



MAINTENANCE OF TRACKAGE

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**DEPARTMENTS OF THE ARMY,
THE NAVY AND THE AIR FORCE**

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THE NAVY, AND THE AIR FORCE
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MAINTENANCE OF TRACKAGE

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Chapter 1.

INTRODUCTION

Section 1. GENERAL

1-1. Purpose

This manual prescribes the policy, criteria, and procedures for inspecting, maintaining, and repairing trackage at military installations. It establishes maintenance standards for railroad and crane trackage systems and provides guidance for the selection, use, and installation of railroad materials and equipment and track components that will perform satisfactorily.

1-2. Scope

This manual is a guide to maintenance of railroad trackage at military installations. Repair, modification, and minor construction procedures are presented within the limitation of maintenance personnel responsibilities. The maintenance standards prescribed have been established to protect Government property, with an economical and effective expenditure of maintenance funds commensurate with the functional requirements and the planned future use of the facilities. The publication furnishes guidance for the maintenance forces in the field who will do the work and is designed for use in the performance of their work.

1-3. Related Publications

The use of the systems and procedures described in this publication, by personnel who have the responsibility for specifications, requisitions, procurement, inspection, storage, issue, application, and safety, should assure uniform, economical, and satisfactory track maintenance and repair. When information in this publication varies from that contained in the latest issue of Federal or Military Specifications, the(se) Specification(s) shall apply. Appendix A lists pertinent regulations, manuals, and other significant publications referenced throughout the text. In case of doubt, advice concerning any procedure may be obtained from the addresses listed below. Also recommendations or suggestions for modification, or additional information and instructions that will improve the publication and motivate its use, are

invited and should be submitted through these channels:

1-3.1. HQDA (DAEN-MPO-B) WASH. DC 20314.

1-3.2. Department of the Navy, Naval Facilities Engineering Command (100), 200 Stovall St., Alexandria, VA 22332, or from its Geographic Engineering Field Division (102).

1-3.3. Department of the Air Force Directorate of Engineering and Services, ATTN: AF/LEE, WASH DC 20330.

1-4. Application

A majority of this manual deals with railroad trackage; however, most information also applies to crane trackage. Where there is a major difference in procedure, trackage will be divided into the following three trackage systems and each discussed separately.

1-4.1. Railroad Trackage. Railroad trackage applies to all track systems used by engines, cars, or locomotive cranes including narrow gage systems.

1-4.2. Ground-Level Crane Trackage. Ground-level crane trackage applies to tracks for all weight-handling equipment that operates on the major working level of an activity. This includes but is not limited to trackage systems for portal, gantry, hammerhead, tower, and the ground-level rail for semi-gantry cranes.

1-4.3. Elevated Crane Trackage. Elevated crane trackage applies to all trackage systems attached or suspended from side walls, columns, buildings, roofs, or separate superstructures. This includes trackage for overhead or bridge cranes, wall cranes, semi-gantry cranes, and floating drydock cranes. NOTE: Rail inspections for monorails, "H" or "I" Beam, and other structural steel shape rail systems and trolley trackage for jib and other hoists are conducted by the crane inspector and/or building inspector.

1-5. Cooperation and Coordination

1-5.1. Intraservice Functions. Cooperation and coordination of track maintenance activities among

the installation departments concerned should be continuous. Programs of properly planned and executed maintenance operations prevent undesirable interruptions of rail traffic on military installations. Measures for the protection of supplies in storage must be coordinated with the storage service primarily responsible for the care and preservation of stored items. Supply officers, through normal channels, provide standard items of materials and equipment for track maintenance.

1-5.2. Interservice and Interdepartmental Functions. Cooperation and coordination in conducting track maintenance activities are encouraged at all levels of command. Appropriate liaison should be established and maintained between major commands and installations in a geographical area. Cross-service assistance shall be provided as necessary in the interests of economy and maximum utilization of manpower and equipment.

1-6. Army Responsibility

Staff, command, and technical responsibility for maintenance and repair of utility railroad track at Army installations will conform to assignments set forth in AR 420-10 and 420-72. The American Railway Engineering Association (AREA) manual will be consulted on methods, tools, and procedures for railroad maintenance involving problems not covered herein and will be followed when not in conflict with current Army, Navy, or Air Force directives.

