



Oceanic Consultants

PROJECT  
QUALITY ASSURANCE PLAN

ENGINEERING PHASE

June 2009

## **QUALITY ASSURANCE**

OCEANIC CONSULTANTS understands the importance of Quality Control during the engineering and design phase of a project.

OCEANIC CONSULTANTS has always exercised quality control over engineering calculations, drawings and project documents by a system of supervisory approval and document tracking. This is further enhanced by a Quality Assurance program that checks on the conformance with standard operational procedures and project specifications.

The following pages are the QA plan for a recent project. The procedures listed in Section 5.1.1 of that document are available for examination.

OCEANIC CONSULTANTS adapts the Engineering QA plan to meet the Scope and needs of each project.

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## **1.0 INTRODUCTION**

Quality Assurance Plans are coordinated, systematic plans, supported by defined requirements, procedures and controls that ensure the completed project meets all regulatory, statutory, codes, specifications and recommended practices.

OCEANIC CONSULTANTS has developed a Quality Assurance Plan for the PROJECT, for the OCEANIC CONSULTANTS Scope of Work for the Design and Procurement Phase of the Project.

This document describes the OCEANIC CONSULTANTS Quality Assurance Plan, Engineering Quality Control and sets forth the procedures for its implementation.

OCEANIC CONSULTANTS work on this project is directed for CONTRACTOR by the Project Management Team Force, SUBCONTRACTOR.

## **2.0 PURPOSE OF QUALITY ASSURANCE PLAN**

The Quality Assurance Plan was developed by OCEANIC CONSULTANTS to inform all Design and Procurement Team members of the Project Quality Requirements and Procedures to be implemented. OCEANIC CONSULTANTS objectives in preparing this plan are:

- To define the minimum requirements for the Quality Assurance Plan and establish procedures for implementing and maintaining quality controls over the OCEANIC CONSULTANTS design and procurement activities.
- To define and establish the quality control functions and operating procedures that OCEANIC CONSULTANTS must implement to meet the quality plan objective of achieving a high standard of quality.
- To establish the authorities, responsibilities and operating controls of the Project Quality Assurance Plan that will ensure all OCEANIC CONSULTANTS Team members perform in accordance with the Quality Assurance Requirements.
- To establish surveillance and audit procedures that the OCEANIC CONSULTANTS Project Manager, Quality Assurance Coordinator and CONTRACTOR shall exercise over the OCEANIC CONSULTANTS Design and Procurement Activities to assist quality control implementation, monitor the effectiveness of the program and ensure corrective actions are taken, as required.
- To provide a document that will instruct the OCEANIC CONSULTANTS members, allow review and approval of the OCEANIC CONSULTANTS Quality Assurance Plan.

### 3.0 PROJECT ORGANIZATION

The project Organization is a part of the General Engineering Design Work Plan developed by OCEANIC CONSULTANTS for the CONTRACTOR. Basic Activities and a copy of the organization section is attached for reference.

#### 3.1 General

The Contractor for the PROJECT is CONTRACTOR with a PROJECT office in Houston, Texas.

The Subcontractor for the CLIENT is OCEANIC CONSULTANTS.

CONTRACTOR will complete the detailed engineering in LOCATION with the technical support from the Engineering Subcontractor.

The basis engineering for the PROJECT will be completed in approximately four months. The Houston Office will continue after this time to support the Procurement Services.

#### 3.2 OCEANIC CONSULTANTS Project Organization

The Project manager, Project Engineer and Lead Personnel for the PROJECT are shown on Figure 3.1. OCEANIC CONSULTANTS Project Manager, (OCEANIC CONSULTANTS PROJECT MANAGER'S NAME) will be OCEANIC CONSULTANTS single-point contact for all project documentation and will interface directly with CONTRACTOR's Engineering Manager, (ENGINEER MANAGER's NAME).

OCEANIC CONSULTANTS Corporate Management is represented by Steve Hill, who is committed to the success of this project and will always be available for consultation by the CONTRACTOR Management Staff.

