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# QUALITY PLAN


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## 1.0 OBJECTIVE

- 1.1 The objective of this Quality Plan is to define and design the Quality Assurance and Quality Control requirements and to ensure that all Quality related activities are planned adequately and implemented to cover all parameters specified for the Contract ..... as per applicable Codes and Construction Industry Standards.
- 1.2 ALYAMAMA Engineering Company (AY ) shall ensure that the activities involved in Procurement and construction activities are specified, managed and implemented under controlled conditions to ensure the quality, reliability, value and integrity of the Contract.....is assured and the sellers (i.e. vendors, suppliers, fabricators and subcontractors) have in place a Quality Assurance and Control Program that meets applicable requirements of this Project Quality Plan including conformance to the applicable requirements of the Project Technical Specification.

## 2.0 SCOPE

- 2.1 The Quality Plan describes a system of procedures and activities encompassing documentation, procurement, construction, installation testing and commissioning as applicable to the technical requirement of the contract

## 3.0 REFERENCE DOCUMENTS

### 3.1 CONTRACT DOCUMENT

### 3.2 PROJECT SPECIFICATIONS

### 3.3 INTERNATIONAL STANDARDS


- a. Quality System Standards                      ISO –9001-2008

### 3.4 APPLICABLE NATIONAL & INTERNATIONAL CODES & REGULATIONS

### 3.5 CONTRACTOR'S DOCUMENTS

- a. Quality System Procedures  
b. Site Work Procedures  
c. Inspection and Test Plan

Quality Plan shall conform to the requirement of the Contract .....

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#### 4.0 MANAGEMENT RESPONSIBILITY

##### 4.1 QUALITY POLICY

- 4.1.1 The Quality Policy is to deliver products and services to Client in conformance with contract requirements on time and free of defects. AY has developed a Project Quality Plan in accordance with Client's quality requirements for the Contract.
- 4.1.2 The contents of the Project Quality Plan are binding on all AY staff and all the subcontractors in carrying out their duties.

#### 5.0 ORGANIZATION

##### 5.1 RESPONSIBILITIES AND AUTHORITY

5.2 The functional responsibilities of various authorities are shown in the Project Organization Chart, and explained throughout the text of this section. Activities related to Quality, responsibilities and authority of personnel performing these activities should be identified and documented.


##### 5.3 Quality Manager

- 5.3.1 The Quality Manager has overall responsibility and authority to direct and coordinate the activities of AY Projects team and maintain direct liaison with Client.
- 5.3.2 The Quality Manager's responsibility and authority shall include as a minimum:
- a) Management of all aspects of the Project from Contract award to final acceptance by Client.
  - b) Directing the activities of Procurement And Material Supply
  - c) Division of assignments and specific responsibilities of other members of the Project Team.
  - d) The Quality Manager is the final authority in all matters related to Procurement and Quality of Materials Supplied.

##### 5.4 PROJECT MANAGER

5.4.1 The Project Manager has the responsibility for the following:


- a) Ensuring that the Project Quality Plans interface satisfactorily with the requirements of the Contract.
- b) Coordination with Client as Contractor's delegated representative.

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- c) Implementation of the Quality Plan of the project.
- d) Delegation of authority to other members of the project management team as appropriate to their functions.
- e) Participating in the formal review of the Project Quality System on a regular basis.
- f) Responsible for all the Materials to be supplied at site. He is to ensure that Material Supplied to the Construction Site is completed in accordance with the Drawings, Specification, Project Quality Plan and meets contractual requirements.
- g) Coordinates with Client and their representatives in order to meet and solve day-to-day problems in regard to requirements and Quality of material to the clients place.
- h) Has overall responsibility on the Material supplied to client place/site in matters related to material quality & Quantity and the equipment Supplied
- i) Participates in the staff meetings at site to review progress, problems and future activities.
- j) Participates in Quality meetings related to Material supply Quality activities
- k) Responsible for Inspection & testing of materials which is supplied

### 5.5 QUALITY ASSURANCE & CONTROL ENGINEER

- 5.5.1 Responsible for administering the Quality of the Materials supplied at the construction site. He is vested with the authority required to ensure Client satisfaction. His interventions and decision can be overruled only by QA Manager.
- 5.5.2 Responsible for preparation of project specific quality manuals, ITPs procedures, and method statements.
- 5.5.3 Responsible for recognition of Quality Problems. He will report to QA Manager and to Project Manager for any breach of the Quality System. He is also responsible for taking initiative to solve recognized problems and for verifying implementation of corrective actions For Materials supplied at the construction site.
- 5.5.4 Responsible for reviewing calibration records, to ensure that all the measuring and test equipment used for Quality inspection are calibrated in accordance with standard procedure.


