

# **Saint Vincent and the Grenadines**

## **Terms of Reference**

**for the**

**Master Plan and Infrastructure Design**

**for the**

**Modern City at Arnos Vale**

**Ministry of Finance, Economic Planning, Sustainable  
Development and Information Technology  
Saint Vincent and the Grenadines**

**August 2019**

# **TERMS OF REFERENCE**

## **1. INTRODUCTION**

The operational opening of the Argyle International Airport (AIA) on February 14<sup>th</sup> 2017, marked the end of the air traffic use of the ET Joshua Airport (ETJ) at Arnos Vale. The natural consequence of the AIA development, was the consideration of an alternative use of the ETJ aerodrome. The Government of Saint Vincent and The Grenadines (GoSVG) as part of its vision for national development, envisaged from the outset of the AIA development, the creation of a modern city on the old airport site. The official aerodrome site at Arnos Vale within the fence line covers 61 acres. There are several government owned properties (developed, and undeveloped) adjacent to the airport approximating to an additional 72 acres (Appendices A, B and C). The total project area under consideration is 133 acres.

## **2. BACKGROUND**

### **2.1 Saint Vincent and the Grenadines**

Saint Vincent and the Grenadines (SVG) is an Archipelago state in the Caribbean comprising 32 islands, Saint Vincent being the main island. The population is 109,557 (2015 census). SVG is an active member of the Organisation of Eastern Caribbean States (OECS)<sup>1</sup>

In 2015, the annual gross domestic product (GDP) growth was 2.1 percent in Saint Vincent and the Grenadines (SVG).<sup>2</sup> During the first three quarters of 2017, the economies in Latin America and the Caribbean rebounded to realise 1.3 percent growth compared with a 0.9 percent contraction in 2016<sup>3</sup>. For the fiscal operations of the Central Government of SVG for the year ending December 31<sup>st</sup> 2017, the revenue was EC\$583.67 million with expenditure at EC\$556.66 million. Capital expenditure was EC\$69.43 million and Capital Revenue EC\$34.5 million<sup>4</sup>.

Tourism is the main pillar of economic growth for SVG and the OECS region, which already has a comparative advantage in the international industry given its location, climate and history. The Grenadine islands currently play host to a plethora of royalty and world celebrities, while the mainland boasts of a wide variety of ecotourism activities. Tourism in SVG, accounts for 50 percent of export earnings and 19 percent of total employment. Nearly 75 percent of tourism

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<sup>1</sup>The OECS is a ten-member grouping comprising the full Member States of Antigua and Barbuda, Commonwealth of Dominica, Grenada, Montserrat, St Kitts and Nevis, Saint Lucia and St Vincent and the Grenadines, with the British Virgin Islands, Anguilla and Martinique as associate members of the OECS. The OECS was created in 1981, as an inter-governmental organisation dedicated to economic harmonisation and integration, protection of human and legal rights, and the encouragement of good governance between countries and dependencies in the Lesser Antilles in the Eastern Caribbean. It also performs the role of spreading responsibility and liability in the event of natural disaster, such as a hurricanes. They share a common currency the EC Dollar. (EC\$2.7 = USD\$1)

<sup>2</sup>World Bank Report PAD 1308 (March 2017)

<sup>3</sup> 2018 SVG Budget Address by Minister of Finance Hon Camillo Gonsalves

<sup>4</sup>

employment is typically unskilled or semiskilled labour, and is highly inclusive of women and youth.

In light of the importance of the tourism sector along with broader developmental considerations in mind, during the period 2005 to 2017, the government of SVG embarked on the largest ever infrastructural project in its history, the Argyle International Airport (AIA). This was achieved at a cost of approximately EC\$700 million, with the specific intention of providing a catalyst for economic growth and opportunity. With the opening of the airport (February 14<sup>th</sup> 2017), the government is expecting to attract local and foreign investors reliant upon international flight connections, especially in the tourism and real estate sector, but also in sensitive agricultural products and their derivatives. The Modern City development will further facilitate this investment activity, by the synergies created through proper master planning and its linkage with the AIA.

An important design aspect of the Modern City will be the recognition of Climate Change and the very real impact that it has had on Saint Vincent. Due to its geographical location, SVG is exposed to high levels of risk to meteorological and geophysical hazards, which have significant negative impacts to SVG's physical, economic and fiscal stability. Volcanic eruptions have affected the country in 1789, 1812, 1902, 1971 and 1979. Tsunami run ups of 3.1m and 1.8m were recorded in 1842 and 1867 respectively in the neighbouring island of Bequia. Storm surge heights have been preliminarily estimated at 2.8m. SVG is located in the Atlantic hurricane belt and has suffered periodic damages from past events e.g. from Hurricane Allen (1980), Hurricane Lenny (1999), and Hurricane Tomas (2010). There have been several major near misses, such as hurricane Ivan in 2004 (category 4) and hurricane Maria in 2017 (category 5). Several storm events have also affected Saint Vincent, most notably the events of December 24<sup>th</sup> 2013 when 278mm of rain fell over a three hour period and the November 2016 floods. These recent hurricanes and floods have individually caused loss and damage amounting to between 5 and 15 percent of GDP. More than 15 percent of accumulated debt since 2010 is directly attributable to post-storm reconstruction, as well as attempts to "future-proof" the country and people through forward looking adaptation and resilience-building efforts.<sup>5</sup>

## **2.2 ET Joshua Airport**

The aerodrome comprises of 61 acres within the fenced line. The 4,750 ft asphalt surfaced runway, runs south west to north east and rises from the seaward end to the landward end, a height of 20m. There are three main structures on the site viz. the Terminal building, Fire Station and the Mustique Airways Hangar, all located on the northern side of the runway. The Terminal building is a single storey reinforced concrete structure (360 ft x 54 ft ) with a concrete roof and a control tower on the northern eastern end of the building. There is a public car park (80 cars) on the northern side. The Fire station is located south of the terminal building and caters for one fire engine. The Mustique Airways hangar is located further south of the Fire Station. It is a steel portal frame structure (100ft x 80ft), that caters for short take off and landing aircraft (twin otters and single engine planes). There are several miscellaneous small office buildings attached.

