pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF RAIL FREIGHT, PORTS,
AND WATERWAYS

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
BUREAU OF RAIL FREIGHT PORTS AND WATERWAYS
TRACKWORK INSPECTION CRITERIA

(**Revised 1/13**)

GENERAL

The purpose of this track work criterion is to provide minimum material and workmanship requirements for common construction items identified in typical track rehabilitation or construction contracts to which the Department is a party. Upon completion of any work, all rubbish, waste, old ties, or any other waste material removed from the tracks will be cleaned up and properly disposed of offsite.

Any steel products used in the performance of the Agreement shall adhere to the Steel Products Procurement Act (Ref. Steel Products Procurement Act 73 P.S. § 1881, et seq.). Certification shall be provided if requested.

Unless specified in these criteria, track material and workmanship will conform to the most current (at time of bid package approval) American Railway Engineering and Maintenance of Way Association (AREMA) Manual, be free of defects, and of the proper size.

Ballast (crushed stone) will be used and will be free of screenings, dirt, and foreign matter. Gradation numbers 24, 25, 3, 4, 4A are mainline ballast materials. Gradation Numbers 5 and 57 are yard ballast materials. All ballast will comply with AREMA Manual.

All bituminous material used for highway grade crossings will be suitable for permanent construction and repairs and be in accordance with the most current (at time of bid package approval) Publication 408 were applicable.

Work will be in compliance with environmental regulations applicable to the nature of the work performed.

At a minimum, all track work will comply with Federal Railroad Administration (FRA) Class I standards (CFR49-213). 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 tables of the AREMA manual. 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.

ITEM #1: CROSS TIES

DESCRIPTION: This work will consist 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 will be oak and/or mixed hardwoods and conform to AREMA specifications. Ties will not be steel, and will not be industrial grade, plant rejects, or relays unless written permission is received from the Chief Railroad Engineer. New cross ties will be installed and will 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 will be allowed in the rail bearing area. As a minimum, cross ties will 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: All ties will be placed with the heartwood face down, square with the line of rail and approximately 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 to prevent skewing of the ties. 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.

METHOD OF MEASUREMENT: This item will be measured by a unit for each tie properly installed.

ITEM #2: 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 conform to the AREMA Manual and/or AREMA Portfolio of Track work Plans. Material and treatment will be the same as for crossties.

WORKMANSHIP: Workmanship as described in Item 1 applies. The distance from the field side base of rail to the end of tie will be in the range of 13" - 24" for both ends of the switch tie. Switch ties will not be interlaced.

METHOD OF MEASUREMENT: This item will be measured by the number of linear feet of switch ties installed and accepted.

ITEM #3: 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 will conform to the AREMA Manual and be of the same or greater weight and section as that being replaced (if applicable). Rail less than 14' in length will 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 ¼" 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 as described in Item 1 applies.

METHOD OF MEASUREMENT: This item will be measured and accepted by the number of linear feet of rail installed and accepted.

ITEM #4: CONTINOUS 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: CWR will conform to the AREMA Manual and as indicated in FRA approved CWR plan of operating railroad (where applicable). 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 ¼" 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 as described in Item 1 applies.

METHOD OF MEASUREMENT: This item will be measured and accepted by the number of linear feet of rail installed and accepted.

ITEM #5: 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 will conform to AREMA specifications and gradation will be suitable for type of track service.

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. Work will comply with the AREMA manual. 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 completed (including the cleaning and inspection of switch points).

METHOD OF MEASUREMENT: This item will be measured by the track feet surfaced and accepted.

ITEM #6: SPOT TAMPING (SURFACING)

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

MATERIAL: Ballast will conform to AREMA specifications and gradation will be suitable for type of track service.

WORKMANSHIP: All cribs 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.

METHOD OF MEASUREMENT: This item will be measured by the actual number of track feet spot surfaced and accepted.

ITEM #7: BRIDGE DECK REPAIR

DESCRIPTION: 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: All material will conform to the AREMA Manual.

WORKMANSHIP: New properly treated bridge ties will be used unless otherwise specified. Bridge ties will be dapped (if applicable) and fitted to support the running rails at the proper grade and elevation across the entire length of the bridge. Workmanship in Item 1 applies where practicable. All joints on the bridge deck will be tightened upon completion of bridge timber installation.

METHOD OF MEASUREMENT: This item will be measured by the number of bridge ties installed and accepted.

ITEM #8: ROAD CROSSING REBUILDING

DESCRIPTION: Work will consist of: 1) obtaining the necessary approval from the proper highway authority; 2) providing proper protection to the public; 3) providing for detour as required; 4) saw cutting existing pavement; 5) roll tamping ballast in no more than 4" lifts; 6) removing and disposing of all old materials; 7) furnishing and replacing all cross ties within the crossing; 8) furnishing welded rail through the crossing, the first joint to be no closer than 6' from the edge of the crossing; 9) furnishing, placing, and compacting bituminous material; 10) providing the proper overlay transition and paving notch; 11) sealing joints and, 12) providing flangeways and drainage facilities. The crossing will be tamped and surfaced with new ballast to the grade and elevation consistent with the adjacent track and roadway.

