BUILDING AMERICA®

UNION PACIFIC RAILROAD
INDUSTRIAL TRACK SPECIFICATIONS
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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. The AREMA *Manual for Railway Engineering* (MRE) 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.arema.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. In all cases, UPRR specifications shall supersede those supplied by the Industry and, 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

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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.
All track design, including all grading and other civil design related to the track components, must be prepared by one of the design firms which have been approved by UP. The list of UP approved design and review consultants can be found through the following link.

https://www.up.com/content/dam/upcom/public-projects/documents/Industry%20Approved%20Design%20and%20Review%20Consultants.pdf

In the alternative, if the Industry's plans (DevCon, Construction and Exhibit A) for the track design have been prepared by a design firm not included on the list, then the Industry must have a third party design firm from the above linked list review and confirm the plans for the track design prior to the Industry consultant submitting to UP and have such UP-approved design firm include a comment resolution form, in pdf form, with submitted plans. The third-party reviewer form can be found through the following link:

https://www.up.com/content/dam/upcom/marketing-salesloup/documents/pdf_up_thirdpartyreviewerform.xlsx

In UP's experience, if the Industry's plans are not prepared or reviewed and confirmed by a design firm on the approved list, then the plans will fail to comply with UP requirements., This results in delays to the track development process and can add additional costs for all parties involved. Other project submittals, including non-track related facility design, may not need to be reviewed and can be designed and uploaded directly by other Industry consultants at the Industry's discretion.

Non-Track facilities design can be designed at Industry's discretion. If an Industry has an active project that a design submittal (DevCon or more detailed plan set) has occurred prior to January 18, 2024, continue submitting directly to Union Pacific.

Example scenario for third party review:

- Industry consultant (IC) hires a UP approved reviewer (AP)
- IC submits plans to AP
- AP reviews plans and uses UP comment form and provides to IC
- IC incorporates comments into plan set, fills in comment form as needed, resubmits to AP
- AP reviews plans and updates comment form (if comments not incorporated, can revert to prior bullet)
- AP creates 11x17 pdf of comment form and provides to IC.
- IC will add comment form pdf as last page(s) of plan submittal document.
- IC will upload to UP.

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 Portal (EDP), which has a file size restriction of 100MB. General information, submittal guidelines, and link for submitting documents through UPRR's EDP can be found through the following link:

https://www.up.com/shipping/connect-to-rail/process-track-construction
It is important the Industry submit documents in the correct sequence and into the proper categories within the EDP system. Failure to do so may result in project delays. Plan submittals must progress sequentially in the following order: DevCon, Construction Plans, and Exhibit "A". Submittals made out of order, or without UPRR acceptance of previous submittals, may be rejected without review and removed from EDP. If the EDP category is not available as a selection, contact the NEID manager. Uploaded files should have short names without special characters, contain only one file per submittal, and be flattened (to the best usable extent) to reduce file size.

EDP upload procedures:

A. Visit: https://benesch.quickbase.com/db/btcc7a684
B. Enter login credentials, select "Submit".
C. Select Submittals tab to locate project, click on Project Name hyperlink.
D. Go to Submittals tab, clink "Add Submittal" button.
E. Select the appropriate type from the drop-down menu. (DevCon, Construction Plans, Structures, Other, etc.)
F. Click on "Add Submission File(s)" button. Drag and drop the submittal file, or use the "Add Files" button to search your file explorer. (the EDP is set to only accept one file per submittal)
G. Enter Communication Email. (The Industry's designated representative who will receive notifications, requested revisions, or acceptance of the submittals)
H. Include comments in the "Submission Remarks" field to help clarify what the submittals contain.
I. Select "Save & Close". (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. Notification of requested revisions or acceptance for each document can be sent to the Industry via the email address provided by the Industry.

After all design redline comments are resolved, all project documents have been accepted, and when applicable, UPRR will develop a cost estimate for UPRR incurred project costs and both parties will take the necessary steps to execute an Industry Track Agreement (ITA).

1.20 UTILITIES

For utilities not owned by UPRR, 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. UPRR will be responsible for design and construction of all underground and overhead utilities owned by UPRR.

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 and AREMA standards and requirements.

Any rail bridge located within 500 feet of a proposed or existing point of switch shall be subject to review by UPRR Structures for determination of required bridge modifications. Upon evaluation, UPRR will notify the Industry of necessary walkway/handrail or other project specific requirements. 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: National Institute of Standards and Technology (NIST) Handbook 44: https://www.nist.gov/

1.40 ACCESS ROADS & ROAD CROSSINGS

The Industry shall be responsible for providing suitable temporary and/or permanent access for use by UPRR for purposes of construction, providing rail service, and maintenance of UPRR owned or operated equipment. Suitable access may include, but not be limited to, properly constructed and maintained access roads, at-grade crossings, bridges, or grade separations. Terms and conditions of access will be covered by applicable agreements to address ownership, maintenance, and use.

