**DESCRIPTION OF CONSTRUCTION CONSULTANCY SERVICES**

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# 1. TOPOGRAPHICAL SURVEYS

**1.1** **GENERAL DESCRIPTION**

The Contractor shall carry out the survey in accordance with the requirements contained in Section 4.3. However, in the course of the survey, should the Contractor observe additional information that will impact on any future construction works, this shall be included in the survey and the Client informed of the item.

This document contains the standard requirements for the gathering of information in the course of a topographical survey. During the course of the survey, the Contractor shall only be responsible for the gathering of information relative to the area to be surveyed.

**1.2 CONSTRAINTS**

* The Contractor shall liaise with the Client and the relevant authority with regards to access to the site location and shall be bound by any restrictions imposed.
* The Contractor shall be responsible for any damage caused to the work or to surrounding areas by the Contractors operatives or any sub-contractor operating under the delegated authority of the Contractor.

**1.3 DETAILED REQUIREMENTS**

**1.3.1 Control Points**

The survey will be referenced to the national/grid reference system and all levels shall be referenced from the national vertical datum or where this is not available to sea level (if related to sea level, full details of the level shall be included e.g. High tide/low tide).

Permanent ground markers (base control points) known as PGM’s will be established on the site. The markers will be established such that they can be utilised as a survey point of reference for the duration of the project. One number PGM shall be positioned at the edge of the site extents with a minimum of two additional PGM’s positioned outside the site extents. The positions of the two PGM’s outside the site are to be agreed with the Client in conjunction with the relevant governmental authority and should be placed in discrete locations where they will not be a hazard and will not be in danger of being damaged. All PGM’s will be surveyed and closed back to the relevant reference datum. The items to be used as PGM’s shall be durable and long lasting.

Details of the PGM’s to be used on the Contract shall be submitted to the Client for approval prior to use. Each PGM shall be surveyed separately and closed back to the national survey datum to ensure the compounding of survey error does not occur.

Details relating to the location of each PGM including a detailed description and sketch referencing it to landmarks local to the survey area or a known point shall be included in the survey report.

**1.3.2 Survey Detail**

The survey detail required by the Client may include but is not limited to the elements contained below. Where the detail of the element is complex, the survey may be supplemented by annotated sketches contained within the survey report to provide more clarity to the element. Such elements shall be cross referenced between the survey drawing and the report.

**1.3.3 Site Boundary**

The survey shall detail accurately the precise location of the site boundary. Where there is no site boundary indicated on site, the Contractor may be required to liaise directly with the Client and any third parties to confirm the precise location of the boundary extents to be surveyed as part of the Contract. The Contractor shall contact the Client prior to executing the survey to confirm the approved site boundaries.

**1.3.4 Existing Elements**

Any existing buildings shall be accurately surveyed with co-ordinates taken at each corner of the building to provide an accurate layout in plan. Additionally, spot levels shall be taken at each corner of buildings at the buildings ground floor level. Where possible, for buildings greater than one storey high, levels of upper floors shall also be surveyed. A sketch of the building containing details (estimated if not surveyed) of the building height and elevations shall be included in the survey report.

Street furniture, antennae, bunkers and other building elements located within the site extents shall be surveyed. This shall include, in addition to an accurate survey of the element plan layout, information of the element dimensions (height, width etc), element use, construction type and any other details relevant to that encountered. Should a complex element (e.g. a sub-station) be encountered, it shall be referred to in detail in the survey report and accompanied by sketch layouts and photographs as required to provide a detailed description. Large elements (buildings, electricity sub stations, antennas etc) located within 50m of the site boundary shall be surveyed where possible. Where the

recording of accurate survey data is not possible, it shall be approximately indicated on the survey plan noting the inability to accurately survey the element in question.

For fences, the detail shall record the type and height of fence, the type of posts and wire and shall record accurately changes in direction of the fence.

For walls, the survey shall detail the height, width and construction type including type of finish, together with the location of pillars, openings, arches and changes in direction.

Trees shall be recorded and separated into categories depending on the girth of the tree encountered. The girth is measured 1.0m above ground level. The survey shall also record the type of tree. Should they number of trees prohibit the recording of this details (ie for a forest, they shall be defined by a line, appropriately referenced, along the line of the trees around the perimeter.

Ditches, streams, rivers, canals ponds, wells and reservoirs shall be accurately recorded. The survey shall, where possible, record the invert level, the water level and the flow direction where relevant. When shown on the final drawing, the water level shall be accompanied by the date on which the survey took place. Should any high water marks be visible in the vicinity of the water feature, the Contractor shall record the level of such and refer to same in the survey report detailing the location with sketches as required.

Any signage located on or adjacent to the site extents shall be recorded.

Any other items such as bunkers, antennas, water tanks, traffic controls, and domestic commercial and industrial elements etc shall all be included within the survey.

**1.3.5** **Transport**

All pavements encountered within the site boundary will be accurately recorded and marked on the survey plan. The survey shall contain information of the pavement type, dimensions and where possible the depth of pavement encountered. Where the pavement is in the form of a trafficked road, the position of lines and markings on the pavement shall be recorded. The location and width of the road verge and/or central medians shall be surveyed. Levels shall be required along the road at 10m intervals. All roads shall be identified by name and by the designated road number. The survey shall also include all road side elements such as barriers (visual, noise and crash type), kerbs (including height), gullies, channels and road side furniture.

Where railroads are encountered, the level shall be taken at the top of the rail at 25m intervals and the locations of any special elements such as switches and crossings and insulated block joints shall be indicated along with the approximate beginning and end of sections of cant (super elevation). Sketches of the rail type and other relevant details shall be detailed in the survey report.

**1.3.6** **Ground Levels**

The survey of the existing ground contours shall extend 20m outside the site extents (where area is unrestricted). This shall indicate the general ground terrain within the site and should detail accurately all changes in grade such as tops of hills and bottoms of hollow areas. Contours shall be interpolated on the drawings at 0.2m intervals with a more prominent layer type and colour used for every 1m change in level. Where side slopes are encountered, slope symbols shall indicate the fall of the slope.

Spot levels shall be shown on the drawing on an approximate 10m square grid and referenced on the output drawing directly (this does not replace the requirement for additional spot levels to enable generation of contours). Spot levels are also required at distinct changes in grade.

**1.3.7** **Drainage and Sewerage**

All pipes drainage, channels and sewers (both above and below ground) shall be recorded. Where existing chambers are encountered, the survey shall record both the cover level and invert level(s) of the chamber and include details of chamber construction, diameter of pipes and type of pipes connecting to it.

For drainage elements, the nearest outlet of the drainage shall be recorded. All drainage outlets within 30m of the outside edge of the site extents shall be recorded. Notwithstanding this, the Contractor shall identify at least one suitable available outfall point for the discharge of storm water run-off from the site.

**1.3.8 Utilities**

All utilities both above ground and below ground (below recorded by scanner tool) shall be surveyed including location of chambers and changes of direction. This shall include all water mains, gas lines, electricity, communications and any other services. All chambers shall be identified and recorded (e.g. in the case of water mains all hydrants, air valves, sluice valves, scour valves etc shall have their own identifier.

For underground services, the survey shall record the utility found, its location, approximate depth and direction leaving the site extents. For overhead services, the position of poles, the height of the service and direction leaving the site extents shall be recorded.

Where the utility is unknown, the Contractor is expected to source the required information from the relevant local authority.

**1.3.9 Accuracy**

The detail will be accurate to the following tolerances when referenced from the nearest PGM

 Horizontal Accuracy ± (plus or minus) 25mm

 Vertical Accuracy ± (plus or minus) 15mm

**1.3.10 Drawings**

An electronic copy of the surveys will be provided to the Client in AutoCAD 2D and 3D file format (AutoCAD 2007.dwg version). Additionally an electronic “hard copy” of the drawing in Adobe PDF format will be issued complete with title block, legends etc.

Where requested by the Client, hard copy paper versions of the drawing shall be issued in A1 size (841mm x 594mm sheet) at a suitable scale to be agreed. Depending on the scale agreed, the survey may extend over more than one A1 sheet.

The Contractor shall ensure that each individual element or group of elements (e.g. utility, wall, spot height) that gets surveyed is contained on a separate layer. These layers shall be named identifying the element in question thus enabling various elements surveyed to be turned off by the Client as required.

**1.3.11 Survey Report**

The survey report and drawings shall be submitted to the Client in the English language. Where the information has been gathered in a language other than English, the Contractor shall include an English translation of all such information in the report and a copy of the information in the original language included as an addendum to the report

The Contractor shall submit a report of the survey carried out. This shall include details of the locations of PGM’s (to include co-ordinates, sketches and photos), a summary of the survey carried out including the elements encountered and a report of the closure of the survey to the reference datum to verify its accuracy. The report shall also confirm

details of the current drainage layout on the site with respect to drainage falls and facilities for outfalling of drainage.

The Contractor shall take photographic records of the survey location. All photographs shall be taken in digital format using a digital camera with a minimum of 3 million pixel resolution shot at the highest resolution and saved in “JPEG” format with a minimum size of 2048 x 1536 pixels. The photographs shall be appropriately tagged identifying the date, location (grid ref) and object being photographed. The photographic record will be provided in both hard copy format, contained within an annex to the survey report, and electronic format (on compact disk in “JPEG” format).

The report shall be submitted in “soft copy” format in Microsoft Word and where necessary Microsoft Excel (version 1997-2003) format and in Adobe PDF (electronic paper copy) format. Where requested by the Client, the Contractor shall also submit a “hard copy” (paper) version of the report (max 3 no. copies).

For the avoidance of doubt, and in respect of contractual obligations, the PDF copy (electronic paper format) of documents and drawings shall be the contractually binding copy of the output information. Documents in other formats (Microsoft Word, AutoCAD Microsoft Excel) shall be provided to the Client for “information only”.

# 2. GEOTECHNICAL SURVEYS

**2.1** **GENERAL DESCRIPTION**

The Consultant will be responsible for the development and management of any Ground Investigation (GI) contracts that is required to support the particular project. The Consultant shall agree with the Client the specification and standards to be applied as part of the development of the GI scope of works prior to carrying out the works. The Consultant will be responsible for all liaison with 3rd parties and for co-ordination of all the GI Contractors activities as described below.

**2.2 CONSTRAINTS**

* The Consultant shall liaise with the Client with regards to access to the site location and shall be bound by any restrictions imposed. In the event of a restriction being imposed by the authorities the Consultant shall inform the Client within 24 hours.
* The Consultant shall be responsible for any damage caused to elements outside of the site extents by the GI Contractors operatives or any sub-contractor. All excavations opened as part of the work shall be backfilled completely to the satisfaction of the Client after investigations have taken place.

**2.3 DETAILED REQUIREMENTS**

There may be access constraints to the work site, details of which will be forwarded to the GI Contractor prior to beginning work.

The Client requires that the Consultant establishes the following details as part of the GI Contract, at a minimum

* Detailed soil characteristics for the full depth of each borehole / trial pit
* Bearing capacity of the soil
* Ground water level
* Depth to bedrock
* Depth of differing soil layers
* Assessment of the potential for aggressive attack by the soil on concrete and steel
* Assessment as to the presence of any contaminated soil
* Study on seismic vulnerability and underlying ground conditions

The ground conditions shall be determined by sinking boreholes, excavating trial pits and in situ tests, obtaining disturbed and undisturbed soil samples, and taking measurements of groundwater behaviour.

All testing of ground conditions shall be carried out in accordance with the British Standard BS 5930:1999 “Code of Practice for Site Investigations”, and/or ASTM Standard D 420-98 (2003) “Standard Guide to Site Characterization for Engineering Design and Construction Purposes” or an internationally recognised equivalent. If an alternative standard is to be used, the Consultant shall forward a copy of the relevant standard to the Client, for approval, prior to commencing work on site.

All reports, borehole records, graphs, drawings shall be submitted to the Client in the English language. Where the information has been gathered in a language other than English, the surveyor shall include as part of the report a certified English translation of all such information.

**2.4 SPECIFICATION**

**2.4.1 General**

* The Consultant shall check for the location of existing services prior to commencing any intrusive works at the site. This shall be done in liaison with the Client.
* At all times it shall be ensured that exploration works does not impact on areas adjacent to the site.
* The commencing level for the Works shall be taken as existing ground level.
* Trial pits and boreholes shall be carried out ensuring the avoidance of surface water inflow into the borehole.
* The borehole location shall be recorded by GPS co-ordinates location (Decimal Degrees) and detailed on a site plan (the scale of which shall be submitted to the Client for approval) of the site and on the borehole / trial pit logs. These locations shall be to an accuracy of 0.5m. In relation to trial pits, the co-ordinate shall be at the centre of the trial pit.
* All logging of results shall be carried out in accordance with BS5930, ASTM D 5434-09 or other internationally recognised standard, to be approved by the Client, and shall be recorded by an experienced Geotechnical Engineer.
* Excavations shall be backfilled with the excavated material compacted in layers. The GI Contractor shall ensure that the site is returned to the condition that it was on arrival to the satisfaction of the Client, reasonably expected disturbance to the excavated areas accepted.
* The GI Contractor is responsible for the safety and stability of the Works, and of all operations on the Site connected with the Works, including temporary works.
* The GI Contractor shall also erect, maintain and remove at the completion of the Works, any temporary support which may be required for the protection of the site or adjoining property.
* The Consultant and GI Contractor must implement the works according to best practice as adjudged by the Client.
* From when the Client provides the GI Contractor access to the Site, the GI Contractor must: as far as practicable, secure the site and keep off the site persons not entitled to be there; keep the site in good order and free from unnecessary obstructions; as far as practicable, secure the safety of persons on the Site and protect them and users, owners and nearby areas from hazards and interference resulting from the Works and as far as practicable, ensure that the GI Contractor’s Personnel and the Works do not unnecessarily or improperly
1. cause a nuisance or inconvenience to the public or users, owners,

occupiers of land, roads, or footpaths on or near the Site, or

* 1. interfere with the use of land, roads, or footpaths.
* The Client may instruct the Consultant to suspend all or part of the Works. The Consultant must, during the suspension, arrange to protect, store, and secure the affected Works and maintain the insurances required by this Contract. The Consultant must resume the Works promptly after the Client instructs.

