

**MINISTRY OF WORKS AND ENGINEERING**

**Longbird Bridge Demolition**

**Project No. 44/21/76**

**SPECIFICATION**

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**SUMMARY OF WORKS****1 General****1.1 WORK COVERED BY CONTRACT DOCUMENTS****.1 Project Identification:**

Work of this Contract generally comprises the demolition of Longbird Bridge including Bridge superstructure, piers, approach slabs and walls.

**.2 Project Location:**

Longbird Bridge is located at the end of The Causeway linking Hamilton Parish and St. Davis Island in St. George's Parish over Castle Harbour.

**.3 Project Owner:**

Ministry of Public Works,  
56 Church Street,  
Hamilton, Bermuda, HM12.

**.4 Project Engineer:**

Ministry of Public Works,  
Department of Works and Engineering  
3<sup>rd</sup> Floor, 56 Church Street,  
Hamilton, Bermuda, HM12

**1.2 FORM OF CONTRACT**

- .1 Project will be constructed under the FIDIC Short Form of Contract First Edition 1999.

**1.3 WORK SEQUENCE**

- .1 Contractor shall schedule the works coordinating all tasks and elements
- .2 Work sequence shall take into account both road and marine traffic considerations.
- .3 Work sequence shall take into account stability of the structure to ensure the safety of workers and of traffic.

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**1.4 CONTRACTOR USE OF SITE**

- .1 Limit use of site to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated. Confine construction and operations to within the boundary shown on drawings.
- .2 Keep driveways and entrances serving all adjacent premises and public property clear and available to the public, owners, owner's employees, guests, and both service and emergency vehicles at all times. These areas shall not be used for parking or storage of materials.
- .3 Use of Site is to be coordinated through the Ministry of Public Works.

**1.5 DRAWINGS AND SPECIFICATIONS FURNISHED**

- .1 Owner Responsibilities:
  - .1 One electronic copy of drawings and specifications to Contractor.
- .2 Contractor Responsibilities:
  - .1 Pay for additional copies of drawings and specifications if required.
  - .2 Maintain at Site one complete set of drawings and specifications. Make available to Engineer at any time.
  - .3 Maintain copy of the Demolition Plan at site

**1.6 SUPPLEMENTARY DRAWINGS**

- .1 Engineer may furnish supplementary drawings to assist proper execution of work. Such drawings will be issued for clarification only and will have same meaning and intent as if included with plans referred to in Contract Documents.

**1.7 DRAWINGS OF EXISTING STRUCTURE**

- .1 Original drawings of the structure are dated 1953; Drawings of Rehabilitation project are dated 2000.
- .2 The Contractor is cautioned that the drawings of the existing bridge may or may not reflect accurately the conditions on site, and the Contractor shall not make any claim with respect to errors or omissions on these drawings.
- .3 The availability of the drawings of the existing bridge does not supersede the requirement for the Contractor to verify all dimensions in the field.

**END OF SECTION**

## PROJECT MEETINGS

### 1 General

#### 1.1 PRECONSTRUCTION MEETING

- .1 Engineer will establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .2 Contractor's Project Manager to be in attendance.
- .3 Agenda to include the following:
  - .1 Appointment of official representatives of participants in the Work
  - .2 Schedule of Work, progress scheduling
  - .3 Schedule of submission of submittals, work plans
  - .4 Requirements for temporary facilities, site sign, storage sheds, utilities, fences
  - .5 Site security
  - .6 Monthly progress claims, administrative procedures, photographs, holdbacks
  - .7 Insurances

#### 1.2 PROGRESS MEETINGS

- .1 Progress meetings will be held at a regular scheduled time and day each week, as agreed by all parties.
- .2 Contractor's Project Manager to be in attendance.
- .3 Agenda to include the following:
  - .1 Review of Work progress since previous meetings
  - .2 Review of progress against Works schedule
  - .3 Field observations, problems, conflicts
  - .4 Problems which impede Works schedule
  - .5 Progress, schedule, during succeeding work period
  - .6 Review submittal schedules: expedite as required
  - .7 Review Traffic Management Plan for subsequent weeks work
  - .8 Maintenance of quality standards
  - .9 Pending changes and substitutions
  - .10 Review proposed changes for effect on Works schedule and on completion date.
  - .11 Other business.
- .4 **Contractor to prepare minutes of all meetings, and distribute to all in attendance within 2 working days.**

