

## Section 5a: SOW

### Scope of Work

**Name of Project:** Perimeter security upgrade and construction of structures for HNEC office

**Location:** Tripoli, Libya

Provide all materials and transport to site, construct/erect all structures as per attached Drawings, Bill of Quantities and Specifications. Structures are described briefly below:

<b>Excavation (any soil type) for foundations and removal of existing RCC slab at main entrance.</b> The volume covers all needed excavation for buildings foundation, removal of Existing RCC floor Slab and septic tank covered in this tender. This item includes excavations, disposal and temporary support or shoring if needed, <b>NOT</b> the bulk volume of disposing materials. The contractor is responsible for any unexpected increment in excavation. The contractor is also responsible for the demining of the under-work area from any un-exploded ordnates or mines.
<b>Grounded landscaping/ vegetation at -0.10, including importation of top soil, plantation, etc.</b> This includes supplying of needed materials. See drawings and schedules for levels/dimensions and details.
<b>Soil backfilling</b> in foundation up to the level shown. The given volume here covers all earth backfill needed in all building mentioned in this tender. This includes supplying of needed materials. See drawings and schedules for levels/dimensions and details.
<b>Ground Improvement.</b> This is at the foundation of reception building only as shown on the drawings. The cost includes supplying of needed materials.
<b>Gravel compaction.</b> The volume covers all needed gravel backfill with compaction anywhere shown in the drawings for this tender. This includes supplying of needed materials.
<b>HESCO,</b> Installation of new HESCO system, with the height of 3 meter from GL, see drawing for details, mainly at interior parts of the compound along with boundary wall around Generator house, and any other location guided by Engineer. The cost includes, site leveling, base compaction of HESCO building, filling and compaction of materials inside HESCO, and any other work and materials needed to complete the job to full satisfaction of Engineer, for more details See drawings and schedule for location, size and details. Cost for following concrete/ non-concrete items includes foundation with the given dimensions, excavations, backfill, ground improvement and compaction, masonry works, concrete (RCC and PCC anywhere shown), reinforcement, shuttering, concrete curing, anchors and embedded items, steel connections at the wall bases, steel plates on top of walls as shown, finishing, installation, and all accessories and works needed to complete the jobs as per engineer approval. All steel-type items that are exposed to weather or touching earth shall be coated with 1 coat of anti-rust painting followed by 2 other coats of oil-based painting. Cast-in-Place walls cost includes filling material at joints
<b><u>Service Trenching</u></b>
<b>Electrical Trenching and Water services Trenching.</b> The cost includes excavation of the trench, backfill using approved material shown on the drawings and all to complete the job. The cost also includes disposal unwanted materials derived from excavation and a supplying of filling materials.
<b>Reception building:</b>
RCC M-350 cast-in-place foundations. This item includes all foundations up to level -0.100 for the reception building as shown on the drawings.
RCC M-350 cast-in-place walls for reception building as shown on the drawings. This item covers concrete for levels between -0.100 to +3.00

