



MDOT/ACEC Design Basic Training: Railroad Coordination



Introduction

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Railroad
Coordination

Initial Perceptions



Grade Separations



Railroad Bridges Over MDOT Facilities

MDOT Bridges Over Railroads

Clearance Adjustments

Plan Submissions

Railroad Protection

Structure Agreements

Special Provisions

Grade Separations



Railroad Bridges Over MDOT Facilities

- Railroad protection
- Required if on RR property.
 - Exceptions for emergencies (high load hit)
- Property lines on vertical plane

MDOT Bridges Over Railroads

- RR liability requirements
 - Falling objects
- Snooper Trucks

Clearance Adjustments



Identify early if a waiver is required

- What might require a waiver?

Requirements found in the Michigan RR Code

- [MLC 462.339](#)

Vertical Clearance

- 22'6" typical minimum
- Some railroads 23'6"

Horizontal Clearance

- 8' 6" on tangent to 400' radius
- 9' when under 400' radius

Plan Submissions

- Submitting initial preliminary plans ahead of plan review milestone dates
- Minimum requirements for initial submittals



Railroad Protection



When do bridge inspections require flagging?



What if the Railroad requires an indemnification clause?



Who to contact to set up flagging and permitting

Structure Agreements

- Why are they needed?
- Importance of getting plans to a 'Final' state in advance of agreement coordination
- Timeframe to secure a structure agreement



Special Provisions



Insurance



Work on Railroad Property



Coordination Clause



Inspection and Flagging
(bridge only)

At-Grade Crossings



MDOT Form 1425

Diagnostic Study Team Review

Design Considerations

Funding Crossing Improvements

Special Provisions

MDOT Form 1425

Notification of Proposed Project Involving a Public Railroad Crossing

Needed for all crossings within CIA of project

- Not needed on delineator or longline pavement marking projects

Submit to MDOT Rail Safety

- Email address located on bottom of form

Michigan Department of Transportation 1425 (10/20) Clear Form

NOTIFICATION OF PROPOSED PROJECT INVOLVING A PUBLIC RAILROAD CROSSING

INSTRUCTIONS: TO BE COMPLETED BY ROAD AUTHORITY OR RAILROAD. PLEASE ATTACH A COPY OF APPLICABLE PLANS IF AVAILABLE.

Road Project - MDOT will determine if a diagnostic review is needed.
 New Crossing - A review is required for new public roadways or trails proposed to cross a rail line, or for new rail lines to cross an existing public roadway or trail.
 Other - _____

DATE: _____ MDOT JOB #: _____ LAP or TAP CONTACT: _____

CROSSING IDENTIFICATION

NAME OF EXISTING OR PROPOSED ROAD/TRAIL		ROAD AUTHORITY	
COUNTY		CITY / VILLAGE / TOWNSHIP	
RAILROAD	NATIONAL INVENTORY #	TRAIN MOVES (Projected if new track) _____ PER _____ (DAY/WEEK/ETC)	
CURRENT ADT	YEAR	PROJECTED ADT (Max. 5 years out)	YEAR

WRITTEN DOCUMENTATION OF CURRENT ADT (WITHIN 3 YEARS / 24 HOUR STUDY) MUST BE PROVIDED AT THE REVIEW.

PROJECT INFORMATION

BRIEF DESCRIPTION OF PROPOSED PROJECT (Attach additional sheets if necessary)

DESCRIPTION OF PLANNED TRAFFIC CONTROL AT CROSSING DURING CONSTRUCTION

PROXIMITY OF WORK TO NEAREST RAIL IN CROSSING: _____ ft SOURCE OF ROAD FUNDING (Check one): Local / Federal-aid

ROADWAY DIMENSIONS	CURRENT	PLANNED
Number of Lanes		
Total Road Width		
Shoulder Width		
Curb & Gutter	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO

WILL ROADWAY ELEVATION CHANGE IN RELATION TO CROSSING ELEVATION? YES NO WILL ALIGNMENT OF THE ROADWAY CHANGE? YES (if yes, please explain above) NO

PROPOSED CONSTRUCTION START DATE SOURCE OF FUNDS FOR POTENTIAL RAILROAD SURFACE / SIGNAL WORK

CONTACT INFORMATION

NAME / TITLE	PHONE	FAX
ORGANIZATION	E-MAIL	
ADDRESS	CITY	STATE ZIP CODE

Please complete and return with a copy of the plans (if available) to MDOT-RailSafety@Michigan.gov.