1-7. Navy Responsibility

1-7.1. Naval Facilities Engineering Command. The Naval Facilities Engineering Command (NAVFAC) provides technical guidelines and advice for inspection and maintenance of trackage and related accessories. The Commanders and Commanding Officers of NAVFAC's Engineering Field Divisions provide technical assistance in operations and maintenance matters to shore installations.

1-7.2 Commanding Officer. The Commanding Officer at each Naval and Marine Corps shore installation

is responsible for providing safe trackage and an adequate maintenance program. Normally, these responsibilities are delegated to the Public Works Centers or Public Works Departments, as appropriate. Design standards shall be in accordance with NAVFAC DM5. Inspection of trackage systems shall conform to the guidelines established in NAVSEA/NAVFAC Instruction 11230.1 or NAVFAC MO-322.

1-8. Air Force Responsibility

1-8.1. Directives. Policy for the maintenance, repair, and minor construction of railroads and appurtenances is set forth in AFM 85-1 and AFM 86-1, Chapter 2.

1-8.2. Major Command Level. Each major command will:

1-8.2.1. Insure that effective preventive and corrective track maintenance measures are established and accomplished at all installations under its jurisdiction.

1-8.2.2. Provide qualified technical supervision for personnel engaged in these operations.

1-8.2.3. Provide for training of personnel engaged in the maintenance of trackage and appurtenances.

1-8.2.4. Make certain that Base Civil Engineer personnel engaged in direct field supervision of maintenance operations, or those who function independently of direct supervision, are technically competent and thoroughly familiar with the performance of all phases of this activity, as outlined in this publication.

1-8.3. Air Force Installations. The Base Civil Engineer will:

1-8.3.1. Plan, initiate, and supervise the execution of track maintenance.

1-8.3.2. Insure that in-house track maintenance personnel are trained.

1-8.3.3. Investigate the occurrence of and reasons for failures and accidents.

1-8.3.4. Inspect and determine the effectiveness of safety measures.

Section 2. RAILROAD AND CRANE TRACKAGE MAINTENANCE

STANDARDS, POLICIES, AND CRITERIA

1-9. Standards

The standards or criteria contained in this manual have been developed by the Army, Navy, and Air Force with the concurrence and approval of the Assistant Secretary of Defense (MRA&L). Compliance with these standards is mandatory in order that the maintenance of trackage at military installations will be uniform, will adequately support the opera-

tional missions of the installations, and will permit interservice assistance and support, where possible, in the interest of efficiency and economy.

1-10. Policies and Criteria

The extent of repair and maintenance of railroad trackage will be governed by the permanency of the installation, operational requirements, track classification and category, or limiting conditions established by the serving railroads. Work necessary to maintain

base railroads at an equivalent of a Class 2 track as defined in the current Federal Railroad Administration (FRA) Track Safety Standards (Appendix B) will normally satisfy operational needs of military installations. However, safety, efficiency, and economy will be the controlling factors. The FRA Track Safety Standards provide descriptions of tolerances and defects for guidance in overall track inspection. Deviation from the standards in the FRA Track Safety Standards may require immediate corrective action to provide for safe operations over the trackage involved. In general, on heavily used sections of trackage, work planning should start when a deficiency on a section of trackage exceeds one-half (1/2) the allowable deficiency. Selection, installation, inspection, and maintenance of trackage systems shall be in accordance with referenced documents, except where criteria in Chapter 7 provide more stringent or restrictive criteria. In determining the extent and nature of Government maintenance, repairs, and rehabilitation of railroads on land that is held under lease, permit, or easement, the terms of such documents will be taken into account.

1-11. Engineering

The need and accomplishment of major repairs and rehabilitation of existing railroads will be based on the determination of qualified engineers. The services of such technical personnel will be used to assist in the establishment of railroad maintenance programs.

1-12. Specifications

The use of AREA specifications, or those of the railroad(s) serving an installation in lieu of Federal or Military Specifications, may be given consideration when such use would be to the advantage of the Government. Otherwise, the applicable Federal or Military Specification shall take precedence.

1-13. Categories

The term "trackage" includes rails, ties, rail accessories, switches, crossovers, ballast, roadbeds, and support structures. Also included for complete coverage of the trackage system are criteria for the maintenance of slopes, ditches, road crossings, culverts, bridges, trestles, overpasses and underpasses, grade separations, tunnels, signals, snow protection, signs, and markings.

