



**Pennsylvania**

DEPARTMENT OF TRANSPORTATION

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**PENNSYLVANIA DEPARTMENT OF TRANSPORTATION  
BUREAU OF RAIL FREIGHT, PORTS AND WATERWAYS  
SUPPLEMENTAL CONDITIONS: TRACKWORK CONSTRUCTION**

*Formerly known as "Trackwork Inspection Criteria"*

**(Revised 05/2019)**

**SECTION 100: GENERAL**

The purpose of this document is to provide minimum material and workmanship requirements for common construction items identified in typical track rehabilitation or construction contracts to which the Department (PennDOT) is a party.

Unless otherwise specified in these criteria and approved by the Chief Railroad Engineer track material and workmanship shall conform to the most current (at time of bid package approval) American Railway Engineering and Maintenance of Way Association (AREMA) specifications, as applicable. AREMA specifications include, but are not limited to, the Manual for Railway Engineering (also referred to as the AREMA Manual) and AREMA Portfolio of Trackwork Plans. Established specifications by the operating railroad may be used in lieu of AREMA specifications. In instances where materials and/or workmanship are not stated in AREMA or operating railroad specification, the PennDOT Publication 408 specifications shall govern. At a minimum, all track work shall comply with Federal Railroad Administration (FRA) Class I standards (49 CFR Part 213).

All material shall be free of defects, and of the proper size. All methods of measurement and payment are as indicated in the bid package or request for quotation (RFQ).

The term " Contractor " in this document shall mean any person performing any construction work, regardless if that person is contracted labor or force account labor.

**SECTION 150: PENNSYLVANIA STEEL PRODUCTS PROCUREMENT ACT**

In accordance with the Act of March 3, 1978 (P.L. 6, No. 3), as amended, known as the "Steel Products Procurement Act" (73 P.S. Section 1881 et seq.), the Grantee and/or Contractor shall only use steel products produced in the United State. If a steel product is identifiable from its face, the Grantee and/or Contractor must provide certification if requested by the Department, that it is in compliance with the Act. If a steel product is unidentifiable from its face the Grantee and/or Contractor must provide documentation, if requested by the Department, which includes, but is not limited to: invoices, bills of lading, and mill certification that the steel

was melted and manufactured in the United States sufficient to demonstrate compliance with the Act.

In Section 6 of the Act, the definition of "steel products" provides that

[i]f a product contains both foreign and United States steel, such product shall be determined to be a United States steel product only if at least 75% of the cost of the articles, materials and supplies have been mined, produced or manufactured, as the case may be, in the United States.

The Department's Office of Chief Counsel has determined:

While the 75/25 rule may apply to certain items that are to be installed on rail freight projects funded through PennDOT state grants, we conclude that the rule does not apply to turnout frogs. Certainly, the frog may have no utility as a stand-alone item, and its utility arises from its incorporation into the turnout. However, these considerations do not mean that its cost must be determined relative to the total cost of the turnout, and not separately from it, so as to bring it within the scope of the 75/25 rule and demonstrate compliance with the Act as long as its cost represents 25 percent or less of the total cost of the turnout. Regardless of the language used in the bid specifications (including but not limited to references to purchasing/installation of turnout components), the Department presumes that the purchasing and installation of distinct steel items that constitute the turnout separately is contemplated.

Because the definition of "steel products" in Section 6 of the Act includes components destined to become part of another item, it offers further support for our conclusion that the Bureau must consider the frog by itself, and where it was manufactured, for purposes of determining compliance with the Act.

The 75/25 rule applies primarily to a piece of machinery or equipment containing foreign-made steel. Such machinery or equipment would normally already be assembled either at the time of purchase or before delivery to the purchaser and is thus distinguishable from the turnout.

Incorporating a foreign-made frog into a project being funded through a state rail freight grant requires submission of a waiver request to PennDOT *before* bid specifications are approved. Only after approval of a waiver is a foreign frog to be purchased and installed. In reviewing the waiver request, PennDOT will consider such factors as the number of domestic manufacturers, the lead time required for a domestic manufacturer to produce the frog, the impact of the lead time on the project completion date, and the possibility and appropriateness of a time extension.

