



TRACK STANDARDS

RC-0506-02TRK

REVISIONS

Changed Metrolinx Logo to reflect new design.

Changed release date / revision date, and updated cover pages.

Section 1

- 1.2.3 Fix wording issues
- 1.4.1 Add reference to new appendix section for construction tolerances
- 1.4.4 Expand on MOW track requirements
- 1.4.5 Prevention of fires note added

Section 2

- 2.7 Definition added for bumping post
- 2.8 Yard tracks explained better
- 2.9 Class of track cross reference fixed
- 2.12 added further information on CWR
- 2.16 Removed detailed measurement requirement from definitions and included in the appropriate section
- 2.27 Added definition of a Fire Watch
- 2.28 Clarified definition of flange wear
- 2.30.a Added definition for Thrice weekly – to be removed
- 2.33 Redefined grade crossing
- 2.35 Expanded the definition of guard rail. Added link to GO Standard Plan

- 2.38 Added definition of Head Wear
- 2.40 Added definition of Hot Work
- 2.41 Added definition for Impedence bond
- 2.42 Added definition of In Service Rail failure
- 2.44 Defined interlocking with CROR definition
- 2.46 Moved definition of Rail Joints from section 4 to definitions section and defined types of all types of joints
- 2.47 Deleted Jordan rail.
- 2.48 Deleted Loss of Vertical Height
- 2.52 Added definition for Overhead Catenary System
- 2.59 Redefined rail.
- 2.62 Deleted Rail Flaw Testing
- 2.63 Redefined Reference marks . Modified location for reference marks in definition
- 2.64 Modified definition of restraining rail
- 2.71 Deleted Sperry Test
- 2.71 Definition of spot tie replacement added
- 2.75 Corrected definition for ambient temperature. Corrected location for where to take rail temperature
- 2.79 Redefined turnout.
- 2.81 Redefined rail flaw testing
- 2.84 Added Vmax definition.
- 2.85 added definition for Weld repair bars
- Renumbered section accordingly to achieve alphabetical definitions.

Section 3 (NEW SECTION)

Section 4 (renumbered)

- 4.1 Added section on Rail Identification, and removed a number of items from the Recommended Method 1303

- 4.2 Unloading rail requirements moved to Section 4.4
- 4.2 Dragging rail requirements moved to section 4.4
- 4.2 UTT testing of rail moved to Section 18.4 and combined with other UTT requirements
- 4.2.5 Minimum plug length changed.
- 4.2.6 Cutting rail section expanded
- 4.2.7 Dye penetrant and longitudinal defect testing requirement for PW rail added, and rail in track
- 4.3 Added section on Plug rail
- 4.4 Added section on Handling and Unloading Rail
- 4.4.1 Added requirement for approved grapples
- 4.4.2.i Requirement to inspect fasteners after dragging rail added
- 4.4.2.j Added requirements for dragging rail through a turnout
- 4.5 Moved joint stagger spacing from this section and moved to 5.2.10
- 4.5 Moved information on joints and expansion gap for rail to Section 4
- 4.5.3 RLT to be included on the web
- 4.5.5 Concrete ties to be spaced at 20" centers for high degree curves
- 4.5.7 Specified timeline for filling cribs.
- 4.5.9 Added requirement to record the rail temperature.
- 4.5.10 Sequence of installing joint bars vs spikes specified
- 4.6.1 Requirement for increasing inspection of rail worn to 75% added. Renamed limits to those in the appendix.
- 4.6.2 Requirement for further increasing inspection of rail worn to 95% added
- 4.7 Moved speed restriction for unanchored track to Section 10.2
- 4.7.4 PRLTR added to table.
- 4.7.7 Destressing timeline added
- 4.7.10 Spiking pattern D added as a requirement
- 4.7.11 Temporary spiking pattern verbiage added to differentiate between curves and tangent

