DESIGN GUIDELINES
FOR
INDUSTRIAL TRACK PROJECTS

July 2015

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TABLE OF CONTENTS **PAGE(S)**

General Procedure for Development of Track Plans	3
Standards for Industrial Trackage	4 - 6
Industrial Track Survey and Plan Requirements	7 - 8
Specifications for Constr. of Industry Trackage by Private Contractor	9 – 16
Track Inspection Acceptance Checklist	17
Vertical Curves	18 - 19
Clearance Requirements	20
Standard Sections for Industry Track	21

GENERAL PROCEDURE FOR DEVELOPMENT OF TRACK PLANS AND ESTIMATES FOR INDUSTRIAL TRACK PROJECTS

These guidelines are intended for the development of industry tracks and facilities. Build-ins and tracks other than industrial need to follow the Chicago South Shore & South Bend Railroad (CSS&SB) Main Line Design Guidelines for Track Projects.

1. Customer will be required to furnish a track plan for the project. Prior to preparing the track plan, it is recommended a site meeting be held to review the proposal. CSS&SB's, Engineering, Maintenance, Signal Engineering and Division Operating personnel should attend as appropriate to meet with the Customer.

   The feasibility of constructing the project at the location will be discussed along with operating issues. Track layout concepts and constraints will be identified with the Customer, the intent being to guide the track design to an efficient layout given specific site conditions. The Customer's track designer can attend this meeting. Following meeting, CSS&SB Engineering will prepare a project schematic and forward to Operating, Maintenance, and Signal Engineering for review and approval. Approvals and comments are returned to CSS&SB Engineering and the sketch is edited as necessary. CSS&SB will furnish a copy to the Customer upon CSS&SB internal approval.

2. The Customer may use a designer or contractor of its choice to prepare the track plans. The project schematic is to be used as a guide for preparation of the track plans. Plans should be complete and follow the example outlined herein. Questions concerning these guidelines should be directed to the CSS&SB Engineering representative. Customers are encouraged to reference this document, including standard plan drawings, in the construction specifications.

3. The Customer will develop an industrial track plan (in electronic format), including plan/profile and drainage plan, which is to be submitted to CSS&SB. Design plans shall include all information contained in "Industrial Track Survey and Plan Requirements" section, pages 7 and 8. CSS&SB Engineering will review and approve the track design, and if there are significant changes from the project schematic, the plan may need to be reviewed by other CSS&SB departments.

4. CSS&SB Engineering will communicate directly with the Customer regarding any plan revisions. Any revisions will be documented on the prints and communicated in writing to the Customer.

5. CSS&SB Engineering will prepare a cost estimate, chargeable to the Customer, for ***the CSS&SB portion of track construction***, and revise the project schematic if necessary. In general, CSS&SB will construct from point of switch to the 14-ft clearance point. When a power turnout is required, CSS&SB will construct from the point of switch to just beyond the power derail and/or entrance signal, if any.

6. Upon receiving the Firm Bid Cost Estimate, CSS&SB will present the formal industrial track package, including all agreements and cost proposal, to the Customer for consideration.

7. Upon Customer's acceptance of the proposal (check, fully executed agreements, and submittal of the final plans) CSS&SB will notify all concerned the project has been approved and funded. The final plans must be approved by CSS&SB Engineering prior to start of work on CSS&SB property. Materials for CSS&SB's portion of the project are ordered, work scheduled and construction completed.

STANDARDS FOR INDUSTRIAL TRACKAGE (NON-UNIT)

1. **Roadbed:**

Roadbed and ballast section for industrial trackage shall conform to the special roadbed section (see, page 21), and to the ballast material requirements on page 13.

2. **Curvature:**

Maximum degree of curve shall not exceed 12°30'. All curves are defined using the chord definition method. A minimum tangent length of 50 feet must be placed between reversing curves. No turnouts (switches) can be placed in a curve. Mainline turnouts must be placed at least 200 feet from the end of a mainline curve.

3. **Profile Grade:**

Track profile grades shall be limited to a maximum of 1.5%.

4. **Vertical Curves:**

Vertical curves must be provided at break points in profile grade. The rate of change shall not exceed 2.0 feet per station in summits or sags. Vertical curves shall not extend into limits of turnout switch ties. See pages 18 and 19 for CSS&SB's standard for vertical curves.

5. **Track:**

Recommended rail section is 100-lb. or greater. Hardwood ties shall be new 7" X 8" (No. 4) or 7" X 9" (No. 5), 8'-6" long, placed on 20" maximum centers with a 6" ballast section. Rail anchorage shall be provided at a minimum rate of 16 anchors per 39' panel. Continuous welded rail (CWR) shall be box-anchored every other tie. Concrete ties can be spaced at 24" center to center with an 8" ballast section. CWR is recommended when using concrete ties. Steel ties are spaced at 24" centers with 8" ballast section.

6. **Turnouts:**

All main line, controlled siding and passing track turnouts will be a minimum new No. 115 lb. or greater and include a rigid, railbound manganese frog, as specified by CSS&SB Engineering. Self guarded frogs with a guardrail added on the turnout side will be permitted on track not maintained by CSS&SB. For other turnouts maintained by CSS&SB, the size and weight will be determined dependent upon the geometry and the transportation commodity, with a No. 10-115 lb. recommended, and a No. 8 - 112 lb. as the minimum. Unless otherwise specified, turnouts will be:

- to the current AREMA standards
- utilize Samson switch points and adjustable stock rail braces
- have all weldable joints thermite welded throughout the turnout
- minimum double shoulder 13" plates,
- utilize 4 spikes per plates in the curves and for 15 ties ahead of the switch points.

Main line turnout switch ties shall be new and hardwood. All mainline, controlled siding and passing track turnouts and trackage are to be placed by CSS&SB personnel out to the 14' clearance point.

Mainline, controlled siding and passing track turnouts may require the placement of a construction berm alongside the track to allow assembly of the turnout, with no disruption to traffic. After the turnout is assembled, a track window is obtained to remove the trackage and insert the turnout.

For turnouts placed off of CSS&SB property and/or maintained by the Customer, and operated by CSS&SB, the recommended minimum is a No. 8 - 100 lb. All switch stands need to include a "30 Degree" handle as specified by CSS&SB.
Switch heaters are required for mainline turnouts where snow and ice present operational challenges. If a power turnout requires a switch heater, the power derail will require one also. The cost estimate will include installation of the switch heaters when required.

7. Derails:

A derail shall be placed on all tracks connecting with a main line, siding, or industrial lead and will be of a type as specified by CSS&SB.

8. Structures:

Bridges, drainage structures, track hoppers, retaining walls, etc. shall be designed to carry Cooper E-80 live load with diesel impact. Structures shall be designed per American Railway Engineering and Maintenance of Way Association (AREMA) Manual chapters 1, 7, 8, or 15 as applicable, and designed by a licensed engineer. See AREMA standards for unloading pits. All structural plans will need to be reviewed and accepted by CSS&SB Engineering. Gratings covering open pits must be bolted in place

9. Road Crossings

The standard for a road crossing surface installed and maintained by the CSS&SB is concrete panel (for appropriate rail size) placed on 10-ft. switch ties. Also, ten each 10-ft. switch ties are placed on both ends of the crossing, replacing any standard cross-ties. For crossings installed and maintained by the Customer, a concrete plank is recommended, with a wood plank surface as acceptable.

