SP-150267
(New)

SPECIAL PROVISIONS
FOR
RAILROAD TRACK

Pottawattamie County
IM-NHS-029-3(69)53--03-78

Effective Date
June 20, 2017

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150267.01 DESCRIPTION.

Railroad Track consists of ties, rails, fastenings, subballast, ballast, asphalt underlayment, and appurtenances delivered in conformity with the contract documents.

150267.02 MATERIALS.

Contractor will provide track material for Contractor installed track with the exception of railroad ballast. Railroad will provide track material for Railroad installed track and special trackwork. Railroad will provide all ballast for Contractor and Railroad installed track. Railroad will provide and install all wayside signal equipment. Contractor shall provide equipment and manpower to support track shift and track panel installation work designated to be performed by Railroad forces in track construction stages 4, 5, 9, and 10.

Material designated to be provided by a UP approved supplier shall be provided by a supplier listed on UP Miscellaneous Drawing 6010 – Approved Trackwork Suppliers. Material supplied by the Contractor shall meet all requirements of applicable regulations governing projects with federal funding, including Buy America / Buy American provisions.

A. Submittals.

Submit the following items to the Engineer:

- The source and/or supplier of materials covered in this special provision.
- Material test results for subballast and HMA materials.
- Documentation and certifications that rail material meets Buy America / Buy American provisions.
- Proposed work plan for track construction.
- Name and resume for track construction supervisor(s).

B. Rail.

New Intermediate Strength Head Hardened (ISHH) or High Carbon Head Hardened (HH) 136JK rail (136 pounds per yard) shall be provided in 39 foot or 80 foot lengths from a UP approved

supplier. Rail shall conform to Common Standard 176500 and Chapter 4, Part 2 of American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.

C. Fastenings.

1. Tie Plates.
New double-shoulder tie plates for 6 inch base rail with e-clips shall be provided per Common Standard 263000. Tie plates shall conform to Chapter 5, Part 1 of AREMA and be provided by a UP approved supplier.

2. Screw Spikes.
New rectangular head timber coach screws shall be provided per Common Standard 130800. Screw spikes shall conform to Chapter 5, Part 10.1 of AREMA and be provided by a UP approved supplier.

3. Elastic Fasteners.
New e2055 Clip elastic fasteners shall be provided per Common Standard 132500. E-Clips shall be provided by a UP approved supplier.

4. Compromise Transition Rails
New compromise transition rails shall be manufactured specifically to join the rail sizes and sections to be joined. Compromise transition rails shall be provided per UP Standard Drawing 0943 by a UP approved supplier. Contractor shall verify existing rail sizes prior to ordering compromise transition rails.

5. Joint Bars.
New joint bars required to provide temporary joining of rail sections shall be new 36 inch joint bars per UP Standard Drawing 0904. New joint bars shall conform to Chapter 4, Part 3.4 of AREMA and be provided by a UP approved supplier.

6. Track Bolts, Nuts, and Washers.
New track bolts, square nuts, and split washers required to provide temporary joining of rail sections shall be provided per UP Standard Drawing 0950. Track bolts, nuts, and split washers shall conform to Chapter 4, Parts 3.5 and 3.6 of AREMA and be provided by a UP approved supplier.

7. Thermite Welding Kits.
Thermite welding materials and equipment shall be provided by a UP approved supplier.

D. Wood Ties.
New wood ties shall conform to Chapter 30, Part 3 of AREMA. Wood ties shall be sawed and shall be not less than 7 inches thick and 9 inches wide. The length shall be 9 feet at road crossings and 8 feet 6 inches for all other track construction. Provide five additional 9 foot ties on either side of the crossing panels at roadway crossings. All ties shall be new hardwood species provided by a UP approved supplier. Ties may be supplied pre-plated with appropriate tie plates at Contractor’s option.

E. Railroad Crossings.
New concrete railroad crossing panels shall be provided per Common Standards 200200, 200201, and 200900. Crossing panels shall be provided by a UP approved supplier.

F. Ballast.
Ballast will be provided by UP. Ballast for tracks will meet Class 1 ballast gradation from UP

Standard Drawing 0010. Ballast for walkways and signal mounds will meet Class 3 ballast gradation from UP Standard Drawing 0010.

