

## 2. SAFETY ADMINISTRATION

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This chapter informs the Surveyor of his legal responsibilities with regards to safety on site, specific guidance on Traffic Accommodation for different types of roads and varying traffic volumes.

### 2.1. Safety and environment

#### 2.1.1 Occupational Health and Safety (OHS) Act, Act No. 85 of 1993

In addition to the Surveyor having to fully comply with this document in all respects, the Surveyor shall at all times comply with the Occupational Health and Safety Act, Act No. 85 of 1993 (as amended). The Surveyor remains fully responsible for the health and safety of his employees and road users.

In the context of a survey project the Surveyor shall indemnify the Client against each and every liability which the Client may incur to any other person and against the adverse effects of any claims, including claims by third parties, where such claim is restricted to that claim that would arise from a breach by the Surveyor of the OHS regulations.

Section 37(1) and (2) of the Occupational Health and Safety Act states as follows:

*“37. Acts or omissions by employees or mandatories –*

- (1) Whenever an employee does or omits to do any act which it would be an offence in terms of this Act for the employer of such employee or a user to do or omit to do, then, unless it is proved that-*
  - i) in doing or omitting to do that act the employee was acting without the connivance or permission of the employer or any such user;*
  - ii) it was not under any condition or in any circumstance within the scope of the authority of the employee to do or omit to do an act, whether lawful or unlawful, of the character of the act or omission charged; and*
  - iii) all reasonable steps were taken by the employer or any such user to prevent any act or omission of the kind in question, the employer or any such user himself shall be presumed to have done or omitted to do that act, and shall be liable to be convicted and sentenced in respect, hereof; and the fact that he issued instructions forbidding any act or omission of the kind in question shall not, in itself, be accepted as sufficient proof that he took all reasonable steps to prevent the act or omission.*
- (2) The provisions of subsection (1) shall mutatis mutandis apply in the case of a mandatory of any employer or user, except if the parties have agreed in writing to the arrangements and procedures between them to ensure compliance by the mandatory with the provisions of this Act”.*

Klass Looch Associates, Occupational Health and Safety legislation consultants, have published an article in April 2009 on the internet which stated:

*“A typical section 37(2) agreement can contain anything as long as the Surveyor (contractor) is able to perform and it’s not against the good morals of society (contro bonos mores).*

*Compliance with the provisions of the OHS Act must always be a requirement. The Client can add its own in-house procedures.*

*Once the Surveyor (contractor) signs a written agreement it becomes a lawful enforceable OHS contract and breach will have the same consequences as breach of any other lawful contract”.*

Refer to **Annexure 26** for a typical example of an agreement between the Surveyor (contractor) and the Client in terms of section 37(2) of the OHS Act.

This example may be altered to suit the Clients’ specific requirements.

The Surveyor shall also comply with the following:

- a) Under no circumstances may a vehicle cross the median of a dual carriageway road; and
- b) The Surveyor must ensure that his personnel are equipped with reflective safety jackets and that these are worn at all times whilst working on or near the road. Any person found not wearing a reflective jacket may be removed from the site until such time as he is in possession of and wearing such a reflective jacket. Reflective safety jackets must be kept in good and clean condition and jackets that are, in the opinion of the Client, ineffective must be immediately replaced with a new jacket by the Surveyor.

#### 2.1.2 General requirements for the Traffic Accommodation on roads and streets

The Surveyor shall be guided by the latest edition of the South African Road Traffic Signs Manual (SARTSM).

At the time of publishing this version of TMH11, the Surveyor must refer to the June 1999 edition of SARTSM and in particular Volume 2 and Chapter 13. This can be obtained from the Government Printing Works.

The Surveyor must also comply with the following:

- a) The Surveyor shall at all times have the following available on site:
  - i) Site safety officer;
  - ii) A suitably stocked first aid box according to General Safety Regulations (GSR 3(2)) where more than five (5) employees are employed on a road survey or other dangerous survey sites;

- iii) A suitably trained and appointed first aid person according to General Safety Regulations (GSR 3(4)) where more than ten (10) employees are employed;
  - iv) Completed risk assessment schedule for all activities on site;
  - v) Safe work procedures for all activities on site;
  - vi) Proof that relevant training has been provided to all staff including OHS Act specified induction training, training in the risk assessments and safe work procedures; and
  - vii) Proof that the necessary personal protective equipment has been issued.
- b) The following requirements shall apply to the field operations:
- i) Work to be scheduled so as to avoid traffic congestion; and
  - ii) In exceptional cases survey work to be undertaken on Saturdays and Sundays or at night so as to avoid traffic congestion. This is especially relevant in major cities.