#### 3.3 Addresses, Phone Numbers, Etc.

3.3.1 CLIENT  
Address  
Address  
Address  
Attn: Project manager  
Phone:

3.3.1 CONTRACTOR  
Address  
Address  
Address  
Attn: Project manager  
Phone:

3.3.1 CONTRACTOR  
Address

Address  
 Address  
 Attn: Project Manager  
 Phone:

Team Members	Title	Ext.
	Director	
	Manager	
	Engineering Manager	
	Assistant Engineering Manager	
	Marine Systems & Turret Engineering	

3.3.4 OCEANIC CONSULTANTS

OCEANIC CONSULTANTS  
 ADDRESS  
 Attn: \_\_\_\_\_, Project manager  
 Phone: - Fax:

Team Members	Title	Ext.
	President	
	Project Manager	
	Facilities Project Manager	
	Structural Project Manager	
	Procurement Coordinator	

3.3.5 CLIENT

Address  
 Address  
 Address  
 Attn: Project Manager  
 Phone:

Team Members	Title
	President
	Project Manager
	Facilities Project Manager
	Structural Project Manager
	Procurement Coordinator

#### **4.0 APPLICABLE CODES, SPECIFICATIONS AND STANDARDS**

A listing of Applicable Codes and Standards is contained in Volume II of the Contract Documents.

##### **4.1 DESIGN CRITERIA**

The Engineering Design Criteria Document for the PROJECT has been prepared by OCEANIC CONSULTANTS. This Document will be updated, as required, during the project and contains the design criteria for the PROJECT.

## 5.0 QUALITY CONTROL SCOPE OF WORK

### 5.1 IDENTIFICATION AND MONITORING OF CRITICAL PROJECT PROCEDURES

#### 5.1.1 Identification of Critical Project Procedures

The Project Team will be following a set of procedures defined by the Project manager. The procedures that will have the most impact on quality control have been identified as:

- a) Procedure for Standardized Reporting of Calculations
- b) Procedure for Document Review and Approval
  - Engineering Studies, Reports, Technical Specifications and OCEANIC CONSULTANTS Data Sheets
- c) Procedure for Drawing Checking
- d) Procedure for Document Release and Revision Control
- e) Procedure for Procurement Inquiry Documents
- f) Procedure for Design Reviews and Project Meetings  
OCEANIC CONSULTANTS, CLIENT and CONTRACTOR.
- g) Procedure for OCEANIC CONSULTANTS Internal Design Review

#### 5.1.2 Engineering Quality Control

- a) Procedure for Standardized Reporting of Calculations

Procedure shall require that the discipline lead engineer review all calculations to verify that they reflect acceptable logic and engineering practice, and specify sign off and approval procedures.

- b) Procedure for Engineering Document review and Approval

Procedure shall require that the discipline lead engineer check documents or engineering studies and reports, technical specifications and OCEANIC CONSULTANTS data sheets to verify:

- Compliance with design requirement, codes and regulations specified in Section 4.0 of the Quality Assurance Plan and applicable standards.

- Engineering suitability and correctness.
- Mathematical and numeric accuracy.
- Format and clarity of presentation.

Procedure shall also define inter discipline checks and specify sign off and approval procedures.

c) Procedure for Drawing Checking

Procedure shall define the method for systematically and uniformly checking drawings, causing any identified problems to be corrected prior to drawing issue. The objective of the checking process is to ensure that the drawings meet project requirements, are technically correct, effect uniform drafting standards and are free of engineering and drafting errors. Procedure shall also define inter discipline checks and specify sign off and approval procedures. The checking of drawings is the responsibility of Drafting Supervision, the lead engineers and checkers.

d) Procedure for Document Release and Revision Control  
 Procedure shall define OCEANIC CONSULTANTS control of revisions prior to approval by CONTRACTOR and after approval by CONTRACTOR. Procedure shall also define control of issues of the documents.

e) Procedure for Procurement Inquiry Documents

Procedure shall define general conditions, instructions to bidders and methods for review of documents by engineering and Quality Assurance, prior to issue.

f) Procedure for Design review and Project Meetings  
 OCEANIC CONSULTANTS, CLIENT and CONTRACTOR

Procedure shall define method and frequency of Design Reviews and Project Meetings between, OCEANIC CONSULTANTS, CLIENT and CONTRACTOR.

g) Procedure for OCEANIC CONSULTANTS Internal Design Review

Procedure shall define OCEANIC CONSULTANTS Internal Design Review conducted during engineering to develop OCEANIC CONSULTANTS design to:

- Verify Quality
- Ensure influence of OCEANIC CONSULTANTS best experience
- Isolate and correct deviations from client requirements and specifications or good engineering practices
- Effect start-of-the-art tradeoff between all segments of OCEANIC CONSULTANTS

The intent is to upgrade the engineering products prior to release of AFC drawings. It is important to note that a OCEANIC CONSULTANTS Design Review is not intended to replace a client review.

