

SPECIFICATION SECTION 01600

MAINTENANCE AND PROTECTION OF TRAFFIC

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SPECIFICATION SECTION 01600

MAINTENANCE AND PROTECTION OF TRAFFIC

1. DESCRIPTION

This Specification Section prescribes the requirements for planning, implementing and monitoring the necessary measures to maintain, control and protect the traffic in and adjacent to the Site and where applicable within the project area during the execution of the Works.

This Specification Section also consists of the requirements for furnishing, maintaining, relocating and removing temporary traffic control devices and services required for the control and protection of public traffic through the Site.

The following definitions shall be referred to for proper interpretation of this Specification Section:

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|-----------------------------|---|
| Traffic Control Plan: | <p>The plan shall be prepared and submitted by the Contractor in compliance with the Contract.</p> <p>The plan shall consist of a complete plan for implementation and monitoring of the necessary measures that the Contractor shall carry out for the maintenance and protection of public traffic, including traffic due to the construction in the project area during the execution of the Works.</p> <p>The project area shall be understood as the area defined on page 12 of Chapter 1 of Section VI of the Specification</p> |
| Temporary Roads Plan: | <p>Comprises the plan for all the temporary roads to be used by the Contractor for executing the Works.</p> <p>Temporary roads shall include not only the construction roads but also existing roads to be used for the transportation of materials and equipment.</p> <p>This plan shall be considered as a key component of the main traffic control plan. Moreover, the Contractor shall also take into account the special loads referred to in subsection 2.1.4 of Specification Section 01050 General Works.</p> |
| Program and the Schedule: | As defined in Specification Section 01300 Program of Work |
| Safety Plan: | As defined in Specification Section 01500 Project Safety |
| Environmental Control Plan: | As defined in Specification Section 01700 Environmental Control and Protection |

2. REQUIREMENTS

2.1 General

- a) The traffic control plan will be subject to the approval of the Engineer and shall be considered one of the key elements of the Program as described in Specification Section 01300 Program of Work.
- b) The Contractor shall; thoroughly acquaint himself with existing traffic conditions, understand the importance of maintaining traffic safety and avoiding excessive traffic delay. The Contractor shall cooperate with the pertinent agencies regarding traffic control.
- c) The Contractor shall take necessary care at all times during the execution of the Works to ensure the convenience, environmental protection and safety of residents along and adjacent to the roads, and any public highways or other facilities that may be affected by the Works.
- d) The Contractor shall be responsible for carrying out any necessary investigations and obtaining approvals, licenses, escorts and any other necessary facilities in order to enable extraordinary traffic to be moved on the roads in the project area.
- e) Before the application of the measures for traffic maintenance and protection, contained in the traffic control plan described below, the Contractor shall investigate and clarify sufficiently the details and regulations established by Local Authorities and pertinent divisions of the Vietnam Road and Railroad Traffic Police Department.
- f) The Contractor shall work in accordance with the requirements of the specialized management authorities and shall obtain the necessary approvals from the relevant Local Authorities to ensure the passage of waterway traffic. Approval shall be obtained from the Engineer for materials used and Contractor's Drawings will be submitted showing the fairway on the river, distribution stations, buoys and floating directional devices.
- g) The technical requirements specified in the Vietnamese Standards 22-TCN-237-01 Road Signs and Signaling Regulations shall be applied to the work contained in this Specification Section. The specifications stated in other international standards such as; AASHTO, ASTM, MUTCD (of the FHWA) or other standards that may be accepted by the Engineer as applicable, shall supplement the aforementioned Vietnamese Standard
- h) The requirements established in this Specification Section are intended to be read in conjunction with and mutually explanatory with the requirements and provisions stated in the following subclauses of the Conditions of Contract and Specification Sections:

Subclause 4.14, Avoidance of Interference;

Subclause 4.15, Access Route;

Subclause 4.16, Transport of Goods;

Subclause 4.18, Protection of the Environment;

Specification Section 01500 Project Safety;

Specification Section 01700 Environmental Control and Protection.

- i) Failure by the Contractor to comply with the requirements of this Specification Section shall be considered as a serious default in meeting his contractual obligations under clause 4.1 of the Conditions of Contract. Should this situation arise the Engineer will adjust the value of the work in the Interim Payment Certificate(s) as foreseen in subclause 14.6(b) of the Conditions of Contract.
- j) In the event the Contractor's failure to comply with the requirements of this Specification Section persist the Engineer, at the request of the Employer, will carry out such Works as he deems necessary and charge the Contractor with the full cost thereof plus respective incidental and administrative costs in accordance with the provisions of subclauses 2.5 and 3.5 of the Conditions of Contract.

