

**DIVISION 1**  
**GENERAL REQUIREMENTS**

**BUILDING WORK**

**DIVISION 1**

**GENERAL REQUIREMENTS**

**INDEX**

SECTION 01100	: Summary
SECTION 01300	: Administrative Requirements
SECTION 01330	: Submittal Procedures
SECTION 01400	: Quality Requirements
SECTION 01500	: Temporary Facilities and Controls
SECTION 01600	: Product Requirement
SECTION 01700	: Execution Requirements

**SECTION 01100****SUMMARY****GENERAL****1.01 CONTRACT DESCRIPTION**

- A. Work of the Project includes:
  - 1. Improvement of Karak Castle Presentation which includes:
    - a. Improvement of existing museum space
    - b. Improvement of the pathway in the castle (total of pathway is 1.35km long together with the covered and open pathways)
  - 2. Improvement of Tourist Street
  - 3. Construction of 2 Castle Observation Points
  - 4. Improvement of the visitor center .

**1.02 WORK SEQUENCE**

- A. Construct Work in stages to accommodate EMPLOYER'S requirements during construction period; coordinate construction schedule and operations with EMPLOYER.

**1.03 WORK BY EMPLOYER**

- A. As indicated in the drawings, the Contractor should pay attention that some works in this project may be executed by the Employer (Department of Antiquities "DOA"); such as part of demolition works, excavations, Stone pointing...etc.
- B. Contractor should make the required arrangements with 'DOA' to organize the schedule of execution such works.

**1.04 CONTRACTOR USE OF PREMISES**

- A. Limit use of premises to Work and construction operations, to allow for EMPLOYER occupancy, work by other contractors, and public access.
- B. Coordinate use of premises under direction of EMPLOYER.

**1.05 REFERENCE STANDARDS**

- A. For products specified by association or trade standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Date of standard is that in effect as of Tender date, except when specific date is specified.
- C. When required by individual Specifications Section, obtain copy of standard. Maintain copy at job site during submittals, planning, and progress of specific work, until Substantial Completion.

- D. Abbreviations used in Drawings and Specifications are as specified in ANSI Y1 and IEEE 260.
- E. For Roads, Sidewalks, Curbs and Parking areas use Perform work in accordance with “Specifications for highway and bridge construction” issued by the ministry of Public Works & Housing in Jordan.
- F. Schedule of references:
  - 1. ACI - American Concrete Institute
  - 2. ANSI - American National Standards Institute
  - 3. ASME - American Society of Mechanical Engineers
  - 4. ASTM - American Society for Testing and Materials
  - 5. AWS - American Welding Society
  - 6. AWWA - American Water Works Association
  - 7. CRSI - Concrete Reinforcing Steel Institute
  - 8. FM - Factory Mutual System
  - 9. IEEE - Institute of Electrical and Electronics Engineers
  - 10. NEMA - National Electrical Manufacturers' Association
  - 11. NFPA - National Fire Protection Association
  - 12. OSHA - Occupational Safety and Health Administration
  - 13. PCA - Portland Cement Association
  - 14. SSPC - Steel Structures Painting Council
  - 15. UBC - Uniform Building Code
  - 16. UL - Underwriters' Laboratories
- G. Products and construction procedures to Deutsches Institut fuer Normung (DIN) Standards or (B.S) British Standards that are equivalent to the Standards listed in these specifications are acceptable.

## **PRODUCTS**

NOT USED

## **EXECUTION**

NOT USED

**END OF SECTION**

**SECTION 01300****ADMINISTRATIVE REQUIREMENTS****PART 1 GENERAL****1.01 COORDINATION**

- A. Coordinate Work of various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
- B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable.
- D. In finished areas, conceal pipes, ducts, and wiring within construction.

**1.02 JOB SITE ADMINISTRATION**

- A. CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out Work and perform construction as required by Contract Documents.
- B. CONTRACTOR shall at all times maintain good discipline and order at site.
- C. Except in connection with safety or protection of persons or Work or property at site or adjacent thereto, and except as otherwise indicated in Contract Documents, all Work at site shall be performed during regular working hours, and CONTRACTOR shall not permit overtime work or performance of Work on Friday or any legal holiday without written approval from the EMPLOYER'S.
- C. Incompetent or incorrigible employees shall be dismissed from Work by CONTRACTOR or its representative when requested by ENGINEER, and such persons shall not again be permitted to return to Work without written consent of ENGINEER.
- E. Workmanship shall be of best quality.

**1.03 MEETINGS**

- A. REQUIREMENTS INCLUDE
  - 1. ENGINEER will schedule and administer preconstruction meeting, periodic progress meetings, and specially-called meetings throughout progress of Work, and:
    - a. Prepare agenda for meetings.
    - b. Distribute written notice of each meeting in advance of meeting date.
    - c. Make physical arrangements for meetings.

- d. Preside at meetings.
- e. Record minutes; include significant proceedings and decisions.
- f. Reproduce and distribute copies of minutes after each meeting.
  - To participants in meeting.
  - To parties affected by decisions made at meeting.
2. Representatives of CONTRACTORS, and suppliers attending meetings shall be qualified and authorized to act on behalf of entity each represents.

