES. BY: S. SPENCE
 CHK. BY: D. ALBRIGHT
 DATE: 12-16-11

RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS	
TR 64 (HAWLEY RD.)	228846J
DETECTION DEVICE CONSIST CNE-93 VALDRIE, OH M.P. CD-113-99	
DESIGNED 488483CP.C01 REV. 11-38-88	CHECKED JRC/OBA
DIGITIZED JRC/SMS	DATE 12-16-11
DRAWING	SHEET C01399
REV. NO. 1	FILE C01399
DESIGN DATE 12-16-11	SHEET C01

DIMENSIONS 23.25" X 22.15" X 12.38"

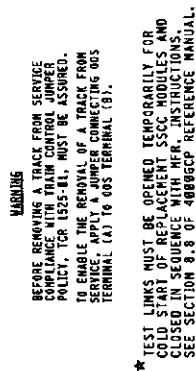


NEW WORK

Rev	1
Proj	A-002811874
Des By	S. SPENCE
Chk By	D. ALBRIGHT
Date	12-15-11

RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS		TR 64 (HAWLEY RD.)		220846J	
DETECTION CIRCUITRY ONE-99 MALBRIDGE, ON M.P. CD-113.99		DESIGNED IRC/SMS		DIGITIZED IRC/ABA	
CHECKED IRC/ABA		DATE 12-16-11		SHEET 002	
DRAWING 12-16-11		SHEET NO 1		FILE C011399	

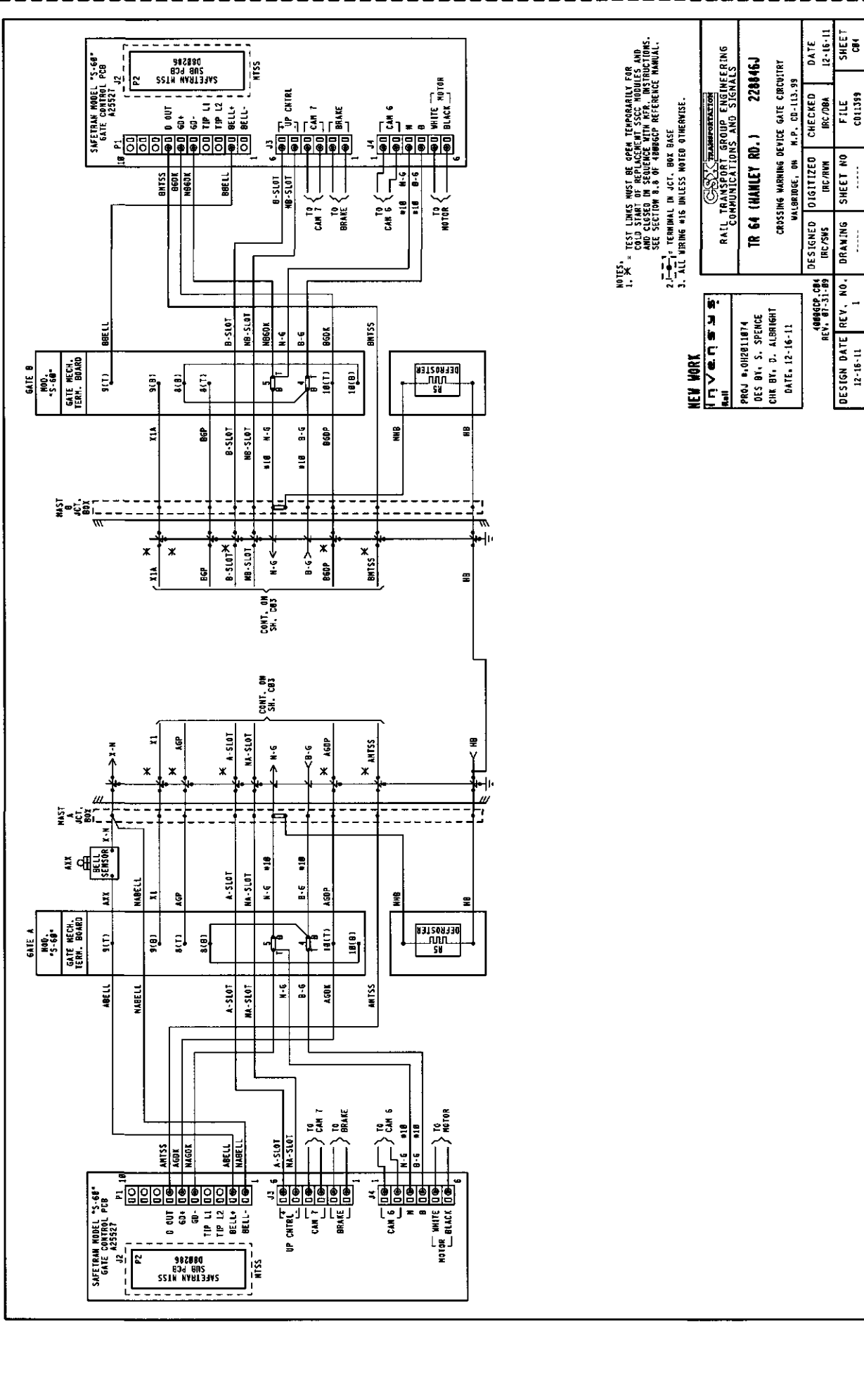
PROJ # 002811074		DES BY, S. SPENCE		CHK BY, D. ALBRIGHT		DATE, 12-16-11	
40000000 C02		REV, 11-30-09		DESIGN DATE 12-16-11		REV. NO. 1	



inven	PROJ #. 0H2011074
Call	DES BY, S. SPENCE
	CHK BY, D. ALBRIGHT
	DATE, 12-16-11

		RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS	
TR 64 (HANLEY RD.)		220846J	
DETECTION CIRCUITRY CUE-89 WALBROGE, OH R.P. CO-113.99			
DESIGNED	DIGITIZED	CHECKED	DATE
INC/PWS	INC/ARM	INC/DMA	12-16-11
DRAWING	SHEET #0	FILE	SHEET
-----	-----	011399	083

DESIGN DATE	REV. NO.
12-16-11	1



NOTES: TEST LINES MUST BE OPEN TEMPORARILY FOR
 1. * = COLD START OF REPLACEMENT SSC MODULES AND
 AND CLOSED IN SEQUENCE WITH KTR. INSTRUCTIONS.
 SEE SECTION 8.8 OF 4086GCP REFERENCE MANUAL.
 2. * = TERMINAL IN JCT. BOX BASE
 3. ALL WIRING #16 UNLESS NOTED OTHERWISE.

NEW WORK

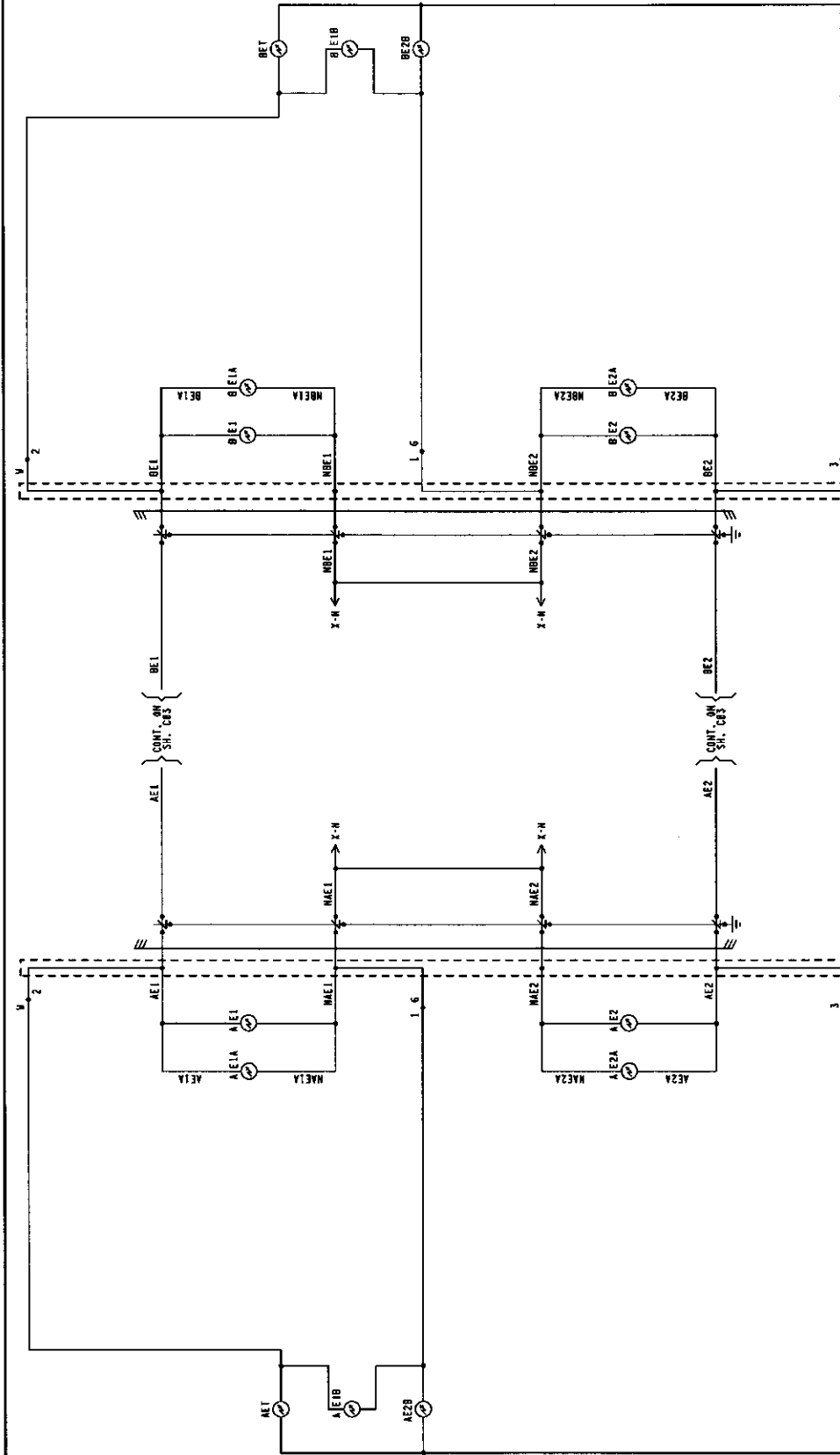
PROJ # 012811074
 DES BY: S. SPENCE
 CHK BY: D. ALBRIGHT
 DATE: 12-16-11

RAIL TRANSPORT GROUP ENGINEERING
 COMMUNICATIONS AND SIGNALS

TR 64 (HAWLEY RD.) 228046J

CROSSING WARNING DEVICE GATE CIRCUIT
 WALBRIDGE, ON M.P. CD-113.99

DESIGNED	DIGITIZED	CHECKED	DATE
4086GCP CB4	IRC/ASNS	IRC/DBA	12-16-11
REV. 01-31-89	DRAWING	SHEET NO	SHEET
12-16-11	1	011399	CB4



NEW WORK

RAIL	RAIL
TRANSPORT GROUP ENGINEERING	TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS	COMMUNICATIONS AND SIGNALS
TR 64 (HANLEY RD.)	220846J
CROSSING WARNING DEVICE LIGHT CIRCUITRY	CROSSING WARNING DEVICE LIGHT CIRCUITRY
WALBRIDGE, OH	W.P. CO-113-99

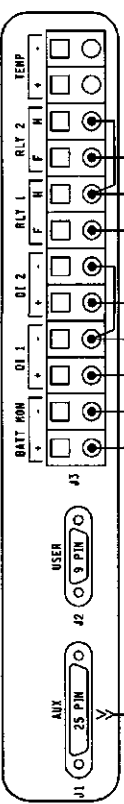
DESIGNED	DIGITIZED	CHECKED	DATE
IRC/MS	IRC/MS	IRC/MS	12-16-11
DRAWING	SHEET NO	FILE	SHEET
-----	-----	CO11399	085

- NOTES:
1. TERMINAL IN JUNCTION BOX
 2. NEW 7' OR MORE LIGHT POLE AND SIGNAL STRUCTURE
 3. REFER TO SS382 FOR REQUIRED AMBERING
 4. FEEDS TO ALL BUSES AND LIGHT CIRCUITS ARE #10 FLEE
 5. UNLESS NOTED ALL OTHER WIRING #16
 6. CABLE SPECIFICATIONS SHOWN ON SH. 501

40886CP-085
REV. 87-31-89

DESIGN DATE	REV. NO.
12-16-11	1

SEAR II INTERNAL EVENT RECORDER I/O

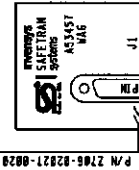
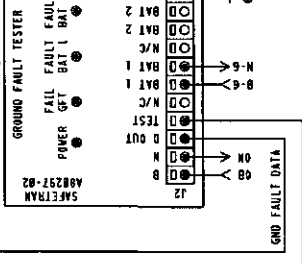
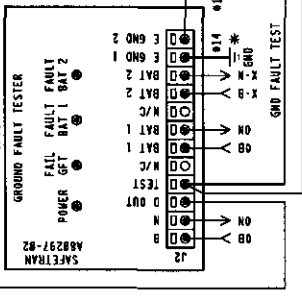


NOTE TO INSPECTOR: WAG, AT INSTALLATION OF GATEWAY, CONFIRMATION, IN UPDATE OF THE EXECUTIVE PROGRAM, MAKE-UP CONFIGURATION TABLE FOR AS IN SERVICE PLANS

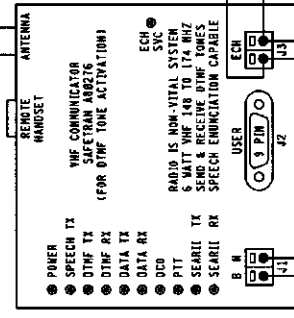
WAYSIDE ACCESS GATEWAY CONFIGURATION	
SITE ATCS ADDRESS	7-125-428-827-32-01
SITE ATCS ADDRESS	7-125-428-827-32-01
SERIAL INTERFACE	30-400-MHz, 8-17-MHz, 0-10-MHz
SERIAL FORMAT	RAM
WAG TEST MODE	DISABLED
ECHELON ADDRESS	81-87
UDP PORTS	5000, 5001, 5002, 5003
ROUTE TABLE EXPIRY	5400 SEC
BROADCAST MEDIUM	IP ETHERNET
TCP PORTS	23, 10023, 6001, 6002
UDP SERVER	DISABLED
IP ADDRESS	192.168.13.1
TYPE T ROUTE LENGTH	12-17MILLIGRESS
IP NETWORK MASK	255.255.255.0
WAG CIRCUIT ID	DISABLE
ROUTING REGION BSMAN 1	DCSERVER1.JAX.COM
ATCS SERVER UDP PORT NUMBER	6001
TELNET NUMBERS	WAG 6002, SERIAL 10023
DEFAULT GATEWAY IP	192.168.13.231

GROUND FAULT DATA

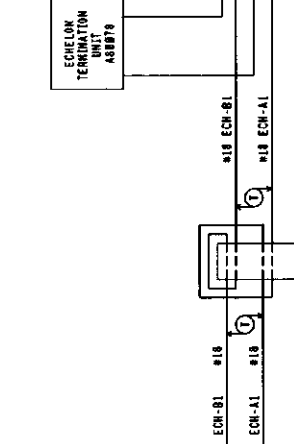
GROUND FAULT TEST



SHIELDED COAXIAL CABLE TO ANTENNA



ECHELON TERMINATION UNIT



COMM NOTES:

- 1. WAG J3A PINOUTS, 4 & 5 = +12VDC RADIO OUT, 7 & 8 = GND RADIO RETURN
- 2. WAG AND SEAR II ECHELON COMM THROUGH GP4088 LONATALK PROTOCOL CONNECTION
- 3. SETUP IN APPENDIX 11, GP4088 SYSTEM CUT OVER TEST PROCEDURE AND CHECK OFF SHEET.

NEW WORK

PROJ 4-04281874
DES BY: S. SPENCE
CHK BY: D. ALBRIGHT
DATE: 12-16-11

NOTES:

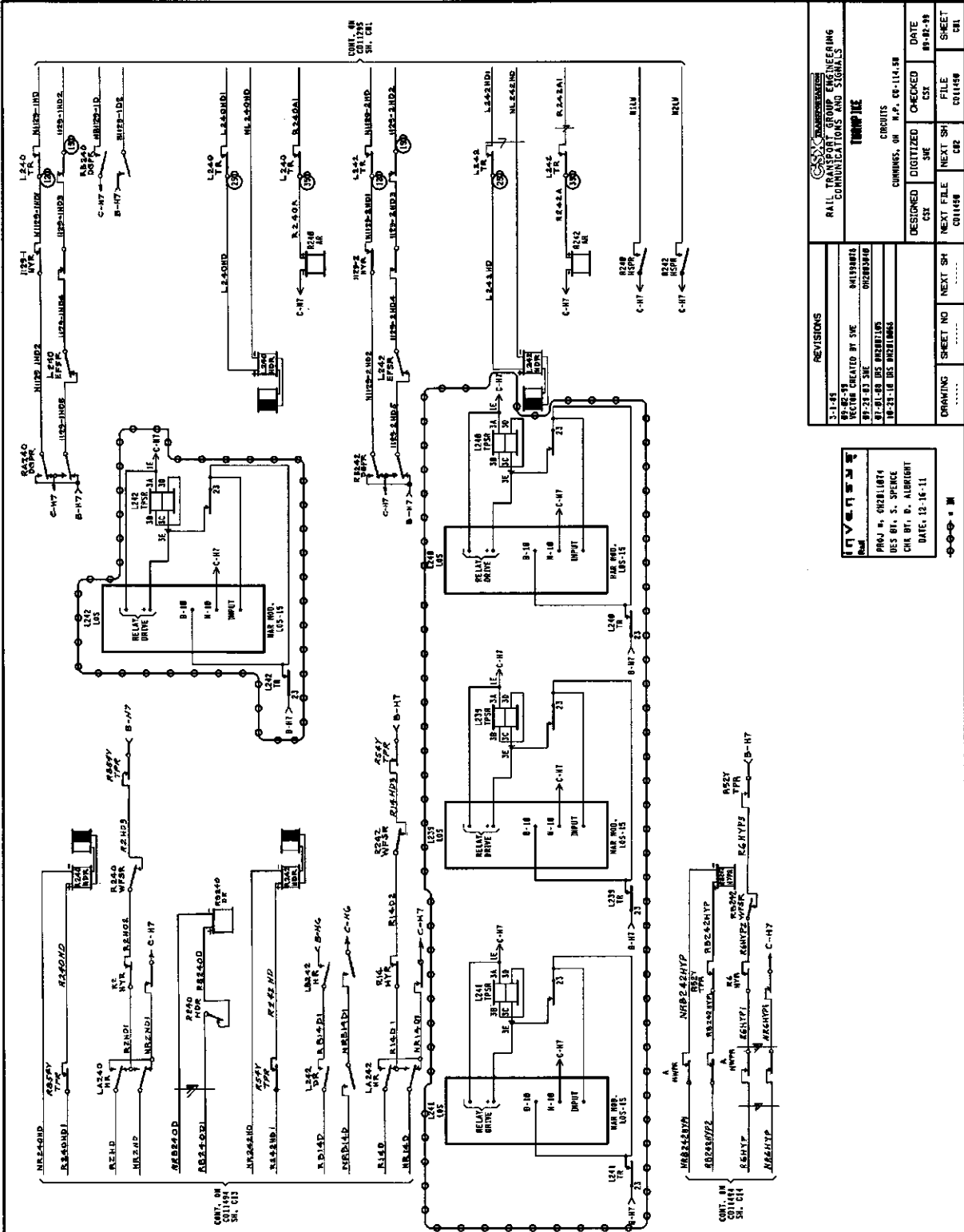
- 1. ALL WIRING #16 UNLESS NOTED OTHERWISE.
- 2. * = EARTH GROUND REF. TERMINALS REQUIRED FOR CONNECTION TO DIFFERENT POINTS OF BONDING.
- 3. ** = TO BE PROVIDED BY COMMUNICATIONS.
- 4. LOOP WIRE THROUGH FERRITE BEAD TWICE.

GP PROGRAMMING FOR VHF RADIO

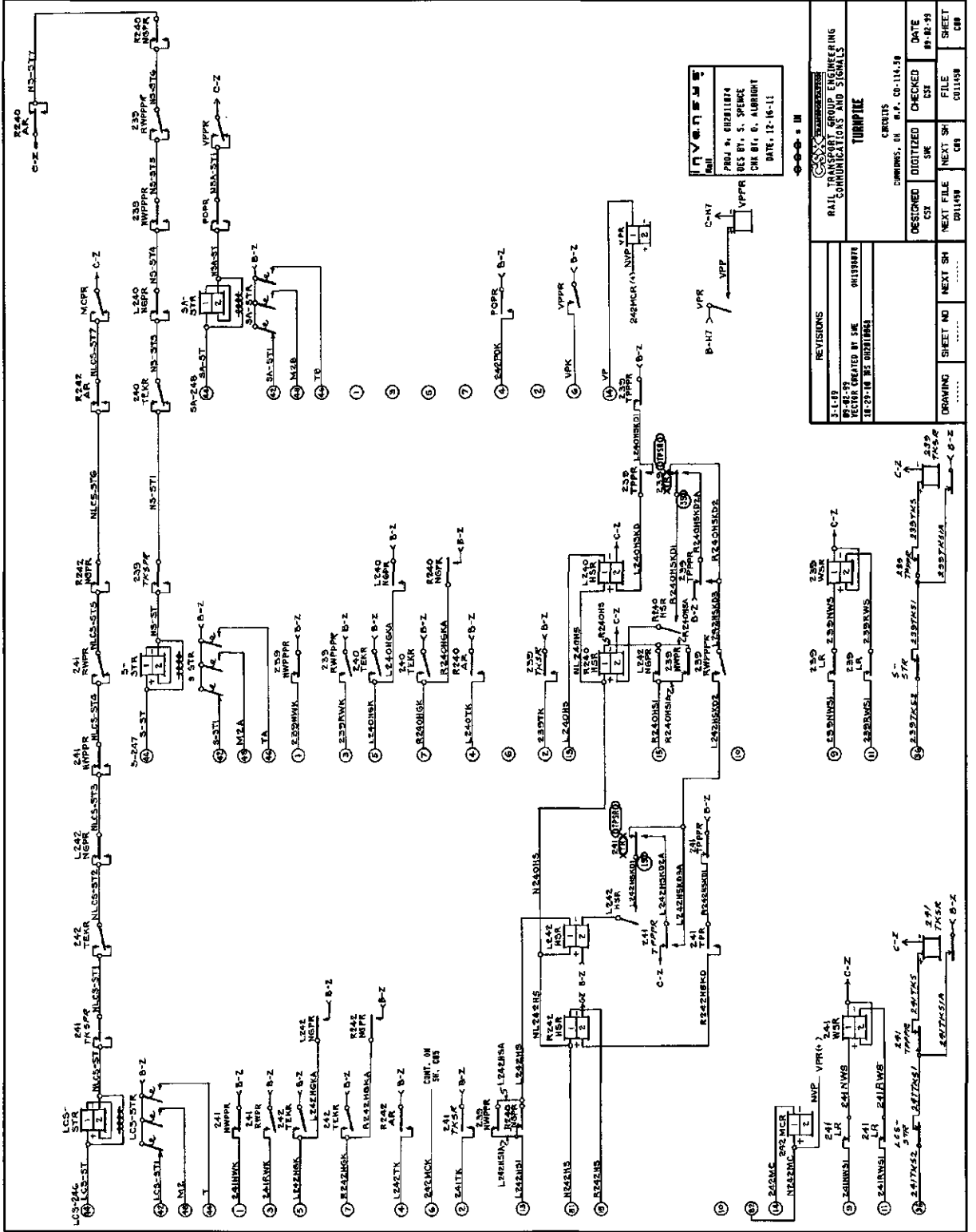
- REMOTE DTMF CROSSING ACTIVATION (ACTIVATES ENTIRE CROSSING)
TO ACTIVATE PRESS, 8460
TO DEACTIVATE PRESS, 8461
(ACTIVATION WILL TIME OUT AFTER 60 SEC.)
- REMOTE DTMF LIGHTING ACTIVATION (ACTIVATES FLASHING LIGHTS ONLY)
TO ACTIVATE PRESS, 8461
TO DEACTIVATE PRESS, 8461
(ACTIVATION WILL TIME OUT AFTER 60 SEC.)