1-13.1. Railroad Trackage System. Railroad trackage systems are divided into six categories according to their principal use.

Category	Service or Use
Running or access	Primary line, industrial and special purpose
Classification yard	Receiving, sorting, and holding
Sidings	Auxiliary (other than for meeting or passing) and house trackage (along or entering a building) and dead storage tracks
Team tracks	Freight transferred directly to highway vehicles
Storage	Hold purposes - low-use spur
Temporary	Generally to facilitate construction

1-13.2. Crane Trackage System. Crane trackage is divided into two major systems: ground level and elevated. Maintenance and inspection procedures are basically the same as those shown for railroad trackage. Operating speeds for cranes shall be initiated and promulgated by activity commanders to meet local safety requirements. Categories may be assigned by type or limiting size of equipment utilizing the trackage system.

1-14. Terms and Engineering Data

A glossary of railroad terms is provided in Appendix C of this manual. Engineering data useful in the maintenance of trackage are presented in Appendix D.

1-15. Active Trackage

The principal tasks to be considered in maintaining active trackage are: renewing ties, ballast, rails, and accessories; raising, realigning, and regrading tracks; oiling and tightening switchpoints and track bolts; cutting vegetation and cleaning ditches; and repairing bridges, trestles, and culverts. Overall maintenance policies and detailed guidance for maintaining these areas are covered in Chapters 2 through 6. Chapter 7 describes procedures for inspecting and reporting trouble areas within trackage systems at military installations. A well-maintained track is shown in Figure 1-1.

1-16. Inactive Trackage.

When trackage is in an inactive status, the maintenance policies will be consistent with the anticipated future mission of the installation and the particular trackage involved.

