

## Design of Sleeper Top in Reinforced Concrete for Piping

### Procedure

This Standard replaces and cancels its previous revision.

The CONTEC - Authoring Subcommittee provides guidance on the interpretation of this Standard when questions arise regarding its contents. The Department of PETROBRAS that uses this Standard is responsible for adopting and applying the sections, subsections and enumerates thereof.

**Technical Requirement:** a provision established as the most adequate and which shall be used strictly in accordance with this Standard. If a decision is taken not to follow the requirement ("non-conformity" to this Standard) it shall be based on well-founded economic and management reasons, and be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by imperative nature.

**Recommended Practice:** a provision that may be adopted under the conditions of this Standard, but which admits (and draws attention to) the possibility of there being a more adequate alternative (not written in this Standard) to the particular application. The alternative adopted shall be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by verbs of a nonmandatory nature. It is indicated by the expression: **[Recommended Practice]**.

Copies of the registered "non-conformities" to this Standard that may contribute to the improvement thereof shall be submitted to the CONTEC - Authoring Subcommittee.

Proposed revisions to this Standard shall be submitted to the CONTEC - Authoring Subcommittee, indicating the alphanumeric identification and revision of the Standard, the clause(s) to be revised, the proposed text, and technical/economic justification for revision. The proposals are evaluated during the work for alteration of this Standard.

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### CONTEC

Comissão de Normalização  
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### SC - 04

Civil Construction

### Foreword

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## **Foreword**

This Standard is the English version (issued in 03/2008) of PETROBRAS N-1689 REV. C 03/2008, which is the Revalidation of PETROBRAS N-1689 REV. B 04/2002, the contents thereof not altered. In case of doubt, the Portuguese version, which is the valid document for all intents and purposes, shall be used.

## **1 Scope**

1.1 This Standard establishes the required conditions for the design of sleeper top in reinforced concrete for pipeline supporting, included all beams metal top, usually made for piping support.

1.2 This Standard is applicable to procedures started as of its date of issuance.

1.3 This Standard only contains Technical Requirements.

## **2 General Conditions**

2.1 The minimum thickness of reinforced concrete shall be 25 cm.

2.2 The sleepers located in soil with accentuate declivity shall have the top according to the Figure A.1.1 (see Annex A).

2.3 The sleepers and other supports located in even soil shall have the top according to the Figure A.1.2 ( see Annex A).

2.4 In the upper part, along all the support length, there shall be a carbon-steel plate fixed in concrete by anchor bolts of steel bar type CA-25 ( $f_y = 250$  MPa), with minimum dimensions according to the Figure A.1.3 (see Annex A).

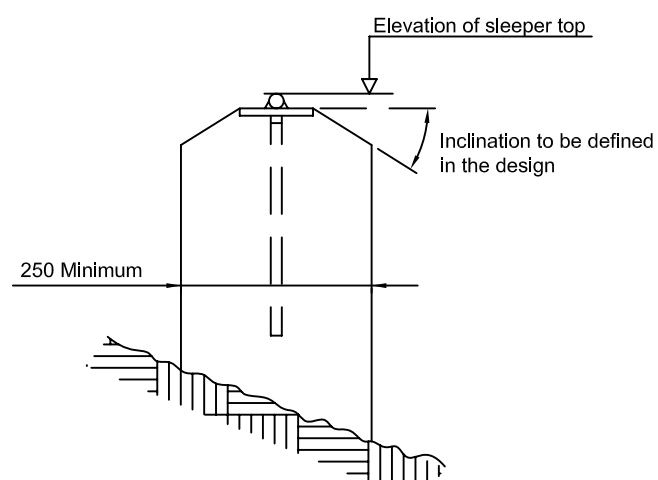
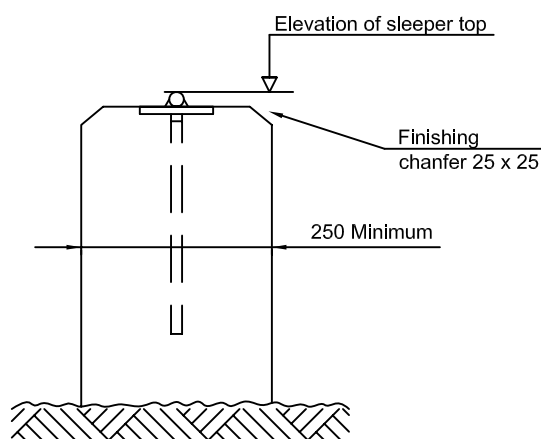
2.4.1 Those anchor bolts shall be dimensioned in accordance with loads of the piping design.