**END OF SECTION**

**SUBMITTALS****1 General****1.1 REQUIRED SUBMITTALS (Selected Proponent Only)**

- .1 Schedule of Work
- .2 Demolition Plan and method statement developed by a professional engineer including, but not limited to the following:
  - .1 Drawings and calculations showing details of temporary support system and/ or staging required
  - .2 Drawings showing details of enclosures for confinement of waste and protective enclosures.
- .3 Health and Safety Plan
- .4 Environmental Method Statement including methods for handling and disposal of waste materials
- .5 Traffic Control Plan
- .6 Insurance Certificates
- .7 Identification of Hazardous Substances written report

**1.2 ADMINISTRATIVE**

- .1 Provide to Engineer for review the submittals specified. Submit with reasonable promptness and in an orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by the submittal until review is complete.
- .3 Review submittals prior to submission to the Engineer. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with the requirements of the Work and Contract Documents. Submittals not stamped, signed, dated and identified as to the specific project will be returned without being examined and will be considered rejected.
- .4 Contractor's responsibility for errors and omission in submission is not relieved by Engineer review of submittals.

- .5 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer review.
- .6 Keep one review copy of each submission on Site.

### **1.3 SCHEDULE OF WORK**

- .1 Prepare schedule in the form of a linked bar chart (Gantt chart). All events, activities and constraints shall be numbered and shall be given a title. Details to be given for each event, activity or constraint should include:
  - .1 Its title
  - .2 Its scheduled start and finish dates
  - .3 Its duration
  - .4 Any relevant "must" start or finish dates
- .2 Provide a separate bar for each event, activity, operation or constraint, show proposed progress of all activities. Where applicable, indicate labour, construction crews, plant and equipment to be employed.
- .3 The key milestones in the construction process shall also be identified. Schedule milestones will include but not be limited to the following:
  - 1. Start of construction
  - 2. Placement of orders for critical equipment items
  - 3. Delivery dates (to site) for critical equipment items
  - 4. Final handover (final completion)
- .4 Revise and resubmit schedule every two weeks to reflect actual progress of the Works.
- .5 With schedule updates, provide written explanations to Engineer as to why previously reviewed schedule is not being met (if applicable).
- .6 Show changes in operations proposed (if required), to complete construction works within Contract Time.
- .7 No progress payments will be approved until receipt of schedule updates acceptable to the Engineer.

### **1.4 DEMOLITION PLAN AND METHOD STATEMENT**

- .1 Provide Method Statement for each key activity and additionally as requested by Engineer, to show demolition methods, demolition sequence, and general methodology for carrying out the Work. Relate Method Statement to activities shown on Work Schedule.

.2 Method Statement shall identify, among other things:

- Sequencing of works
- Hazard identification.
- Identification of required permissions
- Plant and equipment
- Temporary works
- Events affecting traffic, both road and marine.
- Tasks involving lifting, hoisting, and/or specified crane set-ups.
- Methods to ensure appropriate environmental protection including containment and disposal of debris.
- Safety procedures for working at height, over water.
- Handling and/or removal of hazardous materials
- Disposal program
- Other key tasks as specified in the contract Documents or as requested by the Engineer.

## **1.5 HEALTH AND SAFETY PLAN**

.1 Submit a Health and Safety Plan, per Section 01541.

## **1.6 ENVIRONMENTAL METHOD STATEMENT**

.1 Submit an Environmental Method Statement, per Section 01561.

## **1.7 TRAFFIC CONTROL PLAN**

.1 Submit a Traffic Control Plan, per Section 01570.

## **1.8 CERTIFICATES**

.1 Immediately after award of Contract, submit certificates of insurances.

## **1.9 IDENTIFICATION OF HAZARDOUS SUBSTANCES INSPECTION WRITTEN REPORT**

.1 Submit seven (7) days after Inspection completion, per Section 01541.

**END OF SECTION**



**TEMPORARY FACILITIES****1 General****1.1 TEMPORARY STAGING AREA**

- .1 The Contractor shall make arrangements for a temporary staging area for carrying out the works. Staging area is for trailers, storage, parking, and all other Contractor activities required for the works.
- .2 Entry to and exit from the staging area shall be in accordance with the Contractor's traffic Control Plan, per Section 01570.

**1.2 ACCESS**

- .1 Provide and maintain adequate access to project site.
- .2 Maintain roads in safe and clean condition for duration of Contract and make good any damage resulting from Contractor's use of roads.