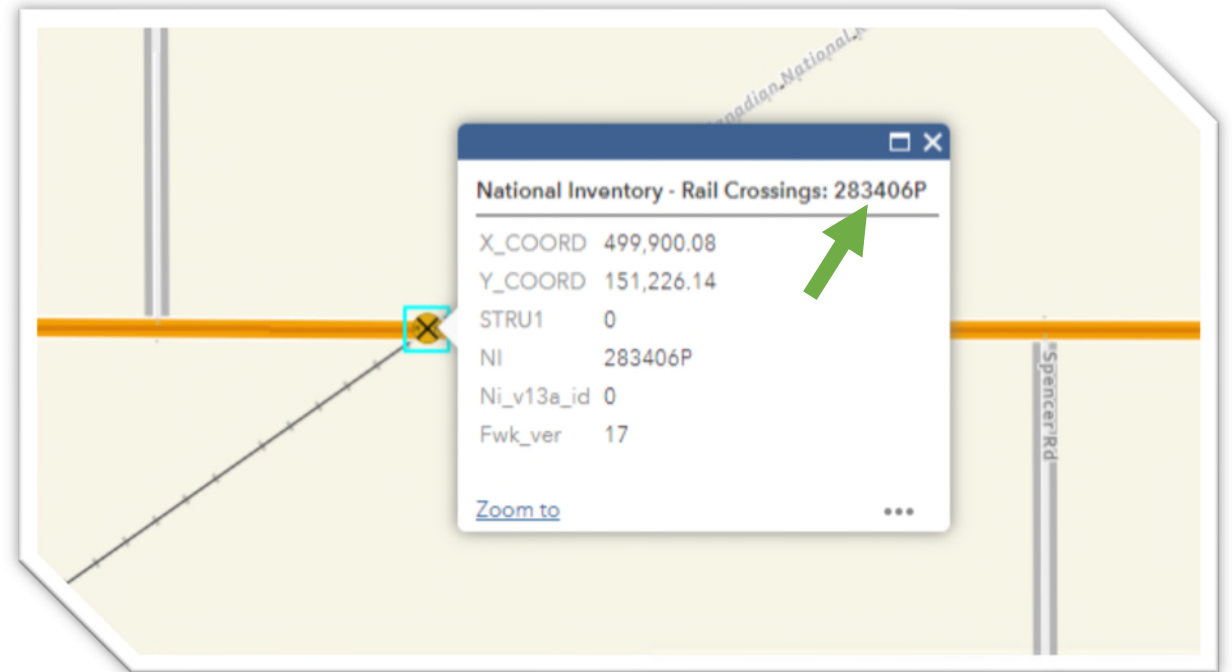
PR Finder

Find the crossing on the map and click the crossing symbol

- National Inventory (NI) number is shown in the box

Crossings can be found using the NI number

- Click the railroad crossing symbol in the top right and type the NI# in the box



<https://mdotgis.state.mi.us/portal/apps/webappviewer/index.html?id=c3aa2462a1e24e37a33184a33e5976aa>

Emergency Notification System (ENS) Sign

- Shows emergency contact info
 - Report vehicle stuck on crossing, obstructions, safety concerns, any emergency
- NI number usually called Crossing #, X-ING #, or DOT #
- Should be found on the crossing sign/signals (49 CFR 234.309)
- Sometimes also found on the nearby signal box



Diagnostic Study Team Review (DSTR) for Proposed Projects

DSTR Meeting will be schedules...

- If geometric revisions are to be done to track crossing surface and/or RR signals upgrades
 - Includes lane configuration changes (road diet)
- If traffic volumes are significantly changed (detour route)
- If there are safety Concerns
 - Sight Distance
- When a new crossing is planned



Diagnostic Study Team Review (DSTR)

- Complete MDOT Form 1425 to request a DSTR meeting
- DSTR Team composition
 - MDOT – Rail Safety Inspector (will lead meeting)
 - Road Authority
 - Railroad
 - MDOT Trunkline or Local Grade Crossing Staff
- Meeting will determine who will be responsible for road and track improvements and who will construct and pay for improvements.
- Other DSTR opportunities - Priority process, crossing in poor condition or safety concerns
- MCL 462.301
- **Contact Kris Foondle – Railroad Safety Manager**