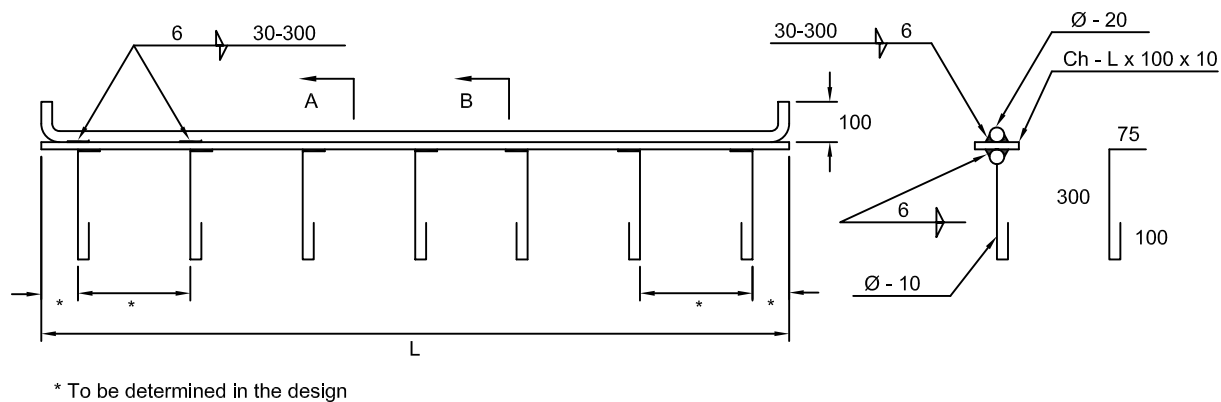
2.4.2 The necessary weld to the fixing of those anchor bolts in the plate shall be defined by the design and shall be executed according to the Figure A.1.3 (see Annex A).

2.4.3 In the upper part and along this plate there shall have a steel bar type CA-25 ( $f_y = 250$ MPa) with 20 mm diameter, fixed according to the Figure A.1.3 (see Annex A).

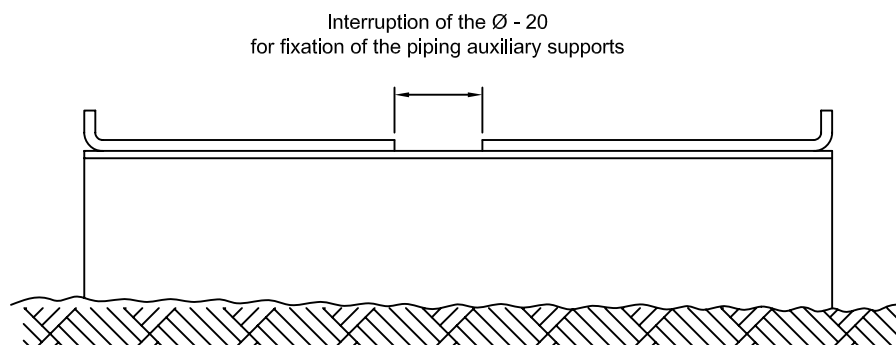
2.4.4 In cases of piping auxiliary supports (guides or cradles), the bar shall be interrupted according to the Figure A.1.4 (see Annex A).

2.4.5 Loads to be considered in the structural dimensioning of supports shall indicated by piping design.

**Annex A - Figures**

**Figure A.1.1 - Section A**

**Figure A.1.2 - Section B**
**Figure A.1 - Sleeper top - Details**



**Figure A.1.3 - Dimensioning**



**Figure A.1.4 - Elevation**

NOTE Dimensions in millimeters.

**Figure A.1 - Sleeper top - Details**

## INDEX OF REVISIONS

**REV. A**

There is no index of revisions.

**REV. B**

| Affected Parts | Description of Alteration |
|----------------|---------------------------|
|                | Revalidation              |

**REV. C**

[illegible]