

Memo

To: Docketing Division
From: Jill Henry, Rail Specialist, Rail Division
Cc: PUCO Legal Department
Date: 12/3/2018

Re: PUCO Case No. 18-1789-RR-FED- In the Matter of a Request for the Installation of Active Warning Devices and Advanced Traffic Preemption at the Wheeling & Lake Erie Railroad Grade Crossing, DOT# 002-124A, at Castle Blvd. in Summit County, Ohio.

On June 26, 2017, the Ohio Rail Development Commission (ORDC) authorized funding for Wheeling & Lake Erie Railroad (WE) to install lights and gates and advanced traffic preemption for future use at Castle Boulevard in Summit County, Ohio. The crossing was surveyed, on April 18, 2017, and was found to warrant the upgrade. The electric utility provider for this crossing is Ohio Edison, First Energy Corporation.

The project will be paid for with federal funds and is actual cost. The plans and estimates for the project in the amount of \$418,330.84 have been approved. Construction may commence at once. **Staff requests a Finding & Order with completion of the project in nine 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:

Wheeling & Lake Erie Railway Company
Tim Andrews
Signals & Communications Supervisor
100 E. First Street
Brewster, Ohio 44613

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

City of Akron
Mike Lupica
Traffic Engineer
1420 Triplett Blvd. Bldg. 2
Akron, OH 44306-3390

Ohio Edison/First Energy

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

TO: Randall Schumacher, Supervisor, Rail Division, PUCO
FROM: Cathy Stout, Manager, Safety Section, ORDC
BY: James Tucker, Project Manager, ORDC J.T.
SUBJECT: Summit County, Castle Blvd, Wheeling & Lake Erie
DOT#002124A, PID#105916
DATE: October 18, 2018

The Ohio Rail Development Commission (ORDC) established a diagnostic survey at the subject location on April 18, 2017. The Diagnostic Team recommended that the crossing be upgraded to flashing lights and roadway gates with advance preemption to be incorporated for future use. Copies of the diagnostic review form and the plan and estimate are attached.

PE has already been provided by the railroad. ORDC approves the site plans and estimates as provided. Please issue a construction-only order for the project outlined above for nine months. This construction 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.

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, PUCO
Heather Hamilton, ORDC
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

October 18, 2018

Mr. Tim Andrews
Wheeling & Lake Erie Railway
100 East First Street
Brewster, Ohio 44613

RE: Summit County, Castle Blvd.
DOT#002124A, PID# 105916

Dear Mr. Andrews:

The plan dated August 31, 2018 and estimate dated October 16, 2018, for the referenced project has been reviewed and is acceptable. Wheeling & Lake Erie (WLE) may proceed with the construction of the proposed grade crossing warning system 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 \$418,330.84. 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 WLE accepting the following instructions:

1. WLE's project foreman will furnish written notification five (5) working days prior to the date work will start at the project site to James Tucker, ORDC, email James.tucker@dot.ohio.gov and to the Public Utilities Commission of Ohio at Jill.henry@puco.ohio.gov. WLE's 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. WLE 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 WLE.
3. WLE's project foremen will notify James Tucker at James.tucker@dot.ohio.gov (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. WLE will furnish two **(2) copies** of each partial bill to ORDC. Please find the enclosed ODOT Purchase Order to reference when billing.



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6. WLE 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. This installation will include any ancillary work to make the warning devices function as designed and meet MUTCD.

Thank you for your assistance with these matters.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Tucker', with a long horizontal flourish extending to the right.

James Tucker
Project Manager

C: Randall Schumacher, Rail Division Supervisor, PUCO
Jill Henry, Grade Crossing Planner, PUCO
Heather Hamilton, ORDC
ORDC (file)

WHEELING & LAKE ERIE RAILWAY COMPANY

Tim Andrews
Signal & Communication Supervisor

100 East First Street
Brewster, OH 44613

Tel. 330-767-7255

tandrews@wlerwy.com

Fax: 330-767-3213

16 October 2018

Ohio Rail Development Commission
Mr. Jim Tucker
1980 West Broad Street, Room 2B
Columbus, OH 43223

Re: Revised Estimate for Railroad Crossing Warning System at Castle Blvd. DOT 002-124-A

Dear Mr. Tucker,

I am providing the revised estimate for the crossing package and installation at Castle Blvd. As discussed in our review, the estimate includes upgrades that will be required at the adjacent crossings for this project. Award of the material package will be the result of a competitive bid; copies of the submitted quotes will be forwarded to your office when they are completed. Installation will be performed by CTC LLC. This revision shows actual material cost provided by CTC.

| | |
|--|---------------------|
| Engineering Services, CTC (breakout attached) | \$362,561.47 |
| Fill Materials, transport, hauling | \$5,500.00 |
| Preliminary Installation Services, Crosier (breakout attached) | \$35,141.37 |
| Electric Service, Emery | \$3,950.00 |
| Electric Utility fees | \$2,500.00 |
| WLE Direct Signal Labor | \$7,500.00 |
| Galvanized signal foundations | \$1,178.00 |
| TOTAL | \$418,330.84 |

Please contact me if additional details are required.

Respectfully,



Tim Andrews

Notes1: Direct purchase 60" galvanized gate foundation, \$589.00 ea.

Wheeling & Lake Erie Railway Company
Akron, OH. Castle Blvd DOT# 002 124 A
CTC Inc. Project Estimate

| ENGINEERING | | | | |
|--|------------|------------|-------------------|--------------------|
| <i>Description</i> | <i>Qty</i> | <i>UOM</i> | <i>Unit Price</i> | <i>Amount</i> |
| SIGNAL DESIGNER | 80 | HR | 32.69 | \$2,615.20 |
| SIGNAL CHECKER, LEVEL 1 | 20 | HR | 39.66 | \$793.20 |
| SIGNAL CHECKER, LEVEL 2/FIELD ENGINEER | 6 | HR | 36.66 | \$219.96 |
| SUBTOTAL | | | | \$3,628.36 |
| G&A BURDEN FOR LABOR (162%) | | | | \$5,877.94 |
| FIXED FEE (14%) | | | | \$1,330.88 |
| ENGINEERING TOTAL | | | | \$10,837.19 |

| PROJECT MANAGEMENT | | | | |
|--|------------|------------|-------------------|--------------------|
| <i>Description</i> | <i>Qty</i> | <i>UOM</i> | <i>Unit Price</i> | <i>Amount</i> |
| SENIOR SIGNAL ENGINEER | 24 | HR | \$75.48 | \$1,811.52 |
| PROJECT MANAGER | 32 | HR | \$39.66 | \$1,269.12 |
| MANAGER - COMMUNICATIONS | 80 | HR | \$43.27 | \$3,461.60 |
| CONSTRUCTION MANAGER | 80 | HR | \$39.66 | \$3,172.80 |
| ACCOUNTING, LEVEL1 | 16 | HR | \$39.81 | \$636.96 |
| ADMINISTRATIVE | 6 | HR | \$25.48 | \$152.88 |
| SUBTOTAL | | | | \$10,504.88 |
| G&A BURDEN FOR LABOR (162%) | | | | \$17,017.91 |
| FIXED FEE (14%) | | | | \$3,853.19 |
| PROJECT MANAGEMENT TOTAL | | | | \$31,375.98 |

| EAF LABOR | | | | |
|--|------------|------------|-------------------|-------------------|
| <i>Description</i> | <i>Qty</i> | <i>UOM</i> | <i>Unit Price</i> | <i>Amount</i> |
| EAF MANAGER | 10 | HR | \$28.00 | \$280.00 |
| EAF LEAD FORMAN | 24 | HR | \$20.19 | \$484.56 |
| LEAD WIREMAN | 40 | HR | \$19.25 | \$770.00 |
| WIREMAN | 40 | HR | \$15.00 | \$600.00 |
| TEST | 8 | HR | \$36.00 | \$288.00 |
| QC | 8 | HR | \$28.85 | \$230.80 |
| SUBTOTAL | | | | \$2,653.36 |
| G&A BURDEN FOR LABOR (162%) | | | | \$4,298.44 |
| FIXED FEE (14%) | | | | \$973.25 |
| EAF LABOR TOTAL | | | | \$7,925.06 |

| CONSTRUCTION LABOR | | | | |
|--|------------|------------|-------------------|--------------------|
| <i>Description</i> | <i>Qty</i> | <i>UOM</i> | <i>Unit Price</i> | <i>Amount</i> |
| SIGNAL FOREMAN | 160 | HR | \$29.04 | \$4,646.40 |
| SIGNALMAN | 320 | HR | \$23.40 | \$7,488.00 |
| SIGNAL HELPER | 320 | HR | \$19.00 | \$6,080.00 |
| SUBTOTAL | | | | \$18,214.40 |
| G&A BURDEN FOR LABOR (162%) | | | | \$29,507.33 |
| FIXED FEE (14%) | | | | \$6,681.04 |
| CONSTRUCTION LABOR TOTAL | | | | \$54,402.77 |

Wheeling & Lake Erie Railway Company
Akron, OH. Castle Blvd DOT# 002 124 A
CTC Inc. Project Estimate

| CONSTRUCTION LABOR EXPENSES | | | | |
|--|------------|------------|-------------------|--------------------|
| <i>Description</i> | <i>Qty</i> | <i>UOM</i> | <i>Unit Price</i> | <i>Amount</i> |
| EMPLOYEE MEALS (PER DIEM) | 240 | EA | \$30.00 | \$7,200.00 |
| EMPLOYEE LODGING | 80 | EA | \$70.00 | \$5,600.00 |
| MOBILIZATION | 6 | EA | \$1,500.00 | \$9,000.00 |
| SUBTOTAL | | | | \$21,800.00 |
| FIXED FEE (6%) | | | | \$1,308.00 |
| CONSTRUCTION LABOR EXPENSES TOTAL | | | | \$23,108.00 |

| CONSTRUCTION EQUIPMENT | | | | |
|---|------------|------------|-------------------|--------------------|
| <i>Description</i> | <i>Qty</i> | <i>UOM</i> | <i>Unit Price</i> | <i>Amount</i> |
| TRUCK, PU, 1 TON CREW CAB | 160 | HR | \$15.71 | \$2,513.60 |
| TRAILER, UTILITY (12,000lb SC410) | 160 | HR | \$7.55 | \$1,208.00 |
| RENTAL EQUIPMENT (FORKLIFT - 8K) | 2 | WK | \$1,400.00 | \$2,800.00 |
| RENTAL EQUIPMENT (BACKHOE W/18" BKT) | 2 | WK | \$1,200.00 | \$2,400.00 |
| RENTAL EQUIPMENT (BACKHOE W/HYDRAULIC AUX ATTACHMENT) | 1 | WK | \$1,400.00 | \$1,400.00 |
| RENTAL EQUIPMENT (AUGER MOTOR/BACKHOE ATTACHMENT/TOOLING) | 1 | WK | \$1,000.00 | \$1,000.00 |
| EQUIPMENT DELIVERY/PICKUP | 4 | LS | \$175.00 | \$700.00 |
| SUBTOTAL | | | | \$12,021.60 |
| FIXED FEE (6%) | | | | \$721.30 |
| CONSTRUCTION EQUIPMENT TOTAL | | | | \$12,742.90 |

| MATERIAL | | | | |
|--|------------|------------|-------------------|---------------------|
| <i>Description</i> | <i>Qty</i> | <i>UOM</i> | <i>Unit Price</i> | <i>Amount</i> |
| HOUSE MATERIAL (SEE ATTACHED DETAIL) | 1 | LS | | \$72,351.04 |
| RADIO MATERIAL (SEE ATTACHED DETAIL) | 1 | LS | | \$98,680.76 |
| FIELD MATERIAL (SEE ATTACHED DETAIL) | 1 | LS | | \$33,107.32 |
| AUGER, 12" w/EXTENSION (TOWER FOUNDATION) (PURCHASE ONLY!!) | 1 | LS | | \$3,607.50 |
| SHIPPING CHARGES (RADIO MATERIALS) | 1 | LS | | \$1,500.00 |
| COVER ROCK (3/4" CRUSHED - WHITE) | 30 | TN | \$26.50 | \$795.00 |
| FREIGHT & CONTAINER PRICE | 1 | LS | \$6,000.00 | \$6,000.00 |
| SUBTOTAL | | | | \$216,041.62 |
| FIXED FEE (6%) | | | | \$12,962.50 |
| MATERIAL TOTAL | | | | \$229,004.12 |
| TOTAL PROJECT ESTIMATE | | | | \$369,396.00 |


| HOUSE MATERIALS | | | | |
|---|-----|-----|--------------|--------------------|
| Description | QTY | UOM | Unit Price | Total Price |
| Bungalow, Alum. 6 X6 w/Heater P/N 91000564 D-1, PTMW (WLE SPECS) | 1 | EA | \$9,477.00 | \$9,477.00 |
| Wrench, AAR terminal - 11", P/N 032619-9X, Siemens | 1 | EA | \$43.63 | \$43.63 |
| Sensor, Hermetic Door Switch, P/N 70168986, Allied Electric | 1 | EA | \$4.99 | \$4.99 |
| Actuator, Hermetic Door Switch, P/N 70168991, Allied Electric | 1 | EA | \$1.99 | \$1.99 |
| Sign, Emergency, ENS, 15"X9" Blue, Eagle Traffic | 2 | EA | \$38.00 | \$76.00 |
| Wire, Case, #16AWG 1000' spool, Blue, P/N 152-11-3002, Okonite | 0.5 | EA | \$198.00 | \$99.00 |
| Wire, Case, #10AWG 1000' spool, Blue, P/N 152-11-3038, Okonite | 0.5 | EA | \$407.00 | \$203.50 |
| Wire, Case, #6AWG, Green, P/N N6GNM, Reynolds | 100 | EA | \$0.35 | \$35.00 |
| Wire, Case, #6AWG, Black, P/N N6BM, Reynolds | 100 | FT | \$0.35 | \$35.00 |
| Wire, Case, #6AWG, Red, P/N N6RD, Reynolds | 100 | FT | \$0.35 | \$35.00 |
| MDA-II With Current Sensors DTMF Radio and GFD - Complete, P/N NAS-WLE, NAS | 1 | EA | \$6,431.00 | \$6,431.00 |
| MDSA-1X Surge arrestor panel, P/N 250204-100, Alstom | 1 | EA | \$474.00 | \$474.00 |
| XP4 Chassis P/N 300752-000, GE ** (Populated as shown on Plans) ** | 1 | EA | \$27,450.00 | \$27,450.00 |
| Module, 44R personality module, #251379-000, Alstom | 2 | EA | \$2,313.00 | \$4,626.00 |
| Cable, XIP 8 ft (cable #1) (need 1 for XP4 Assy) P/N 075046-001, Alstom | 1 | EA | \$104.00 | \$104.00 |
| Cable, XIP 8 ft (cable #2) (need 1 for XP4 Assy) P/N 075047-001, Alstom | 1 | EA | \$104.00 | \$104.00 |
| PSO 4000 Transmitter, #7000-7A471-0001, Siemens | 1 | EA | \$2,431.00 | \$2,431.00 |
| PSO 4000 Receiver, #7000-7A473-0001, Siemens | 1 | EA | \$3,183.00 | \$3,183.00 |
| PSO Tuned Receiver Coupler, #7000-7A355-F, Siemens | 1 | EA | \$882.00 | \$882.00 |
| Relay, 500 Ohm, 6PT, Nuetrail relay, plug-in, P/N A62-0262, Alstom | 6 | EA | \$1,256.80 | \$7,540.80 |
| Plugboard, Kit (1E/3E test posts) P/N 59686-019-02, Alstom | 6 | EA | \$125.00 | \$750.00 |
| Wrench, 3E test tool, P/N P03-0320, Alstom | 1 | EA | \$51.10 | \$51.10 |
| Extractor Tool, Terminal clip, P/N 032619-25, Siemens | 1 | EA | \$1.18 | \$1.18 |
| Relay, 8-pin KRPA style, 10A/240V, P/N 70198711, Allied | 2 | EA | \$18.62 | \$37.24 |
| Socket, 8-pin KRPA style, P/N 70199343, Allied | 2 | EA | \$5.61 | \$11.22 |
| Spring, Hold down for KRPA style relay, P/N 70198576, Allied | 2 | EA | \$0.33 | \$0.66 |
| Battery Charger, ETC-12V 40AMP, P/N 520740, Railway Equipment | 2 | EA | \$590.00 | \$1,180.00 |
| Battery, NiCad 340 A.H., P/N SPL-340, Saft | 9 | EA | \$310.50 | \$2,794.50 |
| Battery, NiCad 250 A.H., P/N SPL-250, Saft | 10 | EA | \$225.00 | \$2,250.00 |
| Terminal, Battery, 3-PT, P/N 225481-000, J&A Industries | 4 | EA | \$24.25 | \$97.00 |
| Transformer, Gate Heater #N66-A, P/N 70218528, Allied | 2 | EA | \$125.00 | \$250.00 |
| Battery Tray 12"x27", Holds (3) Batteries, P/N 027002-001, J&A | 4 | EA | \$48.00 | \$192.00 |
| Nema Plug, Locking, 15 Amp/240V, P/N L6-15P, Reynolds | 2 | EA | \$14.50 | \$29.00 |
| Power Indicator, 2 Eye/4 Wire, Wago connector, P/N LC2-001WB-WG4, Velcorp Gems | 1 | EA | \$139.56 | \$139.56 |
| SO Cord, 14 AWG/4 Conductor, P/N SJOOW-14-4-BLK-250R, Graybar | 100 | EA | \$0.73 | \$73.00 |
| Tie-wrap, 11 1/2", PKG 100, Black, P/N LTS11-0, Vantex | 1 | EA | \$20.21 | \$20.21 |
| Tie-wrap, mounting, PKG 100, P/N TYM, Vantex | 1 | EA | \$27.44 | \$27.44 |
| Loom, Spiral Wrap 100', Black, P/N SW38-0, Vantex | 1 | EA | \$48.54 | \$48.54 |
| Panduit, Wire Duct, 2"X3"X6' Gray, P/N G2X3LG6, Graybar | 3 | EA | \$4.61 | 13.83 |
| Panduit, Cover, 6' Gray, P/N C2LG6, Graybar | 3 | EA | \$1.16 | \$3.48 |
| Terminal, Single Row, 12 x 1 w/hardware, P/N 220-0202, Rebel Rail | 10 | EA | \$0.27 | \$2.70 |
| Terminal, 4-post, Block Kit, w/ 14-24 AAR Hardware, P/N B2700A2C1WH, Erico | 15 | EA | \$0.53 | \$7.95 |
| Connector, 2 3/8", strap style, P/N 220-0507, Rebel | 10 | EA | \$0.70 | \$7.00 |
| Connector, 1", flat, strap style, P/N 220-0501, Rebel | 10 | EA | \$0.30 | \$3.00 |
| Arrestor, Air Gap, With Cover, P/N 4000-44585-001X, Siemens | 10 | EA | \$43.48 | \$434.80 |
| Equalizer, Air Gap, with Cover/Hardware, P/N 4000-44700-001X, Siemens | 5 | EA | \$19.77 | \$98.85 |
| Binding Nut, P/N 13073-000, Rebel | 200 | EA | \$0.18 | \$36.00 |
| Clamp Nut, P/N 13079-000, Rebel | 100 | EA | \$0.14 | \$14.00 |
| Insulated Nut, 1 3/16", P/N 023408-1X, Safetran | 14 | EA | \$4.00 | \$56.00 |
| Washer, P/N 013074-000, Rebel | 200 | EA | \$0.07 | \$14.00 |
| Gold Test Nut, P/N 13296-001, Rebel | 100 | EA | \$0.55 | \$55.00 |
| 1' Test Link, Flat, P/N 32257-002 | 100 | EA | \$1.75 | \$175.00 |
| Terminal Ring, HD, 1/4", insulated, #14 - #16 (yellow w/blk stripe), P/N NC-10HDB, Vantex | 100 | EA | \$0.83 | \$83.00 |
| Terminal, Ring, 1/4", insulated #14 - #16 (100 pk), P/N NB14, Vantex | 2 | EA | \$29.87 | \$59.74 |
| Terminal, Ring, 1/4" insulated, #10 - #12 (100 pk), P/N NC14, Vantex | 2 | EA | \$31.24 | \$62.48 |
| Terminal, Ring, 1/4" insulated, #6, Blue, P/N T6-14N, Vantex | 30 | EA | \$0.67 | \$20.10 |
| Terminal, Ring, 3/8" non-insulated, #6, Battery Lug, P/N T6-38, Vantex | 15 | EA | \$0.97 | \$14.55 |
| | | | TOTAL | \$72,351.04 |