MATERIALS: All materials will comply with the AREMA Manual, except for bituminous materials, which will comply with local, county, or state highway departments in the location of work.

WORKMANSHIP: Ties installed will be tamped firmly against the base of the rail on a bed of new ballast of the required depth. Workmanship in Item 1 applies. After track is brought to the proper line and surface, Superpave Asphalt (HMA Base Course) will be properly compacted within the roadway limits, not to exceed limits of Railroad right-of-way, of the crossing to a depth from 2" below the plane of the top of the rails to the plane of the top of the ties. Superpave Asphalt (HMA Course) will be placed to a depth from the plane of the top of the rails to the HMA Base Course and be properly compacted and rolled to provide a uniform surface at the elevation of the top of the rails. Overlay transition with existing roadway and paving notch will comply with PA DOT Pub. 72 Drawing. No. RC-28 (Figure 2). Flangeways 2.5" wide and 2.5" deep will be provided along the gage side of the rails. Should crossing timbers be used, they will be of proper size, fastened with lag screws and cover the full width of the crossing. Crossing timbers will be flush against the rail on the field side. On the gage side they will be 2.5" from the edge of the rail. All debris from the crossing will be disposed of. Roadway shoulders will be graded and dressed. Pavement markings damaged and/or removed as a result of construction will be replaced in kind.

METHOD OF MEASUREMENT: This item will be measured by the linear feet of crossing replaced.

NOTE: Drainage facilities may include filter fabrics and/or drainage pipe depending on the merits of each individual crossing. If filter fabric is used below the tracks, the fabric will meet AREMA specifications for regular or heavy duty as specified and be a minimum of 10" below the bottom of the ties.

ITEM # 9: TRACK CONSTRUCTION

DESCRIPTION: This work will consist 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.

Description and workmanship in Items 1 through 9 apply where applicable.

- Placing a minimum of 6" of subballast in no more than 4" lifts. Each lift is to be compacted until no movement of material exists beneath compaction equipment.
- Placing a minimum of 6" of ballast below the ties.
- Final leveling and alignment of track.

MATERIAL: All materials will conform to the AREMA Manual.

WORKMANSHIP: Work will comply with the AREMA Manual, workmanship as described in Items 1 through 9 and Figure 1 (Page 9).

METHOD OF MEASUREMENT: This item will be measured by the track feet of railroad track constructed and accepted.

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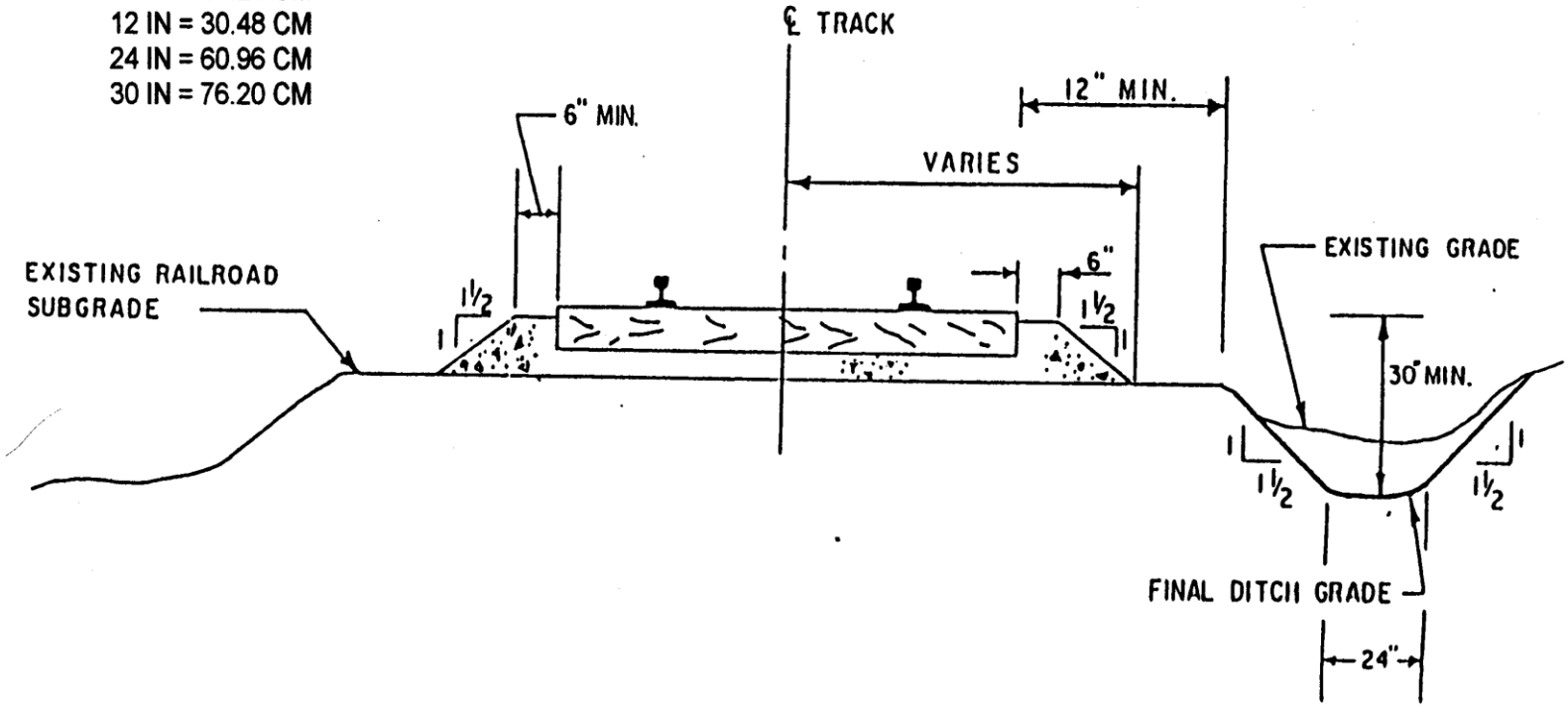
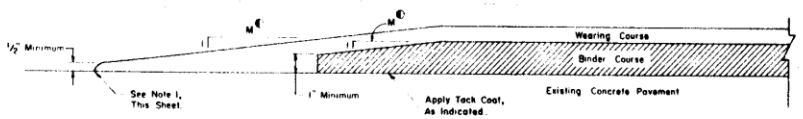
TYPICAL TRACK SECTION