G. Subballast.

Subballast shall be crushed stone produced from oversize quarried aggregate sized by crushing and produced from a naturally occurring single source. Aggregate shall have a percentage of wear of not more than 50% as measured by the Los Angeles abrasion test. Aggregate shall have a maximum freeze/thaw loss of 10%. Aggregate shall meet gradation for select material from UP Standard Drawing 0010.

H. HMA Underlayment.

Dense Graded Hot Mix Asphalt Underlayment shall meet the following requirements.

1. Asphalt Binder.

Asphalt shall be PG 64-22 Performance Graded asphalt binder meeting the requirements of Section 4137 of the Standard Specifications.

2. Aggregate.

Aggregate shall meet the requirements of Section 4127 of the Standard Specifications. Aggregate gradation shall meet the following gradation:

Sieve Size	Percent Passing
1-1/2 in.	100
3/4 in.	70 - 98
3/8 in.	44 - 76
No. 4	30 - 58
No. 8	21 - 45
No. 16	14 - 35
No. 30	8 - 25
No. 50	5 - 20
No. 200	2 - 6

3. Asphalt Mixture.

a. The job mix formula (JMF) is the percentage of each material, including the asphalt binder, to be used in the HMA mixture. The JMF gradation shall fall within the control points for the particular mixture designated. Use the JMF to establish a single percentage of aggregate passing each required sieve size.

b. The dense graded mixture design shall meet the following criteria:

Property	Range
Stability, lbs. (min.)	750
Flow, in.	0.15 – 0.25
Percent Air Voids	1 - 3
Percent Voids Filled	80 - 90
Percent In-place Density (Per ASTM D6925)	100

c. The asphalt content shall be in the range of 3.5% to 6.5%.

d. The asphalt production facility shall be capable of producing a mix meeting the specified mix properties and have sufficient capacity to produce the anticipated volume of asphalt mix.

e. Recycled Asphalt Pavement (RAP) will not be allowed in the HMA underlayment. Any mix design that includes RAP will not be approved. If any HMA underlayment has to be removed, it shall become property of the Contractor and be removed and disposed of by the Contractor.

4. Other Materials.

a. Tack Coat.
Tack coat may be SS-1, SS-1H, CSS-1, or CSS-1H. Do not mix CSS and SS grades. RC-70 and MC-70 may also be used after October 1, at the Contractor's option.

b. Sand for Tack Coats.
Use sand meeting the requirements of Gradation No 1 of the Aggregate Gradation Table in Article 4109.02 of the Standard Specification.

I. Railroad Crossing Sign Assembly.
New Crossing sign assemblies including post and relevant signage shall be provided per UP Standard Drawing 0531. Signs shall be fabricated in accordance with standards established in the current edition of the Standard Highway Signs as published by the USDOT. Emergency phone number sign shall be provided with blank DOT # sign per UP Standard Drawing 0530.

150267.03 CONSTRUCTION.

A. General.
Track construction shall be performed in accordance with Section 34 11 10 – Railroad Track Construction of the UP General Conditions and Specifications and the UP Engineering Track Maintenance Field Handbook with the modifications contained in this special provision. Track construction not covered specifically herein shall be in accordance with AREMA recommendations and recommended practices. All work shall be supervised by experienced personnel skilled in railroad track construction. All Contractor employees and subcontractors shall meet applicable railroad safety requirements.

Contractor shall exercise care in the handling and distribution of track material and in the construction of the track to avoid disturbing the surface of the subballast. Any damage to either the subballast surface or side slopes caused by the Contractor's operations shall be repaired at Contractor's expense to the satisfaction of the Engineer.

Contractor shall be responsible for project materials until final acceptance of track by Engineer. If materials are damaged, lost, or wasted through Contractor's negligence, poor workmanship, or handling, Contractor shall replace said materials in kind at no additional cost to the project. Hardware (Other Track Material) shall be protected as required from corrosion by storing under cover or by a protective coating.

Project involves multiple construction stages and work by Contractor and Railroad forces. Contractor shall coordinate work with UP Railroad operations. All connections to live track shall be completed by Railroad forces, Contractor shall coordinate with Railroad to schedule track connections and determine assistance required from Contractor by Railroad forces to complete connections. Contractor shall provide support for track work performed by Railroad forces; this support is incidental to track construction.