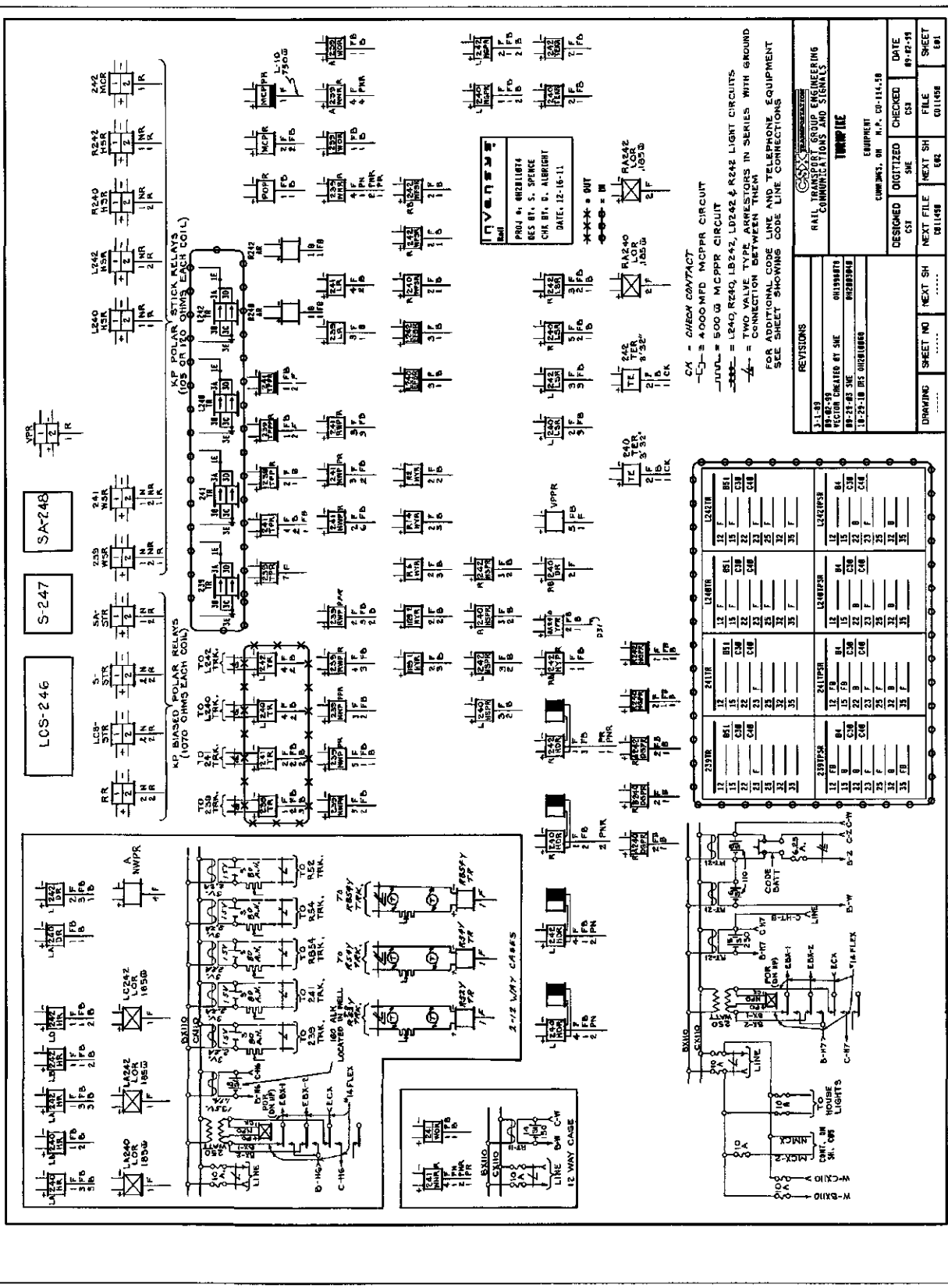
RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS	
TR 64 (HAWLEY RD.) 228046J	
CROSSING WARNING DEVICE CIRCUITRY	
DESIGNED BY	DATE
DIGITIZED	12-16-11
JRC/SMS	JRC/OBA
JRC/RWM	JRC/RWM
DRAWING	SHEET NO
REV. NO.	FILE
1	COL1399
12-16-11	CDB

40866CP.CDB	REV. 11-30-88
DESIGNED BY	DATE
DIGITIZED	12-16-11
JRC/SMS	JRC/OBA
JRC/RWM	JRC/RWM
DRAWING	SHEET NO
REV. NO.	FILE
1	COL1399
12-16-11	CDB



RASTER FILE: 50001158.C11 MS FILE: CD11450.C01





**OHIO RAIL DEVELOPMENT COMMISSION
INTER-OFFICE COMMUNICATION**

TO: Rob Marvin, Director of Transportation, PUCO
Leah Thomas-Dalton, Deputy Chief, PUCO

FROM: Susan Kirkland, Manager, Safety Section, ORDC

BY: Tod Darfus, Project Manager, ORDC

SUBJECT: Wood County, CSX Transportation (CSX)
Ovitt Road/TR-104, 155 809 C, PID 90715

DATE: January 23, 2012, 2011

The Public Utilities Commission of Ohio (PUCO) established a diagnostic survey at the subject location on March 9, 2011. The Ohio Rail Development Commission (ORDC) attended the review. The Diagnostic Team recommended the improvement of warning devices to flashing lights and roadway gates plus cantilevers. A copy of the diagnostic review form is attached.

PE has already been provided by the railroad. ORDC approves the site plans and estimates as provided. Please issue a construction-only order for the project outlined above. This construction authorization is made with the stipulation and understanding that any field work needs prior approval before the work begins. This authorization is made with the stipulation and understanding that an approved estimate may contain entries for items or activities that may be cited and found to be ineligible for federal participation during the project audit.

It is expected that all work necessary for FHWA acceptance of the warning devices will be completed by the in-service due date and that the railroad will be responsible for this work. This work includes, but is not limited to:

- any ancillary work to make warning devices function as designed and visible to the roadway user, and
- MUTCD compliance – including minor roadway work if necessary.

Thank you for your assistance with these matters.

Attachment: Diagnostic Review
Plan & Estimate

c: George Martin, PUCO
T.Darfus (file)



Diagnostic Review Team Survey

Date: 3/9/11 930 AM

Location Data

Street or Road Name:

OVITT RD

Route/Road Number (i.e. Twp., Co., SR or US) TR 104 (Include SLM if State or US route)

AAR-DOT
No.:

155809C

County:

WOOD

Township:

MIDDLETON

City: (In
or Near)

HASKINS

Railroad
Name:

CSX

Railroad
Division:

LOUISVILLE

Branch/Line
Name:

TOLEDO

Nearest RR

Timetable Station:

HASKINS

RR Milepost:

BE 186.88

On-Site Review Team

(Include: Name - Organization - Phone Number)

1. GEORGE MARTIN PUCO 614-752-9107
2. JOD DARTUS GRDC 614-394-9298
3. KAREN MOHLER CSX 904-359-1650
4. JEFF KOKER MIDWEST T&E 919-261-1480
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Existing Traffic Control Devices

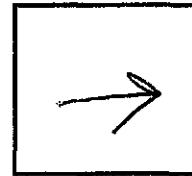
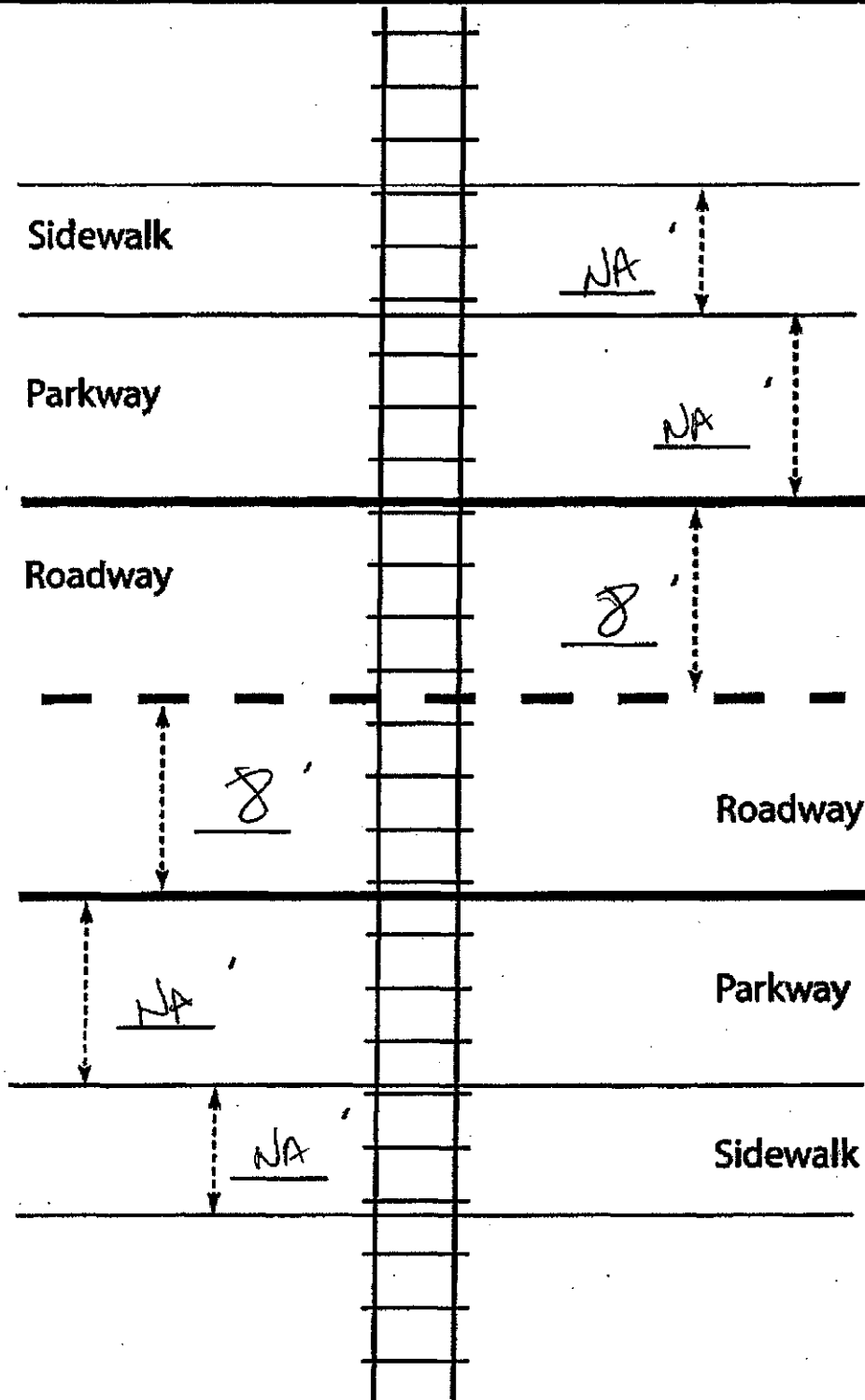
Type of Warning Devices	Installed?		Quantity/Comments
Advance Warning Signs	☒ Yes	☐ No	2
'Stop' Signs	☐ Yes	☒ No	
'Stop Ahead' Signs	☐ Yes	☒ No	
Pavement Markings	☐ Yes	☒ No	
Crossbucks	☒ Yes	☐ No	2
Number of Tracks Signs	☐ Yes	☒ No	
Inventory Tags	☒ Yes	☐ No	2
Interconnected Highway Traffic Signal	☐ Yes	☒ No	
Mast-Mounted Flashing Lights	☐ Yes	☒ No	
Cantilever Flashing Lights	☐ Yes	☒ No	Number: Length:
Side Lights	☐ Yes	☒ No	
Automatic Gates	☐ Yes	☒ No	Number: Length:
Bells	☐ Yes	☒ No	
Sidewalk Gate Arms	☐ Yes	☒ No	
'No Turn' Signs	☐ Yes	☒ No	
Illumination	☐ Yes	☒ No	
Is crossing flagged by train crew?	☐ Yes	☒ No	
Other	☐ Yes	☐ No	

Safety Data (Obtain crash reports, if possible, prior to review)		
	Initial Information (from database)	Revised
Number & dates of crashes in previous 5 years	0	
Hazard Ranking <u>253</u>	Date Run: <u>2/7/11</u>	<u>246 3/21/11</u>
Railroad Data		
Railroad Characteristics	Initial Information (from database)	Revised
Total trains per day	<u>33 (UNDATED)</u>	<u>SAME</u>
< 1 per day		
Day thru trains	<u>15</u>	
Night thru trains	<u>18</u>	
Daytime switching movements		
Nighttime switching movements		
Total number of tracks	<u>1</u>	
Number of main tracks	<u>1</u>	
Number of other tracks		
Maximum train speed	<u>50</u>	
Typical train speed		
Amtrak		
If non-gated crossing, is clearing sight distance adequate in all quadrants? (See Table 1) ☒ Yes ☐ No		
If multiple tracks, can two trains occupy crossing at the same time? ☐ Yes ☒ No <u>SINGLE MAIN</u>		
Can one train block the motorists' view of another train at crossing? ☐ Yes (Explain below) ☐ No		
Are there other track(s) crossing this same roadway within 100 ft of this crossing? ☐ Yes ☒ No		
If yes, Crossing DOT #(if different) _____		
If yes, distance _____ (take measurement between track centerlines at closest point along roadway)		
Roadway Data		
Local Highway Authority: (Who maintains this roadway?) <u>MIDDLETON TOWNSHIP</u>		
Roadway Characteristics	Initial Information (from database)	Revised
Average daily traffic	<u>335 (2007)</u>	
Highway paved	☒ Yes ☐ No	☒ Yes ☐ No
Roadway Surface: ☒ Blacktop ☐ Gravel ☐ Concrete ☐ Other _____		
Roadway width: <u>16</u> ft.		
Number of highway lanes	<u>2</u>	<u>2</u>
Urban or Rural?	<u>RURAL</u>	<u>RURAL</u>
Vehicle Speed: <u>55</u> MPH		
School Bus Operation: ☐ No ☒ Yes <u>2+</u> Amount		
Hazardous Materials Trucks: ☐ No ☒ Yes <u>1</u> Amount		
Shoulders: ☒ No ☐ Yes		
Is the shoulder surfaced? ☒ No ☐ Yes		
Is there existing guardrail along roadway in crossing vicinity? ☒ No ☐ Yes		
Is stopping sight distance adequate? (See Table 2) ☒ Yes ☐ No If no, deficient approach(es) _____		

Quadrant _____ Curb and Gutter: ☐ Functional (Curb height = 4" or more) ☐ Non-functional (Curb height = Less than 4") ☒ None	Quadrant _____ Curb and Gutter: ☐ Functional (Curb height = 4" or more) ☐ Non-functional (Curb height = Less than 4") ☒ None
Pedestrians: ☒ No ☐ Yes	
Is sidewalk present? ☒ No ☐ Yes	
Is there a nearby intersection that could cause queuing over the crossing? ☒ No ☐ Yes If yes, Distance _____	
Is this intersection signalized? ☐ No ☐ Yes	
Are the signals currently interconnected with the existing crossing warning devices? ☐ No ☐ Yes	
Is it the consensus of the Diagnostic Review Team that this is a potential closure project? ☒ No ☐ Yes Explain reasons: _____	
Type of Development	
☒ Open Space ☐ Institutional ☐ Industrial ☐ Commercial ☐ Residential	Location of nearby schools: WITHIN 3 MILES
Utility Information	
Is commercial power available? ☐ No ☒ Yes	
Utility Provider (Company Name) <u>TOLEDO EDISON</u>	Phone Number _____
Nearest Available Power Source <u>AT CROSSING</u>	
What other utilities are present? _____	
Is there potential utility conflict(s) ☐ Yes ☐ No ☒ Unknown	
Diagnostic Team Recommendations	
	Quadrants Needed
☒ Install/upgrade active devices	
☐ Automatic Flashing Lights (AFLS)	
☐ AFLS / Cants	
☒ AFLS / Gates	
☐ AFLS / Gates / Cants	
☐ Upgrade circuitry	
☐ Sidelights	
☐ Guardrail Needed	
☐ Install/Replace curb	
☐ Other (define)	
Comments: _____	

☐ Install/upgrade traffic signal preemption	
☐ No improvements needed	
☐ Other (define)	

Field Dimensions

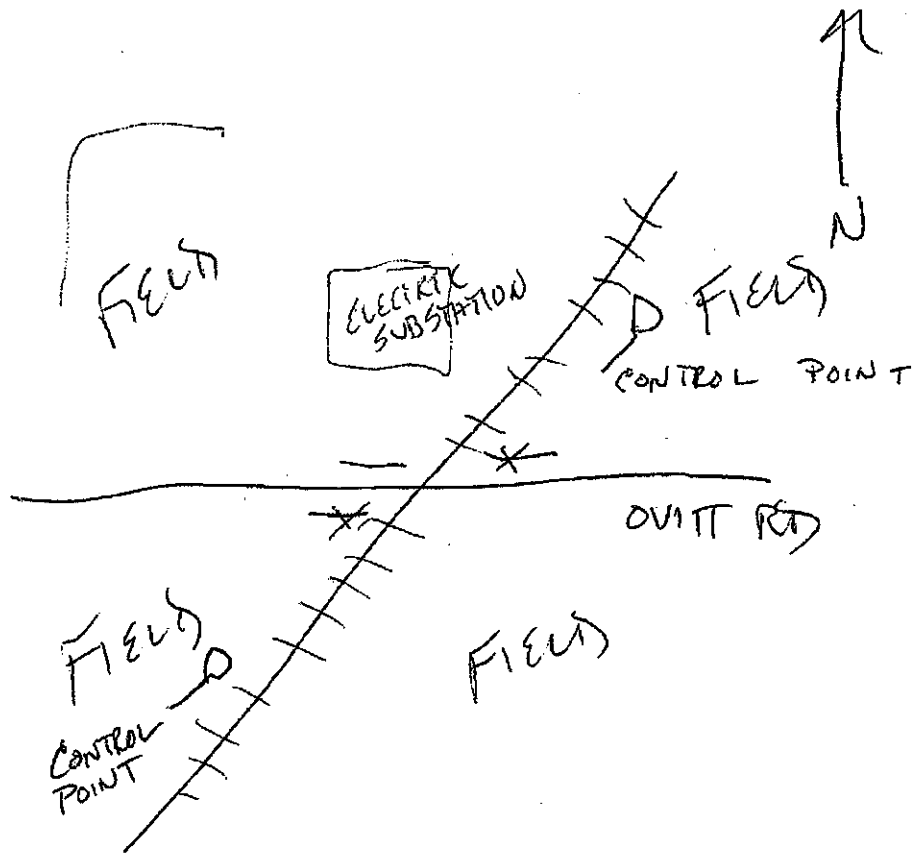


Show North
Direction

Crossing Angle ☐ 0-29° ☐ 30-59° ☒ 60-90° Measured in NW Quadrant?

Measurements by: gm

Field Sketch



Crossing Angle ☐ 0-29° ☐ 30-59° ☒ 60-90° Measured In NW Quadrant?

Sketch by: BM

TABLE 1

Clearing Sight Distances

Maximum Authorized Train Speed	Distance (dT) Along Railroad from Crossing (ft)
1 - 10	240
15	360
20	480
25	600
30	720
35	840
40	960
45	1080
50	1200
55	1320
60	1440
65	1560
70	1680
75	1800
80	1920
85	2040
90	2160

Source: R-H Grade Crossing Handbook Table 36 (pp. 132-133)

Notes:

All calculated distances are rounded up to the next higher 5-foot increment.

Distances indicated are for 65-ft double bottom semi-tractor trailers and level single track 90 degree crossings; and may need to be adjusted for multiple tracks, skewed crossings or approaches on grades.

Clearing Sight Distance is to be measured in each vehicle travel direction at non-gated crossings as viewed from a point 25 feet from centerline of nearest track in the center of whichever travel lane is nearest the direction along track being measured.

Table 2

Stopping Sight Distances

Highway Vehicle Speed	Distance (dH) Along Roadway from Crossing (ft)
0	n/a
5	50
10	70
15	105
20	135
25	180
30	225
35	280
40	340
45	410
50	490
55	570
60	660
65	760
70	865

Source: R-H Grade Crossing Handbook Table 36 (pp. 132-133)

Notes:

All calculated distances are rounded up to the next higher 5-foot increment.

Distances indicated are for 65-ft double bottom semi-tractor trailers on dry level pavements.

Stopping Sight Distance is to be measured on each roadway approach to crossing from stop bar.



Karen E. Murphy, P. E.
Project Manager – Public Projects
500 Water Street (S/C J301)
Jacksonville, FL 32202
Tel. 904-359-1650
Karen_Murphy@csx.com

December 13, 2011

Mr. Tod Darfus
Manager, Safety Programs
Ohio Rail Development Commission
1980 West Broad Street, Second Floor
Columbus, OH 43223

Subject: Haskins, Wood County, OH – Install FLS&G– TR-104 (Ovitt Road); DOT 155809C;
Milepost BE-186.88; PID 90715; OH0849

Dear Mr. Darfus:

Enclosed for your review and approval are the circuit plans and Signal Force Account Estimate in the amount of \$ 266,302.00 for the above referenced project.

We await receipt of your further advice and /or approval of the project cost and authority to proceed.

If I can be of further assistance, please do not hesitate to call.

Very truly yours,


Karen E. Murphy, P.E.
Project Manager, Public Projects

Cc: Jill Henry
Leah Dalton
Susan Kirkland
Susan Arduini
George Martin

**CSX TRANSPORTATION, INC.
FORCE ACCOUNT ESTIMATE**

Page 1

ACCT. CODE : 709 - OH0849

ESTIMATE SUBJECT TO REVISION AFTER:		6/9/2012	DOT NO.: 155809C
CITY: Haskins	COUNTY: Wood		STATE: OH
DESCRIPTION: Warning Device Upgrade - TR 104 (Ovitt Road)			
DIVISION: Louisville	SUB-DIV: Toledo	MILE POST: BE-186.88	
AGENCY PROJECT NUMBER: PID 90715			

PRELIMINARY ENGINEERING:

200 Labor (Non Contract)	\$	-
200 Additive 31.34%	\$	-
230 Expenses	\$	-
212 Contracted & Administrative Engineering Services	\$	4,200
Subtotal	\$	4,200

CONSTRUCTION ENGINEERING/INSPECTION:

200 Labor (Non Contract)	\$	-
200 Additive 31.34%	\$	-
230 Expenses	\$	-
212 Contracted & Administrative Engineering Services	\$	3,700
Subtotal	\$	3,700

FLAGGING SERVICE: (Contract Labor)

070 Labor (Conductor-Flagman)	\$	-
050 Labor (Foreman/Inspector)	\$	-
070 Additive 73.76% (Transportation Department)	\$	-
050 Additive 97.95% (Engineering Department)	\$	-
230 Per Diem (Engineering Department)	\$	-
230 Expenses	\$	-
Subtotal	\$	-

<u>SIGNAL & COMMUNICATIONS WORK:</u>	(Details Attached)	\$	229,302
---	--------------------	----	---------

<u>TRACK WORK:</u>	(Details Attached)	\$	-
---------------------------	--------------------	----	---

ACCOUNTING & BILLING:

040 Labor	\$	3,000
040 Additive 63.03%	\$	1,891
Subtotal	\$	4,891

<u>PROJECT SUBTOTAL</u>	\$	242,093
--------------------------------	----	----------------

900 <u>CONTINGENCIES:</u>	10.00%	\$	24,209
----------------------------------	--------	----	--------

GRAND TOTAL	*****	\$	266,302
--------------------	-------	----	----------------

DIVISION OF COST:

Agency	100.00%	\$	266,302
Railroad		\$	-
TOTAL	*****	\$	266,302

NOTE: Estimate is based on FULL CROSSING CLOSURE during work by Railroad Forces.

