



# **Standard Specifications for Road and Bridge Works**

**Draft Standard (DS)**

**CHAPTER 1.5: ACCOMMODATION OF TRAFFIC**

**February 2020**

# **CHAPTER 1 (contains 7 Sections)**

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## **1.5 ACCOMMODATION OF TRAFFIC**

## **A1.5.1 SCOPE**

**This Section covers the accommodation of vehicular and non-motorised traffic and pedestrians on, over or through the site of the Works. This involves:**

- the construction, maintenance and eventual removal of temporary deviations and detours,
- the construction and eventual removal, if required, of temporary gates, fences, drainage Works and other incidental items that may be required,
- the provision, erection, relocation, maintenance and eventual removal of traffic control facilities and traffic safety items,
- painting and eventual removal, if required, of temporary road markings and placing temporary road studs,
- the issuing of public notices,
- liaison with the relevant traffic authorities, motorists and other affected persons and
- the removal and/or obliteration of temporary deviations as they become redundant.

**The purpose of providing the traffic accommodation measures discussed in this section is to ensure the safety of road users, pedestrians and the Contractor's and Engineer's employees who are engaged on the Works.**

## A1.5.2 DEFINITIONS

**Barriers** – Barriers consist of concrete, plastic or steel sections which are placed across or along the road to stop or divert the traffic or alongside / around the work area to separate the traffic and pedestrians from the work area. **Barriers may be used either as channelization devices or as vehicle restraining systems depending on their type and on their fixing arrangements.**

**Channelization devices** - Channelization devices for diverting and/or separating vehicles, non-motorized traffic and pedestrians from the work areas include barriers, delineators and traffic cones. These channelization devices may be supplemented by temporary road markings and road studs.

**Delineators** – Delineators are rectangular warning signs with a directional chevron on one or both sides which indicates which side of the roadway is open for use by the vehicles, non-motorized traffic and/or pedestrians.

**Detour** - A detour is any section of another existing road onto which traffic is diverted around the work areas. *(This is not the same as a temporary deviation which runs through or alongside the site of the Works.)*

**Partial-width construction** - This is a construction strategy wherein part of a roadway is constructed or reconstructed/rehabilitated as a phase without encroaching on the remaining width of the roadway in order to accommodate traffic. Typically, a two-lane two-way road will be constructed in two phases whereas a multi-lane road will be constructed in several phases.

**Road markings** – Road markings include all the regulatory road markings painted on the surface of existing or newly constructed roads as well as temporary road markings painted on the surface of deviations and detours.

**Road signs** - Road signs include all the regulatory road signs erected along existing or newly constructed roads as well as the temporary road signs erected along temporary deviations and detours.

**Road restraint systems** – Temporary road restraint systems used for preventing vehicles from leaving the permitted lanes, or for separating two opposing streams of traffic, may consist of either movable precast concrete or steel barriers or steel guardrails that **comply with the specifications in Chapter 11.**

**Temporary deviation** - A temporary deviation can be partial width, single or multi-lane roads that are used to accommodate vehicular and non-motorised traffic while the Works are in progress. **They are either a portion (part width) of the road that is under construction or they are newly constructed roads (with a gravel or a bituminous surface) constructed alongside or in close proximity to the road Works construction area.**

**Traffic** – **Traffic means all vehicles, non-motorised vehicles and pedestrians** that need to pass around, alongside or through the work areas.

**Traffic control facilities** - Traffic control facilities include flagmen, portable STOP and GO signs, portable barriers, temporary road signs and signals.

**Traffic calming devices** – Traffic calming devices are used to reduce vehicle speeds and generally consist of temporary or permanent rumble strips, humps or circular bumps placed in an overlapping strip pattern across the width of the traffic lane/s.

**Traffic safety devices** - Traffic safety devices include flashing warning lights, illuminated and/or flashing traffic arrows and signs, electronic message boards, road restraint systems, impact attenuation devices and guardrails.



