Public Utilities
Commission of Ohio

Memo

To: Docketing Division

From: Jill Henry, Rail Specialist, Rail Division

Cc: PUCO Legal Department

Date: 8/22/18

Re: PUCO Case No. 18-1310-RR-FED- In the Matter of a Request for the Installation of New Active Warning Devices at the Norfolk Southern Railway Crossing, CR 5 DOT# 472-496M, in Putnam County, Ohio.

On February 27, 2018, the Ohio Rail Development Commission (ORDC) authorized funding for Norfolk Southern Railway to install active warning devices at CR 5 DOT#472-496M, in Putnam County, Ohio. The crossing was surveyed, on August 10, 2017, and found to warrant the upgrades. The electric utility provider for this crossing is the Hancock Wood Electric Cooperative.

The project will be paid for with federal funds and is actual cost. The plans and estimates for the project in the amount of $428,281.00 have been approved. Construction may commence at once. **Staff requests a Finding & Order with completion of the project in twelve months.** Staff requests that the following language be incorporated in the Finding & Order:

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.**

Please serve the following parties of record:

Norfolk Southern Railway Company
Kurt Young
Public Projects Engineer
1200 Peachtree Street NE
Box 123
Atlanta, GA 30309-3597

Norfolk Southern Railway Company
Cayela Wimberly
Director Grade Crossing Safety
1200 Peachtree Street NE
Atlanta, GA 30309-3597

Eastman & Smith LTD.
Mr. Casey Talbott
Attorney for Norfolk Southern
One SeaGate 24th Floor
P.O. Box 10032
Toledo, Ohio 43699-0032

Ohio Rail Development Commission
Cathy Stout
Safety Manager
1980 West Broad Street
Mail Stop #3140
Columbus, Ohio 43223

Putnam County Engineer
Michael L. Lenhart
245 E. Main Street, Suite 205
Ottawa, OH 45875

Hancock Wood Electric Cooperative
1399 Business Park Drive South
P.O. Box 190
North Baltimore, OH 45872-1090

OHIO RAIL DEVELOPMENT COMMISSION
INTER-OFFICE COMMUNICATION

TO: **Randall Schumacher, Supervisor, Rail Division, PUCO**

FROM: **Cathy Stout, Manager, Safety Section, ORDC**

BY: **Don Damron, Project Manager**

SUBJECT: **Putnam County, CR 5**
Norfolk Southern
DOT# 472496M
PID# 106851

DATE: **7/5/2018**

The Ohio Rail Development Commission (ORDC) established a Diagnostic Review Team Survey at the subject location on August 10, 2017. The Public Utilities Commission of Ohio (PUCO) attended the review. The Diagnostic Team recommended upgrades to the automatic warning devices. Copies of the diagnostic review form and the plan and estimate are attached.

PE has already been provided by the railroad. ORDC accepts the site plans and estimates as provided. Please issue a 12-month construction-only order for the project outlined above. 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: Jill Henry, Rail Specialist, PUCO
ORDC Project Manager (file)

OHIO RAIL DEVELOPMENT COMMISSION
Mail Stop #3140, 1980 West Broad Street, Columbus OH 43223
John R. Kasich, Governor • Mark Policinski, ORDC Chairman

July 5, 2018

Mr. Stephen Klinger
Norfolk Southern Corporation
Administrator Grade Crossing Program
1200 Peachtree St. NE, Box 123
Atlanta, GA 30309

RE: Construction Authorization for Grade Crossing Warning Device Modifications
CR 5 in Putnam County
DOT# 472496M; PID# 106851

Dear Mr. Klinger:

The plan and estimate dated June 12, 2018, for the referenced project is acceptable. Please note that the railroad must provide ORDC with a plan stamped by a professional engineer licensed in the State of Ohio prior to acceptance and close out of the project. Norfolk Southern may proceed with the construction of the proposed grade crossing warning system modifications in accordance with the abbreviated plan. This authorization is made with the stipulation and understanding that the 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. Reimbursement of eligible actual cost is limited to $428,281.00. Additional costs must be approved in writing by the Ohio Rail Development Commission (ORDC) prior to being incurred. Emergency verbal authorizations by ORDC may be permitted and will be confirmed by ORDC in writing within ten (10) business days of the verbal approval.

This authorization is contingent upon Norfolk Southern Corporation accepting the following instructions:

1. The NS project foreman will furnish written notification five (5) working days prior to the date work will start at the project site to Don Damron, ORDC, at don.damron@dot.ohio.gov, cell 614-917-8466, office 614-466-2509, or mail to 1980 West Broad Street, 2nd Floor, Columbus Ohio 43223; and to the Public Utilities Commission of Ohio at Jill.Henry@puco.ohio.gov (phone 614-466-0435). The NS project foreman will also notify the same of any stops and re-starts of the work activity and of the date work was completed for the project.

2. NS will arrange for utilities to be located at the project site by the Ohio Utilities Protection Service (OUPS) prior to any construction activities at the site. Utilities that are not participating members of the service must be contacted directly by NS.

3. The NS project foremen will notify Don Damron at 614-917-8466 (cell) or don.damron@dot.state.oh.us (email) of any changes in the scope of work, cost overruns, material changes, etc. which are not included in the approved plan and estimate and secure approval of same before the work is performed.

4. Open cut of roadways is not permitted except in unusual circumstances and must be coordinated with the local highway authority and preapproved by ORDC.

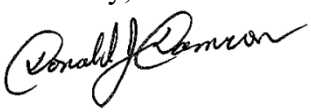
5. Norfolk Southern will furnish two (2) copies of each partial bill to ORDC. Please find the enclosed ODOT Purchase Order to reference when billing.

6. Norfolk Southern will furnish two (2) copies of the final all-inclusive bill to ORDC stating the exact dates of starting and completing work, the initial and final dates of construction and location where the accounts may be audited.

7. The installation of the new warning device system will include any ancillary work needed to make the warning devices function as designed and to satisfy MUTCD requirements.

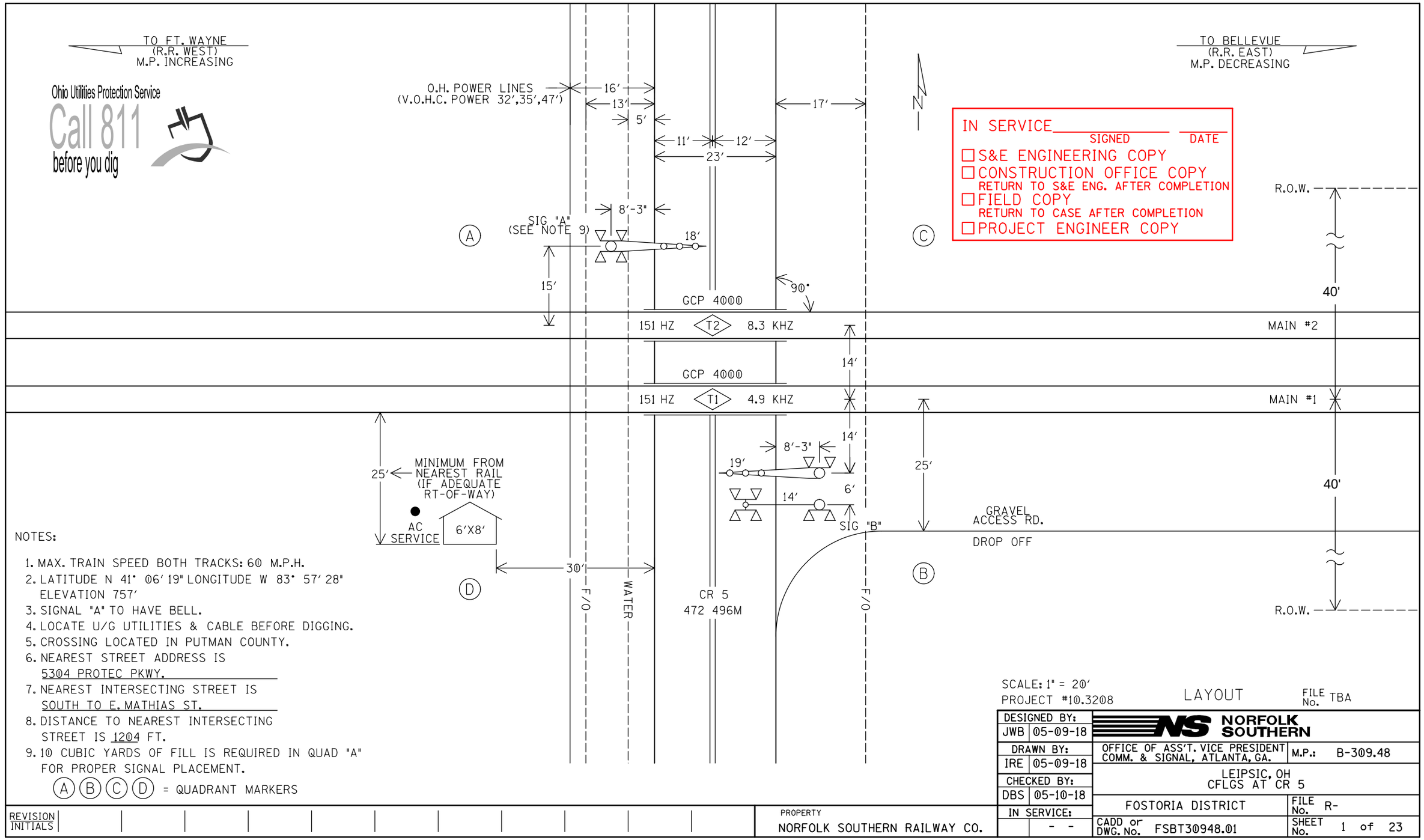
Thank you for your assistance with these matters.

Sincerely,



Donald J. Damron
Project Manager

C: Randall Schumacher, Chief, Rail Division, PUCO
Jill Henry, Rail Specialist, PUCO
ORDC (file)



NOTES:

1. MAX. TRAIN SPEED BOTH TRACKS: 60 M.P.H.
2. LATITUDE N 41° 06' 19" LONGITUDE W 83° 57' 28" ELEVATION 757'
3. SIGNAL "A" TO HAVE BELL.
4. LOCATE U/G UTILITIES & CABLE BEFORE DIGGING.
5. CROSSING LOCATED IN PUTMAN COUNTY.
6. NEAREST STREET ADDRESS IS 5304 PROTEC PKWY.
7. NEAREST INTERSECTING STREET IS SOUTH TO E. MATHIAS ST.
8. DISTANCE TO NEAREST INTERSECTING STREET IS 1204 FT.
9. 10 CUBIC YARDS OF FILL IS REQUIRED IN QUAD "A" FOR PROPER SIGNAL PLACEMENT.

(A) (B) (C) (D) = QUADRANT MARKERS

SCALE: 1" = 20'
PROJECT #10.3208

LAYOUT

FILE No. TBA

DESIGNED BY:	
JWB	05-09-18
DRAWN BY:	
IRE	05-09-18
CHECKED BY:	
DBS	05-10-18
IN SERVICE:	
	- -

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.48

LEIPSIC, OH
CFLGS AT CR 5

FOSTORIA DISTRICT

FILE No. R-

CADD or DWG. No. FSBT30948.01

SHEET No. 1 of 23

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

12-Jun-18

Round Figure Estimate for Grade Crossing Warning Devices

City/State: LEIPSIC, OH
Road: CR 5
MilePost: B-309.48
DOT/AAR: 472496M
State Proj. No.: PID 106851
County: PUTMAN
S&E Proj. No.: 10.3208
File Number: 061-10.0232
Man Days: 228

*****Purchases - Others*****		
Meals and Lodging:	$31,187.12	
Rental of Equipment:	$42,632.67	
(2 Trucks, 1 Backhoe w/ Trailer and 1 Pipe-Pusher for 38 Days)		
Construction Supervision Vehicle:	$6,521.37	
Purchases - Other Total:		$80,341.16
*****Material And Additives*****		
Material Cost:	$142,238.00	
Sales and Use Tax:	$11,379.00	
Material Handling Freight:	$14,223.82	
Material Total:		$167,840.82
*****Labor And Additives*****		
Labor Cost:	$73,416.00	
(6 man crew at $1,932.00 a day for: 38 days)		
Payroll Tax & Overheads:	$62,594.48	
Preliminary Engineering:	$22,643.70	
Construction Supervision:	$21,444.81	
Labor Total:		$180,098.99
	Project Cost:	$428,280.97
	Scrap / Salvage Credit:	$0.00
	Project Total:	**$428,281.00**

Estimated on: 12-Jun-18
Estimated by: ndney

Estimate valid for 1 year from date of estimate

Norfolk Southern Railway

Highway Crossing Signalization Program - Material List

Do not substitute items without permission from S & E Engineering

City:	LEIPSIC
Road:	CR 5
Mile Post:	B-309.48
Drawing Number:	FSBT30948
State ProjectNumber:	PID 106851
County:	PUTMAN
A A R Number:	472496M
Project Number:	10.3208
File Number:	061-10.0232
New File Number:	
WBS:	F-05074
Store Number:	
Supervisor:	UNKNOWN
Tax Code:	

Vendor to supply the following copies after pricing:

1 Set - Material Management with original Invoice
2 Sets - with plans shipped in car with material
1 Set - S&EGen. Supt. Construction w/copy of invoice

Location: LEIPSIC OH S&E Proj. No.: 10.3208 AFE No.: F-05074 Drawing No.: FSBT30948

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Interrail Engineering, INC

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
3	670-360693-4	EA	$5.55	$16.65	AAR/DOT NUMBER PLATE/DECAL, ORDER 3 PER PROJECT. 60 DAY LEAD TIME. SUPPLIED BY S'TRAN.						
1	165-006505-4	EA	$1,075.23	$1,075.23	AC SERVICE, COMPLETE LESS METER BASE, ASSEMBLED ON 30' POLE						
4	670-119241-4	EA	$25.01	$100.04	ARRESTOR, LIGHTNING HEAVY DUTY CLEAR VIEW SAFETRAN 022585-1X						
20	105-002620-4	EA	$248.79	$4,975.80	BATTERY, NICAD 340AH, MODEL SPL340						
1	670-503047-4	EA	$183.15	$183.15	BELL, CROSSING ELECTRONIC GENERL SIGNAL, EB-3-360-5 CR 02-044350						
2	670-980689-4	EA	$75.48	$150.96	BRACKET HIGH WIND, (RIGID 3'), WIG- 191036, WALRUS TUSK TYPE						
2	670-561375-4	EA	$1,197.90	$2,395.80	BRACKET, GATE SAVER, NEG385102GS, SPRING LOADED SWING AWAY ADAPTER FOR FIBERGLASS/ALUMINUM GATES, USE WITH GATE 38' AND LESS						
1	670-356949-4	EA	$94.05	$94.05	CABLE, 10' GENERATOR HOOK UP, SERRMI P/N 40524. FEMALE CONNECTOR						
500	465-939422-4	LF	$2.92	$1,460.00	CABLE, UG 12 CONDUCTOR NO 14 AWG SOLID EACH CONDUCTOR WITH 5/64 IN INSULATION 10 MIL						
600	465-292862-4	LF	$1.49	$894.00	CABLE, UG 2-6 TWISTED, S-23 OKONITE 113-12-3933 SOLID TINNED CONDUCTOR						
500	465-292929-4	LF	$4.12	$2,060.00	CABLE, UG 5 COND. NO. 6 AWG SOLID COPPER CABLE TO MEET NS CORP. SPEC. FOR SIGNAL						
2200	465-954727-4	LF	$1.83	$4,026.00	CABLE, UG 7 CONDUCTOR NO 14 AWG SOLID EACH CONDUCTOR WITH 5/64 IN INSULATION 10 MIL FLAT						
2400	465-791835-4	FT	$3.54	$8,496.00	CABLE, UG AC ENTRANCE 3C#6-7X OKONITE FMPF-L 094-078 TR W/G 1 X 8 7X W010 BRZ TAPE 600V PRODUCT CODE 206-11-6070						
1	670-692686-4	EA	$2,562.44	$2,562.44	CANTILEVER, WT/F ARM 14' W/WALKWAY KIT SAFTRAN #071294-14NS1						
1	670-010671-4	EA	$738.15	$738.15	CHARGER, BATTERY CRAGG MODEL 40 DTC-12V, 40 AMP, P/N 520940						
1	670-010672-4	EA	$960.15	$960.15	CHARGER, BATTERY CRAGG MODEL 60 DTC-12V, 60 AMP, P/N 520960						

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

Location: LEIPSIC OH S&E Proj. No.: 10.3208 AFE No.: F-05074 Drawing No.: FSBT30948

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Interrail Engineering, INC

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
4	670-664917-4	EA	$87.64	$350.56	CONNECTOR KIT, WELDED FAR RAIL, CONSISTING OF RUBBER HOSE PROPERLY DRILLED, BONDSTRAND, 1 SPLICING SLEEVE, 1 REDUCING SLEEVE, 3 CLAMPS, 1 TRACK CLIP, 1 WEB WELDED TRACK CONNECTOR, 1 WELD METAL, SAFETRAN 111359-2X						
4	670-632520-4	EA	$79.69	$318.76	CONNECTOR KIT, WELDED NEAR RAIL, CONSISTING OF, RUBBER HOSE PROPERLY DRILLED, BONDSTRAND, SPLICING SLEEVE, 1 REDUCING SLEEVE, 5 CLAMPS, 1 TRACK CLIP, 1 WEB WELDED TRACK CONNECTOR, 1 WELD METAL, SAFETRAN 111359-1X						
2	670-793404-4	EA	$1,159.00	$2,318.00	COUNTERWEIGHT PKAGE, 17-24'GATE S'TRAN S- MECH ONLY, STAINLESS, TO INCLUDE HUB, SUPPORT ARMS						
6	670-760012-4	EA	$44.32	$265.92	COVER, FOR 1 WAY FLASHING LIGHT ASSY. 18 OZ. BLACK VINYL COATED NYLON. ====TO COVER 2 LAMPS====						
1	670-986650-4	EA	$370.21	$370.21	DISPOSAL, CONSTRUCTION DEBRIS AND CLEANING X'ING EQUIPMENT CONTAINER						
1	670-000004-4	EA	$700.00	$700.00	FCC LICENSE FOR MONITOR/RADIO						
12	670-000003-4	EA	$255.85	$3,070.20	FILL/STONE #57, QUANITY IS BASED ON TRUCK LOAD PLUS DELIVERY COST						
1	670-744631-4	EA	$3,154.39	$3,154.39	FOUNDATION, CFLS FOR SAFETRAN MODEL "WT/F" ARMS 12' TO 30' SINGLE MAST, DIXIE# DP4B-SM12-26-4, 5'10" CR 02-205902						
2	670-015231-4	EA	$599.40	$1,198.80	FOUNDATION, DIXIE,S-2 GATE 2'6"X2'6"X5'6" ASSEMBLED						
2	670-005377-4	EA	$338.00	$676.00	GATE ARM, ALUMINUM, 17-24 FT, ARM ASSEMBLY, INCLUDES GATE GUARD FOR GATE LIGHT CABLE. HIGH INTENSITY VERTICAL STRIPES.						
1	670-698491-4	EA	$35,113.24	$35,113.24	GCP4000 - 2 TRK (2TC) - REDUNDANT - 40/60 AMP WIRED RACK EQUIP. FOR 6X8 XING SHELTER, (INCL. 2 TRK CHASSIS A80465, 4 TRK MODS. A80418, 2-SSCC A80405, 2 CPU A80403, 1 SEAR A80410, 1 DISPLAY A80407, 1 TRANS MOD. A80468, 1-40 & 1-60 AMP CHARGER) IPN: 003131-						
1	670-245212-4	EA	$10,865.86	$10,865.86	GCP4000 - 2 TRK (5TC) - NON-REDUNDANT (INCL. 5 TRK CHASSIS A80440, 2 TRK MODS. A80418, 0 SSCC, 1 CPU A80403, NO SEAR, 1 DISPLAY A80407)						
1	670-477991-4	EA	$410.00	$410.00	KIT, GROUNDING ASSY FOR AL I/S INCLUDES 8 GRD RDS,200'#4WIRE,12 4 WIRE ONE-SHOTS. ERICO SBK206						

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Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Interrail Engineering, INC

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
1	670-123298-4	EA	$345.97	$345.97	KIT, HARDWARE SUPPLIES REQUIRED X'ING P'CKAGES. WEB CONNECTORS FOR SHUNT(8EA) TAPE, AMPS,P'GUM PAINT,SLEEVES,TAGS,GLUE, 100 EA WHITE TAGS,)NE CAN BLUE MARKING PAINT ETC…						
2	670-092155-4	EA	$160.00	$320.00	LAMP ASSY, LED GATE ARM KIT (INCLUDES 3 LAMPS COMPLETE WITH CABLES AND MTG. HARDWARE) REC #: 9298-1120						
1	670-005054-4	EA	$921.25	$921.25	LAMP ASSY, LED, 12” MAST 1 WAY FRONT LIGHTS (IPN: 042003-L489XNS)						
2	670-005057-4	EA	$952.05	$1,904.10	LAMP ASSY, LED, 4” CANT JURY ARM MAST (FRONT OR BACK) (IPN: 042003-L001534)						
1	670-005066-4	EA	$959.37	$959.37	LAMP ASSY, LED, 5” MAST 1 WAY BACK LIGHTS (IPN: 042003-L001493)						
1	670-005058-4	EA	$1,786.08	$1,786.08	LAMP ASSY, LED, 5” MAST BACK TO BACK LIGHTS (IPN: 042003-L487XNS)						
4	670-440826-4	EA	$2.22	$8.88	LINK, SAFETRAN 024620-1X INSL TESTING COMP 1 IN CENTER SIGNAL CIRCUITS CR 02-286662						
5	255-590880-4	EA	$16.72	$83.60	LOCK, AMERICAN LOCK MODEL H-10KA KEYED ALIKE TO PRIVATE KEYWAY D456 AND STAMPED "NS SIG"						
1	670-179911-4	EA	$4,436.00	$4,436.00	MAST, 12” CANTILEVER, FOR 12’-20’ WT/F ARMS, INCL. LADDER KIT (IPN: 071271-20NS)						
2	670-637778-4	EA	$1,325.00	$2,650.00	MAST, 5" ALUMINUM 13'10" WITH DOUBLE JCT. BOX BASE. S'TRAN P# 070519-11AX.						
2	670-521147-4	EA	$3,715.27	$7,430.54	MECHANISM, GATE MODEL S-40, WITH CONTACT HEATER, COMPLETE W/RELAY S'TRAN # 074000-W00090						
2	000-000000-4	EA	$7,000.00	$14,000.00	MISC. EXPENSE, UNDERGROUND BORING						
2	670-001355-4	EA	$74.00	$148.00	PACKAGE, HARDWARE SIGN 12 IN. (USE WITHWT/F MAST) MOUNTING, SERRMI A1250-8, HARMON @180004/0007,						
2	670-001347-4	EA	$59.67	$119.34	PACKAGE, HARDWARE SIGN 5 IN. MOUNTING, SERRMI A1250-5, HARMON @200965-000, OR						
1	255-646807-4	EA	$32.59	$32.59	PADLOCK, SAFETRAN PART NO. 030399-29X SCREW TYPE FOR CIR CONTROLLER AND BTY. BOX						
1	670-514605-4	EA	$11.11	$11.11	PINNACLE, W-C SECT 1-11, 4"& 5" REF K1 110-8 OR SAFETRAN NO. @035045-503X						

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

Location: LEIPSIC OH S&E Proj. No.: 10.3208 AFE No.: F-05074 Drawing No.: FSBT30948

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Interrail Engineering, INC

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
2	670-259211-4	EA	$47.25	$94.50	PLUG BOARD KIT, TYPE B-1 & VOLTAGE TEST TERMINAL, SAFETRAN 420000-75X						
1	165-902002-4	EA	$303.43	$303.43	PROTECTOR, SURGE 120/240VAC, ERICO P/N EPD120/240TDFL						
6	465-002899-4	EA	$22.24	$133.44	REEL, CABLE DISPOSABLE FOR CROSSING SIGNAL PACKAGES						
2	670-456936-4	EA	$145.69	$291.38	RELAY RACK, SWING, FARADAY SHELTER FOR ONE RELAY, SSFETRAN P/N T15331						
2	670-707995-4	EA	$510.12	$1,020.24	RELAY, TYPE B1, NEV LINE, 900 OHMS,.008 AMPERES GRS A62-308 OR SAFETRAN @400003						
2	435-805560-4	EA	$2.78	$5.56	SAND, 25LB BAG FOR CABLE ENTRANCE INTO THE SHELTER						
1	670-113448-4	EA	$910.23	$910.23	SEARIIi, (VHFC w/ANTENNA) - VHF COMMUNICATOR, SAFETRAN P/N A80276, 1/ PER CROSSING						
1	670-749325-4	EA	$237.18	$237.18	SHELF, FOLDING, FOR LAPTOP USE IN FARADAY 6X8 SHELTER, SAFETRAN 052852-128X						
1	670-755523-4	EA	$9,333.50	$9,333.50	SHELTER, 6'X8' ALUMN FARADAY W/1EA EQUIPMENT RACK, W/CABLE CHUTES BEHIND TERMINAL BOARD, W/GEN RECEPTICAL, BREAKER BOX GFI OUTLET FOR LAPTOP SHELF SAFETRAN 058400-68-85						
6	670-586967-4	EA	$42.98	$257.88	SHUNT COVER W/LAG SCREWS, 19"X19", SERRMI #40271, ORDER 1 PER SHUNT						
4	670-868658-4	EA	$899.80	$3,599.20	SHUNT, MULTI-FREQ. #250849-000 FSS-1A ALSTOM NARROW BAND (86, 114, 151, 210, 267)						
2	670-688850-4	EA	$369.89	$739.78	SHUNT, MULTI-FREQ. #62775-3497 SAFETRAN NARROW BAND						
2	670-016346-4	EA	$143.23	$286.46	SIGN, X-BUCK, HI-INTENSIVE REFLECTIVE FRT. & BACK FOR ALL STATES, SAFETRAN# 035200-91X						
1	670-397239-4	EA	$40.23	$40.23	SIGN, CROSSING ENS MALFUNCTION ASSEMBLY FOR 12" MAST, SAFETRAN #T17216						
2	670-330382-4	RL	$18.06	$36.12	TAPE, THOR 3" DURATEC, ORANGE 1000' LENGTHS. "WARNING STOP DIGGING"						
9	670-478560-4	EA	$20.56	$185.04	TERMINAL BLOCK, ERICO 4 POST P/N B2700A2C1WH W/HARDWARE LESS LIGHTNING ARRESTOR						
1	670-007238-4	EA	$118.65	$118.65	UNIT, THE INSTALLATION AND WIRING OF A DEVICE WHICH REQUIRE A MINIMUM OF FOUR WIRE CONNECT-						

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

Location: LEIPSIC OH S&E Proj. No.: 10.3208 AFE No.: F-05074 Drawing No.: FSBT30948

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Interrail Engineering, INC

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
140	165-544477-4	FT	$3.22	$450.80	Z-DNO-CONDUIT, 4"x10' PVC, SCHEDULE 80 BELL CONNECTOR AT ONE END, 1/2 PT. GLUE IN KIT 670-123298-4						
1	670-393331-0	EA	$37.43	$37.43	Z-DNO-SIGN CROSSING MALFUNCTION ASSEMBLY FOR 4" AND 5" MAST						

Total Material: $142,238.24

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

SH. NO.	CONTENTS
NX1	INDEX SHEET
NX2	OUT OF SERVICE (OOS) INSTRUCTIONS
1	LAYOUT
2	PROFILE
3	CABLE PLAN
4	LOAD CENTER
5	B12 & B16 CHARGERS & BATTERIES
6	4000 GCP 2-TK CHASSIS & MODULE LAYOUT
7	4000 GCP PROGRAMMING SETUP
8	4000 GCP PROGRAMMING SETUP
9	CONNECTORS FOR TRACK MODULES
10	CPU MODULE, SEAR IIi & VHF HOOK-UPS
11	SEAR IIi PROGRAMMING SETUP
12	SSCC#1 MODULE HOOK-UP
13	SSCC#2 MODULE HOOK-UP
14	CANTILEVER FLASHER LIGHTS
15	SIGNAL "A" S40 GATE & FLASHER CIRCUITS
16	SIGNAL "B" S40 GATE & FLASHER CIRCUITS
17	BACKBOARD 1A & 1B
18	REAR BACKBOARD 1A & 1B
19	FARADAY SHIELD 1A & 1B
20	FARADAY SHIELD 1C
21	HOUSE SIDE C LAYOUT & RACK PLACEMENT
22	HOUSE SIDE A LAYOUT
23	HOUSE SIDE B LAYOUT & TOP VIEW

IN SERVICE_____ _____
SIGNED DATE

☐ S&E ENGINEERING COPY
☐ CONSTRUCTION OFFICE COPY
RETURN TO S&E ENG. AFTER COMPLETION
☐ FIELD COPY
RETURN TO CASE AFTER COMPLETION
☐ PROJECT ENGINEER COPY

INDEX SHEET

DESIGNED BY:		NORFOLK SOUTHERN	
JWB	05-09-18		
DRAWN BY:		OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: B-309.48
IRE	05-09-18		
CHECKED BY:		LEIPSIC, OH CFLGS AT CR 5	
DBS	05-10-18		
IN SERVICE:		FOSTORIA DISTRICT	FILE No. R-
	- -	CADD or DWG. No. FSBT30948.NX1	SHEET No. 1 of 2

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

TAKING TRACK(S) OUT OF SERVICE (OOS):

SP-1001 MUST BE COMPLIED WITH

THE OUT OF SERVICE MENU IS ACCESSED ON THE DISPLAY BY TOUCHING THE DESIRED TRACK IN THE TRACK STATUS WINDOW ON THE DISPLAY. SELECT OUT OF SERVICE FROM THE DROP DOWN MENU.

PLACE A JUMPER ACROSS THE OOS TERMINALS SHOWN IN THE PLANS.

SP-1001 MUST BE COMPLIED WITH

SELECT "TAKE GCP OUT OF SERVICE."

ONCE THE GCP APPROACH IS TAKEN OUT OF SERVICE, IF AN ISLAND EXISTS, THE OPTION TO "TAKE ISL OUT OF SERVICE" IS PRESENTED. IF THE ISLAND IS LEFT IN SERVICE, THE CROSSING WILL ACTIVATE IF THE ISLAND IS OCCUPIED.

IF DESIRED, SELECT "TAKE ISL OUT OF SERVICE."

THE TRACK IS NOW OUT OF SERVICE. WHEN THE OUT OF SERVICE SCREEN IS CLOSED, THE DISPLAY RETURNS TO THE TRACK STATUS SCREEN. NOTE THAT THE OUT OF SERVICE TRACK IS ALTERNATELY FLASHING DARK GRAY AND LIGHT BLUE.

REPEAT FOR ADDITIONAL TRACKS IF NEEDED.

PUTTING TRACK(S) BACK IN SERVICE:

SP-1001 MUST BE COMPLIED WITH

REMOVE THE JUMPER ACROSS THE OOS TERMINALS SHOWN IN THE PLANS.

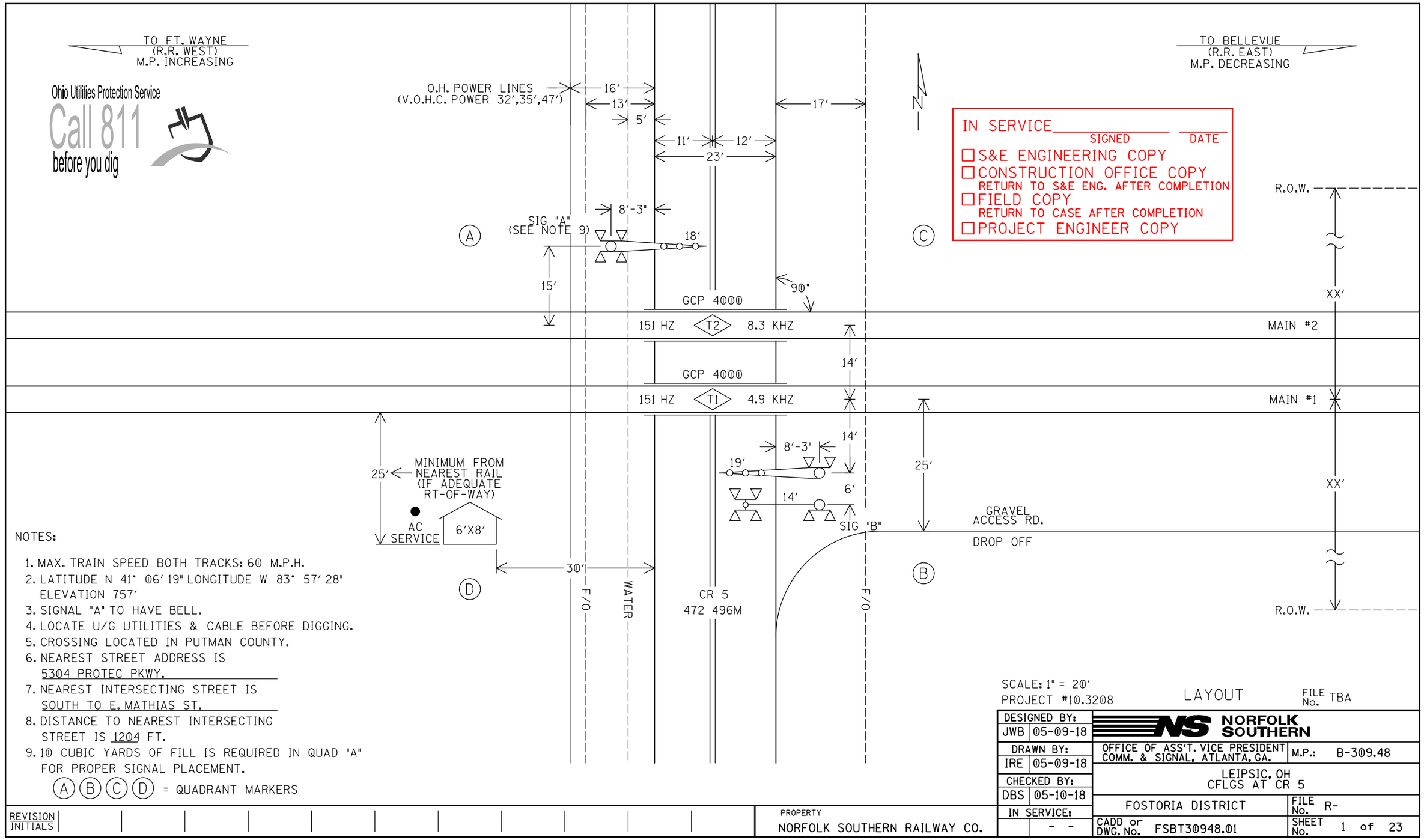
SP-1001 MUST BE COMPLIED WITH

OUT OF SERVICE (OOS) INSTRUCTIONS

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN		
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5		
IN SERVICE: - -	FOSTORIA DISTRICT	FILE No.	R-
	CADD or DWG. No. FSBT30948.NX2	SHEET No.	2 of 2

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



NOTES:

1. MAX. TRAIN SPEED BOTH TRACKS: 60 M.P.H.
2. LATITUDE N 41° 06' 19" LONGITUDE W 83° 57' 28" ELEVATION 757'
3. SIGNAL "A" TO HAVE BELL.
4. LOCATE U/G UTILITIES & CABLE BEFORE DIGGING.
5. CROSSING LOCATED IN PUTMAN COUNTY.
6. NEAREST STREET ADDRESS IS 5304 PROTEC PKWY.
7. NEAREST INTERSECTING STREET IS SOUTH TO E. MATHIAS ST.
8. DISTANCE TO NEAREST INTERSECTING STREET IS 1204 FT.
9. 10 CUBIC YARDS OF FILL IS REQUIRED IN QUAD "A" FOR PROPER SIGNAL PLACEMENT.

(A) (B) (C) (D) = QUADRANT MARKERS

SCALE: 1" = 20'
PROJECT #10.3208

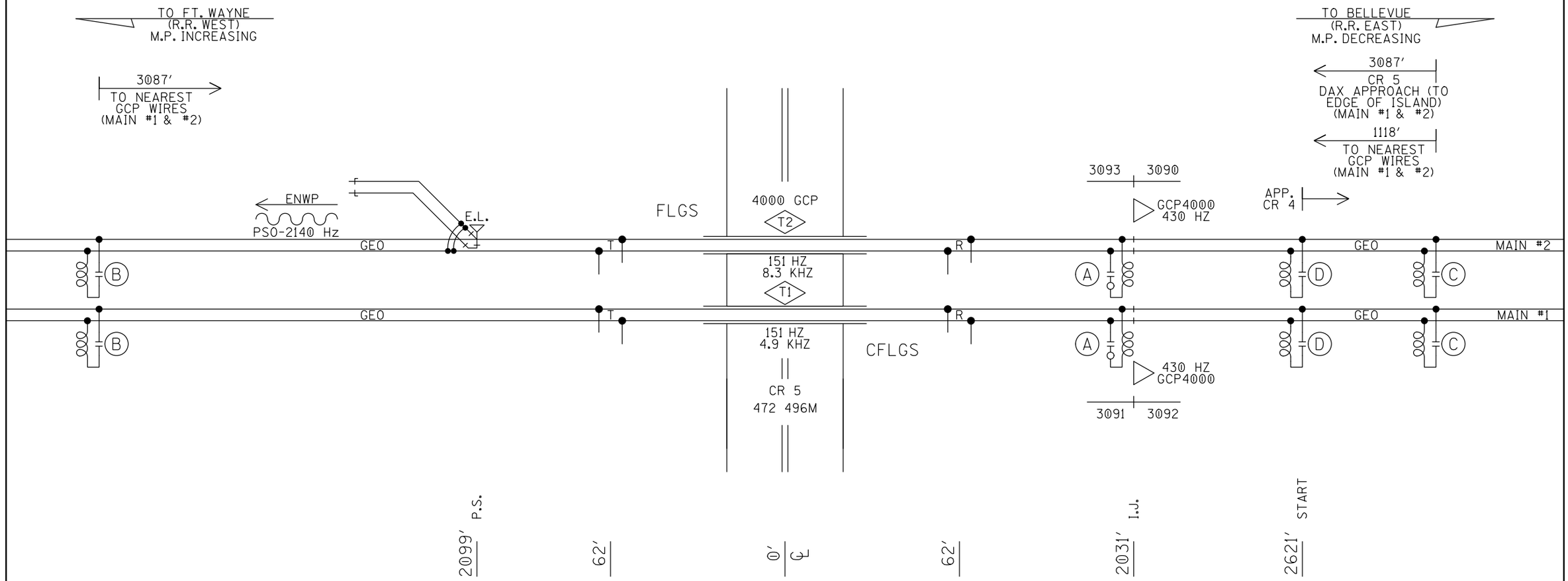
LAYOUT

FILE No. TBA

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.01 — SHEET No. 1 of 23

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



(A)– MF-NBS FSS-1A 250849-000 (151HZ)
W/227032-003 FSS LOAD 1000 FT

(B)– MF-NBS FSS-1A 250849-000 (151HZ)

(C)– MF-NBS 62775-1543 (430HZ)

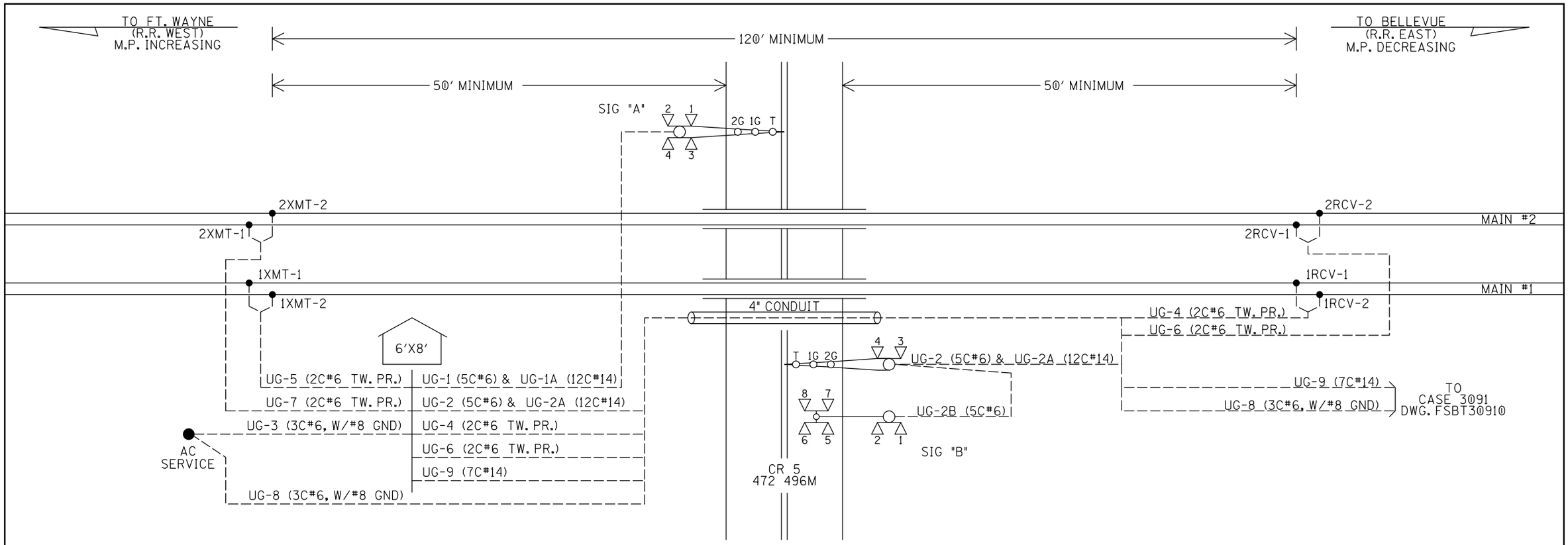
(D)– MF-NBS 62775-1543 (285HZ)