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<sup>5</sup> 2018 SVG Budget Address

Part of the site (8 acres) has already been earmarked for the construction of a new Referral Hospital (130 beds) for which design activity (funded by World Bank) commenced in February 2018 (Appendix B). The development of the hospital site does not form part of the same activity of the development of the airport site. However, the new city plan will necessarily have to consider its presence and provide for its interconnectivity with the new urban layout.

Significant assets contained on contiguous lands (72 acres) and within the project site include primary, secondary and tertiary educational institutions (medical school); international cricket stadium; open playing fields; netball facilities; shooting range; the old terminal building and fire station; old tobacco factory and a decommissioned landfill. There are some preliminary engineering and planning reports that exist for the site (listed in 5.1.1 below).

The site is serviced by water, telephone and electricity, but these utilities will necessarily have to be upgraded to accommodate the further development of the area.

### **3. GOALS and OBJECTIVES**

The goal is to provide on the project site, a sustainable investment (foreign and/or local, large and/or small) that will deliver significant social and economic benefits at a national level.

The Government of Saint Vincent and the Grenadines (GoSVG) is expected to achieve this goal through the accomplishment of the following objectives :

- (i) The procurement through this ToR of an experienced master planning and urban design consulting firm
- (ii) The development in a collaborative and inclusive manner with all stakeholders, of a Modern City Vision that will help guide the decision making process
- (iii) Based on this vision, the development of an exemplary world class master plan and tropical urban design at the project site (133 acres outlined in Appendices A, B and C), such that other Small Island Developing States (SIDS) could use as a template.
- (iv) Completion of site specific studies, that result in complete engineering tender documents for the development of the land based infrastructure works that represents the approved master plan and urban design.

### **4. DURATION**

The duration of the consultancy is expected to take eighty two (82) weeks, including client review periods. The designs should be completed by August 2020.

## **5. GENERAL REQUIREMENTS**

This Consultancy will provide the Ministry of Finance, Economic Planning, Sustainable Development and Information Technology (MOEP) with master planning, urban design, financial modelling, architectural and engineering consultancy services for the preparation of detailed designs for a modern city at the old ET Joshua Airport site located in Arnos Vale.

The MOEP (the Client), will be contractually responsible for the Consultant's assignment. However, the consultant will work closely with the Modern City Development Committee which has been set up with multi disciplinary personnel, to deal specifically with this project.

The Consultant will be responsible for producing a master plan and urban designs, as well as carrying out pre-contract services to provide approved construction drawings, bill of quantities, and technical specifications for all land based infrastructural works in accordance with acceptable international design standards and engineering code of practices.

It is understood that the Consultant will provide all the necessary technical and support staff to administer and manage all the necessary field and office work that are necessary to produce the deliverables. The Consultant will also carry out any additional services, which the Client may reasonably require relating to the design of the project.

The Consultant will liaise closely with the Client's Social and Communications Specialist in order to ensure that communities are consulted, informed and forewarned of planned site activities in a timely manner.

### **5.1 SCOPE OF SERVICES**

The scope of services for this contract is multifaceted and includes all those services required to produce a master plan and the subsequent engineering documents for the construction of the master plan infrastructure, as determined by the consultancy.

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, following recognized engineering, architectural, master planning, accounting 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 carrying out both desktop and field investigations, preparation of detailed Master Planning, Architectural and Engineering Designs, Technical Specifications, Bills of Quantities, Bidding documentation and engineer's estimate.

Finally, freely accessible data and analysis is a core component of this project. Therefore, all 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 for the geospatial data is outlined in Appendix F.

### **Task 1: Inception Report**

Following contract commencement, the consultant will produce an Inception Report in accordance with the content of Appendix D

### **Specific Services**

The consultant is expected to carry out the following specific services in order to achieve the project objectives. The consultant is expected to supplement these services, where in his own judgement it is necessary, in order to achieve the project goal and objectives

### **5.2 Task 2: Data Collection and Site Analysis**

The consultant shall collect all available data required for the master planning and engineering design processes. The data collection activity shall include both desktop and field investigations. The information will be compiled in a report containing the specific information outlined in sections 5.2.2 to 5.2.9 below. An abridged version shall be presented to the client via a Power Point presentation.

#### **5.2.1 Data collection from local and regional institutions**

Data collection from national and governmental institutions will include the following entities:

Local:

Ministry of Transport, Works, Urban Development and Local Government – MOTW  
National Emergency Management Organization – NEMO  
Ministry of Finance and Economic Planning  
Ministry of Housing, Informal Human Settlements, Land and Surveys, and Physical Planning  
Ministry of Transport, Works, Urban Development and Local Government  
Invest SVG

SVG Chamber of Commerce  
National Properties Limited  
AIA Met office  
Ministry of Tourism  
Tourism Authority

Regional:

University of the West Indies (Seismic Research Centre of Tsunami, Earthquake and Volcanic Risk), St Augustine, Trinidad  
OECS Secretariat, Saint Lucia  
Eastern Caribbean Central Bank  
Caribbean Development Bank  
Caribbean Tourism Organisation

Government financial, economic, population and other developmental data can also be obtained from the official government website at gov.vc

Existing reports related to the site and available through the Modern City Development Committee (MCDC) are:

- Concept Layout by Diamond Schmitt Associates (April 2010)
- Market Assessment by Brown and Co (March 2011)
- Transportation Studies for development of Modern City at Arnos Vale by MMM (August 2012)
- Tunnel Feasibility Study by MMM (July 2015)
- Hydraulic / Hydrology Modelling for Warrowarrow Rive at ET Joshua Airport site by EGIS (July 2015)
- Visioning Workshop by UNOPS (May 2017)
- ET Joshua Bypass Traffic Analysis by CARITRANS (June 2018)
- Referral Hospital Site Analysis Report by PINEARQ / Mallol (August 2018)
- Wind Data information for site from Met Office
- Proceedings form World Bank Resilient Urban Development Technical Workshop for Arnos Vale And Kingstown – March 2019

The consultant is expected to identify on his own accord and through his own efforts, additional information, as well as design information, from other sources for analysis.