## **A1.5.3 GENERAL**

### **A1.5.3.1 Access to properties**

**The Contractor shall provide and maintain access to all public and private properties which fall within or adjoin the Works at all times, unless alternate provision is specified in the Contract Documentation.**

### **A1.5.3.2 General requirements**

**The Contractor may not commence any part of the Works until adequate provision has been made for the accommodation of vehicular, non-motorised and pedestrian traffic. Traffic shall be accommodated in accordance with the **requirements given in the Contract Documentation** unless the Contractor has submitted an alternative incorporating an amended method of traffic accommodation and this alternate method has been accepted by the Employer.**

**This is followed by several other general requirements which specify how the traffic accommodation process must be controlled and managed, including safety equipment, maintenance, overnight parking.**

### **A1.5.3.3 Lane width**

The clear width of any traffic lane which is provided along any section of a detour or a **temporary deviation shall not be less than 3,5 m** unless a narrower width is specified in the Contract Documentation or approved by the Engineer in writing. If a lane width less than 3,5 m is specified or approved by the Engineer then **temporary width restriction warning signs** shall be erected at approved locations along the narrow section of the detour or temporary deviation.

### **A1.5.3.4 Late occupation of traffic lanes, interchange ramps and cross roads**

**If specified in the Contract Documentation the Contractor shall be charged a lane occupation levy for any occupation of traffic lanes**, interchange ramps and any cross roads beyond the completion dates and times agreed with the Employer. The lane occupation levies shall be specified in the Contract Documentation and they shall be deducted from payments due on the relevant interim payment certificates.

## **A1.5.3.5 Legal requirements**

**In addition to the specifications given in the Contract Documentation all traffic accommodation arrangements shall also conform to the specifications and provisions given in the latest edition of the South African Road Traffic Signs Manual (SARTSM) and all other current legislation and regulations.**

**The Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road. The Contractor shall indemnify the Employer against all proceedings, claims, actions, damages to vehicles or property, injury or death of persons and all costs which may arise from, or be related to:**

- the absence, improper functioning or incorrect placement of road traffic signs, barriers, channelization devices, road markings, .....**;
- any construction related items, materials or surfacing aggregates that were dropped, deposited, spilt, .....**

**Clause also covers insurance and handling of 3<sup>rd</sup> party claims**

### **A1.5.3.6 Other traffic control measures ordered by the Engineer**

**The Engineer may instruct the Contractor to provide any other road sign, reflective tape, etc. not measured in standard payment items. Such road signs shall conform to the requirements of the SARTSM and/or specified in the Contract Documentation or by the Engineer in writing. To ensure that the travelling public is kept fully informed and warned on matters relating to the accommodation of traffic, construction sign posting and the effect of the construction on the free flow of traffic through the site, the Engineer may instruct the Contractor to arrange for advertising in the press, on the local radio stations and/or for other forms of publicity.**

### **A1.5.3.7 Penalty events**

**Whenever the Contractor fails or refuses to take the necessary steps to ensure the safety and convenience of the public and/or to accommodate the traffic, pedestrians and non-motorised traffic and maintain the temporary detours, deviations, traffic accommodation facilities and traffic safety devices correctly the Contractor shall be subject to fixed & time related penalties.....**

### **A1.5.3.8 Property pegs and survey beacons**

**Temporary deviations shall be constructed so as not to damage or displace existing cadastral beacons or trigonometrical-survey beacons.**

### **A1.5.3.9 Right of way**

**The travelling public shall have the right of way on public roads, existing roads used as detours and on all temporary deviations for the entire contract period.**

### **A1.5.3.10 Safety of the travelling public and the Contractor's employees**

**The safety of the travelling public, and of the Contractor's and the Engineer's employees, is of paramount importance and shall take priority over all aspects of the Works.....**

### **A1.5.3.11 Services**

**Services affected by temporary deviations shall be located, protected and relocated in a similar manner as services affected by the permanent Works as specified in Clause A2.1.3.2 in Section A2.1 of Chapter 2. The requirements given in the Contract Documentation shall also be applicable to any services affected by the construction of temporary deviations.**

