Project Technical Documents
Project Code: DR.0060
Project Name : Bor Flood Risk Management
Title: Bill of Quantites
Date: 19 August 2023

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Bill of Quantities

The Bill of Quantities shall be read in conjunction with the drawings and the technical specifications, if any. All the works are to be executed as per the drawing and the supervising engineer's instruction and commitment to the following:-
1- All materials and tools must comply with international standards (ISO or ASTM) and be approved by the procurement committee before be priced.
2-The contractor should include in the offer the catalogues, photos and specifications of materials he will supply.
3-The contractor shall perform the surveying works using the appropriate surveying equipment before starting the installation works to determine the path line of excavation and installation depth.
4- Salt resistant cement is used in all construction works.
5- Commitment to using clean water for curing all concrete, buildings, and plastering works per IOM engineer's instruction.
6- The contractor should commit to partial hand over the completed phases of the works and obtain approval from the IOM's engineers before proceeding to the next phase as per the approved work plan after satisfactory inspection of the quantity and quality of works/goods delivered.
7- Commitment to levelling and cleaning the work site before and after the completion of the works, from the remnants of the waste to sites authorised by IOM engineers or local authorities.
8- The contractor is obliged to use safety and security measures while carrying out all work.
9- The contractor should submit a detailed work plan along with each purchase order after signing the contract.

Ref.	Description	Unit	Quantity	Unit cost (USD)	Cost (USD)
5.00	**H-3-2 Pumping Station**				**-**
5.01	Excavation of the natural ground to the required levels for pumping station, pipes and fittings and cart away all debris from the site to dump site approved by IOM's Engineer. All extra quantities of hard core resulted from excavation works in site are owned to the project and should be removed or reused according to IOM's Engineer acceptance, all in accordance with the technical specifications and IOMs Engineer's instructions	Cubic Meter	50.00		
5.02	Supply materials and construct a reinforced concrete substructure elevated about 1 meter above the existing ground level on which the pump will be installed. The ground slab is to be 350kg/m3 reinforced with 16mm bars at 200mm c/c both ways. The superstructure is to be made of hollow sections (80x40x3mm for the columns and rafters, and 40x40x2mm for the purlins) and covered using G28 blue prepainted sheets with the aid of self tapping screws.	LS	1.00		

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5.03	Supply and install fixed water pump, With an output of more than 3000 m3 per hour, a maximumheadof 25 mwc, including Priming system of MP 100 (100 m3/h), speed 850 rpm, Diesel or electrical driven, and preferably Volvo Penta engine.	Piece	1.00	
5.04	Supply and install Corrugated High Density Polyethylene Pipes (HDPE), including all fittings needed to be installed from the new pump to the outlet point.	Meter Length	80.00	
17.00	**M-8-1 Pumping Station**			**-**
17.01	Excavation of the natural ground to the required levels for The pipes and fittings and cart away all debris from the site to dump site approved by IOM's Engineer. All extra quantities of hard core resulted from excavation works in site are owned to the project and should be removed or reused according to IOM's Engineer acceptance, all in accordance with the technical specifications and IOMs Engineer's instructions	Cubic Meter	10.00	
17.02	Supply and install Corrugated High Density Polyethylene Pipes (HDPE), The inner diameter is **400** mm, ring resistance (SN8) ASMT F2648, including all fittings needed to be installed to an existing pump.	Meter Length	80.00	
17.03	Supply, lay and compact 100mm thick sandpipe bedding and 300mm of backfill with sand in accordance with the technical specifications and IOMs Engineer's instructions	Cubic Meter	39.36	
Total				**$ -**

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Title: Detailed overview of modelled interventions
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List of Locations

Ref.	ID	GPS Coordinates	Intervention type	Scenario	Drawing Reference
3 Bor South					
5	H-3-2	6.193039°, 31.565246°	Pumping Station	Pumping station utilised with detachable pipe to a rate of 2,700 m3/h (64,800 m3/d)	Pumping Station
8 Bor Market					
17	M-8-1	6.218274°, 31.547395°	Pumping station	Pumping station utilised with detachable pipe to a rate of 2,700 m3/h (64,800 m3/d)	Pumping station

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Scope of Work

Objective 1 (a): Pumping Station		
Activities and Tasks	**Number of Days Per Location**	**Output**
Mobilization of personnel, workers, materials etc to site	14	Quality Checklist + Photos
Heaping soil and spreading work	3 to 5	Quality Checklist + Photos
Compaction of the soil	3 to 5	Quality Checklist + Photos
Construction of the foundation and slab for the pump	4 to 7	Quality Checklist + Photos
Shed frame and roofing works	3 to 5	Quality Checklist + Photos
Pump installation and associated fitting works	2 to 3	Quality Checklist + Photos
Testing and commissioning	1 to 2	Quality Checklist + Photos
Demobilization and site cleaning	2	Quality Checklist + Photos
Handover	7	Quality Checklist + Photos

