

Section 2: General Specifications

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PART 1. SCOPE OF WORKS

1. GENERAL

The Project

The project refers to Construction and Operation and Maintenance works required in order to provide shore area protection measures around two hotels located along the western bank of Pan 5, a large industrial evaporation pan operated by Dead Sea Works Ltd. (DSW) under a concession granted by the Israeli Government in Israel's Dead Sea area.

In the framework of Pan 5 operation, the water level in the pan rises annually by about 20 cm, with the attendant threat of flooding and subsurface penetration of water into the hotels' tourist and recreation facilities. The project thus includes the provision of a dewatering system in order to lower the groundwater level at the site of the hotels.

Project Location

Both hotels are located in the Hamei Zohar area, some 100 km southeast of Jerusalem at the southern basin of the Dead Sea. The hotels are the Leonardo Plaza (referred to hereinafter as "Moriah"), and Leonardo Club (referred to hereinafter as "Nirvana").

Topography and Relief

The Dead Sea is situated in a 15 km wide valley that constitutes a major part of the regional Rift Valley known as the Syrian-African (Transform) Fault. The valley, at an elevation of about -400 m, constitutes the lowest land area in the world. The Dead Sea area is divided into two basins – a shallow southern basin and a deep northern basin. Pan 5 and the project area are located on the western side of the southern basin.

The water level in Pan 5 is currently at an elevation of about -371.7 m (+13.7 m according to the system used by DSW). The role of Pan 5 is to precipitate the high content of salt (NaCl) in the water and concentrate the solution with carnallite, which is the raw mineral source for producing potash, DSW's main product. The solution is then conveyed to the next evaporation pond for further concentration and eventual precipitation of the carnallite.

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Climate

The Dead Sea is known for its unique climatic conditions. The area enjoys 330 sunny days annually, offering practically year-round sunny skies. Annual rainfall is less than 50 mm, the air is dry, temperatures are consistently high and pollution is low.

Average summer temperatures range from 32°C to 39 °C (90–102 °F). Average winter temperatures range from 20 °C to 23°C (68–74 °F).

The region has weakened ultraviolet radiation and an atmosphere characterized by high oxygen content due to the high barometric pressure (800 mm Hg.).

Geology of Moriah and Nirvana Hotel Area

The geology of the Moriah and Nirvana hotels is described in detail in the "General Design of Dewatering for Moriah and Nirvana Hotels – Background Information for Tender" report.

Groundwater

Groundwater in the area is very saline and viscous, with a density of up to 1.25 kg/l. TDS values range from 350 g/l to 620 g/l, and H₂S values are as high as 80 mg/l. Because of the high groundwater salinity, high temperatures and presence of dust, the environment is highly corrosive for all equipment. The Contractor must pay special attention to this factor, and take all necessary precautions to protect his equipment as far as possible.

The chemical composition of Pan 5 water and adjacent groundwater is presented in Table 1.

Table 1: Chemical Composition of Pan 5 Water and Adjacent Groundwater

Location	Density	Na	K	Mg	Ca	Sr	Cl	Br	SO ₄	HCO ₃	TDS	T°C
Pan 5	1.248	27,025	8,860	53,943	20,918	407	238,444	7,045	257		356,900	14
Pan 5		24,224	9,255	55,806	22,106	407	248,734	7,077	142		367,891	
Pan 5		14,200	8,400	51,250	19,900	370	235,210	6,350	400		350,080	
Groundwater	1.227	43,853	16,142	95,658	37,031	681	423,345	11,634	360		614,704	32
Groundwater	1.245	31,427	10,155	60,918	23,914	452	275,589	8,221	324		411,015	14
Groundwater	1.245	31,317	10,014	59,400	23,095	444	268,980	7,967	412		401,629	14
Dead Sea (North basin)		39,700	7,590	42,430	17,180		219,250	5,270	420	220	332,060	

2. DESCRIPTION OF THE WORKS

Goal of the Project

The goal of the project is to provide an immediate complete dewatering solution for the Moriah and Nirvana hotels. The works shall be executed in such manner as to ensure the continual work of the existing dewatering system while the new highly intensive dewatering system is being erected, until the new system is operational.

Project Works

The project works include the provision of a complete dewatering system for the Moriah and Nirvana hotels, comprising the following:

- Study of the project and the requirements
- Coordination and achieving requested permissions from relevant authorities and stakeholders
- Contractor mobilization and possession of site
- Commissioning, receiving and operation & maintenance (O&M) of existing dewatering system for the two hotels as described in the Particular Specifications.
- Drilling of new wells
- Installation of measuring equipment(instrumentation), monitoring and reporting to the Consultant on the results of hydraulic and hydrologic tests
- Construction, Operation and Maintenance of a limited temporary dewatering system at the Nirvana Hotel.
- Construction of the new dewatering systems, comprising construction of wells, supply, installation and running-in of pumping equipment, supplying and laying of piping system of evacuated water, supply and installation of electrical equipment
- Design and providing of automatic control systems and control rooms for monitoring and control of pumping, electrical and piping equipment
- Site reinstatement
- O&M of existing and new dewatering systems during Construction Period and 5-year Operation and Maintenance Period.

3. WORKS METHODOLOGY

Due to the urgency of the situation at the Moriah and Nirvana hotels, as well as uncertainties regarding hydrogeological conditions, the project approach is based on the principle of "design whilst constructing". The process includes construction and design in several phases, detailed below for both hotels. The phases are as follows:

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Phase 1

Commissioning (taking over operation and maintenance) of existing dewatering systems

Phase 2.

2.1. Nirvana:

- Drilling and testing 11 primary dewatering wells and 6 piezometers wells.
- Supply and construction of temporary discharge pipes 4” to Pan 5
- Disconnection of all operating wells.
- Connection of N2 and N4 with temporary 4” discharge pipes directly to Pan5.
- Emptying existing collector (method to be proposed by contractor)
- Installation of 21-9=12 new connections (9 connections exist already). Provide possibility to connect 2 wells per connection to collector. On the 9 existing connections: provide possibility to connect second well .
- Connect 2 productive primary wells in the neighborhood of N2 and N4 to the 4” temporary discharge pipe, together with N2 and N4.
- Providing temporary power supply by mobile diesel generator to 4 temporary pumps.
- Start temporary dewatering by operating 2 productive primary wells, N2 and N4, with the manual control.
- Operation and maintenance of temporary dewatering
- Installations of electricity infrastructure

2.2. Moriah

- Drilling and testing 15 primary dewatering wells and 6 piezometers wells
- Installation of collector diameter 400 mm. .
- Installation of connections at distances up to 50 meter. Provide possibility to connect 2 wells
- Connect productive primary wells to collector
- Installations of electricity infrastructure including electricity and control room

Phase 3

Determination (by the Consultant) of supplementary wells to be added to complete the dewatering system, and issuing instructions to the contractor accordingly.

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Phase 4

Drilling and testing of supplementary wells, on locations instructed by the Supervisor.

Phase 5

Final design by the Consultant of the complete dewatering system, based on all well tests. This final design comprises among others the following elements:

- Pumps and accessories
- Well heads
- Equipment of access chambers
- Control panel with alarms
- Discharge utilities
- Monitoring system elements
- Power back-up system

Phase 6

Supply and installation of the remaining components of the system

Phase 7

Running-in and adjusting of the dewatering system

Phase 8

O&M of the entire dewatering system during the 5-year Operation and Maintenance Period