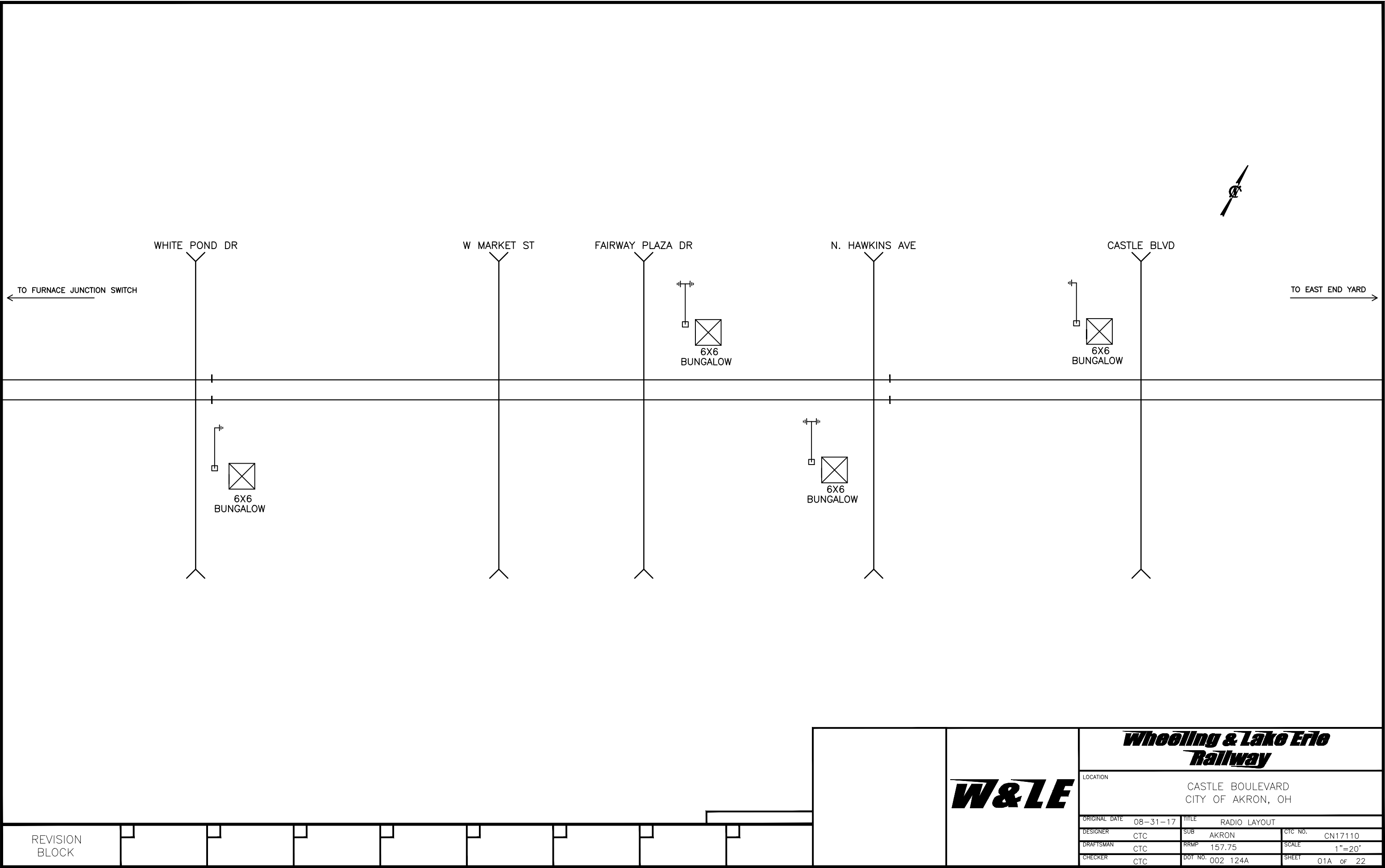
| RADIO MATERIALS | | | | |
|---|------------|------------|-------------------|--------------------|
| Description | QTY | UOM | Unit Price | Total Price |
| Unit, H/D Link, P/N 9000532010018, Siemens | 4 | EA | \$4,458.00 | \$17,832.00 |
| Processor, 2.4GHZ ESSR, w/o wag, P/N 9000533550001, Siemens | 4 | EA | \$3,489.00 | \$13,956.00 |
| Wayside, Access Gateway, P/N 9000534570002, Siemens | 4 | EA | \$2,457.00 | \$9,828.00 |
| Hardware, Mounting, P/N Z916000560000, Siemens | 4 | EA | \$49.04 | \$196.16 |
| Fitting, 2400-2485 MHZ 14DBI N-Male, P/N Z913000480000, Siemens | 4 | EA | \$225.00 | \$900.00 |
| Assy, Cable, P/N Z706002380000, Siemens | 4 | EA | \$203.00 | \$812.00 |
| Wire, 8C/24 AWG-4PR, RJ45-Conn (1FT), P/N Z706002610000, Siemens | 4 | EA | \$3.16 | \$12.64 |
| Cable, CAT5 Patch (2FT), P/N Z706002660002, Siemens | 4 | EA | \$11.89 | \$47.56 |
| Cable, Assy CAT5 (6 FT), P/N Z706002620000, Siemens | 4 | EA | \$17.92 | \$71.68 |
| Arrestor, Inline CAT5, P/N Z803001520000, Siemens | 4 | EA | \$272.00 | \$1,088.00 |
| Power supply, AC Power Inserter, PWI-0109, P/N Z932001840000, Siemens | 4 | EA | \$107.00 | \$428.00 |
| Kit, Weatherproofing, P/N Z801084670000, Siemens | 4 | EA | \$42.18 | \$168.72 |
| Engineering Services - MCF Files (HD Link) | 1 | LS | | \$4,000.00 |
| ESSR Cluster HUB companion CD | 1 | EA | \$0.00 | \$0.00 |
| 30' Folding Tower, P/N 400-004-2050 | 4 | EA | \$7,925.81 | \$31,703.24 |
| 10'X10" Helical screw Pier w/ Leveling hardware, P/N 400-000-1401 | 4 | EA | \$2,356.65 | \$9,426.60 |
| Tower Grounding Kit, P/N V-5210 | 4 | EA | \$832.09 | \$3,328.36 |
| Coax Entry Ports, LMR600 x2, V-5223-02, ARMS | 4 | EA | \$60.91 | \$243.64 |
| 2" Liquidtight conduit (50'), P/N V5219, ARMS | 4 | EA | \$944.64 | \$3,778.56 |
| 2" Liquidtight Conduit Box Adapter, P/N V-5231, ARMS | 4 | EA | \$100.48 | \$401.92 |
| Lightning Protection Conduit Mount, P/N V-5214B, ARMS | 4 | EA | \$114.42 | \$457.68 |
| | | | Total | \$98,680.76 |

| FIELD MATERIALS | | | | |
|---|------------|------------|--------------------|--------------------|
| Description | QTY | UOM | Unit Price | Total Price |
| Cable, 7/C#6, Armored, 206-11-6247, Okonite | 300 | FT | \$8.11 | \$2,433.00 |
| Cable, 7C#14, Armored, 206-11-6887, Okonite | 300 | FT | \$2.99 | \$897.00 |
| Cable, 3C#6, Armored, #206-11-6243, Okonite | 150 | FT | \$6.00 | \$900.00 |
| Wire, Track, 2C/#6, Twist, Solid, 113-12-3933, Okonite | 200 | FT | \$1.86 | \$372.00 |
| Tape, Marker - "Buried RR line"/"Buried electrical line" | 1 | ROLL | \$15.99 | \$15.99 |
| Bootleg Kit, Crossing complete, Wood, 1 Track, CTC Inc. | 2 | EA | \$500.00 | \$1,000.00 |
| Bondstrand, 3/16", Black, 500', P/N SBS8LINSUL, Erico | 500 | FT | \$1.22 | \$610.00 |
| Sleeve, 3/16" - #6 solid, P/N A2363J, Erico | 100 | EA | \$1.29 | \$129.00 |
| Sleeve, 3/16" - 3/16", P/N A2367J, Erico | 100 | EA | \$1.29 | \$129.00 |
| Clip, Retainer - Spring Steel, P/N A248B, Erico | 50 | EA | \$3.22 | \$161.00 |
| Staple, Copper, 1 1/2" x 5/16" x 0.144, | 50 | EA | \$0.38 | \$19.00 |
| Electrical tape, Super 88, Black, 3M | 2 | EA | \$5.00 | \$10.00 |
| Splicing tape, rubber, 3/4"X30', P/N 130C, 3M | 1 | EA | \$39.41 | \$39.41 |
| Bond Wire, 7 1/2" XS Style, P/N SBS24883, Erico | 100 | EA | \$5.12 | \$512.00 |
| Connector, Track, Web of Rail, P/N SBTBBU4A, Erico | 100 | EA | \$4.63 | \$463.00 |
| Rail Welding Material F80, P/N SB25, Erico | 100 | EA | \$1.56 | \$156.00 |
| Wheel, grinding, P/N SB22122, Erico | 4 | EA | \$35.87 | \$143.48 |
| 5/8" X 8' Copper Ground Rod P/N 615880, Erico | 5 | EA | \$9.50 | \$47.50 |
| 5/8" Ground Rod Weld, P/N SBNT1161G, Erico | 5 | EA | \$7.48 | \$37.40 |
| Wire, Ground, #6AWG, Bare Copper, Graybar | 10 | FT | \$0.34 | \$3.40 |
| FSS-IA, Tunable NBS. P/N 250850-000, GE | 2 | EA | \$847.00 | \$1,694.00 |
| Shunt Enclosure, Orange, P/N 500-400-100-09-Orange, G&B | 2 | EA | \$374.00 | \$748.00 |
| Mast, Gate, 18'X5" w/pigtail (single-sided Jct Box), P/N 715-324-2-GS, WCH | 2 | EA | \$578.00 | \$1,156.00 |
| Jct box, Gate, 5" single hole w/24 terminals, P/N 2149-A-139, WCH | 2 | EA | \$395.00 | \$790.00 |
| Gate, Model 3597, P/N 3597-131-R-H-M1 (6 contacts / 115v defroster), WCH | 2 | EA | \$492.00 | \$984.00 |
| Resistor, Adjustable, 5 OHM, P/N 1110-7D, WCH | 2 | EA | \$470.00 | \$940.00 |
| Crossarm Assy, 5" Mtg., 2 Way, P/N 975-0804-5, WCH | 2 | EA | \$3,762.00 | \$7,524.00 |
| Lights, 12" LED, P/N FLX 4000, Safetran | 8 | EA | \$247.76 | \$1,982.08 |
| Counterweight Package, 24', P/N 070755-238G, Safetran | 2 | EA | \$1,356.00 | \$2,712.00 |
| Sign, Crossbuck, No brackets/hardware, P/N 070-0065, Rebel Railway | 2 | EA | \$84.00 | \$168.00 |
| 5" Sign Kit, Brackets/extensions/Ubolts/hardware, P/N 070-5008, Rebel Railway | 2 | EA | \$56.70 | \$113.40 |
| Wind Bracket, 36", Tusk style, P/N 2010-001-01, RDG | 2 | EA | \$136.00 | \$272.00 |
| Bell, Electronic, 5" Base, P/N EB-3-360-5, GSI | 1 | EA | \$165.00 | \$165.00 |
| Gate Keeper, 2-Way, w/Hardware & Buffer Spring, P/N SK-1000-2W, GSI | 2 | EA | \$1,100.00 | \$2,200.00 |
| E-Z Gate 21'-42' (Vertical) A/F + LED gate lamp kit, P/N 9298-6154, Railway Equipment | 2 | EA | \$649.00 | \$1,298.00 |
| Sleeve, 4' Aluminum, P/N 92958, Railway Equipment | 2 | EA | \$39.00 | \$78.00 |
| Wrench, Torque (KIT), P/N 2590-K-9, WCH | 1 | EA | \$191.00 | \$191.00 |
| Field cable Tag Kit, P/N FLDTGKT, CTC Inc. | 1 | EA | \$1,100.00 | \$1,100.00 |
| Emergency Notification Signs, MUTCD, 15" x 9" with 5" mast mounts | 1 | EA | \$649.00 | \$649.00 |
| Schedule 40 2" & 4" PVC Conduit Kit with Elbows | 1 | LOT | \$39.00 | \$39.00 |
| Pull Box, Polymer concrete (30X48X36)w/cover, P/N PHA304836H, Reynolds | 1 | EA | \$171.00 | \$171.00 |
| Duct seal, 1lb, P/N 31-601, Graybar | 1 | EA | \$9.41 | \$9.41 |
| Duct seal, 5lb, P/N 31-605, Graybar | 1 | EA | \$45.25 | \$45.25 |
| Total | | | \$33,107.32 | |

CONSTRUCTION NOTES

- 1.)
- INSTALL NEW 6' X 6' BUNGALOW IN SOUTHWEST QUADRANT.
- 2.)
- INSTALL (2) NEW FLASHING LIGHTS WITH GATES.
- 3.)
- METER POLE LOCATION SHOWN ON THE PLAN
IS SUBJECT TO CHANGE WITHIN RAILROAD
RIGHT-OF-WAY IF UNDERGROUND OBSTRUCTIONS
PREVENT THE INSTALLATION OF THE POLE
IN THE LOCATION SHOWN.
- 4.)
- BUNGALOW LOCATION SHOWN ON THE PLAN IS
SUBJECT TO CHANGE WITHIN RAILROAD
RIGHT-OF-WAY IF UNDERGROUND OBSTRUCTIONS
PREVENT THE INSTALLATION OF THE BUNGALOW
IN THE LOCATION SHOWN.
- 5.)
- REPLACE H.W.S. FOR PORTAGE PATH WITH NEW
FSS.

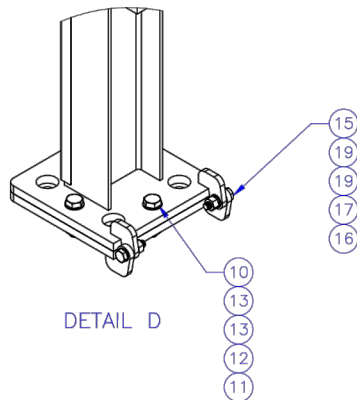
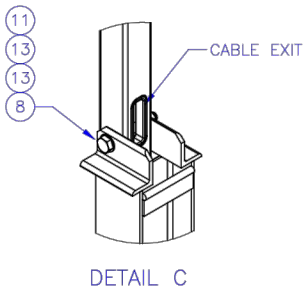
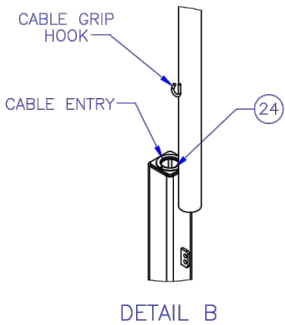
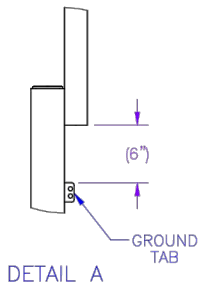
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|-------------------|--|--|--|--|--|--|--|--|---|--|--|--|
| | | | | | | | | |  | Wheeling & Lake Erie Railway | | |
| | | | | | | | | | | LOCATION CASTLE BOULEVARD CITY OF AKRON, OH | | |
| | | | | | | | | | | ORIGINAL DATE 08-31-17 TITLE CONSTRUCTION NOTES | | |
| | | | | | | | | | | DESIGNER CTC SUB AKRON CTC NO. CN17110 | | |
| | | | | | | | | | | DRAFTSMAN CTC RRMP 157.75 SCALE N.T.S. | | |
| | | | | | | | | | | CHECKER CTC DOT NO. 002 124A SHEET 01A of 22 | | |
| REVISION BLOCK | | | | | | | | | | | | |



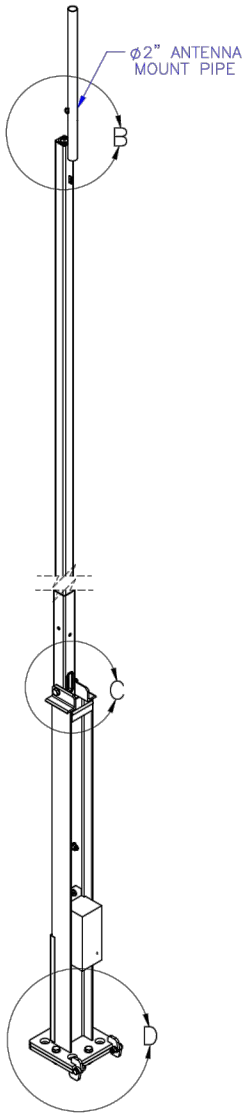
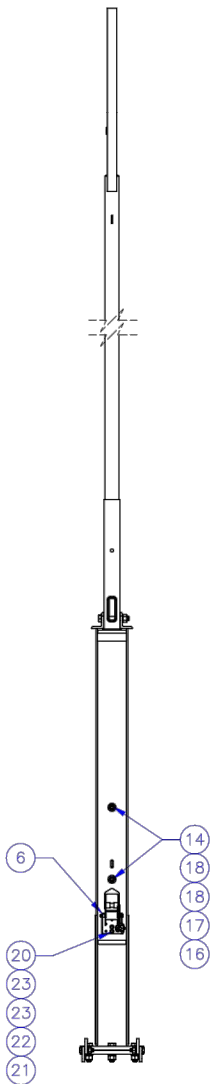
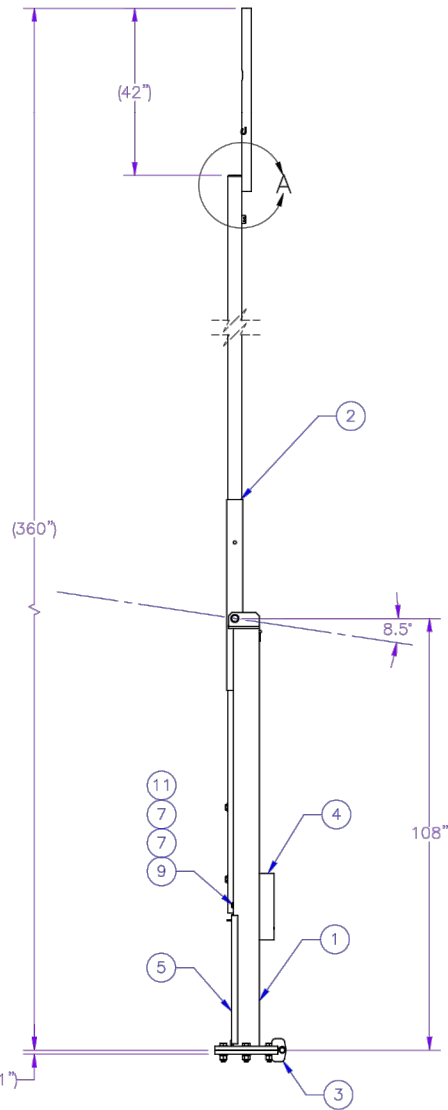
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| REVISION BLOCK | | | | | | | | | |
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| | | | |
|---------------|----------|---|---------------------------------------|
| | | Wheeling & Lake Erie Railway | |
| | | LOCATION | CASTLE BOULEVARD CITY OF AKRON, OH |
| ORIGINAL DATE | 08-31-17 | TITLE | RADIO LAYOUT |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | CTC NO. | CN17110 |
| | | SCALE | 1"=20' |
| | | SHEET | 01A of 22 |

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90 MPH EIA/TIA REV G
PATENT PENDING: #61322706



| ITEM NO. | QTY REQD | PART NUMBER | DESCRIPTION |
|----------|----------|-------------------|---|
| 1 | 1 | W-000-266 | SUPPORT BASE ASSEMBLY |
| 2 | 1 | W-000-267 | MAST ASSEMBLY |
| 3 | 1 | 400-004-3050-0630 | LOWER HINGE BASE ASSEMBLY |
| 4 | 1 | 400-004-3050-0612 | WINCH COVER |
| 5 | 1 | 400-004-3050-0629 | FRONT COVER |
| 6 | 1 | 400-904-3051 | WINCH KIT (1/4" X 14' WIRE ROPE) |
| 7 | 2 | 400-000-0902 | 1" SCH. 40 PVC SLEEVE |
| 8 | 1 | 002-0BG-0081 | BOLT, HX HD, 1.00-8UNC X 7.00 LG, GR B7, GALV |
| 9 | 1 | 002-0BG-0226 | BOLT, HX HD, 1.00-8UNC X 5.00 LG, GR B7, GALV |
| 10 | 4 | 002-0BG-0210 | BOLT, HX HD, 1.00-8UNC X 4.00 LG, ASTM A193 GR B7, GALV |
| 11 | 6 | 002-0NG-0000 | NUT, HX, ANCO LOCK, 1.00-8UNC, GR 2H, GALV |
| 12 | 4 | 002-0LW-G008 | WASHER, SPLIT LOCK, 1.00", GALV |
| 13 | 10 | 002-0FW-G009 | WASHER, FLAT, 1.00", F436, GALV |
| 14 | 2 | 002-0BG-0216 | BOLT, HX HD, .75-10UNC X 6.50 LG, ASTM A325, GALV. |
| 15 | 2 | 002-0BG-0022 | BOLT, HX HD, .75-10UNC X 3.00 LG, A325, GALV. |
| 16 | 4 | 002-0NG-0019 | NUT, HX, .75-10UNC, GR DH, GALV |
| 17 | 4 | 002-0LW-G003 | WASHER, SPLIT LOCK, .75", GALV |
| 18 | 4 | 002-0FW-G015 | WASHER, FLAT, .75 INCH, TYPE A, GALV |
| 19 | 4 | 002-0FW-G003 | WASHER, FLAT, .75 INCH, ASTM F436, GALV |
| 20 | 3 | 002-0BG-0008 | BOLT, HX HD, .375-16UNC X 1.50 LG, GR 5, GALV |
| 21 | 3 | 002-0NG-0003 | NUT, HEX, .375-16UNC, GR 2H, GALV |
| 22 | 3 | 002-0LW-G005 | WASHER, SPLIT LOCK, .375 INCH, GALV |
| 23 | 6 | 002-0FW-G005 | WASHER, FLAT, .375, USS, GALV |
| 24 | 1 | (MCM) 24175K15 | EDGE GUARD, .188, CUT AT 7.50 LG. |

| | | | | | | | |
|--|--|---|--|---|--|--------------------------|--|
| SURFACE FINISH: UNLESS OTHERWISE SPECIFIED | | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES | | APPROVALS | | DATE | |
| MATERIAL | | TOLERANCES | | DRAWN | | 6.23.16 | |
| SEE PARTS LIST | | FRACTIONS ± 1/16 | | C. SANCHEZ | | | |
| THIRD ANGLE PROJECTION | | ANGLES ± .25° | | CHECKED | | | |
| | | HOLES: ± 1/32 | | ENGINEER/DESIGNER | | | |
| NEXT ASSY | | USED ON | | PRODUCTION | | | |
| APPLICATIONS | | BURNED ± 1/32 | | | | | |
| | | | | ELECTRO MECHANICAL INDUSTRIES, INC. 11230 WEEBOW DRIVE HOUSTON, TEXAS 77065 1-800-453-0050 | | TITLE: 30' TILT-UP TOWER | |
| | | | | SIZE B | | DRAWING NO. 400-004-2050 | |
| | | | | SCALE: 1:36 | | WBGHT: 714.6 lbs. | |
| | | | | | | REV 1 | |
| | | | | | | SHEET 1 OF 1 | |

