

TERMS OF REFERENCE

CONSULTANCY SERVICES FOR THE DESIGN OF A REFERRAL HOSPITAL IN SAINT VINCENT AND THE GRENADINES

1. BACKGROUND

In 2008, the European Union funded a detailed review of the Milton Cato Memorial Hospital (MCMH) which clearly identified major structural and construction deficiencies in the existing complex (a combination of constructions ranging from the late 1800's to present). As medical demands have grown, the MCMH has attempted to meet the demands for services through physical expansion but is restricted by limited land space. Urban development, restrictions to access and hazard risks such as flooding and fire, have further exacerbated the problems relevant to the current location of the country's premier hospital. .

Given the inherent structural weaknesses, hazard exposure and site restrictions, the Government of Saint Vincent and the Grenadines (GoSVG) has elected to pursue the construction of a new hospital complex in a more suitable location, to meet the demands of an expanding health care system and to accommodate the requirements of a modern hospital facility. To prepare for the development of the designs for the new construction, the Ministry of Health, Wellness and the Environment (MoHWE), via the Ministry of Economic Planning, Sustainable development, Industry, Information and Labour (MoEP), with the assistance of funds from the Regional Disaster Vulnerability Reduction Project (RDVRP), procured the services of the consortium Conseil Sante to conduct a review of its health care delivery system infrastructure and the service needs throughout the island. This study, completed in August 2014, provided specific functional design criteria for a new hospital complex, including approximate location and services, as well as a framework for future investments in the health services delivery system, particularly with respect to improvements in a national Emergency Management Services (EMS) System. The study recommended inter-alia the construction of a new referral hospital in Arnos Vale (Appendix A) with a capacity of 127 beds supported by essential clinical activities.

Through financing arrangements with the World Bank, under the RDVRP, the GoSVG has secured financing for the design of a new referral hospital. The support is aimed at providing Saint Vincent and the Grenadines (SVG) with financial and technical assistance to reduce vulnerability to natural hazards and climate change impacts. Among the specific aims of the project are the goals to integrate disaster vulnerability reduction and climate resilience in national development strategies and management of public infrastructure. As such, a significant proportion of the project addresses selected engineering works around the country in support of building climate resilience and reducing climate change vulnerability. The referral hospital is one such project that met the criteria.

2. OBJECTIVE

2.01 The objective of this Consultancy is to provide the MOEP, with architectural and engineering consultancy services for the design of a new referral hospital in Arnos Vale.

3. DURATION

The design phase of the consultancy is expected to be approximately 25 months.

4. GENERAL REQUIREMENTS

The Consultant will report to the RDVRP Project Coordinator in the MOEP, the client on this contract, and will be responsible for carrying out the activities outlined in 2.01 above according to best engineering practices. The professional services of the consultants must cover all the technical and associated administrative responsibilities needed in the execution of the different work activities. These responsibilities will be consistent with agreed quality assurance (QA) and quality control (QC) procedures.

It is understood that the Consultant will provide all the necessary technical support to the staff of MOEP, MoHWE and the Ministry of Transport and Works, etc (MoTW) in order to administer, manage and supervise the Project Design phase. The Consultant will also carry out any additional services which the MOEP/MoHWE/MoTW may reasonably require relating to the design of the Project.

To ensure adequate project management and the implementation of agreed QA/QC procedures, the Consultants must include in the technical proposal, a suitable Design Development Program emphasising project organisation and resource management. This will allow the consultants to meet their budget and scheduled objectives, environmental and engineering value analysis, critical path planning and monitoring, design review procedures, and project reporting systems.

A critical element in the QA/QC system will be the incorporation of the Hospital Safety Index assessment procedure by PAHO. Information on the Index can be obtained at the following website

http://www.paho.org/disasters/index.php?option=com_content&view=category&layout=blog&id=907&Itemid=884

The hospital is expected to be classified as a Category A facility.

The Consultant will liaise closely with the MOEP's Social and Communications Specialist in order to ensure that communities are consulted, informed and forewarned of planned site activities in a timely manner. The communities are to be given opportunities to ask questions and kept informed of the nature, timing/duration, extent of activities and likely short, medium and long-term impacts on them. These consultations should be documented and minuted.

The consultant will carry out an Environmental Impact Assessment (EIA) in accordance with the Environmental Management Framework (EMF) and World Bank Guidelines contained therein. The EMF can be viewed at the following link:

http://gov.vc/images/stories/pdf_documents/final%20environmental%20management%20framework%20february%2028%202014%20re-disclosure.pdf

5. SCOPE OF SERVICES

The scope of services shall include, but not be limited to, the following main activities:

General Services

The services shall be carried out in accordance with generally accepted standards of professional practice, guided by recognized engineering and management principles and practices for Pre Contract Services. The consultant's scope of work is understood to cover all activities necessary to accomplish the stated objectives of these services while adhering to the aforementioned principles and practices, whether or not a specific activity is cited in these ToR.

The services will include: the review of project related documents provided by the MOEP, stakeholder meetings, field investigations, detailed architectural and engineering designs, Bills of Quantities (SMM7), Engineers estimate, Specifications, Environmental Management Plan, preparation of contract bidding documents and a final completion report.

Freely accessible data and analysis is a core component of this project. Therefore, all geospatial data collected and created by project activities must be preserved, consolidated and transferred to the Government of Saint Vincent and the Grenadines and the World Bank upon project completion, in a well-known or standard electronic format. This format is outlined in Appendix B

Specific Services

The specific requirements for this consultancy, consist of the following tasks :

- Task 1 – Inception Report
- Task 2 – Detailed site analysis
- Task 3 - Stakeholder meetings to prepare Room Data Sheets
- Task 4 - Concept Design
- Task 5 - Preliminary Design
- Task 6 - Draft Final Design
- Task 7 - Final Design
- Task 8 - Completion Report

Task 1: Inception Report

The consultant shall upon signing the contract provide an Inception Report within the agreed time frame. This report shall contain, but not be limited to, the information contained in the template in Appendix C

Task 2: Detailed Site Analysis

The design process will commence with a detailed site analysis.

Investigations will involve field, laboratory and desktop activities. A thorough investigation of existing information, records and maps shall be carried out. Information shall be obtained from both, local and regional sources such as:

Local:

Ministry of Transport and Works – MoTW
National Emergency Management Organization – NEMO
Housing and Lands Department Corporation – HLDC
Ministry of Health and Environment - MoHE

Seismic Unit, Ministry of Agriculture, Rural Transformation, Forestry and Fisheries
Ministry of Housing, Informal Human Settlements, Lands and Surveys and Physical Planning
Ministry of Economic Planning, etc (MOEP)
Central Water and Sewerage Authority - CWSA

Regional:

University of the West Indies (Seismic Research Centre of Tsunami, Earthquake and Volcanic Risk)
Trinidad & Tobago Meteorological Service
National Emergency Management Agency (NEMA)
Office of Disaster Preparedness and Management (ODPM)
Caribbean Institute for Meteorology & Hydrology (CIMH)
Caribbean Disaster Emergency Management Agency CDEMA
Caribbean Water and Wastewater Association (CWWA)
Caribbean Community Climate Change Centre
Intergovernmental Oceanographic Commission
National Hurricane Center (NOAA)
US Geological Survey (USGS)
Pan American Health Organisation (PAHO)

In addition to the above mentioned institutions, other relevant sources shall also be identified and reviewed by the Consultant on their own initiative. The consultant is expected to provide a Site Analysis Report in accordance with Appendix D.

The Report shall include an executive summary and shall provide a conclusion regarding the suitability of the site in the context of the parameters under investigation viz topography, geotechnical conditions, flood risk, traffic impact assessment, engineering, environmental and social impact assessments.

The consultant shall provide in the report, any interventions which in their opinion would be required to make the site suitable for construction of this facility. If the site is unsuitable, the consultant shall say so.

Task 3: Preparation of Room Data Sheets (RDS)

The consultant shall be responsible for the preparation of the room data sheets. This activity would necessarily include stakeholder participation eg. Hospital Management, MoHWE and MoTW. In preparing the RDS, the consultant will be required to provide advice on the engineering/architectural/costing implications for each decision. Such advice will include suggested alternative solutions.

The guiding principle in the development of the RDS, must be minimum maintenance and operational costs.

The consultant is advised that the Conseil Santé – SOFRECO Report (Task 2- Service Analysis and EMS Optimisation), provides detailed information on the Accident and Emergency Facility only, as follows :

- (i) Functional requirements within the A and E Department
- (ii) Functional relationships with other departments
- (iii) Management and staffing
- (iv) Environment and Equipment
- (v) Resuscitation Room
- (vi) Required medications
- (vii) Basic policy guidelines
- (viii) Quality improvement indicators

This information is not provided for any other department in as much detail, but still does not include architectural floor, wall and ceiling finishes as well as some of the other details listed in the sample RDS Template in Appendix E. The consultant will review and collate the information into their RDS.

The minimum information headings to be included in the RDS would be:

- Description of activity
- Staff compliment
- Medical equipment
- Furniture
- Fittings
- Sanitary fittings
- Finishes
- Environmental engineering
- Engineering services
- Security and safety

The consultant is not mandated to follow the sample example of a RDS shown in Appendix E but the information contained in this sample sheet, is expected to be replicated by the consultants own template.

Task 4: Concept Design

Following Tasks 1, 2 and 3 above and with the receipt of specific written instructions to proceed, the consultant shall commence the preliminary design work with the first step of producing a concept design.

The concept design(s) (number of concepts at the Architects discretion) shall provide the client with a clear visual impression of the site layout, road access, building exterior elevations and building interior layout. The drawings shall be single line and to scale, with rooms and circulation spaces clearly identified. A 3D drawing of the complex shall also be provided.

The consultant shall be required to produce both hard and soft copies of the concept drawing(s) and will be required to make two separate power point presentations to the stakeholders viz. ministerial cabinet and hospital management, MoTW and MoHE

Task 5: Preliminary Design

Following the selection of the approved concept, the consultant shall commence the preliminary design work.