Work Sequence for the Nirvana Hotel

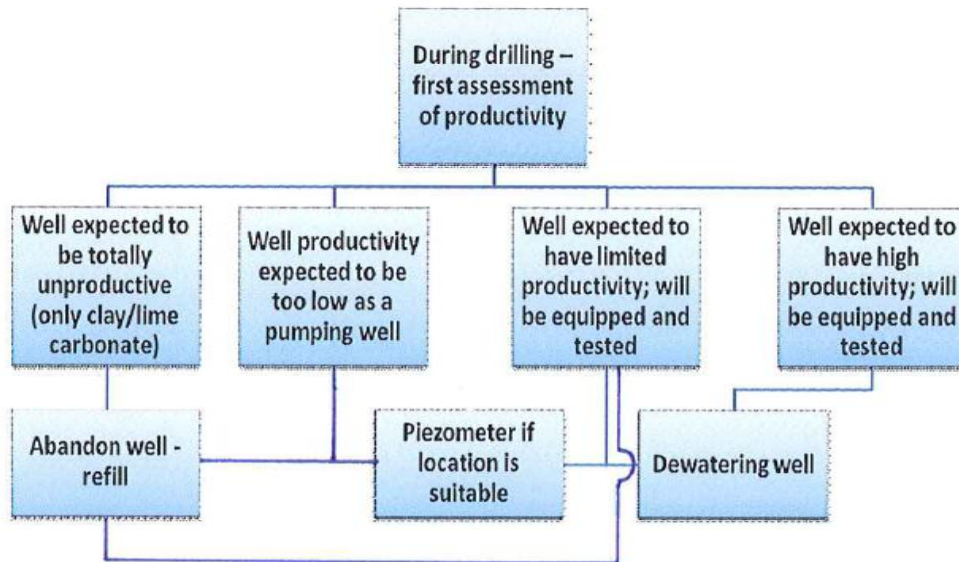
- **Phase 1:**
 - Prior of the beginning of any works, the Contractor shall carry out the process of commissioning and taking-over of full responsibility for O&M of the electro- mechanical components of the existing dewatering system.
 - Upon successful termination of the Commissioning Process, complete responsibility for running and O&M of the existing dewatering system shall be entrusted to the Contractor, including manpower, spare parts, lubricants, repairs, etc. The full description of the Commissioning Process is stated in the Particular Specifications, Section 3.
- **Phase 2:**
 - Start of drillings at the intervals of about 50 m (11 wells)

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- * **The shown locations of the primary and supplementary drilling of dewatering wells and piezometer wells are informational only and cannot be used for any measurement or calculations.**

The exact locations of wells will be defined by Consultant.

- The length of the loop is about 625 m. The average expected depth of the wells is 25 m, with a maximum depth of 30 m.
- Considering the results of the drilling, the decision for installation of the pumping and measuring equipment shall be made by the Consultant, according to the following procedure:



- Drilling of 6 piezometers wells in areas, covered by the loop of the pumping wells. Exact location will be determinate by the Consultant.
- Dismantling of the existing electrical installation, construction of the auxiliary buildings , installation of trenches with power and control cables to all pumping wells and piezometers.
- Well testing shall start and continue as the drilling program advances; the testing program shall be performed in parallel with the drilling program, using two test sets.
- Installation of 12 (21 – 9 already existing) new connections in 4” on the existing DN 400 collector
- Instalations of electricity infrustrucurte
- **Phase 3:**
 - Install temporary dewatering pumps in 2 productive wells of primary stage and N2 and N4, start temporary dewatering.
- **Phase 4:**

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- During drilling and testing of the supplementary wells at the Nirvana Hotel, the Consultant shall analyze well testing results, and take a decision about the number and the location of the supplementary wells.
- According to the Consultant's instructions the Contractor shall begin drilling supplementary wells at the Nirvana Hotel. The expected number of the dewatering wells is 25 per each Hotel. However if the productivity of the constructed wells is not sufficient the total number of the wells shall be increased to 50 per each Hotel.
- **Phase 5:**
 - The Consultant shall concurrently analyze and use data from the Nirvana Hotel well testing as input for a refined local 3D groundwater model.
 - The Consultant shall determine the pumping regime in order to reach the target levels. This includes both the target level settings in the individual wells, and the corresponding discharges per well.
 - Based on pumping regime the Consultant will prepare the final design for the construction of the whole dewatering system.
- **Phase 6:**
 - Based on this pumping regime, the Contractor, shall prepare construction drawings of all components of the dewatering system, except for wells that are already installed. This will among others include pumps and accessories, well heads, access chambers, collectors, control panel with alarms, discharge utilities, monitoring system elements, power backup system, etc., while taking into account their functionality and their role in the system as a whole.
 - The construction drawings shall be submitted to the Consultant for approval; and any changes in design shall be incorporated by the Contractor. Such changes are part of the contractual obligations of the Contractor, and shall not be the cause of changes in the Contract Price or Time Schedule.
 - The Contractor shall provide and install all remaining components of the whole dewatering system in accordance with the final design as stated above. The works shall include, but not be limited to supply and installation of pumps and accessories, well heads, access chambers, control panel with alarms, discharge utilities, monitoring system elements, power back-up system, control system, equipment of the control room, etc.,
 - The Client reserves the right to issue an Order to Commence Phase 6 within a month of the end of Phase 5, at no additional cost to the Client.
 -
- **Phase 7:**
 - Running-in and adjusting of the Nirvana Hotel dewatering system
- **Phase 8:**
 - During the Construction Period, as well as the 5-year Operation and Maintenance Period following the Construction Period and

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Commissioning of the Project, the Contractor shall undertake sole responsibility for running and O&M of the entire dewatering system.

Work Sequence for the Moriah Hotel

The work sequence for the Moriah Hotel is similar to that described above for the Nirvana Hotel. Work at the Moriah Hotel will be conducted in parallel to the drilling and testing program at the Nirvana Hotel. The collector to be installed is new. The collector works start together with the drilling program.

At the end of Phase 5 at Moriah, a decision regarding the necessity of a vacuum system shall be made by the Consultant.

4. WORKS SCHEDULE

The Construction Period for the Project is eleven (11) months and will comprise the following milestones:

4.1 Order to Commence : (One month from Contract Awarding).

During this period the Contractor will prepare and submit to the Client the detailed Work Plan for both of the Hotels, including updated methodology of works, specifications for the proposed materials and will obtain all necessary approvals,

4.2 Mobilization Period : 2 months (Three month from Contract Awarding)

During this period the Contractor will erect the Construction Yard, including workshop, offices, stores and other facilities as stated in Part 2, will supply all necessary materials , tools and machinery. At this stage the Commissioning Process of the existing dewatering systems will take place and Operation & Maintenance of the said systems will start.

4.3 Main Construction Period : 4 months (seven months from Contract Awarding)

During this period all Stage 1 dewatering and monitoring wells and their equipping, collectors and connections, as well as all electrical ducts , manholes and electrical structures will be completed. At this stage supplementary wells (Stage 2) will be drilled where needed as per Consultant's recommendations. This period is strictly limited by the following dates: November, 1st 2012 to March 21st 2013.

4.4 Additional works period : 3 months (ten months from Contract Awarding)

At this stage the following activities will be conducted:

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Installation of power and control equipments, including switchboards, cabling, connectors, starters, sensors, transmission equipment and monitoring command and control systems, connections to the grid etc.

Installation and connection of diesel generators and transformer at Moriah Hotel.
Connections equipping of the supplementary wells.

4.5 Running in and Final Tuning Period : 1 month (ten months from Contract Awarding)

During this period Contractor will run in all dewatering system's components and will perform the final fine tuning of the comprehensive system and will carry out the commissioning process to the Client.

4.6 Operation & Maintenance of the Dewatering System

During five years from the final commissioning the Contractor will conduct all operation and maintenance activities for the entire dewatering systems in the two hotels.

PART 2: GENERAL SPECIFICATIONS

1.1.1 COMPLIANCE WITH STANDARDS

The design, materials, manufacture, testing, inspection and performance shall conform to the latest current IS/ISO Standard, where applicable, and recognized national standards approved by the Consultant. Where particular standards have been specified, other standards will be approved only where they are at least equivalent to the specified standard. The Contractor shall provide a copy of any such standard, if so requested.

The Specifications shall prevail where its requirements conflict with or exceed those of any Standard. For applications where no relevant Standard exists, up-to-date recognized good practice shall apply, to the approval of the Consultant.

1.1.2 DRAWINGS

1.1.2.1 General

The whole of the Works shall agree in all particulars with the levels, dimensions and details contained in the Construction Drawings.

The Contractor shall carefully check the Drawings supplied to him and shall bring any errors or discrepancies discovered therein to the attention of the Consultant, who will issue the necessary instructions for corrections.

Where dimensions and levels are shown on the Drawings or mentioned in the documents forming part of or issued under the Contract, these shall be verified by the Contractor on the site and the Contractor shall be held responsible for pointing out promptly any errors or discrepancies in such dimensions or levels. The Consultant will issue the necessary instructions for corrections.

