



**BUILDING AMERICA®**

**UNION PACIFIC RAILROAD  
INDUSTRIAL TRACK SPECIFICATIONS  
LAST REVISED: February 26, 2020**

**PREFACE**

The following information is provided to help guide you through the planning, design, and construction procedures for developing a rail-served facility. Union Pacific Railroad (UPRR) is committed to working with you to develop the most efficient and cost-effective rail project to meet your transportation needs.

Safety is UPRR's top priority and all parties involved (employees, industries, customers, contractors, and others) are responsible for compliance with all safety requirements. Safety information can be found in Section 4.00.

Design, materials, and methods of construction for all aspects of proposed improvements impacting UPRR owned or maintained property shall be in accordance with the most current edition of the *UPRR General Conditions and Specifications*, *UPRR Engineering Track Maintenance Field Handbook*, and UPRR Standard Drawings. This technical manual provides minimum requirements for Industry owned and maintained property and supplements the aforementioned documents as well as the *Checklist for Industry Track Submittals* and sample plans/exhibits, which are periodically revised. References made to applicable resources throughout this document are not necessarily exhaustive, but have been included to assist with project development and construction. It is the responsibility of the user to update and comply with the most current information, which can be found through the following link:

<https://www.up.com/customers/ind-dev/operations/specs/track/index.htm>

The American Railway Engineering and Maintenance-of-Way Association (AREMA) is commonly referenced throughout this document. AREMA provides technical information and recommended practices pertaining to the design, construction, and maintenance of railway infrastructure. AREMA resources and publications may be obtained through the following link:

<https://www.arena.org/>

The Industry and all affiliates shall not take advantage of any apparent errors, omissions, or discrepancies encountered. Upon such discovery, the appropriate UPRR representative shall be immediately notified to provide further interpretation, clarification, or remediation to help fulfill intent or application. At a minimum, where not otherwise specified, all aspects of design and construction shall meet AREMA specifications. The most restrictive provisions shall govern when there are differences encountered.

If you have any questions concerning project development or require further assistance, please contact the appropriate UPRR Network Economic and Industrial Development (NEID) representative. Contact information can be found through the following link:

<https://www.up.com/customers/ind-dev/contacts/index.htm>

## **SECTION 1 – INDUSTRIAL TRACK DEVELOPMENT OVERVIEW**

### **1.00 PROCEDURES FOR INDUSTRIAL TRACK DEVELOPMENT**

Prior to engineering and construction, the Industry shall familiarize themselves with UPRR's NEID process, which may be found through the following link:

<https://www.up.com/customers/ind-dev/index.htm>

All aspects of project improvements, including design and construction, whether completed by UPRR or others, shall be completed at the Industry's expense. The Industry is responsible for procurement of contractors, engineering design services, materials, permitting, flagging, rights-of-entry, all incidentals, and shall meet all safety, insurance, and all other requirements necessary for the safe and legal execution of work.

No work shall occur on UPRR property without prior authorization from UPRR.

### **1.10 DOCUMENT SUBMITTALS AND PROCEDURES**

The Industry (or Industry's consultant) shall prepare and submit all applicable plans, documents, and other project related information for UPRR review and acceptance. Submittals shall be made through UPRR's online Engineering Document Exchange System (EDS). General information, submittal guidelines, and link for submitting documents through UPRR's EDS can be found through the following link:

[https://www.up.com/customers/ind-dev/document\\_exchange/index.htm](https://www.up.com/customers/ind-dev/document_exchange/index.htm)

It is important that the Industry submit documents in the correct sequence and into the proper category within the EDS system - failure to do so may result in project delays. Plan submittals must progress sequentially in the following order: DevCon, 30% Plans, Construction Plans, and Exhibit "A". Submittals made out of order, or without UPRR acceptance of previous milestones, will be rejected without review and removed from EDS.

EDS upload procedures:

- A. Visit: [https://www.uprr.com/customers/ind-dev/doc\\_ex/jas/index.jas](https://www.uprr.com/customers/ind-dev/doc_ex/jas/index.jas)
- B. Enter login credentials, select "Submit"
- C. Select "Browse..." to locate and select file for upload
- D. Enter a brief description of the file being submitted
- E. Select the appropriate Document Type from the drop-down menu (DevCon, 30% Plans, Construction Plans, Structures, Other, etc.)
- F. If applicable, select appropriate Revision Type
- G. Enter Response Email (the Industry's designated representative whom will receive notifications, requested revisions, or acceptance of the submittal)
- H. If desired, include additional Comments to help clarify submittals
- I. Select "Submit" (confirmation screen will appear after submittal)

Upon receipt by UPRR's Engineering Department, submittals will be distributed to other UPRR departments for review and acceptance, as needed. The EDS will send notification of requested revisions or acceptance for each document to the Industry via the email address provided by the Industry.

After all design issues are resolved and all project documents have been accepted, UPRR will develop a cost estimate for UPRR incurred project costs and both parties will sign and execute an Industry Track Agreement (ITA).

## 1.20 UTILITIES

As required, the Industry shall be responsible for locating, design, and construction for all underground and overhead utility improvements including new construction, relocation, modification, protection, removal, and/or abandonment. Utility design and construction shall comply with UPRR requirements and/or AREMA specifications and be submitted to UPRR and the utility Owner for review and acceptance.

## 1.30 STRUCTURES

As required and as directed by UPRR, UPRR shall be responsible for design and construction of UPRR owned or maintained structures. All structural elements including bridges, crash walls, retaining walls, large drainage structures and end treatments, unloading pits, bore pits, temporary shoring, falsework, utility improvements, and other structural improvements requiring specialized design shall meet UPRR standards and requirements.

Any rail bridge located within 500 feet of a proposed or existing point of switch shall have a walkway and handrail on both sides of the structure. If the structure is owned or maintained by the UPRR, the design and installation of the walkway and handrail system shall be completed by UPRR at the Industry's expense. If the structure is owned or maintained by the Industry, the Industry will design and install the walkway and handrail system. The design of the walkway and handrail system shall be reviewed and accepted by UPRR prior to construction.

It is the responsibility of the Industry to design and test all scales in accordance with current industry standards, guidelines, and specifications. UPRR will not review and/or test scales; however, if scales are ever found to have been constructed and tested out of compliance, UPRR will require scales be brought into compliance by whatever means necessary. Guidelines for scale design include, but are not limited to:

- A. National Institute of Standards and Technology (NIST) Handbook 44: <https://www.nist.gov/>
- B. Association of American Railroads (AAR) Scale Handbook: <https://aarpublications.com/>

## 1.40 ROAD CROSSINGS

As a general policy, UPRR prohibits the construction of new public or private roadways across tracks owned by UPRR. If a project requires the construction of a new crossing across UPRR owned or operated tracks, written authorization will be required from UPRR Public Projects (UPRR field personnel cannot authorize) and all applicable governing agencies. If authorized, a separate crossing agreement will be required. The Industry will be responsible for necessary studies, design, construction, and obtainment of all applicable agency approvals, permits, and agreements.

Each crossing location will be evaluated individually by UPRR and, if applicable, governing roadway agencies. All crossings shall require the installation warning devices, to be jointly determined at a diagnostic. The type of warning devices on public roadways will be jointly determined amongst UPRR, roadway authorities, and/or governing agencies. Be advised, if a new road crossing is proposed near an existing one, the crossing warning devices may need to be upgraded. The warning devices may include automated crossing signals.

If the portion of track owned and operated by the Industry crosses public or private roadways and requires signalization, UPRR will determine UPRR's involvement with signal design, construction, and maintenance work, which may need to be designed and constructed by the Industry per UPRR and/or AREMA specifications..

Turnouts, proposed new track, or proposed removal of existing track at or through the intersection of highway/rail crossings not at grade will require a diagnostic.

Ensure that design and construction is in compliance with state mandated clear sight distances related to crossings. This is to include material storage, vegetation, car storage, etc

All at grade highway/rail crossings, whether public or private, are required to be included in the FRA inventory of road crossings.

The installation will require a DOT number be assigned and Emergency Notification Sign(s) be installed in addition to any required warning devices

## 1.50 CONSTRUCTION

All materials and methods of construction used for the proposed project shall comply with UPRR accepted plans and meet UPRR standards and specifications. UPRR prefers that Industries have their rail contractor furnish UPRR track material for projects requiring UPRR track construction. Upon UPRR acceptance of the design, the Industry may purchase turnouts or any other required track materials from UPRR approved vendors. The terms associated with the procurement, assembly, and installation of turnouts and track materials is project-specific, may be restrictive, and subject to UPRR acceptance. This information will be outlined within the Scope of Work Matrix and included in the ITA.

