



## **FUNDING FACILITY FOR EXPANDED STABILIZATION**

### **RECONSTRUCTION AND REHABILITATION OF JAPANESE BRIDGE IN ANBAR GOVERNORATE, IRAQ**

#### **Section 3**

#### **Schedule of Requirements and Technical Specifications**

- Part 1 - Scope of Works**
- Part 2 - General Requirements**
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- Part 5 - UNDP General Technical Specifications for Building Construction Works**
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## **1 PART 1: - SCOPE OF WORKS**

### **1.1 BACKGROUND**

The UN Development Programme (UNDP) is working closely with authorities to support displaced people who are returning to liberated areas to rebuild their lives after the liberation from ISIL forces.

Conflict The invasion of ISIS in 2014 has led to a huge displacement of Iraqis. More than 3 million Internally Displaced People (IDPs) was the estimation before the Liberation Processes started. Big progress has been made by Iraqi Security Forces and International Coalition Forces in their efforts to support the Government of Iraq. In recognition of the need for immediate response to assist the people of the liberated cities in this critical period, the Iraqi Government, with the support of the International Coalition Partners, has started planning for bringing back stabilization to the newly liberated accessible areas to make it possible for the displaced population to leave the IDPs camps and return to their homes.

Recently, there have been an increasing number of reports of IDP returns to Mosul (one of the liberated areas). The Prime Minister office has approached the UNDP for both Humanitarian and Stabilization support. UNDP has communicated the need for Humanitarian action to responsible parties and a Rapid Response has subsequently been kick started.

As part of the international support to the Iraqi government, UNDP supported conducting the rapid assessment of damages and facilitating the immediate response to meet the prioritized needs as soon as possible for the newly liberated areas under the leadership of local authorities.

Therefore, UNDP is supporting Government efforts to rapidly upgrade areas newly liberated from ISIL and help to prepare for the safe and voluntary return of displaced populations through a Funding Facility for Immediate Stabilization (FFIS). The FFIS includes four components; Public Works and Light Infrastructure Rehabilitation, Livelihoods, Capacity Support for local governments, Community Reconciliation.

Most of the areas that were previously under the occupation of ISIS are badly damaged and all the infrastructure including the Government buildings, schools, electricity and water networks, roads and bridges were severely damaged by them. Now the Government has requested UNDP to provide support in rehabilitation work enabling the local communities to return to their homes. One of the basic requirements of the local communities in the newly liberated areas is the rehabilitation and constructions of bridges to be safe and ideal to achieve the goal of its establishment. Majority of the bridges in Anbar governorate and the newly liberated areas were destroyed partially or completely during the ISIS invasion. The Command Center of Anbar therefore has requested UNDP to provide support in the rehabilitation/reconstruction of the Japanese Bridge in Anbar.

Within this context, UNDP seeks the engagement of the services of reputable and experienced professional engineering entities (contractors) for the rehabilitation and reconstruction of Japanese Bridge. The present TOR details the professional engineering services required for the elaboration of this assignment.

### **1.2 PROJECT AREA**

The Japanese Bridge is a very important part of Expressway No.1 and it is crossed Al Tharthar water canal at station 54+000 km which located in Anbar governorate.



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### **1.3 PROJECT BENEFICIARIES**

The Government and people of Iraq to stabilize areas newly liberated from the Islamic State in Iraq and Levant (ISIL). The main beneficiaries of this project will be the people in Anbar governorate and the surrounding neighborhoods inclusive all the people crossing the Expressway No.1.

### **1.4 OBJECTIVES AND ENVISGED OUTCOMES**

UNDP project's primary envisaged outcome is to assist the Government and people of Iraq to stabilize areas newly liberated from the Islamic State in Iraq and Levant (ISIL) to implement rehabilitation and reconstruction works for Japanese Bridge in Anbar governorate. The planned Bridge will provide a long-term solution to the traffic for the served areas. The rehabilitation and reconstruction of the Bridge includes the entire necessary infrastructure (civil works & electrical works) that provide operational efficiency and ensure sustainability with all required safety requirements.

### **1.5 WORKS TO BE PROVIDED BY THE CONTRACTOR**

#### **1.5.1 Nature of Contract**

This contract includes supply, delivery, installation, testing and commissioning of civil, electrical, mechanical, etc., materials and equipment and appropriate training for the "Works" detailed in this Scope of Works, the attached Technical Specifications and Price Schedule/Bill of Quantities.

#### **1.5.2 Description of Works**

The Government of Iraq constructed a major arterial expressway to connect various parts of Iraq in compliance with the large scale development, therefore taking place in the entire country, and to provide a main link between the Arab World and the Middle East countries. And it's one of the major development projects.

The consulting firm of Dorsch Consult (Ingenieurgesellschaft mbH) in association with Al-Khazen Consulting Engineers, has been chosen as Consultants for the design of the Expressway No. one on the 1975.

Expressway No.1 is served transport goods and persons from/to both destinations among southern and middle and west settlements in Iraq and all other cities bypass and Iraqi borders towards Kuwait, Jordan and Syria as well. It is designed and constructed in well standards, capacity and speed capacity to facilitate the transport and save the time of trips.

It is divided into two parts:

- The first part, which is about 583 km long, will lead from Baghdad to Safwan (Iraqi-Kuwait Borders).
- The second part is about 616 km long and will lead from Baghdad to the Syrian and Jordanian borders.

And the second part becomes out of service due to damage of almost bridges, underpasses, overpasses, box culverts and pipe culverts within the route after the terrorist bombed them.

It was designed to carry loadings in accordance with International and Iraq standard loading and the maximum axle load for road design is 16300 kg.





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The total length of the recent bridge is about 230m and it consists of two parallel separate bridges of 18.75m cross section for each and 6.5m distance in between of them. The northern part operated for transport from Baghdad to Rutba (Iraqi-Jordanian Borders) and the southern part operated in opposite direction from Rutba to Baghdad.

The scope of the required works can be summarized but without being limited to the following:

- Surveying works;
- Structural works;
- Asphaltic works;
- Storm water works.

The works including supply, install all the required materials and equipment, testing & commissioning and training of all related equipment and as detailed in the Price Schedule/Bills of Quantities and Technical Specifications and all other ancillary work required to complete the entire scope of works completely and in accordance with the instructions of the supervision engineer.

The Works includes provision of required manpower, machinery and materials for the works as described hereunder and under the Technical Specifications, Price Schedule/Bills of Quantities and Drawings.

### **1.5.3 Transportation of Materials**

Transportation of materials shall be contractor's responsibility.

### **1.5.4 Test and Commissioning**

The scope of work includes testing and commissioning of all the equipment installed by the contractor.

## **1.6 CONTRACT DURATION**

All works shall be completed within seven (7) calendar months of contract award.

## **1.7 MATERIALS TO BE PROVIDED**

### **1.7.1 Materials to be provided by the Contractor**

The contractor shall be required to provide all equipment and materials as listed under the Bills of Quantities and Specifications" in accordance with the specifications provided to achieve the scope of work completely and in accordance with the instructions of the supervision engineer.

### **1.7.2 Materials to be Provided by UNDP**

No materials will be supplied by UNDP.

## **1.8 FACILITIES TO BE PROVIDED**

### **1.8.1 Facilities Provided by UNDP**

No site facilities shall be provided by UNDP.



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### **1.8.2 Facilities Provided by the Contractor**

All required facilities for proper development of all phases of the project shall be the contractor's own responsibility. Unless otherwise explicitly called upon, any facilities shall be deemed included and/or surcharged in/to the contractor's price.

## **1.9 SECURITY AT WORK**

It is the contractor's responsibility to secure the Works against vandalism and interference during construction all the time till handing over the works officially.

## **1.10 GENERAL RESPONSIBILITIES / REQUIREMENTS**

The Services shall also include some duties normally performed by UNDP field staff, which includes the establishment and maintenance of contacts with counterparts and other stakeholders.

These shall include, yet not be limited to, liaising and maintaining strong working relations with all stakeholders and obtain all required letters, approvals, documentation...etc.

### **1.10.1 Reporting**

One of UNDP's management tools is through comprehensive progress reports supported by photographs, videos and similar materials from its implementation partners. The same also applies for illustrating project impacts.

### **1.10.2 Contents of Report**

During implementation the contractor shall provide UNDP with daily, weekly and monthly progress reports including yet not limited to:

- Meetings held with counterparts, contractors .....etc.
- Progress reporting, delays....etc.
- Staff employed by contractor, sub-contractors, counterparts.
- Financial status, predicted cash flow, expected variations.
- Technical Issues.

However, UNDP will supply the contractor with the format of the progress report.

### **1.10.3 Photography & Video Material**

The contractor shall provide adequate photographs and video materials as an integral part of any submitted report with the purpose of illustrating progress, impact, elements requiring particular attention and so forth. Photographs and videos shall also be captured and submitted as frequent as requested by UNDP.

While in certain instances the photographs/videos shall be required to portray the status of technical elements, which necessitates that these be of technical nature portraying an engineering view of the photographed element (i.e. defective bearing, leaking pipeline, broken cable, defective concrete, etc.), in other instances the photographs/videos are rather required for general illustrative purposes and should convey a general inclusive overview for non-engineering purposes. It should be noted that these should have an artistic essence to them.



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The contractor is alerted to the particular requirements for non-engineering purposes photography/videos, which are required to achieve several purposes including yet not limited to: Conveying the overall extent and magnitude of the intervention.

- Conveying the overall intervention nature.
- Conveying a broad overview of the overall intervention.
- Conveying the pre-intervention conditions (i.e. impact of not having the intervention in place such as streets flooded with wastewater, child without access to water and the like).

Conveying the post-intervention conditions (i.e. impact of having the intervention in place such as dry and clean streets, child with access to water and the like), which are generally used to assess the intervention impact.

Although many professionals have adequate capacity to capture photographs and videos, the contractor shall ensure a professional photographer/cameraman is appointed for this particular purpose that has adequate capacity to capture technical and non-technical photographs with the required artistic essence.

Photographs and videos must be accompanied by basic caption information linked to each image file name identifying the date, location, subject and (if relevant) UNDP activity. The name and contact of the staff photographer should also be provided for follow-up queries.

The contractors cost shall be deemed included and/or surcharged in/to the rates for each activity.

#### **1.10.4 Close Out Report**

Upon completion of all activities of the project the contractor shall submit a collective Close-Out

Report which reflects all aspects encountered during implementation inclusive of all original documentation, photographs...etc. The report shall first be submitted in a draft form to UNDP. The contractor shall do a report presentation during which UNDP shall present and discuss their comments and remarks.

The report shall then be presented in its final form following incorporation of all UNDP comments and remarks.

The contractor shall, at least, submit two (2) hard copies to UNDP (1) soft copy to UNDP.

#### **1.10.5 Translation of Documents**

The contractor shall not convey any Arabic language correspondences to UNDP all official correspondences with the counterparts and other relevant material shall be translated to the English language by a certified translator. The contractor shall always submit the Arabic version together with the translated version including due stamping and sealing of the translated version with sufficient proof that the utilized translator is certified the Government.

The contractors cost shall be deemed included and/or surcharged in/to the rates for each activity.

#### **1.10.6 Project Specific Support Services**

The support services may include fees for payments settled by the contractor on behalf of UNDP for the ongoing activities under the contract. Such as, but not limited to, payments for placing advertisements, printing services, renting site equipment, technical team resources support and so forth. The payment shall be settled based on clear instructions from UNDP after



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at least three quotations are collected and submitted by the contractor to UNDP and the lowest responsive quoted price is approved by UNDP.

UNDP, upon the requirement, shall instruct the contractor to perform the above mentioned services by collecting a minimum of three simple quotations for each type of services.

### **1.11 DRAWINGS**

The attached drawings are to be read together with the Scope of Works, Technical Specifications and the Price Schedule/Bills of Quantities.

## **PART END**

## **2 PART 2: - GENERAL REQUIREMENTS**

### **2.1 SITE OFFICES**

Within one (1) week of the “Commencement Date”, the contractor shall establish a temporary site office which shall include offices for UNDP's as per the description (but not limited to) in clause 23 (Preliminary and General Works).

### **2.2 SERVICES**

The Contractor shall be responsible for the provision of services such as electricity, water, sewerage, telecommunications and roads and other facilities required to execute works.

### **2.3 SAMPLES, TESTING, INSPECTION & WELDING**

Cost of all samples and all laboratory testing in accordance with the instructions of the supervision engineer shall be borne by the Contractor and deemed to be included in the Contract price.

All welding works must be inspected by the supervision engineer and all required tests must be applied according to the latest Iraqi and international standards. All welding works must be done by certified welders whom have certificates in welding as per the international standards.

### **2.4 CONCRETE**

The contractor must supply ready mix concrete for all types of concrete works to achieve the scope of work without any additional cost and as per the instructions of the supervision engineer.

### **2.5 WORKING PRACTICES**

The contractor shall at all times comply with the restrictions and conditions stipulated by the responsible authorities. Before any work is undertaken, the contractor shall give due notice to the engineer and all utilities where services may be in conflict with the works.

The contractor shall provide and erect work signs, bollards, lighting, safety barriers, and such like where necessary or required to ensure safety of the public and workers.

All care shall be taken to minimize damage to property in the execution of these works, by means of route planning, design, and prior consultation with owners, occupiers, and responsible



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authorities. It shall be the contractor's responsibility to make good any damage, which is caused, to lands, crops, trees, walls, fences, gates, drains, pipelines, buildings, roads, or other property, caused directly or indirectly by the execution of the works.

## **2.6 HEALTH, SAFETY & ENVIROMENTAL (HS&E) REQUIREMENTS**

### **2.6.1 General**

The Contractor throughout the execution and completion of the works shall fully comply with international recognized safety regulations specified under the Technical Specifications i.e.:

- Take care for the safety of all persons engaged at site works,
- Use reasonable efforts to keep the site and works clear of unnecessary obstruction so as to avoid danger to these persons,
- Provide and maintain electrical materials, diesel generators, guarding and watching of the works until completion and taking over of the works,
- Take all reasonable steps to protect the environment on and off site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other cause arising as a consequence of his method of operation.
- Provide to all site workers personal protective equipment, safety clothes, equipment, materials, etc., to perform ongoing activity such as portable earths, safety helmets, working and insulated gloves and safety shoes.

## **2.7 SITE SURVEY**

Bidders shall be deemed to have inspected and examined the site and its surroundings, and to have satisfied themselves with site conditions before submitting the Bid.

## **2.8 SITE PREPARATION**

The Contractor shall be responsible for all site preparation works.