### **A1.5.3.12 The use of public roads by the Contractor**

**The Contractor shall have the right to use public roads, including any detours and temporary deviations open to public traffic, subject to the provisions and restrictions stated in clause A4.1.7.1 and the Contract Documentation.**

### **A1.5.3.13 Traffic over completed pavement layers and structures**

**Traffic over the completed pavement layers and structures on an uncompleted road shall be restricted to the vehicles and equipment required for the construction of the remaining Works. (and public traffic if approved by Eng.)**

## **A1.5.3.14 Vertical clearance**

The **minimum vertical clearance over any section of a temporary deviation shall be 5,2 m**. If the minimum vertical clearance is less than 5,2 m then approved warning signage shall be erected at approved locations on the overhead obstruction itself as well as in advance of the obstruction. The advance warning signs shall be erected at distances of 1,0 km, 400 m and 200 m in advance of the overhead obstruction.

**The warning signs shall show the actual clearance height in metres (to 2 decimal places) less a safety allowance of at least 75 mm.**

**Where the overhead obstruction or its support structure is likely to collapse if it is struck by a vehicle or by its load, and thereby represent a danger to the public or to the persons working on the site, then such an obstruction shall, in addition to the warning signs, have an approved height restriction warning gantry erected at least 200 m in advance of the overhead construction, or at the distance specified in the Contract Documentation or specified on site by the Engineer. Gantry to be fitted with beam triggered alarm...**

## **A1.5.4 DESIGN BY CONTRACTOR**

If, during the Contract, the **Contractor would like to amend any of the specified traffic accommodation arrangements** he shall provide his reasons for doing so in writing and **obtain the Engineer's prior written approval**. If the Engineer's prior written approval has been obtained, the Contractor will be remunerated for the revised traffic accommodation arrangements in accordance with the contract rates only up to an amount that does not exceed the tendered amount .....

## **A1.5.5 MATERIALS**

**A1.5.5.1 Material used for construction of temporary deviations**

**A1.5.5.2 Temporary culverts**

**A1.5.5.3 Temporary road restraint systems**

**A1.5.5.4 Temporary fencing and gates**

**A1.5.5.5 Temporary road signs**

**A1.5.5.6 Temporary road markings and road studs**

**A1.5.5.7 Traffic accommodation facilities and safety devices**



## **A1.5.6 CONSTRUCTION EQUIPMENT**

**Specifications for the traffic control facilities and traffic safety items are given in the following Clauses A1.5.6.1 to A1.5.6.4.**

### **A1.5.6.1 Traffic control facilities**

#### **(a) Barriers**

**Barriers manufactured from plastic and ballasted with sand or water, shall only be used to barricade work areas to close off sections of the Works from members of the public and non-motorised traffic. Where specified in the Contract Documentation, steel guardrails may be used as channelization devices provided they comply with the specified requirements and are installed as specified in Section A11.4 of Chapter 11. They may not be affixed to drums or other moveable objects. Guardrails shall not be used for the purpose of preventing heavy vehicles from leaving the permitted lanes or deviations and the Contractor shall use approved vehicle restraining systems for this purpose.**

**Temporary road restraint systems which are erected for the purpose of preventing vehicles from leaving the permitted lanes or deviations shall be movable barriers manufactured from steel or concrete with an approved safety shape design (e.g. New Jersey, F-shape or single slope). The movable barriers shall be obtained from approved suppliers and placed between the trafficked lane/s and/or the construction areas. They shall comply with the specified requirements and be installed as specified in Section A11.4 of Chapter 11 which refers to either of the following specifications:**

- The European Specification EN 1317 with a minimum containment level H1 or as indicated in the Contract Documentation or**
- The American Federal Highways Administration Specification AASHTO MASH (or NCHRP Report 350 where no MASH compliant device is available) with a minimum containment level TL4 or as indicated in the Contract Documentation.**

**The terminal sections of the moveable barriers ..... designed to attenuate head-on impacts of at least Test Level TL2 (70 km/hr) (ASSHTO MASH or NCHRP) or at least EN1317 Containment Level P2 for end terminals or 80/1 for crash cushions**