- 4.8.4.a Specified previous reference marks are to be painted over
- 4.8.9 Added requirement for destressing
- 4.8.12 Added cross reference to Direct Fixed Track
- 4.9.1 Added specific requirement for destressing.
- 4.9.4 merged sections to prevent redundancy
- 4.9.4.d Added information on reference marks
- 4.9.6 Added rail clips
- 4.9.7 Clarified for all tie types
- 4.9.9 Added steel ties
- 4.9.10 Added vibrating as an option
- 4.9.12 Simplified check of box anchors
- 4.9.15 do not remove the RLT from web. add destressed temp.
- 4.9.17 Maximum length for destressing specified
- 4.9.18 reference to destressing road crossings
- 4.9.19 reference to destressing turnouts
- 4.9.22 Speed restrictions for destressing expanded and clarified, and clarified temperature range
- 4.9.24.a RLT to be written on the web of rail.
- 4.9.25 Reworded and timeline added
- RM3205-0 Modified wording. Corrected calculations for PRLT of 100F, and clarified. Also added direct calculation results.
- 4.10.2 Electrification information added
- 4.10.3.b requirement to box anchor every tie added
- 4.10.4 Information requirement following a failure in CWR added
- 4.10.5 information requirement for rail breaks added. Figure added
- 4.10.6 Requirement to retain broken rail ends added
- 4.10.9 Expands on the requirement for reference marks, and revised the location

- 4.10.10.d. Dye Penetrant testing requirement added
- Figure added for rail markings
- 4.11.1 Clarified for electrified territory
- 4.11.6 cross-referenced for clarity and consistency with standards.
- 4.11.9 changed the minimum length of plug
- 4.11.11.a cross-referenced destressing section
- 4.11.12 cross-referenced destressing section
- 4.12.2 Corrected to provide the two options
- 4.12.3 Added from previous bullet
- 4.12.4 added from previous bullet
- 4.12.5 added from previous bullet and renumber remainder
- 4.12.6 Destressing requirement added for permanent repairs
- 4.12 deleted redundant standards
- 4.14.7.a Deleted references to wide gap welds. Specified that defects should be centred when cut out.
- 4.14.8.a Specified that defects should be centred when cut out.
- 4.14.9 Deleted sub requirements for torch cutting. Referenced welding section for torch cutting requirements
- 4.15 Moved items on NTR to section 18.4
- 4.15.1.b Added requirement to check underside of head
- 4.16 Moved tables to Appendix I
- 4.17 Moved Flow Charts to Appendix K
- 4.17 Added requirements for authorizing movements over in service failures
- 4.17.1.c Employee qualifications added for authorizing movements over rail breaks.
- 4.17.2 Added electrified territory requirements
- 4.17.10 Removed the ability to use temporary bonds to prop up the signal system
- 4.18 moved section and renumbered accordingly

- 4.18.1 Allow CAD welds, but not on the head of rail
- 4.18.2 Allow pin brazing, but not on the head of the rail except on IJs
- RM1303-0 deleted items that were covered in Section 4.1
- RM1303-0 Explained spot classification on GO territory

Section 5

- 5.2.3 Proper hole diameter specified and included in standards. Table included
- 5.2.10 Added information on joint stagger
- 5.2.11 Added requirement to lubricate temp joints
- 5.2.11 Added information on expansion gap between rail ends
- 5.2.12 Distance from rail joints to fixed objects added
- 5.2.13 Joint bar requirement added
- 5.2.14 Torque for bolts added
- 5.2.15 Requirement for bolting and spiking after the days work
- 5.2.16 Slotting requirements added
- 5.2.17 Added how to spike joint bar
- 5.2.18 Added requirement for ties supporting joints
- 5.3.1 Defined continuous insulated joints
- 5.3.3 defined non-continuous insulated joints.
- 5.3.9 Clarified
- 5.3.10 prohibit use of fibre insulated joint bars in main track
- 5.3.17 Added requirement for ties supporting insulated joints
- 5.3.18.a Added required for box anchoring
- 5.3.19 added clarification on anchors at IJ locations. Added link to GO Standard Plan
- 5.3.24 specified 9ft ties at IJs, with an exception at turnouts
- 5.4.2 clarified
- 5.4.6 compromise bars are only permitted in non-main.

- 5.5 Section on weld repair bars added
- RM3700-0 Removed reference to flat bits.

Section 6

- 6.1.4 Rail head profiles included and placed in Appendix Q
- 6.1.8.a removed responsibility of selection appropriate pattern from track supervisor duties
- 6.1.10 added reference to new Fire protection section 23.
- 6.3.1.a Not applicable on steel and concrete bridges
- 6.3.10 Added requirement to inspect structures with a thermal imaging device.
- Added Rail Milling information to entire section.