## **2.9 MEASUREMENT OF QUANTITIES**

UNDP reserves right to increase, decrease quantities or cancel any items in the bill of quantities as per actual requirements.

Bidders shall familiarize themselves with the conditions on site and actual quantities required as the prices submitted in the bid shall be inclusive of everything required for successful completion of the project.

## **2.10 TRANSPORTATION OF MATERIALS**

The Contractor shall be responsible for transport of all equipment to the site including loading, off-loading, etc. and all costs and expenses involved in transport from the warehouse storage works to the sites.

The Contractor's responsibility shall also include the construction of an adequate access way, if necessary, for construction and delivery of plant from the public highway to each site.

The Contractor shall ensure that damage to any public or private roads or footpaths used by any vehicles or plant proceeding to or from the site kept to a minimum and shall be responsible for



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the cost of all repairs necessary to restore such roads or footpaths at least to the condition previously obtaining.

## **2.11 REDUNDANT EQUIPMENT**

Redundant equipment as identified by the Engineer shall be carefully removed and delivered to the warehouse as indicated by the Engineer.

The contractor shall keep inventory of the quantities and obtain signature of acceptance from the applicable authority.

## **2.12 PROGRAMME FOR THE WORKS**

The Contractor shall within one (1) week of the “Commencement Date” submit a time-scaled linked bar chart in “Microsoft Projects” for approval by the UNDP.

The program shall identify all key activities required to complete the works, show intermediate milestones for the purpose of assessing progress on the works and the proposed timing for all Contract deliverable’s including documentation.

This program shall be maintained by the Contractor throughout the project and shall only be varied with the approval of the Engineer.

## **2.13 STANDARDIZATION OF CONSTRUCTION WORKS**

The works shall be of similar construction to those existing, in order to aid standardization and simplify stock holding and material rationalization.

All or part of such works and variations to this specification may be required due to particular project requirements and the following shall, therefore, be governed by the project requirements as described hereafter.

## **2.14 STANDARDS**

The equipment and works shall be designed and executed in accordance with specified requirements and in accordance with the latest versions of the standards given in the specifications or other recognized engineering standards and codes of practice approved by the UNDP. The Contractor shall investigate the existence of any regulations and local by-laws governing the proposed works and shall fully comply with relevant requirements therein.

The following quality and shipping standards should be complied with in design, manufacture, and testing for all equipment and materials supplied by the contractor.

## **2.15 CONSTRUCTION AND MANUFACTURING STANDARDS**

All works, activities, equipment and materials of any type shall be strictly in accordance with the latest technical standards & specifications of the following which serialized according to the following priorities:

- All materials, equipment, construction activities and all works of any type to be implemented under this contract shall fully comply with the “Technical Standards & Technical Specifications” mentioned in the Technical Specifications (section 3, part 4), Drawings (section 3, part 6) and the Bill of Quantities (section 7).



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- All materials, equipment, construction activities and all works of any type to be implemented under this contract shall fully comply with the latest “Technical Standards & Technical Specifications” published by Government of Iraq and applied in Iraq.
- UNDP General Technical Specifications for Building Construction Works”. (Copy is available upon request).
- British Standard (BS), European Standards (EN) and American Society for Testing and Materials (ASTM).
- International Electro technical Commission (IEC).
- Standards (ANSI), Electromagnetic Compatibility (EMC), Deutsches Institute fur Normay (DIN).

## 2.16 QUALITY STANDARDS

- ISO 9000: Quality Assurance
- ISO 9001: Quality Systems - Model for quality assurance in design, development, production and servicing.
- ISO 9002: Quality Systems - Model for quality assurance in production, installation and servicing.
- ISO 9004: Quality Management and Quality System Elements.

## 2.17 SHIPPING STANDARDS

- CFR 49: Code of Federal Regulations - Title 49 Part 100 - Part 185
- IATA: International Air Transport Association.
- IMFC: International Motor Freight Code.
- IMO: International Maritime Organization, regulations.

## 2.18 CONTRACT MANAGEMENT

### 2.18.1 The Engineer

The Contractor shall comply with all project instructions, management systems, procedures, general and special requirements of the Engineer when carrying out implementation works.

### 2.18.2 Method Statement

Prior to the commencement of the contract, the Contractor shall provide a detailed methodology statement. This shall include full details of both type and quantity of all the plant and equipment he proposes to use and a work program, clearly showing the timing and sequence of all activities.

### 2.18.3 Records

The Contractor shall keep at the site accurate and detailed electrical drawings of the work, including a record of times, dates for his site activities, and shall provide the Engineer with copies of these records.

At the conclusion of the Project, the Contractor shall supply reproducible copies of all drawings, showing full details of the works implemented.





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#### **2.18.4 Supervision**

The Contractor shall employ at the works at adequate number of engineers and staff during the construction stage to supervise all stages of the work as appropriate.

### **2.19 QUALITY ASSURANCE REQUIREMENTS**

#### **2.19.1 Quality Plan**

The Contractor shall prepare a job specific Quality Plan for all work performed under the Contract.

This Plan shall include, but not be limited to, the following Contract information and quality system elements:

- Identify the senior personnel responsible for execution of work and quality for the Contract.
- Include an organizational chart.
- Name of HS&E Representative
- Name of the Quality Management Representative.
- Contract Program.
- Contract procedures, test certificates and manuals.
- Inspection and Testing including all proposed inspections and testing (ITP's)
- Inspection, measuring and test equipment.
- Control of non-conforming product including all applicable records (NCR).
- Handling, storage, packaging and delivery plan.
- Quality records.

Should the Contractor fail to execute the work in accordance with the approved Quality Plan, the Contractor shall be deemed to be in default.

#### **2.19.2 Submission of HS&E and Quality Plans**

The HS&E and Quality Plans shall be submitted to the Engineer for approval within one (1) week of the Commencement Date” and shall contain the approval signature of a person at a suitable level in the Contractor’s organization.

Inspection and Test Plans are required to be submitted for approval. In addition, the engineer will nominate those plans or other documentation referenced in the Quality Plan, that are to be submitted for approval before that portion of the work is commenced.

When changes to the HS&E and Quality Plans are proposed, they shall be submitted to the Engineer for review and acceptance before they are implemented.

#### **2.19.3 Audits & Quality System**

The Engineer may conduct audits on a daily basis to determine that work is carried out in accordance with the HS&E and Quality Plans.





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## **2.20 DRAWINGS**

### **2.20.1 Design Drawings**

The work shall be implemented strictly in accordance with design drawings to be provided by the Engineer, and Contractor shall liaise with the Engineer to identify final locations.

### **2.20.2 Shop Drawings**

The Contractor shall prepare Shop Drawings for the installation works. These shall be based upon the actual equipment to be installed, selected for use by the Contractor according to manufacturers subsequently approved by the Engineer. The Contractor shall make such adjustments to the design as are necessary to accommodate the technical and physical requirements of the selected equipment in the preparation of the Shop Drawings.

Such adjustments shall at all items ensure that the final performance of the completed installations is achieved as intended.

Shop Drawings shall be checked and coordinated with the work of all trades involved before submission for the approval of the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings submitted without this stamp of approval may be returned to the Contractor for resubmission.

### **2.20.3 As Built Drawings and Manuals**

#### **(a) As Built Drawings**

As Built drawings shall be updated on a daily basis and shall be kept separate from the Design and Shop Drawings. Changes shall be indicated in different color i.e. "Red" - omitted; "Green" - New, etc. All changes shall be approved and countersigned by the engineer.

Within Thirty (30) days of the issue of the "Certificate of Substantial Completion", the Contractor shall provide fully detailed "As Built" Record Drawings for the whole contract works together with full operating and maintenance instructions to be checked and approved by the Engineer. Record drawings shall also be submitted electronically computer CD. Temporary manuals and record drawings shall be made available at least one month before to enable the Employer's staff to familiarize themselves with the installation. These should preferably be the final manuals with temporary insertions for the items, which cannot be finalized until the works are completed and tested.

The Drawings shall comprise general arrangement drawings of all installations; detail drawings of plant rooms and similar areas; single line diagrams of all services; line diagrams of control systems; and electrical circuit diagrams.

The Drawings shall indicate the color coding, labeling & identification of all the services as previously described, & shall give full working details of size, load, duty & capacity of each item of plant. The Drawings shall also clearly indicate the location of all vents, drains, dampers, valves & test points. The line diagrams shall indicate the type, location & function of each component and, together with the interconnecting



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wiring & piping, the terminal connection reference numbers or letter on the actual equipment.

In addition to the As Built Drawings, the Contractor shall obtain and provide two (2) sets of the manufacturer's catalogues, spare parts and detailed drawings of all items of plant, suitably titled and with drawing reference numbers added.

The As built Drawings shall be specially prepared and shall not be modified Working Shop Drawings.

The preparation of these Drawings shall proceed during the installation of the Contract Works, as each section is completed. To ensure that this requirement is met, the Engineer shall be allowed to inspect the Drawings on request.

**(b) Operation and Training Materials**

All manuals shall be supplied together with plant and equipment to be delivered to site. Installation shall not commence without the manuals. Upon completion of testing and commissioning the manuals shall be updated by inserting testing and commissioning sheets and reflects all changes to the original design, if any.

The Operating and Maintenance Instructions shall be prepared as soon as the working drawings are in hand and shall take the form of a manual in which is described the layout and function of the systems, schedules of components comprising each & every item of equipment including manufacturer's name, reference & serial number & operating maintenance instruction based on the manufacturer's standard instruction's simplified where necessary.

An overall maintenance schedule shall be prepared by the Contractor on a system basis, listing out in simple terms the plant, nature of attention and intervals due. This shall be cross referenced with the manufacturer's standard instructions.

Drawings shall be arranged to fold out from their position and be entirely visible when any part of the manual is being read. The manuals shall be encased in binders.

All operating instructions and maintenance procedures must be displayed clearly in plant rooms.

The Contractor shall include for the preparation and supply of the required number of copies for the manuals and drawings after all details have been approved by the Engineer. The Contractor must submit the required number of copies of record drawings as mentioned in the general and special conditions of the contract. Moreover an electronic set (on CD) must be provided.

## **2.21 TESTING UPON COMPLETION**

Prior to taking over of the Works or any section of the Works or to putting any portion of the Works into service, the Contractor shall carry out Tests Upon Completion in accordance with the provisions of the Specification. The tests shall be carried out in the presence of the Engineer and to his satisfaction.

The Contractor shall be responsible for the measurement, recording and reporting of Tests on Completion. As each item is completed, its completion shall be certified by the Contractor and countersigned by the Engineer. Three (3) copies of the certificates shall be submitted to the Engineer.



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The Contractor shall provide and bear the cost of competent test personnel, instrumentation and test rigs together with all auxiliary personnel, electric power and other services necessary for the completion of the tests.

The Tests on Completion shall verify the correct functioning of individual parts of the Works and of systems involving more than one item of equipment. The tests shall include tests for dielectric withstand, insulation resistance, earth resistance, correct wiring and connections, correct functions and operating characteristics, and polarities.

If the Engineer fails to appoint a time after having been requested to do so or to attend at the time and place duly appointed, the Contractor shall be entitled to proceed in the absence of the Engineer and such tests shall be deemed to have been made in the presence of the Engineer.

If any portion of the Works fails to pass the Tests on Completion, then tests on the said portion shall, if required by the Engineer, be repeated within a reasonable time upon the same terms and conditions, save that all costs and losses incurred by the Engineer in consequence of such failure and/or by such repetition shall be borne by the Contractor.

Proximate notification of each particular test or inspection shall be given to the Engineer on an approved form not later than 24 hours prior to the scheduled commencement of the particular test.

## 2.22 STAFF REQUIRED

The Contractor shall provide the required staff and qualifications to manage all the different tasks of the assignment. The Contractor should specify their project management, methodology & approach. In the table below, the personnel that will need to be mobilized.

Regardless the below mentioned staff, it will be the Contractor's full responsibility to bring additional supporting staff to achieve the required scope of work on time without any additional fees.

UNDP reserves the right to reject and/or instruct removal of staff due to nonperformance.

UNDP has the full right to make an appropriate deduction from the contractor's progress payments in case of his failure to secure the site with the below mentioned site staff.

Main Expertise & professional	Particular Experience & Qualifications	Minimum Years of Experience	Minimum experience (year in similar position)	Quantity
<u>Project Manager</u> Civil Engineer Full Time	Minimum B.A. in civil engineering. Excellent experience in bridges construction and excellent communication and management skills. Excellent ability in reading, writing and communicating in English	15	5	1
<u>Site Engineer</u> (Civil Engineer) Full Time	Minimum B.A. in civil engineering. Excellent experience in bridges construction projects with excellent communication and management skills. Excellent ability in reading, writing and communicating in English	10	5	1
<u>Structural Expert Engineer</u> (Steel Structures/Civil Engineer)	Minimum M.A. in structures and bridges engineering. Excellent experience in designing and implementing bridges and excellent	15	10	1



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Main Expertise & professional	Particular Experience & Qualifications	Minimum Years of Experience	Minimum experience (year in similar position)	Quantity
Full Time	communication and management skills. Excellent ability in reading, writing and communicating in English			
<u>Land Surveyor</u> Full time	Excellent experience in land surveying of infrastructure construction projects. Excellent ability in reading, writing and communicating in English	10	5	1
<u>Quality Assurance Engineer, Planning, Quantity Surveyor &amp; AutoCAD Operator</u> Civil Engineer Full Time	Minimum B.A. in civil engineering. Excellent experience in construction projects. Excellent skills in reporting, AutoCAD, shop drawings, planning & quality control. Excellent ability in reading, writing and communicating in English	10	5	1
<u>General Forman</u> Full time	Excellent experience in construction works (preferably steel bridges) and excellent communication and management skills. Excellent ability in reading, writing and communicating in English	10	5	1
<u>HS&amp;E Officer</u> Full time	Excellent experience in HS&E issues related to construction projects and excellent communication and management skills. Excellent ability in reading, writing and communicating in English	10	5	1

### 2.23 PRELIMINARY AND GENERAL WORKS

The contractor has to achieve the following items which are part of his scope of work without any additional cost. These items are as follows:

A	Fixed Items	Remarks
a1	<p>Site establishment and mobilization: provision of brand new (not used) supervision offices as the following:</p> <ul style="list-style-type: none"> <li>➤ Minimum area around 50 m<sup>2</sup> divided into two offices, one meeting room, toilet &amp; kitchen.</li> <li>➤ Full furniture inclusive (but not limited to) office desks, meeting table (ten persons), swivel chairs, fixed chairs, file cabinets, small tables, air conditioning split units, wireless multi-function printer A3 inclusive scanner &amp; copier, wireless internet ... etc.</li> <li>➤ Storage, temporary fencing, fixed and suitable electricity, water, sanitation, communication systems, etc., inclusive of Health, Safety &amp; Environmental requirements (fire extinguishers, safety equipment, personal protection, first aid, etc.).</li> <li>➤ Janitor (housekeeper).</li> <li>➤ Full stationary.</li> </ul>	To be finalized within one (1) week after awarding the contract
a2	Insurances as per UNDP conditions	To be finalized within one



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<b>A</b>	<b>Fixed Items</b>	<b>Remarks</b>
		(1) week after awarding the contract
a3	As per the that will be given, supply and install Project Notice Board indicating the basic information of the project such as the project name, contractors name, UNDP, governmental partners logos, etc.	To be finalized within one (1) week after awarding the contract
a4	Supply and install Project Safety and Environmental Signage Board reflecting all safety signs, instructions, etc., inclusive of records related to contract duration, days of work, number of accidents (if any), days without accidents, etc.	To be finalized within one (1) week after awarding the contract
<b>B</b>	<b>Time Related Items</b>	
b1	Services for site maintenance during construction inclusive maintaining the supervision offices	To be covered for the whole contract period
b2	Maintain insurances during construction	To be covered for the whole contract period
b3	Maintenance of construction plant, site offices and equipment during construction	To be covered for the whole contract period
b4	HS&E and First Aid induction for all contractor personnel including contractor owner/director	To be finalized within one (1) week after awarding the contract
b5	Supply the site supervision team (UNDP supervision team) and the end user's representative team on site with adequate transportation facility for the whole period of the project.	To be covered for the whole contract period

**PART END**



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### **3 PART 3: - DETAILED REQUIREMENTS**

#### **3.1 COORDINATION AND MEETINGS**

##### **1.01 Section Includes**

- A. Coordination
- B. Pre-construction meeting
- C. Site mobilization meeting
- D. Progress meetings
- E. Pre-installation meetings

##### **1.02 Related Sections**

- A. Project Coordination: Coordination with Project Manager.