This preliminary design will be guided inter-alia by the approved concept design, Design Brief (Appendix F), site assessment report, Task 4 Report on “Functional Design Requirements and Parameters” by Conseil Santé SA (Sections 3 and 4), RDS and such other design inputs required by the client.

Where there are differences or “gaps” between The Functional Design Report by Conseil Santé SA and this ToR, this ToR and the design brief contained herein shall govern. In this regard, the consultants attention is drawn to the following sub-headings in section 4.3.4 in the Conseil Santé SA Report.

- (i) Operational Policies – The Milton Cato hospital has developed various policies and protocols which are in written form. These documents are not complete in scope and some are under development. The consultant is expected to interview the hospital management staff where information is required.
- (ii) The consultant will be required to develop the space program following consultations with and advice from the client
- (iii) Medical Equipment – The consultant will be required to develop the list of medical equipment by consultation with and advice from the client. This will include the transfer of existing equipment to the new facility, as well as the purchase of new equipment.
- (iv) Room Data Sheets – The consultant will be required to develop the RDS following consultations with and advice from the client.
- (v) Design Standards – The consultant will be required to follow UK/US standards for the structural designs. The consultants attention is drawn to the following PAHO/WHO publications for some general design guidance :

“Design Manual for Health Services in the Caribbean with particular reference to Natural Hazards and other Low Frequency Events” by Tony Gibbs

“Guidelines for the Reduction of Vulnerabilities in New Health Facilities” by Rubén Boroschek Krauskopf and Rodrigo Retamales Saavedra

- (vi) Legislative Issues – The consultant is not required to consider comments on existing legislation in such detail, as to require pricing.
- (vii) Renewable Energy and Sustainable Resources – The consultant will be required to obtain from the client, anticipated electrical operational costs for the new facility, as well as provide the client the anticipated electrical operational costs of the preliminary design. The design brief covers this topic in more detail.
- (viii) Disaster, Hurricane and Storm Protection - The Report recognises category 2 hurricanes in the region. The consultants attention is drawn to the fact that Saint Vincent has experienced severe hurricane categories most recently in 2004 with hurricane Ivan and Emily (2005) and Tomas in 2010. The December 24 2013 tropical storm in Saint Vincent resulted in record rain intensity of 278mm in three hours. The reference to Miami Dade standards should be considered for door and window specifications only. The design brief covers this topic in more detail.
- (ix) Environmental Impact – As indicated before, the EIA will be guided by the EMF process. The EIA will form part of the site analysis for which certain assumptions will have to be

made eg storey height, building footprint, car park area etc. Where there is a significant departure from the original assumptions (which should be apparent at the preliminary design stage), the consultant will need to design interventions to mitigate the effects and update his site analysis report. Given the nature of the site (abandoned airstrip), the scope of the project and knowledge of the EMF screening process, an EMP is anticipated and not a full EIA.

The consultant is expected to provide preliminary design drawings for the clients review. The minimum drawing content is listed in Appendix G. The consultant is expected to exceed this drawing list.

The consultant is also expected to provide a preliminary design report. The report requirements are contained in Appendix H

The consultant will also be required to make four (4) separate power point presentations of the preliminary designs to various stakeholders viz. ministerial cabinet, doctors, nurses and maintenance staff. The presentations will focus on the relevant interests of the stakeholders and be structured in a manner that represents anticipated operational scenarios. The architectural / engineering presentations shall be accompanied with a section on cost analysis.

Task 6 : Draft Final Design

guided by comments/suggestions arising out of the preliminary design, the consultant shall provide a draft final design (drawings, specifications, Bills of Quantities). The design will be presented in hard copy, digital format and power point (three presentations viz Ministerial Cabinet, Doctors and Nurses, maintenance team).

The consultant shall present at this stage, a detailed cost analysis of the project, highlighting the significant elemental costs arising in the various architectural/engineering disciplines and what steps were taken or remain open, to reduce capital and operational expenditure.

The client will review the documents/presentations and provide comments for inclusion in the final document. This could include adjustments to the airconditioning and electrical systems to reduce operational costs, reduced medical equipment, phased construction and such other cost reduction measures the parties agree to.

Task 7 : Final Design

At this stage, the consultant shall submit fully completed documents i.e. drawings, specifications and Bills of Quantities. Guidance on the minimum requirements for these documents is listed in Appendix I

The BOQ will be in accordance with SMM7. The consultant shall provide both a priced and unpriced copy.

The final bid document will be prepared by the client, who will insert the conditions of contract, particular conditions, data sheet etc. in accordance with World Bank guidelines.

Task 8 : Completion Report

At this stage, the consultant shall submit the project completion report .

6. INPUTS

MOEP will make available to the consultants, all plans, pictures and reports relevant to the proposed works that is in their possession and might be necessary and applicable in the execution of the work required under these Terms of Reference (ToR). A list of some of the important reports is contained in Appendix J

The services of the Consultant will be required over a 25 month period to undertake the various activities outlined in Section 5 of the TOR. The Consultant will provide the equipment and software required to carry out the assignment and be responsible for obtaining all additional information for the execution of the services necessary for the Project.

7. REPORTING REQUIREMENTS AND DELIVERABLES

The Consultants shall submit the following to MOEP's satisfaction:

- (a) **Inception Report:** within four (4) weeks of commencing the works, the Consultants are required to submit an Inception Report. This Report should include the Consultants' detailed work schedule, methodology, recommendations with respect to ToR etc. A typical sample template is attached in Appendix C.

MOEP should forward comments on the Inception Report to the Consultants within two (2) weeks of receipt.

- (b) **Site Analysis Report** – The consultant is expected to submit this report within four (4) months of contract signing. A sample template is provided in Appendix D.

MOEP should forward comments on the Site Analysis Report to the Consultants within four (4) weeks of receipt.

- (c) **Room Data Sheet Report ;** The consultant is expected to submit this report within four (4) months of contract signing. A sample template is provided in Appendix E

MOEP should forward comments on the Room Data Sheet Report to the Consultants within two (2) weeks of receipt.

- (d) **Concept Design :** The consultant is expected to provide a concept design(s) within two(2) months of the instruction to proceed with design work. The designs will be presented both in hard copy, and in power point format. There will be two separate power point presentations.

MOEP should forward comments on the Concept Designs within four (4) weeks of presentations.

- (e) **Preliminary Design Report** The consultant is expected to provide a preliminary design report within six (6) months of the instruction to proceed with these works. The report shall also be presented in power point format to four different stakeholder groups. A

sample template is provided in Appendix H and a preliminary drawing list is provided in Appendix G

MOEP should forward comments on the Preliminary Design report within eight (8) weeks of presentations.

- (f) **Draft Final Designs** – The consultant is expected to provide draft final designs four (4) months after the approval of the preliminary design report. The report shall also be presented in power point format to four different stakeholder groups. The submission will include a separate detailed presentation on project cost. The minimum drawing list is provided in Appendix I

MOEP should forward comments on the Draft final designs and the presentation within two (2) weeks of presentations.

- (g) **Final Design and construction documents** shall be provided one (1) month after approval of the draft final design documents. These documents will include updated Final drawings, Bar Bending Schedules, Specifications, EMP, Priced and Bills of Quantities (priced and un-priced).
- (h) **Project Completion Report:** Submission of the Completion Report of the Project (as per Appendix K), within three months after the submission of the Final Designs.
- (i) **Monthly Report:** The consultant shall prepare monthly reports during the design process (commencing in the preliminary design phase) indicating progress in the various project components. A template is provided in Appendix L

Three hard copies of all reports and drawings are to be submitted. These are also to be submitted in electronic format in Microsoft Word/Excel where appropriate. Drawings are to be submitted in AutoCAD.

8.0 MANPOWER SCHEDULING AND COSTS

In estimating man – month requirements and cost of the services, the consultants should ensure that the proposal takes full account of all of the costs to adequately complete the above requirements, including but not limited to the following items.

- Consultants remuneration
- Consultants out of pocket expenses
- Local, regional and international travel
- Support staff services
- Equipment and vehicle hire
- Communication costs
- Report, documentation and drawing reproduction costs
- Survey costs (topographic and traffic)

- Local accommodation
- Testing

Working Team Minimum Requirements

WORK TEAM MINIMUM REQUIREMENTS		
Position	Qualifications	Specific experience
Project Director	Architect with BSc and RIBA (or equivalent) qualifications.	Advisor, Consultant or management positions in development of projects related to hospitals and buildings > 10,000m ² with experience not less than 25 years with 15 years' experience in hospital design. Experience with at least one hospital >10,000m ² in the last ten years.
Building Architect	Architect with BSc in Architecture.	Fifteen (15) years post graduate experience including several health facility designs and large buildings > 6000m ² , with at least one hospital > 10,000m ² in the last 10 years.
Interior Design Architect	Architect with BSc in Architecture.	Fifteen (15) years post graduate experience with several health, public and commercial facility designs.
Landscape Architect	Architect with BSc in Architecture.	Ten (10) years post graduate experience.
Geotechnical Engineer	BSc in Geotechnical Engineering.	Fifteen years' experience in building foundation geotechnical assessments and designs.
Structural Engineer	MSc in Structural Engineering.	Fifteen (15) years post graduate experience in structural design including health facilities. Seismic and wind force calculations essential. Use of advanced structural design software essential. Experience of base isolation designs will be an advantage.
Mechanical Engineer	BSc in Mechanical Engineering	Fifteen (15) years' experience in HVAC, fire-fighting/suppression, plumbing and waste water treatment designs, on commercial and public buildings, with at least one health facility > 10,000m ² . Design experience with disaster vulnerability

		reduction techniques essential.
Electrical Engineer	BSc in Electrical Engineering	Fifteen (15) years' experience in electrical and building communications designs in commercial and public buildings, with at least one health facility > 10,000m ²
Biomedical Equipment Specialist	BSc in Biomedical Engineering or equivalent	Fifteen (15) years' experience in repairs, development and sales of medical equipment.
Civil Engineer	BSc in Civil Engineering	Ten (10) years' experience in roads and civil works.
Traffic Engineer	BSc in Civil Engineering	Ten (10) years' experience in traffic engineering, modelling and design work.
Environmental Specialist	BSc in Environmental Engineering or Science	At least ten years' experience in EIA reporting.
Hydraulics Engineer	BSc in Hydraulic Engineering	Ten (10) years' experience, including river embankment protection works and flood protection designs.
Quantity Surveyor or Cost Benefit Engineer	BSc in Quantity Surveying or Civil Engineering	At least Fifteen (15) years' experience as a Quantity Surveyor or Cost Engineer and with SMM7 experience
Land Surveyor	Licensed Surveyor or BSc in Land Surveying	At least ten (10) years as lead surveyor

9.0 COMMENTS BY THE CONSULTANTS

The Consultants are invited to make any comments on, and suggestions for, improvements to this ToR. The financial implications, if any, of the said suggestions/recommendations should be clearly indicated in the Financial Proposal.

