

WISCONSIN DOT

STANDARD SPECIFICATIONS

FOR

JOINTED RAILROAD TRACK

CONSTRUCTION AND MAINTENANCE

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1.0 MOBILIZATION

- 1.1 Description. See section 619.1 of WisDOT Standard Specifications for Highway and Structure Construction.
- 1.2 Method of Measurement. See section 619.4 of WisDOT Specifications for Highway and Structure Construction.
- 1.3 Basis of Payment. See section 619.5 of WisDOT Standard Specifications for Highway and Structure Construction, except that 100% of the amount bid for mobilization will be paid when 25% or more of original contract amount is earned.

2.0 REMOVE AND SALVAGE TRACK

- 2.1 Description. Work consists of removing the complete track structure, exclusive of ballast, as may be detailed in the Plans or Special Provisions including ties, rails and fastenings, taking care to not damage salvageable material. The former track zone shall be shaped to drain and allow a wheeled vehicle to drive the grade at 20 mph. Excess ballast material may be wasted within the project at locations approved by the Engineer. The Engineer will mark those track components to be reused on the project or retained by the owner and they shall be sorted and separately stockpiled as directed by the Engineer. All other materials shall become the property of the contractor and shall be removed from the project and properly and legally disposed of off the property of the owner.
- 2.2 Method of Measurement. Will be by each Track Foot (TF.), of track removed and disposed of as described above.
- 2.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for removing and salvaging track as described above, which price shall be full compensation for all equipment, tools, labor and incidentals necessary to complete the work.

3.0 REMOVE AND SALVAGE OF TURNOUTS

- 3.1 Description. Work consists of removing the complete turnout as may be detailed in the Plans or Special Provisions including all track materials, exclusive of ballast, taking care not to damage salvageable material. The turnout refers to all track materials, exclusive of the ballast within the limits of the switch ties, including switch ties, rail, switch points, frog, guard rails, switch stand, tie plates and fastenings. The former turnout zone shall be graded as directed by the Engineer. Excess ballast material maybe wasted within the project at locations approved by the Engineer. The Engineer will mark those components to be reused on the project or retained by the owner and they shall be sorted and separately stockpiled as directed by the Engineer.

All other materials shall become the property of the contractor be removed from the project and be properly and legally disposed of off the property of the owner.

- 3.2 Method of Measurement. Shall be by Each (Ea.) turnout removed and disposed of as described above.
- 3.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for removal and salvage of turnouts as described above, which price shall be full compensation for all equipment, tools, labor and incidentals necessary to complete the work.

4.0 REMOVE AND SALVAGE OF RAILROAD DIAMONDS

- 4.1 Description. Work consists of removing the railroad crossing diamond(s) as may be detailed in the Plans or Special Provisions, including all track materials, exclusive of ballast, within the limits of the supporting ties, taking care not to damage salvageable material. The former diamond zone shall be graded as directed by the Engineer. Excess ballast material may be wasted within the project, at locations approved by the Engineer. All materials shall be sorted and stockpiled by timber, rail, and fastenings and as directed by the Engineer, remain the property of and be disposed of by the owner.
- 4.2 Method of Measurement. Shall be by Each (Ea.) diamond removed and disposed of as described above. The diamond includes all track materials, exclusive of ballast, with the limits of the supporting ties.
- 4.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for removal and salvage of railroad diamonds as described above, which price shall be full compensation for all equipment, tools, labor and incidentals necessary to complete the work.

5.0 REMOVE AND SALVAGE HIGHWAY/RAILROAD GRADE CROSSINGS

- 5.1 Description. Work consists of removing the track grade crossing(s) as may be detailed in the Plans or Special Provisions, including all track, crossing surface materials and ballast located from 12” below the bottom of the cross ties to the top of rail, taking care not to damage salvageable material. The Engineer shall mark those components to be used on the project and they shall be sorted and separately stockpiled as directed by the Engineer. All other material shall, be sorted and stock piled by crossing surface material, timber, rail and fastenings, as directed by the Engineer and shall be removed from the crossing and legally and properly disposed of site by the contractor.
- 5.2 Method of Measurement. Will be by each Track Foot (TF.), as measured along the track center line, of crossing removed and disposed of as described above.

5.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for removing and salvaging track, crossing surface and ballast through a grade crossing as described above, which price shall be full compensation for all equipment, tools, labor and incidentals necessary to complete the work.

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10.0 FURNISH SECONDHAND RAIL

10.1 Description. Work consists of furnishing Grade #1 relay rail which is defined as conforming to the following specifications:

10.1.1 Curves and Bends. Rails are to be a minimum of 33' in length, straight for line and surface and free of kinks, bends and sweeps except that a backsweep of 1" for 33' rails, 1-1/8" for 36' rails and 1-1/2" for 39' rails is acceptable, providing the backsweep is uniform and has no short kinks or bends.

10.1.2 Ball Wear. Wear on the ball shall not exceed 1/8" from the original profile on top and only one side. Smooth built up ends are acceptable. Rail ends must be square. Rail shall not show a loss due to wear of more than 2% from the original weight.

10.1.3 Overflow. Overflow to be a maximum of 1/16" total on one or both sides. No flat spots on rail heads permissible.

10.1.4 End Chipping. No end chipping allowed.

10.1.5 Wheel Burns. No wheel burns allowed.

10.1.6 Bases and Webs. Rail bases and webs shall be solid and free from visual defects. No spike notching or pitting permitted. No additional bolt holes are permitted other than the bolt holes located at the ends of the rail. Bond holes are acceptable as long as they are not located within the joint bar area.

10.1.7 Other Defects. Rail must be free from obvious defects and clean in appearance. Chisel cut or torch cut rail will not be accepted. Rail with split head, broken base, scaling rust, grooves under the head due to joint bar wear, detector car marks, where it is definitely known that a

defect exists, (such as I.D. marks or holes drilled in the web), cracked web, head and web separations, bolt hole cracks or corrugations will not be accepted.

10.1.8 All rails are to be steel and of “tee” rail section and a minimum of 33’ in length.

10.1.9 Rail section, length, and drilling shall be as per the Special Provisions.

10.2 Description. Work consists of furnishing Grade #2 relay rail conforming to the following specifications:

10.2.1 Ball Wear. Wear on the ball shall not exceed 3/16” from the original profile. Smooth built up ends are acceptable. Rail ends must be square. Rail shall not show a loss due to wear of more than 4% from the original weight. Wear on the side of the ball shall be on one side only.

10.2.2 Overflow. Overflow to be a maximum of 1/8” on one or both sides. No flat spots on rail heads are permissible.

10.2.3 End Chipping. End chipping shall not exceed 1” across top of head, and no more than 1/4” in or deeper than 1/8”.

10.2.4 Wheel Burns. 6 wheel burns per rail maximum. Burns shall not be greater than 1” in diameter and 1/16” maximum depth. Rail with wheel burns is not acceptable if the burn is such that metal has started to or has shelled out.

10.2.5 Curves and Bends, Bases, Webs, Other Defects: Refer to Section 10.1 of these specifications.

10.3 Method of Measurement. Will be by each Net Ton (NT.), of rail delivered as described above. The Engineer shall verify the quantities with delivery weight tickets.

10.4 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing rail as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, tools, labor and incidentals necessary to complete the work.

11.0 FURNISH SECONDHAND TIE PLATES

11.1 Description. Work consists of furnishing secondhand tie plates conforming to the following specifications:

- 11.1.1 The tie plates shall conform to the American Railway Engineering and Maintenance of Way Association (AREMA), Manual for Railway Engineering, Chapter 5, Track, Section 1, Designs of Tie Plates for use with RA-A and RE Rail Sections, with the following additions or deletions:
- 11.1.2 Tie plates are to be of number one relay quality and shall not be deformed or have lost more than 5% in weight due to wear. They shall have 4 rail holding spike holes.
- 11.1.3 Tie plate details, i.e. overall dimension, shoulders, punching, rail seat, shall be as per the Special Provisions.
- 11.2 Method of Measurement. Will be by Each (Ea.) tie plate delivered as described above.
- 11.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing tie plates as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, tools, labor and incidentals necessary to complete the work.

12.0 FURNISH TURNOUT COMPONENTS

- 12.1 Description. Work consists of furnishing new or reconditioned secondhand turnout components conforming to the following specifications:
 - 12.1.1 All turnout components shall conform to the appropriate AREMA Portfolio of Trackwork Plans and rail section as noted in the Special Provisions.
 - 12.1.2 Self guarded manganese frogs shall be new or reconditioned secondhand and conform to the appropriate AREMA Portfolio of Trackwork Plans as noted in the Special Provisions. **Note: These frogs are NOT allowed on main tracks.**
 - 12.1.3 Railbound manganese frogs and guard rails shall be new or reconditioned secondhand and conform to the appropriate AREMA Portfolio of Trackwork Plans as noted in the Special Provisions.
 - 12.1.4 Bolted Ridged frogs and guard rails shall be new or reconditioned secondhand and conform to the appropriate AREMA Portfolio of Trackwork Plans as noted in the Special Provisions.
 - 12.1.5 Switch points and accessories (including cast or welded heel block

assemblies) shall be new or reconditioned secondhand. They shall be not less than 16'-6" straight split switch and shall conform to the appropriate AREMA Portfolio of Trackwork Plans as noted in the Special Provisions.