At minimum, Contractor shall anticipate providing the following equipment with operators to support Railroad forces performing track connections:

- Three front end loaders with 5 cubic yard buckets.
- Two Caterpillar 330 (or equivalent) excavators.

Contractor shall expect multiple mobilizations during construction. Project is located on an active railroad mainline with regular railroad operations. Delays associated with coordination with railroad crews, railroad construction forces, and railroad operations shall not justify a change order.

B. Railroad Flagging.

A railroad flagger shall be present whenever Contractor activities are located within 25 feet of an active rail line or have the potential to foul an active track. Coordinate with Railroad to determine when a railroad flagger shall be present. Contractor shall provide a radio to railroad flagger(s) to facilitate communication between construction crews and railroad operations.

Contractor shall provide a vehicle for the railroad flagger through the duration of construction. Vehicle shall be an all-wheel or four-wheel drive vehicle with sufficient ground clearance to be capable of traversing construction and railroad access roads. Vehicle shall be fueled, licensed, insured, and maintained by the Contractor. Vehicle for railroad flagger is incidental to railroad construction.

C. Access Roads.

Contractor shall improve access roads as necessary to support construction activities. Improvements may include blading existing access road to level the surface and spreading aggregate surfacing material. Access roads shall be returned to condition no worse than at the start of construction prior to project completion. Improvement of access roads is incidental to project grading.

D. Subgrade Preparation.

Prior to placement of subballast Contractor shall proofroll exposed subgrade with a fully loaded tandem axle dump truck with the Engineer present. Rutting greater than 4 inches or development of a mud wave shall be considered unacceptable performance. The type and extent of the remedial action to mitigate unacceptable performance will be as determined by the Engineer and may consist of overexcavation, reconditioning, and recompaction; overexcavation and replacement; or installation of geotextile and/or geogrid.

Following completion of proofrolling, any remedial measures, and acceptance by the Engineer of the exposed subgrade shall be scarified to a depth of 8 inches and recompacted to not less than 95% (Modified Proctor) of maximum density with moisture content at or within -4% of optimum. Moisture and density shall be determined with a nucleat density meter in accordance with ASTM D6938. The surface of the exposed subgrade shall be smooth and free of rocks or clay lumps greater than 3 inches in maximum dimension.

E. Subballast.

Subballast shall be placed only when weather conditions do not detrimentally affect the quality of the finished subballast. Hauling and placing of subballast will not be permitted when doing so will rut or deform the finished subgrade.

Subballast shall be placed in uniform lifts of not more than 6 inches loose for the full width of the cross section. Each lift of subballast shall be compacted to a density of not less than 95% of the maximum dry density determined by ASTM Test Designation: D 1557 (Modified Proctor).

The subballast shall be trimmed to the lines and grades shown on the plans and shall be maintained in a condition or manner acceptable to the Engineer until the final acceptance and completion of all work under this Contract. Any irregularities that develop in the subballast section during construction operations and prior to laying track, shall be filled and compacted to a smooth and even surface true to the subgrade elevations without any additional cost to the project. Contractor shall plan and coordinate subballast placement work in such a manner that previously placed and compacted layers be allowed ample time for curing and development of sufficient

stability before vehicles hauling materials for succeeding layers or other heavy equipment are permitted on the subballast. Prior to placing the succeeding layers of material, the top of the preceeding layer shall be sufficiently moistened to ensure a strong bond between the layers. The edges and edge slopes of the subballast shall be bladed or otherwise dressed to conform to the lines and dimensions shown on the plans and present straight, neat, and workmanlike lines and slopes as free of loose material as practicable.

F. HMA Underlayment.

1. General.

a. The Contractor is responsible for all aspects of the project.

b. Provide quality control management and testing and maintain the quality characteristics specified.

c. Submit design mix to Engineer at least 14 days prior to placement of HMA.

2. Equipment.

Equipment necessary for the proper construction of the work shall be on the project site and in good working condition before construction operations will be permitted to begin. The Contractor shall at all times provide sufficient equipment to enable continuous execution of the work. The Engineer shall have the right to reject equipment which is not capable of producing the required results, or which cannot be properly calibrated or controlled. Use equipment meeting the requirements of Section 2001 of the Standard Specification with the following modifications

a. Plant Calibration.