##### **1.03 Coordination**

- A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.
- D. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

##### **1.04 Pre-construction Meeting**

- A. Supervising Engineer/Owner's Representative will schedule a meeting after Notice of Award.
- B. Attendance Required: Supervising Engineer/Owner's Representative, and Contractor.
- C. Agenda:
  - 1) Execution of Owner-Contractor Agreement.
  - 2) Submission of executed bonds and insurance certificates.
  - 3) Distribution of Contract Documents.
  - 4) Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
  - 5) Designation of personnel representing the parties in Contract, and the Supervising Engineer/Owner's Representative.



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- 6) Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract close-out procedures.
- 7) Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Supervising Engineer/Owner's Representative, Owner, participants, and those affected by decisions made.

#### **1.05 Site Mobilization Meeting**

- A. Supervising Engineer/Owner's Representative will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required: Supervising Engineer/Owner's Representative, Special Consultant, Contractor, and major Subcontractors.
- C. Agenda:
  - 1) Use of premises by Owner and Contractor.
  - 2) Owner's requirements.
  - 3) Construction facilities and controls provided by Owner.
  - 4) Temporary utilities provided by Owner.
  - 5) Survey and building layout.
  - 6) Security and housekeeping procedures.
  - 7) Schedules.
  - 8) Procedures for testing.
  - 9) Procedures for maintaining record documents.
  - 10) Requirements for start-up of equipment.
  - 11) Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Supervising Engineer/Owner's Representative, Owner, participants, and those affected by decisions made.

#### **1.06 Progress Meetings**

- A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Main Contractor, major Subcontractors and Suppliers, Owner, Supervising Engineer/Owner's Representative, as appropriate to agenda topics for each meeting.
- D. Agenda:
  - 1) Review minutes of previous meetings.
  - 2) Review of Work progress.
  - 3) Field observations, problems, and decisions.





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- 4) Identification of problems which impede planned progress.
  - 5) Review of submittals schedule and status of submittals.
  - 6) Review of off-site fabrication and delivery schedules.
  - 7) Maintenance of progress schedule.
  - 8) Corrective measures to regain projected schedules.
  - 9) Planned progress during succeeding work period.
  - 10) Coordination of projected progress.
  - 11) Maintenance of quality and work standards.
  - 12) Effect of proposed changes on progress schedule and coordination.
  - 13) Other business relating to Work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Supervising Engineer/Owner's Representative, Owner, participants, and those affected by decisions made.

#### **1.07 Pre-installation Meeting**

- A. When required in individual specification sections, convene a Pre-installation meeting at work site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Supervising Engineer/Owner's Representative four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  - 1) Review conditions of installation, preparation and installation procedures.
  - 2) Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Supervising Engineer/Owner's Representative, Owner, participants, and those affected by decisions made.

**END OF SECTION**





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### **3.2 PROJECT COORDINATION**

#### **1.01 Section Includes**

- A. Project coordination by the Project Coordinator.
- B. Construction mobilization.
- C. Schedules.
- D. Submittals.
- E. Coordination drawings.
- F. Close-out procedures.

#### **1.02 Related Sections**

- A. General Conditions: Duties of the Supervising Engineer/Owner's Representative; unless otherwise noted.
- B. Contract Close-out.

#### **1.03 Project Coordinator**

- A. Project Coordinator: Main Contractor.

#### **1.04 Construction Mobilization**

- A. Cooperate with the Supervising Engineer/Owner's Representative in allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
- B. During construction, coordinate use of site and facilities through the Supervising Engineer/Owner's Representative.
- C. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- D. Comply with instructions of the Supervising Engineer/Owner's Representative for use of temporary utilities and construction facilities.
- E. Coordinate field engineering and layout work under instructions of the Supervising Engineer/Owner's Representative.

#### **1.05 Schedules**

- A. Submit preliminary progress schedule in accordance with Section 01300, and coordinated with Project construction schedule.
- B. After review, revise and resubmit schedule to comply with revised Project schedule.
- C. During progress of work revise and resubmit as directed.

#### **1.06 Submittals**



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- A. Submit preliminary shop drawings, product data and samples in accordance with Section 01300 for review and compliance with Contract Documents, for field dimensions and clearances, for relation to available space, and for relation to work of separate contracts. Revise and resubmit as required.
- B. Submit applications for payment on forms for review, and to Supervising Engineer/Owner's Representative.
- C. Submit requests for interpretation of Contract Documents, and obtain instructions through the Supervising Engineer/Owner's Representative.
- D. Process requests for substitutions, and change orders, through the Supervising Engineer/Owner's Representative.
- E. Deliver close-out submittals for review and preliminary inspection reports, to Supervising Engineer/Owner's Representative.

#### **1.07 Coordination Drawings**

- A. Provide information required by Supervising Engineer/Owner's Representative for preparation of coordination drawings.
- B. Review drawings prior to submission to Supervising Engineer/Owner's Representative.

#### **1.08 Close-Out Procedures**

- A. Notify Supervising Engineer/Owner's Representative when Work is considered ready for Substantial Completion.
- B. Comply with Supervising Engineer instructions to correct items of work listed in executed Certificates of Substantial Completion.
- C. Notify Supervising Engineer/Owner's Representative when Work is considered finally complete.
- D. Comply with Supervising Engineer/Owner's Representative's instructions for completion of items of Work determined by Supervising Engineer/Owner's Representative's final inspection.

**END OF SECTION**



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### 3.3 SUBMITTALS

#### 1.01 Section Includes

- A. Submittal procedures.
- C. Proposed Products list.
- D. Shop Drawings.
- E. Product Data.
- F. Samples.
- G. Manufacturer Installation Instructions.
- F. Manufacturer Certificates

#### 1.02 Related Sections

- A. Contract Close-out.

#### 1.03 General

**The contractor must submit a submittal for any type of work, material, equipment, method statement, shop drawing, technical data ... etc. required for the scope of work to get approval from the supervision engineer in advance before starting any activity of any type.**

**Any works without getting prior approval duly from the supervision engineer, the supervision engineer has the full authority to reject it, and the contractor will carry lonely the full responsibility technically & financially.**

**The contractor has to follow the supervision engineer's instructions duly.**

#### 1.04 Submittal Procedures

- A. Transmit each submittal with an approved transmittal form to the Supervising Engineer / Owner's Representative.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or Supplier; pertinent drawing and detail number, and specification section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to Supervising Engineer/Owner's Representative at Site Office. Coordinate submission of related items.
- F. For each submittal for review, allow 5 (five) working days excluding delivery time to and from the contractor.



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- G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- H. Provide space for Contractor and Supervising Engineer/Owner's Representative review stamps.
- I. Revise and resubmit, identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.
- K. Submittals not requested will not be recognized or processed.

#### **1.05 Proposed Products List**

- A. Within 10 days after date of Owner-Contractor Agreement, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

#### **1.06 Shop Drawings**

- A. Submit in the form of one reproducible and the number of opaque reproductions which Contractor requires, plus two copies which will be retained by Supervising Engineer/Owner's Representative.
- B. Shop Drawings: Submit for review. After review, produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article above and for record documents purposes described in CONTRACT CLOSE-OUT.

#### **1.07 Product Data**

- A. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Supervising Engineer and one copy for the Owner's Representative.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. Indicate Product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in CONTRACT CLOSE-OUT.

#### **1.08 Samples**

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.



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- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Supervising Engineer/Owner's Representative selection.
- C. Include identification on each sample, with full Project information.
- D. Submit the number of samples specified in individual specification sections; one of which will be retained by Supervising Engineer/Owner's Representative.
- E. Reviewed samples which may be used in the Work are indicated in individual specification sections.

#### **1.09 Manufacturer Installation Instructions**

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Supervising Engineer/Owner's Representative in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

#### **1.10 Manufacturer Certificates**

- A. When specified in individual specification sections, submit certification by manufacturer to the Supervising Engineer/Owner's Representative, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Supervising Engineer/Owner's Representative.

**END OF SECTION**



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### **3.4 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

#### **1.01 Requirements Included**

- A. Submit Shop Drawings, Product Data and Samples required by Contract Documents.

#### **1.02 Related Requirements**

- A. Project Record Documents
- B. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Shop Drawings, Product Data and Samples will be needed.

#### **1.03 Shop Drawings**

- A. Drawings shall be presented in a clear and thorough manner.
  - 1. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.

#### **1.04 Product Data**

- A. Preparation
  - 1. Clearly mark each copy to identify pertinent products or models.
  - 2. Show performance characteristics and capacities.
  - 3. Show dimensions and clearances required.
  - 4. Show wiring or piping diagrams and controls.
- B. Manufacturer's standard schematic drawings and diagrams:
  - 1. Modify drawings and diagrams to delete information which is not applicable to the Work.
  - 2. Supplement standard information to provide information specifically applicable to the Work.

#### **1.05 Samples**

- A. Office samples shall be of sufficient size and quantity to clearly illustrate:
  - 1. Functional characteristics of the product, with integrally related parts and attachment devices.
  - 2. Full range of color, texture and pattern.
- B. Field samples and mock-ups:
  - 1. Contractor shall erect, at the Project site, at a location acceptable to the Supervising Engineer/Owner's Representative.
  - 2. Size or area: that specified in the respective specification section.



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3. Fabricate each sample and mockup complete and finished.
4. Remove mock-ups at conclusion of Work or when acceptable to the Supervising Engineer/Owner's Representative.

#### **1.06 Contractor Responsibilities**

- A. Review Shop Drawings, Product Data and Samples prior to submission.
- B. Determine and verify:
  1. Field measurements.
  2. Field construction criteria.
  3. Catalog numbers and similar data.
  4. Conformance with specifications.
- C. Coordinate each submittal with requirements of the Work and of the Contract Documents.
- D. Notify the Supervising Engineer/Owner's Representative in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents.
- E. Begin no fabrication or work which requires submittals until return of submittals with the Supervising Engineer/Owner's Representative approval.

#### **1.07 Submission Requirements**

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor.
- B. Number of submittals required:
  1. All in accordance with Contract Documents.
- C. Submittals shall contain:
  1. All in accordance with Contract Documents.

#### **1.08 Re-submission Requirements**

- A. Make any corrections or changes in the submittals required by the Supervising Engineer/Owner's Representative and resubmit until approved.
- B. Shop Drawings and Product Data:
  1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
  2. Indicate any changes which have been made other than those requested by the Supervising Engineer/Owner's Representative.
- C. Samples: Submit new samples as required for initial submittal.



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### **1.09 Distribution**

- A. Distribute reproductions of Shop Drawings and copies of Product Data which carry the Supervising Engineer/Owner's Representative stamp of approval to:
  - 1. Job site file.
  - 2. Record Documents file.
  - 3. Other affected contractors.
  - 4. Subcontractors.
  - 5. Supplier or Fabricator.
  - 6. As directed by the Supervising Engineer/Owner's Representative.
- B. Distribute samples which carry the Supervising Engineer/Owner's Representative stamp of approval as directed by the Supervising Engineer/Owner's Representative.

### **1.10 Supervising Engineer/Owner's Representative Duties**

- A. Review submittals with reasonable promptness and in accordance with schedule.
- B. Affix stamp and initials or signature, and indicate requirements for re-submittal, or approval of submittal.
- C. Return submittals to Contractor for distribution, or for re-submission.

**END OF SECTION**





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### **3.5 CONTRACT CLOSE-OUT**

#### **1.01 Requirements Included**

- A. Close-out Procedures.
- B. Final Cleaning.
- C. Operation and Maintenance Data.
- D. Systems Demonstration.
- E. Warranties and Bonds.

#### **1.02 Related Requirements**

- A. Conditions of the Contract.

#### **1.03 Close-Out Procedures**

- A. Comply with procedures stated in General Conditions of the Contract for issuance of Certificate of Substantial Completion.
- B. 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 the Supervising Engineer/Owner's Representative's inspection.
- C. In addition to submittals required by the conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
- D. The Supervising Engineer/Owner's Representative will issue a final change order reflecting approved adjustments to Contract Sum not previously made by Change Order.

#### **1.04 Final Cleaning**

- A. Execute prior to final inspection.
- B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment. Clean roofs, gutters, down spouts, and drainage systems.
- C. Clean site; sweep paved areas, rake clean other surfaces.
- D. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site. Owner will provide final cleaning after final acceptance.

#### **1.05 Operation And Maintenance Data**

- A. Provide data for:



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1. Mechanical equipment and controls - Division 15.
2. Electrical equipment and controls - Division 16.
3. Other data as required by Contract Documents.