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- 5.5.5 Coordinates with the Client's representative to witness all the operations specified by Client in the Inspection and Test Plan, and obtain approval on the test reports.
- 5.5.6 Responsible for the final inspection of the product / assembly to ensure compliance with Project Quality Plan. Final Inspection shall be carried out jointly with engineers responsible for each discipline.
- 5.5.7 Responsible for reviewing final inspection documentation with the Client's Representative. He is also responsible for final release of the product. This release may be subject to approval by Client.
- 5.5.8 Participates in Quality meetings with regards to Material Supply And its Quality
- 5.5.9 QC Engineer will report to Project Manager.

## 5.6 PROCUREMENT MANAGER

The Procurement Manager performs the following tasks:


- 5.6.1 Reviews the procurement documents prepared and the activities performed by the procurement staff to assure the quality requirements of the applicable procedures and the Project Quality Plan are adhered to.
- 5.6.2 Monitors the Project Schedule to ensure that Procurement activities confirm to the Schedule.
- 5.6.3 Identifies problem areas within the schedule and discuss with Project Manager, for resolving these problems.
- 5.6.4 Assists and coordinates the resolution of difficult purchasing, expediting, inspection, and traffic/shipment problem.
- 5.6.5 Interfaces with Engineering disciplines and attends engineering review meetings, when required, to ensure that requisitions for major material / equipment are obtained promptly and that technical question raised by vendors are answered promptly and completely.
- 5.6.6 Coordinates with Planning Department towards preparation and issuance of a monthly Materials Procurement Status Report covering equipment and materials. This report shall include the scheduled, forecast and actual dates of accomplishing each referenced task and shall include the anticipated requisitions for material and equipment as well as the currently issued requisitions for material and equipment.

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- 5.6.7 Expedites preparation of the commercial and technical comparison of bids and provides recommendations.
- 5.6.8 Coordinates procurement activities performed by subcontractors with respect to the requirements of the Procurement Plan.
- 5.6.9 Approval of inspection Assignment Packages
- 5.6.10 The Procurement Manager reports to The Quality Manager.

### 5.7 PROJECT ENGINEER / SITE ENGINEER

- 5.7.1 Responsible for the construction activities in his own discipline.
- 5.7.2 Responsible to organize, supervise and perform all the construction activities according to the approved methodology and construction practice.
- 5.7.3 Co-operate with QA/QC personnel to perform QA/QC checks to verify the construction Materials Supplied are according to the project requirements.
- 5.7.4 Co-ordinate with site QA/QC personnel for inspections prior to client's inspection and approval.
- 5.7.5 Should attend to all QA/QC inspection remarks immediately and obtain approval/clearance at the earliest.
- 5.7.6 Should plan, prepare and submit Fortnightly Look ahead Schedule of site activities that require client's QA/QC check / surveillance and obtain approval.
- 5.7.7 Participate in staff meeting at site to review progress and programs to complete the project activities as per schedule.
- 5.7.8 The Project Engineers/Site engineers report to Construction Manager.

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## 6.0 RESOURCES

6.1 The Project Quality Plan has been established in accordance with the requirements under the Technical Specification for the contract and AY 's Quality System. The duties and authorities of the Quality Assurance personnel are outlined in their job description and the department will be staffed to ensure that the Quality Assurance and control duties are carried out as described in this Project Quality Plan.

### 6.2 QC ENGINEERS/SUPERVISORS


6.2.1 The QC Engineers have the responsibility for the preparation and implementation of the Project Quality Plan for Material Supply Quality.