PROFILE

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.02 — SHEET No. 2 of 23

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



UG-1-5CUG #6
AEC
AEZ
AEB
B16-A
N16-A

UG-2-5CUG #6
BEC
BEZ
BEB
B16-B
N16-B

UG-1A-12CUG #14
NAXG
AXG
1AXX
AXX
XGP1
AGD
AGBX120
AGNX120
SPARE
SPARE
SPARE
SPARE

UG-2A-12CUG #14
NBXG
BXG
1BXX
BXX
XGP1
XGP
BGD
BGBX120
BGNX120
SPARE
SPARE
SPARE

UG-2B-5CUG #6
BEC
BEZ
BEB
SPARE
SPARE

UG-3-3CUG #6 W/#8 GND
BX120-A
BX120-B
NX120
GND

UG-4-TW. PR. #6
1RCV-1
1RCV-2

UG-5-TW. PR. #6
1XMT-1
1XMT-2

UG-6-TW. PR. #6
2RCV-1
2RCV-2

UG-7-TW. PR. #6
2XMT-1
2XMT-2

UG-8-3CUG #6 W/#8 GND
BX120-A
BX120-B
NX120
GND

UG-9-7CUG #14
48-1DAXP
N48-1DAXP
48-2DAXP
N48-2DAXP
SPARE
SPARE
SPARE

CABLE PLAN

DESIGNED BY:	
JWB	05-09-18
DRAWN BY:	
IRE	05-09-18
CHECKED BY:	
DBS	05-10-18
IN SERVICE:	
	- -

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48

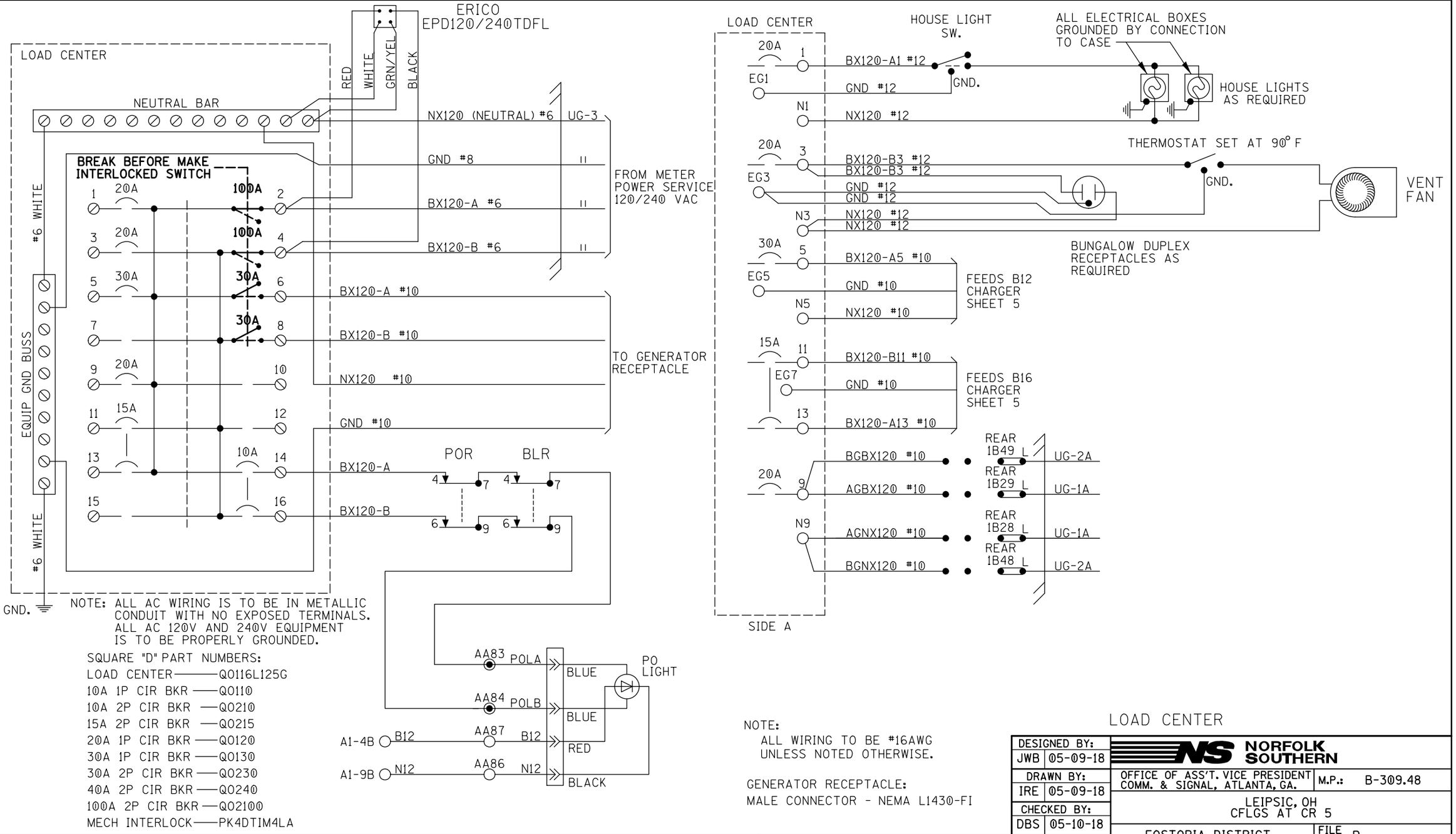
LEIPSIC, OH
CFLGS AT CR 5

FOSTORIA DISTRICT — FILE No. R-

CADD or DWG. No. FSBT30948.03 — SHEET No. 3 of 23

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



LOAD CENTER

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
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	CADD or DWG. No. FSBT30948.04 — SHEET No. 4 of 23

REVISION INITIALS

PROPERTY
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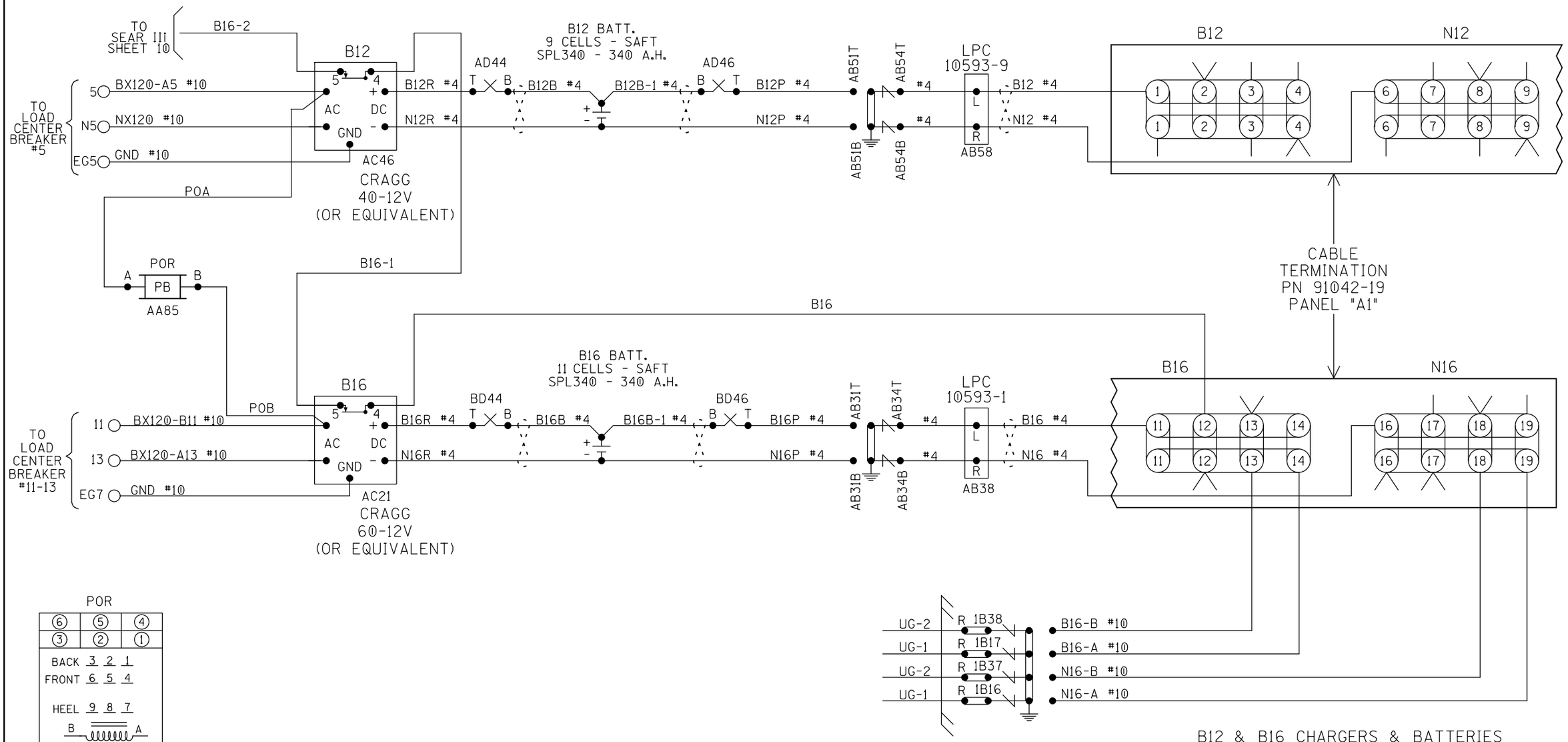


NOTE:
ALL WIRING TO BE #16AWG
UNLESS NOTED OTHERWISE.

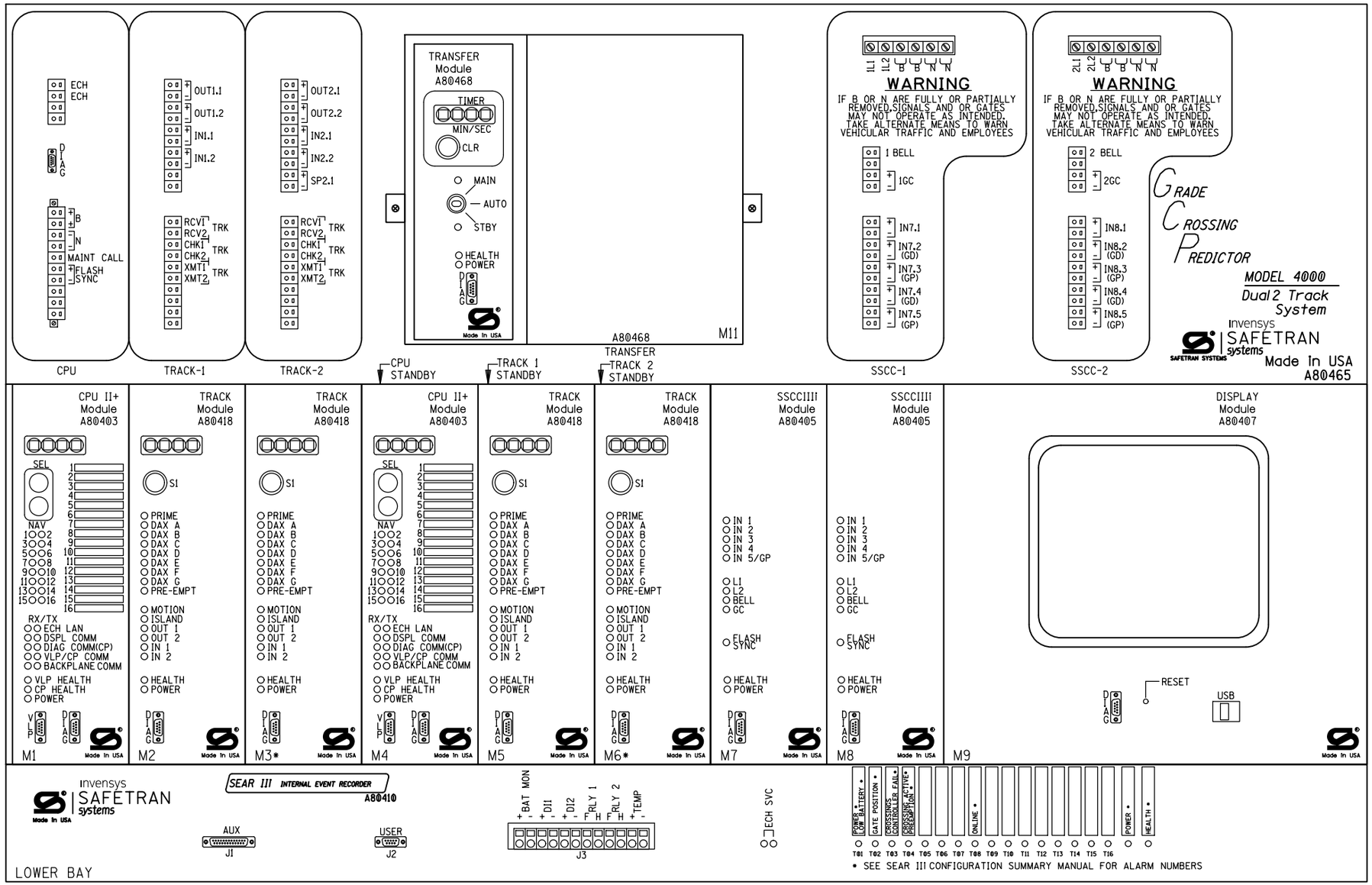
= TWIST

B12 & B16 CHARGERS & BATTERIES

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.05 — SHEET No. 5 of 23

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



WARNING

REMOVAL OF THE SSCCIIII MODULE WILL CAUSE THE GATE(S) TO DROP BUT THE LIGHTS WILL NOT ACTIVATE

CAUTION

ASSURE CORRECT POLARITY OF THE SSCCIIII MODULE OR SEVERE DAMAGE WILL OCCUR.

ATTENTION!

ENSURE THE DISPLAY MODULE HEATER IS DISABLED. LEAVING THE DISPLAY HEATER ENABLED WILL REDUCE THE AMOUNT OF BATTERY STANDBY TIME IN THE EVENT OF AN AC POWER FAILURE.

HEATER FUNCTION IS JUMPER SELECTABLE ON THE DISPLAY MODULE BOARD.
THREE OPTIONS ARE AVAILABLE:
NORMAL LCD HTR (DEFAULT)
HI CURRENT
NO JUMPER (HEATER DISABLED)

* = MAIN AND STANDBY MAY USE RIO IN TRACK 2 SLOTS (M3 AND M6)

4000 GCP 2-TK CHASSIS & MODULE LAYOUT

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
PROPERTY NORFOLK SOUTHERN RAILWAY CO.	CADD or DWG. No. FSBT30948.06 — SHEET No. 6 of 23

REVISION INITIALS

Program Report

Location and SIN

DOT Number: 472496M
Milepost Number: B-309.48
Site Name: CR 5

SIN: 755024019616

MCF and Template Selection

MCF Name: GCP-T6X-02-1.mcf
MCF Revision: 021
MCFCRC: 6076E435

Template = 1A:6 Trk Bi

Check Numbers

Office Check No. (DT 4.6.0): 27A31807
Office Check Number: 27A31807
Config. Check Number: 0B74CB85
(Based on MCF Revision 021)

Program

BASIC: module configuration
Track 1 Slot = Track
Track 2/RIO 1 Slot = Track
Track 3 Slot = Not Used
Track 4 Slot = Not Used
Track 5/RIO 2 Slot = Not Used
Track 6/RIO 3 Slot = Not Used
SSCC-1 Slot = SSCC3i
SSCC-2 Slot = SSCC3i
SEAR Used = Yes

BASIC: MS/GCP operation
Track 1 : MS/GCP Operation = Yes
Track 2 : MS/GCP Operation = Yes

BASIC: island operation
Track 1 : Island Used = Internal
Track 2 : Island Used = Internal

BASIC: preemption
Preempt Logic = No

BASIC: radio Dax links
Radio DAX link A Used = No
Radio DAX link B Used = No

BASIC: Vital Comms links
Vital Comms link 1 Used = No
Vital Comms link 2 Used = No

PREDICTORS: track 1
Track 1 : Prime Used = Yes
Track 1 : Dax A Used = No
Track 1 : Dax B Used = No
Track 1 : Dax C Used = No
Track 1 : Dax D Used = No
Track 1 : Dax E Used = No
Track 1 : Dax F Used = No
Track 1 : Dax G Used = No

PREDICTORS: track 2
Track 2 : Prime Used = Yes
Track 2 : Dax A Used = No
Track 2 : Dax B Used = No
Track 2 : Dax C Used = No
Track 2 : Dax D Used = No
Track 2 : Dax E Used = No
Track 2 : Dax F Used = No
Track 2 : Dax G Used = No

GCP: track 1
Track 1 : GCP Freq Category = Other
Track 1 : GCP Frequency = 151 Hz
Track 1 : Approach Distance = 3087 ft
Track 1 : Uni/Bi/Sim-Bidirnl = Bidirnl
Track 1 : GCP Transmit Level = High
Track 1 : Island Connection = Isl1
Track 1 : Island Distance = 124 ft
Track 1 : Computed Distance = 9999 ft
Track 1 : Linearization Steps = 100

GCP: track 1 enhanced det
Track 1 : Inbound PS Sensitivity = Off
Track 1 : Speed Limiting Used = Yes
Track 1 : Outbound False Act Lvl = Normal
Track 1 : Outbound PS Timer = 20 sec
Track 1 : Trailing Switch Logic = On
Track 1 : Post Joint Detn Time = 15 sec
Track 1 : Adv Appr Predn = No
Track 1 : Cancel Pickup Delay = This Isl

GCP: track 1 prime
Track 1 : Prime Warning Time = 30 sec
Track 1 : Prime Offset Distance = 0 ft
Track 1 : Switch MS EZ Level = 10
Track 1 : Prime MS/GCP Mode = Pred
Track 1 : Prime Pickup Delay = 15 sec
Track 1 : Prime UAX = IP
Track 1 : Prime UAX Pickup = 5 sec

GCP: track 1 pos start
Track 1 : Positive Start = Off
Track 1 : Sudden Shnt Det Used = No
Track 1 : Low EZ Detection Used = No

GCP: track 1 MS Control
Track 1 : MS/GCP Ctrl IP Used = No
Track 1 : MS Sensitivity Level = 0
Track 1 : Compensation Level = 1300
Track 1 : Warn Time-Ballast Comp = High
Track 1 : Low EX Adjustment = 39
Track 1 : Bidirn Dax Passthru = No
Track 1 : False Act on Train Stop = No
Track 1 : EX Limiting Used = Yes
Track 1 : EZ Correction Used = Yes

GCP: track 2
Track 2 : GCP Freq Category = Other
Track 2 : GCP Frequency = 151 Hz
Track 2 : Approach Distance = 3087 ft
Track 2 : Uni/Bi/Sim-Bidirnl = Bidirnl
Track 2 : GCP Transmit Level = High
Track 2 : Island Connection = Isl2
Track 2 : Island Distance = 124 ft
Track 2 : Computed Distance = 9999 ft
Track 2 : Linearization Steps = 100

GCP: track 2 enhanced det
Track 2 : Inbound PS Sensitivity = Off
Track 2 : Speed Limiting Used = Yes
Track 2 : Outbound False Act Lvl = Normal
Track 2 : Outbound PS Timer = 20 sec
Track 2 : Trailing Switch Logic = On
Track 2 : Post Joint Detn Time = 15 sec
Track 2 : Adv Appr Predn = No
Track 2 : Cancel Pickup Delay = This Isl

GCP: track 2 prime
Track 2 : Prime Warning Time = 30 sec
Track 2 : Prime Offset Distance = 0 ft
Track 2 : Switch MS EZ Level = 10
Track 2 : Prime MS/GCP Mode = Pred
Track 2 : Prime Pickup Delay = 15 sec
Track 2 : Prime UAX = IP
Track 2 : Prime UAX Pickup = 5 sec

GCP: track 2 pos start
Track 2 : Positive Start = Off
Track 2 : Sudden Shnt Det Used = No
Track 2 : Low EZ Detection Used = No

GCP: track 2 MS Control
Track 2 : MS/GCP Ctrl IP Used = No
Track 2 : MS Sensitivity Level = 0
Track 2 : Compensation Level = 1300
Track 2 : Warn Time-Ballast Comp = High
Track 2 : Low EX Adjustment = 39
Track 2 : Bidirn Dax Passthru = No
Track 2 : False Act on Train Stop = No
Track 2 : EX Limiting Used = Yes
Track 2 : EZ Correction Used = Yes

ISLAND: track 1
Track 1 : Isl Frequency = 4.9 kHz
Track 1 : Pickup Delay (2s +) = 0 sec
Track 1 : Isl Enable IP Used = No

ISLAND: track 2
Track 2 : Isl Frequency = 8.3 kHz
Track 2 : Pickup Delay (2s +) = 0 sec
Track 2 : Isl Enable IP Used = No

AND: track Anding
AND 1 XR Used = Yes
AND 2 Used = No
AND 3 Used = No
AND 4 Used = No
AND 5 Used = No
AND 6 Used = No
AND 7 Used = No
AND 8 Used = No

AND: AND 1 XR
AND 1 XR Track 1 = Prime
AND 1 XR Track 2 = Prime
AND 1 Enable Used = Yes
And 1 Enable Pickup = 5 sec
AND 1 Enable Drop = 0 sec
AND 1 Wrap Used = No

ADVANCED: MS restart
MS/GCP Restart Used = No

ADVANCED: out of service
OOS Control = Display+OOS IPs
OOS Timeout = Yes
OOS Timeout = 1 hrs

ADVANCED: out of service 2
T1 OOS Control = OOS Input 1
T2 OOS Control = OOS Input 1

ADVANCED: track wrap circuits
Wrap LOS Timer = 5 sec
Track 1 Wrap Used = No
Track 2 Wrap Used = No

ADVANCED: trk 1 overrides
Track 1 : All Predictors Override Used = No

ADVANCED: trk 2 overrides
Track 2 : All Predictors Override Used = No

4000 GCP PROGRAMMING SETUP

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN		
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5		
IN SERVICE: - -	FOSTORIA DISTRICT	FILE No.	R-
	CADD or DWG. No. FSBT30948.07	SHEET No.	7 of 23

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

ADVANCED: OR logic
OR 1 Used = No
OR 2 Used = No
OR 3 Used = No
OR 4 Used = No

ADVANCED: internal I/O 1
Pass Thrus = No
Int.1 Sets = Not Used
Int.1 Set by = Not Used
Int.2 Sets = Not Used
Int.2 Set by = Not Used
Int.3 Sets = Not Used
Int.3 Set by = Not Used
Int.4 Sets = Not Used
Int.4 Set by = Not Used

ADVANCED: internal I/O 2
Int.5 Sets = Not Used
Int.5 Set by = Not Used
Int.6 Sets = Not Used
Int.6 Set by = Not Used
Int.7 Sets = Not Used
Int.7 Set by = Not Used
Int.8 Sets = Not Used
Int.8 Set by = Not Used

ADVANCED: internal I/O 3
Int.9 Sets = Not Used
Int.9 Set by = Not Used
Int.10 Sets = Not Used
Int.10 Set by = Not Used
Int.11 Sets = Not Used
Int.11 Set by = Not Used
Int.12 Sets = Not Used
Int.12 Set by = Not Used

ADVANCED: internal I/O 4
Int.13 Sets = Not Used
Int.13 Set by = Not Used
Int.14 Sets = Not Used
Int.14 Set by = Not Used
Int.15 Sets = Not Used
Int.15 Set by = Not Used
Int.16 Sets = Not Used
Int.16 Set by = Not Used

ADVANCED: site options
Daylight Savings = On
Units = Standard
Maint Call Rpt IP Used = No
Emergency Activate IP = No
EZ/EX Logging = Change
EZ/EX Point Change = 3

SSCC
Gates Used = Yes
SSCC1+2 GPs Coupled = Yes
Min Activation = 0 sec
Rmt Activation Cancel = 2 min
Bell On Gate Rising = No
Mute Bell On Gate Down = No
SSCC IV Controller Used = No

SSCC: 1
SSCC-1 Activation = AND 1 XR
SSCC-1 Gate Delay = 6 sec
SSCC-1 Number of GPs = 1
SSCC-1 Number of GDs = 2
SSCC 1: Flash Rate = 40
SSCC 1: Low Battery Detection = No
SSCC 1: Flash Sync = master
SSCC 1: Invert Gate Output = No
SSCC 1: Lamp Neutral Test = Off
Aux-1 Xng Ctrl Used = No

SSCC: 2
SSCC-2 Activation = AND 1 XR
SSCC-2 Gate Delay = 6 sec
SSCC-2 Number of GPs = 0
SSCC-2 Number of GDs = 0
SSCC 2: Flash Rate = 40
SSCC 2: Low Battery Detection = No
SSCC 2: Flash Sync = slave
SSCC 2: Invert Gate Output = No
SSCC 2: Lamp Neutral Test = Off
Aux-2 Xng Ctrl Used = No

OUTPUT: assignment page 1
OUT 1.1 = Not Used
OUT 1.2 = Not Used
OUT 2.1 = Not Used
OUT 2.2 = Not Used

INPUT: assignment page 1
IN 1.1 = T1 Prime UAX
IN 1.2 = Not Used
IN 2.1 = T2 Prime UAX
IN 2.2 = Not Used

IO: assignment SSCC
OUT GC 1 = Gate Output 1
OUT GC 2 = Gate Output 2
IN 7.1 = Not Used
IN 7.2 = GD 1.2
IN 7.3 = AND 1 XR Enable
IN 7.4 = GD 1.1
IN 7.5 = GP 1.1
IN 8.1 = Out Of Service IP 1
IN 8.2 = Not Used
IN 8.3 = Not Used
IN 8.4 = Not Used
IN 8.5 = Not Used

SEAR
SEAR Subnode = 3
DI 1 = Not Used
DI 2 = Not Used
Rly 1 = General
Rly 2 = Not Used

SEAR: inputs
SP 2.1 = POK 1
SP 3.1 = Not Used
SP 4.1 = Not Used
SP 5.1 = Not Used
SP 6.1 = Not Used

SEAR: slot 1-4 inputs
IN 1.2 = Not Used
IN 2.2 = Not Used
IN 3.1 = Not Used
IN 3.2 = Not Used
IN 4.1 = Not Used
IN 4.2 = Not Used

SEAR: inputs slot 5
IN 5.1 = Not Used
IN 5.2 = Not Used

SEAR: inputs slot 6
IN 6.1 = Not Used
IN 6.2 = Not Used

SEAR: slot 7-8 inputs
IN 7.1 = Not Used
IN 8.2 = Not Used
IN 8.3 = Not Used
IN 8.4 = Not Used
IN 8.5 = Not Used

SITE: programming
Radio Subnode = 1
Field Password = Off
Low Battery Enabled = Off

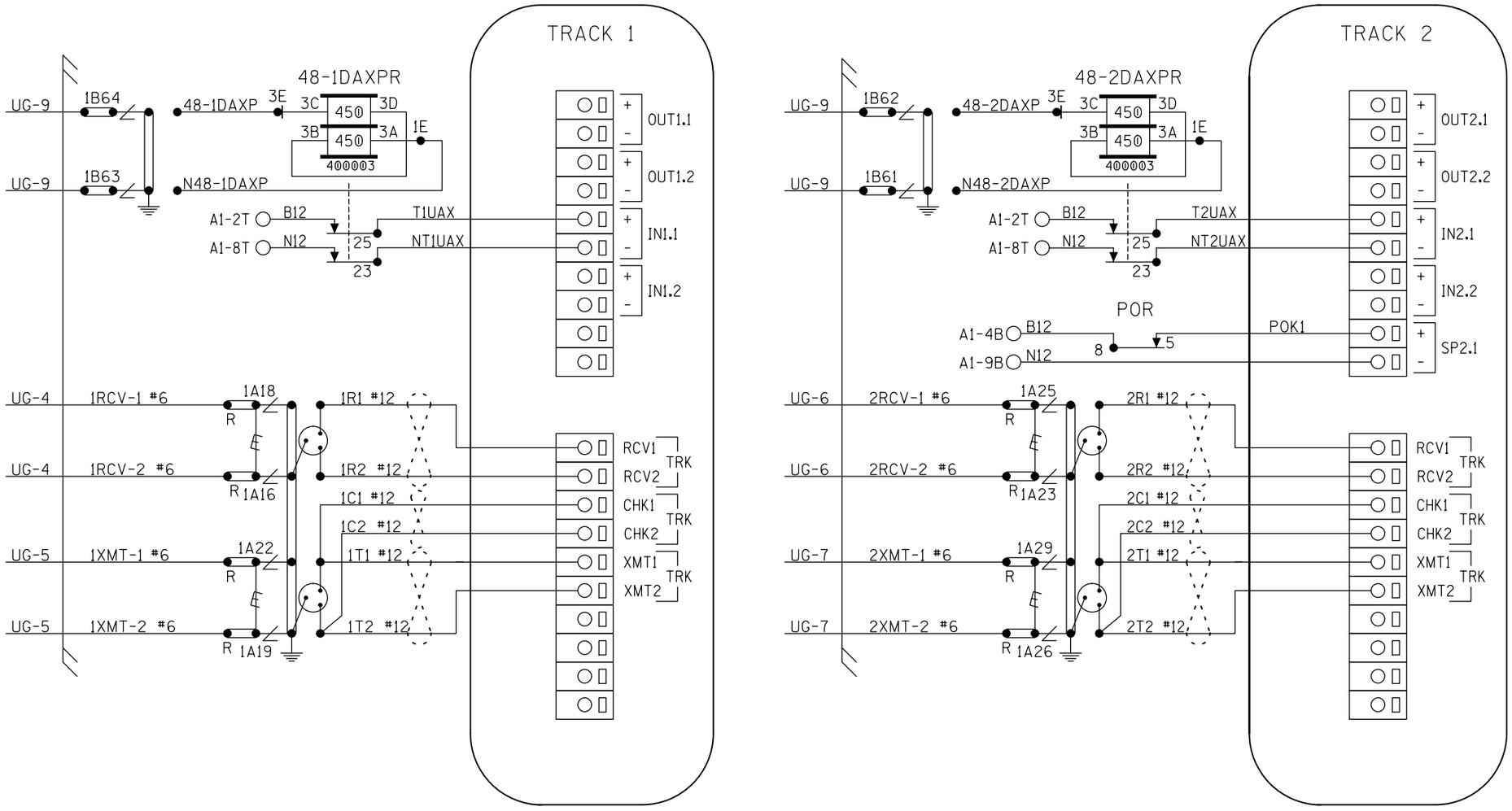
Configuration Package File

Filename: FSBT30948.pac

4000 GCP PROGRAMMING SETUP

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
PROPERTY NORFOLK SOUTHERN RAILWAY CO.	CADD or DWG. No. FSBT30948.08 — SHEET No. 8 of 23

REVISION INITIALS



CONNECTORS FOR TRACK MODULES

NOTES:
ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.

= TWIST

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY:	
JWB	05-09-18
DRAWN BY:	
IRE	05-09-18
CHECKED BY:	
DBS	05-10-18
IN SERVICE:	
	- -

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.48

LEIPSIC, OH
CFLGS AT CR 5

FOSTORIA DISTRICT FILE No. R-

CADD or DWG. No. FSBT30948.09 SHEET No. 9 of 23

* SEE SEAR III CONFIGURATION SUMMARY MANUAL FOR ALARM NUMBERS

SAFETRAN systems
Made In USA

SEAR III INTERNAL EVENT RECORDER
A80410

AUX J1 | USER J2

BATT MON | DI1 | DI2 | RLY 1 | RLY 2 | TEMP | ECH SVC

POWER * LOW BATTERY * | GATE POSITION * | CROSSINGS CONTROLLER FAIL * | CROSSING ACTIVE * PREEMPTION * | ONLINE * | POWER | HEALTH

T01 T02 T03 T04 T05 T06 T07 T08 T09 T10 T11 T12 T13 T14 T15 T16

LOWER BAY

REMOTE HANDSET | ANTENNA

VHF COMMUNICATOR
A80276

- POWER
- SPEECH TX
- DTMF TX
- DTMF RX
- DATA TX
- DATA RX
- DCO
- PTT
- SEARII TX
- SEARII RX
- ECH SVC

B N | USER J2 | ECH | ECH

AA21

N12 A1-8B

B12 A1-3B

ECHELON TERMINATION UNIT A80078

CPU

ECH | *ECH | ECHELON TERMINATION UNIT A80078 | ECH1 | ECH2

DIAG

A1-1B B12 *10 | A1-6B N12 *10

B | B | N | N | MAINT CALL | + - FLASH SYNC

B16-2 TO B12 CHARGER SHEET 5

BL | BLR A PB B | AA88 | N16 A1-17T

BLR

⑥ ⑤ ④
③ ② ①

BACK 3 2 1
FRONT 6 5 4

HEEL 9 8 7
B A

POTTER BRUMFIELD RELAY (FRONT VIEW) KUMP-14D18-12

Ⓑ Ⓐ
⑨ ⑧ ⑦

GCP PROGRAMMING FOR VHF RADIO

REMOTE DTMF CROSSING ACTIVATION
(ACTIVATES ENTIRE CROSSING)

TO ACTIVATE PRESS: 496#

TO DE-ACTIVATE PRESS: 496*

(ACTIVATION WILL TIME OUT AFTER 60 SEC.)

REMOTE DTMF LIGHTING ACTIVATION
(ACTIVATES FLASHING LIGHTS ONLY)

TO ACTIVATE PRESS: 4961#

TO DE-ACTIVATE PRESS: 4961*

(ACTIVATION WILL TIME OUT AFTER 60 SEC.)

NOTES:
ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.

* = ECHELON CONNECTIONS NOT TO EXCEED 53' IN LENGTH AND TOTAL LENGTH NOT TO EXCEED 430' WITH A MAXIMUM OF 8 NODES. RECOMMEND USE BELDEN WIRE CABLE #8461 OR EQUIVALENT.

☆ = A80078 ECHELON TERMINATION UNIT TO TERMINATE ECHELON NETWORK.

= TWIST

CPU MODULE, SEAR III & VHF HOOK-UPS

DESIGNED BY:		NORFOLK SOUTHERN	
JWB	05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: B-309.48
DRAWN BY: IRE	05-09-18	LEIPSIC, OH CFLGS AT CR 5	
CHECKED BY: DBS	05-10-18	FOSTORIA DISTRICT	FILE No. R-
IN SERVICE:	- -	CADD or DWG. No. FSBT30948.10	SHEET No. 10 of 23

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

	SITE SET UP PROCEDURE	
	FUNCTION	LED DISPLAY
	DATE/TIME	
	AUTOMATIC DST ADJUSTMENT	YES
	TIME ZONE	EST
	SITE NAME	CR 5
	MILEPOST	B-309.48
	DOT #	472496M
	TESTER TYPE	CROSSING
	DATE FORMAT	MM-DD-YYYY
	TEMP FORMAT	FAHRENHEIT
	INDICATE HOLD (SEC)	0
	INDICATE REFRESH (SEC)	60
	SITE ATCS	7.550.240.196.03.01
	SITE TYPE	NO COMMUNICATION
**	OFFICE ATCS ADDRESS	2.550.00.0000
**	PRIMARY HOP ADDR	7.RRR.LLL.GGG.XX.XX
**	BACKUP HOP ADDR 1	7.RRR.LLL.GGG.XX.XX
**	BACKUP HOP ADDR 2	7.RRR.LLL.GGG.XX.XX
**	POLL ID	1
**	MODE	GEN/ATCS
**	WAMS XID	DISABLED
**	OFFICE COMM DEVICE	MCM (ECHELON)
**	RADIO ATCS ADDR	7.RRR.LLL.GGG.01.01
**	PHONE #	(OFFICE NUMBER)
**	INIT STRING	
**	FIELD COMM DEVICE	NONE
***	USER PORT BAUD	57600
***	USER PORT DATA BITS	8
***	USER PORT PARITY	NONE
***	USER PORT STOP BITS	1
***	USER PORT FLOW CONTROL	NONE
***	AUX PORT BAUD	9600
***	AUX PORT DATA BITS	8
***	AUX PORT PARITY	NONE
***	AUX PORT STOP BITS	1
***	AUX PORT FLOW CONTROL	NONE

	CONTROL SYSTEM CONFIGURATION MENU QUESTIONS	
	THE QUESTION	SELECT FROM MENU OPTION
	RESET NAMES AND MODULES?	YES
	RAILROAD NUMBER	550
	CROSSING CONFIGURATION	NORMAL
	AND 1 USED AS XR?	YES
	AND 2 USED AS XR?	NO
	AND 3 USED AS XR?	NO
	AND 4 USED AS XR?	NO
	AND 5 USED AS XR?	NO
	AND 6 USED AS XR?	NO
	AND 7 USED AS XR?	NO
	AND 8 USED AS XR?	NO
*	XR CONTROLLED BY FOREIGN RR	
	ENTRANCE GATES	2
	85% VOLTAGE RELAY OUT	YES
*	GATES CONTROLLED BY FOREIGN RR	
	BATTERY BANKS	2
	BATTERY MON USED	NO
	PREEMPTION	NO
	INTERNAL CROSSING CONTROLLERS	2
	EXTERNAL CROSSING CONTROLLERS	0
	VHF COMMUNICATOR	YES
	DTMF ACTIVATION	YES
****	ACTIVATION CODE	496
	ACTIVATION TIMEOUT (SECONDS)	60
	ILOD MODULES	0
*****	ANY LED BULBS USED	
	VHF VOICE CHANNEL	2
	VHF DATA CHANNEL	2
	USE CELL MODEM NON-CRITICAL FEATURE	NO

PROGRAM MENU QUESTIONS	PROGRAM
EDIT DIGITAL INPUTS	NO
EDIT BATTERIES	NO
EDIT RELAYS	NO
EDIT INDICATOR LEDS	NO
EDIT TEST LEDS	NO
EDIT ILOD SENSORS	NO
EDIT VHF SETTINGS	NO
GCP4K ATCS SUBNODE	16

NOTES:

* = DISPLAYED IF CROSSING CONFIGURATION IS SPLIT GATE.

** = IF SITE TYPE = NO COMMUNICATION, THEN THESE OPTIONS ARE NOT DISPLAYED.

*** = THESE SETTINGS SHOULD BE LEFT AT THE DEFAULT SETTING.

**** = USE LAST 3 NUMBERS FROM DOT NUMBER.

***** = IF ILOD MODULE >0.

TO CONFIGURE SEARIII PRESS SITE SETUP KEY.
USE ARROW KEYS TO MAKE SELECTION,
PRESS ENTER AFTER SELECTION HAS BEEN MADE.

SEAR III PROGRAMMING SETUP

REVISION INITIALS											

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY:	
JWB	05-09-18
DRAWN BY:	
IRE	05-09-18
CHECKED BY:	
DBS	05-10-18
IN SERVICE:	
	- -

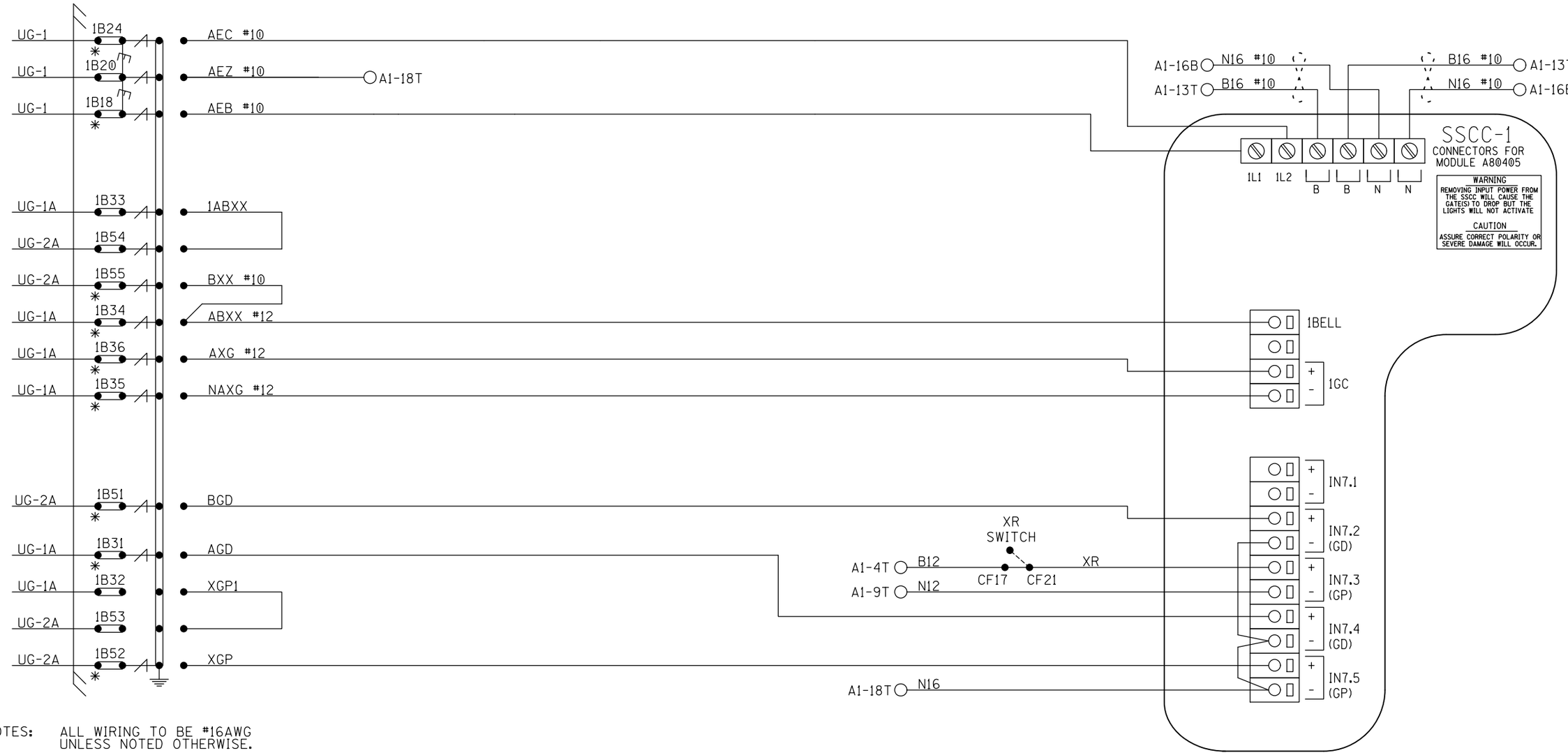
NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. | M.P.: B-309.48

LEIPSIC, OH
CFLGS AT CR 5

FOSTORIA DISTRICT | FILE No. R-

CADD or DWG. No. FSBT30948.11 | SHEET No. 11 of 23



NOTES: ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.

* = TEST LINKS MUST BE OPENED TEMPORARILY FOR NEW COLD START OF NEW OR REPLACEMENT SSCC MODULE AND CAN ONLY BE CLOSED IN SEQUENCE WITH MFR. INSTRUCTIONS: SECTION 8 OF THE GCP 4000 REFERENCE MANUAL.

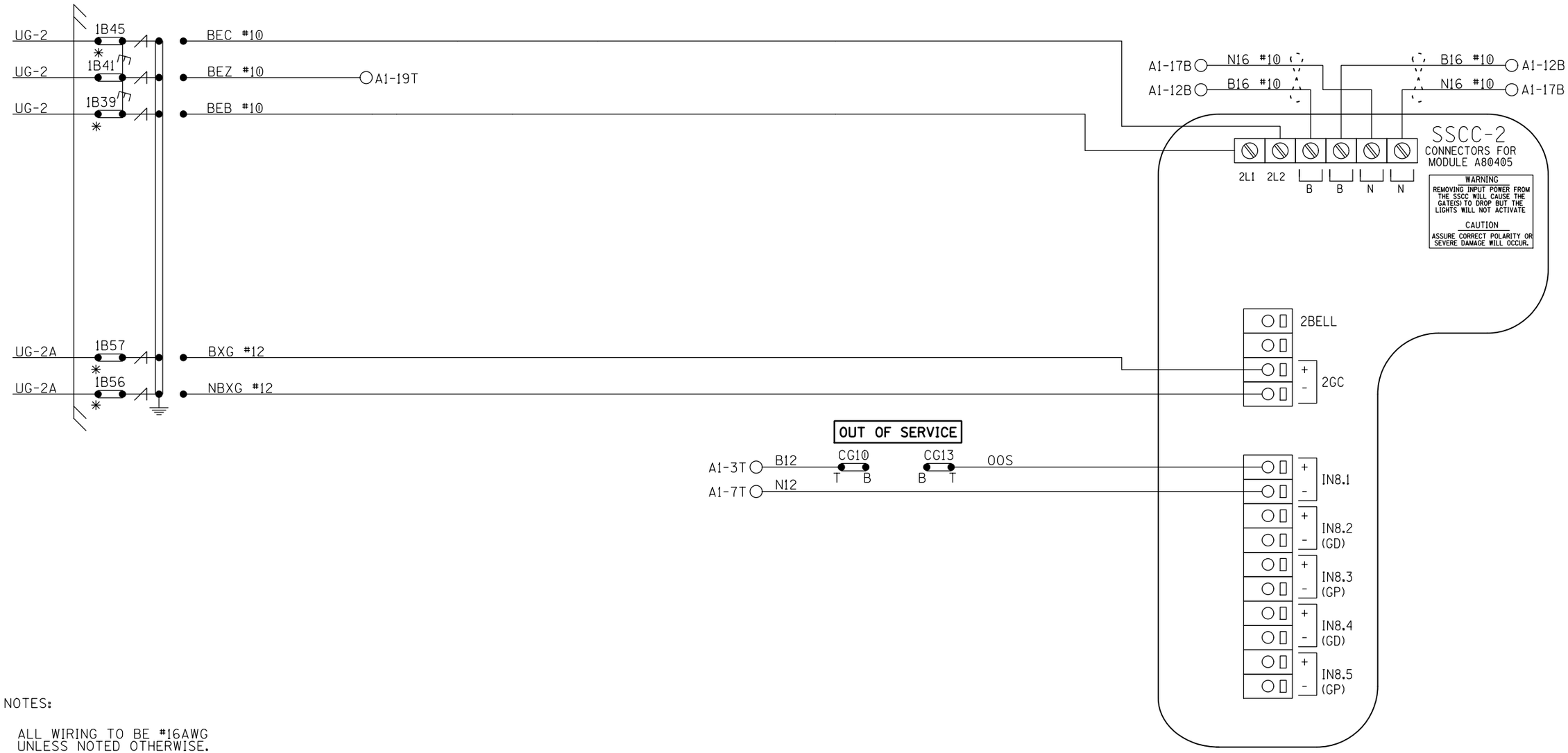
= TWIST

SSCC#1 MODULE HOOK-UP

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.12 — SHEET No. 12 of 23

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



NOTES:

ALL WIRING TO BE #16AWG
UNLESS NOTED OTHERWISE.

* = TEST LINKS MUST BE OPENED TEMPORARILY FOR NEW COLD START OF NEW OR REPLACEMENT SSCC MODULE AND CAN ONLY BE CLOSED IN SEQUENCE WITH MFR. INSTRUCTIONS: SECTION 8 OF THE GCP 4000 REFERENCE MANUAL.