APPENDIX A

PROJECT LOCATION



Figure 1 Hospital Location shown at ET Joshua Airport

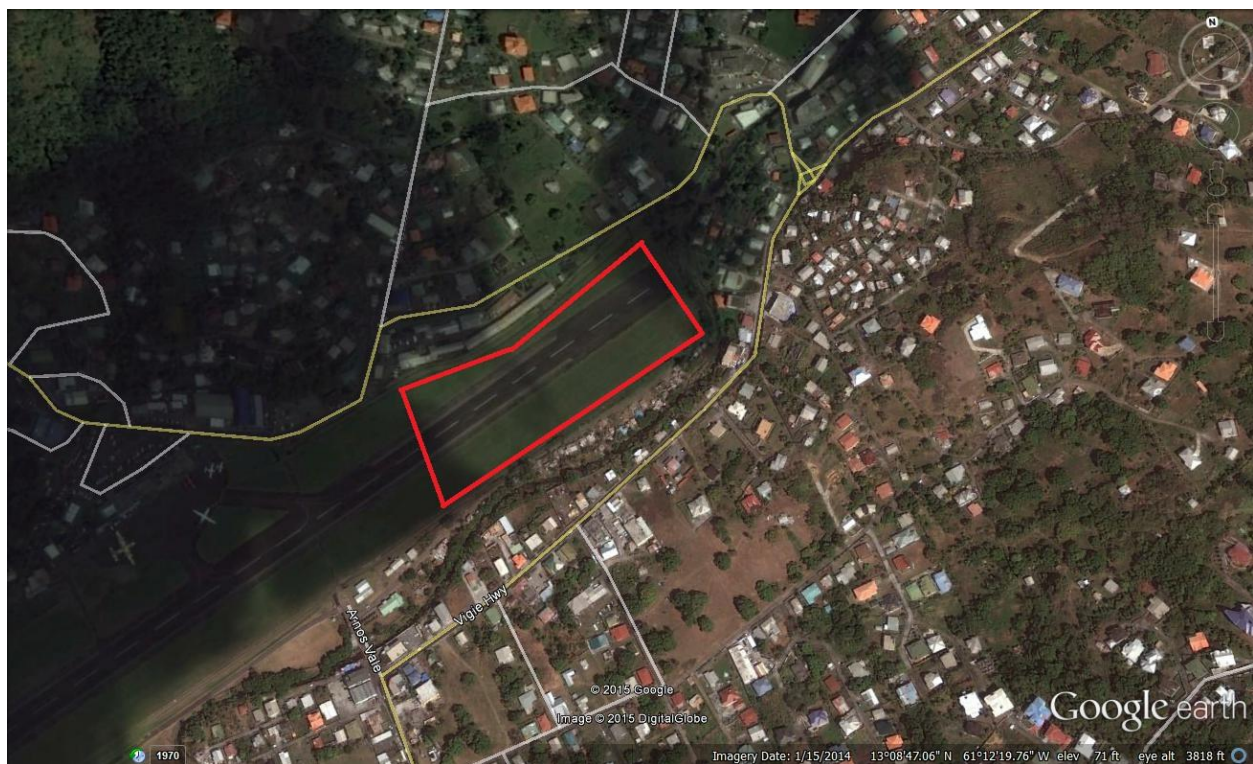


Figure 2 Proposed Hospital Location

APPENDIX B

Terms of Geo-Spatial Data Delivery and Sharing

Freely accessible data and analysis is a core component of this project. Therefore, all geospatial data collected and created by project activities must be preserved, consolidated and transferred to the Government of Saint Vincent and the Grenadines and the World Bank upon project completion, in a well-known or standard electronic format. Specifically the following terms apply:

Licensing: All data procured and developed for this project is done on behalf of the Government of Saint Vincent and the Grenadines and the World Bank and therefore all licensing agreements must be made similarly. In keeping with the World Bank commitment to open data, it is recommended that this license be under Creative Commons CC-BY-SA where possible and appropriate. See: <http://creativecommons.org/licenses/by-sa/2.0/> for more detail.

Vector data: Geospatial vector data must be converted into a standard OGC format or well-known format. This list includes, but is not limited to, shape file format. Additional formats may be delivered with prior approval. All files must include projection parameters. Vector data must adhere to topological standards.

Raster data: Geospatial raster data must be converted into a standard OGC or well-known format. This list includes, but is not limited to, GeoTiff format. Additional formats may be delivered with prior approval. All files must include projection parameters.

Tabular data: Tabular data must be converted into a readily accessible or well-known format. This list includes, but is not limited to, CSV, tab delimited text file, or spreadsheet. Additional formats may be delivered with approval.

Media/method of transfer: All data sets must be transferred on permanent media such as a CD/DVD disk. Very large data sets, too large for CDs and DVDs, may be provided on a hard drive or solid-state drive, as agreed by the Government of Saint Vincent and the Grenadines and the World Bank.

Metadata: Detailed documentation needs to be provided for each data set. This metadata must include description, source, and contact, spatial and attribute keywords, date, accuracy, restrictions. A description of attributes should to be provided for vector and tabular data sets. Spatial data must include details of projection. The World Bank has created metadata standards for internal use, based on ISO 19115:2003, that meets these requirements. Please refer to World Bank metadata standard for details. The metadata standard to be used in this consultancy will be discussed with the involved ministries and the responsible for the National Spatial Data Infrastructure.

Derived data: All derived data generated for this project belongs to the Government of Saint Vincent and the Grenadines and the World Bank and must be transferred under these terms.

Periodic updates: Ongoing updates of this data made by the selected must be provided as they are created.

Disposal of data: The selected firm is free to maintain copies of data collected and developed through this project, without conflicting the terms of any license agreements. Ownership remains with, and must be stated as, the Government of Saint Vincent and the Grenadines and the World Bank. Further data sharing is permissible under these terms only if the data is made freely available without cost.

CARTOGRAPHIC STANDARDS

British West Indies (BWI) Grid parameters

Grid	British West Indies
Projection	Transverse Mercator
Spheroid	Clarke 1880
Datum	St. Vincent
Unit of measurement	Metre
Meridian of Origin	62° West of Greenwich
Latitude of origin	Equator (0°)
Scale factor at origin	0.9995
False Coordinates of Origin	400000 Easting
	Nil Northing

Universal Transverse Mercator Zone 20

Grid	UTM Zone 20
Projection	Transverse Mercator
Spheroid	WGS 1984
Datum	WGS 1984
Unit of measurement	Metre
Meridian of Origin	63° West of Greenwich
Latitude of origin	Equator (0°)
Scale factor at origin	0.9996
False Coordinates of Origin	500000 Easting
	Nil Northing

APPENDIX C

Inception Report Template

The consultant is free to format the Inception Report to his normal presentation, but the report shall contain the following minimum content:

- Executive Summary
- Introduction
- Background and Description of various project elements
- Understanding of Project Objectives
- Contract signing and project commencement
- Team mobilization and project activities to date
- Data collection
- Data gaps
- Assumptions, Risks and Mitigation Strategy regarding data gaps

- Comments on ToR
- Design criteria
- Project Organisation / Lines of communication
- Project execution, methodology and scheduling
- Proposed outlines for interim and final reports
- Appendices eg meeting details, Organisation Chart, ToR, Photographs etc.

APPENDIX D

ToR for Detailed Site Analysis

SCOPE OF SERVICES

The scope of services shall include the activities outlined below, which will be collated into a Site Analysis Report. The Report shall include an executive summary and shall provide a conclusion regarding the suitability of the site in the context of the parameters under investigation viz topography, geotechnical conditions, flood risk, traffic impact assessment, engineering, environmental and social impact assessments. The consultant shall provide in the report, any interventions which in his opinion would be required to make the site suitable for construction of this facility. If the site is unsuitable, even with the best mitigation interventions, the consultant shall say so.

General Services

The services shall be carried out in accordance with generally accepted standards of professional practice, following recognized engineering and management principles and practices for site investigation services.

The Consultant's scope of work is understood to cover all activities necessary to accomplish the stated objectives of these services while adhering to the aforementioned principles and practices, whether or not a specific activity is cited in the ToR.

The services will include Preliminary Engineering Investigations, a Topographic Survey, a Flood Risk Assessment Review, a Traffic Impact Assessment, Geotechnical Investigations and a limited Environmental Impact and Social Assessment.

The associated tasks will involve field observations, drilling, surveying, review of hazard maps and hazard reports, review of existing hydraulic studies, anecdotal information from area residents, desktop reviews, lab analysis, and any other necessary research and analysis that the consultant feels necessary to satisfy the ToR.