Design Considerations

Sidewalks and Ramps



ADA

- Accessibility Guidelines (ADAAG)

Federal and State Guidelines

- MDOT Standard Plan R-28 series

Local Jurisdiction

- Maintaining sidewalk on RR ROW (outside highway ROW)

Account for potential preliminary review costs from railroad

Consider sidewalk placement relative to gates

Design Considerations Signs

- Ensure clear sightlines to crossbucks are maintained
 - Both during construction and final state
- Railroad sign placement locations are in MMUTCD Chapter 8
- Railroad is responsible for all signs attached to active warning devices (flashers, gates)
- Roadway agency is responsible for all other signs (includes crossbuck and stop/yield, at passive crossings)



Design Considerations

Traffic Signals



- All work on railroad property must be approved by the railroad and follow their specifications. Each railroad has their own guidelines.
 - Includes signal wire relocations, interconnects, handholes/junction boxes, pre-empt signals
- Licensing and agreements may be required dependent on the railroad.
- Disappearing legends at intersections for side road crossing where traffic is turning towards the crossing.
 - Preferred treatment and will be interconnected with railroad active warning devices.

Design Considerations

Traffic Signals



Temporary Signals

- Temporary signals may be required for traffic lane switches during construction
 - When traffic is directed over the crossing in opposing direction than normal for extended period of time (overnight).
 - If there is a detour over a crossing where traffic counts exceed safety thresholds.
- Done at project cost

Signal Head Locations

- Traffic lights can be placed on railroad cantilever with the railroad's approval but consideration should be given to future maintenance and improvements.
- New MUTCD standards may impact the placement of railroad flashers that may be in conflict of placement of highway signals.

Special Provisions



Insurance



Work near Railroad Property vs.
Notification of Work



Coordination Clause



Special Considerations at
Railroad Crossings (at-grade
only)

General Considerations



Planisware

Railroad Flagging

MDOT Requirements

Railroad Guidelines

Real Estate

Railroad Reviews

Possible Effects of Failing to Properly Coordinate

- Delayed project implementation
- Increased costs
- Hamper relationships
- Potential impacts to external customers (traffic delays, future projects, etc.)

Planisware



- Grade Separations: Include Task 3650
- Scope of work dictates duration
 - 390 Days for 4R and roadway widening jobs.
 - 260 Days for 3R jobs.
 - 170 days for CPM jobs.
- Task does not start until Preliminary Plans task (3570) is completed.
- Widening of existing structure or structure reconstruction requires amended or new Structure Agreements.
 - Agreement sign-offs can not start until plans and ROW are 100% complete (these documents are Exhibits within the Structure Agreements).
- Projects involving Grade Separation can possibly require 18 months advance notice for situations requiring addition Railroad Right-of-Way activities and agreements.
- Railroad Force Account Authorization issuance (Preliminary Engineering, Construction Engineering and Construction Inspection)
- Accounts for potential necessary design and construction agreements with railroad.

Planisware



- **At-Grade Crossings: Include Task 3655**
- Review proposed Impacts to:
 - Geometrics
 - Horizontal alignments
 - Vertical alignments
 - Widening of road/shoulder at grade crossing
 - Maintain Traffic (CIA & Including detour routes)
 - Utilities
 - Traffic Signal Interconnects
- Reviews for project work conducted within Railroad Right-of-Way
- Railroad Force Account Authorization issuance (Preliminary Engineering, Construction Engineering and Construction Inspection and Railroad construction work activities)
- Scope of work dictates duration
 - 390 Days for 3R and 4R and roadway widening jobs.
 - 170 days for CPM jobs.
- Task starts at Verify Design Scope (3130).
- Do not update durations without contacting the railroad specialist

Railroad Flagging



- Required by 49CFR – Part 214
- Costs:
 - Variable by Railroad
 - Typically \$1,500/ 8 hr day
 - Longer hours, overtime, and weekends may increase rates.
 - Some charge hourly but predominately a daily rate based on a 8 hour day.
- Consideration and issues:
 - Pay/prepay
 - Accurate construction schedule (reimbursement)
 - Plan out limited impact to railroad during PE phase (progress clause)
 - Verify availability of flagmen (accelerated schedules, weekends or fixed hours per week)
 - Track work outage windows/periods
- Filing of Right-of-Entry (ROE) Permit is often the trigger mechanism for railroad flagging account to be established.