### **5.2.2 Preliminary Engineering Investigations**

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

- Walk over visual inspection of the site to develop first hand impressions of the possible scale of development and initial qualitative SWOT analysis of site

- Verification of site boundaries
- Constraints to phased expansion
- The existing capacity and expansion potential of the road access to the site as well as alternative routes
- Existing infrastructure capacity constraints with respect to utilities (water, electricity, cell phone coverage, broad band service, sewage treatment and disposal)
- The site's wind exposure and wind regime
- Site drainage
- Presence of old landfill and any negative/positive effects resulting therefrom

### **5.2.3 Topographic and Bathymetric Survey**

Undertake a detailed topographic survey (Drone survey acceptable) in order to design all required elements of the infrastructure at the location. The survey will include the following information:

- All physical features both man-made and natural within and adjacent to the project site that may affect the infrastructure design including evidence of made up ground e.g. landfill, dumping, subsidence or past demolition
- All adjacent roadways, ramps, bridges, footpaths, tracks, with spot levels to curbs, including all material finishes clearly marked
- All permanent street furniture – lamp standards, bollards, signs, seats, bus stops etc., to be located
- All services related features such as electricity sub-stations, pump houses, telecommunications boxes, manholes, inspection covers, overhead cables, gas governors and valves, water stop cocks and other features to be clearly located
- 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 plan location, cross sections and profiles of all ponds, ditches, drains, swales, streams and rivers (including water level and direction of flow) located on the site. (Warrowarrow River not included)
- Detailed survey and levels of roads providing access to the site for road improvement and intersection designs.
- General details of trees and vegetation indicating the locations and height of canopy
- Any evidence of flooding or ponding or saturated ground conditions at the time of the survey are to be shown
- Outline of any buildings on the site including slab levels
- Bathymetric survey along foreshore of project extending at least 100m beyond low tide beach mark.

### **5.2.4 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 size and positioning of buildings and foundation design. Building sizes off course will also necessarily consider the environmental, desired urban landscape and the development cost of the site. 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:

- Borehole logs including SPT results
- Soil test results and analysis for relevant soil engineering characteristics
- Soil percolation potential
- Water table depth
- General suitability of soils/geology of land for building upon with standard pad or raft foundations
- Identification of unsuitable soils and foundation cost implications for their use eg piles may be required
- Presence of water bearing aquifers and at what depth
- Analysis of site response to seismic activity, including vulnerability to liquefaction
- Seismic site classification per section 11.4.2 and chapter 20 of ASCE 7-05 (Class A through E)

#### Borehole requirements

In determining the borehole drilling regime, the Consultant shall be guided by ASCE 7 Chapters 20 and 21. In any event, the Consultant is expected to provide fifteen (15) boreholes on the site. Five (5) boreholes will be at thirty (30) meters in depth each, with the other ten (10) at ten (10) meters depth or shallower if refusal comes first. Borehole soil sampling will be at a maximum 1.5m spacing.

The boreholes will be distributed around the project area to provide a good interpretation of the sub surface conditions for future building works.

#### **5.2.5 Traffic Impact Assessment**

The Consultant shall undertake a Traffic Impact Assessment (TIA) that includes, at a minimum, the following tasks. The final scope of the TIA to be confirmed with appropriate authorities within the GOSVG:

- Perform a site visit of the road network in the surrounding areas to develop possible connectivity points to the project site
- Review any relevant existing road and transport studies for the site
- Perform a traffic survey at five key locations around the project site. The surveys should be 24 hour automated counts over a seven day period **during the school term** providing hourly volumes and basic vehicle classification

- Confirm any other committed developments in the area as well as Local Area Plans, which might be impacted by or might impact the project in terms of traffic. In this regard, the Consultant is advised that a new Referral Hospital is planned for the landward end of the runway. At the time of writing this TOR, there is no preliminary layout of this hospital. 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 with the new city.
- Review the assessment being carried out by the hospital consultant of likely hospital traffic volume viz. pedestrians, private cars, buses, delivery vehicles, emergency vehicles, etc
- Consider the traffic effect on the Modern City of the proposed tunnel from the site under Cane Garden to Kingstown.
- Estimate the traffic to be generated by the development, at maximum build-out.
- Prepare a ten year growth forecast for vehicles in SVG based on annual vehicle registration statistics and from such other data as may be required for this type of analysis.

### **5.2.6 Flood Risk Assessment and Storm Water Management Analysis**

Flood risk from the Warrawarrow river to the proposed site has been evaluated under two separate studies, DLN ( 2004) and EGIS (2015). The EGIS report contains a flood area analysis and flood mitigation proposals, which the consultant will use to help determine parcel use options. No further hydraulic analysis of Warrowarrow River is required.

Additionally, storm water runoff from adjacent urban areas pose a potential risk to the site, as much of the runoff is directed from adjacent hillside suburbs, through the site in poorly defined and maintained watercourses. There are about seven (7) water course entry points to the site from the northern hillsides. The consultant through site and desktop investigations and analysis, will identify and analyse the current and estimated future flows and design the appropriate interventions to be incorporated into the proposed infrastructure drainage design.

### **5.2.7 Sub-task 1.5 – Preliminary Environmental and Social Impact Assessment (Scoping Report)**

The Consultant shall carry out an Environmental and Social Impact Assessment (ESIA). The assessment shall be carried out to World Bank standards currently employed in Saint Vincent under the Regional Disaster Vulnerability Reduction Project (RDVRP). The Environmental Management Framework (EMF) utilised for these projects can be found at:

[http://www.gov.vc/images/pdf\\_documents/environmental\\_management\\_framework\\_march\\_2016.pdf](http://www.gov.vc/images/pdf_documents/environmental_management_framework_march_2016.pdf)

While there are no land development projects under the RDVRP, the wide range of infrastructure works represented in the EMF and screening procedures etc, provide the necessary guidelines under which this sub task falls.