Failure to discover and/or to notify the Consultant of any errors or discrepancies in the Drawing shall not relieve the Contractor of the responsibility for unsatisfactory work or faulty construction resulting therefore nor from the obligations of rectifying and making good such works or construction at his own expense and to the complete satisfaction of the Consultant.

1.1.2.2 Bid Drawings

Bid Drawings are the drawings prepared by the Client's Consultant for the purpose of the Bid and furnished to the Bidders together with the other Bid Documents. The Bid Drawings show all relevant features of the works in sufficient detail to enable the Bidder to assess correctly the nature and scope of the work requested from him and to price the Bills of Quantities forming part of the Bid Documents. The Bid Drawings could also be used for the construction of the works subject to Clause 1.1.2.3.

1.1.2.3 Construction Drawings

Construction Drawings are Bid Drawings confirmed for construction or any revisions to Bid Drawings and the drawings to be prepared by the Contractor for the purpose of construction of the works.

The Construction Drawings shall be prepared by the successful Bidder on the award of the Contract and thereafter in the course of construction and shall be binding on him in the performance of the works, after their approval by the Consultant.

Construction drawings to be provided by the contractor amongst others are:

- Cross section well equipment (components installed in the drill hole and in the well casing)
- Plan view and cross sections of the well heads
- Plan view and cross sections of the access chambers
- Electrical drawing and pipes drawing including system coordination
- Construction drawing of the electrical room and all other auxiliary structures

The Contractor shall not be entitled to any extra payment or compensation, apart from payment for the quantities of work actually done, because of any deviation of the final Construction Drawings from the Bid Drawings.

1.1.2.4 Additional Construction Drawings

The Consultant may at any time during the Contract period issue such additional Construction Drawings as he may deem necessary for the proper performance of the works.

1.1.2.5 Records and As-Made Drawings

After the work has been completed and prior to obtaining the Certificate of Completion, the Contractor shall furnish "as-made" drawings prepared during construction, showing the works as constructed, together with all other

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information that may either be required or be useful for the O&M of the works in the future.

For the purpose of preparing the "as-made" drawings, the Contractor shall, where possible, use reproducible copies and computerised formats of the Construction Drawings supplied by whoever prepared the original Drawings.

1.1.2.6 Drawings and Documents to be Returned

Before issuing the Final Certificate, the Contractor shall return to the Consultant all Drawings, Specifications, Bills of Quantities (BOQs) and any other documents which may have been supplied to the Contractor for the purpose of the Works, if so required by the Consultant.

1.1.2.7 Drawings Format

a. General

All drawings shall be drawn on the International Standards Organization (ISO) 'A' Series of Drawing Sheets. Drawings shall comply with IEC 617 and ISO 3272.

b. Title Box

The Contractor's or his subcontractors' title box shall show his name, the date, the title and number of the drawing and each new issue of the drawing shall be identified by a revision letter as part of the drawing number. In addition, each drawing shall show the following details:

- Name of the Client
- Name of the Project
- Contract Designation

c. Numbering System

The primary reference to drawing numbers on all drawings, correspondence, O&M instructions and elsewhere shall be the number from the Client's numbering system which system shall be notified within one month of the Commencement Date.

All drawings presented by the Contractor or any of his subcontractors at any time to the Consultant, Client or their representatives shall have an Client drawing number allocated by the Consultant. This number shall be prominently displayed in the title box and added by the Contractor. All references on drawings to other drawings shall be by the Client's drawing number.

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The Contractor may apply his own numbering including inserting his drawing number in the appropriate place on the title box and using the number as a secondary reference in correspondence.

d. Quality

Preliminary and final drawings shall be submitted in the form of reproducible drawings from which legible dyeline prints may be produced.

All drawings shall be clear and legible. As-made drawings shall be of a quality suitable for reprinting.

As-built drawings presented by the Contractor in accordance with the Specifications shall be the original drawings made by in non-fading ink on a white hard plotting paper with density not less than 80g/cm² without any folds.

Drawings prepared by means of computer-aided drafting (CAD) shall comply with the following requirements:

- All drawings prepared by the Contractor or his subcontractors shall be to a common CAD system.
- CAD system software shall be of kind and version as approved by the Consultant.
- CAD drawings shall be no larger than A1 size

Text size shall not be less than 1.5 mm (height) for A2 drawings and 2.5 mm (height) for A1 drawings.

Electronic files shall be submitted in a format approved by the Consultant.

e. Drawing Indexes

The Contractor shall compile drawing indices for all drawings produced by him and his subcontractors, giving the Client's and manufacturer's drawing number, title, revision, approval status, together with reference number and date of all relevant correspondence. The Contractor shall submit three up-to-date copies of each sheet of the index to the Consultant at three-monthly intervals or on request by the Consultant.

1.1.3 SURVEYING

All measurements/survey/map preparation shall be done in accordance to the Israeli surveying Code.

1.1.3.1 Benchmarks

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Prior to the commencement of the work, the Contractor shall provide a number of benchmarks (BM) located on the site(s). Before starting any work, the Contractor shall check the benchmarks in the presence of the Supervisor and shall notify the Consultant of any error or misalignment which may be discovered during such checking.

1.1.3.2 Preservation of Benchmarks

Benchmarks shall, where possible, be preserved, or else be relocated. Where benchmarks could be destroyed, they shall be accurately referred to permanent concrete reference points before work is commenced.

The coordinates and levels of all benchmarks shall be checked by the Contractor at bi-monthly intervals and the Contractor should immediately notify the Supervisor whether or not there are any discrepancies.

1.1.3.3 Setting Out

The Contractor shall then reference these benchmarks with permanent beacons of a type approved by the Consultant. Each point shall have not less than three reference beacons which shall be placed where they will not be disturbed by the Works and the method of referencing shall be agreed with the Consultant. The Contractor shall supply the Consultant with records in an approved form including such drawings, sketches, measurements and reference as may be necessary for the location or relocation of relevant points and shall keep such records up to date by formal notice to the Consultant. The reference beacons shall be used as benchmarks and their levels shall be agreed with the Consultant.

1.1.3.4 Agreement of Topography

Prior to commencing any work, the Contractor shall check, and where necessary, survey the topography of the site of the said work and shall inform the Consultant of the results. The agreed topography shall be used in the calculation of quantities.

1.1.4 WORK MONITORING

1.1.4.1 Contractor's Work Programme

A Programme for the performance of the works as a whole and showing the proposed construction schedule shall be submitted by the Bidder with his Bid.

Within fourteen (14) days after acceptance of the Bid, the Contractor shall submit a comprehensive work programme, showing in detail the order in which the

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various parts of the Works are to be constructed, with dates of commencement and completion and, where necessary, intermediate stages of works and the dates thereof. The work programme shall be drawn using a suitable computer software, and shall be submitted in two (2) hard copy format and a computerised media format, all as instructed by the Consultant.

The Contractor shall pay particular attention to provide the details of the dates on which he will require the delivery plant materials, pipes and accessories for drilling, pipe laying and all electrical and mechanical parts that will be built in or could otherwise affect the progress of his work. The said programme shall take into account the approved holidays during which the engagement of the hotels will be highest.

After approval by the Consultant, the work programme shall be binding on the Contractor. Changes in the programme may be made by the Contractor only after prior approval has been obtained from the Consultant, which approval shall not be reasonably withheld.

The programme shall fully take into account and allow for the need to coordinate procedures to allow for construction of Civil Construction works, erection and installation of mechanical and electrical works and equipment when being provided under other Contracts in a methodical manner.

The Consultant shall be entitled at any time to demand changes in the work programme as he deems necessary for the proper and expedient performance of the works.

1.1.4.2 Progress Reports and Meetings

By the end of the first week of each month the Contractor shall submit a progress report to the Supervisor. The report shall show progress to the end of the preceding month, with respect to the approved Contract programme.

The report shall show the position of all activities required under the Contract: design, drawings, procurement, manufacture, works tests, delivery, erection, testing and commissioning. Any delay shall be detailed by the Contractor, together with the proposed action to overcome the delay.

The Supervisor shall arrange for periodic (regular) and special meetings to consider the progress of the Contractor and/or for liaison with other contractors. The responsible representatives of the Contractor shall attend all such meetings.