**1.3 ENCLOSURES**

- .1 To prevent material from entering the water and where required for protection of adjacent property and traffic, erect temporary barriers or enclosures. Any damages to adjacent property, vehicles and public shall be made good by the Contractor at his own expense to the satisfaction of the Engineer.

**1.4 POWER**

- .1 The Contractor shall make all necessary arrangements for the temporary supply of electricity necessary for the proper completion of the Contract and he shall be responsible for paying all charges and fees in connection therewith.

**1.5 WATER SUPPLY**

- .1 The Contractor shall be responsible for an adequate supply of water for the Works and pay and bear all costs associated therewith.

**1.6 SITE SIGNS AND NOTICES**

- .1 Except for notices related to traffic control, instruction, public safety, etc. as required elsewhere in these specifications, no signboards or other advertising will be permitted on this project.

- .2 Maintain approved signs and notices in good condition for duration of project, and remove from site on completion of project or as directed by Engineer.

### **1.7 SCAFFOLDING**

- .1 Design, construct and maintain scaffolding in rigid, safe and secure manner.
- .2 Remove promptly when no longer required.

### **1.8 REMOVAL OF TEMPORARY FACILITIES**

- .1 Remove temporary facilities from site on completion of the project or when directed by Engineer.
- .2 When project is closed down at end of Work, keep temporary facilities operational until close down or removal is approved by Engineer.
- .3 Make good all surfaces, including roads, walls, permanent buildings, parking areas and lawns which have been affected by temporary facilities.

### **END OF SECTION**

## HEALTH AND SAFETY

### 1 General

- .1 Meet or exceed the requirements of all Bermuda Occupational Safety and Health Regulations 2009 and the Occupational Safety and Health Act 1982, including all amendments up to project date provided that in any case of conflict or discrepancy, the more stringent requirements shall apply with the objective to maintain a safe and injury/illness free construction site.
- .2 The Health and Safety Plan for the Demolition of Longbird Bridge shall be prepared in agreement with the above mentioned requirements. Attention should be drawn to specific items on this section of The Specifications.

### 2 Execution

#### 2.1 REPORTING OF INJURIES AND EMERGENCY PROCEDURES

- .1 Incident reporting shall, at minimum, follow the requirements of Bermuda Occupational Safety and Health Regulations 2009 (OSHR 2009).
- .2 In the event of an accident or dangerous occurrence, employees of contractor's must report the incident to their supervisor, foreman, superintendent, manager, etc.
- .3 Each contractor shall ensure that accidents and dangerous occurrences are thoroughly investigated and reported to the Site Manager on the same day of the occurrence.
- .4 Failure to report an injury or dangerous occurrence in a timely manner may result in immediate termination of the contract.
- .5 The contractor shall prepare emergency procedures plan and an evacuation plan.

#### 2.2 BASIC SAFETY RULES

##### .1 SAFETY AND HEALTH INDUCTION

The Contractor is to ensure that all personnel attend a safety and health induction prior to the commencement of work. All personnel will be required to sign the attendance record accordingly as evidence that they have understood the discussed items.

##### .2 PERSONAL PROTECTIVE EQUIPMENT

- a) All applicable requirements stated in The Occupational Safety and Health Regulations 2009 (Part16) concerning Personal Protective Equipment (PPE) shall be followed. Hard hats, high visibility shirt/vests and steel toed safety shoes/ boots will be worn by all personnel on the site at all times. Personal floatation devices (PFD's) shall be work when working over water or within 6ft of a free edge above water.
- b) All contractors are responsible for ensuring that:
  - PPE is correctly selected for the specified task
  - PPE is correctly fitted, maintained and inspected accordingly.

- Their staff have been suitably trained to use the PPE

### .3 TRAINING

- Supervisors and Contractors shall instruct each worker regarding the correct and proper procedures for performing each task.
- Supervisors and Contractors shall ensure that employees are familiar with the work, potential hazards of doing the works, and how best to mitigate or eliminate the hazard.

### .4 EQUIPMENT AND MACHINERY

- All applicable requirements stated in The Occupational Safety and Health Regulations 2009 (Parts 7, 14, and 15) concerning lockout/ tagout of equipment and machinery will be followed.
- All equipment and machinery must be in good working condition. Defective equipment and machinery shall not be used.
- All operators of equipment and machinery shall have the proper training so as to use the equipment or machinery with competence.
- Protective glasses shall be worn by all personnel using power tools.
- All extension cords, drop cords, and electrical tools shall be checked, properly grounded with ground fault interrupters (GFI's), and color-coded by a designated competent person each month. This shall be part of the assured grounding program. Cords and equipment that do not meet requirements shall be immediately tagged and removed from service until repairs have been made.