6.2.2 They have the authority and organizational freedom to:

- a) Initiate action to prevent the occurrence of non-conformity;
- b) Identify and record any quality problem;
- c) Initiate, recommend or provide solutions through designated channels;
- d) Verify the implementation of solution,
- e) Control further processing, delivery or installation of nonconforming products or assembly until the deficiency or unsatisfactory condition has been corrected to the mutual satisfaction of Client and AY .

6.2.3 Any problem regarding quality shall be referred to Project Manager for resolution and the resolution shall be in accordance with the Project Quality Plan, Contract requirements and latest applicable Codes and Standards



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## 7.0 QUALITY SYSTEM PROCEDURE

7.1 Quality System Procedure shall be prepared in accordance with the project quality requirement. The following items shall be considered in preparations of quality procedure.


- a) Objective
- b) Scope
- c) References
- d) Responsibilities
- e) Sequence of Activities
- f) Written or flow charts to develop quality procedure.
- g) Records

7.2 Following are the list of Quality System Procedure:


Sl. no.	Description
1	Contract review
2	Design Control Program
3	Document Control
4	Procurement Procedure
5	Evaluation of Vendors
6	Procurement Coordination
7	Identification and Traceability
8	Inspection and test plan
9	Inspection and test Plan for Civil works
10	Calibration of Measuring and Test Equipment
11	Process Control
12	Control of Subcontractors
13	Control of Nonconformance
14	Corrective and Preventive action
15	Receipt, Storage and Handling of incoming materials
16	Control of Quality Records
17	Quality System Audits

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7.3 LIST OF SITE WORK PROCEDURES – CIVIL WORKS


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#### 7.4 LIST OF INSPECTION & TEST PLANS - CIVIL WORKS

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## 8.0 QUALITY AUDITS

- 8.1 Auditing of the Quality Assurance System shall be performed on regular basis. Internal auditing shall cover the operation of Head Office in Basrah and the operations of construction sites. Quality Audits shall be conducted in accordance with a defined schedule. Second party audits shall be conducted on all its subcontractors.
- 8.2 Auditing shall be conducted in accordance with project requirements which shall cover the following items:
- a) Purpose and scope
  - b) Responsibility for conducting and reporting the audit
  - c) Schedule of the audit
  - d) Applicable standards
  - e) Activities to be audited
- 8.3 The system audit shall be aimed at a continuous improvement of the Quality Assurance system. The reference base is the Corporate Quality Plan, Project Quality Plan and the applicable standards.
- 8.4 Quality Audit shall be carried out in accordance with established schedule and audit findings shall be reported to the Project Manager and Corporate QA Manager and will be discussed with Senior Management in Management Review Meeting. The schedule and frequency shall be adjusted if (i) the results of previous audit indicate a need to perform them more frequently, (ii) Significant changes are made in the Project Quality Plan, (iii) Reliability and /or performance of an item is questionable due to non-conformance and (iv) Verification of corrective action implementation.
- 8.5 Personnel conducting the Quality surveillance/ auditing shall be independent of those having direct responsibility for the specific activities or areas being evaluated or assessed.

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## 9.0 CONTROL OF NON-CONFORMITIES:

- 9.1 Any non-conforming product/material/equipment shall be identified and segregated to prevent further processing, delivery or installations until the deficiency or unsatisfactory conditions has been corrected. Procedures shall include closed loop control for dispositions of non-conformity materials for corrective action, for waiver of specification and/or contract requirements when appropriate.
- 9.2 A Log of Non-conformance's shall be maintained by the QC Engineer Inspection status of all received items shall be clearly shown. Tags for identification shall be used, and a hold area shall be designated to prevent unauthorized use or mixing with the conforming items.
- 9.3 Non-conformance conditions shall be documented and reported to subcontractors and suppliers for correction and to appropriate level of contractor's management by means of non-conformance reports (NCR).
- 9.4 Bi-weekly site QA/QC reports shall be prepared and reviewed about non-compliance
- 9.5 Non-conformance reports shall have a unique identification and as a minimum shall include the following information.
- a) Identification of supplier/ contractor
  - b) Identification of materials/ equipment
  - c) Type of activity
  - d) Description of the cause of the problem.
  - e) Proposed corrective action.
  - f) Time required for corrective action to be completed.
- 9.6 All NCR's shall be followed up and closed out to assure that the appropriate corrective action has been taken. A summary of NCR's including approved resolutions and closing shall be forwarded to QA Manager.
- 9.7 AY shall not use any repaired item or product unless approved by Client.