**2.4.2 Trial Pits**

* Trial pits shall be excavated utilising machinery of a size suitable for access to the site and to the approval of the Client.
* The GI Contractor shall ensure that all sides of trial pits are sloped back or adequately supported to prevent the risk of inundation of the excavation.
* As part of the activities carried out within the works, the GI Contractor shall calculate the percolation rate of the soil.

**2.4.3 Boreholes**

* The borehole rig used on the site shall be capable of sampling up to a depth of 10m below ground level
* Boreholes shall be of a sufficient diameter to enable the extraction of suitable undisturbed samples (minimum borehole diameter 150mm).
* Where boreholes pass through permeable strata, they shall be lined with suitable liners that shall be maintained within the borehole until all required samples have been taken.
* Samples shall be taken of all strata passed and at a minimum of one meter intervals.

**2.4.4 Water Monitoring**

* Ground water level shall be assessed throughout the site to develop an indication of the water table level.
* During normal testing activities and in the event of groundwater being present, the level at which it is struck shall be noted and standing water level recorded. As the ground water level rises, the approximate rate at which it rises should be measured.
* Should the water level not be identified through the normal borehole testing (i.e. at

≤ 10.0m), the Contractor shall, at one location within the site extents, establish accurately the level at which ground water is present on the site and record in full the details of same.

**2.5 TESTING**

All testing shall be carried out by a material’s testing laboratory certified in accordance with ISO/IEC 17025: 2005 (on national certified, where not available) to carry out the specified tests. Such a laboratory shall be certified as complying with the requirements of ISO/IEC 17025:2005 by a national or international accreditation board. A copy of the accreditation documentation confirming the laboratory’s certification for carrying out the required tests shall be forwarded to the Client prior to signing the Contract.

**2.6 DELIVERABLES**

**2.6.1 Site Investigation Report**

The site investigation report shall be submitted in draft format to the Client for review and comment. On receiving approval from the Client to proceed, the Consultant shall submit the final report.

The report shall be submitted in “soft copy” in Microsoft Word and where necessary Microsoft Excel (version 1997-2003) format and in Adobe PDF (electronic paper copy) format. Where requested by the Client, the Contractor shall also submit a “hard copy” (paper) version of the report

The report shall contain but shall not be limited to the following headings:

* Introduction
* Scope of Work
* Ground Conditions
	+ Soil Characteristics (as per ASTM / BS Requirements)
	+ Regional Geology including seismic considerations
	+ Site Observations
	+ Groundwater
	+ Obstructions encountered
	+ Aggressive Soils
	+ Miscellaneous
* Geotechnical Design Criteria for a new structure at the site
	+ Development Description (if received)
	+ Site Preparation
	+ Foundations
	+ Earthworks
	+ Pavement Works
* Conclusions and Recommendations

The GI Contractor shall take photographic records of each borehole/trial pit location both before and after the borehole or trail pit commence and complete. All photographs shall be taken in digital format using a digital camera with a minimum of 3 million pixel resolution shot at the highest resolution and saved in “JPEG” format with a minimum size of 2048 x 1536 pixels. The photographs shall be appropriately tagged identifying the date, location and trial pit / borehole reference being photographed. The photographic record will be provided in both hard copy format, contained within an annex to the site investigation report, and electronic format (on compact disk in “JPEG” format).

As an appendix, the report shall contain a map of the site with the actual locations of the boreholes/trial pits detailed upon it with co-ordinates. This shall be accompanied by a referenced sheet containing co-ordinates of all the testing locations. The Contractor shall validate the accuracy of the co-ordinates given prior to issuing the report.

All geotechnical results obtained during the site visit shall be included as a second appendix to the report. An additional appendix shall also include background information on the geological aspects of the areas referenced elsewhere in the report.

# 3. HYDROLOGICAL SURVEYS

The Consultant shall undertake a Hydrological Investigation for the Project where required, and submit a report, drawings, calculations and model files (in a digital format approved by The Client) for consent. The investigation shall include, but not limited to, the following:

1. Rainfall
2. The rising ground water table
3. Existing drainage conditions, identifying catchment and sub-catchment areas, collection areas, existing drainage facilities and flood impact on the site and from all contributing areas.
4. Impact assessment for storm return periods, as per local standards and guidelines
5. Drainage Model that shows all assumptions, graphs, charts, and calculations, together with proposed drainage facilities and networks. This shall be presented in report form.
6. The Consultant shall assess the feasibility of localised water retention and detention areas in landscaped, park, or other areas, in addition to Emergency Flood Areas, at the discretion of the Client
7. The Consultant shall utilize existing mapping, where available, to illustrate his representation.
8. The design for surface water drainage shall consider environmental sustainability.
9. Levels of ground water for design purposes.

# 4. ARCHITECTURAL SERVICES

Architectural services covers all aspects of building design and architecture where the types of buildings require specific design consideration by an Architect, typically this would include accommodation, compound and agency facilities.

**4.1 DETAILED REQUIREMENTS**

The Consultant maybe required to provide all or parts of the following activities which included but are not limited to:

* Consultation, at project outset, with the Client to identify the project requirements and constraints;
* Assessment of the proposed site and its current conditions (including existing building, services, utilities, infrastructure and ancillaries) to confirm its suitability for the project proposed;
* Selection, appointment and management of the services of third parties, with the approval of the Client, for the execution of any specialist assessment, investigative works and any other third party services required (topographic, geotechnical surveys etc.);
* Identification, preparation, and if requested by the Client, submission of the necessary permits and statutory approvals required in order to complete the project;
* Execution of the design and provision of deliverables in accordance with this scope of work;
* Liaison with the Client and any other stakeholders to the project including any liaison that may be required with other third parties from time to time,
* Prepare a detailed projected construction programme for the project identifying the likely timeline for the project construction phase and including project milestones;
* Provision of, at preliminary and detailed design stages, cost estimates for the project, based on the relevant schedules of quantities and reflecting local rates, to be utilised to scope the project within the available project budget and as a reference document for the assessment of prices submitted to construct the project;
* Provide detailed specifications for works, materials, equipment and methods to enable the Contractor’s to construct the project.
* In addition, the Consultant maybe required as part of the scope of work to undertake activities related to Phase 4 and 5 of the project phases as described in the RFP. This will include but is not limited to:
* Provide input at Project Tender Stage, as required, to answer queries from the Construction Contractors, to make any necessary alterations to the design and to provide input into the assessment of the Construction Contractor’s tender submissions;
* Provision of assistance and technical expertise throughout the construction phase of the project when required, to respond to Contractor’s queries, to resolve design issues on site and alter elements of the design, if requested, in accordance with the requirements of this scope of work;
* Supervise the construction of the project through to the issue of the certificate of substantial completion and beyond, as required by the Client;
* Provide input and assistance into the completion of project as-built drawings;
* Provide input and assistance into the completion of project financial final accounts;
* Ensure that the production of the design and the completion of the construction is executed in accordance with national and international health & safety standards.
* Ensure that all design and construction is completed to internationally recognised quality standards.
* Any other duties consistent with the normal roles and responsibilities of a Contractor.

In general, the design work should be such that it fits the objective of the project and portray a positive image of the Client to the surrounding host community. The design should consider key elements such as:

* Safety & security according to the requirements of the Client Security
* Internal infrastructure such as connection to services including water supply, electricity, telecom and sewerage
* Internal & external parking as per the specific design requirements
* Provision for generator room, drivers’ room, controlled access gate etc

**4.2 SPECIFICS**

**4.2.1** **Architectural Design Requirements**

* + The facilities should be aesthetically pleasing and appropriate for the planned usage.
	+ The project is to provide a safe environment for the users and enable them to carry out their duties / activities efficiently and without any distractions.
	+ The project design (especially of schools) should even be:
* child-friendly
* Inclusive and accessible to all, and
* take into consideration social and cultural aspects and all other specificities of the geographical area, country or region where the project will be implemented.
	+ The design should be based on sustainability principal and making best use of nationally available materials, Involving, as much as possible, available resources in the community, technologies and skill sets.
	+ The design should give consideration to environmental aspects and where applicable existing green trees and green areas should be retained as much as feasible. Where directed by the Client and feasible adequate landscaping should be planned to enhance the overall aesthetic value of the facilities. The use of greening technologies and energy optimization shall be highly encouraged.
	+ The project is expected to demonstrate innovative ideas for efficient use of space, materials and building concepts to achieve the projects requirements and take into account international and national standards.

**4.3 SCOPE OF WORK**

**4.3.1 Phase 1 – Options design**

This design stage shall include data collection and option design activities which are briefly summarised in table 7.1 below:

**Table 7.1 – Architectural Phase 1 Option design activities**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Activity** | **Sub-activity** |  | **Requirements** |  |
|  |  |  |  |  |  |
|  |  |  |  | Management of surveys in accordance |  |
|  |  | Topographical survey |  | with the requirements provided in Section |  |
|  | Data collection |  | 4.0 |  |
|  |  |  |  |  |
|  |  |  | Management of surveys in accordance |  |
|  |  |  |  |  |
|  |  | Geotechnical survey |  | with the requirements provided in Section |  |
|  |  |  | 5.0 |  |
|  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activity** |  | **Sub-activity** |  | **Requirements** |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  | Surveys may be required to assess the |  |
|  |  |  |  |  |
|  |  |  |  | condition of all utility services present at |  |
|  |  |  |  | the site. This shall assess the condition |  |
|  |  |  |  | of connections, any extensions required |  |
|  |  |  |  | to bring the services to the site and the |  |
|  |  | Utility survey |  | likely capacity of the services to serve the |  |
|  |  |  | requirements of the Clients, or otherwise |  |
|  |  |  |  |  |
|  |  |  |  | shall confirm sufficiency of available |  |
|  |  |  |  | services | with | reference | to | the |  |
|  |  |  |  | requirements. It shall also confirm the |  |
|  |  |  |  | location of any existing services crossing |  |
|  |  |  |  | the site. |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  | Seismic design |  | Management | of, | or | preparation | of | any |  |
|  |  |  | seismic design or analysis as detailed in |  |
|  |  | considerations |  |  |
|  |  |  | section 9.0 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  | The Consultant shall assess and mitigate |  |
|  |  |  |  | through the design the impact of potential |  |
|  |  | Climate information |  | climatic events at the given location (e.g. |  |
|  |  |  |  | wind and snow loading, flooding risks |  |
|  |  |  |  | etc.) |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  | The Consultant shall obtain and review |  |
|  |  |  |  | national and local requirements and |  |
|  |  | National and local |  | guidelines that need to be considered for |  |
|  |  |  | architectural and structural design of the |  |
|  |  | Bylaws and best |  |  |
|  |  |  | facility. | For | development | of | concept |  |
|  |  | practices |  |  |
|  |  |  | design of the facility, these requirements |  |
|  |  |  |  |  |
|  |  |  |  | shall be coordinated with the Client’s |  |
|  |  |  |  | requirements, | and | International | best |  |
|  |  |  |  | practices for office spaces. |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  | The Consultant shall identify local market |  |
|  |  |  |  | conditions, including but not limited to |  |
|  |  |  |  | material, | technologies and | contractor |  |
|  |  |  |  | local capacity. |  |  |  |  |  |  |  |
|  |  | Project Information |  | The Consultant should also identify local |  |
|  |  |  |  | socio-political and cultural considerations |  |
|  |  |  |  | (cultural and religious aspects which |  |
|  |  |  |  | might have an impact on the design and |  |
|  |  |  |  | use of a building) |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  | **Sub-activity** |  | **Requirements** |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  | The Consultant shall research and |  |
|  |  |  |  |  |  |
|  |  |  |  |  | confirm details relating to the permits that |  |
|  |  |  |  |  | will be required to complete the |  |
|  |  |  |  |  | construction of | the | Project. | The |  |
|  |  |  |  |  | Consultant shall prepare a summary |  |
|  |  |  |  |  | document | highlighting | the | information |  |
|  |  |  |  |  | gained and relevant procedures to be |  |
|  |  |  | Permits |  | followed | to obtain all permits for the |  |
|  |  |  |  | Project, and time requirements to obtain |  |
|  |  |  |  |  |  |
|  |  |  |  |  | such permits. All applications for permits |  |
|  |  |  |  |  | shall be prepared by the Consultant with |  |
|  |  |  |  |  | the Client being notified when they are |  |
|  |  |  |  |  | ready for submission. The Consultant |  |
|  |  |  |  |  | shall not submit permits on the Clients |  |
|  |  |  |  |  | behalf unless confirmed in writing by the |  |
|  |  |  |  |  | Client. |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **Progress** |  | **meeting:** | One | or | more |  |
|  |  |  |  |  | meetings with the Client may be required |  |
|  |  |  |  |  | at this stage to let the Consultant be fully |  |
|  |  |  |  |  | informed about Client’s needs and |  |
|  |  |  |  |  | expectations. The Consultant shall be |  |
|  |  |  |  |  | required to attend. |  |  |  |  |  |
|  |  |  | Reporting |  | **Summary report:** The Consultant shall |  |
|  |  |  |  |  | carry out a review of the information |  |
|  |  |  |  |  | arising from the completion of activities |  |
|  |  |  |  |  | outlined | above. | All data collection |  |
|  |  |  |  |  | information and output shall be brought |  |
|  |  |  |  |  | together in the form of a report. The |  |
|  |  |  |  |  | report shall be included as part of the |  |
|  |  |  |  |  | concept design submission to the Client |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  | The design of each option shall comprise |  |
|  |  |  |  |  | of the following or as detailed in the |  |
|  |  |  |  |  | particular project brief: |  |  |  |  |
|  |  |  | Design option |  | General layout |  |  |  |  |  |
|  |  |  |  | Access |  | information | including | road, |  |
|  | Options design |  | development ( min. of |  |  |  |
|  |  |  | parking etc |  |  |  |  |  |
|  |  |  | 3 options) |  |  |  |  |  |  |
|  |  |  |  | Floor plans and building circulation |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  | Exterior elevations, rendering and colour |  |
|  |  |  |  |  | palette |  |  |  |  |  |  |  |
|  |  |  |  |  | Critical building sections and details |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

Any other such details as the Consultant or Client may deem relevant shall also be included. The Client shall assess the proposed designs and discuss their content with the Consultant. One of the concept designs proposed, incorporating any comments by the Client, shall be then implemented on the project as a whole and brought forward to the Preliminary design stage for development. The Consultant shall propose a schedule of data to be prepared for the project preliminary design stage which shall be to the approval of the

**4.3.2** **Phase 1 Preliminary Design**

The design option to be progressed shall be the Client approved option.