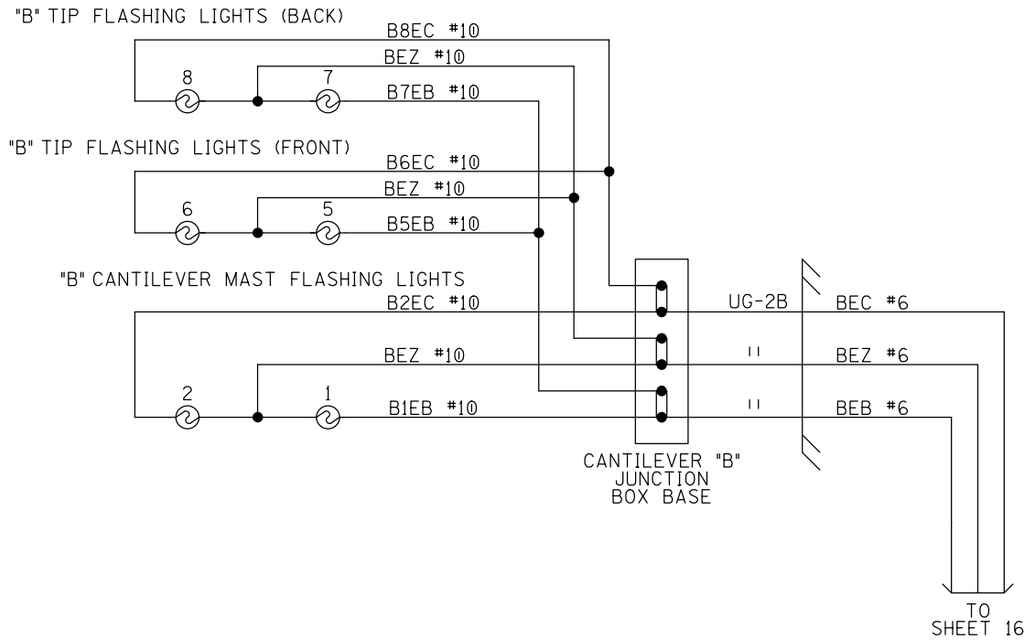
= TWIST

SSCC#2 MODULE HOOK-UP

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN		
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5		
IN SERVICE: - -	FOSTORIA DISTRICT	FILE No.	R-
	CADD or DWG. No. FSBT30948.13	SHEET No.	13 of 23

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

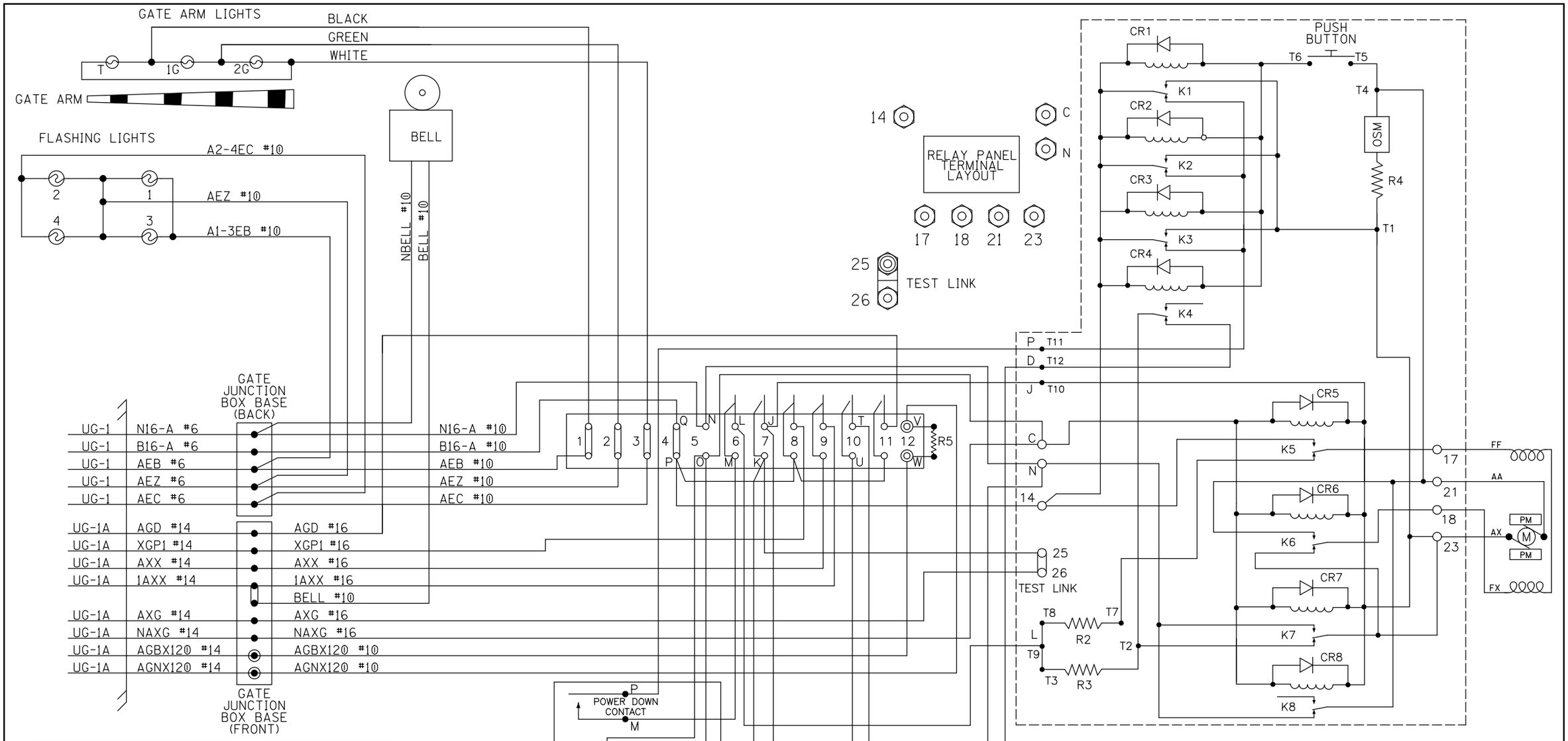


CANTILEVER FLASHER LIGHTS

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN		
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5		
IN SERVICE: - -	FOSTORIA DISTRICT	FILE No.	R-
	CADD or DWG. No. FSBT30948.14	SHEET No.	14 of 23

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



CONTACT SPACE	CONTACT CLOSED AT	FUNCTION OF CONTACT
(6) L-M	45° -90°	POWER DOWN CONTROL
(7) J-K	0° -89°	POWER UP CONTROL
(8)	83° -90°	FLASHING LGT. CONTROL
(9)	5° -90°	BELL CONTROL
(10) T-U	0° -5°	HORIZONTAL SNUB
(11)	0° -5°	GATE DOWN INDICATION

R1 - DOWN SNUB RESISTOR, ADJ.
R2 - POWER DOWN RATE RESISTOR
R3 - POWER DOWN LIMIT RESISTOR

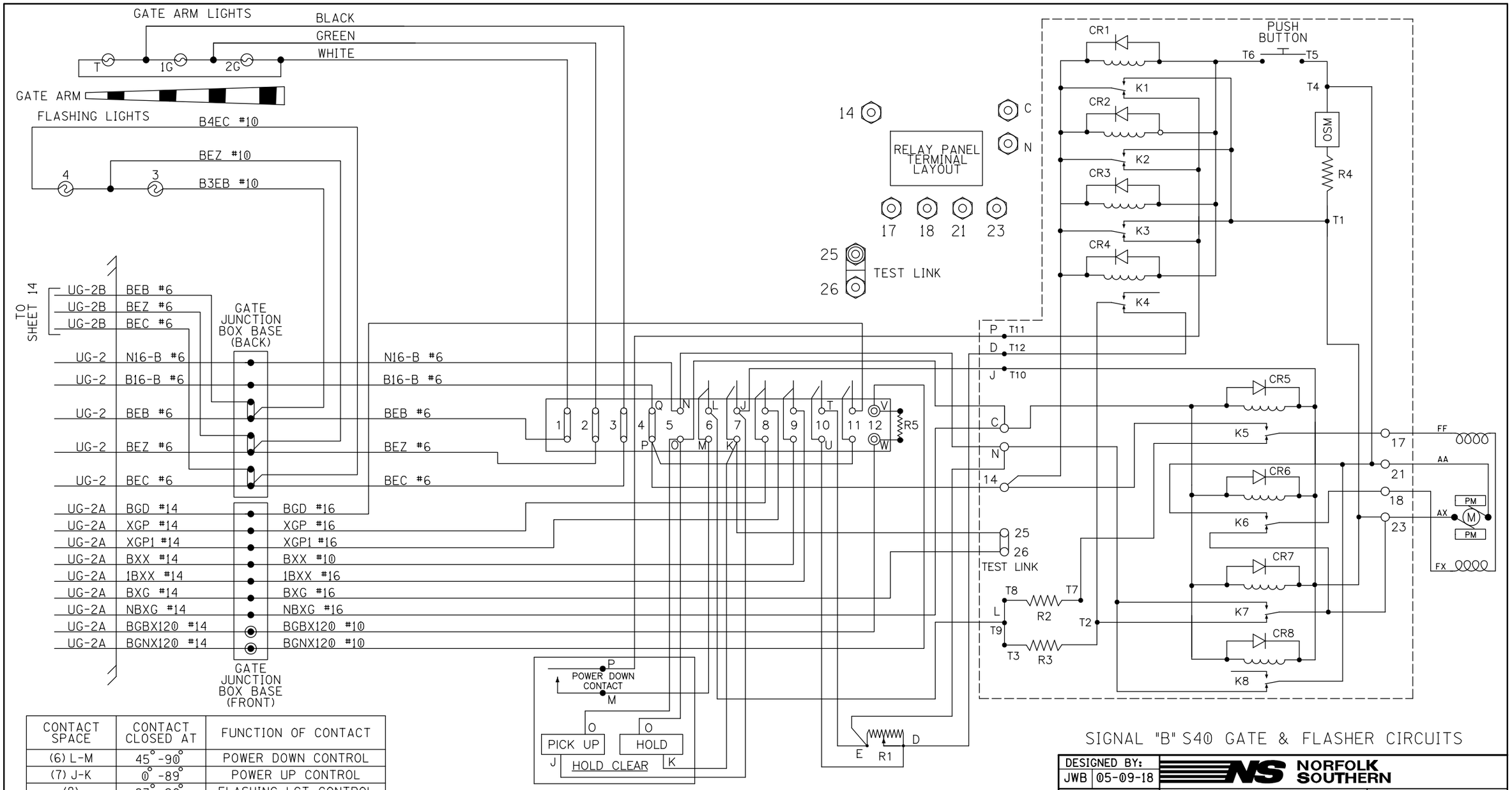
R4 - OSM SNUB RESISTOR
R5 - DEFROSTER
K1-8 - GATE & MAINT. RELAYS
OSM - OVERSPEED MODULE

SIGNAL "A" S40 GATE & FLASHER CIRCUITS

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.15 — SHEET No. 15 of 23

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



CONTACT SPACE	CONTACT CLOSED AT	FUNCTION OF CONTACT
(6) L-M	45° -90°	POWER DOWN CONTROL
(7) J-K	0° -89°	POWER UP CONTROL
(8)	83° -90°	FLASHING LGT. CONTROL
(9)	5° -90°	BELL CONTROL
(10) T-U	0° -5°	HORIZONTAL SNUB
(11)	0° -5°	GATE DOWN INDICATION

R1 - DOWN SNUB RESISTOR, ADJ.
R2 - POWER DOWN RATE RESISTOR
R3 - POWER DOWN LIMIT RESISTOR

R4 - OSM SNUB RESISTOR
R5 - DEFROSTER
K1-8 - GATE & MAINT. RELAYS
OSM - OVERSPEED MODULE

SIGNAL "B" S40 GATE & FLASHER CIRCUITS

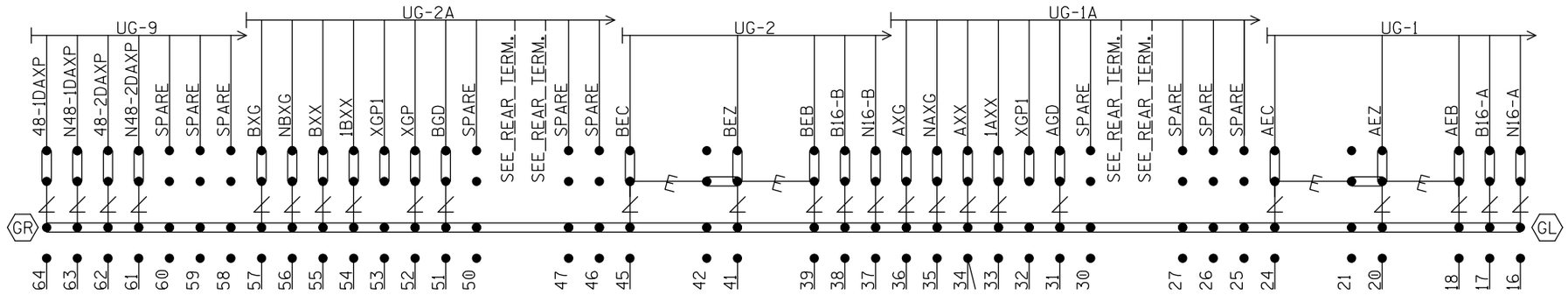
DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.16 — SHEET No. 16 of 23

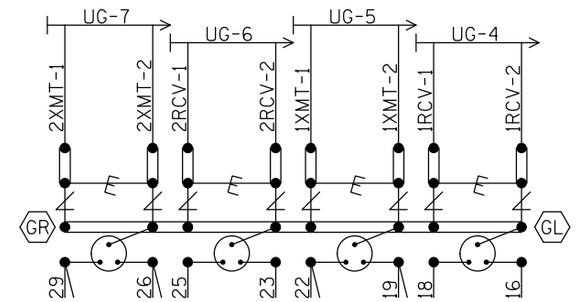
REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

LEFT TWO ROWS TERMINAL BOARD 1

"1A" "1B"





NOTE: INSTALL TEST LINKS ON ALL TRACK WIRES AND ON ALL LOW VOLTAGE UNDERGROUND CABLE TERMINATIONS.

SEE FARADAY SHIELD DETAILS - 1A & 1B FOR HOW THIS PORTION OF THE FARADAY SHIELD IS PREDRILLED. ONLY INSTALL AND USE THE TERMINALS NEEDED.

= Heavy Duty Equalizer (022700-1X)

= Clearview Lightning Arrester (022585-1X)

= LPC-10560-51

GR / GL = TERMINALS GROUNDED TO SHIELD. 4 POST BLOCKS USE EITHER - GR - SERMMI PART NO. 61278 GL - SERMMI PART NO. 61278-1.

BACKBOARD 1A & 1B

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.17 — SHEET No. 17 of 23

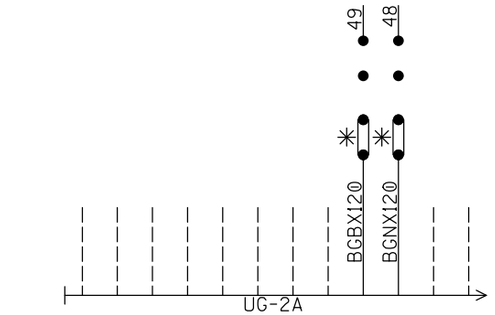
REVISION INITIALS													

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

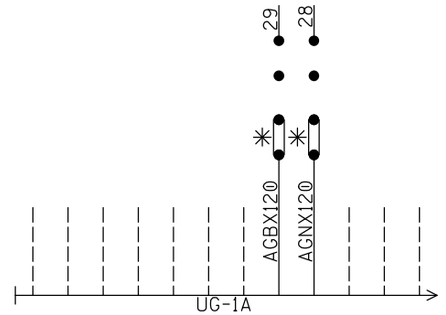
REAR VIEW OF LEFT TWO ROWS TERMINAL BOARD 1

"1A"

"1B"



(SEE PREVIOUS SHEET FOR OTHER WIRES IN CABLE)



(SEE PREVIOUS SHEET FOR OTHER WIRES IN CABLE)

NOTE: ALL 120VAC AND ABOVE WILL BE WIRED TO THE REAR OF FARADAY BACKBOARD. INSULATED NUTS MUST BE USED ON ALL TERMINALS.

✳ = CLOSED DURING WINTER MONTHS

REAR BACKBOARD 1A & 1B

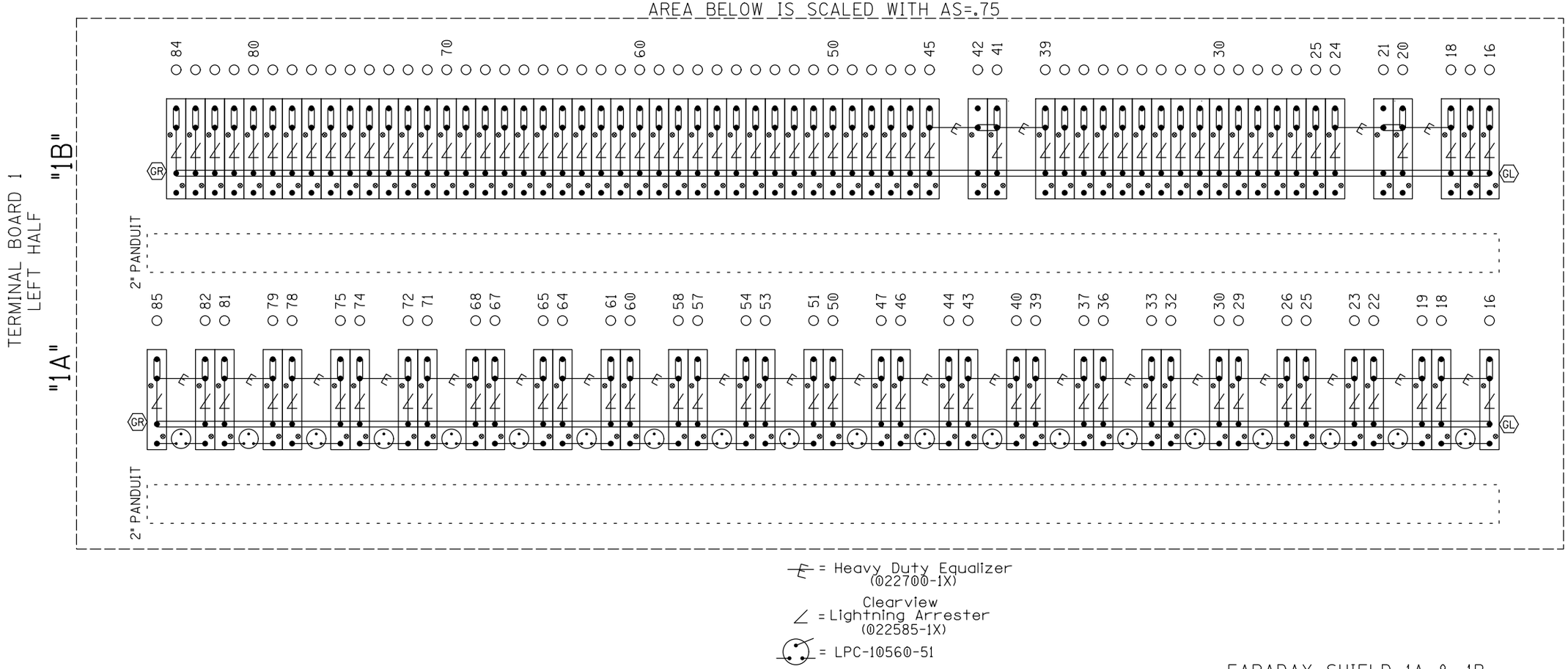
DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN		
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5		
IN SERVICE: - -	FOSTORIA DISTRICT	FILE No.	R-
	CADD or DWG. No. FSBT30948.18	SHEET No.	18 of 23

REVISION INITIALS													

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

NOTE: IF THE FARADAY SHIELD WOULD EVER NEED TO BE DRILLED IN THE FIELD, PROPER PRECAUTIONS MUST BE TAKEN TO INSURE METAL SHAVINGS DO NOT GET INTO EXISTING TERMINALS/WIRES.

AREA BELOW IS SCALED WITH AS=.75



= Heavy Duty Equalizer (022700-1X)

Clearview = Lightning Arrester (022585-1X)

= LPC-10560-51

FARADAY SHIELD 1A & 1B

= INDICATES PLACEMENT OF PANDUIT

THIS SHEET IS FOR REFERENCE ONLY, TO REFLECT HOW THE FARADAY SHIELD IS PREDRILLED. ONLY INSTALL AND USE THE TERMINALS NEEDED.

GR / GL = TERMINALS GROUNDED TO SHIELD. 4 POST BLOCKS USE EITHER - GR - SERMMI PART NO. 61278 GL - SERMMI PART NO. 61278-1.

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.19 — SHEET No. 19 of 23

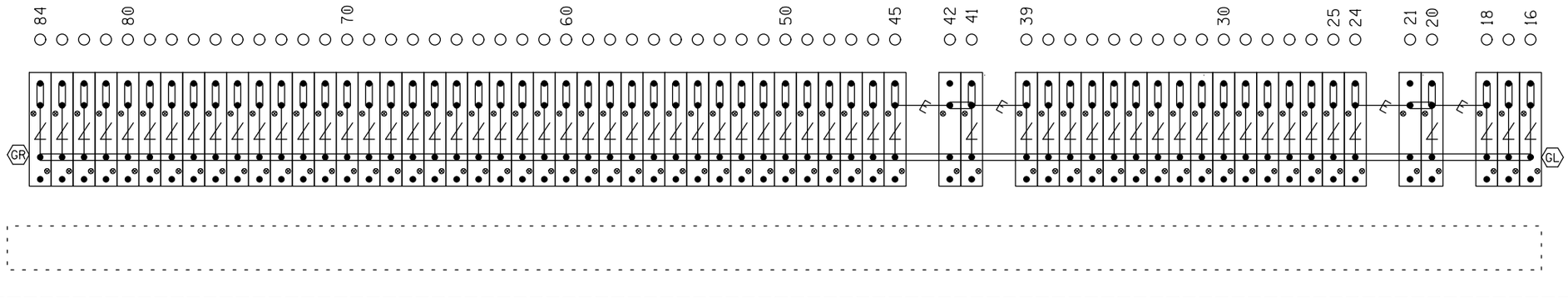
REVISION INITIALS

PROPERTY NORFOLK SOUTHERN RAILWAY CO.

NOTE: IF THE FARADAY SHIELD WOULD EVER NEED TO BE DRILLED IN THE FIELD, PROPER PRECAUTIONS MUST BE TAKEN TO INSURE METAL SHAVINGS DO NOT GET INTO EXISTING TERMINALS/WIRES.

AREA BELOW IS SCALED WITH AS=.75

TERMINAL BOARD 1
RIGHT HALF
"1C"



= Heavy Duty Equalizer (022700-1X)

Clearview = Lightning Arrester (022585-1X)

= LPC-10560-51

FARADAY SHIELD 1C

= INDICATES PLACEMENT OF PANDUIT

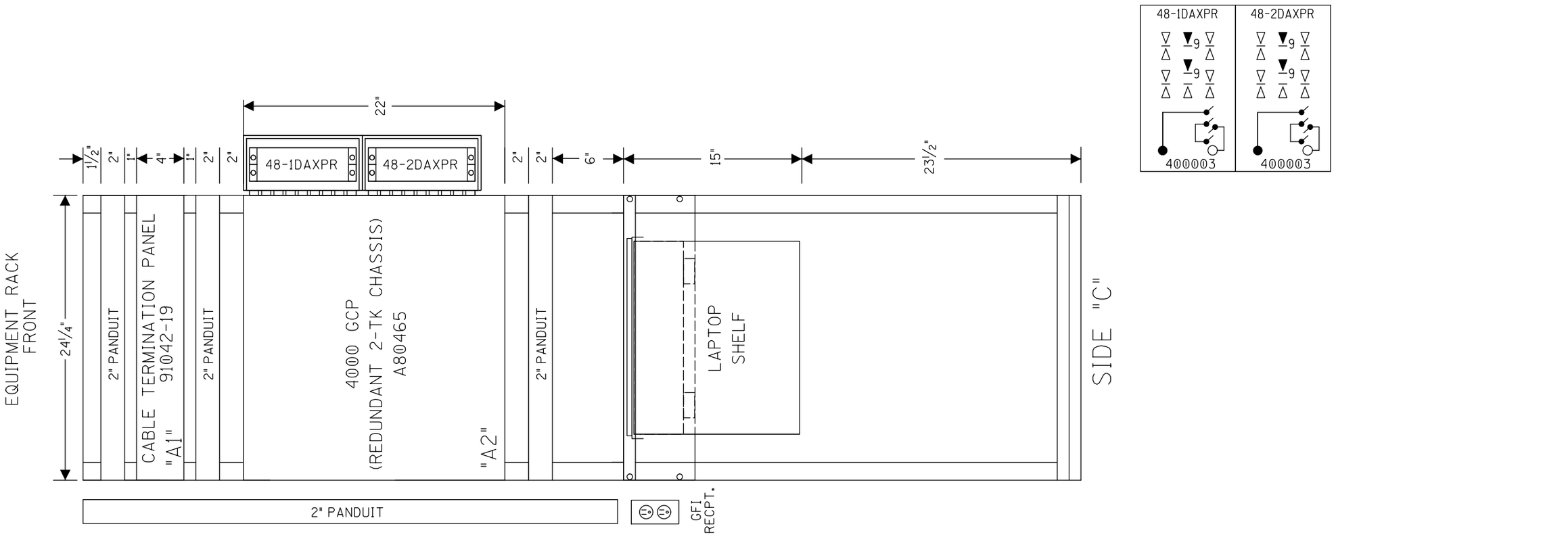
THIS SHEET IS FOR REFERENCE ONLY, TO REFLECT HOW THE FARADAY SHIELD IS PREDRILLED. ONLY INSTALL AND USE THE TERMINALS NEEDED.

GR / GL = TERMINALS GROUNDED TO SHIELD. 4 POST BLOCKS USE EITHER - GR - SERMMI PART NO. 61278 GL - SERMMI PART NO. 61278-1.

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.20 — SHEET No. 20 of 23

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



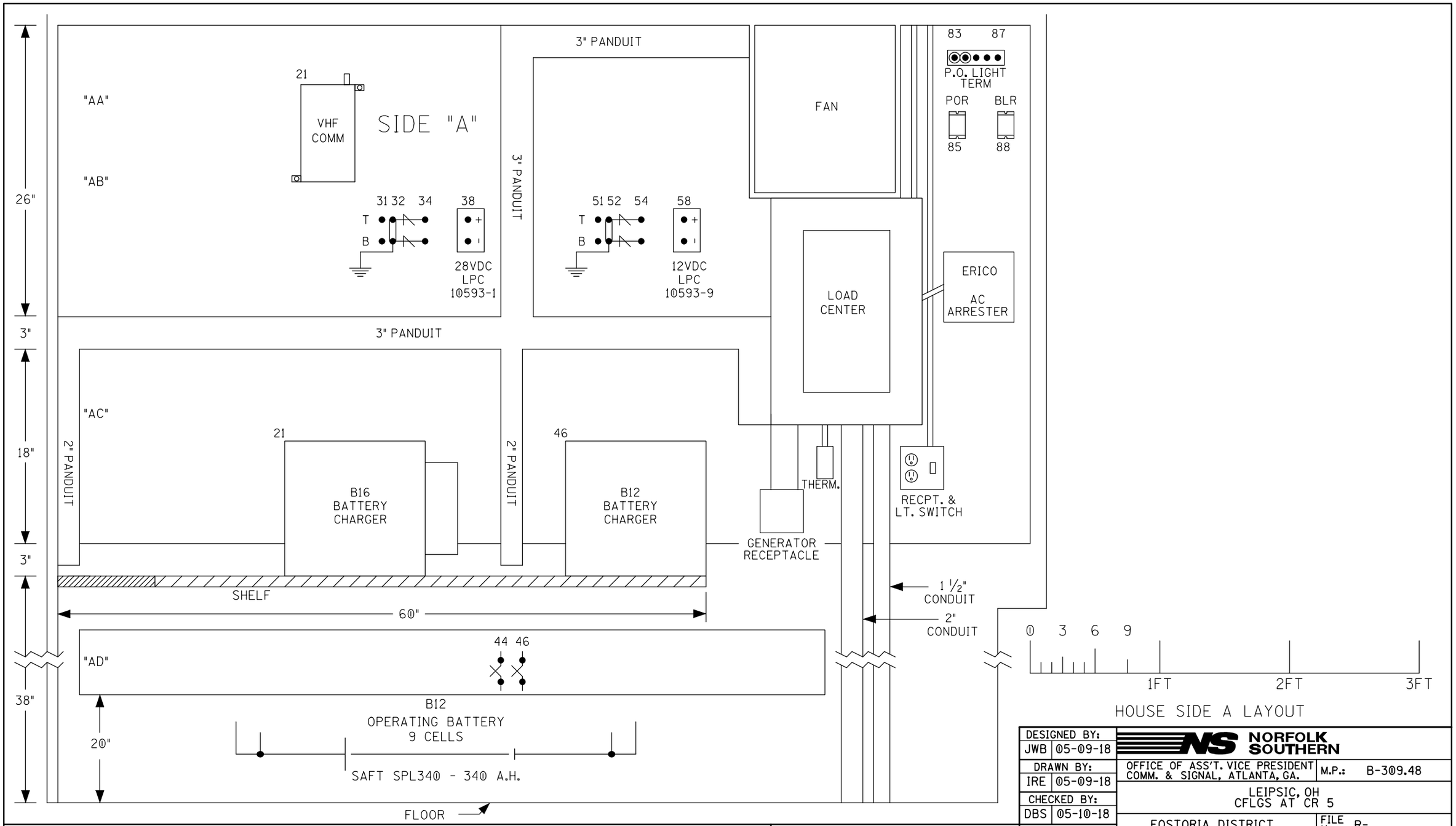
"CA" "CB" "CC" "CD" "CE" "CF" "CG"

HOUSE SIDE C LAYOUT
& RACK PLACEMENT

REVISION INITIALS										

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-
	CADD or DWG. No. FSBT30948.21 — SHEET No. 21 of 23

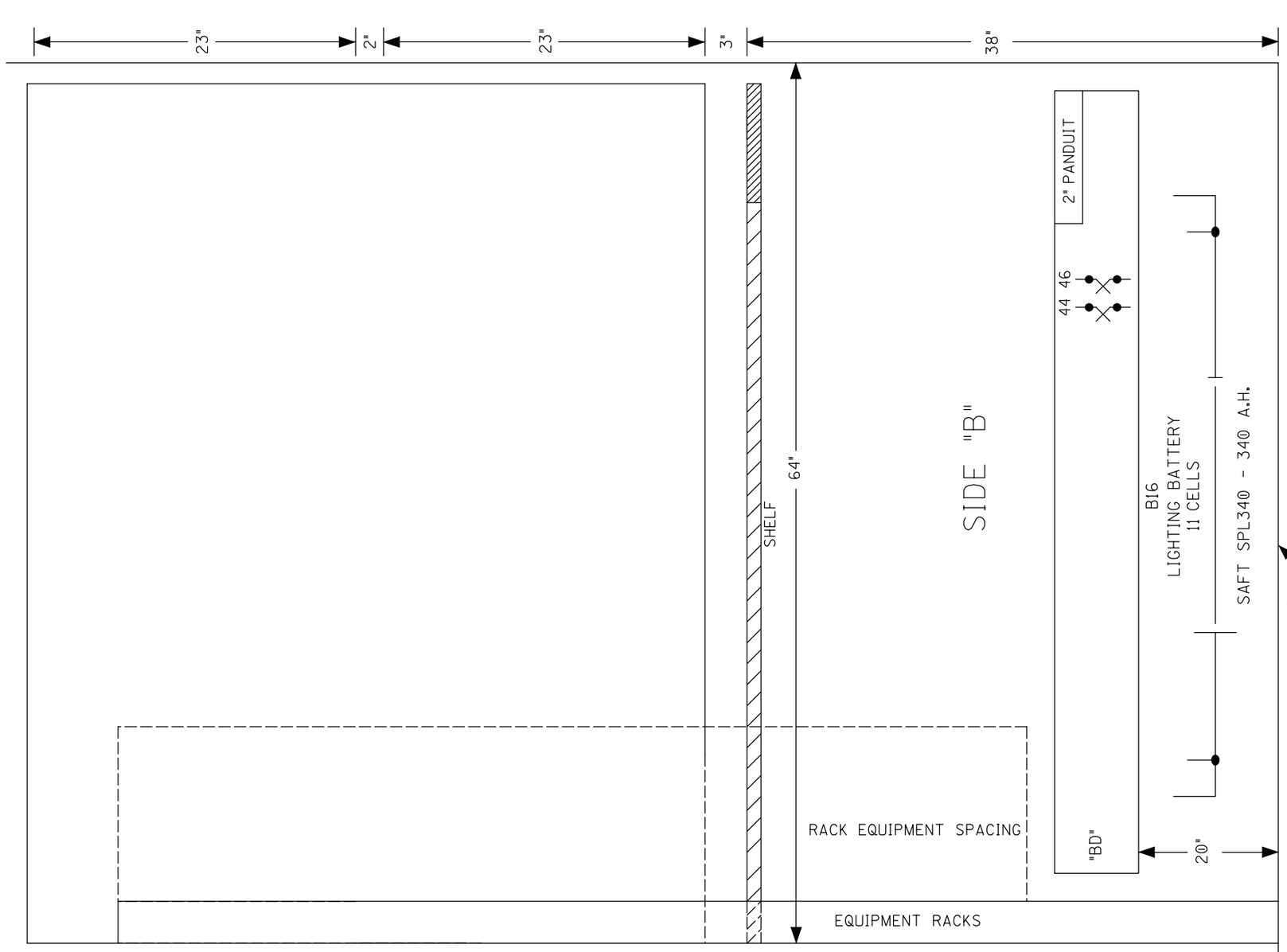


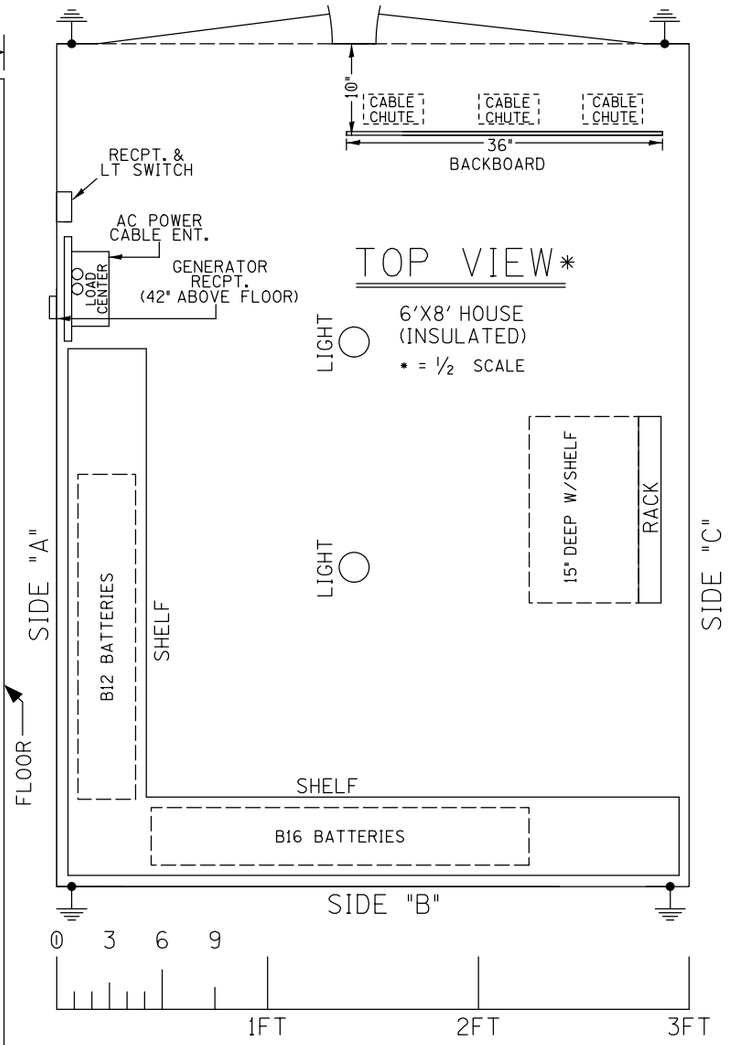
HOUSE SIDE A LAYOUT

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN		
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5		
IN SERVICE: - -	FOSTORIA DISTRICT	FILE No.	R-
	CADD or DWG. No. FSBT30948.22	SHEET No.	22 of 23

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.





HOUSE SIDE B LAYOUT & TOP VIEW

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN		
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B-309.48
CHECKED BY: DBS 05-10-18	LEIPSIC, OH CFLGS AT CR 5		
IN SERVICE: - -	FOSTORIA DISTRICT	FILE No.	R-
	CADD or DWG. No. FSBT30948.23	SHEET No.	23 of 23

REVISION INITIALS											

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

SH. NO.	CONTENTS
NX1	INDEX SHEET
NX2	OUT OF SERVICE (OOS) INSTRUCTIONS
1	OUTSIDE PLAN
2	3000 GCP HOOK-UP
3	3000 GCP SET-UP
2 4	WIRING FOR GEO TRACK 2 & 4 UNITS
3 5	TRACK 2 SIGNAL LIGHTING
4 6	TRACK 4 SIGNAL LIGHTING
5 7	TRACK 2 MODULES AND I/O PINOUTS
6 8	TRACK 4 MODULES AND I/O PINOUTS
7 9	GEO SYSTEM CONFIGURATION - TRACK 2
8 10	GEO SYSTEM CONFIGURATION - TRACK 4
9 11	ASPECTS
10 12	LOAD CENTER, B14 RECTIFIER & BATTERY
11 13	XB12, B14 RECTIFIER AND BATTERY
12 14	GEO CONSOLE - TRACK 2
13 15	GEO CONSOLE - TRACK 2 PROGRAMMING
14 16	GEO CONSOLE - TRACK 4
15 17	GEO CONSOLE - TRACK 4 PROGRAMMING
16 18	PTC RADIO AND MESSAGE SERVER
17 19	PTC RADIO CONFIGURABLE PARAMETERS
18 20	SEAR II RECORDER & VHF RADIO
19 21	SEAR II SET UP & GROUND FAULT TESTER
20	CONNECTORS FOR TRACK MODULES
21	CONNECTORS FOR CPU MODULE
22	BACKBOARD 1A & 1B

SH. NO.	CONTENTS
23	FARADAY SHIELD 1A & 1B
24	FARADAY SHIELD 1C
25	PLACEMENT - SIDE C
26	PLACEMENT - SIDE A
27	PLACEMENT - SIDE B
28	CABLE PLAN

4000 GCP 5-TK CHASSIS & MODULE LAYOUT

4000 GCP PROGRAMMING SETUP

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

IN SERVICE_____ _____
SIGNED DATE

☐ S&E ENGINEERING COPY
☐ CONSTRUCTION OFFICE COPY
RETURN TO S&E ENG. AFTER COMPLETION
☐ FIELD COPY
RETURN TO CASE AFTER COMPLETION
☐ PROJECT ENGINEER COPY

INDEX SHEET

DESIGNED BY:		NORFOLK SOUTHERN	
MAG	09-11-14		
DRAWN BY:		OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: B-309.10
SII	09-11-14		
CHECKED BY:		BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092	
EWP	10-06-14		
IN SERVICE:		FOSTORIA DISTRICT	FILE No. R-3493
NAG	08-18-15	CADD or DWG. No. FSBT30910.NX1	SHEET No. 1 of 21

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

TAKING TRACK(S) OUT OF SERVICE (OOS):

SP-1001 MUST BE COMPLIED WITH

THE OUT OF SERVICE MENU IS ACCESSED ON THE DISPLAY BY TOUCHING THE DESIRED TRACK IN THE TRACK STATUS WINDOW ON THE DISPLAY. SELECT OUT OF SERVICE FROM THE DROP DOWN MENU.

PLACE A JUMPER ACROSS THE OOS TERMINALS SHOWN IN THE PLANS.

SP-1001 MUST BE COMPLIED WITH

SELECT "TAKE GCP OUT OF SERVICE."

ONCE THE GCP APPROACH IS TAKEN OUT OF SERVICE, IF AN ISLAND EXISTS, THE OPTION TO "TAKE ISL OUT OF SERVICE" IS PRESENTED. IF THE ISLAND IS LEFT IN SERVICE, THE CROSSING WILL ACTIVATE IF THE ISLAND IS OCCUPIED.

IF DESIRED, SELECT "TAKE ISL OUT OF SERVICE."

THE TRACK IS NOW OUT OF SERVICE. WHEN THE OUT OF SERVICE SCREEN IS CLOSED, THE DISPLAY RETURNS TO THE TRACK STATUS SCREEN. NOTE THAT THE OUT OF SERVICE TRACK IS ALTERNATELY FLASHING DARK GRAY AND LIGHT BLUE.

REPEAT FOR ADDITIONAL TRACKS IF NEEDED.

PUTTING TRACK(S) BACK IN SERVICE:

SP-1001 MUST BE COMPLIED WITH

REMOVE THE JUMPER ACROSS THE OOS TERMINALS SHOWN IN THE PLANS.