2.2 Traffic Control Plan

- a) The Contractor shall prepare and submit to the Engineer for review and approval, the traffic control plan that shall be; incorporated in the Program, implemented during the work execution and monitored on a daily basis.
- b) The traffic control plan shall include but not be limited to the following:
 - (i) Traffic Control Organizational Structure: The organization classified into subdivisions that can be technically and effectively managed, and described in a traffic control organizational chart identifying the subdivisions, responsibilities and tasks of the personnel and supporting staff, all of them engaged solely and specifically for traffic control issues (including the Contractor's traffic supervisor who will be responsible for all traffic control issues in the Site). Moreover, the criteria for appointment of principal staff shall be also described.
 - (ii) Lines of Communication: The organizational structure shall show direct lines of communication and reporting between the traffic supervisor, Contractor's project manager, and the Contractor's director responsible for the Contract.
 - (iii) Interaction and Communication Procedures: Procedures defining the communication system between the Contractors's construction personnel working in areas where the traffic is being affected and the traffic control staff; including radio communication facilities, regular communication and reporting system. Moreover, the frequency, coverage and intent of Site meetings for traffic coordination shall also be clarified.

- (iv) Subcontractors' Traffic Control Plan: The means by which the traffic control plan will be communicated to Subcontractors (if any), including also the procedure for reviewing the plan for traffic control proposed by Subcontractors, and the method to incorporate the Subcontractors' traffic control plans into the Works traffic control plan.
- (v) Inventory of the Affected Traffic: A detailed inventory of the road sections on which traffic will be affected by the Works, in accordance with the Program prepared by the Contractor.
- (vi) Temporary Roads Plan: A consistent plan for construction, maintenance, and removal including all the necessary temporary roads to be used at all stages of construction in accordance with the Program. This plan shall include a detailed time schedule for the use of all the temporary roads until respective removal. In the event that a local road is planned to be used as a temporary road, the Contractor shall supplement the plan with a construction method statement and a detailed schedule well linked with the construction schedule of the affected local road for review and approval by the Engineer.
- (vii) Drawings for Temporary Roads: Full detailed drawings of the planned temporary roads (if any) and access roads. These drawings shall include details on the; alignment, profile, pavement construction, installation of traffic signs, lighting and the length of each temporary road.
- (viii) Methods, Equipment and Supporting Staff for Traffic Control: A detailed and consistent description of the; methods, equipment and supporting staff to be applied for traffic control, including details for each stage considered during the construction of the Works. The methodology described in the traffic control plan shall cover all the items herein specified, and all applicable requirements of the Vietnamese Standards or the like for traffic control.
- (ix) Traffic Control Schedules: Time schedules in bar format prepared for each case of traffic control necessity identified in the above mentioned inventory, including a description of all the main activities for traffic control, dates for commencement and completion of each activity, critical items of the schedule, all the traffic control means, etc.
- (x) Traffic Control Inspections: The procedure and schedule for inspection of the traffic control equipment, instruments and devices.
- (xi) Supervision and Auditing: The means by which the established traffic control system will be supervised, monitored and audited by the traffic supervisor to ensure its due compliance with the principles and objectives of the traffic control plan. This shall also include the procedure for updating the traffic control plan.

- (xii) Records: To be prepared and maintained by the traffic supervisor and the staff for traffic control and the communication procedures to be adopted by the traffic supervisor such that the Engineer and others associated with the Works are kept fully informed throughout the period of the Contract on matters relating to traffic regulations.

