



Scope of Work/Specification

Washington
Metropolitan
Area
Transit
Authority

Project Title:

Switch Points & Stock Rails

1.0 Scope

1.1. The Washington Metropolitan Area Transit Authority requires Switch Points and Stock Rails for system-wide maintenance of Special Trackwork.

1.2. This statement of work consists of the design, manufacture, inspection, testing, and delivery of Switch Points and Stock Rails to be used in Special Trackwork. Switch Points and Stock Rails will meet, at a minimum, all the requirements as defined in the technical specifications.

2.0 Applicable Documents

2.1. Reference Specifications:

- 2.1.1. The following are a part of the specifications to the extent referenced. Wherein referenced codes, standards and specifications conflict with the contract requirements, the contract requirements govern.
- 2.1.2. Except as modified in the contract documents, the Vendor will manufacture, test, assemble, inspect, and ship Switch Points and Stock Rails in accordance with the most current versions of the American Railway Engineering and Maintenance-of-Way Association (AREMA) Portfolio of Trackwork Plans, herein referred to as the AREMA Portfolio, and AREMA Manual for Railway Engineering, herein referred to as the AREMA Manual. Collectively they will be referred to as AREMA requirements.
- 2.1.3. Except as modified in the contract drawings, the Vendor will use rail conforming to the requirements of the AREMA Manual, Chapter 4, Part 2, Specifications for Steel Rails, High Strength Rail, and as specified in this Scope of Work.

3.0 Technical Specifications

3.1. Vendor's Responsibility:

- 3.1.1. All labor, materials and equipment required for this procurement will be the responsibility of the Vendor.
- 3.1.2. Vendor will furnish Switch Points and Stock Rails as shown in the contract documents/drawings.

3.2. Material Requirements:

- 3.2.1. All Switch Points and Stock Rails will be provided in accordance with AREMA dimensional requirements for 115 RE rail sections.
- 3.2.2. All materials, including oval-neck track bolts of one-inch minimum diameter, nuts and spring washers, and special trackwork assemblies will be provided in accordance with AREMA requirements and the contract documents/drawings.
- 3.2.3. Provide heel ends of switch rails, along with ends of stock, closure, and connecting rails beveled in accordance with AREMA requirements.
- 3.2.4. Cut rail ends in accordance with AREMA requirements except that tolerance be taken up in the rail base.
- 3.2.5. Drill joint holes in accordance with manufacturer's instructions, plus or minus 1/32-inch.
- 3.2.6. Guard rails: Provide 132 RE sections.

3.2.7. Drill and ream holes with edges beveled.

3.3. Stock Rails:

3.3.1. Length: As shown in contract drawings plus or minus 1/8 inch.

3.3.2. All rail ends drilled as shown in contract drawings, except ends to be welded.

3.3.3. All connecting rail will be drilled to match frog guard rail holes.

3.3.4. High Strength (Head Hardened) Rail.

- a) High strength rail will be head hardened.
- b) High strength rail will conform to all requirements for high strength rail specified in the AREMA Manual, Chapter 4.
- c) Rails will have Brinell Hardness in the range of 341 to 388 BHN. A maximum hardness of 388 BHN may be exceeded provided a fully fine pearlitic structure is maintained.
- d) Minimum tensile strength: 170,000 psi.
- e) Minimum yield strength: 120,000 psi.

3.4. Switch Components:

3.4.1. Minimum yield strength: 120,000 psi.

3.4.2. Switch Points and stock rails: In accordance with contract drawings and as specified, and AREMA Plan 221-03, Detail 5100.

- a) Switch rails may be thick web or constructed with reinforcing bars.
- b) Switch rail lengths: as shown in the contract drawings.
- c) Bolts, rivets, fittings and spring washers in accordance with Appendix A of the AREMA Portfolio.
- d) Fabricate five bolt heel joint assemblies in accordance with AREMA Plan 221-03 and AREMA Specifications for Special Trackwork.
- e) Fabricate forged steel rail stops in accordance with AREMA requirements.
- f) Switch inserts with bolts: Manufacture as specified for frog inserts per AREMA requirements.
- g) Drill stock rails for ballasted special trackwork as shown in the contract drawings. Switch heaters will be the responsibility of WMATA.
- h) Floating heel blocks for No. 10 and No. 15 switches will be manufactured as shown in the contract drawings.
- i) Floating heel block for No. 8 guarded switch will be manufactured as shown in the contract drawings.
- j) Guarded switches will have a modified five bolt heel joint assembly to accommodate the stock rail, switch rail and guard rail in accordance with AREMA Plan 221-03 and AREMA Specifications.

3.5. Quality Assurance/Control:

3.5.1. A Quality Assurance/Control Program must be submitted to WMATA and must be consistent with ISO 9001 (International Organization for Standardization).

3.5.2. Tolerances: Conform to the AREMA Portfolio; Plan No. 1020-03, Permissible Variations in Completed Switches; the AREMA Specifications for Special Trackwork, Permissible Variations in Dimensions, Fits and Other Physical Attributes, Section 7; and the AREMA Specifications for Steel Rails, Section 5, in all aspects unless modified by the contract documents, specifications, or the contract drawings.