Topographic Survey

Undertake a digital site topographical survey to determine the commercial viability of construction of a hospital complex at the location, considering the erection of safe buildings and adequate car parks and ancilliary facilities. The map will also provide the following information:

- All physical features both man-made and topographic within the survey area
- Evidence of made up ground, dumping, subsidence or past demolition
- All adjacent roadways, ramps, bridges, tunnels, footpaths, tracks, with spot levels to curbs, channels and crowns including all material finishes clearly marked
- All permanent street furniture – lamp standards, bollards, traffic lights, signs, seats, etc., to be Located
- All services related features such as sub-stations, pump houses, telecommunications boxes, manholes, inspection covers, gullies, overhead cables and other obstructions to be clearly located
- Accurate details of all site boundary walls, fences, hedges, gates, retaining walls, footpaths and the like.
- Levels within the survey area in grid formation at a maximum of 5 metre centres, including 300mm topographic contour lines. All changes of line, level and surface material to be recorded and sufficient levels to be taken to denote all changes in ground profile
- Details of levels, locations and profiles of any ponds, ditches, drains, swales, streams and rivers (including water level and direction of flow).
- Ground and/or slab levels immediately outside the site boundary particularly where a difference in surface material or ground level across the boundary exists
- Detailed survey and levels of the existing highways abutting the site, including lamp posts, manholes, access chambers, gulleys, street furniture. Cross section spot levels at 10 metre intervals to be taken on the existing roads and footpaths at back of path, top of curb, bottom of curb, centre line, recording any changes in surface material or condition

- Outline of any properties adjacent to the site including slab levels, drainage runs, building overhangs, overhead cables within close proximity of site boundary
- Any electricity substation, gas governors and valves, telephone junction boxes, water stop cocks within the site or adjacent areas shall be shown and identified on the survey
- General details of trees and vegetation indicating the locations and height of canopy
- Buildings and paved areas and the like within the site boundary shall be shown in full outline, details to include construction, slab/floor levels and outline of basements or underground structures
- Overhead lines and wires are to be shown with line and height where they cross or are in close proximity to the site
- Any evidence of flooding or ponding or saturated ground conditions at the time of the survey are to be shown
- Position, size and nature of all utility services (gas, water, electricity, telephone, etc.) entries into the site and to any existing buildings

Geotechnical Investigations

The Consultant shall undertake sufficient borehole drilling and sampling to provide a good overview of the geotechnical characteristics across the site in order to inform the subsequent positioning of buildings and foundation design. In addition, the Consultant shall assess, but not be limited to, the following geotechnical issues which shall be collated and formalised as an independent geotechnical report:

- Depth to appropriate soil bearing capacity
- Borehole logs
- Test results for relevant soil engineering characteristics
- Soil percolation potential
- Water table depth
- Identification of historical land uses of the site
- General suitability of soils/geology of land for building upon
- Identification of unsuitable soils
- Presence of water bearing aquifers and at what depth
- Vulnerability to liquefaction
- Chemical analysis on soils to identify any hazardous materials, e.g. fertilizers
- Seismic site classification per section 11.4.2 and chapter 20 of ASCE 7-05 (Class A through E)
- Suggested foundation design type.

Engineering Investigations

The Consultant shall investigate and assess the following general engineering issues:

- Walk over visual inspection of the site and walk-through inspection to identify any potential demolition considerations
- Cadastral survey to verify site boundaries
- Constraints to phased expansion
- Susceptibility to lava flows and ash falls
- The site's vulnerability to tsunamis
- The existing capacity and expansion potential of the road access to the site as well as alternative routes
- Identification of any potential hazards on approach routes from population centres that would jeopardise access to or from the site, e.g. slides, rock falls, old bridges, flood prone zones
- Existing infrastructure capacity constraints with respect to utility access (water, electricity, cell phone coverage, broad band service)
- Identifying whether there are existing important buried utilities, and if so, mapping their locations
- The site's wind exposure
- A wind drift assessment in order to inform the appropriate siting of an incinerator and building ventilation design
- Site drainage
- Exposure to forest fires
- Presence of old landfill(s) and any negative effect resulting therefrom
- Potential effect of explosions from nearby gas or fuel related installations or pipelines
- Proximity to airport
- Proximity to fire station

Flood Risk Assessment

The Consultant shall undertake a Flood Risk Assessment that includes:

- Review of any historic incidences of flooding at the site or the main access road to the site, identifying the specific causes of such flooding, if applicable.
- Review of current hydrologic and hydraulic reports of the catchment basin and adjacent rivers and streams. The consultant is not required to carry out a separate hydrologic/hydraulic survey.
- Based on current reports, an assessment of the likelihood of flooding at the site in terms of flood levels at specific flood return periods including 1 in 10 year, 1 in 50 year, 1 in 100 year and 1 in 500 year.
- Where part of the proposed development site is below these flood levels, identification of any localized flood alleviation options (such as embankment construction or channel maintenance)
- Reporting on the tidal reach in relation to the site and predicted tide surge levels based on current hazard maps.

Traffic Impact Assessment

The Consultant shall undertake a Traffic Impact Assessment (“TIA”) that includes, at a minimum, the following tasks. The final scope of TIA to be confirmed with appropriate authorities within the Government of Saint Vincent and the Grenadines:

- Perform a site visit
- Review existing baseline conditions and relevant planning policies (e.g. any stipulations regarding the number of access routes, etc) to determine potential impacts on the project
- Confirm any other committed developments in the area which might be impacted by or might impact the project in terms of traffic. In this regard, the consultant is advised that a “new city” is planned for the aerodrome site. There is no preliminary layout of this new city. The hospital complex will probably be the first new building on the site, for which subsequent plans will have to consider as an existing facility. The design of the building however, will necessarily have to consider access from the east where the city will be developed.
- Produce junction design(s) based on findings from site visit and/or guidance from local authorities
- Undertake an assessment of likely hospital traffic volume, pedestrians, private cars, buses, delivery vehicles, emergency vehicles etc. based on an appropriate traffic survey analysis at the existing MCMH facility, as well as using data captured in the Conseil-Santé EMS Report.
- Undertake an appropriate traffic survey analysis of existing traffic conditions adjacent to the site, to establish the optimal junction model.

Environmental and Social Impact Assessment

The consultant shall carry out an Environmental and Social Impact assessment exercise. The EIA and SIA will be guided by the Environmental Management Framework (EMF) found at the link given in section 4.05 of the main ToR. Given the scope and nature of the proposed development, it is anticipated that the EMF will point to an EMP as opposed to an EIA. Typical issues to be addressed are listed below:

- Identification of threats to any significant cultural, tourist, historical or archaeological sites of importance
- Impacts on natural habitat and biological resources
- Potential for the project to pollute marine areas and watercourses
- Potential impact on the social fabric of the surrounding communities
- Vulnerability to wind borne pollutants, including noise and odours from surrounding areas, e.g. pig and poultry farms, landfills.
- The Consultant shall indicate whether mitigation or elimination of any red flag issues is possible and a qualitative description of the proposed methods.

APPENDIX E

Sample Room Data Sheet

The consultant is expected to have his own Room Data Sheet. The following template is merely a sample which contains the minimum data which the consultant is expected to collect. The sample refers to an Operating Theatre, but provides sufficient data which can be adjusted or expanded, to incorporate other room types.

Room Planning Data	Sheet 1
---------------------------	----------------

Project:	Aga Khan Hospital Dar es Salaam Third Operating Theatre	
Department:	Operating Theatres	Code:
Room Name:	Theatre (New)	
Room Number:		Revision Date:

Activities:	a) Positioning patient on operating table b) Connecting patient to anaesthetic machine c) Preparing and use of instrument trolleys d) Parking trolley(s) e) Assembling and connecting mobile equipment f) Surgical team performing operative procedures g) Viewing X-ray films h) Viewing patients records i) Checking, weighing and recording used swabs j) Displaying operating lists k) Recording patient data/notes l) Transfer of patient from operating table to trolley		
Personnel:	Up to 5 x Staff 1 x Patient		
Planning Relationships	Adjacent to scrub up area and disposal holding room,		
Space Data:	Area (m²):		Height (mm):
	42		3000 minimum
Notes:			

Room Design Data	Sheet 2
-------------------------	----------------

Project:	Aga Khan Hospital Dar es Salaam Third Operating Theatre	
Department:	Operating Theatres	Code:
Room Name:	Theatre (New)	
Room Number:		Revision Date:

Walls:	Impervious, Washable
Floor:	Slip Resistant, Impervious, Washable, anti static
Skirting:	Cove
Ceiling:	Washable, Jointless
Doors:	2 x 860 leaf, kick plate, 1 vision panel, lockable, trolley protection, self closing.
Windows:	Solar Control, Privacy Control
Internal Glazing:	None
Hatch:	None
Door Signage:	Theatre 1
Sanitary Fittings:	None
Water Supply	None
Drainage;	Floor drainage for cleaning
Electrical Power:	Yes Emergency Power UPS
Lighting Fittings	Flush Fitting Washable, variable level Specialist operating lamp with satellites
Medical Gas	
Oxygen	2 x Connection for pendants
Nitrous Oxide	2 x Connection for pendants
Compressed Air	2 x Connection for pendants, 7 Bar 2 x Connection for pendants, 4 Bar
Vacuum	2 x Connection for pendants
Scavenging	2 x Connection for pendant
Notes:	Consider requirement for radiation protection to walls, ceilings, floors and doors

Room Environment Data	Sheet 3
------------------------------	----------------

Project:	Aga Khan Hospital Dar es Salaam Third Operating Theatre	
Department:	Operating Theatres	Code:
Room Name:	Theatre (New)	
Room Number:		Revision Date:

AIR	Requirements	Notes
Winter Temperature (DegC):	20-25	A/C controlled from theatre control panel
Summer Temperature (DegC):	20-25	
Mechanical Ventilation (Supply ac/hr):		Mechanical engineer to discuss
Mechanical Ventilation (Extract ac/hr):		
Pressure Relative to Adjoining Space:	Positive	
Filtration:	99	
Humidity (%RH):	40-60	
General Notes:		
LIGHTING		
General Illumination (Lux):	400	
Task Illumination (Lux);	50,000	
Night Illumination (Lux):		
Colour Rendering Required:	YES	
Emergency Lighting :	YES	
General Notes:		
ACOUSTICS		
Mechanical Services (NR):		
Acceptable Sound Level: (dB):		
Speech Privacy Required:		
General Notes:		
SAFETY		
Hot Surface Max. Temp (DegC):		
Hot Water Max. Temp (DegC):		
General Notes:		
FIRE		
Compartmentation		
Automatic Detection:	YES	

Equipment & Furniture Data	Sheet 4
---------------------------------------	----------------