2.3 Traffic Supervisor

- a) The Contractor shall appoint a traffic supervisor whose duties throughout the period of the Contract shall be entirely connected with the traffic control activities on the Site.
- b) The traffic supervisor shall be bilingual (Vietnamese/English) and shall be a suitably qualified and experienced person who shall prepare, supervise and monitor the traffic control plan and shall, in particular but without limitation carry out auditing of the operation of the traffic control plan in accordance with a rolling program to be submitted, from time to time, to the Engineer for his consent.
- c) The appointment and designation of the traffic supervisor shall be subject to the Engineer's approval.
- d) If so requested by the Contractor the duties designated for the traffic supervisor could be covered by the safety manager designated as established in Specification Section 01500 Project Safety and upon the Engineer's approval of the Curriculum Vitae and records of the proposed person for this item. The evaluation of the proposed staff shall include an interview performed by the Engineer.
- e) Unless specifically agreed in writing by the Engineer the Contractor shall not undertake any work on the Site, which may affect the traffic, until the traffic supervisor has commenced duties on Site and the traffic control plan has been approved by the Engineer.
- f) The Contractor shall not remove the traffic supervisor from the Site without the express written permission of the Engineer. Within fourteen (14) days of any such removal, or notice of intent of removal, the Contractor shall nominate a replacement traffic supervisor for the Engineer's approval.
- g) The Contractor shall provide the traffic supervisor with enough supporting staff in accordance with the staffing levels set out in the traffic control plan. The supporting staff shall include at least one (1) deputy traffic supervisor whose appointment shall be subject to the Engineer's approval. The deputy traffic supervisor shall be capable of assuming the duties and functions of the traffic supervisor as contained in the traffic control plan whenever necessary.
- h) The Contractor shall ensure that the traffic supervisor maintains a daily Site diary, comprehensively recording all relevant matters concerning Site safety inspections and audits, related incidents and the like. The Site diary shall be available at all times for inspection by the Engineer.

2.4 Special Requirements for Traffic Control

The Contractor's requirements for Maintenance and Protection of Traffic shall include, but not be limited to; construction of detours, temporary works, traffic control devices and services for the control and protection of traffic through areas of construction. These include:

2.4.1 Works for Traffic Control

- a) Prior to the start of construction operations, based on the approved traffic control plan, the Contractor shall furnish, erect and maintain (at prescribed points) warning and guide signs, barricades or barriers, temporary fences (2.0 m height) and other traffic control devices as established in the approved traffic control plan, the Vietnamese Standards, this Specification Section or directed by the Engineer.
- b) As necessary for proper control of traffic, or when/where directed by the Engineer, the Contractor shall furnish and station competent flagmen whose sole duties shall consist of directing the movement of traffic through or around the Works.

2.4.2 Materials for Traffic Control Devices

- a) Retro-reflective Material: Unless otherwise specified in the Contract sign panels, barricades, cones, vertical panels and flagged paddles shall have retro-reflective sheeting
- b) Sign Panels: Sign panels shall be in orange color with black legend unless otherwise required.
- c) Sign Posts: Sign posts shall be fabricated from untreated softwood, metal, or other materials acceptable to the Engineer. Signs shall be capable of remaining in position during normal traffic flow and wind conditions.
- d) Barricades: Barricades shall be constructed of wood, metal or plastic.
- e) Cones:
 - (i) Cones shall be in accordance with the Vietnamese Standards for Roads Sign and Signaling Regulations (Article 91) with a minimum of 60 cm in height and a broadened base and shall be capable of withstanding impact without damage to the cones or vehicles. All cones shall be orange/white colored and highly visible both in daylight and darkness.
 - (ii) Cones shall be capable of remaining bright and in position during normal traffic flow and wind conditions in the area where they are used. Lamps for cones shall be suitable for the purpose.
- f) Temporary Fence: Temporary fence shall be fabricated in panels with timber framework and galvanized metal panels. The panel face towards the traffic shall be painted.
- g) Vertical Panels: Vertical panels shall be constructed of wood, metal or plastic.

- h) Warning Lights (flashing or steady): Warning lights shall be of low intensity flashing type, high intensity flashing type or steady burn type as approved by the Engineer.

2.4.3 Maintenance of Equipment and Devices for Traffic Control

The equipment and devices provided to satisfy the requirements of this Specification Section shall be maintained and kept in good condition of operation all the time.

Any equipment or devices that are lost, stolen, destroyed or deemed unacceptable while their use is required on the Works shall be replaced by at the Contractor expense. Devices for traffic control shall be operated only when necessary.

2.4.4 Traffic Control during Non Working Hours

During non working hours and following the completion of a particular construction operation all warning signs, except those necessary for the safety of the public, shall be removed or entirely covered with either metal or plywood sheeting so that the sign panel will not be visible.

2.4.5 Traffic Control during the Night

- a) Night time operation shall be illuminated by a lighting system approved by the Engineer.
- b) The lighting system shall be positioned and operated to preclude glare.
- c) Incandescent lights will not be permitted.
- d) Retro-reflective sheeting on signs, barricades and other devices shall be kept clean and in good condition. The Contractor shall promptly correct stretches, rips, and tears in the sheeting. Retro-reflective sheeting shall have a maintained retro-reflection.
- e) When applicable, street lighting shall be relocated as necessary to maintain the same standard of lighting in the course of the Works until new lighting facilities are put into operation.