10. Clearances:

CSS&SB will adhere to the "Clearance Requirements By State," (see page 20) for each state. Side clearances for curves should have an additional 1-1/2" per degree of curvature. All effort should be made to provide adequate clearances. In the event clearances cannot be provided for as prescribed, warning signs will be installed and they must be illuminated at night. All loading/unloading equipment that fouls the clearance envelope during operation must positively lock in a non-fouling position when not in use.
All new tracks constructed will maintain a minimum distance of 25 feet for track centers from any main track, controlled siding or passing track. New tracks adjacent to other tracks will maintain a minimum distance of 14 feet for track centers.
At road crossings the set-back distance for storing rail cars on multiple adjacent tracks (track centers less than 25') is 250 feet from the edge of roadway. For single tracks, the setback distance varies for each state and is regulated by the states' appropriate agencies**, but 150 feet from the edge of roadway is the minimum.** However, operating conditions may require greater distances.

11. Walkways:

Walkways on bridges and adjacent to switches and trackage are governed by the appropriate State Public Service Commission, Railway Commission or other State and/or Federal agencies. Walkway ballast shall be Class 2 and no larger than 3/4” in size (ballast gradation shown on page 13).

12. Signals and Electrical Service

Customer shall provide electrical service to CSS&SB property should the proposed trackwork require power for the signal facilities. The requirement and locations will be identified at the initial on-site meeting. If the service is for an electric switch heater, a 200 Amp, Single Phase, 120/240 volt service, with meter socket and service disconnect is required. The service disconnect shall be a 200 amp, 2 pole breaker by either Cutler Hammer or Square D (QO style), with the meter socket requirement as per the power company specifications. No additional electrical panels are necessary as CSS&SB will take a feeder from the load side of the 200 amp service disconnect switch. The service may be either overhead or underground. All electrical installations will be made in accordance with the prevailing State/local electrical code(s), or if there is none, the current edition of the National Electrical Code will govern the installation. If an electric switch heater is not involved, 100 Amp service will be sufficient.

13. Inspection of Materials and Track:

CSS&SB's Roadmaster will inspect all track materials prior to placement to avoid subsequent removal of sub-standard material. CSS&SB personnel will inspect the completed track before placing it into service.

14. General:

a. Loading and unloading tracks must be designed so that they are completely independent of railroad operating lines and passing tracks such that loading and unloading operations in no way interfere with train operations. Design of trackage must be approved by CSS&SB Engineering.

b. Utility installations may require a permit. Pipelines under track are to be encased per CSS&SB requirements. Wirelines are to be installed per CSS&SB requirements. Utilities within 50 feet beyond the end of track must be underground, and protected as if they were under the track.

c. The effect on sight distance must be considered when planning construction of trackage in the vicinity of any grade crossings. The required sight distance should be determined and preserved when performing and designing for construction near any grade crossing. Less than the required sight distance will be the liability of the Customer.

d. An earthen berm or suitable bumping post shall be installed at the end of track. Also, a reflective marker as specified by CSS&SB shall be placed at the end of track.

e. **Customer is responsible for all grading including placing all sub ballast up to CSS&SB ballast and the placement of a construction berm.**

f. Customer is to acquire any additional property required to construct grade and drainage. If the proposed trackage or facility will increase runoff onto CSS&SB property, a detailed drainage plan needs to be submitted for review prior to construction. Drainage should be handled in a manner as not to overload current drainage structures on CSS&SB property.

g. **Contractor must not at any time foul the main line tracks.** A CSS&SB flagman will be required, at the Contractor's expense, when working within 25 feet from centerline of the track. Billing for the flagman is separate from the cost for CSS&SB portion of the track work.

h. Adequate lighting must be provided for train crews working at night. Work areas near switches, gates, doors, pits and buildings should be illuminated to prevent walking/tripping hazards and allow crewmen riding rail cars to see without reliance upon a flashlight.

INDUSTRIAL TRACK SURVEY AND PLAN REQUIREMENTS

Provide a Plan View of new track(s):

Show complete description of all proposed trackage, including mainline or lead track stationing, curvature, milepost location and size (#8, #10, #15) of proposed or future turnouts, car capacities, and location of bumpers or wheel stops and derails. Include at least one existing fixed object (road xing, point of switch) to assist with staking the new trackage.

With track stationing show location of 14′ clearance point, railroad property line and pertinent property corners, and any previously dedicated railroad easements. Ex: "Sta 1+85.0 Clear Pt". Note length of storage capacity of each track (clear length).

Show the location of present or proposed buildings including locations of unloading doors, ramps or docks. Show clearance from centerline of track to these facilities.

Show all existing trackage using railroad stationing, and locate all obstructions such as poles, pole lines, utilities, ditches and road crossings. Note the type of signal protection at grade crossings and location of insulated joints where applicable, and whether modifications to any of these facilities are required.

Note weight of rail in existing and proposed tracks, and list materials to be used for proposed tracks.

Furnish Milepost and Line Segment (if known) in the Title Block, along with name of Industry and date of plan preparation. Contact information for engineering firm should also be included on plans.

Suggested plan scale: 1" = 50'. **All plans and drawings need to be prepared electronically in MicroStation format (AutoCad acceptable)**. This allows for updates to CSS&SB's maps and records to be done electronically. All information is to be in English units. Plan submittals should be in Adobe's Acrobat pdf format, with 11" x 17" sheet size. Upon approval, CSS&SB Engineering will revise the project schematic, if necessary.

Establish and document one local benchmark near industrial track site.

Provide a Profile View of new track(s):

Include profile of top/rail of new track and ground line at centerline of track.

Include profile of existing track at location of switch and switch ties. Include

cross-sections for proposed tracks and existing affected tracks. Show drainage

structures, if required, with invert elevations and ditch profiles.

Suggested scales for drawings:
Profiles: 1" = 50' horizontal and 1" = 5' vertical
Cross Sections: 1"=10' horizontal and vertical

Include a description of work to be performed by the railroad:

Example: "Construct 185 track feet including a #10-136 lb turnout from point of switch to clearance point, raise railroad pole line, and adjust signals."

Include a description of work to be performed by the contractor:

Example: “Construct remaining trackage from clearance point to end, place wheel stops, install plank crossing and signs, perform all grading, install all drainage structures, install double switch point derail, provide electrical service to a point opposite the proposed switch locations.”

Include a list of track materials to be used by the contractor:

Example: “115-lb continuous welded rail (CWR) on #4 new cross-ties, #10-115lb CSS&SB standard turnouts, 32-ft full depth timber crossing planks to be placed in new construction.”

Provide an Operating Plan

Prepare a sketch (does not have to be to-scale) showing in-bound and out-bound switching plans and lengths of tracks to be used. Accompany sketch with a brief narrative of a typical move to switch facility.

Customers are encouraged to reference this document, including standard plan drawings, in the construction specifications.

SPECIFICATIONS FOR CONSTRUCTION OF INDUSTRIAL TRACKAGE BY PRIVATE CONTRACTOR

CONTRACTOR'S RESPONSIBILITY

By acceptance of the contract the contractor assumes complete responsibility for construction of the work. The Contractor should understand that any work not specifically mentioned in the written specifications, but which is necessary, either directly or indirectly, for the proper carrying out of the intent thereof, shall be required and applied, and will perform all such work just as though it were particularly delineated or described. Contractor should also understand that final approval of the track for service is the prerogative of CSS&SB and close contact with CSS&SB's Engineering is required. No work is to be performed on CSS&SB's right-of-way, or in such proximity as to interfere with CSS&SB's tracks or roadbed, without advance permission by CSS&SB, including insurance and if necessary, flagging protection.

