Basic Infrastructure Operations

NTQF Level I

Learning Guide # 37

Unit of Competence: Controlling Traffic with a Stop-Slow Bat
Module Title: Controlling Traffic with a Stop-Slow Bat
LG Code: CON BIO1 M10 LO1-LG37
TTLM Code: CON BIO1 TTLM 1019v1

LO 1: Plan and prepare for work

Instruction Sheet	Learning Guide #37

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Obtain and confirm work instruction
- Applying Safety requirement
- Selecting Tools and equipment's
- Identifying and obtaining traffic management plan
- Applying Environmental protection plan

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Obtain and confirm Work instructions, including plans, specifications, quality requirements and operational details to the allotted task
- obtain Safety requirements from the working place safety plan and organizational policies and procedures, confirmed and applied to the allotted task
- handle Construction materials to be used according to specifications and procedures to be employed are determined
- Select Plant, tools and equipment to carry out tasks are consistent with the requirements of the job.
- Apply Environmental protection requirements identified from the organization environmental management plan,

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information "Sheet 1, Sheet 2, Sheet 3 Sheet 4 and Sheet 5".
4. Accomplish the "Self-check 1, Self-check t 2, Self-check 3 and Self-check 4" **in page -5, 9, 13,19 and 21** respectively.
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 " **in page -.**
6. Do the "LAP test" **in page –** (if you are ready).

Information Sheet-1	Obtain and confirm work instruction

1.1 Importance of Work Instructions

- **Introduction**

  You need to be clear about what work you will be doing. Make sure you have everything about the job written down before you start. This includes what you will be doing, how you will be doing it and what equipment you will be using.

  Make sure you have all of the details about where you will be working, such as information about the site, weather, hazards and traffic conditions.

  You also need to make sure you have all of the details about the kind of work you will be doing. Work instructions for a traffic controller will outline these details and should include guidelines for:

  - Wearing approved high visibility clothing.
  - Use and placement of warning signs.
  - Safe approach speeds up to 60 km/h.
  - Safe distances from approaching traffic and work area.
  - Communication practices.
  - Best positioning for visibility and line of sight.
  - Having a clear escape path.
  - Taking frequent rest breaks to avoid fatigue.
  - Training requirements of anybody performing traffic management.

1.2 Operational details

- **Reduced Visibility**

  Traffic controllers and supervisors should be aware of the dangers faced by road workers as a result of reduced visibility. Reduced visibility on roads can be caused by dust, heavy rain, fog or smoke. At 60km/h, the stopping distance for an average car is 90m assuming level road and reasonable pavement. In situations where visibility is reduced to less than these distances, additional care must be taken by traffic controllers to ensure the safety of themselves and road users.

  Where supervisors have a degree of control over the cause of reduced visibility, such as site-generated dust or burn off, appropriate steps should be taken to avoid the creation of a hazard, or to control the hazard to ensure the safety of road workers. Where there are factors outside the control of the supervisor, such as fog, heavy rain, or bushfires, the supervisor should review the need for the work to be started or continued until visibility conditions have improved.

- **Here are some risk factors**
  - ✓ Operating in and around the active work zone(s)

- ✓ Operating in traffic control or secondary areas that support the work zone
- ✓ Entering and leaving the work zone

- Workers in the roadway are also at risk of injury from a variety of general traffic vehicles Entering the work zone, such as:

  - ✓ drunk drivers
  - ✓ sleepy or impaired drivers
  - ✓ impatient, reckless drivers
  - ✓ drivers using cell phones or other
  - ✓ law enforcement and emergency vehicles
  - ✓ disabled vehicles pulling in and parking
  - ✓ lost drivers looking for directions

1.3 Working at Night

Visibility is greatly reduced at night and your risk of getting injured or even killed increases in the dark. Drivers may be more tired, sleepy, and less attentive

- **Hazards and Problems at Night**
  - ✓ poor visibility
  - ✓ glare off lights
  - ✓ adverse weather conditions
  - ✓ tired drivers
  - ✓ Inattentive workers

- **Protect yourself when you must work at night by doing the following**
  - ✓ Be aware of your surroundings at all times.
  - ✓ Wear high visibility apparel.
  - ✓ Arrange good work area lighting.
  - ✓ Set up proper traffic controls.
  - ✓ Know the traffic flow plan and pattern.