SP-1001 MUST BE COMPLIED WITH

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

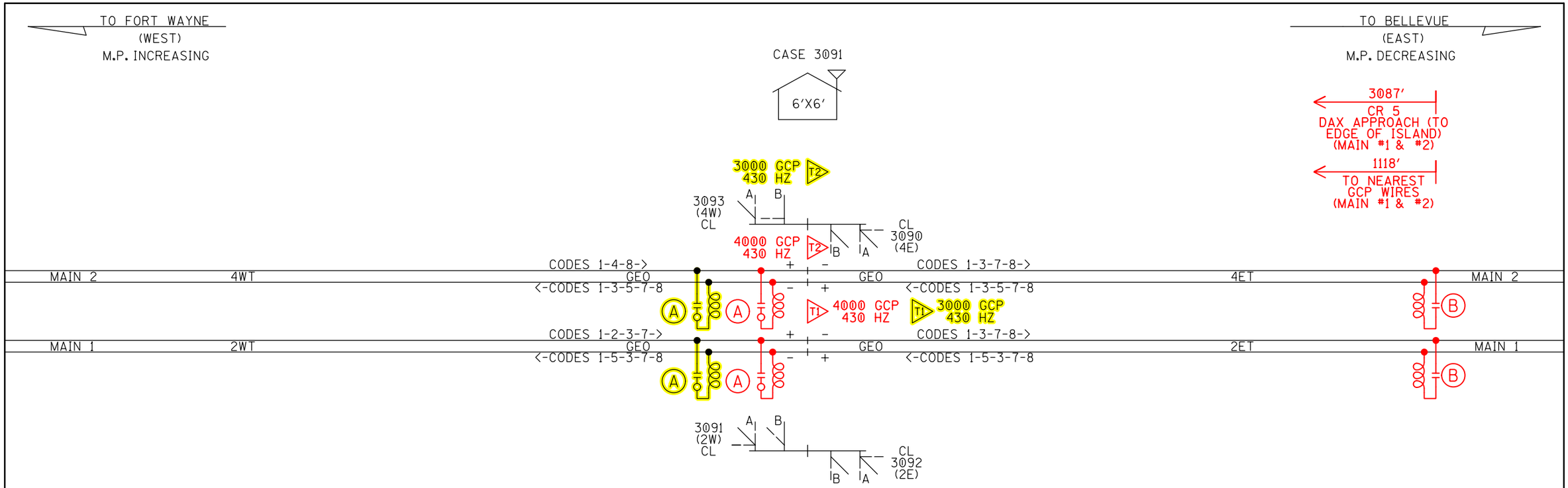
DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

OUT OF SERVICE (OOS) INSTRUCTIONS

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN		
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B-309.10
CHECKED BY: DBS 05-10-18	BELLEVUE TO FORT WAYNE AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092		
IN SERVICE: - -	FOSTORIA DISTRICT	FILE No.	R-1884
	CADD or DWG. No. FSBT30910.NX2	SHEET No.	2 of 2

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

IN SERVICE_____ _____
SIGNED DATE

- ☐ S&E ENGINEERING COPY
- ☐ CONSTRUCTION OFFICE COPY
  RETURN TO S&E ENG. AFTER COMPLETION
- ☐ FIELD COPY
  RETURN TO CASE AFTER COMPLETION
- ☐ PROJECT ENGINEER COPY

(A) – MF-NBS 62775-1543 (348HZ) W/8V617-800

(A)– MF-NBS FSS-1A 250849-000 (151HZ)
W/227032-003 FSS LOAD 1000 FT

(B)– MF-NBS 62775-1543 (430HZ)

OUTSIDE PLAN

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. | M.P.: B-309.10

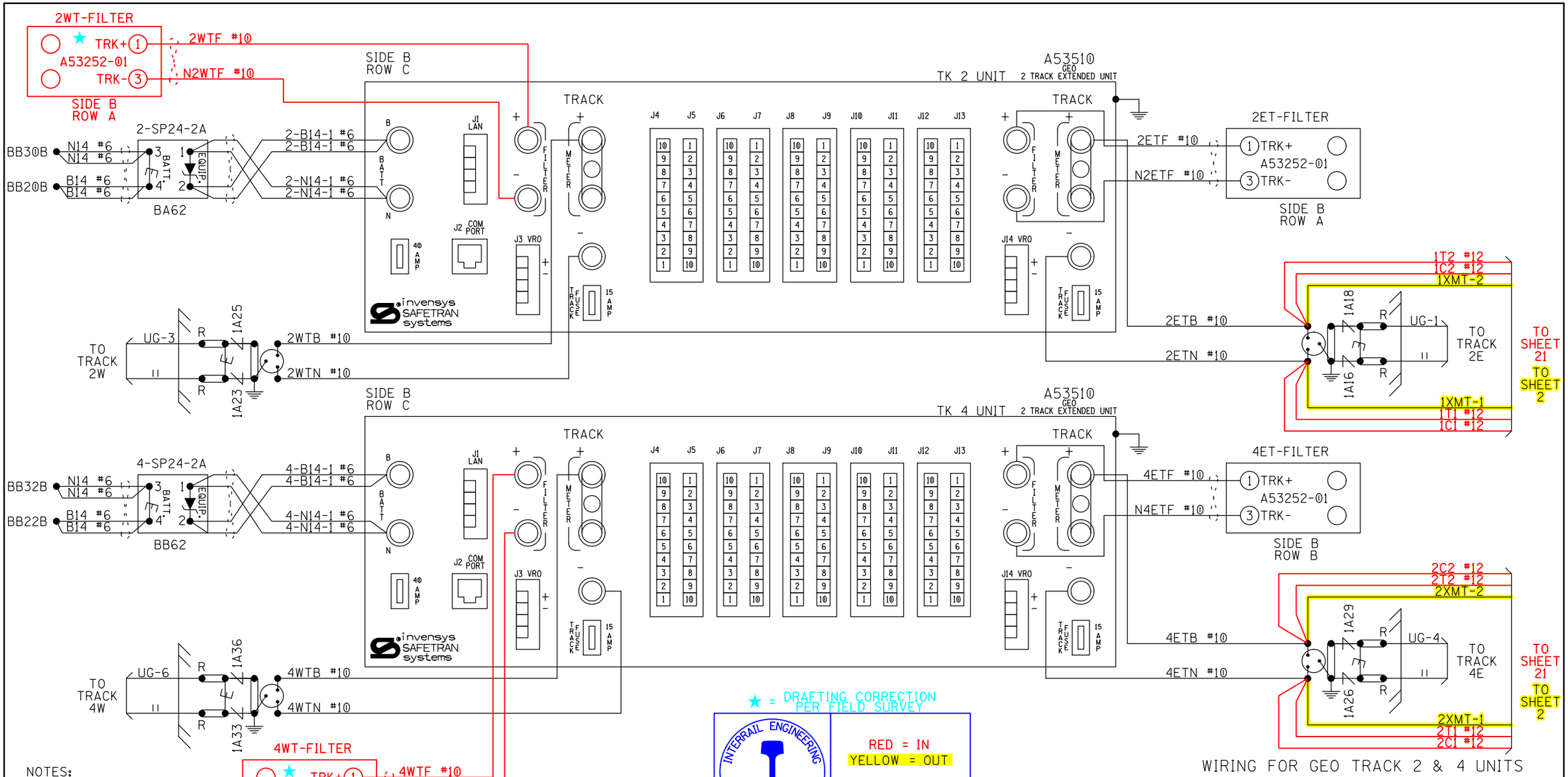
BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT | FILE No. R-1884

CADD or DWG. No. FSBT30910.01 | SHEET No. 1 of 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17											

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



★ = DRAFTING CORRECTION PER FIELD SURVEY

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

NOTES:

1. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
2. ( ) = TWIST BATTERY LEADS

WIRING FOR GEO TRACK 2 & 4 UNITS

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT

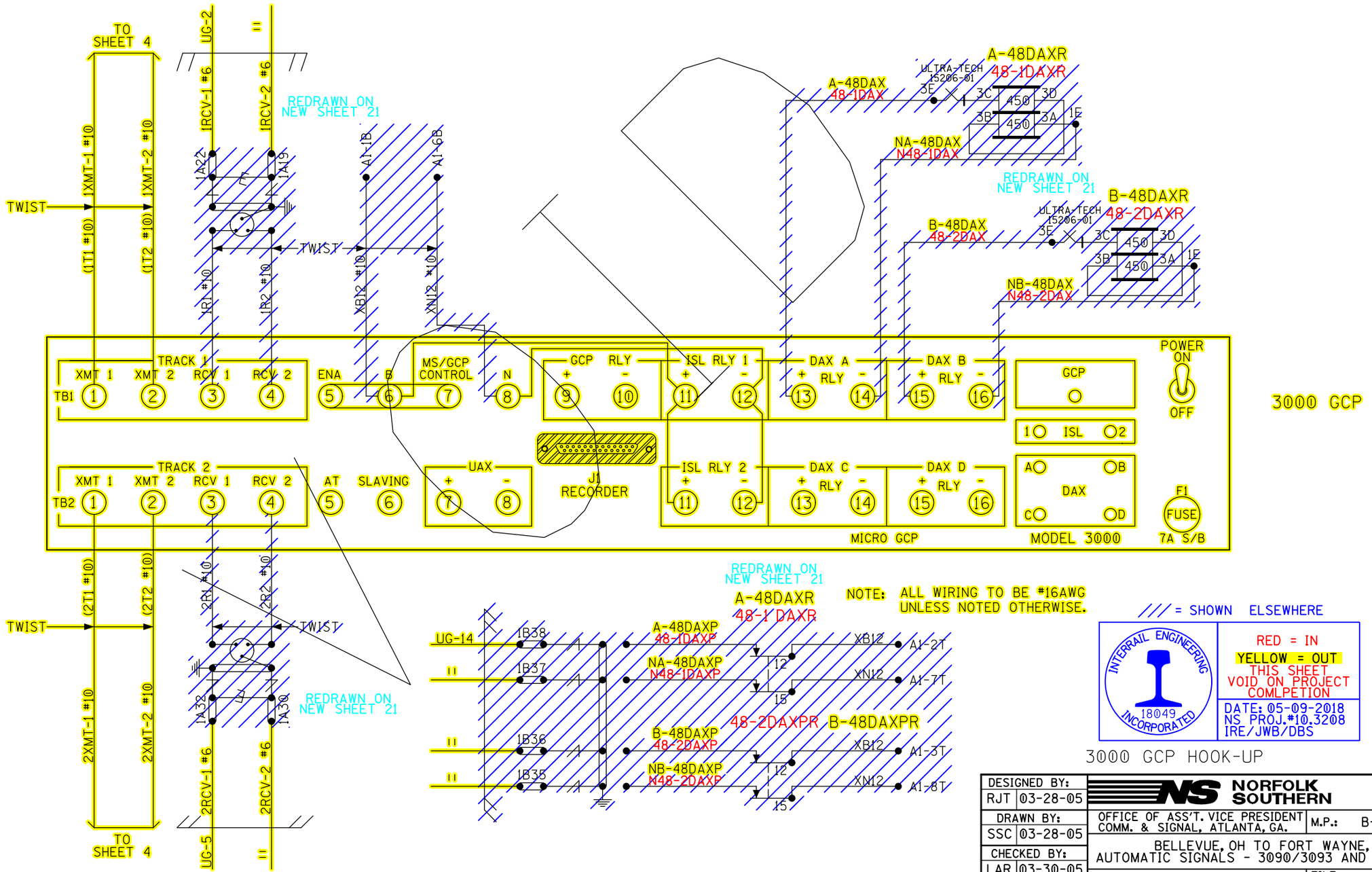
FILE No. R-1884

CADD or DWG. No. FSBT30910.02
FSBT30910.04

SHEET No. 2 of 28
4 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



3000 GCP HOOK-UP

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY: RJT	03-28-05
DRAWN BY: SSC	03-28-05
CHECKED BY: LAR	03-30-05
IN SERVICE: MAL	12-04-06

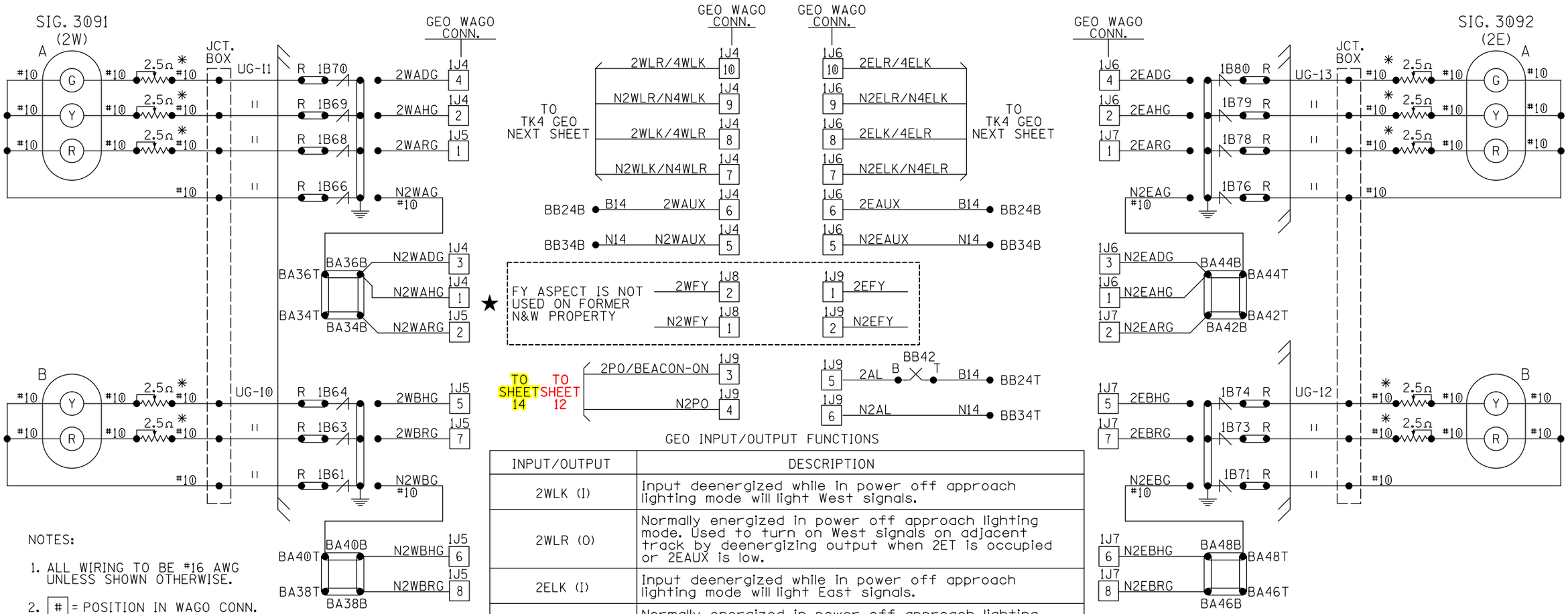
NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT | FILE No. R-1884

CADD or DWG. No. FSBT30910.02V | SHEET No. 2 of 28



NOTES:

1. ALL WIRING TO BE #16 AWG UNLESS SHOWN OTHERWISE.
2. [#] = POSITION IN WAGO CONN.
3. ✳ = ALL LAMP RESISTORS TO BE KEPT AT MINIMUM SETTING. IF THE SIGNAL RUNS ARE VARIED, ADJUST THE LAMP VOLTAGE ON THE GEO CL MODULE TO THE FARTHEST SIGNAL AND USE LAMP RESISTORS TO ADJUST VOLTAGES ON THE NEAR SIGNAL.
4. ★ = ONLY USED FOR FLASHING YELLOW. SEE PROGRAM ON SHEET 11 FOR ADDITIONAL INSTRUCTIONS.

WARNING

Do not use an equalizer or low voltage surge arrester between a Lamp Output and Lamp Common. Install surge arresters only between Lamp Output and earth ground and Lamp Common and earth ground. The GEO System may interpret a failed surge arrester as a lamp filament if the surge arrester is installed incorrectly.

GEO INPUT/OUTPUT FUNCTIONS

INPUT/OUTPUT	DESCRIPTION
2WLK (I)	Input deenergized while in power off approach lighting mode will light West signals.
2WLR (O)	Normally energized in power off approach lighting mode. Used to turn on West signals on adjacent track by deenergizing output when 2ET is occupied or 2EAUX is low.
2ELK (I)	Input deenergized while in power off approach lighting mode will light East signals.
2ELR (O)	Normally energized in power off approach lighting mode. Used to turn on East signals on adjacent track by deenergizing output when 2WT is occupied or 2WAUX is low.
2WAUX (I)	When deenergized - all codes in are disabled, codes 6 and 1 are sent into 2ET and no code is sent into 2WT.
2EAUX (I)	When deenergized - all codes in are disabled, codes 6 and 1 are sent into 2WT and no code is sent into 2ET.
2AL (I)	Approach lighting - (effective only with power off) Energized to enable approach lighting.
2WFY (I)	Aspect on Westbound signal when code 2 is recieved on West track. Energized - Flashing Yellow & Code 7 out East track. Deennergized - Yellow & Code 3 out East track.
2EFY (I)	Aspect on Eastbound signal when code 2 is recieved on East track. Energized - Flashing Yellow & Code 7 out West track. Deennergized - Yellow & Code 3 out West track.

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

TRACK 2 SIGNAL LIGHTING

DESIGNED BY: RJT 03-28-05	NORFOLK SOUTHERN
DRAWN BY: SSC 03-28-05	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: LAR 03-30-05	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: MAL 12-04-06	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.03 FSBT30910.05 — SHEET No. 3 of 28, 5 28

REVISION INITIALS	
R-3493 NAG/08-18-15 SII/07-25-17	

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

3000D2 PROGRAMMING

# OF TKS/TRANSCEIVERS	2
T1 FREQUENCY	430Hz
T2 FREQUENCY	430Hz
T1 UNI/BIDIRECTIONAL	UNI
T2 UNI/BIDIRECTIONAL	UNI
T1 POWER-MAX/MED	MED
T2 POWER-MAX/MED	MED
T1 PRED/MS	PRED
T2 PRED/MS	PRED
T1 WARNING TIME	30 Sec
T2 WARNING TIME	30 Sec
T1 APPROACH DIST	1000 Ft
T2 APPROACH DIST	1000 Ft
UAX PU DLY (0=OFF)	0 Sec
ENA/UAX PU DLY(0=OFF)	0 Sec
T1 ISL DIST	0 Ft
T2 ISL DIST	0 Ft
# OF DAX'S	2 Ea
DAX A = T1/T2?	TRACK= 1
DAX A DIST	1940 Ft
DAX A WARN TIME	30 Sec
DAX B = T1/T2?	TRACK= 2
DAX B DIST	1940 Ft
DAX B WARN TIME	30 Sec
DAX C = T1/T2?	TRACK=
DAX C DIST	Ft
DAX C WARN TIME	Sec
DAX D = T1/T2?	TRACK=
DAX D DIST	Ft
DAX D WARN TIME	Sec
MASTER?/SLAVE?	MASTER
PASSWORD NO/YES	NO
RECORDER NO/YES	NO

EXPANDED PROGRAMMING

T1-SW TO MS AT 10% OF EZ	
T2-SW TO MS AT 10% OF EZ	
T1-DELAY MS TO GCP	0 Sec
T2-DELAY MS TO GCP	0 Sec
T1 PRIME PRE. OFFSET	0 Ft
T2 PRIME PRE. OFFSET	0 Ft
PRIME PU TIME DELAY	15 Sec
DAX A PU DELAY	15 Sec
DAX B PU DELAY	15 Sec
DAX C PU DELAY	-- Sec
DAX D PU DELAY	-- Sec
ENHANCED DETECT MODE	OFF
BACK-TO-BACK	OFF
STATION STOP TIMER	10 Sec
T1# OF TRK. WIRES 4/6	4
T2# OF TRK. WIRES 4/6	4
LOW EX ADJUSTMENT	0
T1 LOW EZ DETECTION	OFF
T2 LOW EZ DETECTION	OFF
T1 LOW EZ DET. TIMER	10 Min
T2 LOW EZ DET. TIMER	10 Min
T1 POS. START EZ LEVEL	0
T2 POS. START EZ LEVEL	0
T1 POS. START T.O.	0 Min
T2 POS. START T.O.	0 Min
SET AT OPERATION	NORMAL
ADV. PRE.TIMER (0=OFF)	0 Sec

✳ = 1ST SLOT AT LEFT END OF BAY

MODEL 3000 GCP MODULE ASSEMBLIES

MODULES POSITION	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
MODULE NUMBERS	80211-f(1) ✳ ISL	80211-f(2) ISL	80012 T/R 1	80012 T/R 2	80013 RLY DRV	80214 PROCS	80255 REC-INTF	80016 (1) DAX	80016 (2)DAX	80020 +80017
MODULES USED			X	X	X	X		X		X

**

NOTES:

1 - TOGGLE SWITCH ON MOTHER BOARD:
UP = DUAL FREQ.
DOWN = SINGLE FREQ.

** = 80214 & 80255 (WITH JUMPER) CARDS AND E-LEVEL OR LATER SOFTWARE NEEDED FOR SEAR II / ECHELON CAPABILITIES.

INTERRAIL ENGINEERING 18049 INCORPORATED

ALL OUT
THIS SHEET VOID ON PROJECT COMLPETION
DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

3000 GCP SET-UP

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

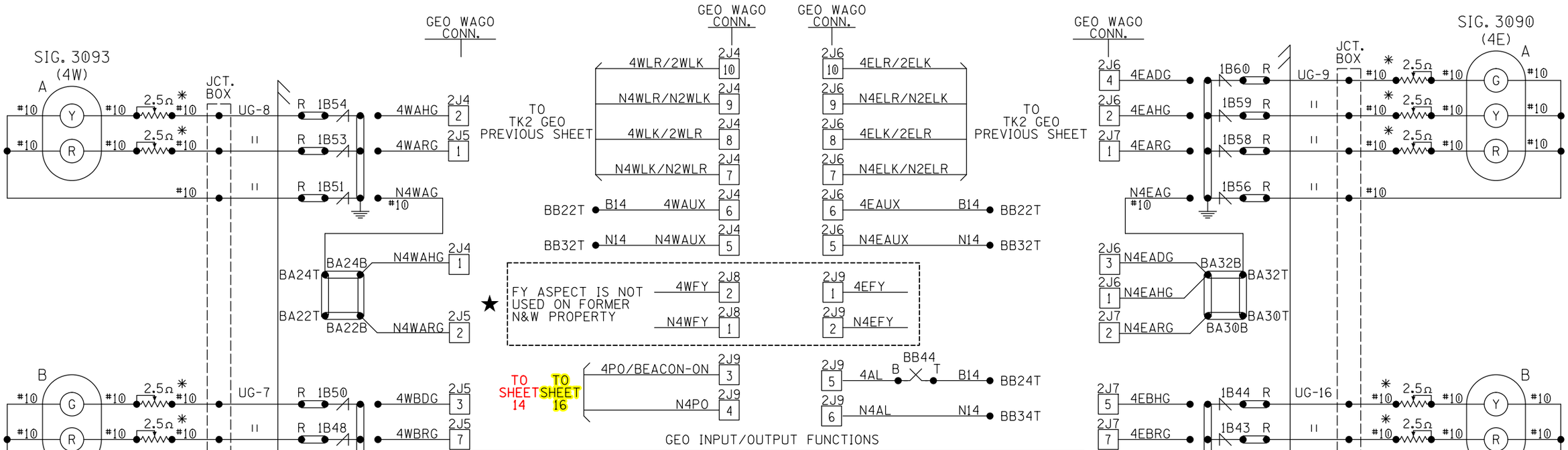
BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT | FILE No. R-1884

CADD or DWG. No. FSBT30910.03V | SHEET No. 3 of 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



NOTES:

1. ALL WIRING TO BE #16 AWG UNLESS SHOWN OTHERWISE.
2. [#] = POSITION IN WAGO CONN.
3. ✳ = ALL LAMP RESISTORS TO BE KEPT AT MINIMUM SETTING. IF THE SIGNAL RUNS ARE VARIED, ADJUST THE LAMP VOLTAGE ON THE GEO CL MODULE TO THE FARTHEST SIGNAL AND USE LAMP RESISTORS TO ADJUST VOLTAGES ON THE NEAR SIGNAL.
4. ★ = ONLY USED FOR FLASHING YELLOW. SEE PROGRAM ON SHEET 11 FOR ADDITIONAL INSTRUCTIONS.

WARNING

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GEO INPUT/OUTPUT FUNCTIONS

INPUT/OUTPUT	DESCRIPTION
4WLK (I)	Input deenergized while in power off approach lighting mode will light West signals.
4WLR (O)	Normally energized in power off approach lighting mode. Used to turn on West signals on adjacent track by deenergizing output when 4ET is occupied or 4EAUX is low.
4ELK (I)	Input deenergized while in power off approach lighting mode will light East signals.
4ELR (O)	Normally energized in power off approach lighting mode. Used to turn on East signals on adjacent track by deenergizing output when 4WT is occupied or 4WAUX is low.
4WAUX (I)	When deenergized - all codes in are disabled, codes 6 and 1 are sent into 4ET and no code is sent into 4WT.
4EAUX (I)	When deenergized - all codes in are disabled, codes 6 and 1 are sent into 4WT and no code is sent into 4ET.
4AL (I)	Approach lighting - (effective only with power off) Energized to enable approach lighting.
4WFY (I)	Aspect on Westbound signal when code 2 is recieved on West track. Energized - Flashing Yellow & Code 7 out East track. Deennergized - Yellow & Code 3 out East track.
4EFY (I)	Aspect on Eastbound signal when code 2 is recieved on East track. Energized - Flashing Yellow & Code 7 out West track. Deennergized - Yellow & Code 3 out West track.

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

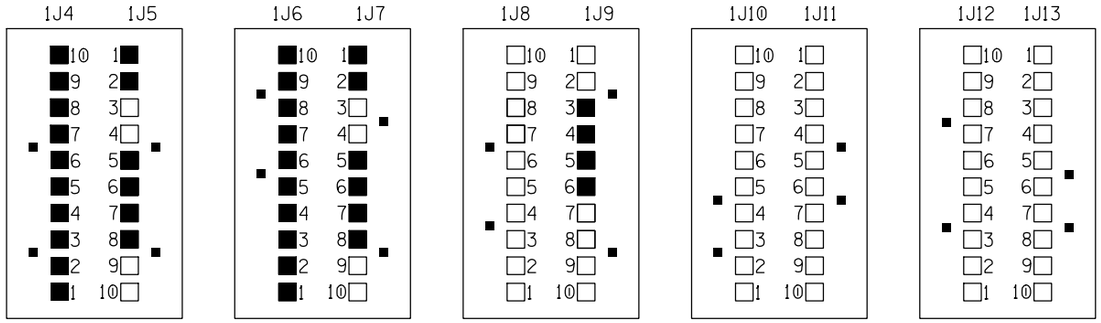
DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

TRACK 4 SIGNAL LIGHTING

DESIGNED BY: RJT 03-28-05	NORFOLK SOUTHERN
DRAWN BY: SSC 03-28-05	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: LAR 03-30-05	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: MAL 12-04-06	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.04 FSBT30910.06 — SHEET No. 4 of 28, 6 28

REVISION INITIALS	
R-3493 NAG/08-18-15 SII/07-25-17	

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



KEYING FINGERS: ■ = CUT

WAGO CONNECTION: ■ = USED

□ = NOT USED

MCF NAME: EGEONSCL002

UCN: 9B4F9F02

SIN: 7000000000000

CRC: DDAC3825

MODULE SOFTWARE VERSIONS

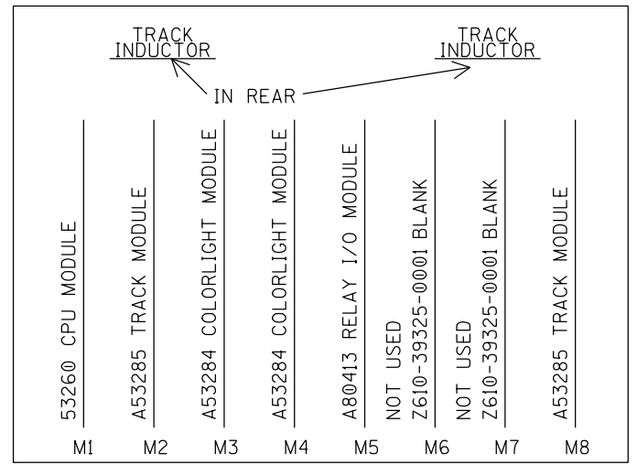
53260 CPU: GEO_00_32.PTC .MEF CRC: 6C06

A53285 TRACK: TRK01_11 .MEF CRC: D3AF

A53284 COLORLIGHT: CLS01_12 .MEF CRC: EFBF

A80413 RELAY I/O: RIO01_06 .MEF CRC: 3433

GEO™
2 TRACK EXTENDED UNIT A53510



GEO A53510 CONNECTOR PINOUTS

PIN	1J4		1J6		1J8		1J10		1J12	
10	VRO +	2WLR	VRO +	2ELR	VRO1 +	2WWL				
9	VRO -	N2WLR	VRO -	N2ELR	VRO1 -	N2WWL				
8	VPI1 +	2WLK	VPI1 +	2ELK	VRO2 +	2EWL				
7	VPI1 -	N2WLK	VPI1 -	N2ELK	VRO2 -	N2EWL				
6	VPI2 +	2WAUX	VPI2 +	2EAUX	VRO3 +					
5	VPI2 -	N2WAUX	VPI2 -	N2EAUX	VRO3 -					
4	LAMP1 +	2WADG	LAMP1 +	2EADG	VRO4 +					
3	LAMP1 -	N2WADG	LAMP1 -	N2EADG	VRO4 -					
2	LAMP2 +	2WAHG	LAMP2 +	2EAHG	VPI1 +	2WFY				
1	LAMP2 -	N2WAHG	LAMP2 -	N2EAHG	VPI1 -	N2WFY				
PIN	1J5		1J7		1J9		1J11		1J13	
1	LAMP3 +	2WARG	LAMP3 +	2EARG	VPI2 +	2EFY				
2	LAMP3 -	N2WARG	LAMP3 -	N2EARG	VPI2 -	N2EFY				
3	LAMP4 +	2WBDG	LAMP4 +	2EBDG	VPI3 +	2PO /BEACON-ON				
4	LAMP4 -	N2WBDG	LAMP4 -	N2EBDG	VPI3 -	N2PO				
5	LAMP5 +	2WBHG	LAMP5 +	2EBHG	VPI4 +	2AL				
6	LAMP5 -	N2WBHG	LAMP5 -	N2EBHG	VPI4 -	N2AL				
7	LAMP6 +	2WBRG	LAMP6 +	2EBRG	N/A +					
8	LAMP6 -	N2WBRG	LAMP6 -	N2EBRG	N/A -					
9	RED RET +		RED RET +		N/A +					
10	RED RET -		RED RET -		N/A -					

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

TRACK 2
2 TRACK EXTENDED UNIT
MODULES AND I/O PINOUTS

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

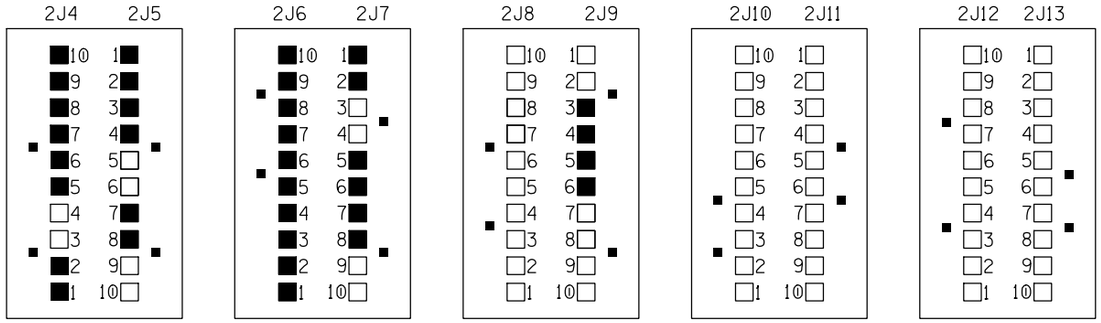
FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.05
FSBT30910.07

SHEET No. 5 of 28
7 28

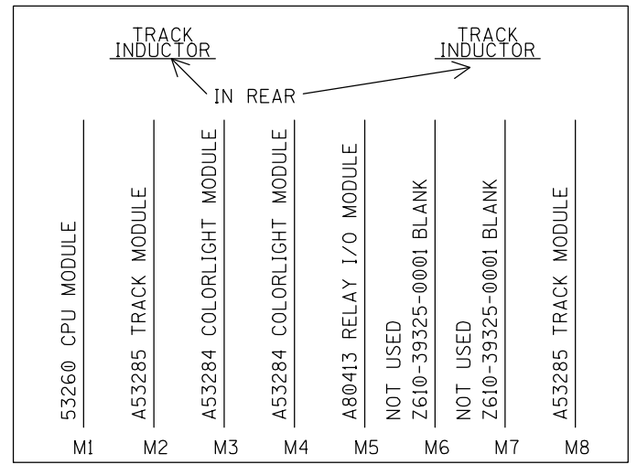
REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17										

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



MCF NAME: EGEONSCL002
UCN: 9B4F9F02
SIN: 7000000000000
CRC: DDAC3825

GEO™
2 TRACK EXTENDED UNIT A53510



KEYING FINGERS: ■ = CUT

WAGO CONNECTION: ■ = USED
□ = NOT USED

MODULE SOFTWARE VERSIONS

53260 CPU: GEO_00_32.PTC .MEF CRC: 6C06

A53285 TRACK: TRK01_11 .MEF CRC: D3AF

A53284 COLORLIGHT: CLS01_12 .MEF CRC: EFBF

A80413 RELAY I/O: RIO01_06 .MEF CRC: 3433

GEO A53510 CONNECTOR PINOUTS

PIN	2J4		2J6		2J8		2J10		2J12	
10	VRO +	4WLR	VRO +	4ELR	VRO1 +	4WWL				
9	VRO -	N4WLR	VRO -	N4ELR	VRO1 -	N4WWL				
8	VPI1 +	4WLK	VPI1 +	4ELK	VRO2 +	4EWL				
7	VPI1 -	N4WLK	VPI1 -	N4ELK	VRO2 -	N4EWL				
6	VPI2 +	4WAUX	VPI2 +	4EAUX	VRO3 +					
5	VPI2 -	N4WAUX	VPI2 -	N4EAUX	VRO3 -					
4	LAMP1 +	4WADG	LAMP1 +	4EADG	VRO4 +					
3	LAMP1 -	N4WADG	LAMP1 -	N4EADG	VRO4 -					
2	LAMP2 +	4WAHG	LAMP2 +	4EAHG	VPI1 +	4WFY				
1	LAMP2 -	N4WAHG	LAMP2 -	N4EAHG	VPI1 -	N4WFY				
PIN	2J5		2J7		2J9		2J11		2J13	
1	LAMP3 +	4WARG	LAMP3 +	4EARG	VPI2 +	4EFY				
2	LAMP3 -	N4WARG	LAMP3 -	N4EARG	VPI2 -	N4EFY				
3	LAMP4 +	4WBDG	LAMP4 +	4EBDG	VPI3 +	4PO /BEACON-ON				
4	LAMP4 -	N4WBDG	LAMP4 -	N4EBDG	VPI3 -	N4PO				
5	LAMP5 +	4WBHG	LAMP5 +	4EBHG	VPI4 +	4AL				
6	LAMP5 -	N4WBHG	LAMP5 -	N4EBHG	VPI4 -	N4AL				
7	LAMP6 +	4WBRG	LAMP6 +	4EBRG	N/A +					
8	LAMP6 -	N4WBRG	LAMP6 -	N4EBRG	N/A -					
9	RED RET +		RED RET +		N/A +					
10	RED RET -		RED RET -		N/A -					

INTERRAIL ENGINEERING INCORPORATED 18049

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

TRACK 4
4 TRACK EXTENDED UNIT
MODULES AND I/O PINOUTS

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.06
FSBT30910.08

SHEET No. 6 of 28
8 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17										

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

CODED TRACK OPERATING PARAMETERS

SLOT 2 (M2)		
PROPERTY	VALUE	UNITS
VCO VOLTAGE	*	mV
RECEIVE	TRUE	
TRANSMIT	TRUE	
CODE 5	ALTERNATING	
EC4 COMPATIBILITY	EC4 PLUS	
NON-VITAL CHANGE	1	CYCLES
VITAL CHANGE	2	CYCLES
SHUNT DROP	2	CYCLES
SHUNT PICK	5	CYCLES
CURRENT LIMIT	*	mA

CODED TRACK OPERATING PARAMETERS

SLOT 8 (M8)		
PROPERTY	VALUE	UNITS
VCO VOLTAGE	*	mV
RECEIVE	TRUE	
TRANSMIT	TRUE	
CODE 5	ALTERNATING	
EC4 COMPATIBILITY	EC4 PLUS	
NON-VITAL CHANGE	1	CYCLES
VITAL CHANGE	2	CYCLES
SHUNT DROP	2	CYCLES
SHUNT PICK	5	CYCLES
CURRENT LIMIT	*	mA

COLORLIGHT OPERATING PARAMETERS

SLOT 3 (M3)		
PROPERTY	VALUE	UNITS
LAMP VOLTAGE	*	mV
FILAMENT THRESHOLD	0	mA
COLD FILAMENT TEST	YES	
VPI DEBOUNCE	20	mS

COLORLIGHT OPERATING PARAMETERS

SLOT 4 (M4)		
PROPERTY	VALUE	UNITS
LAMP VOLTAGE	*	mV
FILAMENT THRESHOLD	0	mA
COLD FILAMENT TEST	YES	
VPI DEBOUNCE	20	mS

RIO OPERATING PARAMETERS

SLOT 5 (M5)		
PROPERTY	VALUE	UNITS
VPI DEBOUNCE	20	mS

CODE 5 COMMENTS

2EGBK OFF = CODE 5 NOT GENERATED OUT EAST TRACK.

2EGBK ON = CODE 5 GENERATED OUT EAST TRACK.

2EGBK ON TK = CODE 5 GENERATED OUT EAST TRACK IF CODE 1 IS RECEIVED FROM WEST TRACK.

2EGBK REPEAT = CODE 5 GENERATED OUT EAST TRACK IF CODE 5 IS RECEIVED FROM WEST TRACK.

2WGBK OFF = CODE 5 NOT GENERATED OUT WEST TRACK.

2WGBK ON = CODE 5 GENERATED OUT WEST TRACK.

2WGBK ON TK = CODE 5 GENERATED OUT WEST TRACK IF CODE 1 IS RECEIVED FROM EAST TRACK.

2WGBK REPEAT = CODE 5 GENERATED OUT WEST TRACK IF CODE 5 IS RECEIVED FROM EAST TRACK.

GENERAL

2WWLNWPOPT = WEST NWP OPTION (ENABLED MEANS THE UNIT MUST SEE BATTERY ON WEST NWP INPUT) ENABLED IS THE DEFAULT.

2EWLNWPOPT = EAST NWP OPTION (ENABLED MEANS THE UNIT MUST SEE BATTERY ON EAST NWP INPUT) ENABLED IS THE DEFAULT.

2WWLNWP = APPLIES TO NWP INPUTS FROM OVERLAY TRACK CIRCUITS ONLY. GEO MUST SEE THE TRACK SHUNTED WITHIN 10 SECONDS OF WEST NWP INPUT GOING LOW IN ORDER TO PERMIT THE STICK TO SET.

2WWLWFD = FALL DOWN TIMER (REMOVAL OF WEST NWP FOR 20 SECONDS WILL OUTPUT 2WLR IF CONDITIONS PERMIT).

2EWLNWP = APPLIES TO NWP INPUTS FROM OVERLAY TRACK CIRCUITS ONLY. GEO MUST SEE THE TRACK SHUNTED WITHIN 10 SECONDS OF WEST NWP INPUT GOING LOW IN ORDER TO PERMIT THE STICK TO SET.

2EWLWFD = FALL DOWN TIMER (REMOVAL OF EAST NWP FOR 20 SECONDS WILL OUTPUT 2ELR IF CONDITIONS PERMIT).

2WWLAUXBK = IF SET TO "OFF" AND WEST NWP INPUT OPENS THE UNIT WILL NOT SEND ANY C5 OUT EITHER DIRECTION. SENDS NO CODE INTO OPEN AUX. AND A CODE 1 & 6 IN THE OPPOSITE DIRECTION.

2EWLAUXBK = IF SET TO "OFF" AND EAST NWP INPUT OPENS THE UNIT WILL NOT SEND ANY C5 OUT EITHER DIRECTION. SENDS NO CODE INTO OPEN AUX. AND A CODE 1 & 6 IN THE OPPOSITE DIRECTION.

2WGAL = WEST POWER OFF APPROACH LIGHT MODE.

2EGAL = EAST POWER OFF APPROACH LIGHT MODE.

2EC3OPT = EAST CODE 3 OUT OPTION. IF CODE 8 RECEIVED FROM WEST, AND OPTION SET FALSE, SENDS CODE 7 OUT EAST TRACK. IF TRUE, SENDS CODE 3 OUT EAST TRACK.

2WC3OPT = WEST CODE 3 OUT OPTION. IF CODE 8 RECIVED FROM EAST, AND OPTION SET FALSE, SENDS CODE 7 OUT WEST TRACK. IF TRUE, SENDS CODE 3 OUT WEST TRACK.

NOTE:

1. * = VALUE TO BE FILLED IN BY FIELD FORCES.

SETUP VITAL OPTIONS

VITAL USER OPTIONS		
USER OPTION	VALUE	UNITS
2EWLNWPOPT	ENABLED	N/A
2WWLNWPOPT	ENABLED	N/A
2EC3OPT	TRUE	N/A
2WC3OPT	TRUE	N/A
VITAL USER TIMERS		
TIMERS	VALUE	UNITS
2EWLNWP	10	SEC
2EWLWFD	20	SEC
2WWLNWP	10	SEC
2WWLWFD	20	SEC

INTERRAIL ENGINEERING INCORPORATED 18049

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10,3208
IRE/JWB/DBS

NON-VITAL USER OPTIONS				
OPTIONS	WEST TRACK (SLOT 2)		EAST TRACK (SLOT 8)	
CODE 5	2WGBK OFF	____	2EGBK OFF	X
	2WGBK ON	____	2EGBK ON	____
	2WGBK ON TRACK	____	2EGBK ON TRACK	____
	2WGBK REPEAT	X	2EGBK REPEAT	____
APPROACH LIGHTING	2WGAL TRUE	X	2EGAL TRUE	X
	2WGAL FALSE	____	2EGAL FALSE	____
AUX BLOCK	2WWLAUXBK OFF	X	2EWLAUXBK OFF	X
	2WWLAUXBK OFF ADJ	____	2EWLAUXBK OFF ADJ	____
	2WWLAUXBK OFF AUX	____	2EWLAUXBK OFF AUX	____
	2WWLAUXBK ON	____	2EWLAUXBK ON	____

GEO TRACK 2 USER OPTIONS AND OPERATING PARAMETERS

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT

FILE No. R-1884

CADD or DWG. No. FSBT30910.07
FSBT30910.09

SHEET No. 7 of 28
9 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

CODED TRACK OPERATING PARAMETERS

SLOT 2 (M2)		
PROPERTY	VALUE	UNITS
VCO VOLTAGE	*	mV
RECEIVE	TRUE	
TRANSMIT	TRUE	
CODE 5	ALTERNATING	
EC4 COMPATIBILITY	EC4 PLUS	
NON-VITAL CHANGE	1	CYCLES
VITAL CHANGE	2	CYCLES
SHUNT DROP	2	CYCLES
SHUNT PICK	5	CYCLES
CURRENT LIMIT	*	mA

CODED TRACK OPERATING PARAMETERS

SLOT 8 (M8)		
PROPERTY	VALUE	UNITS
VCO VOLTAGE	*	mV
RECEIVE	TRUE	
TRANSMIT	TRUE	
CODE 5	ALTERNATING	
EC4 COMPATIBILITY	EC4 PLUS	
NON-VITAL CHANGE	1	CYCLES
VITAL CHANGE	2	CYCLES
SHUNT DROP	2	CYCLES
SHUNT PICK	5	CYCLES
CURRENT LIMIT	*	mA

COLORLIGHT OPERATING PARAMETERS

SLOT 3 (M3)		
PROPERTY	VALUE	UNITS
LAMP VOLTAGE	*	mV
FILAMENT THRESHOLD	0	mA
COLD FILAMENT TEST	YES	
VPI DEBOUNCE	20	mS

COLORLIGHT OPERATING PARAMETERS

SLOT 4 (M4)		
PROPERTY	VALUE	UNITS
LAMP VOLTAGE	*	mV
FILAMENT THRESHOLD	0	mA
COLD FILAMENT TEST	YES	
VPI DEBOUNCE	20	mS

RIO OPERATING PARAMETERS

SLOT 5 (M5)		
PROPERTY	VALUE	UNITS
VPI DEBOUNCE	20	mS

CODE 5 COMMENTS

4EGBK OFF = CODE 5 NOT GENERATED OUT EAST TRACK.

4EGBK ON = CODE 5 GENERATED OUT EAST TRACK.

4EGBK ON TK = CODE 5 GENERATED OUT EAST TRACK IF CODE 1 IS RECEIVED FROM WEST TRACK.

4EGBK REPEAT = CODE 5 GENERATED OUT EAST TRACK IF CODE 5 IS RECEIVED FROM WEST TRACK.

4WGBK OFF = CODE 5 NOT GENERATED OUT WEST TRACK.

4WGBK ON = CODE 5 GENERATED OUT WEST TRACK.

4WGBK ON TK = CODE 5 GENERATED OUT WEST TRACK IF CODE 1 IS RECEIVED FROM EAST TRACK.

4WGBK REPEAT = CODE 5 GENERATED OUT WEST TRACK IF CODE 5 IS RECEIVED FROM EAST TRACK.

GENERAL

4WWLNWPOPT = WEST NWP OPTION (ENABLED MEANS THE UNIT MUST SEE BATTERY ON WEST NWP INPUT) ENABLED IS THE DEFAULT.

4EWLNWPOPT = EAST NWP OPTION (ENABLED MEANS THE UNIT MUST SEE BATTERY ON EAST NWP INPUT) ENABLED IS THE DEFAULT.

4WWLNWP = APPLIES TO NWP INPUTS FROM OVERLAY TRACK CIRCUITS ONLY. GEO MUST SEE THE TRACK SHUNTED WITHIN 10 SECONDS OF WEST NWP INPUT GOING LOW IN ORDER TO PERMIT THE STICK TO SET.

4WWLWFD = FALL DOWN TIMER (REMOVAL OF WEST NWP FOR 20 SECONDS WILL OUTPUT 4WLR IF CONDITIONS PERMIT).

4EWLNWP = APPLIES TO NWP INPUTS FROM OVERLAY TRACK CIRCUITS ONLY. GEO MUST SEE THE TRACK SHUNTED WITHIN 10 SECONDS OF WEST NWP INPUT GOING LOW IN ORDER TO PERMIT THE STICK TO SET.

4EWLWFD = FALL DOWN TIMER (REMOVAL OF EAST NWP FOR 20 SECONDS WILL OUTPUT 4ELR IF CONDITIONS PERMIT).

4WWLAUXBK = IF SET TO "OFF" AND WEST NWP INPUT OPENS THE UNIT WILL NOT SEND ANY C5 OUT EITHER DIRECTION. SENDS NO CODE INTO OPEN AUX. AND A CODE 1 & 6 IN THE OPPOSITE DIRECTION.

4EWLAUXBK = IF SET TO "OFF" AND EAST NWP INPUT OPENS THE UNIT WILL NOT SEND ANY C5 OUT EITHER DIRECTION. SENDS NO CODE INTO OPEN AUX. AND A CODE 1 & 6 IN THE OPPOSITE DIRECTION.

