

# Engineering Standard

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SAES-T-906

12 October 2005

Telecommunications – Structural Coordination

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## Saudi Aramco DeskTop Standards

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## I Scope

This standard prescribes mandatory requirements governing structural coordination of telecommunication - outside plant (OSP) facilities at railroad crossings and in the vicinity of airports.

## II Conflicts and Deviations

Any deviations, providing less than the mandatory requirements of this standard require written waiver approval as per Saudi Aramco Engineering Procedure [SAEP-302](#).

## III References

All referenced specifications, standards, codes, forms, drawings, and similar materials shall be of the latest issue (including all revisions, addenda and supplements) unless stated otherwise. Applicable references are listed below:

### A. Saudi Aramco References

#### Saudi Aramco Engineering Procedure

[SAEP-302](#)

*Instructions for Obtaining a Waiver of a Mandatory Saudi Aramco Engineering Requirement*

#### Saudi Aramco Engineering Standards

[SAES-B-008](#)

*Restriction to Use of Cellars, Pits and Trenches*

[SAES-B-063](#)

*Aviation Obstruction, Marking and Lighting*

[SAES-B-068](#)

*Electrical Area Classifications*

[SAES-L-046](#)

*Pipeline Crossings Under Roads and Railroads*

[SAES-O-119](#)

*Work Permit Procedures*

[SAES-T-018](#)

*Telecommunications - Symbols, Abbreviations & Definitions*

[SAES-T-604](#)

*Communications Plant Clearances and Separations - Aerial*

[SAES-T-624](#)

*Telecommunications - Outside Plant - Fiber Optics*

[SAES-T-628](#)

*Telecommunications - Underground Cable*

[SAES-T-629](#)

*Telecommunications - Buried Cable and Wire*

[SAES-T-634](#)

*Telecommunications - Cable Testing and Acceptance*

[SAES-T-903](#)

*Telecommunications - Outside Plant Electrical Protection and Grounding*

[SAES-T-911](#)

*Telecommunication Conduit System Design*

[SAES-T-928](#)

*Telecommunications – OSP Buried Plant*

#### Saudi Aramco Standard Drawing

[AB-036897](#)

*Buried/Underground Cable Route Marker Posts and Signs*

#### General Instructions

*GI-0002.100*

*Work Permits*

*GI-0887.000*

*Coordination of Saudi Aramco Projects with non-Saudi Aramco Agencies*

*GI-1021.000*

*Streets and Road Closure, Excavations, Reinstatement and Traffic Controls*

#### Construction Safety Manual

#### B. Industry Codes and Standards

##### General Telephone and Electronics

##### National Fire Protection Association

*NFPA 70*

*National Electrical Code (NEC)*

##### Institute of Electrical and Electronics Engineers

*IEEE/ANSI C2*

*National Electrical Safety Code (NESC)*

## IV Modifications to GTE 906 Series

The following paragraph numbers refer to GTE 906 Series on "Structural Coordination", which is part of this standard. The text in each paragraph below is an addition, exception, modification, or deletion to GTE 906 as noted. Paragraph numbers not appearing in GTE 906 are new paragraphs to be inserted in numerical order.

4 DESIGN

4.1 GTE Section 906-001-070: Structural Coordination Joint Use of Wood Poles; Issue 1/Dec., 1961

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- 4.1.1 Paragraph 1.01 (Change) - The joint use of Saudi Aramco owned poles must be coordinated with the Saudi Aramco Power Distribution Department. The placement of Saudi Aramco Telecommunication Facilities on non-owned poles, even on a temporary basis, is not permitted.
  - 4.1.2 Paragraph 6.4 - When telecommunication facilities are placed on poles with power facilities, the telecommunication facilities shall always be placed at the lower level. Refer to [SAES-T-604](#) for clearance requirements.
  - 4.2 GTE Section 906-200-089: Structural Coordination - Height & Boundary Limitations at Airport; Issue 2/April, 1976
    - 4.2.1 General
      - 4.2.1.1 Paragraph 1.01 - This section provides an outline of the restrictions and limitations affecting construction or alteration of communication poles, cable, and antenna or microwave towers in the vicinity of, or bordering Saudi Aramco airports or heliports.
      - 4.2.2 Responsibilities
        - Paragraph 1.02 (Modify) - The construction or alteration of structures in the vicinity of Saudi Aramco airports, heliports, or their flight paths must be approved by the Saudi Aramco Aviation Department.
        - 4.2.2.1 (Addition) - When proposing facilities which might be in conflict with aircraft flight paths, compliance shall be made to [SAES-B-063](#) - "Aviation Obstruction Marking and Lighting" and the necessary coordination carried out with the Saudi Aramco Aviation Department.
  - 4.3 GTE Section 906-300-070: Specification for Communication Lines Crossing Railroad Tracks; Issue 2/August, 1967
    - 4.3.1 Paragraph 1 - The purpose of this section is to list the general requirements for the construction of Saudi Aramco communication lines which will cross railroad tracks.
    - 4.3.2 Paragraph C-6 - (Addition) Refer to GI-0887.000 - Coordination of Saudi Aramco Projects with non-Saudi Aramco Agencies. Where the railroad proponent or government requirements exceed the minimum requirements of this standard, the proponent or government requirements shall be complied with. All proposed railroad crossing designs shall have the written approval of the railroad proponent and all necessary land use permits (GI-0002.716, Land Use Permit Procedures) prior to the start of construction.
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- 4.3.3 Paragraph D - Telecommunication overhead facility crossings of railroads shall not be constructed.
- 4.3.4 Underground Crossings
  - 4.3.4.1 Paragraph U-1. Any work on railroad right-of-way shall be done at such time and in such a manner as not to interfere with the proper and safe use or operation of the property and tracks of the railroad proponent. Prior to starting any construction within the railroad right-of-way, previous arrangements shall be made with the duly authorized representative of the railroad proponent for date and time of construction. (Ref: GI-0887.000)
  - 4.3.4.2 Paragraph U-2. Underground telecommunication facilities on railroad property shall be located so as to be subject to the least practicable disturbance. Manholes, pull boxes, and terminals shall be located a minimum one (1) meter away from the roadbed and off the railroad right-of-way. (See Figure 2.)
  - 4.3.4.3 Paragraph U-4 (Change). The minimum cover over the casing in railroad crossing shall be 1.4 m as required in SAES-L-046, "Pipeline Crossings Under Roads and Railroads", unless specified otherwise by the government or railroad proponent.
  - 4.3.4.4 Paragraph U-8 - Where physical or chemical conditions will permit, and upon approval of the railroad proponent, a conduit system consisting of a group of not more than four galvanized steel pipes not more than 100 mm in diameter may be placed beneath the roadbed (by the pushing or jacking method) without any form of additional protection. Open trench excavations within 4 meters of the nearest rail shall be avoided unless approved in writing by the railroad proponent. Refer to Figure 1 & 2, page 6, for drawings of a typical underground railroad crossing.
  - 4.3.4.5 Paragraph U-10. Shoring. - Where necessary to prevent caving, the sides of trenches shall be supported with suitable planks and bracings. Refer to the Loss Prevention Department's Construction Safety Manual. No bracing shall extend above the base of the rail or be attached in any way to the rails or ties.