1.1.4.3 Daily Reports

The contractor shall provide to the Supervisor the Daily Report, in which it will be stated:

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- Presence of the Staff and Equipment at every working place
- Beginning and finish the works
- Nature and volume of the works done in each site
- Weather conditions
- Goods and Materials, received in Site
- Tests and measurements done at each Site

1.1.4.4 Method Statements

In addition to the requirements of the Contractor's Programme the Contractor shall provide to the Consultant, fourteen (14) days before commencement of the particular operation or work, a detailed method statement of any operation or work which affects the operation of existing works or requires extensive interfacing with the Client.

Each method statement shall comprise a step-by-step schedule of specific operations and activities with descriptions, dates, times and durations for each step. It shall highlight specific points in the programme and include contingency plans for emergency reinstatement of construction plant including "point of no return" and "earliest start time" of modified or new measures. The statement shall clearly state who and what organisation shall carry out work and precisely when and what support or provisions are to be provided by others outside the Contract. The statement shall be supported by sketches, diagrams or other supporting details to enable a clear understanding of the method and significance of each step of work or operation.

1.1.4.4 Photographs

The Contractor shall provide and include in his Bid price for progress photographs as, when, and where, directed by the Supervisor, at intervals of not more than fifteen (15) days. The photographs shall be sufficient in number and location to record the exact progress of works. The photographic records shall include the Works during manufacture, factory assembly, delivery, erection, commissioning and rectification of major assemblies or components and as required by the Supervisor.

The Contractor shall provide digital pictures with resolution not less than 1024 X 768 pixels with date when the photograph was taken. If requested, prints shall be made on a variable contrast paper.

The photographs shall be adequately edited and provided with captions and descriptions to the satisfaction of the Supervisor.

A volume of photographs shall be included with the O&M manuals. The Contractor shall provide the Supervisor with copies of all photographs included in

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the O&M and erection instructions. The digital photographs have shall be in a computer handling format as approved by the Supervisor.

1.1.5 CONTRACTOR'S STAFF

1.1.5.1 General

The Contractor shall employ on the Site only qualified professional persons who have permissions to work according to the Law.

1.1.5.2 Project Management

The specific responsibilities of the Project Manager (PM) on behalf of the Contractor shall be as follows:

- Representation on behalf of the Contractor in all commissioning processes, discussions, correspondence and matters relating to the Works.
- Coordination and monitoring of the Contract progress, which shall include the updating of the Contract Programme, monitoring of progress and submission of monthly Progress Reports. At the discretion of the Consultant, regular meetings shall be called at which the PM shall give a full account of the Contract progress and programme.
- Coordination and checking of designs, drawings and submissions. The PM shall be responsible for coordinating the design, technical information and data submitted to him by his subcontractors. All calculations, drawings and information submitted to the Consultant shall be checked by the PM and certified as having been checked before submission.
- Contract communication between the Consultant, Supervisor and the Contractor. The PM shall attend all meetings involving the Contractor, Supervisor and the Consultant, and shall have full delegated authority on behalf of the Contractor.
- Coordination and programming of factory tests, and the submission of Test Certificates.
- Coordination and programming of delivery of goods and materials and equipment.
- Coordination and programming of installation of goods, material and equipment on site, Site Tests and Take-Over Trials.
- Production of detailed Method Statements of any work which involves or affects the performance of existing equipment, processes, or connections to or disruption of existing supplies or services.
- Coordination and preparation of Working and Record Drawings and O&M Manuals.
- Preparation and coordination of training of the Client's personnel.
- Submission of Payment Valuations and Claims.

1.1.6 CONTRACTOR'S FACILITIES

1.1.6.1 Contractor's Equipment

All Contractors' equipment used in the performance of the works shall be of such type, size and of such method of working as the Supervisor approves. If for any reason whatsoever the Supervisor shall be of the opinion that any excavator, mechanical digger, roller, drilling rigs, concrete mixer, vibrator, welder or other machine or appliance employed or proposed to be employed by the Contractor for the purpose of the works shall not be used, or that any such machine or appliance as aforesaid is unsuitable for use in the Works or any part of them, then such equipment shall be immediately withdrawn from use. In particular the Supervisor may prohibit or suspend the use of machinery which in his opinion is likely to: remove more material than is necessary; damage or render unsuitable any structure; break or damage pipes, conduits, cables or any other property or work of any kind. Similarly, the Supervisor may prohibit use of machinery causing a nuisance by noise or otherwise.

Any change of the method of performing the work as a consequence of such order shall be at the cost of the Contractor who shall have no cause for claim against the Client on account of having to carry out the work by different methods or for the idleness or removal of any constructional plant.

The cost of providing Contractor's Equipment for all purpose shall be uniformly spread over all the items of the Bill of Quantities.

1.1.6.2 Contractor's Yard

The Contractor's yard(s) shall be use by the Contractor for his equipment, offices, stores, plant, workshops, latrines, and messing accommodation. The erection of temporary buildings or structures on the site will not be allowed without the permission in writing of the Supervisor.

At the beginning of the Contract the Contractor's yard(s) shall be fenced off. By the end of period of Maintenance the area and its environs shall be cleared of all construction equipment, materials, buildings and the like and shall be re-graded and reinstated as directed by the Supervisor.

1.1.6.3 Building for Temporary Use by the Contractor

The Contractor shall maintain, in perfectly usable and watertight condition, such temporary and permanent buildings as required for the performance of the Works. These shall include accommodation for his employees and the stores for

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construction materials and tools, pipes and accessories, etc. Before erecting any structure for his temporary use the Contractor shall present the necessary drawings, showing its location and nature, to the Supervisor for his approval. Prior to Bidding, The Contractor must ascertain all the requirements for the above.

1.1.6.4 Temporary Sanitary Conveniences

The Contractor shall provide all proper sanitary conveniences for his staff and labourers at the various sites of works. The conveniences shall be disinfected with lime or otherwise any organic and inorganic refuse produced at the works shall be removed and disposed of by the Contractor in such manner and in such places as may be directed by the Supervisor from time to time. All arrangements shall be submitted to the Supervisor for approval and may be modified by him from time to time as he deems necessary.

1.1.6.6 Fire fighting Equipment

Fire fighting equipment shall be provided by the Contractor and maintained on site to deal with any outbreak of fire. All possible precautions shall be taken to provide for the safe storage of petroleum, explosives, gas bottles and all other dangerous materials.

Permits shall be obtained for the storage of such materials wherever this is required by the regulations of the competent authorities.

1.1.6.7 First Aid Equipment

The Contractor shall provide and maintain on the site first aid equipment comprising the following:

- Complete first aid kit with medicines, bandages, spirit, iodine, etc.
- Motor car to be always available for emergency transportation.
- Stretches for carrying injured persons are to be provided and maintained at the site.

1.1.6.8 Construction Safety, Signs and Barriers

The Contractor shall obey all the statutory safety regulations and trade requirements throughout the time of his possession of the site, from site hand-over to the end of the Operation and Maintenance Period.

The Contractor shall employ safety deputies to enforce safety regulations. Staff and visitors shall be provided with protective measures as deem by the type of work and work conditions, including helmets, eye shields and goggles, protective gloves and mittens, protective boots, etc.

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The Contractor shall erect construction safety signs and barriers as and where directed by the Supervisor. The signs and barriers shall be maintained in good condition and kept clean at all times.

All the places where work is being carried out shall be enclosed by suitable barriers, fence or other means as approved by the Supervisor to avoid entrance of unauthorised persons or animals. Such barriers, fences etc. shall be placed at a safe distance from the work to safeguard against falling debris, collapse of false works and scaffoldings, etc. The Contractor shall provide barriers and warning boards advising of danger and prohibiting access to the site. Barriers and fencing shall be illuminated during night time and watched by the Contractor at all times.

1.1.6.9 Project and Direction Signboard

The Contractor shall provide, erect, and maintain adequate signboards at locations to be determined by the Supervisor. The project signboards shall be 120 cm high and 240 cm wide and shall be lettered according to instructions issued by the Supervisor. Direction signboards shall be erected in sufficient numbers, as instructed by the Supervisor.