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 Industry & Public Projects (IPP) and all applicable governing agencies. If authorized, a separate crossing agreement will be required. UPRR field personnel and management cannot authorize this activity. The Industry will be responsible for necessary studies, design, construction, and obtainment of all applicable agency approvals, permits, and agreements.

Proposed track, turnouts, or removal of existing track at all crossings (at-grade or track/roadway grade separation), whether public or private, will require a diagnostic review. Each crossing location will be evaluated individually by UPRR and, if applicable, governing roadway agencies. All crossings shall require the installation of warning devices, to be jointly determined by means of a diagnostic review. The type(s) of warning device(s) on public roadways will be jointly determined amongst UPRR, roadway authorities, and/or governing agencies. Be advised, if a proposed road crossing is located near an existing crossing, the existing crossing warning devices may require upgrades including signage, pavement markings, automated crossing signals, flashers, or gates. In addition to required warning devices, all crossings (at-grade or track/roadway grade separation), whether public or private, shall be included in the Federal Railroad Administration (FRA) inventory of road crossings and will require an assigned Department of Transportation (DOT) number and Emergency Notification Sign(s).

If the portion of track owned and operated by Industry falls within close proximity of 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.

If proposed construction intersects an existing UPRR ROW road (at grade) and it is determined the UPRR ROW road will be allowed to cross the proposed track, ownership and maintenance of proposed track, by UPRR, typically will extend to include the at-grade crossing.

1.50 CONSTRUCTION

All materials and methods of construction used for the proposed project shall comply with the UPRR accepted plans and meet UPRR standards and specifications. All material provided for UPRR installation, ownership, and maintenance shall be new, unless approved by UPRR Engineering Project Design. UPRR prefers that Industries have their rail contractor furnish UPRR track material for projects requiring UPRR track construction. If required, the Industry shall supply temporary joint bars and other track materials (OTM) for temporary connection with UPRR track or turnouts until welds can be made. All temporary joint bars and OTM may be retained by the Industry upon completion of welding.

Upon UPRR acceptance of the Construction design, and prior to execution of the ITA, the Industry may purchase turnouts or any other required track materials from UPRR approved vendors (Std Dwg 6003) at Industry's risk. The terms associated with the procurement, assembly, and installation of turnouts and track materials are project-specific, may be restrictive, and subject to UPRR acceptance. Some regions of the UPRR require all pre-plated track material supplied (ties/turnouts) by Industry be pre-plated by robotic assembly. The Industry shall supply track material on-site for UP installation that is pre-plated (ties/turnouts) and shall verify with the UPRR Engineering Design Representative, prior to ordering, if fully robotic assembly is required. The Industry shall provide the UPRR Engineering Design Representative verification the material is being procured from a fully robotic assembly line in the form of a vendor invoice.

Industry shall provide, renew, and verify survey stakeout upon request of UPRR throughout the UPRR portion of construction. Requested survey stakeout will typically include, but not be limited to, labeling the stationing, offset staking, point of switch, and or point of frog locations on the web of rail.

All track constructed on UPRR ROW, whether Leased to Industry or otherwise, shall be new material, comply with UPRR standards and specifications, and be welded throughout, and extend beyond the ROW before any transition to other rail size/type. Additional CWR will be required if the UPRR Signal System extends beyond the ROW, to a point designated "End Signal Circuit". Insulated type track material is required through the entirety of this segment (eg. Wood ties, insulated switch rods, insulated turnouts, insulated derail/crowder rods).

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

A. Receive approval of Construction Plans.
B. Secure a fully-executed Contractor's Right-of-Entry (CROE) agreement. All CROE and ITA agreement correspondence and related questions (excluding crossing agreements) shall be routed through UPRR_RETrack@up.com.
C. The designated UPRR representative shall be notified in writing at **least 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 by submitting a ticket at http://www.up.com/cbud to obtain fiber optic information prior to track construction within UPRR property. The phone number 1(800)336-9193 remains active for emergency use only.
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. Any subsequent changes made shall require written UPRR acceptance prior to construction, which may cause project delays. Not seeking prior UPRR acceptance of subsequent changes may potentially result in reconstruction.

1.60 CONSTRUCTION BY UPRR

On connections to UPRR owned track, UPRR constructs, owns, and maintains the new track from the turnout point of switch to a designated point on the Construction plans. 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 to 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.

Industry shall provide, renew, and verify survey stakeout upon request of UPRR throughout the UPRR portion of construction. Requested survey stakeout will typically include, but not be limited to, labeling the stationing, offset staking, point of switch, and or point of frog locations on the web of rail.