### 2.1.3 The survey work

The Surveyor shall be responsible for accommodating traffic whenever surveys are undertaken within a Road Reserve. Traffic shall be accommodated in accordance with the specifications of the South African Road Traffic Signs Manual (SARTSM), Volume 2, Chapter 13, and any applicable Occupational Health and Safety (OHS) Act requirements where the objective of causing the least delay to and disruption of traffic is achieved.

The Surveyor shall always bear in mind the public's right to enjoy the use of the road conveniently and safely and shall be courteous and sympathetic in any discussions or interaction with road users or other contractors working on the roads.

The Surveyor shall submit and have the Client's approval of a programme for the accommodation of traffic in each instance where traffic is encountered and may not commence with surveying activities until full compliance with all requirements has been achieved.

The Surveyor may subcontract the Traffic Accommodation procedures and work provided that such subcontractor is approved by the Client. The subcontractor shall fully comply with all the requirements as specified in this document.

It is again recorded that the Surveyor and/or his subcontractor must have all the necessary equipment available on site as stated in the paragraph headed "General Requirements for Traffic Accommodation on roads and streets". It be noted that this list should not be regarded as exhaustive.

#### 2.1.4 General restrictions

The following general restrictions shall apply:

- a) Under normal conditions this work shall only be carried out between 07h00 and 18h00, Mondays to Fridays, unless otherwise arranged. These conditions may be subject to further restrictions imposed by the Client due to peak traffic hours on public and school holidays or due to reduced visibility, etc.
- b) Traffic Accommodation shall be limited to a 1 kilometer stretch of road only.
- c) Traffic may only be diverted from the right hand side yellow or white lane and only to such an extent that the traffic can remain contained within the traffic lane affected. Only with the prior written approval of the Client may a lane be closed off completely.

#### 2.1.5 Programme

In the case of National Roads, the Surveyor must inform the Routine Road Maintenance Manager of this programme, provided that the Client has first approved the Surveyor's Traffic Accommodation Programme.

It is again emphasized that no survey work may commence until all requirements as specified in this document, the OHS Act and the SARTSM have been fully complied with.

#### 2.1.6 Safety and the suspension of work

Failure by the Surveyor to provide and maintain Traffic Accommodation as defined in this document shall be sufficient cause for the work to be immediately suspended. Only on full compliance by the Surveyor with the above named requirement may work be re-started provided further that the Client's approval to do so has been confirmed. Penalties, if applicable, may be imposed.

#### 2.1.7 General requirements for all work undertaken within the Road Reserve

- a) All field staff shall at all times wear reflective jackets.
- b) All field survey vehicles shall display roof mounted rotating or flashing amber lights at all times
- c) All survey vehicles shall be equipped with a sign on the back of the vehicle displaying "survey vehicle".
- d) Except for the high visibility vehicle, no survey vehicle shall be parked on the Road Surface or on the Road Shoulder
- e) Headlights must be on when a survey vehicle is in motion.

**Note: A law enforcement officer or any other person authorized by the Client may instruct the Surveyor to immediately suspend all survey work in the event that the above requirements have not been fully met.**

## **2.2. Traffic Accommodation requirements for road surveys**

### 2.2.1 General

- a) Chapter 13 of Volume 2 of SARTSM shall be the reference manual for accommodating traffic. In addition specific requirements for certain surveys may be imposed.
- b) Four different work patterns are defined as follows:
  - i) Survey work which extends across the entire Road Prism on a continuous basis including the space 5m beyond the Road Prism;
  - ii) Survey work restricted to the “Road Shoulder” including the space 5m beyond the Road Prism ;
  - iii) Survey work restricted to the space 5m beyond the Road Prism ; and
  - iv) Survey work which extends across the entire Road Prism including the space 5m beyond the Road Prism and where such work is for short durations.
- c) The 300m Work Zone in the context of this Chapter is defined as follows:

In order to meet the DTM height accuracy requirements, 'spot shots' shall be restricted to a maximum distance of 150m from the instrument station i.e. survey control work stations shall not be more than 300m apart.

### 2.2.2 Low volume traffic on Single Carriageway roads i.e. roads with less than 100 vehicles per hour

- a) Definition and requirement
  - i) Low volume traffic roads are defined as roads with less than a total of 100 vehicles per hour counted in both directions.
  - ii) A minimum of four flagmen and two sign boards displaying “workmen next 500m” shall be provided.