1.1.7 SUPPLY OF GOODS

1.1.7.1 Requirement of Specifications, Standards, Brand Names

The Contractor shall fulfil all requirements and obligations under all Clauses of the Specifications. Neither the following clauses of these specifications, any descriptions therein, nor the quantities, shall limit the obligations of the Contractor under the conditions of contract.

All ISO, Israeli, or other Standards (including Codes of Practice) mentioned herein shall be deemed to form part of these specifications. All references to such standards shall be to the latest edition or revision thereof unless otherwise stated. Where a specific Israeli or other standard is referred to in these specifications, another standard will be acceptable, provided that it ensures a quality of material and workmanship equal to or better than the Standard referred to. If the Contractor intends to use such alternative standard, he shall notify the Consultant thereof, submitting with his notice 2 copies (in English) of the proposed standard, and shall not order any material or perform, any work unless and until he has obtained the Consultant's written approval of such Standard.

Brand names, where used in the Specifications or on the Drawings, are only intended to define a standard of quality and performance and the Contractor may use alternative products of at least equal quality and capacity.

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Where the term "or similar" is used it shall be construed as "or equivalent".
When alternatives are offered, the Contractor shall submit to the Consultant for approval a statement detailing the alternatives, and shall include full technical descriptions, drawings, and specifications, and shall provide such full information as is required to enable the Contractor to demonstrate to the Consultant that the alternative is equivalent to the item specified. Any further information that the Consultant may require shall be produced by the Contractor when called for.

1.1.7.2 Approval of Suppliers of Services, Materials and Goods

All materials to be provided shall be new, unused of the most recent manufactures and incorporate all recent improvements in design and materials unless otherwise provided in the Contract.

Before entering into any subcontract for the supply of any materials or goods the Contractor shall obtain the Supervisor 's approval in writing of the subcontractor from whom he proposes to obtain such materials or goods. Should the Supervisor at any time be dissatisfied with such materials or goods or with the method or performance of such subcontractor's work or place of business, the Supervisor shall be entitled to cancel his previously given approval of such subcontractor. The Contractor shall then obtain the said services, materials or goods from such other subcontractor as may be approved by the Supervisor and shall bear any additional cost thereof.

If during the Contract, through any reason, a supplier should increase the cost of materials above that of other equally reputable suppliers, the Supervisor may, at his own discretion, ask the Contractor to change his supplier, or the Supervisor may only authorise payment for materials at the rates of other suppliers.

1.1.7.3 Contractor's Orders for Materials

Without prejudice to any other clause in the Specifications, the Contractor shall, before ordering any plant, building materials, ironwork, pipes and accessories or any other articles for use and installation in the Works, seek the approval of the Supervisor of the names of the persons or firms from whom he desires to obtain any such articles.

Procurement of plant, materials, and any other goods that has not been approved by the Consultant may be rejected by the Supervisor, and shall be at the Contractor's risk.

1.1.7.4 Samples

In addition to any special provisions herein for the sampling and testing of materials, the Contractor shall submit to the Supervisor, as he may require, samples of all materials and goods which the Contractor proposes to use or

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employ in or for the works. The samples should be a true representative of the proposed goods, and shall be marked clearly to bear the following:

- Designation of the Contract;
- The Contractor's identification;
- Notification of identity of the sample;
- The manufacturer of the sample;
- The particulars of the sample;
- The designation of use of the sample.

Such samples, if approved, will be retained by the Supervisor, and no materials or goods of which samples have been submitted shall be used on the permanent works unless and until such samples have been approved in writing by the Supervisor. Notwithstanding the Supervisor's approval as provided for herein, the Contractor shall be solely responsible for the quality of all materials and goods supplied unless specified otherwise.

The cost of supplying all such samples and of conveying the same to such place of inspection or testing as the Supervisor may designate within the country of origin, and of complying with the requirements of this Clause shall be deemed to be included in the Bid rates and prices.

1.1.7.5 Test Certificates

Should the Supervisor not inspect any materials or goods at the places of manufacture the Contractor shall obtain Certificates of Tests performed on such materials or goods by an agency approved by the Supervisor and shall send such Certificates to the Supervisor. Such Certificates shall certify that the materials or goods concerned have been tested in accordance with the requirements of the Specifications and shall give the results of all the tests carried out. The Contractor shall provide adequate means of identifying the materials and goods delivered to the site with the corresponding certificates.

All costs incurred in complying with this Clause shall be deemed to be included in the Bid rates and prices.

1.1.7.6 Packing, Marking and Delivery

Prior to dispatch to the Works, the equipment and materials shall be thoroughly protected against corrosion and incidental damage, including the effects of vermin, strong sunlight, rain, high temperature and humid and, when imported from overseas, salty atmosphere or sea spray.

The equipment and materials shall be packed to withstand rough handling in transit, and packages shall be suitable for export to and storage in the tropics, including possible delays on exposed quaysides. The Contractor shall be held

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responsible for the materials and equipment being packed so that it reaches destination intact and undamaged. The Contractor shall provide, and include in the Contract price the cost of all necessary packing cases and crates, properly strengthened by battens (which shall be considered as non-returnable), packing materials (to include but not limited to the use of polythene or similar water-proof wrapping, silica, etc. wherever necessary), hoop iron bending and labour.

All crates and packages shall be correctly and adequately marked with durable clear print as follows:

- Name of the Project.
- Contract Designation.
- Designation of Materials and Equipment.
- Item Number.

1.1.7.7 Incidental Services

The Contractor shall be responsible to provide any or all of the following services:

- Performance or supervision of on-site assembly and/or operation of the supplied goods.
- Furnishing of tools required for assembly and/or maintenance of the supplied goods.
- Furnishing of a detailed O&M manual for each appropriate unit of the supplied goods.
- Performance, supervision, maintenance and/or repair of the supplied goods for a period of time as stated in the Contract, provided that these services shall not relieve the Supplier of any warranty obligations under this Contract.
- Conduct of training of the Client's personnel at the Supplier's plant and/or on-site, in assembly, operation, maintenance and/or repair of the supplied goods.

The cost of the preceding incidental services, if not specified otherwise in the Bill of Quantities, shall be spread over the rates entered there for the applicable goods.

1.1.7.8 Warranty

The Contractor shall warrant that the goods supplied under the Contract are new, unused, and of the most recent or current models and incorporate all recent improvements in design and materials. The Contractor shall also warrant that the goods supplied under the Contract shall have no defect arising from design, materials or workmanship, except insofar as the design or material has been required by the Client, or from any act or omission of the Supplier, that may develop under normal use of the supplied goods in the conditions obtaining in the site.

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This warranty shall remain valid for at least twenty-four (24) months after the goods, or any portion thereof as the case may be, have been delivered to the final destination indicated in the Contract or throughout the Operation and Maintenance Period, whichever occurs later.

The Client shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Contractor shall promptly repair or replace the defective goods or parts thereof without costs to the Client other than, where applicable, the cost of inland delivery of the repaired or replaced goods or parts from the port of entry to the final destination.

1.1.8 USE OF LAND

1.1.8.1 General

Any geological or hydrological information given hereunder or elsewhere in the Specifications or shown on the Drawings is to assist the Contractor at the time of bidding. Such information shall be deemed to be information provided by or on behalf of the Client under the Conditions of Contract. The information is not warranted by the Client or the Consultant and the Contractor shall make use of and interpret the same on his own responsibility.

1.1.8.2 Subsoil Investigations

Where and to the extent that site investigations have been conducted on the site, the results of such investigations will be made available to the Contractor for inspection, at the Client's office during 10 working days since receiving of such results.

1.1.8.3 Occupation of Land for Temporary Works

Where it is necessary for any reason whatsoever to enter onto land which does not form part of the site, the Supervisor shall be informed of the details, and the Contractor shall make his own arrangements with the land owners and occupiers and shall obtain written permission to occupy the land and the Supervisor's approval.

When permission has been obtained and work is carried out, care shall be taken to ensure that no unnecessary damage is caused to the land and that all reasonable precautions are taken to prevent soil erosion and mosquito breeding. On completion of the work, the land shall be reinstated and left in a tidy condition and protected against erosion, all as approved by the Supervisor.