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## 10.0 CORRECTIVE ACTION

- 10.1 AY shall establish a system for investigation of non-conformance or potential non-conformance, and based on this shall formulate a corrective action that prevents recurrence of the problem.
- 10.2 Corrective action shall be performed in accordance with a written procedure , which includes the following items:
- a) Investigation of the cause of non-conformance;
  - b) Preventive action;
  - c) Effectiveness of the solution;
  - d) Applicable records.
- 10.3 Records of Corrective action shall be maintained by Project QC Engineer and shall be analyzed by the Quality Assurance Manager and discuss at periodic management review meetings. A summary of Corrective Action Repot and resolution shall be forwarded to QA Manager.
- 10.4 Follow up action shall be taken to verify implementation of corrective action.

## 11.0 DOCUMENT CONTROL

- 11.1 The creation, distribution, monitoring, revision control and disposition of all formal documentation to include drawings and records are carried out in controlled manner by authorized personnel.
- 11.2 The QA/QC program includes procedure for control of project documentation, including that of subcontractors and suppliers.
- 11.3 Documentation control includes identification, retrievability, filing, indexing, archive requirements & final disposition at completion of works. Records shall be protected from destruction, deterioration, and against theft.
- 11.4 Regulatory and Owner requirements for permanent records shall be identified in accordance with the requirement of Project Technical Specification.
- 11.5 Retained records shall include drawings, specifications, procurement documents, calibration procedures and reports, nonconforming and corrective action reports, results of review, inspection, tests, audits, material analysis, monitoring of work performance and qualification of personnel.
- 11.6 Charts, reports and other engineering data including photographs, microfilms and radiographs shall be stored and filed in a controlled manner, processed to produce and agreed upon archival life become the property of the Client upon completion of the works.


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## 12.0 CONTROL OF SUBCONTRACTORS

- 12.1 Subcontractors shall be required to develop and submit Project Quality Plan for their scope of work for review and approval by Client. This shall meet all the requirements of Project Technical Specification.
- 12.2 AY shall conduct surveillance and formal audits of their subcontractors and suppliers as required to assure that subcontractors and suppliers activities conform to their approved QA Program and Quality Control Procedures. Quality Audits and Independent Third Party Audits shall be conducted in accordance with a defined schedule. AY 's quality surveillance personnel shall to perform second party audits on all its subcontractors.
- 12.3 AY shall establish and maintain procedures for assuring the quality of work performed by their field subcontractors. The procedures shall incorporate the requirements defined in the project specifications, with special emphasis on the qualification of subcontractors, welders, inspectors and testing personnel.
- 12.4 Audits shall be performed in accordance with pre-established written or procedures checklists and conducted by trained personnel not having direct responsibilities in the areas being audited.

## 13.0 PROCUREMENT

- 13.1 The AY shall procure materials and equipment in accordance with contract requirements. The Procurement Procedure will describe the sequence of actions that shall be followed in the preparation, review, approval and control of procurement documents, including the measures which assume that changes or revision to procurement documents are subject to the same review and approval requirements as the original documents.
- 13.2 All major equipment manufacturers shall be required to submit evidence of quality assurance program satisfactory to Client. All major material and equipment for the project shall be procured from Client approved sources.
- 13.3 Purchasing document shall contain data clearly describing the product ordered. Documents for procurement of materials, equipment or services, whether purchased by AY or its subcontractors shall include the following:
  - a) Applicable codes, standards and design specification requirements.
  - b) Listing of vendor's documents to be submitted to AY for review and approval including drawings, specification, installation, operating and maintenance instructions, inspection plans and inspection and test records.
  - c) Listing and scheduling for inspections, services, witness points and hold points.