B. RELATED REQUIREMENTS to Tenderers: Pre-Tender Conference.

1.4 PRECONSTRUCTION MEETING

- A. ENGINEER will schedule within 15 days after date of Notice to Proceed.
- B. Location: A central site, convenient for all parties, designated by ENGINEER.
- C. Attendance:
  1. EMPLOYER'S representative.
  2. ENGINEER and its professional consultants.
  3. Resident Project Representative.
  4. CONTRACTOR'S superintendent.
  5. Major Subcontractors.
  6. Major suppliers.
  7. Others as appropriate.
- D. Suggested agenda:
  1. Distribution and discussion of:
    - a. List of major Subcontractors and suppliers.
    - b. Project construction schedules.
  2. Critical work sequencing.
  3. Major equipment deliveries and priorities.
  4. Project coordination and designation of responsible personnel.
  5. Procedures and processing of:
    - a. Field decisions.
    - b. Submittals.
    - c. Change orders.
    - d. Applications for Payment.
  6. Use of premises:
    - a. Office, work, and storage areas.
    - b. EMPLOYER'S requirements.
  7. Construction facilities, controls, and construction aids.
  8. Temporary utilities.
  9. Security procedures.
  10. Housekeeping procedures.

11. Coordination procedures with police department, fire department, hospital/ambulance services, and utility companies.

## 1.2 PROGRESS MEETINGS

- A. ENGINEER will schedule regular periodic meetings, as required.
- B. ENGINEER will hold called meetings as required by progress of Work.
- C. Location of meetings: Project field office of ENGINEER.
- D. Attendance:
  1. EMPLOYER.
  2. ENGINEER, and its professional consultants as needed.
  3. CONTRACTOR and Subcontractors as appropriate to agenda.
  4. Suppliers as appropriate to agenda.
  5. Others.
- E. Suggested agenda:
  1. Review approval of minutes of previous meeting.
  2. Review of Work progress since previous meeting.
  3. Field observations, problems, and conflicts.
  4. Problems, which impede construction, schedule.
  5. Review of off-site fabrication, delivery schedules.
  6. Corrective measures and procedures to regain projected schedule.
  7. Revisions to construction schedule.
  8. Progress, schedule, during succeeding Work period.
  9. Coordination of schedules.
  10. Review submittal schedules; expedite as required.
  11. Maintenance of quality standards.
  12. Pending changes and substitutions.
  13. Review proposed changes for:
    - a. Effect on construction schedule and on completion date.
    - b. Effect on other contracts of Project.
    - c. Other business.

## PART 2 PRODUCTS

NOT USED

## PART 3 EXECUTION

NOT USED

**END OF SECTION**

**SECTION 01330****SUBMITTAL PROCEDURES****PART 1 GENERAL****1.01 REQUIREMENTS INCLUDE**

- A. Promptly after Notice of Award, prepare and submit to ENGINEER estimated construction progress schedules for Work, with subschedules of related activities, which are essential to its progress.
- B. Submit revised progress schedules periodically.

**1.02 FORM OF SCHEDULES**

- A. Prepare schedules in form of horizontal bar chart. CONTRACTOR may propose use of other schedule format.
  - 1. Provide separate horizontal bar for each trade or operation.
  - 2. Horizontal time scale: Identify first work day of each week.
  - 3. Scale and spacing: To allow space for notations and future revisions.
- B. Format of listings: Chronological order of start of each item of Work.
- C. Identification of listings: By major Specification Section numbers.

**1.03 CONTENT OF SCHEDULES**

- A. Construction Progress Schedule show:
  - 1. Complete sequence of construction by activity, with Contract Price breakdown at each stage.
  - 2. Dates for beginning, and completion of, each major element of construction.
  - 3. Projected percentage of completion for each item, as of first day of each month.
- B. Submittal Schedule for Shop Drawings and Samples show:
  - 1. Dates for CONTRACTOR'S submittals.
  - 2. Dates submittals will be required for EMPLOYER-furnished products.
- C. Provide subschedules to define critical portions of prime schedules.

**1.04 PROGRESS REVISIONS**

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
  - 1. Major changes in scope.
  - 2. Activities modified since previous submission.
  - 3. Revised projections of progress and completion.
  - 4. Other identifiable changes.
- C. Provide narrative report as needed to define:

1. Problem areas, anticipated delay, and impact on schedule.
2. Corrective action recommended, and its effect.
3. Effect of changes on schedules of other prime contractors.

#### 1.05 SUBMISSIONS

- A. Submit initial schedules within 15 days after Notice of Award.
  1. ENGINEER will review schedules and return review copy within reasonable time after receipt.
  2. If required, resubmit within 7 days after return of review copy.
- B. Submit revised progress schedules with each Application for Payment.
- C. Submit number of opaque reproductions, which CONTRACTOR requires, plus five copies, which will be retained by ENGINEER.

#### 1.06 DISTRIBUTION

- A. Distribute copies of reviewed schedules to:
  1. Job site file.
  2. Subcontractors.
  3. Other concerned parties.
- B. Instruct recipients to report promptly to CONTRACTOR, in writing, any problems anticipated by projects shown in schedules.

#### 1.07 CASH FLOW CHART

Contractor shall prepare and submit to the Engineer a bar chart showing the estimated cash flow for the entire contract.

#### 1.08 PROCEDURES

- A. Deliver submittals to: Address will be provided after award of contract.
- B. Transmit each item under Shop Drawing Transmittal Form. Identify Project, CONTRACTOR, main supplier; identify pertinent Drawing sheet and detail number, and Specification section number, as appropriate. Identify deviations from Contract Documents. Provide space for CONTRACTOR and ENGINEER review stamps on each item.

#### 1.09 WELDING CERTIFICATES

- A. Promptly after Notice of Award, submit to ENGINEER one copy, unless specified otherwise, for each person, by name, assigned to do field welding of materials installed under this Agreement.
- B. Show on certificates that each person has passed tests specified by AWS.
- C. Submit certificates prior to execution of any welding. Certificates not required for nonstructural tack welding.