Prior to performing any track construction on UPRR property, the following shall occur:

- A. Receive approval of Construction Plans.
- B. Secure a fully executed CROE.
- C. The designated UPRR representative shall be notified in writing at **least fifteen (30) working days** prior to start of construction so that appropriate safety precautions may be taken.
- D. All rights-of-entry and applicable permits shall be obtained at the Industry's expense.
- E. UPRR's Call Before You Dig shall be contacted at 1 (800) 336-9193 to obtain fiber optic information prior to track construction within UPRR property.
- F. The Industry's contractor is also responsible for utility locates and securing dig permits from appropriate local one-call services prior to any grading, construction, or other utility work.
- G. Proposed improvements shall be constructed per UPRR accepted plans; written UPRR acceptance for any subsequent changes shall be obtained prior to construction

After performing any track construction on UPRR property, the following shall occur:

- A. Upon completion of construction, UPRR's designated representative shall be contacted for an on-site walkthrough inspection and final UPRR acceptance of all improvements.
- B. UPRR may request "as-built" plans from the Industry. The "as-built" plans will show the corrected stationing, geometry, structures, and clearances. The ITA will then be amended, if necessary.

## 1.60 CONSTRUCTION BY UPRR

Typically, UPRR constructs, owns, and maintains the connection to any existing UPRR owned tracks from the switch connection (point of switch) to the 13-foot clearance point. For projects where the turnout and derail are powered and/or connected to UPRR's signal system, UPRR will typically construct, own, and maintain track beyond the derail at a location determined by UPRR.

The Industry's contractor shall be responsible for all grading and placement of subballast for the entire project, including regions designated for UPRR track, turnout, derail, wayside equipment, and signal construction. Areas requiring UPRR construction shall be prepared in accordance with *UPRR General Conditions and Specifications* and acceptance by UPRR in advance of UPRR mobilization and construction.

The Industry's contractor shall provide permanent access for vehicles and personnel to the project for UPRR construction and maintenance purposes.

Generally, any signal work associated with connecting a new industry track to an existing UPRR owned track will be designed and constructed by UPRR labor forces. UPRR will review each project to evaluate project-specific needs and communicate anticipated signal design and construction requirements.

## 1.70 PROJECT EXEMPTIONS

At any time throughout engineering design and construction, the Industry shall be responsible for requesting project exemptions and obtaining documented acceptance if compliance with UPRR standards, specifications, requirements, and accepted submittals cannot be achieved. Requested exemptions shall be made by filling out the *Exemption Table*, which is to be included with each applicable submittal as sheet 2 and include a concise description, project location, plan set reference location, and explanation for why the exemption request is being made. Upon request, graphic proof to scale will be required from the industry and submitted along with the plan set drawing to document and show why UPRR's standards cannot be met. UPRR's acceptance of requested exemptions shall be obtained prior to procurement, fabrication, delivery, installation, or construction of anything related to each requested exemption. Requested exemptions will likely result in project delays.

## **SECTION 2 – SUBMITTALS**

### 2.00 SUBMITTAL REQUIREMENTS

All submittals shall include all applicable information outlined within UPRR's *Checklist for Industry Track Submittals*. Plans shall use the UPRR Standard Border, Legend, and Abbreviations (*UPRR Exhibit GL001*). These files are available to assist the designer and include MicroStation seed files, sheet borders, etc. UPRR sample plans and exhibits represent UPRR's preferred formatting and also include information typically required for each submittal. Sample plans and exhibits, UPRR resource files, the *Checklist for Industry Track Submittals*, and *Project Exemption Request Form* can be found through the following link:

<https://www.up.com/customers/ind-dev/operations/specs/track/index.htm>

Projects require the following milestones and submittals for UPRR review and acceptance:

- A. DevCon: Industrial Development Concept (DevCon) is a simplified plan depicting key project elements with a description of proposed rail operations, which allows UPRR to evaluate rail serviceability
- B. On-site Meeting: Project review meeting with the Industry and UPRR to review existing site conditions and compatibility with proposed improvements
- C. 30% Plans: 30% Plans may be required for projects, which include additional details pertaining to track, signal, and other aspects of proposed construction; **UPRR's Signal Department will be responsible for all signal design work on track owned by UPRR whom will evaluate and assign signalization roles and responsibilities throughout project review process**
- D. Structures: Detailed drawings for all track structures (bridges, drainage structures, retaining walls, shoring, receiving pits, concrete loadout slabs, buildings, etc.), Drainage Study, clearance diagrams, and utility information/exhibits; the Industry shall include remarks in the comment section noting the type of document being uploaded
- E. Other: Miscellaneous project documents (i.e., pictures, construction schedules, traffic study, geotechnical report, electrical/lighting plans, exhibits, revisions/addenda, etc.); the Industry shall include remarks in the comment section noting the type of document being uploaded
- F. Construction Plans: Final plans including all track geometry, track plan and profiles, grading and cross sections, details, material specifications, etc. required to obtain UPRR's acceptance prior to construction
- G. PTC-KMZ: Upon UPRR's acceptance of 30% Plans, the Industry shall submit a geo-referenced .kmz file of the project. The file will encompass from the proposed PS of the ML connection to 1200 TF beyond the UPRR end of maintenance including all proposed PS, existing PS, and 13' Clear Points both existing and proposed. The file will be submitted through EDS as a .zip. (.kmz is not directly supported).
- H. Exhibit "A": A simplified track plan to be included as an exhibit within the ITA

## 2.10 DEVELOPMENT CONCEPT (DEVCON)

The example *UPRR DevCon Print* should be used as a guideline for preparing the DevCon submittal. The DevCon is a simplified plan showing key components of the project including existing and proposed horizontal track geometry and proposed rail operations. UPRR will use the DevCon to evaluate feasibility of providing rail service to the site.

The DevCon submittal requirements are detailed in the *Checklist for Industry Track Submittals*. The following information provides supporting clarification to the DevCon submittal requirements:

- A. Future Tracks: Future tracks are to be depicted to demonstrate compatibility with future expansion. UPRR will provide limited review of future tracks, which shall not be shown on subsequent submittals. UPRR acceptance of the DevCon submittal does not imply or guarantee acceptance of future track serviceability, layout, design, etc. Development of future tracks shall follow UPRR NEID procedures as a separate project.
- B. Operating Plan: Operating plan needs to include the type of cars contemplated and the proposed sequence of these movements. Indicate whether UPRR shall accommodate Unit Train or Manifest service. Plans must also include the names of all tracks (as indicated on the Checklist for Industry Track Submittals), occupied by Unit Train service (i.e. receiving, staging, departure tracks), staging of inbound/outbound railcars, crew change locations, intraplant switching, and railcar moving devices. This information will be used for UPRR's interdepartmental review.

## 2.20 30% PLANS

Upon acceptance of DevCon Plans, UPRR will notify the Industry if 30% Plans will be required, which are generally necessary for projects involving UPRR track and/or signal construction. The example *UPRR 30% Design Print* should be used as a guideline for preparing the 30% Plans submittal. The purpose of the 30% Plans is to establish the exact locations of turnouts, structures, road crossings, signalized equipment, and horizontal and vertical track geometry. Documents that are to be submitted through EDS under the "Structures" category (Drainage Study, structures, culverts, clearance, utilities, etc.) may be submitted concurrently with 30% Plans, or at the Industry's earliest convenience. If turnout locations are altered after acceptance of 30% Plans, the signal design process will have to start over, causing delays and increasing costs.

The 30% Plans submittal requirements are detailed in the *Checklist for Industry Track Submittals*. The following information provides supporting clarification to the 30% Plans submittal requirements:

- A. Track Materials: UPRR's standard rail and tie configurations are to be used. If any other type of track support system is to be used, detailed structural plans and calculations shall be provided for UPRR review and acceptance.
- B. Rail Bridges: All existing UPRR bridges within 500 feet of any turnout shall be shown.
- C. Drainage: All existing and proposed drainage structures under all existing and proposed roads and in the construction area that would affect drainage on UPRR property shall be shown and follow requirements. Detailed culvert and/or bridge plans and supporting hydrologic and hydraulic Drainage Study shall be submitted through UPRR's EDS system under the "Structures" category.
- D. Under Track Structures: Detailed plans of any proposed under track structures shall be submitted through UPRR's EDS system under the "Structures" category.
- E. Overhead Structures: The clearance envelope must show the minimum clearances when the device is in use and in the retracted position for train movements. Detailed plans of any proposed overhead loading devices, including side-unloading racks with retractable platforms, shall be submitted through UPRR's EDS system under the "Structures" category.
- F. Electrical Service: The Industry shall provide metered electrical service when the proposed track project requires power for facilities such as wayside signals, active warning devices, powered turnouts, switch heaters, overhead lighting and illumination, impaired clearance signs, or other facilities. Show location, indicate overhead or underground, and the size of proposed electrical service. Show location of poles and size of wireline for any overhead lights, etc.