At this stage there are no infrastructure designs from which specific impacts can be assessed and as such this activity is a scoping exercise. However, broad and generic issues can be addressed to “red flag” any early concerns that need to be tackled. Typical issues to be addressed are listed below:

- Identification of threats to any significant cultural, tourist, historical or archaeological areas of importance
- Impacts on natural habitat and biological resources
- Consistency with National Development policies, laws and regulations
- Potential for the project to pollute marine areas and watercourses by discharging wastewater to watercourses, by improper management of solid waste or medical waste or hazardous materials
- Potential positive and negative impact on the social fabric of the surrounding communities, considering inter-alia urban and demographic growth trends
- Potential private land acquisition impacts
- Vulnerability to wind borne pollutants, including noise and odours from surrounding areas, e.g., pig and poultry farms, landfill, etc.

The Consultant shall indicate for those “red flag” or critical issues present, recommended mitigation measures and commence consideration of inclusion into the preliminary designs.

The consultant will be required to work closely with the social safeguard specialist attached to this project to ensure seamless communications with the various government entities associated with this aspect of the project.

The consultant shall provide at this stage a public communication strategy outlining SMART objectives with regards to the various proposed interactions with the public and on project updates. The strategies will incorporate and be subject to government approvals and involvement in every way.

### **5.2.8 Business and Real Estate Demand Assessment**

The consultant shall determine on the basis of studies conducted by them in existing local urban centres, local industrial parks, local and regional real estate markets and the use of such other indicators and analysis necessary for this exercise, the estimated future space/area demand for the following:

- (i) Commercial retail space
- (ii) Business and Industrial space
- (iii) Condominium accommodation
- (v) Hotel development

The consultant shall also suggest the catalytic elements and preferred phasing of the build-out (vertical development).

### **5.2.9 Utility Connectivity**

The consultant shall assess the connectivity status of the site with respect to the water, electricity and telecommunication utilities. The following will be assessed in collaboration with the various utility providers :

- (i) existing baseline conditions
- (ii) future demand
- (iii) potential for increased supply
- (iv) any constraints.

### **6.0 Task 3: Strategic Framework Development Guidelines**

Based on the activities under Task 2, the consultant will have begun to formulate ideas of the modern city landscape and content, which will necessarily require regulatory moulding and the imposition of other physical, social, financial and aesthetic boundary conditions identified in Task 2 to bring the idea(s) to fruition. These guidelines will help steer the master planning and urban design process. In this regard, the consultant will:

- (i) Develop some advance “Vision Scenarios” which will be tested and consolidated through a consultative and SWOT analysis process in the Visioning and Master Planning stages
- (ii) Familiarise himself with the local Physical Planning and Development Board Guidelines for sub-divisions. Identify any gaps regarding the current guidelines and bridge with guidelines based on international best practice for modern city development, considering local, cultural, socio-economic and environmental conditions
- (iii) Review Local Area Plans that are contiguous with the site (where such plans exist) to ensure seamless and synchronised integration of development
- (iv) Identify key economic drivers of economic activity for the city and the development strategy based on section 5.2.8
- (v) Establish the basis for land use and zones (or not) for different city components with associated rationale
- (vi) Initial identification and commentary on legal and financial mechanisms, tools and resources required on the client side, to execute the proposed development

The Strategic Framework Development Guidelines will form a separate report. The Consultant shall be responsible to make a presentation of this report to the Client.

## **7.0 Task 4: Visioning**

The consultants shall conduct public outreach meetings to obtain from stakeholders their visions, aspirations, objectives, strategies, issues and concerns regarding the use of the project site. The consultant will employ in the conduct of these meetings, established methodologies and techniques to extract and record this information from participants. Visioning scenarios from Task 3 will be used to seed the discussions.

Stakeholder participation is expected to come from neighbouring communities, government ministries, NGO's, the business community, academia and the general public. As such, no less than six meetings are anticipated at times and place(s) to be determined in conjunction with the client.

Following these meetings, the consultant will develop a project development theme (tested using SWOT and Multi Criteria Analysis), around which the urban design will revolve eg *Health and Wellness City, Tourism City, Eco Industrial Park, Knowledge City, Smart City, Duty Free City etc.* The consultant will make recommendations to the client, who will review and advise accordingly.

## **8.0 Task 5: Preliminary Master Plans and Urban Designs**

Based on the outputs from Tasks 2 and 3 and an agreed vision and theme from Task 4, the consultant, upon written confirmation from the client, shall proceed to develop at least three (3) generalised preliminary master plans and urban design layouts (1:1000 or less).

Design 1 should be guided by considering the entire 133 acres as a blank sheet and include such of the surrounding areas as may be required to provide a comprehensive development reflecting the stakeholder visioning expectations.

Design 2 should be guided by considering the 133 acres a blank sheet, with the exception of the Referral Hospital, National stadium and adjacent sporting facilities.

Design 3 should be guided by the consideration of the use of existing building assets as per Design 2, as well as the old airport terminal building, Technical College, Medical School and Mustique Airways Hangar.

The designs will be prefaced with a document containing the philosophical approach to both the horizontal and vertical designs, along with a policy document outlining the design standards in this regard.

