SECTION SS 34 11 23

SPECIAL TRACKWORK

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies the material requirements and performance criteria for the Special Trackwork to be furnished in accordance with Contract Documents or required by the Engineer.

B. Special Trackwork materials furnished under this IFB shall include rail, switches, frogs, insulated joints, derails, compromise/transition rail, stick rail, and bumping posts and individual turnout components to be used as replacement parts. All materials furnished shall be entirely new materials.

1.02 REFERENCES

A. American Railway Engineering and Maintenance of Way Association (AREMA):

1. Manual for Railway Engineering

2. Portfolio of Trackwork Plans

3. Specifications for Special Trackwork

B. American Welding Society (AWS):

1. AWS B2.1: Standards for Welding Procedures and Performance Qualifications

2. AWS D1.1: Structural Welding Code

C. American National Standards Institute, Inc. (ANSI)

1. ANSI B1.1: Unified Inch Screw Threads

2. ANSI B1.3M: Screw Threads Gaging System for Dimensional Acceptability

3. ANSI B18.22.1: Plain Washers

D. American Society for Testing of Materials (ASTM)

1. ASTM A307: Carbon Steel Externally Threaded Standard Fasteners

2. ASTM D257: Test Methods for D-C Resistance or Conductance of Insulating Materials

3. ASTM E325: Requirements for a Testing and Inspection Laboratory

E. Association of American Railroads (AAR)

1. AAR: Manual of Standards and Rec. Practices

2. AAR Section J: Quality Assurance M-1003

F. SCRRA: Engineering Standards.

G. BNSF: BNSF Railway applicable specifications and standards

H. UPRR: Union Pacific Railroad applicable specifications and standards

1.03 DEFINITIONS

A. Closure Rails – The rails between the parts of any Special Trackwork layout, such as the rails between the switch and the frog in a turnout

B. The word “Vendor” used in the Material Specifications (SS) shall mean the Contractor.

C. Fasteners – Joint bars, bolts, clips and spikes

D. Frog – A track structure used at the intersection of two running rails to provide support for wheels and passageways for the flanges, thus permitting wheels on either rail to cross the other

E. Guard Rail – A rail or other structure laid parallel with the running rails of a track – used to hold wheels in correct alignment to prevent their flanges from striking the end of switch points of frog points

F. Point Rail – Switch rail or switch point – the tapered rail of a switch used to divert traffic along either route of a turnout

G. Railbound Manganese Steel Frog- A frog consisting essentially of a manganese steel body casting fitted into and between rolled rails and held together with bolts, known as RBM

H. Running Rail – The rail that carries a wheel as differentiated from a guard rail or flange rail which carry no weight

I. Spring Frog – A frog having a movable wing rail which is normally held against the point rail by springs thus making an unbroken sunning surface for wheels using the track. The flanges of wheels on the other track force the movable wing rail away from the point rail to provide a passageway

J. Stock Rail – A running rail against which the switch points operate

K. Switch – A track structure to divert rolling stock from one track to another

1.04 SUBMITTALS

A. The Vendor shall submit supporting information within 60 days of award documenting the past successful performance in furnishing the materials included in the Schedule of Quantities and Prices. Provide references and contact numbers at the railroads where the turnouts have been placed in service.

B. The Vendor shall submit certificate of compliance that the material delivered is in compliance with the specification within 60 days of approval of payment.

C. The Vendor shall submit Special Trackwork packaging, loading, shipping, and handling method.

D. The Vendor shall submit for SCRRA's review and approval quality control and quality assurance plans and related certifications such as ISO 9001, "six sigma" or equivalent demonstrating that the Vendor has the processes, personnel and systems to produce high quality Special Trackwork Materials included in the list of Special Trackwork items as provided in the Schedule of Quantities and Prices.

E. The Vendor shall submit data documenting past performance and projects within the last ten (10) years furnishing Special Trackwork material to Class 1 Freight, passenger or commuter railroads.

F. Administrative and procedural requirements for proposed changes in product and materials from those required by these specifications shall be as per SCRRA's Standard Specifications Section 01 25 00, "Substitution Procedures". The specifications are available on SCRRA's website at www.metrolinktrains.com.

1.05 QUALITY ASSURANCE

A. Vendor's Quality Control Program (QCP) shall be in accordance with the AAR M-1003 or SCRRA approved equivalent quality control program. Comply with AREMA Portfolio of Trackwork Plans.

B. Materials or partially or fully assembled products not meeting the specifications shall be rejected. Special Trackwork materials delivered to SCRRA shall be either promptly modified to meet specifications or removed from SCRRA's delivery and storage locations within 30 calendar days.

C. Equipment used for the manufacturing materials shall be in good operating condition, of adequate capacity and range, and accurately calibrated. Testing equipment shall be certified and traceable to national standards such as the National Institute of Standards and Technology.

D. Insulated gauge plates and switch rods shall be tested in accordance with AAR Manual, Part 116, Signal Section, Assembly and Test of Insulated Track Fittings.