Wheeling & Lake Erie
Railway

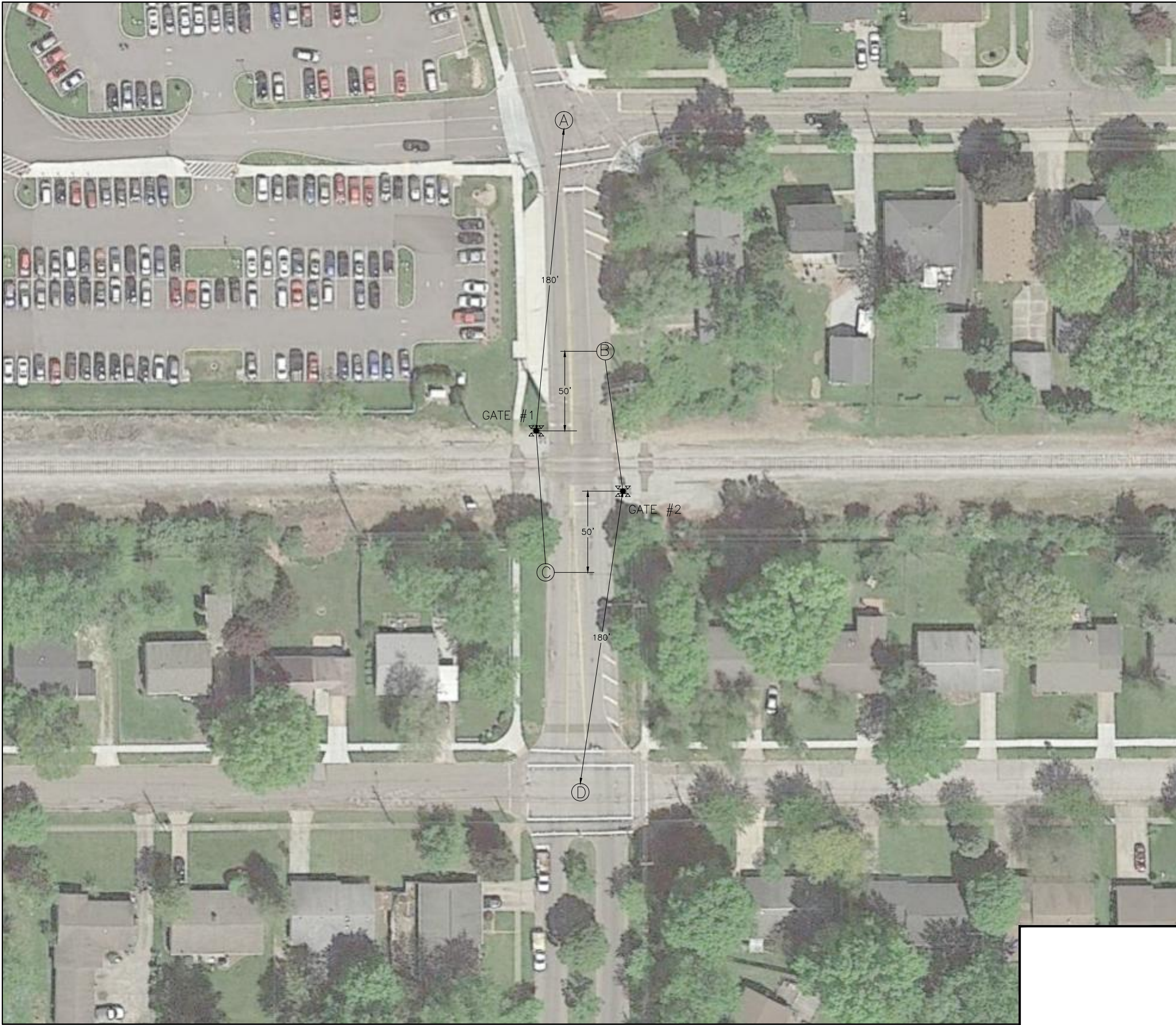
LOCATION
CASTLE BOULEVARD
CITY OF AKRON, OH

ORIGINAL DATE 08-31-17
DESIGNER CTC
DRAFTSMAN CTC
CHECKER CTC
TITLE 30' TILT-UP TOWER
SUB AKRON
RRMP 157.75
DOT NO. 002 124A
CTC NO. CN17110
SCALE N.T.S.
SHEET 01B of 22

W&LE

CHANGE FROM TYPICAL: N

REVISION
BLOCK



CROSSING SIGNAL ALIGNMENT

LEGEND

| | |
|---|---------------------------|
| Ⓐ | GATE #1 FRONT MAST LIGHTS |
| Ⓑ | GATE #2 BACK MAST LIGHTS |
| Ⓒ | GATE #1 BACK MAST LIGHTS |
| Ⓓ | GATE #2 FRONT MAST LIGHTS |

ALIGNMENT

FRONT LIGHTS
ADJUST LIGHT UNIT VERTICALLY TO ALIGN AXIS OF BEAM 5FT. 6IN. ABOVE PAVEMENT AT SELECTED ALIGNMENT DISTANCE. BOTH LAMPS SHOULD BE ALIGNED TO SAME POINT.

ADJUST LIGHT UNIT HORIZONTALLY TO ALIGN AXIS OF BEAM TO CENTER OF APPROACH LANE IN APPROACH TO SIGNAL AT SELECTED ALIGNMENT DISTANCE, MAINTAINING VERTICAL ALIGNMENT. BOTH LAMPS SHOULD BE ALIGNED TO SAME POINT.

BACK LIGHTS
ADJUST LIGHT UNIT VERTICALLY TO ALIGN AXIS OF BEAM 5 FT. 6 IN. ABOVE PAVEMENT AT A POINT 50 FT. IN APPROACH TO THE SIGNAL ON OPPOSITE SIDE OF TRACK.

ADJUST LIGHT UNIT HORIZONTALLY TO ALIGN AXIS OF BEAM TO A POINT 50 FT. IN APPROACH TO THE SIGNAL ON OPPOSITE SIDE OF TRACK AND IN CENTER OF APPROACH TRAVEL WAY.

**Wheeling & Lake Erie
Railway**

W&LE

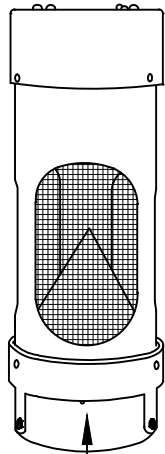
| | | | |
|---------------|----------|---------------------------------------|---------------------------|
| LOCATION | | CASTLE BOULEVARD CITY OF AKRON, OH | |
| ORIGINAL DATE | 08-31-17 | TITLE | CROSSING SIGNAL ALIGNMENT |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | CTC NO. | CN17110 |
| | | SCALE | N.T.S. |
| | | SHEET | 02 OF 22 |

REVISION
BLOCK

SITE LAYOUT NOTES

1.) CROSSING IS LOCATED: LATITUDE 41.1182193
LONGITUDE -81.5619418

ELECTRONIC CROSSING BELL
GSI MODEL EB-3-360-5



THIS SIDE FACING
ROADWAY

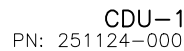
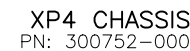
CHANGE FROM TYPICAL: N

REVISION
BLOCK

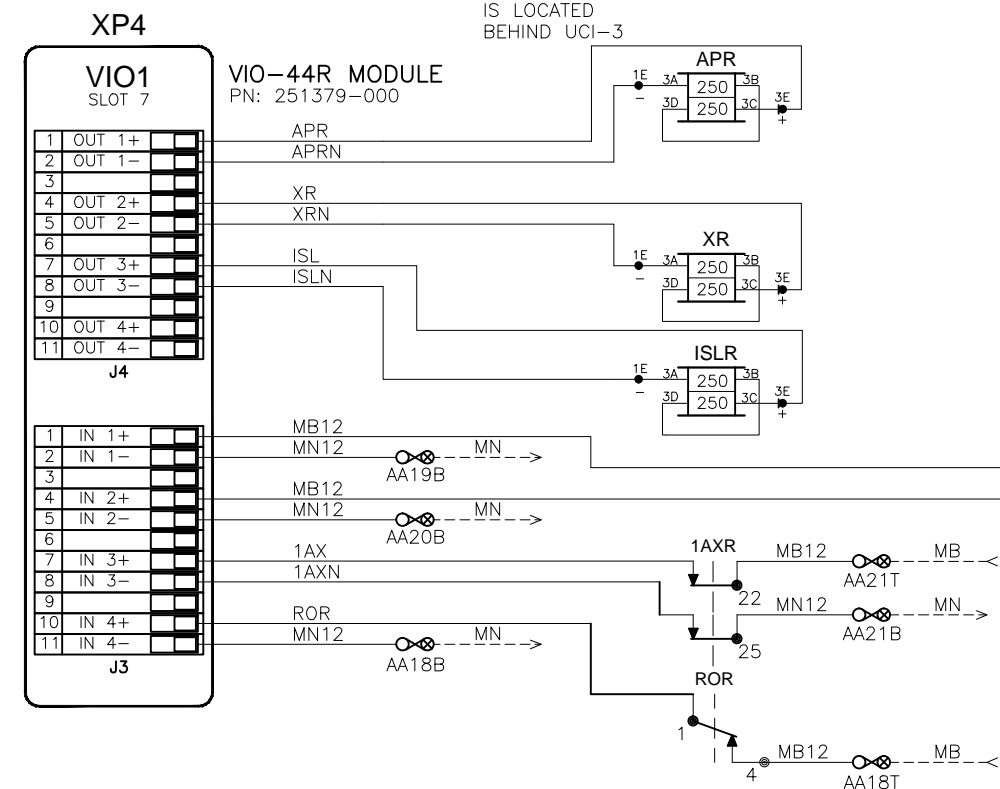


**Wheeling & Lake Erie
Railway**

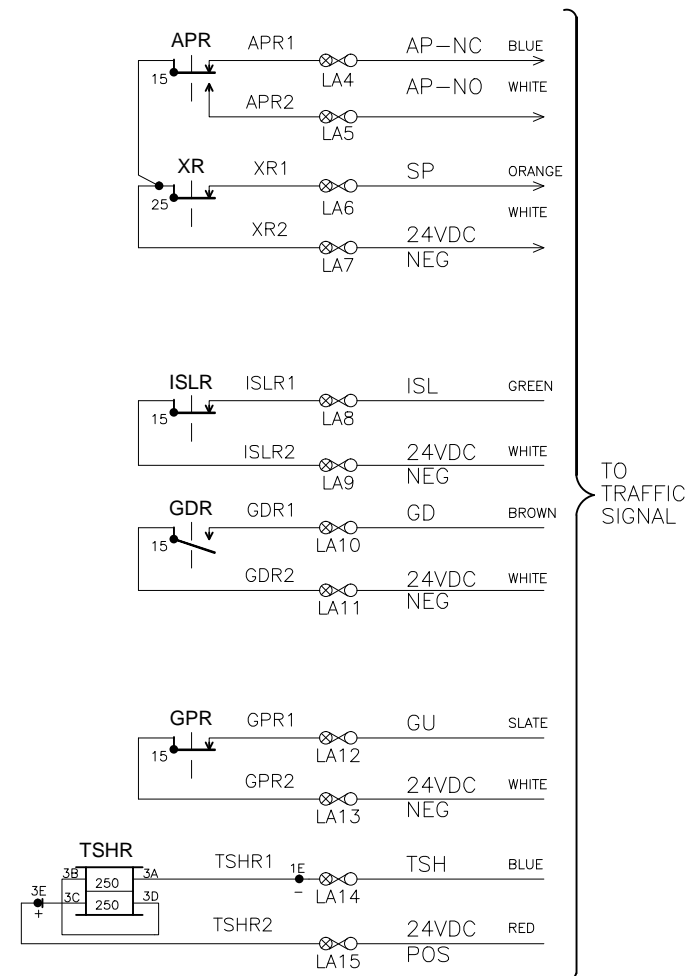
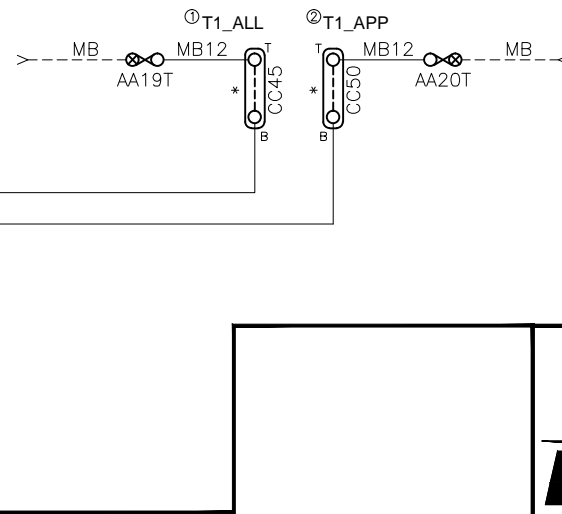
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|---------------|----------|---------------------------------------|-----------------|
| LOCATION | | CASTLE BOULEVARD CITY OF AKRON, OH | |
| ORIGINAL DATE | 08-31-17 | TITLE SITE LAYOUT NOTES | |
| DESIGNER | CTC | SUB AKRON | CTC NO. CN17110 |
| DRAFTSMAN | CTC | RRMP 157.75 | SCALE N.T.S. |
| CHECKER | CTC | DOT NO. 002 124A | SHEET 03 of 22 |



NOTE: ALL WIRING THIS SHEET #16 AWG
UNLESS NOTED OTHERWISE.



- * PLACE JUMPER TO TAKE DESIGNATED FUNCTION OUT OF SERVICE
- ① "ALL" = HIGHWAY GRADE CROSSING WARNING SYSTEM REMOVED FROM SERVICE & NON-FUNCTIONAL.
- ② "APP" = ISLAND FUNCTION ONLY. HIGHWAY GRADE CROSSING WARNING SYSTEM APPROACHES REMOVED FROM SERVICE & NON-FUNCTIONAL.



TO
TRAFFIC
SIGNAL

| | | | | | | | | |
|-------------------|--|--|--|--|--|--|--|--|
| REVISION BLOCK | | | | | | | | |
|-------------------|--|--|--|--|--|--|--|--|

W&LE

Wheeling & Lake Erie Railway

| | |
|----------|---------------------------------------|
| LOCATION | CASTLE BOULEVARD CITY OF AKRON, OH |
|----------|---------------------------------------|

| | | | | | |
|---------------|----------|---------|----------|------------------|----------|
| ORIGINAL DATE | 08-31-17 | TITLE | | XP4/VIO CIRCUITS | |
| DESIGNER | CTC | SUB | AKRON | CTC NO. | CN17110 |
| DRAFTSMAN | CTC | RRMP | 157.75 | SCALE | N.T.S. |
| CHECKER | CTC | DOT NO. | 002 124A | SHEET | 04 OF 22 |

| | | | | | | | | | |
|--------------------|------|------------------|-----|-----|-----|------------------|-----|-----|-----|
| ADJUSTMENT NAME | | MDR1 | | | | MDR2 | | | |
| NAME | | HIGHWAY CROSSING | | | | HIGHWAY CROSSING | | | |
| WARNING TIME | | 27 SEC | | | | 25 SEC | | | |
| CW/MD | | CW | | | | CW | | | |
| AP TIME | | 00 SEC | | | | 00 SEC | | | |
| CWE-WT | | 00 SEC | | | | 00 SEC | | | |
| AUX RECOVERY DELAY | | 05 SEC | | | | 05 SEC | | | |
| | | TK1 | TK2 | TK3 | TK4 | TK1 | TK2 | TK3 | TK4 |
| TRACK ASSIGNED | | ASSIGN | | | | ASSIGN | | | |
| OFFSET DISTANCE | | 0 FT | | | | 0 FT | | | |
| MD RESTART | | * | | | | * | | | |
| SUDDEN SHUNT ZONE | | * | | | | * | | | |
| POSITIVE START | PSEN | DISABLE | | | | DISABLE | | | |
| | PSRX | NA | | | | NA | | | |
| | PST | NA | | | | NA | | | |
| POST JOINT DETECT | PJEN | DISABLE | | | | DISABLE | | | |
| | PJRX | NA | | | | NA | | | |
| | PJDT | NA | | | | NA | | | |

| APPLICATION SOFTWARE INFORMATION | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|
| NAME | * | | | | | | | | | | | | | | | | | | | | | | | |
| REV. | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| CHECKSUM | | | | | | | | | | | | | | | | | | | | | | | | |
| CRC | | | | | | | | | | | | | | | | | | | | | | | | |
| CHASSIS ID | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| LOCATED BEHIND UCI-3 | CHASSIS ID | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>⬤</td><td>⬤</td><td>⬤</td><td>⬤</td><td>⬤</td><td>⬤</td><td>⬤</td><td>⬤</td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ⬤ | ⬤ | ⬤ | ⬤ | ⬤ | ⬤ | ⬤ | ⬤ | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | | | |
| ⬤ | ⬤ | ⬤ | ⬤ | ⬤ | ⬤ | ⬤ | ⬤ | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |

⦿ = TAB INTACT
● = TAB PUNCHED OUT

| | | |
|-----------------------|---------|-------------|
| EXECUTIVE INFORMATION | | |
| VPM-3 | VERSION | PART NUMBER |
| CROSSING SOFTWARE | * | 083024-716 |

| | | | | |
|-------------------|----------|-----|-----|-----|
| BASIC TRACK SETUP | | | | |
| | TK1 | TK2 | TK3 | TK4 |
| FREQUENCY | 645 HZ | | | |
| MASTER/SLAVE | MASTER | | | |
| RX ADJUST | 100 | | | |
| TCA | * | | | |
| DIRECTION MODE | BI | | | |
| LIA | * | | | |
| ADVANCED APR. CAL | INACTIVE | | | |
| NBS COMP RX | * | | | |
| TRK ISLAND ASSIGN | ISL1 | | | |
| APPROACH LENGTH | 2000 FT | | | |
| AUTO RX | ENABLE | | | |

| | | | | |
|--------------------|--------|-------|-------|-------|
| IXC SETUP | | | | |
| CROSSING TEST MODE | OFF | | | |
| FLASH RATE | 55FPM | | | |
| | IXC-1 | IXC-2 | IXC-3 | IXC-4 |
| VOLTAGE REGULATION | ON | | | |
| L1 VOLTAGE | * 10.0 | | | |
| L2 VOLTAGE | * 10.0 | | | |
| GATE 1 DELAY | 6 SEC | | | |
| GATE 2 DELAY | 6 SEC | | | |

| | | | | |
|----------------------|--------|---------|-----|-----|
| ADVANCED TRACK SETUP | | | | |
| | TK1 | TK2 | TK3 | TK4 |
| MOTION DET TIMER | MDEN | DISABLE | | |
| | MDTT | 10 MIN | | |
| FALSE SHUNT | FSEN | DISABLE | | |
| | FSRX | NA | | |
| | FST | NA | | |
| APPROACH RELEASE | AREN | DISABLE | | |
| | ARRX | NA | | |
| | ART | NA | | |
| LOS TIME | 16 SEC | | | |
| IJ-LOS TIME | 5 SEC | | | |
| NRML_SHHTR_VRSHRT | NRML * | | | |

| | | | | |
|----------------|---------|-----|-----|-----|
| ISLAND SETUP | | | | |
| | TK1 | TK2 | TK3 | TK4 |
| ENABLE/DISABLE | ENABLE | | | |
| FREQUENCY | 4.0 KHZ | | | |
| LOSS OF SHUNT | 4 SEC | | | |
| FAULT DELAY | 1 | | | |

| SHUNT RECORDS | | | | | | | | | |
|----------------------|---------|----------|-------|------------|-------|-----------|----|-------|-----------|
| APPROACH 1 (EAST) | | NO SHUNT | | 100% SHUNT | | 50% SHUNT | | | LIA ADDED |
| | | RX | PHASE | RX | PHASE | | RX | PHASE | ± 1 to ±9 |
| Track 1 | Normal | | | | | | | | |
| | Standby | | | | | | | | |
| Track 2 | Normal | | | | | | | | |
| | Standby | | | | | | | | |
| APPROACH 2 (WEST) | | | | | | | | | |
| Track 1 | Normal | | | | | | | | |
| | Standby | | | | | | | | |
| Track 2 | Normal | | | | | | | | |
| | Standby | | | | | | | | |