## **SECTION 151: PENNSYLVANIA TRADE PRACTICES ACT**

In accordance with the Act of July 23, 1968 (P.L. 686, No. 226), as amended, known as the "Trade Practices Act" (73 P.S. Section 1881 et seq.), the Grantee and/or Contractor cannot and shall not use or permit to be used in the work any aluminum or steel products made in a foreign country which is listed below as a foreign country which discriminates against aluminum

or steel products manufactured in Pennsylvania. The countries of Brazil, South Korea, Spain, and Argentina have been found to discriminate against certain products manufactured in Pennsylvania. Therefore, the purchase or use of those countries products, as listed below, is not permitted:

a. Brazil: Welded carbon steel pipes and tubes; carbon steel wire rod; tool steel; certain stainless-steel products including hot-rolled stainless steel bar; stainless steel wire rod and cold-formed stainless steel bar; pre-stressed concrete steel wire strand; hot rolled carbon steel plate in coil; hot-rolled carbon steel sheet; and cold-rolled carbon steel sheet.

b. Spain: Certain stainless steel products including stainless steel wire rod, hot-rolled stainless steel bars, and cold-formed stainless steel bars; pre-stressed concrete steel wire strand; and certain steel products including hot-rolled steel, plate, cold-rolled carbon steel plate, carbon steel structural shapes, galvanized carbon steel sheet, hot-rolled carbon steel bars, and cold-formed carbon steel bars.

c. South Korea: Welded carbon steel pipes and tubes; hot-rolled carbon steel plate; hot-rolled carbon steel sheet; and galvanized steel sheet.

d. Argentina: Carbon steel wire rod and cold-rolled carbon steel sheet.

This provision in no way relieves the Grantee and/or Contractor of responsibility to comply with those provisions which prohibit the use of foreign-made steel and cast-iron products. If a product listed above is identifiable from its face, the Grantee and/or Contractor must provide certification, if requested by the Department, that it is in compliance with the Act. If a product listed above is unidentifiable from its face, the Grantee and/or Contractor must provide documentation, if requested by the Department, which includes, but is not limited to: invoices, bills of lading, and mill certification to demonstrate compliance with the Act.

## **SECTION 152: PENNSYLVANIA UNDERGROUND UTILITY PROTECTION LAW**

In accordance with the Act of December 10, 1974 (P.L. 852, No. 287), as amended, known as the "Underground Utility Protection Law. (73 P.S. Section 176 et seq.), the Grantee and/or Contractor is required to inform himself/herself fully concerning location of public and private utilities which may or may not require the removal, resetting, construction and/or reconstruction, and which may interfere with its operations.

The Grantee and/or Contractor shall take all precautions necessary to protect existing utilities and shall be fully responsible for and shall make good any injury to such utilities that may occur by reason of its operations.

## **SECTION 153: WORK WITHIN COMMONWEALTH PROPERTY/RIGHT-OF-WAY**

No work may occur within Commonwealth property/right-of-way without the prior approval of the appropriate Department or Commission. The Commonwealth, at its discretion, may impose additional requirements to work within Commonwealth property/right-of-way.

## **SECTION 154: COMPLIANCE WITH ENVIRONMENTAL LAWS**

Both the Grantee and Contractor are responsible for ensuring all project work complies with all federal, state, and local environmental laws and regulations.

## **SECTION 155: PREPAREDNESS, PREVENTION, AND CONTINGENCY (PPC) PLAN**

A PPC Plan is required when fuels, lubricants, fertilizers, chemicals, hazardous wastes, or any materials with the potential for causing accidental pollution of air, land, or water are stored or utilized on any project site. If applicable, the PPC Plan must be available at the project site at all times.

## **SECTION 156: PERMITS AND APPROVALS**

The Owner shall ensure all necessary permits and approvals (environmental, municipal, highway occupancy, etc.) have been obtained prior to the commencement of construction.

## **SECTION 157: HEALTH AND SAFETY**

The Contractor shall perform all work in a safe manner in compliance with all applicable federal, state, and local laws, regulations, and railroad safety requirements.