### .5 FALL PROTECTION

- All applicable requirements stated in The Occupational Safety and Health Regulations 2009 (Parts 16 and 17) concerning fall protection shall be followed.
- All scaffolding and work platforms must be built and maintained in accordance with The Occupational Safety and Health Regulations 2009. All ladders must be in a safe condition without broken rungs or split side rails. Damaged ladders shall be removed from service. Metal ladders around electrical work are prohibited. A step ladder shall never be used as an extension ladder. A step ladder must only be used when fully opened with braces locked.
- All body harnesses and lifelines shall be instated and maintained in accordance with the Occupational Safety and Health Regulations 2009.
- Floor openings and/or excavations shall be marked and barricaded on all sides to ensure personnel are aware of the hazards.

### .6 HOT WORK

- All applicable requirements stated in The Occupational Safety and Health Regulations 2009 (part 17) concerning hot work shall be followed.
- Adequate precautions must be taken to protect employees and equipment from hot work such as welding or burning. Fire extinguishing equipment shall be no further than 50 feet away from all hot work. Use of welding blinds is required in high traffic areas.
- The contractor shall be responsible for the provision and maintenance of fire extinguishing equipment. The contractor shall also be responsible for ensuring that their personnel are adequately trained to use this equipment.

## 2.3 DEMOLITION

All applicable requirements stated on the Occupational Safety and Health Regulations 2009 (part 17) concerning demolition shall be followed.

### .1 SUPERVISION AND CO-ORDINATION OF DEMOLITION

- .1 The contractor undertaking the demolition work shall appoint a qualified person to supervise the work.
- .2 Where more than one contractor is engaged in the demolition work, the prime contractor shall appoint a qualified person to act as the safety and health coordinator at the site of the demolition.

### .2 STRUCTURAL STABILITY

- .1 The contractor undertaking the demolition shall ensure that the stability of the bridge is maintained, so far as practicable, by the provision of:
  - (a) a demolition plan developed by a professional engineer; and if appropriate
  - (a) a support system designed by a professional engineer
- .2 A copy of the support system and demolition plan shall be kept at the demolition site and made available for inspection.
- .3 If an employee is likely to be endangered by the bridge's partial or complete collapse, safeguards appropriate in the circumstances shall be provided to prevent injury to an employee.
- .4 Safeguards shall be installed progressively from a safe area towards the hazard so that the employees installing the safeguards are not endangered.

### .3 PRECAUTIONS PRIOR TO DEMOLITION

- .1 The contractor shall, before demolition:
  - (a) take precautions to prevent injury to a person on or near the bridge that may result from its demolition.
  - (b) ensure that all gas, electrical and other services that may endanger persons who have access to the work site is shut off and disconnected, remains shut off and disconnected during the demolition; and
  - (c) ensure the removal of all toxic, flammable or explosive substances from the bridge.

### .4 IDENTIFICATION OF HAZARDOUS SUBSTANCES

- .1 All applicable requirements stated in The Occupational Safety and Health Regulations 2009 (Part 12) concerning hazardous substances shall be followed.
- .2 Before the commencement of demolition work, the contractor undertaking the demolition shall ensure that—
  - (a) the structure has been adequately inspected by a qualified person to identify any asbestos, lead, flammables, explosives or other hazardous substances that will have to be handled, disturbed or removed; and
  - (b) the qualified person who inspects the structure provides the contractor with a written report of the inspection, listing the hazardous substances present in the structure and identifying their location within that building.
- .3 The contractor shall ensure that any hazardous substance revealed by the inspection or found in the course of demolition is safely contained or removed in a manner that does not constitute a hazard to the safety or health of any person.