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Scope of Work

Objective 1 (b): Pumping Station		
Activities and Tasks	**Number of Days Per Location**	**Output**
Setting out of site and site clearance	2	Quality Checklist + Photos
Excavation works	1	Quality Checklist + Photos
Detachable pipe installation and fitting works	2 to 3	Quality Checklist + Photos
Backfill and compaction work	3	Quality Checklist + Photos
Testing and commissioning	1 to 2	Quality Checklist + Photos
Demobilization and site clearance	2	Quality Checklist + Photos
Handover	7	Quality Checklist + Photos

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Scope of Work

Objective 2 : Levelling		
Activities and Tasks	**Number of Days Per Location**	**Output**
Mobilization of personnel, workers, materials etc to site	14	Quality Checklist + Photos
Setting out of site and site clearance	2	Quality Checklist + Photos
Heaping soil and spreading work	5	Quality Checklist + Photos
Compaction work	3	Quality Checklist + Photos
Demobilization and site cleaning	2	Quality Checklist + Photos
Handover	7	Quality Checklist + Photos

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Scope of Work

Objective 3 : Drainage Network		
Activities and Tasks	**Number of Days Per Location**	**Output**
Mobilization of personnel, workers, materials etc to site	14	Quality Checklist + Photos
Setting out of site and site clearance	2	Quality Checklist + Photos
Excavation works	14	Quality Checklist + Photos
Levelling and Compaction work	7	Quality Checklist + Photos
Commissioning	2	Quality Checklist + Photos
Handover	7	Quality Checklist + Photos

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Technical Specification	
Description	**Item**
General Conditions	Samples of the materials to be used in any of the work activities shall be submitted with adequate information about them issued by the equipped company showing their characteristics in detail and specifying the specification under which they were produced and after the approval of the supervising engineer on a model that is signed by the contractor and the engineer and kept with the latter to compare it with the consignments supplied.
	The Contractor acknowledges that he has inspected the site before setting prices and is responsible for facing all the difficulties that may face him due to the nature or condition of the site that appears during the execution process of whatever type and nature and the contractor must make sure for himself to bear the component parts of the building and its accessories on which the works to be carried out are located.
	The contractor shall bear all costs of material damage and maintenance work in the event of any damage to the facilities and infrastructure (service lines, sewage pipes and electrical cables) of the buildings located at the work sites and neighboring areas that he may find during the implementation of breakage, damage or the like, during the period of execution of the works and the restoration of the situation to what it was
	The contractor shall provide water and electricity services to the site and in the quantities and capacity required by the implementation of the project and may contract for this purpose with the relevant authorities or rely on generators, filter units and transport of mobile water for the duration of the implementation and the contractor shall bear the costs of delivering water and electricity and pay the fees and wages that result therefrom and for the duration of the contract and strictly prohibit the use of electricity and water from the people and beneficiaries.
	The contractor shall be solely responsible for all building materials, tools, and other equipment located at the work site.
	Before the delivery phase and completion of the implementation of the works, the contractor must clean the site and remove all excess materials, waste and rubble from inside and outside the site to a landfill approved by the supervising engineer.

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Technical Specification	
Description	**Item**
Leveling excavation and backfill	The contractor shall settle the site and remove rubble, weeds and dirt
	The contractor shall provide the contractor with sufficient information for the planning of the project (for the main planning points or for existing installations) and the contractor shall plan all parts of the project and plant fixed pegs on the heads of the markers in a manner consistent with the plans, provided that such planning is fixed, clear and easily accessible at any stage of the work.
	Excavations of any kind (earthen and rocky) are carried out using mechanical machines and workers according to the annexes of the contract, and the excavation residues are carried over to the places specified by the supervising engineer or used if they are suitable for backfilling in accordance with the directives of the supervising engineer.
	The backfill is carried out using the mechanisms mentioned in the annexes of the contract, with wetting and mud to reach a degree of stacking by 95%, the stacking is done on layers not more than 30 cm before stacking, the quantities after the molting are measured in the appropriate ways determined by the supervising engineer, provided that the final settlement is done using the cradle (creder) and the contractor is not given any compensation for the excess drilling products of the basic excavations that have been used as they are covered by the excavation clause
	In case of backfilling in places that cannot be reached by the landfills, the contractor shall secure small rollers that provide adequate stacking without affecting the existing construction elements and the contractor shall remain responsible for any damage resulting therefrom.
	The cement used in concrete works must be of ordinary Portland cement type 42.5 grade and its shelf life is not more than 3 months from the date of its production Cement bags must be sealed and in a healthy condition and each bag is rejected wet or malfunctioning due to moisture
	Sand and gravel resulting from the cracking of clean hard limestone free of dust, dirt and soft stones are used so that the amount of fine dust does not exceed 10% of the amount of sand
	The water used is potable water
	The texture and operability of the concrete are checked before each pouring by measuring the amount of concrete landing using the Abrams cone provided by the contractor at his own expense.

