

Pavement Construction

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 section, subsection and enumerate to be revised, the proposed text, and technical/economic justification for revision. The proposals are evaluated during the work for alteration of this Standard.

"This Standard is exclusive property of Petróleo Brasileiro S. A. - PETROBRAS, internal application and PETROBRAS Subsidiaries and shall be used by its suppliers of goods and services under contracts or similar under the conditions established in Bidding, Contract, Agreement or similar.

The use of this Standard by other companies / organizations / government agencies and individuals is the sole responsibility of the users.."

CONTEC

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Introduction

PETROBRAS Technical Standards are prepared by Working Groups - WG (consisting specialized of Technical Collaborators from Company and its Subsidiaries), are commented by Company Units and its Subsidiaries, are approved by the Authoring Subcommittees - SCs (consisting of technicians from the same specialty, representing the various Company Units and its Subsidiaries), and ratified by the Executive Nucleus (consisting of representatives of the Company Units and its Subsidiaries). A PETROBRAS Technical Standard is subject to revision at any time by its Authoring Subcommittee and shall be reviewed every 5 years to be revalidated, revised or cancelled. PETROBRAS Technical Standards are prepared in accordance with PETROBRAS Technical Standard N-1. For complete information about PETROBRAS Technical Standards see PETROBRAS Technical Standards Catalog.

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Foreword

This Standard is the English version (issued in 08/2014) of PETROBRAS N-1602 REV. C 11/2013. 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 prescribes the minimum requirements for pavement construction.

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

1.3 This Standard contains Technical Requirement and Recommended Practice.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies.

Resolução [ANP Nº 19](#) de 11/07/2005 - Especificações dos Cimentos Asfálticos de Petróleo;

Resolução [ANP Nº 30](#) de 09/10/2007 - Asfaltos Diluídos de Petróleo;

Resolução [CNP Nº 1](#) de 20/02/1973 - Norma CNP 17 - Dispõe sobre o estabelecimento de Norma relativa a Emulsões para a Lama Asfáltica;

Resolução [CNP Nº 7](#) de 06/09/1988 - Dispõe sobre as especificações das Emulsões Asfálticas Catiônicas;

DNIT [031/2006-ES](#) - Pavimentos Flexíveis -Concreto Asfáltico;

DNIT [032/2005-ES](#) - Pavimentos Flexíveis – Areia Asfalto a Quente;

DNIT [047/2004-ES](#) - Pavimento Rígido - Execução de Pavimento Rígido com Equipamento de Pequeno Porte;

DNIT [048/2004-ES](#) - Pavimento Rígido - Execução de Pavimento Rígido com Equipamento de Fôrma-Trilho;

DNIT [049/2009-ES](#) - Pavimento Rígido - Execução de Pavimento Rígido com Equipamento de Fôrma-Deslizante;

DNIT [137/2010-ES](#) - Pavimentação - Regularização do Subleito;

DNIT [138/2010-ES](#) - Pavimentação - Reforço do Subleito;

DNIT [139/2010-ES](#) - Pavimentação - Sub-base Estabilizada Granulometricamente;

DNIT [140/2010-ES](#) - Pavimentação - Sub-base de Solo Melhorado com Cimento;

DNIT [141/2010-ES](#) - Pavimentação - Base Estabilizada Granulometricamente;

DNIT [143/2010-ES](#) - Pavimentação - Base de Solo-Cimento;

DNIT [144/2012-ES](#) - Pavimentação Asfáltica - Imprimação com Ligante Asfáltico;

DNIT [146/2012-ES](#) - Pavimentação Asfáltica - Tratamento Superficial Simples;

DNIT [147/2012-ES](#) - Pavimentação asfáltica - Tratamento Superficial Duplo;

DNIT [150/2010-ES](#) - Pavimentação Asfáltica - Lama Asfáltica;

DNIT [152/2010-ES](#) - Pavimentação - Macadame Hidráulico;

DNIT [153/2010-ES](#) - Pavimentação Asfáltica - Pré- Misturado a Frio com Emulsão Catiônica Convencional;

PETROBRAS [N-862](#) - Execução de Terraplenagem;

PETROBRAS [N-1601](#) - Construção de Drenagem e de Despejos Líquidos em Unidades Industriais;

ABNT [NBR 6118](#) - Projeto de Estruturas de Concreto - Procedimento;

ABNT [NBR 7182](#) - Solo - Ensaio de Compactação;

ABNT [NBR 7207](#) - Terminologia e Classificação de Pavimentação;

ABNT [NBR 7208](#) - Materiais Betuminosos para Emprego em Pavimentação;

ABNT [NBR 9781](#) - Peças de Concreto para Pavimentação - Especificação e Métodos de Ensaio;

ABNT [NBR 9910](#) - Asfaltos Modificados para Impermeabilização sem Adição de Polímeros - Características de Desempenho.

NOTE For documents referred in this Standard and for which only the Portuguese version is available, the PETROBRAS department that uses this Standard should be consulted for any information required for the specific application.

3 Terms and Definitions

For the purposes of this document terms and are adopted of the in ABNT [NBR 7207](#) and ABNT [NBR 7208](#) and the following.

3.1 earthwork

earth moving activities needed for achieving the alignments and sections indicated in the design

3.2 grade

surface obtained by the earthwork or road structure, and shaped according to its grade and cross-sections

3.3 subgrade

foundation soil of the pavement

3.4 levelling of subgrade

operation intended to shape the grade, when necessary, in the crosswise and longitudinal directions, comprising cuts or fills up to 20 cm thick. Whenever the thickness exceeds 20 cm, this is considered to be earthwork

3.5 reinforcement of subgrade

a layer whose thickness is constant in the crosswise direction and variable in the longitudinal direction, according to the sizing of the pavement of which it is an integral part and being, for technical and economic reasons, applied over the subgrade