1.06 DELIVERY, STORAGE AND HANDLIONG

A. The Vendor shall load, transport, and handle the material in a manner which will prevent damage to the material.

B. Band all switch points and stock rails together in one package for each turnout unit.

C. Package all frog as a single unit per turnout, and identify to indicate the turnout number.

D. Band guard rails together, and identify as to which turnout it is to accompany.

E. The material will be supplied to the SCRRA in accordance with the delivery requirements, FOB Destination. Quantity of each supply will be as requested by the SCRRA release document. The material when purchased is to be delivered to the Los Angeles area at a place designated by the SCRRA. A complete Bill of Material for each order will be submitted with modes, dates, contents, and destinations of shipments clearly indicated. A complete shipping list with reference to blanket purchase agreement, if applicable, will accompany all deliveries of materials.

F. All materials delivered will be colored coded and have bar coded control tags using bar code # 128 system or as approved by SCRRA on all parts/hardware for easy assembly by field personnel.

PART 2 - PRODUCTS

2.01 GENERAL

A. Use SCRRA Standard Specifications and Engineering Standards for all turnouts and crossovers and related replacement and spare parts.

B. Rails, castings, forging, rolled shapes, washers, and fastening used in Special Trackwork ordered to the Engineering Standards shall be produced in conformance to these Specifications and AREMA Specifications for Special Trackwork.

2.02 RAIL

A. All steel rail used in the manufacturing of switches, turnouts and crossovers shall be new Low Alloy, Head Hardened, High Strength Grade HH or LH 136 RE (10 inch radius) conforming to AREMA Chapter 4, Part 2, Section 2.1, “Specifications for Steel Rail” and shall meet or exceed 370 HB or new BNSF Specification HH 370 Rail or an equivalent “Premium Type Head Hardened” Rail. If the Bidder is providing rail from a BNSF or UP specification that meets or exceeds these specifications and the AREMA standard – the Special Trackwork Manufacturer shall supply a copy of the applicable UPRR or BNSF standard for the rail being furnished.

2.03 SWITCHES

A. All switch point rails and stock rails shall be Samson type construction in accordance with SCRRA Engineering Standards.

B. Switch rails shall be fully heat-treated per specifications for heat-treated rails for Special Trackwork, Plan No. 100-92 Specifications in the AREMA Portfolio of Trackwork Plans.

C. Switch rod assemblies shall conform to AREMA Specifications for Special Trackwork, rolled mild steel.

2.04 FROGS

A. Spring frogs shall conform to SCRRA Engineering Standards or approved equal. Castings shall be 3-shot explosion-hardened. Rail shall be deep head hardened rail. Furnish frogs without plates for turnouts and crossovers on concrete ties. Bolts shall be 1-3/8 inch Grade 8 square head with 1/4 inch hardened flat washers and hexagon security locknuts. Lubricate frog bolts and torque to 2,500 foot pounds.

B. Railbound Manganese (RBM) frogs with elastic fastening system shall conform to SCRRA Engineering Standards or approved equal. Manganese castings shall be 3-shot explosion-hardened in accordance with AREMA Specifications. Heel of the frog shall incorporate a 30-degree cut. Frog plates shall be with one inch round holes except as otherwise indicated on the SCRRA Engineering Standards. Bolts shall be 1-3/8 inch Grade 8 square head with 1/4 inch hardened flat washers and hexagon security locknuts. Lubricate frog bolts and torque to 2,500 foot pounds.

C. Casting for frog inserts manganese steel shall be in accordance with AREMA Specifications for Special Trackwork, Article M2.

D. Frog guard rails may be machined initially and subsequently heat treated to achieve the requirements of high strength rail as specified n AREMA Specifications.

E. Tie plates shall conform to AREMA Volume 1, Chapter 5, Section 1.1, Tie Plates - “Specifications for Steel Tie Plates” and appropriate SCRRA Engineering Standard.

2.05 INSULATED JOINTS

A. Bonded insulated rail joints shall conform to the current requirements of the SCRRA Engineering Standards ES2504 and AREMA Manual, Chapter 4, Part 3, Section 3.8, “Specifications for Bonded Insulation Rail Joints”.

B. Insulated rail joints shall be of the epoxy-bonded type as manufactured by Allegheny Rail Products, Co., or equal.

C. Insulated rail joints shall be complete with bars, end posts, bushing, washers, pin

bolts, collars, washers and adhesives.

D. Straight bars shall be new and smooth and will be providing full face contact, conforming to the applicable rail section, and fabricated from material which meets or exceeds the mechanical properties and workmanship requirements of the current AREMA Volume 1, Chapter 4, Part 3, Section 3.4, “Specifications for Quenched Carbon-Steel Joint Bars, Micro-alloyed Joint Bars and Forged Compromise Joint Bars”. The toe of the joint bar shall properly fit against the web of the rail. When elastically fastened, the joint bar shall provide adequate clearance to maintain electrical isolation.

