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NATIONAL IRANIAN OIL REFINING & DISTRIBUTION COMPANY
NATIONAL IRANIAN OIL ENGINEERING
& CONSTRUCTION COMPANY

NIOEC SP

NIOEC SPECIFICATION FOR CONCRETE

FIRST EDITION

JULY, 2005

THIS SPECIFICATION IS THE PROPERTY OF NATIONAL IRANIAN OIL ENGINEERING & CONSTRUCTION COMPANY. IT IS CONFIDENTIAL AND ALL RIGHTS RESERVED TO THE OWNER. NEITHER WHOLE NOR ANY PART OF THIS DOCUMENT MAY BE DISCLOSED TO ANY THIRD PARTY, REPRODUCED, STORED IN ANY RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN CONSENT OF THE NATIONAL IRANIAN OIL ENGINEERING & CONSTRUCTION COMPANY.

IN THE NAME OF GOD**FOREWORD**

By their very nature, technical standard specifications are continuously subject to modifications and revisions. To strengthen their merit and usefulness, continuous improvements, addendum, deletion of disparate information and consequently provision of updated revisions are to be made in order to ascertain that such standard specifications meet the current requirements, inclusive of Iranian Petroleum Standards (IPS) and the recognized and acceptable national and international standards, as well as the optimal codes and practices based on the accumulated in-house know-how and plant knowledge and experiences.

However, in reality, due to several reasons, not to mention the complexity of the matter, the ultimate goal of continuous direct embedment of the required changes on the relevant standard specifications may be far reaching. Therefore, in the interim periods between the officially issued revisions, the required changes will appear in other documents related to the engineering and design work of the on going projects.

In response to the initiative of the Design Division of the Engineering and Construction Directorate, and considering that the task of the execution of several important and mega projects for the realization of the new oil refineries, pipelines and oil terminals as well as improvements of the existing facilities, has been assigned to NIOEC, it was decided to update the NIOEC Specifications and to issue new official revisions.

The Design Division of the Engineering and Construction Directorate was itself entrusted to carry out this important task, and as such by forming several special technical committees, working in close co-operation and cohesion and sharing their expertise and knowledge, the updated and revised NIOEC Specifications were successfully prepared and complied.

These Specifications are intended to be used for Oil Refineries, Distribution Depots, Oil Terminals, Pipelines and Pump Stations within NIOEC's projects, and have been proven to be of high value for such purposes. It must however be appreciated that these Specifications represent the minimum requirements and should in no way be interpreted as a restriction on the use of better procedures, engineering and design practices or materials.

We encourage and highly appreciate the users and other clear sighted and experts to send their comments on the Specifications to the Design Deputy of the Engineering and Construction Director of NIOEC for evaluation and consideration.

S. R. KASAEIZADEH


EXECUTIVE DIRECTOR

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NOTES:

- 1) THIS SHEET IS A RECORD OF ALL REVISIONS TO THIS SPECIFICATION.
- 2) REMARKS RELATED TO EACH REVISION SHOW A BRIEF DESCRIPTION. THESE REMARKS SHALL BE INTERPRETED IN CONJUNCTION WITH THE REVISED TEXT MARKED BY REVISION NUMBERS.
- 3) WHEN APPROVED EACH REVISION SHALL BE CONSIDERED AS A PART OF THE ORIGINAL DOCUMENT.
- 4) NUMBER OF PAGES EXCLUDES THIS SHEET AND THE COVER SHEET.

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0	JULY, 2005	Z.GHETMIRI	S.M.J.SYEDI	M.R.FARZAM	M.A.A.SAJEDI
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1. SCOPE

NIOEC Specifications cover the general requirements for detailed engineering procurements, testing inspection & construction of refinery/oil plant, distribution depots, pump stations and pipe lines.

This NIOEC Specification covers minimum requirements for Design and Construction of reinforced Concrete structures.

2. REFERENCES

Throughout this Specification the following dated and undated standards/codes are referred to these referenced documents shall, to the extent specified here in, form a part of this Specification.

For undated references, the latest edition of the referenced document (including any supplements and amendments) applies. For dated references, the edition cited applies.

The applicability of changes in dated references that occur after the cited date, shall mutually be agreed upon by NIOEC and the Vender / Contractor.