4WGAL = WEST POWER OFF APPROACH LIGHT MODE.

4EGAL = EAST POWER OFF APPROACH LIGHT MODE.

4EC3OPT = EAST CODE 3 OUT OPTION. IF CODE 8 RECEIVED FROM WEST, AND OPTION SET FALSE, SENDS CODE 7 OUT EAST TRACK. IF TRUE, SENDS CODE 3 OUT EAST TRACK.

4WC3OPT = WEST CODE 3 OUT OPTION. IF CODE 8 RECIVED FROM EAST, AND OPTION SET FALSE, SENDS CODE 7 OUT WEST TRACK. IF TRUE, SENDS CODE 3 OUT WEST TRACK.

NOTE:

1. * = VALUE TO BE FILLED IN BY FIELD FORCES.

SETUP VITAL OPTIONS

VITAL USER OPTIONS		
USER OPTION	VALUE	UNITS
4EWLNWPOPT	ENABLED	N/A
4WWLNWPOPT	ENABLED	N/A
4EC3OPT	TRUE	N/A
4WC3OPT	TRUE	N/A
VITAL USER TIMERS		
TIMERS	VALUE	UNITS
4EWLNWP	10	SEC
4EWLWFD	20	SEC
4WWLNWP	10	SEC
4WWLWFD	20	SEC

INTERRAIL ENGINEERING INCORPORATED 18049

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10,3208
IRE/JWB/DBS

NON-VITAL USER OPTIONS				
OPTIONS	WEST TRACK (SLOT 2)		EAST TRACK (SLOT 8)	
CODE 5	4WGBK OFF	____	4EGBK OFF	X
	4WGBK ON	____	4EGBK ON	____
	4WGBK ON TRACK	____	4EGBK ON TRACK	____
	4WGBK REPEAT	X	4EGBK REPEAT	____
APPROACH LIGHTING	4WGAL TRUE	X	4EGAL TRUE	X
	4WGAL FALSE	____	4EGAL FALSE	____
AUX BLOCK	4WWLAUXBK OFF	X	4EWLAUXBK OFF	X
	4WWLAUXBK OFF ADJ	____	4EWLAUXBK OFF ADJ	____
	4WWLAUXBK OFF AUX	____	4EWLAUXBK OFF AUX	____
	4WWLAUXBK ON	____	4EWLAUXBK ON	____

GEO TRACK 4 USER OPTIONS AND OPERATING PARAMETERS

REVISION INITIALS	
R-3493	NAG/08-18-15
	SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

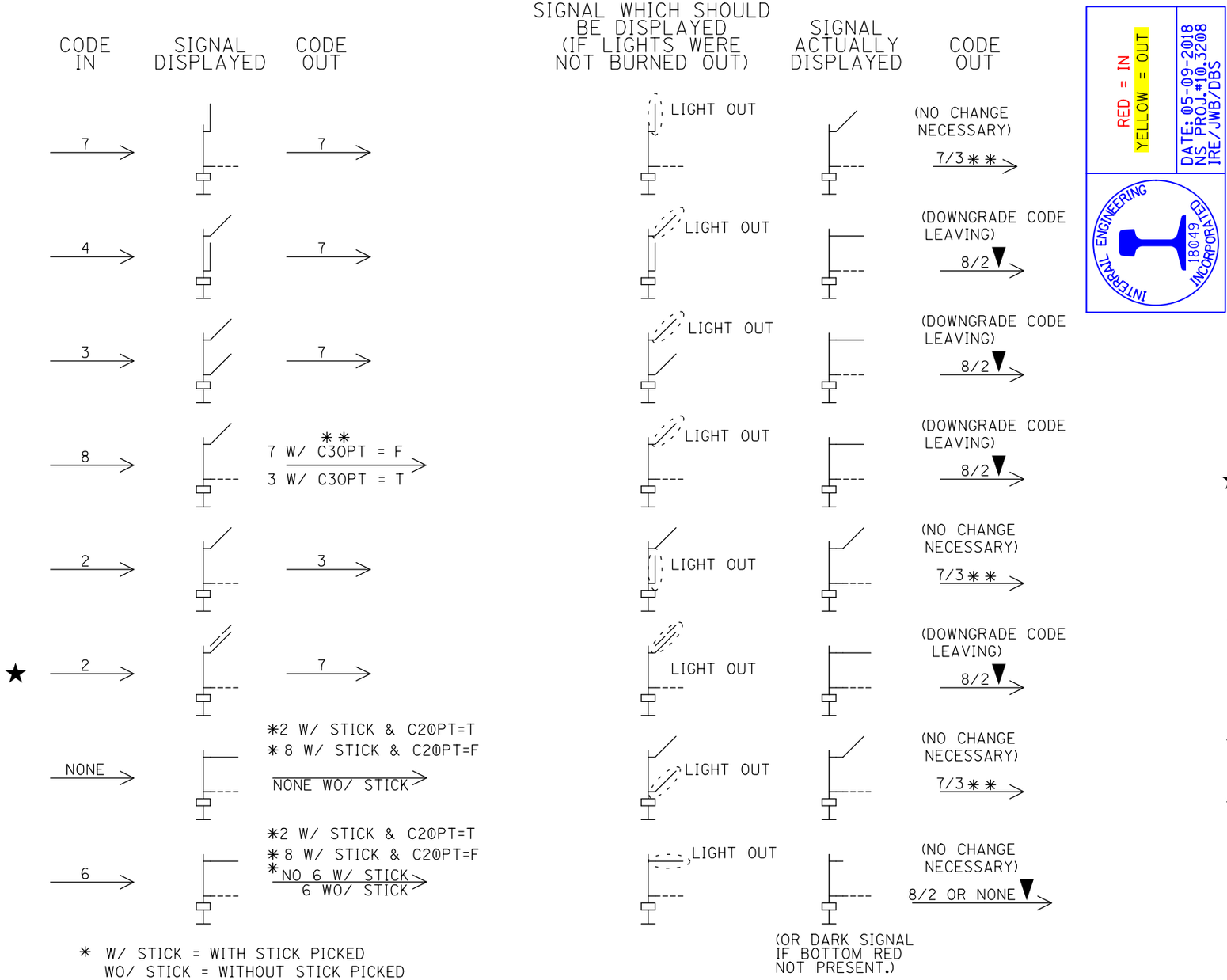
BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT

FILE No. R-1884

CADD or DWG. No. FSBT30910.08
FSBT30910.10

SHEET No. 8 of 28
10 28



* W/ STICK = WITH STICK PICKED
WO/ STICK = WITHOUT STICK PICKED

★ FOR FLASHING YELLOW ASPECT SEE PROGRAM INFORMATION AT RIGHT

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

INTERNATIONAL ENGINEERING INCORPORATED 18049

PROGRAM " EGEONSCL002"

LOGIC IS SYMMETRICAL FOR AUTOMATIC SIGNAL LOCATIONS.

RED ASPECT MAY OR MAY NOT BE PRESENT ON BOTTOM HEAD, IF NOT PRESENT, BOTTOM ASPECT (SHOWN DOTTED) WILL BE DARK WHEN DIAGRAM SHOWS BOTTOM RED ASPECT DISPLAYED.

LOSS OF AN AUX INPUT WILL DISABLE ALL CODES IN AND ALL CODES OUT FOR THAT DIRECTION.

CODES SHOWN IN DIAGRAMS ARE IN ADDITION TO CODE 1, (TRACK CODE), AND POSSIBLY CODE 5, (INDICATION CODE).

A MOVE PAST A PROCEED SIGNAL WILL PICK THE STICK AND SEND OUT A CODE 8 FOR A FOLLOW UP MOVE. AT AN INTERMEDIATE LOCATION, THE OPPOSING SIGNAL WILL REMAIN RED AS LONG AS THE STICK REMAINS PICKED.

THE SYSTEM USES A 10 SECOND LOSS OF SHUNT IN JOINT HOP LOGIC AND ANY VITAL CODES OUT ARE DOWNGRADED TO CODE 8 INTO THE OCCUPIED TRACK.

★ FOR FLASHING YELLOW ASPECT WEST, INSTALL B12 JUMPER TO J8-2 AND N12 JUMPER TO J8-1. FOR FLASHING YELLOW ASPECT EAST, INSTALL B12 JUMPER TO J9-1 AND N12 JUMPER TO J9-2.

SIGNALS ARE CONTINUOUSLY LIT WHEN AC POWER REPEATER INPUT IS PRESENT ACROSS TERMINALS J9-3 & J9-4.

THIS PROGRAM CAN BE USED FOR COLORLIGHT SIGNALS ONLY.

▼ EC20PTOPT - TRUE WILL TRANSMIT CODE 2 OUT EAST TRACK. FALSE WILL TRANSMIT CODE 8 OUT EAST TRACK, WHEN WEST STICK IS PICKED OR SIGNAL DOWNGRADED TO RED.

▼ WC20PTOPT - TRUE WILL TRANSMIT CODE 2 OUT WEST TRACK. FALSE WILL TRANSMIT CODE 8 OUT WEST TRACK, WHEN EAST STICK IS PICKED OR SIGNAL DOWNGRADED TO RED.

** EC3OPT - TRUE WILL TRANSMIT CODE 3 OUT EAST TRACK. FALSE WILL TRANSMIT CODE 7 OUT EAST TRACK, WHEN DISPLAYING WESTBOUND APPROACH SIGNAL.

** WC3OPT - TRUE WILL TRANSMIT CODE 3 OUT WEST TRACK. FALSE WILL TRANSMIT CODE 7 OUT WEST TRACK, WHEN DISPLAYING EASTBOUND APPROACH SIGNAL.

ASPECTS

REVISION INITIALS	
R-3493	NAG/08-18-15
	SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

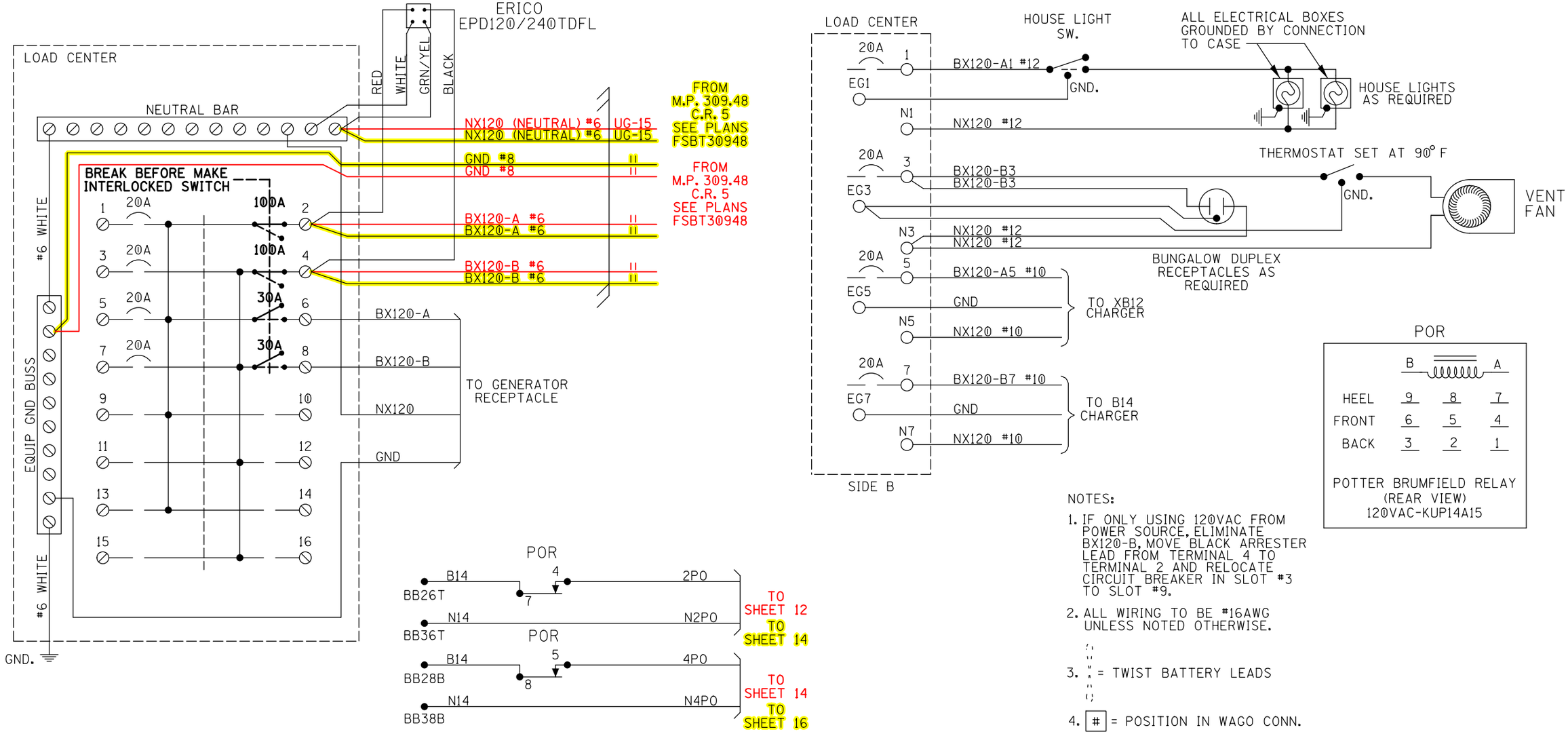
BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT

FILE No. R-1884

CADD or DWG. No. FSBT30910.09
FSBT30910.11

SHEET No. 9 of 28
11 28



NOTES:

1. IF ONLY USING 120VAC FROM POWER SOURCE, ELIMINATE BX120-B, MOVE BLACK ARRESTER LEAD FROM TERMINAL 4 TO TERMINAL 2 AND RELOCATE CIRCUIT BREAKER IN SLOT #3 TO SLOT #9.
2. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
3.) (= TWIST BATTERY LEADS
4. [#] = POSITION IN WAGO CONN.

SQUARE "D" PART NUMBERS:

LOAD CENTER——QO116L125G
100A 2P CIR BKR—QO2100
30A 2P CIR BKR—QO230
MECH INTERLOCK——PK4DTIM4LA

GENERATOR RECEPTACLE:
MALE CONNECTOR - NEMA L1430-FI

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

LOAD CENTER, B14 RECTIFIER & BATTERY

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

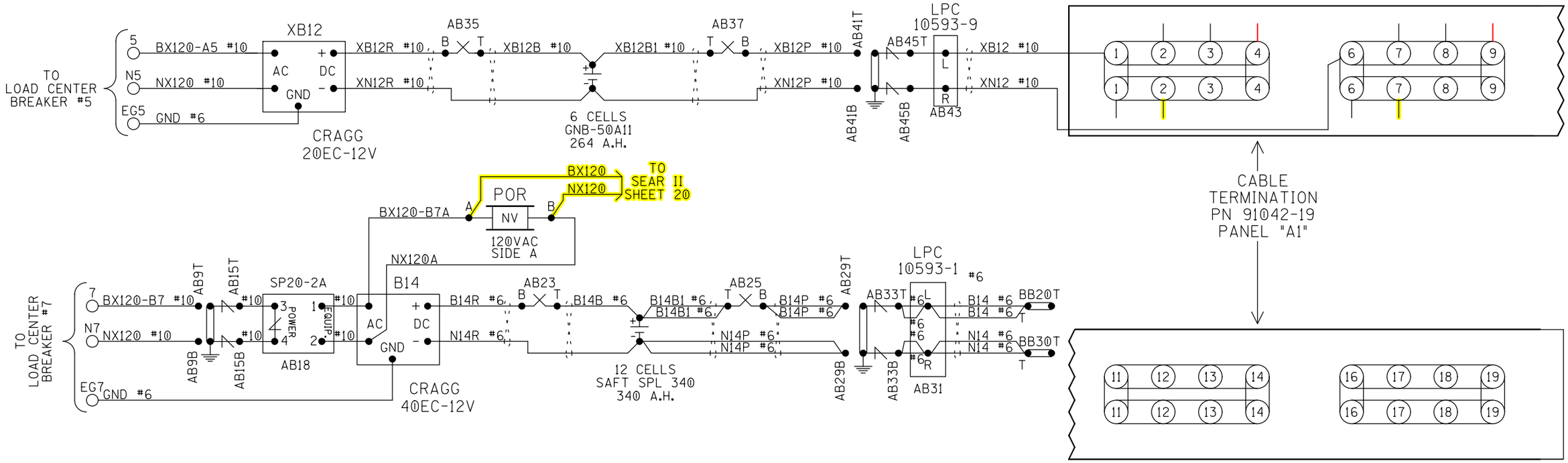
FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.10
FSBT30910.12

SHEET No. 10 of 28
12 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

NOTES:

1. = CLEARVIEW ARRESTER
2. = TWIST BATTERY LEADS

XB12, B14
RECTIFIER AND BATTERY

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

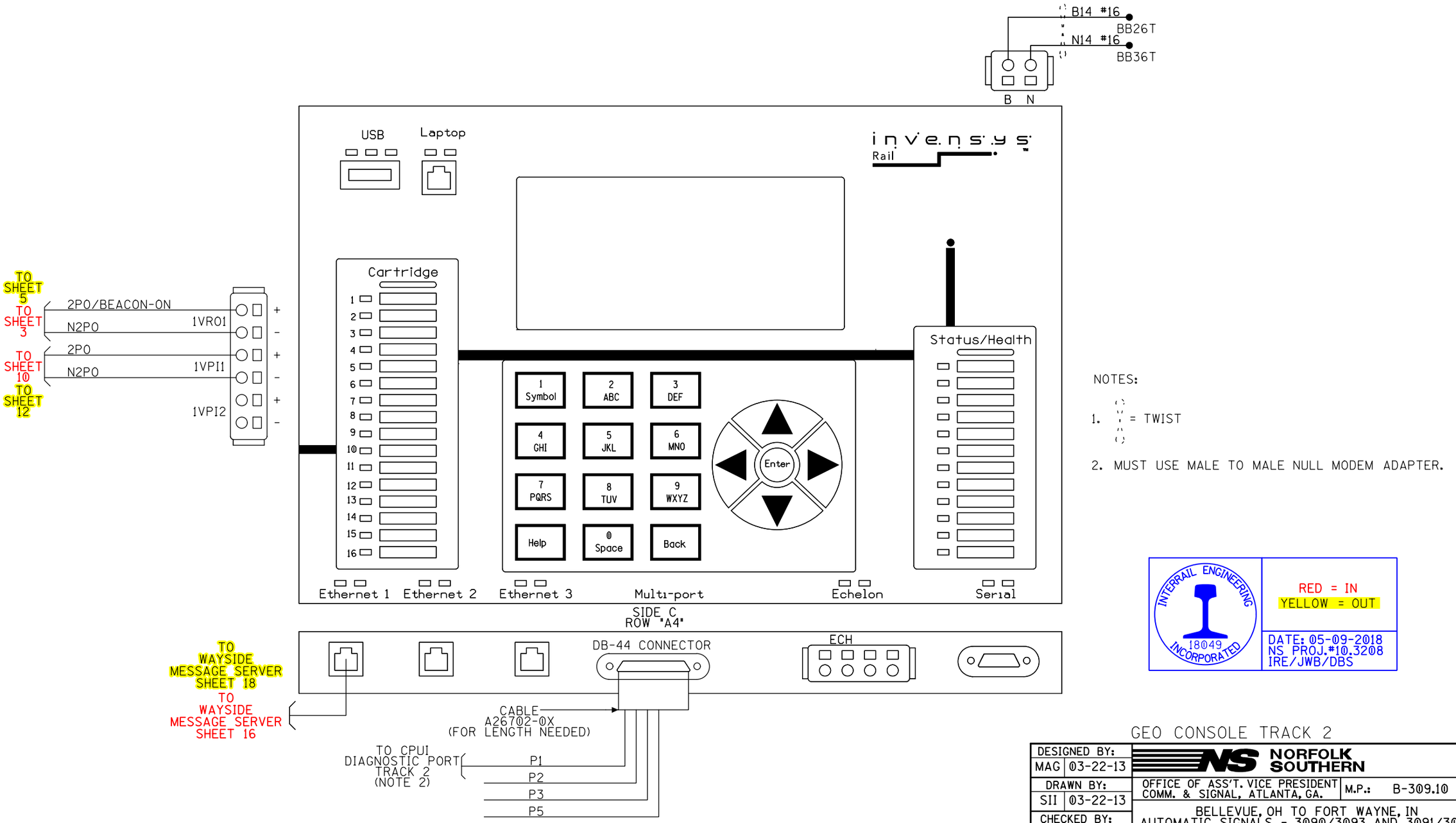
FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.11
FSBT30910.13

SHEET No. 11 of 28
13 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



NOTES:

1. = TWIST

2. MUST USE MALE TO MALE NULL MODEM ADAPTER.

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

GEO CONSOLE TRACK 2

DESIGNED BY: MAG 03-22-13	NORFOLK SOUTHERN
DRAWN BY: SII 03-22-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: SEK 06-12-13	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: NAG 08-18-15	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.12 FSBT30910.14 — SHEET No. 12 of 28 14 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

INTERRAIL ENGINEERING
18049
INCORPORATED

RED = IN
YELLOW = OUT

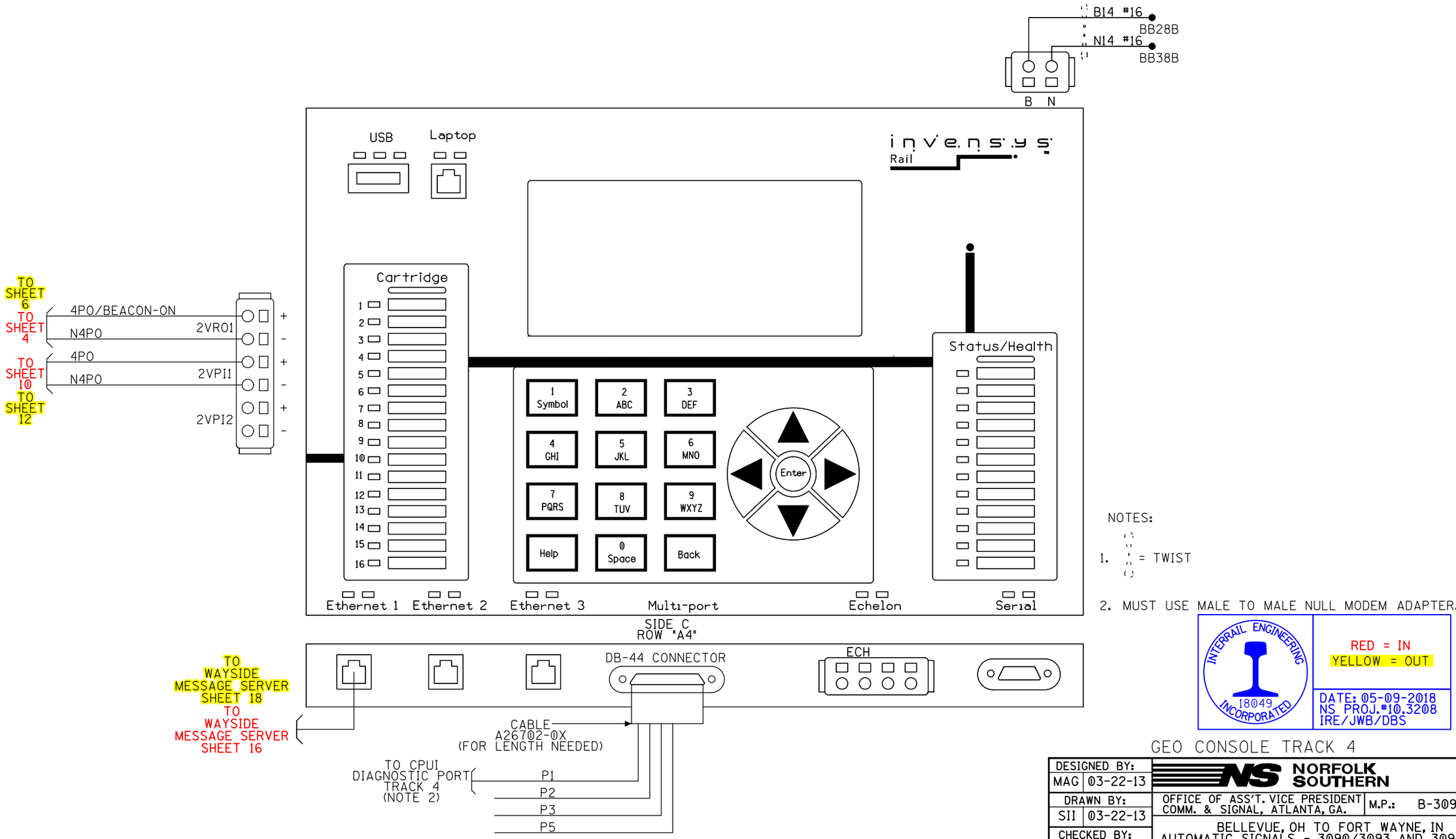
DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

GEO CONSOLE TRACK 2 PROGRAMMING

DESIGNED BY: MAG 03-22-13	NORFOLK SOUTHERN
DRAWN BY: SII 03-22-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: SEK 06-12-13	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: NAG 08-18-15	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.13 FSBT30910.15 — SHEET No. 13 of 28 15 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



NOTES:

1. = TWIST

2. MUST USE MALE TO MALE NULL MODEM ADAPTER.

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

GEO CONSOLE TRACK 4

DESIGNED BY:	
MAG	03-22-13
DRAWN BY:	
SII	03-22-13
CHECKED BY:	
SEK	06-12-13
IN SERVICE:	
NAG	08-18-15

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.14 FSBT30910.16

SHEET No. 14 of 28 16 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

INTERRAIL ENGINEERING
18049
INCORPORATED

RED = IN
YELLOW = OUT

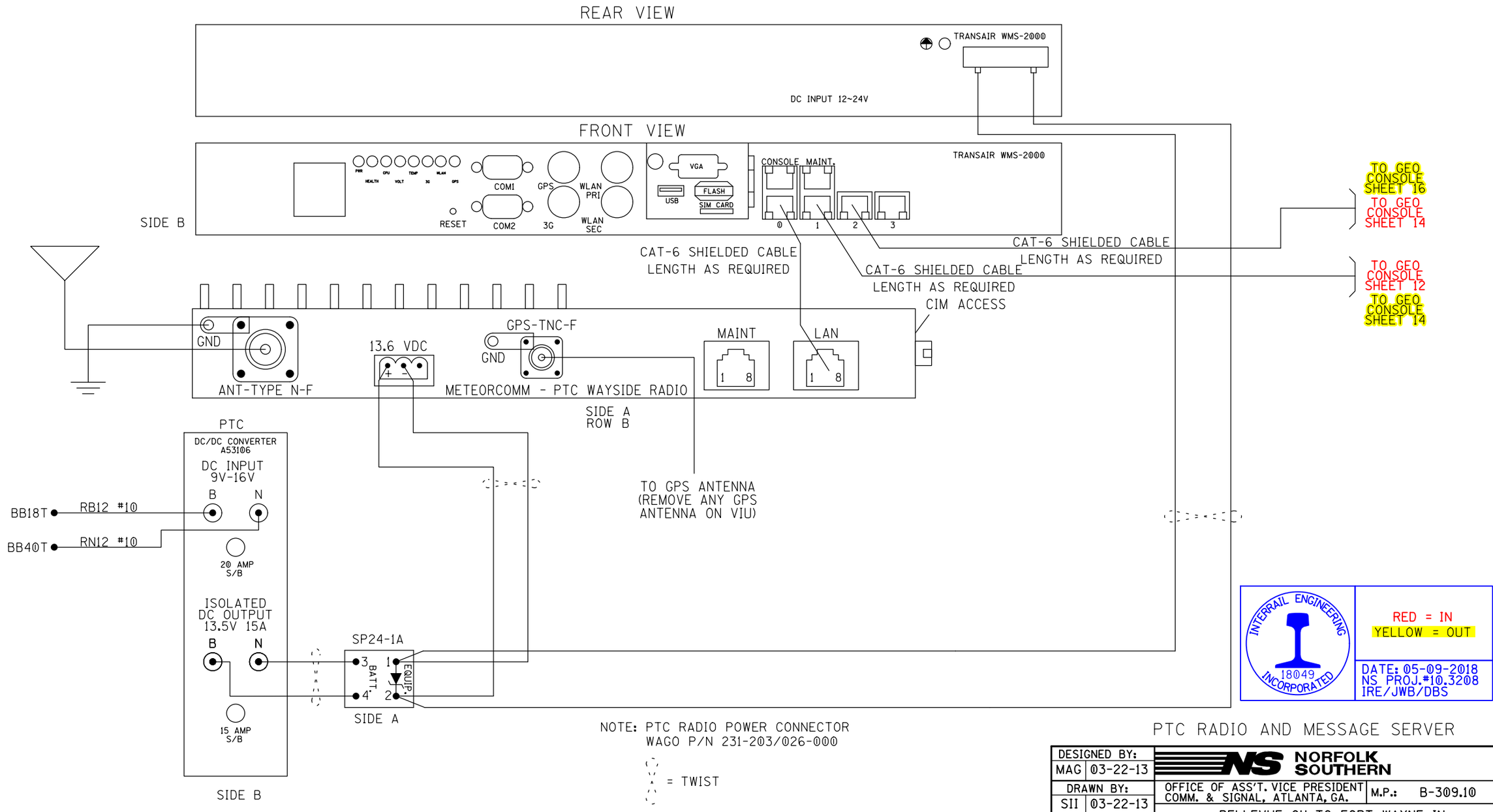
DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

GEO CONSOLE TRACK 4 PROGRAMMING

DESIGNED BY: MAG 03-22-13	NORFOLK SOUTHERN
DRAWN BY: SII 03-22-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: SEK 06-12-13	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: NAG 08-18-15	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.15 FSBT30910.17 — SHEET No. 15 of 28 17 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

PTC RADIO AND MESSAGE SERVER

DESIGNED BY: MAG 03-22-13	NORFOLK SOUTHERN
DRAWN BY: SII 03-22-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: SEK 06-12-13	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: NAG 08-18-15	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.16 FSBT30910.18 — SHEET No. 16 of 28 18 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

COMPONENT	PARAMETER	CONFIGURABLE IN	VALUE	
WIU	WIU ADDRESS	FIELD OR BACK OFFICE	550.629.107.01	
WIU	HMAC KEY	FIELD OR BACK OFFICE	TBD	
WIU	PTC CONFIG CRC	FIELD OR BACK OFFICE	TBD	
WIU	BROADCAST RATE	FIELD OR BACK OFFICE	1000 MS	*
WIU	BroadcastOnChange (EVENT DRIVEN)	FIELD OR BACK OFFICE	NO	*
WIU	BeaconContinuous	FIELD OR BACK OFFICE	1	*
WIU	BeaconBitTime	FIELD OR BACK OFFICE	300 SEC	*
WIU	BeaconEnd	FIELD OR BACK OFFICE	120 SEC	*
WIU	MaxBeaconInterval	FIELD OR BACK OFFICE	DISABLED	*
WIU	EMP HEADER SOURCE ADDRESS	FIELD	TBD	
WIU	CLASS C MULTICAST ADDRESS	FIELD	239.255.0.5	*
WIU	CLASS C PORT ADDRESS	FIELD	32768	*
WIU	EMP DEST ADDRESS	FIELD	TBD	
WIU	TTL BEACON	FIELD OR BACK OFFICE	12 SEC	*
WIU	TTL RESPONSE TO GET WIU STATUS	FIELD OR BACK OFFICE	12 SEC	*
WIU	FLAGS BEACON	FIELD OR BACK OFFICE	00001001	
WIU	FLAGS RESPONSE TO GET WIU STATUS	FIELD OR BACK OFFICE	00010001	
WIU	QOS BEACON	FIELD OR BACK OFFICE	1656	
WIU	QOS RESPONSE TO GET WIU STATUS	FIELD OR BACK OFFICE	3576	
WIU	CLASS D MODE	FIELD OR BACK OFFICE	BIDIRECTIONAL	*
WIU	AG IP ADDRESS (CLASS D)	FIELD OR BACK OFFICE	10.255.255.210	*
WIU	AG PORT (CLASS D)	FIELD OR BACK OFFICE	8001	*

CONFIGURABLE PARAMETERS SUMMARY

COMPONENT	PARAMETER	CONFIGURABLE IN	VALUE	
WIU	CLASS D KEEP ALIVE INTERVAL	FIELD OR BACK OFFICE	9000ms	*
WIU	CLASS D ACKNOWLEDGEMENT TIMEOUT	FIELD OR BACK OFFICE	3000ms	*
WIU	CLASS D NAK RETRY COUNT	FIELD OR BACK OFFICE	2	*
WIU	CLASS D RETRANSMIT DELAY	FIELD OR BACK OFFICE	2000ms	*
WIU	CLASS D CONNECT ATTEMPT TIMEOUT	FIELD OR BACK OFFICE	1000ms	*
WIU	CLASS D CONNECT ATTEMPT DELAY	FIELD OR BACK OFFICE	1000ms	*
WIU	CLASS D CONNECT ATTEMPT RETRY COUNT	FIELD OR BACK OFFICE	-1	*
WIU	CLASS D RECONNECT ATTEMPT RETRY COUNT	FIELD OR BACK OFFICE	-1	*
WIU	CLASS D DATA ACK ENABLED	FIELD OR BACK OFFICE	YES	*
WIU	CLASS D LOG TRAFFIC	FIELD OR BACK OFFICE	NO	*
WIU	TIME MESSAGES BEFORE SENDING WSM	FIELD OR BACK OFFICE	5	*
WIU	TIME MESSAGE DEVIATION	FIELD OR BACK OFFICE	1 SEC	*
WIU	IGNORED TIME DIFFERENCE	FIELD OR BACK OFFICE	3 SEC	*
WIU	MAXIMUM SECONDS TIME CHANGE	FIELD OR BACK OFFICE	3 SEC	*
WIU	MAXIMUM TIME CHANGE WITHIN MINUTES	FIELD OR BACK OFFICE	60 MIN	*
WIU	LRM MAXIMUM SECONDS TIME DIFFERENCE	FIELD OR BACK OFFICE	3 SEC	*
WIU	NO TIME SYNC MESSAGE	FIELD OR BACK OFFICE	6 MIN	*

CONFIGURABLE PARAMETERS SUMMARY (CONTINUED)

* = DEFAULT VALUE

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

PTC RADIO CONFIGURABLE PARAMETERS

DESIGNED BY:	
MAG	03-22-13
DRAWN BY:	
SII	03-22-13
CHECKED BY:	
SEK	06-12-13
IN SERVICE:	
NAG	08-18-15

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. | M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

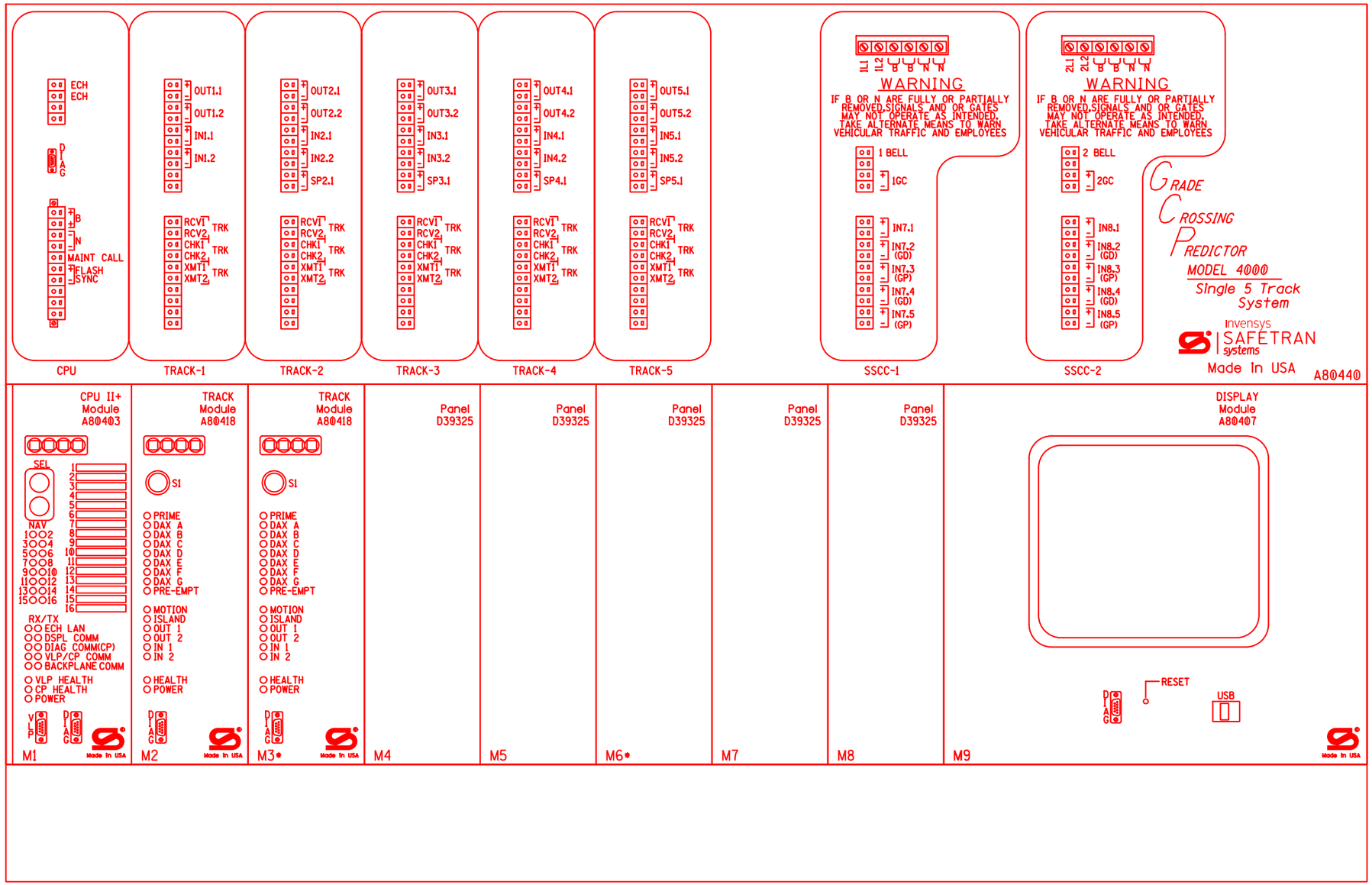
FOSTORIA DISTRICT | FILE No. R-1884

CADD or DWG. No. FSBT30910.17
FSBT30910.19

SHEET No. 17 of 28
19 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



WARNING

REMOVAL OF THE SSCCIIII MODULE WILL CAUSE THE GATE(S) TO DROP BUT THE LIGHTS WILL NOT ACTIVATE

CAUTION

ASSURE CORRECT POLARITY OF THE SSCCIIII MODULE OR SEVERE DAMAGE WILL OCCUR.

INTERRAIL ENGINEERING 18049 INCORPORATED

NEW SHEET
RED = IN

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

ATTENTION!

ENSURE THE DISPLAY MODULE HEATER IS DISABLED. LEAVING THE DISPLAY HEATER ENABLED WILL REDUCE THE AMOUNT OF BATTERY STANDBY TIME IN THE EVENT OF AN AC POWER FAILURE.