- G. Utilities: All existing and proposed utilities (overhead or underground) that cross or parallel within close proximity of any existing or proposed track shall be depicted. Utility drawings and exhibits shall be submitted through UPRR's EDS system under the "Structures" category.
- H. GPS Information: Call out all proposed point of switch, point of derail, 13' clear point, End of Maintenance signs, and No RR Operations Signs to 1200' inside the industry beyond the UPRR End of Maintenance. Measurements shall be taken from center of track using WGS84 Datum in decimal format, to six decimal places.
- I. PTC-KMZ: Upon UPRR's acceptance of 30% Plans, the Industry shall submit a geo-referenced .kmz file of the project. The file will encompass from the proposed PS of the ML connection to 1200 TF beyond the UPRR end of maintenance including all proposed PS, existing PS, and 13' Clear Points both existing and proposed. The file will be submitted through EDS as a .zip. (.kmz is not directly supported).

### 2.30 CONSTRUCTION PLANS

Construction Plans are required for all projects to establish all elements of existing conditions and proposed improvements for UPRR's acceptance prior to construction.

The Construction Plans submittal requirements are detailed in the *Checklist for Industry Track Submittals*. The following information provides supporting clarification to the Construction Plans submittal requirements:

- A. Track Grounding: The track, or segment of track, on which railcars may stand while a flammable liquid or flammable compressed gas is being loaded or unloaded shall be bonded at each rail and grounded (see *UPRR Std. Dwg. No. 6003*).
- B. Clearances: Show all horizontal clearances, perpendicular from adjacent track centerline, to any obstruction within 20 feet of all existing and proposed tracks.

### 2.40 EXHIBIT "A"

The example *UPRR Exhibit "A" Print* should be used as a guideline for preparing the Exhibit "A". All industry tracks operated by UPRR are covered by an ITA that specifies each party's responsibility for construction, maintenance, and operations of the industry tracks. The Exhibit "A" drawing is a simplified track plan used as an exhibit in the ITA, and because the ITA is a legally binding agreement, the Exhibit "A" shall be accurate, legible having a minimum 10-point font, and easy to interpret.

The Exhibit A shall not contain digital aerial imagery.



### SECTION 3 – DESIGN SPECIFICATIONS

Engineering design of proposed construction being performed on UPRR property shall comply with the most current versions of the *UPRR General Conditions and Specifications* and UPRR Standard Drawings. The design specifications below are minimum requirements for all other construction. For any specifications not covered, contact UPRR's IPP representative.

#### 3.00 TRACK ALIGNMENTS

##### Geometry:

Tracks alignment geometry and stationing shall be established using the 100-foot chord definition:

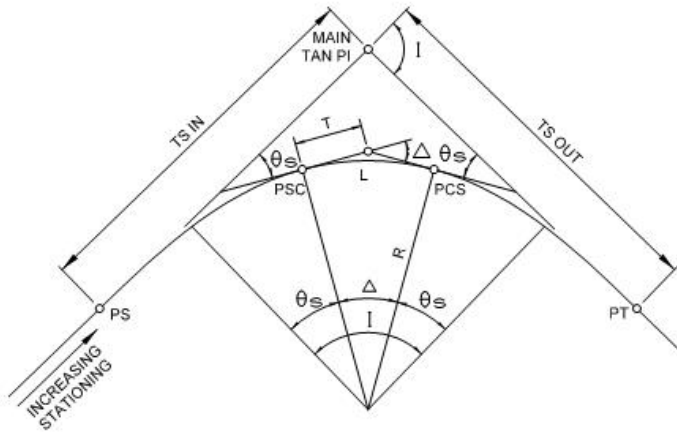


FIGURE A  
CIRCULAR CURVES  
WITH SPIRAL TRANSITION

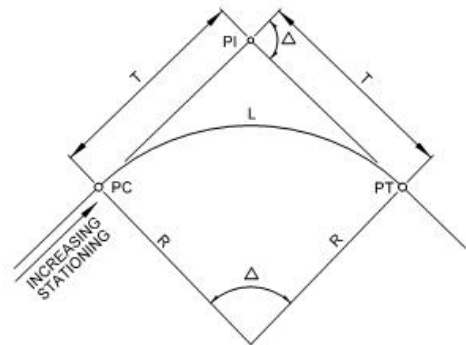


FIGURE B  
SIMPLE CIRCULAR CURVE

- $I$  - TOTAL INTERSECTION ANGLE  
 $\theta_s$  - SPIRAL ANGLE =  $\frac{A L^2}{2}$   
 $\Delta$  - CENTRAL ANGLE OF CIRCULAR CURVE =  $I - 2 \theta_s$   
 $D_c$  - DEGREE OF CURVE  
 $A$  - RATE OF CHANGE OF DEGREE OF CURVE PER 100-ft. OF LENGTH =  $\frac{D_c}{L}$   
 $R$  - RADIUS OF CIRCULAR CURVE  
 $T$  - TANGENT LENGTH OF CIRCULAR CURVE =  $R \tan \frac{\Delta}{2}$   
 $L$  - LENGTH OF CIRCULAR CURVE =  $\frac{\Delta}{D_c} \times 100$   
 PS - TANGENT TO SPIRAL  
 PSC - SPIRAL TO CURVE  
 PCS - CURVE TO SPIRAL  
 PT - SPIRAL TO TANGENT  
 MAIN TAN PI - POINT OF INTERSECTION OF MAIN TANGENTS  
 $\left( \begin{matrix} \text{TS IN} \\ \text{TS OUT} \end{matrix} \right)$  - TANGENT LENGTH OF COMPLETE CURVE =  $(R + o) \tan \frac{I}{2} + t$   
 (WHEN SPIRALS OF EQUAL LENGTH  
 ARE USED ON BOTH SIDES OF  
 CIRCULAR CURVE, SEE FIGURE C.  
 FOR  $o$  AND  $t$ ).

- $R$  = RADIUS OF CIRCULAR CURVE  
 $\Delta$  = CENTRAL ANGLE OF CIRCULAR CURVE  
 $T = R \tan \frac{\Delta}{2}$   
 $L = \frac{\Delta}{D_c} \times 100$   
 $D_c = 2 \sin^{-1} (50/R) = \text{DEGREE OF CURVE}$   
 (CHORD DEFINITION)

Stationing:

Track stationing for UPRR tracks shall be determined from UPRR valuation maps, or as otherwise directed by UPRR. Industrial track alignments and stationing shall begin with Sta. 0+00 at the point of switch for each track alignment.

Horizontal Curves:

Horizontal curves shall be designed having the minimum degree of curvature practical.

For unit train operations, horizontal curves shall be no greater than 7°30'00" (chord definition, radius = 764.49 ft.); curves greater than 7°30'00" will require acceptance from UPRR's Engineering Department. The addition of curve block plates and continuous welded rail may be requested for curves greater than 7°30'00".

For manifest operations, horizontal curves shall be no greater than 10°00'00" (chord definition, radius = 573.69 ft.); curves greater than 10°00'00" will require acceptance from UPRR's Engineering Department. The addition of curve block plates and continuous welded rail may be requested for curves greater than 10°00'00".

Horizontal curves adjacent to turnouts shall comply with turnback curve radii shown on *UPRR Std. Dwg. 0050*.

Horizontal curves shall not begin, end, or fall within the limits a vertical curve or turnout, from stock rail prior to the switch point through the last long tie of the turnout.

The minimum tangent distance between reversing curves shall comply with *UPRR Std. Dwg. 0018*.

The minimum facing point distance between turnouts shall comply with *UPRR Std. Dwg. 0017*.