### 1.10 FIELD PERFORMANCE TESTS

- A. After system or equipment necessary for operation of Work is in operating condition, CONTRACTOR shall supervise operation of equipment or system for period sufficient to assure proper functioning, and make necessary observations, investigations, and adjustment.
- B. Notify ENGINEER when Work is considered to be complete, in operating condition, and ready for inspection and tests.
- C. ENGINEER will conduct tests it deems necessary to determine if equipment or system functions properly.
- D. If equipment or system fails to function properly, or guaranteed performance is not indicated, CONTRACTOR shall make necessary corrections, including replacement, at no cost to EMPLOYER, and after such corrections are completed, demonstrate to ENGINEER that equipment or system functions properly and guaranteed performance is obtainable.

### 1.11 CERTIFICATES

- A. Where certificates are required by the relevant technical specification section, 4 copies of each certificate under manufacturer's letterhead shall be submitted by the CONTRACTOR.
- B. Certificates shall be clearly identified by serial or reference number where possible to the material being certified and shall include, but not be limited to, providing the following information, CONTRACTOR'S name, project name, name of the item, manufacturer's name, and reference to the appropriate drawing, technical specification section and paragraph number, control register reference all as applicable and required by the relevant quality standard or specification.
- C. Schedule for submittal of certificates shall be as follows:
  - 1. Manufacturer's and supplier's test certificates shall be submitted not less than 45 calendar days prior to the time that the materials represented by such certificates are needed for incorporation into any work. Material represented by such certificates shall not be manufactured, delivered to the site, nor incorporated into any work without any such review.
  - 2. Certificates of tests (certificate of compliance to the specification), carried out during the performance or on completion of parts of the permanent works shall be submitted as soon as the tests have been completed.

### 1.12 Shop Drawings and Samples submittal requirements.

- A. **REQUIREMENTS INCLUDES**  
Submit Shop Drawings and Samples required by Contract Documents.
- B. **RELATED REQUIREMENTS**  
Designate in construction schedule, or in separate coordinated schedule, dates for submission and dates that reviewed Shop Drawings and Samples will be needed. In no case shall a schedule be acceptable that allows less than 20 working days for each review by ENGINEER.

**C. SHOP DRAWINGS**

Shop Drawings shall be presented in clear and thorough manner, complete with respect to dimensions, design criteria, materials of construction, and like information to enable ENGINEER to review information as required. Details shall be identified by reference to sheet and detail. Shop Drawings shall be based on new approved field topographical survey. Shop Drawings shall show clearly existing pipelines, cables, right of ways, take off points, valves, fittings, wadi and road crossings, encasement, etc.

**D. SAMPLES**

Samples shall be identified clearly as to material, manufacturer, any pertinent catalog numbers, and use for which intended, and shall be of sufficient size and quantity to clearly illustrate:

- Functional characteristics of item, with integrally related parts and attachment devices.
- Full range of color, texture, and pattern.
- Compliance sheet with specifications stating clearly any derivations to the Tender Documents.

**E. CONTRACTOR RESPONSIBILITIES**

Review Shop Drawings and Samples prior to submission.

Determine and verify:

- Right of Ways.
- Existing Utilities.
- Take off Points.
- Field measurements.
- Field construction criteria.
- Catalog numbers and similar data.
- Conformance to Specifications.

Coordinate each submittal with other submittals and with requirements of Work and of Contract Documents.

Notify ENGINEER in writing, at time of submission, of any variation in submittals from requirements of Contract Documents. Any such deviations permitted by ENGINEER will require modifications of Contract Documents.

Begin no fabrication or Work, which requires submittals until return of submittals by ENGINEER with ENGINEER stamp, as either "Reviewed" or "Reviewed as Noted." Any related Work performed prior to such return of pertinent submittal will be sole expense and responsibility of CONTRACTOR.

Ship no item requiring shop tests until return of submittals by ENGINEER with ENGINEER stamp, as either "Reviewed" or "Reviewed as Noted."

**F. SUBMISSION REQUIREMENTS**

Make submittals to ENGINEER promptly in accordance with approved schedule and in such sequence as to cause no delay in Work or in work of any other contractor.

Number of Shop Drawing submittals required:

Submit one opaque reproducible copy of each Shop Drawing.

Shop Drawings not larger than 36" x 120", copies of Drawings submitted shall be black line on white background or reproducible mylars.

ENGINEER will photographically reproduce additional copies of Shop Drawings as required for distribution.

ENGINEER will use 35 mm microfilm system in processing Shop Drawings. All Shop Drawings shall be suitable for microfilming. Shop Drawings submitted which are not suitable for microfilming will not be reviewed.

If CONTRACTOR will not grant permission for ENGINEER to reproduce Shop Drawings, CONTRACTOR shall submit 6 copies of each Shop Drawing.

For Shop Drawings larger than 36" x 120", printed catalog information or brochures, or other multiple page documents, submit 6 copies of each Shop Drawing.

Samples: Submit number stated in each Specification section.

Submittals shall contain:

Date of submission and dates of any previous submissions.

Project title and number.

Contract identification.

Names of:

CONTRACTOR.

Supplier.

Manufacturer.

Identification of product, with Specification section number.

Field dimensions, clearly identified as such.

Relation to adjacent or critical features of Work or materials.

Applicable standards, such as ASTM or Federal Specification numbers.

Identification of deviations from Contract Documents.

Identification of revisions on resubmittals.

An 8" x 3" blank space for CONTRACTOR and ENGINEER stamps.