HEATER FUNCTION IS JUMPER SELECTABLE ON THE DISPLAY MODULE BOARD.
THREE OPTIONS ARE AVAILABLE:
NORMAL LCD HTR (DEFAULT)
HI CURRENT
NO JUMPER (HEATER DISABLED)

* = MAIN AND STANDBY MAY USE RIO IN TRACK 2 SLOTS (M3 AND M6)

4000 GCP 5-TK CHASSIS & MODULE LAYOUT

DESIGNED BY: JWB	05-09-18
DRAWN BY: IRE	05-09-18
CHECKED BY: DBS	05-10-18
IN SERVICE:	- -

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10

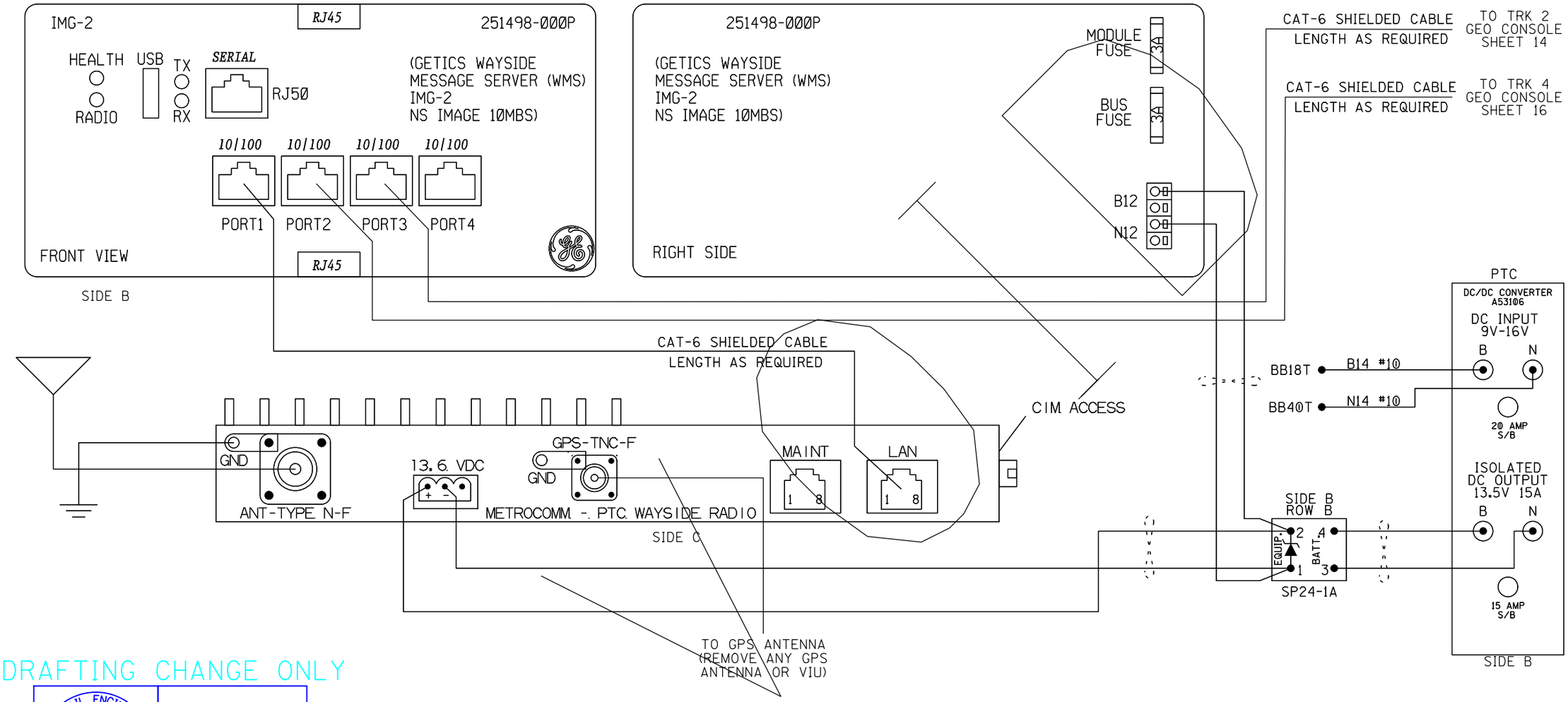
BELLEVUE TO FORT WAYNE
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT — FILE No. R-1884

CADD or DWG. No. FSBT30910.18 — SHEET No. 18 of 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



DRAFTING CHANGE ONLY

INTERRAIL ENGINEERING
18049
INCORPORATED

THIS SHEET
VOID ON PROJECT
COMLPETION

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

NOTE: PTC RADIO AND WMS POWER CONNECTOR
WAGO P/N 231-203/026-000

= TWIST

PTC RADIO AND MESSAGE SERVER

DESIGNED BY: MAG 03-22-13	NORFOLK SOUTHERN
DRAWN BY: SII 03-22-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: SEK 06-12-13	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: NAG 08-18-15	FOSTORIA DISTRICT — FILE No. R-3493
	CADD or DWG. No. FSBT30910.18AV — SHEET No. 18 of 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

Program Report

Location and SIN

DOT Number: 0000000R
Milepost Number: B309-48
Site Name: REMOTE LOCATION

SIN: 7620100010016

MCF and Template Selection

MCF Name: GCP-T6X-02-1.mcf
MCF Revision: 021
MCFCRC: 6076E435

Template = 4A:6 Remotes

Check Numbers

Office Check No. (DT 4.6.0): 393D9227
Office Check Number: 393D9227
Config. Check Number: 537B44AA
(Based on MCF Revision 021)

Program

BASIC: module configuration
Track 1 Slot = Track
Track 2/RIO 1 Slot = Track
Track 3 Slot = Not Used
Track 4 Slot = Not Used
Track 5/RIO 2 Slot = Not Used
Track 6/RIO 3 Slot = Not Used
SSCC-1 Slot = Not Used
SSCC-2 Slot = Not Used
SEAR Used = No

BASIC: MS/GCP operation
Track 1 : MS/GCP Operation = Yes
Track 2 : MS/GCP Operation = Yes

BASIC: Island operation
Track 1 : Island Used = No
Track 2 : Island Used = No

BASIC: radio Dax links
Radio DAX link A Used = No
Radio DAX link B Used = No

BASIC: Vital Comms links
Vital Comms link 1 Used = No
Vital Comms link 2 Used = No

PREDICTORS: track 1
Track 1 : Prime Used = No
Track 1 : Dax A Used = Yes
Track 1 : Dax B Used = No
Track 1 : Dax C Used = No
Track 1 : Dax D Used = No
Track 1 : Dax E Used = No
Track 1 : Dax F Used = No
Track 1 : Dax G Used = No

PREDICTORS: track 2
Track 2 : Prime Used = No
Track 2 : Dax A Used = Yes
Track 2 : Dax B Used = No
Track 2 : Dax C Used = No
Track 2 : Dax D Used = No
Track 2 : Dax E Used = No
Track 2 : Dax F Used = No
Track 2 : Dax G Used = No

GCP: track 1
Track 1 : GCP Freq Category = Standard
Track 1 : GCP Frequency = 430 Hz
Track 1 : Approach Distance = 1118 ft
Track 1 : Uni/Bi/Sim-Bidirnl = Unidirnl
Track 1 : GCP Transmit Level = Medium
Track 1 : Island Connection = No Islands
Track 1 : Island Distance = 0 ft
Track 1 : Computed Distance = 9999 ft
Track 1 : Linearization Steps = 100

GCP: track 1 enhanced det
Track 1 : Inbound PS Sensitivity = Off
Track 1 : Speed Limiting Used = Yes
Track 1 : Outbound False Act Lvl = Normal
Track 1 : Outbound PS Timer = 20 sec
Track 1 : Trailing Switch Logic = On
Track 1 : Post Joint Detn Time = 15 sec
Track 1 : Adv Appr Predn = No
Track 1 : Cancel Pickup Delay = This Isl

GCP: track 1 Dax A
Track 1 : Dax A Warning Time = 30 sec
Track 1 : Dax A Offset Distance = 1969 ft
Track 1 : Switch MS EZ Level = 0
Track 1 : Pickup Delay Mode = Auto
Track 1 : Dax A MS/GCP Mode = Pred
Track 1 : Dax A Pickup Delay = 15 sec
Track 1 : Dax A Enable = Not Used

GCP: track 1 pos start
Track 1 : Positive Start = Off
Track 1 : Sudden Shnt Det Used = No
Track 1 : Low EZ Detection Used = No

GCP: track 1 MS Control
Track 1 : MS/GCP Ctrl IP Used = No
Track 1 : MS Sensitivity Level = 0
Track 1 : Compensation Level = 1300
Track 1 : Warn Time-Ballast Comp = Low
Track 1 : Low EX Adjustment = 39
Track 1 : Bidirn Dax Passthru = No
Track 1 : False Act on Train Stop = No
Track 1 : EX Limiting Used = Yes
Track 1 : EZ Correction Used = Yes

GCP: track 2
Track 2 : GCP Freq Category = Standard
Track 2 : GCP Frequency = 430 Hz
Track 2 : Approach Distance = 1118 ft
Track 2 : Uni/Bi/Sim-Bidirnl = Unidirnl
Track 2 : GCP Transmit Level = Medium
Track 2 : Island Connection = No Islands
Track 2 : Island Distance = 0 ft
Track 2 : Computed Distance = 9999 ft
Track 2 : Linearization Steps = 100

GCP: track 2 enhanced det
Track 2 : Inbound PS Sensitivity = Off
Track 2 : Speed Limiting Used = Yes
Track 2 : Outbound False Act Lvl = Normal
Track 2 : Outbound PS Timer = 20 sec
Track 2 : Trailing Switch Logic = On
Track 2 : Post Joint Detn Time = 15 sec
Track 2 : Adv Appr Predn = No
Track 2 : Cancel Pickup Delay = This Isl

GCP: track 2 Dax A
Track 2 : Dax A Warning Time = 30 sec
Track 2 : Dax A Offset Distance = 1969 ft
Track 2 : Switch MS EZ Level = 0
Track 2 : Pickup Delay Mode = Auto
Track 2 : Dax A MS/GCP Mode = Pred
Track 2 : Dax A Pickup Delay = 15 sec
Track 2 : Dax A Enable = Not Used

GCP: track 2 pos start
Track 2 : Positive Start = Off
Track 2 : Sudden Shnt Det Used = No
Track 2 : Low EZ Detection Used = No

GCP: track 2 MS Control
Track 2 : MS/GCP Ctrl IP Used = No
Track 2 : MS Sensitivity Level = 0
Track 2 : Compensation Level = 1300
Track 2 : Warn Time-Ballast Comp = Low
Track 2 : Low EX Adjustment = 39
Track 2 : Bidirn Dax Passthru = No
Track 2 : False Act on Train Stop = No
Track 2 : EX Limiting Used = Yes
Track 2 : EZ Correction Used = Yes

AND: track Anding
AND 1 XR Used = No
AND 2 Used = No
AND 3 Used = No
AND 4 Used = No
AND 5 Used = No
AND 6 Used = No
AND 7 Used = No
AND 8 Used = No

ADVANCED: MS restart
MS/GCP Restart Used = No

ADVANCED: out of service
OOS Control = Display+OOS IPs
OOS Timeout = Yes
OOS Timeout = 1 hrs

ADVANCED: out of service 2
T1 OOS Control = OOS Input 1
T2 OOS Control = OOS Input 1

ADVANCED: track wrap circuits
Wrap LOS Timer = 5 sec
Track 1 Wrap Used = No
Track 2 Wrap Used = No

ADVANCED: trk 1 overrides
Track 1 : All Predictors Override Used = No
Track 1 : Dax A Override Used = No

ADVANCED: trk 2 overrides
Track 2 : All Predictors Override Used = No
Track 2 : Dax A Override Used = No

ADVANCED: OR logic
OR 1 Used = No
OR 2 Used = No
OR 3 Used = No
OR 4 Used = No

ADVANCED: Internal I/O 1
Pass Thrus = No
Int.1 Sets = Not Used
Int.1 Set by = Not Used
Int.2 Sets = Not Used
Int.2 Set by = Not Used
Int.3 Sets = Not Used
Int.3 Set by = Not Used
Int.4 Sets = Not Used
Int.4 Set by = Not Used

ADVANCED: Internal I/O 2
Int.5 Sets = Not Used
Int.5 Set by = Not Used
Int.6 Sets = Not Used
Int.6 Set by = Not Used
Int.7 Sets = Not Used
Int.7 Set by = Not Used
Int.8 Sets = Not Used
Int.8 Set by = Not Used

ADVANCED: Internal I/O 3
Int.9 Sets = Not Used
Int.9 Set by = Not Used
Int.10 Sets = Not Used
Int.10 Set by = Not Used
Int.11 Sets = Not Used
Int.11 Set by = Not Used
Int.12 Sets = Not Used
Int.12 Set by = Not Used

ADVANCED: Internal I/O 4
Int.13 Sets = Not Used
Int.13 Set by = Not Used
Int.14 Sets = Not Used
Int.14 Set by = Not Used
Int.15 Sets = Not Used
Int.15 Set by = Not Used
Int.16 Sets = Not Used
Int.16 Set by = Not Used

ADVANCED: site options
Daylight Savings = Off
Units = Standard
Maint Call Rpt IP Used = No
Emergency Activate IP = No
EZ/EX Logging = Change
EZ/EX Point Change = 3

OUTPUT: assignment page 1
OUT 1.1 = T1 Dax A
OUT 1.2 = Not Used
OUT 2.1 = T2 Dax A
OUT 2.2 = Not Used

INPUT: assignment page 1
IN 1.1 = Not Used
IN 1.2 = Out Of Service IP 1
IN 2.1 = Not Used
IN 2.2 = Not Used

SITE: programming
Radio Subnode = 1
Field Password = Off
Low Battery Enabled = Off

Configuration Package File

Filename: FSBT30910.pac

INTERRAIL ENGINEERING 18049 INCORPORATED

NEW SHEET
RED = IN

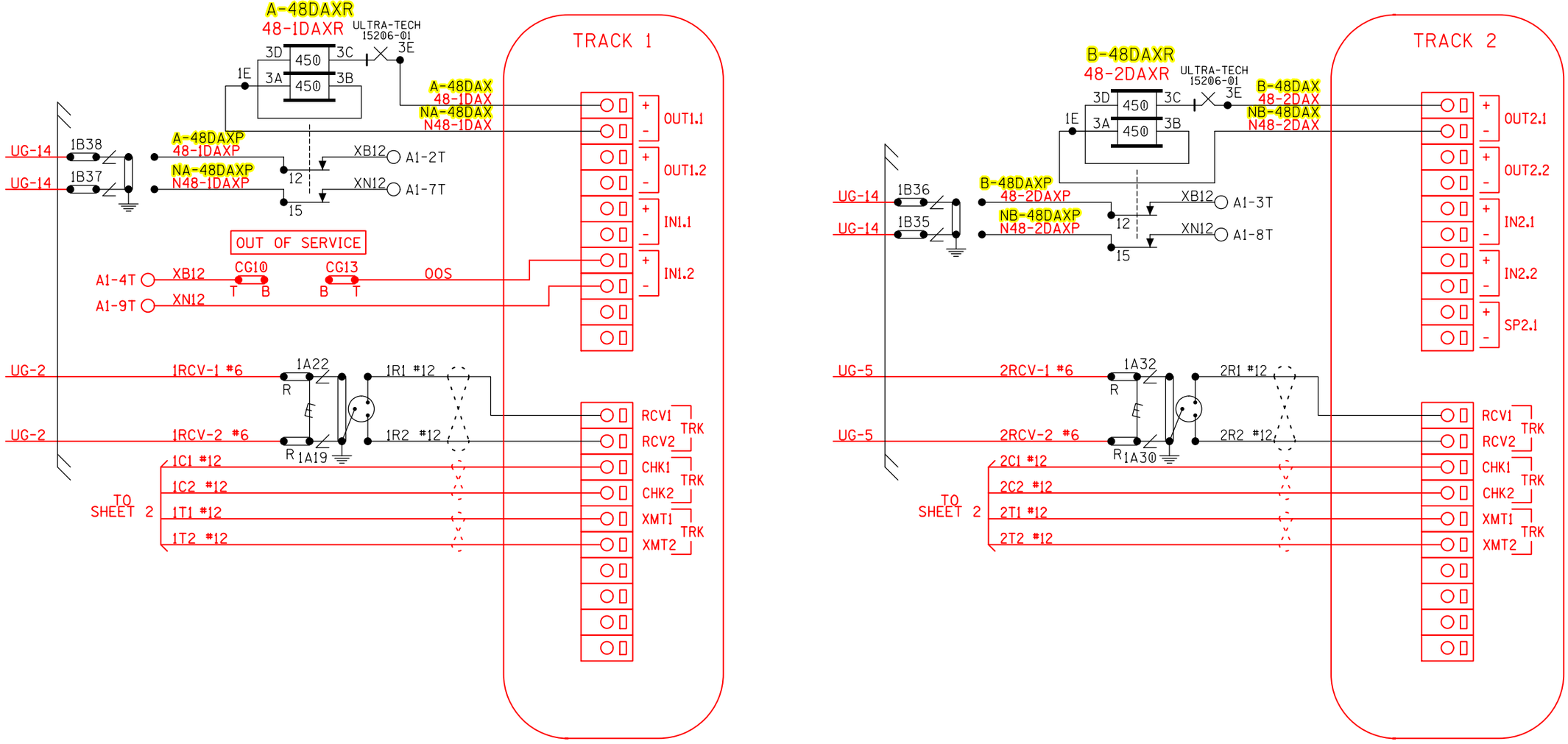
DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

4000 GCP PROGRAMMING SETUP

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: DBS 05-10-18	BELLEVUE TO FORT WAYNE AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.19 — SHEET No. 19 of 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



INTERRAIL ENGINEERING 18049 INCORPORATED

NEW SHEET
RED = IN
YELLOW = OUT
BLACK = EXISTING

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

NOTES:
ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.

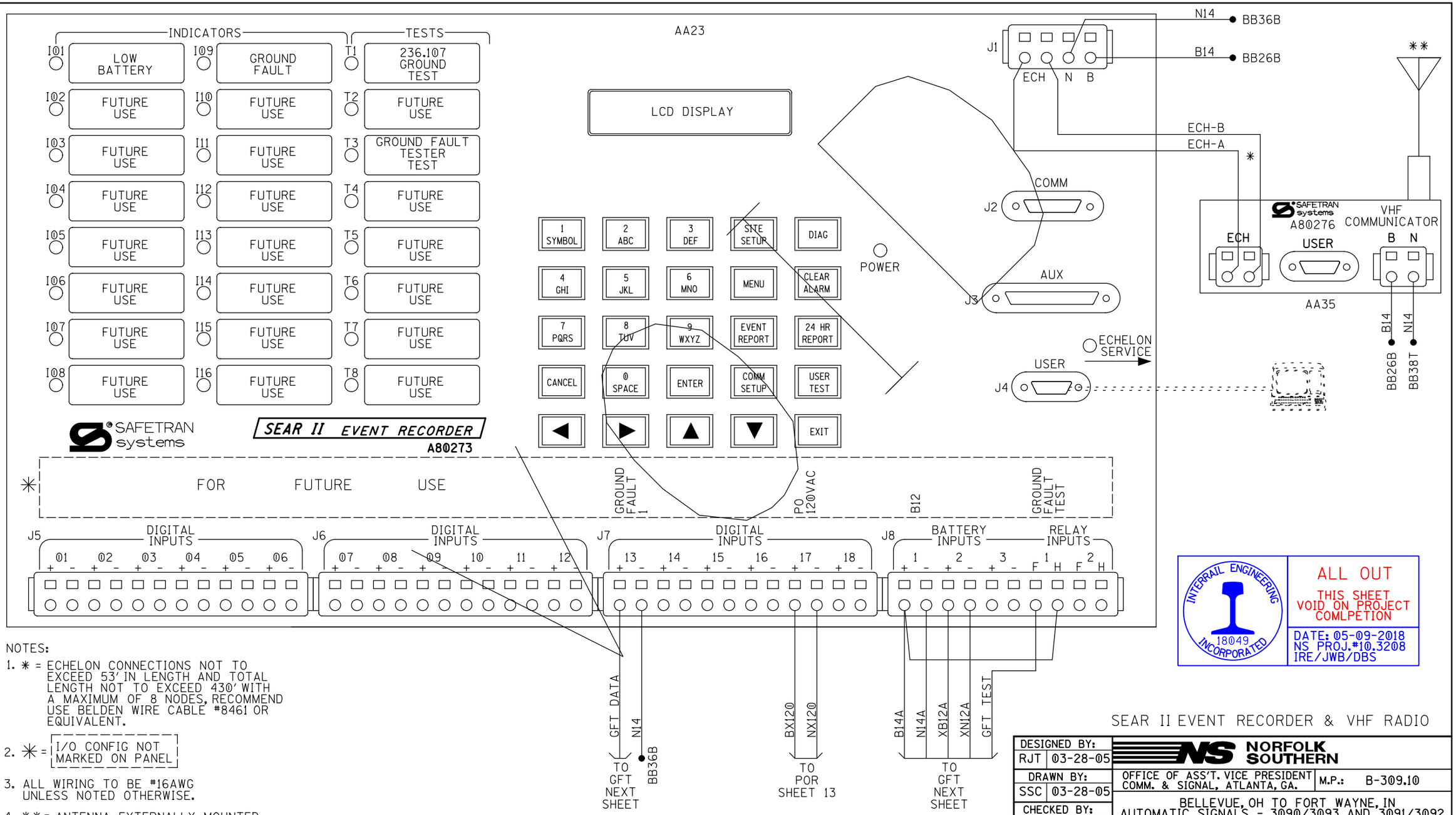
= TWIST

CONNECTORS FOR TRACK MODULES

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: DBS 05-10-18	BELLEVUE TO FORT WAYNE AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.20 — SHEET No. 20 of 28

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



NOTES:

1. ✳ = ECHELON CONNECTIONS NOT TO EXCEED 53′ IN LENGTH AND TOTAL LENGTH NOT TO EXCEED 430′ WITH A MAXIMUM OF 8 NODES, RECOMMEND USE BELDEN WIRE CABLE #8461 OR EQUIVALENT.
2. ✳ = I/O CONFIG NOT MARKED ON PANEL
3. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
4. ✳✳ = ANTENNA EXTERNALLY MOUNTED.

INTERRAIL ENGINEERING 18049 INCORPORATED

ALL OUT
THIS SHEET VOID ON PROJECT COMLPETION
DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

SEAR II EVENT RECORDER & VHF RADIO

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

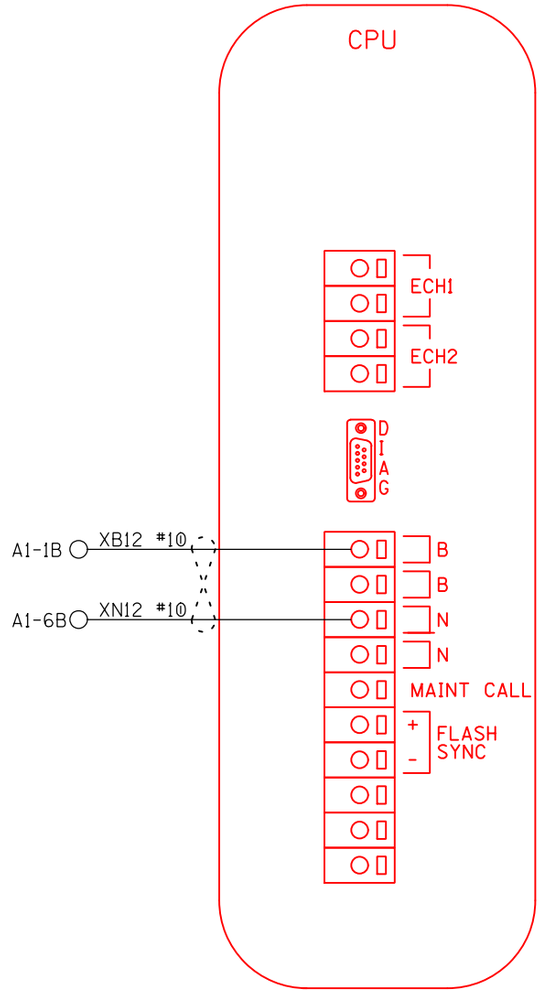
BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.20V SHEET No. 20 of 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



= TWIST

INTERRAIL ENGINEERING 18049 INCORPORATED

NEW SHEET

RED = IN
BLACK = EXISTING

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

CONNECTORS FOR CPU MODULE

DESIGNED BY: JWB 05-09-18	NORFOLK SOUTHERN
DRAWN BY: IRE 05-09-18	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: DBS 05-10-18	BELLEVUE TO FORT WAYNE AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: - -	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.21 — SHEET No. 21 of 28

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

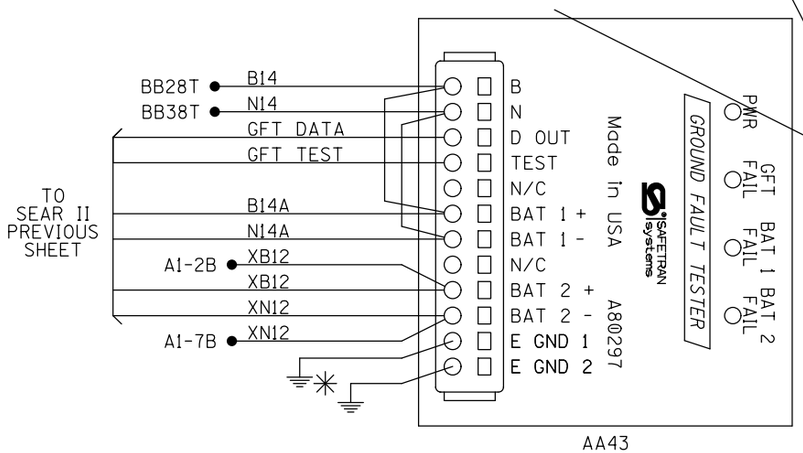
SITE SET UP PROCEDURE	
FUNCTION	LED DISPLAY
DATE	- -
TIME	:
DAYLIGHT SAVINGS TIME	
SITE NAME	SIGNAL 3090-3093
DOT NUMBER	N/A
MILEPOST	B-309.10
HOP ALARMS ?	NO HOP ALARMS

CPC PROTOCOL	02
ADDRESS IDENT. DIGIT	7
ADDRESS LENGTH	14
RAILROAD NUMBER	550
UNIT ADDRESS	LLLGGG
NODE NUMBER	SS
DEVICE NUMBER	01

✳✳

CONTROL SYSTEM CONFIGURATION MENU QUESTIONS	
THE QUESTION	SELECT FROM MENU OPTION
GROUND FAULT TESTERS?	YES
FUTURE USE	FUTURE USE
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"
"	"

VERIFY THE BATTERY SUPPLY VOLTAGES	
B14 BATTERY VOLTAGE AT SEAR II BATT INPUT 1	VOLT 1: .
XB12 BATTERY VOLTAGE AT SEAR II BATT INPUT 2	VOLT 2: .



AA43

NOTES:

1. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
2. ✳ = CONNECT "E GND 1" AND "E GND 2" TO INDEPENDENT GROUND POINTS ON SIDE A AND SIDE B.
3. ✳✳ = LLL = CODE LINE
   GGG = LOCATION NUMBER
   SS = SUBNODE NUMBER

INTERRAIL ENGINEERING 18049 INCORPORATED

ALL OUT
THIS SHEET VOID ON PROJECT COMLPETION

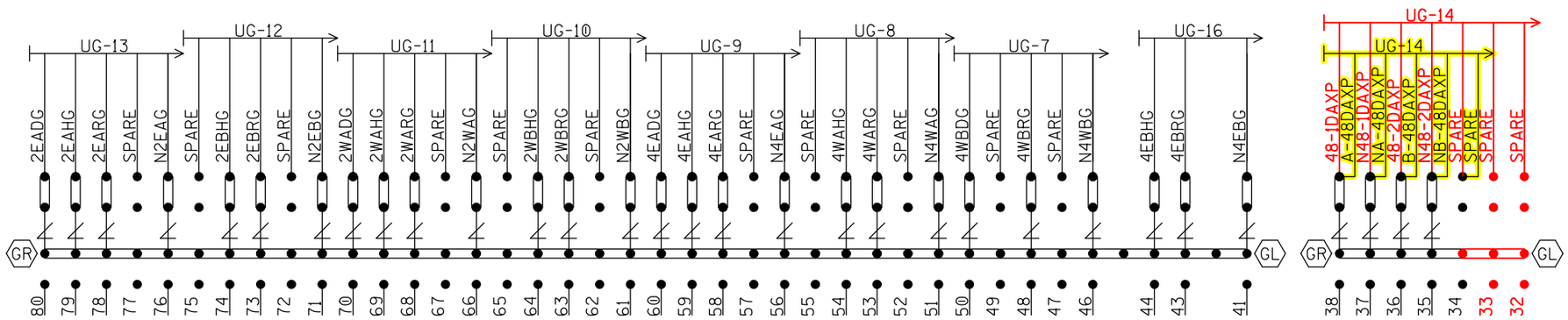
DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

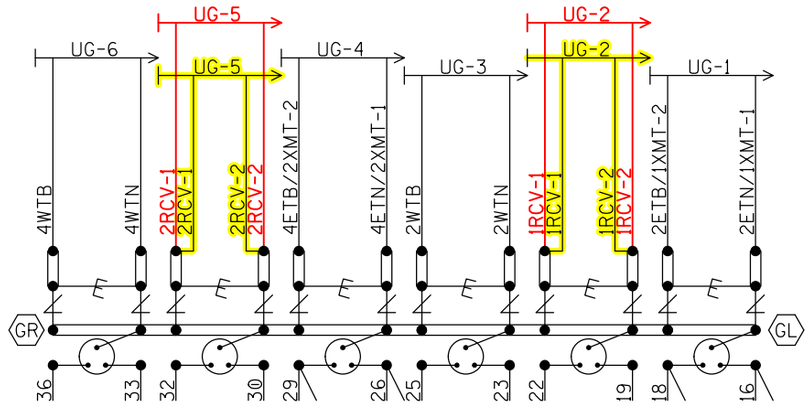
SEAR II SET UP CHART
AND GROUND FAULT TESTER

DESIGNED BY:		NORFOLK SOUTHERN	
RJT	03-28-05		
DRAWN BY:		OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: B-309.10
SSC	03-28-05		
CHECKED BY:		BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092	
LAR	03-30-05		
IN SERVICE:		FOSTORIA DISTRICT	FILE No. R-1884
MAL	12-04-06	CADD or DWG. No. FSBT30910.21V	SHEET No. 21 of 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.





INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

NOTE: INSTALL TEST LINKS ON ALL TRACK WIRES AND ON ALL LOW VOLTAGE UNDERGROUND CABLE TERMINATIONS.

SEE FARADAY SHIELD DETAILS - 1A & 1B FOR HOW THIS PORTION OF THE FARADAY SHIELD IS PREDRILLED. ONLY INSTALL AND USE THE TERMINALS NEEDED.

= Heavy Duty Equalizer (022700-1X)

= Clearview Lightning Arrester (022585-1X)

= LPC-10560-51

GR / GL = TERMINALS GROUNDED TO SHIELD. 4 POST BLOCKS USE EITHER - GR - SERMMI PART NO. 61278 GL - SERMMI PART NO. 61278-1.

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

BACKBOARD DETAIL - 1A & 1B

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

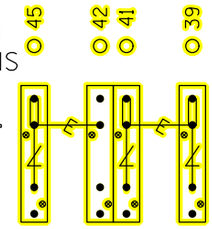
FOSTORIA DISTRICT — FILE No. R-1884

CADD or DWG. No. FSBT30910.22 — SHEET No. 22 of 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

NOTE: IF THE FARADAY SHIELD WOULD EVER NEED TO BE DRILLED IN THE FIELD, PROPER PRECAUTIONS MUST BE TAKEN TO INSURE METAL SHAVINGS DO NOT GET INTO EXISTING TERMINALS/WIRES.

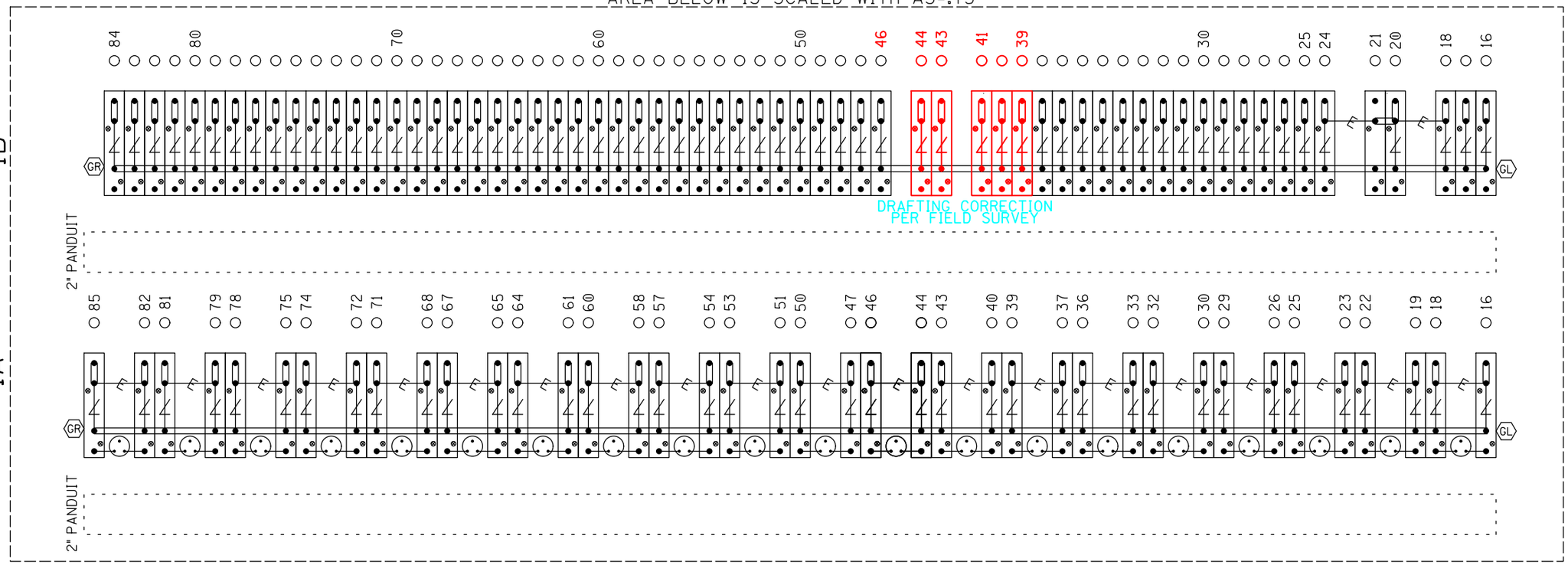


INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

AREA BELOW IS SCALED WITH AS=.75



= Heavy Duty Equalizer (022700-1X)

Clearview = Lightning Arrester (022585-1X)

= LPC-10560-51

TERMINAL BOARD 1
LEFT TWO ROWS
FARADAY SHIELD DETAIL - 1A & 1B

= INDICATES PLACEMENT OF PANDUIT

THIS SHEET IS FOR REFERENCE ONLY, TO REFLECT HOW THE FARADAY SHIELD IS PREDRILLED. ONLY INSTALL AND USE THE TERMINALS NEEDED.

GR / GL = TERMINALS GROUNDED TO SHIELD. 4 POST BLOCKS USE EITHER - GR - SERMMI PART NO. 61278 GL - SERMMI PART NO. 61278-1.

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY: RJT	03-28-05
DRAWN BY: SSC	03-28-05
CHECKED BY: LAR	03-30-05
IN SERVICE: MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT

FILE No. R-1884

CADD or DWG. No. FSBT30910.23

SHEET No. 23 of 28

NOTE: IF THE FARADAY SHIELD WOULD EVER NEED TO BE DRILLED IN THE FIELD, PROPER PRECAUTIONS MUST BE TAKEN TO INSURE METAL SHAVINGS DO NOT GET INTO EXISTING TERMINALS/WIRES.

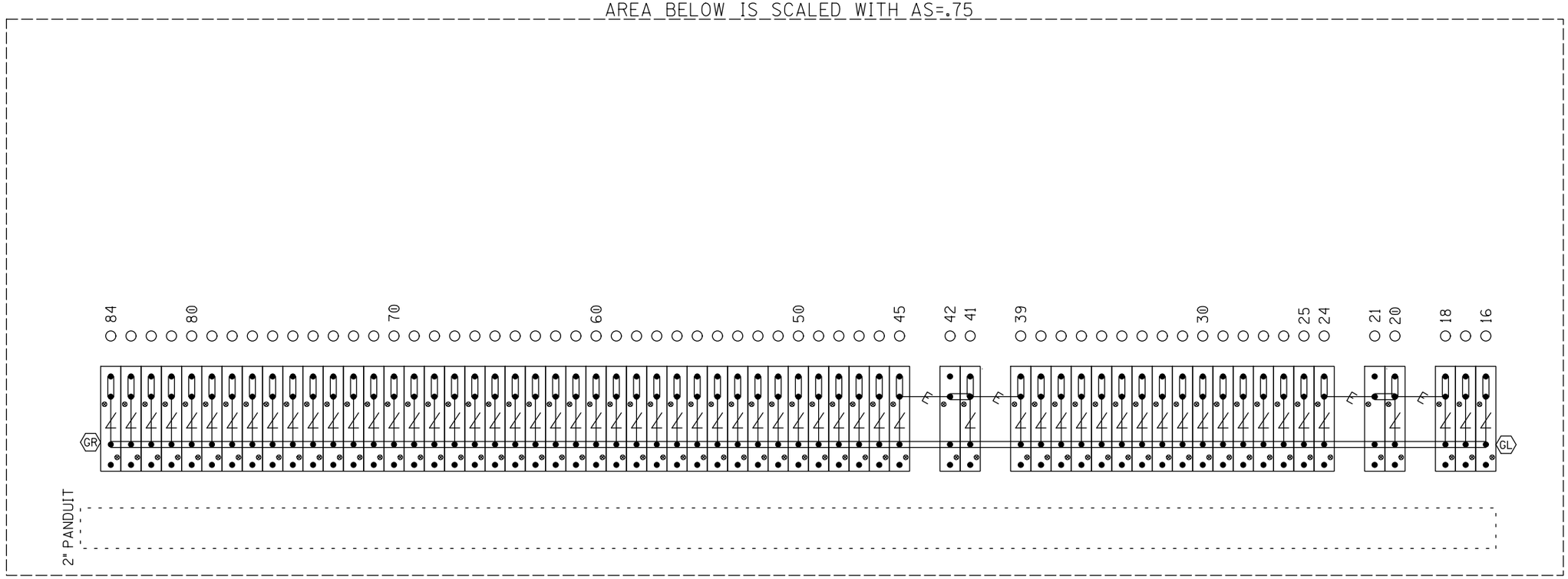
INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10,3208
IRE/JWB/DBS

AREA BELOW IS SCALED WITH AS=.75

TERMINAL BOARD 1
RIGHT HALF
"1C"



= Heavy Duty Equalizer (022700-1X)

Clearview = Lightning Arrester (022585-1X)

= LPC-10560-51

TERMINAL BOARD 1
RIGHT ROW
FARADAY SHIELD DETAIL - 1C

= INDICATES PLACEMENT OF PANDUIT

THIS SHEET IS FOR REFERENCE ONLY, TO REFLECT HOW THE FARADAY SHIELD IS PREDRILLED. ONLY INSTALL AND USE THE TERMINALS NEEDED.

GR / GL = TERMINALS GROUNDED TO SHIELD. 4 POST BLOCKS USE EITHER - GR - SERMMI PART NO. 61278 GL - SERMMI PART NO. 61278-1.

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

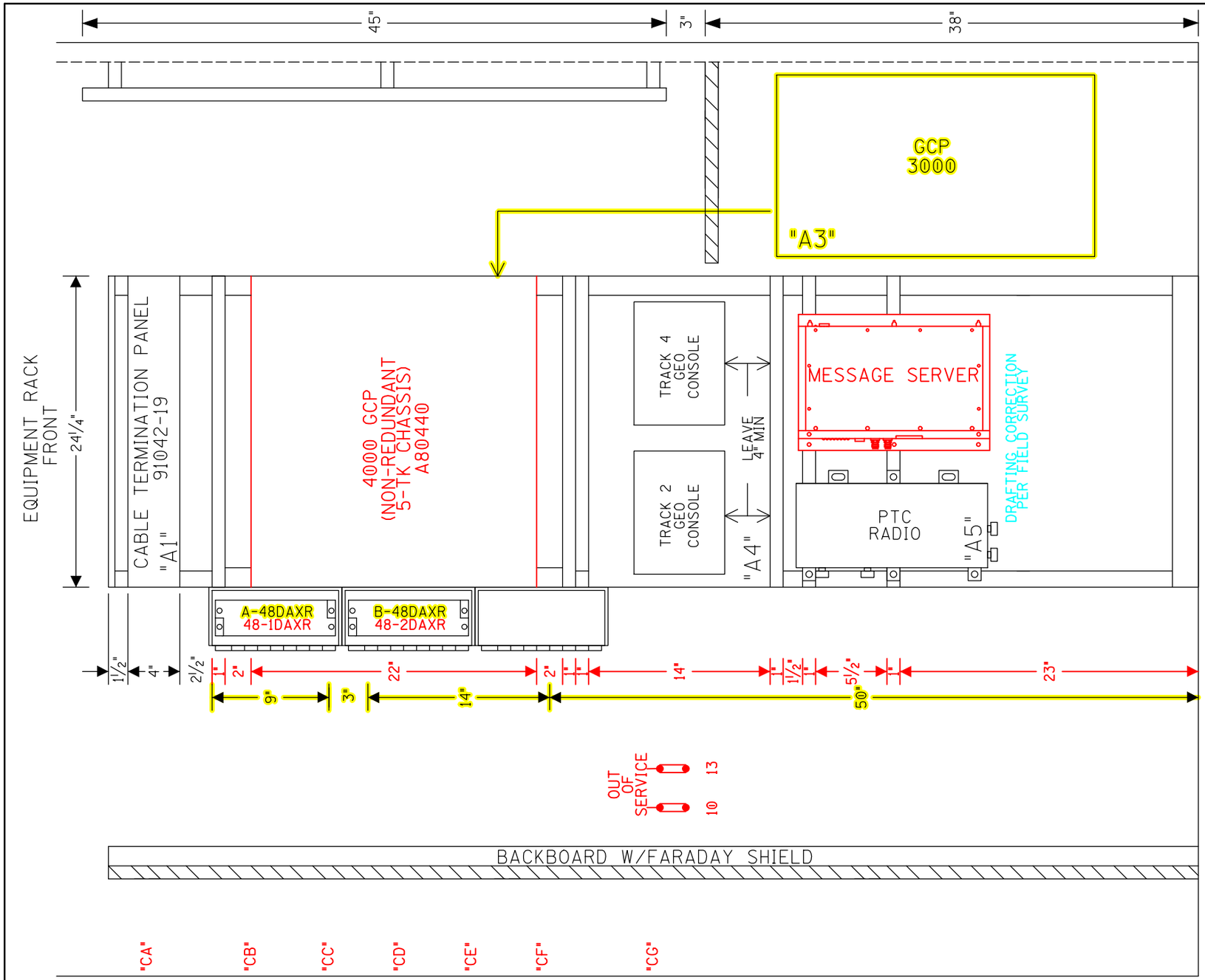
BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

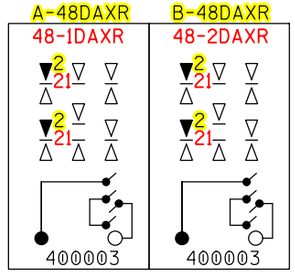
FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.24 SHEET No. 24 of 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.