- .4 If a hazardous substance that was not identified during the inspection is found in the course of demolition, personnel shall notify their supervisor and the site manager immediately. No attempts by untrained personnel shall be made to remove the hazardous substance. The contractor shall cease all demolition work until such substance is contained or removed.
- .5 PRECAUTIONS DURING DEMOLITION**
- .1 The contractor shall, so far as practicable, ensure that adequate precautions are taken to protect the safety and health of any person from dangers that may result from:
- (a) the uncontrolled collapse of the bridge;
  - (b) the twisting, springing or collapse of steelwork or ironwork;
  - (c) the lack of adequate shoring or other structural support systems;
  - (d) the risk of fire or explosion through leakage or accumulation of gas or vapour.
- .6 PROTECTION FROM FALLING MATERIAL**
- .1 The contractor shall ensure that any opening through which material may fall and endanger the safety or health of a person is adequately covered with material capable of supporting all loads that may be imposed on it.
- .7 ACCUMULATION OF MATERIALS**
- .1 Contractor shall ensure that materials and debris do not accumulate to the extent that the safety or health of persons may be endangered.
- .2 The contractor shall ensure that material and equipment shall not be allowed to fall or accumulate in quantities that will exceed the safe carrying capacity of the structure.
- .8 SALVAGE OPERATIONS**
- .1 No salvage operations shall be undertaken.
- .9 ACCESS TO SITE**
- .1 Only a person who is directly engaged in the demolition of a structure shall be in, on or near it.
- .2 If the demolition is discontinued for any reason, barriers shall be erected to prevent access by people to the remaining part of the structure.
- .3 A person shall enter only the part of the bridge being demolished that will safely support the person
- .4 No employee shall stand on top of a structure to remove material from it, where a fall of more than 6 ft may occur, unless fall restraint or fall arrest is provided appropriately.
- .10 SEQUENCE OF DEMOLITION**
- .1 Demolition shall proceed systematically and continuously from the highest to the lowest point unless an employee is endangered by this procedure, or otherwise agreed.
- .2 No materials of the structure being demolished shall be loosened or permitted to fall in masses that are likely to endanger a person or the structural stability of a scaffold or of any part that supports the parts of the bridge that are still remaining.

- .3 No truss, girder or other structural member being demolished or dismantled shall be disconnected until—
  - (a) it is relieved of all loads other than its own weight; and if necessary
  - (b) it has temporary support.
- .4 The contractor shall, so far as is reasonably practicable, leave intact any existing stairways or ladders, complete with handrails, until access to the level they serve is no longer required.
- .5 The controls of any mechanical device used to demolish the bridge shall be operated from a location that is as remote as is practicable from the structure

**END OF SECTION**

## ENVIRONMENTAL PROTECTION

### 1 General

- .1 Meet or exceed the requirements of all Bermuda environmental legislation and regulations, including all amendments up to project date provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

### 2 Execution

#### 2.1 FIRES

- .1 Fires and burning of rubbish on site will not be permitted.

#### 2.2 DISPOSAL OF WASTES

- .1 Collect all rubbish and waste material and dispose of in accordance with the latest editions of the Ministry of Public Works Waste Management Plan.
- .2 Do not bury rubbish and waste materials on site.
- .3 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .4 When cleaning with needle scalers or grit blasting, provide enclosures, screens and traps to confine and contain all material and paint debris and other extraneous material.
- .5 Dispose of all grit debris containing lead in the following manner; the Contractor shall pack and seal the debris in 1 cubic yard boxes and place the boxes in a single tier in 20 foot containers. The Contractor shall transport the containers to the Sally Port waste site: The 1 cubic yard boxes and 20 foot containers will be supplied free of charge to the Contractor by the Ministry of Works and Engineering and Housing, and must be collected from the Sally Port waste site by the Contractor. No untreated debris containing lead can be disposed of at any of Bermuda's waste receiving sites. All handling of lead contaminated waste will be subject to the requirements of the Solid Waste Management Section of the Ministry of Works and Engineering and Housing and SSPC Guides 6 and 7.

#### 2.3 WORK ADJACENT TO WATER

- .1 Works performed in and around water will be carried out in accordance with regulations of Bermuda authorities having jurisdiction.
- .2 Do not allow any paint debris or other foreign material to enter the water.



- .3 Remove immediately any solid objects dropped into the water. On conclusion of the Work, dispose of all debris to prevent its entry into the water.
- .4 If necessary provide debris confinement booms to contain debris and particles dropped in the water. Dispose of all debris captured by the booms.
- .5 Re-fuelling of machinery must take place at a safe distance from the water as designated by the Engineer.

## **2.4 DRAINAGE**

- .1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Bermuda authority requirements.

## **2.5 VEGATATION PROTECTION**

- .1 When, in opinion of Engineer, negligence of Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features, the Contractor shall be responsible, at his expense, for complete restoration including replacement of trees, shrubs, grass, etc. to satisfaction of Engineer.