This estimate has been prepared based on site conditions, anticipated work duration periods, material prices, labor rates, manpower and resource availability, and other factors known as of the date prepared. The actual cost for CSXT work may differ based upon the agency's requirements, their contractor's work procedures, and/or other conditions that become apparent once construction commences or during the progress of the work.

Office of Assistant Chief Engineer Public Projects--Jacksonville, Florida

Estimated prepared by:

Deb Baldino

Approved by:

CSXT Public Project Group

DATE: 12/12/2011

REVISED:

DATE:

Form Revised 03-02-2010-LLS

Project Summary Sheet

**CSX TRANSPORTATION, INC.
FORCE ACCOUNT ESTIMATE**

Page 1 of 3

ACCT. CODE : 709 - OH0849
Pub EB - OH EB3 (OH)

ESTIMATE SUBJECT TO REVISION AFTER:		6/9/2012	DOT NO.: 155809C
CITY: Haskins	COUNTY: Wood		STATE: OH
DESCRIPTION: Warning Device Upgrade - TR 104 (Ovitt Road)			
DIVISION: Louisville	SUB-DIV: Toledo	MILEPOST: BE-186.88	
DRAWING NO.: BE18688.H01	DRAWING DATE: 11/29/2011		
AGENCY PROJECT NUMBER: PID 90715			

PRELIMINARY ENGINEERING:

200	Labor (Non Contract)	0	Days @	\$ 270.00	\$ -
200	Additive 31.34%				\$ -
230	Expenses				\$ -
212	Contracted & Administrative Engineering Services				\$ 4,200
	Subtotal				\$ 4,200

CONSTRUCTION ENGINEERING/INSPECTION:

200	Labor (Non Contract)	0	Days @	\$ 270.00	\$ -
200	Additive 31.34%				\$ -
230	Expenses				\$ -
212	Contracted & Administrative Engineering Services				\$ 3,700
	Subtotal				\$ 3,700

FLAGGING SERVICE: (Contract Labor)

70	Labor (Conductor-Flagman)	0	Days @	\$ 350.00	\$ -
50	Labor (Foreman/Inspector)	0	Days @	\$ 336.00	\$ -
70	Additive 73.76% (Transportation Department)				\$ -
50	Additive 97.95% (Engineering Department)				\$ -
230	Expenses (Engineering Department)	0	Days @	\$ 75.00	\$ -
230	Expenses (Transportation Department)	0	Days @	\$ 45.00	\$ -
	Subtotal				\$ -

COMMUNICATIONS WORK:

Temporary (Details Attached)	\$ -
Permanent (Details Attached)	\$ -
Subtotal	\$ -

TRACK: LABOR

50	Traffic Control	0	MAN-HRS	\$ 24.00	\$ -
50	Remove Existing Crossing	0	MAN-HRS	\$ 24.00	\$ -
50	Renew Cross Ties	0	MAN-HRS	\$ 24.00	\$ -
50	Renew Rail	0	MAN-HRS	\$ 24.00	\$ -
50	Install OTM	0	MAN-HRS	\$ 24.00	\$ -
50	Install Field Welds	0	MAN-HRS	\$ 24.00	\$ -
50	Install Geo-Textile Fabric	0	MAN-HRS	\$ 24.00	\$ -
50	Install Sub-Drains	0	MAN-HRS	\$ 24.00	\$ -
50	Install Ballast	0	MAN-HRS	\$ 24.00	\$ -
50	Line and Surface	0	MAN-HRS	\$ 24.00	\$ -
50	Install Crossing Materials	0	MAN-HRS	\$ 24.00	\$ -
50	Install Bituminous Pavement	0	MAN-HRS	\$ 24.00	\$ -
50		0	MAN-HRS	\$ 24.00	\$ -
50		0	MAN-HRS	\$ 24.00	\$ -
50		0	MAN-HRS	\$ 24.00	\$ -

**CSX TRANSPORTATION, INC.
FORCE ACCOUNT ESTIMATE**

Page 2 of 3

ACCT. CODE : 708 - OH0849
Pub EB - OH EB3 (OH)

50	Clean-Up		0	MAN-HRS	\$ 24.00	\$ -
50	Additive	97.95%				\$ -
230	Per Diem		0	MAN-DAY	\$ 90.00	\$ -
	Subtotal					\$ -
<u>TRACK; MATERIAL</u>						
220	Cross Ties, Main Line		0	EA	\$ 39.00	\$ -
220	Cross tie - pre-plated		0	EA	\$ 83.50	\$ -
220	Cross-tie - Borate		0	EA	\$ 56.00	\$ -
220	Crossties, 10' Length		0	EA	\$ 46.00	\$ -
220	Tie plates		0	EA	\$ 10.51	\$ -
220	Rail, 136RE, New		0	LF	\$ 21.00	\$ -
220	Misc. OTM		1	LOT	\$ -	\$ -
210	Geo-Textile Fabric		0	RL	\$ 930.00	\$ -
210	Sub-Drains		0	LF	\$ 6.00	\$ -
220	Ballast - Car load		0	NT	\$ 12.00	\$ -
220	Ballast - Trucked in		0	NT	\$ 45.00	\$ -
220	Field Welds		0	EA	\$ 100.00	\$ -
			0		\$ -	\$ -
			0		\$ -	\$ -
210	Concrete Full Width		0	TF	\$ 250.00	\$ -
210	Concrete/Rubber Xing (CSX)		0	TF	\$ 200.00	\$ -
210	Rubber Crossing, Full Depth		0	TF	\$ 325.00	\$ -
210	Timber/Asphalt Crossing (CSX Standard)		0	TF	\$ 42.00	\$ -
210	Bituminous Material		0	NT		\$ -
210	Sales Tax on Material	0.00%				\$ -
210	Material Handling	5.00%				\$ -
	Subtotal					\$ -
<u>CONTRACT:</u>						
215	Asphalt Paving (In Place)		0	NT		\$ -
241	Disposal of Waste Materials		0	TF	\$ 15.00	\$ -
215	Maintenance of Traffic		0	DAY	\$ 350.00	\$ -
	Subtotal					\$ -
241	<u>EQUIPMENT RENTAL:</u>					\$ -
	Subtotal					\$ -
50	<u>WORK TRAIN:</u>		0	DAY	\$ 2,100.00	\$ -
	Subtotal					\$ -
<u>SALVAGE:</u>						
228	Rail		0	NT	\$ 65.00	\$ -
228	OTM		0	NT	\$ 75.00	\$ -
	Subtotal					\$ -
<u>SIGNAL WORK:</u>						
210	Material - Field & Consumables					\$ 113,390
210	Material - Sales Tax					\$ -
220	Material - Shop					\$ -
60	Construction Labor (85 man-days)					\$ 25,235
65	Shop Labor (5 man-days)					\$ 1,050
230	Per Diem (85 man-days)					\$ 11,050
200	RR Engineering,Preliminary					\$ 5,011
200	RR Engineering,Construction					\$ 3,785

**CSX TRANSPORTATION, INC.
FORCE ACCOUNT ESTIMATE**

Page 3 of 3

ACCT. CODE : 709 - OH0849
Pub EB - OH EB3 (OH)

60	Additives to Construction Labor		\$	23,446
65	Additives to Shop Labor		\$	931
200	Additives to Engineering		\$	2,757
241	Equipment Expense	(16 work days)	\$	10,400
241	Waste Management	(16 work days)	\$	384
212	Contract Engineering		\$	22,887
211	Freight		\$	6,476
216	AC Power Service		\$	2,500
228	Salvage		\$	-
900	Other		\$	-
	Subtotal		\$	229,302

ACCOUNTING & BILLING:

40	Labor		15 Days @ \$ 200.00	\$	3,000
40	Additive	63.03%		\$	1,891
	Subtotal			\$	4,891

PROJECT SUBTOTAL:

900	<u>CONTINGENCIES:</u>	10.00%		\$	242,093
				\$	24,208

GRAND TOTAL	*****	\$	266,302
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DIVISION OF COST:

Agency	<u>100.00%</u>	\$	266,302
Railroad	<u>0.00%</u>	\$	-
TOTAL	*****	\$	266,302

NOTE: Estimate is based on FULL CROSSING CLOSURE during work by Railroad Forces.

This estimate has been prepared based on site conditions, anticipated work duration periods, material prices, labor rates, manpower and resource availability, and other factors known as of the date prepared. The actual cost for CSXT work may differ based upon the agency's requirements, their contractor's work procedures, and/or other conditions that become apparent once construction commences or during the progress of the work.

Office of Assistant Chief Engineer Public Projects--Jacksonville, Florida

Estimated prepared by: Deb Baldino

Approved by:

CSXT Public Project Group

DATE: 12/12/2011

REVISED:

DATE:

Form Revised 05-05-2011-LLS

ACCT. CODE : 709 - OH0849
 Pub EB - OH EB3 (OH)

ESTIMATE SUBJECT TO REVISION AFTER:
CITY: Haskins
DESCRIPTION: Warning Device Upgrade - TR 104 (Ovitt Road)

6/9/12
COUNTY: Wood

DOT NO.: 155809C
STATE: OH

DIVISION: Louisville
DRAWING NO.: BE18688.H01
AGENCY PROJECT NUMBER: PID :

SUB-DIV: Toledo

DRAWING DATE: 11/29/2011

MILEPOST: BE-186.88

Amount		
Task	Task Desc	Total
40	Labor General Office	\$4,891
50	Labor Roadway	
60	Labor Signal	\$48,681
65	Labor Signal1	\$1,981
70	Labor Transportation	
200	Labor NonContract	\$11,553
210	Invoice Material	
	Material - Field & Consu	\$113,390
211	Invoice Freight	\$6,476
212	Invoice Contract Eng	\$30,787
215	Invoice Misc	
216	Invoice Utilities	\$2,500
220	Material New	
	Material - Shop	
228	Scrap Credit	
230	ExpenseRpts	\$11,050
241	Invoice Rental	\$10,784
900	Other	
900	Contingencies	\$24,209
	Material New	
Grand Total		\$266,302

Estimate No. 119435
CSX Transportation
TR-104 (Ovitt Rd.) - Install FLS&G.
Haskins, OH

DOT: 155809C

OP: OH0849

CSX Project: OH2011076

Summary

Material	\$ 113,390
Sales Tax	\$ 0
Labor:	
Construction Labor (85 man-days).....	\$ 25,235
Shop Labor (5 man-days).....	\$ 1,050
Subsistence (85 man-days).....	\$ 11,050
Railroad Engineering, Preliminary	\$ 5,011
Railroad Engineering, Construction	\$ 3,785
Additives to Construction Labor	\$ 23,446
Additives to Shop Labor	\$ 931
Additives to Track Labor	\$ 0
Additives to Engineering	\$ 2,757
Equipment Expenses (16 work days).....	\$ 10,400
Waste Management (16 work days).....	\$ 384
Contract Engineering	\$ 22,887
Freight	\$ 6,476
Poleline Removal	\$ 0
AC Power Service	\$ 2,500
Salvage	\$ 0
TOTAL ESTIMATE COST	\$ 229,302

Date: 12/07/2011

Estimated By: David Leddy

NOTE: This estimate should be considered void one year from date of estimate.

Shop Material List for CSX Project: OH2011076 (Effective: 12/07/2011)
Install automaticly controlled FLS&G
Haskins, OH - BE 186.88

Catalog Num	Cond	Unit Price	Qty	Cost	Description
N/A		1542.00	1	1542.00	PCB ASSY, HCA MODEM MODULE PN 227212-000 FOR HAWK EVENT RECORDER
020-0003401	1	8480.00	1	8480.00	HOUSE 8X8L ALUM INCLUDES 7 SHELFs, FARADAY CLOSET, 240V
020-0017120	1	11.52	8	92.16	BLOCK TERMINAL 12 POST SINGLE STRIP AAR 14.1.6 WITH 1 AAR
020-0017125	1	3.54	6	21.24	BLOCK TERMINAL 2 POST AAR 14.1.8 WITH 1 AAR 14.1.11
020-0017211	1	627.20	1	627.20	TRANSFORMER 010520-50X LIGHT 750VA MOD SLT 50 SAFETRAN PRI
020-0017385	1	57.71	1	57.71	CABLE RJ45 TO RJ4 15' GETS P/N 075061-015
020-0021965	1	8.96	1	8.96	EXTRACTOR DWG 59688-4 TERMINAL GRS CAT P3-308 REF
020-0022651	1	55.89	9	503.01	PLUGBOARD KIT TYPE B1 OR ST1 RELAY ASSEMBLY WITH 12 EACH
020-0022701	1	68.00	29	1972.00	ARRESTER LPC 15012-1 0-30V DC OR 0-24V AC RATED AT 15 AMP
020-0025595	1	20.72	1	20.72	WRENCH DWG 55393-3 GR1 "E" TERMINAL POST NUT GRS CAT
020-0053360	1	406.56	3	1219.68	CHARGER BATTERY ELC 12/20 S 20 AMP 10-19.9 VDC ROTARY SW
020-0053510	1	233.11	1	233.11	KIT 240V AC EMERGENCY GENERATOR CABLE AND
020-0660077	1	597.41	1	597.41	ARRESTER GE 9L10KAC213 FOR 240 VOLT SINGLE PHASE 3 WIRE
020-0770060	1	13.44	20	268.80	ARRESTER US&S N451552-0201 TRACK SERIES RED LABEL USGA
020-0770105	1	22.40	8	179.20	ARRESTER HARMON 202217-000 AGE-1 TRACK AIR GAP EQUALIZER
020-1940055	1	14.22	1	14.22	CONTAINER CIRCUIT PRINT 24" SCHEDULE 20 4" PVC PIPE WITH
020-2501400	1	1043.84	1	1043.84	CONTROLLER DTMF RADIO KEY DOWN MODE 6 SET TIMER TO 60
020-2532515	1	32.48	1	32.48	MODULE RESISTOR ISLAND OUTPUT RESISTIVE LOAD ASSEMBLY 560
020-2552400	1	7357.56	1	7357.56	DETECTOR HARMON 250826-200 PMD-3R SYSTEM W/8KHZ RSI
020-2552480	1	5853.97	3	17561.91	DETECTOR HARMON 300611-000 PMD-3R SYSTEM W/MDSA
020-3430110	1	321.84	5	1609.20	RELAY SAFETRAN 400004 500 OHMS CONTACTS 4FB-2F-1B CSX
020-3430115	1	421.20	1	421.20	RELAY SAFETRAN 400005 500 OHMS CONTACTS 4FB HEAVY DUTY
020-3430135	1	513.30	1	513.30	RELAY SAFETRAN 400213 460 OHMS CONTACTS 2FB CSX
020-3430170	1	413.95	1	413.95	RELAY SAFETRAN 400800-CSX 100/100 OHMS CONTACTS 6FB
020-3430185	1	431.55	1	431.55	RELAY SAFETRAN 400700-X 60 OHMS CONTACTS 4FB CSX

Shop Material List for CSX Project: OH2011076 (Effective: 12/07/2011)
Install automaticly controlled FLS&G
Haskins, OH - BE 186.88

Catalog Num	Cond	Unit Price	Qty	Cost	Description
020-4200100	1	7.45	3	22.35	CONNECTOR BUS 1" CENTERS 1/2" X 36" 18 GAGE PUNCHED 1/4" X
020-4200340	1	1.74	4	6.96	LINK TEST ASSEMBLY 1" CENTERS COMPLETE WITH INSULATED
020-4200350	1	2.06	9	18.54	LINK TEST ASSEMBLY 2-3/8" CENTERS COMPLETE WITH
020-8000067	1	14.42	2	28.84	LOCK AMERICAN H10SIGRA CSX SIGNAL PADLOCK WITH BLACK
020-8100031	1	23.82	1	23.82	CABLE EVENT RECORDER HARMON HAWK NETWORK CABLE USED WITH
020-8100034	1	2503.80	1	2503.80	RECORDER EVENT HARMON HAWK ASSEMBLY COMPLETE WITH
022-5290559	1	325.00	1	325.00	CONVERTER WILMORE INPUT 10V DC TO 16V DC OUTPUT 13.6V DC
Total Cost: \$				48,151.72	

Field Material List for CSX Project: OH2011076 (Effective: 12/07/2011)
Install automaticly controlled FLS&G
Haskins, OH - BE 186.88

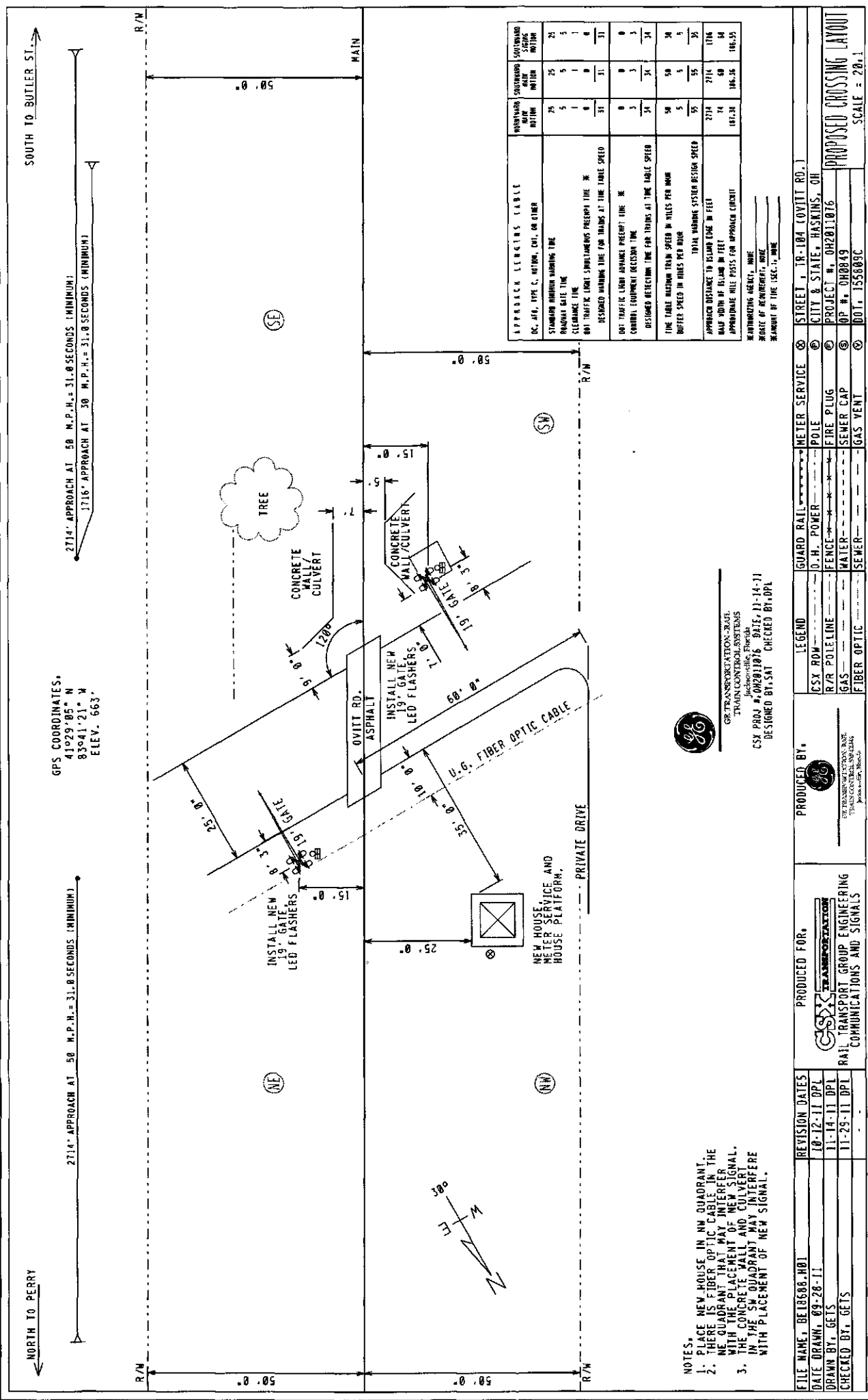
Catalog Num	Cond	Unit Price	Qty	Cost	Description
020-0013686	1	40.43	7	283.01	BOOTLEG KIT CSX RAIL CONN W/15 FT 3/16 IN BDSTRAND 6/64
020-0013908	1	7.78	350	2723.00	CABLE UG COMPOSITE 19 CONDUCTOR INCLUDES 13
020-0014700	1	12733.00	2	25466.00	PLATFORM SIGNAL HOUSE/CASE 12'X12' COMPLETE WITH
020-0052475	1	11.20	4	44.80	ARM EXTENSION 10-1/2" ALUM WITH 3/8" DIAMETER MOUNTING
020-0053225	1	7.00	150	1050.00	CABLE POWER FOR PLOWING UG 3 COND NO 6 AWG WITH GROUND AND
020-0054075	1	1006.88	2	2013.76	GATE GARD NORMAL MOVEMENT COMPLETE WITH SHEAR PIN AND
020-0055421	1	18.61	6	111.66	BRACKET SIGN 4" OR 5" MAST W/1/2" U-BOLT FOR ALL SIGNS
020-0056678	1	5913.43	2	11826.86	SIGNAL 0221-L GCWD GATE ASSY DWG SS222 INCLS ADJ 19 TO 28
020-0057275	1	1.37	2000	2740.00	WIRE UG TRACK TWISTED PAIR NO. 6 AWG SOLID CONDUCTOR
020-1040322	1	162.40	30	4872.00	BATTERY SAFT SPL165, 165 AH POCKET PLATE NICKEL CADMIUM
020-1040540	1	31.36	4	125.44	TRAY BATTERY FIBER CO 82687-1-P 12" WIDTH 24" LONG
020-1040550	1	45.92	1	45.92	TRAY BATTERY FIBER CO 82687-3-P 12" WIDTH 38"
020-1360014	1	844.23	1	844.23	PACKAGE FOREMANS CARE FOR ALUMINUM TYPICAL BOM FOR USE
020-1360016	1	21.18	1	21.18	PACKAGE SAFETY & SECURMENT WITH 1 EA CAUTION TAG 1 EA
020-1360103	1	1376.43	1	1376.43	LAYOUT METER SERVICE WITH 25' POLE CSX DWG SS351 SH 2 ITEMS
020-2500615	1	301.96	2	603.92	SHUNT SAFETRAN 62775-156 NARROW BAND 156HZ
020-2530287	1	247.52	4	990.08	FILTER EPC 800-080055-103 TF-156
020-2530300	1	190.40	1	190.40	REACTOR TRACK BATTERY MODEL 5025A GETS P/N 250141-001
020-2530407	1	46.64	1	46.64	LOAD DUMMY PMD HXP 1186A-1 1000 HARMON 250069-001
020-2531160	1	265.93	3	797.79	SHUNT HARMON 250250-816 NBS-1-10 816HZ 10 FT LEADS
020-2531295	1	265.93	1	265.93	SHUNT HARMON 250250-452 NBS-1-10 452HZ 10 FT LEADS
020-2541317	1	78.50	2	157.00	INDUCTOR 227032-002 750 DUMMY LOAD HARMON
020-3901895	1	92.68	2	185.36	TIP FLEX HWY CROSSING GATE 24 IN LONG RED & WHITE STRIPES
020-3920200	1	181.17	2	362.34	BELL GCWD ELECTRONIC 4" OR 5" MAST 8 TO 13 VOLTS DC GSI PN
020-3930010	1	3.70	2	7.40	KIT GATE ARM WARNING STICKER KIT INCLUDES 1-EA 5"X3"