During the preliminary design stage, Consultant shall develop the Clients requirements with respect to the requirements for the completed facilities and any other innovative elements that the Client or Consultant may propose throughout this stage. During this stage, the consultant shall develop the details in table 7.2 below;

**Table 7.2 – Architectural Phase 1 Preliminary design activities**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Site plans including boundary elements, |  |
|  |  |  |  |  |  |  | paving layouts, traffic circulation, external |  |
|  |  |  |  |  |  |  | lighting, and locations for security cameras |  |
|  |  |  |  |  |  |  | Lighting, signage and utilities |  |
|  |  |  |  |  |  |  | Structural, Civil, Architectural floor plans for |  |
|  |  |  |  |  |  |  | main buildings as well as adjacent buildings |  |
|  |  |  |  |  |  |  | such as security check post, drivers’ room, |  |
|  |  |  |  |  |  |  | vehicle shed, water tank |  |
|  |  |  |  |  |  |  | General drainage and storm water drainage |  |
|  |  |  |  | Preparation of |  | plan |  |
|  | Preliminary |  |  | MEP and Fire Protection details |  |
|  |  | architectural design |  |  |
|  | design |  |  | Landscaping |  |
|  |  | elements |  |  |
|  |  |  |  |  | Exterior elevations, rendering and colour |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | palette |  |
|  |  |  |  |  |  |  | Building sections and details |  |
|  |  |  |  |  |  |  | Interior elevations, casework and millwork |  |
|  |  |  |  |  |  |  | elevations |  |
|  |  |  |  |  |  |  | Internal space allocation/arrangement of |  |
|  |  |  |  |  |  |  | work stations, common office services etc., |  |
|  |  |  |  |  |  |  | details of which shall be discussed and |  |
|  |  |  |  |  |  |  | agreed with the Client during the design |  |
|  |  |  |  |  |  |  | stage |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | The report shall cover: |  |
|  |  |  |  |  |  |  | All elements including data collection, |  |
|  |  |  |  |  |  |  | conceptual design, client discussions and the |  |
|  |  |  |  | Preparation of the |  | completed preliminary design |  |
|  |  |  |  |  | Confirmation of the current status of the |  |
|  |  |  |  | preliminary design |  |  |
|  |  |  |  |  | design. |  |
|  |  |  |  | report |  |  |  |
|  |  |  |  |  |  | Preliminary design drawings |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Preliminary cost assessment of the chosen |  |
|  |  |  |  |  |  |  | design option |  |
|  |  |  |  |  |  |  | Presentation to the client |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | 3D renderings of external (3 minimum) and |  |
|  |  |  |  | 3D rendering | of the |  | internal facility layout of the proposed design |  |
|  |  |  |  |  | The renderings may be prepared on |  |
|  |  |  |  | preliminary design |  |  |
|  |  |  |  |  | minimum ISO A1 size sheets; in both hard |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | paper and soft electronic formats. |  |
|  |  |  |  |  |  |  |  |  |  |

**4.3.3** **Phase 3 – Detailed Architectural Design**

Following the completion of the Preliminary Design Stage, the Consultant shall, on receipt of such an instruction from the Client proceed with the detailed design in accordance with the details in table 7.3 below

**Table 7.3 – Architectural Phase 3 Detailed design activities.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Further development and finalisation of the |  |
|  |  |  |  | Development of |  | architectural elements provided in previous |  |
|  |  |  |  |  | section based on Client input to the level that |  |
|  |  |  |  | detailed design |  |  |
|  |  |  |  |  | is constructible and can be accurately priced. |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Final presentation to the client |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Complete | set of | architectural, structural, |  |
|  | Detailed design |  |  |  |  | MEP and | joinery | drawings | including plan |  |
|  |  |  |  |  | layouts, elevations, sections, typical and |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  | Preparation of final |  | specific details | required | to enable a |  |
|  |  |  |  |  | contractor | to construct the | works. These |  |
|  |  |  |  | detailed design |  |  |
|  |  |  |  |  | drawings shall be presented on Client title |  |
|  |  |  |  | package |  |  |
|  |  |  |  |  | blocks. |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Architectural perspectives and details of all |  |
|  |  |  |  |  |  |  | external and internal building elements with |  |
|  |  |  |  |  |  |  | details of all finishing, case work, mill works |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Landscaping design where and as required; |  |
|  |  |  |  |  |  |  | Layout showing planned work spaces, |  |
|  |  |  |  |  |  |  | arrangement of furniture and office |  |
|  |  |  |  |  |  |  | equipment etc as directed by the Client; |  |
|  |  |  |  |  |  |  | All design specifications, wiring diagrams, |  |
|  |  |  |  |  |  |  | material details and plant specifications |  |
|  |  |  |  |  |  |  | required to compliment the drawings; |  |
|  |  |  |  |  |  |  | Schedules of quantities, separated for each |  |
|  |  |  |  |  |  |  | element of the works, in a format to the |  |
|  |  |  |  |  |  |  | approval of the Client, compiled to enable a |  |
|  |  |  |  |  |  |  | tendering contractor to accurately price the |  |
|  |  |  |  |  |  |  | Project; |  |
|  |  |  |  |  |  |  | All relevant background information required |  |
|  |  |  |  |  |  |  | by the Contractor in order to proceed with the |  |
|  |  |  |  |  |  |  | construction of the works (issued for |  |
|  |  |  |  |  |  |  | information only); |  |
|  |  |  |  |  |  |  | A report detailing any health and safety risks |  |
|  |  |  |  |  |  |  | inherent in the design; |  |
|  |  |  |  |  |  |  | Completed application documentation for |  |
|  |  |  |  |  |  |  | any permits/approvals required; and |  |
|  |  |  |  |  |  |  | An Engineer’s estimate or detailed cost |  |
|  |  |  |  |  |  |  | estimate that may be used as a reference to |  |
|  |  |  |  |  |  |  | evaluate the proposed bid prices received for |  |
|  |  |  |  |  |  |  | the works; |  |
|  |  |  |  |  |  |  | A full suite of contract documentation (Note, |  |
|  |  |  |  |  |  |  | the Client may provide some elements such |  |
|  |  |  |  |  |  |  | as conditions of contract and capacity |  |
|  |  |  |  |  |  |  | assessments). |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Preparation of final cost estimate if directed |  |
|  |  |  |  | Additional |  | by the client as per the requirement covered |  |
|  |  |  |  | supplemental |  | elsewhere in the RFP |  |
|  |  |  |  | activities as directed |  | Preparation of final construction programme |  |
|  |  |  |  | by the client |  | if an as directed by the client as per the |  |
|  |  |  |  |  |  |  | requirement covered elsewhere in the RFP |  |
|  |  |  |  |  |  |  |  |  |  |

# 5. BUILDING DESIGN SERVICES

Building design services covers all aspects of building design including (but not limited to) Structural works, Civil Design, Mechanical and Electrical works, fire and security design amongst others. This scope also includes for works such as irrigation, drainage, water supply and sewage works.

The Civil Works elements associated with the projects, which may include the following, non-conclusive list of works;

* Geotechnical Design
* Design of earthworks
* Utility diversions
* Drainage works
* Access roads

**5.1 STRUCTURAL AND CIVIL WORKS**

In line with requirements of project phases 1 to 3 as described in section 3, the Consultant maybe required to provide all or parts of the following activities which include but are not limited to:

* Consultation, at project outset, with the Client to identify the project requirements and constraints;
* Assessment of the proposed site and its current conditions (including existing building/ structures, services, utilities, infrastructure and ancillaries) to confirm its suitability for the project proposed;
* Selection, appointment and management of the services of third parties, with the approval of the Client, for the execution of any specialist assessment, investigative works and any other third party services required (topographic, geotechnical surveys etc.);
* Identification, preparation, and if requested by the Client, submission of the necessary permits and statutory approvals required in order to complete the project;
* Execution of the design and provision of deliverables in accordance with this scope of work;
* Liaison with the Client and any other stakeholders to the project including any liaison that may be required with other third parties from time to time
* Prepare a detailed projected construction programme for the project identifying the likely timeline for the project construction phase and including project milestones;
* Provision of, at preliminary and detailed design stages, cost estimates for the project, based on the relevant schedules of quantities and reflecting local rates, to be utilised to scope the project within the available project budget and as a reference document for the assessment of prices submitted to construct the project;
* Provide detailed specifications for works, materials, equipment and methods to enable the Contractor’s to construct the project.
* Ensure that the production of the design and the completion of the construction is executed in accordance with national and international health & safety standards.

In addition, the Consultant maybe required as part of the scope of work to undertake activities related to Phase 4 and 5 of the project phases as described in the RFP.

This will include but is not limited to:

* Provide input at Project Tender Stage, as required, to answer queries from the Construction Contractors, to make any necessary alterations to the design and to provide input into the assessment of the Construction Contractor’s tender submissions;
* Provision of assistance and technical expertise throughout the construction phase of the project when required, to respond to Contractor’s queries, to resolve design issues on site and alter elements of the design, if requested, in accordance with the requirements of this scope of work;
* Supervise the construction of the project through to the issue of the certificate of substantial completion and beyond, as required by the Client;
* Provide input and assistance into the completion of project as-built drawings;
* Provide input and assistance into the completion of project financial final accounts;
* Ensure that construction is completed to internationally recognised quality standards.
* Ensure that the production of the design and the completion of the construction is executed in accordance with national and international health & safety standards.
* Any other duties consistent with the normal roles and responsibilities of a Contractor.

In general, the design work should be such that it fits the objective of the project and portray a positive image of the Client to the surrounding host community. The design should consider key elements such as:

* Safety & security according to the requirements of the Client Security
* Internal infrastructure such as connection to services including water supply, electricity, telecom and sewerage
* Internal & external parking as per the specific design requirements

**5.1.1** **Structural & Civil Works Design Requirements**

The principle project objectives for building design are as follows:

* During the planning and design phase, an optimum structural & civil design should be developed considering all the essential aspects of a structure such as: durability, functionality and cost efficiency.
* The design shall factor in all the country specific geographical hazards such as Seismic analysis and design.
* The design shall consider the latest updates of nationally recognised design and construction standards during all the phases of the project.
* The design should take into consideration sustainability principal making the best use of nationally available materials, technologies and skill sets.
* The design should give consideration to environmental aspects and where applicable existing green trees and green areas should be retained as much as feasible. The use of greening technologies and energy optimization shall be highly encouraged.
* The project is expected to demonstrate innovative ideas for efficient use of space, materials and building concepts to achieve the projects requirements.