Section 7

- 7.1.2 clarified for main line. Non-main track requirements specified.
- 7.1.3.a Added requirement for power and access
- 7.1.3.e Lubricator spacing added
- 7.1.4.h deleted / redundant
- 7.1.5.a requirement to remove protecting fabric every spring to inspect track added, as well as installation instructions
- 7.1.13.a.i requirement added for reporting defective lubricators
- 7.1.17 added exception to top of rail lubrication

Section 8

- 8.1.2 Added electrified territory info
- 8.1.4 Added spacing requirements for welds
- 8.1.5 clarified field welding locations
- 8.1.7 Added requirement for dye penetrant testing
- 8.1.9.a deleted a number of provisions for torch cutting
- 8.1.9.b Added speed restriction for movements over torch cut rail.
- 8.1.10 removed class 1 exception

- 8.1.11 clarified location for marking
- 8.1.14 limit the number of times a switch point could be welded and clarified wording
- 8.1.15 Added table for vertical offset
- 8.1.16 Requirements for marking welds added with figure
- 8.1.17 Weld report requirement added
- 8.1.18 requirements for work following completion of weld added and clarified.
- 8.1.19 grinding of welds requirement added. Added table, figures, and grinding tolerances
- 8.1.21 Added requirement for welder qualification
- 8.1.22 Added temporary bonds for welding within a crossing circuit.
- 8.2.3.a Requirement to grind base risers added
- 8.2.8 specified not to use expired weld kits
- 8.3 New section on flash butt welding
- 8.4 modified section on arc welding
- 8.5.1.b corrected to values in welder manual
- 8.5.2.a added when preheating of rail should be done
- 8.5.4 requirement for rail pullers added
- 8.5.5/6 Simplified temperature requirements for welding
- 8.6.2 corrected the clear time following ignition of the weld charge
- 8.6.5 corrected wording
- 8.7 Added Section for welding on bridges

Section 9

- 9.1.1 Added specification on type of ties allowed
- 9.1.1.c added requirement for centring ties
- 9.1.2 Crossing tie replacement information added
- 9.1.2.c corrected TSO requirements
- 9.1.3 Crossing tie specification added

- 9.1.4 turnout tie specs added
- 9.1.4.b.i Allowing field cutting of turnout ties
- 9.1.5 turnout tie use for special locations
- 9.1.11 added in electrification group
- 9.1.15.b Track Supervisor requirement to mark ties added
- 9.1.15.c.i information on tie distribution added
- 9.1.15.c.ii information on tie distribution in residential areas
- 9.1.15.d GO Standard Plan referenced
- 9.1.15.j requirements to dispose of ties added
- 9.1.17 requirement for ties at joints added
- 9.1.18 number of non-defective ties in 39 ft added
- Table 17 modified for more conservative amount of maximum defective ties per mile
- 9.1.21.f added requirement for adzing new ties
- 9.1.21.g further clarified when unspiked ties can be left.
- 9.1.21.h further clarified damaged plates
- 9.1.31 Added section on track shim
- 9.2 new section on transition ties created and all transition tie info moved.
- 9.3.1 Concrete tie handling added
- 9.3.2 Concrete tie spacing added
- 9.3.5 information on removing insulators added
- 9.3.13 Rail seat abrasion information added
- 9.3.14 Inspection requirement for rail seat abrasion added
- 9.3.15 requirement for what to do when rail seat abrasion is found added
- 9.3.20 concrete ties are not to be modified
- 9.4.16 added temperature requirements for repairs
- 9.5.5 cross-referenced for pre-ballast requirements

- 9.5.7 Added info on hollow steel ties

- 9.6.1 reworded

Section 10

- 10.1.1 Tie plate installation requirement added

- 10.1.3.e.i Added 1:20 cant plates for use on the Galt sub for maintenance only

- 10.1.4 All ties must have plates

- 10.1.7 Prohibit the use of roll plates on mainline with exceptions

- 10.1.8 Cast tie plates requirements added

- 10.2.1 anchor application requirements specified

- 10.2.7 anchor requirements on elastic fastener tracks

- 10.2.8 Sliding anchors on the base

- 10.2.9 Re-adjustment of anchor requirements

- 10.2.10 tools for removal of anchors specified

- 10.2.14.f Anchoring requirements near road crossings added

- 10.2.18 authorizing train movements over unanchored tracks specified

- 10.3.1.f requirement for derails where operating rules dictate

- 10.3.2 requirement for derails in Rule 841

- 10.3.3 requirements for portable derails.