Minimum Track Centers for Industrial Tracks:

Other than required connections, industry tracks, access roads, and facilities shall be designed and constructed off UPRR property. All industry tracks shall be at least 45 ft. away from any UPRR mainline and meet the following:

- A. 15-foot track centers preferred between industry owned tracks.
- B. 15-foot track centers when industry owned track is adjacent to an industry owned lead track.
- C. 20-foot track centers when industry owned track is adjacent to an industry owned switching lead.
- D. 25-foot track centers when industry owned track is adjacent to a UPRR track not considered a main or branch line track.
- E. 45-foot track centers when industry owned track is adjacent to a UPRR main or branch line track.

Resources:

- A. UPRR Exhibit "A-3" – Preferred Layout Standards for Industrial Track
- B. UPRR Std. Dwg.:
  - i. 0017 – Facing Point Turnout Arrangement
  - ii. 0018 – Minimum Tangent Distance
  - iii. 0050 – Design Data for Turnout Layout
  - iv. 0080 – Standard Turnout Applications
  - v. 5001 – Nomenclature for Most Turnouts
- C. AREMA Manual:
  - i. Chapter 5, Part 3 – Curves
  - ii. Chapter 14, Part 4.4.2.6.1 – Track Geometry - Unit Train Facility
  - iii. Chapter 14, Part 4.4.2.6.2 – Track Geometry - Non-Unit Train System

### 3.10 TRACK PROFILES

Track profiles shall be designed for the least grade practical, having minimal grades changes, and with grades not exceeding those shown on *UPRR Exhibit "A-3"*.

Vertical curves must have a minimum length of 100 ft. and be designed with the longest curve and smallest V/L practical. Per *UPRR Std. Dwg. 0016*, the V/L shall not exceed values corresponding with each track's designated classification.

The minimum distance between vertical curves shall be 100 feet.

Vertical curves shall not begin, end, or fall within the limits a horizontal curve or turnout, from stock rail prior to the switch point through the last long tie of the turnout.

#### Resources:

- A. UPRR Exhibit "A-3" – Preferred Layout Standards for Industrial Track
- B. UPRR Std. Dwg. 0016 – Vertical Curve Design
- C. AREMA Manual:
  - i. Chapter 5, Part 3 – Curves
  - ii. Chapter 14, Part 4.4.2.6.1 – Track Geometry - Unit Train Facility
  - iii. Chapter 14, Part 4.4.2.6.2 – Track Geometry - Non-Unit Train System

### 3.20 TURNOUTS

Turnout application, size, frog type, and materials for proposed turnouts shall correspond with *UPRR Std. Dwg. 0080*. Common Standard turnouts shall be used for turnouts owned and/or maintained by UPRR. Industry owned turnouts shall be No. 9 or larger; industry turnouts meeting AREMA specifications will be acceptable.

All turnouts along UPRR owned or maintained track will be equipped with a new standard switch stand and target supplied by a UPRR approved vendor. Turnouts in UPRR owned or maintained track will be insulated. Type of switch stand shall be designated by UPRR's Engineering Department.

If a proposed turnout is located within 500 feet of a bridge, refer to Section 1.30 – Structures.

Proposed turnouts located within 300 feet from the edge of an at-grade crossing's surface will require written approval from UPRR's Engineering Department.

Proposed turnouts located at over/under highway/rail grade separations, refer to section 1.40.

If a turnout is to be powered operated (POTO), special ties and components may be required. Power operated derails with special ties and components may be required if a POTO is used.

#### Resources:

- A. UPRR Industrial Track Specifications, Section 4.80 – Track
- B. UPRR Std. Dwg.:
  - i. 0017 – Facing Point Turnout Arrangement
  - ii. 0050 – Design Data for Turnout Layout
  - iii. 0080 – Standard Turnout Applications
  - iv. 5001 – Nomenclature for Most Turnouts
- C. AREMA Manual Chapter 5, Part 3.4 – Speeds of Trains through Level Turnouts

### 3.30 DERAILS

Derail application, type, and location of proposed derails shall correspond with *UPRR Std. Dwg. 2000*. Power operated derails with special ties and components may be required if a POTO is used.

Resources:

- A. UPRR Industrial Track Specifications, Section 4.80 – Track
- B. UPRR Std. Dwg. 2000 – Permanent Derail Installation Instructions

### 3.40 DRAINAGE

A comprehensive hydrologic and hydraulic Drainage Study is required when the following occurs:

- A. Additional runoff is discharged towards UPRR's right-of-way.
- B. A UPRR drainage structure is being added, removed, or modified.
- C. A drainage structure is being added, removed, or modified upstream or downstream of a UPRR structure.

The Drainage Study and all drainage improvement designs, plans, drawings, and exhibits shall be submitted through UPRR's EDS system under the "Structures" category.

The Drainage Study for UPRR owned or maintained track must include, but is not limited to:

- A. Top of rail elevations.
- B. The 50-year and 100-year water surface elevations for both the existing and proposed conditions.
- C. Flow rates for both events.
- D. Location map of drainage area(s), including UPRR mileposts and engineering stations.
- E. Size of the drainage area(s).
- F. Location of the water flowing along the right-of-way.
- G. Location where the water leaves the right-of-way.

The following UPRR criteria for sizing bridges and culverts on UPRR owned or maintained track is used to determine the adequacy of existing and proposed structures:

- A. The 50-year flood elevation shall not come into contact with the crown of the culvert or the low chord of the bridge, whichever is applicable.
- B. The 100-year flood elevation shall not exceed the track subgrade elevation at the structure.
- C. Both UPRR's criteria and local criteria shall be evaluated, and the more restrictive shall be adopted in sizing the drainage structure or replacement.
- D. If the existing structure opening more than satisfies the foregoing criteria, a smaller section which satisfies the criteria set forth above may be recommended.
- E. Minimum culvert size allowed under UPRR owned or maintained track is 30 inches (30").
- F. The use of any drainage culverts other than annular CMP will require prior acceptance by UPRR before installation.
- G. The use of elliptical or arch pipe is strictly prohibited.

If the existing bridge or culvert does not meet the design criteria, an enlarged opening will be considered. To the extent possible, this enlargement will be made laterally. If it is found that the criteria cannot be met with maximum widening, the UPRR will be contacted to discuss consideration of relief bridges on the overbank floodplain, raising track grades, or other alternatives which should be evaluated. All structures shall be designed, at a minimum, to meet the latest edition of the AREMA Manual. If the bridge structures are in a FEMA designated floodplain, the water surface elevation for a 100-year event shall be determined regardless of line classification.

The Drainage Study for Industry owned or maintained track must include, but is not limited to:

- A. Top of rail elevations.
- B. The 25-year and 50-year water surface elevations for both the existing and proposed conditions.
- C. Flow rates for both events.
- D. Location map of drainage area(s), including UPRR mileposts and engineering stations.
- E. Size of the drainage area(s).
- F. Location of the water flowing along the right-of-way.
- G. Location where the water leaves the right-of-way.

The following UPRR criteria for sizing bridges and culverts on Industry owned or maintained track is used to determine the adequacy of existing and proposed structures:

- A. The 25-year flood elevation shall not come into contact with the crown of the culvert or the low chord of the bridge, whichever is applicable.
- B. The 50-year flood elevation shall not exceed the track subgrade elevation at the structure.
- C. Both UPRR's criteria and local criteria shall be evaluated, and the more restrictive shall be adopted in sizing the drainage structure or replacement.
- D. If the existing structure opening more than satisfies the foregoing criteria, a smaller section which satisfies the criteria set forth above may be recommended.
- E. Minimum culvert size allowed under UPRR owned or maintained track is 30 inches (30").
- F. The use of any drainage culverts other than annular CMP will require prior acceptance by UPRR before installation.
- G. The use of elliptical or arch pipe is strictly prohibited.