12.1.6 All reconditioned components shall be unpainted.

12.1.7 Switch Stand shall be a two tie switch stand and shall be National Trackwork Heavy Duty "Back Saver" Model 1008ARS or approved equal.

12.2 Method of Measurement. Shall be by Each (Ea.), turnout component delivered as described above and including high star, 2 tie, switch stand with target and connecting rod. The switch target type, style and color must be approved by the operating railroad.

12.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing turnout components as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

13.0 FURNISH SECONDHAND JOINT BARS

13.1 Description. Work consists of furnishing secondhand joint bars conforming to the following specifications:

13.1.1 The joint bars must be the toeless type, straight, free from cracks, alterations, flame cuts, damages or breaks, and shall be designed for, and make up a tight joint when applied to the rail section furnished herein.

13.1.2 No pig eye or reformed bars permitted.

13.1.3 Angle bar details, i.e. punch, size, etc., shall match rail provided or other specific rail and drilling. Holes Drilled in rail ends should be sized 1/16"-1/8" larger than the diameter of the bolt to be used.

13.2 Method of Measurement. Will be by each Pair (Pr.), of joint bars delivered, as described above.

13.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing joint bars as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

14.0 FURNISH TRACK BOLTS, NUTS AND SPRING WASHERS

- 14.1 Description. Work consists of furnishing new track bolts, free fit nuts and spring washers conforming to the following specifications:
- 14.1.1 The track bolts and nuts shall conform to the AREMA Manual for Railway Engineering, Chapter 4, Rail, Section 2.
 - 14.1.2 Bolt details, i.e. length, diameter shall be as per Special Provisions.
 - 14.1.3 Spring washers shall be 3/8" heavy duty carbon steel for the supplied bolts and shall conform to both the AREMA Manual for Railway Engineering, Chapter 4, Rail, Section 2 and the Special Provisions.
- 14.2 Method of Measurement. Will be by Each (Ea.), bolt, nut and spring washer as a unit, delivered as described above.
- 14.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing track bolts, nuts and spring washers as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

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16.0 FURNISH TRACK SPIKES

- 16.1 Description. Work consists of furnishing new track spikes and conforming to the AREMA Manual for Railway Engineering, Chapter 5, Section 2, Specifications for High-Carbon Steel Track Spikes. Maximum of 200 lb. kegs shall be used. Spike details, i.e., size as per Special Provisions.
- 16.2 Method of Measurement. Will be by each Keg (Kg.) of track spikes delivered as described above.
- 16.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing track spikes as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

17.0 FURNISH CROSS TIES

- 17.1 Description. Work consists of furnishing new cross ties of that size and grade noted in the Special Provisions and are to conform to AREMA Manual for Railway Engineering, Chapter 3, Ties and Wood Preservation, with the following

additions or deletions:

- 17.1.1 New industrial ties shall be oak or other hard woods. The ties shall be 6"X8" (not to exceed plus or minus 1/2" variance) X 8'6" (not to exceed plus or minus 2" variance). Ties shall have anti-splitting devices applied selectively. The maximum allowable split shall be 8" long by 1/2" wide providing anti-splitting devices have been applied. In addition, shake cannot appear on more that one face and the following is allowed as long as the tie strength and spike holding capacity is not impaired; fire scar, sound knots not exceeding 1/3 the tie width, splinter pull, holes (grub or other) 1 1/2" diameter and/ or 5" deep.
- 17.1.2 All AREMA 6" and 7" ties shall conform to AREMA Manual for Railway Engineering Chapter 3, Ties and Wood Preservations. The maximum allowable split, in the cross ties, shall be 5" long by 3/16" wide, providing sufficient anti-splitting devices have been applied.

Woods acceptable for ties shall be from Groups Ta, Tc, and Td of 1.1.6.4 of Chapter 3 of the afore mentioned Manual. Boultonized material is acceptable.

- 17.1.3 Grade B Creosote Coal Tar solution shall be used on new ties as a preservative with minimum retention of eight pounds (8.0 lb.) per cubic foot. Treatment shall be in accordance with the American Wood Preserver's Association Standard (AWPA) and Creosote solutions per P2-89. The owner reserves the right to conduct independent inspections on the ties; to perform borings to determine the depth of treatment.

Adzing and boring of new ties is not required.

- 17.2 Description. Work consists of furnishing second hand relay ties of that size and grade noted in the Special Provisions and shall conform to AREMA Manual for Railway Engineering, Chapter 3, Ties and Wood Preservation, with the following additions or deletions:

- 17.2.1 All secondhand relay cross ties shall be oak or other hardwoods and shall have previously conformed with all applicable requirements of AREMA Specs., Chapter 3. The ties shall be a minimum of 7" X 8" X 8'6", straight, sawed top and bottom sides and ends. The maximum allowable split in the ties shall be 8" long by 3/8" wide providing sufficient anti-splitting devices had been properly applied. No ties will be accepted with decay, excessive or elongated spike holes or in a generally unacceptable condition.

17.2.2 No tie shall be plate cut or wheel marked deeper than 1/4".

17.3 Method of Measurement. Will be by Each (Ea.) cross tie delivered as described above.

17.4 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing cross ties as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

18.0 FURNISH SWITCH TIES

18.1 Description. Work consists of furnishing new switch ties, 7"x 9" and of that length noted in the Special Provisions, and shall conform to AREMA Manual for Railway Engineering, Chapter 3, Ties and Wood Preservation, with the following additions or deletions:

18.1.1 Sections 17.1.1, 17.1.2 and 17.1.3 shall apply.

18.1.2 Switch tie lengths shall be in equal increments of one foot.

18.1.3 Complete sets of switch ties shall contain 4 additional 17' switch ties.

18.2 Method of Measurement. Will be by each Thousand Board Foot Measure (MBM) of switch ties delivered as described above.

18.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing switch ties as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

19.0 FURNISH BALLAST

19.1 Description. Work consists of furnishing ballast conforming to the AREMA Manual for Railway Engineering, Chapter 1, Part 2, Section 2.4, Specifications for Processed Stone with the following additions:

19.1.1 AREMA Size No. 4 or 4A ballast shall be used as specified in the Special Provisions.

19.1.2 Representative samples weighing not less than 100 lb. of the material shall be furnished for testing purposes. Ballast sampling and testing shall conform to the AREMA Manual, Chapter 1, Part 2, Section 2.8.

19.2 Method of Measurement. Will be by each Net Ton (NT.) of ballast delivered as

described above, including sampling and testing. The Engineer shall verify the quantities with delivery weight tickets.

- 19.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing ballast as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

20.0 FURNISH INSULATED JOINT

- 20.1 Description. Work consists of furnishing new insulated joint per the following specifications:

20.1.1 Insulated joint shall be Portec Continuous insulated or equal and be supplied with Portec Black Belt-Mark II insulation or equal.

20.1.2 Joint shall be supplied to fit rail section as per Special Provisions.

- 20.2 Method of Measurement. Will be by each Pair (Pr.) of insulated joints delivered as described above.

- 20.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing insulated joints as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, tools, labor and incidentals necessary to complete the work.

21.0 FURNISH RAIL LUBRICATOR

- 21.1 Description. Work consists of furnishing new rail lubricator per the following specifications:

21.1.1 Lubricator shall be Portec Model MC-2 or equal.

21.1.2 Wiping bar detail as well as rail section shall be as per Special Provisions.

- 21.2 Method of Measurement. Will be by Each (Ea.) rail lubricator delivered as described above.

- 21.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing rail lubricator as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, tools, labor and incidentals necessary to complete the work.

22.0 FURNISH COMPROMISE JOINT BARS

- 22.1 Description. Work consists of furnishing new compromise joints. The new compromise joints shall conform to the following specifications:
- 22.1.1 Compromise joint bar pairs shall have matched bars, i.e. LH/RH or Inside/Outside or IR/2R or 3L/4L, etc. and shall be a minimum of 30” in length to fit that rail section as per the Special Provisions.
- 22.1.2 Type shall be Western-Cullen-Hayes Q&C or equivalent.
- 22.2 Method of Measurement. Will be by each Pair (Pr.) of compromise joints delivered as described above.
- 22.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing compromise joints as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

23.0 FURNISH TIE PLUGS

- 23.1 Description. Work consists of furnishing new, treated wood tie plugs of that size specified in the Special Provisions and shall conform to AREMA Manual of Railway Engineering Chapter 3, Ties and Wood Preservation or shall be new untreated Cedar wood tie plugs of that size specified in the Special Provisions.
- 23.1.1 The size of the plug as specified in the Special Provisions.
- 23.2 Method of Measurement. Shall be per 1000 Each (1000 Ea.) tie plugs delivered as described above.
- 23.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing tie plugs as described above, which price shall be full compensation for all material, equipment, tools, labor and incidentals necessary to complete the work.