- 10.3.4 clarified that this is for permanent derails

- 10.3.5 Clarified wording

- 10.3.8 replaced with GO Standard Plans

- 10.3.14 Derail height for hinge and sliding type derails in non-derailing positions specified

- 10.3.15 deleted redundant info

- 10.3.16 Modified correct derail size for associated rail as per new CN ETS

- 10.3.17 Limits on shimming provided

- 10.3.23 provided GTS plan reference and limited the use of conventional switch targets and tips

- 10.3.24 GO Standard Plans added
- 10.3.25 requirement for special derails to be operated by a switch stand added. GO Standard Plans added
- 10.3.31 GO Standard Plans added
- 10.3.33 Added info on derails in CTC
- 10.3.35.d Straight guard rail requirement added for where cars can roll
- 10.3.35.e GO Standard Plans added
- 10.3.36 requirement for a railway lock on derails added
- 10.3.38 Added tie requirements for derails
- 10.3.39 GO Standard Plans added, and information on tie plates at derail location
- 10.3.42 Track inspections of derails shall include checking that the lock is in place and locked.
- 10.3.48 requirement for wheel crowders added
- 10.4.2 clarified that square holes are for spike and round holes for screws.
- 10.4.3 Track spiking requirements clarified
- 10.4.8 plugging spike holes requirement added.
- 10.5.1 Pilot hole requirements modified
- 10.5.3 Clarified requirements for timber screws
- 10.5.4-7 added further requirements for screw spikes
- 10.6.1 added that spring clips must match the fastening system.
- 10.6.2.a added requirement for e-clips not to be overdriven.
- 10.6.5 added section on clips with concrete ties.
- 10.6.6 specified not to lift ties using the clips
- 10.6.7 added information on removing clips.
- 10.6.8 added requirement for clips on joints
- 10.7 section on bumping posts added

Section 11

- 11.2.1 added GO Standard Plan and reference to bridges and structures manual
- 11.2.2 Minimum requirements for pre-ballast.
- 11.2.3.a clarified requirement is for wood tie territory
- 11.2.3.b added section on requirement for ballast for concrete ties.
- 11.2.4.b.i height of ballast on concrete ties specified
-

Section 12

- 12.1.7 added electrification requirements
- 12.1.9 specified exemption to tamping centres of ties
- 12.1.12 added requirements for tamping steel and concrete ties
- 12.1.13 replaced should with shall
- 12.1.19 added requirements for surfacing CWR track.
- 12.1.20 Superelevation requirements for surfacing curves provided
- 12.1.23 added requirements for surfacing turnouts
- 12.1.26 surfacing through platforms information added
- 12.1.27 added reference for regulating ballast, and added further requirements for protection of adjacent structures
- 12.1.27.a added requirement for cleaning platforms and walkways.
- 12.1.28 added requirement for dressing ballast shoulders
- 12.3.2 added requirement for surfacing curves
- 12.3.5.a expanded on requirements for staking curves prior to surfacing and lining
- 12.3.6 added a temperature range
- 12.3.9 Added item for surfacing through boltless adjustable rail braces
- 12.3.10 Added requirement for surfacing switches at end of sidings and double tracks.

Section 13

- 13.1.6 Added approval requirement for using turnouts smaller than No. 10

- 13.1.9 Provision for number 24 turnouts added
- 13.1.10 Provision for concrete tie turnouts added
- 13.1.11 renumbered
- 13.2.1.a placing new turnouts in service.
- 13.2.4 turnouts in vertical curves
- 13.2.5 turnouts on bridges
- 13.2.6 turnouts near crossings
- 13.2.7 turnout separation
- 13.2.8 reverse curve requirements
- 13.2.11 Added requirements for assembling turnouts
- 13.2.12.d Ballast removal requirement added
- 13.2.12.e speed restriction for turnout without a stand
- 13.2.15 requirement added for placing packing materials to block ballast
- 13.2.16 requirement added for covering roller bodies to prevent filling with ballast
- 13.2.17 Ballast cribbing requirements added for winter maintenance
- 13.2.19 Location of switch stands specified
- 13.2.22 Specified requirement for low profile switch stands
- 13.2.23 Added reference to Table for switch adjustment recommendations and Added associated table
- 13.2.24-26 Added requirement for switch point protectors and an associated table
- 13.2.27 Added option to protect mainline switch points with guardrails
- 13.2.33 – 34 added handle and level positioning requirements for switch stands.
- 13.2.37 Added frog type requirements.
- 13.3 re-written entire section
- 13.4.1 Requirements for signal maintainer presence for switch work added
- 13.4.7 clarified grinding requirements for flow on points