INSURANCE REQUIREMENTS

These requirements are contained within the Industrial Track Agreement to be signed prior to construction.

GRADING & EMBANKMENT

The work covered by this section of the specifications consists of furnishing all plant, labor, material and equipment and performing all operations in connection with construction of track roadbed, including clearing and grubbing, excavation, construction of embankments and incidental items, all in accordance with the contract drawings and specifications.

The Contractor shall load, haul, spread, place and compact suitable materials in embankments and shall finish the embankments to the grade, slope and alignment as shown in the plans. Suitable materials shall consist of mineral soils free from organics, debris, and frozen materials. Embankment slopes shall be compacted and dressed to provide a uniform and dense slope. Embankments shall be built with approved materials from excavation of cuts or from borrow unless otherwise shown on the plans.

If materials unsuitable for embankments (organics, debris, brush and trees, etc.) are encountered within the areas to be excavated, or material existing below the designated subgrade in cuts or within areas on which embankments are to be placed are of such nature that stability of the roadbed will be impaired, such materials shall be removed and wasted or stockpiled for other use. Topsoil removed from embankment areas shall be spread uniformly over the embankment slopes.

Unsuitable material removed from embankment foundations or below subgrade elevation in excavation areas shall be replaced to grade with suitable material compacted as specified for embankments in these specifications.

Wherever an embankment is to be placed on or against an existing slope steeper than four horizontal to one vertical, such slope shall be cut into steps as the construction of the new embankment progresses. Such steps shall each have a horizontal dimension of not less than three feet and a vertical rise of one foot.

At all times, the Contractor shall operate sufficient equipment to compact the embankment at the rate at which it is being placed. Compaction shall be accomplished by sheep’s foot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Use construction procedures and drainage design that will provide a stable roadbed.

Each layer in embankments made up primarily of materials other than rock shall not exceed 6" in loose depth and shall be compacted to the dry density as specified hereinafter before additional layers are placed. All

embankments shall be compacted to a density of not less than 95% of the maximum standard laboratory density, and not more than +4 percentage points above the optimum moisture content, unless otherwise specified on the drawings. The standard laboratory density and optimum moisture content shall be the maximum density and optimum moisture as determined in accordance with ASTM Designation: D 698 (Standard Proctor Test). Copies of soil test results shall be furnished to owner.

On top of the embankment fill, the Contractor shall place a minimum of 6 inches of granular sub-ballast which meets the above criteria and contains no material larger than that which will pass through a (3) inch square sieve. Sub-ballast shall be crushed gravel or crushed stone with a minimum 75% of the material having two fractured faces. Sub-ballast must meet the quality requirements of ASTM Designation: D 1241 and be approved by the Engineer. Additional sub-ballast may be required as determined from an engineering soil analysis.

CORRUGATED METAL CULVERTS

These instructions cover the selection, installation, and fabrication of circular type zinc coated (galvanized) corrugated steel culverts for nominal diameters of 36-inch to 96-inch, inclusive. Additional protective coatings may be specified or allowed by CSS&SB Engineering. The minimum diameter for all culverts installed under main tracks or tracks maintained by CSS&SB is 36 inches. This diameter will allow for inspection and cleaning. For culverts maintained by the Customer, 24 inches is the minimum diameter.

Galvanized corrugated steel pipe shall be manufactured in accordance with ASSHTO Specifications M 36 and M 218. All areas of surface rust on re-corrugated ends or lockseams shall be painted using the hot-dip or metallizing process.

Design, installation, and fabrication shall be in accordance with current American Railway Engineering and Maintenance of Way Association (AREMA) Specifications Chapter 1, Part 4, Culverts. Additionally, all culvert pipes shall meet the requirements shown in Table 1.

TABLE 1

Nominal Diameter (Inches)	Nominal* Corrugation (Inches)	Minimum** Width of Lap (Inches)	Nominal Thickness (Inches)	Thickness U.S. Std. Gage	Rivet** Diameter (Inches)	Max. Cover	Min. Cover
36	2-2/3 x 1/2	2	0.109	12	3/8	40'	***
42	2-2/3 X 1/2	3	0.138	10	3/8	70'	***
42	3 x 1 &5 x 1	3	0.109	12	7/16	70'	***
48	2-2/3 x 1/2	3	0.138	10	3/8	65'	***
48	3 x 1 & 5 x 1	3	0.109	12	7/16	70'	***
54	2-2/3 x 1/2	3	0.168	8	3/8	60'	***
54	3 x 1 & 5 x1	3	0.138	10	7/16	75'	***
60	2-2/3 x 1/2	3	0.168	8	3/8	55'	***
60	3 x 1 & 5 x 1	3	0.138	10	7/16	70'	***
66	3 X 1 & 5 X 1	3	0.138	10	7/16	60'	***
72	3 X 1 & 5 X 1	3	0.168	10	7/16	65'	***
84	3 X 1 & 5 X 1	3	0.168	8	7/16	55'	***
96	3 X 1 & 5 X 1	3	0.168	8	7/16	45'	***

* Where two types of corrugation are acceptable, the use of standard 2-2/3" x 1/2" material is preferred, if available. 5 x 1 corrugations to be used only on helical pipe.

** For riveted pipe.
Pipes 48 inches or greater in diameter shall be shop-elongated 5 percent of their diameter in a vertical direction and have lifting lugs.

***Minimum cover to be one-half diameter of culvert pipe from top of subgrade to top of pipe.

Due to settlement of culvert pipes, cambering longitudinally is recommended to improve the flow line profile after settlement. This is accomplished by laying the upstream half of the pipe on a flatter grade than the downstream half. Riveted pipe shall be placed with the inside circumferential laps pointing downstream and with the longitudinal laps at the side. Pipes shall be installed with a camber suitable to the height of the cover over the pipe and bearing capacity of the supporting soil.

Firm support must be provided to obtain a satisfactory installation. The filling material adjacent to pipes shall be loose granular material, free from large stones, frozen lumps, cinders, or rubbish. The filling shall be deposited alternately on opposite sides of the pipe in layers not exceeding 6 inches in depth, and each layer shall be thoroughly tamped before placing the next layer. Special care shall be taken in tamping under the lower part of the pipe. For a trench installation, the backfill shall be tamped the entire width of the trench, and for surface installation it shall be tamped not less than one half the pipe diameter out from the sides of the pipe. The density of the backfill after tamping must be at least 95% of its maximum density, as determined by ASTM D 698.

Any other type or size drainage structure shall have approval of CSS&SB Engineering prior to installation under track locations.

UTILITY CROSSINGS

Utility crossings and relocations shall conform to AREMA standards. Applications for utility crossings and relocations are handled by Omega Rail Management. Any questions regarding utilities can be directed to the CSS&SB Engineering representative.

CURVATURE AND GRADES

Tracks will be staked by the customer's surveyor (under flag protection if necessary) and constructed as shown on the approved plans. Any changes to the approved design need to be reviewed by CSS&SB Engineering or appointed representative.