1) Calibrate each plant scale and metering system before work on a contract begins. Use calibration equipment meeting the manufacturer's guidelines and Materials I.M. 508.

2) The Engineer may waive calibration of permanent plant scales when a satisfactory operational history is available. The Engineer may require any scale or metering system to be recalibrated if operations indicate it is necessary.

3) Make calibration data available at the plant.

4) Calibrate each aggregate feed throughout an operating range wide enough to cover the proportion of that material required in the JMF. Make a new calibration each time there is a change in size or source of any aggregate being used.

5) For continuous and drum mixing plants, calibrate the asphalt metering pump at the operating temperature and with the outlet under pressure equal to that occurring in normal operations.

b. Paver.

Apply Article 2001.19 of the Standard Specification.

c. Rollers.

Use self-propelled, steel tired, pneumatic tired, or vibratory rollers meeting the requirements of Article 2001.05, B; C; or F of the Standard Specifications. Their weight (mass) or tire pressure may be adjusted when justified by conditions.

d. Scales.

Apply Article 2001.07, B of the Standard Specifications to paving operations regardless of the method of measurement.

3. HMA Construction.

a. Subgrade.

Prior to installation of HMA underlayment, the subgrade and subballast shall be compacted and shaped in conformance with the lines, grades and cross sections in the plans. The subgrade and subballast shall be free of ruts, depressions, or loose material.

b. Preparation of Existing Surfaces.

1) Cleaning.

Clean and prepare existing surface according to Article 2212.03.B.1 of the Standard

Specifications.

2) Tack Coats.

a) Apply tack coats when the entire surface area on which the coat is to be applied is free of moisture. Do not apply them when the temperature on the surface being covered is less than 25°F.

b) Place a tack coat to form a continuous, uniform film on the area to be covered. Unless directed otherwise, spread tack coat at the following undiluted rates: 0.03 to 0.05 gallon per square yard. Tack coat may be diluted with water up to 1:1 to improve application.

c) Allow tack coat to adequately cure prior to placement of HMA to assure bond to the underlying surface and avoid damage of the HMA being placed. If tack coat surface becomes dirty from weather or traffic, thoroughly clean and, if necessary, re-tack. A light application of sand cover may also be required, but this is anticipated only for excessive application rates, breakdowns, and short sections remaining at the end of a day's run.

d) Tack before the adjoining lift is placed. Lightly paint or spray vertical surfaces of all fixtures with which the hot mixture will come in contact to facilitate a tight joint with the fresh mixture.

c. Handling, Production, and Delivery.

Ensure plant operation complies with the following requirements.

1) Handling Mineral Aggregate.

a) Keep various aggregate products used separate from one another. Make adequate provisions to prevent intermingling.

b) Handle stockpiling and processing in a manner to ensure uniform incorporation of the aggregate into the mix.

c) Feed various aggregates separately in their proper proportions using feeders to the cold elevator. Feed them at a rate to permit correct and uniform temperature control of heating and drying operations.

2) Handling Asphalt Binder.

Bring asphalt binder to a temperature of 260°F to 330°F before being measured for mixing with the aggregates. The temperature between these limits may be further regulated according to the characteristics of the mixture, method of proportioning, and viscosity of the asphalt binder. Heat modified asphalt binder according to the supplier's recommendations.

3) Production of Hot Mix Asphalt Mixtures.

a) Regulate the exact proportions of the various materials to be within the limits specified to produce a satisfactory bituminous coating and mixture. First dry mix the aggregates, then add the asphalt binder.

(1) In batch plants, add the asphalt binder in an evenly spread sheet over the full length of the mixer box.

(2) In continuous plants, spray the asphalt binder evenly into the aggregate within the first 30% of the length of the mixer box using a positive pressure spray.

(3) In drum mixing plants, spray the asphalt binder evenly into the aggregate using a positive pressure spray.

b) Operate the mixer so that the mixture is of consistently uniform temperature, and when discharged from the mixer does not vary more than 20°F.

c) Do not allow the temperature of the mixtures to fall outside the following parameters:

(1) Keep the production temperature of HMA mixtures between 225°F and 330°F until placed on the grade. Do not discharge HMA into the hopper when its temperature is less than: 245°F for a nominal layer thickness of 1 1/2 inches or less, or 225°F for a nominal layer thickness of more than 1 1/2 inches.