2.4.6 Traffic Control Conserving Existing Traffic

- a) When the construction is going to affect an existing road (feeder roads or others) where traffic closing is not permissible the Contractor shall keep that open to traffic during the execution of the Works, provided that when approved by the Engineer the Contractor may bypass traffic over a detour.
- b) The Contractor shall at all times keep roads and footpaths, affected by his operations, free from soil and material spillage and properly repaired at his expense if the road is damaged by those operations.

- c) The Contractor shall keep the Site in such condition that traffic will be accommodated safely. Traffic control devices and services shall be provided and maintained both inside and outside the Site limits as needed to facilitate traffic guidance should this be necessary.

2.4.7 Temporary Road Works:

In accordance with his temporary roads plan (reviewed and approved by the Engineer) the Contractor shall:

- a) Furnish, maintain and remove on completion of the Works, for which they are required, all temporary roads and road works such as staging over roads, access and service roads, temporary crossing structures for maintaining the existing traffic. Such temporary road works shall be constructed to the satisfaction of the Engineer taking into account the actual traffic levels and shall be maintained in good condition all the times. The Contractor shall pay special attention for the initial pavement of unpaved local roads, if they are included in temporary roads plan, to protect the local people from the dust and vibration caused by his vehicles. Prior to the issue of the Taking-Over Certificate the Contractor shall repave all of local roads on the Site that he used as temporary roads for executing the Works.
- b) Take cognizance that access to the Site may be available via EARs (Entrance Access Roads) No.2B and No.3. EAR No.2B may also be used by the Package 1 Contractor. Generally, the Contractor shall construct all necessary passing places to allow the traffic, etc. to flow smoothly on all the Entrance Access Roads to the Site that he uses for the Works. The Contractor will be responsible for maintaining all Entrance Access Roads, which he and/or his subcontractors and/or his suppliers and/or his workforce use for access to the Site up to the issue of the Taking-Over Certificate, except where the maintenance is specifically excluded from his scope of work, in the same condition that the roads were when he commenced the Works. Only the Entrance Access Roads on the traffic control plan, approved by the Engineer, may be used for access to the Site by the Contractor, his subcontractors, his suppliers and his workforce. If the Contractor, his subcontractors, his suppliers and his workforce use Entrance Access Roads, which were not on the approved traffic control plan then the Contractor shall also be responsible for maintaining those roads too. The use of the Entrance Access Roads by; other contractors employed by the Employer on the Danang-Quang Ngai Expressway project and by vehicles and persons not connected to the Contractor shall not relieve the Contractor of his obligation to maintain these roads nor entitle the Contractor to any assistance with his maintenance costs or obligations.
- c) Take cognizance that any improvements and/or additions to the public roads shall be the responsibility of and to the account of the Contractor. Prior to the issue of the Taking-Over Certificate any improvements and/or additions to the entrance access roads shall be removed and those parts of the public roads restored to their original condition.

- d) Make all necessary arrangements, including payment if required, with the Public Authorities or landowners concerned, for the use of the land, (before constructing the works for temporary roads and obtaining the Engineer's prior approval). The Engineer's approval shall depend upon the Engineer's satisfaction with the Contractor's proposals for items such as paving, signs installation, lighting and riding quality of the temporary road together with the proposed maintenance arrangements. Such approval will not, however, relieve the Contractor of his responsibilities under the Contract.

2.4.8 Temporary Traffic Ramps

Where temporary traffic ramps are required or if so requested by the Engineer the Contractor shall furnish all the labor and materials, construct and maintain such temporary traffic ramps to the satisfaction of the Engineer.

2.4.9 Passing of Other Contractors

When applicable, the Contractor shall make all the necessary arrangements to permit the passage along the road section relating to this Contract of the constructional plant, materials and employees belonging to other contractors engaged in the construction of contiguous stretches of road.

For this purpose the Contractor and the contractors engaged in the construction of the stretches contiguous to those through which they must pass shall, when necessary and with at least 15 days' notice, request the Engineer for permission to pass and submit a schedule for such passage.

After the Engineer has granted such permission and approved the schedule submitted, both the Contractor permitting the passage and those requesting it shall undertake to observe the schedule approved by the Engineer for the passage along the Site without having any right to extra payment in consequence of the restrictions on passage or the necessary temporary suspension of work due to the aforesaid schedule.