Indication of CONTRACTOR'S approval, initialed or signed, with wording substantially as follows:

"CONTRACTOR represents to EMPLOYER and ENGINEER that CONTRACTOR has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, or assumes full responsibility for doing so and has reviewed or coordinated each Shop Drawing or Sample with requirements of Work and Contract Documents."

If Contract Documents include performance specifications stating required results which can be verified as meeting stipulated criteria, so that further detailed design by CONTRACTOR prior to fabrication is necessary, Shop Drawings must be prepared under seal of professional engineer registered in appropriate jurisdiction and Shop Drawing certification shall contain wording substantially as follows:

*"I hereby certify that this Shop Drawing was prepared by me or under my direct personal supervision or that I have personally reviewed this Shop Drawing which*

*was prepared by others, and I accept responsibility for the adequacy of the document to meet criteria stipulated in the Contract Documents to the same degree that I would if I had prepared it and that I am competent to prepare or review this document."*

Shop Drawing Transmittal Form will be furnished after award of Tender. This form is also available on disk, formatted for WordPerfect 5.1, and for printing on HP LaserJet Series II using Swiss Roman and Dutch Roman fonts, and may be obtained from the ENGINEER. CONTRACTOR shall reproduce any additional copies required and use in accordance with instructions given with Transmittal Form. CONTRACTOR shall submit 2 copies of Transmittal Form for initial submittals and resubmittals.

**G. RESUBMISSION REQUIREMENTS**

Make any corrections or changes in submittals required by ENGINEER and resubmit until stamped as either "Reviewed" or "Reviewed as Noted" by ENGINEER. Indicate any changes which have been made other than those requested by ENGINEER.

**H. DISTRIBUTION**

Distribute reproductions of Shop Drawings which carry ENGINEER stamp as either "Reviewed" or "Reviewed as Noted" to:

- Job site file.
- Record Documents file.
- Other affected contractors.
- Subcontractors.
- Supplier or fabricator.

Distribute Samples which carry ENGINEER stamp as either "Reviewed" or "Reviewed as Noted" as directed by ENGINEER.

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

**END OF SECTION**

## **SECTION 1400**

### **QUALITY REQUIREMENTS**

#### **PART 1 GENERAL**

##### **1.1 QUALITY CONTROL, GENERAL**

- A. Maintain quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. CONTRACTOR shall designate one of its key personnel as Quality Control Supervisor. It shall be the sole duty and responsibility of the Quality Control Supervisor and his staff to organize, coordinate, conduct, and otherwise implement the Quality Control Program as submitted by the CONTRACTOR and acceptable to the ENGINEER. No other duties or responsibilities shall be assigned to the Quality Control Supervisor, or its approval alternate. He shall be on the Work Site at all times while work is in progress. Quality Control Supervisor shall have good command of English Language.
- C. CONTRACTOR shall submit its proposed organization complete with names and positions for acceptance.
- D. The Contractor shall provide at all times a construction force of sufficient size and of a sufficient number of required skills, as approved by the Engineer, to accomplish the work in this contract within the specified time and according to the quality and workmanship indicated herein.

##### **1.2 WORKMANSHIP**

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform Work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

##### **1.3 MANUFACTURERS' INSTRUCTIONS**

- A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from ENGINEER before proceeding.

##### **1.4 MANUFACTURERS' CERTIFICATES**

- A. When required by individual Specifications section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

### 1.5 MANUFACTURERS' FIELD SERVICES

- A. When specified in respective Specification sections, require manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, test, adjust, and balance of equipment as applicable, and to make appropriate recommendations.
- B. Representative shall submit written report to ENGINEER listing observations and recommendations.

### 1.6 TESTING LABORATORY SERVICES

- A. CONTRACTOR shall employ and pay for services of independent testing laboratory to perform inspections, tests, and other services required by various Specification sections.
- B. Services will be performed in accordance with requirements of governing authorities and with specified standards.
- C. CONTRACTOR shall cooperate with testing laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage, and assistance as requested.
  - 1. Notify ENGINEER and testing laboratory 24 hours prior to expected time for operations requiring testing services.
  - 2. Make arrangements with testing laboratory and pay for additional samples and tests for CONTRACTOR'S convenience.
- D. CONTRACTOR shall provide testing services required for his use in monitoring his construction means and methods.
- E. Costs for all other required tests in the Specifications, unless otherwise noted, shall be the responsibility of the Contractor and shall be included as a part of the appropriate unit price in the Bill of Quantities.
- F. When re-tests are required due to failure of a material to comply with quality standards, the cost of such additional testing shall be at Contractor's expense.

### 1.7 SUBMITTALS

- A. Quality Control Program:
  - 1. Within 30 days after Notice to Proceed, CONTRACTOR shall submit a detailed outline of the Quality Control Program proposed. Completed procedures for each element of the outline will be submitted for review and shall be implemented before any new items of work begin.
  - 2. CONTRACTOR shall be responsible both for the quality of all his manufactured and purchased items and for the construction work. As such, 2 basic plans shall be submitted:
    - a. Off-Site: Supplier Quality Control and Inspection Plan which covers all items intended for inspection at the CONTRACTOR'S and/or supplier's plants and

the procedures for carrying out same.