Field Material List for CSX Project: OH2011076 (Effective: 12/07/2011)
Install automaticly controlled FLS&G
Haskins, OH - BE 186.88

Catalog Num	Cond	Unit Price	Qty	Cost Description
020-4200340	1	1.74	31	53.94 LINK TEST ASSEMBLY 1" CENTERS COMPLETE WITH INSULATED
020-4200900	1	0.29	6	1.74 CONNECTOR SHEATHING AMP 329860 FOR NO. 14 WIRE
020-4201042	1	0.12	40	4.80 NUT HEX BINDING (RSA NUT) AAR 14.1.11-6 14-24 NS-2 THD CONE
020-4201043	1	0.11	250	27.50 NUT HEX CLAMP (FLAT NUT) AAR 14.1.11-7 14-24 NS-2 THD FLAT
020-4201044	1	0.11	200	22.00 WASHER AAR 14.1.11 ROUND COPPER NICKEL PLATED FOR AAR
020-9999991	1	100.00	1	100.00 BLOCKING AND BRACING FOR PROJECTS BURCO DIST
250-0001827	1	13.75	1	13.75 BREAKER CIRCUIT SQ D QO235
250-1680406	1	0.50	40	20.00 CONDUIT LIQUID TIGHT 3/4" FLEXIBLE GREY PVC CARLON P/N
250-1680408	1	1.08	40	43.20 CONDUIT LIQUID TIGHT 3/4" NON-METALLIC ORANGE PVC
360-0006100	1	35.07	1	35.07 STOOL STEP WOOD 14"X 20" SIGNAL MAINTAINERS CSXT
360-0800145	1	4.93	1	4.93 BROOM WAREHOUSE CORN HVY DUTY ID300
Total Cost: \$				57,478.08

Consumables List for CSX Project: OH2011076 (Effective: 12/07/2011)
Install automaticly controlled FLS&G
Haskins, OH - BE 186.88

Catalog Num	Cond	Unit Price	Qty	Cost	Description
N/A		500.00	1	500.00	CELLULAR MODEM RAVEN AIR LINK COMMUNICATION
N/A		50.00	50	2500.00	FILL MATERIAL, 1 CUBIC YARD
N/A		800.00	1	800.00	WALKWAY ROCK, 10 CUBIC YARDS
020-0017605	1	0.34	350	119.00	WIRE CASE 10 AWG FLEX CSX SPEC SS796 OKONITE
020-0017607	1	0.77	500	385.00	WIRE CASE TW PR NO 10 AWG FLEX CSX SPEC SS796 TWIST 2
020-0017625	1	0.43	150	64.50	WIRE CASE TW PR NO 14 AWG FLEX CSX SPEC SS796 TWIST 2
020-0017630	1	0.14	200	28.00	WIRE CASE NO 16 AWG FLEX CSX SPEC SS796 FURN 1000 FT SPOOL
020-0017635	1	0.80	130	104.00	WIRE SIGNAL DEL 018 NO 6 COPPER STRANDED SINGLE
020-0028610	1	0.22	100	22.00	TERMINAL RING AMP 35628 YELLOW PLASTI-BOND HVY DUTY
020-1710045	1	2.13	250	532.50	CONDUIT SDR 13.5 4" POLYETHYLENE TRENCHLESS
020-2060072	1	750.00	2	1500.00	FOUNDATION HELICAL SCREW-IN ASSEMBLY 7' X 10", USED FOR
020-2060074	1	525.00	2	1050.00	EXTENSION 10" X 3' USE WITH XING GATE AND SIGNAL MAST
020-3261970	1	9.41	2	18.82	DECAL ASSY 2" BLACK PRESSURE SENSITIVE VINYL PRE-MASKED
020-4200880	1	0.53	2	1.06	CONNECTOR TERMINAL 2-3/8" CENTERS AAR 14.1.15-4 NICKEL
020-4200892	1	0.44	27	11.88	CONNECTOR TERMINAL 1" CENTERS AAR 14.1.15-3 NICKEL PLATED
020-4251190	1	0.13	120	15.60	TERMINAL RING AMP 35627 BLACK PLASTI-BOND WIRE SIZE 10-12
020-4251290	1	0.49	30	14.70	TERMINAL WIRE AMP 322051 BLUE WIRE SIZE NO 6 AWG 1/4" STUD
020-4251295	1	0.49	6	2.94	TERMINAL WIRE AMP 322007 BLUE WIRE SIZE NO 6 AWG 3/8" STUD
020-9999992	1	50.00	1	50.00	HOUSE, SIGNAL HANDLING CHARGE, BURCO DISTRIBUTION
450-0019212	1	0.40	100	40.00	SCREW 10 X 1" SHT METAL PAN HD TYPE A COARSE THREAD
Total Cost: \$				7,760	



GPS COORDINATES:
 41°29'05" N
 83°41'21" W
 ELEV. 663'

2714' APPROACH AT 50 M.P.H. = 31.0 SECONDS (MINIMUM)
 1716' APPROACH AT 30 M.P.H. = 31.0 SECONDS (MINIMUM)

SOUTH TO BUTLER ST.

NORTH TO PERRY

NOTES:
 1. PLACE NEW HOUSE IN NW QUADRANT.
 2. THERE IS FIBER OPTIC CABLE IN THE NE QUADRANT THAT MAY INTERFERE WITH THE PLACEMENT OF NEW SIGNAL.
 3. IN THE SW QUADRANT MAY INTERFERE WITH PLACEMENT OF NEW SIGNAL.

APPROACH LENGTHS TABLE	STANDARD	STANDARD
DC, AT, TYPE C, RETAIN, CUL, OR OTHER	MINIMUM	MINIMUM
STANDARD MINIMUM WARNING TIME	25	25
PERMITTED RATE TIME	5	5
CLEARANCE TIME	1	1
NOT TRAFFIC LIGHT SIGNALS PRESENT TIME *	0	0
DESIGNED WARNING TIME FOR TRUCKS AT TIME TABLE SPEED	31	31
NOT TRAFFIC LIGHT ADVANCE PRESENT TIME *	0	0
CONTROL EQUIPMENT DECEASE TIME	3	3
DESIGNED DETECTION TIME FOR TRUCKS AT TIME TABLE SPEED	34	34
TIME TABLE MINIMUM TRUCK SPEED IN MILES PER HOUR	50	50
BUFFER SPEED IN MILES PER HOUR	5	5
TOTAL WARNING SYSTEM DESIGN SPEED	55	55
APPROACH DISTANCE TO ISLAND TIME IN FEET	2714	2714
HALF MILE IN FEET	14	14
APPROXIMATE MILE POSTS FOR APPROACH CIRCUT	181.24	186.55

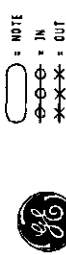
* INTERFERING AGENT, NONE
 * DATE OF INTERFERENCE, NONE
 * AMOUNT OF TIME (SEC.), NONE



GE TRANSPORTATION - RAIL
 TWIN CONTROL SYSTEMS
 Jackson, Ohio, 45228
 CSX PROJ # 00281076 DATE: 11-14-11
 DESIGNED BY: SMT CHECKED BY: DPL

FILE NAME: B18688.H01	REVISION DATES	PRODUCED BY:	LEGEND	STREET, TR-184 (OVITT RD.)
DATE DRAWN: 09-28-11	10-12-11 DPL	CSX R/W	CSX R/W	CITY & STATE, HASKINS, OH
DRAWN BY: GETS	11-14-11 DPL	R/R POLE LINE	R/R POLE LINE	PROJECT #, 04201076
CHECKED BY: GETS	11-23-11 DPL	GAS	GAS	OP #, 040819
		FIBER OPTIC	FIBER OPTIC	DOT, 15589C
				SCALE = 20:1

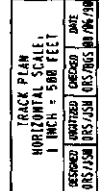
PROPOSED CROSSING LAYOUT

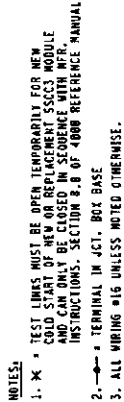


770 BE-186	 RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS
PLAN 1804V1510M	
CHECKED 085/865	DATE NOV 06 1998
	NEXT FILE BE 18500
	NEXT SH 101
	FILE BE 18600
	SHEET T01

	DRAWING	SHEET NO.	PAGE NO.
	1900-14	38	37

190500ZNO
BT 90-62-90
9206661100
3MS 0002-01-ZL
SH002543M





NO CHANGES

SEE TRANSPORTATION - RAIL.

TRAIN CONTROL SYSTEMS
Jacksonville, Florida

PROJ. NO. 04201076 DATE, 11-14-11

DESIGNED BY, SAT CHECKED BY, OPL

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DESIGN DATE REV. NO. 03-14-95 1

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CONTENTS

☒	* PLANS SENT TO FIELD (DISTRIBUTED)
☒	* PLANS AS-IN-SERVED (UP TO DATE)

TO BE COMPLETED
ON A.I.S.

 = NOTE
 = MI
 = LMO

Jacksonville, Florida
CSX PROJ # 0N201076 DATE, 11-14-11
DESIGNED BY, SAT CHECKED BY, DPL

DESIGN DATE 03-14-86 REV. NO. 043

RAIL TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS

PERRY TO BUTLER ST.

TR 100 (1558084)

INDEX AND REVISIONS

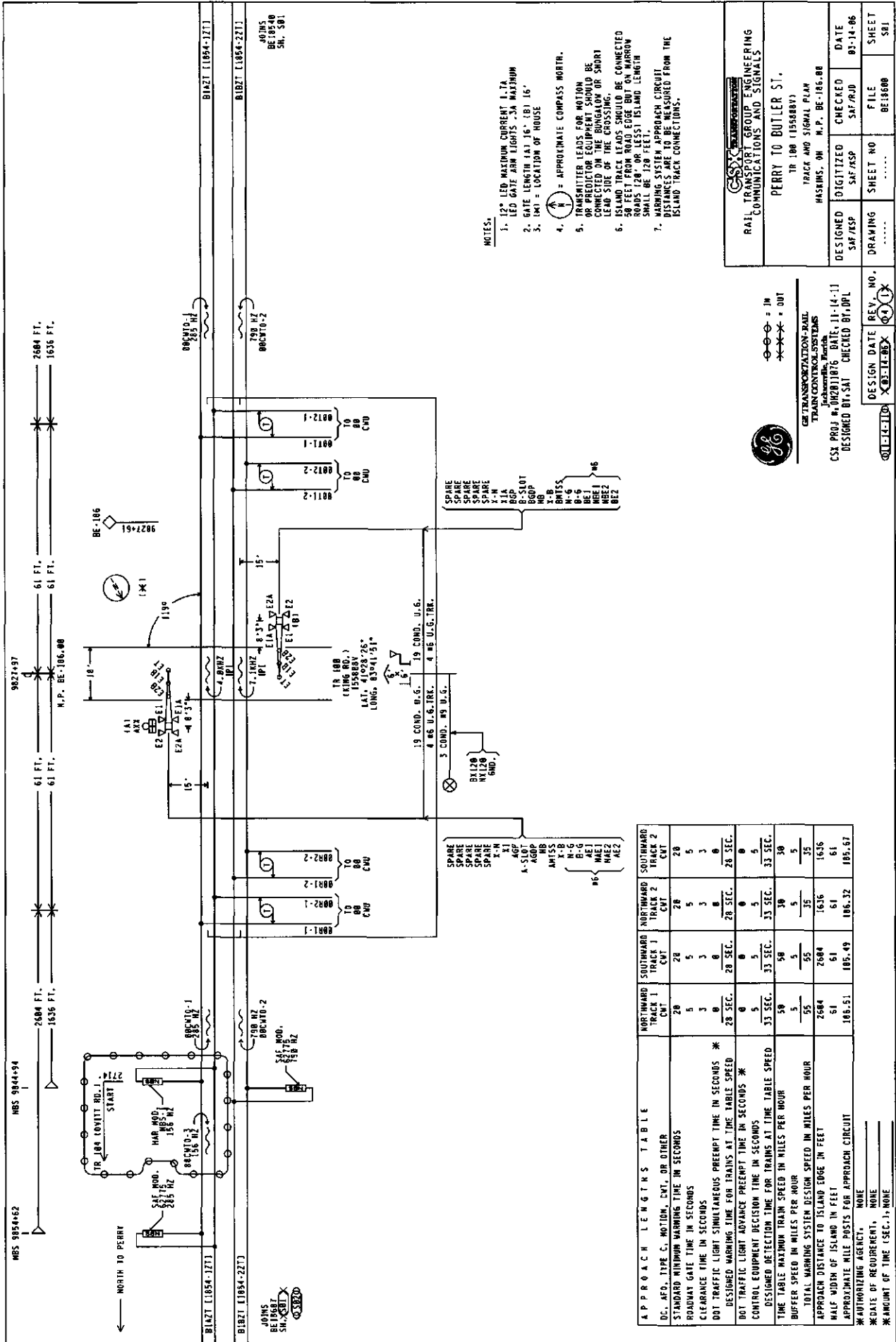
HASKINS, OW N.P. BE-186.88

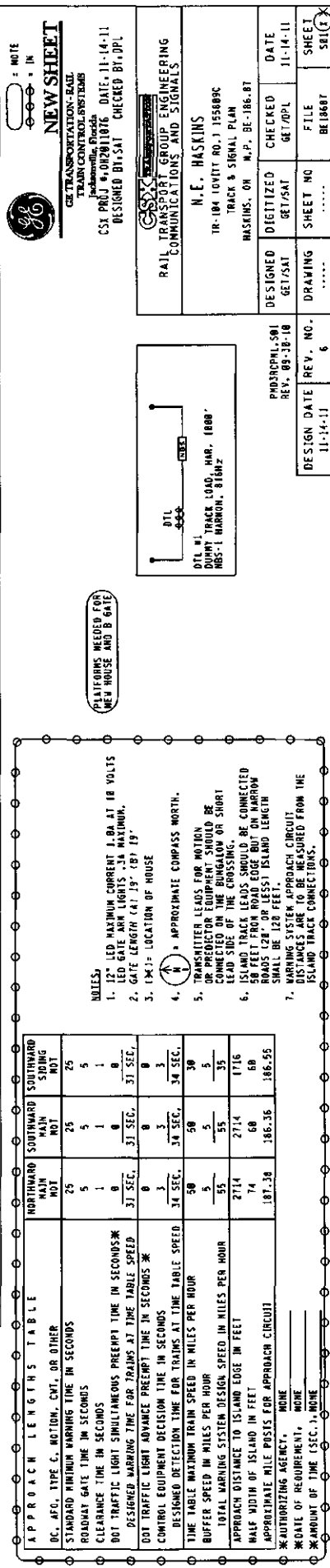
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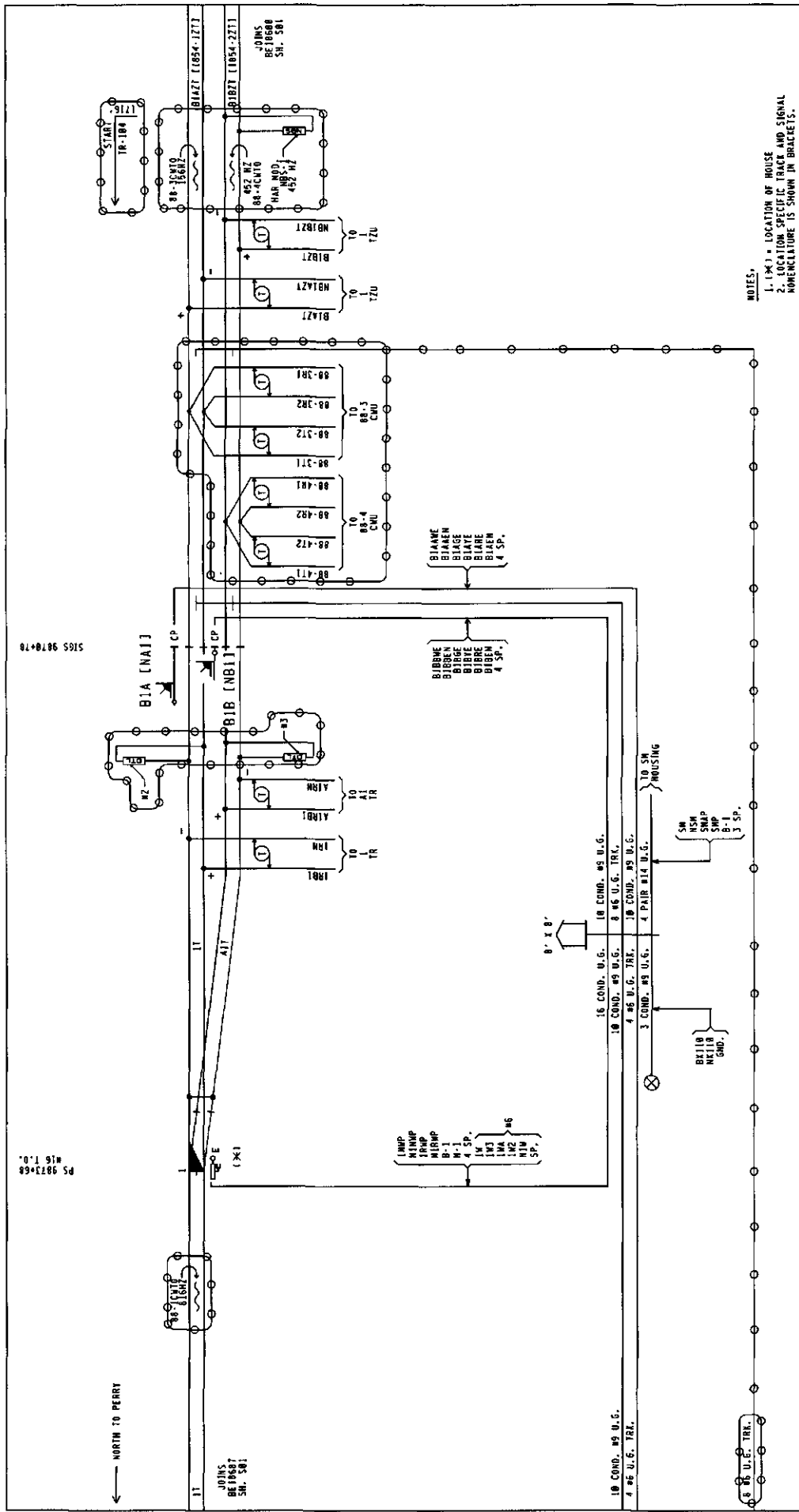
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APPROACH LENGTHS TABLE		NORTHWARD		SOUTHWARD	
		MAIN MOT.	MAIN MOT.	MAIN MOT.	SIDING MOT.
DC, AFG, TYPE C, MOTION, CMT, OR OTHER					
STANDARD MINIMUM WARNING TIME IN SECONDS		25	25	25	25
ROADWAY GATE TIME IN SECONDS		5	5	5	5
CLEARANCE TIME IN SECONDS		1	1	1	1
DOT TRAFFIC LIGHT SIMULTANEOUS PREEMPT TIME IN SECONDS*		0	0	0	0
DESIGNED WARNING TIME FOR TRAINS AT TIME TABLE SPEED		31 SEC.	31 SEC.	31 SEC.	31 SEC.
DOT TRAFFIC LIGHT ADVANCE PREEMPT TIME IN SECONDS*		0	0	0	0
CONTROL EQUIPMENT DECISION TIME IN SECONDS		3	3	3	3
DESIGNED DETECTION TIME FOR TRAINS AT TIME TABLE SPEED		34 SEC.	34 SEC.	34 SEC.	34 SEC.
TIME TABLE MAXIMUM TRAIN SPEED IN MILES PER HOUR		50	50	50	30
BUFFER SPEED IN MILES PER HOUR		5	5	5	5
TOTAL WARNING SYSTEM DESIGN SPEED IN MILES PER HOUR		55	55	55	35
APPROACH DISTANCE TO ISLAND EDGE IN FEET		2714	2714	2714	1716
HALE WIDTH OF ISLAND IN FEET		74	60	60	60
APPROXIMATE MALE MOTHS FOR APPROACH FLIGHTS		197.34	195.35	195.35	166.65



NOTES:

1. (M) = LOCATION OF HOUSE
2. LOCATION SPECIFIC TRACK AND SIGNAL NOMENCLATURE IS SHOWN IN BRACKETS.

RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS

N. E. HASKINS

TRACK & SIGNAL PLAN
HASKINS, OH M.P. BE-186.87

DESIGNED	DIGITIZED	CHECKED	DATE
GET/SAT	GET/SAT	GET/SAT	11-14-11

DRAWING	SHEET NO	FILE	SHEET
.....		BE18687	582

GE TRANSPORTATION - RAIL

TRAIN CONTROL SYSTEMS

DESIGNED BY: SAT
CHECKED BY: DPL
DATE: 11-14-11
REV: 05-31-09

DESIGNED BY: SAT
CHECKED BY: DPL
DATE: 11-14-11
REV: 05-31-09

NEW SHEET

DESIGNED BY: SAT
CHECKED BY: DPL
DATE: 11-14-11
REV: 05-31-09

DESIGNED BY: SAT
CHECKED BY: DPL
DATE: 11-14-11
REV: 05-31-09

CARD NO.		CODED CIRCUIT INTERFACED OUTPUTS							
1	2	3	4	5	6	7	8	9	10
64	A123	B123	UNUSED	UNUSED	UNUSED	UNUSED	UNUSED	UNUSED	UNUSED

CARD NO.	VITAL SIGNAL LAMP DRIVER OUTPUT BITS																VITAL GENERAL PURPOSE I/O BITS																				
	OUTPUTS																INPUTS																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	STOP	516	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	STOP		
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69																																					
610																																					
611	A126	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE	A126	SPARE
612	B126	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE	B126	SPARE

WIRE - LED INDICATORS (I/O BOARD)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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REVISIONS 12-18-2000 SEE 001199824, 001199823 01-22-01 SEE 002000050		RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS PERRY TO BUTLER ST	
DESIGNED SHEET 01-01-99		CHECKED SHEET 01-01-99	
NEXT FILE 01-01-99		NEXT SH 01-01-99	
EQUIPMENT CIRCUITS AT X-111-111111-111111-111111		DATE 01-01-99	

GE TRANSPORTATION - RAIL
 TRANSPORTATION
 DESIGNED BY: SA1
 CHECKED BY: SA1
 DATE: 11-14-11

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LSR PROGRAM TIME
AFTER [5.178] 346 SEC.
BFTER [5.178] 390 SEC.

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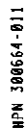
OFFICE CONTROL AND INDICATION
NOMENCLATURE IS SHOWN IN BRACKETS.