SAFETRAN, ALSTOM (GRS)
RELAY CROSS REFERENCE LIST

SAFETRAN		ALSTOM (GRS)
400003	—	A62-308

SIDE "C"

INTERRAIL ENGINEERING
18049
INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

RACK PLACEMENT
6' X 6' HOUSE - SIDE "C"

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10

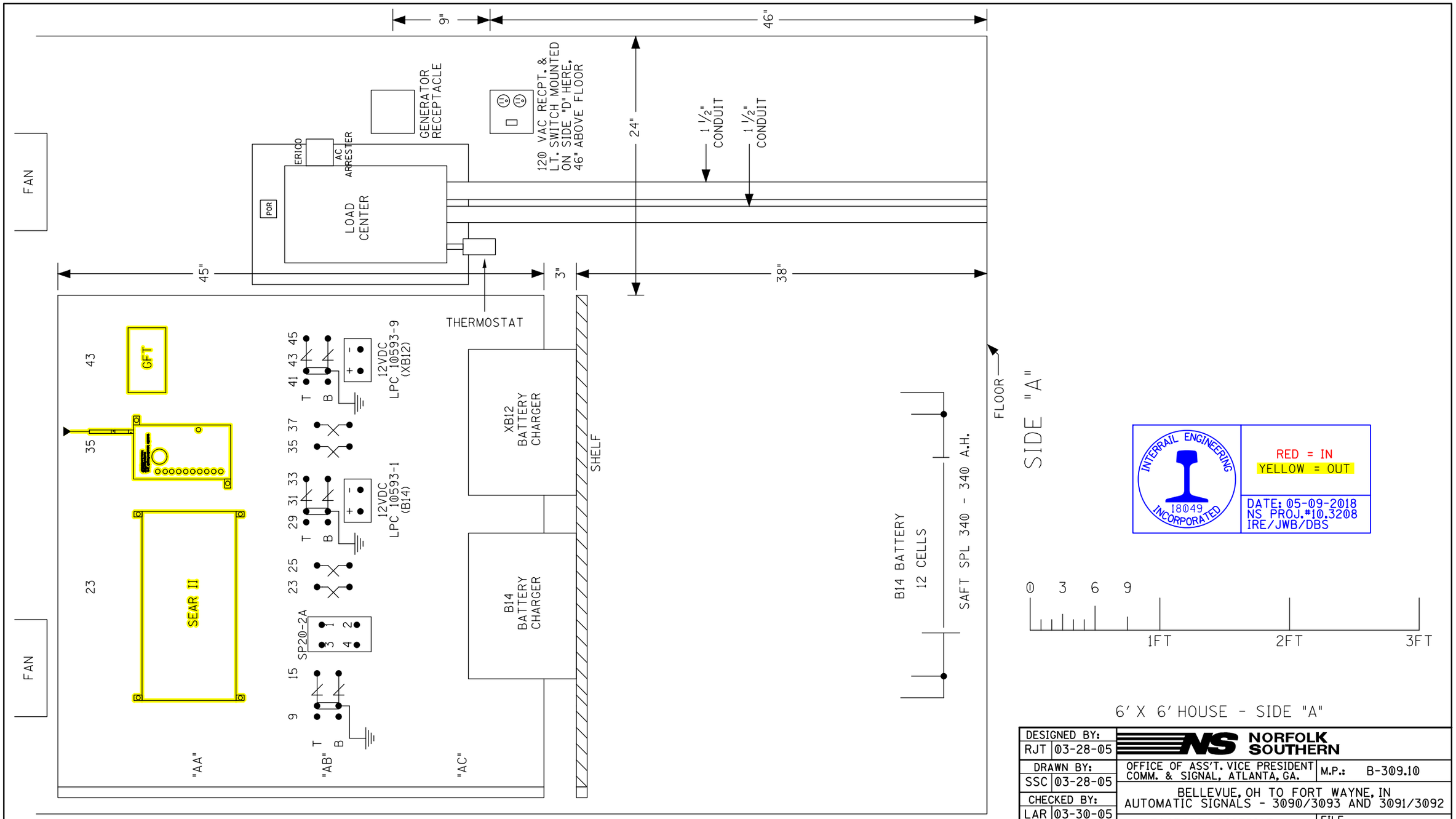
BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT — FILE No. R-1884

CADD or DWG. No. FSBT30910.25 — SHEET No. 25 of 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

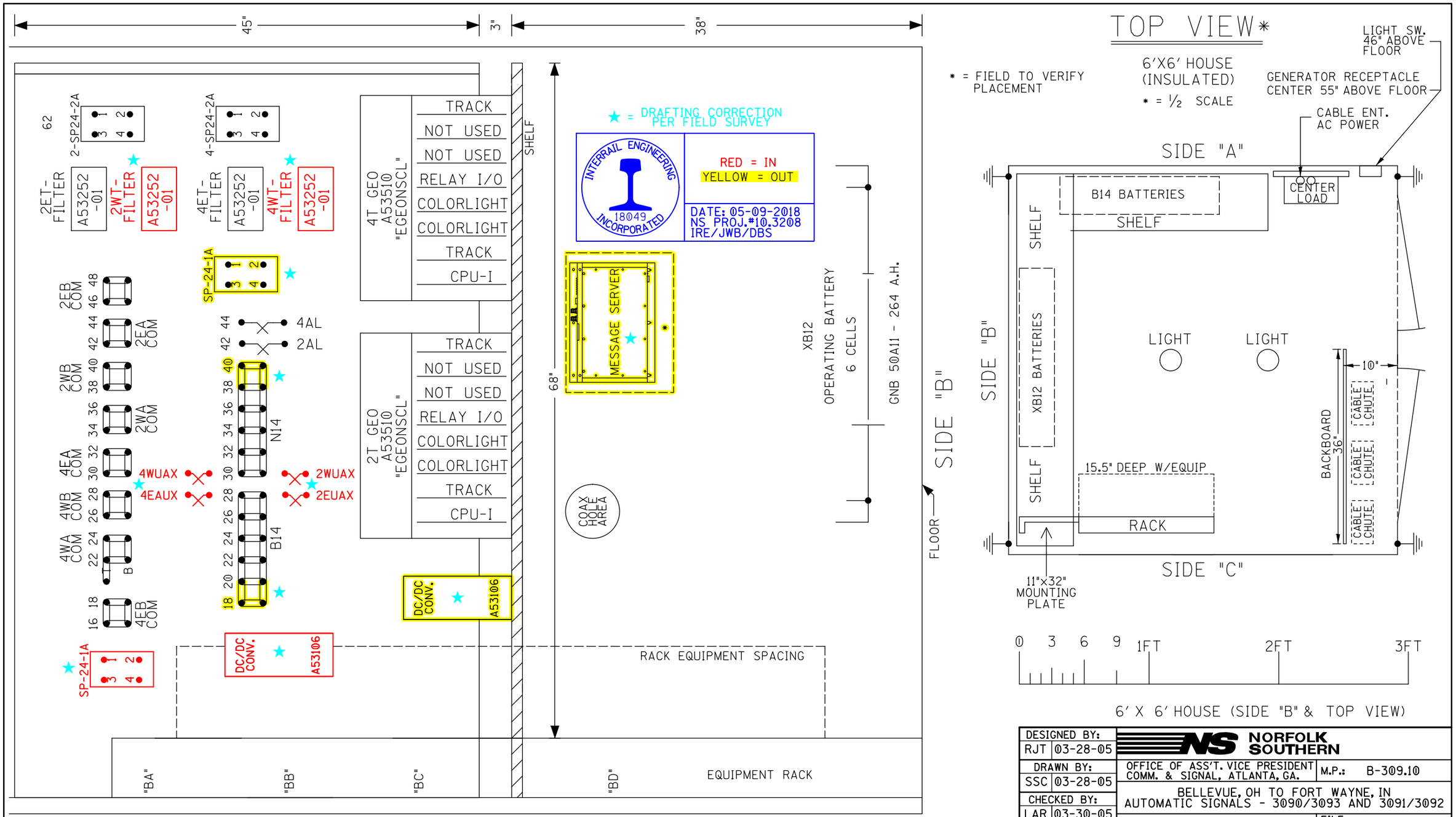


6' X 6' HOUSE - SIDE "A"

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY: RJT 03-28-05	NORFOLK SOUTHERN
DRAWN BY: SSC 03-28-05	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: LAR 03-30-05	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: MAL 12-04-06	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.26 — SHEET No. 26 of 28



TOP VIEW*

* = FIELD TO VERIFY PLACEMENT

6'X6' HOUSE (INSULATED)

* = ½ SCALE

LIGHT SW. 46" ABOVE FLOOR

GENERATOR RECEPTACLE CENTER 55" ABOVE FLOOR

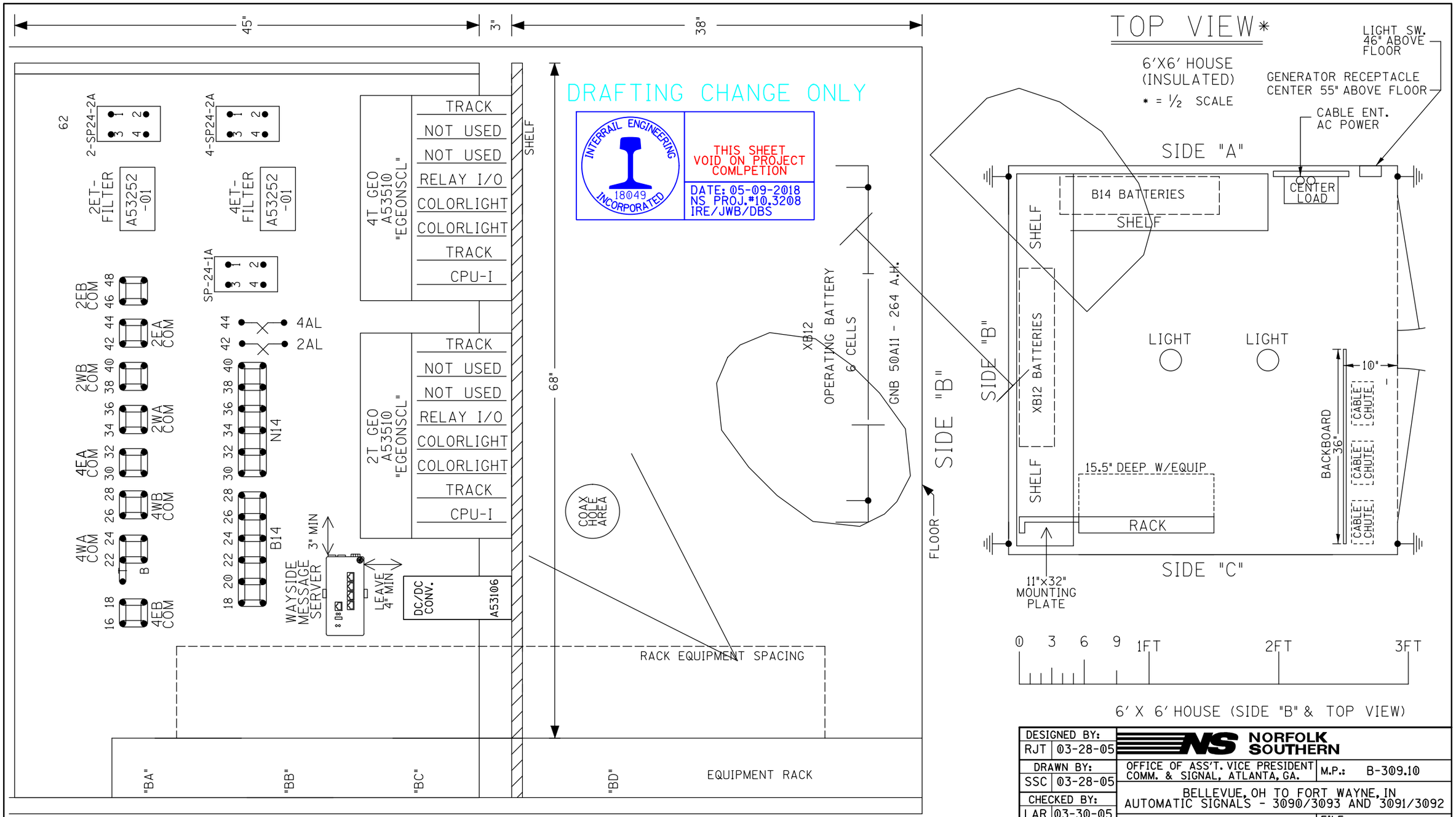
CABLE ENT. AC POWER

6' X 6' HOUSE (SIDE "B" & TOP VIEW)

DESIGNED BY: RJT 03-28-05	NORFOLK SOUTHERN
DRAWN BY: SSC 03-28-05	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B-309.10
CHECKED BY: LAR 03-30-05	BELLEVUE, OH TO FORT WAYNE, IN AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092
IN SERVICE: MAL 12-04-06	FOSTORIA DISTRICT — FILE No. R-1884
	CADD or DWG. No. FSBT30910.27 — SHEET No. 27 of 28

REVISION INITIALS	
R-3493 NAG/08-18-15 SII/07-25-17	

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

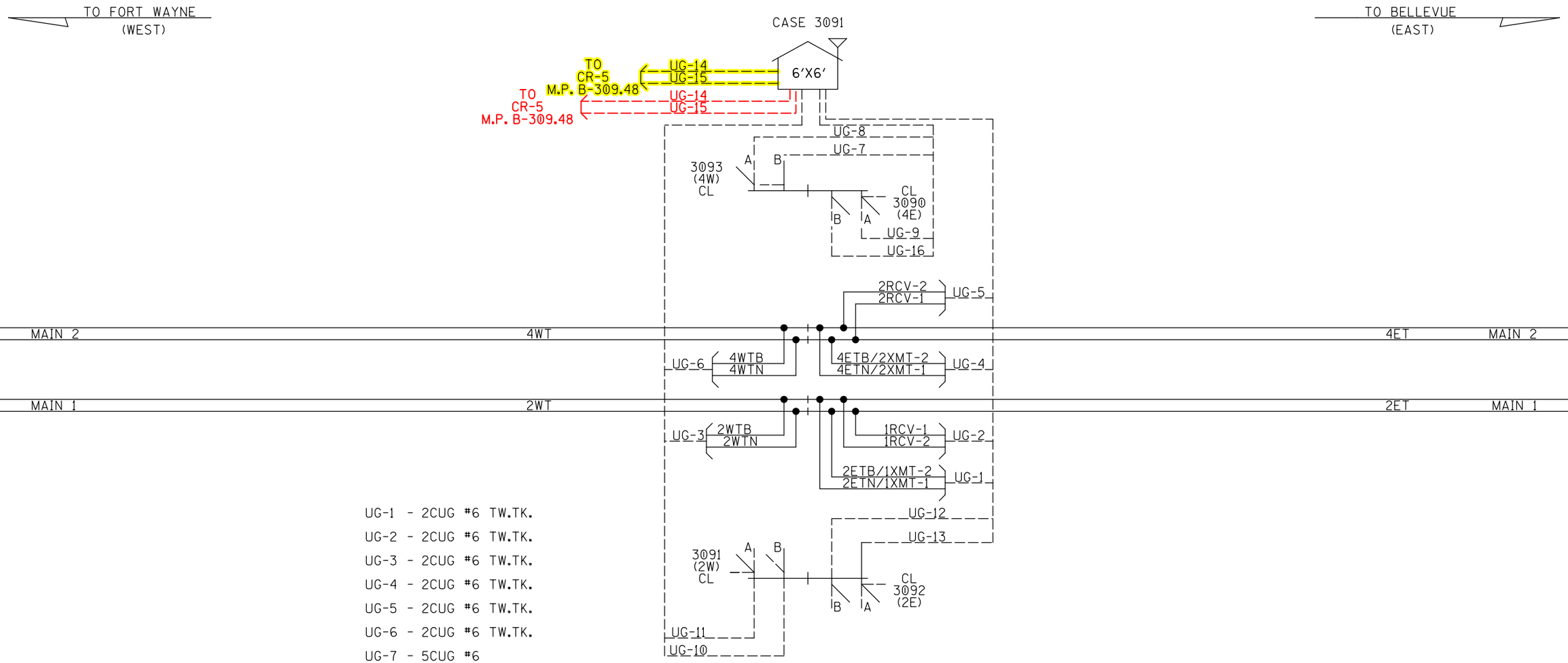
BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.27AV SHEET No. 27Aof 28

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



UG-1 - 2CUG #6 TW.TK.
UG-2 - 2CUG #6 TW.TK.
UG-3 - 2CUG #6 TW.TK.
UG-4 - 2CUG #6 TW.TK.
UG-5 - 2CUG #6 TW.TK.
UG-6 - 2CUG #6 TW.TK.
UG-7 - 5CUG #6
UG-8 - 5CUG #6
UG-9 - 5CUG #6
UG-10 - 5CUG #9
UG-11 - 5CUG #9
UG-12 - 5CUG #9
UG-13 - 5CUG #9
UG-14 - 7CUG #14 UG-14 - 5CUG #14
UG-15 - 3CUG #6 W/#8 GND UG-15 - 3CUG #6 W/#8 GND
UG-16 - 5CUG #6

CABLE PLAN

REVISION INITIALS	R-3493 NAG/08-18-15 SII/07-25-17

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

DESIGNED BY:	
RJT	03-28-05
DRAWN BY:	
SSC	03-28-05
CHECKED BY:	
LAR	03-30-05
IN SERVICE:	
MAL	12-04-06

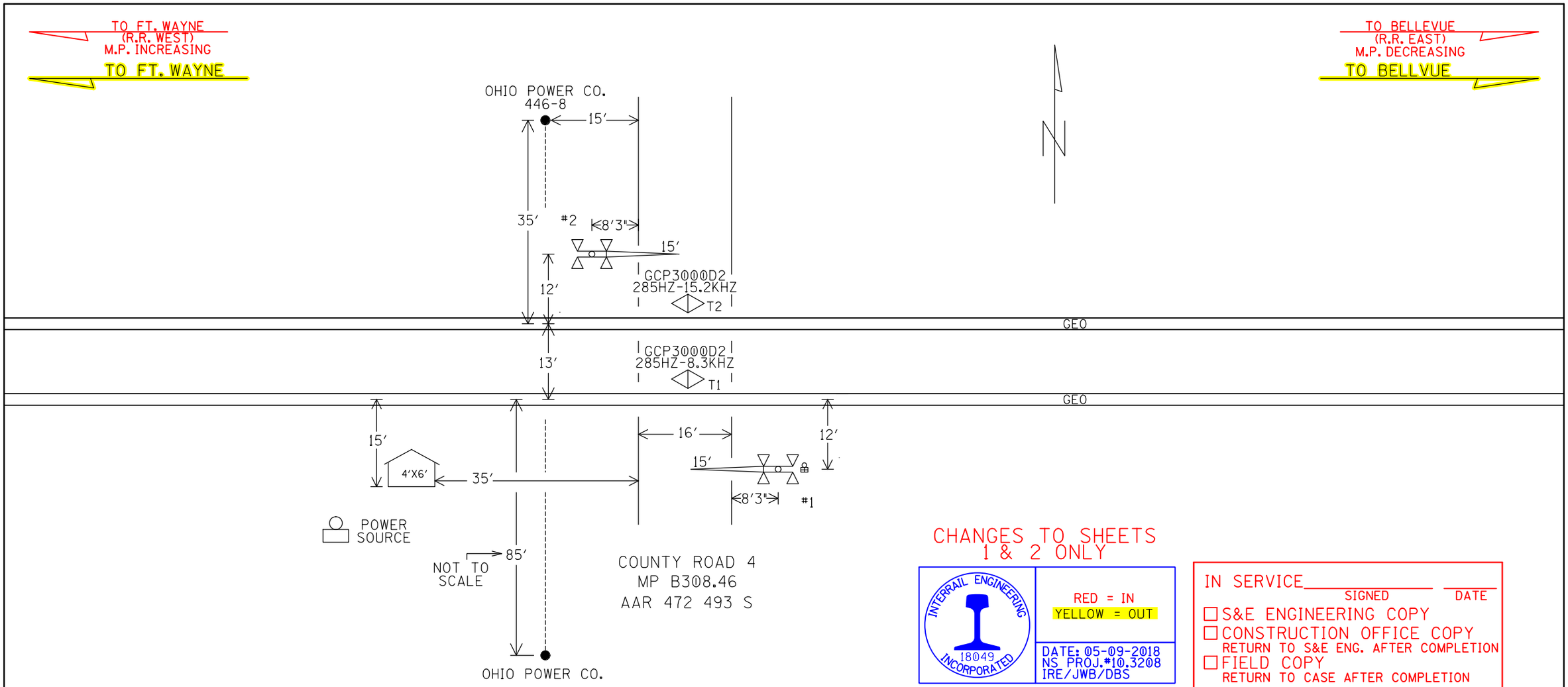
NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B-309.10

BELLEVUE, OH TO FORT WAYNE, IN
AUTOMATIC SIGNALS - 3090/3093 AND 3091/3092

FOSTORIA DISTRICT FILE No. R-1884

CADD or DWG. No. FSBT30910.28 SHEET No. 28 of 28



CHANGES TO SHEETS
1 & 2 ONLY

INTERRAIL ENGINEERING 18049 INCORPORATED

RED = IN
YELLOW = OUT

DATE: 05-09-2018
NS PROJ.#10.3208
IRE/JWB/DBS

IN SERVICE_____ _____
SIGNED DATE

☐ S&E ENGINEERING COPY
☐ CONSTRUCTION OFFICE COPY
RETURN TO S&E ENG. AFTER COMPLETION
☐ FIELD COPY
RETURN TO CASE AFTER COMPLETION
☐ PROJECT ENGINEER COPY

NOTES:
1. MAX. TRAIN SPEED 60 M.P.H.
2. CROSSING LOCATED IN PUTNAM COUNTY

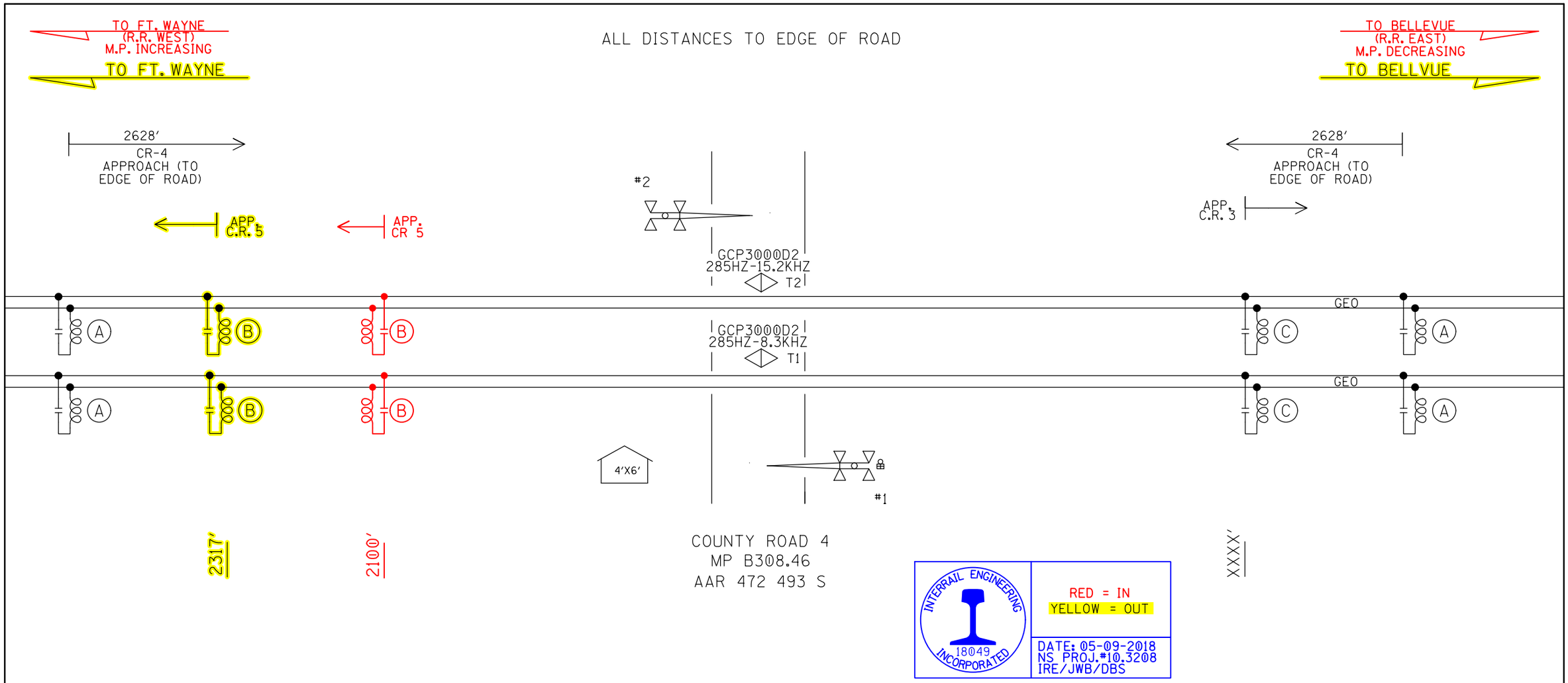
SCALE: 1"=20′

PROJECT 10.0203 R-9727

DESIGNED BY:		NORFOLK SOUTHERN	
MEI	05-15-93		
DRAWN BY:		OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: B308.46
MEI	05-15-93		
CHECKED BY:		YELLOW CREEK, OH. GATES/FLS. AT CO. RD. 4	
	- -		
IN SERVICE:		FOSTORIA DISTRICT	FILE: 061-10.321
JF	06-01-95	CADD or DWG. No. FSBT30846.01	SHEET No. 1 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97	EGC 5/13/98 SWS 8/11/98	R-1884 10-09-06 SSC/MAL

PROPERTY
NORFOLK & WESTERN RWY. CO.



(A)– MF-NBS 62775-1543 (285 HZ)

(B)– MF-NBS 62775-1543 (430HZ) (B)– NBS 62775-1543 (430 HZ)

(C)– MF-NBS 62775-1543 (348 HZ)

PROJECT 10.0203

DESIGNED BY:	
MEI	05-15-93
DRAWN BY:	
MEI	05-15-93
CHECKED BY:	
	- -
IN SERVICE:	
JF	06-01-95

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. | M.P.: B308.46

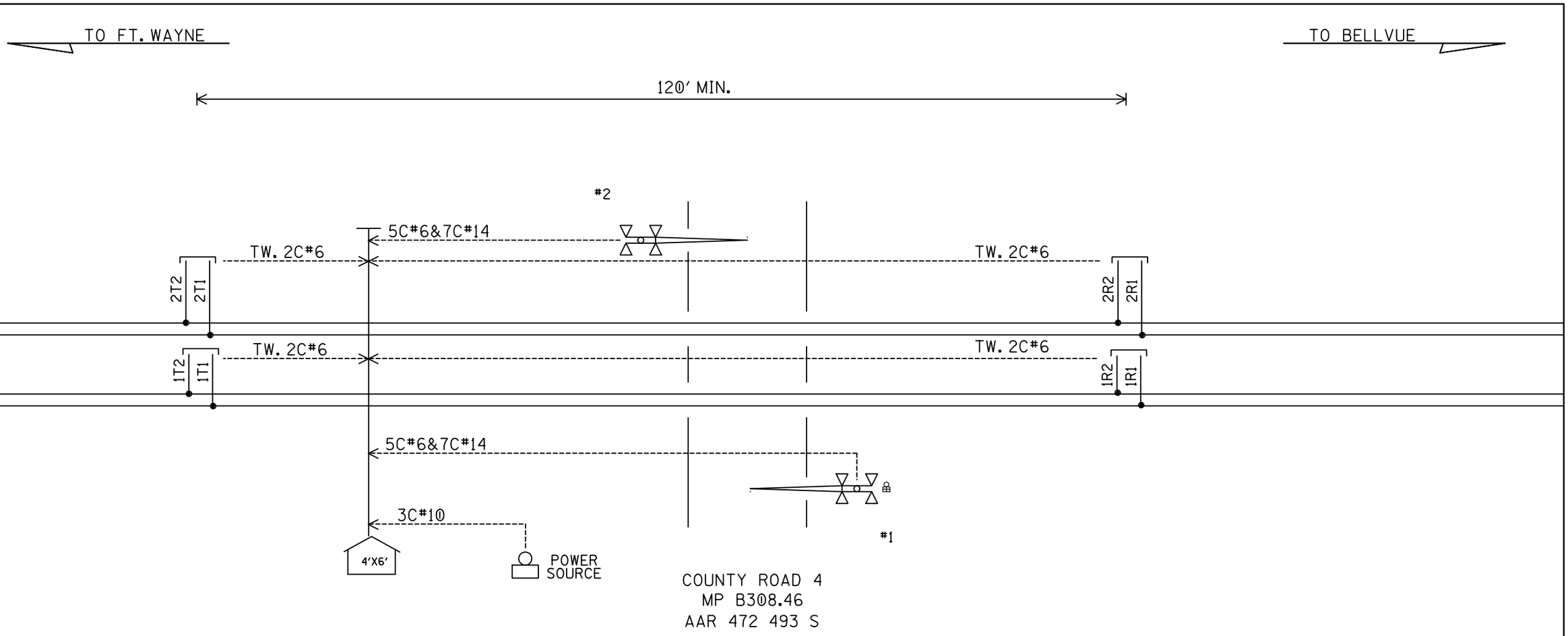
YELLOW CREEK, OH.
GATES/FLS. AT CO. RD. 4

FOSTORIA DISTRICT | FILE: 061-10.321

CADD or DWG. No. FSBT30846.02 | SHEET No. 2 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97	EGC 5/13/98 SWS 8/11/98	R-1884 10-09-06 SSC/MAL

PROPERTY
NORFOLK & WESTERN RWY. CO.

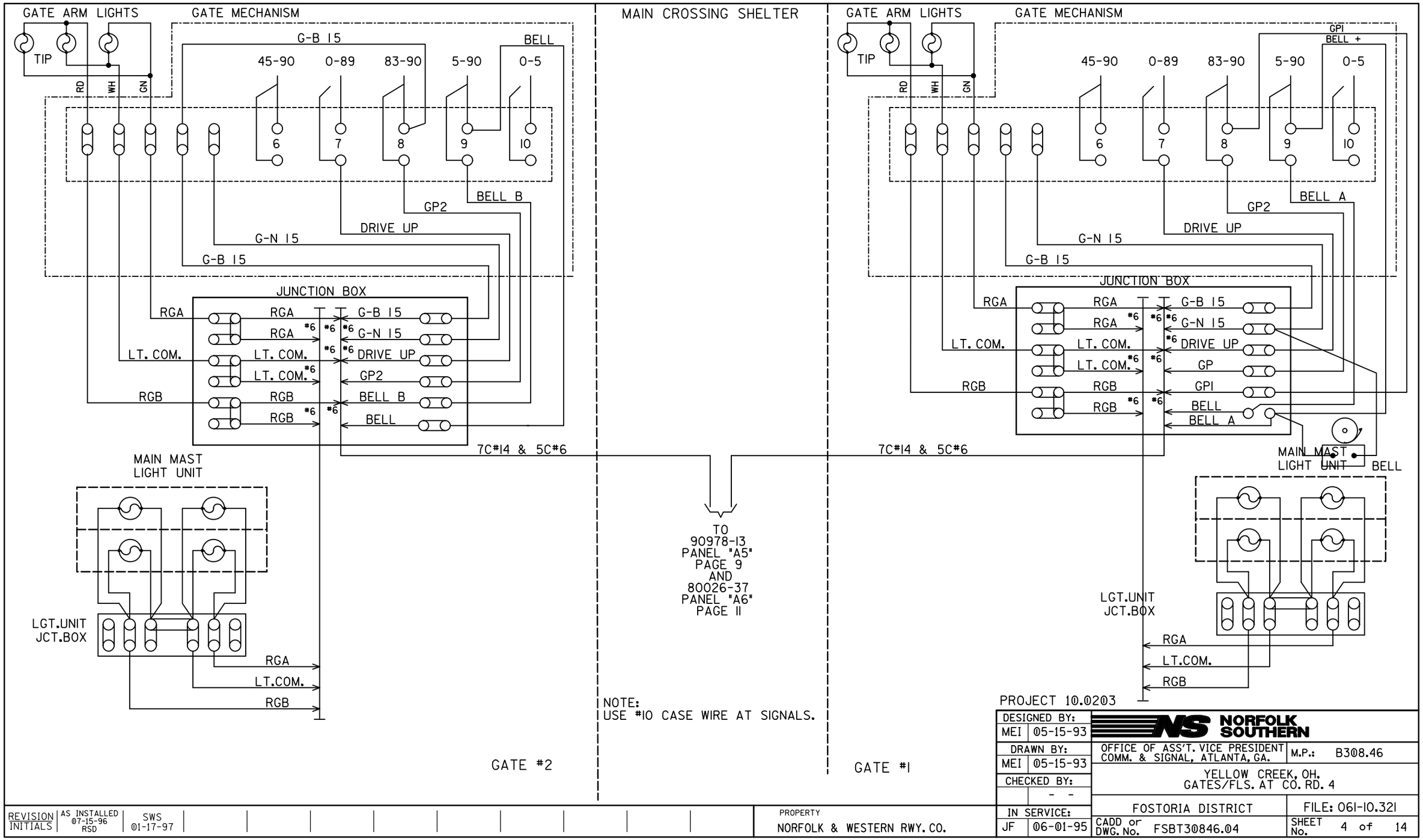


PROJECT 10.0203

DESIGNED BY: MEI 05-15-93	NORFOLK SOUTHERN		
DRAWN BY: MEI 05-15-93	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: B308.46	
CHECKED BY: - -	YELLOW CREEK, OH. GATES/FLS. AT CO. RD. 4		
IN SERVICE: JF 06-01-95	FOSTORIA DISTRICT	FILE: 061-10.321	
	CADD or DWG. No. FSBT30846.03	SHEET No. 3 of 14	

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97

PROPERTY
NORFOLK & WESTERN RWY. CO.



PROJECT 10.0203

DESIGNED BY:	
MEI	05-15-93
DRAWN BY:	
MEI	05-15-93
CHECKED BY:	
	- -
IN SERVICE:	
JF	06-01-95

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B308.46

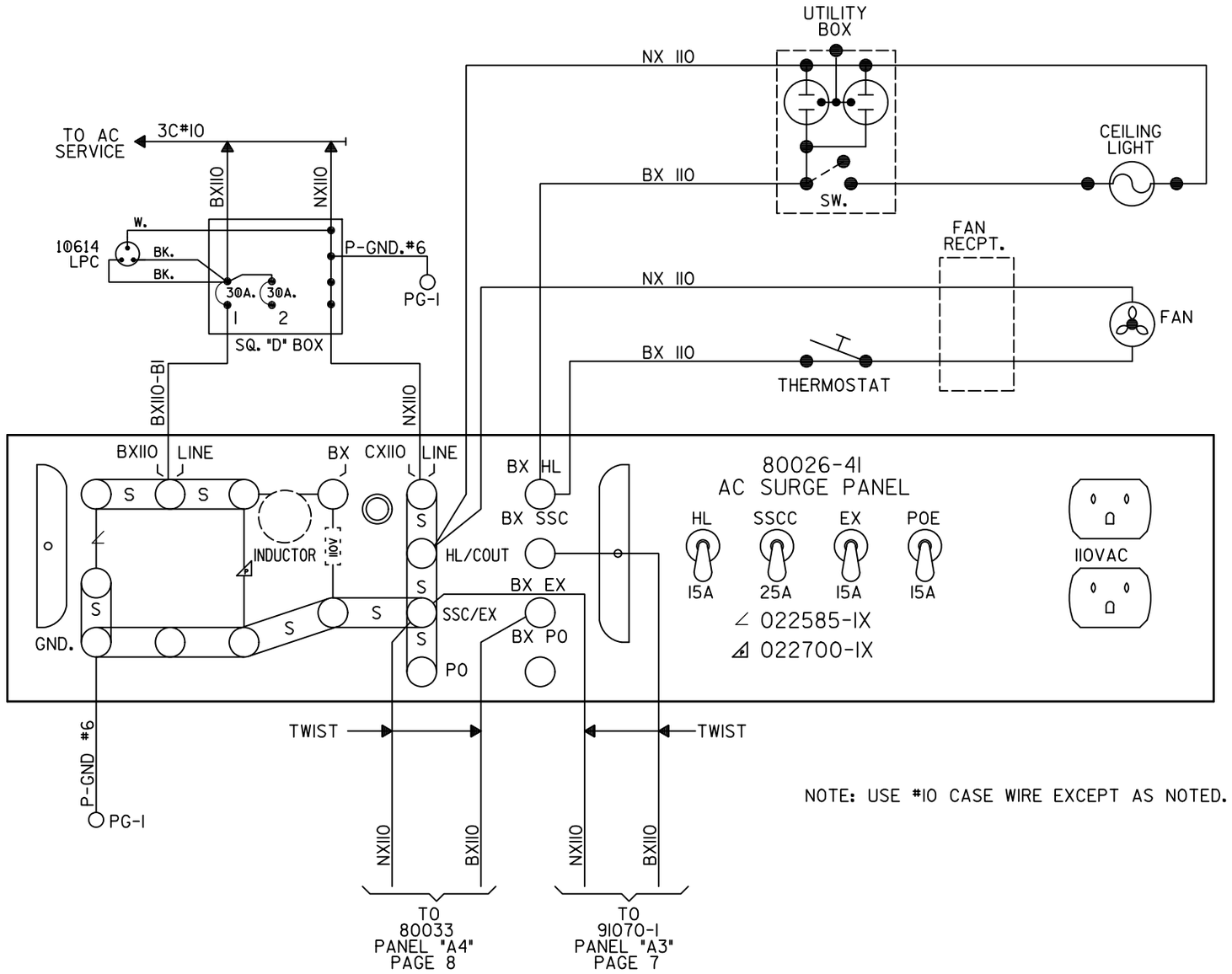
YELLOW CREEK, OH.
GATES/FLS. AT CO. RD. 4

FOSTORIA DISTRICT | FILE: 061-10.321

CADD or DWG. No. FSBT30846.04 | SHEET No. 4 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97

PROPERTY
NORFOLK & WESTERN RWY. CO.



NOTE: USE #10 CASE WIRE EXCEPT AS NOTED.

PROJECT 10.0203

DESIGNED BY: MEI 05-15-93	NORFOLK SOUTHERN		
DRAWN BY: MEI 05-15-93	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B308.46
CHECKED BY: - -	YELLOW CREEK, OH. GATES/FLS. AT CO. RD. 4		
IN SERVICE: JF 06-01-95	FOSTORIA DISTRICT	FILE: 061-10.321	
	CADD or DWG. No. FSBT30846.05	SHEET No.	5 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97

PROPERTY
NORFOLK & WESTERN RWY. CO.

MODEL 3000D2 GCP MODULE ASSEMBLIES

	UPPER BAY										LOWER BAY										
MODULES POSITION	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21
MODULE NUMBERS	80011-f(1) ✳	80011-f(2)	80012	80012	80013	80014	80015	80016 (1)	80016 (2)	80020	80011-f(1) ✳	80011-f(2)	80012	80012	80013	80014	80015	80016 (1)	80016 (2)	80020	80028
MODULES USED	X	X	X	X	X	X				X	X	X	X	X	X	X				X	X

✳ = 1ST SLOT AT LEFT END OF BAY

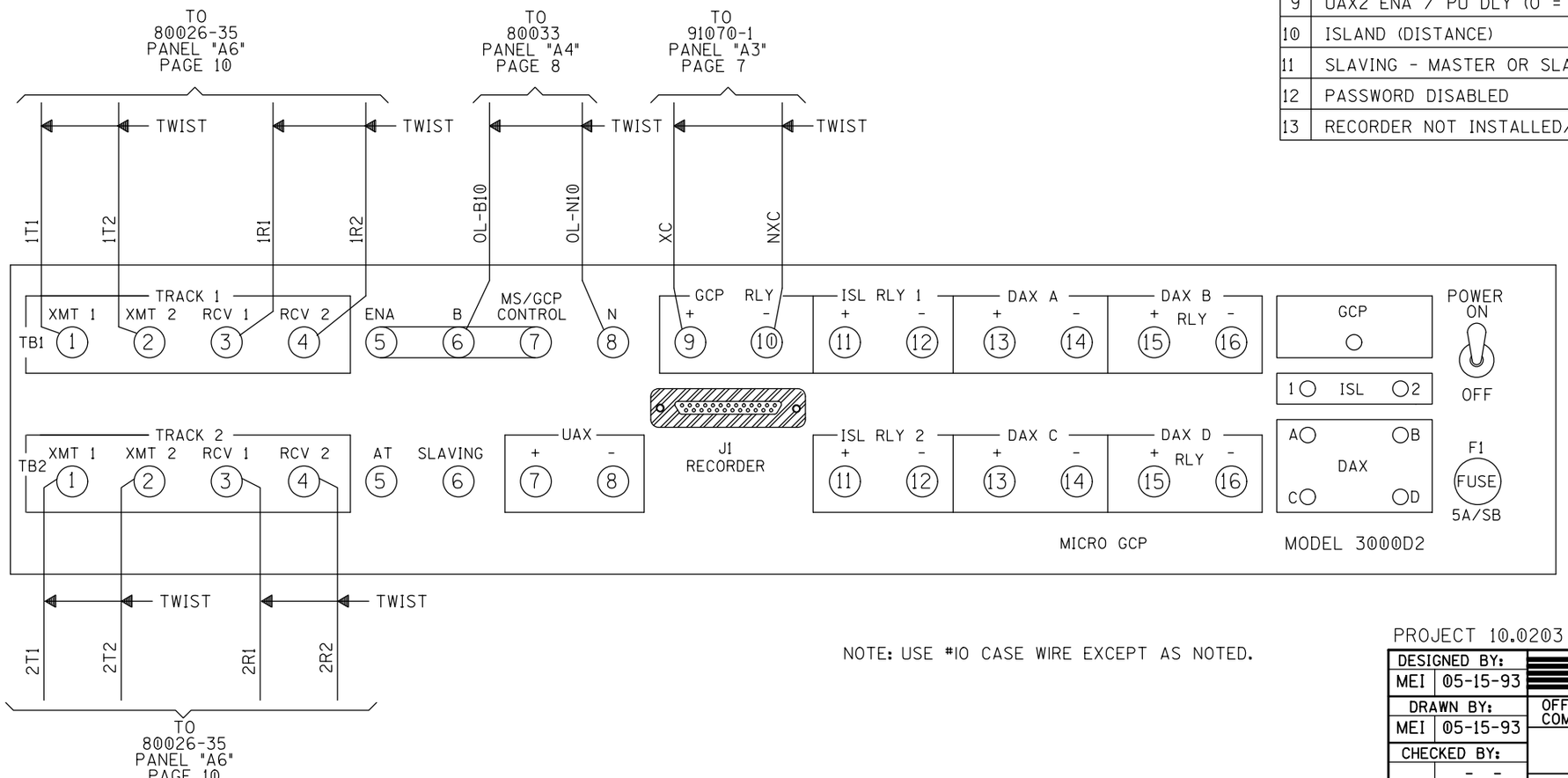
EXPANDED PROGRAMMING PARAMETERS

	PROGRAM	ENTER T1	ENTER T2
1	SWITCH TO MS (EZ VALUE)	10	10
2	TRANSFER DELAY MS TO GCP	0	0
3	PRIME PREDICTION OFFSET	0	0
4	PICKUP DELAY PRIME	15	
5	COMPENSATION	1000	1000
6	NO OF TRACK WIRES	4	4

3000D2 (REDUNDANT)

PROGRAMMING SYSTEM APPLICATION PARMETERS (F-LEVEL)

	PROGRAM	ENTER T1	ENTER T2
1	NUMBER OF TRACKS	2	
2	FREQUENCY	285 HZ.	
3	UNIDIRECTIONAL/BIDIRECTIONAL	BI	BI
4	TRANSMIT LEVEL	MED	MED
5	PREDICTOR/MOTION SENSOR	PRE	PRE
6	WARNING TIME	30	30
7	APPROACH (DISTANCE)	2628′	2628′
8	UAX PICKUP DELAY (0 = OFF)	0	
9	UAX2 ENA / PU DLY (0 = OFF)	0	
10	ISLAND (DISTANCE)	MIN.120′	MIN.120′
11	SLAVING - MASTER OR SLAVE	MASTER	
12	PASSWORD DISABLED	DIS	
13	RECORDER NOT INSTALLED/INSTALLED	NOT INSTALLED	



3000D2 GCP

(TRACK 1)
MF = 156 HZ.
IF = 15.2 KHZ
(TRACK 2)
MF = 156 HZ.
IF = 8.3 KHZ

NOTE: USE #10 CASE WIRE EXCEPT AS NOTED.

PROJECT 10.0203

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97	EGC 5/13/98 SWS 8/11/98	R-1884 10-09-06 SSC/MAL

PROPERTY
NORFOLK & WESTERN RWY. CO.

DESIGNED BY: MEI	05-15-93
DRAWN BY: MEI	05-15-93
CHECKED BY:	- -
IN SERVICE: JF	06-01-95

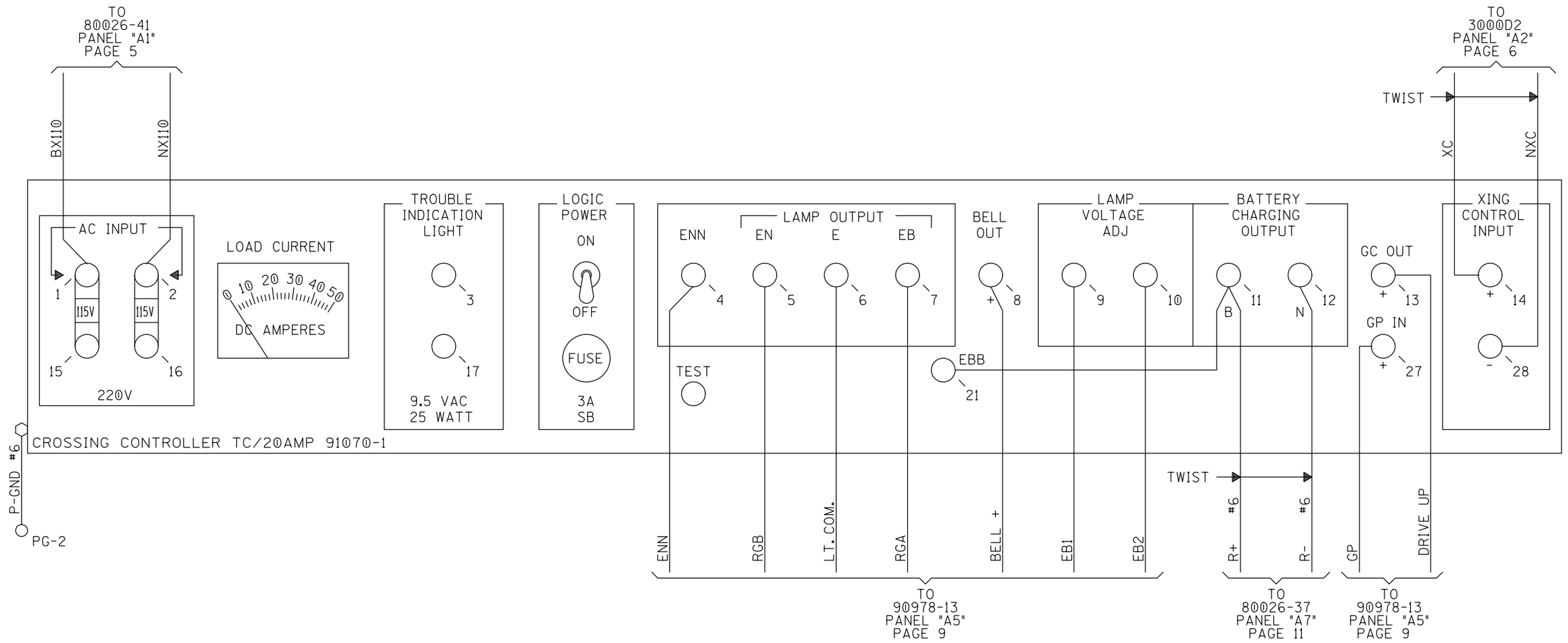
NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B308.46

YELLOW CREEK, OH.
GATES/FLS. AT CO. RD. 4

FOSTORIA DISTRICT | FILE: 061-10.321

CADD or DWG. No. FSBT30846.06 | SHEET No. 6 of 14



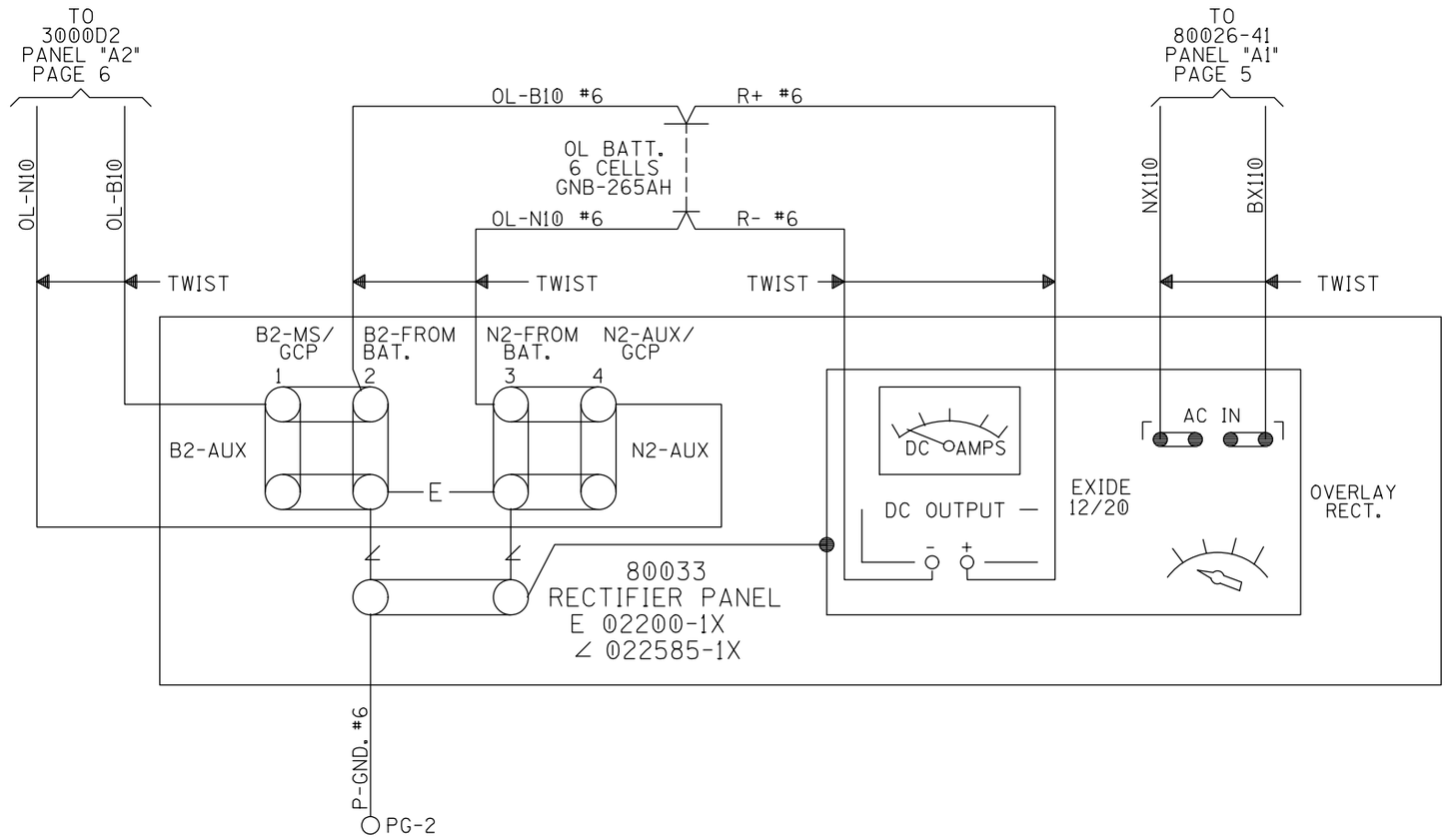
NOTE: USE #10 CASE WIRE EXCEPT AS NOTED.