- b. On-Site: On-Site Quality Control and Inspection Plan, which covers all aspects of control, inspection, and testing of field activities and construction works.
3. When CONTRACTOR'S Quality Control Program has been reviewed and agreed upon with the ENGINEER, it shall become a part of the Contract.
- B. Periodic reporting:
1. Daily records of inspection and testing will be prepared and copies submitted as often as directed by ENGINEER. Daily records of inspection and testing shall be used as basis for a Quality Control Weekly Report to be submitted.
  2. Weekly Quality Control Report shall summarize all inspection reports and any Certificates of Non-Compliance issued or remedied that week for the Permanent Works (i.e. Off-Site and On-Site).
  3. On a monthly basis, all test data shall be summarized in tabular and/or graphical form in a manner, which best illustrates the trends, specific results, and specification requirements and shall be submitted to the ENGINEER. Where tests do not meet specification requirements, full explanations shall be provided to show what action was taken (i.e. rejection of the work, retest, etc.). On a monthly basis, and from the inspection and testing reports, the Quality Control Supervisor shall clearly indicate what elements of work are completed and recommended by the CONTRACTOR for acceptance by the ENGINEER.
- C. Inventory records:
1. CONTRACTOR shall keep detailed and up-to-date records of all materials and equipment, which are on order, delivered, found faulty, lost during the work or found to be surplus to requirements.
  2. Summary inventory records shall be submitted to the ENGINEER once a month.
- D. As-Built Drawings:
1. CONTRACTOR shall prepare and furnish to the ENGINEER a complete set of "As-Built" drawings of the constructed works. CONTRACTOR must collect and maintain the necessary data as the work progresses. He shall incorporate this requirement into his Quality Control Program and shall prepare "As-Built" drawings of portions of the works as completed. As-built information shall be submitted to the ENGINEER progressively on a monthly basis, in a format approved by the EMPLOYER and the ENGINEER.
  2. The CONTRACTOR shall submit the As-Built Drawing in hard and soft copies. All as built drawing and final data shall be submitted in ARC/INFO standard export format in the version used at WAJ. The CONTRACTOR shall coordinate with the EMPLOYER/WAJ on the use of such format including symbols used, presentation of data, etc.
  3. Upon completion, the as-built drawings shall show accurately the entire works as and where constructed including all changes and deviations from the Contract Documents. These drawings shall be clearly labeled "As-Built."

4. Information shall include location in plan and elevation of buried utilities, correct installation of piping and equipment, addition of complete electrical information on single line and schematic diagram, and other deviations from the design are to be shown. As a minimum the following information (where applicable) is required on the “As-Built” Drawings:
  - a. Site Plan
  - b. General arrangement of all equipment & pipe works.
  - c. Variations in equipment location & arrangement.
  - d. Details of equipments.

**PART 2      PRODUCTS**

NOT USED

**PART 3      EXECUTION**

NOT USED

**END OF SECTION**

**SECTION 01500**

**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

**1.01 ELECTRICITY, LIGHTING**

- A. CONTRACTOR shall arrange with utility company to provide electrical power supply and temporary lighting as required during construction.
- B. Illumination levels: In accordance with OSHA requirements for construction lighting.
- C. Equipment and materials need not be new.
- D. Temporary wiring shall be sized and fused in accordance with NEC requirements and shall be in conduit.

**1.02 TEMPORARY HEATING AND COOLING**

- A. Provide heating and cooling devices and heat and cool as needed to maintain specified conditions for construction operations.
- B. If Employer will pay cost of energy used, reimburse him for cost of energy used.
- C. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.
- D. Maintain minimum ambient temperature of 10 degrees C in areas where construction is in progress, unless indicated otherwise in specifications.

**1.03 TEMPORARY VENTILATION**

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

**1.04 TELEPHONE SERVICE**

- A. Make necessary arrangements and pay all installation charges for telephone lines in its offices at the site.
- B. Provide separate telephone line and all telephone instruments in ENGINEER'S office. The Contractor shall pay the cost of installation and monthly bills.
- C. The Contractor shall provide a cellular telephone for the sole use of the Supervising Engineer and shall pay all the charges except the cost for international calls.

### 1.05 WATER

- A. Provide and pay for water required for and in connection with the Work to be performed, and for any specified test of piping, equipment, devices, etc., for any other use as may be required for proper completion of the Work. No separate payment for water used or required for testing will be made and all costs in connection therewith shall be included in the Tender.
- B. Furnish necessary pipe, hose, nozzles, and tools and perform necessary labor.

### 1.06 SANITARY FACILITIES

- A. Provide temporary sanitary facilities for the needs of all construction workers and others performing work or furnishing services on the Project.
- B. Sanitary facilities shall be of reasonable capacity, properly cleaned and maintained daily throughout the construction period.
- C. Obscure from public view to greatest extent practicable. If toilets of the chemically treated type are used, at least one toilet shall be furnished for each 20 persons.

### 1.07 BARRIERS

- A. Provide as required to prevent public entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barriers around trees and plants designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

### 1.08 SECURITY

- A. Provide security program and facilities to protect Work, existing facilities, and EMPLOYER'S operations from unauthorized entry, vandalism, and theft. Coordinate with EMPLOYER'S security program.
- B. Provide the necessary security protection of all materials and equipment delivered to the Site, installed, or to be installed as a part of the Temporary Works or Permanent Works.
- C. Provide for the necessary security at all times and be responsible for providing protection to the Construction Plant, the Temporary Works and Permanent Works, until issuance of the "Certificate of Completion" of the Works.

### 1.09 SAFETY

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Works. In that regard, Contractor shall appoint one of its permanent field staff whose responsibility shall be promoting safe working procedures and to comply with all applicable laws, ordinances, and regulations of any authority having jurisdiction.
- B. Contractor shall erect and maintain, as conditions require all reasonable safeguards for safety and protection, including but not limited to, posting of danger signs, barricades,

shores, and other protection against hazard. Contractor's activities involving crossing or entering public highways shall be accompanied by appropriate lighting, signage, and flagmen.