REVISIONS 12-12-12 12-2000 SMC 01-13-99-24 01-22-01 SAR 00200000-0	RAIL TRANSPORT GROUP ENGINEERING CONSULTATIONS AND STUDIES	GSK GROUP CONSULTATIONS AND STUDIES	PERMIT TO BUTLER ST. 3 EQUALIZER CEMENTS AT W. C. MASKINS, INC. 116.87	DESIGNED SWE	DIGITIZED SWE	CHECKED SWE	DATE 07-08-99	NEXT FILE BE1087	FILE SHEET 002
0 N.E. MASKINS			MASKINS, DR. H.P. 116.87						

~~SECRET~~ ~~SECRET~~ ~~SECRET~~



GE TRANSPORTATION-RAIL
TRAIN CONTROL SYSTEMS
Jacksonville, Florida
CSX PROJ #, GW2011076 DATE, 11-14-11
DESIGNED BY, SAT CHECKED BY, GPL



VITAL HARMON LOGIC CONTROLLER/RADIO EQUIPMENT BACK 84" x 30"		
REF.	HARMON LOGIC CODE	TYPE
01	LOGIC PROCESSOR	PNP 132208-601
02	AUXILIARY COM. PROCESSOR	PNP 132208-601
03	SITE SPECIFIC MODULE	PNP 132282-601
04	CODED CIRCUIT INTERFACE	PNP 132282-601
05	VITAL GENERAL PURPOSE I/O	PNP 100025-000
06	CABLE - VITAL GEN. PURPOSE I/O	PNP 2300726-001
07	VITAL SIGNAL DRIVER	PNP 236610-000
08	CABLE - VITAL SIGNAL DRIVER	PNP 236611-000
09	POWER SUPPLY MODULE	PNP 236612-001
10	ECU CABINET W/IN TSS-1	PNP 236602-001
11	24 REGULATED WTR. CONVERTER	PNP 236603-001
12	7X TRUCK RECEIVER	PNP 236608-000
13	24X TRUCK RECEIVER	PNP 2400174-110
14	VITAL SIGNAL DRIVER	PNP 236601-000
15	CABLE - VITAL SIGNAL DRIVER	PNP 236602-000
16	POWER SUPPLY MODULE	PNP 236603-001
17	ECU CABINET W/IN TSS-1	PNP 236604-001
18	24 REGULATED WTR. CONVERTER	PNP 236605-000
19	7X TRUCK RECEIVER	PNP 236606-000
20	24X TRUCK RECEIVER	PNP 236607-100
21	24X TRUCK RECEIVER	PNP 236608-000
22	24X TRUCK RECEIVER	PNP 236609-000
23	24X TRUCK RECEIVER	PNP 236610-000
24	24X TRUCK RECEIVER	PNP 236611-000
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83	24X TRUCK RECEIVER	PNP 236670-001
84	24X TRUCK RECEIVER	PNP 236671-001
85	24X TRUCK RECEIVER	PNP 236672-001
86	24X TRUCK RECEIVER	PNP 236673-001
87	24X TRUCK RECEIVER	PNP 236674-001
88	24X TRUCK RECEIVER	PNP 236675-001
89	24X TRUCK RECEIVER	PNP 236676-001
90	24X TRUCK RECEIVER	PNP 236677-001
91	24X TRUCK RECEIVER	PNP 236678-001
92	24X TRUCK RECEIVER	PNP 236679-001
93	24X TRUCK RECEIVER	PNP 236680-001
94	24X TRUCK RECEIVER	PNP 236681-001
95	24X TRUCK RECEIVER	PNP 236682-001
96	24X TRUCK RECEIVER	PNP 236683-001
97	24X TRUCK RECEIVER	PNP 236684-001
98	24X TRUCK RECEIVER	PNP 236685-001
99	24X TRUCK RECEIVER	PNP 236686-001
100	24X TRUCK RECEIVER	PNP 236687-001
101	24X TRUCK RECEIVER	PNP 236688-001
102	24X TRUCK RECEIVER	PNP 236689-001
103	24X TRUCK RECEIVER	PNP 236690-001
104	24X TRUCK RECEIVER	PNP 236691-001
105	24X TRUCK RECEIVER	PNP 236692-001
106	24X TRUCK RECEIVER	PNP 236693-001
107	24X TRUCK RECEIVER	PNP 236694-001
108	24X TRUCK RECEIVER	PNP 236695-001
109	24X TRUCK RECEIVER	PNP 236696-001
110	24X TRUCK RECEIVER	PNP 236697-001
111	24X TRUCK RECEIVER	PNP 236698-001
112	24X TRUCK RECEIVER	PNP 236699-001
113	24X TRUCK RECEIVER	PNP 236700-001
114	24X TRUCK RECEIVER	PNP 236701-001
115	24X TRUCK RECEIVER	PNP 236702-001
116	24X TRUCK RECEIVER	PNP 236703-001
117	24X TRUCK RECEIVER	PNP 236704-001
118	24X TRUCK RECEIVER	PNP 236705-001
119	24X TRUCK RECEIVER	PNP 236706-001
120	24X TRUCK RECEIVER	PNP 236707-001
121	24X TRUCK RECEIVER	PNP 236708-001
122	24X TRUCK RECEIVER	PNP 236709-001
123	24X TRUCK RECEIVER	PNP 236710-001
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127	24X TRUCK RECEIVER	PNP 236714-001
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142	24X TRUCK RECEIVER	PNP 236729-001
143	24X TRUCK RECEIVER	PNP 236730-001
144	24X TRUCK RECEIVER	PNP 236731-001
145	24X TRUCK RECEIVER	PNP 236732-001
146	24X TRUCK RECEIVER	PNP 236733-001
147	24X TRUCK RECEIVER	PNP 236734-001
148	24X TRUCK RECEIVER	PNP 236735-001
149	24X TRUCK RECEIVER	PNP 236736-001
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153	24X TRUCK RECEIVER	PNP 236740-001
154	24X TRUCK RECEIVER	PNP 236741-001
155	24X TRUCK RECEIVER	PNP 236742-001
156	24X TRUCK RECEIVER	PNP 236743-001
157	24X TRUCK RECEIVER	PNP 236744-001
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175	24X TRUCK RECEIVER	PNP 236762-001
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213	24X TRUCK RECEIVER	PNP 236800-001
214	24X TRUCK RECEIVER	PNP 236801-001
215	24X TRUCK RECEIVER	PNP 236802-001
216	24X TRUCK RECEIVER	PNP 236803-001
217	24X TRUCK RECEIVER	PNP 236804-001
218	24X TRUCK RECEIVER	PNP 236805-001
219	24X TRUCK RECEIVER	PNP 236806-001
220	24X TRUCK RECEIVER	PNP 236807-001
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226	24X TRUCK RECEIVER	PNP 236813-001
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243	24X TRUCK RECEIVER	PNP 236830-001
244	24X TRUCK RECEIVER	PNP 236831-001
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256	24X TRUCK RECEIVER	PNP 236843-001
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287	24X TRUCK RECEIVER	PNP 236874-001
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292	24X TRUCK RECEIVER	PNP 236879-001
293	24X TRUCK RECEIVER	PNP 236880-001
294	24X TRUCK RECEIVER	PNP 236881-001
295	24X TRUCK RECEIVER	PNP 236882-001
296	24X TRUCK RECEIVER	PNP 236883-001
297	24X TRUCK RECEIVER	PNP 236884-001
298	24X TRUCK RECEIVER	PNP 236885-001
299	24X TRUCK RECEIVER	PNP 236886-001
300	24X TRUCK RECEIVER	PNP 236887-001
301	24X TRUCK RECEIVER	PNP 236888-001
302	24X TRUCK RECEIVER	PNP 236889-001
303	24X TRUCK RECEIVER	PNP 236890-0

3' X 8' RELAY HOUSE

REVIEWS	DATE	BY	REMARKS
12-18-2000	SW	999824	
03-22-04	SW	00000520	
RAIL TRAINING GROUP CONSTRUCTION AND ENGINEERING CORPORATION PERMIT TO BUTLER ST.			
DESIGNED SWE CHECKED SWE DIGITIZED SWE DATE 07-08-99			
NEXT FILE BE 16687 FILE 003 FILE 0116687 SHEET 002			

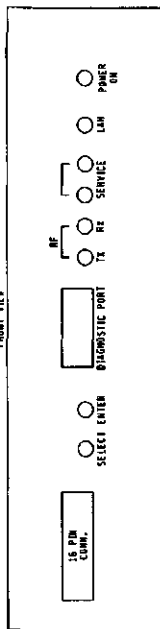
~~SECRET~~



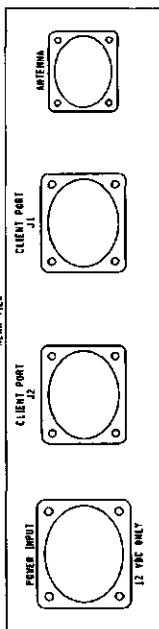
CSX TRANSPORTATION - RAIL
TRAIN CONTROL SYSTEMS
Jacksonville, Florida
CSX PROJ # 00N2010176 DATE, 11-14-11
DESIGNED BY: SA1 CHECKED BY: DPM

CSK PROJ # 0N201076 DATE 11-14-11
DESIGNED BY SA1 CHECKED BY DPM

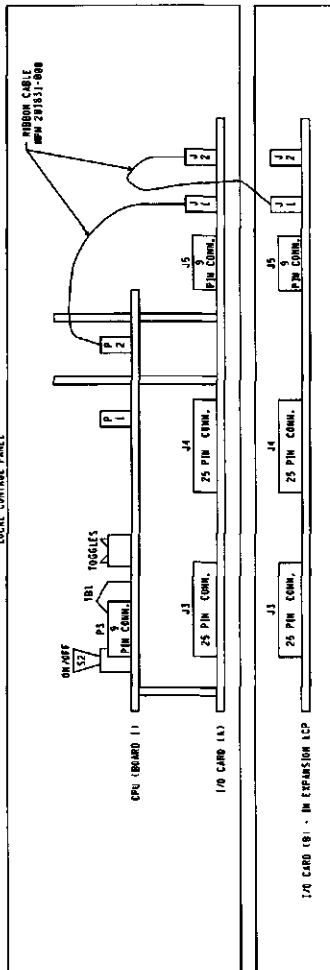
DATA RADIO FRONT VIEW



REAR VIEW



LOCAL CONTROL PANEL



LOCAL CONTROL PANEL

- NO START SWITCH
- START SWITCH
- PROGRAMMABLE
- PROGRAMMABLE
- PROGRAMMABLE
- RESERVED
- INVERT OUTPUTS
- INVERT INPUTS
- SELF TEST MODE
- LOCATED ON
CPU BOARD INSIDE
LCP CABINET

8' X 8' RELAY HOUSE

REVIEWS		RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS	
12-14-2008 SDC	001590824	DESIGNED	CHECKED
01-22-04 SAT 002000020	001590824	FILE	FILE
Q. N.E. HASTINGS		PERRY TO BUTLER ST	
Q. HASTINGS, ON J.P. BELLEVILLE		EQUIPMENT AT	
Q. HASTINGS, ON J.P. BELLEVILLE		EQUIPMENT AT	
DESIGNED	CHECKED	DATE	DATE
FILE	FILE	07-08-99	07-08-99
NEXT FILE	FILE	SHEET	SHEET
BEHIND	BEHIND	100	100



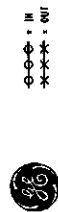
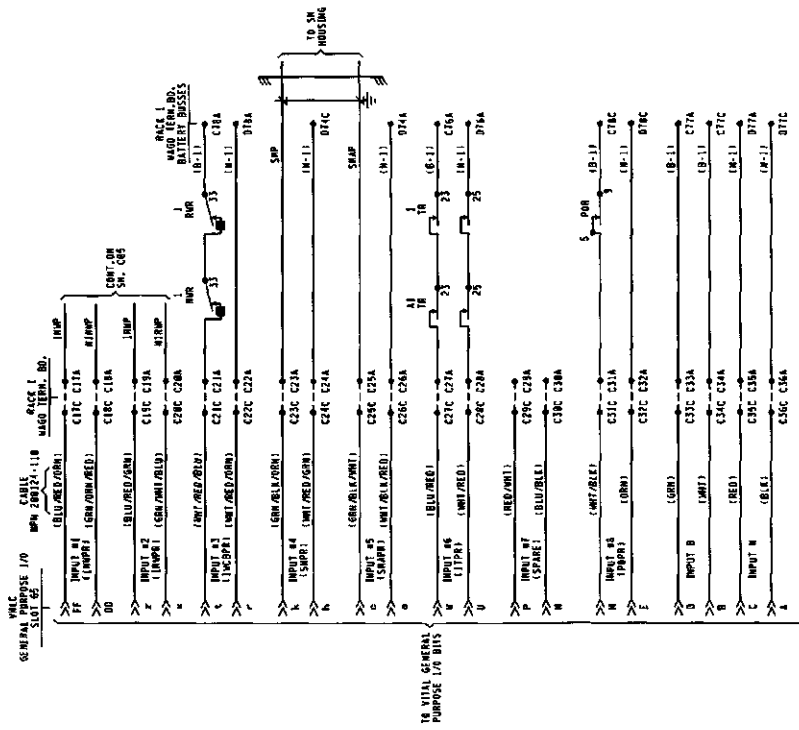
GE TRANSPORTATION-RAIL
TRAIN CONTROL SYSTEMS
CS1 PROJ #100211876 DATE: 11-14-11
DESIGNED BY SAT CHECKED BY DPL

TOP ROW																																																																																														
88-1 RDR					88-204XR					88-304XR					88-404XR					4R					RPR					GPR					LCR					POR																																																						
12	15	22	25	35	12	15	22	25	35	12	15	22	25	35	12	15	22	25	35	12	15	22	25	35	12	15	22	25	35	12	15	22	25	35																																																												
FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB																																																													
C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18	C18																																																													



CSK PROJ # 012011076 DATE 11-14-11
DESIGNED BY: SAJ CHECKED BY: OPI
Jacksonville, Florida
TRAIN CONTROL SYSTEMS
OR TRANSPORTATION - RAIL

REVIEWS	CSX	RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS		M.E. MASKINS		CHECKS AT MASKINS, ON M.P. BE-106.87		DESIGNED		DIGITIZED		CHECKED		DATE	
12-18-2008 SWE	001839824							SWE		SWE				07-01-99	
01-22-04 SAR 0030806570								NEXT FILE		FILE		SHEET			
08-18-10 REC 0030806558								BE 16687		C87		BE 10387		C81	

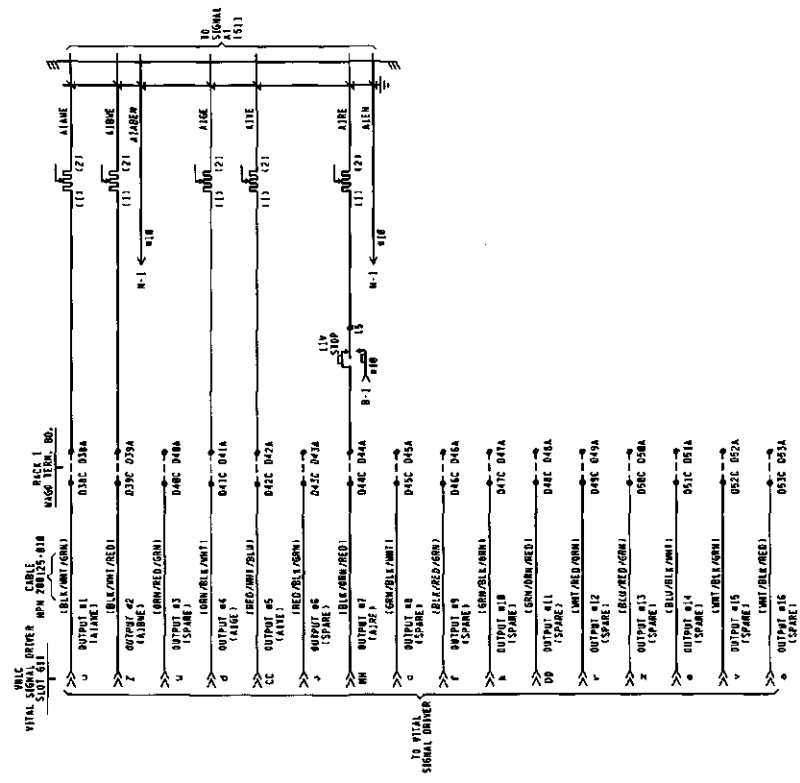
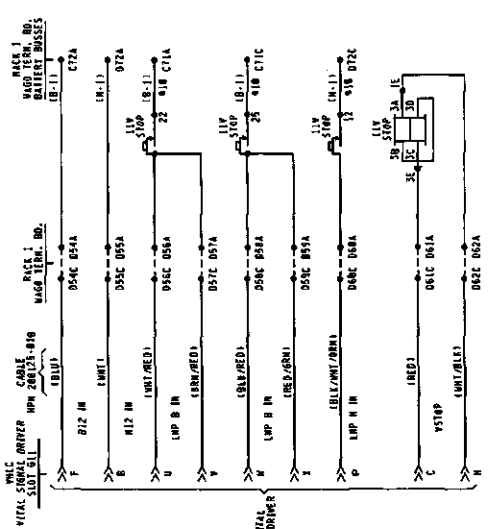


GE TRANSPORTATION RAIL
TRAIN CONTROL SYSTEM
RAILWAY SIGNALING
DESIGNED BY: SAT. CHECKED BY: DPL

NOTE:
1. ALL WIRING a14 UNLESS NOTED OTHERWISE.

REVISIONS			
12-10-2000	001390824	01-22-04 SHI 000000000	01-22-04 SHI 000000000
BY: N.E. HASKINS			
CHECKED BY: PERRY TO BUTLER ST.			
CIRCUITS AT			
DESIGNED	DIGITIZED	CHECKED	DATE
SW	SW	SW	07-01-99
NEXT FILE	NEXT SH	FILE	SHEET
001390824	001390824	001390824	001390824

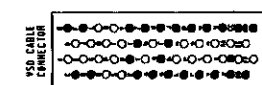


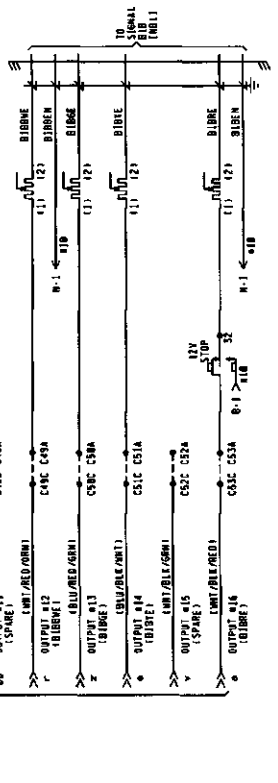
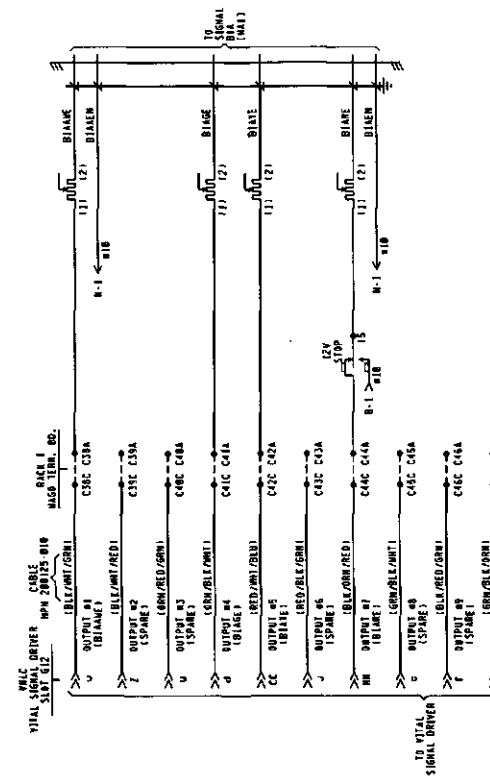
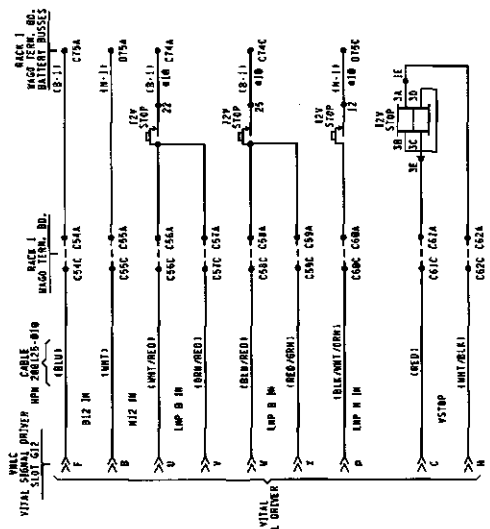


GE TRANSPORT GROUP
TRAIN CONTROL SYSTEMS
SIGNALS, POWER
DESIGNED BY: SAT
CHECKED BY: RPL

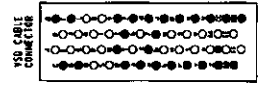
NOTE:
1. LOCATION SPECIFIC SIGNAL INFORMATION, APPLIES ON PLANS ONLY.
2. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
3. ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE NOTED.

REVISIONS		RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS	
12-10-2008	20130824	CIRCUITS AT	
01-22-04	0401000020	CIRCUITS AT	
DESIGNED		DIGITIZED	CHECKED
DATE	DATE	DATE	DATE
87-08-99	87-08-99	87-08-99	87-08-99
FILE	FILE	FILE	FILE
BE10407	BE10407	BE10407	BE10407

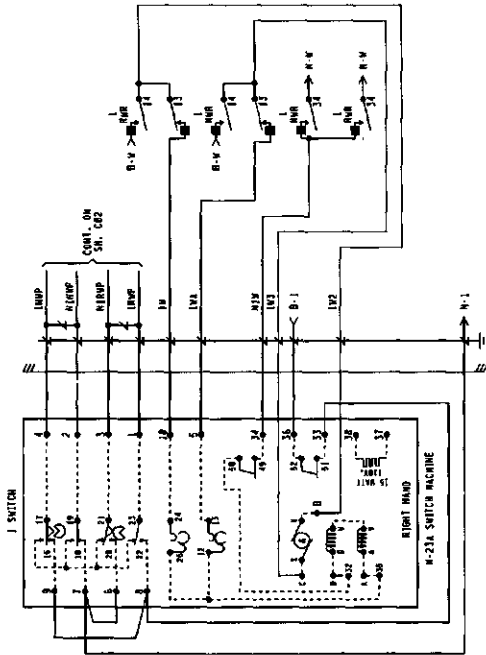




GE
 ON TRANSPORTATION RAIL
 TRAIN CIRCULATING SYSTEMS
 CSX PROJ. N. 00211876 DATE: 11-14-11
 DESIGNED BY: SAJ CHECKED BY: GPL
 NOTE:
 1. LOCATION SPECIFIC SIGNAL INFORMATION APPEARS ON PLANS ONLY.
 2. ALL WIRING FROM SIGNALS TO ALL OTHER WIRING AND POWER DISCONNECT NOTED.
 3. ALL RESISTORS ARE 1 OHM UNLESS NOTED IN SIGNAL HEAD.



REVISIONS			
12-10-2009	SAJ	0015558243	
01-22-09	SAJ	0015558243	
N.E. HASKINS			
CIRCUITS AT			
CIRCUITS AT			
DESIGNED	DIGITIZED	CHECKED	DATE
SAJ	SAJ	SAJ	01-22-09
NEXT FILE	NEXT SH	FILE	SHEET
0015558243	0015558243	0015558243	001



⊖ ⊖ ⊖ = IN
* * * * * = OUT

GE TRANSPORTATION - RAIL
TRANSPORT GROUP
DESIGNED BY: SGT
CHECKED BY: SGT
DATE: 11-14-11
CSF PROJ. # 0001076

RIGHT HAND LAYOUT, RIGHT HAND RAIL CLOSED.

RAIL TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS

PERMIT TO ROUTE ST.