#### **1.06 Systems Demonstration**

- A. Prior to final inspection, demonstrate operation of each system to the Supervising Engineer/Owner's Representative.
- B. Instruct Owner's personnel in operation, adjustment, and maintenance of equipment and systems, using the operation and maintenance data as the basis of instruction.

#### **1.07 Warranties and Bonds**

- A. Provide duplicate, notarized copies. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.
- B. Submit material prior to final application for payment. For equipment put into use with Owner's permission during construction, submit within 10 days after first operation. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

**END OF SECTION**



### **3.6 CLEANING**

#### **PART 1 GENERAL**

##### **1.01 Requirements Included**

- A. Execute cleaning, during progress of the Work, and at completion of the Work.

##### **1.02 Related Requirements**

- A. Conditions of the Contract.
- B. Each Specification Section: Cleaning for specific Products or work.

##### **1.03 Disposal Requirements**

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

#### **PART 2 PRODUCTS**

##### **2.01 Materials**

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

#### **PART 3 EXECUTION**

##### **3.01 During Construction**

- A. Execute periodic cleaning to keep the Work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from demolition works, and construction operations.
- B. Provide on-site containers for the collection of waste materials, debris and rubbish.
- C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

##### **3.02 Dust Control**

- A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as needed basis until painting is finished.



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- B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

### **3.03 Final Cleaning**

- A. Employ skilled workmen for final cleaning.
- B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- C. Prior to final completion, or Owner occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire work is clean.
- D. The Contractor will assume responsibility for final cleaning of interior and exterior surfaces of buildings before handing over.

### **3.04 Deep Cleaning**

- A. Where specified deep cleaning shall be carried out to suit hospital environment as per standard health requirements and to suit occupation.
- B. Employ skilled and specialized sub-contractor for deep cleaning.
- C. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- D. Provide required level of finish to floors, ceilings, exterior and interior surfaces.
- E. The Contractor obtains Engineer's approval / certifications as required for deep cleaning.

**END OF SECTION**

### 3.7 HEALTH SAFETY AND ENVIRONMENTAL PROVISIONS

#### 3.7.1 LIFE SAVING RULES

All Personnel must adhere to the 12 Life Saving Rules.



**Violations and/or disregards for the 12 Life Saving Rules may lead to immediate dismissal.**



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### **3.7.2 PROTECTIVE CLOTHING**

Personal safety depends very much on wearing appropriate protective clothing.

a) **THE HEAD**

Safety helmets must be worn at all times and a chin strap used when working at heights.

b) **THE EYES**

Eye protection (approved safety glasses or goggles) must be worn at all times.

c) **MOUTH AND NOSE**

Inhalation of dust and fibrous material can cause irritation of the mouth, nose, throat and lungs.

When working in dusty environments or other similar environment, the personnel must wear a mask which covers the nose and mouth.

d) **EARS**

When working in noisy environments, ear plugs or muffs must be worn.

e) **HANDS**

Safety gloves must be worn during any activity that there is a risk of hand injury (climbing of ladder, cable pulling, hoisting etc.)

f) **FEET**

Safety boots must be worn at all times.

g) **BODY**

Fire Retardant coveralls must be worn at all times.

### **3.7.3 WORK AREA**

All personnel shall ensure the following:

- a) All new personnel must undergo a Site Induction prior to being allowed to commence working at the site
- b) A tidy site must be established and maintained.
- c) All accumulated site rubbish must be removed at regular intervals.
- d) All statutory warning signs must be installed.
- e) A site diary must be established and filled in daily.
- f) Safe access and exit to and from sites must be maintained.
- g) All site materials must be stored in an orderly fashion.
- h) Contractor management must regularly inspect working site and submit inspection reports to MFD HS&E Team.
- i) All inspection records, certificates for lifting equipment, plant, etc. must be available for inspection.



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- j) Permit to work must be obtained for most activities, displayed and kept-up to date.
- k) Tool box talks must be given on a weekly basis and pre-job meeting held daily.

#### **3.7.4 FIRST AID**

- a) Approved first aid kits shall be available and crew made aware of their location.
- b) Selected members of the crew must be trained in first aid.
- c) Supervision to be trained in location of nearest emergency Medical facility.
- d) Supervision to be provided MFD fire and medical emergency response numbers

#### **3.7.5 FIRE PRECAUTIONS**

It is a major requirement to protect against losses due to fire. As a result, adequate measures must be taken to protect individuals as well as the asset for risk due to fire or explosion.

Suitable firefighting equipment shall be provided to ensure adequate protection against these hazards. This equipment, together with fire alarm system and means of escape shall be maintained as far as reasonably practical.

As part of the site induction, all the personnel involved in the execution of the works for this CONTRACT shall receive basic information of the site fire prevention and emergency procedures

Minimum standard is defined as:

- a) Knowledge and understanding of cause and nature of fire.
- b) Knowledge and use of fire extinguishers.
- c) Understanding of evacuation procedure in case of emergency.
- d) Recognition of calm behavior in order to eliminate panic.
- e) Recognition of fire extinguishers and types of fires they are most effective against.

#### **3.7.6 WELFARE FACILITIES**

CONTRACTOR shall provide for his employees on site:

- a) Protection against weather.
- b) Adequate supplies of drinking water.

#### **3.7.7 CONTROL OF HAZARDS TO HEALTH**

- a) Material Safety Data Sheets (MSDS) must be made available at the work site for all controlled (hazardous) products.
- b) A work permit will be required for all work carried out in the vicinity of electrical and process systems.
- c) A first-aid kit adequate appropriate to number of personnel on site must be provided.
- d) An emergency list of telephone numbers and location of nearest first aid facility must be posted.



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### **3.7.8 HS&E INCIDENT REPORTING**

- a) In the event of any emergency, injury, spill and/or near miss the ENGINEER must be informed immediately.
- b) All unsafe acts and unsafe acts must also be reported to must be reported to the ENGINEER in a timely manner.



**3.7.9 HS&E Mobilization Checklist**

No.	Item	Yes	No	N/A
1	Contract signed and issued to contractor. (Provided by UNDP)			
2	Establish Contractor HS&E focal point specific to UNDP to facilitate implementation and execution of Contractor HS&E requirements.			
3	Submission and approval of contractor HS&E policies/plans. As a minimum, execution details specific to:			
3.1	< Fall Protection Plan.....			
3.2	< Critical / Engineered Lifts.....	— —	— —	— —
3.3	< Confined Space Entry.....	— —	— —	— —
3.4	< Electrical Isolations.....	— —	— —	— —
3.5	< Piping Isolations.....	— —	— —	— —
3.6	< Journey Management.....	— —	— —	— —
3.7	< Alcohol and Drug Policy.....	— —	— —	— —
3.8	< Personal Protective Equipment.....	— —	— —	— —
4	Hazard Assessment for Overall Work Activities			
5	Detailed Job Hazard Analysis (JHA) for each phase of work activities identified in Hazard Assessment for Overall Work Activities (Mobilization Activities, Offloading Procedures, Material Handling, Temporary Facilities, etc.) Require review and site sign-off.			
6	Proof of Certification and/or documented Inspections by competent person for the following Equipment:			
6.1	< Cranes (Structural also required for cranes, including Drill Rigs)			
6.2	< Mobile Equipment (Excavators, Back-Hoes, Crawler Tractors, Front-End Loaders, etc.).....	— —	— —	— —
6.3	< Aerial Work-platforms.....			
6.4	< Welding Machines and Generators.....	— —	— —	— —
6.5	< Forklifts and Zoom Booms.....	— —	— —	— —



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No.	Item	Yes	No	N/A
6.6	< Inspections per manufacturer specifications for all other equipment.	— —	— —	— —
7	Proof of Training :			
7.1	< Trade Certification per legislation (e.g. crane operators, gas fitters, electricians, welders, divers, boom truck operators, air brake endorsements, etc. ....			
7.2	< Proof of accredited / competency training for scaffolders, riggers and equipment operators (other than the requirement for driver's license .....	— —	— —	— —
7.3	< Proof of compliance by all contractor employees with Pre-Access Alcohol and Drug Testing requirements and results of approved personnel forwarded			
8	Specific Emergency Response Plan including Emergency Contact Names, Emergency Phone Numbers, etc.			
9	Submission for approval of vehicle pass applications for all vehicles required to operate on the MFD concession.			
10	Confirm with the contract owner (e.g. Construction Manager, Superintendent, Project Engineer, etc. as applicable), assisted by HS&E Lead, any additional site-specific training requirements. This may include some of the following additional courses:			
10.1	< UNDP Facility Owner Orientation (Owner Provided – Mandatory for All Personnel .....			
10.2	< General Orientation.....			
10.3	< Explosive Remnants of orientation.....			
10.4	< Security Orientation.....			
10.5	< Permit to work (Mandatory for Permit Receivers in Operational Areas).....	— —	— —	— —
10.6	< Excavation and trenching (Task specific - all involved with task)	— —	— —	— —
10.7	< Confined Space Entry (Task specific - all involved in task).....	— —	— —	— —
10.8	< Job Hazard Analysis (JHA) Training (Minimum Supervision Only).....	— —	— —	— —
10.9	< Gas Detection (Task Specific –all persons required to conduct and document gas tests).....			
10.10	< Elevated work platform (Task Specific –equipment operator).....	— —	— —	— —
10.11	< Energy Isolation (Task Specific –all involved in task).....			
10.12	< Respiratory Protection, including Self Contained Breathing Apparatus (SCBA) (Task Specific –all involved in task).....	— —	— —	— —



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No.	Item	Yes	No	N/A
10.1 3	< Fall Protection (Task Specific –all involved in task).....			
11	Attend a pre-mobilization kick-off meeting involving UNDP personnel, contractor, UNDP's Engineer. The pre-mobilization kick-off will, at a minimum, review and discuss the following:			
11.1	< The HS&E execution plan.....			
11.2	< Permits, standards, procedures, practices, rules etc.....			
11.3	< Regulatory requirements such as applicable commitments or permits.....	— —	— —	— —
11.4	< All underground locates.....	— —	— —	— —
11.5	< HS&E meeting schedule establishment.....			
11.6	< Reporting requirements.....	— —	— —	— —
11.7	< Emergency response reporting and plans.....	— —	— —	— —
11.8	< Awareness of other work scopes.....	— —	— —	— —
11.9	< Pre-Task Assignment (toolbox, Talk Risk Identification Card (TRIC) etc...).....	— —	— —	— —
11.1 0	< Site vehicle requirements.....	— —	— —	— —
11.1 1	< Personal protective equipment.....	— —	— —	— —
11.1 2	< Orientations/ Site Access.....	— —	— —	— —
11.1 3	< Communication strategies / On-site contacts.....	— —	— —	— —
11.1 4	< Water crossing management plan / Archaeological Site locations.....	— —	— —	— —
12	Establishment of Lagging and Leading indicators			
12.1	< Recordable incidents (Fatality, Lost time, medical injury and major spills).....			
12.2	< First Aid, Near Miss, minor spills.....	— —	— —	— —
12.3	< Non Compliance to Regulatory requirements such as applicable commitments or permits.....	— —	— —	— —
12.4	< Inspections conducted.....			
12.5	< Management HS&E tours.....	— —	— —	— —



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No.	Item	Yes	No	N/A
12.6	< Pre-job (toolbox talks) conducted.....	— —	— —	— —
13	Life Saving Rules			
13.1	< List Provided by the Engineer.....	— —	— —	— —
13.2	< Leadership understand.....	— —	— —	— —

As a minimum, the contractor prior to work beginning at Site will confirm the following items:

**Contractor Designate**

\_\_\_\_\_  
\_\_\_\_\_  
Name  
Date

\_\_\_\_\_  
\_\_\_\_\_  
Designation

\_\_\_\_\_  
\_\_\_\_\_  
Signature

**UNDP Designate**

\_\_\_\_\_  
\_\_\_\_\_  
Name  
Date

\_\_\_\_\_  
\_\_\_\_\_  
Designation

\_\_\_\_\_  
\_\_\_\_\_  
Signature

**END OF SECTION**



### 3.8 INSTRUCTIONS FOR PREPARATION OF OPERATION AND MAINTENANCE MANUALS

#### Table of Content

1.	<b>GENERAL PROVISIONS</b>
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10	Appendix 7: Essential Safety Inspection Data: Sample Inspection Schedules
11	Appendix 8: Maintenance Task: Sample Maintenance Schedules
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14	Appendix 11: Spare Parts and Consumables Provided
16	Appendix 12: Pro-Forma Layout



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### **1.1. General Provisions**

The following guidelines shall be followed in preparation of Operation and Maintenance Manuals (O&M):

### **1.2. Language**

Unless otherwise mentioned in the Scope of Works, O&M manuals shall be prepared in both the English and Arabic languages.

### **1.3. General**

O&M manuals are to provide concise descriptions, technical details, operating and maintenance instructions and schedules, commissioning records, log books, catalogues, principles of operation, method of operation and other information that will enable the on-going operation and maintenance of the fabric, material, services, plant and equipment and works.

Comprehensive descriptions are to be accompanied by appropriate diagrams and other necessary illustrations so as to facilitate knowledge and understanding about the operation of the plant and equipment. Examples include hydraulic flow diagrams, electric single line /wiring diagrams, electronic circuit plans and mechanical air flow diagrams etc.

### **1.4. Quality**

Ensure the content of the documents is provided by personnel with skill and experience in the operation and maintenance of the installation and that the content is clear, succinct, accurate and relevant, the terminology is appropriate and the grammar is correct.

### **1.5. Delivery**

Operation and maintenance manuals shall be supplied as a quality publication and shall be A4 sized hard vinyl/pvc cover, 4D ring vinyl covered binder with lettering in “Times Roman” as per the below sample layout.

### **1.6. Format**

In each manual, provide the specified number of manuals, as-built drawings and test results in hard copy as specified in the table over the page.

Provide the entire set of the as- built drawings, all manuals and all test results in electronic format on CD or DVD as follows:

- Drawings in AutoCAD DWG Version 2007 format, files as per the drawing specifications outlined in the technical specifications
- Operating and Maintenance manuals, equipment ratings and documentation in MS Word for Windows 2003 format and / or Adobe Acrobat Version 2007 format.
- Manufacturer’s literature is to be presented in Adobe Acrobat Version 2007 format.

### **1.7. Dividers**

A durable divider is to be provided for each separate section, with a typed description of the system and major equipment components on the tab.



## 1.8. Text

Manufacturers' printed data, including associated diagrams, or typed text, in clear, concise English.

## 1.9. Pagination

Loose-leaf A4 pages consecutively numbered Page # of # of Number of Pages (i.e. 3/17).