PROJECT 10.0203

DESIGNED BY: MEI 05-15-93	NORFOLK SOUTHERN
DRAWN BY: MEI 05-15-93	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B308.46
CHECKED BY: - -	YELLOW CREEK, OH. GATES/FLS. AT CO. RD. 4
IN SERVICE: JF 06-01-95	FOSTORIA DISTRICT — FILE: 061-10.321
	CADD or DWG. No. FSBT30846.07 — SHEET No. 7 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97

PROPERTY
NORFOLK & WESTERN RWY. CO.



NOTE: USE #10 CASE WIRE EXCEPT AS NOTED.

PROJECT 10.0203

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97	EGC 5/13/98 SWS 8/11/98	R-1884 10-09-06 SSC/MAL

PROPERTY
NORFOLK & WESTERN RWY. CO.

DESIGNED BY:	
MEI	05-15-93
DRAWN BY:	
MEI	05-15-93
CHECKED BY:	
	- -
IN SERVICE:	
JF	06-01-95

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: B308.46

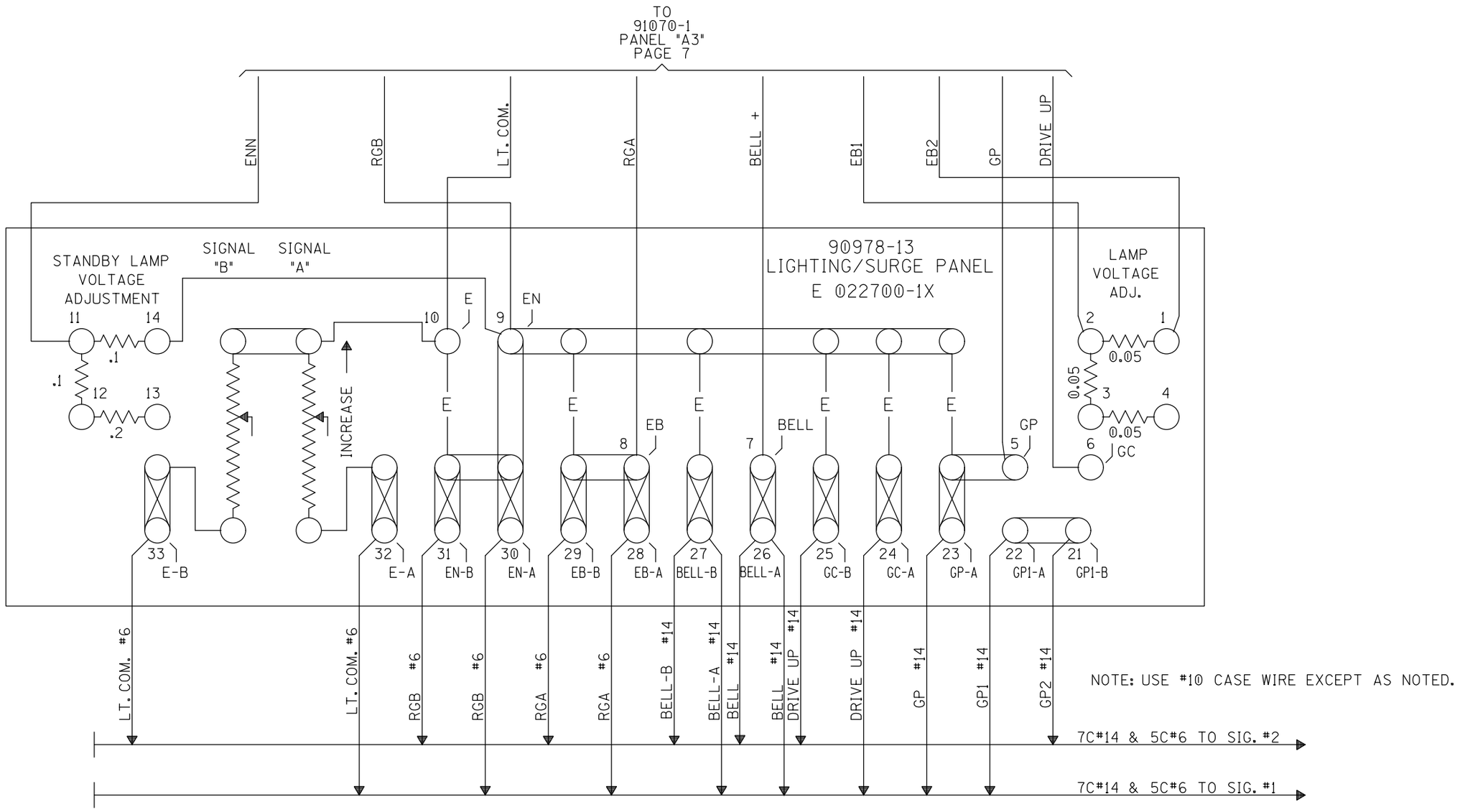
YELLOW CREEK, OH.
GATES/FLS. AT CO. RD. 4

FOSTORIA DISTRICT

FILE: 061-10.321

CADD or DWG. No. FSBT30846.08

SHEET No. 8 of 14

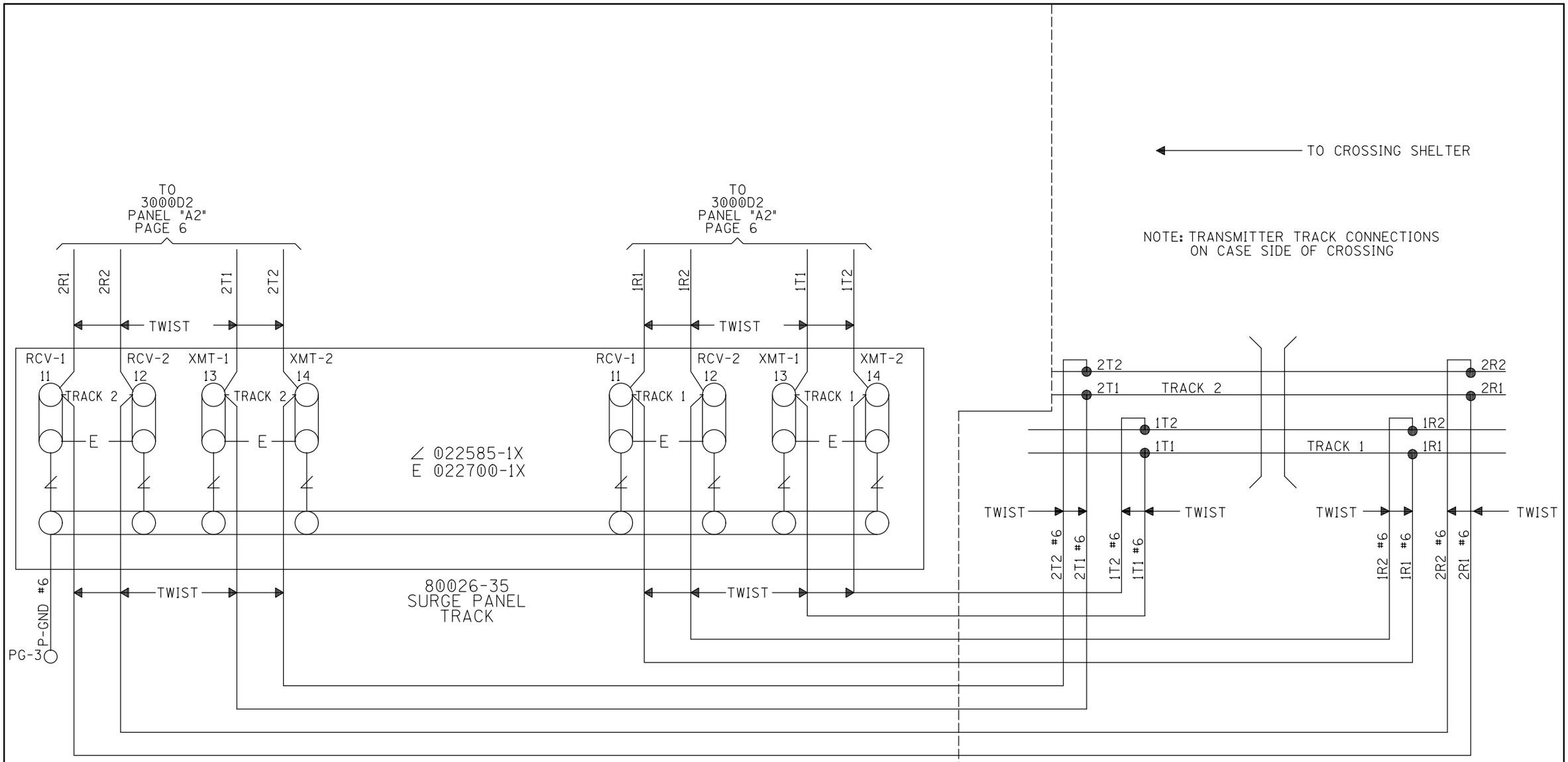


PROJECT 10.0203

DESIGNED BY: MEI 05-15-93	NORFOLK SOUTHERN
DRAWN BY: MEI 05-15-93	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B308.46
CHECKED BY: - -	YELLOW CREEK, OH. GATES/FLS. AT CO. RD. 4
IN SERVICE: JF 06-01-95	FOSTORIA DISTRICT — FILE: 061-10.321
	CADD or DWG. No. FSBT30846.09 — SHEET No. 9 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97

PROPERTY
NORFOLK & WESTERN RWY. CO.



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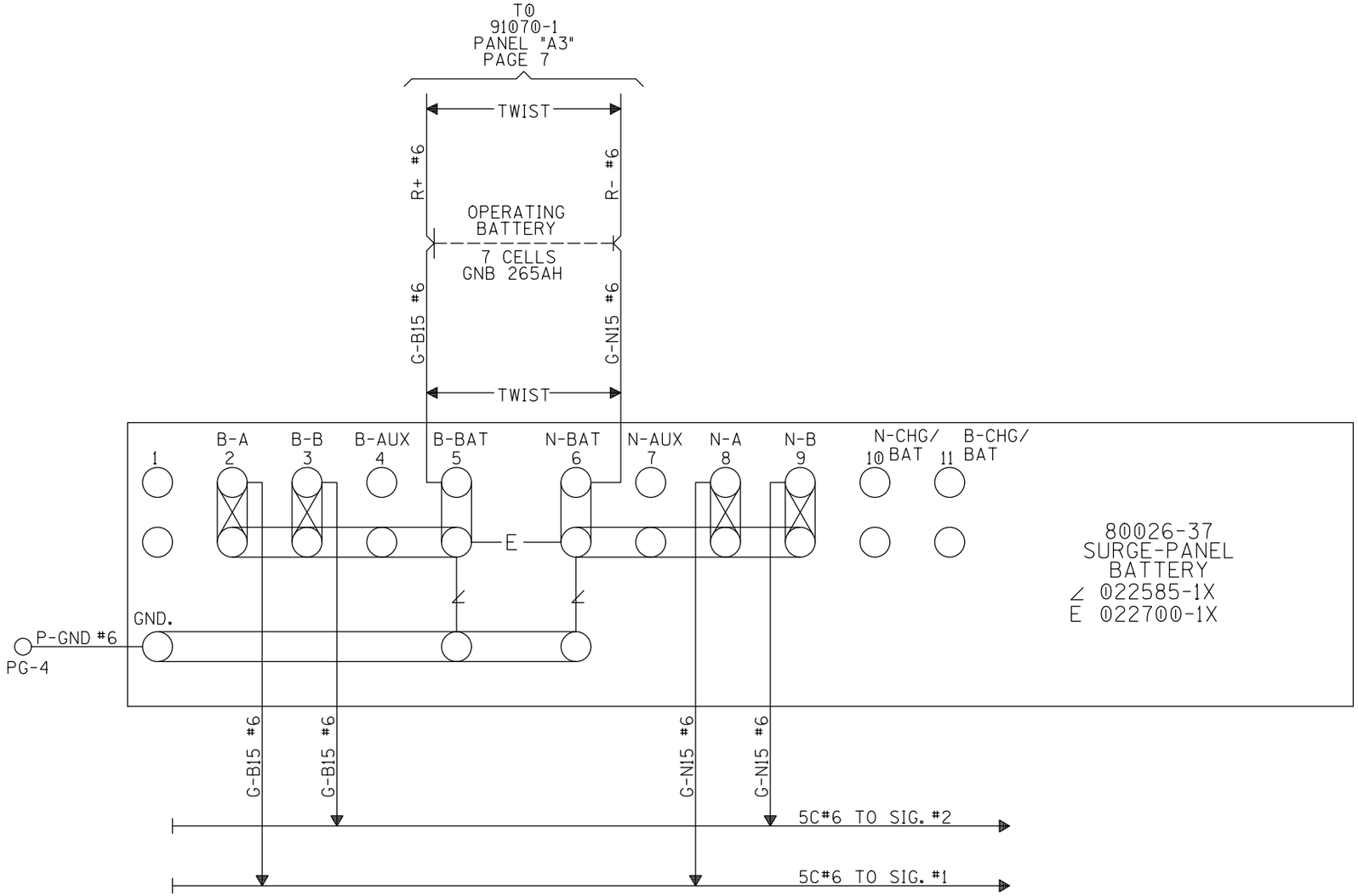
PROJECT 10.0203

DESIGNED BY:		NORFOLK SOUTHERN	
MEI	05-15-93		
DRAWN BY:		OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: B308.46
MEI	05-15-93		
CHECKED BY:		YELLOW CREEK, OH. GATES/FLS. AT CO. RD. 4	
	- -		
IN SERVICE:		FOSTORIA DISTRICT	FILE: 061-10.321
JF	06-01-95	CADD or DWG. No. FSBT30846.10	SHEET No. 10 of 14

REVISION INITIALS											
AS INSTALLED 07-15-96 RSD	SWS 01-17-97	EGC 5/13/98 SWS 8/11/98	R-1884 10-09-06 SSC/MAL								

PROPERTY
NORFOLK & WESTERN RWY. CO.



NOTE: USE #10 CASE WIRE EXCEPT AS NOTED

PROJECT 10.0203

DESIGNED BY:	
MEI	05-15-93
DRAWN BY:	
MEI	05-15-93
CHECKED BY:	
	- -
IN SERVICE:	
JF	06-01-95

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. | M.P.: B308.46

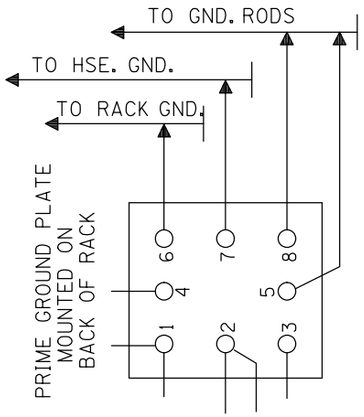
YELLOW CREEK, OH.
GATES/FLS. AT CO. RD. 4

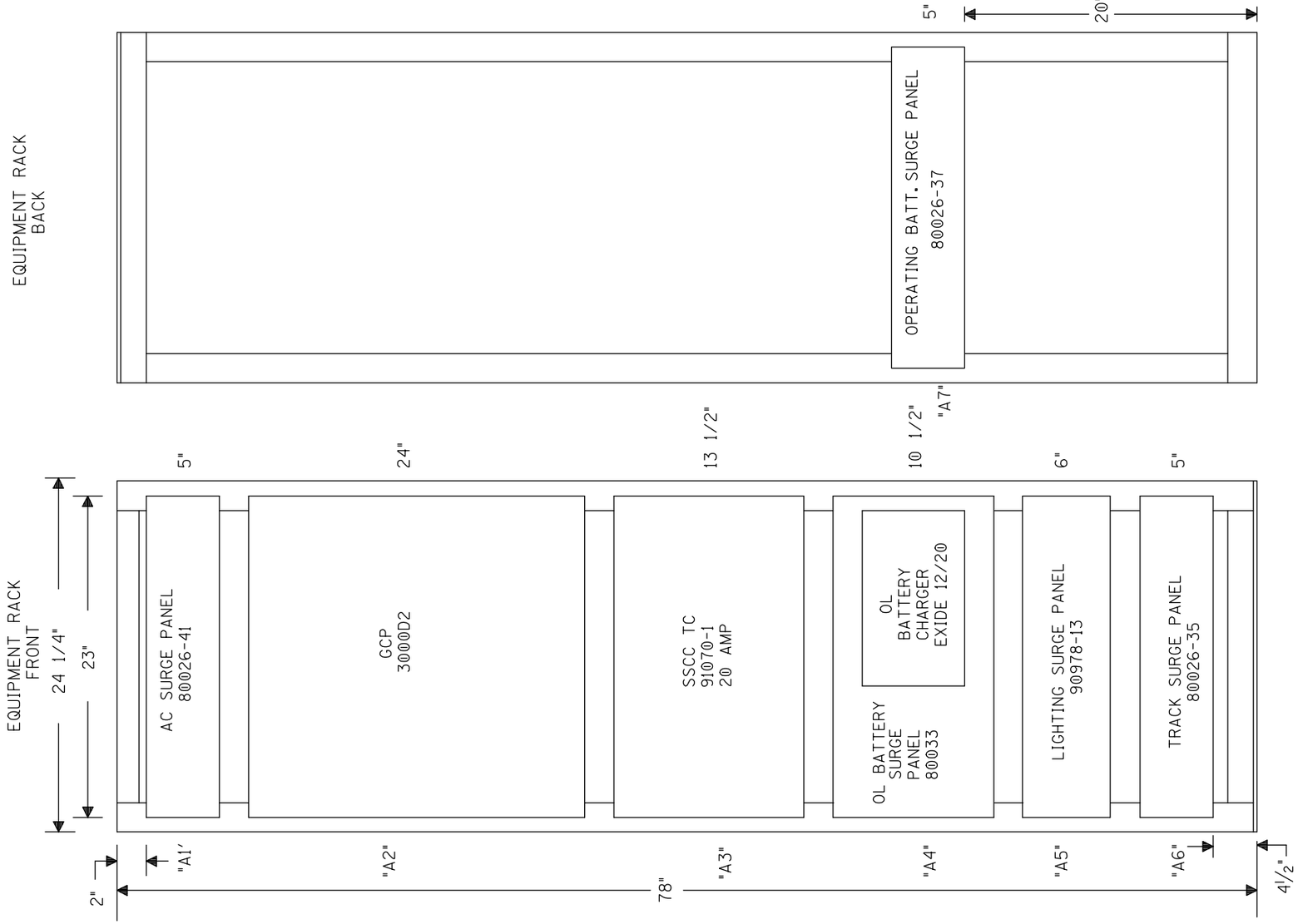
FOSTORIA DISTRICT | FILE: 061-10.321

CADD or DWG. No. FSBT30846.11 | SHEET No. 11 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97

PROPERTY
NORFOLK & WESTERN RWY. CO.





PROJECT 10.0203

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DRAWN BY: MEI 05-15-93	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: B308.46
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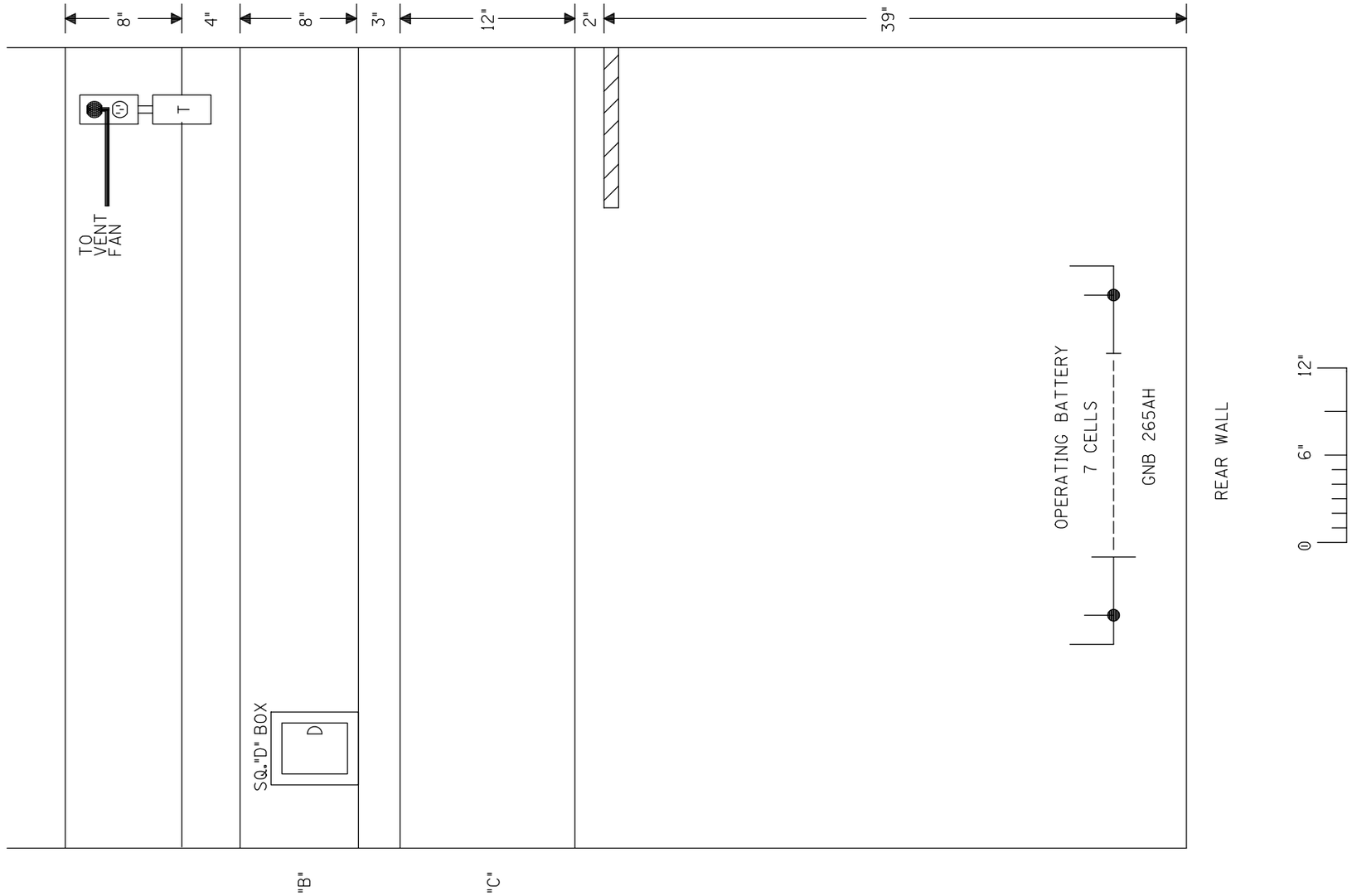
IN SERVICE: JF 06-01-95	FOSTORIA DISTRICT — FILE: 061-10.321
	CADD or DWG. No. FSBT30846.12 — SHEET No. 12 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97

PROPERTY
NORFOLK & WESTERN RWY. CO.



PROJECT 10.0203

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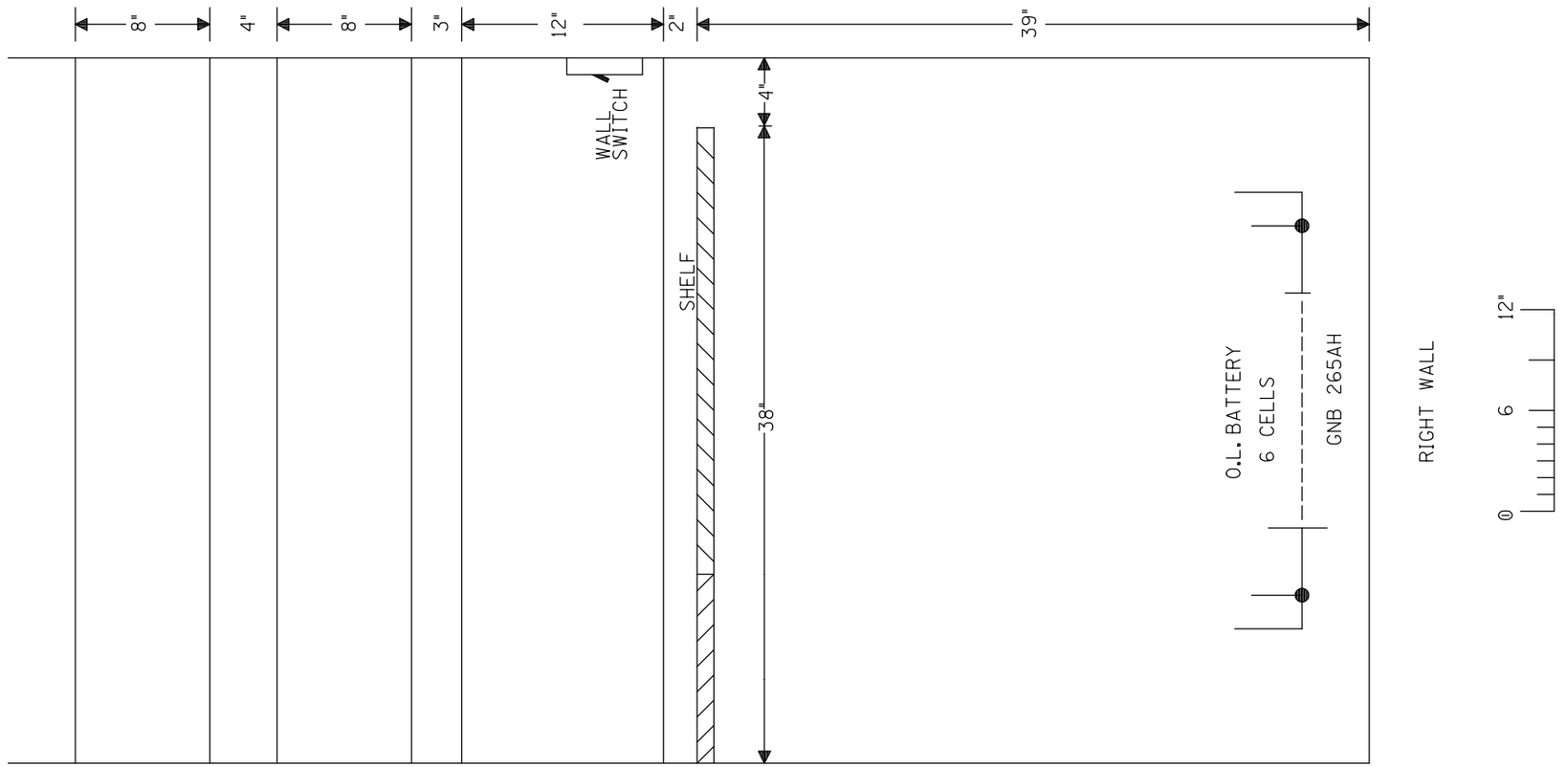
DRAWN BY: MEI 05-15-93	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	B308.46
CHECKED BY: - -	YELLOW CREEK, OH. GATES/FLS. AT CO. RD. 4		
IN SERVICE: JF 06-01-95	FOSTORIA DISTRICT	FILE:	061-10.321
	CADD or DWG. No. FSBT30846.13	SHEET No.	13 of 14

REVISION INITIALS	AS INSTALLED 07-15-96 RSD	SWS 01-17-97

PROPERTY
NORFOLK & WESTERN RWY. CO.



PROJECT 10.0203

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CHECKED BY: - -	YELLOW CREEK, OH. GATES/FLS. AT CO. RD. 4
IN SERVICE: JF 06-01-95	FOSTORIA DISTRICT — FILE: 061-10.321
	CADD or DWG. No. FSBT30846.14 — SHEET No. 14 of 14

REVISION INITIALS												
AS INSTALLED 07-15-96 RSD	SWS 01-17-97	R-1884 10-09-06 SSC/MAL										

PROPERTY
NORFOLK & WESTERN RWY. CO.

OHIO RAIL DEVELOPMENT COMMISSION

Mail Stop #3140, 1980 West Broad Street, Columbus OH 43223
John R. Kasich, Governor • James G. Bradley, Chairman

February 27, 2018

Mr. Stephen Klinger
Norfolk Southern Corporation
Administrator Grade Crossing Program
1200 Peachtree St. NE, Box 123
Atlanta, GA 30309

RE: Grade Crossing Warning Device Improvements
Putnam County, CR 5
DOT# 472496M; PID# 106851

Dear Mr. Klinger:

A diagnostic review was held at the above grade crossing on 8/10/2017. As a result of the Diagnostic, the existing active warning device system (lights and gates) will be upgraded to include a new cantilever in the southeast quadrant for north-bound vehicular traffic along with other upgrades to the installation as needed.

Norfolk Southern Corporation is authorized to proceed with the site plans and cost estimates (PE) for this project. This authorization is made with the stipulation and understanding that any field work needs prior approval before 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.

The ORDC is not requesting that the PUCO issue an Order at this time. When the ORDC receives the PE it will be evaluated and a construction-only Order will be requested from PUCO. Please submit the PE to ORDC within 90 days of receipt of this letter.

The diagnostic review form is attached. Please note any recommendations (page 5), if any, made by the team with regard to requirements for this location. Any minor roadway work necessary for MUTCD compliance should be incorporated into the PE and such costs will flow through the railroad reimbursement process

The ORDC Project Manager for this project is Don Damron. Don can be reached at 614-466-2509 (office), or 614-917-8466 (cell), or don.damron@dot.state.oh.us , if you have any questions.

Sincerely,

Donald J. Damron
Project Manager

C: Randall Schumacher, Rail Division Chief, PUCO
Jill Henry, Rail Specialist, PUCO
ORDC (file)

Attachments: Diagnostic Review Team Survey dated 8/10/2017
PUCO/ORDC/NS Letter Agreement dated 1/17/2017

OHIO RAIL DEVELOPMENT COMMISSION

Mail Stop #3140, 1980 West Broad Street, Columbus OH 43223
John R. Kasich, Governor • Mark Policinski, ORDC Chairman

January 17, 2018

Norfolk Southern Railway Company
Mr. Stephen Klinger
Administrator Highway Grade Crossing Improvements
1200 Peachtree Street
Atlanta, GA 30309-3597

Subject: Grade Crossing Warning Device Improvements, PID 106851
Putnam County, CR 5, DOT# 472496M

Dear Mr. Klinger:

A diagnostic review was conducted at the subject grade crossings on 8/10/2017. As a result of the review, the warning devices will receive equipment upgrades as needed and a cantilever at the crossing.

This project shall be completed in compliance with Agreement No. 17450, dated December 19, 2012, entered into by the State of Ohio and Norfolk Southern Railway Company (NS) and incorporated as if fully rewritten herein. This construction shall also meet the general terms and conditions under the Fixing America's Surface Transportation Act and subsequent amendments and the State of Ohio's Federally Funded Warning Device Program.

Preliminary engineering (PE) and construction costs shall be borne one hundred percent (100%) by ORDC. Reimbursable costs will be limited by the ORDC based on approved estimates and bid tabulations, if applicable. These limits will be quantified by the ORDC in its construction authorization to NS and may be amended by the ORDC based on revised estimates and bid tabulations.

This Letter Agreement and the approved plans constitute the scope of the project. NS shall notify ORDC in writing of any changes in the scope of work which are not in the approved plans and estimates and secure approval in writing of same before the work is performed.

PE will not be commenced by NS prior to ORDC issuing a PE authorization. PE will be submitted by NS to ORDC within ninety (90) days or other time specified by ORDC in the PE authorization. Construction will not be commenced by NS prior to ORDC issuing a construction authorization. Construction will be completed by NS within nine (9) months or other time specified in the time specified by ORDC in the construction authorization.

Please indicate your acceptance of the terms and conditions of this Letter Agreement by signing and returning one (1) copy to me at the address listed above and retain a copy for your files. This Agreement may be executed in one or more counterparts, each of which shall be deemed to be a duplicate original, but all of which taken together shall be deemed to constitute a single Agreement.

Sincerely,

for

Matthew R. Dietrich
Executive Director

Norfolk Southern:

By: Gregory R. Comstock

Title: General Manager

Date: 1/22/18

PUT CR 5 PID 106851 472496M

OHIO RAIL DEVELOPMENT COMMISSION

Ohio Rail Development Commission
Mail Stop 3140, 1980 W. Broad Street,
Columbus, OH

High Hazard Crossing With Active Warning Devices			
Street Name: CR 5		County: PUT	
LHA: Putnam County		USDOT#: 472496M	
Nearest City: Leipsic		Hazard Rank: 49	
Roadway Information			
ADT: 2527 (2015)	Posted Speed Limit:		
Railroad: Norfolk Southern	Number of Tracks: 3		
Train Count: 26	Speed Over Crossing: 60		
Storage Distance (Ft.): Not Listed	Train Detection Type: CD/AFO		
Accidents			
Accident Factors	2 # of Accidents in Last 5 Years:		
	1 # of Fatalities in Last 5 Years:		
Accident Date	2/14/15	5/29/13	
Position of Accident	Moving over the crossing.	Moving over the crossing.	
Circumstance			
Visibility/Time of Day	Dark	Day	
Weather Conditions	Clear	Snow	
Crossing Interconnect.	No	No	
Crossing Illuminated	No	No	
Drove Around Train	No	No	
Highway User Action	Stopped on crossing	Went thru Gate.	
Alcohol/Drug Related?			
Driver Speeding?			

Other Notes: 2/24/15: Train was struck by hwy-user at crossing. 5/29/13: Train traveling westbound on main 2 when northbound hwy user failed to stop and skid into the path of the train.

Recommendations:

- ADD SINGLE CANTILEVER TO S. SIDE (NORTH-BOUND TRAFFIC)
- UPDATE EQUIPMENT ON AS NEEDED BASIS.

MLL LH TSB

County: PUT Route: CR 5 DOT#:472496M Date: 8/10/2017

Existing Traffic Control Devices

Type of Warning Devices	Installed?	Quantity/Comments
Advance Warning Signs (condition?)	(Yes) No	
'Stop' Signs	Yes (No)	
'Stop Ahead' Signs	Yes No	
Pavement Markings (condition?)	Yes (No)	
Crossbucks	(Yes) No	
Number of Tracks Signs	(Yes) No	
Inventory Tags	(Yes) No	
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	Number: 1 BELL
Sidewalk Gate Arms	Yes (No)	
'No Turn' Signs	Yes (No)	
Illumination	Yes (No)	
Is crossing flagged by train crew?	Yes No	
Other	Yes No	

Railroad Data

Railroad Characteristics	Initial Information (from database)	Revised
Total trains per day	26	OK
< 1 per day		
Day thru trains	12	MAY VARY
Night thru trains	12	
Daytime switching movements	1	
Nighttime switching movements	1	
Total number of tracks	3	
Number of main tracks	2	
Number of other tracks	1 Siding	
Maximum train speed	60 / 40 - MAIN #TWO	
Typical train speed	60 40-45 MPH TRACK	NEITHER 40/60 MPH IS TYPICAL
Amtrak		

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

Can one or more tracks be eliminated through the crossing? (Yes) 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)

County: PUT Route: CR 5 DOT#:472496M Date: 8/10/2017

Roadway Data

Local Highway Authority: Putnam County

Roadway Characteristics	Initial Information (from database)	Revised
Average daily traffic 2527	TIMS (2015)	OK (40% TRUCK)
Highway paved	Yes X No	Yes No
Roadway Surface: Blacktop Gravel Concrete Other _____		HIGHEST TRAFFIC ROAD IN COUNTY
Roadway width: 24 ft.	26 FT WIDE PAVEMENT	
Number of highway lanes	2	OK
Urban or Rural	Local	OK
Vehicle Speed: 55 MPH		

School Bus Operation: **No** **X Yes** Amount 4 UNKNOWN

Hazardous Materials Trucks: **No** **X Yes** Amount .04%

Shoulders: **No** **Yes** (2-3 FT.)

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:	Quadrant _____ Curb and Gutter:
Functional (Curb height = 4" or more)	Functional (Curb height = 4" or more)
Non-functional (Curb height = Less than 4")	Non-functional (Curb height = Less than 4")
None	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,

Street Name _____

Distance _____

Is this intersection signalized? **No** **Yes**

Are the signals currently interconnected with the existing crossing warning devices? **No** **Yes**

Is there a 'Do not Stop on Track' sign? **No** **Yes**

Is a roadway improvement project (e.g. widening, turn lanes, nearby new or upgraded traffic signal, sidewalk) planned at or near this location in the foreseeable future? **No** **Yes** ROAD WAS RECENTLY WIDENED

If yes,

Improvement type POSSIBLE CHIP+SEAL Lead Agency COUNTY

Timeline/completion SURFACING WITHIN NEXT TWO YEARS

Is it the consensus of the Diagnostic Review Team that this is a potential closure project? **No** **Yes**

Explain reasons: MAJOR ARTERIAL ROAD SERVES DEVELOPING INDUSTRY.

Type of Development

Open Space Institutional Industrial Commercial Residential	Location of nearby schools:

County: PUT Route: CR 5 DOT#:472496M Date: 8/10/2017

Potential Red Flags / Project Challenges

Traffic Signal Preemption (include traffic signal intersection name and LHA with jurisdiction over traffic signal, if known):

NA

Crossing Consolidation or Closure:

NA

Real Estate or ROW:

NA

Culverts / Drainage / Ballast Conditions:

NA

Roadway and/or Sidewalks:

NA

Circuitry (e.g. reaches out to other crossings, specific needs, etc.): SUPERVISOR SUGGESTED:

- SSEC3
- NEW CHARGERS
- NEW BATTERIES
- RECORDER NEEDED
- NO SEAR
- SOLID STATE NEEDED

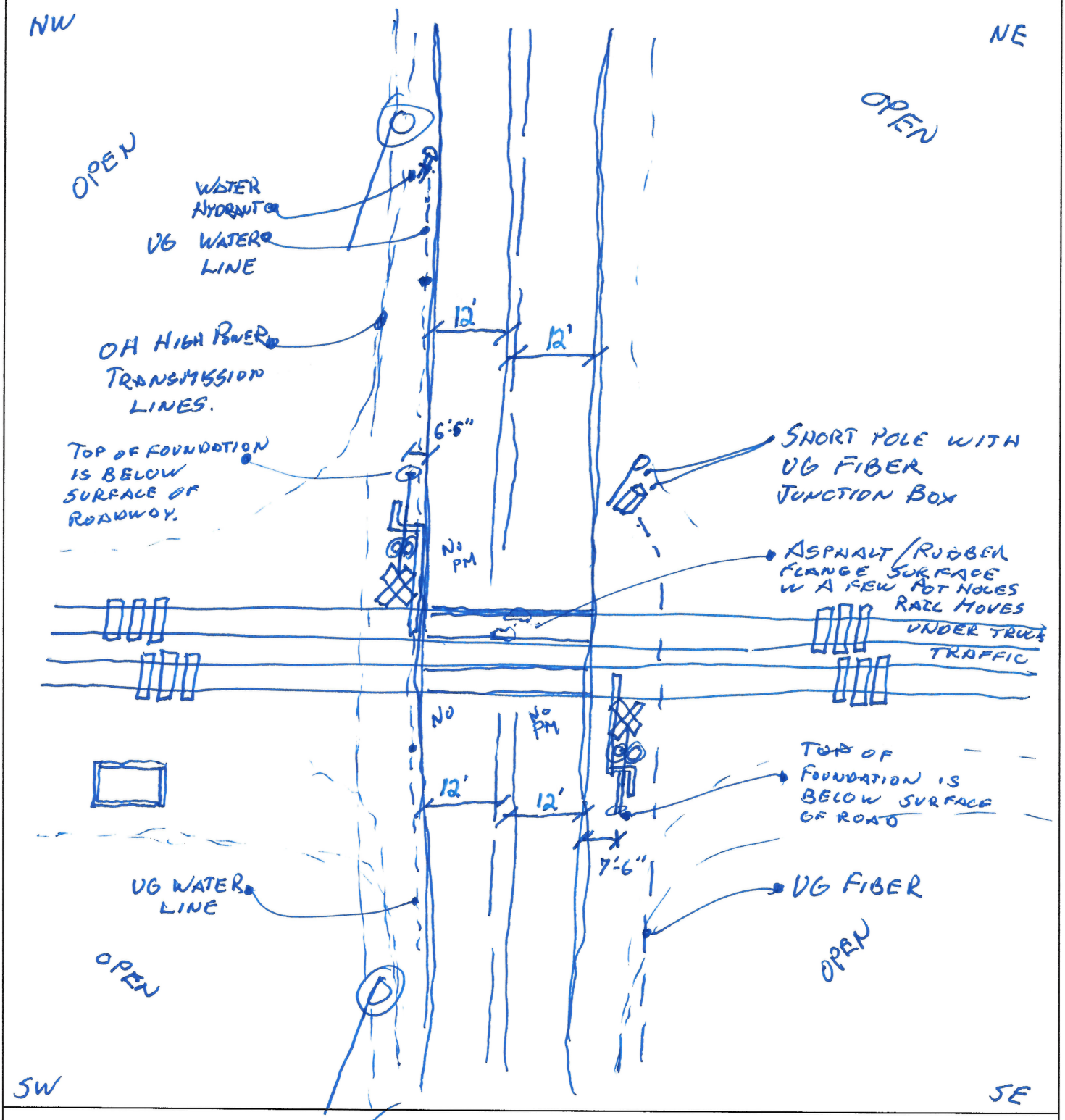
Environmental:

NA

Other:

County: PUT Route: CR 5 DOT#:472496M Date: 8/10/2017

Field Sketch



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

Sketch by: DJD

BUFFALO II
"B LINE
FOOTPRINT DIV.

County: PUT Route: CR 5 DOT#:472496M Date: 8/10/2017

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.

OHIO RAIL DEVELOPMENT COMMISSION

Ohio Rail Development Commission
Mail Stop 3140, 1980 W. Broad Street,
Columbus, OH

Diagnostic Review

(PUT CR 5 DOT # 472496M)

8/10/2017

Please print:

NAME	AGENCY	EMAIL ADDRESS	PHONE
Lincoln G. Harrison	PUCO	Lincoln.Harrison@ohio.gov	419-204-7333
Cathy Stout	ORDC	catherine.stout@dot.ohio.gov	
Tom Burns	ORDC	THOMAS.BURNS@DOT.OHIO.GOV	614-644-0293
Harold B. Nelson	Putnam CO. S.O.	nelsonb@sheriffoff.com	419-523-3208
Michael Klear	Putnam County EMA	Mike@pcops.org	419-538-7315
Cory J Zender	Norfolk Southern		
Mike Lenhart	Putnam Cty Engineer	michael.lenhart@putnamcountyohio.gov	419-523-6931
Cory Wylie	Norfolk Southern	Cory.Wylie@nscorp.com	404-278-3491
TyroneMcCroskey	NorfollSouthern	tyrone.mccroskey@nscorp.com	

Summary: Application In the Matter of a Request for the Installation of New Active Warning Devices at the Norfolk Southern Railway Crossing, CR 5 DOT# 472-496M, in Putnam County, Ohio. electronically filed by Mrs. Jill A Henry on behalf of PUCO/Rail Division