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 signal design and construction requirements.

1.65 CONSTRUCTION COMPLETION

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

A. Industry shall restore UPRR property to conditions equal to or better than pre-construction conditions. UPRR owned rail and OTM may be retained by UPRR at the discretion of UPRR Engineering. The Industry shall dispose of all debris and excess materials (ties, ballast, subballast, soil, etc.) in a manner which is safe, legal, and follows applicable UPRR policy.
B. Upon completion of construction, UPRR's designated representative shall be contacted for an on-site walkthrough inspection.
C. UPRR may request "as-built" plans from the Industry. The "as-built" plans will show the corrected stationing, geometry, structures, and clearances. If necessary, UPRR may require a revised or supplemented ITA.
D. UPRR will not provide service until UPRR accepts the project inspection, including remedy of any outstanding punch list items that arise during inspections.

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 shall be included with each applicable submittal as Sheet 2 and include a concise description, project location, plan set reference location, and an explanation for the exemption request. 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. The act of requesting an exemption does not constitute automatic acceptance.

If project exemptions are not required, the *Exemption Table* shall still be included with plan submittals to demonstrate that exemptions have not been requested or accepted by UPRR as part of the project. In such cases, the *Exemption Table* shall be completed with "None" or "N/A" entered in appropriate fields and submitted as Sheet 2 of all plan set submittals. The Exemption Table can be found through the following link:

https://www.up.com/shipping/connect-to-rail/specs/track

A. Use of No UPRR Operations Line Style Guidelines (Gray Hatch Line Style)

The gray with hatch line style reflects tracks that will not be recognized by UPRR and are excluded from the ITA and does so in perpetuity. The use of the gray line style does not correlate to the proposed operating plan, and instead identifies where operations by UPRR cannot occur, because the tracks are undocumented. Inclusion of tracks that were previously excluded from the agreement will not be considered. The gray line style use shall never be acceptable on UPRR ROW.

The use of the gray line style shall only become an option once a design submittal has been reviewed by UP Engineering and it is determined that an engineering or safety reason justifies the decision. Initial submittals shall only use existing and proposed line styles. Include design exceptions in the plan set exemption table, as provided in our standard documents, with detailed reason to facilitate acceptance as well as noting if you have a request to use the gray line style. UP will push back on exceptions as necessary if meeting standards and project objectives can both occur. The preference of UPRR is to have all tracks included in UPRR records including the ITA, if feasible.

If it is determined the use of the gray hatch line style is acceptable, the beginning limits of that line style shall be denoted by a callout with the station, LAT/LONG, the text "UP OPS LMT," and the associated sign shall be installed. The sign is found in the standard drawings under End OF UPRR OPERATIONS SIGN, and the text on the sign reads "UP OPS LMT."

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 *Exemption Table* 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: For projects requiring UPRR design or construction, an on-site project review meeting will be required. The on-site meeting shall be held with the Industry and UPRR to review existing site conditions and compatibility with proposed improvements. UPRR will coordinate the on-site meeting soon after an executed Letter Agreement.
C. 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. **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 the project review process.** 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.
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 "Submission Remarks" field, 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 "Submission Remarks" field, noting the type of document being uploaded.
F. Pre-construction On-site Meeting: For all projects, and upon submittal of Construction Plans, an on-site pre-construction meeting will be required. The on-site meeting shall be held with the Industry and UPRR to review existing site conditions and compatibility with proposed improvements and all construction documents. UPRR will coordinate the on-site meeting after Industry submittal of the Construction Plans.
G. Exhibit "A": An executive summary version of the track plan, without cross sections, 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 typical DEVCON submittal sheets should be in the following order:

1. Cover Page & Overview
2. Exemption Table
3. Plan Views

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.

C. Crossings: Existing and proposed crossings within 1000' of any proposed connection to UPRR track shall be depicted. Existing and proposed crossings inside the Industry and any track mobile set-on/set-off are to be depicted and shall be called out as such. A Call out with DOT number and roadway name shall be included for existing public or private crossings. Track mobile set-on/set-off may be configured to ensure only one approach is accessible. The use of bollards or other devices may be used for this purpose. Failure to properly depict crossings or track mobile set-on/set-off will result in delays scheduling diagnostic meetings, rejection of plan submittals, and additional cost.

D. Dimensions: Include dimensions from proposed PS to items such as 13'CP, derail, insulated joints, EOM, etc. Distance from existing or proposed Industry driveway to existing or proposed roadway/rail crossing shall be identified.

E. Title block: The mile post (MP) for the project shall be a range of MP that encompasses the furthest points of the project to perpendicular points on the UPRR adjacent track. The "station" identification is a Rail Station, which can be provided by UPRR NEID.