**5.1.2 Phase 1 Option Design**

The Option design stage shall include data collection and concept design activities which are briefly summarised in table 8.1 below:

**Table 8.1 – Structural Phase 1 Option design activities**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | Data collection |  | Topographical |  | Management of surveys in accordance with the |  |
|  |  | survey |  | requirements provided in Section 4.0 |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | Geotechnical |  | Management of surveys in accordance with the |  |
|  |  |  |  | survey |  |  |  | requirements provided in Section 5.0 |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | Surveys will be required to assess the condition |  |
|  |  |  |  |  |  |  |  | of all utility services present at the site. This |  |
|  |  |  |  |  |  |  |  | shall assess the condition of connections, any |  |
|  |  |  |  |  |  |  |  | extensions required to bring the services to the |  |
|  |  |  |  | Utility survey |  | site and the likely capacity of the services to |  |
|  |  |  |  |  | serve the requirements of the Clients, or |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | otherwise shall confirm sufficiency of available |  |
|  |  |  |  |  |  |  |  | services with reference to the requirements. It |  |
|  |  |  |  |  |  |  |  | shall also confirm the location of any existing |  |
|  |  |  |  |  |  |  |  | services crossing the site. |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  | Seismic | design |  | Management of, or preparation of any seismic |  |
|  |  |  |  | considerations |  | design or analysis as detailed in section 9.0 |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | The Consultant shall assess and mitigate |  |
|  |  |  |  | Climate |  |  |  | through the design the impact of potential |  |
|  |  |  |  | information |  | climatic events at the given location (e.g. wind |  |
|  |  |  |  |  |  |  |  | and snow loading, flooding risks etc.) |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | The Consultant shall obtain and review national |  |
|  |  |  |  |  |  |  |  | and local requirements and guidelines that |  |
|  |  |  |  | National | and |  | need to be considered for the structural design. |  |
|  |  |  |  | local bylaws and |  | For development of concept design, these |  |
|  |  |  |  | best practices |  | requirements shall be coordinated with the |  |
|  |  |  |  |  |  |  |  | Client’s requirements, and International best |  |
|  |  |  |  |  |  |  |  | practices relevant to the project. |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | The Consultant shall research and confirm |  |
|  |  |  |  |  |  |  |  | details relating to the permits that will be |  |
|  |  |  |  |  |  |  |  | required to complete the construction of the |  |
|  |  |  |  |  |  |  |  | Project. The Consultant shall prepare a |  |
|  |  |  |  |  |  |  |  | summary | document | highlighting | the |  |
|  |  |  |  |  |  |  |  | information gained and relevant procedures to |  |
|  |  |  |  | Permits |  |  |  | be followed to obtain all permits for the Project, |  |
|  |  |  |  |  |  |  | and time requirements to obtain such permits. |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | All applications for permits shall be prepared by |  |
|  |  |  |  |  |  |  |  | the Consultant with the Client being notified |  |
|  |  |  |  |  |  |  |  | when they are ready for submission. The |  |
|  |  |  |  |  |  |  |  | Consultant shall not submit permits on the |  |
|  |  |  |  |  |  |  |  | Clients behalf unless confirmed in writing by the |  |
|  |  |  |  |  |  |  |  | Client. |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Progress meeting: There may be the possibility |  |
|  |  |  |  |  |  |  | to have one or more meetings with the Client at |  |
|  |  |  |  |  |  |  | this stage to let the Consultant be fully informed |  |
|  |  |  |  |  |  |  | about Client’s needs and expectations. The |  |
|  |  |  |  |  |  |  | Consultant shall be required to attend. |  |
|  |  |  |  | Reporting |  | Summary report: The Consultant shall carry out |  |
|  |  |  |  |  |  |  | a review of the information arising from the |  |
|  |  |  |  |  |  |  | completion of activities outlined above. All data |  |
|  |  |  |  |  |  |  | collection information and output shall be |  |
|  |  |  |  |  |  |  | brought together in the form of a report. The |  |
|  |  |  |  |  |  |  | report shall be included as part of the concept |  |
|  |  |  |  |  |  |  | design submission to the Client. |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | The Consultant shall prepare a number of |  |
|  |  |  |  |  |  |  | layout showing the positioning of all major |  |
|  |  |  |  |  |  |  | project components for Client’s review. |  |
|  |  |  |  |  |  |  | Alternately, the Client may provide the general |  |
|  |  |  |  | Option layouts |  | layouts to Consultant for further development. |  |
|  |  |  |  |  |  |  | These option designs shall comprise a plan |  |
|  | Option Layouts |  |  |  |  | layout and some concept perspective views of |  |
|  |  |  |  |  | the selected site and any other such details as |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | the Consultant or Client may deem relevant |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | The Consultant shall provide at this stage a |  |
|  |  |  |  | Cost estimates |  | cost estimate based on the site layouts, market |  |
|  |  |  |  |  | rates relevant to the project site and previous |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | relevant experience. |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | The design for each option shall comprise of: |  |
|  |  |  |  |  |  |  | General layout |  |
|  |  |  |  |  |  |  | Critical sections of the structure and views |  |
|  |  |  |  |  |  |  | showing the dimensions of structural elements. |  |
|  |  |  |  |  |  |  | Existing utilities layout, identification of conflict |  |
|  |  |  |  | Design option |  | areas and relocation requirements |  |
|  |  |  |  |  | Civil works layout and arrangements including |  |
|  | Option Design |  | development |  |  |
|  |  |  | relation to external roads and services, internal |  |
|  |  | (min. of 3 |  |  |
|  |  |  |  |  | road arrangements, parking arrangements, |  |
|  |  |  |  | options) |  |  |
|  |  |  |  |  | drainage etc |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Provision of detailed information regarding the |  |
|  |  |  |  |  |  |  | material used and its’ properties. |  |
|  |  |  |  |  |  |  | Provision of design criteria with all the |  |
|  |  |  |  |  |  |  | standards, parameters and factors utilised |  |
|  |  |  |  |  |  |  | and/or assumed for designs |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Summary report: The Consultant shall carry out |  |
|  |  |  |  |  |  |  | a review of the information arising from the |  |
|  |  |  |  | Option design |  | completion of activities outlined above. All data |  |
|  |  |  |  |  | collection information and output shall be |  |
|  |  |  |  | report |  |  |
|  |  |  |  |  | brought together in the form of a report. The |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | report shall be included as part of the option |  |
|  |  |  |  |  |  |  | design submission to the Client |  |
|  |  |  |  |  |  |  |  |  |  |

Any other such details as the Consultant or Client may deem relevant shall also be included. The Client shall assess the proposed options designs and discuss their content with the Consultant. One of the designs proposed, incorporating any comments by the Client, shall be then implemented on the project as a whole and brought forward to the Preliminary design stage for development. The Consultant shall propose a schedule of data to be prepared for the project preliminary design stage which shall be to the approval of the Client.

**5.1.3 Preliminary Structural & Civil Works Design**

The design option to be progressed shall be the Client approved option.

During the preliminary design stage, Consultant shall develop the Clients requirements with respect to the requirements for the completed facilities and any other innovative elements that the Client or Consultant may propose throughout this stage. During this stage, the consultant shall develop the details given in table 8.2 below.

**Table 8.2 – Structural Phase 1 Preliminary design activities**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  | **Sub-activity** |  | **Requirements** |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | Structural plans for all the structural elements |  |
|  |  |  |  |  | and all associated works including civil works, |  |
|  |  |  |  |  | MEP etc as applicable. |  |  |  |  |
|  |  |  | Preparation of |  | Structural | sections | and | details, | showing |  |
|  | Preliminary |  |  | clearly the dimensions | of | all | structural |  |
|  |  | structural & civil |  |  |
|  | design |  |  | elements | and the | material | type | (all basic |  |
|  |  | design elements |  |  |
|  |  |  |  | material properties have to be provided). |  |
|  |  |  |  |  |  |
|  |  |  |  |  | Diagram showing the development of internal |  |
|  |  |  |  |  | forces developed within all the structural |  |
|  |  |  |  |  | elements. |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity** | **Sub-activity** | **Requirements** |  |
|  |  |  |  |
|  |  | Civil works plans including general |
|  |  | arrangements, sections, | elevations, plans, |
|  |  | details related to all associated utilities, roads, |
|  |  | parking, drainage etc. |  |
|  |  | Simulation of structure response (indicating |
|  |  | software used). |  |
|  |  | Outline of assumptions made during |
|  |  | calculations |  |
|  |  | Preliminary cost assessment |
|  |  |  |
|  |  | The Consultant shall carry out a review of the |
|  |  | information arising from the completion of |
|  | Preparation of the | activities outlined above. | All data collection |
|  | preliminary design | information and output shall be brought |
|  | report | together in the form of a report. The report |
|  |  | shall be included as part of the preliminary |
|  |  | design submission to the Client. |
|  |  |  |  |

**5.1.4 Phase 3 – Detailed Structural Design**

Following the completion of the preliminary design stage, the Consultant shall, on receipt of such an instruction from the Client proceed with the detailed design in accordance with table 8.3 below.

**Table 8.3 – Structural Phase 3 design activities**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Activity** |  |  | **Sub-activity** |  |  | **Requirements** |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | Further development and finalisation of the |  |
|  |  |  |  |  |  |  | structural and civil elements provided in |  |
|  |  |  |  | Development | of | previous section based on Client input to the |  |
|  |  |  |  | detailed design |  |  | level that is constructible and can be |  |
|  |  |  |  |  |  |  | accurately priced. |  |
|  |  |  |  |  |  |  | Final presentation to the client. |  |
|  | Detailed |  |  |  |  |  |  |  |
|  |  |  |  |  | Complete set of structural and civil drawings |  |
|  | Design Stage |  |  |  |  |  |
|  |  |  |  |  | including plan layouts, elevations, sections, |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  | Content of final |  |  | typical and specific details required to enable |  |
|  |  |  |  |  |  | a contractor to construct the works. These |  |
|  |  |  |  | detailed design |  |  |  |
|  |  |  |  |  |  | drawings shall be presented on Client title |  |
|  |  |  |  | package |  |  |  |
|  |  |  |  |  |  | blocks. |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | The Consultant shall complete the detailed |  |
|  |  |  |  |  |  |  | design of all project components and shall |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| **Activity** | **Sub-activity** | **Requirements** |
|  |  |  |
|  |  | provide the detailed drawings with complete |
|  |  | works specifications complete with materials, |
|  |  | method statements, and processes to |
|  |  | complete the works. |
|  |  | All design specification and material details |
|  |  | required to compliment the drawings. |
|  |  | Schedules of quantities, separated for each |
|  |  | element of the works, in a format to the |
|  |  | approval of the Client, compiled to enable a |
|  |  | tendering contractor to accurately price the |
|  |  | Project |
|  |  | All relevant background information required |
|  |  | by the Contractor in order to proceed with the |
|  |  | construction of the works (issued for |
|  |  | information only). |
|  |  | A report detailing any health and safety risks |
|  |  | inherent in the design. |
|  |  | Completed application documentation for |
|  |  | any permits/approvals required. |
|  |  | An Engineer’s estimate or detailed cost |
|  |  | estimate that may be used as a reference to |
|  |  | evaluate the proposed bid prices received for |
|  |  | the works. (If directed by the client as per the |
|  |  | requirement covered elsewhere in the RFP.) |
|  |  | A full suite of contract documentation (Note, |
|  |  | the Client may provide some elements such |
|  |  | as conditions of contract and capacity |
|  |  | assessments). |
|  |  |  |
|  |  | Preparation of final cost estimate if directed |
|  | Additional | by the client as per the requirement in section |
|  | supplemental | 11.5 |
|  | activities as directed | Preparation of final construction programme |
|  | by the client. | if an as directed by the client as per the |
|  |  | requirement covered elsewhere in the RFP. |
|  |  |  |

**5.2 IRRIGATION/WATER SYSTEMS (CHANNELS)**

In line with requirements of project phases 1 to 3 as described in section 3, the Consultant maybe required to provide all or parts of the following activities for the design of the irrigation system which include but are not limited to:

* + 1. Evaluate current agricultural needs,
		2. Estimate available lands for agriculture,
		3. Estimate farmers’ agricultural capacities,
		4. Determine most adequate type of agricultural production for the area
		5. Determine future agricultural production needs
		6. Perform water quality analysis at the intake and assess if the water can be used for the required purposes.
1. Evaluate water balance on the basin
	1. Evaluate hydrological date on the basin (average monthly rainfall, monthly

temperature, average monthly evaporation, average monthly evapotranspiration, monthly runoff, peak flows, minimum flows).

* 1. Determine monthly water supply,
	2. Determine average available monthly flow on the basis of hydrological data,
	3. Determine 75% occurrence flow rates
	4. In case of Dams and reservoirs, determine monthly water volumes considering intake flows, environmental flows, losses, etc.
	5. Determine minimum and maximum water needs according to agricultural projections, type of crops, agricultural land areas, etc.
	6. Determine sediment transport rates in the basin and assess mitigation measures for the effect that Dams, intakes and other structures will have on the river.
1. Detailed design
	1. Perform a detailed topographical survey that includes topographical information of major works and structures in the irrigation system (dam, spillway, adduction and main channels, hydraulic structures, distribution channels, etc.)
	2. Follow through a geological and geotechnical study in main hydraulic structures and irrigation channels.
	3. For hydraulic design of Dams (if applicable);
		* 1. Determine maximum storage volumes, considering regulation and reservoir operations.
			2. Maximum water inflow to the reservoir for return periods of 500 and 1000 years (according to the importance of the works and foreseeable damages in case of failure).
	4. Determine Maximum flow output though the spillway
	5. Sediment transport for the basin, estimating dead volumes in the reservoir and lifespan of the dam.
	6. Determine Dam’s crown head, normal water levels, maximum water levels, etc.
	7. Define floodplains including security strips
2. For the structural design of Dams (if Applicable)
	* 1. Determine preferred type of dam structure (Earth dam, rock fill, RC, RCC, etc.).
		2. Determine geometry of the dam (maximum height, length and width of the crown, maximum width foot of the dam, freeboard, slopes, levels, etc.)
		3. Perform a slope stability analysis for various loading conditions, considering seismic forces.
		4. Design construction details for the dam (dam body, foundations, concrete injections if needed, drains, slope protections, etc.).
		5. Propose construction strategies for the dam.
		6. Produce design documentation as technical specifications, bill of quantities, schedules, etc.
3. Spillway design (if applicable)
	1. Hydraulic design of the spillway and ancillary works
	2. Structural design and constructive analysis of the spillway
	3. Produce design documentation as detailed drawings, technical specifications, bill of quantities, schedules, etc.
4. Intake design
	* 1. Determine design flows, maximum design flood and Hydrology conditions of the basin
		2. Perform all studies required for the design (geological, geotechnical, topographical, etc.)
		3. Hydraulic design of the intake; details of valves and dampers, pipes, channels, etc. Determine intake capacity, design energy dissipation structures and design additional works (channels, gates, pipes, etc)
		4. Structural design of the intake
		5. Design protection structures,
		6. Produce construction drawings showing plan views, longitudinal and cross section views, details of the structure, structural details, etc.
		7. Produce design documentation as technical specifications, schedules, etc.
	1. Design of the irrigation system
		1. Determine design flows, maximum design flood and Hydrology conditions of the basin
		2. Determine Hydraulic and geometric characteristics of the irrigation system.
		3. Design channels, consider materials for the design, channel geometry, topography conditions, geology, slopes, lengths, operational conditions of the system, etc.
		4. Produce construction drawings including general plan view (scale 1:1000); longitudinal profiles (scale horizontal: 1:1000; vertical: 1:100); showing location of hydraulic structures, benchmarks, horizontal and vertical features of the track, etc.
		5. Produce detailed drawings for geometric sections of the channel and cross sections,
		6. Prepare a description of the general geology of the route;
		7. Identify volumes for earthworks and location
		8. Produce design documentation as technical specifications, bill of quantities, schedules, etc.
	2. Hydraulic structures in the irrigation areas
		1. Identify location of all irrigated areas, determine irrigation scheme and hydraulic structures required
		2. Produce hydraulic and structural designs for all hydraulic structures as falls, siphons, aqueducts, etc.
		3. Produce detailed drawings for hydraulic structures including plan views, longitudinal profiles, geometric sections,
		4. Describe building materials and their characteristics,
		5. For minor structures (falls, gauges, valves, pedestrian and vehicular crossings, etc.) it will be possible to produce only standard designs and provide information in regard to number of structures required and location.
5. Perform an environmental assessment of the project and propose mitigation measures to be included in the construction project.

