APTA / AREMA Differences in Track Design Practices

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APTA / AREMA
Joint Recommended Practices for the Design of Rail Transit Track

- Goal: develop up-to-date recommended track & infrastructure practices for urban rail transit
- How: combine the membership resources of APTA and AREMA
- Method: creating up-to-date recommended practices for rail transit design, construction and maintenance using known best practices and research findings

Special Trackwork, Embedded AREMA Style

- The design is the typical split switch and usually has an RBM frog
- The switch machines are above ground, mounted on the head block ties
- The preponderance are #8 or higher
- Only one turnout design is shown in the Portfolio for embedment
- Stray current is not normally a problem

Special Trackwork, Embedded AREMA Style

Special Trackwork, Embedded APTA Style

- Multi-designs are used, tongue & mate, double tongue, double flexive tongue
- Many designs use grooved girder rail
- The switch machines are usually below ground, mounted in the gauge
- Seldom are conventional ties used
- Stray current is always a problem

Special Trackwork, Embedded APTA Style

Corrosion Control & Stray Current AREMA Style

- AREMA primarily addresses AC traction power issues
- Wood ties with steel plates usually provide sufficient isolation
- In almost all cases the traction power is an OCS
- The TP voltage is usually above 3,000 v. AC
- Loss or damage to metallic assets, own and others is not a big problem

Corrosion Control & Stray Current APTA Style

- APTA is almost entirely concerned with DC traction power
- Wood ties with steel plates usually DON’T provide sufficient isolation
- In many cases the TP distribution is a 3rd rail for heavy rail; OCS for LRT
- The TP voltage is usually less than 1,500 v. DC
- Loss or damage to metallic assets, owners and others is a BIG problem

Rail Welding
AREMA Style

- AREMA is primarily concerned with welding heavier rail sections, both flash butt & thermite
- AREMA-recommended practice covers Tee-type rails only
- Most Tee rails are “compact” sections per ASCI definition for bending
- Almost all rail produced for mainline is to AREMA specs

Rail Welding
AREMA Style (continued)

- The qualification testing and production QA/QC use the Slow Bend Test as one parameter, which is not an issue for a compact section
- Thermite welds are produced that are compatible with AREMA rail chemistry

Rail Welding
APTA Style

- APTA must cover Tee rails and non-domestic grooved rails
- Many non-domestic grooved rails are not compact sections per ASCI
- The qualification testing and production QA/QC technically don’t use AREMA specs, but in practice they do
- The use of the Slow Bend Test as one test parameter can be a major issue for a non-compact section
- Transition rails for compromise welds

Rail Welding
AREMA vs. APTA

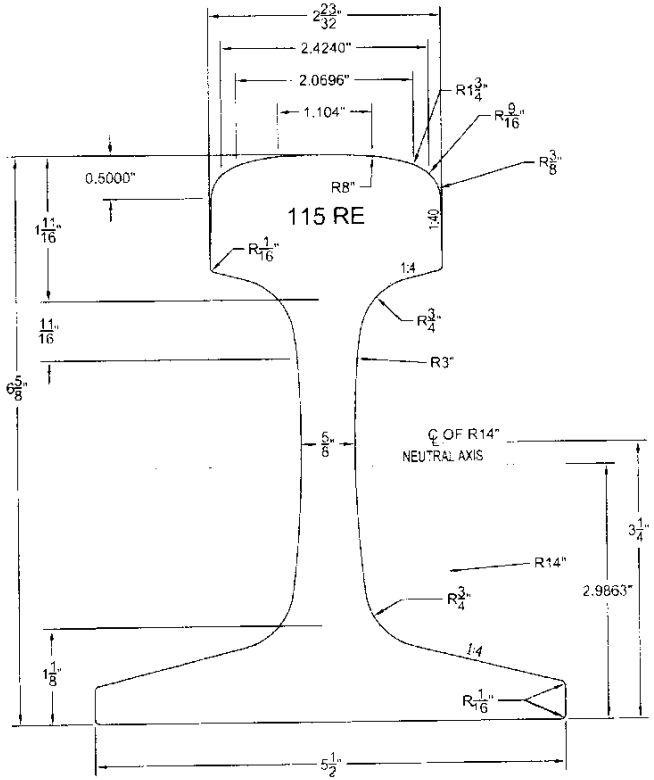

Fig 1 - AREMA Section 115 RE

Weight per yard: 114.4 lb

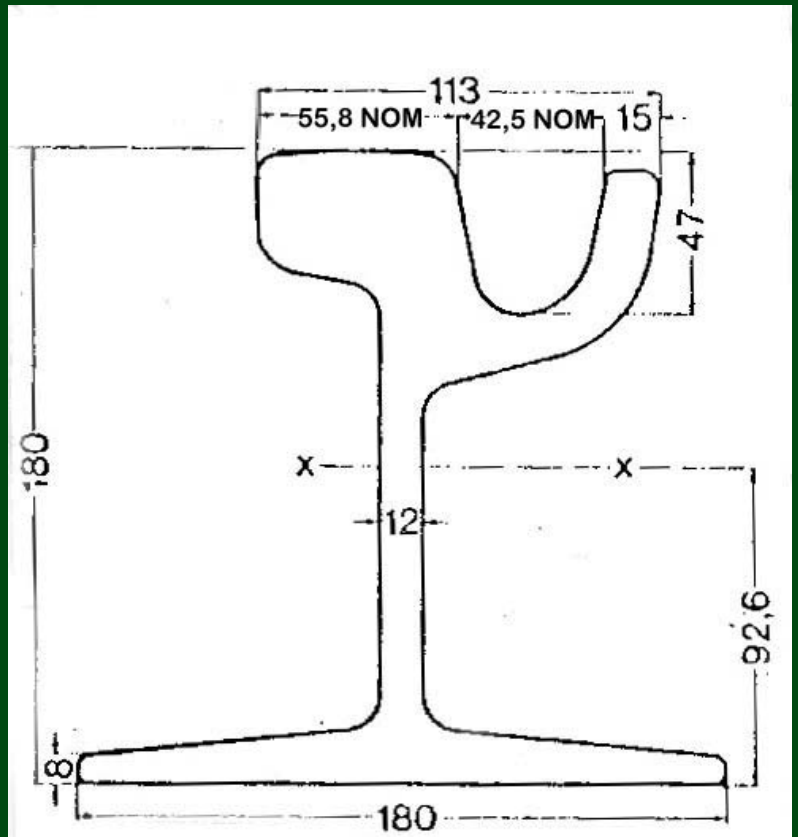

Fig 2 - CEN Section 59R2

Weight per yard: 117 lb

Slab Track Design
AREMA Style

- AREMA assumes that the loadings are freight
- AREMA applies an extraordinarily high impact factor based presumably on rigid rail fasteners
- AREMA provides no guidance for the design of embedded track

Slab Track Design
APTA Style

- APTA assumes that the loadings are transit vehicles, and
- The impact factors are greatly mitigated by compliant rail fasteners and low un-sprung mass
- Needs to provide guidance for design of all slabs, but especially embedded track

Slab Track Design
APTA Style

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