- 13.4.8 Prohibited the welding of switch points and stock rails on mainline tracks, and provides an exception for emergency situations
- 13.4.9 Prohibited the welding of switch rod connecting clips
- 13.4.13 requirement to maintain gauge added
- 13.4.14 requirement for switch point positioning with respect to rollers added
- 13.4.15 Roller maintenance requirements added
- 13.4.18 Bolt requirements for special track work added
- 13.4.19 Made allowance for use of guard bars
- 13.4.20-23 Added requirements for use of guard bars
- 13.4.24 Added requirements for removing a switch from service
- 13.5.8 Added spring frog maintenance requirements

Section 14

- 14.1.3 Specified location of jacks and lifting slings
- 14.1.8 Bolting requirements for diamonds added
- 14.1.9 Maintenance requirements for manganese diamonds added
- 14.1.10 Flange-way requirements added
- 14.1.11-14 Moved items to this section as relevant.
- 14.3.1 Expanded on the requirement for good drainage and keeping culverts clean
- 14.3.11 Added approval requirement for changing of road crossings
- 14.3.12 Added Emergency Notification Signage requirement at all crossings
- 14.3.17 Changed joint free length from 20 to 25 ft
- 14.3.21.a.i Further clarification of the gauge side pin spike.
- 14.3.22 requirement for MSR plates through crossings
- 14.3.24 rail seal will be clipped in every crib
- 14.3.36 ballast cribs for concrete and rubber panel crossings
- 14.4.3 Dirt and gravel crossing restrictions added

- 14.5.3.a Destressing both sides of the crossing may be required
- 14.6.3 Existing infrastructure must be inspected prior to construction.
- 14.6.8 Changed requirement for plank crossings in concrete tie territory.
- 14.6.12 allow fence gates, remove rising barriers
- 14.6.14 fence gates cannot swing towards tracks
- 14.6.16 Barriers at the discretion of sr manager.
- 14.7.1 Temporary planking must be approved
- 14.7.3 Existing infrastructure must be inspected prior to construction.
- 14.8.3 Removed requirement for testing RCWS
- 14.8.7 Removed inspection form and information on inspection.

Section 15

- 15.1 Class of Track table moved to Appendix A
- 15.2.1 Cross reference TS Section 1
- 15.2.3 Clarified requirements of Transport Canada and the GO Standards
- 15.2.6.e Requirement added for traversing siding tracks monthly
- 15.2.14 Track inspectors tool requirements added
- 15.3.6 Added requirement for inspection of compromise bars
- 15.4.2 Changes GEI to TWSI per document title
- 15.5.1 modified table to add clarity
- 15.6 Added new section on walking curve inspections
- 15.7 Created new section for joints and joint bar inspection
- 15.7.3 Walking inspection requirements added for jointed tracks
- 15.7.6 Inspection requirements added for embedded joints
- 15.8 New section added for Ballast inspection
- 15.10 Inspection of Derails added
- 15.11 Added section on Bumping posts

- 15.12.3 Change frequency of inspection and size of culverts
- 15.12.4 change frequency of inspection and size of culvert
- 15.12.8 Further information on beaver dams
- 15.12.9 Added cross reference to Section 21.3
- 15.20.2 Hot weather speed restriction modified to 15MPH lower than track speed or 60MPH whichever is greater
- RM3100-0 Expanded Track inspection check list

Section 16

- 16.1.2 Seven classes of track
- 16.1.5 expanded on definition of near urgent
- 16.1.6 Redefined PRIORITY defect
- 16.1.8 Three or more non-overlapping defect requirements
- 16.1.9.a further clarified
- 16.2.1.d-e Narrow gauge speed restrictions added
- 16.2.2 added Changes in Gauge category.
- 16.2.3 added cant defect information info on cant caused gauge variations and table of rail base gauge
- 16.2.3.a.ii Clarified the line rail for a turnout
- 16.2.4.e Explained how to determine the alignment in a curve
- 16.2.5.b maximum superelevation specified
- 16.2.5.d Minimum superelevation specified
- 16.2.5.e Added cross reference for Vmax to TS 19.4
- 16.2.5.g.i Added speed restriction requirement
- 16.2.7.iv added clarification on WARP 31 and WARP 62
- 16.2.9.b Clarified staggered joints
- 16.2.9.c Clarified joints with a series of low joints.