RCC M-350 cast-in-place roof slab for reception building as shown on the drawings. This item covers concrete for +3.15 level.
RCC M-350 cast-in-place floor slab for reception building as shown on the drawings. This item covers concrete for 0.00 level.
RCC M-200 with Thickness of 200 mm pavement/Parking area at the out-door area. See drawing for locations.
Door truck feeder as per drawings
RCC M-350 cast-in-place parapet wall. This portion of the RCC to be connected to the other RCC parts as shown on the drawing. This item includes all needed works and connections. Surface finish for this RCC is off-form finish/ exposed concrete finish for all side but only for the external side of the wall located to the South side. See Insulation and Vapour Barrier section below for cost of the surface finish for the south side surface.
RCC M-350 cast-in-place Guard Booths enclosure. This portion of the RCC to be connected to the other RCC parts as shown on the drawing. Surface finish for this RCC is off-form finish/ exposed concrete finish for all side, Cost for following concrete items includes stairs, roofing system, reinforcement, shuttering, concrete curing, anchors and embedded items, steel connections, installations, transportation, joint filling materials as shown on the drawing to complete the jobs as per engineer approval.
RCC M-350 cast-in-place water collector 300x300x300mm (internal sizes) at the endpoint of the downpipes. This item includes 5mm steel sheet cover on the collector and 125mm PVC pipe connection from the water collector to the RCC drain channel. See drawings for details. This item includes gravel/ earth compaction for collector and PVC pipe as shown. The cost includes all needed materials and accessories.
RCC M-350 cast-in-place drain water channel (400mm internal width) with RCC covers. See drawings. This item includes all connections of downpipes, connections to the soakage pit etc., and gravel/ earth compaction under the structure as shown. The cost includes all needed materials and accessories.
<b>Internal guard booths:</b>
RCC M-250 cast-in-place foundation slab for the internal guard tower booths.
RCC M-350 Cast in place wall, stairs, veranda, parapets and roof slab
Roofing system and steel work, Applying of some steel frame/ steel work out at the out-door guard booths for the purpose of extra security levels for the guard booths. The cost includes all needed work, materials, installation etc to a complete job. for more detail please, ref to drawings
<b>Vehicles Examination /Search area:</b>
PCC M-200 layer as the base of the RCC pavement at the vehicle examination area.
RCC M-350 cast-in-place foundation and walls located at the West side of Vehicles examination area the compound behind the monitoring booths and watch tower .
RCC M-250 slab/ramp at the vehicle examination area. The cost includes dowels and all other accessories shown.
<b>Septic tank and soakage pit:</b>
PCC lean concrete under foundations:
PCC M-200 used inside the septic tank.
RCC M-250 cast-in-place M-250 for the whole body of the septic tank including its manhole cover and also anywhere else shown RCC. The cost includes making and installation of embedded steel steps inside the septic tank and the soakage pit and as well as the embedded 4" PVC pipe as the ventilation pipe shown on septic tank's roof.
<b>Outside ground floor slab Parking Area:</b>
RCC M-350 cast-in-place outside RCC floor slab waiting area. This item includes supply installation and all needed materials and accessories. See drawings for details.

Benches. Supply and installation of benches cast-in-place outside 150 mm thick RCC floor slab Pedestrian Area. This item includes gravel compaction under the slab, reinforcement and all needed materials and accessories. See drawings for details.
<b><u>Waterproofing</u></b>
<b>Polyethylene sheet</b> , 10 mil (0.25mm) underneath the floors of the reception building rooms as shown.
<b>Damp proof course (ISOGAM)</b> beneath brick wall of the charging station room.
<b>Single layer bitumen membrane</b> at the floor and up to 300mm-height-walls of toilets. This includes preparation of base layers shown on the drawings. Refer to schedule for details.
<b>Reception building and toilets Roofing:</b>
Ventilation outlets to the roof (250x250mm). This applies at the toilets of the reception building. For the details of these outlets on roof, the contractor will prepare a shop drawing for getting approvals from engineer. The cost includes all needed work, accessories and materials to complete the job.
<b>Down pipes.</b> The cost includes gutter inlet capping and all accessories required for complete installation such as supplying, fixing and connection as per drawing and schedules.
<b>50mm concrete screed</b>
<b>Two layers geofabric membrane</b>
<b>Two layers Damp prove membrane insulation 5mm thick</b>
<b>Burnt brick powder at least 50mm thick</b>
GI sheet gauge 22 capping to the wall attached to the building. This item covers all needed materials and accessories to fix the capping as per given drawings including waterproofing Silicon sealant etc.
<b>Internal Waiting Area:</b>
<b>Folded metal</b> , K-span roofing with the thickness of 0.8mm. This includes all accessories required for installation of roof on the prepared C-shape purlins. See drawing and schedules for details. . The cost includes steel framing, K-Span sheet roofing and all needed accessories to complete the job. See drawing and schedule for details.
<b>Flat sheet metal capping and flashing</b> for all roofs anywhere shown for this tender. This includes any needed work. See drawing and schedule for details.
<b>Walk way and VIP Parking Area:</b>
<b>Folded curved metal</b> , K-span roofing with the thickness of 0.8mm. This includes all accessories required for installation of roof on steel frame. See drawing and schedules for details. The cost includes steel framing, K-Span sheet roofing and all needed accessories to complete the job. See drawing and schedule for details.
<b><u>Brickwork for toilets waiting area and check point</u></b>
<b>Second Class Brick Masonry</b> , Full Brick. Solid wall. approx. thickness: 340 mm incl. mortar Surface finish not included.
RCC M-250 cast-in-place for columns, beams and slab of check points the Toilets
<b><u>Windows and Window Hardware</u></b>
<b>Reception building:</b>
<b>Steel window W1</b> See drawing for full details of this window. (These are W1 with deal tray hole).
<b>Steel window W2.</b> See drawing for full details of this window.
<b>Steel window W3.</b> See drawing for full details of this window.
<b>Steel window W4.</b> See drawing for full details of this window.
<b>PVC window W5.</b> See drawing for full details of this window.