INITIAL VALUES WHEN PLACED IN SERVICE

NOTES:
* = FIELD ADJUSTMENT
NA = NOT APPLICABLE

CHANGE FROM TYPICAL: Y

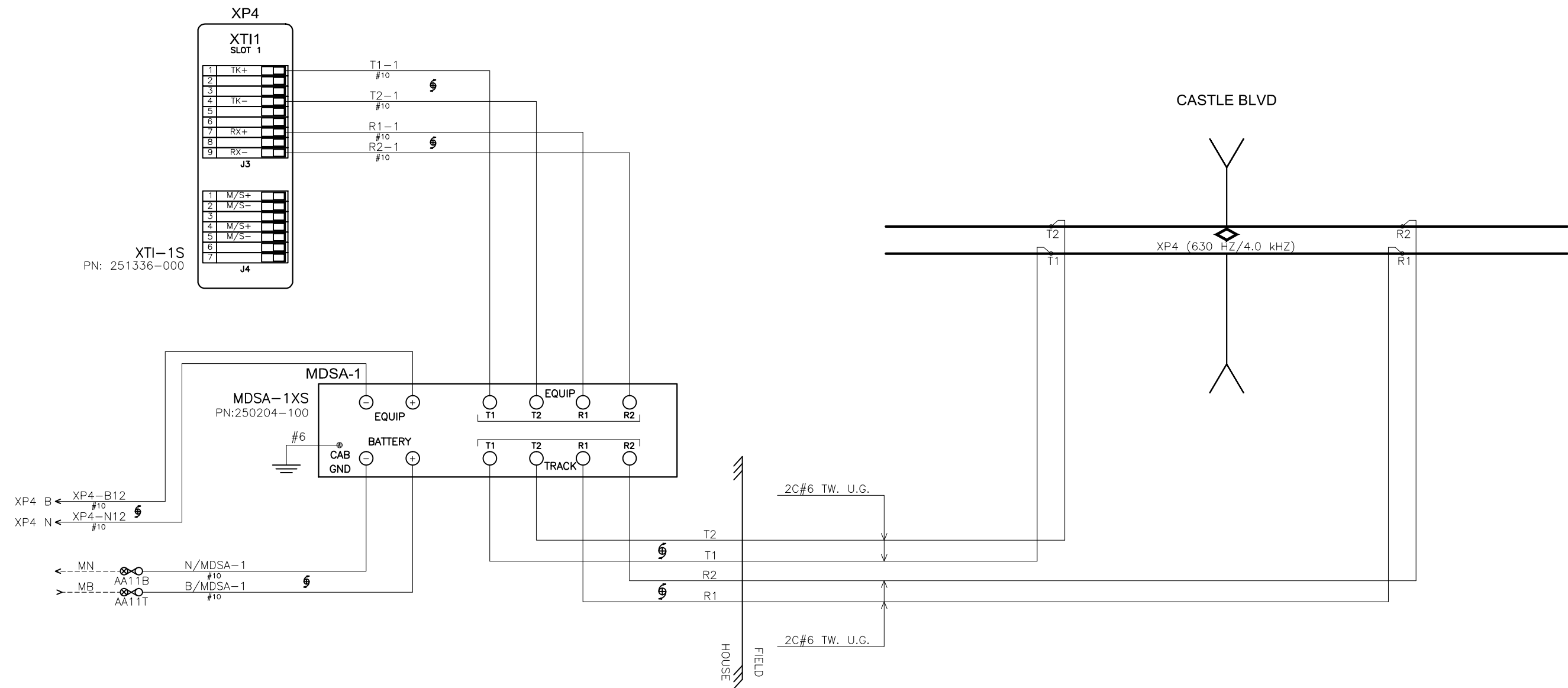
REVISION
BLOCK

W&LE

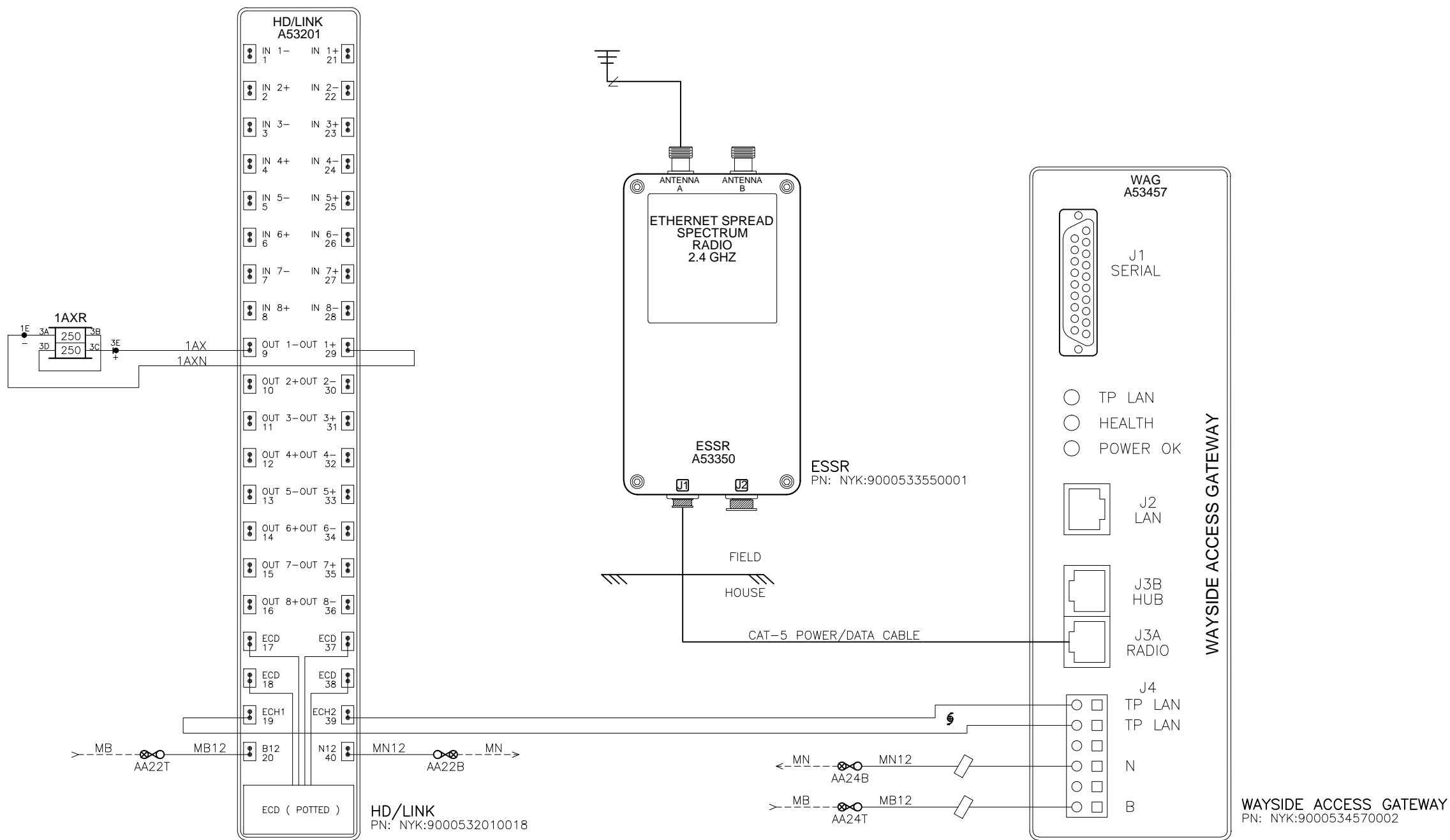
Wheeling & Lake Erie
Railway

LOCATION
CASTLE BOULEVARD
CITY OF AKRON, OH

| | | | |
|---------------|----------|---------|-----------------|
| ORIGINAL DATE | 08-31-17 | TITLE | XP4 SETUP SHEET |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | CTC NO. | CN17110 |
| CHECKER | CTC | SCALE | N.T.S. |
| | | DOT NO. | 002 124A |
| | | SHEET | 05 of 22 |



| | | | | | | | | | | | | | | |
|-------------------|--|--|--|--|--|--|--|--|--|---------------------|---|--|--|--|
| | | | | | | | | | | <div>W&LE</div> | <div>Wheeling & Lake Erie Railway</div> | | | |
| | | | | | | | | | | | LOCATION CASTLE BOULEVARD CITY OF AKRON, OH | | | |
| | | | | | | | | | | | ORIGINAL DATE 08-31-17TITLE TRACK CONNECTION CIRCUITS | | | |
| | | | | | | | | | | | DESIGNER CTCSUB AKRONCTC NO. CN17110 | | | |
| | | | | | | | | | | | DRAFTSMAN CTCRRMP 157.75SCALE N.T.S. | | | |
| | | | | | | | | | | | CHECKER CTCDOT NO. 002 124ASHEET 06 of 22 | | | |
| | | | | | | | | | | | CHANGE FROM TYPICAL: Y | | | |
| REVISION BLOCK | | | | | | | | | | | | | | |



NOTE: ALL WIRING THIS SHEET #16 AWG
UNLESS NOTED OTHERWISE.

LEGEND:

- FERRITE BEAD
- TWISTED WIRE

REVISION
BLOCK

CHANGE FROM TYPICAL: Y

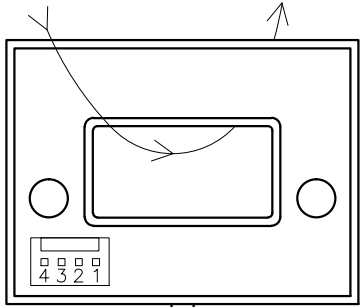
W&LE

**Wheeling & Lake Erie
Railway**

| | | | |
|---------------|----------|---------------------------------------|-------------------------|
| LOCATION | | CASTLE BOULEVARD CITY OF AKRON, OH | |
| ORIGINAL DATE | 08-31-17 | TITLE | HD LINK/ SPECTRUM RADIO |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | CTC NO. | CN17110 |
| | | SCALE | N.T.S. |
| | | SHEET | 07 of 22 |



HASS 50-S CURRENT SENSOR
#10 RUN THROUGH EACH SENSOR



TO RCDR
TB5

CHANGE FROM TYPICAL: N

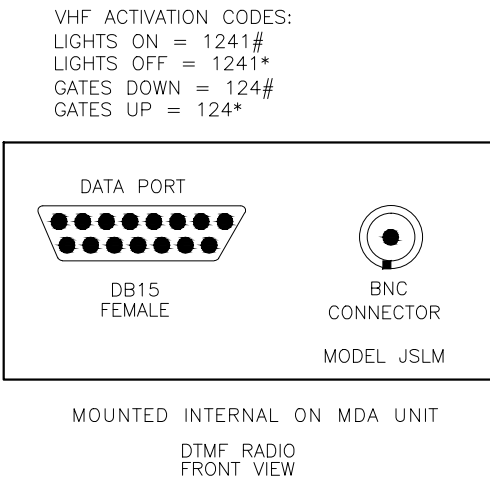
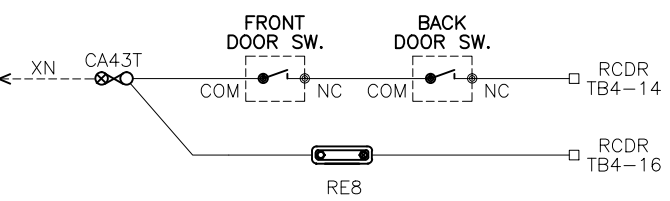
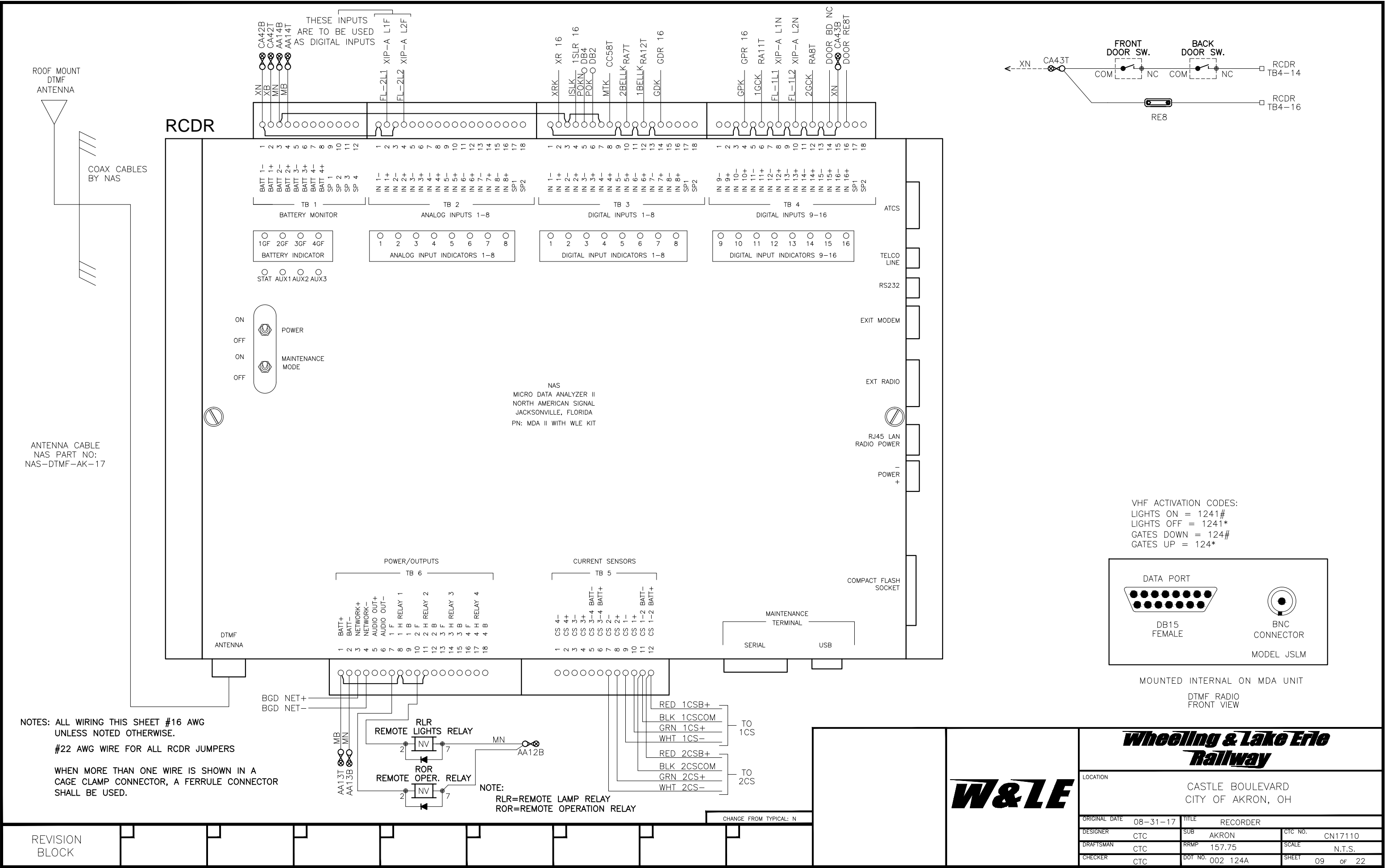
REVISION
BLOCK

W&LE

Wheeling & Lake Erie Railway

LOCATION
CASTLE BOULEVARD
CITY OF AKRON, OH

| | | | | | |
|---------------|----------|---------|-------------------------------|---------|----------|
| ORIGINAL DATE | 08-31-17 | TITLE | ENTRANCE GATE CONTROL CIRCUIT | | |
| DESIGNER | CTC | SUB | AKRON | CTC NO. | CN17110 |
| DRAFTSMAN | CTC | RRMP | 157.75 | SCALE | N.T.S. |
| CHECKER | CTC | DOT NO. | 002 124A | SHEET | 08 OF 22 |



NOTES: ALL WIRING THIS SHEET #16 AWG UNLESS NOTED OTHERWISE.
#22 AWG WIRE FOR ALL RCDR JUMPERS
WHEN MORE THAN ONE WIRE IS SHOWN IN A CAGE CLAMP CONNECTOR, A FERRULE CONNECTOR SHALL BE USED.

NOTE:
RLR=REMOTE LAMP RELAY
ROR=REMOTE OPERATION RELAY

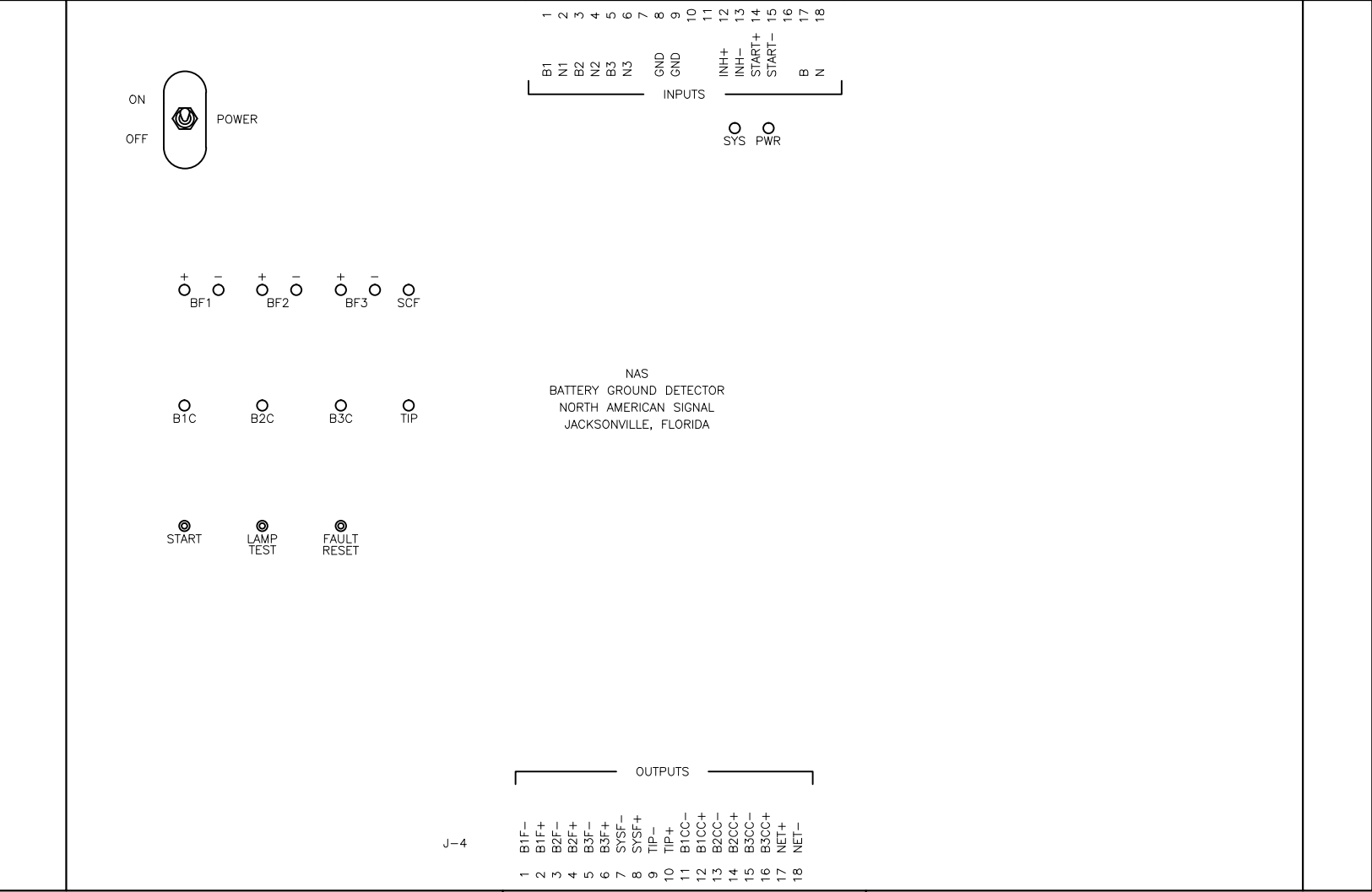
CHANGE FROM TYPICAL: N



Wheeling & Lake Erie Railway

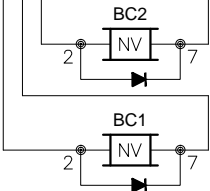
| | | | | | |
|---------------|----------|---------|---------------------------------------|---------|----------|
| LOCATION | | | CASTLE BOULEVARD CITY OF AKRON, OH | | |
| ORIGINAL DATE | 08-31-17 | TITLE | RECORDER | | |
| DESIGNER | CTC | SUB | AKRON | CTC No. | CN17110 |
| DRAFTSMAN | CTC | RRMP | 157.75 | SCALE | N.T.S. |
| CHECKER | CTC | DOT NO. | 002 124A | SHEET | 09 of 22 |

BGD



| NAS CONTROLLER SOFTWARE CONFIGURATION MANAGEMENT TABLE | | | |
|--|-----------|------------|----------------------|
| APPLICATION | FILE NAME | DATE | DESCRIPTION |
| GFD EXEC | XXX | XX/XX/XXXX | GFD MODULE EXECUTIVE |

NET- □ RCDR TB6-4
NET+ □ RCDR TB6-3



NOTES: ALL WIRING THIS SHEET #16 AWG
UNLESS NOTED OTHERWISE.
#22 AWG WIRE FOR ALL RCDR JUMPERS

WHEN MORE THAN ONE WIRE IS SHOWN IN A
CAGE CLAMP CONNECTOR, A FERRULE CONNECTOR
SHALL BE USED.