## **2.6 POLLUTION CONTROL**

- .1 Control emissions from equipment and plant to Bermuda authorities' emission requirements.
- .2 Prevent extraneous materials from contaminating air, land or water, by vacuum, temporary enclosures, screens, traps or other devices.
- .3 Spills of deleterious substances should be immediately contained and cleaned up in accordance with Bermuda regulatory requirements. Spills should be reported forthwith to the Engineer.
- .4 Activity that is likely to generate sufficient noise that may be deemed a nuisance to the public shall not occur outside standard working hours (8am - 5pm Monday through Saturday). Should such activity be necessary, the contractor shall seek permission from the Ministry and any other relevant authorities.

## **2.7 STORAGE AND HANDLING OF FUELS AND DANGEROUS FLUIDS**

- .1 Fuel storage facilities shall not be permitted on site. Fuelling of vehicles or equipment will not be permitted within 100 m of any water body.

- .2 Prevent spillage of gasoline, diesel fuel and other oil products into the water and on land. Clean up spills promptly at own cost in accordance with Bermuda regulatory requirements. Report any fuel spills immediately to Engineer.
- .3 Proper use of paints and other hazardous substances will be undertaken to prevent their entry into the water. Substances are to be stored and mixed on protected surfaces away from site to prevent their entry into waterways and contamination of soils.

**END OF SECTION**

## TRAFFIC CONTROL

### 1 General

- .1 This section specifies requirements and procedures for traffic control to ensure protection of work and safety of public to the satisfaction of the Engineer.
- .2 The work in this Contract shall be so carried out that it shall not interfere with road or marine traffic other than as permitted in this section.
- .3 The Contractor shall be responsible for the staging of the work and the control of traffic within the Contract limits.
- .4 The Contractor shall prepare and adhere to a Traffic Control Plan which describes all details for the staging of the Traffic Control work, and communications with Emergency Services.
- .5 Certain tasks of the work may require specific traffic closures and/or restrictions. Any such traffic closures or restrictions shall be implemented in accordance with the Traffic Control requirements of this Section.
- .6 The Contractor shall supply the personnel for the traffic control and shall supply, install, maintain and remove traffic control devices as required for the staging of the work, in accordance with these specifications and the approved Traffic Control Plan.

### 2 Execution

#### 2.1 GENERAL

- .1 Conduct operations so as to create an absolute minimum of inconvenience to road or marine traffic.
- .2 Where necessary, provide traffic control through use of an approved Traffic Control Plan.

#### 2.2 TRAFFIC CONTROL PLAN

- .1 The Contractor shall submit to the Engineer for approval a detailed, written document describing the proposed staging, traffic control devices and traffic maintenance operations as well as plans showing the exact location of all control devices and personnel at each stage of the Work.
- .2 The Traffic Control Plan shall be submitted to the Engineer for approval forthwith upon award of the Contract and five (5) days prior to the commencement of activities on site that affect traffic.
- .3 The Contractor shall conduct traffic control operations in accordance with his Traffic Control Plan as approved by the Engineer. Modifications to the

- Contractor's traffic control operations will not be permitted without written approval from the Engineer.
- .4 The Contractor is responsible for providing advertising regarding any lane or navigational channel closure, including notification of night closures to all marine traffic during work on the main span, in the Official Gazette (Bermuda Sun), and in the Royal Gazette for three consecutive days, commencing a minimum of two weeks prior to any closures.
  - .5 The Contractor is responsible for informing the Department of Marine and Ports of any changes in the navigational channels that impacts the marine traffic in the area.
  - .6 For the duration of the works, the contractor shall adequately illuminate the area of works during the hours of darkness to ensure that marine traffic in the area is aware of the extent of the work area.
  - .7 The Traffic Control Plan shall include the following:
    - .1 Details of work to be performed.
    - .2 A schedule describing all stages of Work.
    - .3 Plans showing the location of all temporary barriers, signs or marker buoys, delineators, flashers, traffic control persons, lane markings and signs.
    - .4 The location of traffic at all stages.
    - .5 Access during all stages of the work.
    - .6 Details of temporary lighting installations, including illumination of the area of works, and signage regarding navigational closures, during night hours.
    - .7 Temporary barrier systems.
    - .8 Communications with Emergency Services such as Police, Fire and Ambulance.
    - .9 Communications with Department of Marine and Ports Services
    - .10 Method of ensuring safe and clear passage of emergency vehicles during lane closure.
    - .11 Method of prohibiting boat traffic beneath bridge spans on which work is in progress.
  - .8 In addition, the Contractor shall name in the Traffic Control Plan a qualified individual who shall:
    - .1 Ensure that all elements of the approved Traffic Control Plan are implemented and effective in providing safe conditions for all motorised traffic, pedestrians, the Contractor's forces and the Engineer.
    - .2 Implement any modifications to the Traffic Control Plan, if such modifications are approved or requested by the Owner or Engineer.
    - .3 Monitor and maintain the traffic control measures, including the temporary weather and traffic volume conditions.
    - .4 Maintain communications with the Engineer during Work to review Traffic Management Plan changes if necessary.
    - .5 Clean and maintain traffic control devices to ensure that they are visible.
    - .6 Ensure communications with Emergency Services and Marine and Ports are maintained.