<b><u>Doors and Door Hardware</u></b>
<b>Supply and Installation steel/blast prove Door 'A'.</b> See drawing for full details. (Including its mechanical and electrical system installation)
<b>Supply and Installation steel/blast prove Door 'B'.</b> See drawing for full details. (Including its mechanical and electrical system installation)
<b>Supply and Installation steel/blast prove Door.</b> See drawing for full details. (Including its mechanical and electrical system installation)
<b>Supply and Installation steel/blast prove Door.</b> See drawing for full details. (Including its mechanical and electrical system installation)
<b>Supply and Installation steel/blast prove Door 'E'.</b> See drawing for full details. (Including its mechanical and electrical system installation)
<b>Supply and Installation steel/blast prove Door 'F' .</b> See drawing for full details. (Including its mechanical and electrical system installation)
<b>Supply and Installation steel/blast prove Door 'G' .</b> See drawing for full details. (Including its mechanical and electrical system installation)
<b>PVC Door 'J'.</b> See drawing A03 and A08 for full details on this window.
<b>Supply and Installation steel/blast prove Door 'K'.</b> See drawing for full details. (Including its mechanical and electrical system installation)
<b>Supply and Installation steel/blast prove Door 'L'.</b> See drawing for full details on this window.
<b>Turning Style gates Steel 'M'. Supply and installation</b> See drawing A01 and A07 for full details on this window.
<b>Steel Door 'H'. Supply and installation</b> See drawing for full details on this window.
<b>Main Entrances Steel Sliding Gates.</b> Supply Fabrication Installation of Steel Sliding Gate 'E'. See drawing for full details. (Including its mechanical and electrical system installation,
<b>Boom gate at Main Entrances.</b> Supply, Fabrication Installation of Boom Gate at check point area. See drawing for full details.
<b><u>Glazing</u></b>
<b>Mirrors (40x60cm)</b> at common toilets. This includes complete installation.
<b><u>Insulation and Vapour Barriers</u></b>
<b>Rock wool thermal insulation</b> on RCC roofs Reception building and internal guard booths. See drawings and schedules for details.
<b><u>Metalwork</u></b>
<b>Metal handrails, balustrades, infill and moldings</b> to concrete Pad both side of walk way inner and outer side of the as shown on the drawing. This includes any needed work for complete installation and also includes painting as per schedule and specification for metallic surface painting. See drawing for details.

<p><b>Fencing:</b> Installation of new fencing system around the Walk way area. The fencing system will be made of galvanized with 2 " pipe for posts and horizontal railing; the posts embedded into M-150 Portland cement plain concrete foundations of 400x400x400mm size. The posts are @2000mm c/c with the height of 2500mm from ground level.</p> <p>There will be galvanized 2" bracings @ 10m distance and also at each corner of the system. The cost for liner meter of the fencing covers main single leaf gates and one double leaf gate as shown on the drawing or guided by engineer.</p> <p>The cost includes any foundation digging, concrete foundation and all needed work and materials to complete job. The cost also includes whatever is in drawings and mentioned in General Notes to full satisfaction of Engineer.</p>
<b>Toilet roll holders.</b> This also includes installation.
<b>Soap dishes.</b> This also includes installation.
<b><u>Plastering</u></b>
<b>Internal walls and ceiling surfaces of reception building rooms and all guard booths:</b>
Gypsum plaster medium GPM as the base coat followed with gypsum plaster fine GPF as the final layer. See schedule for details.
<b>External and internal walls and ceiling surfaces :</b>
Cement render medium CRM as the base coat followed with cement render fine CRF as the final coat. See schedule for detail.
<b><u>Tiling</u></b>
<b>Ceramic wall tiles</b> for toilets. The cost includes bed preparation, bedding and grout.
<b>Ceramic floor tiles</b> for toilets including bed preparation, bedding and grout.
<b>Marble tiles and skirting for all internal floors of reception building (except floors got ceramic tiles) .</b> The cost includes bed preparation, installation and bedding & grout and all to complete the job.
<b>Skirting for all external wall.</b> The cost includes bed preparation, installation and bedding & grout and all to complete the job.
<b><u>Painting</u></b>
Internal walls and ceiling surfaces of reception building rooms, guard booths:
Flat water based: Interior. See schedule for detail on this paint system
<b>External walls surfaces:</b>
Flat water based: Exterior. See schedule for detail on this paint system
<b><u>Water Services</u></b>
<b>Water supply piping</b>
PVC water supply pipe D=50mm, including fittings and installation.
PVC water supply pipe D=25mm, including fittings and installation.
PVC water supply pipe D=15mm, including fittings and installation.
Water supply bronze Valve D=25mm, including fittings and installation.
Water supply bronze Valve D=15m, including fittings and installation.
Water supply bronze Valve D=50m, including fittings and installation.
Damp proof Insulation rubber tape for all PVC Piping.
Water supply Manhole, complete structure including all needed jobs and installation required.
<b>Sanitation Piping</b>
PVC pipe D=100mm, including installation.