## **(b) Delineators**

**Delineators shall comply with the manufacturing and reflective requirements of SANS 1555. In addition, they shall also:**

- **have blades that are reversible with dimensions as specified in the SARTSM and/or as indicated in the Contract Documentation,**
- **be manufactured from durable, impact resistant plastic material,**
- **be designed such that they, together with their mounting base, will collapse in a safe manner under traffic impact,**
- **have the lower edge of the reflective part of the delineator mounted at least 100 mm above the road surface and**
- **be capable of withstanding the movement of passing heavy vehicles travelling at speeds of up to 80 km/hr and gusting winds with a wind speed of up to 60 km/h without falling over.** The base area shall be at least 0,18 m<sup>2</sup> and ballasted by its own weight or with durable sandbags filled with fine, clean sand of adequate mass. (The sand bags shall be partially filled to ensure a flattish surface without bulging and they shall not be filled with anything other than fine, clean sand).

### **(c) Temporary signs**

All temporary signs shall be manufactured to the sizes and in accordance with the specifications given in Volume 2 of the SARSTM and in Section A11.6 of Chapter 11 as well as with any additional specifications that are given in the Contract Documentation.

### **(d) Traffic cones**

Traffic cones shall be manufactured in a fluorescent red-orange or red impact resistant plastic material. The minimum height of traffic cones shall be 750 mm. **The design and weight of the traffic cone shall be such that it will not be displaced or blown over by passing heavy vehicles travelling at speeds of up to 80 km/hr and gusting winds with a wind speed of up to 60 km/h.**

### **(e) Traffic signals**

Temporary traffic signals shall conform with the requirements of traffic signals and conform to the size and visibility requirements specified for permanent traffic signals in Volume 3 of the SARTSM. The traffic signals shall be provided with either a permanent electricity supply or with a generator .....

## **(f) Traffic control stations**

**Traffic control stations shall be provided at each traffic control point **that is in operation during hours of darkness.** They shall have the following:**

- **a trained traffic controller;**
- **an effective communication system that allows the controllers at each end of the deviation to communicate effectively with each other;**
- **an all-weather shelter fitted with a clear window facing the oncoming traffic that can be opened if required, and a portable chemical toilet;**
- **a red/green stop/go electric traffic signal system .....**;
- **a floodlight system ..... to illuminate the traffic control point**
- **Additional floodlight system..... **to adequately illuminate the full length of the vehicle queuing area;****
- **Electrical power supply;**
- **a moveable barrier fitted with a STOP sign facing the oncoming traffic....**

### **A1.5.6.2 Illuminated traffic signs and safety devices**

- (a) Flashing illuminated arrow board**
- (b) Illuminated road signs**
- (c) Mobile Variable Message Sign**
- (d) Sign mounted flashing lights**
- (e) Warning flags**
- (f) LED strobe light wands**

### **A1.5.6.3 Traffic safety vehicle**

**The traffic safety vehicle to be used for transporting, placing, relocating and removing the traffic accommodation facilities and the traffic safety devices shall be a **truck with a capacity of at least 5 tons fitted with:****

**- High visibility rear panel, rear mounted impact attenuation device (TL2 AASHTO MASH), flashing light, warning sign....**

### **A1.5.6.4 Traffic safety officer's vehicle**

**The traffic safety officer's vehicle shall be provided for his sole use to enable him to carry out his supervisory duties.**

## **A1.5.7 EXECUTION OF THE WORKS**

**A1.5.7.1 Accommodation of pedestrian traffic**

**A1.5.7.2 Accommodation of non-motorised traffic**

**A1.5.7.3 Accommodation of traffic where the road is constructed in half or partial widths**

**Where, for reasons related to traffic, geometric or other restraints, the provision of a detour or the construction of a temporary deviation is not possible or unfeasible, the Contractor shall construct the Works on a half or partial width of the existing road so as to allow public and construction traffic to use that remainder of the road which is currently not under construction.**