2.20 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 *UPRR Construction Sample Design Print* should be used as a guideline for preparing the Construction Plans submittal. The Construction Plans will establish the exact locations of turnouts, structures, road crossings, signalized equipment, and horizontal and vertical track geometry. Documents that are to be submitted through EDP under the "Structures" category (Drainage Study, structures, culverts, clearance, utilities, etc.) may be submitted concurrently with initial Construction Plan submittal, or at the industry's earliest convenience.

Immediately following Letter Agreement execution, Union Pacific's Field Consultant will make initial contact with the Industry, their Design Firm, and any Contractor assigned to the project to schedule an initial on-site meeting. Prior to on-site meeting, the industry shall survey stake all proposed points of switches that are proposed to be installed on UPRR track. Following initial on-site, comments will be provided to Industry

through QuickBase to update plans as needed based on conditions observed at initial on-site.
If turnout locations are altered after initial submittal of Construction Plans, the signal design process will have to start over, causing delays and potentially increasing costs.

The typical Construction submittal sheets should be in the following order:

1. Cover Page & Overview
2. Exemption Table
3. Scope of Work Matrix
4. Plan & Profile Views
5. Typical Sections
6. Cross Sections
7. Structure Submittal Table
8. Drainage Structure Detail Table
9. PTC Design Sheet

The Construction Plans submittal requirements are detailed in the *Checklist for Industry Track Submittal*s. The following information provides supporting clarification to the Construction 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, and include callout to cover either existing and/or proposed walkway/handrail.
C. Drainage: All existing and proposed drainage structures under all existing and proposed roads and tracks 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 EDP system under the "Structures" category.
D. Under Track Structures: Under track structures need to be called out in the plan views as well as shown in the profile views with depths below base of rail labeled. There also needs to be a special cross section cut for each under track structure included in the cross sections. In addition to the preceding items, detailed plans of any proposed under track structures shall be submitted through UPRR's EDP system under the "Structures" category.
E. Overhead Structures: Overhead structures need to be called out in the plan views as well as shown in the profile views with clearances above top of rail labeled. For any structures adjacent to the track, a typical section may be requested with all vertical and horizontal clearances labeled. The clearance envelopes must show the designed 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 EDP 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, but not limited to wayside signals, active warning devices, power operated turnouts and/or derails, 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 in the plan views as well as shown in profile views with clearances or depths labeled. Utility drawings and exhibits shall be submitted through UPRR's EDP system under the "Structures" category.
H. GPS Information (PTC Design): On a separate sheet at the end of the plans set, include a sheet titled "PTC Design" and list GPS coordinates (lat/long) and elevations for the PS of turnouts on UPRR tracks, PS of derail, 13ft clear point, end of UPRR mtc, and all other PS of turnouts and 13ft clear points for a minimum of 1,200 ft. into the Industry facility past UPRR End of Maintenance sign. (Measurements shall be taken from center of track using WGS84 Datum in decimal format, to eight

decimal places. End of UPRR Operations signs, regardless of location, will require this information on the plan views and PTC Design sheet.

I. 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. 6002*).
J. Clearances: Show all horizontal clearances, perpendicular from adjacent track centerline to any obstruction within 20 feet of all existing and proposed tracks. Show all vertical clearances, measured from top of rail, for all existing and proposed tracks.
K. Title block: The mile post for the project shall be a range of MP that encompasses the furthest points of the project to perpendicular points on the UPRR adjacent track. The "station" identification is a Rail Station, which can be provided by UPRR NEID.
L. Structure Submittal Table: On a separate sheet, provide the UP Structure Submittal Table in a legible size. Provide all details listed in the table and submit with the Construction, Exhibit A, and Structural submittals
M. Drainage Details Table: On a separate sheet, provide the UP Drainage Structure Detail Table in a legible size. Provide all details listed in the table and submit with the Construction, Exhibit A, and Structural submittals

2.30 EXHIBIT "A"

The example *UPRR Exhibit "A" Sample Print* should be used as a guideline for preparing the Exhibit "A". All Industry tracks recognized by UPRR are covered by an ITA that specifies each party's responsibility for construction, maintenance, and ownership. The Exhibit "A" drawing is an executive summary version of the track plan used as an exhibit in the ITA, and because the ITA is a legally binding agreement, the Exhibit "A" shall be accurate, easy to interpret, adhere to UPRR design standards, and shall not contain aerial imagery. The Exhibit "A" shall not reference any pages, details, or other sets of plans that are not included as part of the Exhibit "A" Submittal. While the Exhibit "A" plans are submitted to the EDP in 11x17 format, the text on the plans should be large enough to be legible when printed in 8.5x11 format.

In the title block, the mile post for the project shall be a range of MP that encompasses the furthest points of the project to perpendicular points on the UPRR adjacent track. The "station" identification is a Rail Station, which can be provided by UPRR NEID.