## **V Installation**

Installation of telecommunication cable shall be in accordance with this and other appropriate standards as listed in paragraph 3 above. All construction within the railroad right of way shall be approved in writing by the proponent prior to the start of any work.

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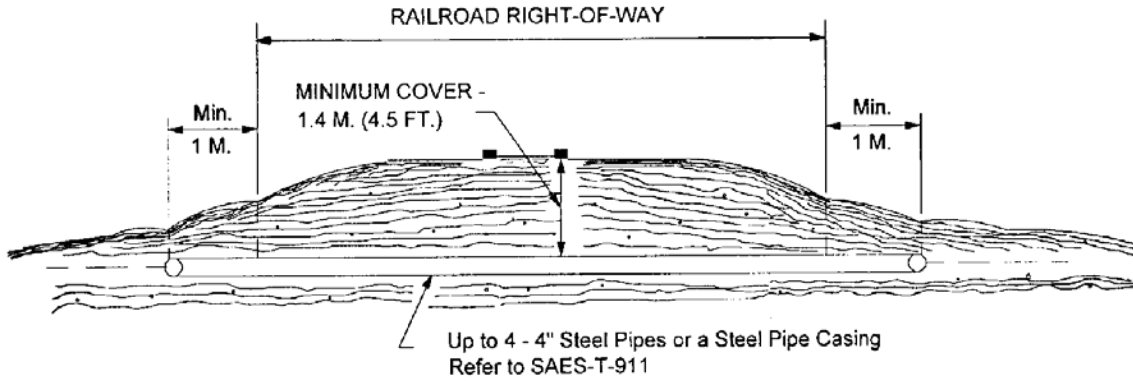
## VI Testing and Inspection

The installation of all Telecommunication facilities within the vicinity of airports, heliports or their flight paths shall be subject to the inspection and approval of the Saudi Aramco Aviation Department. The installation of all telecommunication facilities within railroad rights of way shall be subject to the inspection and approval of the railroad proponent.

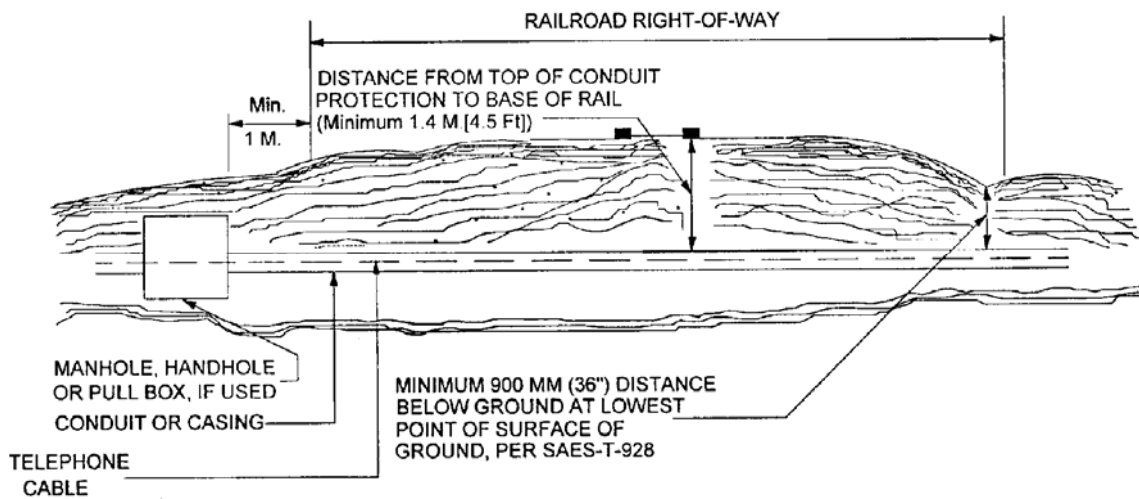
The testing and inspection of new telecommunications cables shall be done in accordance with [SAES-T-634](#), "Telecommunications - Cable Testing and Acceptance".

### Revision Summary

12 October 2005	Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with editorial changes.
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**Figure 1 – Typical Railroad Conduit Crossing**



**Figure 2 – Typical Arrangement of Underground Rail Crossing**