Project:	Aga Khan Hospital Dar es Salaam Third Operating Theatre	
Department:	Operating Theatres	Code:
Room Name:	Theatre (New)	
Room Number:		Revision Date:

Item	Code	Qty	Eng Serv	Length	Depth	Height	Group
Electrical							
Outlet Voice Data RJ45 4 Way		2		0	0	0	
Panel Theatre Control With Xray illumination panel, time elapsed clock, humidity and temperature control, Intercom, medical gas warning, fire alarm activation point, lighting level control,		1		100	0	90	
Socket Single Low Level Switched		1		0	0	0	
Spur Outlet High Unswitched		1		0	0	0	
Connection for OT Light		1		0	0	0	
Socket Double Mid Level Switched		8		0	0	0	
Uninterrupted Power Supply (UPS)		1		0	0	0	
Sign Warning "Laser in Use"		1		0	0	0	
Connection for OT Pendant		2		0	0	0	
Mechanical							
Pendant Anaesthetic, Heavy Duty, Adjustable		1		0	0	0	
Pendant Surgical, Heavy Duty, Adjustable		1		0	0	0	
Connection Medical Vacuum, Pendant		2		0	0	0	
Connection Medical Gas O2, Pendant		2		0	0	0	
Connection Medical		2		0	0	0	

Gas N2O, Pendant					
Connection Medical Air 7 Bar, Pendant	2		0	0	0
Connection Medical Air, 4 Bar, pendant	2		0	0	0
Connection scavenging, Pendant	2		0	0	0
Medical Equipment & Furniture					
Warmer Blood/Fluids	1	E(P)	0	0	0
Writing Flap Wall Mounted Folding	1		0	0	0
Anaesthesia System/3 Vaporiser	1	PG	35	69	168
Stand IV Antis-Static Castors S/S	2		0	0	272
Driver Syringe	1	E(P)	16	2	5
Pump Volumetric Infusion	1	E(P)	19	14	20
Monitor System – Theatre	1	E(P)	11	32	8
Trolley Storage 5 Drawers A/S Castors	2		51	48	89
Accessory Set Basic	1		0	0	0
Stand for Table Accessories	1		68	20	175
Stirrups Lithotomy With Antis Pads Pair	1		0	0	0
Stand Bowl Double Horizontal	1		0	0	0
Kickabout – Bowl	2		0	0	0
Diathermy Unit Mono & Bipolar	1	E(P)	42	34	20
Chair Anaesthetist	1		33	33	68
Step Single Antistatic	1		25	51	15
Stool Surgeon Mobile	2		33	33	0
Trolley Anaesthetic 2 Shelves/1 Drawer	1		61	46	86
Lamp Operating Main & Satellite	1	E(S)	0	0	0
Warming Unit for Theatre Patients	1	E(P)	41	36	61
Suction Unit Twin Jar Pipeline	2	PV	51	5	26
Table Operating Major Plain Mattress	1		187	54	0

Scales Swab 180mm Dial	1		26	18	25
Board Swab Count Pre Ruled	1		0	60	40

APPENDIX F

DESIGN BRIEF FOR REFERRAL HOSPITAL IN ARNOS VALE SAINT VINCENT

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1 SITE ASSESSMENT

The current information on the site does not extend to any quantitative assessment. The consultant is expected, as part of the deliverables to produce a detailed site analysis report, the contents of which can be found in Appendix D. The following information provides only basic site parameters.

2.1 LOCATION

The proposed site (Appendix A) is located in Arnos Vale on the Eastern end of the existing airstrip of the ET Joshua Airport (13° 8' 49.48"N and 61° 12' 19.95"W) . The location is 10 minutes drive from the capital Kingstown in a mixed residential/commercial suburb. A new international airport is currently being constructed at Argyle 30 minutes up the east coast, which when commissioned, will make this site available for the construction of a new city, part of which will include the new referral hospital.

There are no preliminary design available of the new city. The Referral Hospital will probably be the first building constructed on the site, which the new city designs will need to consider. The hospital design however, will necessarily have to consider in its layout, access from the east, where the city will be built.

2.2 AREA

The suggested area required for the project is 31,000m². The building footprint is anticipated to be 12,000m² (assuming a one storey design) with an additional 2000m² to be set aside for future, but as yet undesignated expansion. A site circulation area of 45% has been assumed.

2.3 ACCESS AND TRAFFIC

The site is adjacent to the main road into the capital Kingstown. The road is heavily trafficked and is the main artery to Kingstown from the Windward coast. Site access will have to consider an appropriate junction model(s) that would not exacerbate the existing traffic jams that occur on mornings and evenings. The site analysis report requires a traffic analysis to be carried out both at the existing Milton Cato Hospital facility and the main road adjacent to the site, to determine the appropriate junction model. Close consultation with the police traffic department will be necessary

The facility will have a public car park, with a dedicated bus drop off point.

There will also be a main building entrance that will service both vehicular and pedestrian access to the public.

A service entrance will need to be provided for staff, service and emergency vehicles.

The facility should be provided with a helipad.

2.4 CLIMATE

There are fairly extensive climate records available for the site, given the fact that it is located at an airport. The consultant will avail himself of these records for design purposes. General guidance on some weather parameters based on 2008 to 2012 figures follow.

Over the course of a year, the temperature typically varies from 25°C to 31°C and is rarely below 23°C or above 32°C.

The estimated maximum probable 24hr precipitation recorded at the ET Joshua airport is 251mm (100 year return period). The rainfall season is between July and December.

Hurricanes affect Saint Vincent. The most recent hurricanes are Hurricane Ivan (2004), Emily (2005) and Tomas (2010). There was a severe tropical storm in December 2013 which dumped 278mm over a three hour period in the North of the island.

The relative humidity typically ranges from 60% (mildly humid) to 92% (very humid) over the course of the year.

Typical annual wind speeds vary from 1 m/s to 8 m/s. The wind is most often out of the East (40% of the time) with the South East accounting for about 10% of the time. Wind from the other directions occur less than 1% of the time or not at all.

Climate change is a reality, requiring the necessary design adjustments in the building and external works. The consultant will consider the increased frequency of environmental hazard events brought on by climate change.

The design of the building will need to take account of the exposed nature of the site, the corrosive maritime environment and be engineered to comply with the relevant hurricane wind loadings, earthquake codes, torrential rains and the possibility of tsunami floods.

2.5 TOPOGRAPHY AND ENVIRONMENTAL ISSUES

Being the location of an airstrip, the site is well drained and flat. The site is the floodplain of the Warrowarrow River and is bordered by hills on three sides.

1D and 2D analysis has been carried out to determine flood potential of the Warrowarrow River in the area. This analysis shows relatively minor flooding for a 1 in 500 year event. There is another minor gully on the north western end of the site which floods in heavy rains, for which drainage provisions need to be made. The current drainage in this area diverts the water parallel and then under the runway through a culvert which also serves other gullies South West of the hospital location.

No EIA has been carried out on the site. This activity forms part of the consultants ToR. Given the nature of the project, no significant impacts are envisaged. The consultant will be required to carry out an EIA in accordance with World Bank Environmental Management Framework (EMF) guidelines. It is anticipated that the EMF will suggest an Environmental Management Plan (EMP)

There is a 2003 decommissioned landfill at the South West end of the airstrip, for which the effects (if any) on the site will need to be considered.

2.6 SERVICES

Water, electricity and telephone connections are all available along the main road adjacent to the site. The cost of electricity is high in SVG (EC\$1.05 per Kwh approx.). The architectural and engineering designs will need to address this issue. Further discussion on this issue can be found in section 5 on “Guidelines for Green Building Design”

2.7 GEOTECHNICAL STUDIES

There was no geotechnical study done on the site. The site is located in the flood plain of a river valley (Warrowwarro River) so that sedimentary soils should be expected. Existing soil maps indicate a Sandy Loam. The consultant will be required to carry out a geotechnical analysis of the site as per the ToR in Appendix D.

2.8 SECURITY

The site is located in a mixed residential / commercial suburb of Kingstown. The nature of the facility will require a security fence topped with barbed wire around the site.

The consultant will incorporate the existing aerodrome perimeter fence as much as possible.

Access to the staff, service and emergency parking areas, will be controlled by a traffic barrier manned by a guard hut. As indicated above, the hospital access will also need to consider access from the new city located to the south west of the site.

CCTV will be required on the perimeter fencing, and key locations only on the building exterior and interior.

3 USER REQUIREMENTS

3.1 BUILDING

The Conseil Sante- SOFRECO report provides a list of the functional requirements for the facility. The consultant is to make reference to this document for relevant information viz Task 2 – Service Analysis and EMS Optimisation and Task 4 - Functional Design Requirements and Parameters.

The report however, does not go as far as the development of Room Data Sheets which will have to be done by the consultant. This matter is addressed in Appendix E and will help define/refine the user requirements.

3.2 EXTERNAL CIVIL WORKS AND CAR PARKING TO BE PROVIDED

The following civil works are required:

- Earthworks associated with constructing the building platforms, car parking and road access.
- Internal access road and car park.

- Security chain-link fencing including main entry gates.
- Sewer treatment and disposal system
- On-site water harvesting system with back up to town water supply.
- Connection to main electrical grid with some on-site power generation (refer section on Green Building design criteria).
- Surface water drainage systems
- River / Tsunami protection works
- Helipad for emergency services.

3.3 FURNITURE AND EQUIPMENT

The building will be completely fitted out before handover to the GoSVG. The consultant will provide in his design documents, a comprehensive schedule and specifications of all such furniture and equipment necessary for the proper functioning of the facility.

4 BUILDING DESIGN CRITERIA

4.1 GENERAL

As specific user requirements can change with different personnel, it is important that the building design criterion is verified before the architect proceeds with his designs.

Additionally, the building design should consider

- (i) Flexible floor space adjustments, to cater for mass casualty situations
- (ii) Serviceability
- (iii) Durability
- (iv) Maintenance
- (v) Safety.