24.0 FURNISH ENGINEERING FABRIC

- 24.1 Description. Work consists of furnishing engineering fabric. The fabric shall be 12’-6” wide and US Fabrics 205NW or equal.
- 24.2 Method of Measurement. Will be by the Square Yard (Sq. Yd.) of engineering fabric delivered as described above.
- 24.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing engineering fabric as described above, which

price shall be full compensation for all material, equipment, tools, labor and incidentals necessary to complete the work.

25.0 FURNISH RAIL ANCHORS

25.1 Description. Work consists of furnishing new rail anchors of the drive on type.

25.1.1 The anchors shall fit the rail section as specified in the Special Provisions and conform to AREMA Manual for Railway Engineering, Chapter 5, Part 7 Rail Anchors, specifications for function and design.

25.1.2 The rail base measurements shall be made by the supplier prior to manufacturing to ensure proper fit for the rail size specified in the Special Provisions.

25.2 Method of Measurement. Will be by Each (Ea.) rail anchor furnished as described above.

25.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing rail anchors as described above and in the Special Provisions which price shall be full compensation for all the material, equipment, tools, labor and incidentals necessary to complete the work.

26.0 FURNISH TIMBER CROSSING MATERIAL

26.1 Description. Work consists of furnishing new crossing timber material of the size noted in the Special Provisions and fastenings, and shall conform to AREMA manual for Railway Engineering, Chapter 3, Ties and Wood Preservation, with the following additions or deletions:

26.2 New Timber shall be from live timber, fresh cut logs, White Oak, Red Oak, Hard Maple, Yellow Birch, Black Walnut, Cherry, Locust, Red Gum, (sap) and Black Gum. Others will not be accepted.

26.3 All Timber shall be full sawn to meet specified dimensions, shall be straight, cut square at the ends, have bottom and top parallel and have bark entirely removed. All timbers shall have Galvanized end plates applied to the ends prior to creosote treatment. Timbers shall not have holes larger than ½” in diameter and 3” deep within, or more than one-fourth the width of the surface on which it appears and 3” deep outside the section of the timber between 12” from each end of the timber. Maximum allowable split shall be no more than 5” long by ½” wide, providing anti-splitting devices have been applied. Shake may not exceed one-third the width of the timber and extend nearer than 1” to any surface. Large knots with an average width of one-fourth the width of the surface, on which it appears, are allowed only within 12” from each end of the timber. Flange and

guard timber shall be in lengths of 8'0", 12'0" and 16'0". On track curves of 5 degrees or over timber shall be 8'0" in length only.

26.4 All timber fasteners shall be Camcar Textron Timber Screw or equal; ¾" x 12" square head to securely fasten the timber crossing material.

26.5 Method of Measurement. Will be by LF of crossing.

26.6 Basis of Payment. This item of work as measured above will be paid for at the contract unit price per track feet of crossing for furnishing timber crossing material as described above and in the Special Provisions which, price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

27.0 FURNISH CONCRETE CROSSING MATERIAL

27.1 Description. Work consists of furnishing concrete crossing material, fastenings, end plates and attached flange material per BNSF and Union Pacific Common Standards, or approved equal and the following specifications.

27.2 The concrete material along with fastenings, end plates and attached flange material supplied shall fit the rail section and specifications per the Special Provisions and manufacturer's specifications.

27.3 Contractor shall furnish the Engineer with a copy of the installation specifications supplied by the manufacturer

27.4 Method of Measurement. Will be by track foot of crossing.

27.5 Basis of Payment. This item if work as measured above, will be paid for at the contract unit price of track feet of crossing for concrete crossing material as described above and in the Special Provisions which, price shall be full compensation for all material, equipment, labor and incidentals necessary to complete the work.

28.0 Blank

29.0 REPLACE RAIL

29.1 Description. Work consists of removing and replacing existing rails at random locations in track, including the following:

29.1.1 The Engineer shall mark those rails that require replacement, and shall advise the Contractor of their location. In general, the rails to be replaced may be in various locations within the Project limits, as indicated in the Special Provisions.

- 29.1.2 Any rail cropping shall be accomplished by saw cut, and new bolt holes made shall be by drilling, for which payment is incidental to this item. The use of a torch is strictly prohibited for cutting rails and blowing bolt holes.
 - 29.1.3 All labor and equipment, which is necessary to remove and replace the rails and fastenings as well as for the installation of tie plugs as per Section 41.1, shall be included in this item. All serviceable rail and fastening materials necessary to reassemble the track will be paid for under another pay item.
 - 29.1.4 Section 63.1 where appropriate shall apply.
 - 29.1.5 The Engineer will mark those usable rails and fastenings and these shall be sorted, separately stockpiled, and any remaining scrap rail and fastenings shall be sorted, stockpiled as directed by the Engineer, and remain the property of the owner.
- 29.2 Description. Work consists of removing and replacing rails out of face in existing track as specified in the Special Provisions.
- 29.2.1 The Engineer will advise the contractor of the location and limits of the rail renewal.
 - 29.2.2 Rail renewal may either be in kind or of a different section, as described in the Special Provisions.
 - 29.2.3 All labor and equipment, tools and incidentals necessary to remove and replace rails and fastenings, as well as the installation of tie plugs as per Section 41.1 shall be included in this item.
 - 29.2.4 Section 63.1 where appropriate shall apply.
 - 29.2.5 The Engineer will mark those usable rails and components and these shall be sorted and separately stockpiled as directed by the Engineer. Remaining scrap rail and fastenings shall be sorted and stockpiled as directed by the Engineer, and remain the property of the owner.
- 29.3 Method of Measurement. Will be by the Linear Foot (LF.) of rail installed as described above.
- 29.4 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing rail as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools,

and incidentals necessary to complete the work.

30.0 REPLACE TIE PLATES

30.1 Description. Work consists of replacing tie plates as described in the Special Provisions where tie plate installation has not been covered in another item and includes the following:

30.1.1 Removal of spikes, plugging the holes, adzing tie, placing tie plate on tie, gaging and spiking. Plate must be placed so as to have full bearing on the tie.

30.1.2 All fastenings necessary to reassemble the track shall be paid for under another pay item. Installation may be out of face or random plates throughout the project zone as directed by the Engineer, and described in the Special Provisions.

30.1.3 The remaining scrap fastenings shall be stockpiled as directed by the Engineer and shall remain the property of the owner.

30.2 Method of Measurement. Will be by Each (Ea.) tie plate installed as described above.

30.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing tie plate as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

31.0 INSTALL TURNOUT

31.1 Description. Work consists of removing the entire existing turnout excluding switch ties, to the first rail joint beyond the switch ties and either upgrading or renewing the turnout in accordance with specific AREMA Plans referred to in the Special Provisions. The Engineer shall mark those components to be reused on the project and they shall be sorted and separately stockpiled as directed by the Engineer. All other materials shall be sorted by rail, and fastenings and stockpiled as directed by the Engineer and remain the property of, and be disposed of by the owner.

31.1.1 Section 55.1 and 64.1 where appropriate shall apply.

31.1.2 Payment for switch tie plugging shall be included in this item and installed in accordance with Section 42.1.

31.1.3 Spiking of regular tie plates shall consist of two rail holding spikes per

plate on tangent track and one additional rail holding spike per plate on the gage side of curve track.

- 31.2 Method of Measurement. Will be by Each (Ea.) turnout removed and replaced as described above.
- 31.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for removal and installation of a new or reconditioned secondhand turnout as described above and in the Special Provisions, which price shall be full compensation for all the equipment, labor, tools and incidentals necessary to complete the work.

32.0 INSTALL SECONDHAND JOINT BARS

- 32.1 Description. Work consists of replacing defective joint bars with material as described in the Special Provisions, and includes:
 - 32.1.1 Removing the defective joint bars as directed by the Engineer and applying tie plugs and usable joint bars, with full compliment of bolts, nuts and washers, and redriving spikes.
 - 32.1.2 The rail (within the limits of the joint bar) shall be lubricated with Texaco 904 or equivalent (applied @ a rate of 1 pound per 24" bar) prior to applying the joint bars. No spike shall be driven in the slots of the joint bar, nor within 2" of the edge of the bar, unless in contact with the toe of the bar. Scrap material shall be stockpiled as directed by the Engineer and remain the property of, and be disposed of by the owner.
- 32.2 Method of Measurement. Will be by each Pair (Pr.) of joint bars fully installed as described above.
- 32.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for replacing joint bars as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

33.0 INSTALL TRACK BOLTS, NUTS, AND SPRING WASHERS

- 33.1 Description. Work consists of replacing or installing, as a unit, track bolts, nuts and washers as identified by the Engineer and described in the Special Provisions and includes:
 - 33.1.1 Removal of defective track bolts, nuts and washers and installing and

tightening new or usable track bolts, nuts and spring washers using a power track wrench with torque adjustment.