Resources:

- A. UPRR Industrial Track Specifications, Section 4.40 – Shoring
- B. UPRR Bridge Std. Plan:
  - i. 680000 – General Notes and Details for Round Steel Pipe Culverts
  - ii. 680010 – Construction Notes and Table for Smooth Steel Pipe Culverts
  - iii. 680020 – Construction Notes and Table for Corrugated Steel Pipe Culverts
  - iv. 680021 – Construction Notes and Table for Corrugated Metal Pipe Culverts
  - v. 680030 – Construction Notes and Table for Structural Plate Pipe Culverts
- C. UPRR General Conditions and Specifications:
  - i. Section 33 42 00 – Culverts
  - ii. Section 33 42 16 – Reinforced Concrete Box Culverts
  - iii. Section 33 42 20 – Smooth Steel Pipe Culverts
  - iv. Section 31 37 00 – Rip Rap
  - v. Section 40 05 39 – Reinforced Concrete Pipe
- D. UPRR Engineering Track Maintenance Field Handbook:
  - i. Section 1.2 – Drainage
  - ii. Section 1.3 – Surface Drainage
  - iii. Section 1.4 – Subsurface Drainage
- E. AREMA Manual:
  - i. Chapter 1, Part 3 – Natural Waterways
  - ii. Chapter 1, Part 4 – Culverts
  - iii. Chapter 8, Part 10 – Reinforced Concrete Culvert Pipe

### 3.50 CLEARANCES

Horizontal and vertical clearances shall comply with *UPRR Std. Dwg. 0035* and *UPRR Std. Dwg. 0038*. All clearance exhibits shall be submitted through UPRR's EDS system under the "Structures" category.

States may have vertical or horizontal clearance requirements slightly less than UPRR standards. In these instances, UPRR may accept the State's lesser clearance requirements; however, the Industry will be required to sign an agreement with UPRR that includes language regarding the impaired clearance. In any instance, when either horizontal or vertical clearances are less than those of the State, UPRR, or

Public Service Commission, the Industry shall secure necessary approval from the appropriate State Authority for each impaired clearance. The agreement covering service to the Industry's track will include specific reference to the substandard clearance involved. When State law requires clearances that are more restrictive, such laws shall govern.

Impaired Clearance Warning Signs shall be illuminated at night per *UPRR Std. Dwg. 0513*.

Clearances with respect to installation of loading or unloading facilities for handling Liquefied Petroleum Gas (LPG), anhydrous ammonia, ethanol, or other Hazardous Materials as described under Sec. 172.101-Hazardous Materials Table, of the U.S. Dept. of Transportation's hazardous materials regulations.

Loading and unloading tracks, storage tanks and other permanent installations shall be governed by the following table:

Activity / Description	Class 3: Combustible Liquids Class 8: Corrosive Materials Class 9	All Other Classes of Hazardous Materials
Loading and Unloading	50 Feet	100 Feet
Storage of Loaded Tank Cars	25 Feet	50 Feet
Storage in Tanks	50 Feet	100 Feet

Exceptions to these clearances will require a project exemption request followed by review and acceptance from UPRR.

Consideration must be given for placement of turnouts and derails to avoid conflicts with adjacent tracks, signal and wayside equipment, communication lines, utilities, access roads, ditches, waterways, structures, or other adjacent features.

Resources:

- A. Guidelines for Railroad Grade Separation Projects
- B. UPRR Std. Dwg.:
  - i. 0025 – Rail Marking for Engines, Cars or Equipment Clear of Road Grade Crossing
  - ii. 0035 – Design Clearances for Highway and Pedestrian Overpasses
  - iii. 0038 – Standard Minimum Operating Clearances
  - iv. 0513 – Clearance Warning Signs
- C. UPRR Engineering Track Maintenance Field Handbook, Section 2.4 – Clearances
- D. AREMA Manual, Chapter 28 – Clearances

**3.60 UTILITIES**

Design of utility improvements shall comply with UPRR requirements and/or AREMA specifications and be submitted to UPRR and the utility Owner for review and acceptance.

Proposed utility improvements within UPRR right-of-way shall be submitted through the following link:

[http://www.up.com/real\\_estate/utilities/index.htm](http://www.up.com/real_estate/utilities/index.htm)

Proposed utility improvements outside UPRR right-of-way shall be submitted through UPRR's EDS system under the "Structures" category.

UPRR's wireline specifications can be found through the following link:

[http://www.up.com/real\\_estate/utilities/wireline/wirespecs/index.htm](http://www.up.com/real_estate/utilities/wireline/wirespecs/index.htm)

UPRR's pipeline crossing procedures can be found through the following link:

[https://www.up.com/real\\_estate/utilities/pipeline/pipeline\\_procedure/index.htm](https://www.up.com/real_estate/utilities/pipeline/pipeline_procedure/index.htm)

Resources:

- A. UPRR Industrial Track Specifications:
  - i. Section 1.20 – Utilities
  - ii. Section 3.50 – Clearances
  - iii. Section 4.40 – Shoring
- B. UPRR General Conditions and Specifications:
  - i. Section 01 18 13 – Utility Lines
  - ii. Section 33 05 23 – Pipe Under Crossing
  - iii. Section 33 05 25 – Horizontal Directional Drilling
- C. AREMA Manual, Chapter 1, Part 5 – Utilities  
[https://www.arena.org/files/pubs/UP\\_Special\\_Order\\_for\\_Part\\_5\\_Uilities.pdf](https://www.arena.org/files/pubs/UP_Special_Order_for_Part_5_Uilities.pdf)

### 3.70 STRUCTURES

All structural elements including road bridges, rail bridges, crash walls, retaining walls, culverts, end treatments, unloading pits, bore pits, temporary shoring, falsework, utility improvements, and other structural improvements require specialized design and shall meet all UPRR requirements. All structural designs, plans, drawings, and exhibits shall be submitted through UPRR's EDS system under the "Structures" category.

Resources:

- A. UPRR Industrial Track Specifications
  - i. Section 1.20 – Utilities
  - ii. Section 3.40 – Drainage
  - iii. Section 3.50 – Clearances
  - iv. Section 4.40 – Shoring
- B. UPRR Exhibit "B" – Unloading Pit Specifications
- C. AREMA Manual:
  - i. Chapter 7 – Timber Structures
  - ii. Chapter 8 – Concrete Structures and Foundations
  - iii. Chapter 9 – Seismic Design for Railway Structures
  - iv. Chapter 10 – Structures, Maintenance and Construction
  - v. Chapter 15 – Steel Structures

### 3.80 ROAD CROSSINGS

Grade separation and/or at-grade roadway crossing design shall comply with all UPRR and governing agency standards, specifications, and requirements.

Resources:

- A. UPRR Industrial Track Specifications:
  - i. Section 1.40 – Road Crossings
  - ii. Section 1.60 – Construction by UPRR
  - iii. Section 3.50 – Clearances
  - iv. Section 4.95 – Road Crossings

- B. UPRR Std. Dwg.:
  - i. 0301 – Installation of Road Crossing with Prefab Timber Panels
  - ii. 0302 – Light Duty Road Crossing Asphalt with Rubber Seal Sections
  - iii. 0304 – Installation of Road Crossing with Precast Concrete Panels
  - iv. 0308 – General Specifications for Road Crossings with Concrete Panels
  - v. 0311 – StarTrack Standard Duty Road Crossing
  - vi. 0312 – StarTrack Heavy Duty Road Crossing
- C. Common Std. Dwg.:
  - i. 200100, 200101, 200102 – Concrete Panels for 10' Long Wood Ties (10W)
  - ii. 200200, 200201 – Concrete Panels for 9' Long Wood Ties (9W)
  - iii. 200300, 200301, 200302 – Concrete Panels for 10' Long Concrete Ties (10C)
  - iv. 200400, 200401 – Concrete Panels for 8'-6" Long Concrete Ties (85C)
  - v. 200900 – Typical Details for Concrete Panels
  - vi. 200902 – Curved Concrete Panels
  - vii. 200903 – Shunt Resistance Test for Concrete Panels
- D. UPRR General Conditions and Specifications:
  - i. Section 01 55 13 – Access Roads and Crossings
  - ii. Section 32 01 13 – Asphalt Concrete Paving
  - iii. Section 32 12 16 – Hot Mix Asphalt Paving
  - iv. Section 32 13 00 – Rigid Paving
  - v. Section 32 13 13 – Cement Concrete Pavement
  - vi. Section 32 17 23 – Paint Striping and Markings
  - vii. Section 34 11 10 – Railroad Track Construction
- E. UPRR Engineering Track Maintenance Field Handbook:
  - i. Section 1.3.5 – Grade Crossing Drainage
  - ii. Section 1.4 – Subsurface Drainage
  - iii. Section 6.4 – Roadways
- F. AREMA Manual, Chapter 5, Part 8 – Highway/Railway Grade Crossings
- G. Manual on Uniform Traffic Control Devices (MUTCD)



## **SECTION 4 – CONSTRUCTION SPECIFICATIONS**

All materials and methods of construction for work being performed on UPRR property shall comply with the most current versions of the *UPRR General Conditions and Specifications*, *UPRR Engineering Track Maintenance Field Handbook*, and UPRR Standard Drawings. The specifications below are minimum requirements for all other construction. For any specifications not covered, contact UPRR's IPP representative.