Right-of-Entry Permits, Insurances & Agreements



- Right-of-Entry Permit will require following items:
 - Insurance
 - Plans
 - Agreements
- Insurance Coverages:
 - Liability
 - Railroad Protective Liability or
 - Commercial General (CG 24 17 1001 endorsement) – no exclusions or limitations of working within 50 feet of the railroad track.
 - Contamination/Environmental
 - Professional Engineering
- MDOT cannot purchase insurance nor indemnify per State Constitution, therefore MDOT typically requires Contractor or Consultant to obtain permits.
- Potential option to purchase insurance through railroad.
- Ancillary agreements: (sidewalk, utility, design/construction, structure)
- Unique railroad standards (i.e. utility installation, grade crossing surfaces, etc.)

MDOT Requirements

(State Owned Railroad Lines)



Plans need to be submitted for approval

Plans still need “no exceptions” from the railroad

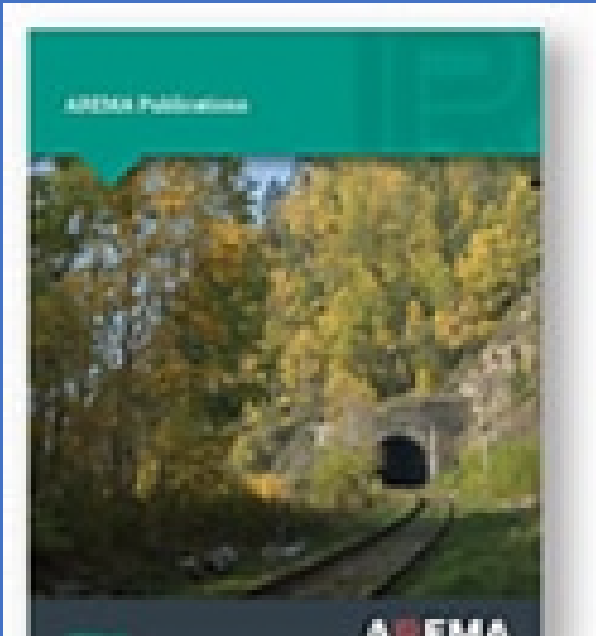
Freight Lines

- Right of Entry – MDOT **Form 0072**
- Use MDOT Railroad Spec Book and Typical Plans
 - Posted on the [MDOT Rail website](#)

Michigan Line

- Right of Entry – MDOT **Form 1444**
- Uses Amtrak specifications

Railroad Design Guidelines



- AREMA provides recommended guidelines, reference materials and specifications for railroads (similar to AASHTO for roadways)
- Each railroad has their own guidelines and Public Project Manuals which must be conformed with.
 - Typically more stringent than AREMA
 - Will also ensure conformance with CFR requirements
- Specifications and guidelines change, so check for updates each time when working within a railroads right-of-way.
- Innovative Design projects (i.e. Design-Build) should be closely evaluated to ensure Railroad Coordination Issues can be accurately defined.
- Items of Concern:
 - Design revisions impacting cost (i.e. Crash Walls)
 - Structure Agreements impacting schedule
 - Design approvals time-frames impacting schedule

Railroad representative statement: "We have no incentive to meet any set timeframe and we have no disincentive if we don't"

Utility Crossings



- Utility Crossings
 - Railroads require permits to cross their right-of-way.
 - Railroad utility lines are **not** on the MISS DIG system
 - Some Railroads will require payments for utility crossings.
 - Current lawsuit in State of Michigan, regarding utilities ability to cross railroad right-of-ways when in a public highway easement, without railroad permit.
- Real estate should be reviewed to understand who holds what property right.

Railroad ROW Needs



- Permanent property rights (Fee/Easement/license agreement/lease of space) -23CFR 216(c)Obtain property rights before project commences
- Temporary property rights – 23CFR 216(d)Right of Entry
- Survey and inspection prior to design
- Temporary grade crossings

Railroad Real Estate



- Railroads are the fee property right owners in a vast majority of locations.
- MDOT does not have valuation maps for privately owned railroads.
- MDOT Region Real Estate staff are responsible for obtaining the necessary ROW property rights and approvals for MDOT projects (similar to any other Public/Private entity acquisition).
- MDOT Region pays costs to Railroad for their review and approval of plans.
- MDOT Region Real Estate staff pays for the cost associated with:
 - ROE permit submissions (when work not going through MDOT bid letting or unique circumstances)
 - To secure property rights transaction.
- Non-motorized pathways that encroach onto Railroad Right-of-Way require MDOT Real Estate involvement (for MDOT projects).
- On traffic signal interconnect projects, MDOT signals group is responsible for obtaining the necessary License Agreements with Railroads.
- Note: On Local Agency projects, the Local Road Authority will be responsible for obtaining all the necessary project property rights.