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Technical Specification	
Description	**Item**
Concrete works	Rebar of the highly resistant shaved type so that it is not less than 300 MPa in the diameters and lengths mentioned in the contract attachments, must be of the new type that is not renewed free of rust or other foreign substances with good fixation with tying wires and maintain during casting to provide sufficient thickness coverage
	The work includes the work of the wooden mold (formwork) and securing the materials required to mix, pour and hammer the concrete well and refine it and everything necessary and not to dismantle the mold before the end of the specified period
	The wooden mold must be of the clean type free of twists and defects with the need to use sufficient supports and the mold is not removed until after the period specified in the annexes to the contract
	The steel rods (reinforcing bars) are attached to a steel strip in a way that prevents any movement in them during the pouring of concrete and lifts the skewers from the formwork by means of biscuits that achieve the required coverage distance
	The length of the steel overlap (steel strip) must not be less than 60 times the diameter of the rod
	The dimensions, diameters and lengths of the steel used shall not be less than the measurements required in the plans and instructions, and if the contractor is unable to secure the steel lengths with the required descriptions, he may not replace them with any steel lengths except after obtaining written approval from the supervising enginee.
	The steel is received after it is placed ready for pouring and therefore the pouring of concrete should not be initiated except with the written permission of the supervising team after examining and accepting the steel according to the details contained in the plans and instructions issued during the work and in the case of pouring a section without taking permission the contractor must remove it at his own expense
	Sprinkle all wooden formwork with water before starting the casting process
	The contractor shall secure wooden walkways and regulate the movement of work in a way that does not affect the shape and cleanliness of steel and formwork.
	Mechanical vibrator should be used during casting
	The contractor must equip all electrical and sanitary wiring according to the contract annexes and leave the necessary openings before starting the casting process.
	The contractor corrects the surface for dips and heights and gives it the required inclination during casting with good polishing by spraying cement as directed by the supervising engineer
	Poured concrete must be watered at least three days at the rate of twice a day in the morning and evening

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Technical Specification	
Description	**Item**
Paint for all elements	Painting works for steel sections (for structural steelwork): The sections are first well carved so as to ensure the removal of any trace of rust, bumps or sharp corners and then the work of painting the steelwork is carried out in the following way: The paint is established using a layer base layer and then proceeds with painting the first layer. After drying the first layer, the second and last layer is started with a paint so that the surfaces become completely smooth without a trace of ripples, dirt and small granules or collected in the paint and the color is determined by the supervising engineer, cleaning the site from the traces of paint in case of presence
Structural steelwork	The steel sections are made according to the contract attachments according to the specified sizes of the designs and the pieces are connected to each other by welding according to the conditions imposed on the welding works so that they appear after manufacture as if they are one piece and the difference between the moving and stationary parts should not exceed one millimeter
	The outer surface of the welding must be smooth, without cracks and no residues or any porous holes, free of waste such as slag, the welding must be evenly distributed, sealant, does not contain dissolved/additional substances on the surface (inside/outside), free of scratches, without bends or grafts
	After manufacture, all unfinished ferrous metal surfaces shall receive an anticorrosive protection (heavy coat of varnish or other equivalent material readily removed by commercial solvents).
	Stainless steel parts, non-ferrous metal or galvanized parts shall not receive any protective treatment. The same applies to metal surfaces to be embedded in concrete.
	Where dissimilar metals are in contact, these must be insulated from one another to prevent electrochemical corrosion.
	All protective coating systems must have a high durability such that no maintenance in the first five years is required.
	The steelwork after installation is identical to the building elements adjacent to it, true vertical and horizontal, durable and does not give any vibration
	All surfaces permanently submerged or temporarily submerged shall include: (1) Near-white blast cleaning (2) One coat of zinc-rich epoxy paint, minimum dry film thickness of 75 micrometres (3) Two finish coats of high build epoxy paint, each coat with minimum fry film thickness of 150 micrometres.
	All steel supplies such as hinges and locks are installed according to the requirements of the work

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