The typical Exhibit A submittal sheets should be in the following order:

1. Cover Page & Overview
2. Exemption Table
3. Scope of Work Matrix
4. Plan Views
5. Structure Submittal Table
6. Drainage Details Table

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 designated project representative.

3.00 TRACK ALIGNMENTS

Geometry:

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

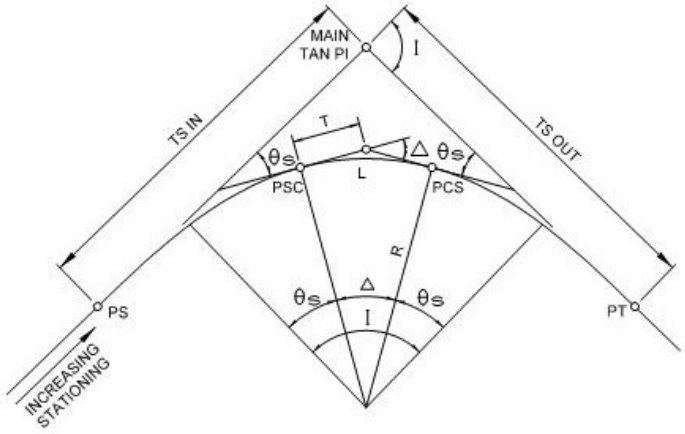

FIGURE A
CIRCULAR CURVES
WITH SPIRAL TRANSITION

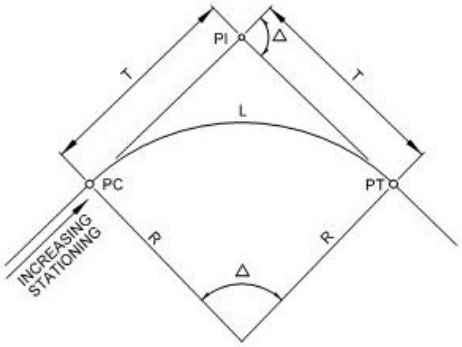

FIGURE B
SIMPLE CIRCULAR CURVE

I - TOTAL INTERSECTION ANGLE

θ_S - SPIRAL ANGLE = $\frac{A L^2}{2}$

Δ - CENTRAL ANGLE OF CIRCULAR CURVE = $I - 2\theta_S$

Dc - DEGREE OF CURVE

A - RATE OF CHANGE OF DEGREE OF CURVE PER 100-ft. OF LENGTH = $\frac{Dc}{L}$

R - RADIUS OF CIRCULAR CURVE

T - TANGENT LENGTH OF CIRCULAR CURVE = R TAN $\frac{\Delta}{2}$

L - LENGTH OF CIRCULAR CURVE = $\frac{\Delta}{Dc}$ x 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

(TS IN)
(TS OUT) - 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

Δ = CENTRAL ANGLE OF CIRCULAR CURVE

T = R TAN $\frac{\Delta}{2}$

L = $\frac{\Delta}{Dc}$ x 100

$Dc = 2 \sin^{-1} (50/R)$ = DEGREE OF CURVE (CHORD DEFINITION)

North Arrow Orientation:

Plans must be oriented with the north arrow pointing upward or to the right, which are the preferred directions. Alternatively, the north arrow can point to the left, which is acceptable. The north arrow must not point downward

Stationing:

Track stationing for existing UPRR tracks shall be determined from UPRR valuation maps, or as otherwise directed by UPRR. Proposed track alignments and stationing shall begin with Sta. 0+00 at the point of switch for each track alignment and continue through the straight side of any subsequent turnouts. For the diverging turnout route, a new track alignment and stationing starting at 0+00 is to begin at the point of switch and proceed through the diverging side of the turnout.

Horizontal Curves:

Horizontal curves shall be designed to have the minimum degree of curvature practical and have a preferred minimum length of 100 feet but shall not be less than 60 feet in length.

For unit train operations, horizontal curves shall not exceed 7°30'00" (chord definition, radius = 764.49 ft.); curves exceeding 7°30'00" will require an exemption request and acceptance from UPRR's Engineering Department. The addition of curve block plates and continuous welded rail may be requested for curves exceeding 7°30'00".

For manifest operations, horizontal curves shall not exceed 10°00'00" (chord definition, radius = 573.69 ft.); curves exceeding 10°00'00" will require and exemption request and acceptance from UPRR's Engineering Department. The addition of curve block plates and continuous welded rail may be requested for curves exceeding 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 of 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 meet the following minimum requirements:

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

When practical, UPRR prefers Industry to design their track alignment to leave the UPRR owned ROW as soon as feasible. Note that any track built on UPRR may need to be UPRR owned and leased back to the Industry. When the Industry track is being built on UP ROW, Industry shall make all efforts to keep the proposed track as far from the existing UPRR owned tracks or as close to the edge of the UPRR owned ROW as possible.