PVC pipe D=50mm, including installation.
PVC Elbow 135deg D=100mm including supply and installation
Sanitation Elbow 45deg D=100x50mm
PVC Tee D=100x50, 45, including supply and installation.
PVC Eye inspection D=100mm, including supply and installation.
Ventilation PVC pipes D=50mm (from toilets to roof). This also includes supplying and installation of PVC screen at the pipe inlets inside the toilets. See drawing and schedule for details.
Ventilation cap D=50mm, including supply and installation.
Sanitation clean out D=50mm
Floor trap D=50mm, including supply and installation.
PVC 4000lit Septic Tank. This includes excavation and Installation.
Warning tape, including supply and installation.
Sanitation Manhole. This includes excavation and any needed work to make the manhole according to the drawings and schedules.
<b>Sanitary and other fixtures</b>
Western toilet, including supply, installation and accessories.
Ceramic sink at toilets, including mixer and all accessories, supplying and installation.
Steel sink including mixer and all accessories, supplying and installation.
Electrical water boiler with capacity of 50 Liter, including supply and installation.
Muslim shower, including all accessories.
<b><u>Electrical Services</u></b>
<b>Switchboard and sub boards</b>
Main distribution panel, 400x600x250 mm(WxHxD), POWDER Coated, weather proof, mounted
Sub distribution panel, 600x900x250 mm (WxHxD), Powder coated, weather proof, mounted
Sub distribution panel, 300x250x250 mm (WxHxD), Powder coated, weather proof, mounted
Busbar link for connecting between Main CB and outgoing CB's
DIN Rail.
Copper busbar, 5x20mm
Cable Lugs for connecting each grounding points to the Earthing strip different size
Busbar insulator, M10
Circuit breaker, MCCB, 3x100Amps, Type-C
Circuit breaker, MCB, 3x32Amps, Type-C
Circuit breaker, MCB, 1x32Amps, Type-C
Circuit breaker, MCB, 1x20Amps, Type-C
Circuit breaker, MCB, 1x16Amps, Type-C
Circuit breaker, GFI/RCCD , 1x20Amps, fault current capacity 150mAmps
Circuit breaker, MCB, 1x10Amps, Type-C

<b>Distribution cabling</b>
Cable NYY 4x25mm <sup>2</sup>
Cable NYY 4x8mm <sup>2</sup>
Wire 1x6mm <sup>2</sup> Black Color
Wire 1x6mm <sup>2</sup> Blue Color
Wire 1x6mm <sup>2</sup> Yellow Green Color
Wire 1x2.5mm <sup>2</sup> Black Color
Wire 1x2.5mm <sup>2</sup> Blue Color
Wire 1x2.5mm <sup>2</sup> Yellow Green Color
PVC Join Box 70x70mm
PVC Duct 40x40mm
Wire Nut for 6mm <sup>2</sup>
Wire Nut for 4mm <sup>2</sup>
Single pole/double pole or two-way light switch
2x36W ceiling light , IP54 Compact Fluorescent light fixture
2x36W water proof for the toilet
Water Proof Lihgt for the top entrance
Roof mounted exhaust fans 80W
15 Amp single electrical outlet/socket, recessed mount IP-56
20A Out let for the AC
AC split system 18000BTU
Acsplit system 9000BTU
400-watt Floodlight IP-56 HPS lamps with all accessories and requirements
1x50mm <sup>2</sup> Grounding Cable
Grounding Rod Copper 0.02m dia, 3m Length with all accessories. Cable for grounding of DB and 4 Sub point different size, Grounding Rod, CU (18mmx3000mm) with clump,