The designer will be required to prepare documentation that describes hydraulic and structural design procedures, selected construction materials, suggested construction approaches, etc.

Similarly, the designer may have to prepare a detailed project program, detailed bill of quantities and schedules, technical specifications, and other documentation required to carry out the construction.

**5.3 BUILDING SERVICES (MECHANICAL AND ELECTRICAL)**

In line with requirements of project phases, the Consultant maybe required to carry out designs for some of the following non-conclusive list of systems / installations.

* Heating, Ventilation and Air Conditioning (HVAC) systems
* Extraction systems
* Elevators and escalators
* Internal Services
* Water Pumps and Well systems
* Water Purification Systems
* Waste management
* Environmental efficiency systems
* Health Care facilities
* Automated doors and windows
* Backup power supplies
* Airfield systems
* Internal Lighting
* Fire detection and suppression systems (see section 8.3)
* Security Systems (see section 8.4)
* Building control systems.
* Energy distribution.
* Energy supply (gas, electricity and renewable sources such as solar, wind, geothermal and biomass).
* Information and communications technology (ICT) networks.
* Lightning protection.
* Refrigeration.
* Water, drainage and plumbing (including sustainable urban drainage systems (SUDS)).
* Carbon emissions calculations and reduction

**5.3.1 External Lighting**

Where required by a particular project, the Consultant shall prepare a Design Basis statement, upon commencement, for all the external lighting following liaison with the local authority as noted below.

* For lighting in areas to be taken in charge by the local authority, the Consultant shall liaise with the local Authority’s Design and Maintenance Departments to agree on the lighting design and specification requirements. (E.G. BS4589) Calculations shall be submitted to the Client. The calculations shall include cd/m2 , lux TI (%), overall average uniformity and voltage drop calculations. A summary shall be submitted along with the calculations clearly indicating compliance with the standards
* The Consultant shall prepare Detailed Design and drawings to a scale of 1:500 (or as otherwise agreed), construction details and specifications covering all aspects (including civil, electrical and mechanical equipment and control works). The Consultant shall be responsible for all coordination with the electricity supply company for power supply constraints, location of feeder pillars and load requirements etc.
* For external lighting to public accessible areas, the requirements shall be identified as part of the Local Authorities permitting system and shall be designed in accordance with international design standards acceptable to both the client and the Local Authority.
* Where security lighting is required, this shall be design in accordance with the requirements of section 8.4
* The need for and provision of temporary lighting shall be considered, designed and documented as required by the particular project.
* Emergency and decorative lighting if required, shall be designed in accordance with the particular project requirements.

**5.3.2** **Water Supply**

In line with requirements of project phases 1 to 3 as described in section 3, the Consultant maybe required to provide all or parts of the following activities which include but are not limited to:

* Feasibility studies related to the design including gathering of data such as survey work, identification of source of water (of required),condition assessment of any existing network and connection point, coordination with relevant authorities etc
* Development of schematic design and minimum of 3 options based on the feasibility studies for various components such as:
	+ Water storage
	+ Treatment system
	+ Distribution network including pipelines, pumps, connection to existing network
* Identification of the preferred design based on the three options developed
* Development of the preferred option’s preliminary and detailed design in consideration to access to water supply, water quality, site location, material availability, durability and economics for:
	+ Water storage facility
	+ Water treatment system
	+ Distribution network including all pipework, pumps and connections to the existing networks
	+ All associated civil, electrical and mechanical works associated with the above
* Development of bill of quantities, scope of work and for construction drawings to allow tender and construction work

**5.4 FIRE PREVENTION**

**5.4.1 Overview**

In line with requirements of project phases 1 to 3 as described in section 3, the Consultant maybe required to provide all or parts of the following activities which include but are not limited to:

* To get acquainted with the building, checking and measuring the structure, mechanical and electrical elements, and the already existing structures/systems (the Consultant shall execute a survey in the extents he requires / no tests are authorised without the prior approval from the Client);
* To prepare a design for the fire suppression system inclusive of a detection system; The Consultant shall estimate and make the relevant assumptions in order to properly calculate the fire load and the systems accordingly.
* To propose the adequate measures/civil works required to the building in order to achieve a watertight condition (if and where required for the correct functionality of the systems).
* To propose any necessary mechanical/electrical upgrade in the existing systems.
* To prepare a detailed design of the entire Works for Client approval.
* To supply and install all materials and equipment/machineries, inclusive of any additional civil works or upgrades, and to connect them to the main existing utility networks (electrical panels and LAN network).
* To execute and complete the additional works to the building and systems as required by this Contract and by the Consultant’s proposal (approved by the

Client);

* To execute and install any other accessories or optional as may be required;
* To test the systems, and release certifications as required by the laws of the country.

The systems under this scope of work may include but not be limited to the following main elements:

* Smoke or fire detectors;
* Detection station;
* Central station;
* Gas cylinders;
* Mechanicals;
* Nozzles;
* Call point with breakable glass;
* External and internal alarm chime with display
* Design of the necessary safety signage, and
* Any other necessary accessory/equipment as described here under or proposed by the Consultant and accepted by the Client.

For all the elements of the Works where no specific details have been included (pipes diameters, taps locations, characteristics of civil materials, concrete, pressure gauge locations, electrical cable sections, etc) it is responsibility of the Consultant to design what is necessary and to propose the best cost-benefit solution to the Client, who will approve the solution and the materials.

The scope of works provided within this document are indicative and not exhaustive of the works required. It is responsibility of the Consultant to satisfy himself with the scope of works, and eventually to include in the tender proposal clear indications about the works he thinks are missing or necessary to fully complete the job. When completed, the Works shall be fit for the purposes for which the Works are intended as defined in the Contract.

**5.4.2** **Detection System**

The requirements for the detection system may include:

* Designed in accordance with the norms such as EN12094:1/2003, EN54-2, EN 54-4 and shall be able to activate the suppression system in case of need. The country specific requirements as required by law also shall be incorporated and considered into the design.
* Provision of switch for control of the operational mode of the control station: automatic, manual, disabled
* Time counter (with two digits) for the countdown of the seconds before the fire suppression phase starts shall be included.
* Monitoring system for the control station to check malfunctions.
* Allowance for a personalised programming.
* Data connection with the LAN switch with ability to manage the system remotely through software.
* Propose and design all the other equipment/tools/machineries necessary to allow the detection system to work and adequately perform the function in the building.
* Pipes, conduits and connections shall be placed where it is most convenient and where it does not create obstacle to the usability of the space.

**5.4.3 Suppression system**

The requirements for the suppression system may include:

* Design properly to operate in the space (fire load to be determined by the Consultant together with the other required parameters) and it shall meet the main goals of:
	1. high capacity to quickly extinguish the fire,
	2. use environmental friendly gas, and
	3. maximum attention to safety of persons and employees if present in the building.
* Provision for adequate switches/remote controls to allow for stopping the suppression, for monitoring the fluxes, for monitoring the pressure (and its levels,

in particular when these go under minimum thresholds) and for activate or deactivate any other equipment/tool required for the system.

* Data connection with the LAN switch with ability to be managed remotely through software.
* All materials used and installed to conform to the particular project requirements. All materials must be certified for being used in fire suppression systems.
* Identification, design and where directed execute/install all the other necessary civil works and/or equipment required to guarantee the watertight of the building.
* Gas cylinders (testes and homologated), their quantity and the gas volume shall be designed by the Consultant.
* All mechanics of the systems (including pipes, distribution network, valves, pressure gauges, seals, gaskets, nozzles, etc) and the gas are considered included in the contract.
* Pipes, conduits and connections shall be placed where it is most convenient and where it does not create obstacle to the usability of the space.

**5.4.4 Ancillaries**

The Consultant shall consider all ancillary work required for connection to the existing or new electrical or LAN network including all associated civil works.

**5.5 SECURITY**

**5.5.1 Overview**

In line with requirements of project phases 1 to 3 as described in section 3, the Consultant maybe required to provide all or parts of the following activities which include but are not limited to:

* Consultation, at project outset, with the Client to identify the project requirements and constraints;
* Assessment of the proposed site and its current condition (including existing building/ structures, services, utilities, infrastructure and ancillaries);
* Selection, appointment and management of the services of third parties, with the approval of the Client, for the execution of any specialist assessment, investigative works and any other third party services required (topographic, geotechnical surveys etc.);
* Identification, preparation, and if requested by the Client, submission of the necessary permits and statutory approvals required in order to complete the project;
* Execution of the design and provision of deliverables in accordance with this scope of work;
* Liaison with the Client and any other stakeholders to the project including any liaison that may be required with other third parties from time to time
* Prepare a detailed projected construction programme for the project identifying the likely timeline for the project construction phase and including project milestones;
* Provision of, at preliminary and detailed design stages, cost estimates for the project, based on the relevant schedules of quantities and reflecting local rates, to be utilised to scope the project within the available project budget and as a reference document for the assessment of prices submitted to construct the project;
* Provide detailed specifications for works, materials, equipment and methods to enable the Contractor’s to construct the project.
* Ensure that the production of the design and the completion of the construction is executed in accordance with national and international health & safety standards as well as the client security requirements.

**5.5.2** **Specifics**

The design of security upgrades under this scope of work may include but are not be limited to the following main elements as advised by the Client Security based on the assessment of threats and proposed mitigation measures:

* Co-ordination and management of the design of Security perimeter wall in response to wide range of threat including blast and ballistic protections. (see section 9.0)
* Provision of reinforcement of internal/ external structure as directed by the client.
* Design of bunkers, strong rooms and vaults.
* Provision of intruder alarm and security system (internal & external) including lock and keying systems.
* Provision of CCTV/ surveillance cameras and infrared detection systems including the associated central information/ control system.
* Provision of security lighting.
* Provision of entry and exit control for pedestrians and vehicles including hostile vehicle mitigation measures and barriers.
* All associated civil, electrical and mechanical work as part of the response to the mitigation measures required by the Client Security.
* Any other necessary accessory/equipment as described here or proposed by the Consultant and accepted by the Client.

**5.6** **PERMITTING**

The Consultant shall research and confirm details relating to the permits that will be required to complete the development and construction of the Project. The Consultant shall prepare a summary document highlighting the information gained and relevant procedures to be followed to obtain all permits for the Project. All applications for permits shall be prepared by the Consultant with the Client being notified when they are ready for submission. The Consultant shall not submit permits on the Clients behalf unless confirmed in writing by the Client.