## **SECTION 158: HOUSEKEEPING OF THE PROJECT SITE**

The Contractor shall take all necessary measures, including in designated storage area, to prevent all pollution discharge. The project site shall be kept clean and neat throughout the duration of work. Waste, rubbish, and scrap shall be properly disposed of offsite and off railroad property. The project will not be considered complete until such disposal is complete, and the project site is returned to its original condition.

## **SECTION 159: DISPOSAL OF TIES AND TIMBERS**

Ties and timbers removed as part of the project shall be properly disposed of at a permitted/licensed facility (landfill, recycler, incinerator, etc.). The disposal of ties and timbers shall be documented with a dated receipt identifying the quantity, location, and party receiving the ties and/or timbers. This documentation shall be provided to the Department upon request.

## **SECTION 160: SELECTED APPLICABLE REFERENCES**

The list below contains online links to selected published references which may be applicable to project work. The list is in no way meant to be exhaustive and complete.

PennDOT Publication 72M - Roadway Construction Standards:  
[http://www.dot.state.pa.us/public/Bureaus/design/PU B72M/PUB72COV .pdf](http://www.dot.state.pa.us/public/Bureaus/design/PU%20B72M/PUB72COV.pdf)

PennDOT Publication 371 - Grade Crossing Manual:  
<http://www.dot.state.pa.us/public/pubs/forms/Publications/PUB%20371.pdf>

PennDOT Publication 408 - Highway Specifications:  
[http://www.dot.state.pa.us/public/Pubs Forms/ Publications/PUB -108/PUB% 2048.pdf](http://www.dot.state.pa.us/public/Pubs%20Forms/Publications/PUB%20408.pdf)

## **SECTION 200: TRACK CONSTRUCTION**

**DESCRIPTION:** This work consists of the following:

- Preparation of the subgrade including all clearing, excavating, filling and grading necessary for the placement of the railroad track.
- Furnishing, distributing and assembling all components of the railroad track in accordance with this document and AREMA specifications.
- Final leveling and alignment of track.

**MATERIAL:** All materials shall conform to AREMA specifications and to the criteria contained within this document.

**WORKMANSHIP:** Work shall comply with AREMA specifications and to the criteria contained within this document.

## **SECTION 300: CROSS TIES**

**DESCRIPTION:** This work consists of furnishing and distributing the required number of ties, installation of replacement ties, removal and disposal of defective ties, replacement of tie plates, spiking of replacement ties, tamping, replacement of rail anchors, and dressing of ballast.

**MATERIAL:** Ties shall be oak and/or mixed hardwoods and conform to AREMA specifications. Ties shall not be industrial grade, plant rejects, relays, or manufactured with a material other than wood unless written permission is received from the Chief Railroad Engineer. New cross ties shall be installed and shall measure a minimum of 6"x8"x8'-6" (ties may have a tolerance of - 1/4" to +3/4" width and height and be 1" shorter or longer than the length of 8'-6"). No more than 1" of wane shall be allowed in the rail bearing area. As a minimum, cross ties shall be treated with a 60/40 creosote-coal tar solution per cubic foot of material. Boron and Copper Naphthenate treated wood ties may be requested to the Chief Railroad Engineer for review. Treatment reports will be provided if requested.

**WORKMANSHIP:** Ties shall be delivered clean and free of surface residue. Ties shall be stored at a location where any releases from the wood (i.e. weeping or bleeding) will not

contaminate a sensitive environmental area (i.e. soil, groundwater, surface water, or sediment). Ties shall remain stored until sufficient drying time has elapsed where the placement will not present an environmental hazard. All ties will be placed with the heartwood face down, square with the line of rail and centered with the track. All ties will be brought up tight against the base of the rail and be tamped with an appropriate device. Scarify tie cribs to avoid damaging ties upon insertion. Ties will be handled with tie tongs or approved mechanical device. The use of a pick is not allowed. All ties will be spiked to a minimum gage of 56" but will not exceed 57.5". In areas where ties are spotted in, blending of the existing ties will be required. Where spikes are withdrawn, the spike holes in the tie will be plugged with a creosoted tie plug. Spikes will be driven vertically and square against the rail and driven to allow 1/8" to 3/16" space between the spike head underside and top of rail base. No spikes will be driven into the joint bar slot or at the joint bar ends. Tie plates will be centered on the tie under the rail with the base of the rail bearing firmly against the tie plate. Under no circumstances will the shoulder of the plate be under the base of the rail. Rail anchors disturbed as a result of the work will be reinstalled as per existing anchor pattern.