The visual presentation of the designs will have a level of detail that will include, but not be limited to, the following critical design elements;

- transport network and circulation pattern (vehicle, pedestrian, bicycle, cable cars)
- water bodies (lakes, channels, ponds)
- storm water drainage

- commercial, hotel, industrial and residential zones, mixed zones, along with associated lot sizes and building volumes
- concept building designs
- sewage treatment and disposal location
- architectural landscaping
- utility corridors
- concept marina works if any

The development of the urban design will recognise the following:

- (i) Tropical urban design principles. In this regard the design will clearly demonstrate inter-alia, the efforts made in both the vertical and horizontal development, to consider the effects of temperature, humidity, wind direction and shade.
- (ii) While the modern city is an aspirational project, the design must reflect cultural and tropical aesthetic values, as opposed to a Manhattan skyline
- (iii) The Modern City is not intended to replace the Capital City of Kingstown. It will be connected to the Capital via a proposed tunnel (future project), which the design must incorporate in its road network.
- (iv) Having regard to (iii) above, it is not expected that government administration buildings will be provided for in the Modern City, neither will there be a concentration of large retail facilities (shopping malls) in the Modern City. These operations / enterprises are expected to remain in Kingstown, but nevertheless their inclusion will be guided by the visioning exercise and the goal of the project.
- (v) The development is not meant to represent the arbitrary expansion of urban settlement. The Modern City represents an area of economic activity, with a bias to foreign exchange earners
- (vi) The design must reflect urban resilience to climate change through adaptation and mitigation considerations. In this regard, special attention is drawn to the requirement to provide interventions to safeguard the landfill and the site against Sea Level Rise, storm surge and flooding.

The consultant shall use Virtual Reality modelling software to present these options to the client for final selection.

## **9.0 Task 6: Financial Analysis**

For each of the three (3) options, the consultant shall conduct a financial analysis with the following focus areas:

- (i) Development costs

- (ii) Revenue forecasts
- (iii) Financial modelling
- (iv) Project Financing
- (v) Financial viability assessment

## **9.1 Development Costs**

The consultant will develop cost estimates for the proposed infrastructure considering various horizontal (infrastructure) and vertical development (build-out) scenarios.

In terms of the infrastructure costs, the consultant is expected to provide at a minimum, the following cost details

### *(a) On site general infrastructure costs*

- (i) Site preparation
- (ii) Remediation e.g. landfill and swamp areas
- (iii) Flood protection
- (iv) Storm water drainage
- (v) Roads
- (vi) Parks
- (vii) Water supply
- (viii) Sewage collection, treatment and disposal
- (ix) Electrical supply
- (x) Telecommunications
- (xi) Sea defense
- (xii) Landscaping
- (xiii) Any proposed public facilities
- (xiv) Any other relevant areas inadvertently omitted above

### *(b) Off site infrastructure costs*

- (i) Water system upgrades
- (ii) Electrical supply upgrades
- (iii) Road and road intersection upgrades
- (iv) Telecommunication upgrades
- (v) Other

### *(c) Commercial/Industrial/Tourism/Residential costs*

- (i) Design fees
- (ii) Land costs

- (iii) Site preparation
- (iv) Site infrastructure
- (v) Other

## **9.2 Revenue forecasts**

The consultant will develop revenue and cost recovery forecasts (with associated assumptions), for each of the three preliminary design options. In this regard the revenue forecasting will consider:

- (i) Sales and/or tax revenue from the build-out of condominiums / hotel / commercial / industrial space. These projections should be in line with market study conclusions and development phasing arising from activity 5.2.8 above.
- (ii) Potential government concessions
- (iii) Rental / lease / sale of existing government buildings on the site
- (iv) Land swaps
- (v) Such other revenue streams that the consultant considers relevant

## **9.3 Financial Modelling**

The cost and revenue forecasts developed in 9.1 and 9.2 above, must be analysed with a financial model(s) for each of the three preliminary design options. This financial model(s) will be used to consider best case and break even scenarios for the build-out phases.

The model(s) will be created with Microsoft Excel. The model(s) will inherently be a flexible tool and at a minimum:

- (i) Contain, concise notes to describe variables,
- (ii) Provide for inputs and results
- (iii) Reflect various project life periods
- (iv) Provide for revenues and costs in annual increments
- (v) Allow for changes in model input data eg phasing of project elements / assumptions in project development / revenues and costs, with immediate results eg
  - revenues and costs ( per square foot or other appropriate metric)
  - adding, amending or deleting costs for infrastructure and build-out elements
  - project financing costs
  - Cap rate
  - Etc.
- (vi) Reflect standard financial indicators such as payback period, IRR, NPV, CBR etc.
- (vii) Provide a meaningful integration of local, regional and SIDS development statistics, with financial projections
- (viii) Provide for the incorporation of estimates of resultant project land and building values following build-out
- (ix) Be able to calculate break even scenarios and perform sensitivity analysis

**9.4 Project Financing**

Project Financing shall consider both (a) Traditional and Non Traditional financing sources and (b) a funding strategy for both the horizontal and vertical development costs of the site, as follows::

9.4.1 Traditional and Non Traditional Financing Sources

The consultant shall consider, but not be limited to, the project financing sources in the table below:

<b>TRADITIONAL GOVERNMENT RESOURCES</b>	<b>LAND VALUE CAPTURE INSTRUMENTS</b>	
	<b>TRADITIONAL</b>	<b>NON TRADITIONAL</b>
Capital Reserves	Property Tax	Tax Increment Financing
Grants	Betterment Levy	Air Development Rights
Tax Abatements	Capital Gains	Public Private Partnerships (PPP)
International Bi Lateral Arrangements (in consultation with the government)	Leverage Government Owned Real Estate	Special Assessment Districts

9.4.2 Funding Strategy

The consultant shall also consider but not be limited to the following strategies:

- (i) The government funds the infrastructure, with buildings funded (a) primarily by the private sector and (b) catalytic build-out funded by government
- (ii) The government regulates the development only (infrastructure and build-out), with the private sector funding essential / targeted infrastructure and agreed upon selected build- out, with concessionary arrangements, all constructed in accordance with the master plan guidelines and regulations

The consultant shall provide all the assumptions used in the scenarios above (9.4.1 and 9.4.2). He shall also provide for the scenarios above, a risk matrix for market risk, financial risk, developmental risks and possible external influences, with suggested mitigation measures.