UBC (UNIFORM BUILDING CODES)

" UBC 1997 Edition "

ACI (AMERICAN CONCRETE INSTITUTE)

ACI-211	" Proportioning Concrete Mixes "
ACI-305	" Hot weather Concreting "
ACI-306	" Cold Weather Concreting "
ACI-315	" Manual of Standard Practice for detailing Reinforced Concrete Structures. "
ACI-318	" Building Code Requirements for Reinforced Concrete. "
ACI-347	" Recommended Practice for Concrete from work. "
ACI-304	"Recommended Practice for Measuring Mixing and Placing Concrete"
ACI-350 R	" Concrete Sanitary Engineering Structures "

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

ASTM C150	" Standard Specification for Portland Cement "
ASTM C109-86	" Method of Test for compressive Strength of Hydraulic Cement Mortars "

ASTM C 33-86	" Specification for Concrete Aggregates"
ASTM A 615	" Plain reinforcing steel "
ASTM A 496	" Standard Specification Welded Steel wire fabric for concrete. reinforcement."
ASTM A 497	" Standard Specification for weld deformed Steel wire fabric for concrete reinforcement."
ASTM C 94-86	"Specification for Ready-mixed Concrete "
ASTM C 260-86	"Specification for Air-Entraining Admixtures for Concrete "
ASTM C 496-86	"Specification for Chemical Admixtures for Concrete "
ASTM C 989-87a	"Specification for Ground Iron Blast Furnace in Cement "
ASTM C 618-87	"Specification for Fly Ash and Raw or calcined Natural pozzolan for mineral Admixture in Portland Cement Concrete. "
ASTM C171-87	"Test Method for Compressive strength of Natural Building "
ASTM C172-82	"Method of Sampling freshly Mixed Concrete "
ASTM C309-81	" Specification for Liquid Membrane-Forming compounds for curing Concrete "
ASTM C 144-87	"Specification for Aggregate for Masonry Concrete."
ASTM C 31-88	" Test Method of Making and curing Concrete test Specimens in the Field."
ASTM C 143-78	" Test Method for Slump of Portland cement Concrete."

**AASHTO (AMERICAN ASSOCIATION OF STATE HIGHWAYS AND
TRANSPORTATION ORGANIZATION)**

AASHTO T260-84 " Method of sampling and Testing for total chloride Ion in
Concrete and Concrete Raw Materials.

NIOEC-SP (NIOEC SPECIFICATIONS)

[NIOEC-SP-00-10](#) " NIOEC Specification for Units "

Where reference is made to "Building Official", this designation for the purpose of this contract shall mean the Employer.

Copies of the ACI Building code and all other applicable standard specifications, last edition (specifically the following American society for testing and materials). For general list of standards used in this Specification refer to section 3-8 of ACI code 318 M-89 plus the Portland cement Association "Design and control of concrete Mixtures "Which shall be supplied by the contractor and shall be available at the job site for reference as required.

3. UNITS

International system of unites (SI) shall be used in accordance with [NIOEC-SP-00-10](#), unless otherwise specified.

4. GENERAL

4.1 Contractor shall design all the concrete structures. Design shall include computations and the preparation of the engineering drawings to show the general arrangement of the members, and all other information in the form of notes and diagrams necessary for the proper interpretation of the designer's ideas. All the design work should be in accordance with the codes mentioned in Articles 2. and 14. of this Specification.

The Contractor shall furnish all materials (except as noted in the Contract.), loots, equipment, utilities (except as noted), facilities scaffolding, etc., and shall perform all labor and services necessary for the proper execution and completion of all concrete work as shown on the drawings, as specified herein and/or reasonably implied there by to carry out the apparent intent of the work.

4.2 The Contractor's scope of work shall include the following item:

- Design of all the concrete structures and preparation of all the engineering drawings.
 - Design, construction and removal of forms including scaffolding and required supports.
 - The furnishing, cutting, bending and placing of reinforcing steel and reinforcing accessories.
 - Concrete including admixtures, mixing, placing finishing, protection and curing.
 - The placing of moisture barriers, anchor bolts, sleeves. Inserts, trench angles and other embedded items detailed on the concrete drawings. Embedded items not detailed on concrete drawings such as electrical conduit, boxes, etc. Will be placed under other parts of this specification.
 - Expansion and contraction joints, water stops, keyways and similar items as shown on the drawings and/ or herein specified.
 - Providing suitable openings through the concrete as necessary for the proper installation, attachment and/or passing of the work of other trades.
 - Preparation of concrete surfaces for grouting and dry packing.
 - Surface preparation of concrete for protective coatings and hardeners. The Contractor will furnish hardeners.
 - One site bench mark will be furnished by Employer. Contractor shall establish the necessary lines and elevations for his own work. The contractor for verification and use by Employer shall carefully preserve all stakes and marks.
- Item excluded from this part of specification is:
- Masonry work.