4.2 STANDARDS

The new hospital building will be designed to satisfy the provisions of the SVG Building Code and Guidelines and other relevant UK/US building codes. In particular, the building will:

- Be designed as a landmark civic building that will enhance the new city.
- Due to the exposed nature of the site, ensure that all building elements are designed to be hurricane and earthquake resistant complying with the current versions of the wind and earthquake standards as recommended by the Codes.
- Ensuring that the building is accessible by people with disabilities, including wheelchair users by complying with the British Standard BS8300:2009 “Design of buildings and their approach to meet the needs of disabled people”

4.3 MULTI-HAZARD DESIGN

Saint Vincent is very susceptible to the hazards of hurricanes and earthquake activity in particular, but also volcanic activity. The La Soufriere volcano in the North of the island, last erupted in 1979 and there is an active underwater volcano just to the north of Grenada – Volcano Kick'em Jenny, which could generate a Tsunami. In designing the building, the consultant will consider :

- (i) Geometrical issues in relation to favourable shapes, soft storeys, conservative cantilevers, wind uplift etc.
- (ii) Various structural systems viz. moment resisting frames, shear walls, mixed systems
- (iii) Ease of construction
- (iv) The stability of both structural and non-structural elements (including equipment)
- (v) Structural connection details
- (vi) Construction material choices

Connections are of paramount importance. The consultant will be expected to use the latest architectural and structural detailing standards to :

- (i) Eliminate damage in the event of hurricanes and torrential rain.
- (ii) Limit damage to repairable damage, following earthquake events.
- (iii) Eliminate loss of life in all circumstances of a hazard event

Design guidance for health facilities in the Caribbean in particular, can be found in the following PAHO/WHO manuals :

“Design Manual for Health Services in the Caribbean with particular reference to Natural Hazards and other Low Frequency Events” by Tony Gibbs

“Guidelines for the Reduction of Vulnerabilities in New Health Facilities” by Rubén Boroschek Krauskopf and Rodrigo Retamales Saavedra

The consultant is expected to utilise advanced 3D structural software in the design of the facility.

4.4 BUILDING AESTHETICS AND BUILDING FABRIC

The design must be modern, but rooted in traditional Caribbean design vernacular either in its geometry and/or elemental components ranging between the building fenestration, balustrading, external corridors, natural ventilation, colours, landscaping etc. The consultant will also consider any significant local forms that could be included in the design. The building will be part of a new city and as such, must set the standard for future civic buildings.

Building fabric and finishes must optimally be cost effective and low maintenance. The choice of materials will also take into account :

- Local availability
- Construction skills
- GoSVG limited capacity for ongoing maintenance and repair.

Within this context, the architects will need to investigate alternatives and prepare whole-of-life costings for options to be considered by the GoSVG

The maximum building height will be two floors.

4.5 BUILDING SERVICES

The building services will need to be designed in accordance with the best international “Green Design” practice that is practical and achievable within the SVG environmental context. The next section sets out guidelines for green building design. The building services engineering firm responsible for the design of the electrical, mechanical, water, communication, IT and sanitation systems, will be expected to have credible regional and international experience in the design of “Green” buildings.

4.5.1 Electrical and Mechanical systems

Electrical and mechanical systems, including lighting and air conditioning, will be provided in accordance with the more onerous of both local and international standards.

The electrical and mechanical systems will be designed based on:

- reliability and performance;
- ease of maintenance and replacement;
- energy efficiency and cost effectiveness;
- maximizing natural lighting and ventilation, and
- use of design options that maximise the use of “Green Technological” input.

The building(s) will be connected to the islands main electricity supply. The electrical system will also have a back-up power supply both with a standby generator (with dedicated fuel tank) and some form of renewable energy supply. The electrical system should be dual voltage (110V and 220V) in areas as agreed with the client. The requirement for a new transformer substation to service the facility will need to be investigated.

It is anticipated that a central engineering plant room will be provided, supplemented as necessary by further engineering plant space located departmentally. Engineering services will be distributed throughout the hospital in concealed (but easily accessible) vertical ductwork and in suspended ceiling zones, also easily accessible for repair and maintenance when necessary, by removable access panels clearly identified as such. All services are to be clearly labelled and colour coded for maintenance purposes.

Surface mounted engineering services will not be acceptable in clinical areas and in this respect, services provided to inpatient beds and recovery beds will be installed in purpose made bed head units.

Mechanical and Electrical equipment systems will be designed to withstand earthquake forces through appropriate fixings, base isolation, flexible conduit joints, emergency shutoff valves etc.

4.5.2 Fire Services

Fire escape and fire fighting/suppression systems will be as required by the more onerous of the local and international (UK/US) Building Codes and Guidelines . It will include provisions for :

- (i) vertical and horizontal escape routes with minimum travel distances,
- (ii) signage throughout building,
- (iii) fire alarms,
- (iv) sprinklers in key areas,
- (v) smoke detectors,
- (vi) fire extinguishers,
- (vii) dry risers if necessary,
- (viii) booster pumps,
- (ix) fire hydrants and
- (x) connection to emergency water storage tank in the event of water shortage.
- (xi) the use of non-flammable construction / finishing materials

Discussion with the local fire services will be essential regarding local equipment and practices.

The consultants structural design shall consider the appropriate concrete cover to main reinforcement.

4.5.3 Communications

The room data sheets will identify the areas where communications systems will be necessary. The architects and building services engineers will work closely with the hospital management to ensure that these services are relevant and cost effective.

A cost benefit exercise will be required regarding computer cable networking and WiFi to the various offices, work rooms and conference room.

Nurse call, paging, landline telephone with PABX and wireless communications systems (linked to coast guard, international airport, police, NEMO) will need to be provided.

4.5.4 Water

The water supply system should be connected to the town supply, but should also maximise on-site rain water harvesting and integrate water collected into the building's plumbing systems as outlined under the next section on "Green Building Design".

A water storage tank will need to be provided. The consultant should be guided by the following documentation by the American Water Works Association (AWWA) “Emergency Water Supply Planning Guide for Hospitals and Health Care Facilities”

<http://www.cdc.gov/healthywater/pdf/emergency/emergency-water-supply-planning-guide.pdf>

The consultant shall specify the use of spring loaded faucets as much as possible to restrain water wastage.

Hot water supply shall be provided by solar heaters. Electrical hot water supply may be considered for essential locations only.

4.5.5 Sanitation

Sanitation systems should maximise the use of low flush toilets and urinals and low flow shower heads.

There are no public sewers in the area and as such, the consultant will need to design a low cost, low maintenance waste water treatment system. A package treatment plant should be avoided as much as possible.

4.5.6 Archiving

The consultant should consider a “compactus” storage system for existing and future hard copy records. The fire rating of the system and storage room must be considered in the design.

4.5.7 Security

The building will be provided with CCTV at key entrance and exit areas.

Provision will be made for the stationing of security personnel at key entry and exit points of the building.

Locker rooms for staff shall be provided.

4.5.8 Incinerator

The designs shall provide for a low energy consumption incinerator for hospital waste.

4.6 FUTURE EXPANSION

The building must be located on the site in such a manner as to accommodate a future building 2000m² in plan. The future use is as yet undesignated.

4.7 SUSTAINABILITY

The building will need to be designed in a way that responds to established environmental and ecological concerns and in particular ensure that:

- building structure and fabric,
- building services,

- energy use, and
- operation and maintenance,

are durable, cost effective and sustainable. Equipment and fixtures that are specified must be low maintenance and easily operated with readily available replacement parts. This will minimise the recurrent operating costs and the requirement for specialised training and maintenance personnel.

As noted in section 4.4 the architects will need to investigate alternatives for building materials, services and F&E and prepare whole-of-life costings for options based on sustainable outcomes for consideration by the Client. This could include a Value Management Workshop with the intended users and O&M managers.

4.8 ENVIRONMENT

SVG currently has legislation covering various aspects of the environment. A table of this legislation is contained in the EMF at the following location

http://gov.vc/images/stories/pdf_documents/final%20environmental%20management%20framework%20february%2028%202014%20re-disclosure.pdf

An initial assessment of the site and the project design criteria indicates that:

1. The activity is not in an environmentally sensitive area, however consideration will need to be given to the exposed nature of the site in terms of hurricane activity.
2. The activity will impact on the environment in the usual ways that a new building structure does, there will be energy, water and sanitation implications.
3. Because of the emphasis on “Green Design” an explicit aim of the activity will be to improve environmental outcomes.
4. The activity is not relevant to multi-lateral environmental agreements.
5. It is not expected that the construction activity will have any negative environmental impacts.

5 GUIDELINES FOR GREEN BUILDING DESIGN

5.1 GENERAL

The building is to be designed in accordance with the best international “Green Design” practice that is practical and achievable within the SVG environmental context, is resistant to hurricanes and earthquakes and generates a minimal carbon footprint. “Green Design” is:

‘The practice of creating structures that are environmentally responsible and resource-efficient throughout a buildings’ life cycle: from siting to design, construction, operation, maintenance,

renovation and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability and comfort”¹

The building services engineering firm responsible for the design of the mechanical, electrical and hydraulic design of the building will be expected to have credible international experience in the design of “Green” buildings.

5.2 LOCATION, ORIENTATION, SITING AND STRUCTURE

The building design and structure should be in harmony with natural features and resources surrounding the site. The building should recognize the site’s topography and minimize onsite excavation.

5.3 ENERGY EFFICIENCY AND CONSERVATION

The building should use high-efficiency windows where air conditioning is used. The building should incorporate good passive solar design principles, including the careful orientation of windows, walls, awnings, verandahs and trees. Window placement should maximise natural light, lessening the need for electric light during the day. Solar water heating should be used.

Consideration needs to be given as to whether some onsite renewable energy generation (Solar and/or wind) are power supply options. The airport has extensive wind data in this regard. Access road, car park, perimeter security and external building lighting are some areas that should be considered for renewable energy power supply.

Energy efficient lighting systems should be specified such as Light Emitting Diodes (LEDs) and/or Compact Fluorescent Lights (CFLs).

5.4 WATER CONSERVATION AND EFFICIENCY

Reducing water consumption and protecting water quality are key “Green Design” objectives. Water efficiency measures to be considered should include:

- Increased dependency on water that is collected for use on site.
- Specifying ultra-low flush toilets and urinals and low flow shower heads.
- Use of spring loaded faucets as much as possible.