Clear Lengths:

Track clear lengths and track storage capacities shall account for clearance point markings, at-grade crossing clearances, end of track device with properly installed sign, any buffer distance, and be calculated in accordance with *UPRR Std. Dwg. 0025*, *UPRR Std. Dwg. 0026*, and *UPRR Std. Dwg. 0030*, and consideration for coupling with locomotive and first car both in tangent track.

UPRR operations prefers not to spot or pull cars within the limits of a curve. Typically, a tangent length long enough for both the locomotive and the first car is ideal for safe operations. A minimum tangent track length of 175' should be considered for UPRR car spotting and pulling. The 175' accounts for the locomotive (±85'), the first car length (±65'), and a 25' buffer.

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. 0025 – Rail Marking for Engines, Cars or Equipment clear of Road Grade Crossings
    iv. 0026 – Clearance Point Marking
    v. 0030 – Standard Treatment for End of Track
    vi. 0050 – Design Data for Turnout Layout
    vii. 0080 – Standard Turnout Applications
    viii. 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 feet 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.

For unit train operations, the rate of change for vertical curves shall be no more than 0.12 per 100 foot station in sags and 0.20 per 100-foot station in summits. Also, the unit train track profile shall have a max grade of no more than 1% on approach to the loop.

The minimum distance between vertical curves shall be 100 feet. Vertical curves shall not begin, end, or fall within the limits of 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 shall be insulated and equipped with a new standard switch stand and target (unless power operated) supplied by a UPRR approved vendor. The type of switch stand shall be designated by UPRR's Engineering Department.

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. If a proposed turnout is located near an at-grade crossing or rail/roadway grade separation, refer to Section 1.40 – Access Roads & Road Crossings.

If a turnout is to be power operated (POTO), special ties and components may be required. In most cases, POTO turnouts do not require a manual switch stand. Power operated derails with special ties and components may be required if a POTO is used.

If a proposed turnout is located within 500 feet of a bridge, refer to Section 1.30 – Structures. Turnouts shall not be installed within 100' of a rail bridge.

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 or adjacent to UPRR ROW.

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

The Drainage Study for UPRR owned or maintained track, or changes that may impact UPRR ROW, must include, but is not limited to:

A. An executive summary at the beginning of the report.
B. Top of rail and top of subgrade elevations.
C. Drainage structure details, including stationing, which match the construction plans.
D. The 50-year and 100-year water surface elevations for both the existing and proposed conditions.
E. Flow rates for both events.
F. Location map of drainage area(s), including UPRR mileposts, engineering stations, and locations of all proposed and existing drainage structures.
G. Size of the drainage area(s).
H. Location of the water flowing along the right-of-way.
I. Location where the water enters or leaves the UPRR right-of-way.

The following UPRR criteria for sizing bridges and culverts on UPRR owned or maintained track, or proposed structures that may impact UPRR ROW, 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 preferred culvert diameter allowed under UPRR owned or maintained track is 36 inches (36").
F. The use of any drainage culverts other than helical lockseam corrugated metal pipe (CMP) or smooth steel pipe (SSP) will require prior acceptance by UPRR before installation.
G. The use of elliptical or arch pipe is strictly prohibited.

If an existing bridge or culvert does not meet design criteria, UPRR will consider and evaluate alternatives such as relief bridges on the overbank floodplain, raising track grades, or other measures. All drainage structures shall be designed, at a minimum, to meet the latest edition of the AREMA Manual. If the drainage structure falls within a FEMA-designated floodplain or floodway, 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. An executive summary at the beginning of the report.
B. Top of rail and top of subgrade elevations.
C. Drainage structure details, including stationing, which match the construction plans.
D. The 25-year and 50-year water surface elevations for both the existing and proposed conditions.

E. Flow rates for both events.
F. Location map of drainage area(s), including UPRR mileposts, engineering stations, and locations of all proposed and existing drainage structures.
G. Size of the drainage area(s).
H. Location of the water flowing along the right-of-way.
I. Location where the water enters or leaves the UPRR 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 preferred culvert diameter allowed under Industry owned or maintained track is 30 inches (30").
F. The use of any drainage culverts other than CMP or SSP will require prior acceptance by UPRR before installation.
G. The use of elliptical or arch pipe is strictly prohibited.

UPRR Engineering may require any drainage structure to be designed to the UPRR owned standards (50-yr & 100-yr), even if the structure is to be Industry owned and maintained, if UPRR Engineering determines that the proposed structure could negatively impact UPRR owned track or ROW if undersized.