CHANGE FROM TYPICAL: N

SW1 CURRENT 1/10 MA

| POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------|---|---|---|---|---|---|---|---|
| CLOSED | | | | | | | | |
| OPEN | | | | | | | | |

(2 MA)

SWITCH VALUES CLOSED
POSITION (BINARY)

SW1 = 1
SW2 = 2
SW3 = 4
SW4 = 8
SW5 = 16
SW6 = 32
SW7 = 64
SW8 = 128

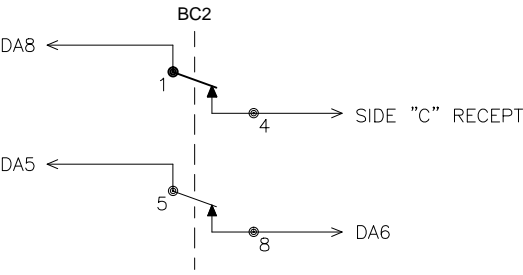
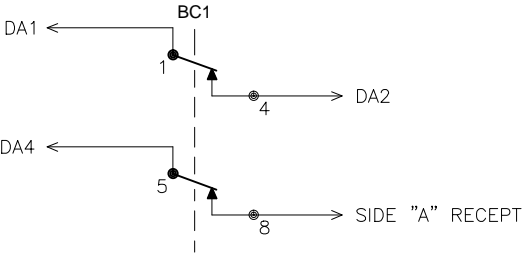
SW1 CURRENT 1/10 MA

| POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------|---|---|---|---|---|---|---|---|
| CLOSED | | | | | | | | |
| OPEN | | | | | | | | |

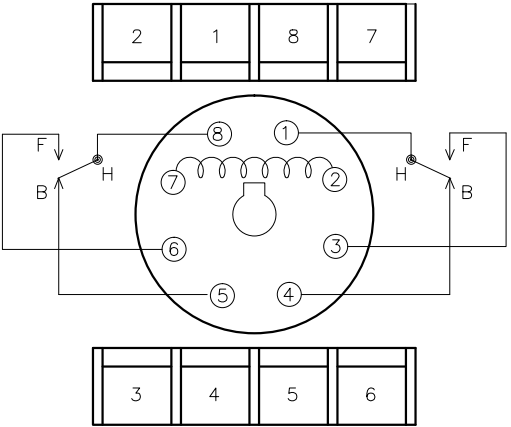
(12 HOURS)

SWITCH VALUES CLOSED
POSITION (BINARY)

SW1 = 1
SW2 = 2
SW3 = 4
SW4 = 8
SW5 = 16
SW6 = 32
SW7 = 64
SW8 OPEN=HOUR CLOSED=DAYS



DAYTON
12VDC
1A484



BC1, BC2, ROR, RLR

**Wheeling & Lake Erie
Railway**

LOCATION
CASTLE BOULEVARD
CITY OF AKRON, OH

| | | | |
|---------------|----------|---------|----------|
| ORIGINAL DATE | 08-31-17 | TITLE | BGD |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | SCALE | N.T.S. |
| | | SHEET | 10 of 22 |

REVISION
BLOCK



CHANGE FROM TYPICAL: N



Wheeling & Lake Erie Railway

LOCATION

CASTLE BOULEVARD
CITY OF AKRON, OH

| | |
|---------------|----------|
| ORIGINAL DATE | 08-31-17 |
|---------------|----------|

| | |
|-------|----------------|
| TITLE | ARRESTOR PANEL |
|-------|----------------|

| | |
|----------|-----|
| DESIGNER | CTC |
|----------|-----|

| | |
|-----|-------|
| SUB | AKRON |
|-----|-------|

CTC NO. CN17110

| | |
|-----------|-----|
| | CTC |
| DRAFTSMAN | CTC |

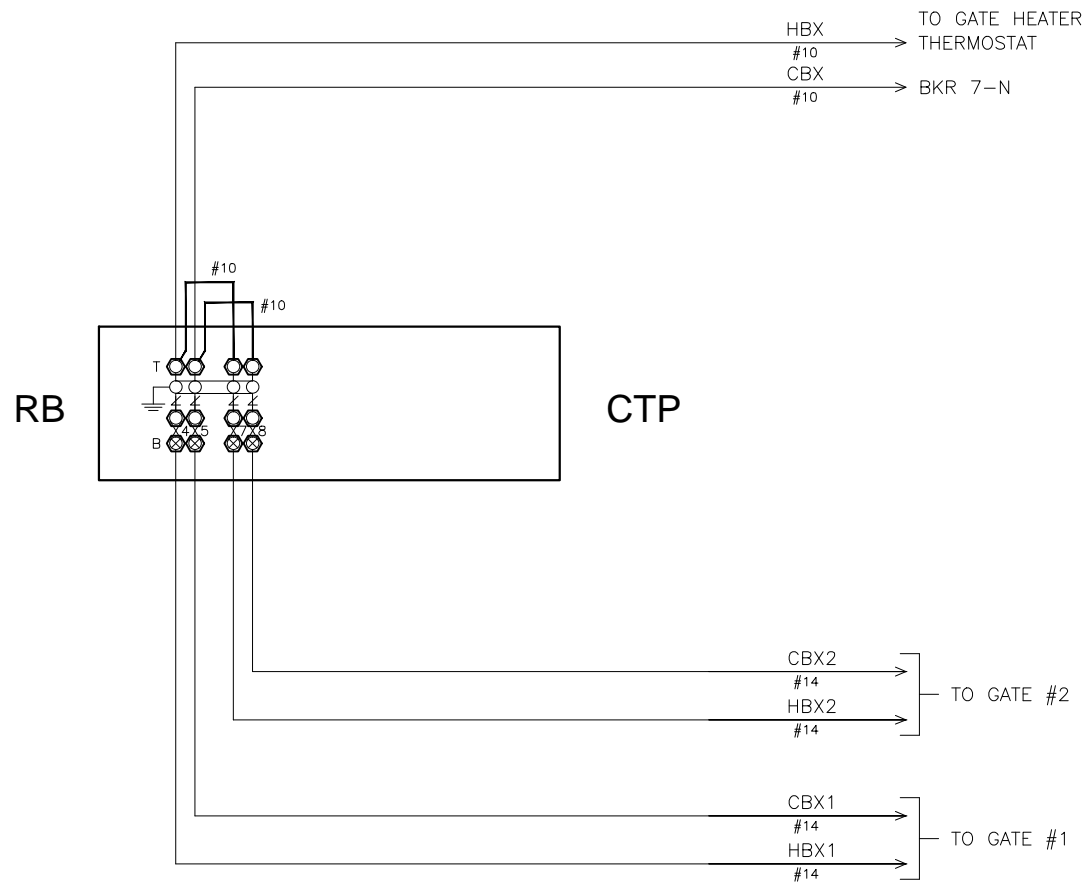
| | |
|------|--------|
| RRMP | 157.75 |
|------|--------|

| | |
|-------|-----|
| SCALE | NTS |
|-------|-----|

| | |
|---------|-----|
| CHECKER | CTC |
|---------|-----|

DOT NO. 002 124A

| | | | |
|-------|----|----|----|
| SHEET | 11 | 25 | 33 |
|-------|----|----|----|



LEGEND:

⊗ = INSULATED NUT

| | | | | | | | | | | | | | | | | | |
|-------------------|--|--|--|--|--|--|--|--|--|------------------------|---------------------|---|--|------------------|--|-----------------|--|
| | | | | | | | | | | <div></div> | <div>W&LE</div> | <div><i>Wheeling & Lake Erie Railway</i></div> | | | | | |
| | | | | | | | | | | | | LOCATION CASTLE BOULEVARD CITY OF AKRON, OH | | | | | |
| | | | | | | | | | | | | ORIGINAL DATE 08-31-17 | | TITLE CTP | | | |
| | | | | | | | | | | | | DESIGNER CTC | | SUB AKRON | | CTC NO. CN17110 | |
| | | | | | | | | | | | | DRAFTSMAN CTC | | RRMP 157.75 | | SCALE N.T.S. | |
| | | | | | | | | | | | | CHECKER CTC | | DOT NO. 002 124A | | SHEET 12 OF 22 | |
| | | | | | | | | | | CHANGE FROM TYPICAL: N | | | | | | | |
| REVISION BLOCK | | | | | | | | | | | | | | | | | |


| CONTACT | CLOSED | FUNCTION | TENSION |
|---------|------------|------------|-----------|
| 1B | 75-90 DEG. | POWER DOWN | 18-28 OZ. |
| 1F | 0-70 DEG. | SNUB DOWN | 18-28 OZ. |
| 2 | 0-86 DEG. | POWER UP | 18-28 OZ. |
| 3 | 0-10 DEG. | GATE DOWN | 16-24 OZ. |
| 4 | 82-90 DEG. | GATE CLEAR | 16-24 OZ. |
| 5 | 10-90 DEG. | BELL | 16-24 OZ. |
| 6 | SPARE | SPARE | 16-24 OZ. |
| 7 | 0-2 DEG. | SNUB | 16-24 OZ. |

LEGEND:

 = INSULATED NUT

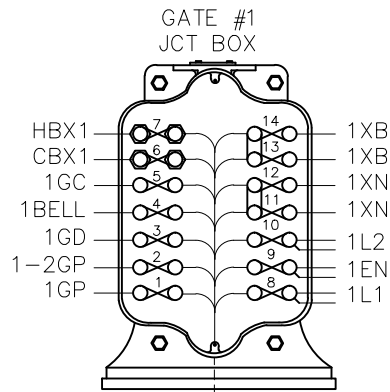
NOTES:

* BELL TO BE ELECTRONIC.

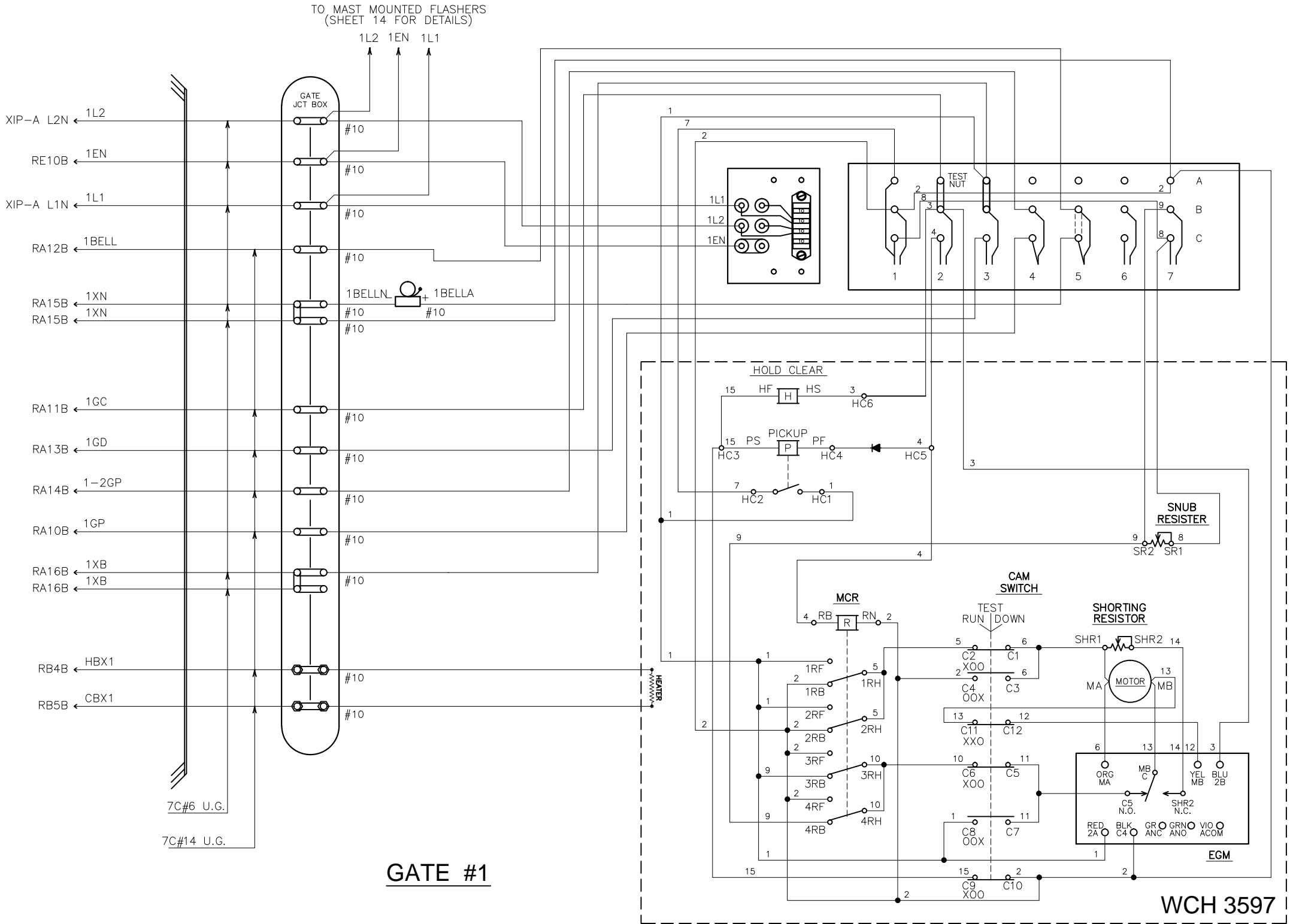
 = INTERNAL GATE WIRES THAT SHARE ELECTRICAL CONNECTIONS WITH OTHER WIRES THAT ARE ASSIGNED THE SAME NUMBER.

REFER TO SHEET 14 FOR GATE ARM LIGHT WIRING

ADD BOLD STRAPS AND JUMPERS AS SHOWN



-----> CABLES TO HOUSE



REVISION
BLOCK

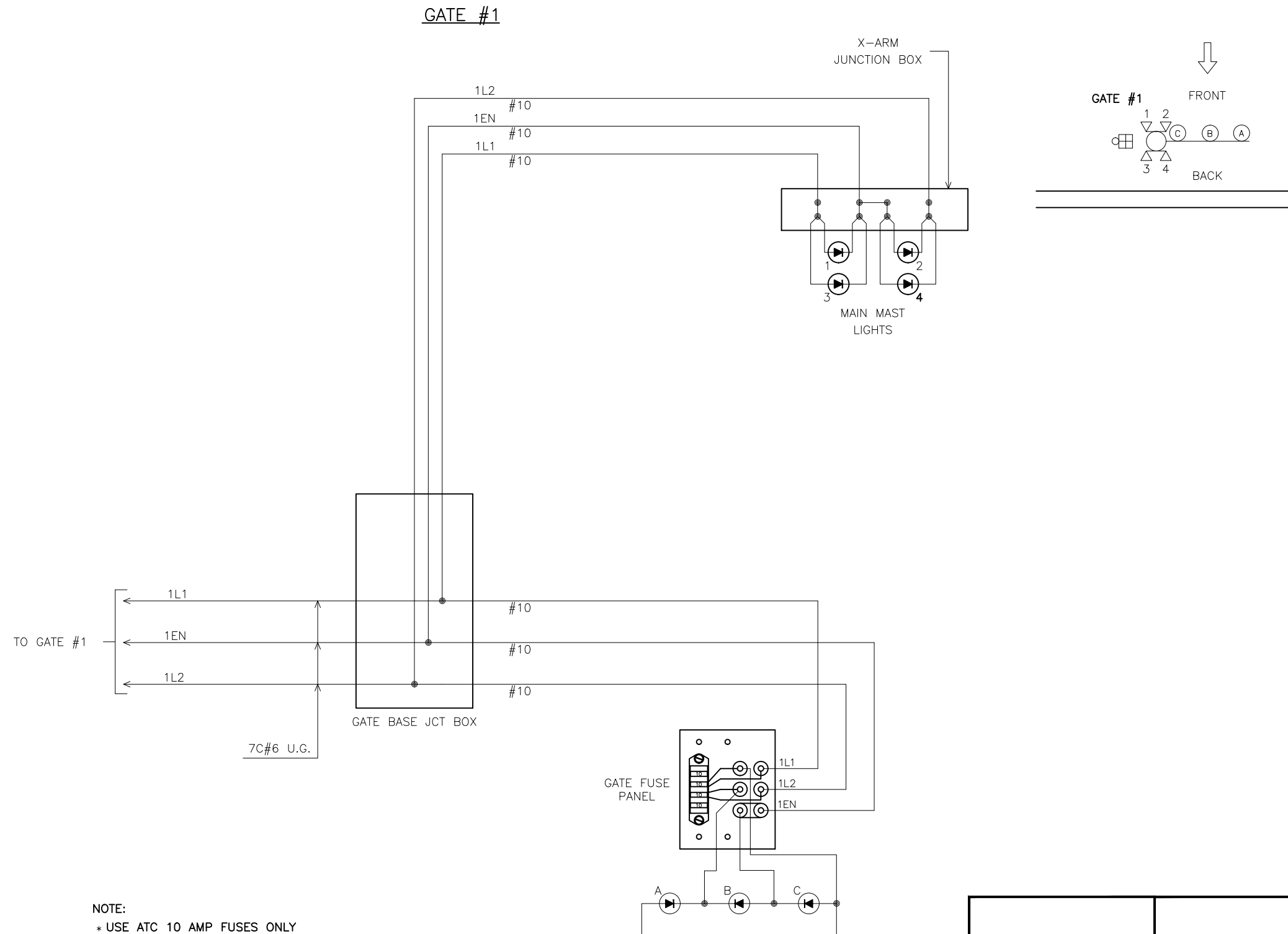
CHANGE FROM TYPICAL: N

W&LE

**Wheeling & Lake Erie
Railway**

LOCATION
CASTLE BOULEVARD
CITY OF AKRON, OH

| | | | |
|---------------|----------|---------|-------------------------------|
| ORIGINAL DATE | 08-31-17 | TITLE | GATE #1 MECHANISM (NEAR SIDE) |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | SCALE | N.T.S. |
| | | SHEET | 13 of 22 |



NOTE:
* USE ATC 10 AMP FUSES ONLY

◀ IS LED SYMBOL ONLY. INSTALL ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

CHANGE FROM TYPICAL: Y

REVISION
BLOCK

W&LE

**Wheeling & Lake Erie
Railway**


| | | | | | |
|---------------|----------|---------|---------------------------------------|---------|----------|
| LOCATION | | | CASTLE BOULEVARD CITY OF AKRON, OH | | |
| ORIGINAL DATE | 08-31-17 | TITLE | GATE #1 LIGHTS (NEAR SIDE) | | |
| DESIGNER | CTC | SUB | AKRON | CTC NO. | CN17110 |
| DRAFTSMAN | CTC | RRMP | 157.75 | SCALE | N.T.S. |
| CHECKER | CTC | DOT NO. | 002 124A | SHEET | 14 of 22 |

| CONTACT | CLOSED | FUNCTION | TENSION |
|---------|------------|------------|-----------|
| 1B | 75-90 DEG. | POWER DOWN | 18-28 OZ. |
| 1F | 0-70 DEG. | SNUB DOWN | 18-28 OZ. |
| 2 | 0-86 DEG. | POWER UP | 18-28 OZ. |
| 3 | 0-10 DEG. | GATE DOWN | 16-24 OZ. |
| 4 | 82-90 DEG. | GATE CLEAR | 16-24 OZ. |
| 5 | 10-90 DEG. | BELL | 16-24 OZ. |
| 6 | SPARE | SPARE | 16-24 OZ. |
| 7 | 0-2 DEG. | SNUB | 16-24 OZ. |