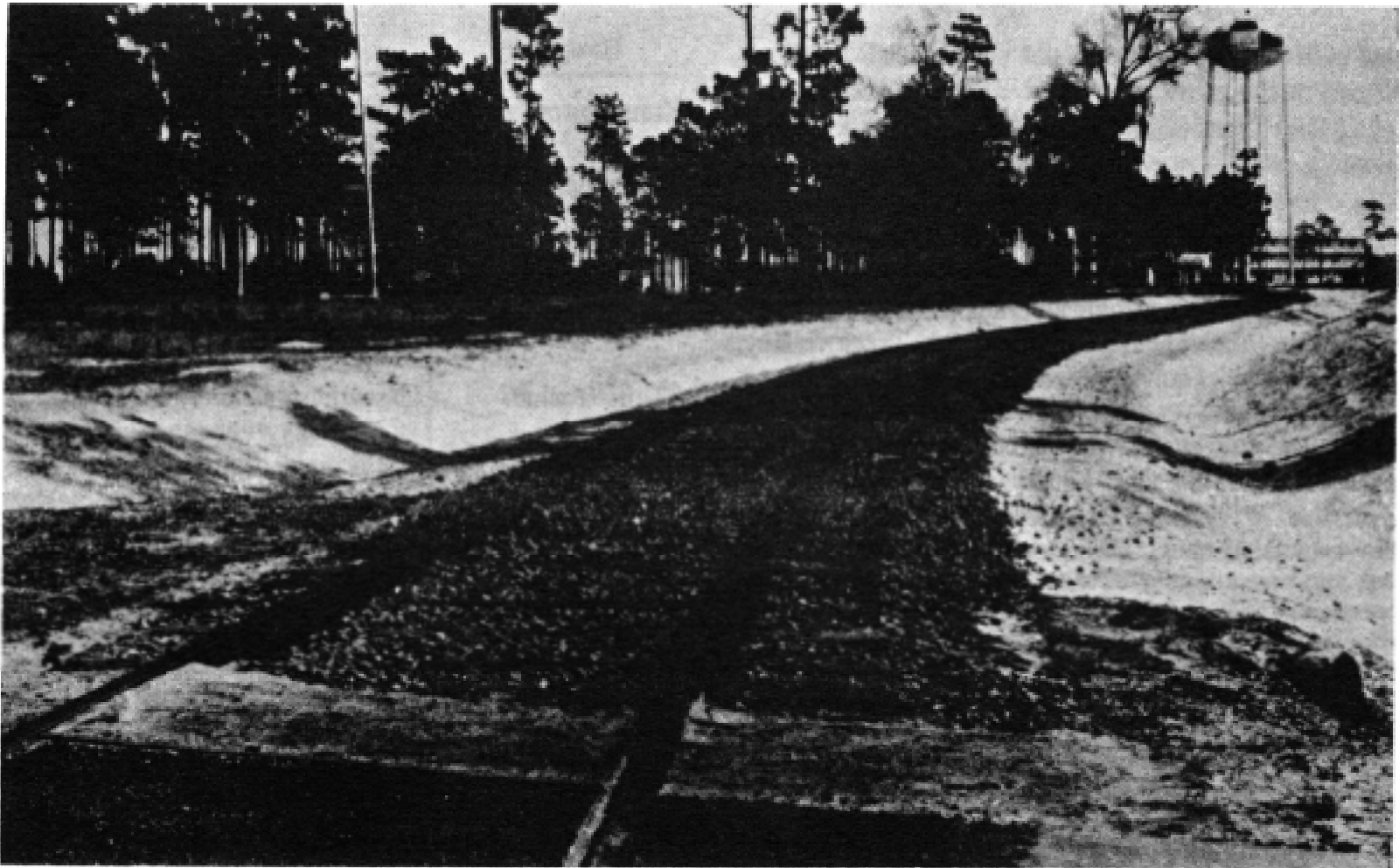


Figure 1-1. Example of well-maintained track.

1-17. Surplus Trackage.

Trackage that is planned for disposal should receive no maintenance except vegetation control. Useful material should be salvaged when such action is in the best interest of the Government.

1-18. Safety

The Occupational Safety and Health Act (OSHA)

guidelines and regulations make certain safety equipment and procedures mandatory.. Safety precautions and safe maintenance practices are covered in detail in the following publications:

1-18.1. ARMY — EM 385-1-1.

1-18.2 NAVY — NAVMAT P-5100

1-18.3. Air Force — AFM 127-101

CHAPTER 2.

MATERIALS, TOOLS, AND EQUIPMENT

Section 1. MATERIALS

2-1. General

Maintenance and repair of railroad trackage require the use of special materials, tools, and equipment. It is important that personnel responsible for this maintenance be completely familiar with identification and nomenclature for purposes of use and requisitioning.

2-2. Material Nomenclature and Specifications

In requisitioning track materials, it is important that proper details be given to obtain the exact material required. Figures 2-1 through 2-14 illustrate the most common track materials and present specification details required for drawing clear requisitions.

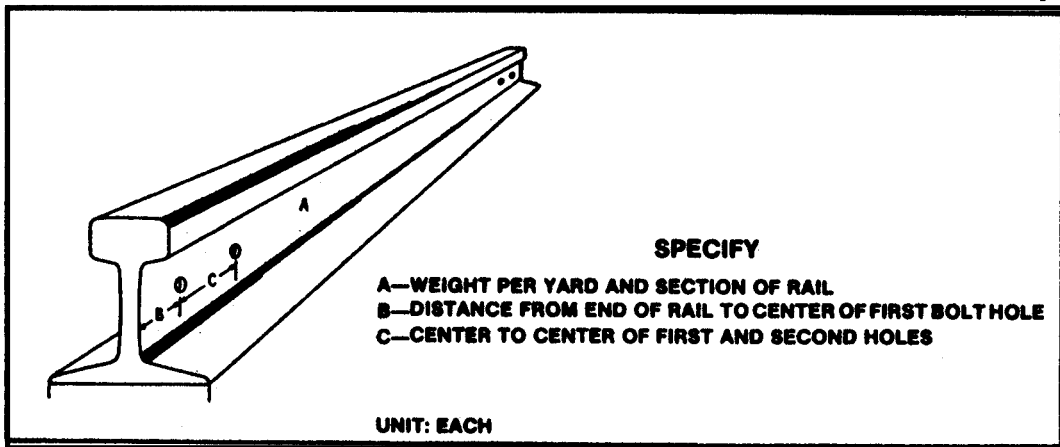


Figure 2-1. Rail details.

2-3. Stocks of Material

Recommended stock quantities for emergency and replacement use are outlined below.

2-3.1. Where deemed appropriate, it is recommended that the following quantities of material be stocked at a convenient location along running tracks or industrial trackage.

2-3.1.1. Two full-length rails of representative weight and section (Figure 2-1).