- **Protecting Workers in Work Zones**

  Employers must conduct crew meetings and train all workers on work zone safety. They should discuss potential hazards, equipment blind spots, and movement precautions in the activity area.

Self-Check -1

Directions: Answer the questions listed below. Use the Answer sheet provided in the next page:

1. Before starting work you should be make Shure about **?(3 points)**
   A information about the site C. traffic condition
   B weather D .all
2. Which one of the following is hazardous and problem working at night? **(2 points)**

   A. Poor visibility
   B. Adverse whether
   C. Glare of light
   D. All

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-2	Applying safety requirements

2.1 Safety requirement

Road construction workers on both highways and city streets are at risk of fatal or serious injuries. The majority of road work takes place in congested areas with exposure to high traffic volumes and speeds. Workers may also deal with low lighting, low visibility, and inclement weather conditions. Moving construction vehicles and passing motor vehicle traffic can both cause problems for road construction workers. Workers in temporary traffic control work zones are exposed to injury from construction vehicles and motorized equipment.

The traffic controller is required to be alert while acting in an official capacity. In addition to looking after their own safety and that of the road workers in a hazardous environment, traffic controllers have the responsibility of ensuring the safety of the travelling public, including pedestrians through or around the works area. For these reasons, only competent persons should be appointed as traffic controllers.

A potential hazard confronting the traffic controller is a vehicle that fails to stop, or fails to slow down. Interpretation of the SLOW sign means many things to different motorists and traffic controllers should not assume that motorists will reduce their speed to a speed consistent with the level of safety desired at the worksite.

Caution should also be exercised when standing close to the path travelled by vehicles, as protruding loads can present a hazard, especially if part of the load on the vehicle has moved without the driver's knowledge.

The traffic controller should remain standing at all times while carrying out their duties. This ensures the traffic controller is not unduly restricted if there is a need for evasive action.

Traffic controllers should be mindful to never turn their backs to traffic and to always maintain an escape path.

2.2 How to Keep Everyone Safe

WHS law says that all companies and personnel need to keep themselves and other people safe while they work. This is allied a duty of care. To keeps yourself and other personnel safe you need to:

- ✓ Follow your instructions.
- ✓ Follow all workplace rules.
- ✓ Make sure all equipment is safe to use.
- ✓ Carry out your work safely.
- ✓ Report any problems.

If you think something is dangerous tell your boss or supervisor as soon as possible. Your worksite will also have instructions for working safely including:

- ✓ Emergency procedures, including first aid and evacuation.
- ✓ Safe work practices.
- ✓ Personal protective clothing and equipment.
- ✓ Safe use of tools and equipment.

2.3 Traffic Control and Safety

- **Rules To Follow**

As a road work contractor you are directly responsible for the safety of your workers and the road users. Whenever work is being carried out on or close to the carriageway, adequate measures have to be taken to warn and protect both road users and your workers by ensuring that:

- ✓ The necessary temporary traffic signs and protection are provided and correctly located on site for the duration of the work,
- ✓ All equipment and vehicles are parked off the carriageway or behind protective barriers and signs, when not in use,
- ✓ No material is to be left in a dangerous location and that the road adjacent to the work site is kept clean and swept of any debris arising from the work,
- ✓ All excavations are protected for the benefit of all road users, equipment and workers,
- ✓ All operators are trained in the operation of their equipment,
- ✓ Operators and laborers are informed of the potential risks of and procedures for working with or close to machinery,
- ✓ Traffic control operations are carried out properly and that road users are not unnecessarily delayed,
- ✓ where work on the carriageway or shoulder remains unfinished overnight, then proper warning lights re to be arranged and, if necessary protected,
- ✓ All sites are to be left tidy and cleared of debris when the work is completed.