**5.7** **TECHNICAL PEER REVIEW**

Where required, a technical review shall be carried out by a suitably qualified person who is not directly involved with the project. The technical review should consist of a report that records the Technical Review of the particular phase of the project

The Technical Review should be divided into a number of assessment criteria numbered 1 to 13. As provided in table 8.6 below. Note, not all items will be applicable to every project

**Table 8.6 – Technical review requirements**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Technical Review Coverage** | **Comments** |  |
|  |
|  |  |  |  |  |
| 1 | Compliance with the brief |  | Check against the requirements and |  |
|  |  |  | deliverables within Client’s Brief. |  |
|  |  |  | Change Control Register in place. |  |
|  |  |  |  |  |
| 2 | Checking / Verification have been |  | Verification that checking procedures |  |
|  | undertaken. |  | are being followed and that |  |
|  |  |  | appropriate / correct signatures are |  |
|  |  |  | being used. |  |
|  |  |  | Verification that all 3rd party of sub- |  |
|  |  |  | consultant works are being checked |  |
|  |  |  | and approved |  |
|  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Technical Review Coverage** | **Comments** |  |
|  |
|  |  |  |  |  |
| 3 | The completed works should be |  | Level of Service appropriate to the |  |
|  | able to perform satisfactorily under |  | local conditions has been evaluated. |  |
|  | the expected conditions of use. |  | Strategy to minimise maintenance. |  |
|  |  |  |  |  | Works designed to relevant |  |
|  |  |  |  |  | standards. |  |
|  |  |  |  |  |
| 4 | Health & Safety requirements of |  | Design Risk assessments carried out |  |
|  | the brief and as required by local |  | Contract Documents include |  |
|  | practice are in place and recorded |  | appropriate direction and guidance to |  |
|  |  |  |  |  | the contractor in relation to Health and |  |
|  |  |  |  |  | safety risks |  |
|  |  |  |  |  |  |  |
| 6 | Compliance | with | relevant |  | Evidence that designs have been |  |
|  | regulatory | requirements, |  | carried out that meets the required |  |
|  | national/international | codes & |  | compliance with codes and standards |  |
|  | standards and Company practices |  |  |  |
|  |  |  |  |  |  |
| 7 | Validation of survey | information |  | Confirmation that appropriate surveys |  |
|  | and constraints to the design |  | have been carried out |  |
|  |  |  |  |  |
| 9 | Design plan and methodology |  | Design methodology developed for |  |
|  |  |  |  |  | each major element |  |
|  |  |  |  |  | Design Assumptions recorded |  |
|  |  |  |  |  |  |
| 10 | Constructability | & Maintainability |  | Construction strategy / plan prepared |  |
|  | considerations |  |  |  | and appropriate |  |
|  |  |  |  |  | Maintenance Handover Plan prepared |  |
|  |  |  |  |  | and appropriate |  |
|  |  |  |  |  |  |
| 11 | Value Engineering. |  |  | Engineering solutions have been |  |
|  |  |  |  |  | developed that provide a cost |  |
|  |  |  |  |  | effective design |  |
|  |  |  |  |  |
| 12 | Interdisciplinary checks |  | Each Design element should be |  |
|  |  |  |  |  | checked for compatibility with each |  |
|  |  |  |  |  | other. |  |
|  |  |  |  |  | Evidence of interdisciplinary design |  |
|  |  |  |  |  | reviews carried out |  |
|  |  |  |  |  |  |  |
| 13 | Project Specific |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

# 6. LARGE CIVIL ENGINEERING PROJECTS

Sometimes UNICEF deals with large projects in for new construction, rehabilitation, reconstruction in country of response. These projects include, but not limited to, the followings.

* Construction/rehabilitation of schools
* Construction/rehabilitation of water treatment plants.
* Construction/rehabilitation of sewage treatment plants.
* Construction/rehabilitation of pumping stations.
* Construction/rehabilitation of water and sewage networks.
* Construction of water storage reservoirs.

In line with the Ukraine state construction regulations, mostly following construction and rehabilitation projects are considered as “large Civil Engineering Projects”.

* Estimated cost more than 20 million UAH.
* Complexity category from I-IV
* Class of consequences CC3

For each specific project, UNICEF will decide and communicate its category when required.

# 7. BLAST DESIGN AND SEISMIC ANALYSIS

**7.1** **BLAST VULNERABILITY ASSESSMENT**

**7.1.1 Vulnerability Assessment**

The Consultant shall review the designated premises against assessed risk and threat in country, and specifically the risk and required mitigation measures against explosive devices, placed or person or vehicle born. The said review will encompass adequacy of existing mitigation measures against delineated threat, as well as an assessment of possible additional or alternatives mitigation measures that may be required, included but not limited to, frame catcher, credible explosive detection devices (including explosives detection technology and dogs), blast walls, etc. For each of the facilities, a full report and recommendations should be prepared. The tasks/activities required during this phase shall generally include the following:

* Data collection, field verification and records documentation and keeping;
* Site investigations are to include an evaluation of the existing building(s), perimeter structures, and access control infrastructures summary of the level of protection to occupants currently provided by these structures;
* Familiarization of conceptual design requirements against established threat assessment;
* Evaluation of alternatives or additional mitigation measures recommended, and selection of optimum solution within the given physical environment as well as risk and threat diagnosis;
* Formulation of engineering solution to establish parameter specifications;
* Identify any recommended additional investigations (i.e. materials testing, etc);
* Provide a close out report and prepare a presentation that shall contain findings, recommendations, schematic layouts, sketches, conceptual design criteria with appropriate exhibits to indicate clearly the consideration involved including applicable requirements of governmental authorities. All of the above will include detailed and specific technical requirements, so as to ease the implementation of the proposed recommendation by the Client; and
* Survey of buildings and structures where required.

**7.1.2** **Explosive Threats**

Explosive threats will be identified in the risk assessment performed by UN security personnel. For the purposes of the task, the Contractor will be provided with information relevant to risk to the particular premises:

* Details of vehicle/personnel/remote controlled delivered explosive device threats
* Stand-off scenarios
* Description of other relevant threats

**7.1.3** **Level of Protection**

The target level of protection for the buildings/ facilities is to withstand the blast effects of an explosive device detonated external to the building – Vehicle Borne Improvised Explosive Devices (VBIED), or within the proposed primary access area - Person-Borne Improvised Explosive Devices (PBIED). To the extent possible mitigate against structural failure and secondary effects from explosions and thereby reduce or eliminate serious and fatal injuries.

**7.1.4** **Briefing prior to start of work**

The Consultant will attend a briefing with the Client in country to discuss scope of works, logistics, approach and timing.

**7.1.5 Blast Effects Analysis**

The Contractor is to determine air-blast parameters and building performance in response to the identified threats for overall compound structural assets and perimeter wall plus building face or individual building elements, as applicable. This will include:

* Assessment and analysis of threat scenarios. The Contractor shall calculate and plot the peak pressure and impulse engulfment of the facility for the specified threat scenarios. The contours depicted on a three dimensional representation of the facility shall be plotted to two different scales; one scale showing the maximum magnitudes of peak pressure and impulse and the second scale limited to a maximum peak pressure of 20-psi and a maximum impulse of 100-psi-msec. The Contractor shall also provide tabulated peak pressure and impulse magnitudes at representative locations for each threat scenario;
* Analysis of building elements for the determined blast loading and evaluate the performance of typical members by comparing the support rotations and member ductility to established guidelines to determine the level of protection provided by the elements;
* Analysis and modelling of the facility against extreme loading events;
* Identify vulnerabilities in architecture, structure, external glazing, building envelope, procedures; and
* Assessing secondary effects of an explosion.

**7.1.6** **Develop Mitigation Measures/Recommendations**

When the calculated performance of the existing building elements does not achieve the desired level of protection identified above, conceptual mitigation measures are to be developed to achieve the target level of protection. The Contractor shall propose a minimum of three feasible options for representative vulnerable structural elements or façade types and demonstrate the conceptual attachment of these retrofits to the existing structure. The Contractor shall perform blast vulnerability analyses for each of the proposed options in order to quantify the improved level of protection. The Contractor shall also identify any impact of the proposed options on historical/architectural issues, heating/cooling, or environmental concerns. For each retrofit option, the Contractor shall prepare a Rough Order of Magnitude (ROM) cost estimate. In cases where the pressures and impulses are found to make retrofits cost prohibitive or not feasible, the Contractor may present other options such as access restrictions or change of function for particular areas. The retrofit options may include:

* Modifications to the site and/or the building structure;
* Increased standoff distances, safety perimeters, and potential collateral damage;
* Protection from progressive collapse with advanced structural modifications;
* Protection from secondary threats such as fragmentation, fire, etc;
* The improvement of perimeter and external walls (including gate house structures), glazing and windows subjected to extreme loads; and
* Safe rooms.

**7.2 SEISMIC ANALYSIS**

**7.2.1 Overview**

The objective of this project is to assess the structural performance of the existing buildings and assess their likely structural response and behavior to the magnitude of seismic event to which the specific location is susceptible. As part of this assessment, the Consultant shall provide clear recommendations to the Client regarding the expected performance of the surveyed facilities in their current state in the event of a major earthquake. Where deficiencies are identified, and can be mitigated, the scope of rehabilitation work to be undertaken and details of the likely cost to complete the works shall be provided.

The Consultants responsibilities shall include, but shall not be limited to the following:

* + The seismic evaluations shall be based on tier level analysis in accordance with ASCE 31-03 and design of remedial measures shall conform to ASCE 41-06 respectively.
	+ Confirm the design standards to which seismic assessments will be undertaken and provide the Client with details of their compliance with national design standards and legislative requirements in the country;
	+ The assessment of potential seismic event for each location shall be based on level of seismicity, soil conditions and performance level of the structure. The recommended critical earthquake to carry out the assessments shall be:
* Immediate occupancy performance level for 1 in 2500 year return period earthquake
* Rehabilitation performance level shall be operational level for a 10% in 50 years and immediate occupancy level for a 2% in 50 years event.
	+ The Consultant shall research the level of seismic risk present at the project locations and in case of any discrepancies from recommended earthquake level, shall confirm with the Client the magnitude of seismic event that the buildings will be assessed to resist;
	+ The Consultant shall be responsible to carry out the building survey to confirm the existing construction details, as structural drawings are not immediately available and in any case, alterations may have been made during the building operations. The Consultant shall complete the as-built survey where sufficient design information to complete the assessments is not available. The survey shall be executed to the extent required to determine dimensions, details and construction techniques of all the structural members of the buildings;
	+ Procure the required third party services, if necessary, to undertake the surveys required to complete a full building assessment in accordance with the specified standards (e.g. any intrusive and non-intrusive survey to determine sufficient details to complete the assessments). For assessments, the Consultant shall also consider the alterations that could have been made to the initial building layouts during building operations. Client approval is required for all third parties that the Consultant would intend to utilise on the project. Any intrusive and non-intrusive surveys required to determine properties of materials and structural details shall be considered to be included in the Consultant’s scope of work;
	+ Noting the tier level structure of ASCE 31-03, the Consultant shall report to the Client at the end of each tier level assessment with a summary review of the results obtained and a recommendation regarding the building in question. Where further assessment is proposed, full details shall be provided regarding the benefits inconducting same. The Consultant shall not progress to the next tier level without the approval of the Client;
* During the evaluation of each building, the Consultant shall also pay close attention and note the condition, general construction quality of any other elements or structures present within the immediate vicinity of the building, and shall evaluate the seismic hazards attached with those elements which could constitute a risk to the building being surveyed. Where required, remedial measures shall be proposed for any such structure/element;
* Recommend design of rehabilitation measures, following the completion of assessments. The Consultant shall propose separate remedial measures proposals based on the following two occupancy requirements:
	+ Immediate Occupancy
	+ Operational Level
* The Consultant shall also provide an initial estimate of cost of remedial measures for the both occupancy requirements.
* Report to the Client periodically on the status of the building surveys, updating the Client on project programme and summarising the work accomplished;
* Compile a separate detailed assessment report for each location subject to this review. The report may, at the direction of the Client, include the following key headings:
	+ - Location details and description of buildings surveyed
		- Survey details and findings
		- Determination of seismic loads
		- Detailed description of evaluation methodology
		- Completed Tier level checklists
		- Calculation and analysis details
		- Results of seismic assessment
		- Recommendation for design of rehabilitation measures where required
		- A brief summary of the extent of remedial works required (if any) and construction duration that these measures are expected to take
		- Timelines for recommended detailed design and construction of rehabilitation measures
		- An initial cost assessment of proposed remedial works
* On completion of assessments, and submission of project reports, review and brief the Client on the findings of the reports. Said discussions shall include details of the design and construction standards observed during the completion of the assessments and recommendations for the buildings under consideration.

**7.2.2** **Guiding Standards**

The seismic evaluation and any proposals for completion of remedial works shall be in accordance with the following standards or their latest edition:

* ASCE 31-03 – Seismic Evaluation of Existing Buildings.
* ASCE 41-06 – Seismic Rehabilitation of Existing Buildings

**7.2.3 ASCE 31-03 – Seismic Evaluation of Existing Buildings**

Unless the use of an alternative standard is approved by the Client, the Consultant shall conduct all evaluations in accordance with the requirements of ASCE 31-03. The standard employs a three tier level of surveys and assessments as follows:

* Tier 1 - Screening Phase
* Tier 2 - Evaluation Phase
* Tier 3 - Detailed Evaluation Phase (where required)

Each phase comprises an increasingly complex level of analysis with an inherent additional cost impact. The phase structure is designed such that the Client can assess the output from a tier level review and form an opinion as to whether, based on the results gained from that review, there is a defined value in proceeding to the next tier review stage.

Prior to commencing the assessment of the buildings, the Consultant shall provide to the Client its proposed assessment strategy for the relevant building. This shall include details of the tier assessments it would intend to complete and the rationale behind the choice of assessment strategy.

Notwithstanding the provision of this assessment strategy, the Consultant shall require the approval of the Client when progressing from one tier to the next (e.g. Tier 1 to Tier 2). Should the Consultant intend to conduct a number of tier level assessments concurrently, full details regarding the extent of the assessments shall be provided to the Client. Client approval shall be required prior to commencement.

**7.2.4 ASCE 41-06 Seismic Rehabilitation of Existing Buildings**

Unless the use of an alternative standard is approved by the Client, the Consultant shall propose all remedial/rehabilitation measures (where required) in accordance with the requirements of ASCE 41-06. Remedial works proposed shall consist of repairs that shall be implementable using locally available materials. In completing the design of rehabilitation measures, following the completion of assessments. The Consultant shall propose separate remedial measures proposals based on the following two occupancy requirements:

* Immediate occupancy
* Operational Level

The consultant shall submit a report advising on the extent of remedial measures, initial design, cost estimate and time lines to complete the works.