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. 680021 – Construction Notes Corrugated Metal Pipe Culverts
    iv. 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 Guidelines for Rail Separation Projects* and *UPRR Std. Dwg. 0038*. Industry must make all efforts to adjust any proposed structures and or proposed tracks to meet UPRR standard clearances. Adjacent or overhead structures should be shown in typical

sections with all horizontal and vertical clearances labeled. All clearance exhibits shall be submitted through UPRR's EDP system under the "Structures" category.

Horizontal clearances for structures or facilities on curves must be increased laterally on each side 1 ½" per each degree of curvature, extending to 80' beyond the end of the curve. Please note that UPRR considers the diverging side of a turnout as a curve.

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 or governing regulatory agency, the Industry shall secure necessary written approval from the appropriate authority for each impaired clearance. This written approval shall be provided to UPRR and included as a separate sheet in the Construction and Exhibit "A" plan sets. The agreement covering the Industry's track will include specific reference to the impaired clearance involved. When governing regulatory agency standards require clearances that are more restrictive, such laws or regulations shall govern.

Any existing clearances found to not meet UP Standard must either be altered to meet, or have close clearance signage installed, but only if UP Engineering and UP Operations accept the exemption request. Clearance Warning Signs shall be in accordance with *UPRR Std. Dwg. 0507*.

Minimum clearances with respect to installation of loading or unloading facilities for handling Liquefied Petroleum Gas (LPG), anhydrous ammonia, ethanol, or other Hazardous Materials shall be maintained in accordance with 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 distance from the nearest UPRR owned track 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 Rail Separation Projects
B. UPRR Std. Dwg.:
    i. 0025 – Rail Marking for Engines, Cars or Equipment Clear of Road Grade Crossing
    ii. 0038 – Standard Minimum Operating Clearances
    iii. 0507 – 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

Proposed utility improvements outside UPRR right-of-way shall be submitted through UPRR's EDP system under the "Structures" category. Include any plan and profile views of the utility crossing, along with any other details such as special sections. For under track crossings, label the depth of the utility below base of rail. For over track crossings, label the overhead clearance from the top of rail. UPRR's wireline specifications can be found through the following link:

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

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.arema.org//files/pubs/UP_Special_Order_for_Part_5_Utilities.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 EDP 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.

A diagnostic may need to be performed to determine the required crossing protection for both public and private crossings. Label all crossings on plans with “Protection Per Diagnostic.”

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 Road Crossing
    vi. 0312 – StarTrack Heavy Duty Road Crossing
C. Common Std. Dwg.:
    i. 320, 321, 322 – Concrete Panels for 10’ Long Wood Ties (10W)
    ii. 323, 324 – Concrete Panels for 9’ Long Wood Ties (9W)
    iii. 325, 326, 327 – Concrete Panels for 10’ Long Concrete Ties (10C)
    iv. 328, 329 – Concrete Panels for 8’-6” Long Concrete Ties (85C)
    v. 330 – Typical Details for Concrete Panels
    vi. 331 – Curved 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 designated project 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/emp/engineering/mapcontent/standards/track%20standard%20drawings/UP_GENERAL_SPEC_ADDENDUM.pdf

All finished track subgrade within the top three feet (3') of finished subgrade elevation, including excavation, embankment, or backfill, 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 100% 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

Subballast and base materials shall meet specifications of Section 34 11 27 of the *UPRR General Conditions and Specifications*, *UPRR Std. Dwg. 0010,* and *UPRR Std. Dwg. 0013*, or as directed by a geotechnical engineer. The Industry shall provide certification that subballast/base material meets applicable UPRR and AREMA specifications. Use of reclaimed asphalt pavement (RAP) for subballast material is strictly prohibited.

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 for Subgrade Soils
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

Ballast material 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 ballast 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 Std. Dwg. 0008*. 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 the correct class of 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. The 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 Std. Dwg. 0008 – Recommended Ballast Section for Renewed Turnouts and Derails
C. UPRR General Conditions and Specifications, Section 34 11 10 – Railroad Track Construction

4.75 FENCING AND GATES

Track gates shall be operated by Industry to permit UPRR to access the track, unless the gate is equipped to operate via automated activation in which case either party may operate the gate. If it is not automated, the gate shall include anchor posts and fastenings to secure the gate when open.

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 equal to, or 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. Except when pre-plated, 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. 0416* and *UPRR Std. Dwg. 0417*. 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. 0420* 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. 0901*. 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. If temporary jointed connections are required, refer to Section 1.50 – Construction.

Transition Rails & Compromise Joints:

Transition rails shall be used on UPRR owned track and 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. 0902*. 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 not install compromise joint bars within 10’ of the end of UPRR ownership/maintenance.

Insulated Joint Plug Rails / Poly Insulated Joints:

All required Insulated Joint Rail Plugs (IJ's) proposed on UPRR owned and maintained track will be supplied and installed by UPRR for the project.