## 1.10. Drawings

Drawings are to be folded to A4 size in the binders with reinforced punched binder tabs so that they can be unfolded without detaching from the rings.

## 1.11. Timeline for Delivery and Approvals of Manual

Manuals shall be delivered to the Project Manager within the timelines mentioned below:

#	Activity	Description / Timeline
1	<b>Draft Manuals</b>	Submit draft manuals, including maintenance records, <b>twelve (12) weeks before</b> the date for practical completion of works. Include provisional as-built drawings and preliminary performance data. Format: As for the final manuals, with temporary insertions for items that cannot be finalized until the installation is commissioned and tested. <ul style="list-style-type: none"> <li>Two (2) copies of draft manuals to be submitted.</li> </ul>
2	<b>Revised Draft Manuals</b>	Submit revised draft manuals <b>two (2) weeks before</b> commissioning of the installation. <ul style="list-style-type: none"> <li>Two (2) copies of revised draft manuals to be submitted.</li> </ul>
3	<b>Final Drafts</b>	On completion of commissioning, submit the Final Drafts for review no later than <b>two (2) weeks before</b> the date for Substantial Completion. If available, include certificates from authorities and warranties. Two (2) copies of final draft manuals to be submitted.
4	<b>Final Copies</b>	Submit <b>five (5) sets</b> of final volumes within <b>two weeks after</b> Substantial Completion. Incorporate comments from the review and from training of the end user's staff, and include any additional relevant material.
5	<b>Revisions</b>	Submit five (5) sets of loose-leaf amendments for insertion in the manuals <b>two weeks (2) before</b> the date for Final Completion, incorporating changes and comments during the Defect and Liability Period.
6	<b>Preliminary Manuals</b>	For equipment put into service during construction and operated by the end user, submit manuals within <b>two (2) weeks before</b> Partial Substantial Completion.

## 2. CONTENT OF O&M MANUAL

The following minimum information to be provided for the Works / Plant / Equipment:





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## **2.1. Section 1: Project Details**

### **2.1.1. Soft Copies**

- Provide soft copies of all information provided in the O&M Manuals in the formats mentioned above.

### **2.1.2. Description of the Complete Installation / Works**

- A general description of the installation / works as required for providing a general understanding of the equipment and its operation.

### **2.1.3. Contract Information**

- Provide full details on the Contract Name, Contract Number, Names, addresses, telephone and facsimile numbers, email, website of the principal consultant, sub consultants, contractor, subcontractors and responsible parties.

## **2.2. Section 2: Asset Register**

- A complete list of all equipment used in the installation, as per the attached Appendices, reflecting quantity, replacement costs per unit, including demolition, access cost, disposal cost of each item, etc.
- The asset hierarchy is to be as per the outline under item 3 below.

## **2.3. Section 3: Specific System Description**

- Technical description of each system of the installation, written to ensure that it can be clearly understood by persons not familiar with the installation.

## **2.4. Section 4: Performance Data**

- Technical description of the mode of operation of each system provided. This section to provide functionality details.
- Design / expected performance data including flags / alarms indicative of abnormal operation that should be considered for necessary action during plant operation shall be provided.

## **2.5. Section 5: Manufactures Equipment Brochures and Technical Data Sheets**

- Manufacturers' technical literature assembled specifically for the project and excluding irrelevant matter.
- Each product data sheet marked to clearly identify the specific products and components used in the installation and the data applicable. Additional instructions and illustrations as required to identify any changes to the manufacturer's data or to illustrate the function of each component in the installation.
- Manufacturer's type / routine / factory test reports.

## **2.6. Section 6: Installation and Dismantling Instructions**



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- Instructions for the proper installation and dismantling of the equipment

## 2.7. Section 7: Operating Instructions

- Manufacturers' technical literature as appropriate. For other than common accessories, where no manufacturer literature is available, a precise and concise description of the operation procedure in plain English.
- Safe starting, running, operating and shutting-down procedures for the equipment installed including a logical step-by step sequence of instructions for each procedure.
- Control sequences and flow diagrams for the systems installed.
- A legend for color-coded services.
- A legend of the symbols used on the drawings, unless included on the drawings.
- Schedules of the parameter settings of each protective device, including fixed and adjustable circuit breakers, protective relays, adjustable photoelectric switches, pressure switches, and any other control and monitoring device, as established during commissioning and maintenance.

## 2.8. Section 8: Maintenance Instructions

- Emergency procedures and procedures for fault-finding / trouble shooting.
- Manufacturers' technical literature as appropriate.
- Detailed recommendations for the frequency of performance of routine maintenance tasks.
- List of procedures and tasks associated with preventive (routine) maintenance.
- Procedures for safe trouble shooting, disassembly, repair and reassembly, cleaning, alignment inspection and adjustment, including a logical step-by-step sequence of instructions for each procedure.
- For additional requirements and sample layout of schedules refer Appendix 8

## 2.9. Section 9: Maintenance Schedules

- A schedule of the frequency of the required or recommended maintenance, testing or inspection for each type of equipment, other than those classified as Essential Safety Provision. This schedule is to include weekly, monthly attendance times.
- A separate schedule for each type of equipment, other than Essential Safety Provision.
- For additional requirements and sample layout of schedules refer Appendix 8

## 2.10. Section 10: Essential Safety Procedures

The following schedules are to be provided:

- 2.10.1. A schedule of the frequency of the required or recommended maintenance, testing or inspection for each type of equipment classified as Essential Safety Procedures
- 2.10.2. A separate schedule for each type of Essential Safety Procedures for equipment including:
  - The type of equipment
  - The location of the equipment, including building number and/or name, level number and/or name, room number and/or name and any other information required for prompt and definitive identification
  - The type of inspection and maintenance required
  - Space is to be left in order to enable the recording of results of each inspection, with sufficient spare space for not less than two years



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- Space is to be left for comments on each inspection
  - Space for the recording of the date and time of each inspection, the name, title, address and signature of the person performing each inspection.
- 2.10.3. For additional requirements and sample layout of schedules refer Appendix 7

### **2.11. Section 11: Tools and Testing Equipment**

This section relates to any special, non-generic tools and instruments that are not commercially available for the operation, maintenance and dismantling or assembly of the plant and equipment provided. Provide list of recommended tools and testing equipment required (refer Appendix 9)

### **2.12. Section 12: Recommended Spares and Consumables**

The following schedules are to be provided:

- Schedule of spares (including bearings) with an expected operating life less than 40,000 hours, including item label manufacturer name, address and telephone number, catalogue number, name and address of the local distributor, and the expected replacement frequency. (refer Appendix 10)
- Schedule of consumable items (oil, grease, belts, bearings) to be used during servicing (refer Appendix 10)
- List of spare parts and consumables provided under this contract (refer Appendix 11)
- Spares and Consumables Provided – Signed Certificates

### **2.13. Section 13: Drawings**

- One copy of each as-built drawing, including shop drawings, full size.
- Drawings shall be arranged in sequence according to Asset Groups as per item 3 below
- On small projects, the services may be combined however, the drawings of each discipline shall be kept in separate folders.

### **2.14. Section 14: Certificates, Guarantees and Warranties**

- Copies of Manufacturers' Warranties.
- Certificates of Substantial Completion
- Transfer of Title of Equipment (Spare parts and consumables)
- Certificates of Final Completion
- Certificates from Authorities.
- If installation is not by the manufacturer, and product warranty is conditional on the manufacturer's approval of the installer, submit the manufacturer's approval of the installing firm.

### **2.15. Section 15: Commissioning Data**

- Records of commissioning test results.
- Records of commissioning data.

### **2.16. Section 16: Pest Control**

- Provide details of all provisions for permanent pest control and details of any regular inspections and maintenance required



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- For additional requirements and sample layout of schedules refer Appendix 5

## **2.17. Section 17: Training Information**

Training manuals shall include the following minimum information for each asset group or piece of equipment provided:

### **2.17.1. Future Training by End User**

The following minimum information to be provided for any recommended future training/ re-training to be arranged by the End User:

- Specific nature of training required for each asset group or piece of equipment.
- Category of staffs to be trained and the minimum number of persons to be trained in each category.
- Recommended time to be spent in training
- Full details as where training can be conducted.
- The number of training sessions required

### **2.17.2. Training Conducted by Contractor / Supplier**

The following minimum information shall be provided for training provided by the contractor / supplier:

- Details of Training Programme and type of training provided
- Trainers name and contact details
- Company / Organization name and contact details
- Dates and period of training
- Place and venue of training
- Full names, surname, category, position, etc. of persons trained
- Provide copies of certificates issued to persons trained
- Training Literature
- Provide copies of training materials related to operation and maintenance of the assets.



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### 3. ASSET GROUPS

Asset groups include the following however, not limited to:

#	Item / Description	Manual Cover Color
1.	Roofing	Light Grey
2.	Concrete and Reinforcement	
3.	Walls	
4.	Floors	
5.	Ceilings	
6.	Windows	
7.	Doors and Hatches	
8.	Glazing	
9.	Joinery	
10.	Metal Fixtures (balustrades, handrails, fencing, ladders, etc.	
11.	Waterproofing	
12.	Thermal Insulation	
13.	Finishes	
14.	Signage	
15.	Roads and Paving	Dark Grey
16.	Landscaping	Light Green
17.	Irrigation	
18.	Furniture	Pink
19.	IT Equipment	Silver
20.	Audio Visual	
21.	Water	Dark Green
22.	Electrical	Orange
23.	Data and Communication Systems	Silver
24.	Electronic Security and Access Control Systems	Brown
25.	Fire Systems	Red
26.	Air Handling Systems	Dark Blue
27.	Heating	Yellow
28.	Vertical Transport (Lifts, Escalators, etc.)	Black
29.	Mechanical Services (Plant and Equipment)	Black
30.	Other Equipment (Medical Equipment i.e.X-Ray; MRI Scanner, etc.)	White

Note:

- Asset Groups such as architectural elements (1 - 14 above) may be provided in a single “Architectural Manual” (refer Appendix 1, for detailed info required) rather than a separate series of folders.
- Similarly, elements such as 16 - 17 may be grouped into a Site Manual.



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- Plant such as diesel generator installation may be grouped into a single “Diesel Generator Manual” rather than a separate series of folders.
- Equipment such as medical equipment may be grouped into a single “Medical Equipment Manual” rather than a separate series of folders.



## Appendix 1

### Example of Detail Requirements

Item / Description	
<b>1. Water:</b>	
1.1. Domestic Water Supply:	
1.1.1. Distribution Cabinets	
1.1.2. Isolating Valves	
1.1.3. Shut off Valves.	
1.1.4. Piping	
1.1.5. Pipe Fittings	
1.2. Sanitary Drainage:	
1.2.1. Piping	
1.2.2. Fittings and Accessories	
1.2.3. Floor Cleanouts, Floor Drains, etc.	
1.3. Storm Drainage:	
1.3.1. Piping	
1.3.2. Fittings and Accessories	
1.3.3. Rain Water Roof Drainage	
1.3.4. Supports, Hangers, etc.	
1.4. Bathroom Sanitary Fixtures and Fittings:	
1.4.1. Fixtures	
1.4.2. Fittings	
1.4.3. Taps	
1.4.4. Mixers	
1.4.5. Traps	
1.4.6. Toilets	
1.4.7. Water Heaters	
1.4.8. Shower Nozzles	
1.4.9. Hose spray,	
<b>2. Ventilating and Air Conditioning:</b>	
2.1. Chillers, Package Units, or Split Units and Accessories	
2.2. Air Handling Units and Accessories,	
2.3. Grilles, Diffusers, Registers, Dampers, and Filters.	
2.4. Ductwork, Supporting System, Flexible Connection, Fittings Insulation Material, etc.	
2.5. Cladding to insulation	
2.6. Thermostats	
2.7. Fans	
2.8. Identification Labels, Plates, Charts, Color Coding, etc.	
<b>3. Heating:</b>	
3.1. Chimney/Stack Cleaning Information	
3.2. Boiler/Furnace Cleaning and maintenance schedule	
3.3. Boiler/furnace shutoffs	
3.4. Under floor heating or radiators	
3.5. Collectors and manifolds	
3.6. Thermo pipe	
3.7. Thermostats	
3.8. Identification labels, plates, charts, color coding and the like.	
<i>Note:</i>	



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*The abovementioned index is indicative contractor / consultant to ensure that all relevant equipment / materials are listed and information is provided*





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## Appendix 2

### Internal and External Painting Schedule

Location:

Building Name:

Floor No.:

Room No.:

Element	Manufacturer	Product Type	Color Code	Finish – Color	Quantity Square Meter	Estimated Useful Life (under normal wear & tear conditions)	Cost per Square Meter (including of demolition and dumping costs)
1. External Free Standing Walls							
2. External walls, shade structures							
3. External walls (general)							
4. External walls (feature)							
5. Internal walls (general)							
6. Internal walls (feature)							
7. Doors (including toilet partitions)							
8. Frames and stairs, balustrades							
9. Ceilings and bulkheads							
10. Floors (if painted)							
11. Concrete sealer							
12. Line marking							
13. Clear penetrative sealer							
14. Other painted surfaces							
15.							



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### Appendix 3

#### Plants Schedule

Location	Common Name	Botanical Name	Quantity	Estimated Life Span (under normal conditions)	Cost Each (including of demolition and dumping costs)
1.					
2.					
3.					
4.					
5.					
6.					
7.					



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## Appendix 4

### Paving Schedule

Location	Pavers Name	Pavers Type	Color	Finishing	Manufactures Details	Quantity	Estimated Useful Life (under normal wear & tear conditions)	Cost per Square Meter (including of demolition and dumping costs)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								



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## Appendix 5

### Pest Control Schedule

Location	Reference Drawing	Type
1. Slab penetrations		
2. Slab / Footing Joints		
3. Building Perimeter		
4. Perimeter Wall		
5.		
6.		
7.		