- b) Protecting the Work Zone on the Road Surface and Road Shoulder and the area up to 5m from the road prism edge (Refer to **Annexure 2**)

- i) Phase 1 – Prior to Commencement of Survey Work:

The sign board displaying “Workmen next 500m” must be placed on the paved Road Shoulder or just off the road edge on both sides of the road and 300m on either side of the survey instrument position.

- ii) Phase 2 – During Survey Work:

- Position flagman No. 1: 20m behind the survey assistant and facing in the direction of the traffic;
- Position flagman No. 2: at 50m beyond flagman No. 1 and facing the oncoming traffic;
- Position flagman No. 3: on the opposite side of the road 20m in front of the survey assistants and facing the oncoming traffic;
- Position flagman No. 4: at 50m in front of flagman No. 3 and facing the oncoming traffic;
- Flagmen 1, 2, 3 and 4 must at all times maintain these distances and must move with the survey assistants as the survey progresses; and
- More flagmen should be employed in dangerous areas such as sharp curves, steep inclines (road passes) etc.

- iii) Further Phases

When moving to the next Work Zone phases 1 and 2 above must be reinstated and carried out as described above.

- c) Short periods of static work

This applies to static work on the Road Prism and also to within 5m outside of the Road Prism (Refer to **Annexure 3**).

- i) Position flagman No. 1: approximately 20m from the working area. Position flagman No. 2 at 30m behind flagman No. 1. Both must face oncoming traffic;
- ii) Position flagman No. 3: at 75m behind flagman No. 2 where he faces the oncoming traffic;
- iii) Position flagman No. 4: at 30m in front of the working area in the Road Shoulder opposite to where the work is being carried out and facing the oncoming traffic; and

- iv) Position three (3) cones, 10m apart, so as to demarcate the working area. The middle cone must be opposite the middle of the working area. The cones shall be located in a safe position and must not obstruct the traffic.

d) Surveying on the Road Shoulder (Refer to **Annexure 4**)

- i) Position flagman No. 1: approximately 20m behind the survey assistant located closest to the oncoming traffic;
- ii) Position flagman No. 2: at 50m behind flagman No. 1;
- iii) Position flagman No. 3: on the opposite side of the road 30m in front of the furthest located survey assistant; and
- iv) All flagmen to face the oncoming traffic.

When moving to the next Work Zone phases 1 and 2 above must be reinstated and carried out as described above.

e) Surveying whilst driving with a GPS mounted on a vehicle

- i) With the vehicle moving during these surveys, limited Traffic Accommodation, as described below is required.
- ii) These surveys must be undertaken at predetermined offsets as instructed by the Client. Driving on the centre line is prohibited.
- iii) The vehicle used to undertake this survey must display a high visibility sign (which must first be approved by the Client), have a roof-mounted rotating amber light and the vehicle's headlights must be on.

2.2.3 Medium and high volume traffic on Single Carriageway roads i.e. roads with more than 100 vehicles per hour

a) Definitional requirements

- i) Refer to the paragraph above where the four work patterns are defined.
- ii) Medium and high volume traffic roads are defined as roads with more than a total of 100 vehicles per hour counted in both directions.

b) Specific applications

- i) Establishment of Permanent Survey Control:

- Beacon building, co-ordinated outside of the Road Prism – requirements in terms of paragraph 2.1.7 “General requirements for all work undertaken within the Road Reserve” shall be applicable.
  - Horizontal fixing carried out outside of the Road Prism – requirements in terms of paragraph 2.1.7 “General requirements for all work undertaken within the Road Reserve” shall be applicable.
  - Levelling in the area 5m from the Road Prism – **Annexure 7** in terms of paragraph 2.2.3(e) “Surveying on the Road Shoulder” shall be applicable.
  - Levelling in the area beyond 5m from the Road Prism – requirements in terms of paragraph 2.1.7 “General requirements for all work undertaken within the Road Reserve” shall be applicable.
  - Marking of painted arrows on the road edge of Road Prisms (short duration presence) – **Annexure 6** shall be applicable.
- ii) Staking of Kilometer Markers
- Within the Road Prism and for a short duration – **Annexure 6** in terms of paragraph 2.2.2(c) “Short periods of static work” shall be applicable.
- iii) Topographical and any other surveys
- Within the Road Prism and Road Shoulder– **Annexure 5** and paragraph 2.2.3(c) “Working on the Road Prism and in the area up to 5m from the Road Prism edge” shall be applicable.
  - Within the Road Reserve but in the area beyond 5m from the Road Prism – paragraph 2.1.7 “General requirements for all work undertaken within the Road Reserve” shall be applicable.
- iv) Driving on the Road
- Driving on the road with a mounted GPS – requirements in terms of paragraph 2.2.3(f) “Surveying whilst driving with a GPS mounted on the vehicle” shall be applicable.
- c) Working on the Road Prism and in the area up to 5m from the Road Prism edge
- i) Phase 1 – Protection of the Work Zone when working 150m behind the survey instrument (dual direction traffic) (Refer to **Annexure 5**):
- The survey instrument shall be positioned at point B.
  - A high visibility vehicle, or high visibility trailer as indicated in SARTSM Volume 2, Chapter 13, Figure 13.31 and/or **Annexure 5**, must be parked on the road verge 150m behind the survey instrument position (i.e. off the Road Surface).
  - A signboard indicating “Workmen, next 500m” must be placed on the Road Shoulder (or just off the Road Surface edge in the case of an unpaved Road Shoulder) both sides of the road, 300m on either side of the instrument position and in line with survey instrument positions A or C.