**7.2.5 Project Stages**

The project may be separated into a number of stages in order to clearly define the Consultant’s responsibilities under the contract. These stages are summarised in the following table 9.1 below;

**Table 10.1 Seismic Analysis Activities**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Stage** |  | **Activities** |  | **Description** |  |  |  |
|  |  |  |  |  |  |  |
| Data Collection |  | Sourcing any and all |  | Data to be sourced in order to |  |
|  |  | additional information |  | complete the assessment may |  |
|  |  | necessary in order to |  | include: |  |  |  |  |
|  |  | undertake the evaluations |  |  Building planning and control |  |
|  |  | required as part of these |  |  | records; |  |  |  |  |
|  |  | seismic assessments. |  |  |  |  |  |  |
|  |  |  |  | Site Geotechnical records; |  |
|  |  |  |  |  |
|  |  |  |  |  Area seismic activity records; |  |
|  |  |  |  |  | Local drainage records |  |
|  |  |  |  |  | Review | of | any | as-built |  |
|  |  |  |  |  | information | for the | subject |  |
|  |  |  |  |  | buildings; |  |  |  |
|  |  |  |  | Review | of | all | relevant |  |
|  |  |  |  | construction | standards and |  |
|  |  |  |  | legislative |  | requirements |  |
|  |  |  |  | currently in force in the country |  |
|  |  |  |  | and ensure | that | relevant |  |
|  |  |  |  | sections are referenced, where |  |
|  |  |  |  | relevant, in the execution of |  |
|  |  |  |  | project | surveys | and |  |
|  |  |  |  | assessments. |  |  |  |
|  |  |  |  |  |  |  |
| Survey & Testing |  | Surveys and testing as may |  |  | Non- intrusive surveys |  |
|  |  | be necessary at the project |  |  Intrusive surveys & testing |  |
|  |  | sites in order to complete |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Stage** |  | **Activities** |  |  |  |  | **Description** |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  | the assessments required |  |  |  |  |  |  |  |
|  |  | by ASCE 31-03 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Assessment | of |  | Assessment | of |  | the | Undertaking | Tier | level | 1 to 3 |
| information |  |  | buildings | in | accordance | reviews according to ASCE 31- |
|  |  |  | with ASCE 31-03. |  |  | 03 standard. |  |  |  |  |
|  |  |  Tier level reviews and |  |  |  |  |  |  |  |
|  |  |  | accurate | assessment | of |  |  |  |  |  |  |  |
|  |  |  | condition |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | Provision |  |  |  | of |  |  |  |  |  |  |  |
|  |  |  | recommendation | related |  |  |  |  |  |  |  |
|  |  |  | to: |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  Fit | for | continued |  |  |  |  |  |  |  |
|  |  |  | operations | without |  |  |  |  |  |  |  |
|  |  |  | remedial |  | works |  |  |  |  |  |  |  |
|  |  |  | being necessary; |  |  |  |  |  |  |  |  |
|  |  |  |  Fit | for | continued |  |  |  |  |  |  |  |
|  |  |  | operations | with |  |  |  |  |  |  |  |
|  |  |  | completion |  | of |  |  |  |  |  |  |  |
|  |  |  | remedial works; and |  |  |  |  |  |  |  |
|  |  |  |  Not | suitable | for |  |  |  |  |  |  |  |
|  |  |  | continued |  |  |  |  |  |  |  |  |  |
|  |  |  | operations, remedial |  |  |  |  |  |  |  |
|  |  |  | works | are |  | not |  |  |  |  |  |  |  |
|  |  |  | feasible | from | an |  |  |  |  |  |  |  |
|  |  |  | economical | and/or |  |  |  |  |  |  |  |
|  |  |  | practical | point | of |  |  |  |  |  |  |  |
|  |  |  | view. |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |
| Final assessment | Preparation of a conclusive | The | report | shall | include full |
| report |  | assessment report. |  |  | details | of | the | assessment |
|  |  |  |  |  |  |  |  | undertaken | and | summarising |
|  |  |  |  |  |  |  |  | the | findings. | These | reports |
|  |  |  |  |  |  |  |  | should | also | include | clear |
|  |  |  |  |  |  |  |  | recommendations | regarding |
|  |  |  |  |  |  |  |  | the continued use of buildings |
|  |  |  |  |  |  |  |  | and /or for successive Tier level |
|  |  |  |  |  |  |  |  | assessments where required as |
|  |  |  |  |  |  |  |  | directed by the Client. |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

# 8. ENVIRONMENTAL ASSESSMENT AND PERMITTING

The Consultant shall research and confirm details relating to the permits that will be required to complete the construction of the Project. The Consultant shall prepare a summary document highlighting the information gained and relevant procedures to be followed to obtain all permits for the Project and present this information in the Assessment Report.

**8.1 DETAILED REQUIREMENTS**

Generally, the environmental assessment and permitting is related to Phase 2 of the project life cycle; however depending on the situation the project may be at any of the phases 1 to 6 within the project life cycle as described in the RFP document.

In preparation of the environmental assessment, it is expected that the following requirements are addressed:

* Provide a project description suitable for the report use and assessment. The project description should include all on and off lease activities relevant to the project including construction, operation and decommissioning activities. If the delivery of the project is to be staged, the nature and timing of the stages should be fully described.
* For all the relevant matters, the environmental assessment must identify and describe the environmental values that must be protected. Environmental values shall be based on the country specific Environmental Protection (EP) Act, the EP Regulations, EP policies (EPPs) and relevant guidelines.
* The assessment should cover both the short and long-term scenarios and state whether any relevant impacts are likely to be irreversible.
* Provide all available baseline information relevant to the environmental risks of the project. Provide details about the quality of the information provided, in particular: the source of the information; how recent the information is; how the reliability of the information was tested; and any uncertainties in the information.
* Demonstrate how the construction, operation and decommissioning (to the extent known) of the project would be consistent with best practice environmental management. In general, the preferred hierarchy for managing likely impacts is:

 (a) to avoid; (b) to minimise or mitigate; and (c) if necessary, and possible, to offset.

* Provide detailed strategies in regard to all critical matters for the protection, or enhancement as desirable, of all relevant environmental values in terms of outcomes and possible conditions that can be measured and audited.
* Impact minimisation measures should include ongoing monitoring and proposals for an adaptive management approach, as relevant, based on monitoring. The proposed measures should give confidence that, based on current technologies, the impacts can be effectively minimised over the long-term.
* Present feasible alternatives of the project’s configuration (including individual elements) that may improve environmental outcomes. Discuss the consequences of not proceeding with the project.
* For unproven elements of a resource extraction or processing process, technology or activity, identify and describe any global leading practice environmental management where available.
* The assessment and supporting information should be sufficient for the Client to decide whether to proceed with the project or not.
* To the extent of the information available, the assessment should endeavour to predict the cumulative impact of the project on environmental values over time and in combination with impacts created by the activities of other adjacent and upstream and downstream developments and landholders—as detected by baseline monitoring. This will inform the decision on the Environmental Impact Statement (EIS) and the setting of conditions. The absence of a comprehensive cumulative impacts analysis need not be fatal to the project. The EIS should also outline ways in which the cumulative impact assessment and management could subsequently be progressed further on a collective basis.
* Include a consolidated description of all the proponent’s commitments to implement management measures (including monitoring programs). Should the project proceed, these should be able to be carried over into the approval conditions as relevant.
* Provide all geographical coordinates throughout the EIS in latitude and longitude against the Geocentric Datum of the Country.
* An appropriate public consultation program is essential to the impact assessment process. The proponent should consult with local, government authorities, and potentially affected local communities as directed by the Client.
* The EIS should describe the consultation that has taken place and how the responses from the community and agencies have been incorporated into the design and outcomes of the project. The public consultation plan should be prepared in consultation with the Client and relevant government authorities.
* Include, as an appendix, a public consultation report. The report should detail how the public consultation plan was implemented including the results.

**8.2 ASPECTS TO BE ADDRESSED**

The structure of the EIS shall be agreed with the Client at the start of the project. In general the EIS shall address the following requirements as a minimum:

* Executive summary
* Introduction
	+ Project owner
	+ Outline of EIS process applicable in the context of the country
	+ List of permits required and the outline of approval process
* Project description
	+ Proposed development details
	+ Site description
	+ Climate
	+ Proposed construction & operation
* Assessment of critical matters requiring treatment in relation to activities causing a high or medium level of environmental harm, have the potential to create a perception by the community to cause harm to the environment or matters that of national environmental significance.
* Assessment of routine matters such as:
	+ - Land use
		- Flora, fauna
		- Biosecurity
		- Water quality
		- Water resources
		- Flooding & regulated dams
		- Air
		- Noise & vibration
		- Waste management
		- Cultural heritage
		- Social & economic
		- Transport
		- Hazard & safety

Permit required including further explanation of the documentation required and the applicable processes. The Consultant maybe engaged to prepare and source are permits required.

# 9. PROJECT MANAGEMENT

**9.1 PROGRAMME AND CONTRACT MANAGEMENT**

The Client requires the Consultant to undertake the overall programme management including contract management of the works. The details regarding the type of project and status of the work will be provided to the Consultant prior to commissioning.

The Consultant may have the responsibility for undertaking all or some of the following activities as part of the Consultancy:

* Overall project management and reporting for the project.
* The creation and management of programme and contract management methodology and system (documentary and software support shall be provided by the Consultant);
* In case of claims and disputes, to provide the necessary evidentiary records and analyses and bear expert witness in defence of the case of the Client.
* Consultation, at project outset, with the Client to identify the project requirements and constraints.
* Selection, appointment and management of the services of third parties, with the approval of the Client, for the execution of any specialist assessment, investigative works and any other third party services required (topographic, geotechnical surveys etc).
* Identification, preparation, and if requested by the Client, submission of the necessary permits and statutory approvals required in order to complete the project.
* Preparation of a project delivery programme for all phases of the project including identification of key milestones and decision/ control points.
* Assistance to the Client during the tender stage in response to RFIs, tender evaluation, preparation of tender evaluation reports and providing recommendation to the Client for award.
* Liaison with the Client and any other stakeholders to the project including any liaison that may be required with other third parties from time to time.
* Prepare a detailed projected construction programme for the project identifying the likely timeline for the project construction phase and including project milestones.
* Overall management of preliminary and detailed design.
* Provision of, at preliminary and detailed design stages, cost estimates for the project, based on the relevant schedules of quantities and reflecting local rates, to be utilised to scope the project within the available project budget and as a reference document for the assessment of prices submitted to construct the project at the various locations.
* Provide input at Project Tender Stage, as required, to answer queries from Contractors, to make any necessary alterations to the design and to provide input into the assessment of Contractor’s tender submissions.
* Provision of assistance and technical expertise throughout the construction phase of the project when required, to respond to Contractor’s queries, to resolve design issues on site and alter elements of the design, if requested.
* Establishment of management control systems for civil engineering works contracts.
* Administration of Contracts under direction of the Client.
* The provision of assistance to the Client maintaining control over estimated works quantities and contract outcome costs, in monitoring the progress of the Works, the disbursements and technical records.
* Acceptance and/or approval, as appropriate, of submissions required from the Contractors, including, but not limited to: key staff appointments, programmes, method statements, environmental management plans, safety measures, suppliers and materials for incorporation in the works, the quality assurance and control plans, laboratory provisions and execution of the testing programme, and all other submissions related to subcontractors, plant, and equipment.
* Direct supervision of the works and monitoring of progress;
* Preparation of progress, technical and contractual reports;
* Establishment and management of a programme of test work to be carried out at an independent laboratory.
* Attendance at progress meetings
* Management of stakeholders

**9.2 PROCUREMENT DOCUMENTATION AND MANAGEMENT**

The Client requires the Consultant to undertake the overall procurement management including preparation of the tender document. The details regarding the type of project and status of the work will be provided to the Consultant prior to commissioning.

Overall, the project’s current status may be at any of the phases 1 to 6 within the project life cycle as described in the RFP document and the Consultant may be asked to manage the procurement for one or a number of the phases.

The Consultant may have the responsibility for undertaking all or some of the following activities as part of the Consultancy:

* Overall procurement management and reporting for the project.
* Consultation, at project outset, with the Client to identify the project requirements and constraints;
* Development of scope of works, method statement and preparation of the tender documents including cost estimation for selection of a design consultancy firm to undertake the design work.
* Provision of, at preliminary/ detailed design/ construction stages, cost estimates for the project, based on the relevant schedules of quantities and reflecting local rates, to be utilised to scope the project within the available project budget and as a reference document for the assessment of prices submitted to construct the project at the various locations.
* Undertaking construction market survey to enable the Client to gain a good understanding of the local market. The market survey requirements may include a number of factors in addition to the rates such as availability of the construction material, tools, contractor capability, local practices, level of quality control required in relation to the available capacity in the country or/ and region.
* Undertaking the required activities, as per direction of the Client, during the tender stage in response to RFIs, tender evaluation, preparation of tender evaluation reports and providing recommendation to the Client and evaluation panel for award.
* Preparation of cost comparison between bids received and the engineer’s cost estimate. Reasons for major differences must be given.
* Additional activities in relation to procurement may include but are not limited to:
	+ review of shortlisted construction companies prior to tender phase;
	+ attendance at pre bid meetings with shortlisted companies
	+ technical input, as and when required, to client tender evaluation panels
	+ collation of design and/or construction contract package in liaison with the Client

The requirement for the Consultant to participate in these activities shall be agreed on a case by case basis.