### **4.00 SAFETY REQUIREMENTS**

Safety of personnel, property, rail operations, and the public is of paramount importance in the prosecution of the work pursuant to the project. As reinforcement and in furtherance of overall safety measures to be observed (and not by way of limitation), industries, customers, contractors, and all affiliates shall comply with all CROE safety requirements (Exhibit D) in addition to UPRR safety rules and requirements, which can be found through the following link:

<https://www.up.com/suppliers/contractor-safety/index.htm>

Construction activities and equipment operations shall be performed by contractors specialized, experienced, and/or normally engaged in performing relevant services. At all times during the performance of the work, the Industry shall exercise precaution for the protection of persons and property. The Industry shall observe and comply with all current and applicable Federal, State and Local laws, regulations, codes, and requirements governing the safety of men and materials throughout construction including Occupational Safety and Health Administration (OSHA), and Code of Federal Regulations (CFR). Machinery, equipment, and other hazards shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America (AGC), to the extent such provisions are not inconsistent with applicable law or regulations.

### **4.10 GRADING AND EARTHWORK**

Grading activities include, but are not limited to, the following: dust control, demolition, clearing and grubbing, excavation, loading, hauling, subgrade preparation, proofrolling, scarification, moisture conditioning, stabilization, compaction, finish grading, and testing. Grading activities shall be performed in accordance with *UPRR General Conditions and Specifications*, UPRR Standard Drawings, UPRR accepted typical sections, and as directed by a geotechnical engineer.

Additional grading and roadbed width will be required along all track, turnout, derail, wayside equipment, and signal construction to provide adequate room for installation of equipment and walkways. See Section 4.70 – Walkways.

Grading activities shall be performed in a manner and sequence that will provide positive drainage away from track infrastructure at all times.

#### **Benching of Existing Embankment:**

Wherever an embankment is placed on or against an existing embankment, the existing embankment shall be benched (stepped) per Section 31 24 13, Part 3, 3.03, C., 2 of the *UPRR General Conditions and Specifications*. Existing embankments shall be supported, as necessary, at all times to accommodate rail traffic. Slopes shall be cleared and benched immediately ahead of placing embankment lifts. No benches or steps shall remain exposed overnight.

Moisture, Compaction, and Testing:

All imported materials shall comply with the *Soil Import Specifications* document. It is the responsibility of the user to update and comply with the most current version, which can be found through the following link:

<https://www.up.com/customers/ind-dev/operations/specs/track/index.htm>

Embankments and backfills within the top three feet (3') of finished subgrade elevation shall be compacted to an unyielding condition not less than 95% of maximum density as determined by ASTM D1557 (Modified Proctor). Material below the upper three feet (3') from finished subgrade elevation shall be compacted to not less than 90% of maximum density as determined by ASTM D1557 (Modified Proctor).

Moisture content of structural fill, at the time of compaction, shall be within three percent (3% ±) of the optimum moisture content as determined by ASTM D1557 (Modified Proctor), by field tests performed in accordance with ASTM standards, or as directed by a geotechnical engineer.

Each embankment lift shall be tested for compaction compliance before the next lift is placed. All compaction shall be determined using ASTM D1556 or ASTM D6938 for field tests and ASTM D1557 for moisture and density. Copies of all soils tests, observations, and discrepancy reports shall be provided to the UPRR Engineer.

At completion of clearing, grubbing, and grading, the subgrade shall be observed and approved (by proofrolling or other approved methods) for stability and suitability prior to additional construction and placement of subballast.

Turnout Construction Pad:

In accordance with *UPRR Exhibit "T.O. Pad"*, the Industry shall provide a turnout construction pad adjacent to the location where a turnout will be installed along UPRR track. The construction pad must be sufficiently sized to facilitate turnout assembly and installation.

Resources:

- A. UPRR Exhibit "T.O. Pad" – Industrial Construction Turnout Pad Details
- B. UPRR Std. Dwg.:
  - i. 0001 – Roadbed Section for Wood Tie Track Construction
  - ii. 0002 – Roadbed Sections for Concrete Tie Track Construction
  - iii. 0003 – Roadbed Section for Industrial Track Construction
- C. UPRR General Conditions and Specifications:
  - i. Section 31 11 00 – Clearing and Grubbing
  - ii. Section 31 14 14 – Topsoil
  - iii. Section 31 22 19 – Finish Grading
  - iv. Section 31 23 26 – Compaction Control and Testing
  - v. Section 31 24 13 – Excavation, Embankments and Other Fills
- D. UPRR Engineering Track Maintenance Field Handbook, Chapter 1 – Roadbed
- E. AREMA Manual:
  - i. Chapter 1, Part 1 – Roadbed
  - ii. Chapter 1, Part 10 – Geosynthetics

#### 4.20 EROSION AND SEDIMENT CONTROL

The Industry shall be responsible meeting all National Pollutant Discharge Elimination System (NPDES), State, and Local requirements including development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) along with installation, maintenance, and removal of all Best Management Practices (BMPs). The Industry shall also be responsible for applications, fees, filing of the Notice of Intent (NOI), Notice of Termination (NOT), and all other applicable requirements.

Resources:

- A. UPRR General Conditions and Specifications:
  - i. Section 31 14 14 – Topsoil - Stockpile and Placing
  - ii. Section 31 35 20 – Slope Protection and Erosion Control
  - iii. Section 31 37 00 – Rip Rap
  - iv. Section 32 92 19 – Seeding
- B. UPRR Engineering Track Maintenance Field Handbook, Section 1.3.7 – Erosion Control

#### 4.30 DRAINAGE STRUCTURES

Materials and methods of construction for bridges, culverts, riprap, or any other drainage improvements owned or maintained by UPRR shall be in accordance with the UPRR accepted Drainage Study, *UPRR General Conditions and Specifications*, and UPRR Standard Drawings.

Culvert installations may require a bore and/or receiving pit. A detailed plan of the pit, including shoring (see *Section 4.40 - Shoring*), shall be accepted by the UPRR Engineering Department before work begins.

Foundation, bedding, and backfill shall be compacted to an unyielding condition not less than 95% of maximum density as determined by ASTM D1557 (Modified Proctor), with moisture content adjusted as necessary to achieve density. Foundation, bedding, and backfill material shall be placed simultaneously on both sides of the pipe and between multiple pipes and compacted in lift thicknesses not exceeding six inches (6"). Each lift shall be properly compacted, and verified with field tests, before the next lift is placed.

Resources:

- A. UPRR Industrial Track Specifications:
  - i. Section 3.40 – Drainage
  - ii. Section 3.70 – Structures
  - iii. Section 4.40 – Shoring

#### 4.40 SHORING

When working near UPRR tracks, temporary shoring may be required. The *UPRR Guidelines for Temporary Shoring* document can be found at the following site:

<http://www.up.com/customers/ind-dev/operations/specs/>

Before beginning any work that would require shoring, as determined by the above standards, the Industry shall provide detailed plans of proposed bore pits and/or shoring. If the shoring falls within Zones A or B, the plans shall include design calculations. Detailed drawings and calculations shall be sealed and signed by a licensed Professional Engineer and shall be accepted by UPRR before work begins.

Resources:

- A. Guidelines for Temporary Shoring

- B. Common Std. Plan:
  - i. 710000 – General Shoring Requirements
  - ii. 710001 – Live Load Pressure Due to Cooper E80
- C. UPRR General Conditions and Specifications, Section 01 71 23 – Field Engineering

#### 4.50 SUBBALLAST AND BASE MATERIAL

Gradations, depths, and material properties of subballast or base materials shall meet specifications of *UPRR Std. Dwg. 0010* and *UPRR Std. Dwg. 0013*, or as directed by a geotechnical engineer. The Industry shall provide certification that the subballast/base material meets applicable UPRR and AREMA specifications.