CIRCUITS AT

X-ALL WIRING TO BE 15-17

DESIGNED	DIGITIZED	CHECKED	DATE
SHE	SHE	SHE	07-08-99
NEXT FILE	FILE	FILE	SHEET
000000	000	000	000

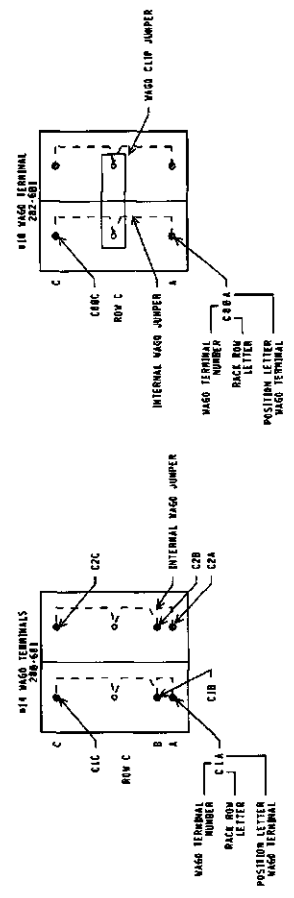
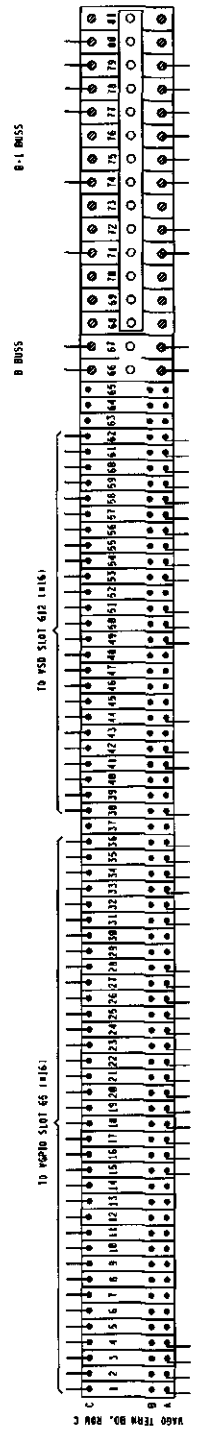
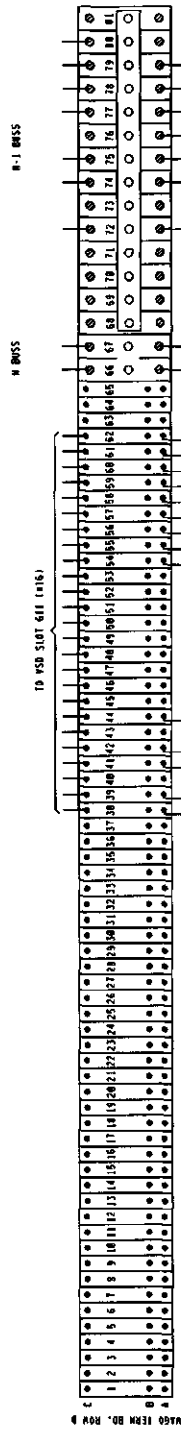
REVISIONS
12-11-2000 SHE
01-22-04 SHE

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DESIGNED	DIGITIZED	CHECKED	DATE
SHE	SHE	SHE	07-08-99
NEXT FILE	FILE	FILE	SHEET
000000	000	000	000



GE TRANSPORTATION RAIL
TRAIN CONTROL SYSTEMS
CSE PROJ. N. 0001170, DATE: 11-14-11
DESIGNED BY: SAT. CHECKED BY: APPL

REVISIONS
1. 060A & 060C TO N SUPPLY
2. 070A & 070C TO N-1 SUPPLY
3. C80A & C80C TO B SUPPLY
4. 070A & 070C TO B-1 SUPPLY

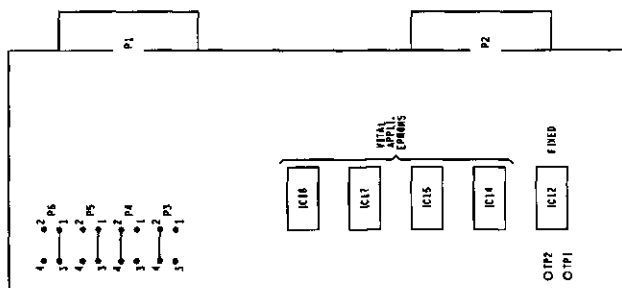
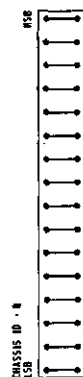
RAIL TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS
PERRY TO BUTLER ST.

DATE
87-01-99
SHEET
1 OF 1
FILE
REMARK
CSE

DESIGNED
SHE
DIGITIZED
SHE
CHECKED
SHE
DATE
87-01-99
SHEET
1 OF 1
FILE
REMARK
CSE

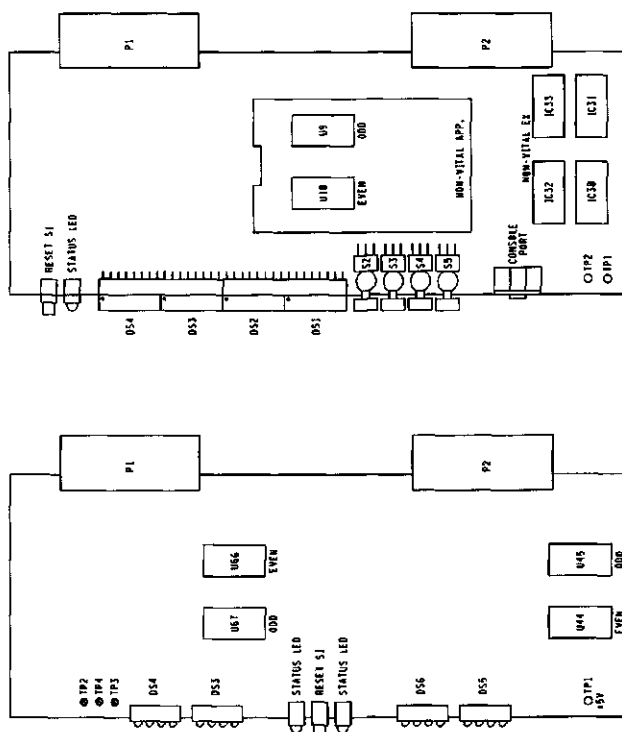
SITE SPECIFIC MODULE
JUMPER SETTINGS
SLOT 63

CPROM	P3	P4	P5	P6
27C004	1-3	1-3	1-3	1-3
27C010	1-3	1-3	1-3	1-3
27C026	2-4	1-3	1-3	1-3
27C012	2-4	2-4	1-3	1-3
27C018	2-4	2-4	2-4	1-3



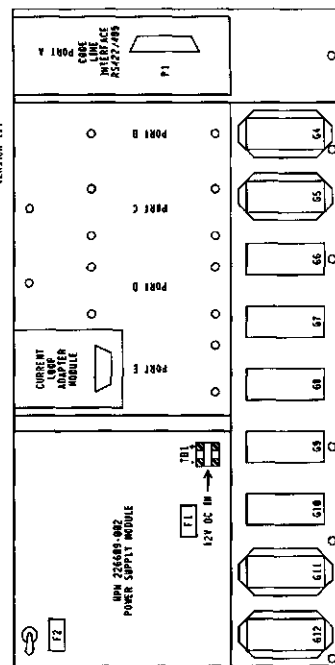
SITE SPECIFIC MODULE
SLOT 63

IC14	CSSUM	8102	CRC	IC141	895A
IC15	CSSUM		CRC	IC151	
IC17	CSSUM		CRC	IC171	
IC18	CSSUM		CRC	IC181	



SITE SPECIFIC MODULE
SLOT 61

IC9	CSSUM	44C3	IC10	CSSUM	422B
IC38	CSSUM	CAB2	IC31	CSSUM	1616
IC32	CSSUM	1CBB	IC33	CSSUM	44C8
FROM EPROM A1C5 MP420204-0071 VERSION 1.1					



VITAL LOGIC CONTROLLER (REAR VIEW)



GE TRANSPORTATION RAIL
TRAIN CONTROL SYSTEM
Indianapolis, Indiana
CSF PRA 1 & 2 (REV. 11-14-91)
DESIGNED BY: SAT CHECKED BY: BPL

REVISIONS		CIRCUITS AT	
12-11-2000	SHE	12-11-2000	SHE
12-22-01	SAT	12-22-01	SAT
12-13-03	MS	12-13-03	MS

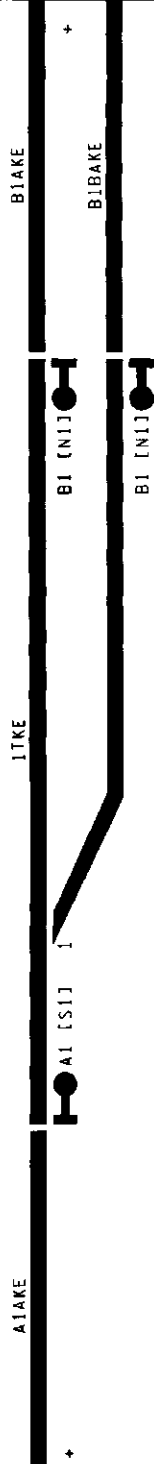
DESIGNED	CHECKED	DATE
SHE	SHE	07-08-99

NEXT FILE	NEXT SH	FILE	SHEET
12-13-03	000	12-13-03	001

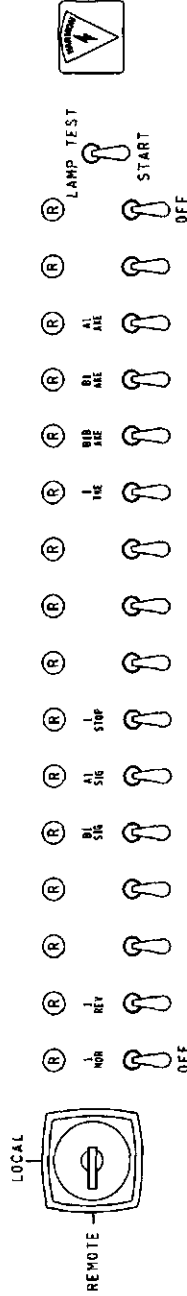


N.E. HASKINS

MP, BE-186.87

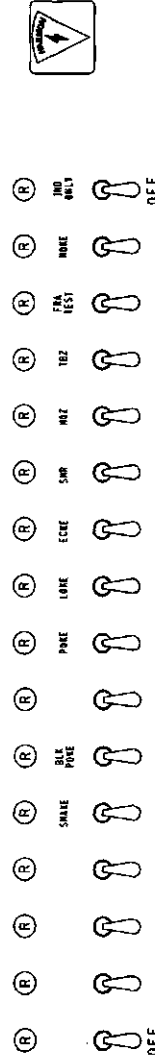


LOCAL CONTROL PANEL



HARMON ELECTRONICS GRAIN VALLEY, MO. 64029 U.S.A.

LOCAL CONTROL PANEL EXPANSION



HARMON ELECTRONICS GRAIN VALLEY, MO. 64029 U.S.A.

NOTE

1. WHERE "T" APPEARS AT END OF WORD ONLY INDICATES "T" APPEARS IN TRACK NAME.
2. LOCATION SPECIFIC TRACK SWITCH AND SIGNAL NOMENCLATURE IS SHOWN IN CAPITAL LETTERS AND APPEARS IN TRACK AND SIGNAL FUNCTION ASSIGNMENTS ONLY.



GE TRANSPORTATION RAIL
TRAIN CONTROL SYSTEMS
CSE PROJ. N. 0020107A, DATE: 11-14-11
DESIGNED BY: SAJ, CHECKED BY: APL

***** IN
***** OUT

REVISIONS		RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS	
12-15-2000	SH	00159021	
01-22-01	SAJ	002000520	
06-21-05	SAJ	002000521	
10-13-05	MS	002000522	
DESIGNED BY: SAJ, CHECKED BY: APL		LOCAL CONTROL PANEL AT HASKINS, BE-186.87	
DESIGNED	SH	DIGITIZED	SH
CHECKED	SH	FILE	SH
DATE	07-08-10	SHEET	01
RETURN		FILE	

88-104U

TRM LOCAL PARAMETERS PMD-3R DESIGN CARD

OPERATING PROGRAM	VERSION AND COMPILE DATE	REMARKS A FOR STYLE	FIELD RECORD
SYSTEM MONITOR PROGRAM EPROM	VERSION AND COMPILE DATE	35.2 MAY00/11	11-11
ADJUSTMENT	RANGE	28.2 MAY00/11	11-11
R1 RX	100 IS INTENDED	NA	TRACK 1
R2 PH (PHASE)	INTENDED ABOVE 32 (NOT ADJUSTABLE)	NA	
R3 CW / NO	CW OR NO NOT ADJUSTABLE FROM NO TOWARD CW (SEE ICR 430-B1 FOR CONSTRAINTS)	NO	NO
R4 UNL/BI (IF CW IS CHOSEN IN #3)	UNL OR BI	BI	NA
R5 LIA (IF CW IS CHOSEN IN #3)	-9 TO +9	LIA=B	NA
R6 MT (IF CW IS CHOSEN IN #3)	23 TO 93	MT=99	NA
R7 TC	WHEN IN CONFORMANCE WITH PMD-3R MANUAL - ADJUST TC FOR A TRANSMITTER CHECK MONITOR VALUE LESS THAN 470	NA	
R8 B (BALLAST COMPENSATION)	50 TO 250 (FIELD ADJUSTMENT - ADJUST ONLY WHEN IN CONFORMANCE WITH DATA ACCUMULATED AT THIS SITE AND IN COMPLIANCE WITH SUPERVISOR INSTRUCTIONS & PMD-3R MANUAL)	NA	
R9 PC (PHASE COMPENSATION)	0 TO +10 (FIELD ADJUSTMENT - ADJUST ONLY WHEN IN CONFORMANCE WITH SUPERVISOR INSTRUCTIONS & PMD-3R MANUAL)	PC=0	
R10 FREQ	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA
R11 F5-C (FALSE SHUNT TIMER)	ENTRANCE TO SODDER FALSE SHUNT SUB-MENU	NA	NA
R12 FR (FALSE SHUNT % OF RX APPROACH)	0 TO 80 NOT ADJUSTABLE FROM ZERO UNTIL AFTER STRICT DESIGN REVIEW FOR SITE APPLICATION CONFLICTS. FR=B MEANS DISABLED (SEE ICR 430-B1 FOR CONSTRAINTS)	FR=0	FR=0
R13 FT (FAULT TIMER)	0 TO 99 MINUTES (FACTORY DEFAULT IS 10)	FT=10	NA
R14 AR-T (APPROACH RELEASE TIMER)	ENTRANCE TO SUB-MENU FOR RESIDUAL FALSE SHUNT STARTED DURING TRAIN PASSAGE	NA	NA
R15 AR (FALSE SHUNT % OF RX APPROACH)	0 TO 80 NOT ADJUSTABLE FROM ZERO UNTIL AFTER STRICT DESIGN REVIEW FOR SITE APPLICATION CONFLICTS. AR=B MEANS DISABLED (SEE ICR 430-B1 FOR CONSTRAINTS)	AR=0	AR=0
R16 AT (FAULT TIMER)	0 TO 99 MINUTES (FACTORY DEFAULT IS 10)	AT=10	AT=10
R17 RS (HIGHEST STABLE R VALUE)	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA
R18 LP (LOWEST STABLE PHASE)	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA
R19 SD (SELF DIAGNOSTICS)	REFERENCE, NOT ADJUSTABLE FROM MENU BUT MENU CAN REVIEW, THEN CLEAR DIAGNOSTIC CODES	NA	NA
R20 REC (TRAIN RECORD DISPLAY)	REFERENCE, SEQUENTIAL DISPLAY OF PREVIOUS WARNING TIME RECORDS (NO ADJUSTMENT)	NA	NA
R21 PRN (PRINTER/LAPTOP READY)	STARTS DOWNLOAD OF INTERNAL TRAIN EVENT LOG WHEN SERIAL PORT CABLE CONNECTED	NA	NA
R22 LSP (LOCAL SERIAL PORT)	ENTRANCE TO SUB-MENU FOR SETTING SPEED OF SERIAL PORT DOWNLOADS	NA	NA
R23 @ (BAUD RATE)	BAUD RATE OF 38,400 IS 384 AND DEFAULT	@=384	@=384
R24 DB (DATA BITS)	7 OR 8 IS DEFAULT	DB=8	DB=8
R25 PA (PARITY)	0, E, OR N IS DEFAULT	PA=N	PA=N
R26 AR (AUTO RX)	UP OR DN ON IS FACTORY DEFAULT (FIELD ADJUSTMENT - ADJUST TO "UP" ONLY WHEN RX HAS BEEN PREVIOUSLY STABILIZED THROUGH ADJUSTMENT AND ONLY WHEN IN CONFORMANCE WITH SUPERVISOR INSTRUCTIONS AND PMD-3R MANUAL)	AR=DN	AR=DN
R27 RX (POTENTIOMETER VALUE)	REFERENCE, DISPLAY ONLY	NA	NA
R28 VRS (PROGRAM VERSION)	REFERENCE, SEQUENTIAL DISPLAY OF EPROM AND SOFTWARE VERSIONS	NA	NA

8' X 8' HOUSE



NEW WORK

OR TRANSPORTATION-RAIL
TRAIN CONTROL SYSTEMS
Jacksonville, Florida

CSX PROJ # 002911876 DATE: 11-14-11
DESIGNED BY: SAT CHECKED BY: DPL

RAIL TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS

N.E. HASKINS

TR-104 10/11/11 NO. 135889C
DETECTION DEVICE PROGRAM
HASKINS, ON N.P. BE-105.07

DESIGNED	DIGITIZED	CHECKED	DATE
GET/SAT	GET/SAT	GET/DPL	11-14-11
DRAWING	SHEET NO	FILE	SHEET
.....	.....	BE10687	C10

PMD3RPHL.C02
REV. 01-00-18

DESIGN DATE	REV.	NO.
11-14-11	6	

88-2 CWU PMD-3R MODULES REQUIRED

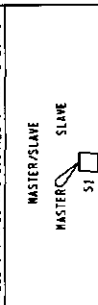
RNM (REORDER MEMORY) (NOT USED)
TRM (TRANSCIVER)
TRM (TRANSCIVER)
MD (RELAY DRIVE)
CPU (CENTRAL PROCESSOR UNIT)
TLN (TRANSFER LOGIC)

ISLAND FREQ.	226736-000 4.8KHZ
ISLAND FREQ.	226736-001 4.8KHZ
NORMAL RSI JUMPERS	LOS 0
STANDBY RSI JUMPERS	LOS 1
	LOS 2
	FAULT 0
	FAULT 1

FRONT VIEW

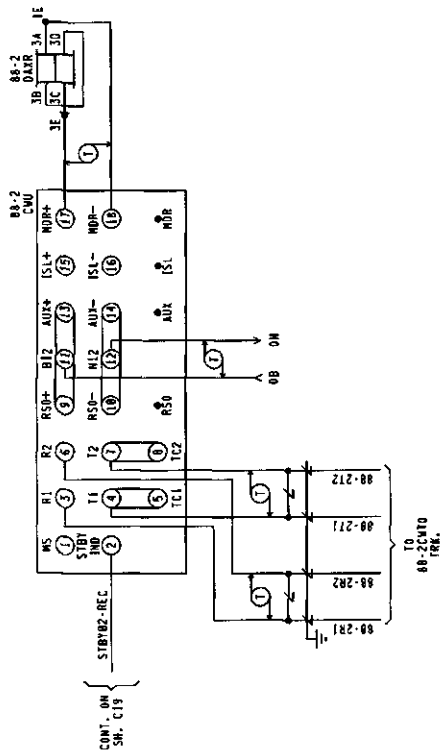
88-2 CWU

CABINET SWITCHES
THESE SWITCHES ARE LOCATED ON THE REAR BOARD



SYSTEM CONFIGURATION	
SS & ST DIP SWITCH POSITIONS	APPROACH NORMAL (NOT USED)
SWITCH 1 2 3 4	
SWITCH POSITION ON OFF OFF OFF	

FREQUENCY SELECT	
S2 & S3 DIP SWITCH POSITIONS 156 HZ	STANDBY
SWITCH 1 2 3 4 5	
SWITCH POSITION OFF OFF ON OFF OFF	
S4 & S5 DIP SWITCH POSITIONS 156 HZ	STANDBY
SWITCH 1 2 3 4 5	
SWITCH POSITION OFF OFF ON OFF OFF	



ILM MODULE
JUMPERS AND SWITCHES

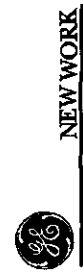
STANDBY (TOGGLE MODE)	W1
ONLY	3 2 1 (*)
ISL 1 (DISABLE MODE)	W2
DISABLE	3 2 1 (*)
ISL 2 (DISABLE MODE)	W3
DISABLE	3 2 1 (*)

NOTE:
PIN 1 IS IDENTIFIED BY ASTERISK BELOW IT.
(*) = MAY BE SET PER FIELD CONDITIONS.