### **SECTION 301: SWITCH TIES**

**DESCRIPTION:** This work consists of furnishing and distributing switch ties, removing and disposing of defective switch ties, installing of replacement switch parts and tie plates as required, driving spikes, tamping ties, and dressing ballast.

**MATERIAL:** Switch ties will be oak and/or mixed hardwoods and conform to AREMA specifications. Switch ties will not be industrial grade, plant rejects, relays, or manufactured with a material other than wood unless written permission is received from the Chief Railroad Engineer. New switch ties will measure as specified in the AREMA Portfolio of Trackwork Plans. No more than 1" of wane will be allowed in the rail bearing area. As a minimum, switch ties will be treated with a 60/40 creosote-coal tar solution per cubic foot of material. Boron and Copper Naphthenate treated wood switch ties may be requested to the Chief Railroad Engineer for review. Treatment reports will be provided if requested.

**WORKMANSHIP:** Workmanship as described in Section 200 applies. The distance from the field side base of rail to the end of the switch tie will be in the range of 13" - 24" for both ends of the switch tie. Switch ties will be installed per AREMA specifications. Under no circumstances shall switch ties be interlaced, nor shall switch ties be placed off-center for the purpose of avoiding interlacing.

### **SECTION 302: BRIDGE TIES**

**DESCRPTION:** This work consists of furnishing and distributing bridge ties, removing and disposing of defective ties, installing replacement ties, reinstalling tie plates, spiking, installing tie bolts, and installing tie spacer bar or timber.

**MATERIAL:** Bridge ties shall be made of wood and conform to AREMA specifications. Bridge ties will be new and properly treated unless otherwise approved by the Chief Railroad Engineer.

**WORKMANSHIP:** Workmanship in Section 300 applies, where applicable, and AREMA specifications. Bridge ties will be clapped (if applicable) and fitted to support the running rails at the proper grade and elevation across the entire length of the bridge. For securing the rail to the ties, workmanship shall be as described in the appropriate Section number of this document and AREMA specifications. All joints on the bridge deck will be tightened upon completion of bridge timber installation.

#### **SECTION 400: SUB-BALLAST**

**DESCRIPTION:** This work consists of furnishing sub-ballast for all work.

**MATERIAL:** All sub-ballast shall comply with AREMA specifications.

**WORKMANSHIP:** A minimum of six (6) inches of sub-ballast shall be placed below the ballast. Placement shall be in individual lifts not exceeding four (4) inches. Each lift shall be compacted until no movement of material exists beneath compaction equipment. All other workmanship shall be as described in AREMA specifications.

#### **SECTION 401: BALLAST**

**DESCRIPTION:** This work consists of furnishing ballast for all work. This includes but is not limited to Section 500 - Raising, Lining, and Surfacing and/or Section 501- Spot Tamping (Surfacing).

**MATERIAL:** Ballast (crushed stone) shall be new or used (cleaned) and free of screenings, dirt, and foreign matter. Gradation numbers 24, 25, 3, 4, 4A are acceptable as mainline and siding materials. Gradation Numbers 5 and 57 are acceptable as yard materials. All ballast shall comply AREMA specifications. Use of ballast material and/or gradations other than is listed in this Section shall require the approval of the Chief Railroad Engineer.

**WORKMANSHIP:** Ballast shall be placed a minimum of twelve (12) inches below the bottom of all ties, where practicable, but never less than six (6) inches, and within all void space between ties. All other workmanship shall be as described in the appropriate Section number of this document and all applicable AREMA specifications.