CLEARANCES

CSS&SB will adhere to the "Clearance Requirements By State," (see page 20) for each state. Side clearances for curves should have an additional 1-1/2" per degree of curvature. Warning signs will be installed for all close clearances less than standard. All loading/unloading equipment that fouls the clearance envelope during operation must positively lock in a non-fouling position when not in use.

MATERIAL

CSS&SB's Division Engineer representative should inspect all track materials prior to placement to avoid removal of sub-standard material. CSS&SB personnel will also inspect the track before placing it into service.

Rail:

For trackage maintained by the Customer the minimum acceptable rail shall be 100# section (5-1/2" base) and shall be compatible with CSS&SB standard rail section. For locations where trackage will be maintained by CSS&SB rail and fastenings shall conform to the CSS&SB standard rail section in use in that area. Contractor shall contact CSS&SB Engineering for approved section. Transition rails or compromise joints at the CSS&SB-Customer interface are the responsibility of the customer. Minimum length shall not be less than 39 feet except in turnouts and shall be free from defects. Rail should be minimum full ball relay rail, not exceeding 3/16 inch wear on any surface. Continuous welded rail (CWR) will need to be de-stressed as soon as possible after laying (see "Procedures for the Installation, Adjustment, Maintenance, and Inspection of CWR in Industry Tracks" in a separate document). CWR is recommended when using concrete ties. Thermite and flash-butt welds must be placed in crib area between ties. An abrasive rail saw will be used to cut rail—no torch-cutting.

Anchors:

Rail anchors shall be new, sized to fit the rail section. High traffic volumes or unusual grade or alignment problems may require additional anchors as determined by CSS&SB Engineering. Turnouts shall be fully anchored where special track work and joint bars permit.

Ties:

Hardwood ties shall be new 7" X 8" (AREMA No. 4) or 7" X 9" (No. 5), 8'-6" long, placed on 20" centers. Switch ties shall have a minimum cross section of 7" x 9" and minimum lengths shall conform to applicable CSS&SB Standard plans.

Concrete ties shall be pre-stressed, measure 11" wide at the bottom and 9" high with a length of 8' 3" and weight of 630 pounds. Concrete ties can be placed on 28" centers provided there is a minimum ballast section of 8" below the tie. Second-hand, or "3/4" concrete ties can be used after inspection and approval from the CSS&SB Roadmaster. When placing 3/4 ties, the damaged shoulders should be alternated from left to right sides so that they are not on the same side.

Steel ties are spaced at 24" centers with 8" ballast section and can be used with timber or concrete ties. Steel ties should not be used within 200 feet of a signal circuit identified by insulated joints.

Turnouts (Switches, Frogs & Guardrails):

All parts shall be new or good secondhand, with secondhand parts being free of injurious defects.

Tie Plates:

Tie plates may be new or secondhand, free of injurious defects and foreign material, conforming to AREMA Specifications, and shall fit rail being used. For rail 110# section and greater, all plates will be double-shouldered.

Joints:

New or secondhand joints, free of foreign material and without injurious defects, and with 4 or 6 bolt holes, conforming to AREMA requirements, may be furnished to fit rail section for which they are designed. Bolt holes must be drilled with proper equipment. Torch-cutting of bolt holes is not allowed. New or secondhand compromise joints of manufactured type (welded or homemade are not acceptable), free of foreign material and without injurious defects, shall be furnished and used where rail section (weight or design) changes. Rail section by weight shall not be compromised where difference in weight is in excess of 25 lbs. When this becomes necessary, a rail of some weight between the two different rail sections, in excess of 25 lbs., shall be used and the compromise made in two steps. The length of the medium-weight rail should be 39 feet where practical.

Spikes:

New 5/8" x 6" cut track spikes shall be installed. All spikes shall conform to AREMA requirements.

Track Bolts, Nuts and Lock Washers:

New track bolts and nuts shall be installed conforming to AREMA Specifications. Bolts will be correct size and length to fit rail. One new lock washer conforming to AREMA Specifications shall be installed on each track bolt.

Ballast:

Track ballast shall be Class 2 (1" - 3/8"). Ballast shall be free from loam, dust, and other foreign particles and shall not have less than 75% crushed particles with two or more fractured faces, unless otherwise approved by CSS&SB.

Processed ballast shall be hard, dense, of angular particle structure, providing sharp corners and cubicle fragments and free of deleterious materials. Ballast materials shall provide high resistance to temperature changes, chemical attack, have high electrical resistance, low absorption properties and free of cementing characteristics. Materials shall have sufficient unit weight (measured in pounds per cubic foot) and have a limited amount of flat and elongated particles.

Unless it meets or exceeds CSS&SB requirements, slag is not an approved ballast material.

Walkway ballast shall be ¾" clean crushed rock of the same material as the ballast

SIZE NO.	SQ. OPENING	2 1/2"	2"	1 3/4"	1 1/2"	1 1/4"	1"	3/4"	1/2"	3/8"	No. 4
Class 2	1" – 3/8"				100		90-100	40-75	15-35	0-15	0-5

Bumping Post:

An earthen berm or suitable bumping post (as specified by CSS&SB and approved by the Railroad, shall be installed at the ends of tracks. Also, a red retro-reflective marker shall be placed at the end of track.

Derails:

A derail shall be placed as specified by CSS&SB on all tracks connecting with a main line, siding, or industrial lead. Derails protecting mainline tracks and controlled sidings shall be double switch point and installed so that the derailed car is directed away from CSS&SB trackage. A power derail is required when the mainline turnout is powered, and CSS&SB will install track and signal from the point of switch to the insulated joints just beyond the power derail. Derails protecting mainline tracks

shall be placed a minimum of 100 feet behind the 14' clearance point, and placed on tangent track where possible. Derails protecting other-than-mainline tracks shall be placed a minimum of 50 feet behind the 14' clearance point, and placed on tangent track where possible. The type of derail and actual location may be determined by CSS&SB Operating Department requirements. A “Derail” sign needs to be placed next to the derail.

A second derail may be required where CSS&SB locomotives are parked during unit train loading operations. CSS&SB's Operating department will determine the necessity and type. If required, placement will be 275 feet from first derail. A “Derail” sign needs to be placed next to the derail.

Timber ties are recommended within 50 feet of a derail.

Highway Crossings:

All crossings shall be approved by CSS&SB Engineering and local governments as to type and design, in advance of placing order. Effect on sight distance of crossings must be considered when planning construction of trackage in vicinity of public grade crossings not equipped with automatic signals.

Under Track Hoppers or Pits:

Plans shall be approved by CSS&SB Engineering or authorized representative. Specifications for unloading pits are covered in the "AREMA Manual for Railway Engineering," Section 8.4. Gratings covering open pits must be bolted in place.

TRACK CONSTRUCTION

General:

All work shall be of good quality in materials, equipment and workmanship and shall conform in every respect with the specifications and instructions.

Ties:

Ties will be unloaded and handled in such a manner as not to damage ties, using approved handling equipment.

Ties to be placed at design spacing of 20-inch center to center (24 ties/39 feet) for wood, and 24-inch centers for concrete, on the finished subgrade, perpendicular to center line of track with the right hand ends of ties being parallel. Exception: On curves, align the ties to the inside of the curve. All joints are to be suspended between ties.

Top surface of ties shall be clean and smooth to provide full bearing for tie plates.