1.1.8.4 Payments of Compensation

The Supervisor may require the Contractor to make direct payment to the owner of land, crops or structures or other person in respect of any required compensation. On receipt of such written instruction from the Supervisor, the Contractor shall forthwith pay the required amount, which will be reimbursed through the next Interim Payment Certificate.

Under no circumstances is land to be interfered with, whether for Permanent or Temporary works, until the official evaluation of all compensation has taken place and permission to proceed has been received from the Supervisor.

1.1.9 UTILITIES

1.1.9.1 Water Supply

Water will be required for the purpose of construction and for other uses in and about the Works. The Contractor shall make his own arrangements for obtaining supplies of water of approved quality, and shall erect and maintain all required pumps, pipes, valves, cocks, tanks, portable tanks, hoses, roses and all other appliances required to distribute the water as necessary to the various parts of the Works.

The Contractor shall provide at all times and at his own expense, for his own labour and for the Consultant and Supervisor and their staff, a supply of potable water, which shall be kept cool in proper hygienic conditions.

The cost of supplying water shall in each instance include the cost of water at the source of supply and its distribution and conveyance to where it is used, including connecting up, laying of pipes, metering, pumping, use of tankers and the like.

The Contractor shall not assume that water will be available for his use from the public mains at the times and in the quantities required by him.

Where permitted to connect up to existing mains and pipelines for the purpose of obtaining water, the Contractor shall comply with all regulations and requirements of the competent authority. The Contractor shall himself obtain all related permits and make all arrangements as may be required for the performance of the connection.

The Contractor shall be solely responsible for the supply of all water required in the works for whatever purpose and no claims for extra payment or extension of time based on the lack or insufficient or delayed supply of water will be considered or maintained.

1.1.10 SAFETY PRECAUTIONS

1.1.10.1 General

The Contractor shall comply with any safety instruction given by the Supervisor. In the performance of the Works, the Contractor shall exercise every reasonable precaution to protect from injury any person or property. The Contractor shall erect and maintain all necessary temporary fencing, barricades, barriers, signs and lights and provide fire alarm, fire extinguishing and fire fighting services at strategic points on the Site. The Contractor shall provide adequate ventilation, lighting and safe working conditions for his workmen engaged in all aspects of the Works. The Contractor shall adopt and enforce such rules and regulations as may be necessary, desirable or proper, to safeguard the public, and all persons engaged in the work and its supervision. Safety measures shall include but shall not be limited to those safety measures mentioned in this Clause.

1.1.10.2 Safety Officer

The Contractor shall constantly employ, during the progress of the Works, an employee qualified in safety, and familiar with the type of work being performed, whose assignments shall include initiation of measures for the protection of health and the prevention of accidents and who shall see, by personal inspection, that all safety rules and regulations are enforced.

The Contractor shall hold regular scheduled safety meetings at least once each month with his Supervisor, supervisors and foremen and, when instructed, with the Supervisor. The Contractor shall keep the Supervisor advised as to when these meetings are to be held and shall provide the Supervisor with a copy of the proposed agenda.

1.1.10.3 Temporary Fencing

The Contractor shall erect, maintain and remove suitable and approved temporary fencing to enclose such areas of the Permanent and Temporary Works and areas of land occupied by the Contractor within the Site as may be necessary to implement his obligation under the Contract, in an approved manner.

Safety fences shall be erected around electrical and mechanical equipment before that equipment is connected to any electrical supply. Where any temporary fence has to be erected alongside a road, footpath, or other public thoroughfare, it shall be of the type required by and shall be erected to the satisfaction of the Government authority concerned.

1.1.10.4 Lighting

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Not less than 14 days before the start of any night operations, the Contractor shall submit to the Supervisor his proposals for lighting in the areas in which he proposes to work at night. The Contractor shall modify the proposal if instructed and shall not begin operations at night until the proposals for lighting, in an amended form if required, have been approved.

The submission to, or approval by, the Supervisor of the Contractor's proposals for lighting shall not relieve the Contractor of any of his liabilities or obligations under the Contract.

1.1.10.5 Signs

The Contractor shall provide all necessary signs for the Works. These shall include, but not be limited to:

- Standard road signs.
- Warning signs.
- Danger signs.
- Safety signs.
- Control signs.
- Direction signs.

The size, colour, lettering and location of all signs will be subject to approval of the Supervisor and international sign convention.

The Contractor shall maintain all signs placed by himself, as well as those placed by the Client.

If the Supervisor considers that the system of signs provided by the Contractor is inadequate to ensure safety, or is unsatisfactory in other respects, the Contractor shall add to, amend, or otherwise change the system to the satisfaction of the Supervisor.

1.1.10.6 Accident Reports

The Contractor shall promptly report to the Supervisor in the form to be prescribed, all accidents involving death or serious injury to staff or workmen, and furnish monthly reports of all accidents to staff or workmen involving loss of time, giving such information as may be instructed by the Supervisor.

1.1.10.7 First Aid Officer

During the Construction and Running –In Period the Contractor shall employ a sufficient number of skilled and registered first aid officers such that at least one person is available at all times work is in progress. The first aid officers shall have a certificate demonstrating that they have completed and passed a training

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course and are registered with the appropriate authorities. Acceptance of the Contractor's first aid officers shall be subject to the approval of the Supervisor.

1.1.10.8 Other Safety Measures

Work in the vicinity of electrical equipment: In the interest of safety and security, the Contractor shall complete the erection of any safety fencing round electrical and mechanical equipment by the time he carries out works in the vicinity.

Safety Instructions: The Contractor shall at his own cost supply and issue to his employees, those of his subcontractors and the Supervisor, printed booklets, of pocket-size, on the scale of one per person, in Hebrew and in other languages used by his employees at Site, instructions based on good practice. Within 30 days of the order to commence the Works, proof copies of the booklet shall be submitted to the Supervisor for approval before printing and amendments shall be made to the booklet to his entire satisfaction. The Contractor shall issue the booklet immediately after printing as required by this Clause and ensure that all employees are fully conversant with the instructions. Safety instructions shall deal with all safety including:

- Protective clothing, headgear and footwear.
- Use of lifting equipment.
- Use of drilling equipment.
- Trenching and work in trenches.
- Grouting.
- Earthmoving.
- Formwork erection.
- Concreting.
- Structural steelwork.
- Compressed air.
- Welding and painting.
- Routine for accidents or fires.
- Watchmen, warning notices and barriers.

The Contractor shall allow for thirty (30) booklets in the ruling language for the use of the Supervisor.

1.1.10.9 Provision of Personal Protective Equipment (PPE)

No construction work shall be carried on the Site before appropriate Personal Protective Equipment (PPE) is available for the operations planned. The Contractor shall, within 14 days of the Commencement Date, prepare for the consent of the Supervisor a schedule of Personal Protective Equipment (PPE) for free issue, including replacement, to all persons employed on the Works, including employees of the Supervisor and Client. Provision shall also be made for supplying PPE to site visitors.

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The schedule shall address the need to provide such clothing and equipment suitable for the climatic conditions on the Site.

The Contractor shall immediately implement the issue of such PPE once he has obtained the Supervisor 's consent to the schedule. During the course of the Contract, he shall ensure that at no time do the stocks of PPE in his Site stores fall below the levels consented to by the Supervisor in that schedule. As proof of this, he shall submit to the Supervisor each month during the Contract an inventory of PPE showing records of issue and demonstrating the levels of such PPE being retained in his Sites stores. Furthermore, all persons employed by him on the Works shall be made aware of the need to wear such clothing and to use such equipment, and to maintain the same in good working order.

The Supervisor will monitor the effectiveness of the implementation of the use of the PPE during the course of the Works, and may certify the reduction of the value of some or all of the relevant Bill of Quantities items in the Monthly Statements in the event of non-usage of PPE on the Site.

Pursuant to Clause 16 of the Conditions of Contract the Contractor shall remove from the Works any person who fails to wear PPE, or to use equipment as intended, or who has otherwise failed to comply with the Site safety regulations, and any supervisor who fails to enforce those regulations. The Contractor shall make this a condition of employment of every employee engaged in construction work.

DIVISION 1:

CHAPTER 1.2: ENVIRONMENTAL CONTROL

1.2.1 CONTROL OF WATER DURING CONSTRUCTION

1.2.1.1 General

The Contractor shall design, construct and maintain all temporary diversion and all protective works which are necessary for the prevention of surface drainage and ground water entering the various parts of the Works.