33.1.2 Drill new bolt holes where none exist.

33.1.3 Scrap material shall be stockpiled as directed by the Engineer and remain the property of the owner.

33.2 Method of Measurement. Will be by Each (Ea.) track bolt unit removed and installed. When installation only of track bolt unit is directed by the Engineer, measurement shall be the same as for track bolt removed and installed.

33.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for replacing or installing track bolts, nuts, and washers as described above and in the Special Provisions, which price shall be full compensation of all equipment, labor, tools and incidentals necessary to complete the work.

34.0 INSTALL TRACK SPIKES

34.1 Description. Work consists of applying additional track spikes at locations identified by the Engineer and described in the Special Provisions.

34.1.1 Spiking of regular tie plates shall consist of two rail holding spikes per plate on tangent track. Additional spikes may be required as directed by the Engineer.

34.2 Method of Measurement. Will be by Each (Ea.) additional track spike applied as described above.

34.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for applying additional track spikes as described above and in the Special Provisions, which price shall be full compensation for all, equipment, material, labor, tools and incidentals necessary to complete the work.

35.0 INSTALL CROSS TIES

35.1 Description. Work consists of replacing those ties as indicated by the Engineer and described in the Special Provisions.

35.1.1 Work includes all labor, equipment and tools necessary to remove and replace the tie, spikes, tie plates, anchors and other fastenings.

35.1.2 Cross ties shall be spaced uniformly with adjacent ties, inserted normal to the center line of the track in line with the existing ends of ties on

the line side, with hearts down for new ties and former top side up for second hand ties.

- 35.1.3 In project segments where surfacing will not be performed the ties shall be inserted with a minimum of track disturbance and tamped firmly.
 - 35.1.4 Ties shall be fully plated and spiked in accordance with Section 63.1.4. Spikes are not to be installed in slots of slotted joint bars or within 2” of the end of the bar unless the spike is in contact with the face of the bar. Tie plugging is covered in Section 41.1.
 - 35.1.5 Ballast section shall be dressed down to conform to the existing adjacent section.
 - 35.1.6 All scrap ties shall be stockpiled in areas within the project limits designated by the Engineer and shall be properly and legally disposed of by the contractor.
- 35.2 Method of Measurement. Will be by the Each (Ea.) cross tie installed as described above.
- 35.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for cross tie installation, as described above and in the Special Provisions, which price shall be full compensation for all the equipment, labor, tools and incidentals necessary to complete the work.

36.0 INSTALL SWITCH TIES

- 36.1 Description. Work consists of replacing those ties as indicated by the Engineer and described in the Special Provisions with owner furnished ties.
- 36.1.1 Work includes all labor, equipment necessary to remove and replace the tie, spikes, tie plates, anchors and other fastenings.
 - 36.1.2 Switch ties shall be spaced in accordance with the turnout plan, inserted normal to the center line of the straight track in line with the existing ends of ties on the line side, with hearts down for new ties and former top side up for second hand ties.
 - 36.1.3 In project segments where surfacing will not be performed the ties shall be inserted with a minimum of track disturbance and tamped firmly for their entire length.
 - 36.1.4 Ties will be fully plated and spiked in accordance with Section 35.1.4

and 63.1.4.

- 36.1.5 Ballast section shall be dressed down to conform to the existing adjacent section.
- 36.1.6 All scrap ties shall be stockpiled in areas designated by the Engineer and shall be properly and legally disposed of by the contractor.
- 36.2 Method of Measurement. Will be by each Linear Foot (LF.) of switch ties installed as described above.
- 36.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for switch tie installation, as described above and in the Special Provisions which price shall be full compensation for all the equipment, labor, tools and incidentals necessary to complete the work.

37.0 PLACE BALLAST AND SURFACE TRACK

- 37.1 Description. Work consists of the following (in the sequence shown below only):
 - 37.1.1 Distribute ballast at the rate of .25 net tons to .60 net tons per track foot including turnouts, or as designated by the Engineer, or as described in the Special Provisions.
 - 37.1.2 Track shall be raised to the elevation shown on the plan, or as provided in Special Provisions, or directed by the Engineer. No raise shall be more than three inches in one lift. Areas requiring a greater raise will have to be worked more than once and additional ballast may be required. All cross ties are to be fully tamped before proceeding with any additional lift. The track raising and surfacing equipment shall be power tamping machines. Tamping shall consist of two insertions per lift at an inserting depth of not less than one and one half inches (1&1/2") and not more than two inches (2") below the tie bottom. The ballast under the track ties shall be tamped under both sides from each end of the tie to a point 15" inside each rail. Centers will be filled with ballast but not tamped, except at crossings. Switch ties must be thoroughly tamped for the entire length.

The power tamping machines shall be multi-tooled automatic tamping machines having automatic profile reference beams of not less than seventy five (75) feet, equipped with a laser alignment and having tamping pressures sufficient to provide complete and uniform consolidation of the ballast beneath each tie. No shoulder hack tampers may be used. When track is raised or jacked, care must be exercised to avoid stressing or permanently bending the rail, joints or turnout

components. Should a rail or joint bar be broken in the course of the work, it shall be replaced. Payment for broken rails or joint bars are considered incidental to surfacing of track.

Each tamping tool foot shall be replaced once its aggregated size is reduced to one and one half inches by three inches (1&1/2" x 3"). If track is surfaced with a defective or missing tamping tool, the track (over which the defective or missing tamping tool was operated) shall be resurfaced, at no cost to the project.

The lead tamping machine may be followed by a junior machine; the junior machine may lack the profile reference system, otherwise the tamping operation shall be identical to the lead machine as far as tamping feet, the number of insertions, squeeze pressures and other related characteristics. The lead machine shall tamp a minimum of every other tie and the junior machine tamp all other ties. During the surfacing operation, if any crib is void of ballast below the bottom of the tie, the area of track shall be re-tamped following the application of additional ballast.

Unless provided otherwise in the plans or Special Provisions, super elevation of curves will be established by the Project Engineer per curve location and generally will be from 1/2" to 1".

- 37.1.3 Lining may be accomplished in conjunction with the surfacing or as a separate operation and shall be accomplished with a machine capable of producing smooth and uniform curves per 37.1.2.
- 37.1.4 All down or down and cornered ties shall be raised to their proper elevation and properly tie plated and spiked prior to being tamped with a tamper equivalent to the machine referred to in 37.1.2.
- 37.1.5 High spikes within the surfacing limits shall be removed, tie plugs shall be installed, and new spikes driven down. Tie plugs shall be installed in accordance with 41.1.
- 37.1.6 Track surface tolerances shall comply with the following (except for grade crossings, turnouts and bridges):

The runoff in any 31feet of rail at the end of a raise may not be more than 1/8".

The deviation from uniform profile on either rail at the mid-ordinate of a 62 foot chord may not be more than 1/8".

The deviation from zero cross level at any point on tangent or from

designated elevation on curves between spirals may not be more than 1/8".

The difference in cross level between any two points less than 62 feet apart on tangents or curves may not be more than 1/8".

37.1.7 Track alignment tolerance shall comply with the following;

On tangent track, the deviation of a mid-ordinate from a 62 foot line may not be more than 1/8".

On curved track, the deviation of the mid-ordinate from a 62 foot chord may not be more than 1/8".

37.1.8 The surface tolerance through and 50 feet either side of the ends of grade crossings and turnouts, 50 feet either side of open deck bridges and across ballast deck bridges shall comply with the following:

The deviation from uniform profile on either rail at the mid-ordinate of a 62 foot chord may not be more than 1/8".

The deviation from zero cross level at any point on tangent or from designated elevation on curves may not be more than 1/4".

The difference in cross level between any two points less than 62 feet apart on tangents and designated elevation on curves may not be more than 1/4".

The alignment tolerance shall comply with the following:

On tangent tracks, the deviation of the mid-offset from a 62 foot line may not be more than 1/8".

On curved track the deviation of the mid-ordinate from a 62 foot chord may not be more than 1/8".

37.1.9 Spiral transitions shall be employed at each end of every curve on a main track. The spiral shall fit the curve to provide a smooth transition at the maximum allowable train speed. Change in superelevation in any 31 foot section of spiral may not be greater than 1/4".

37.1.10 Ballast shall be dressed to the section for the track shown on the WisDOT Standard Drawing entitled Standard Railroad Section dated 12/7/2004, using a machine designated or that purpose which includes adequately sweeping the ballast to an elevation approximately 1" below the top of ties. When brooming, the shield shall be down.

Whenever the ballast, following the dressing operation, is 2” or more below the top of the ties, additional ballast shall be applied. The ballast section must be dressed uniformly any surplus ballast shall be dressed evenly along the ballast shoulder. Dressing ballast by placing earth higher than the ballast toe, preventing proper drainage, shall not be permitted.