Lay wood ties with heartwood face down, and if not possible to determine position of the heartwood, lay the widest surface of the tie down.

If spikes are pulled from any tie, hole shall be filled by driving in a treated wood tie plug the full depth of the hole.

Boring or adzing of ties shall be kept to a minimum.

Tie Plates:

Double-shouldered tie plates will be used on all ties and set in position with cant surface sloping inward, making sure they are firmly seated and have full bearing. After rails are in place, shoulder of plates shall be in full contact with outside edge of rail base.

Rails:

Assemble joints before fastening rails to ties, using joint bars with full number of track bolts and spring washer for each bolt, first removing loose mill scale and rust from contact surfaces or joint bars and rails.

In laying secondhand rail, care must be taken to rail end mismatch at the joints.

Under no circumstances must rail be struck in web with tool or any metal object.
The right-hand rail facing in direction of increasing construction shall be spiked to ties, and the opposite rail shall be brought to gage of 4' 8-1/2", measured at right angles between the rails, in a place 5/8" below top of rail. A track gauge manufactured for the purpose of measuring gage should be used rather than a tape measure. Gage is to be checked at every third tie. Do not strike rail directly with a maul, either on top when driving spikes, or on side to obtain track gage.

Rail shall be laid with staggered joints. Joints shall be located as nearly as possible to the middle of the opposite rails with the following variation: (a) except through turnouts, the staggering of the joints on one side shall not vary more than 6' in either direction from the center of the opposite rail.
Continuous welded rail (CWR) will need to be de-stressed as soon as possible after laying (see "Procedures for the Installation, Adjustment, Maintenance, and Inspection of CWR in Industry Tracks" in a separate document). The completed "Record of Neutral Temperature of Welded Rail as Laid" form will be completed and presented to the CSS&SB Roadmaster at time of final track inspection.

Joints:

If necessary to force joint bar into position, strike lower edge of bar lightly with 4-lb. maul. Do not drive bolts in place. Tighten bolts in sequence, beginning at joint center and working out to ends. Bolts are to be tightened to a range of 20,000 to 30,000 ft-lbs. tension. If a bolt tightening machine is not used, a standard track wrench with a 42" long handle may be used.
At the time of installation, rail expansion shims of softwood not over 1" width shall be placed between the ends of adjacent rails to insure proper space allowance for expansion required by the rail temperatures in the following table, and shall be left in place:

39-ft Rail Temperature

Deg. F	Expansion
Over 85	None
66 to 85	1/16
46 to 65	1/8
26 to 45	3/16
6 to 25	1/4
Below 6	5/16

Bending Stock Rails:

Use approved rail bending equipment. Make bends uniform and accurate for all stock rails.

Spiking to Wood Ties:

Rails shall be spiked to every tie, using not less than 2 spikes for each rail at each tie. Drive spikes through tie plate holes into ties, located diagonally opposite each other but not less than 2" from edge of tie. Start and drive spikes vertically and square with rail. Take care to avoid slanting, bending, or causing sideways movement of spike.
Each rail will be spiked with two spikes per tie plate on tangent track staggered with inside spikes to the east or north and outside spikes to the west or south. On curves a third spike is required on the gage side of the rail. Spikes should not be placed in the slots on skirted joint bars when such practice can be avoided by providing other plates with a hole pattern that will clear the skirts.
When spikes are driven by machine, work shall be closely supervised to see that they are driven with hammer centered exactly over each spike head and drive spike vertically. Set stop bolt on the machine to prevent over-driving.
Withdraw spikes that are incorrectly driven and fill hole by driving a tie plug to full depth of hole. Locate replacement spike at another hole in tie plate and tie.

Ballast and Surfacing:

Raise track by means of jacks placed close enough together to prevent excessive bending of rails or strain on joint. Lift both rails simultaneously and as uniformly as possible. Power jack may also be used. Each track raise shall not exceed 4" with ties tamped prior to additional raise.

Unloading and Tamping Ballast:

Unload and level down ballast by most practical means, taking care not to disturb grade stakes. Perform tamping, using power tamping machines wherever possible, or manually, using approved AREMA tamping tools appropriate for type of ballast being placed. Tamp each layer of ballast from a line 15" inside each rail, on both sides of and to the ends of ties. Center area between these limits shall be filled lightly with ballast but not tamped. At turnouts and crossovers, tamp ballast uniformly for full length of ties. Tamping shall proceed simultaneously at both ends of same tie, making sure ballast is forced directly under the ties and against sides and ends of ties.

Finishing and Dressing:

Dress ballast in conformance with dimensions shown on drawings, placing additional ballast material as necessary. When placing pavement up to the track and flush with top of rail it is important to make sure water drains away from the track. This will prevent pooling and freezing which create hazardous walking conditions. Lines should be painted 10 feet parallel to the centerline of track on both sides to serve as visual reminder of the track's foul zone. Crushed rock or fabric should be placed over the ties to keep the pavement from adhering to them. Flange ways need to be kept clean to allow wheels to contact top of rail at all times.

Final Inspection:

After ballasting and surfacing are completed, inspect track to see that joints are tight and rail attachments to ties are secure.

Customer will notify the CSS&SB that the trackwork is complete and ready for inspection. The ED Mgr will arrange an on-site inspection with the BNSF Roadmaster, or designate, who will inspect the finished trackwork and complete the checklist on page 17, or similar document. The Contractor will provide a copy of the "Record of Neutral Temp of Welded Rail as Laid" form to the Roadmaster prior to or during inspection. After the Roadmaster's approval the track will be placed in service by the Division's General Manager and can then accept rail cars. Rail cars delivered to site before the track is in service will be stored at another location at an additional cost to the customer, or returned to origination point.

MISCELLANEOUS

Fencing and Gates:

Gates and fences must be grounded in accordance with National Electric Safety Code requirements to prevent an injury resulting from an electrical charge. Gates crossing tracks must have the ability to lock in the open position during train operations. If a fence parallel to a track has an angled piece at the top with security wire it must not foul the clearance envelope of the track.

ACCEPTANCE

Final acceptance of the work will be subject to the inspection by CSS&SB, and any portion of the work not accepted will have its faults corrected before the track is put into service.

Customer: _____ Contractor: _____

Location: _____

Roadmaster's Check List: Indicate OK, NO, N/A or other comments

Before traffic is permitted on trackage constructed by private contractor, Roadmaster shall make an inspection for compliance with the attached specifications and submit form to Division Engineer and Manager Economic Development:

Subgrade _____ Drainage _____

Ballast _____ Curvature & Alignment _____

Surface _____ Any Clearance Problems? _____

Rail/Gage _____ Anchors _____

Record of Neutral Temp of Welded Rail as Laid (from Contractor) _____

Ties _____ Switches, Frogs & Guard Rails _____

Tie Plates _____ Joint Bars _____

Spikes _____ Bolts, Nuts & Washers _____

Earthen Berm or
Bumping Post _____ Derails & Derail Signs _____

Walkways _____

Track or Highway Crossings _____

Comments: _____

_____

Roadmaster Name: _____ Signature: _____

Date: _____

Vertical Curves

a. Vertical curves should be used to round off all intersecting grades.

b. The length of a vertical curve is determined by the grades to be connected and the speed of the traffic.

c. The rate of change for tracks with a vertical curve concave upwards (sag) should be one-half the rate of change of a vertical curve concave downward (summit).

d. The rate of change for high-speed main tracks (> 50 MPH) should not be more than 0.05 feet per station (of 100 feet) in sags, and not more than 0.10 feet per station on summits.

e. For secondary main tracks (speed < 50 MPH), the rate of change should not be more than 0.10 feet per station in sags, and not more than 0.20 feet per station on summits.