## **9.5 Financial Viability Assessment**

Using the financial model, the consultant shall conduct such variety of analysis as is necessary to recommend the preferred master plan / urban design option. The report shall provide at a minimum

- (i) Executive Summary
- (ii) a clear and concise list of assumptions and supporting reasoning
- (iii) explanation of the various analysis conducted
- (iv) recommendation of the preferred option
- (v) a development strategy for both options
- (vi) a project financing plan for both options
- (vii) suggested financing modalities for the project
- (viii) a soft copy of the Excel model for client use

## **10.0 Task 7: Final Design**

Following the client selection of the preliminary design option, the consultant shall proceed to the final stage of the master plan, urban and infrastructure designs.

### **10.1 Urban Design**

The consultant shall complete the selected urban design option, incorporating any comments received from the client.

The urban designs shall consist of different views of the architectural interpretation of the Modern City at full build-out stage. These views will include views (at a minimum) from:

- Casson Hill,
- Sion Hill
- Belmont
- The sea
- Plan View
- Ground level, facing east, west, north, and south

The design deliverable shall also consist of isolated, layered presentations of :

- The road network
- Utility corridors and substations
- Amenities Plan
- Development parcels

- Zoning
- Landscape plan
- Demolition Plan

The deliverable will comprise both hard copies and a soft copy and will be professionally packaged for use by the business development committee, in its promotional activities.

The hard copies will comprise of twelve A1 (23.39 x 33.11 inches) drawing sets and twelve A3 (11.69 x 16.54 inches) drawing sets.

## **10.2 Final EIA/SIA Report**

Based on the Initial scoping report in section 5.2.7 above and the final urban design footprint, the consultant shall finalise the EIA/SIA Report.

Applying qualitative and quantitative techniques, the consultant will identify and prioritize any potential negative physical impacts caused by the project during implementation and operation and the estimated costs of recommended mitigation measures both during implementation and in the long term.

The social management plan should analyse any potential negative social risks and impacts arising out of, but not limited to land acquisition / resettlement, anticipated demographic and land use changes in the surrounding areas and recommended mitigation measures. These measures should reflect the principles and guidelines laid out in National Development and Planning policies. The Consultant should liaise closely with the MCDC Social Development contact in the assessment of social risks and impacts and in the recommendation of mitigation measures.

The consultant will finalise the public communication strategy to include an EMP with mitigation measures for the construction of the facility (erosion control, health and safety, access, etc.) which will be included in the construction document and BOQ.

## **10.3 Infrastructure design and drawings**

The consultant shall carry out and complete the infrastructure design and drawings for the site.

For the utilities (water, electricity), the consultant shall provide estimates of maximum demand at full build-out and provide for their accommodation in the design, through prescribed corridors / routes and sub stations. The consultant (following consultation with the local utility companies) will be responsible for the sizing of the main distribution cables, transformers and water lines.

The consultant will be responsible for the design of the sewage collection system and the performance specifications only of the treatment plant. The consultant will be required to indicate the suggested treatment plant location and outfall location of the treated waste (or such other recommended disposal method). It is anticipated that the consultant will conduct such off shore current data collection activities, as will be required to make this decision.

The construction drawings shall include (at a drawing scale to be agreed upon with the client), but not be limited to:

- (i) General Site Layout including locations (with coordinates) and elevations of at least three survey benchmarks
- (ii) Site grading elevations
- (iii) Internal road layout, cross sections and profiles, including all setting out, geometric, and elevation data
- (iv) Road intersection designs with existing roads at site boundary
- (v) Lot layout, including all survey boundary data and lot sizes
- (vi) Storm water drainage layout, including all cross sections, profiles and elevation data
- (vii) Landscape design drawings
- (viii) Pedestrian walkways, cycle pathways, boardwalks and promenades
- (ix) Pond and channel designs if any
- (x) Car park layouts with setting out data
- (xi) Drawings and specifications for street furniture and public space lighting
- (xii) Electrical, telecommunication, sewage collection and water supply infrastructure corridors, including typical trench cross sections
- (xiii) Sewage treatment plant location and performance specifications only
- (xiv) On shore sea defense works
- (xv) Other drawings

#### **10.4 Construction Cost Estimate**

The consultant shall provide a complete Bills of Quantities (BOQ) for the infrastructure construction using the latest CESSM documentation in Excel format. The BOQ shall be in sufficient detail for tender purposes. The consultant shall provide a construction cost estimate for the infrastructure based on local construction rates and a fully priced BOQ.

The consultant will provide separately, a cost report summarising infrastructure costs with applicable commentary on any assumptions, as well as the costs associated with the items indicated below:

- (i) Electrical infrastructure- cabling costs etc provided in consultation with local electrical company Vinlec
- (ii) Water Supply – pipe costs etc provided in conjunction with local water supply company CWSA
- (iii) Sewage Treatment Plant
- (iv) Telecommunication cabling – fiber optics etc with costs developed in consultation with local regulatory commission (NTRC) and local service providers
- (v) An estimate of full build-out costs based on a cost per area metric
- (vi) Land acquisition costs
- (vii) Demolition costs

- (viii) Any proposed marine works (rough estimate) based on current local rates per square meter of construction.