**The length of the half or partial width construction sections and number of one-way sections under construction at any one time shall not exceed the length specified in the Contract Documentation. Two-way traffic sections of at least 2.0km in length shall be provided between each of the one-way construction sections.**

**Comprehensive specifications are also provided for all of the following aspects:**

- A1.5.7.4** Crossing the median or the road centreline (incl entry & exit)
- A1.5.7.5** Display of existing permanent signs
- A1.5.7.6** Maintenance of existing roads used as detours
- A1.5.7.7** **Liaison with traffic authorities** (see next slides)
- A1.5.7.8** Informing the road users
- A1.5.7.9** Lighting of construction access points during night work
- A1.5.7.10** Construction of temporary deviations (including maintenance)
- A1.5.7.11** **Temporary traffic control facilities** (see next slides)  
(for short and long deviations / day and night closures)
- A1.5.7.12** **Traffic safety officer** (see next slides)
- A1.5.7.13** Towing of public vehicles



## **A1.5.7.7 Liaison with traffic authorities**

The **Contractor shall liaise with the relevant provincial and/or municipal traffic authority, and with the Employer's traffic management centre** if applicable, at the start of the contract period and as often as required thereafter .....

**A daily report** ..... for the following day shall be submitted to the relevant traffic authorities or to the traffic management centre not later than 10h00.

For **exceptional traffic accommodation impacts**, ....., the relevant traffic authorities, and the Employer's traffic management centre if applicable, **shall be informed seven days prior to the event**.

The Contractor shall inform the relevant traffic authorities, and the Employer's traffic management centre if applicable, about all **traffic related incidents** .....

If the road under construction forms part of an **abnormal load route** the Contractor shall liaise with the relevant provincial abnormal load office that issues permits to ensure that permits are not issued when horizontal and/or vertical restrictions do not allow passage of the abnormal load.

## **A1.5.7.11 Temporary traffic control facilities**

- a) General**
- b) Channelization devices**
- c) Erection of temporary vehicle restraint systems (working width requirements)**
- d) Cleaning of traffic control facilities**
- e) Flagmen and traffic controllers**
- f) Temporary road markings and road studs**
- g) Temporary road signs**
- h) Traffic calming devices**
- i) Traffic control measures**
  - Day time traffic control for short deviations**
  - Day time traffic control for long deviations**
  - Night time traffic control**
  - Traffic control on side roads**

## **A1.5.7.12 Traffic safety officer**

The Contractor shall appoint **a knowledgeable, experienced and conscientious person** as his traffic safety officer who shall be responsible for the arrangements and maintenance of all accommodation of traffic measures required for the duration of the contract. The Contractor shall submit details of the person's qualifications, training and experience to the Engineer for comment before appointing him.

The traffic safety officer shall be able to communicate in the languages of the area and **shall be a dedicated official who shall have no other responsibilities on site unless permitted otherwise on small projects in the Contract Documentation or by the Engineer.**

**The traffic safety officer shall be equipped with a dedicated vehicle and a cellular telephone and shall have sufficient labour and a Traffic Safety Vehicle, as specified in Clause A1.5.6.2, at his disposal 24 hours a day.**

The traffic safety officer shall always have a direct line of communication with the police and traffic officers responsible for the area within limits of the contract and shall be responsible for maintaining liaison with them in accordance with the requirements given in Clause A1.5.7.7.

## **The traffic safety officer shall:**

- **Ensure that all the Contractor's personnel, all the Engineer's site staff and all visitors are wearing approved, clean safety jackets when they are on the site of the Works;**
- **be responsible for keeping the temporary traffic accommodation requirements up to specification;**
- **set out and record the position of each sign, barricade, delineator, cone, amber flicker light, guardrail and permanent or temporary painted road marking feature and every other traffic control facility;**
- **take digital photographs and/or video footage of the full extent of the traffic accommodation arrangements;**
- **inspect the position and condition of each traffic accommodation feature on the site of Works twice per shift;**
- **record all irregularities discovered and the remedial action taken and then date and sign the record sheets;**
- **collate and submit the daily labour returns of flagmen, stop/go, and traffic signal control personnel employed and the open/close periods and traffic count data recorded at each traffic control point;**
- **exercise control in terms of traffic safety over the safe movement of personnel, visitors and plant on site;**
- **ensure that all road signs, delineators, barrier reflectors and traffic cones are always kept clean and visible;**
- **attend to the training and performance of flagmen and all other personnel involved in the control of traffic;**
- **attend to all complaints and claims from the public with respect to traffic safety and report on such matters;**
- **ensure that all obstructions that are caused by Contractor's vehicles, equipment, materials and tools or other objects related to the work activities are removed out of and away from the trafficked area and**
- **arrange for the removal of stationary or broken down vehicles off the roadway.**