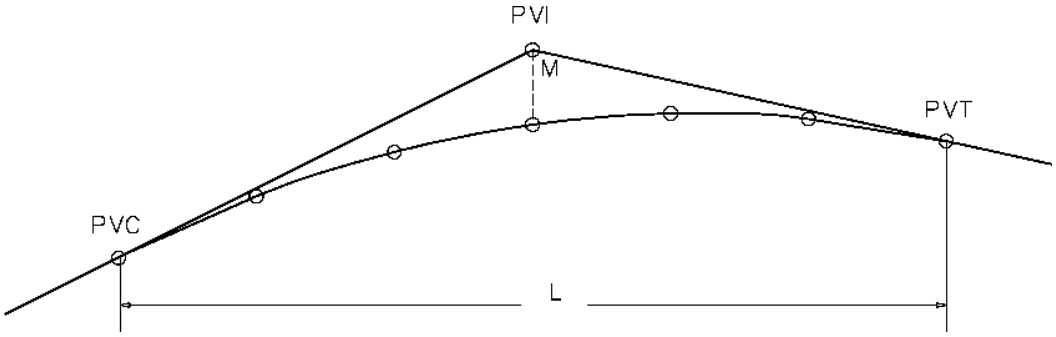
f. For industry tracks and non-main tracks with speeds not greater than 20 MPH, the rate of change should not be more than 2.0 feet per station for both sags and summits.

g. The rate of change per station is calculated as follows: R = D/L Where:

R = Rate of change per station
D = Algebraic difference of the two intercepting grades
L = Length of vertical curve in 100-ft. stations

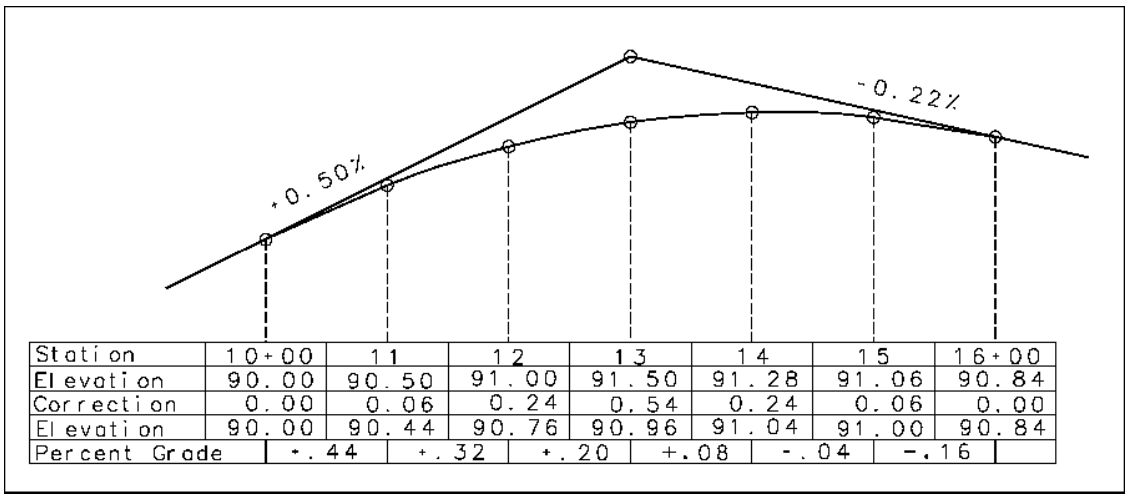
M = Correction from the straight grade to the vertical curve

A parabola is used for the vertical curve in which the correction from the straight grade for the first station is one half the rate of change, and the others vary as the square of the distance from the point of tangency. Where points fall on full stations, it will be necessary to figure these for only one half the vertical curve, as they are the same for corresponding points each side of the vertex. Corrections are (-) when the vertical curve is concave downwards (summit), and (+) when the vertical curve is concave upwards (sag). The rate of change may be assumed and the length of vertical curve computed, or preferable the length assumed and the rate computed.



For example:

Assume length = 600 feet (6 stations)
D – 0.50 minus –0.22 = 0.72
R = 0.72/6 = 0.12



Station	10+00	11	12	13	14	15	16+00
Elevation	90.00	90.50	91.00	91.50	91.28	91.06	90.84
Correction	0.00	0.06	0.24	0.54	0.24	0.06	0.00
Elevation	90.00	90.44	90.76	90.96	91.04	91.00	90.84
Percent Grade		+.44	+.32	+.20	+.08	-.04	-.16	

Calculate the straight-grade elevations for each station.

The correction for the first station is one-half the rate of change (R). So, the correction for station 11 is 0.06 (minus since it concaves downwards).

The correction for the Station 12 is 4(0.06) = 0.24. This is the correction to the first station (one-half the rate of change) multiplied by the square of the length, in stations, from the PVC. At Station 13 (the PVI), the correction is 9(0.06) = 0.54. Notice the corrections for Stations 11 and 15 are the same. Likewise for 12 and 14, since they are the same distance from the PVC and PVT. So, only one-half of the curve's corrections need to be calculated.

Next, apply the correction at each station to the straight-grade elevation to obtain the elevation on the vertical curve.

A simpler method of computing this and one that furnishes a check throughout is the following:

Sta. 10	90.00	
	+0.44	(% grade sta. 9 to 10) minus one half rate = 0.50 – 0.06
Sta. 11	90.44	
	+0.32	(% grade sta. 10 to 11) minus rate = 0.44 – 0.12
Sta. 12	90.76	
	+0.20	(% grade sta. 11 to 12) minus rate = 0.32 – 0.12
Sta. 13	90.96	
	+0.08	(% grade sta. 12 to 13) minus rate = 0.20 – 0.12
Sta. 14	91.04	
	-0.04	(% grade sta. 13 to 14) minus rate = 0.08 – 0.12
Sta. 15	91.00	
	-0.16	(% grade sta. 14 to 15) minus rate = -0.04 – 0.12
Sta. 16	90.84	