2.4 Personal Protective Equipment

- Personal Protective Equipment's (PPE) plays a vital role in safety
  - ✓ Depending on the activities involved, PPE is chosen. E g as far as masks are concerned there are different types of masks are available but the right choice depends on the activity for which it is to be selected
  - ✓ Generally there are numerous PPE available out of which prominent PPEs are discussed

- **Head protection**
  - ✓ Falling objects, overhead loads and sharp projections are to be found everywhere on construction sites
  - ✓ Safety helmets protect the head effectively against most of the hazards
  - ✓ Everybody should wear a helmet whenever on site and particularly working in an area where overhead work is going on (Hard-Hat area). This area should be clearly marked with safety signs

Fig 2.1 helmet

- **Hearing protection**

  - ✓ The noise level in some areas on construction sites are often above the level which causes sensory hearing loss to workers in the vicinity
  - ✓ The common form of protection in industry is ear defender consisting of a head band and cup

  There are several types of head bands depending upon helmet attachment

  Helmet muffs and ear plugs can also be used. The reduction in noise level

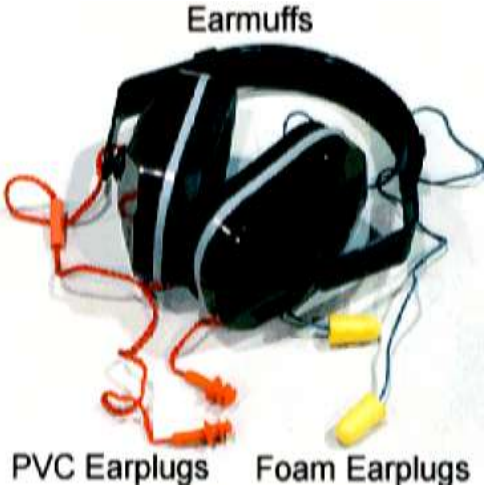


Fig 2.1.2 ear protection

- **Eye protection**

  - ✓ The chances of eye accidents are there in jobs like breaking, cutting, drilling, chipping, dry grinding, welding etc.
  - ✓ While working on these jobs, goggles, safety glasses or shields are the only practical solutions
  - ✓ Wearing of eyewear is readily accepted, as danger from flying particles and dust are obvious to most construction workers
  - ✓ Goggles, face shields and spectacles can also be used against impact, chemicals, molten metal and
  - ✓ gas hazards

Fig 2.1.3 eye protection

- **High visibility**

  High visibility of the workers and equipment's in construction sites is vital

  This has many advantages like:

  - ✓ Preventing accidents
  - ✓ Spotting or location accident victim
  - ✓ Clear identification/separation of the work and equipment

- The high visibility clothing maintain a contrast
  - ✓ They should be of vibrant colors with reflective stripes
  - ✓ All the types of PPE discussed so far are available with high visibility
- Some of the disadvantages of PPE:
  - ✓ Wearing PPE may involve discomfort to the user and slow down the work and reduce efficiency
  - ✓ PPE is costly
  - ✓ But as human life is precious, use of PPE should be mandatory

Self-Check -2

Directions: Answer the questions listed below. Use the Answer sheet provided in the next page:

1. ----------is protect head from falling objects **(3 points)**

   A .glove C. goggle

   B helmet D .none

2. What is advantage of high visibility cloth? **(2 points)**

   A. Protecting accident
   B. Locate accident victim
   C. Clear identification of the work and equipment
   D. All

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-3	selecting Tools and equipment

3.1 Choose and Check Tools and Equipment

Once you have confirmed your job requirements you need to choose the right equipment to get the job done. Information about technical capabilities and limits can be found in the operator manuals for each item. When choosing equipment you need to think about:

- ✓ The task requirements, specifications and goals.
- ✓ The appropriateness of the equipment for the completion of the task.
- ✓ The characteristics, correct use, operating capacity and limitations of each item.
- ✓ The potential risks to yourself and others in the intended use of the equipment.

3.2 Signs and Warning Devices

The Traffic Management Plan should state the types, sizes and numbers of signs and devices required for the project.

- Signage and warning devices required at all sites are:
  - ✓ Temporary warning signs.
  - ✓ Regulatory and traffic cones.

Temporary warning signs are used to alert the public of changed conditions ahead, for example: Roadwork ahead; Prepare to stop; Workers (symbolic).

- Other signs and devices that may be used depending on the work include:

- ✓ Warning signs.
- ✓ Vehicle mounted signs and flashing lights.
- ✓ Guide signs.
- ✓ Barriers.
- ✓ Hazard markers.
- ✓ Bollards.
- ✓ Arrow boards.

- **Traffic Controller Signs**

Whenever a traffic controller is on duty, the "Traffic Controller Ahead – PREPARE To stop sign must be displayed.