Sewerage package plants that treat sewerage water, grey water and storm water for non-potable purposes such as flushing toilets are not considered appropriate, due to the high cost of running the plants, the non-availability in SVG of spare parts and the lack of personnel capacity by the maintenance staff who will operate the facility.

¹ US Environmental Protection Agency

5.5 MATERIALS EFFICIENCY

Materials specified should ideally be non-toxic, reusable, renewable and/or recyclable. Preferably they would be manufactured locally to minimize the energy embedded in their transportation.

5.6 ENVIRONMENTAL QUALITY ENHANCEMENT

Natural ventilation and lighting should be maximised and carefully integrated into air conditioning and lighting systems.

Energy efficient air conditioning systems that reduce Volatile Organic Compounds (VOCs) and other air microbial contaminants should be specified. Air quality will be improved by specifying construction materials and interior finish products with zero or low emissions. Materials and products that emit toxic gases such as VOC's and formaldehyde should be avoided. The building design, orientation and site positioning, should be such that the natural ventilation will work effectively throughout offices, patient wards and general circulation areas, as much as possible.

Where air conditioning is required for clinical and other reasons, the consultant is expected to properly design the building envelope to aid in increasing the building's thermal quality to reduce energy costs.

5.7 WASTE REDUCTION AND RECYCLING

Buildings should be designed so that during the construction phase the amount of material going to landfills and the amount of energy and water used to construct the building is minimized.

Rainwater collecting systems should be specified that can be used for sub-surface irrigation. During construction operations, recycling systems available in SVG will be utilised.

5.8 OPERATIONS AND MAINTENANCE (O&M)

No matter how "Green" a building design is, it will only remain "Green" if it is operated responsibly and maintained properly. This means having a realistic O&M recurrent budget and properly trained O&M staff.

The building design will include the training of the current O&M staff by the building designer and the preparation of an O&M manual.

The training will comprise of a workshop, the details of which are included in Appendix M

APPENDIX G

MINIMUM PRELIMINARY DESIGN DRAWING SUBMITTAL REQUIREMENTS

Preliminary Design Drawing Submittal Requirements as shown below, will be the minimum required from the consultants. The drawings titles indicated will require in many cases, several drawings to complete the title scope. The scales are suggested, but can change with the agreement of the client.

(1) Preliminary Construction Site Plan (prepared at 1:250 scale) showing:

- (A) Proposed Hoarding and fencing;
- (B) Temporary fire exits, including protection of required egress routes from the Replacement Hospital;
- (C) Demolition;
- (D) Applicable phasing;
- (E) Construction traffic routes to and from the site, site access points
- (F) Proposed construction equipment and materials staging areas; and
- (G) Designated Construction Parking Area.

(2) Site plan (prepared at 1:250 scale) showing:

- (A) Full ground floor plan
- (B) Full hard/soft landscape plan showing integration of landscaping features/areas with floor plan elements and entrances;
- (C) Treatment of main approach to public entrance;
- (D) Treatment of local transit stop area;
- (E) Vehicular drop-off and main road right-of-way improvements;
- (F) Site furnishings;
- (G) Additional Site features, including natural features, storm water management structures and design of outdoor spaces for patient care;
- (H) Vehicle access/egress driveways to and from Site, including parking, entrance ramp, service vehicle route and emergency vehicle route.

(3) Site servicing plan (prepared at 1:250) showing:

- (A) Storm water management/storm sewer;
- (B) Sanitary sewer system;
- (C) Water mains - domestic use;
- (D) Water mains - fire fighting; and
- (E) Electrical utilities.
- (F) Gas utilities
- (G) Telecommunication lines
- (H) Water storage supply system

(4) Architectural floor plans (prepared at 1/8"=1'-0" scale) of every level, including roof(s), showing:

- (A) All walls and partitions in actual thicknesses;
- (B) All clinical and non-clinical rooms/areas (colour-coded if necessary) and numbered using the alphanumeric Room Codes used in Room Data Sheets.
- (C) List of additional rooms not previously identified with additional sequential room codes as required;
- (D) Door and window schedule;
- (E) All millwork/systems furniture and workstation layouts (including filing storage units, shelving)
- (G) Integration of structural, mechanical, electrical and IT/TEL systems in terms of columns, service shafts, risers, etc., in sufficient detail to demonstrate that functional and net area requirements are compliant;
- (H) Food service equipment identification and layout

(5) Enlarged architectural plan details (prepared at 1/4"=1'-0" scale), including all floor plan information described previously, for each of the following key clinical areas:

- (A) Inpatient Ward/Bedded areas;
- (B) Diagnostic Imaging (Radiology, Pathology, Investigations and scoping);
- (C) Main Theatres;
- (D) Intensive Care (ICU, HDU, Paediatric Unit, NNICU);
- (E) Ophthalmology Unit;
- (F) Day Surgery/Endoscopy;
- (G) Cardiology
- (H) Orthopaedics
- (I) Paediatrics
- (J) Gynaecology
- (K) Oncology
- (L) ENT
- (M) Ophthalmology

- (N) Dermatology
- (O) Gastroenterology
- (P) Dentistry
- (Q) Rehabilitation
- (R) Pulmonology
- (S) Haemodialysis
- (T) Urology
- (U) Endocrinology
- (V) Neurology
- (W) Nephrology
- (X) Emergency Department (Examination, Observation, Admissions, Treatment)
- (Y) Laboratories;
- (Z) Therapy Services;
- (AB) Pharmacy;
- (AC) Central Sterilization Unit;

(6) Structural plans (prepared at 1/8"=1'-0" scale) of every level, including roof(s), showing:

- (A) Foundation plan and sections showing preliminary type, locations and elevations of footings;
- (B) General arrangement drawings (dimensions, no reinforcement) showing structural system, framing plan, stairs, ramps and details provided for any significant architectural features.
- (C) Building cross sections at key structural and architectural locations
- (D) Provisions for seismic and wind forces
- (E) Provisions for any significant equipment requirements (eg roof top generator)

(7) Mechanical floor plans (prepared at 1/8"=1'-0" scale) of every level, including roof(s), showing:

- (A) Location and basic layout of major equipment;
- (B) Routing of main feeds and associated shafts and risers;
- (C) Isometric single line drawings for all services (water, waste water, gas, a/c etc);
- (D) Preliminary sizing of equipment;
- (E) Provisions for adaptability, flexibility, expandability, removal and replacement of medical systems and equipment;
- (F) Waste Disposal system
- (G) Preliminary drawings and load estimates for storm and sanitary sewers, potable water supply, heating and cooling plants;
- (H) Preliminary drawings and flow estimates for heating and cooling systems, air supply, return and exhaust systems;
- (I) Preliminary plumbing fixture schedules; and
- (J) Preliminary estimate of annual energy use.
- (K) Fire fighting provisions viz. hose cabinet and fire extinguisher locations, dry risers, sprinklers, fire hydrants, smoke detectors, pressure pumps etc.
- (L) Water storage tank(s) supply system

(8) Electrical floor plans (prepared at 1/8"=1'-0" scale) of every level, including roof(s), showing:

- (A) Location and basic layout of major Equipment;
- (B) Routing of main feeds and associated shafts and risers;
- (C) Schematic single-line drawings for all services (lights, power outlets, equipment supply etc);
- (D) Legends
- (E) Preliminary sizing of Equipment;
- (F) Provisions for adaptability, flexibility and expandability, removal and replacement of building and medical systems and Equipment;
- (G) Preliminary lighting loads for typical rooms and the clinical areas
- (H) Preliminary load estimates for normal power distribution centres, vital power distribution centres, and heating and cooling plants
- (I) Renewable energy supply system (if proposed)
- (J) Standby power generation location

(9) Food services floor plans (prepared at 1/4"=1'-0" scale).

- (A) Proposed equipment and furnishing layout

(10) Typical building sections (prepared at 1/8"=1'-0" scale) showing:

- (A) Relative thickness of floors/walls;
- (B) Major floor elevations, including any below grade;
- (C) Relationship to Site contours and other important site elements as shown in building elevation drawings; and
- (D) Major room names.

(11) Stair and ramp plans, sections and details (scales as appropriate).

(12) Exterior elevations (prepared at 1/8"=1'-0"0) showing:

- (A) Indication of surface materials for all areas;
- (B) Different vertical planes differentiated with line weights or shadows;
- (C) Finish grades;
- (D) Major floor elevations, including those below grade;
- (E) Sections when elevation is shown by taking vertical cut-through another space; and
- (F) Significant plantings/Site elements when important in defining space and volume, such as bodies of water, hills, earth berms.

(13) Interior elevations (prepared at 1/4"=1'-0"0) for public entrances and all other major public spaces.

(14) Preliminary door and ironmongery schedules and hardware cut sheets.

(15) Preliminary lighting design submittals, including fixture cut sheets and

illumination level analysis.

- (16)** Preliminary security systems floor plan layouts, locations of all security systems equipment, connection points and control points.
- (17)** Preliminary drawings of all millwork/systems furniture elements identified in the Room Data Sheets
- (18)** Single line audio/visual distribution diagrams showing cable management and Equipment rooms.
- (19)** Single line information technology distribution diagrams showing cable management and equipment rooms,
- (20)** Laundry and Solid Waste Management services design
- (21)** Fire protection rating of closures in fire separations (in table format);
- (22)** Barrier free accessibility provisions for :
 - (A) Entrances;
 - (B) Parking;
 - (C) Doorways;
 - (D) Washrooms;
 - (E) First floor

APPENDIX H

Preliminary Design Report Content

The consultant is free to use his own Design Report Template, but the report will have the minimum content indicated below:

- Executive Summary
- Table of Contents
- List of Tables and Figures
- Introduction
- Design Philosophies (Architectural and all engineering disciplines regarding performance in hazardous and non hazardous environmental conditions)
- List of Design Codes
- Building Functional Requirements
- Estimated loads and required capacities (patients, visitors, staff, power, dead and live loads, wind and seismic forces, vehicles etc)
- Design assumptions
- Design Solutions (Architectural, Engineering)
- Drawings (See Appendix)
- Preliminary construction cost estimates (mobilisation, substructure, superstructure, cladding, finishes, doors and windows, electrical, standby power generation, air conditioning, ventilation, IT, internal communications, security, fire suppression, plumbing, waste disposal, external civil and drainage works, landscaping, water storage, etc).
- Preliminary monthly power consumption rates for various types of installations eg lighting, air conditioning, ventilation, medical equipment office equipment, etc. The consultant is expected to consider the current usage of medical equipment when estimating the power usage.