Caution shall be exercised while regulating ballast shoulders so as to avoid track misalignment and to avoid obstructing adjacent drainage ditches, structures or culverts with ballast, dirt, vegetation or other material. Care shall be taken, around turnouts to provide adequate walkways.

Switch points, switch rods, and spring frogs, shall be pocketed and cleaned of ballast to a depth of 3” below the top of the tie for the length of the tie. No ballast shall be left on the top of open deck bridge ties, girders, or abutments.

37.2 Method of Measurement. Will be by each, Net Ton (NT) of ballast used as described above.

37.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for ballast distributed, track and turnouts surfaced, lined and dressed, as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

38.0 INSTALL INSULATED JOINT

38.1 Description. Work consists of installing new insulated joint as described in the Special Provisions and may include:

38.1.1 Remove existing joint and stockpile as directed by the Engineer.

38.1.2 Cut and drill rail at the new joint location. Rail ends shall be ground smooth to eliminate any contact between the rail ends.

38.1.3 Install new insulated joint, plugging and driving spikes.

38.2 Method of Measurement. Will be by each, Pair (Pr.) of insulated joint bars installed as described above.

38.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing new insulated joint, as described above and in the Special Provisions, which price shall be full compensation for all the equipment,

labor, tools and incidentals necessary to complete the work.

39.0 INSTALL RAIL LUBRICATOR

- 39.1 Description. Work consists of installing flange oiler in accordance with the manufacturer's instructions and at the location designated by the Engineer.
- 39.2 Method of Measurement. Will be by Each (Ea.) flange oiler installed as described above.
- 39.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing flange oiler, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

40.0 INSTALL COMPROMISE JOINT BARS

- 40.1 Description. Work consists of replacing or installing compromise joint bars with new or usable material as described in the Special Provisions and including:
- 40.1.1 Removing spikes and the defective compromise bars, or
 - 40.1.2 Removing spikes and the joint bars where required to join unequal rail Sections, or
 - 40.1.3 As directed by the Engineer, where spike pulling, rail cutting and drilling new bolt holes maybe required.
 - 40.1.4 Space ties so that no part of the tie is under the ends of the rail.
 - 40.1.5 Apply tie plugs and the new or usable compromise bars, with full compliment of usable bolts, nuts and washers and redriving spikes. Compromise bars are to be applied after the rails have been lubricated with Texaco 904 or equivalent (at a rate of one pound per 24").
 - 40.1.6 Scrap material shall be stockpiled as directed by the Engineer and remain the property of, and be disposed of by the owner.
- 40.2 Method of Measurement. Will be by each Pair (Pr.) of compromise joint bars fully installed as described above.
- 40.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for replacing and/or installing compromise joint bars as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to

complete the work.

41.0 INSTALL TIE PLUGS IN SECONDHAND CROSS TIES

- 41.1 Description. Work consists of installing new treated tie plugs for secondhand cross ties. The new wood tie plugs shall conform to AREMA, Manual for Railway Engineering, Chapter 3, Ties and Wood Preservation, and the Special Provisions. The tie plugs shall be driven to refusal in all former spike holes and the excess removed flush with the tie surface.
- 41.2 Method of Measurement. Will be by Each (Ea.) cross tie plugged as described above.
- 41.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing tie plugs, as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

42.0 INSTALL TIE PLUGS IN SECONDHAND SWITCH TIES

- 42.1 Description. Work consists of installing new treated tie plugs for secondhand switch ties. The new wood tie plugs shall conform to AREMA, Manual for Railway Engineering, Chapter 3, Ties and Wood Preservation, and the Special Provisions. The tie plugs shall be driven to refusal in all former spike holes and the excess removed flush with the tie surface.
- 42.2 Method of Measurement. Will be by Each (Ea.) switch tie plugged as described above.
- 42.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing tie plugs, as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

43.0 PLACE ENGINEERING FABRIC

- 43.1 Description. Work consists of placing filter fabric, a minimum of 10 feet wide on the prepared sub grade of the track zone or as described in the Special Provisions and including:
- 43.1.1 Care shall be taken to keep the wrinkles to a minimum. Longitudinal and transverse fabric joints shall overlap a minimum of 3 feet, or shall be sewn. Transverse laps shall be in the direction for stone placement.
- 43.1.2 Filter fabric damaged by equipment or other causes shall be replaced

or repaired following installation by placing a patch over the damaged area (the patch shall overlap a minimum of 3' on undamaged material).

43.1.3 The initial 3 inches of lift shall be made without using the tamping machine's tamping tools so as to prevent damage to the filter fabric. In subsequent lifts care shall be taken to prevent damage to filter fabric.

43.1.4 Earth work done in conjunction with this item shall be paid for under a separate item.

43.1.5 Filter fabric shall extend 10 feet beyond each end of the crossing.

43.2 Method of Measurement. Will be by the Square Yard (Sq. Yd.) of filter fabric installed as described above.

43.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing filter fabric, as described above and in the Special Provisions, which price shall be full compensation for all equipment, tools, labor, tools and incidentals necessary to complete the work.

44.0 INSTALL HINGED OR SLIDING OR SWITCH POINT DERAIL

44.1 Description. Work consists of installing derail as directed by the Engineer, and described in the Special Provisions.

44.2 Method of Measurement. Will be by Each (Ea.) derail installed as described above.

44.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing hinge derail or switch point derail as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor and incidentals necessary to complete the work.

45.0 INSTALL STOCK RAILS

45.1 Description. Work consists of replacing existing stock rails as identified by the Engineer and described in the Special Provisions, including:

45.1.1 Removing existing stock rail and fastenings.

45.1.2 Replacement rail shall be cut, drilled, bent and installed with fastenings as directed by the Engineer.

45.1.3 Payment for cross tie plugging shall be included in this item and scrap material shall be stockpiled within the project limits as directed by the

Engineer and remains the property of the owner.

45.2 Method of Measurement. Will be by each Linear Foot (LF.) of rail replaced, as described above.

45.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for replacing defective stock rails as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

46.0 INSTALL RAIL ANCHORS

46.1 Description. Work consists of installing drive on type rail anchors per WI DOT Standard Detail titled Standard Box Anchor Pattern dated 6/30/2004 or as described in the Special Provisions.

46.2 Method of Measurement. Will be by Each (Ea.) rail anchor installed as described above.

46.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing rail anchors as described above and in the Special Provisions, which price shall be full compensation for all the equipment, labor, tools and incidentals necessary to complete the work.

47.0 INSTALL SWITCH POINT

47.1 Description. Work consists of replacing existing switch points as identified by the Engineer and described in the Special Provisions, including:

47.1.1 Removing existing stock rail and fastenings.

47.1.2 Switch points shall be the same rail size and type as the stock rail they are mated to.

47.1.3 Switch points shall fit tight with no gap between switch point and stock rail.

47.1.4 Crop extended length switch points as directed by Engineer.

47.2 Method of Measurement. Will be by each Linear Foot (LF.) of rail replaced, as described above.

47.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for replacing defective switch points as described above and in the Special Provisions, which price shall be full compensation for all equipment,

labor, tools and incidentals necessary to complete the work.

48.0 FURNISH AND INSTALL INSULATED JOINT

48.1 Description. Work consists of furnishing and installing new insulated joint as described in the Special Provisions and may include:

48.1.1 Removing existing joint and stockpile as directed by the Engineer and remain the property of the owner.

48.1.2 Cut and drill rail at new joint location and installing new insulated joint, plugging and respiking ties.

48.1.3 Rail ends shall be ground smooth to eliminate any contact between the rail ends.

48.1.4 Sections 20.1.1 and 20.1.2 shall apply.

48.2 Method of Measurement. Will be by Each (Ea.) insulated joint furnished and installed as described above.

48.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing new insulated joint, as described above and in the Special Provisions, which price shall be full compensation for all the material, equipment, labor, tools and incidentals necessary to complete the work.

49.0 FURNISH AND INSTALL RAIL LUBRICATOR

49.1 Description. Work consists of furnishing and installing flange oiler in accordance with the manufacturer's instructions and described in the Special Provisions and at the location designated by the Engineer. Sections 21.1.1 and 21.1.2 shall apply.

49.2 Method of Measurement. Will be by Each (Ea.) flange oiler furnished and installed as described above.

49.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing flange oiler, as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

50.0 FURNISH AND INSTALL COMPROMISE JOINT BARS

50.1 Description. Work consists of furnishing and installing new compromise joints as described in the Special Provisions. The new compromise joints shall conform to

the following specifications:

50.1.1 Sections 22.1.1 and 22.1.2 shall apply.

50.1.2 Installation shall be according to manufacturer's or industry standards and may include cutting and drilling of rail as directed by the Engineer.