#### 5.1.3 Quality Assurance Monitoring of Critical Project Procedures

The Quality Assurance Coordinator shall consistently monitor the Critical Project Procedures to verify procedural compliance as follows:

- a) Access to Documents - Engineering shall systematically issue one copy of all specifications, data sheets and drawings to the Quality Assurance Coordinator as soon as pre-release drafts are available.

Procurement shall systematically issue one copy of all procurement documents to the Quality Assurance Coordinator as soon as pre-release drafts are available.

- b) Review of the specifications and drawings, prior to issue, to verify quality requirements.
- c) Review of Procurement documents for Quality Requirements.
- d) Attend the Design Reviews and monitor activities.
- e) Monitor the engineering files containing originals of documents to verify checking and sign off of the project documents. This will be accomplished by use of a check off register to record checks and OCEANIC CONSULTANTS approval of project documents.

- f) Maintain a QA working file of specifications, data sheets and drawings for reviews and reference.

## 5.2 CHECKS FOR COMPLIANCE WITH CODES AND PROJECT SPECIFICATIONS

### 5.2.1 Engineering Quality Control

OCEANIC CONSULTANTS shall perform the Design Engineering in a professional manner in accordance with the codes, regulations and standards specified for Section 4.0 of the Quality Assurance Plan. Lead Engineers are responsible for the discipline and inter discipline checks of all technical work to ensure compliance with codes, regulations, standards and completeness of design.

### 5.2.2 Design Reviews

The OCEANIC CONSULTANTS design review team will review the project documents and report anomalies for correction.

### 5.2.3 Quality Assurance Checks

Quality Assurance Coordinator shall review the specifications, drawings and procurement documents to ensure compliance with the codes and specifications, reporting anomalies for corrective action.

## 5.3 PARTICIPATION IN DESIGN REVIEWS

OCEANIC CONSULTANTS Quality Assurance Coordinator shall monitor the minutes of the Project meetings. He will be provided with meeting agendas prior to the meetings to determine the need for his attendance at the meetings.

OCEANIC CONSULTANTS will conduct a formal in-house Design Review prior to issuance of Construction Drawings and documents. The OCEANIC CONSULTANTS Quality assurance Coordinator shall participate in the Project Design Reviews to ensure reviews are held as planned. Quality Assurance Coordinator will note levels of checks, areas of concern and anomalies affecting quality and shall report these to the OCEANIC CONSULTANTS Project Manager.

## 5.4 REVIEW OF QUALITY PROVISIONS IN PROCUREMENT DOCUMENTS

### 5.4.1 Procurement Documents

Prior to the beginning of procurement request for bid activity, the procurement documents, standardized for the project requirement, shall be reviewed by the Quality Assurance Coordinator to ensure general quality provisions have been defined. Documents to be reviewed include shall be in accordance with the requirement as defined by the CONTRACTOR, Directives for Procurement.

OCEANIC CONSULTANTS has prepared a Project Procurement Procedures manual for the project.

### 5.4.2 Quality Assurance Checks of Procurement

1. Ensure Specifications referenced in Procurement Documents have been checked and approved according to project procedures.
2. Review and coordinate with CONTRACTOR/SUBCONTRACTOR to ensure all quality and testing requirements are specified in all procurement documents.
3. Sign off on all request for quotes.

## 5.5 INTERFACE COMPLIANCE CHECKS

### 5.5.1 Scope of Interface Work

The control interfaces of the OCEANIC CONSULTANTS PROJECT NAME Scope of Work with the other project elements will be performed by CONTRACTOR.

OCEANIC CONSULTANTS will provide and obtain design data and drawings for portions of the work that is outside of the OCEANIC CONSULTANTS scope of work as applicable to the design interface areas. OCEANIC CONSULTANTS will provide required design data and/or drawings for approval and concurrence by others involved in design at the interface. OCEANIC CONSULTANTS will receive design data and/or drawings for approval and concurrence of the design by others at the interface.

Design interfaces occur between the subcontractors as follows:

- a) Subcontractor for the PROJECT NAME - OCEANIC CONSULTANTS - OCEANIC CONSULTANTS
- b) Subcontractor for \_\_\_\_\_
- c) Subcontractor for the \_\_\_\_\_.

CONTRACTOR shall be responsible to provide the necessary drawings and data, originating from other contractors involved in the interface work, to OCEANIC CONSULTANTS, so the OCEANIC CONSULTANTS work can be performed in a timely manner in accordance with the project schedule.