Diversion and protective works may comprise, but are not necessarily limited to, channels, flumes, conduits, drains, pumps and settling ponds. The location of these works shall be such that there shall be no encroachment on any area required for the construction of the Works.

On completion of the Works, all diversion and protective works shall be removed and disposed of or shall be levelled in a manner to give a sight appearance, and so as not to interfere in any way with the operation or usefulness of the Works.

1.2.1.2 Prevention of spills

The Contractor shall provide spills prevention systems and shall furnish, install, maintain and operate all necessary pumping, piping and other equipment and temporary structures for spills prevention and maintaining the various parts of the Works free from water during construction and, as required, for inspection, safety and installations by other contractors or the Client or, if directed, after any part of the Works is completed.

1.2.1.3 Interference with Streams and Sea

The Contractor shall not interfere with the natural flow of streams or Dead Sea on the Site for any purpose without prior approval of the Supervisor.

1.2.1.4 Responsibility for Works

The Contractor shall be fully responsible for any damage or delay to the Works caused by failure of the diversion and protective works and/or dewatering installations constructed by him and shall indemnify the Client against claims by other contractors employed by the Client working on the Site or by landholders or other persons, arising out of any such failure.

The Contractor shall be responsible for, and shall repair or reinstate at his expense, any damage to foundations, excavated slopes or any other parts of the

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Works caused by the failure of the diversion and protective works and/or dewatering installations.

1.2.1.5 Run off Control Plan

At least 14 days before commencing any work on diversion works the Contractor shall submit to the Supervisor a detailed Water Control Plan describing the works.

The Contractor shall ensure that the dewatering system, as well as other temporary works, shall not prevent passage through the site.

The Contractor shall design, construct and maintain for the duration of the Contract all diversion works. Any damage, caused by the Contractor's operations or negligence, to the Works during the diversion shall be repaired by and at the expense of the Contractor.

1.2.2 POLLUTION CONTROL

1.2.2.1 General

The Contractor shall design, construct, maintain and operate suitable pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into streams or existing drainage systems. These facilities shall be in addition to any control measures shown on the Drawings and may include some or all of the following:

- Control over surface runoff by:
 - Construction of stabilised diversion or perimeter drains to intercept runoff from undisturbed areas and to divert runoff around the works areas;
 - Installation of stabilised interceptor drains which run across the site along the contour lines;
 - Installation of stabilised collector drains which run down the slope perpendicular to the contour lines.
- Limit movement of vehicles and equipment.

All diverted and pumped water shall be discharged at locations on the surface from which it cannot re-enter the Works and in a manner which shall not cause erosion, pollution or nuisance to land-holders, other contractors employed by the Client or other persons within or adjacent to the Site.

Disposal of waste oil from workshops and other areas shall be done strictly according to the applicable environmental protection by-laws and it shall not cause pollution of streams.

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The burning of plastic material shall not be permitted and all such material shall be disposed of in accordance with the applicable Clauses of these Specifications and as directed by the Supervisor. All garbage shall be disposed of in accordance with the applicable Clauses of these Specifications and as directed by the Supervisor. Soil contamination by cement or other chemicals shall be removed and placed in disposal areas as directed by the Supervisor.

Before any work is carried out in any area of the Site, all specified or directed or approved pollution control measures shall be in place and operational.

1.2.2.2 Pollution Control Plan

The Contractor shall prepare and submit a Pollution Control Plan to the Supervisor at least 14 days before commencing work on the Site. The importance of designing and maintaining sound erosion and sediment control measures is stressed.

The Pollution Control Plan shall detail areas and methods of working, drainage paths, silt interception devices, surface treatments and the like, including maintenance of such devices and treatments at the various stages of the work under the Contract.

1.2.2.3 Refuse and Waste Control

Littering shall be avoided. All refuse shall initially be placed in containers provided by the Contractor for such purpose and subsequently disposed of in approved refuse dumps.

All hazardous waste and materials soiled with hazardous wastes shall not be disposed of on the Site. All such waste shall be stored in an approved manner on Site and removed at regular intervals to off-Site waste disposal facilities designed to handle such hazardous waste.

1.2.3 FUEL STORAGE AND MACHINERY MAINTENANCE

1.2.3.1 Requirement

The Contractor shall provide and maintain bund walls around his fuel storage areas within the Site. Such walls shall be of a sufficient height to contain a volume equal to one and one half (1.5) times the entire contents of his fuel storage facilities.

Fuel dispensing areas and machinery maintenance areas shall be provided with concrete hard standing surface, draining to oil separators.

1.2.3.2 Drainage

Drainage from fuel storage and machinery maintenance areas shall be treated to remove oil and/or fuel. Where the drain passes through or across the bund wall the Contractor shall provide means to prevent flow so that in the event of a leak all split fuel and other liquids shall be contained by the bund walls.

1.2.3.3 Soil Contamination

Soil contaminated by fuel leakage shall be removed and placed in disposal areas as directed by the Supervisor.

1.2.4 ENVIRONMENTAL PROTECTION - GENERAL

The Contractor shall conduct his activities so as to cause the least possible disturbance to the existing amenities, whether natural or man-made, and so as to comply with all statutory requirements.

In undertaking the Works the Contractor shall:

- Undertake all work in an environmentally sensitive manner;
- Undertake no work outside the defined area of the Works without prior written approval from the Supervisor;
- As far as possible, set up temporary works, park vehicles, etc., within the area designated for this purpose;
- Take all necessary actions to ensure that water quality in nearby streams is not adversely affected;
- Minimise the effects of runoff and erosion;
- Minimise disturbance or disruption of the daily lives of local communities to the maximum possible extent; and
- Ensure that at all times the Site is maintained in a neat and tidy condition.

The Supervisor may, at his discretion, direct in writing additional environmental requirements which shall be observed by the Contractor.

1.2.5 ENVIRONMENTAL PROTECTION PLAN

Within 14 days of the Commencement Date and before commencing work on the Site, the Contractor shall prepare and submit to the Consultant for approval an Environmental Protection Plan. The Plan shall cover all environmental protection works and shall also include descriptions of environmental safeguards and emergency procedures.

The Plan shall include a description of the administrative structure and lines of communication that will be established within the Contractor's and his subcontractors' workforce for the implementation of environmental protection procedures. Details of the expertise available for the implementation of environmental protection procedures shall be provided.

After approval, this Plan shall be strictly adhered to. See also Annex A: General Environmental Management Conditions for Construction Contracts, at the end of this chapter.

1.2.6 GUIDANCE TO EMPLOYEES

The Contractor shall arrange that all his employees and those of his subcontractors are guided to ensure that they:

- Have a basic understanding of the key environmental features of the Site and environs;
- Are thoroughly familiar with the environmental protection requirements as they apply to the Works;
- Receive training in the identification of archaeological artefacts, special flora and fauna; and
- Are made aware of any other environmental matters which are deemed to be necessary by the Supervisor.

1.2.7 SCENIC QUALITY

The Contractor shall not establish or undertake any activities which, in the opinion of the Supervisor, are likely to adversely affect the scenic quality of the area. The Supervisor may direct the Contractor to refrain from such activities or to take ameliorative actions to reduce the adverse effect of such activities on the scenic quality of the environment.

Painting or marking on natural features shall not be permitted. Marking for surveying and other purposes shall only be done with pegs and beacons.

1.2.8 PROTECTION OF VEGETATION

1.2.8.1 Preservation of Trees within or Adjacent to the Works

Trees which have been selected for preservation within or adjacent to any area of the Works shall be fenced and no open fires shall be permitted under these trees.

1.2.8.3 Rare and Endangered Plant Species

Prior to clearing or stripping any area, any rare or endangered plant species which have been identified by the Supervisor shall be removed and transplanted as instructed.

1.2.9 ARCHAEOLOGICAL FINDINGS

Should the Contractor expose any archaeological artefacts during excavation, work shall cease immediately and the Supervisor shall be notified as soon as possible.

Upon receipt of such notification, the Supervisor shall arrange for the excavation to be examined as soon as practicable. The Supervisor shall advise the Contractor of necessary actions to be taken.