##### Resources:

- A. UPRR Exhibit “T.O. Pad” – Industrial Construction Turnout Pad Details
- B. UPRR Std. Dwg.:
  - i. 0001 – Roadbed Section for Wood Tie Track Construction
  - ii. 0002 – Roadbed Sections for Concrete Tie Track Construction
  - iii. 0003 – Roadbed Section for Industrial Track Construction
  - iv. 0010 – Ballast & Subballast Gradation Table
  - v. 0013 – Grain Size Distribution
- C. UPRR General Conditions and Specifications:
  - i. Section 01 71 23 – Field Engineering
  - ii. Section 34 11 27 – Subballast
- D. AREMA Manual, Chapter 1, Part 2 – Ballast

#### 4.60 BALLAST

Gradations, depths, and material properties of ballast shall meet specifications of *UPRR Std. Dwg. 0010* and AREMA Manual Chapter 1, Part 2, or as directed by a geotechnical engineer. The Industry shall provide certification that the subballast/base material meets applicable UPRR and/or AREMA specifications. Experienced personnel skilled in railroad construction shall supervise track laying and surfacing.

##### Resources:

- A. UPRR Std. Dwg. 0010 – Ballast & Subballast Gradation Table
- B. UPRR General Conditions and Specifications, Section 34 11 10 – Railroad Track Construction
- C. UPRR Engineering Track Maintenance Field Handbook, Section 1.6 – Ballast
- D. AREMA Manual, Chapter 1, Part 2 – Ballast

#### 4.70 WALKWAYS

Walkways are required around all turnout and derail switch stands and shall be constructed in accordance with *UPRR Exhibit “E”*. Walkways shall be maintained to provide a traversable walking surface and shall be maintained in a safe condition clear of vegetation, debris, standing water, and other obstructions. Walkways are to be constructed with Class 2 ballast and/or AREMA Standard 57 ballast unless prior acceptance by UPRR’s Engineering Department is granted for alternate material.

All walkway construction shall conform to the UPRR specifications or Federal, State, and/or Local specifications, whichever is the most protective from the standpoint of public safety. Industry shall be responsible for the proper construction of all walkways. In some areas, the Industry will be required to stockpile sufficient walkway ballast, at a location designated by UPRR’s representative, for subsequent walkway installation by UPRR forces.

If a proposed turnout is located within 500 feet of a bridge, refer to Section 1.30 – Structures.

Resources:

- A. UPRR Industrial Track Specifications, Section 4.60 – Ballast
- B. UPRR Exhibit “E” – Typical Walkway Standards for Industrial Tracks
- C. UPRR Std. Dwg. 0008 – Recommended Ballast Section for Renewed Turnouts and Derails
- D. UPRR General Conditions and Specifications, Section 34 11 10 – Railroad Track Construction

**4.75 FENCING AND GATES**

Resources:

- A. UPRR Std. Dwg.:
  - i. 0075 – Standard Right of Way Fence
  - ii. 0076 – High Security Gate at Grade Crossing
- B. UPRR General Conditions and Specifications:
  - i. Section 32 31 10 – Right of Way Fences and Gates
  - ii. Section 32 31 13 – Chain Link Fencing and Gates
  - iii. Section 32 31 56 – Wire Fences (Deer Proof)
- C. UPRR Engineering Track Maintenance Field Handbook, Section 6.5 – Fencing
- D. AREMA Manual, Chapter 1, Part 6 – Fences

**4.80 TRACK**

Unless otherwise specified below, all industry track materials shall be new or reprocessed secondhand material. Experienced personnel skilled in railroad construction shall supervise track laying and surfacing.

Industry Rail:

112 lb. to 141 lb. new or relay rail is required. Rail shall meet or exceed AREMA Class 1 specifications for tracks having anticipated railcar traffic greater than 300 cars per year; Class 2 rail is acceptable for tracks having anticipated railcar traffic less than 300 cars per year.

Rail shall be unloaded, stored, and/or distributed along the roadbed in such a manner as to prevent damage. Rails shall be cut square and clean by means of rail saws. Cutting rails by means of torching is prohibited. Rail shall not be struck with maul or heavy tool when spiking, gauging or lining. The bottom of the rail, the tie plate and the wearing surface of the tie shall be cleaned before the rail is laid. Rails less than 15 feet long shall not be used except for temporary closures.

Tie Plates:

Tie plates shall be double shouldered plates having a width no less than twice the base width of the rail. The use of single shoulder tie plates is prohibited. Track shall be fully-plated with plate shoulders bearing against the outside base of the rail. Tie plates shall be applied at the time the rail is laid to avoid unnecessary spiking.

Track Bolts:

Track bolts shall be appropriately sized for the bolt holes in the rail section with sufficient length for a full nut and heavy-duty spring washers, which shall be new material.

Track Spikes:

Track spikes shall be new 5/8" x 6" or 5/8" x 6 ¼" installed per *Common Std. Dwg. 130005* and *UPRR Std. Dwg. 0453*. Spikes shall be started vertically and square and be driven straight with full bearing

against the base of the rail. The pulling of spikes, once driven, shall be avoided. If spikes are pulled, the holes shall be immediately plugged with creosoted tie plugs of the proper size to completely fill the hole, or an approved form of plugging compound shall be used. Straightening with maul or spikes started crooked will not be permitted. Spikes started crooked shall be pulled, the holes plugged and spikes redriven. Immediately after completion of track surfacing, spikes shall be settled in place with the underside of the head of the spike contacting the top of base with a minimum of pressure.

Rail Anchors:

Rail anchors control longitudinal rail movement on ties from temperature variations, traffic, grade, and train braking. On all tracks, apply rail anchors per *UPRR Std. Dwg. 0460* with out-of-face along each rail, directly across from each other on the same tie. As specified, use Standard Box Pattern (Pattern #1, every other tie) or Solid Box Pattern (Pattern #2, every tie).

Joint Bars:

Joint bars shall match the rail section used per *UPRR Std. Dwg. 0904*. When jointed track is constructed, joints should be staggered between consecutive rail joints on opposite rails of 12 feet, plus or minus two feet. When staggering joints through a curve, a shorter rail may be required on the low rail of the curve to maintain the stagger. Joints shall be kept out of road crossings. All UPRR standards and specifications regarding bolt hole drilling shall apply to jointed industry track construction.

Transition Rails & Compromise Joints:

Transition rails should be used in place of compromise joint bars whenever feasible. If used, compromise joint bars shall match the rail sections used per *UPRR Std. Dwg. 0948*. Compromise joints/transition rails are not allowed within a turnout. Turnouts shall use the same rail section on the running rail, closure rail, and turnout components throughout the body of the turnout. As specified within the Scope of Work Matrix, the Industry shall provide transition when compromise joints/transition rail is required at the transition from UPRR ownership/maintenance to Industry ownership/maintenance.

Insulated Joints / I-Bonds:

Insulated joints / I-bonds are to be furnished by Industry and shall be all new material. Insulated joints / I-bonds will be installed by the Industry at locations designated by UPRR and in accordance with *UPRR Std. Dwg. 0960*.

Grounding / Bonding:

Tracks on which railcars of flammable liquids are spotted shall be bonded, protected by insulated joints, and grounded in accordance with *UPRR Std. Dwg. 6003*. Such insulated rail joints shall not be bridged by rail equipment or other means during transfer operations.

Crossties:

Crossties meeting AREMA specifications (Grade 4 or Grade 5), shall be acceptable for tracks owned and maintained by the Industry. For UPRR owned and maintained track Grade 5 ties will be required. Crosstie materials, installation, and other specifications shall meet the following requirements for various tie materials:

- A. Timber Ties (*UPRR Std. Dwg. 0210*):
  - i. New creosoted Oak or Douglas fir ties only for new construction.
  - ii. Only new creosoted Oak or Douglas fir switch ties will be used to accommodate turnout pattern.

- B. Concrete Ties (*UPRR Std. Dwg. 0204* as an example 720 lb. tie):
  - i. CWR is recommended for use with concrete ties.
  - ii. Concrete switch ties may be used where concrete standard ties are used.
  - iii. Concrete ties shall be new ties produced in accordance with UPRR's Concrete Tie Specifications for Construction.
- C. Steel Ties (*UPRR Std. Dwg. 0237, 0238, and 0241*) shall have 10 mm thickness.
- D. Composite Ties (*UPRR Std. Dwg. 0210*)

Industry ties shall be uniformly spaced no greater than 20 ties per 39 feet (24" centers) from center to center of tie. Ties shall be laid perpendicular to the rail with at least one tie located at the joint location per FRA track standards for Class 1 track. Care shall be taken to not damage ties during installation.

#### Turnouts:

All turnout components in UPRR owned or maintained track shall be new material supplied by UPRR, or a UPRR approved vendor, and comply with Common Standard Drawings. The Industry shall provide verification that turnouts are from a UPRR approved vendor. Turnouts meeting AREMA specifications will be acceptable for turnouts owned and maintained by the Industry.