2-3.1.2. Two short-length rails of representative weight and section.

2-3.1.3. Two pairs of joint bars and compromise joint bars (when appropriate) with bolts and lock washers (Figures 2-2 and 2-3).

2-3.2. Classification/Receiving Yard or Industrial Area. At classification and receiving yard, or other congested areas, stocks should include:

2-3.2.1 One frog of representative number, weight,

and section (Figure 2-4 and Table D-1).

2-3.2.2. One set of switch points (right and left hand) (Figure 2-5 and Table D-1). **NOTE:** Must match existing points in type, section, length, and drilling pattern.

2-3.2.3. Two guardrails (Figure 2-6). Tee rail or one piece manganese. **NOTE:** Guardrails may be straight on ends.

2-3.2.4. One full-length rail.

2-3.3. Central Storage. Recommended stock quantities at a designated central storage area are two full-length rails with track fastenings such as joint bars, bolts, spikes, rail anchors, and tie plates (Figures 2-7 through 2-11) for each mile of track.

2-3.4. Emergency. Minimum standby stocks for emergency use at central storage area are:

2-3.4.1. Switch stand repair parts (complete) (Figure 2-12).

2-3.4.2. Two sets of switch ties (Figure 2-13).

2-3.4.3. One care (30 to 50 tons) of ballast. NOTE: This may be deleted at small installations with short trackage.

2-4. Storage of Material.

Stocks of material in the warehouse, section tool house, or in open storage will be properly stored (Figures 2-14 through 2-16).

2-4.1. Rails and Track Accessories. Rails stored at points along a railroad for future use should be segregated by weight and section and stacked in neat piles (Figure 2-14). Store rails above probable high water in case of flooding, and at least 10 feet from the nearest track. Protect accessories from the effects of inclement weather. Always store materials so that they will not interfere with the movement of train

crews or personnel frequenting the area.

2-4.2. Wood and Concrete Ties. Segregate timber crossties according to size and type, and store by stacking on high, dry ground. Treated ties may be stacked edge to edge (Figure 2-15). Avoid handling ties with sharp instruments other than tie tongs. Keep ground in the storage area bare of debris or vegetation for at least 2 feet around every stack of ties and clear of vegetation over 6 inches high within 10 feet of any stack; slope the ground so that water will not remain under the stacks or in their immediate vicinity. It is especially important that all decaying wood debris be removed and that fire prevention measures be observed around the storage area. Figure 2-16 shows the proper method of storing concrete ties.

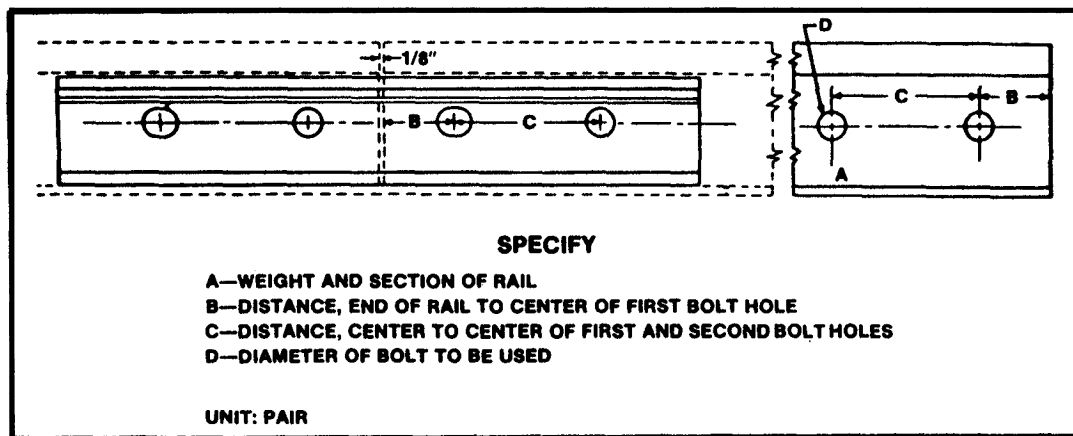


Figure 2-2. Joint bar details.