A traffic controller is responsible for making sure the "Traffic Controller Ahead –PREPARE TO STOP" sign is set up correctly when the shift begins or resumes and also making sure the sign is removed or covered when work ceases or is suspended during a shift.

- **Cones**

Traffic cones are generally used on short-term works to define the traffic path past or around the work area. Various sizes are available for different situations such as footpaths or freeways.

Fig 2.1.4 cone

- **Stop-Slow Bat**

An essential item of equipment for a traffic controller is the stop-slow bat. This is a double-sided hand held sign with STOP on one side and SLOW on the other. The handle should be a minimum of 1.8m long.

Traffic control bats should be made of retro-reflective material, clean and in good repair. Damaged or defaced bats should be repaired or replaced promptly. For night operations, an illuminated wand should be used as well as the bat.

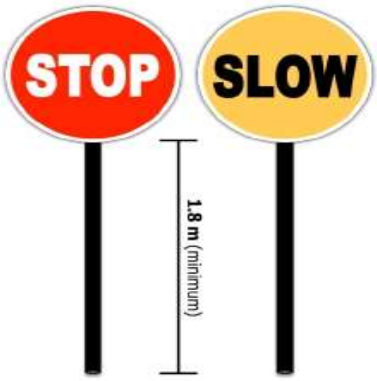


Fig2.1.5 stop slow bat

- **TCP SIGNALS**

1. To Stop Traffic –

The TCP will stand outside the traffic lanes, and in a stationary position while facing traffic, extend the STOP sign over the traffic lane. Hold the STOP sign in a vertical position at arm's length. For greater emphasis, the free arm may be raised with the palm toward approaching traffic.

Fig 2.1.6 stop bat

2. When it is Safe for Traffic to Proceed –

The TCP shall face the traffic, and with the SLOW sign held in a vertical position, motion traffic ahead with the free arm.

Fig2.1.7 slow bat

- **SLOW sign**

Where it is desired to Alert or Slow Traffic –

The TCP shall face traffic and hold the SLOW sign in a vertical position at arm's length. For added emphasis, the TCP may slowly raise and lower the free hand with the palm down

Fig 2.1.7 slow sign

- **Radio**

Situations can arise at worksites where traffic controllers may need to use radios to ensure adequate communication over long work lengths, or due to limited sight distances.

If the work is to occur over a long period of time, the capacity of the battery in the radio should be carefully monitored. When using hand-held radios, traffic controllers should ensure that the standard of hand signals in support of the STOP/SLOW bat is not adversely affected

Fig2.1.8 radio

A neck or shoulder strap, attached to the radio, should be used to maintain a free hand for signaling. It is not recommended to use two-way radios operating on CB (citizen band) frequencies, as interruptions or interference may be caused by other operators using the same frequency.

Fig 2.1.9 using radio

Self-Check -3

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. ---------- is used to define the traffic path part or around the work area **(3points)**

   A .stop low bat C. barrier

   B. traffic cone D .none

2. ----------Is a double sided hand held sign? **(2 points)**

   A cone

   B. stop low bat

   C. barrier

   D. All

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-4	Identifying and obtaining traffic management plan

4.1 Work place traffic management

4.1.1Traffic management plan

- Depending on circumstances, movement of traffic may be achieved in one of the following ways:-

✓ Through the work area by intermingling with workers or plant.

✓ Pass the work area by means of a delineated path alongside but clear of the work area.

✓ Around the work area by a detour which may be via a side track or an existing road

4.1.2Safety and convenience

In order to achieve minimum disruption and inconvenience to road users only the minimum practicable length and width of a road shall be closed off at any time. Adequate provision shall be made for capacity requirements.

Work schedules shall be arranged to minimize:-

✓ Disruption of established traffic movements and patterns;

✓ Interference with traffic at peak movement periods and at night, weekends, holly day's period s or other special events;

✓ Interference with public transport services.

The traffic guidance scheme shall provide for the safety of workers. Where they are not applicable during the work period, regulatory signs may need to be removed or covered. Regulatory pavement markings likewise may need to be either obliterated or traffic control measures employed to direct traffic along paths which might otherwise infringe the regulatory requirements of the markings.

4.1.3Traffic through the work area

Passage of traffic through a work area shall only be permitted where both the traffic and the work can be adequately controlled. Traffic controllers or traffic signals shall be employed as necessary to slow traffic on the immediate approach to an active work area, to stop traffic for short periods when required for the movement of plant or other operations, or to control single line flow. A pilot vehicle may be required to lead traffic along the desired path and to control its speed. Controllers shall also be provided if necessary to control the movement of plant with in the trafficable area.