- a) Switch tuck mating against the stock rail will be such that the assembled switch, with minimal bar pressure acting on the switch rail at rod number 1, 25% or more of the switch point contact length, starting from the tip of the point, will make positive, firm contact with the ball of the stock rail.
- b) Switch spring backs will be such that the assembled switch, with no pressure acting on the switch rail, having maximum allowable spring back between the switch point and the ball of the stock rail will be 3/16 inch, be measured six inches back from the tip of the point.
- c) The specific criteria for a Switch Point/Stock Rail set must, at minimum, include the following:
 - Stock Rail Length
 - Point Rail Assembly Length
 - Line of Straight Run (Stock Rail or Switch Point whichever is straight): (+/- 1/32")
 - Point Tip to Point End of Stock Rail (+/- 1/2")
 - Point Fit to Stock Rail (1/32" Max Gap for 75% of head contact area with one clamp at First Rod location & Heel if needed)
 - Spreads at Stops (+/- 1/32")
 - Spread at Heel Block (+/- 1/32")
 - Stops (contact - 0.030" max. gap)
 - Switch Heel Block (contact - 0.030" max. gap)
 - Flangeway (if assembly is guarded): +/- 1/16" with point thrown to designed point throw.
 - Proper Tags Applied

3.6. WMATA Inspection:

3.6.1. The Contract Officer's Technical Representative (COTR) reserves the right to inspect parts and assembly in accordance with pertinent sections of the AREMA Manual, as modified herein. Vendor will make available to WMATA, without charge, the facilities and the assistance needed to examine the work in progress and the finished product. WMATA will determine if the finished product complies with the contract documents.

3.6.2. If WMATA determines the need to inspect the Switch Points and Stock rails, the following will apply.

- a) The Vendor will provide a mock up switch panel complete with switch plates in order to completely assemble the Switch Points and Stock Rails for inspection by WMATA and the Vendor Quality Control (QC) staff.

- b) Manufactured Switch Points will be floor assembled to mating stock rails in a predetermined fixture for inspection. The fixture should include, but is not limited to, a minimum of 4 to 6 fixed plates (appropriate for a switch panel using the switch point/stock rail assembly to be inspected), a single clamp or stop at the heel to approximate the action of a heel block (in the event of a floating heel block design) and a single clamp to be located at the designed first switch rod location.
- c) Bracing, wedging, or support blocking will be permitted at the heel of the switch and the rails can be clamped at rod No. 1 to hold components to proper gauge and alignment.
- d) Variations from WMATA approved shop drawings or the contract documents will constitute noncompliance and will not be accepted for shipment. Shipment will be accepted when previously unaccepted variations are properly modified, reviewed, and approved by WMATA.
- e) Vendor will provide templates and one yard straight edge or longer, as necessary, to check flangeway, rail end drilling, switch rail planing, and other features of the work usually checked by templates.
- f) Vendor will present material for inspection in a safe area away from excessive noise and manufacturing activities. Vendor will provide labor to facilitate WMATA's inspection of the top, side and bottom of switches.
- g) Vendor will provide WMATA with a copy of the Vendor's completed switch point inspection checklist.

3.7. Shop Drawings and Submittals

3.7.1 Shop drawings and submittals must be provided to the WMATA COTR no later than (30) calendar days after the contract is awarded.

3.7.2 The Vendor will create and provide to WMATA a copy of all working drawings and shop drawings that are required in addition to the contract drawings or other drawings provided by WMATA. All drawings created by the Vendor will be delivered to the WMATA COTR at WMATA.

3.7.3 Shop Drawings for components will be in CADD and PDF, including the following:

- a) A laboratory certified copy of reports on the analyses and tests required by referenced ASTM specifications.

3.7.4 In conjunction with the specified tests, submit the following documents for review and approval by WMATA:

- a) Shop Drawings for special trackwork components, including split switches, stock rails and assembly.

3.8. Packaging:

3.8.1. All materials for this contract will be delivered to:

WMATA Auth Road Material Storage Facility
4305 Auth Place
Suitland, MD 20746

WMATA Industrial Road Material Storage Facility
6851 Industrial Road
Springfield, VA 22151

Alternate locations within the WMATA rail system (DC, MD, VA)

Deliveries will be coordinated with TRST Material Control. Hours of delivery will be between 7:00 am and 2:00 pm Monday through Friday, exclusive of Federal holidays in the Washington, DC area. The Vendor will notify WMATA of material deliveries (48) hours in advance. The supplier will contact Ms. Kimberly Hammond at (202) 253-4127 for instructions.

3.8.2. The switch points and stock rails will be packaged as follows:

- a) No. 6 guarded and No. 6 guarded equilateral switch points and stock rails will be shipped with heel blocks and assembled.
- b) No. 8 guarded, No. 10, and No. 15 turnout switch points and stock rails will be shipped as individual units.
- c) Switch Points and Stock Rails will be loaded head up with branding on all rails facing the same direction.
- d) Switch Points and Stock Rails will be loaded with adequate wood strips between tiers or rails to prevent damage during transit.
- e) Package and label all parts and replacement materials in moisture-proof containers suitable for shipment and storage.

3.8.3. Identification Numbers:

- a) a) As shown on the contract drawings, each Switch Point and Stock Rail has an identification number. Each number will be stamped on a metal tag and the tag affixed to the corresponding part and separate component bundle.
- b) b) Tags will be made of corrosive-resistant metal such as anodized aluminum or brass. Fastening hardware will be the same material as the tags. Numbers will be stamped in characters $\frac{1}{2}$ inch minimum in height. Tags will measure at a minimum: .050 inches thick, 1-1/4 inches wide and two inches long.

3.8.4. All deliveries must include a detailed Bill of Lading. All packages will have a visible and readable shipping list on the corresponding package.

3.8.5. WMATA will unload the shipments of Switch Points and Stock Rails.

3.8.6. WMATA staff will inspect Switch Point and Stock Rail deliveries upon receipt. The Vendor will replace defective materials within (14) calendar days of rejection notice when they are damaged, or if they do not meet specifications. WMATA will not incur any additional cost for replaced materials.