



Iowa Department of Transportation

SPECIAL PROVISIONS FOR RAILROAD TRACK

Pottawattamie County
IM-NHS-080-1(370)4--03-78

Effective Date
April 15, 2014

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120164.01 DESCRIPTION.

Railroad Track consists of ties, rails, and fastenings delivered in conformity with the contract documents.

120164.02 MATERIALS.

A. Rail.

New 136 RE rail (136 pounds per yard) shall be provided in 39 or 80 foot lengths. Rail shall conform to Chapter 4, Part 2 of AREMA Manual for Railway Engineering (AREMA). Rail shall be standard strength commercial grade, no industrial grade rail will be accepted.

B. Fastenings.

1. Tie Plates.

Shall be new tie plates per Common Standard 263000 for 6 inch base rail. Tie Plates shall conform to Chapter 5, Part 1 of AREMA.

2. Track Bolts and Nuts.

Shall be new, appropriately sized for the bolt holes in the rail section with length sufficient for a full nut and heavy-duty spring washers (new), including length sufficient to leave at least two threads exposed after the nut is tightened. Track Bolts and Nuts shall conform to Chapter 4, Part 3.5 of AREMA. Refer to BNSF Standard Plan 1600 for details and item numbers.

3. Spring Washers.

Spring washers and nuts shall be sized to ensure that the spring washer develops its full reactive force and does not jam into the joint bar hole. Spring washers shall be of the size to fit the bolt and nut used, shall be new, and shall conform to Chapter 4, Part 3.6 of AREMA.

4. Track Spikes.

Shall be new screw spikes per Common Standard 130800.

5. E Clips.

Shall be new clips per Common Standard 132500.

6. Joint Bars.

Joint bars shall be new and of the size, shape, and punching pattern to fit the rail being joined. Joint bars shall be of the "toeless" and "head free design" to match rail section. New joint bars shall conform to Chapter 4, Part 3.4 of AREMA. Refer to BNSF drawing 1400 for 132 pound details and item numbers.

7. Transition Rails.

Transition rails shall be new and for 136 pound new rail to 132 pound worn (1/4 inch head loss) rail. Refer to BNSF Standard Plan 1457.04 for details and item numbers.

C. Wood Ties.

Wood ties shall conform to Chapter 30, Part 3 of AREMA. All ties shall be new hardwood species. No industrial grade ties will be accepted.

1. Splits shall not be longer than 4 inch and not wider than 1/4 inch at either end. Splits longer than 4 inch but not longer than the width of the face in which the split appears, will be acceptable if specified anti-splitting devices are installed with the splits compressed. Any required adzing and drilling for spikes shall be performed prior to treatment.
2. Wood ties except at the concrete crossing panel: Wood ties shall be sawed and shall be not less than 7 inch thick and 9 inch wide. The length shall be 9.0 feet.
3. Wood ties at the concrete crossing panel: Wood ties shall be sawed and shall be not less than 7 inch thick and 9 inch wide. The length shall be 10.0 feet.

D. Crossing Surface.

Concrete panels for 10.0 foot long wood ties per Common Standards 200100, 200101, 200102, 200900 and 200901. Crossing panels shall be supplied with flangeway fillers attached.

E. Ballast.

Prepared ballast shall be crushed stone Size No. 4 or 4A conforming to Chapter 1, Part 2, of AREMA for quality, soundness and gradation.

120164.03 CONSTRUCTION.

A. General.

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. Track construction not covered by this specification shall be per AREMA Chapter 5, Parts 4, 5, and 8.

B. Wood Ties.

Ties will be unloaded and handled in such a manner as to not damage ties using approved handling equipment such as tie tongs. Standard center-to-center spacing of ties shall be 19.5 inch. Tie spacing within the limits of the crossing panels shall be per crossing panel manufacturer recommendations. Ties shall be laid perpendicular to the center line of the track with the grain up (heartwood side down) for wood ties. The best ties shall be used at the rail joints. The ends of ties on one side of the track shall be parallel to the rail and the center of the tie shall be on the approximate center line of the track. The top surface of ties shall provide full bearing for the tie plates. Adzing of wood ties shall be restricted to that necessary to provide a sound true bearing for the tie plate. Adzing in excess of 0.2 inch will not be permitted. Where adzing is necessary,

the cut surface of the wood tie shall be completely saturated with creosote or other approved preservatives.

C. Tie Plates.

Track shall be fully plated with double-shouldered tie plates set in position with cant surface sloping toward the center of the track. Tie plates shall be free of dirt and other foreign material when installed. Tie plates shall be placed so that the rails will have full bearing on the plate, and the plate will have full bearing on the tie. Tie plates shall be set at right angles to the rail with the outside shoulder against the base of the rail, and centered on the tie. Tie plates shall be applied at the time the rail is laid to avoid unnecessary spiking.