All IJ's proposed within the limits of Industry construction, including UPRR owned tracks that are Leased to Industry and Industry owned tracks, will be supplied and installed by the Industry. All IJ’s on the Leased

portion, owned by UPRR, shall comply with UPRR standards (eg. UPRR Std Dwg 0903) and, if acting in conjunction with the UPRR Signal System shall be installed at a place verified by a UPRR Signal representative. All UPRR owned tracks require the use of Insulated Joint Plug Rails.

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. 6002*. 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. 0230*):
    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. 0221, ,* and *0222*) shall have 10 mm thickness.
D. Composite Ties (*UPRR Std. Dwg. 0230*)

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, 2003, 2007, 2008, 2009, 2020, 2021* and/or *2022*.

End of Track Device:

All open-ended or stub-ended tracks shall be equipped with an end of track device and applicable sign. Earthen bumpers shall be used when possible. If Industry proposes to install an end of track device other than an earthen bumper, the Industry shall submit proposed device(s) for UPRR review. Any acceptance is afforded on a case-by-case basis. If bumping posts are proposed, they shall be Hayes Type WD with Shock Free Head, or equivalent.

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. 5009 – No. 9 Turnout
        b. 5011 – No. 11 Turnout
        c. 5015 – No. 15 Turnout
B. Derails:
    i. UPRR Std. Dwg.:
        a. 2000 – Permanent Derail Installation Instructions
        b. 2020 – 16'-6" Double Switch Point Derail
        c. 2021 – Single Switch Point Derail
        d. 2007 – Sliding Derail with Wheel Crowder
C. Track Materials:
    i. UPRR Std. Dwg.:
        a. 0030 – Standard Treatment for End of Track
        b. 0204 – Concrete Tie 497S For Safelok I Fasteners
        c. 0208 – Rubber Padded Concrete Ties
        d. 0230 – Wood and Composite Cross Ties
        e. 0270 – Standard Transition Zones
        f. 0309 – Landing Pad
        g. 0417 – Spiking Pattern
        h. 0420 – Rail Anchor Patterns
        i. 0460 – Double Shoulder Tie Plate 5 ½" and 6" Base Rail
        j. 0461 – Double Shoulder Tie Plate 8" x 14" for 6" Base Rail
        k. 0462 – Double Shoulder Tie Plate for 5 ½" Base Rail
        l. 0463 – Double Shoulder Tie Plate for 132 Lb. and 136 Lb. Rail
        m. 0513 – End of Track Sign
        n. 0464 – Double Shoulder Tie Plate for 6" Base Rail – 1:40 Cant
        o. 0539 – End of UPRR Maintenance Sign
        p. 0902 – Compromise Joints
        q. 0903 – Insulated Joint Plug Rails
        r. 0904 – Miscellaneous Joint Bars
        s. 0923 – Transition Rail 141 Lb. to 132 Lb. Worn

t. 0924 – Transition Rail 136 Lb. to 132 Lb. Worn
u. 6002 – Grounding Detail for Loading and Unloading Flammable Commodities

ii. Common Std. Dwg.:
a. 0416 – 6” Track Spike
b. 0431 – Rectangular Head Timber Coach Screw

D. Switch Stands:
i. UPRR Std. Dwg.:
a. 2100 – Switch Targets
b. 2105 – Switch Padlock
c. 2115 – Switch Stand Placement
d. 2130 – No. 112E High Switch Stand
e. 2132 – 36-E and 36-EH Switch Stands
f. 2136 – No. 22-E Switch Stand, Trailable
g. 2138 – No. 1003ARS Automatic Switch Stands, Trailable
h. 2140 – 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 WELDING

Electric flash-butt welding, where practicable, shall be utilized for welding of all components assembled by Industry for UPRR installation, ownership, or maintenance.

When granted an exception, UPRR approved welds may be installed. Welds currently approved by UPRR 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 for UPRR owned or maintained track shall be inspected by the UPRR Manager of Track Construction (MTC) or a designated representative.

In all instances, welds for UPRR owned or maintained track are required to have associated weld test/inspection results available for review by UPRR 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 Call Before You Dig shall be contacted by submitting a ticket at http://www.up.com/cbud to obtain fiber optic information prior to track construction withing UPRR property. The phone number for Telecommunications Operation Center, 1 (800) 336-9193, remains active for emergency use only.

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_Utilities.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. 0331*, shall be utilized as conditions warrant.

Road crossings on Industry-owned track, not on UPRR ROW, may be constructed with precast concrete or timber, 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 ¾" 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").

The use of asphalt for road crossing construction is permissible if qualified and constructed per Std Dwg 0302. The installation of ballast rock crossings is strictly prohibited on tracks where UPRR will operate.

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