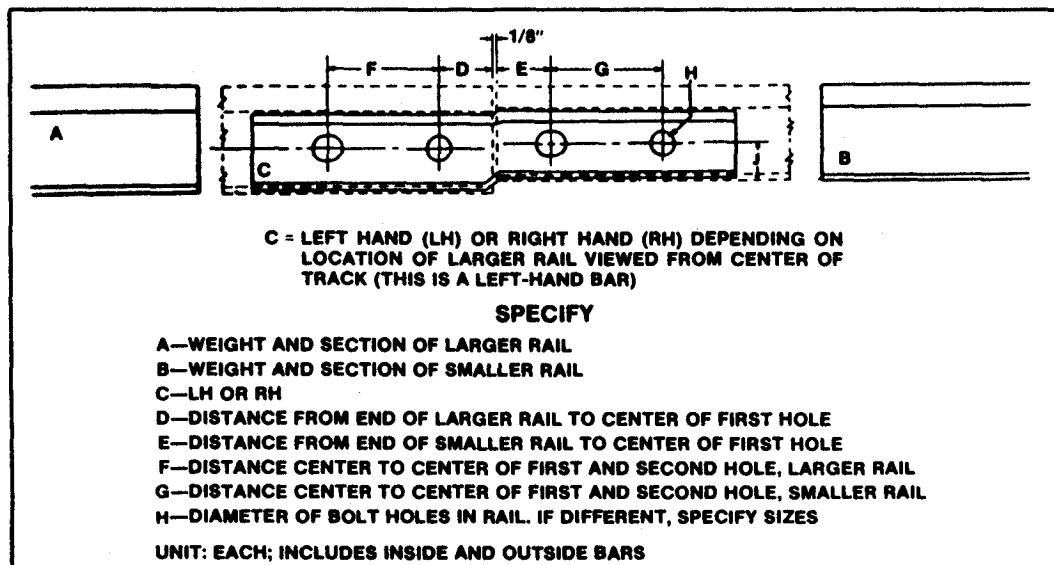


Figure 2-3. Compromise joint details.

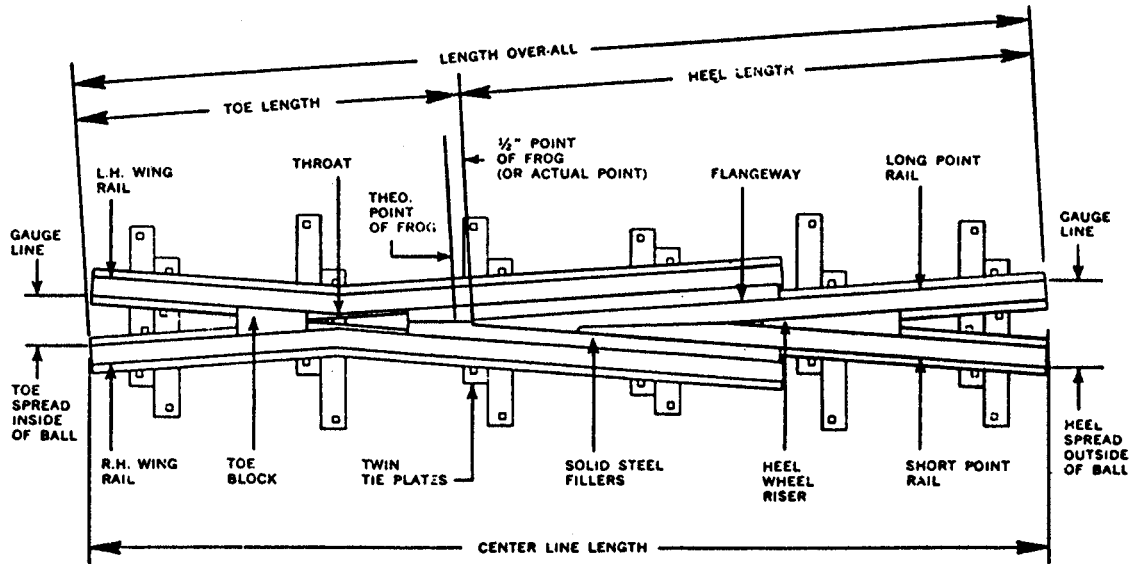


Figure 2-4. Frog details.