- Position the first flagman 50m behind the high visibility vehicle and facing the oncoming traffic.
  - A further signboard indicating "Workmen, next 1km" must be placed on the paved Road Shoulder (or just off the road edge in the case of an unpaved Road Shoulder) on both sides of the road, 500m on either side of the instrument position.
  - The Work Zone is then protected and the 150m section behind the survey instrument may then be surveyed.
  - Flagmen must be employed to protect the Surveyors.
- ii) Phase 2: - Protection of the Work Zone when working 150m in front of the survey instrument position (traffic in both directions):
- Move the high visibility vehicle or trailer to a position 30m behind the survey instrument.
  - Move the '300m sign board' used in Phase 1 to a position 150m before the instrument (where the high visibility vehicle is parked).
  - Position the first flagman 50m behind the high visibility vehicle facing the oncoming traffic.
  - Proceed to survey the 150m beyond the survey instrument.
  - Flagmen must be employed to protect the Surveyor's assistants.
- iii) Further Phases:
- iv) When moving to the next Work Zone, Phases 1 and 2 above must be reinstated and carried out as described above.
- v) Flagmen protecting the Surveyors and their assistants in Phases 1 and 2:
- Position flagman No. 3: at 20m behind the survey assistants in the direction of the traffic approaching from behind.
  - Position flagman No. 2: at 30m behind flagman No 3.
  - Position flagman No. 4: on the opposite side of the road 20m in front of the Surveyor's assistants in the direction of the oncoming traffic.
  - Position flagman No. 5: at 30m in front of flagman No. 4 in the direction of the oncoming traffic.
  - Flagmen 2, 3, 4 and 5 must at all times keep their distance from each other and must move with the Surveyor's assistants as the survey progresses.
- d) Short periods of static work (Refer to **Annexure 6**)
- i) This applies to work on the Road Prism and also to within 5m outside of the Road Prism.
- Park the high visibility vehicle or trailer on the Road Shoulder approximately 20m from the working area.
  - Position flagman No. 1: at 30m behind the high visibility vehicle.
  - Position flagman No. 2: at 75m behind the first flagman.

- Position flagman No. 3: at 30m in front of the working area in the Road Shoulder of the road opposite to where the work is being carried out facing in the direction of the oncoming traffic.
- Position a minimum of 5 cones, 10m apart, to demarcate the working area. The middle or third cone must be opposite the middle of the working area. These cones shall be placed in safe positions and which do not block the traffic lane.

e) Surveying on the Road Shoulder (Refer to **Annexure 7**)

i) This section relates to Traffic Accommodation for Surveyors moving on the Road Shoulder and anywhere up to 5m outside of the Road Prism, for the purposes of levelling etc.

- Park the high visibility vehicle or trailer on the Road Shoulder of the road approximately 20m behind the survey assistant closest to the oncoming traffic.
- Position flagman No. 1: at 30m behind the high visibility vehicle or trailer.
- Position flagman No. 2: at 75m behind flagman 2.
- Position flagman No.3 on the opposite side of the road 30m in front of the front survey assistant.

ii) This configuration must move with the survey team maintaining the specified distances apart.

f) Surveying whilst driving with a GPS mounted on the vehicle

Refer to paragraph 2.2.2(e) “Surveying whilst driving with a GPS mounted on a vehicle”.