FIGURE 1

CONVERSIONS

6 IN = 15.24 CM
12 IN = 30.48 CM
24 IN = 60.96 CM
30 IN = 76.20 CM



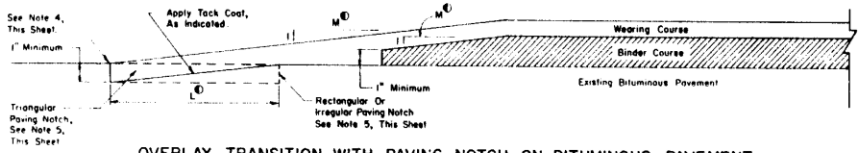


OVERLAY TRANSITION ON CONCRETE PAVEMENT

◐ See Table A, This Sheet, For Dimensional Requirements

TABLE A

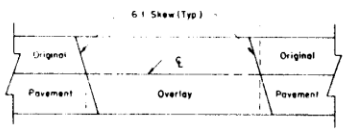
FUNCTIONAL CLASSIFICATION	SLOPE M (MAXIMUM)	PAVING NOTCH L (MINIMUM)
Interstate And Other Limited Access Freeways	1" in 15'	15'
Arterials > 45 MPH (See Note 3, This Sheet)	1" in 10'	10'
Arterials ≤ 45 MPH (See Note 3, This Sheet)	1" in 5'	5'
Collectors And Local Roads	1" in 5'	5'
Cross Streets (See Note 2, This Sheet)	1" in 1'	1'
Driveways	1" in 1'	No Notch



OVERLAY TRANSITION WITH PAVING NOTCH ON BITUMINOUS PAVEMENT

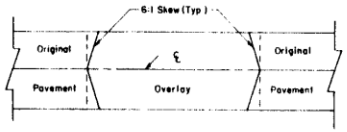
NOTES

1. Seal edge as specified in Publication 408, Section 401.3(j)3.
2. Use higher appropriate criteria if a cross street has a functional classification of Collectors and Local Roads or higher.
3. Use 85th percentile speed, if available. Otherwise, use the posted speed.
4. Place edge flush with existing pavement and seal as specified in Publication 408, Section 401.3(j)3.
5. Use of a triangular paving notch, as shown, is preferred. However, the the notch may be rectangular or irregular as long as the minimum dimensional requirements are met.



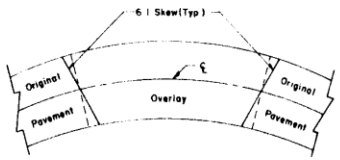
PLAN VIEW

TANGENT SECTION
TWO-LANE DIRECTIONAL



PLAN VIEW

TANGENT SECTION
TWO-LANE, TWO-WAY TRAFFIC



PLAN VIEW

SUPERELEVATION SECTION

OVERLAY TRANSITIONS

Commonwealth of Pennsylvania
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

OVERLAY TRANSITIONS AND PAVING NOTCHES

Recommended May 2, 1983	Recommended May 2, 1983	Sht 1 Of 1
Dir., Bureau of Highway Design	Chief Highway Engineer	RC-28

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