		TRACK CENTERS									VERTICAL						HORIZONTAL																		
																							PLATFORMS						SIGNALS								
																							H-HORIZONTAL CLEARANCE (MIN) V-VERTICAL CLEARANCE (MAX)							LOW BETWEEN TRACKS		SWITCH BOXES, ETC.					
STATE	REGULATION REFERENCE	YEAR OF LATEST AMENDMENT	MAIN TRACKS	ANY TWO SUBSIDIARY TRACKS	ADJACENT SUBSIDIARY TRACK TO ANY MAIN TRACKS	LADDER TRACK ADJACENT TO ANY PARALLEL TRACK	TWO ADJACENT PARALLEL LADDER TRACKS	LEAD, REPAIR AND CABOOSE TRACKS	TEAM TRACKS IN PAIRS	UNLOADING TRACKS AT PLATFORMS	GENERAL	THRU BRIDGES	HIGHWAY BRIDGES	TUNNELS	BUILDING DOORS	IN BUILDINGS	GENERAL	THRU BRIDGES	HIGHWAY BRIDGES	TUNNELS	BUILDING DOORS	IN BUILDINGS	V_1	H_1	V_2	H_2	V_3	H_3	HIGH	HEIGHT (MAX)	CLEARANCE	HEIGHT (MAX)	CLEARANCE	POLES	ORE AND COAL DOCKS	CATTLE CHUTES
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
ALABAMA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ARIZONA	CHPTR. 5, ART. 1	1987	14-0	14-0	15-0	20-0	20-0	NR	13-0	13-6	22-0	22-0	23-0	22-0	18^{3}-0	18^{3}-0	8-6	8-0	8-6	8-0	7^{2}-8	8-6	0-8	4-8			4-6	8-0	8-6	3-0	6-0	0-5	3-0	8-6	8-6	8-6
ARKANSAS	CASE R-1012	1956	14-0	14-0	14-0	17-0	20-0	14-0	13-0	13-0	22-0	22-0	22-0	23-0	17^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	7^{4}-0 [2]	7^{5}-0	0-8	5-0	4-0	5^{6}-9	4-0	8-0	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
CALIFORNIA	G.O. 26-D	1988	14-0	14-0	15-0	20-0	20-0	14-0	13-0	13-0	22-6	22-6	22-6	22-6	18-0	18^{3}-0	8-6	8-0	8-6	8-0	8-6	8-6	0-8	4-8	NR	NR	4-0	7^{8}-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
CANADA	CHPTR. 1189	1983	13-0	13-6	14-0	15-0	18-0	13-6	12-0	12-0	22-6	22-6	22-6	22-6	22-6	22-6	8-4 1/4	8-0	8-4 1/4	8-0	8-4 1/4	8-4 1/4	12	12	12	12	4-0	12	8-4 1/4	3-0	8-4 1/4	NR	NR	8-4 1/4	8-4 1/4	8-4 1/4
COLORADO	DEC. 55621	1987	14-0	14-0	15-0	17-0	20-0	14-0	13-0	13-6	22-6	22-0	22-6	23-0	17^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	7-0	8^{5}-0	0-8	5-0	4-0	5^{6}-9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
IDAHO	G.O. NO. 158	1980	14-0	14-0	15-0	20-0	20-0	14-0	13-0	13-0	23-6	22-6	22-6	22-6	18^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	8^{2}-6	8^{2}-6	0-8	4-8	4-0	7-3	4-0	8^{8}-6	8-0	3-0	6-0	0-4	3-0	8-6	8-6	8-6
ILLINOIS	TITLE 92 I.A.C.	1986	13^{11}-6	13-6	15-0	17^{15}-0	19^{16}-0	NR	13-6	13-6	21-6	21-3	21-6	21^{1}-6	H	21-6	8-0	8-0	8-0	8^{1}-0	7^{2}-0	8-0	0-4	4-6	0-8	5^{7}-1	CFH	6-2	8-6	NR	NR	NR	NR	9-0	8-0	8-0
IOWA	NR	1982	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
KANSAS	ART. 5 -RSR	1987	14-0	14-0	14-0	17-0	20-0	14-0	13-0	13-6	22-6	22-6	22-6	23-0	17-0	18-0	8-6	8-6	8-6	8-0	7^{13}-0	7^{14}-0	0-8	5-0	4-0	6^{8}-2	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
KENTUCKY	277.240	1942	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	22-0	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
MINNESOTA	219.47	1980	14-0	14-0	14-0	17-0	19-0	14-0	14-0	14-0	22-0	22-0	22-0	22-0	22^{2}-0	22-0	8-6	8-6	8-6	8-6	8^{2}-6	8-6	NR	NR	NR	NR	NR	NR	8-6	NR	NR	NR	NR	8-6	8-6	8-6
MISSISSIPPI	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
MISSOURI	TTL 4 CSR 265-8.060	1987	14-0	14-0	14-0	17-0	19-0	14-0	13-6	14-0	22-0	22-0	22-0	22-0	22-0	22-0	8-6	8-0	8-0	8-6	8^{2}-6	8-6	0-4	4-6	0-8	5^{7}-1	CFH	8-6	8-6	4-0	5^{0}-0 [10]	0-3	4-2	8-6	8-6	8-6
MONTANA	ADM. RULES	1980	14-0	14-0	15-0	20-0	20-0	14-0	13-0	13-0	22-6	22-6	22-6	22-6	18^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	8^{2}-6	8-6	0-8	4-8	4-0	5^{6}-9	4-0	8^{8}-6	8-0	3-0	6-0	0-4	3-0	8-6	8-6	8-6
NEBRASKA	ORD 16, CHPT 5, ART 4	1987	14-0	14-0	15-0	17-0	20-0	14-0	13-0	13-6	22-6	22-0	23-0	23-0	17^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	7^{2}-0	8^{5}-6	0-8	5-0	4-0	5^{5}-9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
NEW MEXICO	ORDER 2202	1987	14-0	14-0	15-0	17-0	20-0	14-0	13-0	13-6	22-6	22-0	22-6	23-0	17^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	7^{4}-0	7^{5}-0	0-8	4-8	4-0	5^{5}-9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
NORTH DAKOTA	SEC.49.10.1-13	1981	NR	NR	NR	NR	NR	NR	NR	NR	21-0	21^{1}-0	21-0	21^{1}-0	21-0	21-0	8^{1}-0	8^{1}-0	8-0	8^{1}-0	8-0	8-0	NR	NR	NR	NR	4-0	8-0	8-0	NR	NR	NR	NR	8-0	8-0	8-0
OKLAHOMA	ORDER 33847	1987	14-0	14-0	14-0	17-0	20-0	14-0	13-0	13-6	22-0	22-0	22-0	23-0	17^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	7^{2}-0 [4]	7^{5}-0	0-8	4-8	4-0	5^{5}-9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
OREGON	ORDER 83-313	1983	15-0	14-0	15-0	20-0	20-0	14-0	14-0	13-0	20-9	20-9	20-9	20-9	18^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	8-6	8-6	0-8	4-8	NR	NR	4-0	7^{8}-3	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
SOUTH DAKOTA	ORDER F2465	1957	NR	NR	NR	NR	NR	NR	NR	NR	22-6	22-6	22^{1}-6	22-6	17-0	22-6	8-6	8-0	8^{1}-0	8-6	7-0	8-6	0-8	4-8	CFH	5^{5}-9	NR	NR	8-0	NR	NR	0-4	3-0	8-6	8-6	8-6
TENNESSEE	RULE 1220-3-1-.12	1970	14-0	13-0	14-0	18-0	18-0	14-0	13-0	13-0	22-0	22-0	22-0	22-0	17-0	17^{3}-0	8-0	8-0	8-0	8-0	8-0	8-0	0-8	4-8	4-0	5-9	4-0	7-6	8-0	NR	6-6	0-4	3-0	8-0	8-0	8-0
TEXAS	SEC. 5, CHPT 11	1988	NR	NR	NR	NR	NR	NR	NR	NR	22-0	22-0	22-0	NR	22^{2}-0	22-0	8-6	7-6	8-6	NR	8^{2}-6	8-6	1-0	4-6	NR	NR	4-0	8-6	8-6	2-6	5-6	0-6	4-0	8-6	8-6	8-6
WASHINGTON	CHPTR. 480-60	1969	14-0	14-0	15-0	20-0	20-0	14-0	13-0	13-0	22-6	22-6	22-6	22-6	18^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	8^{2}-6	8-6	0-8	4-8	4-0	7^{6}-3	4-0	8^{8}-6	8-0	3-0	6-0	0-4	3-0	8-6	8-6	8-6
WISCONSIN	CHPTR. TC-3	1982	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0	22-0	22^{1}-0	22-0	22^{1}-0	22-0	22-0	8-6	E	8-6	8^{1}-6	8-6	8-6	0-4 0-8	4-6 5-1	1-9	6^{7}-0	5-0	6-4	8-6	E	E	E	E	12-0	8-6	8-6
WYOMING	CHPTR. XIII	1979	14-0	14-0	15-0	17-0	20-0	14-0	13-0	13-0	22-6	22-0	23-6	23-0	17^{2}-0	18^{3}-0	8-6	8-0	8-6	8-0	7^{2}-0 [4]	7^{5}-0	0-8	5-0	4-0	5^{5}-9	4-0	8-6	8-6	3-0	6-0	0-4	3-0	8-6	8-6	8-6
BNSF RY. CO.	[18]	1997	25^{19}-0	14-0	25-0	20-0	20-0	14-0	14-0	20	23-0	23-0	21	23-0	20	20	8^{17}-6	8-6	21	8-6	20	20	20	20	20	20	20	20	8-6	20	6^{12}-0	20	20	8-6	8-6	8-6