#### **SECTION 500: RAISING, LINING, AND SURFACING**

**DESCRIPTION:** This work consists of raising, lining and surfacing the track to specifications; installing ballast; spiking and tamping all ties; tightening of joints; and regulating ballast.

**MATERIAL:** Ballast shall be as described in Section 401 - Ballast. All other material shall be as described in AREMA specifications.

**WORKMANSHIP:** Adequate ballast for dressing to the proper cross section will be distributed in advance of raising. All joints in the work limits will be tightened prior to beginning the surfacing work. Workmanship shall be as described in the appropriate Section number of this

document and AREMA specifications. All spikes will be driven down with care taken not to overdrive. All ties will have a tight bearing against the base of the rail, all joints will be retightened, and ballast will be regulated and dressed after surfacing and lining have been complete d (including the cleaning and inspection of switch points).

## **SECTION 501: SPOT TAMPING (SURFACING)**

**DESCRIPTION:** This work consists of installing the necessary ballast, tamping all low spots, sink holes, d own ties, respiking improperly spiked ties, and realigning track areas where needed.

**MATERIAL:** Ballast shall be as described in Section 401 - Ballast. All other material shall be as described in AREMA specifications.

**WORKMANSHIP:** Workmanship shall be as described in the appropriate Section number of this document and AREMA specifications. All c ribs are to be filled with ballast and ties tamped up tightly to the base of rail. Down ties are to be plugged, respiked, and tamped up tightly to the base of rail. Work area will be properly dressed after completion of surfacing.

## **SECTION 600: RAIL**

**DESCRIPTION:** This work consists of furnishing rail required for all work. This includes but is not limited to Section 601 - Jointed Rail and/or Section 602 - Continuously Welded Rail (CWR).

**MATERIAL:** Rail shall be new, relay (used/second-hand), or Industrial Quality (IQ) of a brand manufactured in the United States (The Bureau uses the list of brands of rail manufactured in the United States found in the " Federal Railroad Administration, Office of Railroad Safety, Track Inspector Rail Defect Reference Manual" as its reference of domestic rail manufacturers.) Rail shall conform to AREMA specifications, with the exception of Industrial Quality rail.

Relay rail purchased for and used in any project will not exceed Class I or II allowable wear as specified in the "Rail Grading Classification by Wear" table in the AREMA Manual (Table 4-3-17). The use of relay rail with wear classified as AREMA Class III or IV will not be used unless approved by the Chief Railroad Engineer. Certification of relay rail Class grading shall be provided to the Bureau upon request.

All Industrial Quality rail shall be permanently identified by grinding diagonally through every "RE" or other designation within the rails ' branding. Each designation shall be ground or milled diagonally from the top right-hand corner to the bottom left-hand corner, a minimum of ¼-inch in width and within 0.0 10-inch of the parent rail web surface (depth). Documentation from the rail manufacturer must be provided to both the client and the Bureau indicating the reason for the Industrial Quality designation.

**WORKMANSHIP:** Workmanship shall be as described in the appropriate Section number of this document and AREMA specifications. Industrial Quality rail may not be used on a mainline and may only be used in yards or sidings both that do not carry hazardous materials (hazmat).



## **SECTION 601: JOINTED RAIL**

**DESCRIPTION:** This work consists of furnishing and distributing required length of rail, installing rail, disposing of replaced rail, installing tie plates, driving spikes, and installing rail anchors.

**MATERIAL:** Rail shall be as described in Section 600 - Rail. Rail shall be of the same or greater weight and section as that being replaced (if applicable). Rail less than 14' in length shall not be used as replacement rail.

**WORKMANSHIP:** Rail will be cut with a saw and new bolt holes will be drilled. A torch will not be used for these operations. Rail end mismatch will not exceed 1/4" on both the tread and gage side. All rail will be spiked to a minimum gage of 56" but will not exceed 57.5". For securing the rail to the ties, workmanship shall be as described in the appropriate Section number of this document and AREMA specifications.