#### 1.10 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide and operate pumping equipment.

#### 1.11 CLEANING DURING CONSTRUCTION

- A. Control accumulation of waste materials and rubbish; periodically dispose of off-site.

#### 1.12 PROJECT IDENTIFICATION

- A. Provide 4 identical 2.5 m x 1.8 m Project identification sign of wood frame and exterior grade plywood construction, painted, with exhibit lettering by professional sign painter, to ENGINEER'S design and colors. List title of Project, names of EMPLOYER, ENGINEER, and CONTRACTOR.
- B. Signs shall be in both the Arabic and English languages, with the Arabic text taking precedence above or to the right of the English text. English lettering for primary wording shall be provided in upper case (capitals) with sizes as approved by the ENGINEER. Style of secondary wording in ENGLISH and the style of all Arabic lettering shall be approved by the ENGINEER.
- C. Erect on site at locations established by ENGINEER.
- D. Allow no other signs to be displayed.
- E. Paint: all surfaces shall receive prime coat plus background coat of white gloss exterior enamel. Lettering to be black and blue gloss exterior enflame.
- F. Lettering: both Arabic and English; exact final sign lettering to be provided to the Contractor by the Employer at the Preconstruction Conference.
- G. Maintain and repaint as directed by Engineer during the course of the execution of the Works.
- H. Dismantling: all signs required in this Section shall be dismantled, removed and disposed of by the Contractor prior to the Engineer's signing and delivery to the Employer of the Certificate of Maintenance.

#### 1.13 REMOVAL

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of 0.5 m; grade site as indicated.
- C. Restore existing facilities used during construction to specified, or to original, condition.

#### 1.14 FIELD OFFICES AND SHEDS

- A. Office: Weather tight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture as indicated by the Engineer. Office area shall not be less than 200 m<sup>2</sup> and as shown in (APPENDIX A).
- B. Employ boy-office to keep the office clean and to serve the kitchen.

#### 1.15 ACCESS ROADS

- A. Construct and maintain temporary roads (If needed) accessing public thoroughfares to serve construction area.
- B. Designated and existing on-site roads may be used for construction traffic only with permission of authorities.

#### 1.16 PARKING

- A. Arrange for temporary parking areas to accommodate construction personnel.

#### 1.17 ENCLOSURES

- A. Provide temporary partitions to separate work areas from Employer occupied areas, to prevent penetration of dust and moisture into Employer occupied areas, and to prevent damage to existing materials and equipment.
- B. Paint surfaces exposed to view from Employer occupied areas.

#### 1.18 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Prohibit traffic or storage upon waterproofed or roofed surfaces.

### **PART 2 PRODUCTS**

NOT USED

### **PART 3 EXECUTION**

NOT USED

**END OF SECTION**

**SECTION 01600**

**PRODUCT REQUIREMENT**

**PART 1 GENERAL**

**1.01 PRODUCTS**

- A. Products include material, equipment, and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.

**1.02 TRANSPORTATION AND HANDLING**

- A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

**1.03 STORAGE AND PROTECTION**

- A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- C. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.

**1.04 PRODUCT OPTIONS**

- A. Products specified by reference standards or by description only: Any product meeting those standards.

- B. Products specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not specifically named.
- C. Products specified by naming only one manufacturer: No options, no substitutions allowed.

#### 1.05 PRODUCTS LIST

- A. Within 30 days after effective date of Agreement, submit to ENGINEER five copies of complete list of major products, which are proposed for installation.
- B. Tabulate products by Specification section number and title.
- C. For products specified only by reference standards, list for each such product:
  - 1. Name and address of manufacturer.
  - 2. Trade name.
  - 3. Model or catalog designation.
  - 4. Manufacturer's data:
    - a. Reference standards.
    - b. Descriptive literature.

#### 1.06 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standard, select product meeting that standard, by any manufacturer.
- B. For products specified by naming several products or manufacturers, select any one of products and manufacturers named which complies with Specifications.
- C. For products specified by naming one or more products or manufacturers and stating "or equal," submit request as for substitutions for any product or manufacturer which is not specifically named.
- D. Whenever Specifications call for item by manufacturer's name and type and additional features of item are specifically required by Specifications, additional features specified shall be provided whether or not they are normally included in standard manufacturer's item listed.

#### 1.07 SUBSTITUTIONS

- A. For period of 30 days after effective date of Agreement, ENGINEER will consider formal requests from CONTRACTOR for substitution of products in place of those specified. After end of that period, requests will be considered only in case of product unavailability or other conditions beyond control of CONTRACTOR.
- B. Submit separate request for each substitution. Support each request with:
  - 1. Complete data substantiating compliance of proposed substitutions with requirements stated in Contract Documents.
    - a. Product identification, including manufacturer's name and address.

- b. Manufacturer's literature; identify:
    - 1 Product description.
    - 2 Reference standards.
    - 3 Performance and test data.
  - c. Samples, as applicable.
  - d. Name and address of similar projects on which product has been used, and dates of each installation.
2. Itemized comparison of proposed substitution with product specified; list significant variations.
  3. Data relating to changes in construction schedule.
  4. Any effect of substitution on separate contracts.
  5. List of changes required in other work or products.
  6. Accurate cost data comparing proposed substitution with product specified. Amount of any net change to Contract Price.
  7. Designation of required license fees or royalties.
  8. Designation of availability of maintenance services, sources, or replacement materials.
- C. Substitutions will not be considered for acceptance when:
1. They are indicated or implied on Shop Drawings.
  2. They are requested directly by Subcontractor or supplier.
  3. Acceptance will require substantial revision of Contract Documents.
- D. Substitute products shall not be ordered or installed without written notification from ENGINEER of acceptance.
- E. ENGINEER will determine acceptability of proposed substitutions.