(2) Flexible paving mixtures not meeting these requirements will be rejected.

(3) Production temperature limits apply starting at point of discharge from the mixer.

d) Use a rate of production that will not exceed the manufacturer's rated capacity for the mixer and will provide uniform coating. For batch mixers, use a dry mixing time of no less than 5 seconds and a wet mixing time of no less than 25 seconds. For continuous mixers, use a mixing time of no less than 30 seconds.

e) Control handling and manipulation of the hot mixture from the mixer to the final spread on the road in order to maintain uniform composition and minimize segregation of coarser particles. Minimize segregation to the extent that it cannot be visibly observed in the compacted surface. Apply only approved release agents to trucks and equipment, as specified in Article 2001.01 of the Standard Specifications.

f) Except for an unavoidable delay or breakdown, provide continuous and uniform delivery of hot HMA to any individual spreading unit. Deliver at a rate sufficient to provide as continuous an operation of the spreading unit as practical. Keep the paver hopper sufficiently full at all times to prevent non-uniform mixture flow to the screed.

d. Placement.

1) Clean the surface of each layer according to Article 2212.03, B, 1 of the Standard Specifications. If necessary, re-tack to provide bond with the succeeding course.

2) Do not place HMA mixtures under the following circumstances:

a) On a wet or damp surface.

b) When the road surface temperate is less than 40°F for a nominal layer thickness of 1 1/2 inches or less, or 35°F for a nominal layer thickness of more than 1 1/2 inches.

c) After November 15, except with the Engineer's approval.

3) The Engineer may further limit placement if, in the Engineer's judgment, other conditions are detrimental to quality work.

4) When placing the mixture, maintain a finishing machine forward speed that will provide a continuous uniform operation. Minimize stopping.

5) Use a wire or string line to guide finishing machine and maintain alignment. Correct edge alignment irregularities immediately.

6) The contract documents show the total thickness to be placed. Spread the mixture at a rate such that, when compacted, the layer(s) will be the required thickness.

7) Lift thickness shall in no case be more than 2 inches in compacted thickness. Each layer shall be compacted using pneumatic roller or steel drum vibratory compactors to 100% in-place density.

8) Complete each layer to full width before placing succeeding layers.

9) Whenever practical, spread mixtures using a finishing machine. Irregular areas may be spread by hand. Spread the hot mixture uniformly to the desired depth with hot shovels and rakes. Do not dump loads faster than they can be spread properly. Do not allow workers to stand on the loose mixture while spreading.

10) After spreading, carefully smooth to remove all segregated coarse aggregate and rake marks. Use rakes and lutes designated for use on HMA mixtures.

11) Do not spread more mixture than can be compacted in the specified working hours of the same working day.

e. Compaction.

1) Promptly and thoroughly compact each layer. Use mechanical tampers for areas inaccessible to the rollers.

2) Use a rolling procedure and compactive effort that will produce a surface free of ridges, marks or bumps. Obtain the Engineer's approval for the rolling procedure and compactive effort.

4. Quality Control for Small Paving Quantities.

a. Mix Design.

Prepare the JMF. Prior to HMA production, obtain the Engineer's approval for the JMF. Comply with Article 150267.02, H of the Standard Specifications and Materials I.M. 510.

b. Plant Production.

1) Ensure HMA production plant calibration for the JMF is current and no more than 12 months old.

2) Use certified asphalt binder and approved aggregate sources meeting the JMF. Ensure the plant maintains an asphalt binder log to track the date and time of binder delivery. Ensure HMA delivery tickets identify the JMF.

3) Monitor the quality control test results and make adjustments to keep the mixture near the target JMF values.

c. Construction.

1) Take compacted mixture Gmb measurements, no later than the next working day following placement and compaction. Use the field quality control laboratory compaction for field Gmb control. The Engineer may accept the void content of the compacted layer based on cores or calculations from density gauge measurements. The Engineer may waive field void sampling provided the compaction has been thorough and effective.

2) For small quantities, a lot will be the entire quantity of each HMA mixture bid item.

3) The PWL for field voids will not apply to small quantities.

d. Certification.