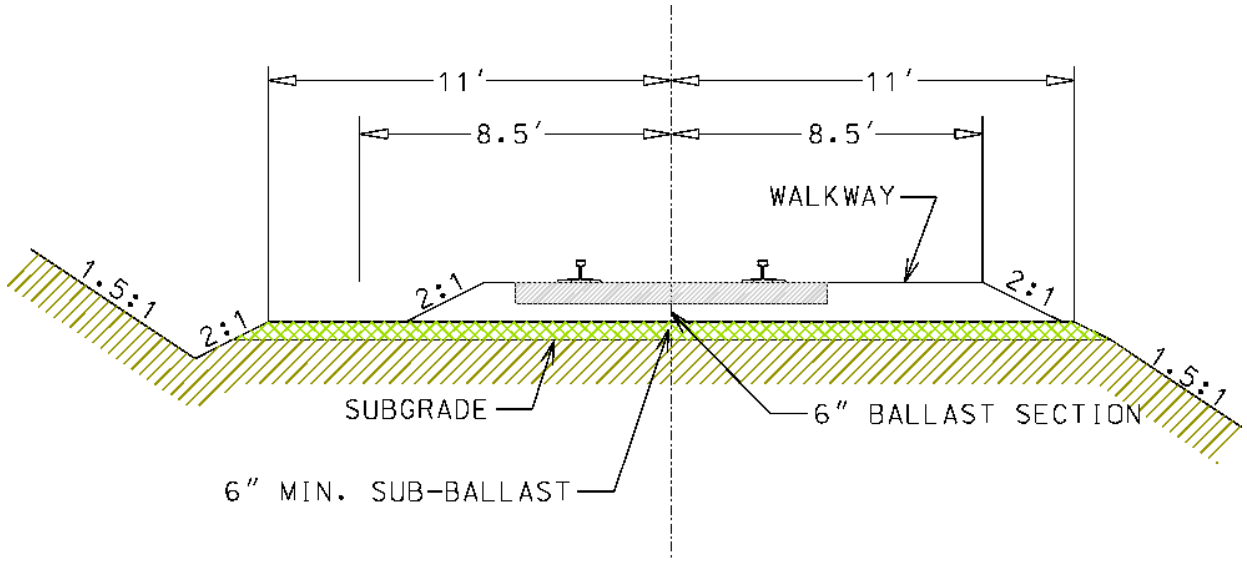
THIS CHART FOR INFORMATION ONLY - NO LIABILITY CAN BE ASSUMED
ARCHITECTS, CONTRACTORS, ETC., SHOULD CHECK WITH STATE INVOLVED.

DIMENSIONS:
SHOWN IN FEET AND INCHES.
ARE FOR TANGENT TRACK - MOST LAWS SPECIFY INCREASES FOR CURVED AND SUPERELEVATED TRACK.
VERTICAL - MEASURED FROM TOP OF RAIL. EXCEPT CANADA BASE OF RAIL FOR OTHER THAN PLATFORMS.
HORIZONTAL - MEASURED FROM CENTER LINE OF TRACK.
APPLY TO NEW CONSTRUCTION. SOME RECONSTRUCTION AND SOME EXTENSIONS SOME CAN BE VARIED UPON APPROVAL OF APPLICATION BY GOVERNING BODY.
ARE BASED ON MAXIMUM CAR SIZE FOR CALIFORNIA IDAHO MINNESOTA

ABBREVIATIONS
CFH - CAR FLOOR HEIGHT
E - EXEMPT
H - HEIGHT OF CAR GOVERNS
NR - NO CURRENT REGULATION TO COVER

COLUMN HEADINGS
2 SHOWS BASIC REGULATION
3 SHOWS EFFECTIVE YEAR OR YEAR OF LATEST AMENDMENT
7 & 8 APPLY TO HAND AND MECHANICALLY OPERATED SWITCHES EXCEPT AS NOTED
12 & 18 PREVAILS FOR ALL ITEMS NOT OTHERWISE PROVIDED FOR
13 & 19 BRIDGES SUPPORTING TRACKS
14 & 20 BRIDGES SPANNING TRACKS
24 & 25 PASSENGER PLATFORMS
26 & 27 PASSENGER/FREIGHT PLATFORMS ON SIDE TRACKS EXCEPT AS NOTED.
28 & 29 FREIGHT PLATFORMS ON SIDE TRACKS
STEPPED PLATFORMS ARE NOT ALLOWED.
35 OTHER THAN TROLLEY CONTACT POLES.
36 TO CENTER OF STAND EXCEPT AS NOTED.

FOOTNOTES:
1 LESSER CLEARANCES NOT PERMITTED IN QUADRANTS
2 ENGINE HOUSES AND SHOP BUILDINGS EXEMPT OR PERMITTED LESSER DIMENSIONS
3 ONLY IF TRACKS END WITHIN BUILDINGS.
4 MAY BE REDUCED TO 5-9 IF 8-3 (8-6 FOR WY) PROVIDED ON OPPOSITE SIDE
5 MAY BE REDUCED TO 5-9 IF 8-0 (8-6 FOR NE, MO & WY) PROVIDED ON OPPOSITE S
6 ONLY IF 8-0 (7-3 FOR MT & WY; 8-6 FOR WA & SD) PROVIDED ON OPP. SIDE
7 PASSENGER PLATFORMS ONLY.
8 MAY BE 8-0 AT 4-6 FOR REFRIGERATOR CAR PLATFORMS ONLY.
9 TO ENDS OF ARMS IN OPERATING POSITION.
10 FOR PLATFORMS AT CAR EAVE HEIGHT - SUPPORTS TO BE 8-0 (8-6 FOR TEXAS).
11 FOR FREIGHT TRACKS - CAN BE 13-0 FOR PASSENGER TRACKS.
12 REGARDING CANADA - CHECK STANDARD CLEARANCE DIAGRAM APPROVED BY BOARD



INDUSTRY TRACK STD SECTION
WITH 8.5' WALKWAY