Interfacing shall include meeting with other contractors as required and exchanging sufficient technical data to insure compatibility of the overall project design. OCEANIC CONSULTANTS shall review for approval or concurrence design data at the interface as required such that design work by others can proceed. OCEANIC CONSULTANTS shall notify CONTRACTOR, accompanied by adequate definition and schedule duration, of requests for data for other contractors design work. OCEANIC CONSULTANTS shall provide designs for approval or concurrence by others at the interface to other contractors requesting information through CONTRACTOR.

CONTRACTOR to confirm, approve the design information provided by the interface contractors at the weekly project management meetings

CONTRACTOR shall be responsible for developing the procedure for the interface work and coordination of contractors.

#### 5.5.2 Interface Compliance Checks

OCEANIC CONSULTANTS Quality Assurance coordinator shall consistently monitor the OCEANIC CONSULTANTS discipline engineer's request for information from other contractors involved in the interface design by review of the following:

- a) Correspondence Files
- b) Telephone conversation record file
- d) Minutes of Meetings
- e) Drawing transmittal file

Checks will be made on Quality items contained in the documents transmitted and received and to verify that the OCEANIC CONSULTANTST interface requirements are accomplished. Checks on OCEANIC CONSULTANTS interface requirements will also be included in the Design Reviews.

## 5.6 PROJECT DOCUMENTATION COMPLIANCE CHECKS

### 5.6.1 OCEANIC CONSULTANTS Project Manager

The OCEANIC CONSULTANTS Project Manager shall be responsible for the following:

- OCEANIC CONSULTANTS Project manager, with assistance from the Lead Engineers, shall monitor the Project Quality by way of review of ongoing project documents produced and progress meetings.
- Arrange and direct all design reviews and conformance checks

### 5.6.2 OCEANIC CONSULTANTS Members

All OCEANIC CONSULTANTS members are responsible for adhering to the Project Quality Procedures and incorporation of the Quality Plan in the day to day work activities.

### 5.6.3 Quality Assurance Coordinator

The project Quality Assurance Coordinator shall be responsible for the following:

- Monitor the OCEANIC CONSULTANTS Deliverables to ensure Quality Procedures are implemented and maintained.
- Audit OCEANIC CONSULTANTS activities to ensure that checks are being performed in accordance with the project procedures.
- Maintain project Quality Assurance Records.
- Monitor and review specifications and drawings.
- Ensure and monitor requirements for Procurement Inquiry Packages, Bid Documents, Services and Subcontracts.
- Coordinate Quality Assurance activities with the CONTRACTOR Quality Personnel.
- Attend and monitor the design review team meetings.
- Report Non-Compliance.

## 6.0 DESIGN REVIEWS

It is the responsibility of the Project manager and the Lead Project Engineers to ensure technical accuracy, consistency, and quality of the work performed by the design department.

### 6.1 OCEANIC CONSULTANTS, CONTRACTOR AND SUBCONTRACTOR

Design Reviews shall be apart of the Scheduled Weekly Project meetings between, OCEANIC CONSULTANTS, CLIENT and CONTRACTOR. Further detailed in Procedure for Design Reviews and Project meetings, OCEANIC CONSULTANTS, CLIENT and CONTRACTOR.

### 6.2 OCEANIC CONSULTANTS IN-HOUSE DESIGN REVIEW

A formal Design Review will be conducted during engineering development of the project by an impartial review team of experienced engineering personnel selected from OCEANIC CONSULTANTS Senior Engineering Staff. Results of the design review will be documented and reviewed by the OCEANIC CONSULTANTS PROJECT Design Team, OCEANIC CONSULTANTS Management and, where applicable, used to upgrade the OCEANIC CONSULTANTS engineering deliverables prior to release to client or for construction.

#### 6.2.1 Design Review Team

The Design Review will be performed by two(2) impartial engineers selected from OCEANIC CONSULTANTS staff, with necessary assistance from the Project manager and the Project Lead Engineers. The OCEANIC CONSULTANTS Corporate Sponsor, \_\_\_\_\_, will review and approve the findings and any corrective actions.

#### 6.2.2 Location of Design Review

The Design Reviews will take place in the OCEANIC CONSULTANTS Houston office.

#### 6.2.3 OCEANIC CONSULTANTS In-House Design Review

OCEANIC CONSULTANTS Procedure for OCEANIC CONSULTANTS Internal Design Review defines the Review Process.

## 7.0 QUALITY AUDITS

### 7.1 SCHEDULE OF AUDITS

Audits shall be scheduled to take place during the course of the design phase of the project. Audits will be in relation to the project schedule for the deliverables.