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- d) Packaging, shipping and storage requirement and delivery date.
- e) All witness and hold points and special inspection specified in Purchase Orders shall be incorporated in Supplier's P.O to subcontractors and suppliers.
- f) Provision's for Client's and AY 's right of access to supplier's facilities for inspection and audits.

13.4 AY Corporate QA Manager shall review all procurement documents prior to procurement processing.

13.5 All purchase orders to the approved manufactures/suppliers are not re-assigned or subcontracted to other manufactures/suppliers without Client 's written consent.

#### 14.0 PROCESS CONTROL

14.1 AY shall identify installation, and construction, which affect Quality and shall ensure that these processes are carried out under controlled conditions.

14.2 The methods of verification of manufacturer's production shall be listed in the purchase order. Controlled conditions shall include the following:


- a) Documented work instructions
- b) Use and approval of processes and equipment
- c) Qualification of personnel
- d) Compliance with reference Standards / Codes
- e) Monitoring and control during production
- f) Criteria of workmanship

14.3 AY shall identify and plan installation processes that affect Quality and shall ensure that these processes are carried out under controlled conditions. All assemblies shall be in conformance to the approved design and Project Specifications.

14.4 AY shall identify special processes and shall ensure that these processes are carried out under controlled conditions. All special processes shall be reviewed / approved by client and shall also comply with the applicable Codes and Standards. Records shall be maintained for approved processes, equipment, and personnel.

14.5 Special process shall include welding, NDE, hydrostatic testing etc and shall be included in the Inspection & Test Plan. Welding procedures & NDE procedures shall be carried out by qualified personnel who are examined and certified by Independent Testing Agency/Laboratory.



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14.6 AY shall develop & implement the use of inspection logbook for use by AY QC Engineers in recording their comments & observations as a result of their inspection. AY personnel responsible for rectifying any observed deficiency or non-conformance shall also write in the logbook stating the action taken to correct the deficiency. QC Engineer shall ensure that all unsatisfactory observations are cleared before proceeding to the succeeding stage.

#### 15.0 INSPECTION AND TESTING AT WORK SITE

15.1 AY shall be responsible for inspecting and testing the project in its entirety and all component parts of the project, including those parts installed by subcontractors. AY shall provide all inspection and testing facilities to ensure conformance.

15.2 Client shall be entitled to have their representative present at all locations where contractor or subcontractors are engaged in the performance of the work, at any and all times, to review and inspect all aspects of their performance of the work and to perform or witness whatever tests are required under this contract or which Client otherwise considers necessary.


15.3 For any inspection or any test to be witnessed by Client's representative, AY shall advise Client's representative in writing of said inspection or tests sufficiently in advance to enable Client's representative to attend.

#### 16.0 INSPECTION AND TESTING (Construction)

16.1 AY shall provide and document all Quality activities, in the fabrication/construction facilities. Fabrication/Construction shall be in accordance with contract document and Specifications related to the scope of work. AY subcontractors are required to meet the contract document and Specifications related to their scope of work.

16.2 AY shall document observed deficiencies on non-conformance reports and shall maintain a log on all non-conformance. AY shall be responsible for all required inspection and tests at the fabrication yards and at work sites.

16.3 AY shall use QA/QC personnel other than those performing or directly supervising the work. The QA/QC personnel shall not report directly to immediate supervisors responsible for producing the work being inspected. QA/QC personnel shall be kept free from the pressure of cost, schedule, and production, and shall be given the necessary authority and independence to perform their role effectively.


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## 17.0 INDEPENDENT TESTING LABORATORY

- 17.1 AY shall contract client approved Independent Testing laboratory for material and field-testing services if required or any reliable laboratory.
- 17.2 AY shall instruct the contracted independent testing laboratory to provide sufficient number of copies of the test results and reports to furnish to client. Test reports shall indicate the tested characteristics, test methods acceptance criteria and applicable standard.
- 17.3 AY shall ensure that contracted independent Testing Laboratory does not re-assign or sublet any portion of their contracted testing work.
- 17.4 Client's Representative shall be provided timely access to the Independent Testing Laboratory's facilities for witnessing of tests and verification of calibration status of testing equipment.
- 17.5 Employment of an Independent Testing Laboratory shall in no way relieve AY of any obligation set forth in the contract.