Abandonment and Discontinuance of Rail Corridor



- Abandonment:
 - A rail carrier can abandon a rail line only if it has STB authority to do so.
 - Once a railroad “consummates” abandonment authority, it may dismantle the tracks and dispose of its property.
- Discontinuance:
 - A rail carrier can only discontinue service with STB permission
 - Discontinuance authority ends a rail carrier’s obligation to serve shippers on a line
 - Track can be removed (if no other carrier use it) or remain intact; however, right-of way should remain intact
- Variances or waivers to standard specs may potentially be obtained on abandoned/discontinued rail corridors.
- Waivers to standard insurance requirements may potentially (ie: Railroad liability insurance) on abandoned/discontinued rail corridors.

Railroad Plan Reviews

- **Requirements depend on contractor means and methods and the railroad**

- Clearances to tracks
 - Horizontally and vertically
 - During construction and final condition
- Steel sheet piling
- Drainage
 - Ditch lines and bridge deck drains and pump houses.
 - Vibrations (blasting, piling installation, boring)
- Utilities
- Impact to footings/foundations
- ROW
- Safety
- Dynamic envelope
- Construction timeframes
- Flagging needs
 - Need contiguous flagging as much as possible
 - Limited staffing for flagging
- Track outages
- Protection of existing facilities (ballast and track)
- MDOT vs. Railroad standards/details

****Railroad Group can not sign off on Certification Acceptance (CA) Form until notice of No Exceptions has been received from the Railroad and all agreements have been finalized****

Utility Construction



- Each railroad has their own guidelines:
 - CN Railroad (GTW & WC) - <https://www.cn.ca/en/safety/supplier-safety/>
 - CSX Transportation- <https://www.csx.com/index.cfm/customers/value-added-services/property-real-estate/permitting-utility-wireless-infrastructure-installations-and-rights-of-entry/utility-permits/>
 - Norfolk Southern Railroad- <http://www.nscorp.com/content/nscorp/en/real-estate/norfolk-southern-services/wire-pipeline-fiber-optic-projects.html>
 - Watco (GDLK & AA) - <https://omegarail.com/permitting/>
 - Genesee and Wyoming Railroad (MQT, GRE, MS, MMRR, & HESR) - <https://www.gwrr.com/real-estate/utility-occupancies/>
 - Adrian and Blissfield Railroad (ADBF, CHS, DCON, JAIL, & LIRR) - <https://abrailroad.com/real-estate/permitting/>
 - Lake State Railway - <https://www.lsrc.com/services/servproperty/>
 - MDOT Owned - <https://www.michigan.gov/mdot/travel/mobility/rail/state-owned>
- Licensing and fees may be a requirement depending on the railroad

Public Projects Manuals

- Amtrak
 - [Utility & Right-of-Way Occupations](#)
- Canadian National (GTW)
 - [Utilities and Flagging](#)
- Conrail
 - [Working on Conrail Property](#)
- CSX
 - [Public Projects Manual](#)
- Norfolk Southern
 - [Public Project Guidelines](#)
- G&W
 - [Real Estate – Genesee & Wyoming Inc. \(gwrr.com\)](#)

Other Helpful Resources

- FHWA and FRA; Highway-Rail Crossing Handbook, 3rd Edition
 - <https://railroads.dot.gov/gxhandbook>
- MDOT; Guidelines for Highway-Railroad Grade Crossings
 - <https://www.michigan.gov/-/media/Project/Websites/MDOT/Travel/Mobility/Rail/Safety-Regulation/Guidelines-Highway-Railroad-Crossings.pdf?rev=0c98535227e543499a2233938ac8ff9b>
- MMUTCD, Part 8
 - https://mdotcf.state.mi.us/public/tands/Details_Web/mmutcdcompleteinteractive.pdf
- FRA Crossing Inventory Lookup
 - <https://railroads.dot.gov/safety-data/crossing-and-inventory-data/crossing-inventory-lookup>
- FRA Crossing Map
 - fragis.fra.dot.gov/GISFRASafety/