MINUTE TIMEOUT SWITCH
SETTING FOR 9 MINUTES

STANDBY	W4
AUTO	W5
NORMAL	W6

8' X 8' HOUSE



NEW WORK
GE TRANSPORTATION RAIL
TRAIN CONTROL SYSTEMS
Jacksonville, Florida
DESIGNED BY: SAT CHECKED BY: DPL

DATE: 11-14-11
REV. 12-17-10
PMD3RCPML-001

RAIL TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS

N.E. HASKINS
7R-104 104171 10.1 155089C
CROSSING DETECTION CIRCUITRY
HASKINS, OH N.P. BE 186.87

DESIGNED	DIGITIZED	CHECKED	DATE
GET/SAT	GET/SAT	GET/OPL	11-14-11
DRAWING	SHEET NO	FILE	SHEET
.....	.....	BE18687	C11

DESIGN DATE	REV. NO.
11-14-11	6

88-72301

TRM LOCAL PARAMETERS PMD-3R DESIGN CARD

PROG	VERSION AND COMPILE DATE	DEFAULTS & FIELD RECORD
OPERATING PROGRAM		35.0
SYSTEM MONITOR PROGRAM		MM/00/YY
EPROM		MM/00/YY
ADJUSTMENT	RANGE	DEFAULT TRACK 1
R1 RX	100 IS INTENDED	NA
R2 PH (PHASE)	INTENDED ABOVE 32 (NOT ADJUSTABLE)	NA
R3 CW / MD	CW OR MD NOT ADJUSTABLE FROM MD TOWARD CW (SEE TCR 43B-B1 FOR CONSTRAINTS)	MD MD
R4 UN1/B1 (IF CW IS CHOSEN IN #3)	UN1 OR B1	BL NA
R5 (EA (IF CW IS CHOSEN IN #3)	-9 TO 49	LT+0 NA
R6 WT (IF CW IS CHOSEN IN #3)	23 TO 49	WT+99 NA
R7 TC	WHEN IN CONFORMANCE WITH PMD-3R MANUAL, ADJUST TC FOR A TRANSMITTER CHECK MONITOR VALUE LESS THAN 470	NA
R8 B (BALLAST COMPENSATION)	FR TO 250 (FIELD ADJUSTMENT - ADJUST ONLY WHEN IN CONFORMANCE WITH DATA ACCUMULATED AT THIS SITE AND IN COMPLIANCE WITH SUPERVISOR INSTRUCTIONS & PMD-3R MANUAL)	NA
R9 PC (PHASE COMPENSATION)	0 TO +10 (FIELD ADJUSTMENT - ADJUST ONLY WHEN IN CONFORMANCE WITH SUPERVISOR INSTRUCTIONS & PMD-3R MANUAL)	PC=0
R10 FREQ	REFERENCE, NOT ADJUSTABLE FROM MENU	NA NA
R11 FS-T (FALSE SHUNT TIMER)	ENTRANCE TO SUDEN FALSE SHUNT SUB-MENU	NA NA
R12 FR (FALSE SHUNT & OF RE APPROACH)	0 TO 80 NOT ADJUSTABLE FROM ZERO UNTIL AFTER STRICT DESIGN REVIEW FOR SITE APPLICATION CONFLICTS, FR=0 MEANS DISABLED (SEE TCR 43B-B1 FOR CONSTRAINTS)	FR=0 FR=0
R13 FT (FAULT TIMER)	0 TO 99 MINUTES (FACTORY DEFAULT IS 10)	FT=10 NA
R14 AR-T (APPROACH RELEASE TIMER)	ENTRANCE TO SUB-MENU FOR RESIDUAL FALSE SHUNT STARTED DURING TRAIN PASSAGE	NA NA
R15 AR (FALSE SHUNT & OF RX APPROACH)	0 TO 80 NOT ADJUSTABLE FROM ZERO UNTIL AFTER STRICT DESIGN REVIEW FOR SITE APPLICATION CONFLICTS, AR=0 MEANS DISABLED (SEE TCR 43B-B1 FOR CONSTRAINTS)	AR=0 AR=0
R16 AT (FAULT TIMER)	0 TO 99 MINUTES (FACTORY DEFAULT IS 10)	AT=10 AT=10
R17 HS (HIGHEST STABLE R VALUE)	REFERENCE, NOT ADJUSTABLE FROM MENU	NA NA
R18 LP (LOWEST STABLE PHASE)	REFERENCE, NOT ADJUSTABLE FROM MENU, BUT MENU CAN REVIEW, THEN CLEAR DIAGNOSTIC CODES	NA NA
R19 SD (SELF DIAGNOSTICS)	REFERENCE, SEQUENTIAL DISPLAY OF PREVIOUS WARNING TIME RECORDS (NO ADJUSTMENT)	NA NA
R20 REC (TRAIN RECORD DISPLAY)	STARTS DOWNLOAD OF INTERNAL TRAIN EVENT LOG WHEN SERIAL PORT CABLE CONNECTED	NA NA
R21 PRN (PRINTER/LAPTOP READY)	ENTRANCE TO SUB-MENU FOR SETTING SPEED OF SERIAL PORT DOWNLOADS	NA NA
R22 LSR (LOCAL SERIAL PORT)	BAUD RATE OF 38,400 IS 384 AND DEFAULT	0=384 0=384
R23 Q (BAUD RATE)	7 OR 8 8 IS DEFAULT	08=8 08=8
R24 DB (DATA BITS)	0, 1, OR 8 8 IS DEFAULT	PAR=8 PAR=8
R25 PA (PARITY)	UP OR DN DN IS FACTORY DEFAULT (FIELD ADJUSTMENT - ADJUST TO "UP" ONLY WHEN BE HAS BEEN PREVIOUSLY STABILIZED THROUGH ADJUSTMENT, AND ONLY WHEN IN CONFORMANCE WITH SUPERVISOR INSTRUCTIONS AND PMD-3R MANUAL)	AR=DN AR=DN
R26 AR (AUTO RX)	REFERENCE, DISPLAY ONLY	NA NA
R27 RX (POTENTIOMETER VALUE)	REFERENCE, SEQUENTIAL DISPLAY OF EPROM AND SOFTWARE VERSIONS	NA NA
R28 VRS (PROGRAM VERSION)		

8' X 8' HOUSE



NEW WORK

GE TRANSPORTATION-RAIL

TRAIN CONTROL SYSTEMS

Jacksonville, Florida

CSX PROJECT # 002011816 DATE: 11-14-11

DESIGNED BY: SAT CHECKED BY: DPL

PMD3RPNL.CRX

REV. 01-00-18

DESIGN DATE 11-14-11

REV. NO. 6

SHEET NO. 6

DRAWING FILE BE10687

SHEET 11-14-11

DATE 11-14-11

CHECKED M.P. BE-106.87

HASKINS, OH

DETECTION DEVICE PROGRAM

N.E. HASKINS

1R-104 (01111 NO.1) 155009C

RAIL TRANSPORT GROUP ENGINEERING

COMMUNICATIONS AND SIGNALS

88-3 CPU PMD-3B MODULES REQUIRED

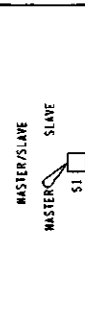
RNM (RECORD MEMORY) (NOT USED)	TRM (TRANSCIVER)	TRM (TRANSCIVER)	RMD (RELAY DRIVE)	CPD (CENTRAL PROCESSOR UNIT)	TM (TRANSFER LOGIC)
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FRONT VIEW

88-3 CPU

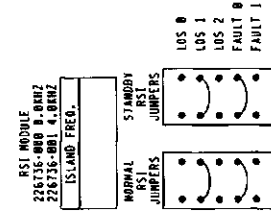
CABINET SWITCHES

THESE SWITCHES ARE LOCATED ON MOTHERBOARD



SYSTEM CONFIGURATION	
SWITCH	POSITION
S6 & S7 DIP SWITCH POSITIONS	ON OFF OFF OFF
APPROACH	NORMAL (NOT USED)

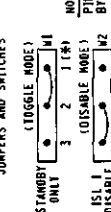
FREQUENCY SELECT	
SWITCH	POSITION
S2 & S3 DIP SWITCH POSITIONS 156 KZ	ON OFF OFF OFF
S4 & S5 DIP SWITCH POSITIONS 156 KZ	ON OFF OFF OFF



88-3 CPU

TM MODULE

JUMPERS AND SWITCHES



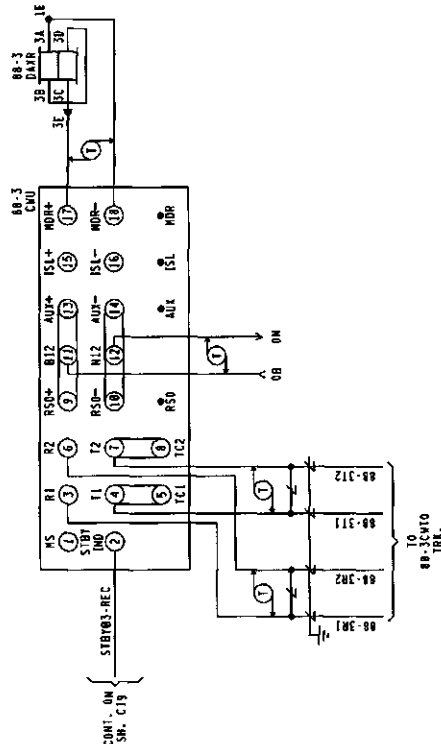
NOTE:
PIN 1 IS IDENTIFIED BY ASTERISK BELOW IT.
PINS 1-3 MAY BE SET PER FIELD CONDITIONS.

MINUTE TIMEOUT SWITCH
SETTING 2 3 9 MINUTES



8' X 8' HOUSE

NEW WORK OR TRANSPORTATION-RAIL TRAIN CONTROL SYSTEMS Jacksonville, Florida CSX PROJ. N. 002011876 DATE: 11-14-11 DESIGNED BY: SAT CHECKED BY: DPL PHD/CPM/CUI REV. 12-17-18		RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS N.E. HASKINS 1R-104 (001111) RD. 1 155009C CROSSING DETECTION CIRCUITRY HASKINS, ON M.P. BE-105.87	DESIGNED 11-14-11 CHECKED 11-14-11 DATE 11-14-11	SHEET NO FILE BE10607	SHEET C13
--	--	---	---	--------------------------------------	--------------



TRM LOCAL PARAMETERS PWD-3R DESIGN CARD				DEFINITION	FIELD RECORD
OPERATING PROGRAM	VERSION AND COMPIL DATE	15.0	NA	15.0	15.0
SYSTEM MONITOR PROGRAM	VERSION AND COMPIL DATE	28.2	NA	28.2	28.2
EPROM	RANGE	NA	NA	NA	NA
#1 RX	100 IS INTENDED	NA	NA	NA	NA
#2 PH (PHASE)	INTENDED ABOVE 32 (NOT ADJUSTABLE)	NA	NA	NA	NA
#3 CW / MD	CW OR MD NOT ADJUSTABLE FROM MD TOWARD CW 1552 ICR 430-B) FOR CONSTRAINTS)	MD	MD	MD	MD
#4 UNIBI LIP CW IS CHOSEN IN #3)	UNIBI OR BI	BI	BI	BI	BI
#5 LIA LIP CW IS CHOSEN IN #3)	-9 TO +9	LIA=0	NA	NA	NA
#6 W LIP CW IS CHOSEN IN #3)	23 TO 99	MI=99	NA	NA	NA
#7 TC	WHEN IN CONFORMANCE WITH PWD-3R MANUAL, ADJUST TC FOR A TRANSMITTER CHECK MONITOR VALUE LESS THAN 470	NA	NA	NA	NA
#8 B (BALAST COMPENSATION)	50 TO 250 (FIELD ADJUSTMENT - ADJUST ONLY WHEN IN CONFORMANCE WITH DATA ACCUMULATED AT THIS SITE AND IN COMPLIANCE WITH SUPERVISOR INSTRUCTIONS & PWD-3R MANUAL)	NA	NA	NA	NA
#9 PC (PHASE COMPENSATION)	0 TO +10 (FIELD ADJUSTMENT - ADJUST ONLY WHEN IN CONFORMANCE WITH SUPERVISOR INSTRUCTIONS & PWD-3R MANUAL)	PC=0	NA	NA	NA
#10 FREQ	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA	NA	NA
#11 FST (FALSE SHUNT TIMER)	ENTRANCE TO SUDEN FALSE SHUNT SUB-MENU	NA	NA	NA	NA
#12 FR (FALSE SHUNT % OF RX APPROACH)	0 TO 80 NOT ADJUSTABLE FROM ZERO UNTIL AFTER STRICT DESIGN REVIEW FOR SITE APPLICATION CONFLICTS; FR=0 MEANS DISABLED (SEE ICR 430-B) FOR CONSTRAINTS)	FR=0	FR=0	FR=0	FR=0
#13 FT (FAULT TIMER)	0 TO 99 MINUTES (FACTORY DEFAULT IS 10)	FT=10	NA	NA	NA
#14 AR-T (APPROACH RELEASE TIMER)	ENTRANCE TO SUB-MENU FOR RESIDUAL FALSE SHUNT STARTED DURING TRAIN PASSAGE	NA	NA	NA	NA
#15 AR (FALSE SHUNT % OF RX APPROACH)	0 TO 80 NOT ADJUSTABLE FROM ZERO UNTIL AFTER STRICT DESIGN REVIEW FOR SITE APPLICATION CONFLICTS; AR=0 MEANS DISABLED (SEE ICR 430-B) FOR CONSTRAINTS)	AR=0	AR=0	AR=0	AR=0
#16 AT (FAULT TIMER)	0 TO 99 MINUTES (FACTORY DEFAULT IS 10)	AT=10	AT=10	AT=10	AT=10
#17 MS (HIGHEST STABLE R VALUE)	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA	NA	NA
#18 LP (LOWEST STABLE PHASE)	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA	NA	NA
#19 SD (SELF DIAGNOSTICS)	REFERENCE, NOT ADJUSTABLE FROM MENU, BUT MENU CAN REVIEW, THEN CLEAR DIAGNOSTIC CODES	NA	NA	NA	NA
#20 REC (TRAIN RECORD DISPLAY)	REFERENCE, SEQUENTIAL DISPLAY OF PREVIOUS WARNING TIME RECORDS (NO ADJUSTMENT)	NA	NA	NA	NA
#21 PHN (PRINTER/LAPTOP READY)	STARTS DOWNLOAD OF INTERNAL TRAIN EVENT LOG WHEN SERIAL PORT CABLE CONNECTED	NA	NA	NA	NA
#22 LSP (LOCAL SERIAL PORT)	ENTRANCE TO SUB-MENU FOR SETTING SPEED OF SERIAL PORT DOWNLOADS	NA	NA	NA	NA
#23 @ (BAUD RATE)	BAUD RATE OF 30,400 IS 304 AND DEFAULT	@=304	@=304	@=304	@=304
#24 DB (DATA BITS)	7 OR 8	DB=8	DB=8	DB=8	DB=8
#25 PA (PARITY)	0, E, OR N N IS DEFAULT	PA=N	PA=N	PA=N	PA=N
#26 AR (AUTO RX)	UP OR DN DN IS FACTORY DEFAULT (FIELD ADJUSTMENT - ADJUST TO "UP" ONLY WHEN BE HAS BEEN PREVIOUSLY STABILIZED THROUGH ADJUSTMENT, AND ONLY WHEN IN CONFORMANCE WITH SUPERVISOR INSTRUCTIONS AND PWD-3R MANUAL)	AR=DN	AR=DN	AR=DN	AR=DN
#27 RX (POTENTIOMETER VALUE)	REFERENCE, DISPLAY ONLY	NA	NA	NA	NA
#28 VRS (PROGRAM VERSION)	REFERENCE, SEQUENTIAL DISPLAY OF EPROM AND SOFTWARE VERSIONS	NA	NA	NA	NA

88-3100

8' X 8' HOUSE



NEW WORK

CSX TRANSPORTATION RAIL
TRAIN CONTROL SYSTEMS
Jacksonville, Florida
CSX PROJ # 002011076 DATE 11-14-11
DESIGNED BY SAT CHECKED BY DPL

RAIL TRANSPORT GROUP - ENGINEERING
COMMUNICATIONS AND SIGNALS

N.E. HASKINS

78-104 (09/17/00) 155089C
DETECTION DEVICE PROGRAM
HASKINS, ON N.P. BE-106.07

DESIGNED	GET/SAT	SHEET NO	DRAWING	FILE	SHEET
DIGITIZED	GET/SAT	.....	.....	BE10607	C14
CHECKED	GET/DPL	.....	.....	.....	.....
DATE	11-14-11	.....	.....	.....	.....

DESIGN DATE	REV. NO.	6
11-14-11	.....	.....

88-4 CPU

PMO-3R MODULES REQUIRED

RSM (REORDER MEMORY) (NOT USED)
TSM (TRANSMITTER)
TSM (TRANSMITTER)
RSD (RELAY DRIVE)
CPU (CENTRAL PROCESSOR UNIT)
TSM (TRANSFER LOGIC)

FRONT VIEW

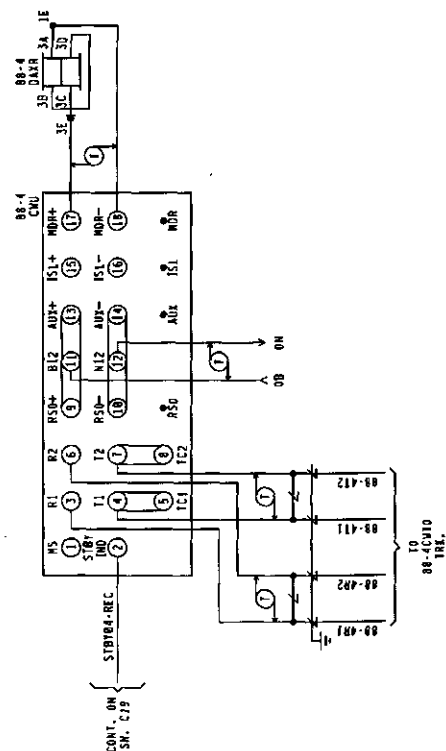
88-4
CPU

CABINET SWITCHES
THESE SWITCHES ARE LOCATED ON MOTHERBOARD

MASTER/SWAVE
MASTER SLAVE
S1

SYSTEM CONFIGURATION			
SWITCH	1	2	3
56 & 57 DIP SWITCH POSITIONS	ON	OFF	OFF
APPROACH	NORMAL	(NOT USED)	

FREQUENCY SELECT			
SWITCH	1	2	3
52 & 53 DIP SWITCH POSITIONS 452 NZ	ON	ON	ON
SWITCH POSITION	OFF	ON	ON
54 & 55 DIP SWITCH POSITIONS 452 NZ	ON	ON	ON
SWITCH POSITION	OFF	ON	ON



TLM MODULE
JUMPERS AND SWITCHES

STANDBY
ONLY

ISL 1
ISOLATE MODE 1
3 2 1 (4)

ISL 2
ISOLATE MODE 2
3 2 1 (4)

ISL 3
ISOLATE MODE 3
3 2 1 (4)

ISL 4
ISOLATE MODE 4
3 2 1 (4)

ISL 5
ISOLATE MODE 5
3 2 1 (4)

ISL 6
ISOLATE MODE 6
3 2 1 (4)

ISL 7
ISOLATE MODE 7
3 2 1 (4)

ISL 8
ISOLATE MODE 8
3 2 1 (4)

ISL 9
ISOLATE MODE 9
3 2 1 (4)

ISL 10
ISOLATE MODE 10
3 2 1 (4)

ISL 11
ISOLATE MODE 11
3 2 1 (4)

ISL 12
ISOLATE MODE 12
3 2 1 (4)

ISL 13
ISOLATE MODE 13
3 2 1 (4)

ISL 14
ISOLATE MODE 14
3 2 1 (4)

ISL 15
ISOLATE MODE 15
3 2 1 (4)

ISL 16
ISOLATE MODE 16
3 2 1 (4)

ISL 17
ISOLATE MODE 17
3 2 1 (4)

ISL 18
ISOLATE MODE 18
3 2 1 (4)

ISL 19
ISOLATE MODE 19
3 2 1 (4)

ISL 20
ISOLATE MODE 20
3 2 1 (4)

ISL 21
ISOLATE MODE 21
3 2 1 (4)

ISL 22
ISOLATE MODE 22
3 2 1 (4)

ISL 23
ISOLATE MODE 23
3 2 1 (4)

ISL 24
ISOLATE MODE 24
3 2 1 (4)

ISL 25
ISOLATE MODE 25
3 2 1 (4)

ISL 26
ISOLATE MODE 26
3 2 1 (4)

ISL 27
ISOLATE MODE 27
3 2 1 (4)

ISL 28
ISOLATE MODE 28
3 2 1 (4)

ISL 29
ISOLATE MODE 29
3 2 1 (4)

ISL 30
ISOLATE MODE 30
3 2 1 (4)

ISL 31
ISOLATE MODE 31
3 2 1 (4)

ISL 32
ISOLATE MODE 32
3 2 1 (4)

ISL 33
ISOLATE MODE 33
3 2 1 (4)

RSI MODULE
226736-000 8.8MHz
226736-001 4.0MHz
ISLAND FREQ.

STANDBY
RSI
JUMPERS

ISLAND FREQ.

ISLAND FREQ.

ISLAND FREQ.

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8' X 8' HOUSE

RAIL TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS

N. E. HASKINS

TR-104 10/11/11 NO. 1 155089C

CROSSING DETECTION CIRCUITRY

HASKINS, OM N.P. BE-106.87

DESIGNED BY: SA

CHECKED BY: DPL

DATE 11-14-11

SHEET 6

FILE BE10687

SHEET C15

NEW WORK

GP TRANSPORTATION RAIL
TRANS CONTROL SYSTEMS

Indianapolis, Indiana

CSK PROJ. # 002011076 DATE: 11-14-11

DESIGNED BY: SA

CHECKED BY: DPL

PHOTOGRAPH: GSI

REV. 12-17-10

DESIGN DATE 11-14-11

REV. NO. 6

SHEET 6

FILE BE10687

SHEET C15

88-400U

TRM LOCAL PARAMETERS PMD-3R DESIGN CARD

OPERATING PROGRAM	VERSION AND COMPIL DATE	DEFINITION FOR STYLE	FIELD RECORD
PMO		35.0	11-11
SYSTEM MONITOR PROGRAM	VERSION AND COMPIL DATE	28.2	11-11
EPMD		DEFAULT	TRACK 1
ADJUSTMENT	RANGE		
R1 RX	100 IS INTENDED	NA	
R2 PH (PHASE)	INTERED ABOVE 32 (NOT ADJUSTABLE)	NA	
R3 CV / NO	CV OR NO NOT ADJUSTABLE FROM MD TOWARD CV (SEE TCR 430-B FOR CONSTRAINTS)	NO	NO
R4 UNIBI (IF CV IS CHOSEN IN #3)	UNIT OR BI	BI	NA
R5 LIA (IF CV IS CHOSEN IN #3)	-9 TO +9	LIA=0	NA
R6 MI (IF CV IS CHOSEN IN #3)	23 TO 95	VI=95	NA
R7 TC	WHEN IN CONFORMANCE WITH PMD-3R MANUAL - ADJUST TC FOR A TRANSMITTER CARRIER MONITOR VALUE LESS THAN 470	NA	
R8 B (BALLAST COMPENSATION)	50 TO 250 (FIELD ADJUSTMENT - ADJUST ONLY WHEN IN CONFORMANCE WITH DATA ACCUMULATED AT THIS SITE AND IN COMPLIANCE WITH SUPERVISOR INSTRUCTIONS & PMD-3R MANUAL)	NA	
R9 PC (PHASE COMPENSATION)	0 TO +10 (FIELD ADJUSTMENT - ADJUST ONLY WHEN IN CONFORMANCE WITH SUPERVISOR INSTRUCTIONS & PMD-3R MANUAL)	PC=0	
R10 FREQ	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA
R11 TS-T (FALSE SHUNT TIMER)	ENTRANCE TO SUDEN FALSE SHUNT SUB-MENU	NA	NA
R12 ER (FALSE SHUNT & OF RX APPROACH)	0 TO 80 NOT ADJUSTABLE FROM ZERO UNTIL AFTER STRICT DESIGN REVIEW FOR SITE APPLICATION CONFLICTS, FRI-0 MEANS DISABLED (SEE TCR 430-B FOR CONSTRAINTS)	FR=0	FR=0
R13 FT (FAULT TIMER)	0 TO 99 MINUTES (FACTORY DEFAULT IS 10)	FT=10	NA
R14 AR-T (APPROACH RELEASE TIMER)	ENTRANCE TO SUB-MENU FOR RESIDUAL FALSE SHUNT STARTED DURING TRAIN PASSAGE	NA	NA
R15 AR (FALSE SHUNT & OF RX APPROACH)	0 TO 80 NOT ADJUSTABLE FROM ZERO UNTIL AFTER STRICT DESIGN REVIEW FOR SITE APPLICATION CONFLICTS, AR=0 MEANS DISABLED (SEE TCR 430-B FOR CONSTRAINTS)	AR=0	AR=0
R16 AT (FAULT TIMER)	0 TO 99 MINUTES (FACTORY DEFAULT IS 10)	AT=10	AT=10
R17 RS (HIGHEST STABLE R VALUE)	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA
R18 LP (LOWEST STABLE PHASE)	REFERENCE, NOT ADJUSTABLE FROM MENU	NA	NA
R19 S0 (SELF DIAGNOSTICS)	REFERENCE, NOT ADJUSTABLE FROM MENU, BUT MENU CAN REVIEW, THEN CLEAR DIAGNOSTIC CODES	NA	NA
R20 REC (TRAIN RECORD DISPLAY)	REFERENCE, SEQUENTIAL DISPLAY OF PREVIOUS WARNING TIME RECORDS (NO ADJUSTMENT)	NA	NA
R21 PH (PRINTER/LAPTOP READY)	STARTS DOWNLOAD OF INTERNAL TRAIN EVENT LOG WHEN SERIAL PORT CABLE CONNECTED	NA	NA
R22 LSP (LOCAL SERIAL PORT)	ENTRANCE TO SUB-MENU FOR SETTING SPEED OF SERIAL PORT DOWNLOADS	NA	NA
R23 @ (BAUD RATE)	BAUD RATE OF 30,400 IS 384 AND DEFAULT	@=384	@=384
R24 DB (DATA BITS)	7 OR 8	DB=8	DB=8
R25 PA (PARITY)	0, E, OR N	PA=N	PA=N
R26 AR (AUTO RX)	UP OR DN DN IS FACTORY DEFAULT (FIELD ADJUSTMENT - ADJUST TO "UP" ONLY WHEN RX HAS BEEN PREVIOUSLY STABILIZED THROUGH ADJUSTMENT, AND ONLY WHEN IN CONFORMANCE WITH SUPERVISOR INSTRUCTIONS AND PMD-3R MANUAL)	AR=DN	AR=DN
R27 RI (POTENTIOMETER VALUE)	REFERENCE, DISPLAY ONLY	NA	NA
R28 VRS (PROGRAM VERSION)	REFERENCE, SEQUENTIAL DISPLAY OF EPMD AND SOFTWARE VERSIONS	NA	NA