The Industry shall verify with the UPRR Engineering Design representative that turnouts to be installed on the UPRR owned portion of the track will be provided loose or assembled. Turnouts to be provided shall meet provisions of the local collective bargaining agreements. If turnout assembly is performed by the Industry, the assembly, in all cases, shall occur outside of 25 feet from live track unless flagging protection is provided according to CROE.

#### Derails:

A derail is required for all new connections to UPRR track, and shall be clearly visible, appropriately sized for the designated rail section, complete with proper length connecting rod and operating stand with target. The type of derail required, its placement, and type of switch stand to be used shall comply with UPRR accepted drawings, as determined by the UPRR's Engineering Department, and be in accordance with *UPRR Std. Dwg. 2000, 2005, 2006, 2007, 2020, and/or 2050*.

#### End of Track Device:

All open-ended or stub-ended tracks shall be equipped with an end of track device. Earthen bumpers shall be used when possible. If Industry chooses to use an end of track device other than an earthen bumper, the Industry shall submit proposed device(s) for UPRR review and acceptance. If bumping posts are used, they shall be Hayes Type WD with Shock Free Head, or equal.

#### Resources:

- A. Turnouts:
  - i. UPRR Std. Dwg.:
    - a. 0050 – Design Data for Turnout Layout
    - b. 0080 – Standard Turnout Applications
    - c. 5001 – Nomenclature for Most Turnouts
  - ii. Common Std. Dwg.:
    - a. 341000, 341001, 341002, 341003, 341004, 341100, 341200 – No. 9 Turnout
    - b. 343000, 343001, 343002, 343003, 343004, 343100, 343200 – No. 11 Turnout
    - c. 345000, 345001, 345002, 345003, 345100, 345200 – No. 15 Turnout
- B. Derails:
  - i. UPRR Std. Dwg.:
    - a. 2000 – Permanent Derail Installation Instructions
    - b. 2005 – 16'-6" Double Switch Point Derail

- c. 2006 – Single Switch Point Derail
- d. 2007 – Sliding Derail with Wheel Crowder
- C. Track Materials:
  - i. UPRR Std. Dwg.:
    - a. 0030 – Standard Earth Bumper for End of Spur Track
    - b. 0204 – Prestressed Scalloped Concrete Tie
    - c. 0210 – Wood and Composite Cross Ties
    - d. 0215 – Rubber Padded Concrete Ties
    - e. 0220 – Standard Transition Zones
    - f. 0238 – M10 Steel Yard Tie for 5 ½" and 6" Base Rail
    - g. 0309 – Landing Pad
    - h. 0438 – Double Shoulder Tie Plate 5 ½" and 6" Base Rail
    - i. 0439 – Double Shoulder Tie Plate 8" x 14" for 6" Base Rail
    - j. 0440 – Double Shoulder Tie Plate for 5 ½" Base Rail
    - k. 0441 – Double Shoulder Tie Plate for 132 Lb. and 136 Lb. Rail
    - l. 0442 – Double Shoulder Tie Plate for 6" Base Rail – 1:40 Cant
    - m. 0453 – Spiking Pattern
    - n. 0460 – Rail Anchor Patterns
    - o. 0550 – End of UPRR Maintenance Sign
    - p. 0904 – Joint Bars, Miscellaneous
    - q. 0944 – Transition Rail 141 Lb. to 132 Lb. Worn
    - r. 0945 – Transition Rail 136 Lb. to 132 Lb. Worn
    - s. 0948 – Compromise Joints
    - t. 0960 – Insulated Joint Plug Rails
    - u. 6003 – Grounding Detail for Loading and Unloading Flammable Commodities
  - ii. Common Std. Dwg.:
    - a. 130005 – 6" Track Spike
    - b. 130800 – Rectangular Head Timber Coach Screw
- D. Switch Stands:
  - i. UPRR Std. Dwg.:
    - a. 2020 – Switch Targets
    - b. 2050 – Switch Padlock
    - c. 2101 – Switch Stand Placement
    - d. 2103 – No. 112E High Switch Stand
    - e. 2111 – 36-E and 36-EH Switch Stands
    - f. 2116 – No. 22-E Switch Stand, Trailable
    - g. 2120 – No. 1003ARS Automatic Switch Stands, Trailable
    - h. 2121 – No. 1004ARS Manual Switch Stand
- E. UPRR General Conditions and Specifications, Section 34 11 10 – Railroad Track Construction
- F. UPRR Engineering Track Maintenance Field Handbook:
  - i. Chapter 3 – Ties and Fastenings
  - ii. Chapter 4 – Rail and Joints
  - iii. Chapter 5 – Turnouts
- G. AREMA Manual:
  - i. Chapter 4 – Rail
  - ii. Chapter 5 – Track
  - iii. Chapter 30 – Ties

#### **4.85 FIELD WELDING**

UPRR approved welds shall be installed. The welds currently approved are Railtech Boutet one shot kits and Orgo-Thermit single use kits. The Industry and the individual installing the welds shall be qualified by the manufacturer of the kits being used and have documentation to support such qualification. All welds shall conform, at a minimum, to meet AREMA specifications.



Field welds made on UPRR owned or maintained track be inspected by the UPRR Manager of Track Construction (MTC) or a designated representative.

Resources:

- A. UPRR General Conditions and Specifications, Section 34 11 10 – Railroad Track Construction
- B. UPRR Engineering Track Maintenance Field Handbook:
  - i. Section 4.10 – Field Welding (Thermite)
  - ii. Section 4.11 – In-Track Welding
  - iii. Section 4.12 – Weld Tolerance Specifications
- C. AREMA Manual:
  - i. Chapter 4, Part 3.10 – Specification for the Quality Assurance of Electric-Flash Butt Welding of Rail
  - ii. Chapter 4, Part 3.11 – Specification for Fabrication of Continuous Welded Rail
  - iii. Chapter 4, Part 3.12 – Inspection and Classification of Second Hand Rail for Welding
  - iv. Chapter 4, Part 3.13 – Specification for the Quality Assurance of Thermite Welding of Rail

#### **4.90 UTILITIES**

Utility improvements shall comply with UPRR requirements, UPRR and utility Owner accepted utility drawings, and/or AREMA specifications.

The Industry shall be responsible for coordinating with all utility agencies and verifying locations and elevations of existing utilities, whether known or unknown, prior to construction. The Industry shall protect in place, by any means necessary, all existing utilities to remain. The Industry shall be responsible for the complete repair at their expense, for any damage to existing utilities, structures, or other features, as a result of its work.

Be advised that no UPRR underground facilities will be located by the “One Call” service. UPRR’s NEID representative can help arrange for the UPRR underground utility location.

Please note that fiber optic cable systems may be buried on UPRR property within the project limits. UPRR’s Telecommunications Operation Center shall be contacted at 1 (800) 336-9193 prior to construction.

Resources:

- A. UPRR Industrial Track Specifications:
  - i. Section 1.20 – Utilities
  - ii. Section 3.50 – Clearances
  - iii. Section 3.60 – Utilities
  - iv. Section 4.40 – Shoring
- B. AREMA Manual, Chapter 1, Part 5 – Utilities  
[https://www.arema.org/files/pubs/UP\\_Special\\_Order\\_for\\_Part\\_5\\_Uilities.pdf](https://www.arema.org/files/pubs/UP_Special_Order_for_Part_5_Uilities.pdf)

#### **4.95 ROAD CROSSINGS**

All crossings on UPRR owned tracks shall be constructed with UPRR precast concrete crossing materials. Curved concrete panels, per *UPRR Std. Dwg. 200902*, shall be utilized as conditions warrant. Road crossings on industry-owned trackage may be constructed with precast concrete, timber, or asphalt crossing materials. Timber crossing materials shall conform to *UPRR Std. Dwg. 0301* and shall be square-edged and of sound creosoted planks of fir, hemlock, or equal, with the height of plank equal the distance from top of tie to top of rail. Timber planks are to be fastened with countersunk  $\frac{3}{4}$ " x 12" galvanized Lewis washer head drive spikes, in pre-drilled holes. The Industry shall maintain the flangeway opening along the gauge side of the running rail at no less than a width of three inches (3").

Resources:

- A. UPRR Industrial Track Specifications:
  - i. Section 1.40 – Road Crossings
  - ii. Section 1.60 – Construction by UPRR
  - iii. Section 3.50 – Clearances
  - iv. Section 3.80 – Road Crossings