## **10.5 Specifications**

The consultant shall provide the technical specifications for:

- (i) All land based infrastructure works
- (ii) Street furniture
- (iii) Public space lighting

## **11.0 INPUTS**

### **The Client**

The client will provide the following:

- a) All plans, pictures, reports, topographical surveys, etc. of the proposed works that might be necessary, applicable and already in the clients possession for the execution of the work required under these TOR. The client will not be responsible for data collection of any type , nor is the client responsible for the provision of any reports other than those listed in section 5.2.1
- b) Access to the project sites
- c) Liaison with other Ministries, Departments, and Authorities, etc. in order to introduce the Consultant. The Consultant however shall be fully responsible for collecting data, information etc. from these agencies and the organization of further meetings.
- d) The client may assign staff to the Consultant for training in the various aspects of the work,
- e) Assistance in obtaining visas, work permits, driving licenses, car registration, etc. and any other formalities found necessary for the Consultant's personnel entering or leaving SVG for the purpose of carrying out the services.
- f) Use of its laboratory facilities and staff for the performing of tests both in the laboratory and in the field to the extent that they are capable of, or have the necessary equipment to undertake such tests. These tests are very limited and consist of density testing, sieve analysis and DCP tests.
- g) The client will provide the consultant with local office space (20ft x 20ft)

### **The Consultant**

The consultant will provide the following:

- (a) All services required to undertake the various activities outlined at Sections 5 to 10 (inclusive) of the TOR
- (b) Provision of manpower, equipment and software required to carry out the assignment
- (c) All activities required to obtain all additional information to the client input above.

## **12.0 REPORTING REQUIREMENTS**

The Consultants shall submit six (6) hard copies and six (6) CDs of EACH of the following deliverables to the Client's satisfaction. The drawings shall be on 36" x 24" paper in Auto Cad format with written reports in Microsoft Word and Excel:

- a) **Inception Report (Task 1):** within four (4) weeks of commencing the works, the Consultants are required to submit an Inception Report. A typical sample template is attached in Appendix B.

The Client will forward comments on the report to the Consultants within two (2) weeks of receipt.

- b) **Preliminary Studies (Tasks 2 and 3)**

The consultant shall provide this report within six months of the acceptance of the Inception Report.

The Client should forward comments on the report to the Consultants within four (4) weeks of receipt.

- c) **Visioning Report (Task 4):** within four (4) weeks after acceptance of the preliminary studies the Consultants are required to submit the Visioning Report.

The Client should forward comments on the report to the Consultants within two (2) weeks of receipt.

- d) **Preliminary Design (Task 5):** Within twelve (12) weeks after acceptance of the Visioning Report, the Consultant is required to submit at least three (3) master plans along with full build-out concepts. The consultant will present his findings to stakeholders at three separate events during a one week period, in Virtual Reality format.

The client should forward comments within eight (8) weeks

- e) **Financial Analysis (Task 6):** The Consultant is required to submit the Financial Report along with the Preliminary Design Report.

The client should respond with comments within eight (8) weeks

- f) **Final Designs (Task 7):** The consultant is required to develop and submit the selected preliminary design, as final designs within sixteen (16) weeks after the acceptance of the Financial Analysis Report. The urban and infrastructural designs will be accompanied by the technical specifications, detailed BoQ and final ESIA. The report template is contained in Appendix E. The client will respond with comments within four (4) weeks. The consultant will have two (2) weeks to make corrections.

Four (4) hard copies and four (4) CD copies of all reports are to be submitted to the Client. Drawings are to be submitted on 36” x 24” paper and in AutoCAD format and on CD/DVD.

### **13.0 WORKING TEAM MINIMUM REQUIREMENTS**

The consulting firms eligible for these works will have a minimum of twenty five (25) year’s experience in master planning and urban design. The firm will also need to have completed three similar assignments in the last five years.

The minimum working team requirements for this exercise is shown below.

<b>WORK TEAM MINIMUM REQUIREMENTS</b>		
<b>Position</b>	<b>Qualifications</b>	<b>Specific experience</b>
Team Leader / Project Director (Urban Planner)	MSc degree in Urban Planning or Urban Development.	Consultant or lead management position in development of projects related to large urban, residential, campus or industrial developments. Experience not less than 20 years.
Financial Risk and Investment analyst	BSc in Financial Management or Chartered Accountant	Specific experience in developing various financial solutions for large infrastructure and real estate projects including PPP solutions. General experience not less than 15 years
Urban Economist	BSc in Economics	Specific experience in developing urban economic analysis, economic modelling, demographic analysis and

		strategic planning. General experience not less than 15 years
Urban Designer	MSc in Urban Design or Urban Architecture	Specific experience in the design and creation of city features including public space, infrastructure, transport, landscapes and community facilities. General experience not less than 15 years.
EIA Specialist	BSc. In Natural Sciences or related field	Specific experience in conducting environmental impact analysis with focus on infrastructure, urban and industrial developments. General experience not less than 15 years.
SIA Specialist	BSc in Social Studies	Specific experience in conducting social impact analysis with focus on infrastructure, urban and industrial developments. General experience not less than 15 years.
Infrastructure Design Expert	BSc in Civil Engineering	Specific experience in the design of roads, storm water drainage, water and utility distribution systems, for large industrial, residential or campus estates. General experience not less than 15 years.
Coastal Defense Expert	BSc in Civil Engineering	Specific experience in the design of coastal defense works. General experience not less than 15 years.
Sewage Treatment	BSc in Mechanical or Civil Engineering	Specific experience in the design of sewerage collection, treatment and disposal systems for large industrial, residential or campus estates. General experience not less than 15 years.
Landfill Expert	BSc in Civil Engineering or Environmental Engineering or Landscape Architecture	Specific experience in the conversion and use of decommissioned landfill projects. General experience not less than 15 years
Legal Advisor	LLB in Law	Specific experience in urban legislation and regulations. General experience not less than 10 years.
Quantity Surveyor	BSc in Quantity Surveying or Civil Engineering or Construction Cost	Specific experience in cost estimation of large infrastructure projects, CESSM documentation,