E. Pin bolts shall be of ASTM A325 structural steel furnished with the appropriate collar.

F. Flat circular shall be hardened steel washers in accordance with ASTM F436.

G. Bolt hole size shall be in accordance with the bonded insulated joint Vendor's recommendation. If bolt hole diameter is larger than 1-3/16 inches, place ASTM A325 hardened washers between the joint bars and the nut.

H. The bolt hole locations shall be as specified in AREMA, Chapter 4, Part 3, Section 3.3, Rail for a 36-inch joint bar. Insulated joint bar lengths for main track installations shall be 36 inches.

I. Insulated material shall be high pressure, laminated design, impervious to oil, grease, and water, and having electrical characteristics equal to or greater than fiber insulation meeting requirements of the AAR Manual, Part 14.5.1, and electrical resistance tested as specified.

J. Each plug shall be Megohmmeter electrical resistance tested as per AREMA Manual.

2.06 DERAILS

A. Bi-directional Power Sliding Derail 136RE shall be Hayes model HBXS or approved equal. Derail package shall include all rods, hardware and wood switch timbers, dual powered Electric/Hand operated machine, target and fasteners. Timber to conform No. 8 Turnout Standards above. Derail to be compatible with 136 lb. rail.

B. Bi-directional Sliding Derail 136RE shall be Hayes model HBXS or approved equal. Derail package shall include all rods, hardware and wood switch timbers, low profile switch stand, target and fasteners. Derail shall be compatible for use with or without electric lock. Timber to conform No. 8 Turnout Standards above. Derail to be compatible with 136 lb. rail.

C. Switch Point Derail 136RE or Double Switch Point Derail with wood switch timbers shall meet the requirements of SCRRA Engineering Standard drawing ES2601, ES2602 and ES2604. 16’-6” switch points, Pandrol plates, and galvanized e-clip fasteners with all rods, connection hardware, and target shall be included for use with Union Switch and Signal M23E USS model machine. Timber to conform No. 8 Turnout Standards above. Derail to be compatible with 136 lb. rail.

D. Rail Mounted Flop-over Derail shall be bi-directional with flag, 136RE or 115RE as listed in the Schedule of Quantities and Prices, all hardware and mounting kit included.

2.07 COMPROMISE/TRANSITION RAIL

A. Forged transition rail shall be 136RE to 115RE. Use UPRR or BNSF standard for fabricating this rail section. Length of forged rail section to be 25 feet plus or minus one inch.

2.08 STICK RAIL

A. Furnish 80'-00" long rail with blank ends.

2.09 BUMPING POST

A. Bumping Post shall be as manufactured by Western Cullen Hayes Model "WAC" Bumping Post or equal. Western Cullen Hayes "Hayco Cushion Head" or equivalent that matches with the WAC bumping Post. Bumping post to be compatible for stopping Passenger Cars.

2.10 SWITCH STANDS

A. Hand throw switch stands shall be Racor 36-EH switch stand or approved equal furnished with a 14-inch red target with reflective material such as Scotchlite or equal on both sides.

B. Hand throw switch stand for crossovers shall be Racor 36-E switch stand, or approved equal, furnished with a 40 1/2 inch straight handle providing maximum clearance between tracks and an 8-inch red target with reflective material such as Scotchlite or equal on both sides.

C. Hand throw switch stand for double point split switch derail shall be Racor 36-EH switch stand, or approved equal, in accordance with SCRRA Engineering Standards furnished with a 14-inch round "D" target with yellow reflective material such as Scotchlite or equal on both sides.

2.11 SOURCE QUALITY CONTROL

A. During Special Trackwork fabrication, perform the tests and inspections specified in the AREMA Specifications.

B. Examine each forging and weld by the dry powder method of magnetic particle inspection in accordance with ASTM E709.

C. Perform ultrasonic testing on all forging and welds in accordance with ASTM E164.

D. All frog points shall be Brinell hardness tested on the head and along the side wearing surface in accordance with ASTM E10.

E. The bonded insulated rail joints shall meet electrical resistance test as specified in AREMA Chapter 4, Section 3.8.7.3.

PART 3 – EXECUTION

3.01 GENERAL

A. Comply with the SCRRA Engineering Standards Standard Specifications unless specifically noted or excepted within these specifications. Promptly notify SCRRA of any conflicts, omissions or needed clarifications arising from the use of the designated drawings, standards or specifications**.**

3.02 SCHEDULE

A. The Vendor providing the materials shall contact SCRRA's Material Management Supervisor, 48 hours prior to the date of delivery.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Work of this Section is considered incidental to work associated with project item in Section 34 72 00, Trackwork or Section 34 72 20, Track Shifting, Relocation, and Resurfacing and no separate measurement and payment will be made to the Contractor for Work of this Section.

4.02 PAYMENT

A. Work of this section shall include furnishing all acceptance testing, transportation, storage, assembly, delivery and incidentals as shown on the Plans, and as specified in these Specifications, and as directed by the Engineer.

END OF SECTION