1) Provide a certification for the production of any mixture in which the requirements in this article are applied. Place the test results and the following certification statement on the Daily HMA Plant Report (Form 800241). "The HMA mixture contains certified asphalt binder and approved aggregate as specified in the approved mix design and was produced in compliance with the provisions of Article 150267.03, F, 04."

2) The Daily HMA Plant Report for certified HMA may be submitted at the end of the project for all certified HMA quantities, or submitted at intervals for portions of the certified quantity.

G. Removal of Abandoned Track Material.

Remove track, turnouts, and associated track material that has been abandoned along the railroad right-of-way as indicated in the project plans. All abandoned track materials shall become property of the Contractor and shall be removed from the project site and be properly and legally disposed of off of the property. At Contractor's option, abandoned track material removed may be salvaged.

H. Track and Turnout Removal.

Remove track and turnouts including rail, ties, ballast, fasteners, and other associated materials. All track materials shall become property of the Contractor and shall be removed from the project site and be properly and legally disposed of off of the property. At Contractor's option, track material removed may be salvaged.

Scrape remaining ballast from the track bed and shape former track zone per project plans; where project plans do not detail shaping of track and turnout removal zones the track bed shall be shaped to drain and allow a wheeled vehicle to drive the grade at 20 mph. Coordinate with Railroad for timing of all track and turnout removals.

I. Remove and Stockpile Track.

Panelize track to be removed and stockpiled by cutting the rail with a rail saw to create track panels of a length that can be moved with standard construction equipment. No track panels shall be less than 39 feet in length.

Panel lengths should be able to be handled by the Contractor without damaging track components; any components damaged by the Contractor during removal and stockpiling shall be replaced by the Contractor at no cost to the project. Stockpile the track panels in a location

outside the work area but accessible to Railroad forces for reinstallation in a later stage. Coordinate final stockpile location(s) with Railroad.

After removal and stockpiling of track panels, scrape remaining ballast from the track bed and shape former track zone per project plans; where project plans do not detail shaping of track and turnout removal zones the track bed shall be shaped to drain and allow a wheeled vehicle to drive the grade at 20 mph. Coordinate with Railroad for timing of all track removals.

J. Remove Crossing Panels.
Remove crossing panels and associated material. Removed crossings panels shall become property of the Contractor and shall be removed from the project site and be properly and legally disposed of off of the property. At Contractor's option, removed crossing panels may be salvaged.

K. Track Construction.
Track Construction by Contractor shall conform to Section 34 11 10 – Railroad Track Construction of the UP Specifications. Additional requirements and modifications are as follows.

1. General.
Railroad plans have been developed per Railroad standard. Contractor work is depicted in the project plans with build notes with grayscale backgrounds. Work to be performed by Railroad forces is depicted in the project plans with build notes with white backgrounds.

2. Track Material.
Contractor shall supply track material for track to be assembled and/or installed by Contractor. Track material supplied by Contractor shall be provided by UP approved suppliers. Contractor shall submit proposed supplier and relevant product information to Engineer for approval prior to ordering material.

Ballast will be supplied by the Railroad and delivered by rail in ballast cars. Contractor shall support Railroad unloading and placement or stockpiling of ballast. Railroad may not be able to place ballast directly on track to be surfaced; Contractor shall make accommodation for stockpiling and redistributing ballast that cannot be placed directly on track to be surfaced.

3. Execution.
Contractor shall provide horizontal and vertical track survey for Contractor and Railroad work. Track survey shall be paid for under the Construction Survey item.

All Contractor installed track and Contractor assembled track panels shall be welded to eliminate joints. Welds and testing of welds shall be performed in accordance with UP specifications and manufacturer recommendations. Welds, ultrasonic testing of rail welds, support for Railroad performed VERSE testing, and incidental work are incidental to track construction and track panel installation.

Transition rails shall be installed at locations indicated in the project plans; transition rails are incidental to track construction and track panel assembly.

4. Payment and measurement.
Part 4 – Payment and Measurement of Section 34 11 10 – Railroad Track Construction of the UP Specifications shall not apply to this project.

L. Crossing Panel Installation.
Concrete crossing panels shall be installed per UP Standard Drawing 0304H and manufacturer recommendations. Perforated drain pipes may be omitted for crossings installed on shoofly tracks. Perforated drain pipes shall be installed for crossings on final tracks and routed to drain at

edge of existing embankment.