50.2 Method of Measurement. Will be by each Pair (Pr.) of compromise joints furnished and installed as described above.

50.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing compromise joints, as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

51.0 FURNISH AND INSTALL TIE PLUGS FOR SECONDHAND TIES

51.1 Description. Work consists of furnishing and installing new treated or Cedar tie plugs for secondhand cross ties as described in the Special Provisions. The new wood tie plugs shall conform to AREMA, Manual for Railway Engineering, Chapter 3, Ties and Wood Preservation. Tie plug size is noted in the Special Provisions. The tie plugs shall be driven to refusal in all former spike holes and the excess removed.

51.2 Method of Measurement. Will be by Each (Ea.) plugged tie as described above.

51.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing tie plugs as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

52.0 FURNISH AND INSTALL ENGINEERING FABRIC

52.1 Description. Work consists of furnishing and installing engineering fabric as described in the Special Provisions. The fabric shall be US Fabrics 205NW, or equivalent, 12'-6" wide and installed as directed by the Engineer.

52.2 Method of Measurement. Will be by each Square Yard (Sq. Yd.) of engineering fabric furnished and installed as described above.

52.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing engineering fabric as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

53.0 FURNISH AND INSTALL WHEEL STOPS

- 53.1 Description. Work consists of furnishing and installing new wheel stops and single hook gage rod as described in the Special Provisions and as directed by the Engineer. The new wheel stops shall be Western-Cullen-Hayes type SF or equivalent. Installation shall be according to manufacturer's or industry standards.
- 53.2 Method of Measurement. Will be by each Pair (Pr.) of wheel stops furnished and installed as described above.
- 53.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing wheel stops and gage rod as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

54.0 FURNISH AND INSTALL RAIL FIELD WELDS

- 54.1 Description. Work consists of furnishing, installing and testing field welds within the project zone as described in the Special Provisions and as directed by the Engineer.
- 54.1.1 Rail sections to be field welded are noted in the Special Provisions.
- 54.1.2 Ends of rails shall be cropped and cleaned prior to welding and no rails less than 33' in length shall be welded together. No holes shall remain within 24" of the field welds.
- 54.1.3 The welding kits shall be by the Thermite or Aluminothermic process or equal and installed according to the manufacturer's recommendations. Final location of field welds shall be within the tie crib area. Ties may require relocation and spacing to accommodate the welds.
- 54.1.4 Welds shall be ultrasonically tested, by an independent contactor for internal defects and written results provided to the Engineer before they are accepted. Defective welds found shall be removed and another weld installed, tested and written results provided at contractors expense.
- 54.2 Method of Measurement. Will be by Each (Ea.) field welding kit furnished and installed as described above.

- 54.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing each field weld kit as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

55.0 FURNISH AND INSTALL RAIL ANCHORS

- 55.1 Description. Work consists of furnishing and installing rail anchors per Wis DOT Standard detail entitled Standard Box Anchor Pattern dated 6/30/04 or as described in the Special Provisions.

55.1.1 Anchors shall be new and of the drive on type.

- 55.2 Method of Measurement. Will be by Each (Ea.) rail anchor furnished and installed as described above.

- 55.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing rail anchors as described above and in the Special Provisions, which price shall be full compensation for all the material, equipment, labor, tools and incidentals necessary to complete the work.

56.0 FURNISH AND INSTALL BITUMINOUS PAVING

- 56.1 Description. Work under this item shall consist of furnishing and installing bituminous pavement in grade crossings as specified per WisDOT Pavement Details For Railroad Approach 6/20/04 or as described in the Special Provisions and in accordance with the following specifications:

56.1.1 All materials used in the work shall conform to the requirements designated in Sections 401 and 405 of WisDOT Specifications for Highway and Structure Construction and this specification. Bituminous material to be used in the work shall be type AC asphalt penetration grade 85-100.

56.1.2 The bituminous binder course shall conform to the gradation requirements for Gradation No. 2, Section 401.2.5 WisDOT Specifications, and shall be placed in lifts of no more than 3". Finished height shall be 1-1/2 inches from the top of the rail. The bituminous surface course shall be Gradation No. 3, Section 401.2.5. Finished thickness of the surface course shall be 1-1/2 inches. The Engineer shall indicate the limits of the paving.

56.1.3 Installation methods shall be as required under Section 405 WisDOT Specifications. The edge of existing bituminous surface shall be trimmed with a wheel or sawed prior to placing the final bituminous

surfacing.

- 56.2 Method of Measurement. Will be by each Net Ton (NT.) of bituminous paving furnished and installed as described above. Weight tickets showing the net weight of each load of material shall be supplied to the Engineer.
- 56.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing bituminous paving material as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

57.0 FURNISH AND INSTALL NEW SLIDING OR HINGED OR SWITCH POINT DERAIL

- 57.1 Description. Work consists of furnishing and installing the new Sliding derail with target as described in the Special Provisions and where directed by the Engineer. The new Sliding derail shall be Western-Cullen-Hayes Model HB-OS or equal; Hinged derail shall be Western-Cullen-Hayes EB or equal, to fit the rail supplied as per the Special Provisions. Switch Point derails shall fit rail supplied and have a two tie National Trackwork “Back Saver” Model 1008ARS manual switch stand or equal per the Special Provisions. Installation shall be according to manufacturer's and industry standards. Switch Point Derail shall conform to AREMA Portfolio of Trackwork Plans for Split Switch and the Special Provisions.
- 57.2 Method of Measurement. Will be by Each (Ea.) derail furnished and installed as described above.
- 57.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing each derail, as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

58.0 FURNISH AND INSTALL RAIL JOINT BONDS

- 58.1 Description. Work consists of either replacing and/or installing rail bonds as described in the Special Provisions and of a type acceptable to and as designated by the Engineer.
- 58.2 Method of Measurement. Will be Each (Ea.) rail bond furnished and installed as described above.
- 58.3 Basis of Payment. This item of work, as measured above, will be paid for at the

contract unit price for furnishing and installing rail bonds as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

59.0 FURNISH AND INSTALL JOINT INSULATION

59.1 Description. Work consists of furnishing and installing new insulated joint insulation as described in the Special Provisions.

59.1.1 New insulation shall be Portec Black Belt - Mark II or equal and shall be for insulated joint bars as specified in the Special Provisions.

59.1.2 Remove existing insulation and replace with new material. Plug and respike joint ties.

59.1.3 Rail ends shall be ground smooth to eliminate any contact between the rail ends.

59.2 Method of Measurement. Will be Each (Ea.) joint renewed as described above.

59.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing new insulation for insulated joints as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

60.0 FURNISH AND INSTALL CROSSING SURFACE

60.1 Description. Work consists of furnishing and installing new crossing surface material, as described in the Special Provisions.

60.1.1 Crossing surface material shall be installed according to the manufacturer's recommendations.

60.1.2 Contractor shall furnish the Engineer a copy of the installation specifications supplied by the crossing surface manufacturer.

60.2 Method of Measurement. Will be by each Track Foot (TF.) of material furnished and installed as described above.

60.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing the grade crossing surface material, as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals

necessary to complete the work.

61.0 FURNISH AND INSTALL MANGANESE SWITCH POINT PROTECTOR ASSEMBLY

61.1 Description. Work consists of furnishing and installing new manganese switch point protector as described in the Special Provisions including drilling of new bolt holes, and may include removing two existing rail braces and installing one additional slide plate, on the turnouts where switch point protectors are applied.

61.1.1 The switch point protector shall be new and of the design that spans 3 ties and is placed on the field side of the rail. It shall be constructed of solid manganese and shall be ABC Corp's Racor manganese steel switch point guard assembly, or equal and supplied with one slide plate.

61.1.2 Should a pair of joint bars fall within the location of the point protector the relocation of those joint bars will be paid for under stock rail replacement.

61.2 Method of Measurement. Will be by Each (Ea.) switch point protector furnished and installed as described above.

61.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing manganese switch point protectors, as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

62.0 FURNISH AND INSTALL BUMPING POST (STEEL OR EARTH)

62.1 Description. Work consists of furnishing and installing the new or reconditioned bumping post or earth bumper, as described in the Special Provisions and where directed by the Engineer. The bumping post shall be Western-Cullen-Hayes Model WG or equal to fit rail supplied or earth material as per Special Provisions. Installation shall be according to manufacturer's or industry standards. Earth Bumper shall be per WIDOT drawing entitled Standard Earthen Bumper dated 6/31/2004.

62.1.1 All Bumping Posts shall be fitted with permanent red-board, as directed by Engineer.

62.2 Method of Measurement. Will be by Each (Ea.) bumping post or earth bumper furnished and installed as described above.

- 62.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for furnishing and installing each bumping post or earth bumper as described above and in the Special Provisions, which price shall be full compensation for all material, equipment, labor, tools and incidentals necessary to complete the work.