2.4.10 Number of Lanes for Traffic Control

The existing number of traffic lanes of the roads that may be affected by the Works must be maintained at all times during the work execution and if diversions are provided these must be of the same traffic capacity as the original road.

Notwithstanding the above, the Engineer may give approval to reductions in traffic capacity if the Contractor can show that these will not cause excessive delay to traffic. If such approval is given, the Engineer may specify the hours during the day when the reduction in capacity may be applied and it should be anticipated that these hours may not include the peak period for the traffic movement under consideration.

2.4.11 Half Width Construction

The Contractor shall include in his traffic control plan and his proposed method for construction described in the Program pertinent details of the construction method to be applied where a detour is not feasible and the construction on existing public roads should be undertaken only over a half of the full width of the roadway.

The following aspects shall be considered for this purpose:

- a) The length of such half width construction shall be kept as short as possible.
- b) Work on culverts must be commenced and completed in the dry season and the embankments adjacent to them must be reinstated so that at least half the full width will be available for use by the public throughout the next rainy season.
- c) A single lane at least 3.5 m wide shall be kept open to traffic.
- d) The Contractor shall conduct his operations in such a manner as to cause the least possible obstruction, inconvenience and delay to traffic and shall be responsible for adequate control of the traffic using such lengths of single lane.

2.4.12 Vertical Clearance

In general any Temporary Works placed over roads or diversions used by public traffic should have a vertical clearance specified by the Vietnamese Standards TCVN5729-97, TCVN4054-2005 and Decision No.315/QD-BGTV, as follows:

- | | |
|---|-----------------|
| a) Expressways and Highways Class I, II and III | at least 4.75 m |
| b) Highways Class IV, V and VI | at least 4.50 m |
| c) Rural Roads Class A | at least 3.50 m |
| d) Rural Roads Class B and C | at least 3.00 m |

Where required by the Engineer, the Contractor shall erect and maintain suitable approved check gates, fitted with warning signs indicating the vertical clearance.

3. MEASUREMENT AND PAYMENT

3.1 Method of Measurement

The preparation of the traffic control plan, the implementation and maintenance of the same for 24 hours of every single day up to the issue of the Taking-Over Certificate, including but not limited to the provision of all; supervision and flagmen, Temporary Works, site access roads, maintenance of the entrance access roads, detours, traffic control devices, materials, fences, barricades, signs, etc and the suppression of dust using water sprinkler trucks and any other works necessary to comply with this Specification Section shall be measured for payment as a lump sum.

The Maintenance and Protection of Traffic provisions and requirements identified in this Specification Section shall be measured for payment in pay item 01600-01.

Any Maintenance and Protection of Traffic Works not specifically indentified in this Specification Section but which are necessary for the performance of the Works shall be deemed to be included in pay item 01600-01.

3.2 Basis of Payment

- a) The work under this Specification Section shall be paid for in accordance with the applicable unit prices as indicated in the Bill of Quantities and given below. Payment shall constitute full compensation for performing the requirements of the Contract for the item of work as specified in this Specification Section including; the implementation of the traffic control plan fully in accordance with the requirements of this Specification Section, all updates and submittals, supervision, materials, equipment, apparatuses, devices, labor, furnishing/installing/maintaining traffic control devices, providing temporary fences/services/road works required by the Contract for the control and protection of traffic.
- b) All traffic control devices provided by the Contractor shall remain the property of the Contractor and shall be removed upon completion of the Contract.
- c) Payments shall be made in the following three installments:
 - ◆ **20%** (twenty percent) upon the issuance of the Engineer's approval of the submitted traffic control plan, and of the mobilization of the Contractor's traffic supervisor(s);
 - ◆ **50%** (fifty percent) over the duration of the construction period prorated to the progress of the Works expressed in financial terms through the Interim Payment Certificates, upon the Engineer's certification of the Contractor's compliance with the requirements of this Specification Section and
 - ◆ **30%** (thirty percent) upon the issuance of the Engineer's certification that all the requirements of this Specification Section including those for demobilization have been satisfactorily completed by the Contractor.
- d) The Engineer may at any time withhold certification of monies if, in his opinion, the Maintenance and Protection of Traffic has not been provided in due compliance with the requirements and procedures of this Specification Section.

| <u>Pay Item</u> | <u>Description</u> | <u>Unit</u> |
|-----------------|--|-------------|
| 01600 | Maintenance and Protection of Traffic | |
| 01600-01 | Maintenance and Protection of Traffic | LS |