### 7.2 PROCEDURE FOR QUALITY AUDITS

#### 7.2.1 Purpose

To establish and define the plan for auditing functions of Quality Assurance.

#### 7.2.2 Scope

Audits will be performed on the principal functions of Quality Assurance as set for the in the PROJECT Quality Assurance Program and Project Procedures. The OCEANIC CONSULTANTS Quality Assurance Coordinator will perform the Quality Audits as he is not directly responsible for the Function or Procedure being audited.

Prompt corrective action to rectify deficiencies noted by the Quality Assurance Audits shall be carried out by the OCEANIC CONSULTANTS section responsible for deficient items.

Follow-up audits shall be performed by the Quality Assurance Coordinator to determine the adequacy and effectiveness of the corrective actions taken.

#### 7.2.3 Procedure for Internal Audits

The OCEANIC CONSULTANTS Quality Assurance Coordinator establishes a schedule for audits, as set forth in Section 7.1 of the Quality Program.

OCEANIC CONSULTANTS Quality Assurance Coordinator designates the Quality Assurance System element or Project Procedure to be audited based upon:

- a) Scheduled frequency set forth in Section 7.1 of the Quality Plan.
- b) An indication that a system is not functioning according to established procedures.
- c) Specific OCEANIC CONSULTANTS Project Corporate Sponsor or Project Manager direction.

OCEANIC CONSULTANTS Quality Assurance Coordinator reviews the corresponding Quality Assurance Requirement or Project Procedure for the element to be audited.

OCEANIC CONSULTANTS Quality Assurance Coordinator audits against the requirements of Quality Assurance Requirement or Project Procedures. This audit consists of the following as applicable:

- a) A review of the requirements of all pertinent procedures, forms or specifications to determine adequacy.
- b) A review of all operations associated with the procedure to determine adherence to written procedures.

The auditor will include the following on the Audit Report:

- a) The QA Procedure, QA Function or Project Procedure audited
- b) The individuals contacted during the audit
- c) The results of the audit as determined through interviews with persons involved in the performance of the work.

Audit reviews findings with the OCEANIC CONSULTANTS person having lead responsibility over the area audited and obtains any necessary actions commitments.

Audit findings, with appropriate corrective action commitments, are published. The distribution list shall include the following:

- a) The Project Corporate Sponsor
- b) OCEANIC CONSULTANTS Project Manager
- c) Quality Assurance Document File

The Quality Assurance Coordinator shall monitor progress and ensure that the corrective action is completed in accordance with the corrective action commitments. The auditor shall be notified of the completion and shall conduct a follow-up audit to determine the effectiveness of the corrective action and prepares a report of the results.

Results of all audits and corrective action documents will be reviewed with the OCEANIC CONSULTANTS Corporate Sponsor, Project Manager, and shall be made part of the permanent Quality Assurance Document File.

## 8.0 QUALITY RECORDS

### 8.1 CHECK AND APPROVAL REGISTERS

Quality Assurance Coordinator shall maintain registers of checks, OCEANIC CONSULTANTS and client approvals. The registers shall indicate the date of the check and approvals of the following items:

- Calculations
- Studies
- Reports
- Specifications
- OCEANIC CONSULTANTS Data Sheets
- Drawings
- Inquiry Packages
- Interface Documents

### 8.2 QUALITY ASSURANCE FILE

File Index:

- Correspondence
- Meeting Notes
- Memorandums
- Telephone Conversations
- Audit Reports
- Non-Conformance
- Corrective Action
- Schedules
- Specifications
- Inquiry Packages (sections related to quality)
- Fabrication Packages (sections related to quality)

### 8.3 QUALITY CONTROL RECORDS

#### 8.3.1 Engineering and Design

OCEANIC CONSULTANTS engineering and drafting groups shall maintain files containing the originals and/or copies of the project deliverables in order to document the checking process. The originals and/or copies shall show date of check and be signed by the person(s) making the check and/or approval. These files shall contain originals and/or copies of the following:

- Calculations
- Studies
- Reports
- Specifications
- OCEANIC CONSULTANTS Data Sheets

#### 8.3.2 Procurement

OCEANIC CONSULTANTS Procurement shall maintain files containing the files of the Inquiry Packages in order to document the checking process. Documents shall show date of check and signed by person(s) making the check.

#### 8.4 SIGN-OFF OF DOCUMENTS

OCEANIC CONSULTANTS shall acknowledge checks and approvals of Project Documents by signing the originals upon completion of the check or approval.