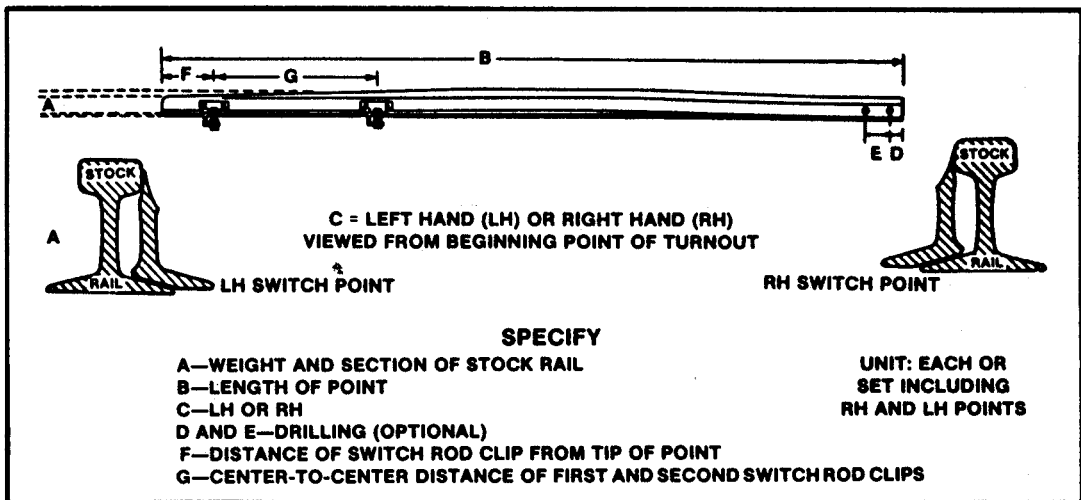


Figure 2-5. Switch point details.

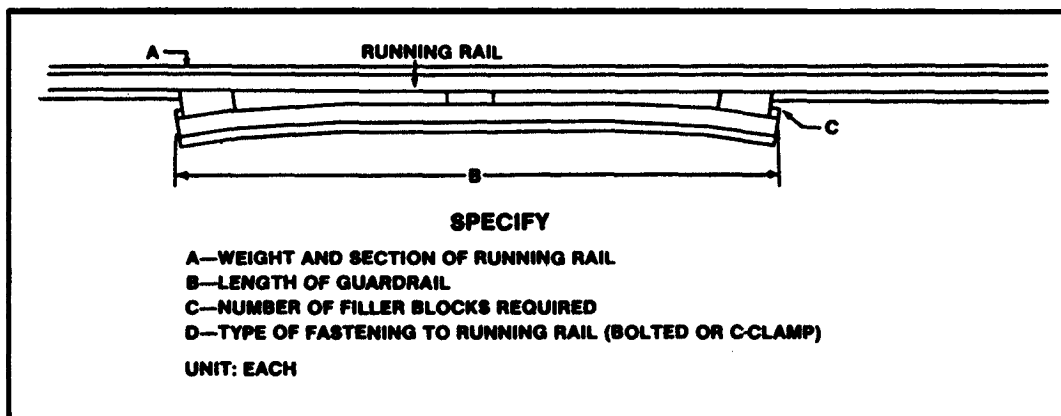


Figure 2-6. Guardrail details

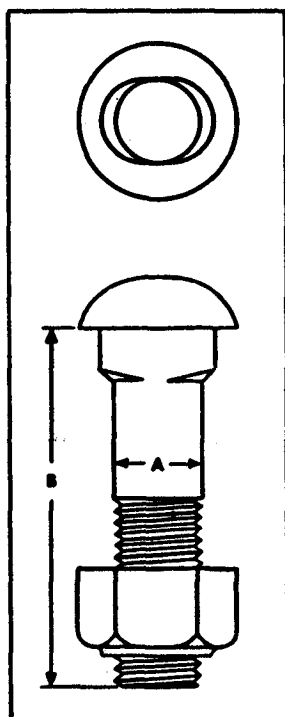


Figure 2-7. Track bolt details.