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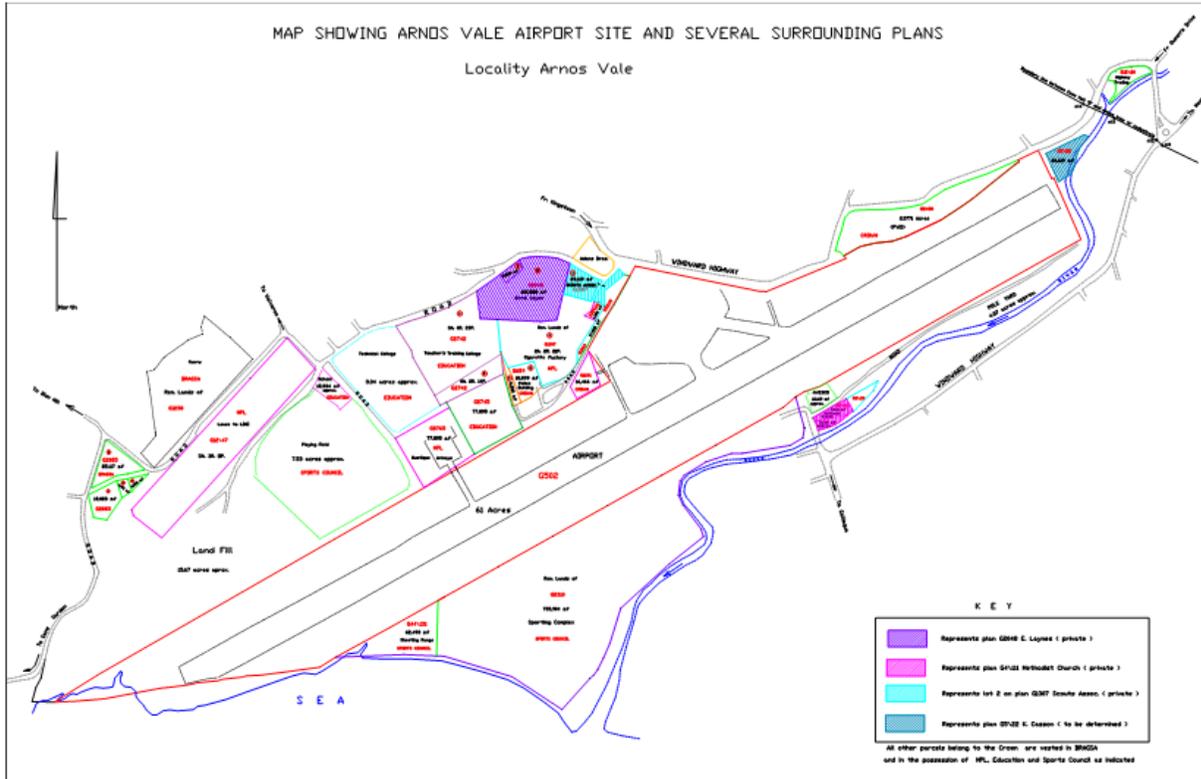
Estimation

tender document assembly. General  
experience not less than 15 years.

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# APPENDIX A

## Survey Plan of Airport Site including contiguous lands



## APPENDIX B

### Project Limits



The project limit is shown in black outline. The hospital site is shown in red. The coordinates for the airport terminal building are:  $13^{\circ} 8' 45.14''$  N and  $61^{\circ} 12' 36.97''$  W

## APPENDIX C

### Potential Land Areas For the Modern City Development

#	Parcel #	Area Sq Ft	Area Acres	Description
1	G30/116	4,003	0.092	AVIS - exact status of ownership to be determined
2	G2310	755,904	17.353	Arnos Vale grounds 1 and 2. AV#1 including the netball courts and cricket nets is approximately 518,000 square feet (11.892 ac)
3	G820	4,975	0.114	Land upstream of Methodist Church
4	G1291	16,466	0.378	Land adjacent to Fire station
5	G1307	118,701	2.725	Remaining lands of Cigarette Factory
6	G2408	103,547	2.377	MoTW storage yard
7	G2765	77,895	1.788	Mustique Airways (moved to AIA)
8	G12\47	228,690	5.25	LIME Compound
9		328,006.8	7.53	Sion Hill Playing Field
10		145,490	3.340	SVGCC Division of Technical and Vocational Education
11	G2742	164,166.75	3.769	Teachers Training College currently used by offshore medical school
12	G2745	77,895	1.788	Ministry of Education
13	G684	25,179	0.578	Licensing Department
14	G1863	17,098	0.393	Road to Licensing Department
15		682,585.2	15.67	Landfill
16	G1238	108,900	2.5	BRAGSA Quarry (estimated area) - abandoned
17		190,357.2	4.37	Pole Yard
18		12,169	0.279	AVESCO (Opposite Methodist Church)
19	G522	20,169	0.463	Landscaped area at end of runway
20	G44\131	62,493	1.435	Shooting range
21	<b>Sub Total</b>		72.192	<b>Potential additional land area available for the New City</b>
22	G502-Y	2,657,160	61.0	<b>ET Joshua aerodrome</b>
23	<b>TOTAL</b>		133.192	

## APPENDIX D

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

- ExecutiveSummary
- Introduction
- Contract signing and project commencement
- Project Organisation / Internal Lines of communication
- Team mobilization
- Background and description of various project elements
- Understanding of Project objectives resulting from initial stakeholder engagements.
- Comments on ToR in light of initial stakeholder engagements
- Project manpower, methodology and scheduling if different from proposal
- Team activities to date
- Data collection to date
- Data gaps anticipated
- Assumptions, Risks and Mitigation Strategy resulting from data gaps
- Design criteria and codes
- Public communications plan
- Proposed outlines for interim and final reports
- Appendices e.g. Meeting details, Organisation Chart, ToR, photographs, etc.

## **APPENDIX E**

### **Final Design 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

- Title Page
- Table of Contents
- Acknowledgements
- Executive Summary
- Background
- Goals and Objectives
- Methodology (including codes and standards used)
- Implementation
- Outputs and Results (including designs and design calculations)
- Outcomes
- Conclusions
- Recommendations
- Lessons learned
- References
- Appendices (ESIA, Geotechnical Report, TIA etc.)

## **APPENDIX F**

### **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 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 therefore all licensing agreements must be made similarly. In keeping with the government's 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.
- 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 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 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.

## **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