## **A1.5.8 WORKMANSHIP**

**The Contractor shall implement a process control system which shall ensure that all traffic control facilities and signs are erected in the correct position and are regularly maintained and kept clean.**

**The Contractor's process control system shall also ensure that all safety personnel are correctly trained and that they are carrying out their duties correctly.**

# **PART C: MEASUREMENT AND PAYMENT**

## **(ii) Items that will not be measured separately**

**The following required activities will not be measured or paid for separately and the Contractor shall include the cost thereof in other items as deemed appropriate:**

- Removal of any material that is driven onto or spilt .....,**
- the provision of lighting for construction access and exit points during night work ...,**
- the provision of the flashing amber lights / light bars and “Construction Vehicle” warning boards .....,**
- The provision of safety clothing, warning flags .....,**
- the cleaning, repair or replacement of traffic control facilities damaged .....,**
- Replacement of stolen traffic control facilities .....**

**(iii) Items to be measured and paid for using items specified elsewhere in the Specifications**

**For activities shown in Table C1.5-1 payment items specified in other chapters or sections of the Specifications, where they relate to work under this section, will be listed in the Pricing Schedule.**

**Table C1.5-1: Items from other chapters or sections**

<b>ACTIVITY</b>	<b>SECTION A1.5 CLAUSE REFERENCE</b>	<b>SECTION – ITEM REFERENCE</b>
<b>IDENTIFICATION, PROTECTION AND RELOCATION OF EXISTING SERVICES</b>	A1.5.3.11	SECTION C2.1 - ITEMS C2.1.1 & C2.1.2

**Table C1.5-1: Items from other chapters or sections**

ACTIVITY	CLAUSE REFERENCE	SECTION – ITEM REFERENCE
IDENTIFICATION, PROTECTION AND RELOCATION OF EXISTING SERVICES	A1.5.3.11	C2.1.1 & C2.1.2
TEMPORARY DEVIATIONS	A1.5.5.1	CH 1, 3, 4, 5, 9 & 10
TEMPORARY CULVERTS	A1.5.5.2	C3.2.1 TO C3.2.24
<b>TEMPORARY ROAD RESTRAINT SYSTEMS</b>	<b>A1.5.5.3 &amp; A1.5.6.1</b>	<b>C11.4.1 TO C11.4.15</b>
TEMPORARY FENCING AND GATES	A1.5.5.4	C11.5.1 TO C11.5.10
<b>TEMPORARY ROAD SIGNS</b> AND REMOVAL, STORAGE, COVERING AND RE-ERECTING EXISTING ROAD SIGNS	A1.5.5.5 & A1.5.6.1	C11.6
TEMPORARY ROAD MARKINGS AND ROAD STUDS	A1.5.5.6	C11.7.1 TO C11.7.10



#### **(iv) Items specifically for this section of the Specifications**

**12 payment items, most of them with several sub-items, are provided to cover all aspects of the work involved in accommodating vehicles, non-motorised vehicles and pedestrians who need to passing through the site of the Works.**

**A number of “month” items rather than “lump sum” and “km” items**

## **PART D: GUARANTEES AND COMPLIANCE CERTIFICATES**

### **D1.5.1 SCOPE**

**The product quality and safety compliance certificates mentioned in Clauses A1.5.5 and A1.5.6 shall be provided if requested by the Employer or the Engineer.**

**THANK YOU FOR YOUR ATTENTION**