#### 1.08 CONTRACTOR'S REPRESENTATION

- A. In making formal request for substitution CONTRACTOR represents that:
1. It has investigated proposed product and has determined that it is equal to or superior in all respects to that specified.
  2. It will provide same warranties or Bonds for substitution as for product specified or as required by EMPLOYER.
  3. It will coordinate installation of accepted substitution into Work, and will make such changes as may be required for Work to be complete in all respects.
  4. It waives claims for additional costs caused by substitution which may subsequently become apparent.
  5. Cost data is complete and includes related costs under its Agreement, but not:
    - a. Costs under separate contracts.
    - b. ENGINEER'S costs for redesign or revision of Contract Documents.
  6. It will reimburse EMPLOYER for charges of ENGINEER or ENGINEER'S consultants for evaluating any proposed substitute, whether proposed substitute is accepted or rejected.

#### 1.09 ENGINEER DUTIES

- A. Review CONTRACTOR'S requests for substitution with reasonable promptness.
- B. Notify CONTRACTOR in writing of ENGINEER'S decision to accept or reject requested substitution.

### 1.10 MATERIAL SUPPLIES AND DISPOSAL

- A. Contractor shall be responsible for locating, establishing, and maintaining uninterrupted during the course of the Works all the necessary supply of construction materials including, but not limited to, the following:
  - 1. Bedding material.
  - 2. Backfill material.
  - 3. Concrete.
- B. Contractor shall be responsible for locating, as approved by the Engineer, establishing and maintaining all disposal areas necessary for the proper disposal of waste materials including, but not limited to, the following:
  - 1. Construction debris.
  - 2. Excess excavated material.
  - 3. Demolition debris.
- C. Contractor shall provide all necessary transport of materials to and from material supply and disposal areas.

#### **PRODUCTS**

NOT USED

#### **EXECUTION**

NOT USED

**END OF SECTION**

**SECTION 1700****EXECUTION REQUIREMENTS****PART 1 GENERAL****1.1 CLOSEOUT PROCEDURES**

- A. When CONTRACTOR considers Work has reached final completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for ENGINEER'S inspection.
- B. In addition to submittals required by conditions of Agreement, provide submittals required by governing authorities, and submit final statement of accounting giving total adjusted Contract Price, previous payments, and sum remaining due.
- C. ENGINEER will issue final change order reflecting approved adjustments to contract Price not previously made by Change Order.

**1.2 FINAL CLEANING**

- A. Execute prior to final inspection.
- B. Clean site; sweep paved areas, rake clean other surfaces.
- C. Remove waste and surplus materials, rubbish, and construction facilities from Project and from site.

**1.3 PROJECT RECORD DOCUMENTS**

- A. Maintain documents in clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- B. Make documents and Samples available at all times for reference by ENGINEER.
- C. Recording:
  - 1. Label each document "PROJECT RECORD" in neat large printed letters.
  - 2. Record information concurrently with construction progress. Do not conceal any Work until required information is recorded.
  - 3. Drawings shall be legibly marked to record actual construction:
    - a Horizontal and vertical locations.
    - b Field changes of dimension and detail.
    - c Changes made by Instruction to CONTRACTOR or by Change Order.
    - d Details not on original contract Drawings.
  - 4. Specifications and Addenda shall be legibly marked to record:
    - a Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
    - b Changes made by Instruction to CONTRACTOR or by Change Order.
- D. Submittal:

1. At Contract closeout, deliver record documents to ENGINEER for EMPLOYER.
  2. Accompany submittal with transmittal letter in duplicate, containing:
    - a Date.
    - b Project title and number.
    - c CONTRACTOR'S name and address.
    - d Title and number of each record document.
    - e Signature of CONTRACTOR or its authorized representative.
- E. Other documents, which will serve as a permanent record of the Works, shall be provided either by the Contractor or to the Contractor by the appropriate independent firm or agency for submittal to the Employer. These documents will include all requirement certification and test reports.

#### 1.4 WARRANTIES AND BONDS

- A. Provide duplicate, notarized copies. Execute CONTRACTOR'S submittals and assemble documents executed by Subcontractors, suppliers, and manufacturers.
- B. Submit material prior to final application for payment.
  1. For equipment put into use with EMPLOYER'S permission during construction, submit within 10 days after first operation.
  2. For items of Work delayed materially beyond date of Substantial completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

#### 1.5 REQUIREMENTS INCLUDE

- A. Compile product data and related information appropriate for OWNER'S maintenance and operation of products furnished under Agreement.
- B. Prepare operating and maintenance data as specified in this section and as referenced in other pertinent sections of Specifications.

#### 1.6 QUALITY ASSURANCE

- A. Preparation of data shall be done by personnel:
  1. Trained and experienced in maintenance and operation of described products.
  2. Familiar with requirements of this section.
  3. Skilled as technical writers to extent required communicating essential data.
  4. Skilled as draftsmen competent to prepare required drawings.

#### 1.7 FORM OF SUBMITTALS

- A. Prepare data in form of an instructional manual for use by EMPLOYER'S personnel.
- B. Format:
  1. Paper: 20 lb minimum, white, for typed pages.
  2. Text: Manufacturer's printed data, or neatly typewritten.
  3. Drawings:
    - Provide reinforced punched binder tab, bind in with text.
    - Fold larger drawings to size of text pages.
  4. Provide flyleaf for each separate product, or each piece of operating equipment.
    - a Provide typed description of product, and major component parts of equipment.
    - b Provide indexed tabs.

5. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS." List:
  - a Title of Project.
  - b Identities of separate structure or plant as applicable.
  - c Identity of general subject matter covered in manual.
6. Binders:
  - a Commercial quality 3-ring binders with durable and cleanable plastic covers.
  - b When multiple binders are used, correlate data into related consistent groupings.

## 1.8 CONTENT OF MANUAL

- A. Neatly typewritten table of contents for each volume, arranged in systematic order.
  1. CONTRACTOR, name of responsible principal, addresses, and telephone number.
  2. List of each product required to be included, indexed to content of volume.
  3. List, with each product, name, address, and telephone number of:
    - a Subcontractor or installer.
    - b Maintenance contractor, as appropriate.
    - c Identify area of responsibility of each.
    - d Local source of supply for parts and replacement and list of recommended spare parts.
  4. Identify each product by product name and other identifying symbols as set forth in Contract Documents, including nameplate information and shop order numbers for each item of equipment furnished.
- B. Product data:
  1. Include only those sheets, which are pertinent to specific product.
  2. Annotate each sheet to:
    - a Clearly identify specific product or part installed.
    - b Clearly identify data applicable to installation.
    - c Delete references to inapplicable information.
- C. Drawings:
  1. Supplement product data with Drawings as necessary to clearly illustrate:
    - a Relations of component parts of equipment and systems.
    - b Control and flow diagrams.
  2. Coordinate Drawings with information in Project record documents to assure correct illustration of completed installation.
  3. Do not use Project record documents as maintenance Drawings.
- D. Written text, as required to supplement product data for particular installation.
  1. Organize in consistent format under separate headings for different procedures.
  2. Provide logical sequence of instructions for each procedure.
- E. Copy of each warranty, Bond, and service contract issued.
  1. Provide information sheet for EMPLOYER'S personnel, giving:
    - a Proper procedures in event of failure.
    - b Instances which might affect validity of warranties or Bonds.

## 1.9 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit 5 copies of complete manual in final form.
- B. Contents, for each unit of equipment and system, as appropriate:
  1. Description of unit and component parts:

- a Function, normal operating characteristics, and limiting conditions.
  - b Performance curves, engineering data, and tests.
  - c Complete nomenclature and commercial number of replaceable parts.
  2. Operating procedures:
    - a Startup, break-in, routine, and normal operating instructions.
    - b Regulation, control, stopping, shutdown, and emergency instructions.
    - c Summer and winter operating instructions.
    - d Special operating instructions.
  3. Maintenance procedures:
    - a Routine operations.
    - b Guide to "trouble-shooting."
    - c Disassembly, repairs, and reassembles.
    - d Alignment, adjusting, and checking.
  4. Servicing and lubrication schedule: List of lubricants required.
  5. Manufacturer's printed operating and maintenance instructions.
  6. Description of sequence of operation by control manufacturer.
  7. Original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
    - a Predicted life of parts subject to wear.
    - b Items recommended to be stocked as spare parts.
  8. As-installed control diagrams by controls manufacturer.
  9. Each contractor's coordination Drawings. As-installed color-coded piping diagrams.
  10. Chart of valve tag numbers, with location and function of each valve.
  11. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
  12. Other data as required under pertinent sections of Specifications.
- C. Content, for each electrical and electronic system, as appropriate.
1. Description of system and component parts:
    - a Function, normal operating characteristics, and limiting conditions.
    - b Performance curves, engineering data, and tests.
    - c Complete nomenclature and commercial number of replacement parts.
  2. Circuit directories of panel boards:
    - a Electrical service.
    - b Controls.
    - c Communications.
  3. As-installed color-coded wiring diagrams.
  4. Operating procedures:
    - a Routine and normal operating instructions.
    - b Sequences required.
    - c Special operating instructions.
  5. Maintenance procedures:
    - a Routine operations.
    - b Guide to "trouble-shooting."
    - c Disassembly, repair, and assembly.
    - d Adjustment and checking.
  6. Manufacturer's printed operating and maintenance instructions.
  7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
  8. Other data as required under pertinent sections of Specifications.
- D. Prepare and include additional data when need for such data becomes apparent during instruction of EMPLOYER'S personnel.
- E. Additional requirements for operating and maintenance data: Respective sections of

Specifications.

- F. Provide complete information for products specified in Division 11.

#### 1.10 SUBMITTAL SCHEDULE

- A. Submit two copies of preliminary draft of proposed formats and outlines of contents prior to start of Work. ENGINEER will review draft and return one copy with comments.
- B. Submit one copy of completed data in review form at least 30 days prior to final inspection or acceptance. Copy will be returned after review, with comments.
- C. Submit specified number of copies of approved data in final operating and maintenance manual format prior to 10 days after final inspection or acceptance.

#### 1.11 INSTRUCTION OF EMPLOYER'S PERSONNEL

- A. Fully instruct EMPLOYER'S designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment and systems.
- B. Manual for equipment and systems shall constitute basis of instruction. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

#### 1.12 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Selection of spare parts and maintenance materials will be by Employer form parts and material lists furnished by Contractor.
- B. Parts and material lists shall be based on recommendation of equipment manufacturer.
- C. Spare parts and maintenance materials shall be paid for from the provisional sum.
- D. Furnish parts and material lists to Employer not later than 6 months before projected date of operational tests.

#### 1.13 SPECIAL TOOLS AND DEVICES

The Contractor shall provide all special tools and other maintenance devices required for equipment supplied under this Contract.

#### **PART 2 PRODUCTS**

NOT USED

#### **PART 3 EXECUTION**

NOT USED

**END OF SECTION**