**2.3 OPERATIONAL REQUIREMENTS AND CONSTRAINTS**

- .1 Maintain existing conditions for vehicular traffic throughout period of contract except that, when required for Work and when measures have been taken as specified herein and approved by Engineer to protect and control vehicular traffic, existing conditions for vehicular traffic can be restricted as follows:
  - .1 Only one lane may be closed to traffic at any time.
  - .2 No individual vehicle shall be delayed more than 10 minutes on the crossing in either direction.
  - .3 If requested by the Engineer or Emergency Services, restore crossing to traffic service immediately.
- .2 Obtain the Engineer's approval on period and timing of any traffic interruption. Notify the Engineer 48 hours in advance of any period of traffic interruption.
- .3 Provide for safe movement of vehicles travelling through work area in a manner approved by the Engineer.
- .4 Provide for the safe operation of Work traffic in accordance with these specifications.
- .5 No Work traffic shall stop or park on travelled lanes at any time, except under approved lane closures.
- .6 No equipment or loading operations shall be permitted to swing over operating traffic lanes at any time.
- .7 When lane closures are necessary, maintain one full traffic lane not less than 10' wide. Provide details of plans for accommodating safe and clear passage of emergency vehicles during this lane configuration.
- .8 For boat traffic install signs and take other necessary measures prohibiting boat traffic beneath the structure on which work is in progress. Provide signs and marker buoys showing the primary and secondary navigation channels. Signs, buoys and all other measures shall accord with the requirements of the Department of Marine and Ports Services of the Ministry of Transportation of Bermuda.
- .9 For boat traffic maintain at least one navigation channel open at all times, except as noted below.
- .10 For work in progress on the main span (designated navigational channel) the Contractor is responsible for ensuring the safe navigation of marine vessels through the alternate navigational channel during daylight hours, or for the notification of closure of the navigation channel. The bridge will be closed to marine traffic during the hours of darkness during work in progress on the main span.

**2.4 INFORMATIONAL AND WARNING DEVICES**

- .1 Supply, erect, move and maintain all traffic control devices and other safety measures and provide staff to ensure the safe passage of all traffic over the project from the date of commencement of the work to the date of acceptance by the Engineer.
- .2 Supply and erect delineators, barricades, signs, marker buoys and miscellaneous warning devices. Traffic control measures will be monitored by the Engineer, and the Engineer may require modifications of these measures from time to time.
- .3 Provide competent supervision during non-working hours to ensure that lights, safety flares, flashing beacons, signs, etc. are in proper working order.
- .4 Supply, erect and maintain signs and other devices required for project. If situation on site changes, change the signs as required.
- .5 Continually maintain traffic control devices in use by:
  - .1 Checking signs daily for legibility, damage, suitability and location.
  - .2 Clean, repair or replace to ensure clarity and reflectance.
  - .3 Removing or covering signs which do not apply to conditions existing from day to day.

**END OF SECTION**

## **FINAL CLEANING.**

- .1 In preparation for partial or final acceptance of the project, perform final cleaning:
  - .1 All demolition debris, arisings or miscellaneous material shall be removed from site and disposed of appropriately
  - .2 Slopes, embankments and surfaces, particularly those adjacent to the bridge abutments, shall be in stable condition
  - .3 Vehicle barriers shall be reinstated to their previous positions
  - .4 The site will be made reasonably safe for public access
- .2 Ensure that environmental regulations are respected.

**END OF SECTION**