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## Appendix 6

### Floor Covering Schedule

Building Name/No; Floor Level; Room No (s)	Manufacturer	Product Type	Colour - Code	Finish – Colour	Quantity Square Metre	Estimated Useful Life (under normal wear & tear conditions)	Cost per Square Metre (including of demolition and dumping costs)



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## Appendix 7

### Essential Safety Inspection Data: Sample Inspection Schedules

*Note: Separate Sheet to be provided for each piece of equipment*

Information / Data Name	Definition of Information
Location of the Equipment.	Include building number and/or name, level number and/or name, room number and/or name and any other information required for prompt and unequivocal identification
Description of Equipment	Describe the equipment
Inspection Type	Description of tasks

Inspection Frequencies						
Item Name	Weekly	Monthly	Bi - Monthly	Quarterly	6 Monthly	Annually
Item A	X					
Item B		X				
Item C			X			
Item D				X	X	
Item E						X

*Note: Allow space to record results of each inspection, with sufficient spare space for not less than one year*

Inspection Results				
Inspectors Details	Name	Title	Date	Signature



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## Appendix 8

### Maintenance Task: Sample Maintenance Schedules

*Note: Separate Sheet to be provided for each piece of equipment*

Information / Data Name	Definition of Information
Location of the Equipment.	Include building number and/or name, level number and/or name, room number and/or name and any other information required for prompt and unequivocal identification
Description of Equipment	Describe the equipment

Maintenance Schedule												
Item Name	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Item A	B	B	B	B	B	B	B	B	B	B	B	B
Item B	C			C			C			C		
Item C	B	C	B	B	B	B	B					
Item D							A					

Maintenance Tasks						
#	Tasks	Service Type				
		A	B	C	D	E
1	All doors should open freely without the use of a key. If an automatic-unlocking device has been approved, check that the door opens freely when the device is actuated.	▲	▲			
2	All hold-open devices operate correctly.	▲	▲			
3	Treads are stable and non-slip surfaces are in good condition.	▲		▲		
4	All handrails are in good repair.	▲		▲		
5	Obstructions above the rail which would tend to break a handhold.	▲		▲		
6	Handrail is continuous between stair landings.	▲		▲		
A = Annual; B = Monthly; C = 3 Monthly; D = Bi-Monthly; E = Weekly						

*Note: Allow space to record results of each maintenance, with sufficient spare space for not less than one year*

Maintenance Results				
Technician / Engineers	Name	Title	Date	Signature





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<b>Details</b>				
----------------	--	--	--	--

### Appendix 9 Recommended Tools and Testing Equipment

#	Item / Description	Model / & Catalogue No.	Recommended Supplier	QTY	Unit Price \$US
1	<i>Provide full details such as item name, model/catalogue number etc.</i>	<i>Provide Model, catalogue number, etc.</i>	<i>Provide full contact details of recommended suppliers</i>		



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### Appendix 10 Recommended Spares and Consumables

#	Item / Description	Model / & Catalogue No.	Recommended Supplier	QTY	Unit Price \$US
1	<i>Provide full details such as item name, model/catalogue number etc.</i>	<i>Provide Model, catalogue number, etc.</i>	<i>Provide full contact details of recommended suppliers</i>		



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### Appendix 11 Spare Parts and Consumables Provided

#	Item / Description	Model / & Catalogue No.	QTY
1	<i>Insert full description.</i>	<i>Provide Model, catalogue number, etc.</i>	5

*Insert note stating:*

**Note: Refer attached “TRANSFER OF TITLE OF EQUIPMENT”**



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**Appendix 12**  
**Pro-Forma Layout**



*Insert Consultants Logo*

*Insert Contractors Logo*

**PROJECT NAME**

**Contract No.**

**Operation and Maintenance**  
**Manual**

**Asset Group: Mechanical**  
**Services Diesel Generator**

**Volume 1 of 3**  
**(Sections 1 to 6)**

**Contractor**

**Contractor's Name**

**Date: January**  
**2010**



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Section 7: Operating Instructions	Volume 2
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Section 16: Pest Control	Volume 3
Section 17: Training Information	Volume 3

*Note:*

*For a single small project all sections may be included into one volume however, the index shall remain the same*



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## Sections 1 to 6

### Table of Content

#	Item / Description	Page No.
<b>1</b>	<b>Section 1: Project Details</b>	
1.1	Soft Copies of O&M Manuals	
1.2	Description of Works	
1.3	Contract Information	
1.3.1	Contract Details	
1.3.2	UNDP Contact Details	
1.3.3	Consultants Contact Details	
1.3.4	Contractors Contact Details	
<b>2</b>	<b>Section 2: Asset Register</b>	
2.1	Diesel Generator Plant	
2.2	Fuel Tank	
2.3	Change Over Switch	
2.4	Cabling	
2.5	Fuel Pipes	
<b>3.</b>	<b>Section 3: Specific System Description</b>	
<b>4.</b>	<b>Section 4: Performance Data</b>	
<b>5.</b>	<b>Section 5: Manufactures Equipment Brochures and Technical Data Sheets</b>	
<b>6</b>	<b>Section 6: Installation and Dismantling Instructions</b>	



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## **1 Section 1: Project Details**

### **1.1 Soft Copies of Operation Manuals**

*Insert soft copies (electronic format) of this manual*

*CD/DVD shall be clearly marked showing Volume No's included*

*CD/DVD shall be housed in pre-fabricated pockets which form part this manual,*

*Flash disks / memory sticks will not be accepted*

### **1.2 Description of Works**

*Provide a general description of the installation / works as required for providing a general understanding of the works, its equipment and operation.*

### **1.3 Contract Information**

#### **1.3.1 Contract Details**

*Contract No.*

#### **1.3.2 UNDP Contact Details**

**Main Office Address**

**Project Manager**

*Name:*

*Email:*

*Tel:*

**Procurement Unit**

*Name:*

*Email:*

*Tel:*

#### **1.3.3 Consultants Contact Details**

*Provide relevant info as above*

#### **1.3.4 Contractor Contact Details**

*Provide relevant info as above*



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## **2 Section 2: Asset Register**

### **2.1 Diesel Generator**

- Quantity: 1
- Size: 750kVA
- Purchase Price: \$US 45 000.00
- Estimated Life / Useful Life: 20 years
- Handover Date: 1 January 2010
- Location Installed: Energy Room
- Make: Cummins
- Model No.: DET400/E 170385100
- Serial No.: D20809700
- Country of Manufacture: United Kingdom
- Manufacturers Contact Details

➤ **International Name & Address**

*Cummins Company  
Vatican St #17, London, England  
PO Box 202, London, 101, England  
Tel No.: +395 516 786 811  
Fax No.: +395 516 786 812  
Email: [cumminssales@it.com](mailto:cumminssales@it.com)  
Website: [www.cummins.uk](http://www.cummins.uk)*

➤ **Local Agent Name & Address**

*Provide similar info as above*

- Manufacturers Warranty Details

*Three (3) years starting 22 September 2009*

*Note: Limited to certain items as per attached Warranty Certificate*

- Contractual Defects and Liability Period

*One (1) year starting 1 January 2010*





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## 2.2 Fuel Tanks

- Quantity: 2
- Size: 10 000 liter
- Purchase Price: \$US 2 000.00 (each)
- Estimated Life / Useful Life: 20 years
- Handover Date: 1 January 2010
- Location Installed: Energy Room
- Make: Dessert Metal Works
- Model No.: GV10
- Serial No.: GV10 123 450
- Country of Manufacture:
- Manufacturers Contact Details:
  - International Name & Address  
*Locally manufactured*
  - Local Agent Name & Address  
*Provide similar info as above*
- Manufacturer's Warranty Details  
*None*
- Contractual Defects and Liability Period  
*One (1) year starting 1 January 2010*



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### 2.3 Change Over Switch

- Quantity: 1
- Size: 1 000Amp
- Purchase Price: \$US 5 000.00
- Estimated Life / Useful Life:
- Handover Date: 1 January 2010
- Location Installed: Energy Room
- Make:
- Model No.:
- Serial No.:
- Country of Manufacture: United Kingdom
- Manufacturers Contact Details:

➤ International Name & Address

*Cummins Company  
Vatican St #17, London, England  
PO Box 202, London, 101, England  
Tel No.: +395 516 786 811  
Fax No.: +395 516 786 812  
Email: [cumminssales@it.com](mailto:cumminssales@it.com)  
Website: [www.cummins.uk](http://www.cummins.uk)*

➤ Local Agent Name & Address

*Provide similar info as above*

- Manufacturers Warranty Details

*One (1) yeas starting 22 September 2009*

- Contractual Defects and Liability Period

*One (1) year starting 1 January 2010*



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## 2.4 Cabling

- Estimated Life / Useful Life: *20 years*
- Handover Date: *1 January 2010*
- Location Installed: *Energy Room*
- Country of Manufacture: *Saudi Arabia*
- Manufacturers Contact Details:

➤ International Name & Address

*Provide similar info as above*

➤ Local Agent Name & Address

*Provide similar info as above*

- Manufacturers Warranty Details

*None*

- Contractual Defects and Liability Period

*One (1) year starting 1 January 2010*

- Details:

#	Description	Size	Qty	Total Price
1	Single (1) Core Copper Cable PVC SWA PVC	240mm <sup>2</sup>	150m	\$US 1 200.00
2	Single (1) Core Copper Cable PVC SWA PVC	120mm <sup>2</sup>	50m	\$US 600.00
3	Three (1) Core Copper Cable PVC SWA PVC	10mm <sup>2</sup>	30m	\$US 200.00
4	Two (2) Core Copper Cable PVC SWA PVC	4mm <sup>2</sup>	15m	\$US 100.00
5	Single Core Bare Copper Conductor	70mm <sup>2</sup>	50m	\$US 500.00



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## 2.5 Copper Pipes

- Estimated Life / Useful Life: *20 years*
- Handover Date: *1 January 2010*
- Location Installed: *Energy Room*
- Country of Manufacture: *Italy*
- Manufacturers Contact Details:

➤ International Name & Address

*Provide similar info as above*

➤ Local Agent Name & Address

*Provide similar info as above*

- Manufacturers Warranty Details

*None*

- Contractual Defects and Liability Period

*One (1) year starting 1 January 2010*

- Details:

#	Description	Size	Qty	Total Price
1	Copper Piping	6mm dia.	50m	\$US 600.00
2				
3				



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**3. Section 3: Specific System Description**

*3.1 Standby diesel generators for provision of electricity to the hospital*

**4. Section 4: Performance Data**

*4.1 Included under Section 5*



**5. Section 5: Manufactures Equipment Brochures and Technical Data Sheets**

**5.1. *Diesel Generator***

*Insert Manufactures Equipment Brochures and Technical Data Sheets*

**5.2. *Fuel Tanks***

*Insert Manufactures Equipment Brochures and Technical Data Sheets, inclusive of miscellaneous item such as gauges, pipes, level indicators, etc., and number accordingly*

**5.3. *Change Over Switch***

*Insert Manufactures Equipment Brochures and Technical Data Sheets*

**5.4. *Cabling***

*Insert Manufactures Equipment Brochures and Technical Data Sheets inclusive of miscellaneous item such as cable glands, cable lugs, cable joints, etc., and number accordingly*

**5.5. *Copper Pipes***

*Insert Manufactures Equipment Brochures and Technical Data Sheets inclusive of miscellaneous item such as pipe fittings, etc., and number accordingly*

**6. Section 6: Installation and Dismantling Instructions**

*6.1 Included under Sections 5 and 7*



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*Insert Consultants Logo*

*Insert Contractors Logo*

**PROJECT NAME**

**Contract No.**

# **Operation and Maintenance Manual**

## **Asset Group: Mechanical Services**

**-**

## **Diesel Generator**

### **Volume 2 of 3**

**(Sections 7 to 12)**

**Contractor**

**Contractor's Name**

**Date: January 2010**



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## Sections 7 to 12

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#	Item / Description	Page No.
<b>7</b>	<b>Section 7: Operating Instructions</b>	
<b>8</b>	<b>Section 8: Maintenance Instructions</b>	
<b>9</b>	<b>Section 9: Maintenance Schedules</b>	
<b>10</b>	<b>Section 10: Essential Safety Procedures</b>	
<b>11</b>	<b>Section 11: Tools and Testing Equipment</b>	
<b>12</b>	<b>Section 12: Spares and Consumables</b>	



## 7. **Section 7: Operating Instructions**

### 7.1. **Manufactures Operating Instructions**

*Insert manufacturers Operating Instructions*

### 7.2. **Supplementary Operating Instructions**

*Insert supplementary instructions not covered under the Manufactures Operating Instructions. However, if manufactures data is sufficient insert the following.*

**Refer Manufactures Operating Instructions**

## 8. **Section 8: Maintenance Instructions**

*Insert special instructions. However, if sufficient information is given under the Maintenance Schedules insert the following:*

**Refer Section 9, Maintenance Schedules**

## 9. **Section 9: Maintenance Schedules**

*Insert special instructions and Maintenance Schedules as per Appendix 8*

## 10. **Section 10: Essential Safety Procedures**

*Insert special instructions and Essential Safety Procedures as per Appendix 7*

## 11. **Section 11: Tools and Testing Equipment**

### 11.1. **Tools and Testing Equipment Provided**

*Insert list of Tools and Testing Equipment provided under this contract as per Appendix 9*

### 11.2. **Recommended Tools and Testing Equipment**

*Insert list of Recommended Tools and Testing Equipment t as per Appendix 9*



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## **12. Spares and Consumables**

### **12.1. Spares and Consumables Provided**

*Insert list of Spares and Consumables Equipment provided under this contract as per Appendix 11*

### **12.2. Recommended Spares and Consumables**

*Insert list of Recommended Spares and Consumables Equipment as per Appendix 10*



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*Insert Consultants Logo*

*Insert Contractors Logo*

**PROJECT NAME**

**Contract No.**

# **Operation and Maintenance Manual**

## **Asset Group: Mechanical Services**

-

## **Diesel Generator Volume 3 of 3**

**(Sections 13 to 17)**

**Contractor**

**Contractor's Name**

**Date: January  
2010**



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## Sections 13 to 17

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#	Item / Description	Page No.
13	Section 13: Drawings	
14	Section 14: Certificates, Guarantees and Warranties	
15	Section 15: Commissioning Data	
16	Section 16: Pest Control	
17	Section 17: Training Information	



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### 13. Section 13: Drawings

#### Table of Content

No.	Drawing Title
<b>1</b>	<b>General</b>
<b>2</b>	<b>Architectural</b>
<b>3</b>	<b>Structural</b>
<b>4</b>	<b>Mechanical</b>
<b>5</b>	<b>Electrical</b>
<b>6</b>	<b>Civil</b>

*Note: The above is not pertaining to the previous samples however, is rather indicating multi discipline Works*



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### 13.1. General

*Insert a separator between each discipline.*

*Preferable all drawings shall be printed on A3 size*

***Note: Drawings (schematic / block diagrams) pertaining to specific plant and equipment such as Diesel Generators for which O&M Manuals are provided should be included with the O&M Manual, not under this section***

### 13.2. Architectural

*Insert a separator between each discipline.*

*Preferable all drawings shall be printed on A3 size*

***Note: Drawings (schematic / block diagrams) pertaining to specific plant and equipment such as Diesel Generators for which O&M Manuals are provided should be included with the O&M Manual, not under this section***