D. Rail.

1. The base of the rail and the surface of the tie and tie plate shall be free of dirt and other foreign materials prior to laying rail. Rail shall be laid without bumping or striking, to standard gage (4 feet 8 1/2 inch between points 5/8 inch below the top of the rail). A track gauge manufactured for the purpose of measuring gage shall be used rather than a tape measure and gage shall be checked every third tie.
2. Any joints shall be assembled prior to fastening rail to ties using joint bars with full number of track bolts and spring washer for each bolt. Loose mill scale and rust shall be removed from rail contact surfaces and joint bars prior to installation.
3. Jointed rail shall be laid with staggered joints located as nearly as possible to the middle of the opposite rail. Continuous welded rail (CWR) will need to be destreeded as soon as possible after laying per BNSF "Procedures for the Installation, Adjustment, Maintenance, and Inspection of CWR in Industry Tracks." All welds shall be installed by an individual qualified by the manufacturer of the weld kit and have documentation to support such qualification. All welds must conform at a minimum to the latest addition of the AREMA Manual.
4. Rails shall be cut square and clean by means of a rail saw. Holes for complete bolting of cut rails shall be drilled and under no circumstances shall new holes be drilled between two holes already drilled. Cutting rails or drilling holes in cut rails by means of acetylene or electric torch will not be permitted.

E. Fastenings.

1. Joints.

- a. Bolted joints will not be permitted within 20 feet of the crossing panels.
- b. Allowance for expansion shall be provided at rail joints by using rail-expansion shims of softwood not over 1 inch width. Shims shall be of the thickness shown in TABLE I. The temperature of the rail shall be determined by use of a thermometer placed on the rail base on the side away from the sun. Typical rail gap gages are as shown.

TABLE I. SHIM THICKNESS

| Rail Temperature (degrees F) | Shim Thickness per 39 ft rail length (inch) |
|---------------------------------|---|
| Below 6 | 5/16 |
| 6 to 25 | 1/4 |
| 26 to 45 | 3/16 |
| 46 to 65 | 1/8 |

| | |
|----------|------|
| 66 to 85 | 1/16 |
| Over 85 | None |

- c. Joint bars shall be clean. Rail joints shall be installed so that bars are not cocked between the base and head of the rail. Bars shall be properly seated in the rail and the full number of correct-size bolts, nuts, and spring washers installed. Bolts shall be placed with nuts alternately on inside and outside of rail. A corrosion resistant lubricant shall be applied to the bolt threads prior to application of nuts. Bolts shall be tightened to an initial bolt tension of between 20,000 and 30,000 pounds, beginning at the center of the joint and working both ways to the ends of the joint.

2. Track Spikes.

- a. Rail shall be spiked promptly after being laid. Screw spikes shall be started and driven vertically and square with the rail. Screw spikes shall be driven until flush with tie plate and shall not be overdriven, or straightened while being driven. Spikes shall not be driven against the ends of joint bars.
- b. Four screw spikes shall be used on each tie driven through the round holes in the tie plates. If spikes are withdrawn from wood ties, the holes shall be swabbed with creosote and plugged with creosoted tie plugs of proper size to fit the hole. If spikes are withdrawn and spikes are to be reinserted in existing spike holes, the holes shall be swabbed with creosote and plugged with creosoted tie plugs prior to re-driving the spike. Tie plugs shall not be installed in pre-bored holes unless spikes have been driven and withdrawn.

3. E Clips.

E Clips shall be installed in accordance with manufacturer recommendations with two clips per tie plate, 4 clips per tie. Do not overdrive the clips, a 3/8 inch gap between the back of the clip and the shoulder is required.

F. Ballast.

- 1. Every tie in the track shall receive two or more full insertions of the tamping heads. Ballast shall be power-tamped under both sides of ties from each end to 15 inches inside each rail. The center shall be filled with ballast, but tamping will not be permitted in the center of the tie between the above stated limits. Both ends of the ties shall be tamped simultaneously and tamping inside and outside of the rail shall be done at the same time. Tamping tools shall not be used with more than 35% wear and shall be worked opposite each other on the same tie. All ties shall be tamped to provide solid bearing against the base of the rail after the track or turnout is raised to grade at final surfacing. All down ties shall be brought up to the base of rail and shall be machine tamped. The resultant track surface and alignment shall be uniform and smooth. Tamping of track in snow or frozen ballast conditions will not be permitted.
- 2. For the road crossing, tamping of ballast materials shall be performed by setting the tamping force and insertion depth to the minimum necessary to adequately tamp the track. The tamper operator shall monitor the depth of tamping and limit the depth to prevent detrimental effects of the tamper feet on the HMA underlayment.
- 3. The ballast between the ties shall be thoroughly compacted with a vibratory compactor, or other approved means, after each raise. The ballast shall be tamped for the entire length of the crossties for the crossing. The track shall receive final alignment and surfacing prior to placement of the crossing surface. The ballast in the cribs and on the shoulders shall be compacted using a vibratory plate compactor or other approved means.
- 4. The minimum depth of ballast between the bottom of the tie and the top of the HMA underlayment shall be 12 inch.

G. Crossing Surface.

Concrete crossing panels shall be installed per manufacturer recommendations.

120164.04 METHOD OF MEASUREMENT.

Measurement will be as follow:

A. Rail (Railroad).

Track linear feet shown in the contract documents.

B. Railroad Crossing, PCC.

Track linear feet shown in the contract documents.

120164.05 BASIS OF PAYMENT.

Payment will be the contract unit price as follows:

A. Rail (Railroad).

1. Per track linear feet.
2. Payment is full compensation for furnishing and installing all ballast, ties, fasteners, rail, and accessories.

B. Railroad Crossing, PCC.

1. Per track linear feet.
2. Payment is full compensation for furnishing and installing crossing panels and accessories.