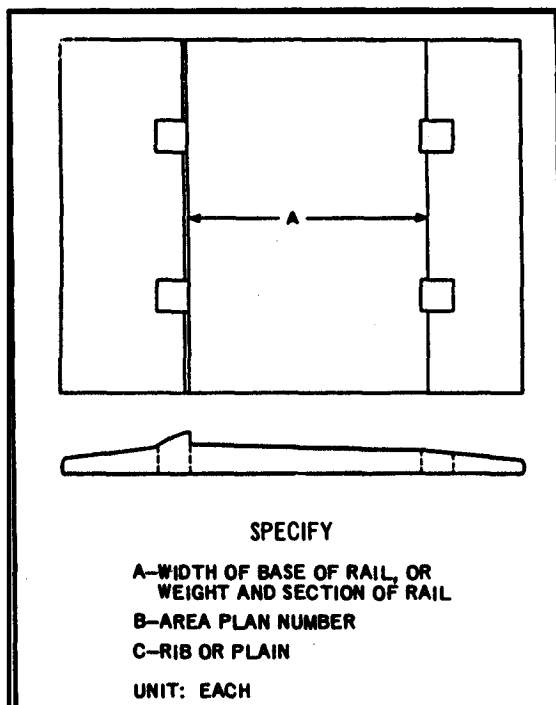


Figure 2-8. Tie plate details.

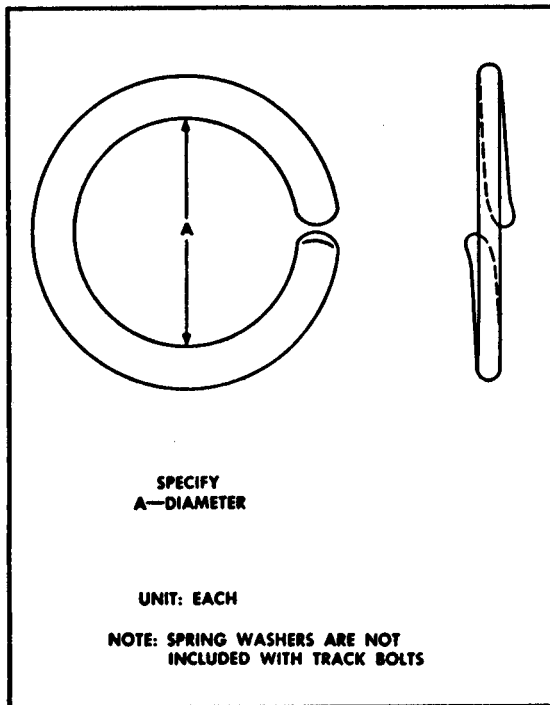


Figure 2-9. Spring lock washer details.

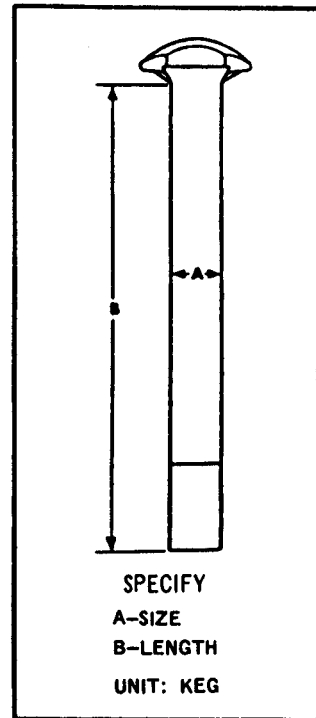


Figure 2-10. Track spike details.

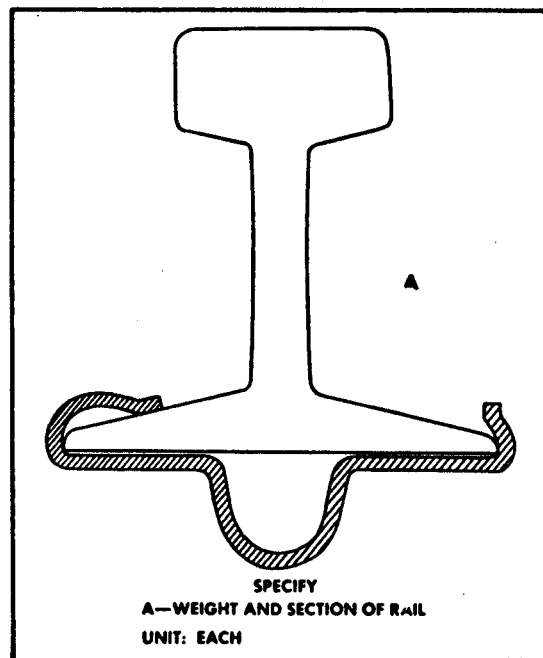


Figure 2-11. Typical rail anchor.

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