8' X 8' HOUSE



NEW WORK

CSX TRANSPORTATION RAIL
TRAIN CONTROL SYSTEMS
Jacksonville, Florida

CSX PROJ # 072011076 DATE: 11-14-11
DESIGNED BY SAT CHECKED BY DPL

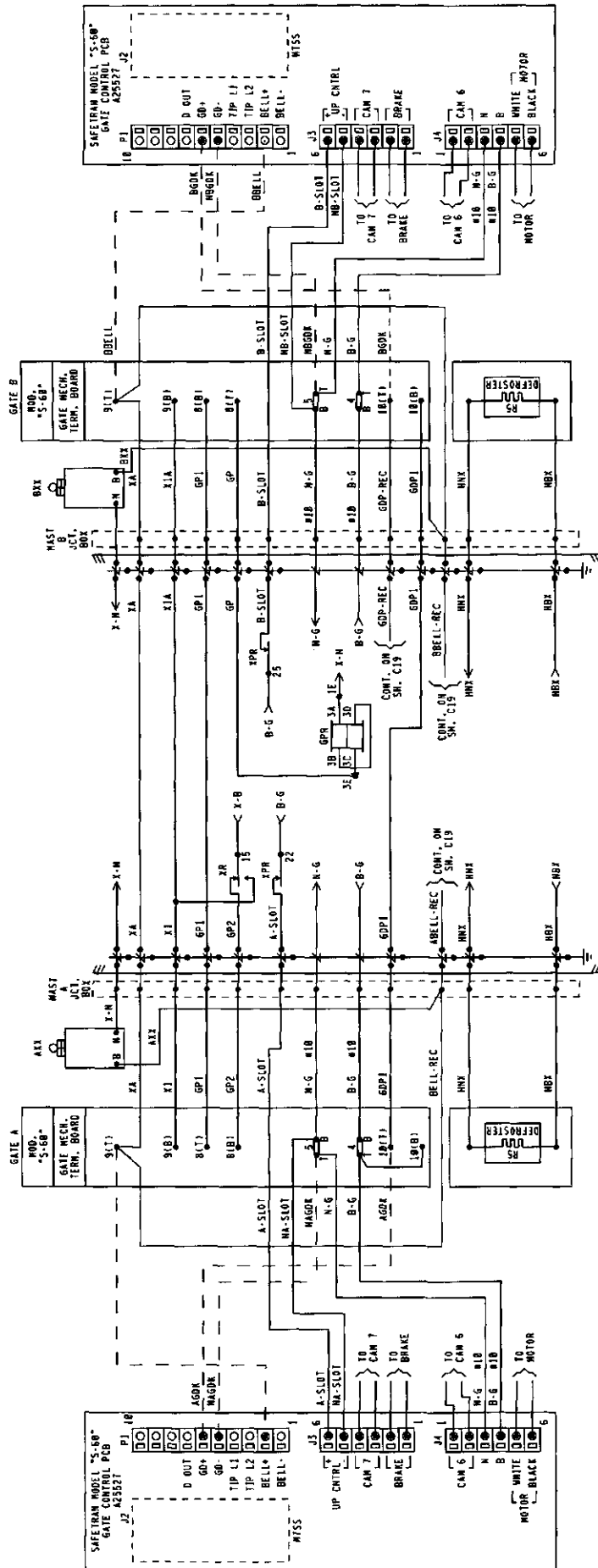
RAIL TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS

N.E. HASKINS
TR-104 (01/11 RD.) 155899C
DEFLECTION DEVICE PROGRAM
HASKINS, ON N.P. BE-106-47

DESIGNED	DIGITIZED	CHECKED	DATE
GET/SAT	GET/SAT	GET/PL	11-14-11
DRAWING	SHEET NO	FILE	SHEET
.....	.....	BE10647	C16

PH03RPHL.C02
REV. 01-08-10

DESIGN DATE	REV. NO.
11-14-11	6

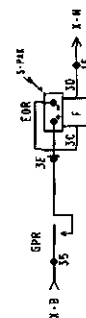


NOTES:
1. TERMINAL IN JCT. BOX BASE
2. ALL WIRING NIS UNLESS NOTED OTHERWISE.

8' X 8' HOUSE

RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS		N.E. HASKINS	
TR-104 10/11/11 RD. 1 155089C		CROSSING WARNING DEVICE GATE CIRCUITRY	
HASKINS, OH W.P. BE-106-87		DATE 11-14-11	
DESIGNED	GET/SAT	CHECKED	FILE
DIGITIZED	GET/SAT	BE-106-87	BE-106-87
DRAWING	SHEET NO	BE-106-87	SHEET
11-14-11	6	BE-106-87	C17

NEWWORK		GE TRANSPORTATION-SIGNALS	
TRAIN CONTROL SYSTEMS		CROSSING WARNING DEVICE GATE CIRCUITRY	
HASKINS, OH W.P. BE-106-87		DATE 11-14-11	
DESIGNED BY: SAT		CHECKED BY: DPL	
REV. 09-30-10		REV. 09-30-10	
DESIGN DATE	REV. NO.	SHEET NO	SHEET
11-14-11	6	BE-106-87	C17





NEW WORK

CE TRANSPORTATION-RAIL
TRAIN CONTROL SYSTEMS
N.E. HASKINS
CS1 PROJ. # 00281076 DATE: 11-14-11
DESIGNED BY: SAT CHECKED BY: DPL

8' X 8' HOUSE

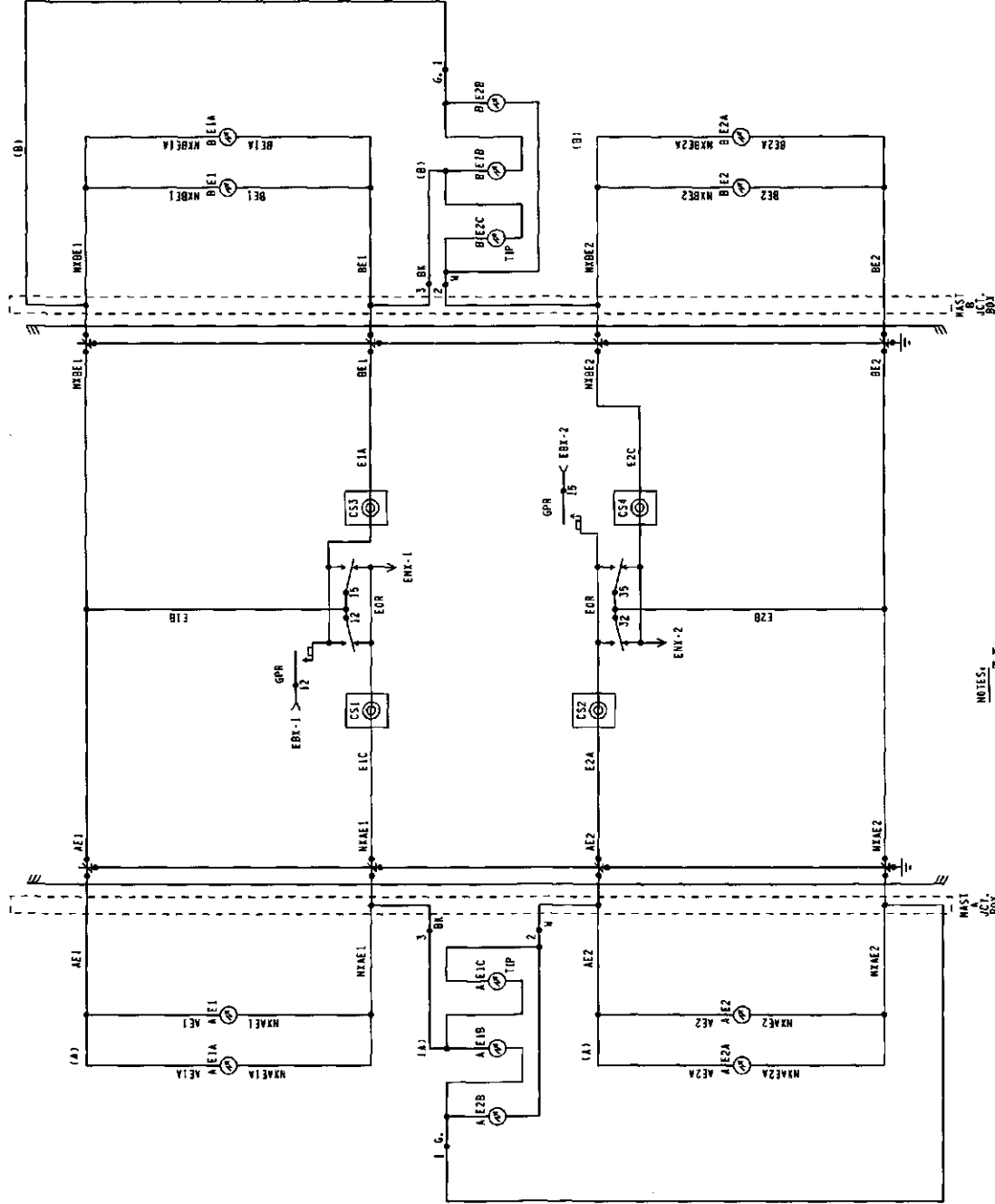
RAIL TRANSPORT GROUP ENGINEERING
COMMUNICATIONS AND SIGNALS

TR-104 (01/11) RD-1 155889C
CROSSING WARNING DEVICE LIGHT CIRCUITRY
N.E. HASKINS, ON N.P. BE-106.07

DESIGNED	DIGITIZED	CHECKED	DATE
GET/SAT	GET/SAT	GET/DPL	11-14-11
DRAWING	SHEET NO	FILE	SHEET
.....	.....	BE10687	C18

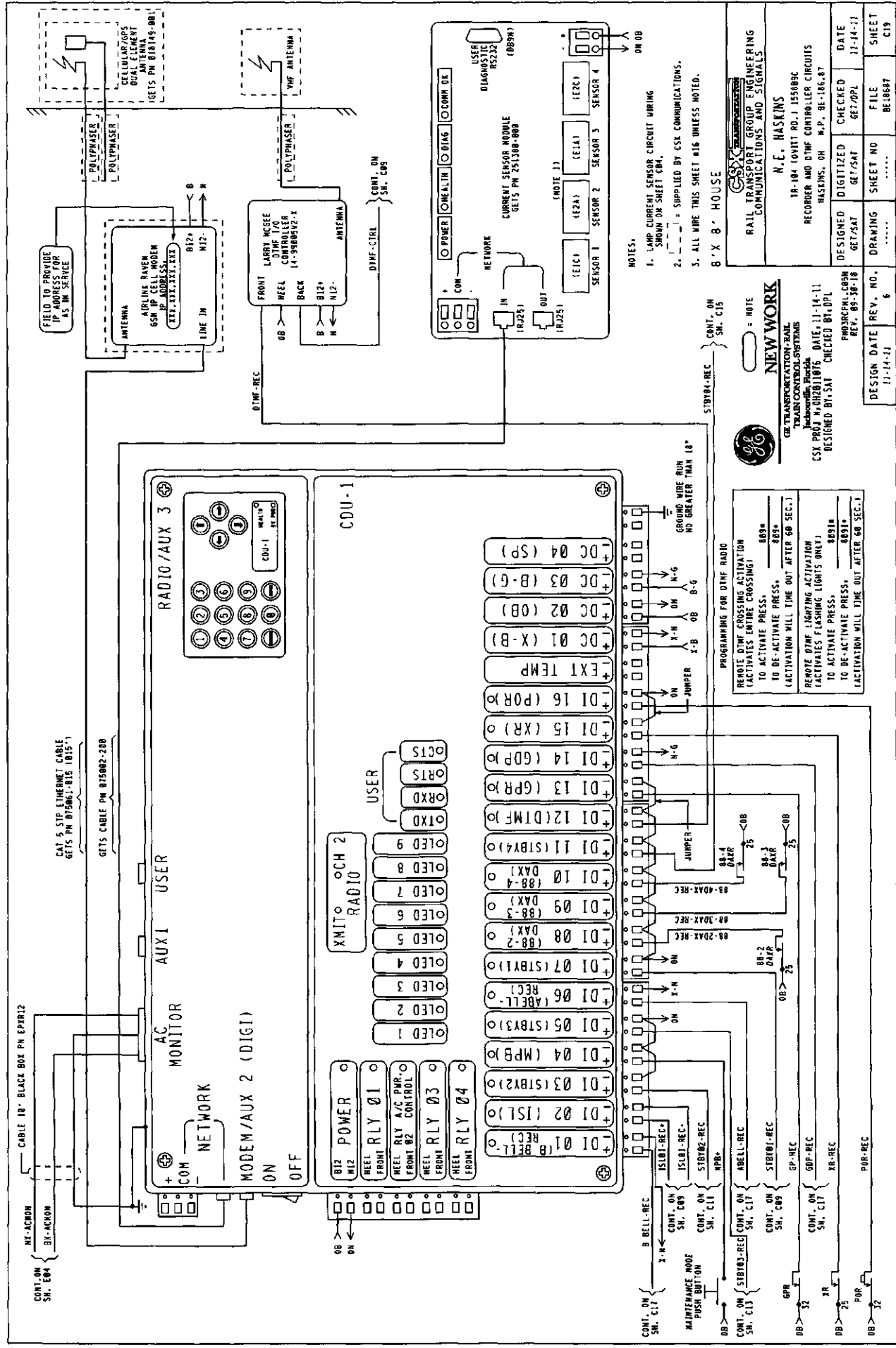
PH030RPHL.C04
REV. 09-30-10

DESIGN DATE	REV. NO.
11-14-11	6



NOTES:

1. 1 = TERMINAL IN JCT. BOX
2. WHEN 7 OR MORE LIGHTS ON A SINGLE STRUCTURE REFER TO SS-382 FOR REQUIRED ARRESTER RATING.



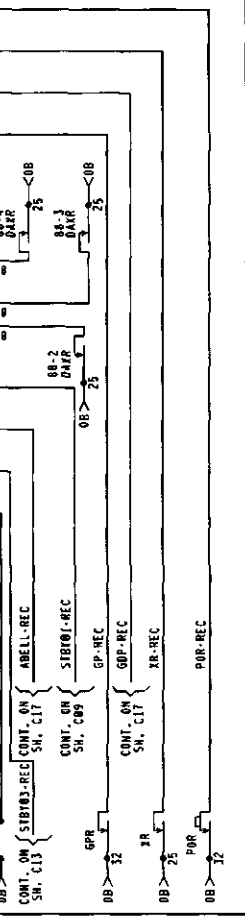
- NOTES:
1. LAMP CURRENT SENSOR CIRCUIT WIRING SHOWN ON SHEET C64.
 2. [Symbol] = SUPPLIED BY CSX COMMUNICATIONS.
 3. ALL WIRE THIS SHEET #16 UNLESS NOTED.

RAIL TRANSPORT GROUP ENGINEERING COMMUNICATIONS AND SIGNALS			
N.E. HASKINS			
1R-104 (01111 RD. 1) 155609C			
RECORDING AND DTMF CONTROLLER CIRCUITS			
HASKINS, OH M.P. BE-186-87			
DESIGNED	DIGITIZED	CHECKED	DATE
GET/SAT	GET/SAT	GET/OPL	11-14-11
DRAWING	SHEET NO	FILE	SHEET
.....	.....	BE18687	C19

NEW WORK

GE TRANSPORTATION-RAIL
TRAIN CONTROL SYSTEMS
Indianapolis, Florida
CSX PROJ W-002810176 DATE: 11-14-11
DESIGNED BY: SAT CHECKED BY: DPL
PH030PM1-C03H
REV. 09-30-10

PROGRAMMING FOR DTMF RADIO	
REMOTE DTMF CROSSING ACTIVATION (ACTIVATES ENTIRE CROSSING)	889*
TO ACTIVATE PRESS.	889*
TO DE-ACTIVATE PRESS.	889*
(ACTIVATION WILL TIME OUT AFTER 60 SEC.)	
REMOTE DTMF LIGHTING ACTIVATION (ACTIVATES FLASHING LIGHTS ONLY)	8891*
TO ACTIVATE PRESS.	8891*
TO DE-ACTIVATE PRESS.	8891*
(ACTIVATION WILL TIME OUT AFTER 60 SEC.)	



		DEFAULTS AND/OR STYLE		FIELD RECORD	
EVENT ANALYZER EXECUTIVE PROGRAM		VERSION 2.7, COMPILED ON NOV. 11, 2003		VERSION _____ (FIELD TO ENTER)	
CSAT USER PROGRAM (IF LOADED)		VERSION 1.0, COMPILED ON 12-31-83 (TM-90-11)		VERSION _____ (FIELD TO ENTER)	
SYSTEM SETTINGS					
DATE & TIME (ENABLE DAYLIGHT SAVINGS TIME = Y (YES))		NM-00-11 23:01:55		n/a	
FILE POST		X12-789.01		BE-186.00	
SITE NAME		MAIN ST. (SR-17, US-1)		TR-104 (VOLT RD. 1)	
DOT NUMBER		123456A		155089C	

BATTERY INPUTS		DC B1		DC B2		DC B3		DC B4	
CHANNEL 1		X-B BULB BATTERY		00 ELECTRONIC BATTERY		B-G GATE BATTERY		SPARE	
BATTERY CHANNEL NAMES		X-B		00		B-G		SP	
BATTERY CHANNEL I.D.		500 ms		500 ms		500 ms		10,000 ms	
SAMPLE PERIOD		500 ms		500 ms		500 ms		10,000 ms	
RESOLUTION		00.2 V		00.2 V		01.0 V		02.0 V	

DIGITAL INPUTS		DI B1		DI B2		DI B3		DI B4		DI B5	
CHANNEL 1		BELL REC		ISLAND TRACK 1		STANDBY 1		MAINTENANCE PB		STANDBY 5	
NAME		BELL-REC		ISL		STBY1		MPO		STBY5	
ID		BELL-RINGING		ISL 1 UP		STANDBY UNIT		MAINTENANCE PB HI		STANDBY UNIT	
ON NAME		BELL NOT RINGING		ISL 1 DN		PRIMARY UNIT		MAINTENANCE PB LOW		PRIMARY UNIT	
ON DEBOUNCE TIME		100 ms		100 ms		100 ms		100 ms		100 ms	
OFF DEBOUNCE TIME		100 ms		100 ms		100 ms		100 ms		100 ms	
TOGGLE PERIOD		500 ms		500 ms		500 ms		500 ms		500 ms	

DIGITAL INPUTS		DI B6		DI B7		DI B8		DI B9		DI B10	
CHANNEL 1		ABELL REC		STANDBY 1		STBY 1		80-204Z		80-204Z	
NAME		ABELL-REC		STBY 1		DAX 1		DAX 2		DAX 3	
ID		BELL RINGING		STANDBY UNIT		DAX UP		DAX UP		DAX UP	
ON NAME		BELL NOT RINGING		PRIMARY UNIT		DAX DN		DAX DN		DAX DN	
ON DEBOUNCE TIME		100 ms		100 ms		1000 ms		1000 ms		1000 ms	
OFF DEBOUNCE TIME		100 ms		100 ms		1000 ms		1000 ms		1000 ms	
TOGGLE PERIOD		500 ms		500 ms		500 ms		500 ms		500 ms	

DIGITAL INPUTS		DI 11		DI 12		DI 13		DI 14		DI 15		DI 16	
CHANNEL 1		STANDBY 4		DTR TEST		GATE VERTICAL		GATE HORIZONTAL		BR		AC POWER OFF	
NAME		STBY4		DTRF		GP		GDP		SR		POR	
ID		STANDBY UNIT		DTRF TEST ON		GATE VERTICAL		GATE HORIZONTAL		SR UP		AC POWER ON	
ON NAME		STANDBY UNIT		DTRF TEST OFF		GATE NOT VERTICAL		GATE NOT HORIZONTAL		SR DN		AC POWER OFF	
ON DEBOUNCE TIME		100 ms		100 ms		100 ms		100 ms		100 ms		100 ms	
OFF DEBOUNCE TIME		100 ms		100 ms		100 ms		100 ms		100 ms		100 ms	
TOGGLE PERIOD		500 ms		500 ms		500 ms		500 ms		500 ms		500 ms	

NOTE TO INSPECTOR: AT IN SERVICE OF EVENT ANALYZER OR UPDATE OF ITS INTERNAL EXECUTIVE PROGRAM OR ITS CSAT USER PROGRAM, THE VERSION NUMBER AND COMPLETE DATES OF EACH PROGRAM MUST BE INSERTED IN THE BLANK FIELDS.

EVENT ANALYZER ETHERNET PORT SETUP	
ETHERNET DIAGNOSTIC PORT (TOP)	192.168.13.2
ETHERNET REMOTE PORT (BOTTOM)	192.168.13.1

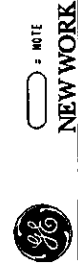
MODULE: DIGITAL 4 QUAD CURRENT SENSOR SERIAL NUMBER: 1 (BLANK UNTIL A15 RECEIVED)	
RESOLUTION (LAPS RMS): 100.21 ARMS	
AUTOMATICALLY ALLOCATED DIGITAL INPUT	
DIGITAL 4 QUAD CURRENT SENSOR	
NAME	1
ID	ETC
TO	ETC
LIT BULB COUNT ON EACH CIRCUIT	4
CURRENT READING IN AMPS AT APPROXIMATE 10.8 VOLTS BULB VOLTAGE	2.6
	2.6
	2.6
	2.6

CHANNEL 1		RELAY OUTPUT B1		RELAY OUTPUT B2		RELAY OUTPUT B3		RELAY OUTPUT B4	
NAME		R101		R102		R103		R104	
ID		ON		ON		ON		ON	
ON NAME		OFF		OFF		OFF		OFF	
PULSE DURATION		1000 ms		1000 ms		1000 ms		1000 ms	

PORT		USER		MODE/ANX 1		MODE/ANX 2	
BAUD RATE		38400		9600		9600	
PARITY		N		N		N	
DATA BITS		8		8		8	
STOP BITS		1		1		1	
FLOW CONTROL		NONE		NONE		NONE	

XII * DATA TO BE INSERTED BY DESIGN CONTRACTOR

8' X 8' HOUSE



RAIL TRANSPORTATION GROUP, ENGINEERING COMMUNICATIONS AND SIGNALS

N.E. HASKINS

TR-104 (VOLT RD. 1) 155089C

RECORDED PROGRAM

HASKINS, OR W.P. BE-186.87

CSAT PROGRAM: 00231070 DATE: 11-14-11

DESIGNED BY: SA1 CHECKED BY: DPL

PH03RPHL:006 REV. 01-00-10

DESIGNED DIGITIZED CHECKED DATE

GET/SAT GET/SAT GET/SAT 11-14-11

SHEET NO. DRAWING SHEET NO. FILE SHEET

11-14-11 11-14-11 11-14-11 11-14-11

BE10687 BE10687 BE10687 BE10687

C20 C20 C20 C20