LEGEND:

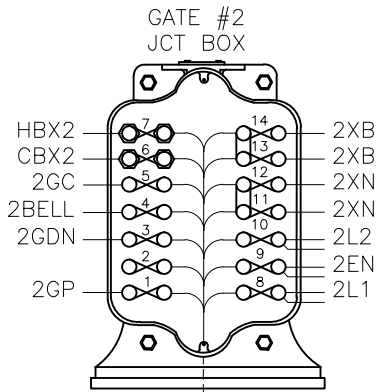
 = INSULATED NUT

NOTES:

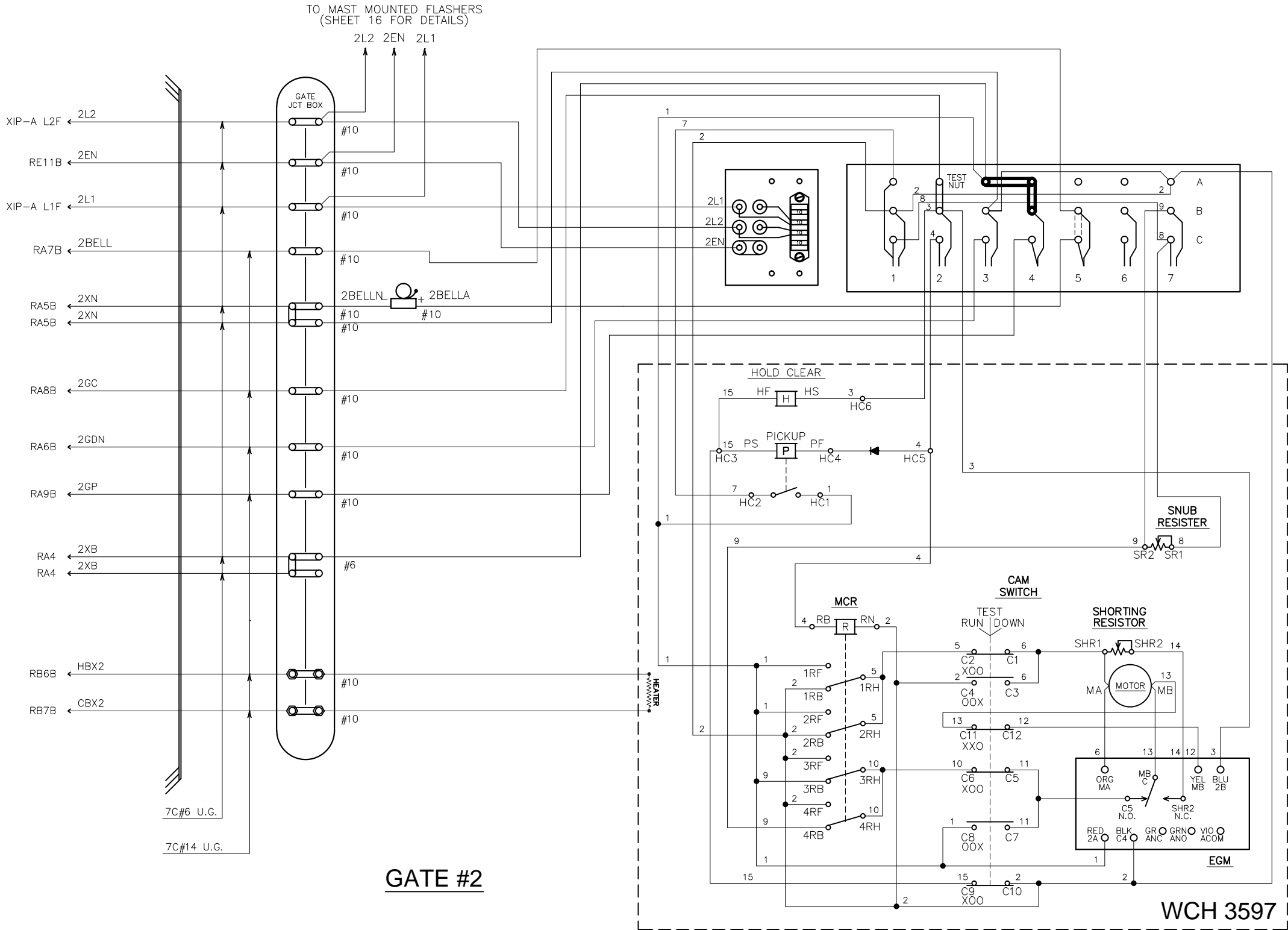
* BELL TO BE ELECTRONIC.
 = INTERNAL GATE WIRES THAT SHARE ELECTRICAL CONNECTIONS WITH OTHER WIRES THAT ARE ASSIGNED THE SAME NUMBER.

REFER TO SHEET 16 FOR GATE ARM LIGHT WIRING

ADD BOLD STRAPS AND JUMPERS AS SHOWN




-----> CABLES TO HOUSE



REVISION
BLOCK

CHANGE FROM TYPICAL: Y



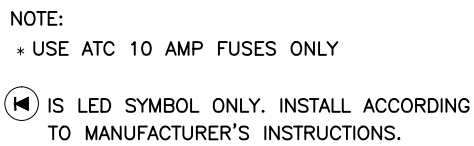
**Wheeling & Lake Erie
Railway**

LOCATION
CASTLE BOULEVARD
CITY OF AKRON, OH

ORIGINAL DATE 08-31-17
DESIGNER CTC
DRAFTSMAN CTC
CHECKER CTC

TITLE GATE #2 MECHANISM (FAR SIDE)
SUB AKRON
RRMP 157.75
DOT NO. 002 124A

CTC NO. CN17110
SCALE N.T.S.
SHEET 15 of 22



CHANGE FROM TYPICAL: Y

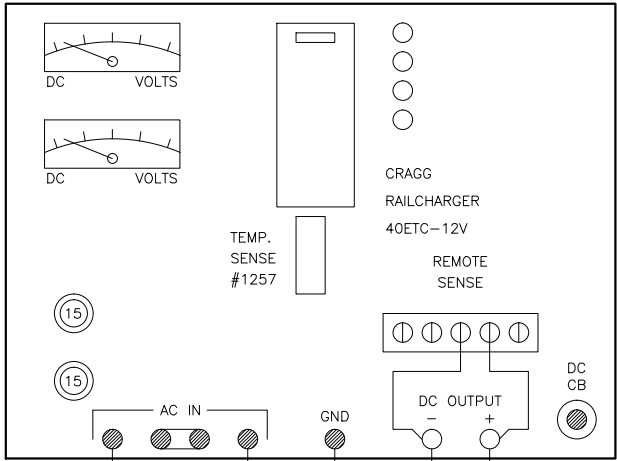
REVISION
BLOCK

W&LE

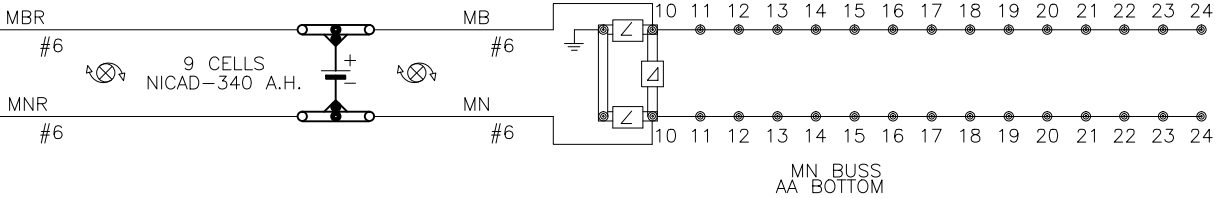
Wheeling & Lake Erie Railway

| | | | | | | | |
|---------------|--|----------|--|---------------------------------------|--|---------------------------|--|
| LOCATION | | | | CASTLE BOULEVARD CITY OF AKRON, OH | | | |
| ORIGINAL DATE | | 08-31-17 | | TITLE | | GATE #2 LIGHTS (FAR SIDE) | |
| DESIGNER | | CTC | | SUB | | AKRON | |
| DRAFTSMAN | | CTC | | RRMP | | SCALE | |
| CHECKER | | CTC | | DOY NO. | | N.T.S. | |
| | | | | 002 124A | | SHEET 16 OF 22 | |

MB-CHARGER
(SIDE "A" WALL)



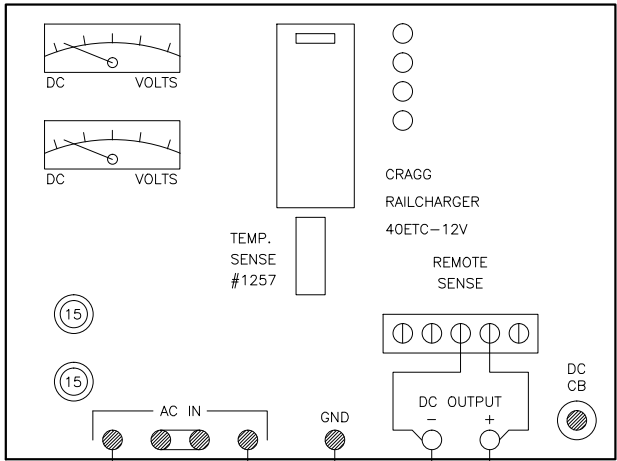
MB-BATTERY



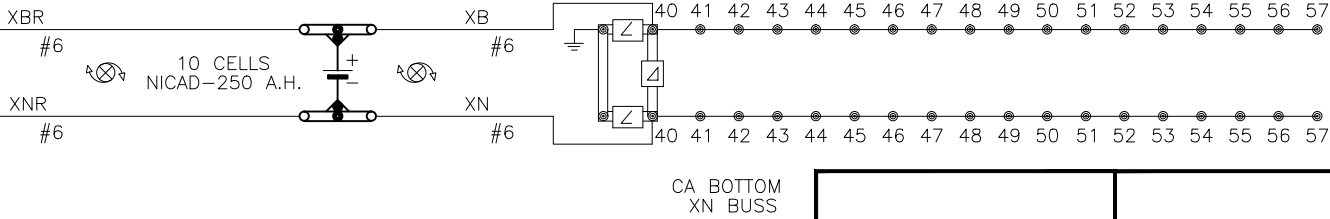
BATTERY BUSS DETAILS

| MB BUSS (TOP) | | AA | | MN BUSS (BOTTOM) | |
|---------------|----|-------------|----|------------------|----|
| SPARE | 24 | SPARE | 24 | SPARE | 24 |
| WAG J4-B | 23 | WAG J4-N | 23 | WAG J4-N | 23 |
| HD B12 20 | 22 | HD N12 40 | 22 | HD N12 40 | 22 |
| 1AXR 22 | 21 | 1AXR 25 | 21 | 1AXR 25 | 21 |
| T1_APP 50T | 20 | VI01 J3-5 | 20 | VI01 J3-5 | 20 |
| T1_ALL 45T | 19 | VI01 J3-2 | 19 | VI01 J3-2 | 19 |
| ROR-4 | 18 | VI01 J3-11 | 18 | VI01 J3-11 | 18 |
| PO DB1 | 17 | PO DB3 | 17 | PO DB3 | 17 |
| BGD B1 | 16 | BGD N1 | 16 | BGD N1 | 16 |
| CC58T | 15 | IXC-A J5-14 | 15 | IXC-A J5-14 | 15 |
| RCDR TB1-4 | 14 | RCDR TB1-3 | 14 | RCDR TB1-3 | 14 |
| RCDR TB6-1 | 13 | RCDR TB6-2 | 13 | RCDR TB6-2 | 13 |
| SPARE | 12 | RLR-7 | 12 | RLR-7 | 12 |
| MDSA-1 B+ | 11 | MDSA-1 B- | 11 | MDSA-1 B- | 11 |
| MB BATT+ | 10 | MN BATT- | 10 | MN BATT- | 10 |

XB-CHARGER
(SIDE "C" WALL)



XB-BATTERY



BATTERY BUSS DETAILS

| XB BUSS (TOP) | | CA | | XN BUSS (BOTTOM) | |
|---------------|----|-------------|----|------------------|----|
| SPARE | 57 | SPARE | 57 | SPARE | 57 |
| SPARE | 56 | SPARE | 56 | SPARE | 56 |
| ISLR 22 | 55 | SPARE | 55 | SPARE | 55 |
| TSHR 25 | 54 | IXC-A J5-6 | 54 | IXC-A J5-6 | 54 |
| BGD B2 | 53 | BGD N2 | 53 | BGD N2 | 53 |
| XR 15 | 52 | XIP-A G1- | 52 | XIP-A G1- | 52 |
| RA4T | 51 | RA5T | 51 | RA5T | 51 |
| RA16T | 50 | RA15T | 50 | RA15T | 50 |
| XIP-A B | 49 | XIP-A N | 49 | XIP-A N | 49 |
| GDR 25 | 48 | IXC-A J5-2 | 48 | IXC-A J5-2 | 48 |
| GPR 12 | 47 | IXC-A J5-10 | 47 | IXC-A J5-10 | 47 |
| GDR 15 | 46 | SPARE | 46 | SPARE | 46 |
| GPR 15 | 45 | GPR 1E | 45 | GPR 1E | 45 |
| SPARE | 44 | SPARE | 44 | SPARE | 44 |
| FD COM | 43 | RCDR TB4-15 | 43 | RCDR TB4-15 | 43 |
| RCDR TB1-2 | 42 | RCDR TB1-1 | 42 | RCDR TB1-1 | 42 |
| XIP-A L1B-B | 41 | XIP-A L1B-N | 41 | XIP-A L1B-N | 41 |
| XB BATT+ | 40 | XN BATT- | 40 | XN BATT- | 40 |

NEMA PLUG
L6-15P

3C#14 ←

NEMA PLUG
L6-15P

3C#14 ←

CHANGE FROM TYPICAL: Y

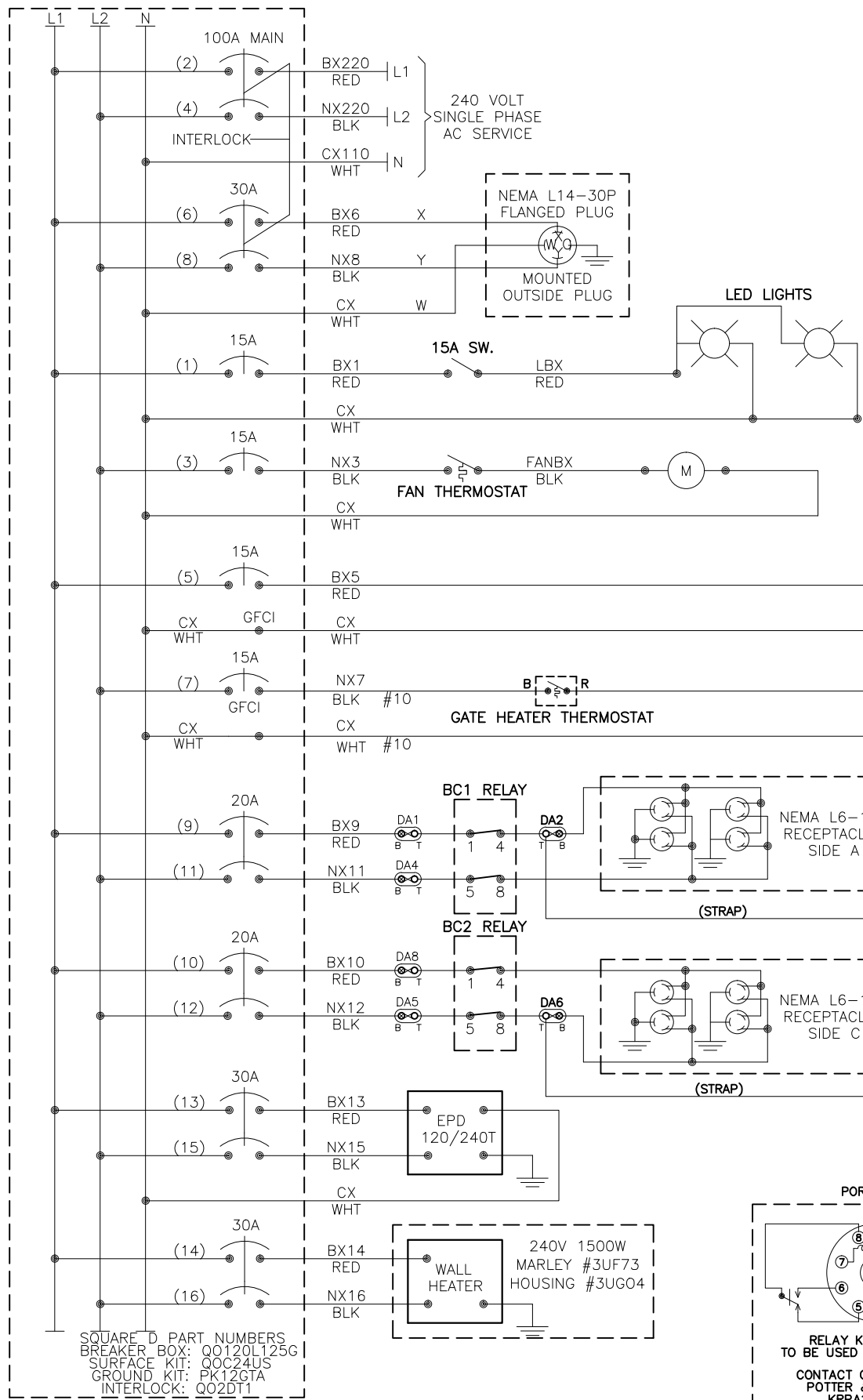
REVISION
BLOCK

W&LE

**Wheeling & Lake Erie
Railway**

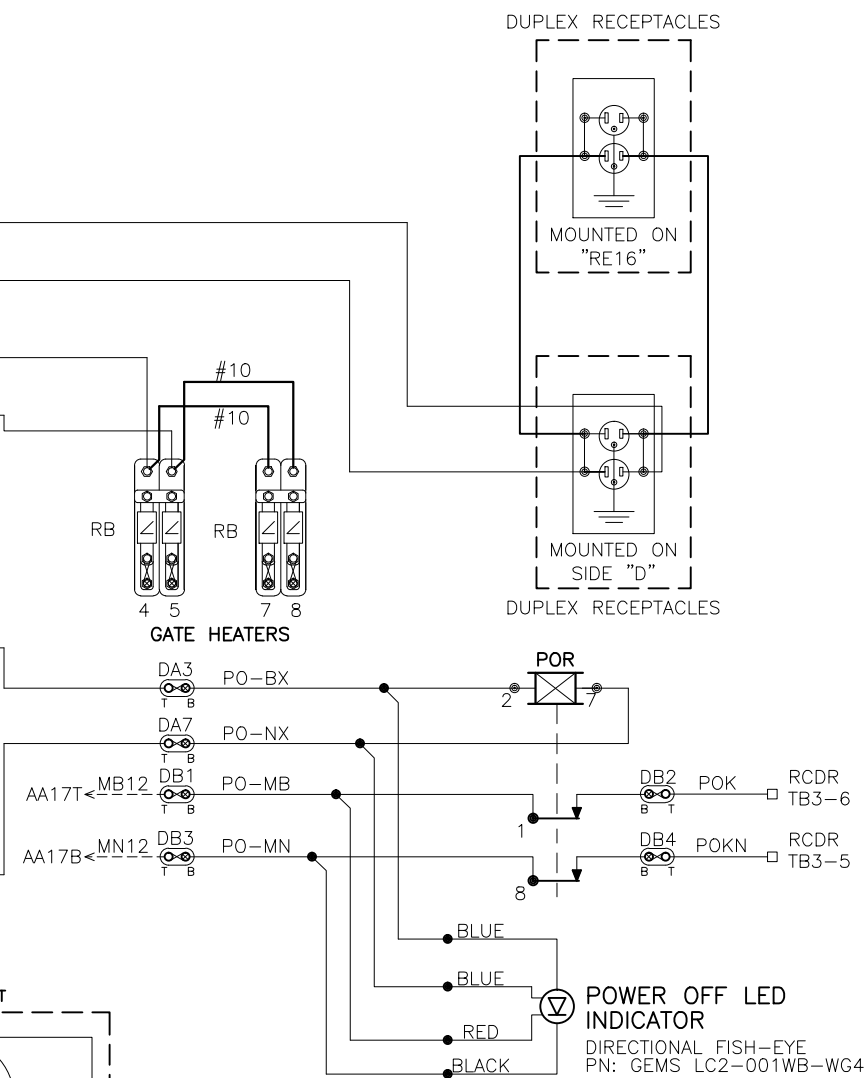
LOCATION
CASTLE BOULEVARD
CITY OF AKRON, OH

| | | | |
|---------------|----------|---------|------------------|
| ORIGINAL DATE | 08-31-17 | TITLE | BATTERY CHARGERS |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | SCALE | 1"=2' |
| | | SHEET | 17 of 22 |