**9.3** **RISK MANAGEMENT**

The Consultant shall maintain a Risk Register that records all risks to the successful completion of the project. Within 14 days of agreement, the Consultant shall prepare and submit a Risk Management procedure and the first issue of the project Risk Register for approval by the client.

The Risk Register shall conform to the requirements of Risk procedures identified for each project.

The Risk Management procedure developed by the Consultant will address:

* Responsibility for the risk management process – Who, within the Consultant’s organization, will be undertaking the coordination of risk management activities on the project.
* Identification of Risks – When and how risks are identified and updated. (Note: it is envisaged that this may be achieved through Risk Workshops and subsequent interactive maintenance of the risk register). An up to date risk register must be maintained and provided with progress reports.
* Commercial Impact of Risks – Following his analysis, the Consultant is required to advise the Client of any budgetary/cost impacts (together with likelihood of occurrence) that might arise from any identified risks.
* Mitigation of Risk – How mitigation plans are created and implemented. How the effectiveness of the implementation of such mitigation plan(s) are monitored and fed back into the risk management process.

Following direction by the Client, the Consultant shall use the preferred templates and tools to record and present the findings of the risk assessment and management process.

**9.4 QUALITY MANAGEMENT**

**9.4.1** **Quality System**

The purpose of this specification is to define the Consultant’s general responsibility for demonstrating that the work under the contract or purchase order is executed to the Quality standards required by the particular project / agreement.

Individual Consultants may be required to employ their own Quality System including internal auditing with associated records. They may be required to develop initial Quality and Project Plans

**9.4.2** **Acceptable Quality System Standards**

The following list identifies the recommenced quality standards that could be used by the consultant, other standards are available and the initial quality and project plan should identify the standards to be used as part of the project.

1. BS EN61160:2005 Design Review
2. ISO 9000:2008 Quality Management Systems-Fundamentals and Vocabulary
3. ISO 9001:2008 Quality Management Systems Requirements
4. ISO 9004:2008 QMS Guidelines for Performance Improvement
5. ISO 10006:1997 Quality Management – Guidelines to Quality in Project Management
6. ISO 10005:1995 Quality Management – Guidelines for Quality Plans
7. ISO 19011:2002 Guidance on auditing of Quality & Environmental Management Systems
8. Others by agreement

The Consultant will be responsible for Quality auditing and oversight of any sub-entities under their control. The Client may review the design for accuracy. That will consist mainly of reviewing design and associated documents for accuracy. The Client may audit and monitor the Consultant’s records and documents for compliance with their contract, Quality Plan and procedures.

**9.4.3 Quality System Documentation**

The Consultant’s Quality system may be required to include the following elements:

1. Quality Plan including internal surveillance plans and audit schedule
2. Procedures and work instructions: The Consultant‘s Quality system must include all relevant technical procedures and other documents to ensure that the design works are completed in accordance with the contract with specific reference to the development and implementation of Quality Procedures.
3. Quality records: In addition to (and including) Quality records identified in the contract or other applicable codes, standards or procedures, the Consultant shall identify project Quality records. That list of Quality records generated during the life of the contract, and made available upon request for review by the Client, shall be indexed by the Consultant.
4. Reference and other related documents.

These Quality System documents shall be submitted to the Client for review, comment and approval within 30 days after contract award or as agreed otherwise

**9.4.4 Quality Plan**

Consultants are required to submit Quality Plans (addressing their activities) which are specific to the Contract and not generic. This plan shall reference, or include other documentation which is relevant to the Contract. However as a stand-alone document, the Quality Plan shall clearly indicate how the Quality Assurance processes shall be applied to meet the requirements of the Contract:

1. Specific work practices. methods and events;
2. Lists of all procedures applicable to the Project;
3. Audit Plan;
4. Management Review;
5. Performance indicators;
6. Allocation of resources;
7. Responsibilities and authority for all phases of the work;
8. Control of Non-conformances;
9. Lessons learned continual improvement
10. QA/QC Organisation

The Design Consultants’ Quality Plan will include or make reference to the plan(s) for design and development. It will take into account applicable codes, standards, specifications, Quality characteristics and regulatory requirements as appropriate. It will identify the criteria by which the design and development inputs and outputs should be accepted, and how, at what stage(s), and by whom, the outputs should be reviewed, verified and validated.

The Design Consultant’s Quality Plan will also state the following:

1. How requests for changes and development will be controlled;
2. Who is authorised to initiate a change request;
3. How changes will be reviewed in terms of their impact
4. Who is authorised to approve or reject changes;
5. How the implementation of changes will be verified.
6. When design and development reviews take place;
7. When value engineering reviews take place;
8. When design and development verification take place,
9. When design and development validation take place.

**9.5 COST ESTIMATION**

Overall, the project’s current status may be at any of the phases 1 to 6 within the project life cycle as described in the RFP document and the Consultant may be asked to prepare a construction cost estimate for one or a number of the phases within the project life cycle.

In preparation of the cost estimation and undertaking the market survey, the Consultant may maybe asked to consider the following requirements:

* The cost estimate should take into consideration to all project’s aspects that need to be completed and shall be generated based on the local cost of materials and services.
* It shall be in the currency of the Contract.
* The content, level of detail and the basis of the cost estimate shall be agreed with the Client.
* The estimate shall be based on the schedules of quantities completed for each element of the Project and shall include the capital cost of the proposed works and include separately all other costs associated with the project.
* The cost estimate shall reflect the cost of required materials and services of the implemented project.
* It shall be based on the schedules of quantities completed for each element of the work.
* The cost estimate shall be in the format agreed with the Client.
* In addition the Consultant maybe asked to undertake the following activities:
* The Market Survey which includes the assessment of local factors/conditions such as: availability of construction materials, tools and technical know-how available in that country, or in the region, monopoly situations, local practices, etc. The outcome can facilitate informed decisions, time and budget required to be implemented as well as special considerations to mitigate identified risks.
* A detailed report of cost estimate has to be submitted considering all the above which includes a market survey

# 10. SITE SUPERVISION

The details regarding the type of project and status of the work will be provided to the Consultant prior to commissioning.

The Consultant shall have responsibility for the following elements of work:

* Supervise the construction of the project through to the issue of the certificate of substantial completion and beyond;
* The establishment, through and in the course of the assignment, of supervision methodology and system (documentary and software support shall be provided by the Consultant);
* The transfer of expertise in supervision on construction contracts
* In case of claims and disputes, to provide the necessary evidentiary records and analyses and bear expert witness in defence of the case of the Client.
* Provide input and assistance into the completion of project as-built drawings;
* Provide input and assistance into the completion of project financial final accounts;
* Ensure that the completion of the construction is executed in accordance with national and international health & safety standards.
* Ensure that all construction is completed according to internationally recognised quality standards.
* Constant supervision of the construction work, programming and co-ordination.
* Provision of engineering and project management services from inception to completion.
* Inspect and monitor time, progress, cost, quality and quantity of the works and other agreed targets.
* Ensure the implementation of the project in accordance with the approved design and the construction contract and local circumstances.
* Exercise any and all powers delegated by the Employer under the construction contract and ensure the successful delivery of the project.
* Liaison with local authorities, as required, to obtain any necessary authorizations for the implementation of the project and to ensure co-ordination of activities throughout the project duration.
* Assessment and approval of the contractor’s security provisions, with the WFP Security officer, to protect the Employer’s personnel and assets during the construction phase of the project.
* Provision of advice to the Employer concerning the schedule of handing over of the site and any designated access to the successful contractor including notification of possible delays that could affect such a handover.
* Approval of the contractors site supervision personnel that have not already received the prior approval of the Employer.
* Approval of the contractors selected sub-contractors that have not already received the prior approval of the Employer.
* Inspection and evaluation of the contractors' on-site and off-site facilities to ensure compliance with the terms and conditions of the contract. This shall include inspecting any material sources, fabrication facilities and the contractors' proposed laboratory testing facilities and recommending improvements (if any) to said facilities or procedures to ensure the desired performance.
* Advice on the selection of contractor's equipment. Assess minimum construction equipment, plant and machinery requirements, by type and specification, and monitor, keep and regularly update a list of the contractor’s equipment, plant and machinery in order to keep a check on the contractor’s mobilisation.
* Inspection of contractor's construction equipment ensuring that compliance with the manufacturers’ requirements is being achieved and international standards relating to pollution, noise and vibration are being complied with.
* Inspection of material sources both on and off site. Ensure the completion of tests of materials to ensure adherence to specifications. Approval of all material to be used on the projects.
* Assessment of the contractors construction methods for the works ensuring that the methods proposed are satisfactory with respect to the requirement of programme, quality, and health and safety.
* Continuously monitor the construction progress to ensure it is proceeding in accordance with the approved design, methodology and work programme. Liaise with the contractor in the event of problems occurring to attempt to arrest the situation.
* Liaison with the Employer in relation to any variations. Assessment and approval of variations required, at the rates established in the construction contract, or at alternative rates mutually agreed between the Employer and the contractor, in accordance with the delegated authority assigned under the construction contract.
* Ensure that the contractor adheres to local laws and customs and in particular does not use child labour for the execution of the contract.
* Any other duties consistent with the normal roles and responsibilities of a Consultant.
* Providing input in relation to applications for payment and contract variations;
* If required, attending site for progress meetings and to provide onsite support; and
* Oversee and review the completion of the contract “as-built” drawings.

In relation to the provision of design input and technical advice, this will largely be in response to information requests from the Contractor. The Consultant will provide a response to queries from the field as soon as possible and in any case no longer than one working day from receipt of such a request. Where the response to a query is agreed between the parties as requiring additional time, the Consultant shall notify the Client in writing as to the expected timeline for receipt of the response.

**10.1.1 Construction Supervision Role**

The Consultant shall include within the supervision report, details of the procedures that it would intend to implement at each of the work sites and the national / international standards the supervision of the project would be carried out to.

Each site supervision team shall consist of a minimum of three individuals as follows:

* Senior Resident Engineer / Clerk of Works (minimum 12 years relevant experience)
* Resident Engineer (minimum 5 years relevant experience)
* Administration Assistant (minimum 3 years relevant experience)

Each member of the site supervision team shall be suitably qualified and to the approval of the Client. Notwithstanding the minimum membership of each individual site team detailed above, the Consultant shall be responsible for ensuring that the number of supervision personnel assigned to each individual work site is sufficient to satisfy to site and complexity of the project at each identified location. The level of supervision provided shall ensure that there is always a presence at the worksite during the construction stage to account for absences and the long working hours that may occur throughout the duration of a project such as this.

The Consultant shall include a fully detailed schedule of daily rates for the site supervision team. The rate shall encompass all variables for each site team member including but not limited to basic salary, travel, subsistence, supervision equipment and working outside normal construction hours.

The duration of the site supervision contract shall extend from the signing of the Contract with the selected construction firm to the signing of the Certificate of Substantial completion for the Project. A reduced level of supervision may be necessary, in advance of contract signing, through the defects notification phase and to cover unforeseen conditions such as particular weather events. Should this be the case, it shall be agreed on a case by case basis with the Consultant.

**10.1.2 Commissioning / Defects Notification Period**

The Consultant shall make its team available through the defects notification stage of the project to provide input as required into the completion of As-Built drawings and to the preparation of project related final accounts and contractual close-out. Additionally the Consultant may be requested to maintain a presence on site for the supervision of remaining construction works or the repair of identified defects.

Where the Client requires that the Consultant performs additional services after the issue of the certificate of substantial completion, the extent of these services shall be agreed on a case by case basis and shall be deemed to be an Additional Service under the Contract.

# 11. HYDROGEOLOGICAL SURVEYS:

The hydrogeological investigations may require for different purposes and construction of projects, such as:

* Water supply of settlements,
* Exploitation of groundwater for bottling,
* Exploitation of groundwater for irrigation and industry,
* Exploitation of groundwater as condensator of thermal pump,
* Investigation in catchment areas for energetic purposes,
* Hydrogeological investigation for design of mini hydro power plants,
* Hydrogeological investigation for design of surface and ground water reservoirs,
* Hydrogeological investigation for irrigation,
* Hydrogeological investigation for determination of zones of sanitary protection of water springs, etc.

The Consultant shall undertake a Hydrogeological Investigation for the Project where required, and submit a report, drawings, calculations and model files (in a digital format approved by The Client) for consent. The investigation shall include, but not limited to, the following:

* Review of available documentation,
* Field reconnaissance,
* Development of Investigation Design,
* Geomorphological analysis of field,
* Photogeological detection of terrain by means of remote detection,
* Hydrogeological mapping of terrain along with preparation of hydrogeological maps at different scales,
* Test of routing (marking) of groundwater,
* Geophysical survey,
* Drilling of exploratory and exploratory – abstraction boreholes,
* Development of exploitation water- wells,
* Mapping of borehole cores,
* Flushing and testing of exploratory – exploitation boreholes and water wells (pumping test),
* Hadrochemical analysis,
* Measurement of temperature and other physical parameters of water,
* Measurement of water table,
* Determination of groundwater direction,
* Drafting of maps of vulnerability, hazard and risk of groundwater contamination,
* Determination of zone of sanitary protection,
* Data processing with reporting on the hydrogeological investigations,
* Development of studies on reserves of groundwater,
* Development of concession studies for bottling of groundwater, etc