63.0 CONSTRUCT JOINTED TRACK EXCLUSIVE OF BALLAST

- 63.1 Description. Work consists of installing the cross ties, rail, tie-plates, joint bars, track bolts, nuts and spring washers, track spikes, rail anchors and other fastenings provided by the contractor and as described in the Special Provisions and includes the following:

- 63.1.1 Cross ties shall be placed normal to the center line of the track on 19.5 inch centers on main track and 21 inch centers on industrial track or as otherwise specified in the Special Provisions. All tie plates shall be removed from cross ties taken out. All bent, missing or broken tie plates shall be replaced on renewed ties. All ties installed shall be spiked and all anchors reinstalled at the end of each days work. All slewed ties shall be straightened and all ties evenly spaced with adjacent ties. Secondhand ties shall be placed with the former top side down, and new ties shall be placed with their heart side down. Cross ties shall be placed so that no more than two secondhand ties are adjacent to each other. Care must be taken when spiking ties in cold weather. Ties split greater than 1/4" in width will be rejected. Predrilling of ties may be necessary.
- 63.1.2 Distribution of rail shall be done with adequate equipment to prevent damage to the rail. Joints are to be staggered with minimum distance between opposite rail joints of 1/2 rail length, or as directed by the Engineer. Deviations may be required at insulated joints, turnouts, or crossings subject to the Engineers approval. In laying rail on curves, short rails should be installed on the low rail at proper intervals to maintain the proper stagger throughout the curve. Rails shorter than 15 feet shall not be installed in the main track. The rail (within the limits of the joint bar) shall be lubricated with Texaco 904 or equivalent (applied @ a rate of 1 pound per 24" bar) prior to applying the joint bars.
- 63.1.3 Rail shall be laid to gage 4'-8 1/2" ± 1/8", joint bars are to be lubricated and fully bolted. Following rail relay, the abutting rail shall be built up by welding to the height or gage width of the relay rail when the difference is 1/8" or greater in accordance with section 81.1.
- 63.1.4 Rail anchors shall be installed following the WISDOT drawing entitled Standard Box Anchor Pattern 6/30/2004 unless a different pattern is shown on the plan.

- 63.1.5 Each cross tie shall have two tie plates of the proper size. Tangents and curves up to 2 degrees require two rail holding spikes per plate, and curves over 2 degrees require one additional rail holding spike per plate on the gage side of the rail. Additional spikes may be required as directed by the Engineer.
- 63.1.6 Expansion shims shall be used to provide for the proper openings between the rails. Thickness of the shims shall be in accordance with the standards as listed as follows:

Table of Expansion for Rail Laying

<u>Temperature of Rail - Fahrenheit</u>	<u>Thickness of Shims 33'0" Rails</u>
below - 10	5/16"
-10 to 14	1/4"
15 to 34	3/16"
35 to 59	1/8"
60 to 85	1/16"
over 85	1/16" every other joint

<u>Temperature of Rail - Fahrenheit</u>	<u>Thickness of Shims 39'0" Rails</u>
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	1/16" every other joint

Temperature of the rail shall be determined by a digital instrument or thermometer laid on the base of the rail, on the side away from the sun.

- 63.1.7 The track shall be surfaced in accordance with Section 37.1, payment for which shall be under a separate item.
- 63.2 Method of Measurement. Will be by the Track Foot (TF.) of completed work as described above and measured along the center line of the track.
- 63.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for constructing track, as described above and in the Special Provisions, which price shall be full compensation for all material, equipment,

labor, tools and incidentals necessary to complete the work.

64.0 CONSTRUCT TURNOUT

64.1 Description. Work consists of turnout construction as directed by the Engineer, as described in the Special Provisions, and includes all track materials except ballast within the limits of the switch ties. Details of the turnout and its construction shall be as per the following:

64.1.1 AREMA Plans referred to in the Special Provisions.

64.1.2 Construction includes proper switch lubrication, adjustment, and installation of all spikes and cotter keys as directed by the Engineer.

64.1.3 Applicable parts of Sections 63.1 shall apply.

64.2 Method of Measurement. Will be by Each (Ea.) turnout installed as described above. The turnout refers to all track materials, except ballast, within the limits of the switch ties, including switch ties, rail, switch points, frog, guard rails, switch stand, tie plates, anchors and other fastenings.

64.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for installing turnouts as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

65.0 PREPARATION OF TRACK BED FOR GRADE CROSSING

65.1 Description. Work consists of excavating to a minimum width of 13' and to a depth of 12" below the existing bottom of ties and more if poor soils are encountered, for the full length of the crossing plus 10' off each end. The excavated materials shall be removed and disposed by the contractor off the project site.

65.1.1 Track Materials Removed All track materials removed shall be sorted and stockpiled as directed by the Engineer and remain the property of the owner.

65.2 Method of Measurement. Will be by each Track Foot (TF.) as measured along the center line of the track through the grade crossing as described above.

65.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price to prepare the track bed for construction of the grade crossings described above, which shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

66.0 CONSTRUCT TRACK THROUGH GRADE CROSSING

66.1 Description. Work consists of constructing track through the grade crossing site with owner or contractor supplied new material as described in the Special Provisions and in accordance with the following specifications:

66.1.1 Size of new ties and spacing shall be in accordance with the crossing surface manufacturer's recommendations, but in no case will the new ties be less than 7" X 9" X 8'6".

66.1.2 Spiking of tie plates shall consist of two rail holding spikes per plate on all track within 25 feet of grade crossing. Additional spikes may be required as directed by the Engineer. 20 consecutive ties on either side of the grade crossing shall be fitted with four rail anchors.

66.1.3 Minimum length of CWR through the crossing shall be sufficient in length to extend 25 feet beyond the edge of crossing surface material.

66.1.4 The top of rail elevation and track alignment will be established by the Engineer.

66.1.5 Applicable parts of Sections 29.0, 30.0, 37.0, 43.0, 52.0, 54.0, 56.0, 63.0, and 80.0 shall apply. Also prior to construction of track, ballast shall be distributed in two (2) equal lifts throughout the excavated area and thoroughly compacted by a roller vibrator prior to placing the next lift.

66.1.6 Ballast shall be spread and track raised in a series of lifts to the required height as indicated by the Engineer. No single lift shall be higher than 3" and both rails shall be raised simultaneously and to proper elevation by utilizing automatic tampers. The entire length of cross ties shall be tamped.

66.1.7 Minimum depth of ballast below the ties shall be 12 inches. Ballast shall be spread and the track raised in a series of lifts to the required height as indicated by grade stakes approved by the Engineer. No single lift shall be higher than three inches. In raising track, raising equipment shall be so regulated as to avoid bending joint bars or straining of rails. Each tie shall be tamped for the full length of the tie. Both rails shall be raised simultaneously and to proper elevation by utilizing a 16 tool-tamping machine, per section 37.1.2, capable of raising, lining and surfacing simultaneously.

66.2 Method of Measurement. Will be by each Track Foot (TF.) as measured along the centerline of the track through the grade crossing as described above.

- 66.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price to construct track thru the grade crossing as described above and in the Special Provisions, which price shall be full compensation for all the equipment, labor, tools and incidentals necessary to complete the work.

67.0 CONSTRUCT TIMBER AND ASPHALT GRADE CROSSING

- 67.1 Description. Work consists of constructing timber and asphalt, i.e. guard timber, flange timber and asphalt grade crossing as described in the Special Provisions and in accordance with the following.

67.1.1 Timber, timber fastenings, rail, ties and fastenings shall be supplied by the Contractor and shall be paid for under their respective pay items. Likewise ballast and bituminous material shall be paid for under their respective items.

67.1.2 The Engineer shall indicate crossing locations and limits.

67.1.3 Applicable parts of Sections 56.1 and 63.1 shall apply.

67.1.4 The Asphaltic material and placement shall in accordance with the Department of Transportation Standard Specifications for Highway and Structure Construction latest edition.

67.1.5 Pavement approaches shall be per Wis DOT Standard entitled Pavement Details for Railroad Approach dated 8-28-09.

- 67.2 Method of Measurement. Will be by each, Track Foot (TF.), as measured, along the centerline of track, through the grade crossing, as described above.

- 67.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price to construct a timber and asphalt grade crossing as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

68.0 CONSTRUCT CONCRETE GRADE CROSSING

- 68.1 Description. Work consists of constructing a concrete grade crossing following the manufacturer's recommendations and as described in the Special Provisions and Minimum Technical Specifications for the Construction of Grade Crossings in accordance to the following:

68.1.1 Concrete panels, concrete fasteners, attached flange filler, rail, ties and fastenings shall be supplied by the contractor and shall be paid for under their respective pay items. Likewise, ballast and bituminous material shall be paid for under their respective pay items.

68.1.2 Concrete panels shall comply with Common Standards of BNSF and UPRR dated April 24, 2001.

68.1.3 Rail fasteners and tie plates, within the limits of the concrete panels and 10 feet on each end of the crossing shall be Pandrol or equal with galvanized rail clips.

68.1.4 The Engineer shall indicate crossing locations and limits. The minimum depth of ballast below the ties shall be 12”.