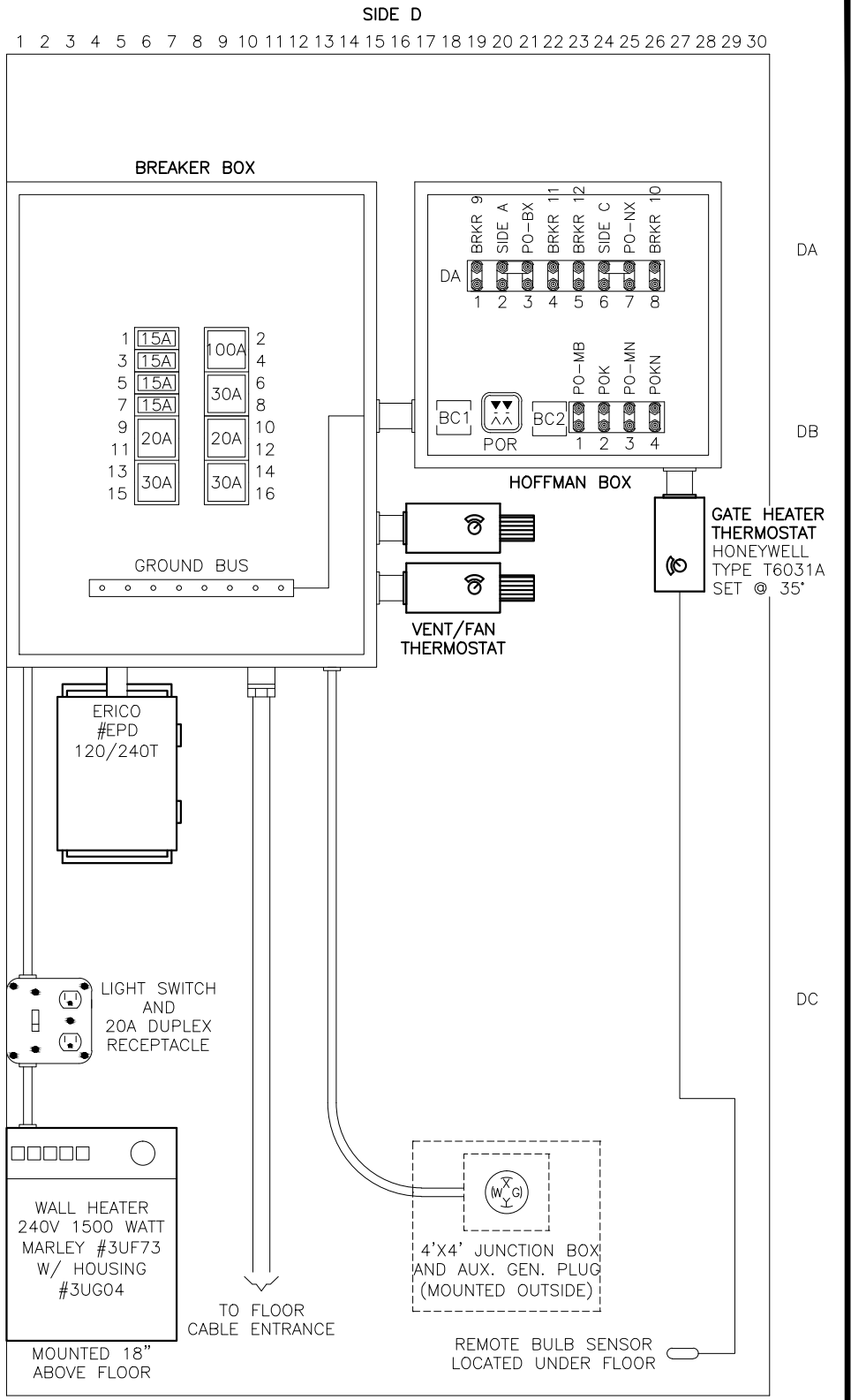
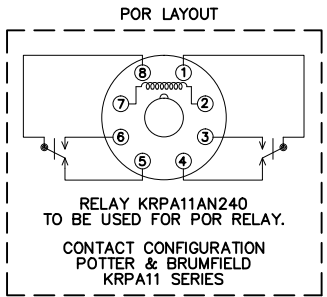


SQUARE D PART NUMBERS
BREAKER BOX: Q0120L125G
SURFACE KIT: Q0C24US
GROUND KIT: PK12GTA
INTERLOCK: Q02DT1

- NOTES:
- USE THE FOLLOWING COLOR CODE:
GRN - GREEN - SAFETY EQUIPMENT GROUND
WHT - WHITE - CX110 (NEUTRAL)
BLK - BLACK - NX220 (L2)
RED - RED - BX220 (L1)
EXCEPTIONS TO THE ABOVE COLOR CODE ARE THE PRE-WIRED, SEALED ARRESTOR UNITS MOUNTED ON THE BREAKER BOX WHICH HAVE TWO BLACK AND ONE WHITE WIRE EACH.
 - MINIMUM WIRE SIZE:
10 AMP - NO.14 AWG THHN OR THWN SOLID
20 AMP - NO.12 AWG THHN OR THWN SOLID
30 AMP - NO.10 AWG THHN OR THWN SOLID
 - GROUND FAULT INTERRUPT (GFCI) MUST BE USE ON ALL CIRCUITS SERVING CONVENIENCE OUTLETS AND ANY EQUIPMENT OUTSIDE THE BUNGALOW. RECEPTACLE MOUNTED GFCI MAY BE USE INSTEAD OF BREAKER TYPE.
 - ALL GROUND WIRES RUN TO BREAKER BOX GROUND BUS



- NOTE:
- WHEN AC IS ON LED IS ON
 - WHEN AC IS OFF LED FLASHES UNTIL BATTERY IS DISCHARGED.
 - WHEN AC IS OFF AND BATTERY IS DISCHARGED LED IS OFF.



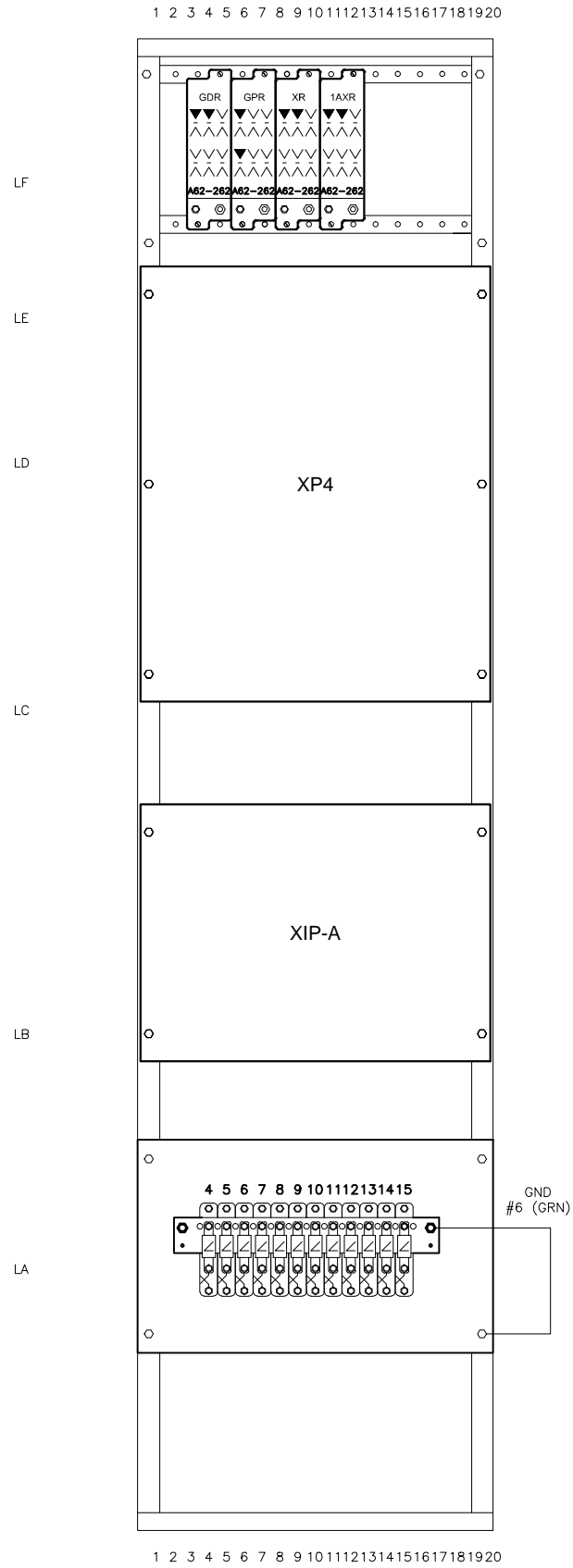
REVISION
BLOCK

CHANGE FROM TYPICAL: N

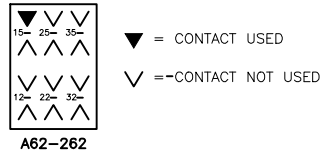
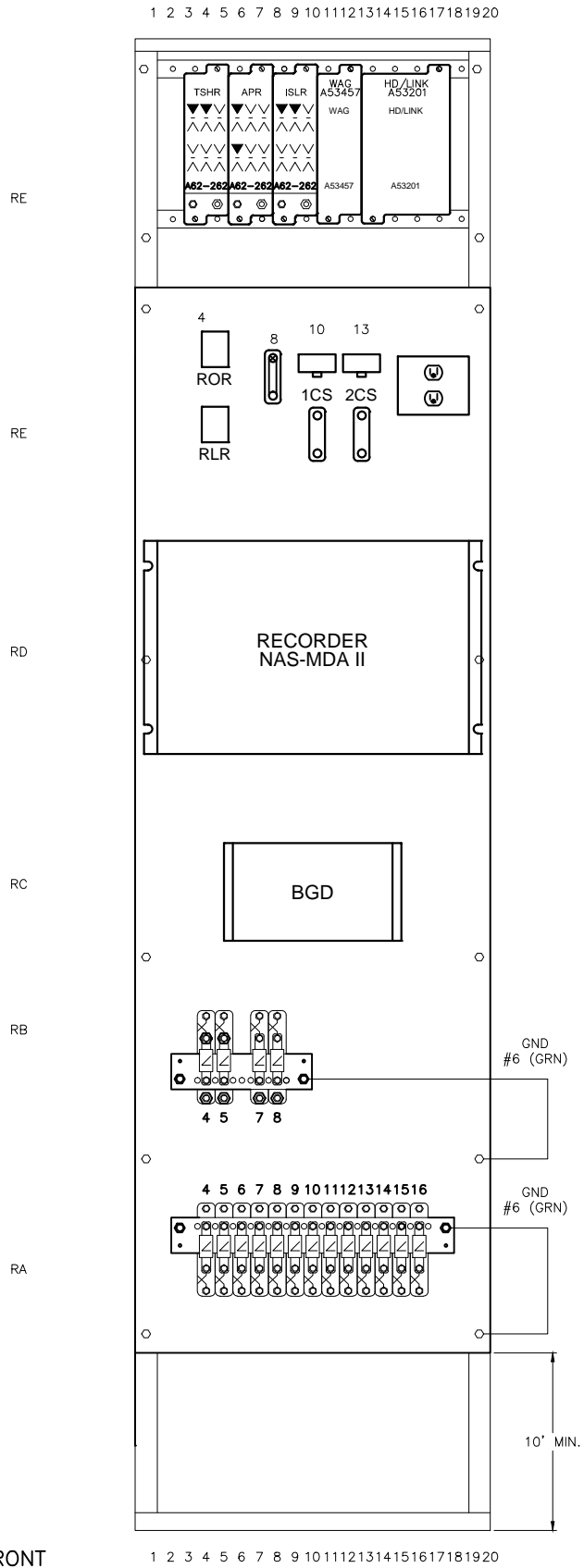
W&LE

**Wheeling & Lake Erie
Railway**

| | | | | | |
|---------------|----------|---------|---------------------------------------|---------|----------|
| LOCATION | | | CASTLE BOULEVARD CITY OF AKRON, OH | | |
| ORIGINAL DATE | 08-31-17 | TITLE | AC POWER DISTRIBUTION | | |
| DESIGNER | CTC | SUB | AKRON | CTC NO. | CN17110 |
| DRAFTSMAN | CTC | RRMP | 157.75 | SCALE | 1"=2' |
| CHECKER | CTC | DOT NO. | 002 124A | SHEET | 18 of 22 |



SIDE 'B' FRONT



| RELAY CROSS REFERENCE | |
|-----------------------|----------|
| GRS | SAFETRAN |
| A62-262 | 400000 |

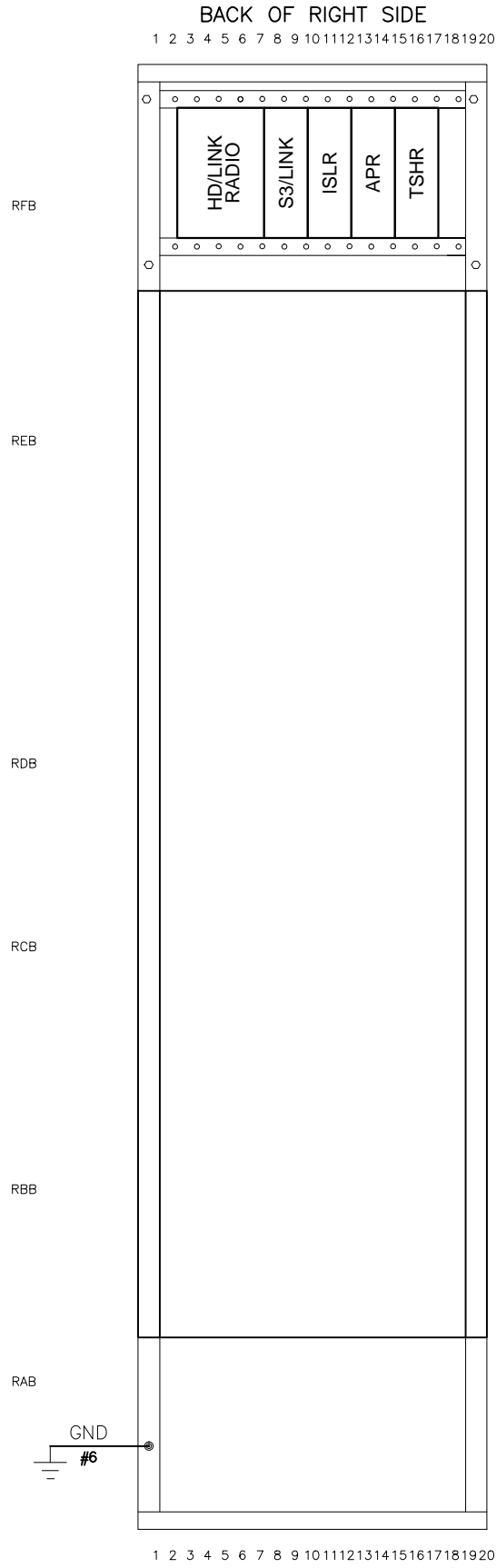
REVISION
BLOCK

CHANGE FROM TYPICAL: Y

W&LE

**Wheeling & Lake Erie
Railway**

| | | | |
|---------------|----------|---------------------------------------|-----------------|
| LOCATION | | CASTLE BOULEVARD CITY OF AKRON, OH | |
| ORIGINAL DATE | 08-31-17 | TITLE | RACK FRONT VIEW |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | CTC NO. | CN17110 |
| | | SCALE | 1"=2' |
| | | SHEET | 19 of 22 |



SIDE 'B' BACK

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

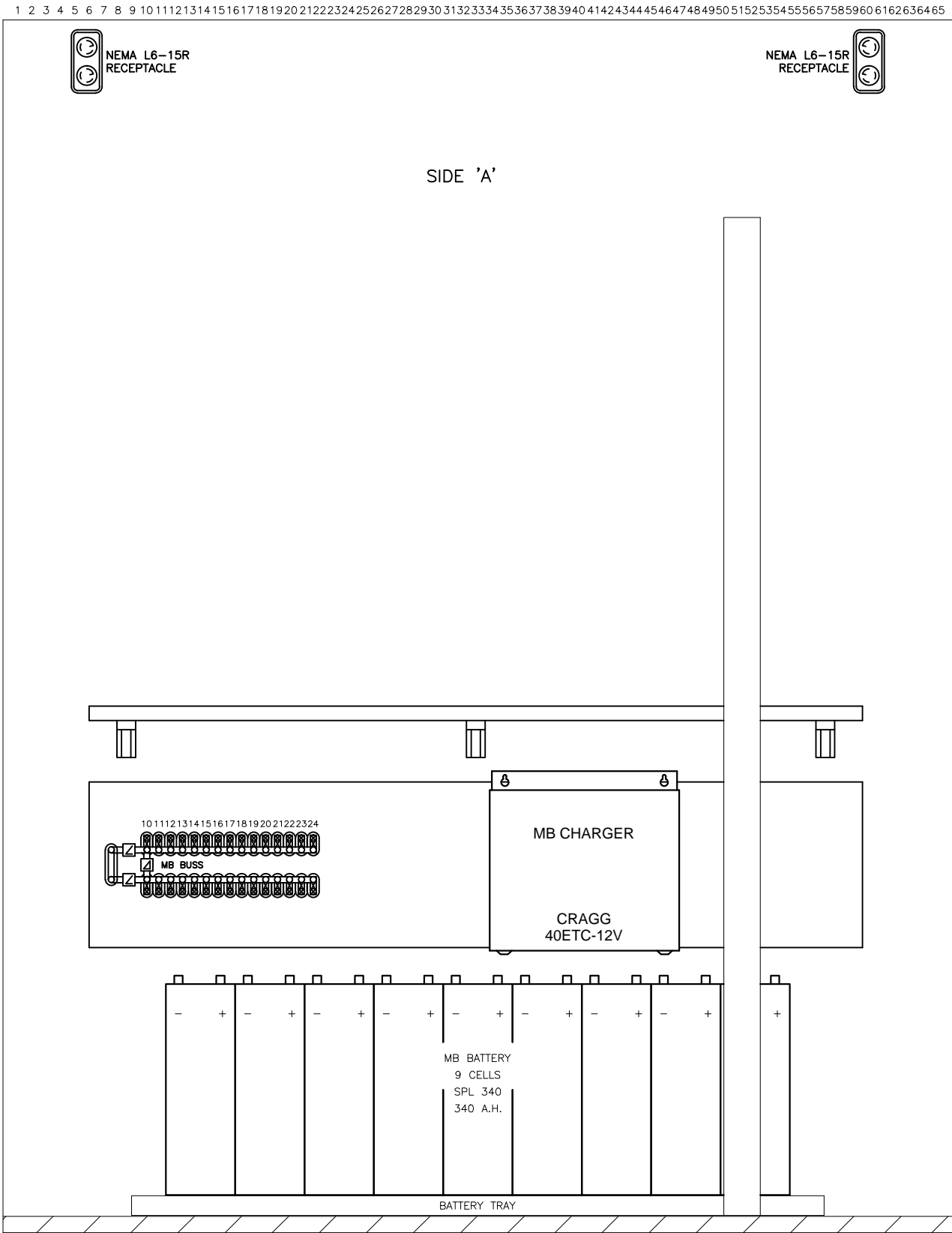
CHANGE FROM TYPICAL: Y

REVISION
BLOCK



**Wheeling & Lake Erie
Railway**

| | | | |
|---------------|----------|---------------------------------------|----------------|
| LOCATION | | CASTLE BOULEVARD CITY OF AKRON, OH | |
| ORIGINAL DATE | 08-31-17 | TITLE | RACK BACK VIEW |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | CTC NO. | CN17110 |
| | | SCALE | 1"=2' |
| | | SHEET | 20 of 22 |