M. Railroad Crossing Sign Assembly.
Install railroad crossing sign assembly at crossing locations per UP Standard Drawing 0531. Crossing sign assemblies shall be provided at both approaches of shoofly crossing and final crossing locations. Removal of crossing sign assemblies from shoofly crossing as part of crossing removal is incidental to Railroad Crossing Sign Assembly.

N. Railroad Signals.
All work associated with active railroad signals will be performed by Railroad forces. Railroad forces will remove existing signals from service and salvage any material for their own use. After railroad has decommissioned existing system the Contractor shall remove and dispose of any remaining components of the signal system in conflict with the work including equipment and cabling. At Contractor's option, decommissioned signal equipment not salvaged by the Railroad may be salvaged by the Contractor.

The Contractor shall protect existing railroad signal cabinets, masts, wiring, and appurtenances during construction until they have been decommissioned by the Railroad. All signal equipment and cabling shall be assumed to be active until verified by Railroad forces to be inactive.

150267.04 METHOD OF MEASUREMENT.
Measurement will be as follows:

A. Railroad Subballast, Furnish & Place.
Per ton, satisfactorily placed.

B. Removal of Railroad Track.
Per track linear foot removed measured along the centerline of track.

C. Removal of Railroad Turnout.
Per each removed and disposed of in its entirety.

D. Install Railroad Crossing Sign Assembly.
Per each crossing assembly supplied and installed.

E. Removal of Abandoned Track Materials.
One lump sum for removal and disposal of abandoned track materials as indicated in the plans.

F. HMA Underlayment.
Per square yard of HMA, satisfactorily placed.

G. Subgrade Preparation for Railroads.
Per square yard of subgrade prepared for subballast placement.

H. Track Construction.
Per track linear foot installed measured along the centerline of track.

I. Track Panel Assembly.
Per track linear foot assembled measured along the centerline of track.

J. Remove Crossing Panels.
Per track linear foot removed measured along the centerline of track.

K. Install Crossing Panels.
Per track linear foot installed measured along the centerline of track.

L. Remove and Stockpile Track.
Per track linear foot removed, stockpiled, and reinstalled measured along the centerline of track.

150267.05 BASIS OF PAYMENT.
Payment will be the contract unit price as follows:

A. Railroad Subballast, Furnish & Place.
Payment is full compensation for furnishing, placing, compacting, and trimming subballast per plans and specifications.

B. Removal of Railroad Track.
Payment is full compensation for removal and disposal of all track components including ballast.

C. Removal of Railroad Turnout.
Payment is full compensation for removal and disposal of all turnout components including ballast.

D. Install Railroad Crossing Sign Assembly.
Payment is full compensation for supplying and installing railroad crossing sign assembly.

E. Removal of Abandoned Track Materials.
Payment is full compensation for removal and disposal of all track materials abandoned along railroad right-of-way as indicated in the project plans.

F. HMA Underlayment.
Payment is full compensation for furnishing and installing HMA underlayment. Payment shall be full compensation for furnishing all labor, materials, tools, equipment, supplies, supervision, loading, hauling, placing, compacting, quality control, and incidentals necessary to complete the work in accordance with these specifications.

G. Subgrade Preparation for Railroads.
Payment is full compensation for proofrolling (excluding mitigation), scarification, and compaction of exposed subgrade.

H. Track Construction.
Payment is full compensation for furnishing and installing rail, ties, fasteners, compromise transition rails, joint bars, welding (as necessary), testing, incidental items and accessories, and placing and tamping ballast. Ballast for track construction will be supplied by the Railroad.

I. Track Panel Assembly.
Payment is full compensation for furnishing and installing rail, ties, fasteners, compromise transition rails, joint bars, welding (as necessary), testing, and incidental items and accessories to assemble complete track panels for installation by Railroad forces.

J. Remove Crossing Panels.
Payment is full compensation for removal and disposal of existing crossing panels.

K. Install Crossing Panels.
Payment is full compensation for furnishing and installing concrete crossing panels.

L. Remove and Stockpile Track.
Payment is full compensation for panelizing and stockpiling existing track, including installation of additional track fasteners necessary to keep track panel intact during movement and stockpiling, for future installation by Railroad forces.