## 18.0 INDEPENDENT INSPECTION AGENCY

- 18.1 AY shall contract Client approved Quality Assurance and Quality Control Services agency and provide documents of all quality assurance monitoring of all quality activities related to procurement and manufacturing of materials and equipment to be used in this project. Or AY performs Inspection In 3<sup>rd</sup> party recognized Labs For the Above mentioned Irrespective of the client requirement
- 18.2 AY shall direct Quality Control Services agency to provide sufficient number of copies of material status, quality surveillance reports inspection and test reports immediately after the inspection.
- 18.3 The contracted Quality Assurance and Quality Control Services shall not re-assign or sublet the portion of their work.
- 18.4 AY shall instruct the Quality Assurance and Quality Control Services contractor to verify and check each material/equipment for conformance against the Project Scope of Work and Technical Specification and each clause of the applicable Client Material Standard Specification and report. The report shall include the following:
  - a) Project title, Contract Number
  - b) Complete description of the inspected material/equipment
  - c) Report number and date
  - d) Place and date of inspection, scope of inspection
  - e) Documents used during inspection
  - f) Manufacturer and plant location where the equipment was manufactured.

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- g) Detailed description of the inspection and testing activities and their results, deviations to specification, manufacturer's explanation to the deviations, visual inspection result, packing and marking inspection result, conclusion and copy of the outline drawing of the inspected material/equipment. Witnessed tests and reviewed test data shall be clearly identified in the inspection reports.
- h) Name of the inspector.

18.5 AY shall furnish copies of the following document to the Quality Assurance and Quality Control Services Agency contracted to perform quality assurance and quality control monitoring of each material and requirement before surveillance.


- a) Copy of Purchase Order placed to the manufacturer/ supplier.
- b) Relevant section of Project Scope of Work and Technical Specification
- c) Applicable Company developed standard and specification
- d) Manufacturers Technical Specification and Client approved design drawings
- e) Client's approval of material/ equipment and applicable clarifications issued by the Client.
- f) Client's approved inspection and test plan/manufacturing quality control plan.

18.6 Employment of a Quality Assurance and Quality Control Services shall in no way relieve AY of any obligation set forth in the contract.

#### 19.0 SPECIAL INSPECTION REQUIREMENTS FOR CRITICAL ACTIVITIES:

19.1 Certain critical equipment and or field activities shall be sufficiently important to warrant direct surveillance by Client personnel and or engineering specialists. An inspection coverage list for such equipment/activities shall be prepared got prior approval from client.

19.2 Surveillance by Client shall be performed on a preplanned basis, shall be early enough to ensure that adequate controls have been developed and implemented during initial activities. Subsequent and continuing surveillance may need to be adjusted with the schedule of fabrication and construction activities, complexity of installation and nature of deficiency encountered

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## 20.0 QUALITY RECORDS

20.1 The result of the activities listed in the Project Quality Plan and in the Inspection and Test Plans shall be documented to ensure that the products confirm to specification and the prescribed activities have been carried out

20.2 Quality records provide necessary information for problems analysis and long-term improvement in product quality and quality assurance system. For the Project Quality Records, the following items as a minimum shall be considered.

- a) Storage and maintenance,
- b) Identification and collection,
- c) Indexing and filing and,
- d) Retrieval and disposition.

20.3 The following is the list of Quality Records requiring control:

Sl. no.	Description
1	Drawings, Specifications and, Blueprints
2	Operation and Maintenance Manuals
3	Inspection Instructions and work Instructions
4	Test Procedures and Operational Procedures
5	Quality Manuals and System Procedures
6	Review Records
7	Internal Audit Records
8	Subcontractors Records
9	Process, Equipment and Personnel employed for Special Processes
10	Inspection Measuring and Test Equipment Calibration records
11	Training Records
12	Nonconformance and Corrective action Records
13	Vendor Inspection and Procurement Records
14	Field Inspection and Checklists and inspection reports
15	Inspection log book
16	Laboratory test reports
17	Approved submittals