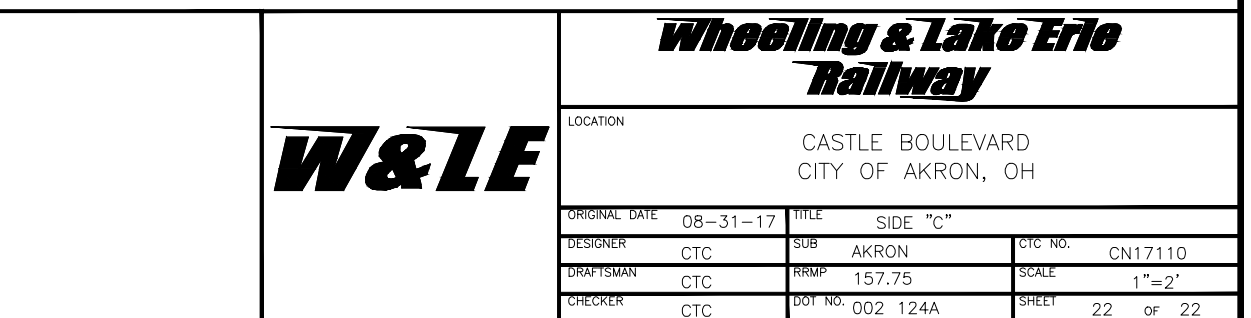
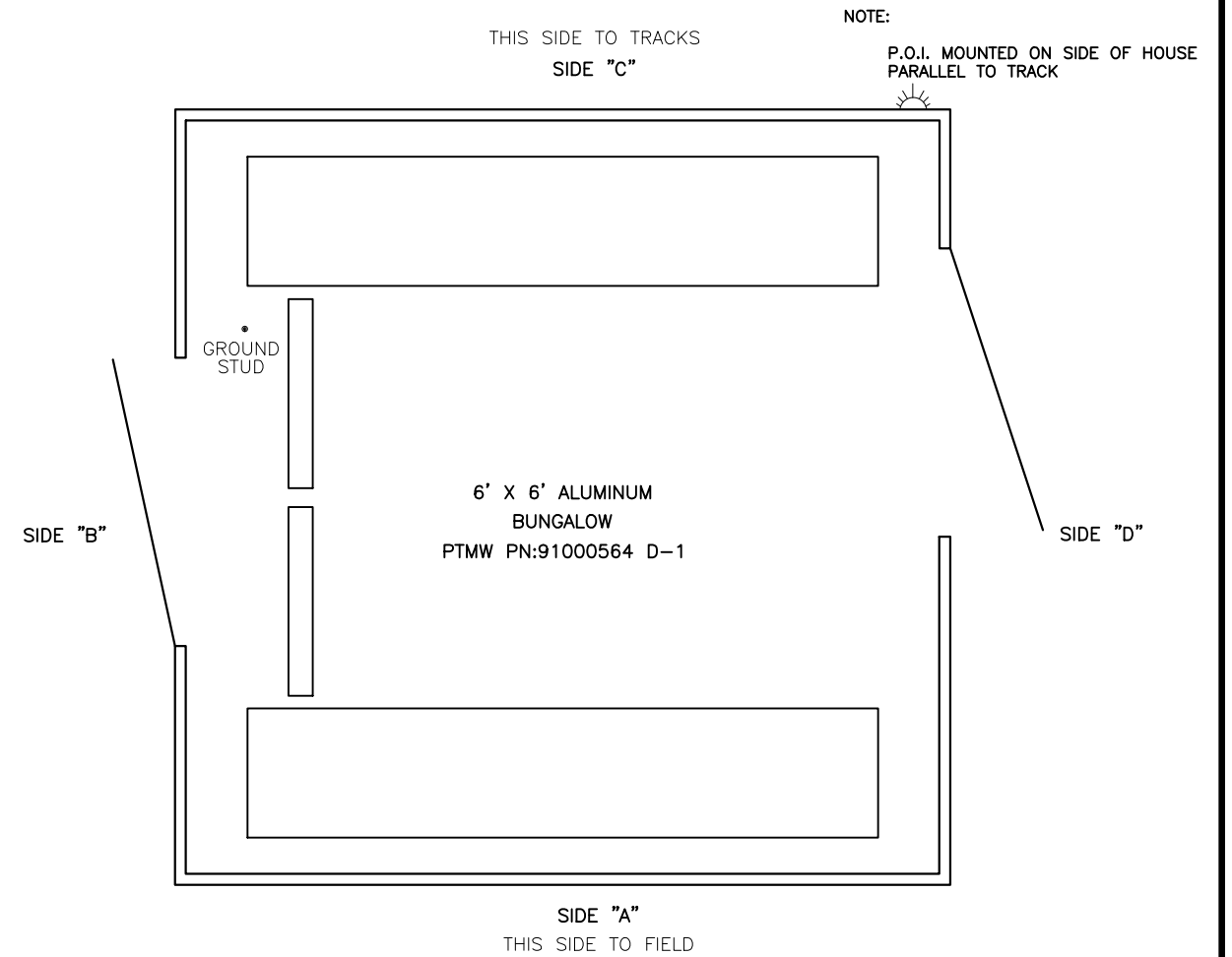
CHANGE FROM TYPICAL: N

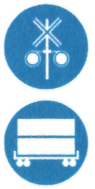
REVISION
BLOCK

W&LE

**Wheeling & Lake Erie
Railway**

| | | | |
|---------------|----------|---------------------------------------|----------|
| LOCATION | | CASTLE BOULEVARD CITY OF AKRON, OH | |
| ORIGINAL DATE | 08-31-17 | TITLE | SIDE "A" |
| DESIGNER | CTC | SUB | AKRON |
| DRAFTSMAN | CTC | RRMP | 157.75 |
| CHECKER | CTC | DOT NO. | 002 124A |
| | | CTC NO. | CN17110 |
| | | SCALE | 1"=2' |
| | | SHEET | 21 of 22 |





OHIO RAIL DEVELOPMENT COMMISSION

Mail Stop #3140, 1980 West Broad Street, Columbus OH 43223

John R. Kasich, Governor • Mark Policinski, ORDC Chairman

June 26, 2017

Mr. Tim Andrews
Wheeling & Lake Erie
100 East First St.
Brewster Oh, 44613

RE: Summit County, Castle Boulevard, DOT# 002124A, PID# 105916

Dear Mr. Andrews:

A diagnostic review was held at the above grade crossing on April 18, 2017. The crossing has been recommended for the installation of lights and gates.

Wheeling & Lake Erie (WE) is authorized to proceed with the site plans and cost estimates (PE) or bid package 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 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 Project Manager for this project is James Tucker. James can be reached at (614) 398-6897, or james.tucker@dot.ohio.gov, if you have any questions.

Sincerely,

Project Manager

C: Randall Schumacher, Supervisor, Rail Division, PUCO
Jill Henry, Grade Crossing Planner, PUCO
Susan Arduini, ORDC
ORDC (file)

Attachment: 1 (diagnostic review form)



www.rail.ohio.gov

phone: 614.644.0306

IMPROVING RAIL TODAY FOR TOMORROW'S ECONOMY



OHIO RAIL DEVELOPMENT COMMISSION

Mail Stop #3140, 1980 West Broad Street, Columbus OH 43223

John R. Kasich, Governor • Mark Policinski, ORDC Chairman

May 2, 2017

Wheeling & Lake Erie Railroad
Mr. Tim Andrews
Signals & Communications Supervisor
100 E. First Street
Brewster, Ohio 44613

Subject: Grade Crossing Warning Device Improvements
Summit County, Castle Blvd., DOT# 002124A, PID 105916

Dear Mr. Andrews:

A diagnostic review was conducted at the subject grade crossing on 4/18/2017. As a result of the review, the devices will receive flashing lights and roadway gates.

This project shall be completed in compliance with Agreement No. 0001-A, dated September 17, 1990, entered into by the State of Ohio and Wheeling & Lake Erie Railroad (WE) 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 WE 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. WE 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 WE prior to ORDC issuing a PE authorization. PE will be submitted by WE to ORDC within ninety (90) days or other time specified by ORDC in the PE authorization. Construction will not be commenced by WE prior to ORDC issuing a construction authorization. Construction will be completed by WE 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,

Matthew R. Dietrich
Executive Director



www.rail.ohio.gov

phone: 614.644.0306

IMPROVING RAIL TODAY FOR TOMORROW'S ECONOMY

Wheeling & Lake Erie Railroad:

By: 

Title: S&L Supervisor

Date: 5-3-2017

SUM Castle Blvd., DOT# 002124A, PID 105916



Diagnostic Review Team Survey

Reason for Survey:

(e.g. formula, accident, constituent, etc.)

Constituent

Date: 4/18/2017

Location Data

Street or Road Name:

Castle Blvd.

Route/Road Number
(i.e. Twp., Co., SR or US)

US DOT No.:

002124A

County:

SUM

Township:

City:

(In or Near)

City of Akron

Railroad
Name:

Wheeling & Lake Erie RR

Railroad
Division:

WLE System

Branch/Line
Name:

Main

Nearest RR

Timetable Station:

Fairlawn

RR Milepost:

157.75

On-Site Review Team

(Include: Name - Organization - Phone Number - Email)

1. James Tucker ORDC 614-398-6897 James.tucker@dot.ohio.gov
2. Randy Johr PULO 330-495-3810 ON FILE.
3. Tim Andrews WLE 330-767-7255 Tandrews@wle.org
4. Rob Boxler APS 330-761-2977 rboxler@apslearns.org
5. Mike Lupica City of Akr 330-375-2851 mlupica@akronohio.gov
6. Cathy Stout ORDC 614 644 0313 catherine.stout@dot.ohio.gov
7. Susan Kirkland ORDC 614.644.0286 Susan.Kirkland@dot.ohio.gov
8. _____
9. _____

Existing Traffic Control Devices

| Type of Warning Devices | Installed? | | Quantity/Comments |
|---------------------------------------|---|--|-------------------|
| Advance Warning Signs (condition?) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | 2 |
| 'Stop' Signs | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| 'Stop Ahead' Signs | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| Pavement Markings (condition?) | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| Crossbucks | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | |
| Number of Tracks Signs | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| Inventory Tags | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | |
| Interconnected Highway Traffic Signal | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| Mast-Mounted Flashing Lights | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | |
| Cantilever Flashing Lights | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Number: Length: |
| Side Lights | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| Automatic Gates | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Number: Length: |
| Bells | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Number: |
| Sidewalk Gate Arms | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| 'No Turn' Signs | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| Illumination | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | |
| Is crossing flagged by train crew? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| Other | <input type="checkbox"/> Yes | <input type="checkbox"/> No | |

| Safety Data (Obtain crash reports, if possible, prior to review) | | |
|--|-------------------------------------|--|
| | Initial Information (from database) | Revised |
| Number & dates of crashes in previous 5 years | 0 (7/23/77) | |
| Hazard Ranking | 1754 | Date Run: 2/3/2017 |
| Railroad Data | | |
| Railroad Characteristics | Initial Information (from database) | Revised |
| Total trains per day | 4 | 6 |
| < 1 per day | | |
| Day thru trains | 2 | 4 |
| Night thru trains | 2 | 2 |
| Daytime switching movements | 0 | |
| Nighttime switching movements | 0 | |
| Total number of tracks | 1 | |
| Number of main tracks | 1 | |
| Number of other tracks | 0 | |
| Maximum train speed | 40 | |
| Typical train speed | 40 | |
| Amtrak | | |
| If non-gated crossing, is clearing sight distance adequate in all quadrants? (See Table I) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | |
| If multiple tracks, can two trains occupy crossing at the same time? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | |
| Can one train block the motorists' view of another train at crossing? <input type="checkbox"/> Yes (Explain below) <input checked="" type="checkbox"/> No | | |
| Can one or more tracks be eliminated through the crossing? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | |
| Are there other track(s) crossing this same roadway within 100 ft of this crossing? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | |
| If yes, Crossing DOT #(if different) _____ | | |
| If yes, distance _____ (take measurement between track centerlines at closest point along roadway) | | |
| Roadway Data | | |
| Local Highway Authority: | | City of Akron |
| Roadway Characteristics | Initial Information (from database) | Revised |
| Average daily traffic | 5350 (2012) | City will provide update |
| Highway paved | X Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Roadway Surface: <input checked="" type="checkbox"/> Blacktop <input type="checkbox"/> Gravel <input type="checkbox"/> Concrete <input type="checkbox"/> Other _____ | | |
| Roadway width: 34 ft. | | |
| Number of highway lanes | 2 | |
| Urban or Rural | Urban | |
| Vehicle Speed: 25 MPH | | |
| School Bus Operation: <input type="checkbox"/> No X Yes 102 Amount | | |
| Hazardous Materials Trucks: <input checked="" type="checkbox"/> No X Yes 03% Amount | | |
| Shoulders: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes | | |
| Is the shoulder surfaced? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes | | |
| Is there existing guardrail along roadway in crossing vicinity? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes | | |
| Is stopping site distance adequate? (See Table 2) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, deficient approach(es) _____ | | |

| | |
|---|---|
| Quadrant <u>NW</u> Curb and Gutter: <input checked="" type="checkbox"/> Functional (Curb height = 4" or more) <input type="checkbox"/> Non-functional (Curb height = Less than 4") <input type="checkbox"/> None | Quadrant <u>SE</u> Curb and Gutter: <input type="checkbox"/> Functional (Curb height = 4" or more) <input checked="" type="checkbox"/> Non-functional (Curb height = Less than 4") <input type="checkbox"/> None |
|---|---|

Pedestrians: ☐ No ☒ Yes

Is sidewalk present? ☐ No ☒ Yes

Is there a nearby intersection that could cause queuing over the crossing? ☐ No ☒ Yes

If yes,
Distance 180' Winhurst

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 (Z)

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

If yes,
Improvement type _____ Lead Agency _____ Timeline/completion - _____

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

Explain reasons:

Type of Development

| | |
|--|---|
| <input type="checkbox"/> Open Space <input type="checkbox"/> Institutional <input type="checkbox"/> Industrial <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Residential | Location of nearby schools: <u>Harvey firestone @ crossing</u> <u>CASE CLC on Garman 1/2 mile west.</u> |
|--|---|

Utility Information

Is commercial power available? ☐ No ☒ Yes

Utility Provider (Company Name) Ohio Edison Phone Number _____

Nearest Available Power Source @ crossing

What other utilities are present? (add locations to sketch)

| | | | |
|---|---|--|---|
| <input checked="" type="checkbox"/> Gas | <input checked="" type="checkbox"/> Cable | <input checked="" type="checkbox"/> Telephone | <input checked="" type="checkbox"/> Fiber Optic Cable |
| <input type="checkbox"/> Petroleum | <input checked="" type="checkbox"/> Water | <input checked="" type="checkbox"/> Sanitary Sewer | |
| <input type="checkbox"/> Other _____ | | | |

Is(are) there potential utility conflict(s) ☐ Yes ☐ No ☒ Unknown

Comments:
SE Quad overhead utilities might conflict with new gate ARM.

Potential Red Flags / Project Challenges

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

NONE currently. However there is queuing.

Crossing Consolidation or Closure:

N/A

Real Estate or ROW:

N/A

Culverts / Drainage / Ballast Conditions:

Terrible BALLAST conditions

Roadway and/or Sidewalks:

N/A

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

Several overlaps with adjoining crossings

PSO circuit ?

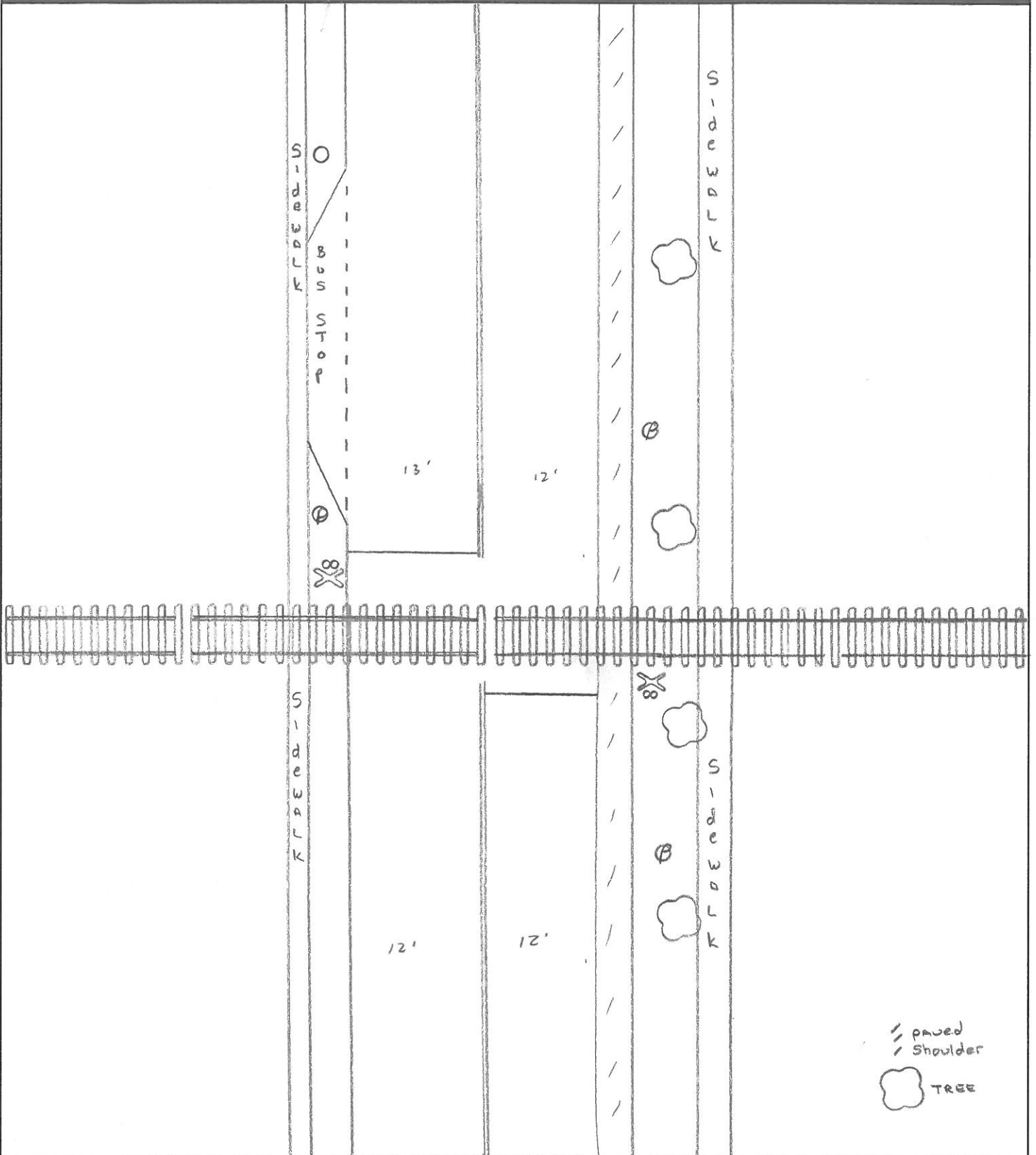
Environmental:

N/A

Other:

SE Quad

Field Sketch



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

Sketch by: JT

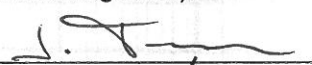


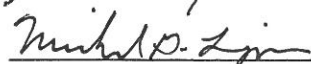
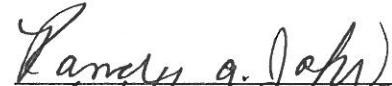

Diagnostic Team Recommendations

| | Quadrants Needed |
|---|-----------------------|
| <input checked="" type="checkbox"/> Install/upgrade active devices | |
| <input type="checkbox"/> Automatic Flashing Lights (AFLS) | |
| <input type="checkbox"/> AFLS / Cants | |
| <input checked="" type="checkbox"/> AFLS / Gates | NW + SE Quads |
| <input type="checkbox"/> AFLS / Gates / Cants | |
| <input checked="" type="checkbox"/> Bells / number | 2 NW + SE |
| <input type="checkbox"/> Upgrade circuitry / type | |
| <input type="checkbox"/> Sidelights | |
| <input type="checkbox"/> Guardrail Needed | |
| <input type="checkbox"/> Install/Replace curb | |
| <input checked="" type="checkbox"/> Bungalow placement & offset from rail & highway | Same Quad as Existing |
| <input type="checkbox"/> Other (define) | |

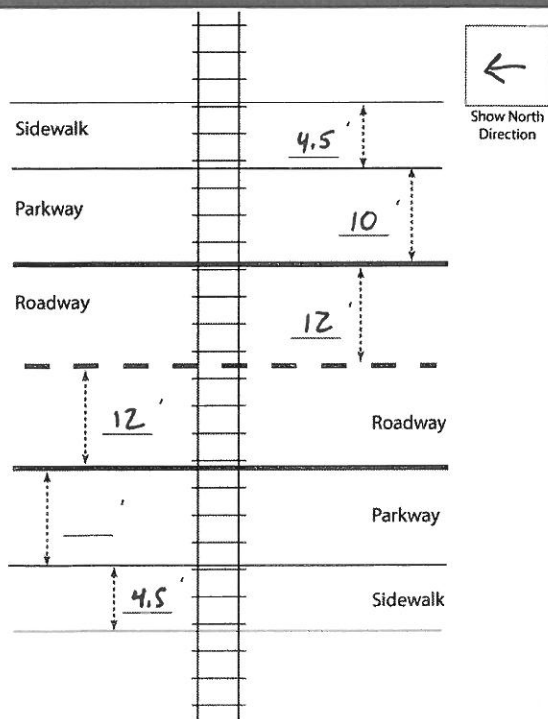
Comments: Gate delay 6-7 seconds. Need to incorporate Advance Preemption into design.

| | |
|--|--|
| <input type="checkbox"/> Install/upgrade traffic signal preemption | |
| <input type="checkbox"/> No improvements needed | |
| <input type="checkbox"/> Other (define) | |

Acknowledgement of Recommendations (each entity represented at the diagnostic must have at least one signature acknowledgement):

Field Dimensions



Asked the City of Akron to trim the trees located in the SE Quad to help with visibility of the gate mech.

SE Quad utilities might be an issue with new gate arm length.

TABLE I

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.

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

12/3/2018 2:35:05 PM

in

Case No(s). 18-1789-RR-FED

Summary: Application In the Matter of a Request for the Installation of Active Warning Devices and Advanced Traffic Preemption at the Wheeling & Lake Erie Railroad Grade Crossing, DOT# 002-124A, at Castle Blvd. in Summit County, Ohio. electronically filed by Mrs. Jill A Henry on behalf of PUCO/Rail Division