68.1.5 Applicable parts of Sections 37.1, 56.1, 63.1 and 67.1 shall apply.

68.2 Method of Measurement. Will be by each, Track Foot (TF.) as measured along the center line of the track through the grade crossing as described above.

68.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price to construct a concrete grade crossing as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

69.0 CONSTRUCT WALK WAY AT TURNOUTS

69.1 Description. Work consist of installing, walkway, as described in the Special Provisions and in accordance with the following.

69.1.1 Walkway shall be installed per WI DOT Standard Drawing entitled Walkways at Turnouts, Dated 2/7/2004.

69.1.2 Walkways shall be constructed with AREMA Size # 57 Stone and the walkway elevation shall be level with the top of ties.

69.2 Method of Measurement. Will be by Each (Ea.), walkway constructed and installed.

69.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for constructing walkway at turnouts, as described above and in the Special Provisions, which shall be full compensation for all equipment, labor, tools, material and incidentals necessary to complete the work.

70.0 Blank

71.0 CLEAN TRACK

71.1 Description. Work consists of cleaning the track as described in the Special

Provisions and in accordance with the following:

71.1.1 Removing all debris above the top of the ties and for a distance of 8' from the centerline of the track on each side.

71.1.2 The cleaning beyond the ends of the ties shall include debris removal to an elevation that is no higher than the top of the tie nor lower than the bottom of the tie. The Engineer shall identify both the areas of cleaning and the required elevation of that cleaning beyond the ends of the ties.

71.1.3 Cleaning shall be done so as to provide the Engineer with a track zone which can be adequately inspected for rail, tie and fastening deficiencies. A ballast regulator with a broom attachment may be used to perform the work.

71.1.4 The removed debris may be wasted within the project limits as directed by the Engineer.

71.2 Method of Measurement. Will be by each Track Foot (TF.) of track cleaning as described above.

71.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for cleaning track, as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

72.0 CLEARING AND GRUBBING

72.1 Description. Refer to Section 201.1 of WI DOT Standard Specifications for Highway and Structure Construction and the Special Provisions.

72.2 Method of Measurement. Refer to Section 201.3.2 of WI DOT Standard Specifications for Highway and Structure Construction.

72.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for clearing and grubbing per inch diameter as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

73.0 GRADING

73.1 Description. Work consists of the grading of the track zone where removal of the existing track has taken place in preparation of new track construction. Work is to be accomplished in conformance with the Special Provisions and shall result in a smooth and uniform sub grade on which the new track will be constructed.

73.1.1 Grading width shall be as per Special Provisions.

73.1.2 Typical cross section shall conform to Wis DOT Typical Sections dated 6/30/04.

73.1.3 Excess material shall be leveled off adjacent to the track zone so as not to create a drainage problem.

73.2 Method of Measurement. Will be by each Square Yard (Sq. Yd.) of area graded as measured by the Engineer.

73.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for grading, as described above and in the Special Provisions, which price shall be full compensation for all the equipment, labor, tools and incidentals necessary to complete the work.

74.0 UNCLASSIFIED EXCAVATION

74.1 Description. Work consists of excavating existing ballast section and/or placing or wasting that material as described in the Special Provisions and as directed by the Engineer within the project limits.

74.1.1 Track zone shall be excavated in accordance with the Special Provisions and as directed by the Engineer.

74.1.2 A portion of the excavated material may be used as fill material to build up the sub grade to conform to the Special Provisions. This material shall be well compacted and free of debris and other organic or perishable material. See Section 208.2.1, Borrow Excavation, WI DOT Standard Specifications for Highway and Structure Construction.

74.1.3 Wasted material may be leveled off on sites designated by the Engineer within the project limits.

74.1.4 Cut/fill stakes shall be provided by the Engineer.

74.2 Method of Measurement. Will be by each, Cubic Yard (Cu. Yd.), of material excavated as measured by the Engineer.

74.3 Method of Payment. This item of work, as measured above, will be paid for at the contract unit price for excavating and either placing or wasting the same as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

75.0 GAGING TRACK

- 75.1 Description. Work consists of regaging the track and described in the Special Provisions and at locations identified by the Engineer and includes:
- 75.1.1 Removing spikes, plugging spike holes, adzing ties, gaging and re-driving spikes.
 - 75.1.2 Respike track to 4'-8 1/2" ± 1/8" gage and retighten gage rods if any.
 - 75.1.3 When gaging track, that rail showing the most uniform line will be used as the line rail, the other rail will be gaged to it.
 - 75.1.4 Payment for tie plugging shall be included in this item and according to Section 41.0.
- 75.2 Method of Measurement. Shall be by each Track Foot (TF.) of track gaged as described above.
- 75.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for gaging track, as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

76.0 TIGHTENING TRACK BOLTS

- 76.1 Description. Work consists of tightening the existing track bolts as described in the Special Provisions and as identified by the Engineer including:
- 76.1.1 Driving down those spikes which interfere with the torque wrench chuck.
 - 76.1.2 Using power track wrench with torque adjustment to tighten track bolts. Center bolts shall be tightened first. Any bolts broken and/or replaced during the tightening processing shall be paid for under the respective pay item.
- 76.2 Method of Measurement. Will be by Each (Ea.) track bolt tightened as described above.
- 76.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for tightening existing bolts, as described above and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

77.0 PRERAISING TRACK

- 77.1 Description. Work consists of surfacing the track and switches on the existing ballast, i.e. sod, cinders, dirt, sand, etc. as described in the Special Provisions and prior to replacement of track components.
- 77.1.1 Track will be raised as uniformly as possible, a minimum of 3-1/2", tamping at a minimum every 4th tie and maintaining horizontal and vertical alignment to comply with minimum FRA Class I track.
- 77.1.2 Track approaches to bridges, grade crossings and other fixed objects will be skeletonized for at least 30 track feet to allow for a proper runoff of the preraised track and the fixed object.
- 77.1.3 No train movements over the pre raised track, prior to the replacement of the track components, with our approval by the operating railroad.
- 77.2 Method of Measurement. Will be by each Track Foot (TF.), preraised as described above. Measurement through turnouts shall be double the distance measured from the head block to the end of the long ties.
- 77.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for preraising tracks as described above, and in the Special Provisions, which price shall be full compensation for all equipment, labor, tools and incidentals necessary to complete the work.

78.0 RESTORING TURNOUT FROGS

- 78.1 Description. Work consists of removing the unacceptable portions of the frog, building up those areas by an acceptable welding process, and grinding as described in the Special Provisions, and accepted by the Engineer. The Engineer shall indicate those portions of the frogs that require welding and grinding.
- 78.2 Method of Measurement. Will be by Each (Ea.) frog restored as described above.
- 78.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for restoring turnout frogs, as described above and in the Special Provisions, which price shall be full compensation for all welding rod, equipment, labor, tools and incidentals necessary to complete the work.

79.0 RESTORING TURNOUT SWITCH POINTS

- 79.1 Description. Work consists of removing the unacceptable portion of the switch points and stock rails, building up those portions by an acceptable welding process, and grinding as described in the Special Provisions and accepted by the

Engineer. The Engineer shall indicate those portions of the switch points and stock rails that require welding and grinding.

79.2 Method of Measurement. Will be by Each (Ea.) switch point restored as described above.

79.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for restoring switch points, as described above and in the Special Provisions, which price shall be full compensation for all welding rod, equipment, labor, tools and incidentals necessary to complete the work.

80.0 RESTORING RAIL ENDS

80.1 Description. Work consists of removing the unacceptable portions of the rail end, building up that area by an acceptable welding process, and grinding as described in the Special Provisions and accepted by the Engineer. The Engineer shall indicate those portions of the rail heads that require welding and grinding.

80.2 Method of Measurement. Will be by Each (Ea.) rail end built up as described above.

80.3 Basis of Payment. This item of work, as measured above, will be paid for at the contract unit price for building up rail heads, as described above and in the Special Provisions, which price shall be full compensation for all welding rods, equipment, labor, tools and incidentals necessary to complete the work.

81.0 RAIL END MISMATCH

81.1 Description. Rail end mismatch of 1/16" or greater shall be restored by an acceptable welding and grinding process, to the height or gage width of the adjacent rail. The entire railhead and gage side shall be welded. Rail ends shall not be grinded down to remove mismatch, unless directed so by Engineer. The welded portion shall be a minimum of 5" in length for up to 1/8" mismatch, a minimum of 6" in length for 3/16" mismatch and a minimum of 7" in length for 1/4" mismatch and no weld portion shall extend closer than 1" to the end of the joint bar. The welding and grinding process shall be completed within 24 hours of the rail relay or prior to allowing train service over the track.

81.2 Method of Measurement. Will be by Each (Ea.) rail joint, restored, as described above.

81.3 Basis of Payment. This item of work, as measured above, will be paid for at the contact unit price for restoring mismatch rail joints, as described above and in the Special Provisions, which price shall be full compensation for all welding rods, equipment, labor, tools and incidentals necessary to complete the work.