Under no circumstances shall archaeological artefacts be removed, destroyed or interfered with by the Contractor, his employees, his subcontractors or his subcontractors' employees.

1.2.11 DUST CONTROL

The Contractor shall take appropriate measures to minimise the generation of dust as a result of his works, operations and activities to the satisfaction of the Supervisor.

Such measures shall include, but not be limited to, regular and effective treatment of gravel access roads and working areas, use of dust extractors on drilling equipment or wet drilling and water sprays on aggregate crushing and screening plants.

1.2.12 NOISE POLLUTION

1.2.12.1 Restrictions on Working Hours

The Contractor shall restrict any of his operations which result in undue noise disturbance to nearby Hotels and dwellings according to the Supervisor Instructions .

1.2.12.2 Equipment to be provided

The Contractor shall provide and maintain, for the exclusive use of the Supervisor, equipment to measure noise levels. The equipment shall meet the IS standards and shall be recalibrated at a two yearly interval by an acoustics laboratory approved by the Supervisor.

1.2.12.3 Permitted Noise Levels

The Contractor shall provide all his plant and equipment with suitable silencers or adopt other measures such that the noise level in residential areas adjacent to the work areas shall not increase. In recreation areas the maximum noise levels shall correspond the requirements of Israel Ministry of Environmental and shall be approved by Supervisor.

1.2.13 REHABILITATION OF WORK AREAS

1.2.13.1 General

The Contractor shall rehabilitate disturbed areas of Permanent Works, quarries, borrow and spoil areas, the Contractor's works and accommodation areas (including the areas designated for the Supervisor 's use) and the areas required for the construction of temporary access roads as well as such other areas as may be specified or instructed by the Supervisor. Such rehabilitation shall comprise grassing and planting of trees and shrubs and shall be carried out at the earliest opportunity during the course of the Works.

The planting of grass, trees and shrubs shall be carried out during periods most likely to produce beneficial results.

Rehabilitation measures shall be carried out concurrently with the construction of the Works.

1.2.13.2 Shaping of Areas

Cut and fill slopes shall be shaped in a manner such that the final profile appears as a natural extension of the adjacent undisturbed ground profiles.

Shaped surfaces shall be left slightly rough to facilitate binding with topsoil or the natural establishment of vegetation. Shaped surfaces which have been hardened or compacted shall be broken by ripping or scarifying.

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DIVISION 1:

CHAPTER 1.3: FACILITIES FOR THE SUPERVISOR AND HIS STAFF

1.3.1 LOCATION OF SUPERVISOR'S OFFICES

The Contractor shall provide, erect, construct and maintain, and subsequently remove, all temporary offices, sanitary arrangements, stores, workshops, compounds, parking areas and the like for the use of his own staff and work force necessary for the completion of the Works and maintenance of the Permanent Works. The sitting and layout of these facilities shall be to the general approval of the Supervisor.

The Contractor shall allocate, within his major site offices as above, adequate facilities for the Supervisor and his staff, as described below.

1.3.2 SUPERVISOR'S OFFICES

The Contractor shall provide, erect, furnish, equip, clean, maintain and provide lighting and ventilation, including air conditioning, and subsequently at the completion of the works remove temporary buildings for the use of the Supervisor's representative, his staff and the Consultant, together with access for cars, car park and suitable footpaths. Before providing any of these facilities the Contractor shall submit detailed proposals including drawings and specifications for the approval of the Supervisor.

The time within which the offices and other accommodation shall be fully equipped and serviced for use shall be fourteen (14) days from the commencement of the Contract. The Contractor shall provide interim facilities until the offices are complete.

The accommodations shall be cleaned daily.

External doors of the offices shall be fitted with locks or similar approved make and at least two (2) keys for each lock shall be handed to the Supervisor.

The Contractor shall insure the personal belongings and possessions of the Supervisor's staff whilst these are on the Site against loss, damage or theft.

The Contractor shall arrange for the Supervisor's office to be connected by exclusive phone line and shall keep them connected, pay all charges for installation and disconnection.

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The Contractor shall provide, on a permanent basis, a cellular telephone for the use of the Supervisor.

1.3.3 OFFICES

1.3.3.1 Supervisor's Office

The Contractor shall provide to the Supervisor office facilities, having a total floor area of not less than 30 m². The office shall be subdivided as directed by the Supervisor into areas of one principal room, one office room, kitchen, toilet and washing area, store and entrance lobby.

The office shall be provided with suitable floor covering and the walls and ceiling shall be lined internally. Partition walls shall separate the offices. The linings and walls shall be painted in a suitable colour to the approval of the Supervisor. Lighting shall be by means of electricity and a stand by diesel generator

The office shall be properly ventilated, provided with air conditioning and well lighted with a window area of not less than ten percent (10%) of the floor area and shall be fitted with adequate and secure door and window fastenings. Three (3) keys of each lock shall be handed to the Supervisor.

The toilet shall be provided with WC bowl with adjoining hand wash basin with running water, soap and clean towels (to be supplied as required) provided for the sole use of the Supervisor and his staff.

1.3.3.2 Parking Areas

A hard-standing of sufficient area to permit a vehicle to manoeuvre shall be provided around the outside of the building as instructed by the Supervisor. A paved parking area shall have the provision for at least 3 vehicles.

1.3.3.3 Services and Maintenance

The Contractor shall be responsible for providing all required services such as water supply, sewerage, electricity supply, cleaning, rubbish collection and disposal services to the Supervisor's office.

The Contractor shall provide all labour, equipment and material, which may be necessary to keep all accommodation in a neat and clean condition and any repairs shall be done immediately upon the request of the Supervisor.

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1.3.5 ASSISTANCE FOR THE SUPERVISOR'S STAFF

The Contractor shall provide every assistance to the Supervisor and his staff in carrying out their duties, and shall provide a sufficient supply of pegs, poles, paint lines and other materials and small tools for checking and setting out and for the measurement of work.

1.3.7 FACILITIES FOR SUPERVISOR TO TAKE SAMPLES

The Contractor shall provide facilities for the Supervisor to take samples for testing of any of the fill, concrete or other materials to be incorporated in the Works. Such samples may be taken before or after incorporation into the Works or at any stage during construction at the discretion of the Supervisor.

1.3.8 INSPECTIONS AND MATERIALS TESTING

1.3.8.1 Inspections

The Contractor shall carry out the inspections and tests stipulated in the respective sections of these Specifications in the presence of the Supervisor or any person authorised by him.

No work shall be covered up or put out of view without the approval of the Supervisor and the Contractor shall afford full opportunity for the Supervisor to examine and measure any work which is about to be covered up or put out of view and to examine foundations before the Permanent Work is placed thereon.

The Contractor shall give due notice to the Supervisor whenever any such work or foundation is or are ready or about to be ready for examination and the Supervisor will without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, examine and measure such work or examine such foundations.

The Contractor shall record the results of such inspections and tests using the form specified by the Supervisor, and submit to the Supervisor the report by attaching the record photographs of the said inspections and tests as the record and report. These records and reports shall be subject to the approval of the Supervisor.

These records and reports shall be prepared and submitted to the Supervisor for approval irrespective of whether or not the Supervisor has witnessed such inspections and tests.

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In the case where the Supervisor has approved and qualified the results of such inspections and tests, the Contractor may proceed to the next stage of the Works.

The inspections and tests specified herein shall include the following:

- Inspection of volume of work executed.
- Inspection and test of construction materials.
- Inspection of excavation (including bed surface).
- Inspection of reinforcement bar assembly.
- Inspection of formwork.
- Inspection of the dimensions of the structures.
- Inspection of disposal of excavated materials.
- Identification test of the quality of concrete at site.
- Inspection of backfilling.
- Other tests and inspections the Supervisor deems necessary.
- Other tests and inspections required according to pertinent regulations, codes and standards.

The following tests and inspections shall be executed in the presence of the Supervisor:

- Witnessing at concrete placing (slump and casting of sample cubes).
- Compression test of concrete.
- Other tests and inspections the Supervisor deems necessary.

1.3.8.2 Material Testing Laboratory

The Contractor shall provide and maintain until completion of the Works a materials testing laboratory complete with furnishing, fixtures and equipment and carry out all routine tests including preliminary tests for the concrete works as required by the Technical Specifications.