APPENDIX I

MINIMUM REQUIREMENTS FOR DRAFT FINAL CONSTRUCTION DRAWINGS

The consultant shall provide the following Minimum Submittal Requirements for the Draft Final Construction Drawings to the client for review and comment. The following drawings/submittals are not meant to be complete and is expected to be exceeded. The drawings submitted in the preliminary phase, are all expected to be updated, but with some specific additional requirements where noted below. It is understood that detailed specifications (materials, workmanship, performance) for all works and equipment will be provided, whether or not included below. As indicated previously, the scales are suggested and may with client agreement, be changed accordingly.

- (1) Finalized Preliminary Construction Site Plan (prepared at 1:250 scale) showing all previously listed requirements.
- (2) Updated Site plan (prepared at 1:250 scale) showing all previously listed requirements including planting schedule, vertical and horizontal traffic signage, barriers, handrails.
- (3) Updated Site expansion plan (prepared at 1:250) showing all previously listed requirements.
- (4) Updated Site servicing plan (prepared at 1:250) showing all previously listed requirements.
- (5) Updated and augmented Site and landscape details (prepared at 1/2"=1'-0" scale).

(6) Architectural floor plans (prepared at 1/8"=1'-0" scale) of every level showing all previously listed requirements and:

- (A) Full dimensions;

- (B) Layout of all spaces;
- (C) Fire and Life safety plans;
- (D) Material symbols;
- (E) Door symbols;
- (F) Glazed light symbols;
- (G) Window types and numbers;
- (H) Floor finishes;
- (I) Pits, trenches, etc.;
- (J) Furring notes;
- (K) Hatch walls and partitions;
- (L) Depressed floor for terrazzo, tile, etc.;
- (M) Lead shielding indications;
- (N) Curbs for mechanical room penetrations;
- (O) Sump pits, gratings;
- (P) Recessed mats;
- (Q) Expansion joints;
- (R) Pipe trench;
- (S) Convectors;
- (T) Low partitions; and
- (U) Folding partitions.

(7) Updated reflected ceiling plans (prepared at 1/8"=1'-0" scale) for all areas, showing:

- (A) Light fixtures and schedule;
- (B) Grilles;
- (C) Diffusers;
- (D) Heat detectors;
- (E) Smoke detectors;
- (F) Soffits;
- (G) Folding partitions;
- (H) Cubicle tracks;
- (I) Drapery tracks;
- (J) Skylights;
- (K) Access panels;
- (L) Hatches;
- (M) Major structural members (if sight exposed);
- (N) Surgical lights
- (O) Hoods;
- (P) Gas columns;
- (Q) Exit signs; and
- (R) Room numbers.

(8) Updated building sections (prepared at 1/8"=1'-0" scale) showing all previously listed requirements and:

- (A) Completed ceiling space coordination diagrams;
- (B) Vertical dimensions;
- (C) Floor elevations;
- (D) Column and beam grid lines and
- (G) Wall sections

(9) Updated and augmented exterior wall sections (prepared at 1/2"=1'-0" scale) and 1/2 cladding details (prepared at 1"=1'-0" scale),

(10) Updated and augmented stair and ramp plans, sections and details (scales as required).

(11) Updated exterior elevations (prepared at 1/8"=1'-0) showing all previously listed requirements and:

- (A) Windows ;
- (C) Doors;
- (D) Wall material indication;
- (E) Coping materials;
- (F) Overhead fascia materials;
- (I) Floor lines;
- (J) Vertical dimensions;
- (K) Signage;
- (L) Section lines;
- (M) Grid Lines;
- (N) Louvers;
- (O) Stairs and ramps;
- (Q) Stacks;
- (R) Light fixtures; and
- (S) Other mechanical or electrical Equipment.

(12) Updated interior elevations (prepared at 1/4"=1'-0") for all previously listed areas and showing:

- (A) Casework ;
- (B) Millwork details ;
- (C) Shelving;
- (D) Tack board;
- (E) Chalkboard;
- (F) Interior glazed panels
- (G) Skirting boards, wainscoats, ceiling mouldings, architraves
- (H) Mechanical grilles, thermostats, gas outlets, convectors etc.;
- (I) Wall handrails;
- (J) Graphics;
- (K) Equipment;
- (L) Interior finishes
- (M) Electrical receptacles speakers, clocks, light fixtures, etc.);
- (N) Plumbing fixtures; and
- (O) Lockers
- (P) Signage

(13) Miscellaneous Interior details (scaled as appropriate) showing:

- (A) Skirtings and mouldings ;
- (B) Soffits;

- (C) Curbs for mechanical penetrations;
- (E) Hollow metal glazed panels;
- (F) Expansion joints;
- (H) Low walls;
- (I) Folding partitions
- (J) Rolling doors;
- (K) Dressing compartments;
- (L) Pass-windows;
- (M) Supports - surgical lights, gas column;
- (O) Hanger details for suspended Equipment and ceilings;
- (P) Movement joint details;
- (Q) Typical partition construction;
- (R) Exhaust hoods
- (S) Corner guard details.
- (T) Washroom fixtures (soap dispensers, hand drying equipment, baggage rack, mirrors etc)

(14) Updated room finish schedule.

(15) Updated door, window and ironmongery schedules with cut sheets.

(16) Updated lighting design submittals, including fixture cut sheets and illumination level analysis.

(17) Updated structural plans (prepared at 1/8"=1'-0" scale) of every level, showing all previously listed requirements including

- (A) Foundation, beam, column, floor reinforcement details
- (B) Partition wall, shear wall, ramp, shaft and stair reinforcement details
- (C) Sections/elevations showing all structural elements;
- (D) Bar bending schedules
- (E) External works structural details (kerbs, drainage, walls, culverts etc)
- (F) Reinforcement details to other major and minor architectural features
- (G) Movement joint details

(18) Updated mechanical floor plans (prepared at 1/8"=1'-0" scale) of every level, showing all previously listed requirements

- (A) Interior building section details coordinating and confirming finalized fit of structural/electrical/mechanical
- (B) All legends and schedules;
- (C) HVAC ;
- (D) Equipment room plans;
- (E) Mechanical room plans;
- (F) Control schematics;
- (G) Supply and waste isometrics and plans
- (H) Equipment specifications
- (I) Pipe colour coding

(19) Updated electrical floor plans (prepared at 1/8"=1'-0" scale) of every level, showing all previously listed requirements including :

- (A) Interior building section details confirming finalized fit of structural/electrical/mechanical elements;
 - (B) All legends and schedules;
 - (C) Grounding details;
 - (D) Fire alarm riser diagram;
 - (E) Nurse call riser diagram;
 - (F) Telephone riser diagram;
 - (G) Paging riser diagram;
 - (H) Television riser diagram;
 - (I) Control schematics where necessary;
 - (J) CCTV
 - (K) Necessary equipment specifications for all the above
-
- (20) Updated and augmented security systems floor plans and Equipment specifications, locations of all security systems equipment, connection points and control points.
 - (21) Drawings of all millwork/systems furniture elements identified in the Room Data Sheets including all dimensions, key elevations, and all fixed and moving elements (1/2"=1'-0" scale) and details (1"=1'-0" or 1:20 scale, as appropriate).
 - (22) Updated and augmented audio/visual drawings and equipment specifications.
 - (23) Updated and augmented information technology drawings and equipment specifications.
 - (24) Updated vertical transportation analysis, if there are any changes to previous version, including a statement of how the proposed matter has changed from the previous matter reviewed by the client.
 - (25) Updated Schedule of Accommodations, including all previously listed requirements.
 - (26) Signage schedule
 - (27) Any other submittals that the client reasonably requires to understand the Design and be able to go to tender.

APPENDIX J

Documents to be provided by Client

The client has in its possession the following reports which will be made available to the consultant

- Task 2 Service Analysis and EMS Optimisation – Conseil Santé – SOFRECO
- Task 4 Functional Design Requirements and Parameters – Ditto
- Final Report – Health Service Analysis for the Milton Cato Memorial Hospital
- Final Report – Warrawarrow River at ET Joshua Airport and Fenton – Greenhill Roadside Drainage – Hydrology/Hydraulic Modelling and Geotechnical Site Investigations

APPENDIX K

Final Completion Report Template

The consultant is free to format the Final Completion Report to his normal presentation, but the report shall contain the following minimum content

A typical Contents page is as shown below :

- Title Page
- Table of Contents
- Acknowledgements
- Executive Summary
- Background
- Aims and Objectives
- Methodology (including codes and standards used)
- Implementation
- Outputs and Results (including designs, design calculations, geotechnical investigation, site analysis, geospatial data etc)
- Outcomes
- Conclusions
- Recommendations
- References
- Appendices

APPENDIX L

Monthly Report Content

The consultant is free to format the Monthly Design Progress Report to his normal presentation, but the report shall contain the minimum content shown below.

This report shall provide a brief end-of-month design progress assessment (% completion) in all the various project disciplines and in accordance with the agreed design program submitted with the Inception Report

Architectural

- Building interior and exterior elevations
- Room Data Sheets
- Interior Design
- Landscape Design
- Drawings as per Appendices

Structural

- General framing
- Reinforcement details
- Bar Bending Schedules
- Drawings as per Appendices

Electrical

- Schematics and Power Diagrams
- Communications systems
- Lighting Schedules
- CCTV
- IT
- Drawings as per Appendices

Mechanical

- Isometrics
- Fixture schedules
- Wastewater treatment system
- Fire Suppression system
- Drawings as per Appendices