## **SECTION 602: CONTINUOUS WELDED RAIL (CWR)**

**DESCRIPTION:** This work consists of furnishing and distributing required length of CWR, installing rail, disposing of replaced rail, installing tie plates, driving spikes, and installing rail anchors.

**MATERIAL:** Rail shall be as described in Section 600 - Rail. Rail shall be of the same or greater weight and section as that being replaced (if applicable).

**WORKMANSHIP:** CWR will conform to AREMA specifications and as indicated in an FRA approved CWR Plan of the operating railroad (if required by the FRA and/or 49 CFR 213). CWR will not have holes closer than 4.5" to the weld. All tie holes will be plugged with treated plugs. All CWR rail will be laid to a minimum gage of 56" but will not exceed 57.5". Every tie will be box anchored for 200' beyond each bolted end of the CWR strings, each end of road crossings, and each end of switches. Ballast will extend beyond the tie ends at least 12". Rail will be cut with a saw and new bolt holes drilled; a torch will not be used for these operations. Rail end mismatch will not exceed 1/4" on both the tread and gage side. Proper welding specifications will be determined by the contractor performing the welding operation and will be acceptable to the Department. For securing the rail, workmanship shall be as described in the appropriate Section number, AREMA specifications, and FRA approved CWR Plan, as applicable.

## **SECTION 603: TURNOUT**

**DESCRIPTION:** This work consists of furnishing all materials required for the construction of a turnout.

**MATERIALS:** All materials shall comply with AREMA specifications.

**WORKMANSHIP:** The turnout shall be either a Left Hand (LH) or Right Hand (RH). The use of another geometry, such as an equilateral or 3-way turnout, requires the approval of the Chief Railroad Engineer. The placement of a turnout on a curve is discouraged. Workmanship shall be as described in the appropriate Section number of this document and AREMA specifications.

## **SECTION 700: RAILROAD GRADE CROSSING OF A PUBLIC ROAD**

**DESCRIPTION:** This work consists of the rehabilitation or new construction of a railroad grade crossing a road open to public vehicular and/or pedestrian traffic.

**MATERIALS:** All materials shall comply with AREMA specifications and the specifications of the governmental agency having jurisdiction.

**WORKMANSHIP:** Prior to any construction, all approvals shall be obtained. Approvals include, but are not limited to, municipality, PennDOT, and the Pennsylvania Public Utility Commission (PUC). Pedestrian and vehicular traffic shall be fully protected. Work shall not extend beyond railroad right-of-way. All work shall comply with AREMA, owner of the public road (municipality, PennDOT, etc.), and manufacturer (if applicable, such as if using prefabricated concrete panels) specifications. All rail through the crossing shall be continuously welded with the first joint being no closer than six (6) feet from the edge of the road crossing. The crossing shall be constructed to provide a minimum storm water and surface water conveyance of a ten (10)-year storm (a rainfall event with a ten (10) percent maximum exceedance probability in a single year.) Any filter fabric used below the tracks shall meet AREMA specifications, be of weight between ten (10) to sixteen (16) ounces per square yard and placed a minimum of ten (10) inches below the bottom of the ties. All workmanship shall be in accordance with the most current (at time of bid package approval) PennDOT Publication 408 and Publication 72M - Drawing No. RC-28M, as applicable, for crossings on roads owned by the Commonwealth unless otherwise approved by the appropriate Commonwealth delegated Engineer (i.e. District Grade Crossing Engineer).

## **SECTION 701: RAILROAD GRADE CROSSING WITHIN PRIVATE PROPERTY**

**DESCRIPTION:** This work consists of the rehabilitation or new construction of a railroad grade crossing of a road within private property (i.e. rail yard, manufacturing plant).

**MATERIALS:** All materials shall comply with AREMA specifications.

**WORKMANSHIP:** All work shall comply with AREMA and manufacturer (if applicable, such as when using prefabricated concrete panels) specifications. No joints shall be placed inside six (6) feet from either edge of the road crossing. Any filter fabric used below the tracks shall meet AREMA Specification, be of weight between ten (10) to sixteen (16) ounces per square yard and placed a minimum of ten (10) inches below the bottom of the ties.