Section 17

- Modified Title of section
- 17.1.1 added requirement to notify the manager of track
- 17.1.3 turnout inspection requirements clarified
- 17.1.3a removed confusing language and simplified.
- 17.4 modified title
- 17.8 Moved Diamond inspection here, including tables and RMs

Section 18

- 18.4.6 Added requirements for marking defective rail
- 18.4.13 Added requirement for marking NTR
- 18.4.15 Added requirement for marking NTR following successful UTT test
- 18.5.6 Added requirement to field test loaded gauge measurements
- 18.7 Added section for V/TI monitoring

Section 19

- 19.1.2 Referenced that only GO approved materials are to be used
- 19.1.3 added clause for Sr Manager approval
- 19.1.7a explained effective grade
- 19.1.8 Added requirement for maximum curve design and approval process to deviate
- 19.1.9 Added requirement for RCI to inspect new track prior to in-service
- 19.1.10 Added requirement for derails to be installed as appropriate
- 19.1.13 Direct fixation design requirement added
- 19.2 New section for Construction Tolerances
- 19.3.2 Fixed mistake in clearances for yard tracks with service road and lighting poles (28ft)
- 19.4.1 Added design requirements for curves
- 19.4.2 high degree curve gauge widening requirements added
- 19.4.8 Added metric units
- 19.4.24 length of tangents between curves for non-main track added

- RM1305-0 Fixed RM to include appropriate imbalance.

Section 20 (New Section)

- 20.1.6 A minimum of 18” of ballast required for excavation adjacent to tracks

Section 21

- 21.1.5.b. Convergence sets required on all tie types
- 21.1.5.c. Minimum spacing between guard and rail
- 21.1.10 guard rails in multi-track concrete tie territory
- 21.2 New Section for Restraining Rails
- 21.3 Changed Title
- 21.3.6 Added requirement for maintaining waterways, ditches and drainage
- 21.3.7 Added requirements for soft spots
- 21.3.8 Added requirements for lateral drains
- 21.3.9 Added requirement to keep tops of embankments clean
- 21.3.10 Added requirements for keeping vegetation on embankments
- 21.3.11 Added information that adjacent land owners cannot drain onto railway property
- 21.5.1 Deviation from standard excavation profiles requirements added

Section 22

- 22.1.3 requirements for locates further emphasized
- 22.2.7 added requirement for working around bond wires
- 22.3 Added section for working within crossing circuits

Section 23

- 23.1. Added the vertical clearance tolerance to table 41
 - Removed USRC special platform clearances.
 - Fixed errors with clearances
 - Fixed UP platform requirements
 - Added UP mixed use platform requirements
 - Added Mini-platform requirements
- 23.8 Clarified that all elastic clips at stations shall be galvanized

- 23.9 Clarified surfacing requirements adjacent to station platforms.

Section 24 – New Section

Appendix A – Added class of track table

Appendix C – Added Class 6 and 7. Added Narrow Gauge

Appendix D – Fixed urgent defect errors
- Added narrow gauge
- Added multiple defects table

Appendix E – Fixed TSO tolerances for IRIS

Appendix G – modified rail wear tables to simplify

Appendix H – Added further pictures to show defects

Appendix I - Moved tables on surface defects to appendix. Corrected existing Tables

Appendix J – Rebuilt the table for simplicity. deleted note 2b. Added speed restrictions for distressing. Based table on tonnage. provided a Tonnage reference table. Clarified reduced speed restriction requirements. Added table for speed restrictions following repairs of a track buckle without cutting rail.

Appendix K – New appendix for authorizing movements over rail breaks

Appendix N – Removed 2” imbalance tables as no longer relevant

Appendix O – clarified tie spacing, tie types, frog types.
- Added construction tolerances

Appendix P – Fixed table

Appendix Q – Added rail head profiles

Appendix R – Fixed error in pattern C

Appendix V – modified crossing surface requirements

Appendix X – New diagram attached

Appendix Y – new and updated diagrams including electrification requirements