*Note:*

*Remaining disciplines not shown however, to follow same sequence*





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#### 14. Section 14: Certificates, Guarantees and Warranties

##### Table of Content

#	Item / Description	Page No.
14.1	<b>Manufactures Guarantees and Warranties</b>	
14.1.1	Diesel Generator	
14.1.2	Change Over Switch	
14.2	<b>Certificates of Substantial Completion</b>	
14.2.1	Diesel Generator	
14.2.2	Change Over Switch	
14.3	<b>Transfer of Title of Equipment (Spare parts and consumables)</b>	
14.4	<b>Certificates of Final Completion</b>	
14.5	<b>Certificates from Authorities</b>	
14.6	<b>Manufactures Conditional Warranty</b>	



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#### **14.1. Manufactures Guarantees and Warranties**

##### **14.1.1. Diesel Generator**

Insert Manufactures Guarantee and Warranty

##### **14.1.2. Change Over Switch**

*Insert Manufactures Guarantee and Warranty*

#### **14.2. Certificates of Substantial Completion**

##### **14.2.1. Diesel Generator**

*Insert Certificate of Substantial Completion*

##### **14.2.2. Change Over Switch**

*Insert Certificate of Substantial Completion*

#### **14.3. Transfer of Title of Equipment (Spare parts and consumables)**

*Insert Certificate of Transfer of Title of Equipment (Spare parts and consumables)*

#### **14.4. Certificates of Final Completion**

*Insert Certificate of Final Completion*

#### **14.5. Certificates from Authorities**

*Insert Approval Letters/Certificates from Authorities*

#### **14.6. Manufactures Conditional Warranty**

*Insert Manufactures Conditional Warranty*



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## 15. Commissioning Data

### Table of Content

#	Item / Description	Page No.
14.1	<b>Test Results</b>	
14.1.1	Diesel Generator	
14.1.2	Change Over Switch	
14.1.3	Fuel Tank	
14.1.4	Copper Pipes	
14.1.5	Cabling	
14.2	<b>Commissioning Data</b>	
14.2.1	Diesel Generator	
14.2.2	Change Over Switch	
14.2.3	Fuel Tank	
14.2.4	Copper Pipes	
14.2.5	Cabling	



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## 15.1. Test Results

### 15.1.1. Diesel Generator

*Insert Diesel Generator's Test Results*

### 15.1.2. Change Over Switch

*Insert Change Over Switch Test Results*

### 15.1.3. Fuel Tank

*Insert Change Fuel Tank Test Results*

### 15.1.4. Copper Pipes

*Insert Change Copper Pipes Test Results*

### 15.1.5. Cabling

*Insert Change Cabling Test Results*

## 15.2. Commissioning Data

### 15.2.1. Diesel Generator

*Insert Diesel Generator's Commissioning Data*

### 15.2.2. Change Over Switch

*Insert Change Over Switch Commissioning Data*

### 15.2.3. Fuel Tank

*Insert Change Fuel Tank Commissioning Data*



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15.2.4. Copper Pipes

*Insert Change Copper Pipes Commissioning Data*

15.2.5. Cabling

*Insert Change Cabling Commissioning Data*

**16. Pest Control**

*Insert Pest Control information as per Appendix 5*

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**17.1. Future Training by End User**

*Insert information as mentioned under item 2.17.1 in the “Instructions for the Preparation of O&M Manuals”*

**17.2. Training Conducted by Contractor / Supplier**

*Insert information as mentioned under item 2.17.2 in the “Instructions for the Preparation of O&M Manuals”*



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## **FUNDING FACILITY FOR EXPANDED STABILIZATION**

# **Invitation to Bid**

## **RECONSTRUCTION AND REHABILITATION OF JAPANESE BRIDGE IN ANBAR GOVERNORATE, IRAQ**

### **Section 3**

#### **4 PART 4: TECHNICAL SPECIFICATIONS**



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**FUNDING FACILITY FOR EXPANDED  
STABILIZATION**

**RECONSTRUCTION AND REHABILITATION OF  
JAPANESE BRIDGE IN ANBAR GOVERNORATE,  
IRAQ**

**Section 3**

**5    PART 5: QUALITY ASSURANCE MANUAL**

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## **1. INTRODUCTION**

Quality Control is fundamental to the works and services undertaken by the United Nations Development Program (UNDP). Quality is enhanced by working systematically, according to formalized procedures, designed to prevent or eliminate errors from occurring. It shall be the responsibility of UNDP Project Managers to ensure that these procedures are implemented consistently and effectively, and that they are reviewed regularly to reflect the requirements of the Contracts throughout the duration of works. It shall be the responsibility of the Quality Control Manager to constantly monitor the implementation of the Quality Control Plan to establish and put into practice necessary systems and procedures, and ensure adherence to the Quality Control Plan through regular auditing. The UNDP quality Control Manager for this project will be its nominated Engineer.

## **2. SCOPE OF THE PROJECT**

3. UNDP project's primary envisaged outcome is to assist the Government and people of Iraq to stabilize areas newly liberated from the Islamic State in Iraq and Levant (ISIL) to implement rehabilitation and reconstruction works for Japanese Bridge in Anbar governorate. The planned Iron Bridge will provide a long-term solution to the traffic for the served areas. The rehabilitation and reconstruction of the Bridge includes the entire necessary infrastructure (civil works & electrical works) that provide operational efficiency and ensure sustainability with all required safety requirements.

## **4. SCOPE OF THE QUALITY ASSURANCE MANUAL (QAM)**

The scope of the QAM is to define the responsibilities of the Contractor for Quality Assurance in the engineering, supply, construction, installation, inspection and testing of the Project.

## **5. CONTRACTOR'S QUALITY PLAN**

The Contractor shall prepare a job specific Quality Plan for all work performed under the Contract.

This Plan shall include, but not be limited to, the following Contract information and quality system elements:

- Identify the senior personnel responsible for execution of work and quality for the Contract.
- Include an organizational chart.
- Name of HS&E Representative
- Name of the Quality Management Representative.
- Contract Program.
- Contract procedures, test certificates and manuals.
- Inspection and Testing including all proposed inspections and testing (ITP's)
- Inspection, measuring and test equipment.
- Control of non-conforming product including all applicable records (NCR).

- Handling, storage, packaging and delivery plan.
- Quality records.

Should the Contractor fail to execute the work in accordance with the approved Quality Plan, the Contractor shall be deemed to be in default.

The Quality Plan shall be submitted to the Engineer for approval within one (1) week of the Commencement Date and shall contain the approval signature of a person at a suitable level in the Contractor's organization.

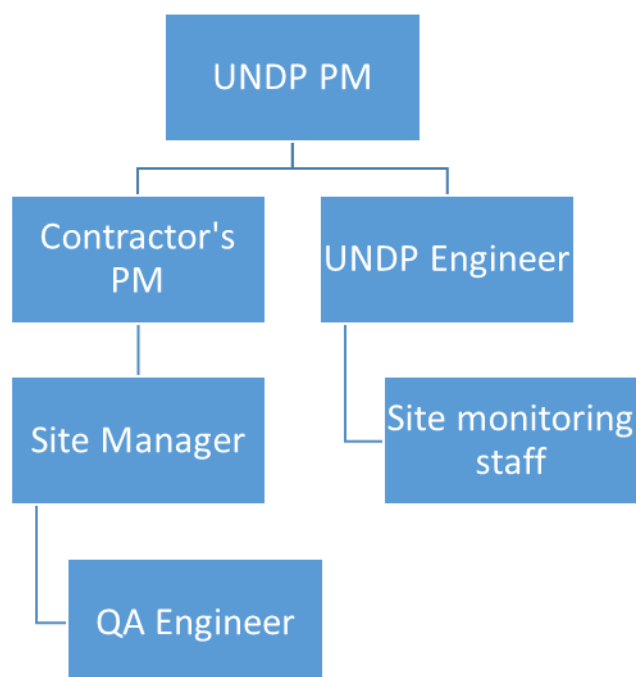
Inspection and Test Plans are required to be submitted for approval. In addition, the Engineer will nominate those plans or other documentation referenced in the Quality Plan, that are to be submitted for approval before that portion of the work is commenced.

When changes to the Quality Plan is proposed, it shall be submitted to the Engineer for review and acceptance before they are implemented.

The Engineer may conduct audits on a daily basis to determine that work is carried out in accordance with the Quality Plan.

## **6. QUALITY CONTROL AND ASSURANCE ORGANIZATION AND PERSONNEL**

The Quality Control and Quality Assurance functions of the project organizations are functionally integrated although contractually separate. The next figure shows the functional structure of the project Quality Control team.



### **6.1. RESPONSIBILITIES AND AUTHORITIES OF KEY PERSONNEL**

Quality Control Representatives shall be thoroughly familiar with all the provisions of the Contract Documents, including submittals. Plans and specifications shall include all revisions, changes, and amendments. In addition, thorough familiarity with the administrative policies of the Engineers is expected. Key personnel involved in the project and their Quality Control roles and responsibilities are described below in Sections 6.1.1 and Section 6.1.2. Since personnel assignments are subject to change over time, the UNDP Project Manager will maintain Quality



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Control Staffing List of personnel assignments including the description of each position, along with information on the responsible organization.

#### **6.1.1. UNDP QUALITY CONTROL PERSONNEL**

The following key quality control personnel will be identified prior to the start of the construction works. A list of all quality control personnel will be compiled, including the following details for each personnel: name, main responsibilities, qualifications and years of work experience in the same field.

##### **A. UNDP Project Manager (PM)**

The UNDP Project Manager is the primary point of contact for UNDP on all construction management issues. The Project Manager is responsible for the overall management of activities related to the construction program, including the implementation of the Quality Control Plan and the health and safety program. As such, the Project Manager will exercise approval authority over contractor submittals including the Quality Control Plan. The Quality Control Plan shall include the names and qualifications of contractor's Quality Control personnel pursuant to Section 5.1.2 below.

##### **B. UNDP Engineer**

The UNDP Engineer monitors the field implementation of the Quality Control Plan at the project sites under control of UNDP PM. Engineer will monitor the day-to-day activities of the contractor. This includes ensuring that contractors comply with the plans and specifications, applicable building codes, good workmanship, and the Quality Control requirements of the contract. As part of this effort, the Engineer will:

- conduct independent inspections to verify the quality of the work;
- participate in contractor four phase inspections;
- review test and inspection reports; and
- ensure that the required documentation is submitted.

The Engineer shall be alert to detecting, recording, and reporting any deviation from the contract documents, including calling any deficient item to the attention of the contractor's superintendent, and/or other representative. The Engineer shall keep accurate and detailed records of the contractor's performance and progress, delivery of materials, and other pertinent matters, including the daily inspection report.

#### **6.1.2. CONTRACTOR'S QUALITY CONTROL PERSONNEL**

The following key quality control personnel will be identified prior to the start of the construction works. A list of all quality control personnel will be provided to UNDP, including the following details for each personnel: name, main responsibilities, qualifications and years of work experience in the same field.

##### **A. Contractor's Project Manager (PM)**

The Contractor's PM has ultimate authority for the project execution activities. He/she establish policy and approves implementation plans. He/she refers to the Contractor's

firm administration. The Contractor's PM controls the entire project, in relation with the UNDP's requirements and Contract. Additionally the Contractor's PM:

- Represents the Contractor's firm to UNDP and to other regulatory and statutory bodies;
- Conducts meetings with UNDP and/or Engineer;
- Takes responsibility for the overall cost and schedule of the project and for meeting the prime contractual commitments;
- Measures and controls the work progress on site and takes all the necessary measures to maintain the conformity to the planned work progress.

Contractor's PM must be Civil Engineer with excellent experience in bridges construction and excellent communication and management skills. He must also have excellent competency in reading, writing and communicating in English. He must have minimum 15 years of experience and 5 years of experience in similar position.

#### B. Site Engineers

Site Engineers are the superior administrators on the site and carry the responsibility of the project execution activities. They manage the communication between Contractor and the Engineers on site. They also control the activities of the subcontractors and ensure that the subcontractor activities are conducted in line with the Contract. Site Engineers also prepare and report the monthly progress payments.

Site Engineers must be Civil Engineers with minimum 10 years' experience with excellent experience in bridges construction works and excellent communication and management skills. They must also have an excellent competency in reading, writing and communicating in English.

#### C. Contractor Quality Assurance Engineer

The Contractor Quality Assurance Engineer must be full-time employed in the project. The Quality Control Systems Manager shall have minimum 5 years of experience and 3 years of experience in similar position and shall be Civil Engineer. He/she will have full authority to institute any and all actions necessary for the successful implementation of the Quality Control program to ensure compliance with the contract plans and technical specifications. He/she performs also the following functions:

- Inspect all materials, construction, plant, and equipment for conformance with the technical specifications; and
- Perform all Quality Control tests as required by the technical specifications.

### 7. SUBMITTALS

This section describes the procedures for submittals. The Engineer shall administer, control, and process submittals from the Contractor. The Engineer shall review all Contractor submittals, and related supporting documents, to ensure compliance with project specifications and drawings. The submittals disposition will be noted on the submittal, which will be signed, dated and recorded. If required, The Engineer will return the submittal to the contractor for revision, incorporating the comments. The contractor shall resubmit it for review and

verification for compliance. Submittals will be logged and copies will be retained in the project files.

### **7.1. SUBMITTAL SCHEDULE**

The Contractor will prepare and submit a submittal schedule to the Engineer, which will then be provided to UNDP project manager. The schedule will be initially submitted within 10 days after the award of the contract and updated on a weekly basis. The Quality Control Management Team shall work with the contractor to prioritize and sequence submittals so that the most critical submittals are received and processed first. The submittal schedule will become the baseline against which receipt of all required submittals will be compared. The approved submittal schedule will be forwarded to the Engineer and (if required) to UNDP PM for resource availability planning.

### **7.2. PROCESS, REVIEW AND ACCEPTANCE**

Submittals will be managed as follows:

- A. Contractor will number and certify the completeness of all submittals before submitting to the Engineer;
- B. Contractor shall also complete submittal transmittal forms and submit six paper copies and one electronic copy of all required submittals to the Engineer;
- C. Upon receiving the submittal, the Engineer will log the submittal and provide a review to ascertain whether the package is complete. If the submittal is incomplete the submittal will be returned to the contractor.
- D. The original submittal transmittal and all copied attachments will be logged into the document tracking system.
- E. The Engineer shall review the submittal for general conformance with contract design documents, will coordinate concurrent discipline reviews within the design team, and consolidate responses into a single coordinated action.
- F. The Engineer will return a copy of the submittal to the contractor with an original stamp of the action required.
- G. When a submittal is to be revised and resubmitted, the contractor will revise the submittal and indicate this revision by incrementing the revision number. The UNDP submittal process will then be repeated.

The Engineer is responsible for tracking the submittal package during the entire review process and advising all concerned of any schedule impacts to ensure that the review process timeframe is adhered to. The Engineer will retain copies of all submittal documents and revisions and ensure that an accurate file is available for ready retrieval during the life of the project. The Engineer will maintain all submittal files. These files will be filed by numeric sequence. Each submittal file will contain a complete submittal copy of the submittal before and after the review process.

## **8. INSPECTION AND VERIFICATION ACTIVITIES**

The Quality Control, verification, and acceptance testing plans set out the Quality Control inspections and testing for implementation of each technical specification applicable to the Contractor's scope of work. The plans will cover the type, test standard, frequency, control requirements, and assigned responsibility for inspections and tests. The Engineer will review and approve these plans as part of the contractor Quality Control Plan submittals. After being approved by the Engineer, the Contractor Quality Control Plan is available upon request for informational purposes only. In this manner, the inspections and tests required to measure compliance with the relevant portions.





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## **8.1. GENERAL CONSTRUCTION INSPECTION & VERIFICATION REQUIREMENTS**

Contractor shall perform the inspections and tests as prescribed in the technical specifications of the Contract. Quality Control inspection and testing will be used to verify the adequacy and effectiveness of the contractor Quality Control program. The Quality Control inspection and testing frequency will be at the discretion of the Engineer based on results of Quality Control tests, evaluation of daily reports, audits of the Quality Control program and verification testing conducted by UNDP. Should information become available that indicates a potential problem, the Engineer will review in detail all pertinent information and order additional verification testing if necessary. Contractor Quality Control, verification, and acceptance testing plans set out the contractor's specific Quality Control testing and inspection pursuant to Specification and the relevant design specification.

### **8.1.1. INSPECTIONS**

The contractor shall establish a program for inspection of activities affecting quality and shall cover the construction site, including both onsite and offsite operations. Inspections shall be performed to verify compliance with documented instructions, drawings, procedures, and specifications as required by the contract. All inspections shall be documented by the Contractor as required by Technical Specification.

### **8.1.2. CONTRACTOR QUALITY CONTROL TESTING**

As required by the contract specifications, the Contractor shall establish a test program to ensure that all required testing is properly identified, planned, documented and performed under controlled and suitable environmental conditions. Testing shall be performed in accordance with written test procedures in the Quality Control Plan. Such test procedures shall incorporate or reference the requirements as contained in the contract technical specifications, codes, and industry standards. Per the Quality Control Plan, the contractor shall submit the test procedures to the Engineer for review and acceptance prior to their implementation. The contractor shall propose a materials testing laboratory as part of the work plan.

The Contractor shall be responsible for establishing a system of daily test reports that will record all Quality Control test results. Test results from each day's work period shall be submitted to the Engineer prior to the start of the next day's work period. When required by the Technical Specifications, the Contractor shall maintain statistical Quality Control charts. The Contractor's responsible technician shall sign the daily test reports. The Engineer will review test results on a daily basis and identify any nonconforming test results for discussion with the Contractor regarding potential corrective action.

## **8.2. CONSTRUCTION ACCEPTANCE CRITERIA**

Construction acceptance criteria for materials qualifications, inspection, and testing are established by Technical Specifications.

## **8.3. COMPLIANCE WITH HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY REQUIREMENTS**

The Engineer will inspect the construction contractor's activities to ensure technical compliance in identification, handling, storage, packaging, preservation, and delivery of materials, parts, assemblies, and end products. Related quality records and documents will be



maintained and controlled in accordance with the procedures provided in Section 7 of this Quality Control Plan.

#### **8.4. MATERIAL IDENTIFICATION AND TRACEABILITY**

The Engineer will monitor the construction Contractor to ensure that identification and traceability requirements are met. Products and materials shall be traced from receipt through all project stages to installation. Documentation such as project control checklists, material receipts, material tracking forms, procedures, sample and test documentation, and reports will ensure that the applicable material item traceability is maintained. Project Technical Specifications and/or procedures define product identification and traceability requirements,

### **9. CONSTRUCTION DEFICIENCIES**

This section provides procedures for tracking construction deficiencies (non-compliance) from identification through acceptable corrective action. It defines the controls and related responsibilities and authorities for dealing with noncompliant products or services.

#### **9.1. DEFICIENCY IDENTIFICATION**

Deficiency occurs when a material, performed work, or installation does not meet the plans and/or specifications for the project.

#### **9.2. QUALITY CONTROL DEFICIENCY IDENTIFICATION AND CONTROL**

When material, performed work, or installation is found deficient, the Engineer shall ensure that the non-conforming material, work, or installation is identified and controlled to prevent unintended use or delivery. The Engineer will notify the contractor of non-compliance with any of the foregoing requirements. The contractor shall, after receipt of such notice, immediately take corrective action. Minor deficiencies noted during test or inspection are to be verbally reported to the Contractor's representative and noted on the Daily Construction Report. Minor deficiencies are items that do not require significant rework or repair work to correct, and will not result in significant deviations from required quality standard if corrected immediately.

Control and disposition of such deficiencies shall be by the originator of the Daily Construction Report and the Contractor's supervisor responsible for the work and do not require formal action by UNDP or Engineer. Ideally, such minor deficiencies can be corrected on the spot by agreement with the Contractor's supervisor. Non-conformances are major deviations from the contract requirement and/or accepted standard of quality, which shall be formally documented for corrective action by the Engineer. Failure by the Contractor to correct a minor deficiency after having been put on notice will also result in a non-conformance if it is not corrected within 5 days of notification. A log shall be maintained for all Non-conformance reports. The Non-conformance report shall be distributed to the Contractor Quality Control Manager, UNDP Project Manager. The Engineer shall follow up on the Non-conformance report as required to verify that corrective action has been completed.

#### **9.3. NON-CONFORMANCE REPORT**

The Non-Conformance Report (NCR) is a formal notification to the contractor that work does not meet the plans or the specifications for the project. Any item of work found to be deficient - out of conformance with the construction drawings and/or specifications - will be identified by the Engineer on the nonconformance report as described in this section. Non-conformance reports will be included on the nonconformance log and tracked through verification that the non-conformance has been corrected.



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#### **9.4. QUALITY CONTROL DEFICIENCY CORRECTION**

When material, performed work or installation is found to be deficient and/or does not meet the project specifications, the Engineer will assure deficiency correction is implemented. The Engineer shall ensure that the non-conforming material, work or installation is identified and controlled to prevent unintended use or delivery. The non-conforming material or item shall be tagged and segregated by the construction Contractor, when practical, from conforming material or items to preclude their inadvertent use. If segregation is impractical or impossible because of the physical characteristics of the item or other reasons, the non-conformance tag shall be displayed prominently to preclude inadvertent use. The Engineer is responsible for documenting the non-conformance in a NCR as specified in Section 9.3, Non-Conformance Report. The Engineer and UNDP will implement corrective actions to remedy work that is not in accordance with the drawings and specifications. The corrective actions will include removal and replacement of deficient work using methods approved by the UNDP Project Manager. Removal shall be done in a manner that does not disturb work that meets Quality Control criteria; otherwise, the disturbed material shall also be removed and replaced. Replacement shall be done in accordance with the corresponding Technical Specifications. Replacement will be subjected to the same scope of Quality Control inspection and testing as the original work. If the replacement work is not in accordance with the drawings and specifications, the replacement work will be removed, replaced, re inspected, and re-tested.

#### **9.5. PREVENTIVE ACTIONS**

Preventive actions are to be taken to eliminate the cause of a potential non-conformity. Engineer shall take preventive actions as necessary to eliminate the causes of potential deficiencies so as to prevent their occurrence. Contractor's Quality Control Plans are to include quality improvement practices to continually improve construction practices and address quality problems at their source. The Engineer will monitor, inspect, and audit processes used to prevent erroneous information or construction products from being passed to the owner. The UNDP PM and the Engineer have the authority to implement, verify and review the project's preventive and corrective action effectiveness. They are empowered to improve the project's work processes to eliminate the causes of potential non-conformities.

### **10. DOCUMENTATION**

#### **10.1. DAILY RECORD KEEPING**

Project documents will be managed through a combination of a secure document filing and storage system and a computerized document tracking system. Sufficient records shall be prepared and maintained as work is performed to furnish documentary evidence of the quality of construction and laboratory analysis and of activities affecting quality. The Engineer shall maintain a daily log of all inspections performed for both contractor and subcontractor operations. The Daily Inspection and Daily Test reports shall be signed by Engineer. The Engineer shall be provided at least one copy of each daily inspection and test report on the work day following the day of record.

#### **10.2. DAILY CONSTRUCTION REPORT**

A daily construction report will be prepared and signed by the Engineer. The report will include a summary of the contractor's daily construction activities. Supporting inspection data sheets will be attached to the daily report where needed. At a minimum, the daily construction report will include the following information:



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- a) Date, project name, location, and other identification
- b) Description of weather conditions, including temperature, cloud cover, and precipitation
- c) Reports on any meetings held and their results
- d) Record of visitors to site
- e) Locations of construction underway during that day
- f) Equipment and personnel working in each activity, including subcontractors
- g) Descriptions of work being inspected
- h) Decisions made regarding approval of units of material or of work, and corrective actions to be taken
- i) Description of problems or delays and resolution
- j) Communications with contractor staff
- k) Construction activities completed and/or in progress
- l) Progress photos, where applicable
- m) Signature of the report developer

### **10.3. INSPECTION AND TESTING REPORT FORMS**

Report forms will be completed for inspections and tests conducted. The forms vary depending on inspection or test type. These forms include:

- a) Description or title of the inspection activity
- b) Location of the inspection activity or location from which the sample was obtained
- c) Recorded observation or test data
- d) Results of the inspection activity
- e) Personnel involved in the inspection activity
- f) Signature of the inspector

### **10.4. RECORD DRAWINGS**

The Contractor will submit draft record drawings to the UNDP Project Manager and the Engineer for review and prepare final record drawings based on UNDP Project Manager and Engineer's comments. The draft record drawings shall be submitted on one set of CD-ROM disks. Record drawings submitted on CD-ROM shall be the latest version of AutoCAD by Autodesk Inc.



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## **FUNDING FACILITY FOR EXPANDED STABILIZATION**

# **RECONSTRUCTION AND REHABILITATION OF JAPANESE BRIDGE IN ANBAR GOVERNORATE, IRAQ**

### **Section 3**

#### **6 PART 6: UNDP'S GENERAL TECHNICAL SPECIFICATIONS FOR BUILDING WORKS**

##### **6.1 GENERAL TECHNICAL SPECIFICATIONS FOR BUILDING WORKS**

In accordance with clause 2.15 previously mentioned under part 2 of this document, the works shall be carried out in accordance with **UNDP's General Technical Specifications for Building Works**, which is **available upon request** and as summarized below:

- 1 SECTION 1 – GENERAL REQUIREMENTS**
  - 1.1 GENERAL TECHNICAL SPECIFICATIONS
  - 1.2 MARKINGS



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- 1.3 PACKING AND SHIPPING
- 1.4 SERVICE CONDITIONS
- 1.5 ELECTRICAL SYSTEM CONDITIONS
- 1.6 CONTRACT MANAGEMENT
- 1.7 WORKING PRACTICES
- 1.8 QUALITY ASSURANCE REQUIREMENTS
- 1.9 DRAWINGS
- 1.10 INSPECTIONS AND TESTING
- 1.11 CO-ORDINATION AND MEETINGS
- 1.12 PROJECT COORDINATION
- 1.13 SUBMITTALS
- 1.14 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
- 1.15 CONTRACT CLOSE-OUT
- 1.16 CLEANING
  
- 2 SECTION 2 - BUILDING DEMOLITION**
  - 2.1 GENERAL
  - 2.2 BUILDING DEMOLITION
  - 2.3 HAZARDOUS MATERIALS
  
- 3 SECTION 3 - GROUND INVESTIGATION**
  - 3.1 GENERAL
  - 3.2 BOREHOLES
  - 3.3 PITS AND TRENCHES
  - 3.4 SOIL SAMPLING
  - 3.5 IN SITU TESTING, INSTRUMENTATION AND MONITORING
  - 3.6 LABORATORY TESTING
  
- 4 SECTION 4 – PILING WORKS**
  - 4.1 GENERAL REQUIREMENTS FOR PILING WORK
  - 4.2 GENERAL REQUIREMENTS FOR CONCRETE PILES
  
- 5 SECTION 5 - CONCRETE**
  - 5.1 GENERAL
  - 5.2 AGGREGATES
  - 5.3 CEMENT
  - 5.4 WATER
  - 5.5 ADMIXTURES
  - 5.6 PROPERTY REQUIREMENTS
  - 5.7 BATCHING AND MIXING
  - 5.8 TRANSPORTATION AND PLACING OF CONCRETE
  - 5.9 FORMWORK
  - 5.10 CURING
  - 5.11 REINFORCEMENT
  - 5.12 JOINTS
  - 5.13 INSPECTION AND TESTING OF HARDENED CONCRETE
  - 5.14 PROTECTIVE TREATMENTS FOR CONCRETE
  - 5.15 HOT WEATHER CONCRETING
  - 5.16 MISCELLANEOUS
  - 5.17 TESTING OF WATER RETAINING STRUCTURES
  
- 6 SECTION 6 - UNDERGROUND WORKS**
  - 6.1 GENERAL
  - 6.2 SITE CLEARANCE



- 6.3 EARTHWORKS
- 6.4 ASPHALT WORKS
- 6.5 KERBS, FOOTWAYS AND PAVED AREAS
- 6.6 ROAD LIGHTING
- 6.7 ROAD DRAINAGE
- 6.8 MISCELLANEOUS
  
- 7 SECTION 7 - SEWERAGE**
  - 7.1 GENERAL
  - 7.2 EARTHWORKS
  - 7.3 PIPES AND FITTINGS MATERIALS
  - 7.4 PIPELINE INSTALLATION
  - 7.5 PENSTOCKS AND APPURTENANCES
  - 7.6 METAL WORKS
  - 7.7 GLASS REINFORCED PLASTICS
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**PART END**



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## **FUNDING FACILITY FOR EXPANDED STABILIZATION**

### **RECONSTRUCTION AND REHABILITATION OF JAPANESE BRIDGE IN ANBAR GOVERNORATE, IRAQ**

#### **Section 3**

##### **7. PART 7: DRAWINGS**