4.1.4Traffic past the work area

This will be the normal method of traffic management at sites where complete elimination of traffic from the site is not required. Traffic paths past the work area shall be clearly delineated. At long term works, if the travel path substantially deviates from normal, as far as practicable, original pre works

delineation including pavement markings and raised pavement marker(RPMs) shall be obliterated if they are likely to misdirect drivers negotiating the site.

4.1.5Traffic around the work area (side-tracks and detours)

When it is not practicable to allow traffic through or past the work area, it may be created by for means of either a detour using existing roads or a specifically constructed side-track.

4.1.5 Night conditions

Where work at a site extends for more than a single day or is to be performed at night the following requirements and recommendations for operating or securing the site at night apply:-

- **General**

The following requirements and recommendations apply to all night – time road closures whether or not workers or plant are on site:

- ✓ Wherever practicable, any part of the normal roadway which is closed and can be opened at night, should be opened if, by so doing, either travel conditions or safety, or both for night traffic, can be improved.
- ✓ Temporary traffic route lighting a works site may be required in high-volume, high – speed rural areas if there is substantial deviation of travel path from normal, and in urban areas where the path through the site could be difficult to follow. The existence of extraneous lighting, especially glare sources, should be taken into account when assessing the need for temporary traffic route lighting.
- ✓ Uncontrolled single lane operation shall not be permitted except for very short lengths in special circumstances e.g. in residential streets. The need for lighting should be considered. If single lane operation is required at night, the preferred method is to use portable or temporary fixed traffic signals. Traffic controllers should only be used as a last resort and then, only if their position can be adequately floodlit.
- ✓ Signs and devices shall be provided in accordance with the relevant code or standard.
- ✓ Illuminated flashing arrow signs and similar devices having light emitting elements should be dimmed for night use where necessary to avoid glare.

4.1.6 Work in progress at night

The following requirements and recommendations applicable to works being carried out at night are additional to those given in Item (a).

- Lighting at a work site shall, as a minimum requirement, illuminate the following areas:-
  - ✓ The work area.
  - ✓ Any locations where workers or plant might encroach on traffic lanes.
  - ✓ Intersections in which works are taking place.
  - ✓ Any traffic controller positions, noting item

- *Wherever practicable it is recommended that the entire work area and immediate approach be lit.*
  - ✓ Flood lighting is recommended as traffic route lighting levels will not normally be adequate for an active work site.
  - ✓ Steps should be taken to ensure that floodlighting does not produce glare sources for approaching drivers.
  - ✓ The adverse environmental effects of high lighting levels close to residential property should be considered.
  - ✓ Dimming controls on illuminated flashing arrow signs and matrix type variable message signs should be checked for correct operation.

4.1.7 Provision for pedestrians and bicycles

Where pedestrians including people with disabilities have to move through, past or around a work site or to cross the road within a work site, they shall be provided with and directed to suitably constructed and protected temporary footpaths and crossing points, or formal pedestrian crossings, or refuges if warranted.

Bicycle or shared paths separate from vehicular traffic paths should be provided through, past or around the work area whenever there is a bicycle demand and the volume of vehicles or bicycles, or both, is too great for bicycles to be safely accommodated within vehicular traffic paths. Bicycle paths, where provided, shall be at least 1.2 m wide, one–way, or 2.0m wide, two–way. Shared paths where provided, shall be at least 2.0 m wide, one-way or 3.0m wide, two-way. Both shall have an alignment and surface condition suitable for riding.

4.1.8 Temporary footpaths and pedestrian crossing

Where footpaths or pedestrian crossings have been temporarily relocated, requirements and recommendations for the temporary facilities are as follows:

- The unobstructed width at local constrictions shall be not less than 1.0 m. elsewhere, a width of at least 2 m should be provided.
- Where pedestrian traffic has been diverted onto an existing roadway the pedestrian path may be separated from vehicular traffic by a mesh fence, provided that –
  - ✓ The clearance to the delineated edge of the traffic lane is at least 1.2m and the speed limit is 60 km/h or less; or
  - ✓ The clearance to the delineated edge of the traffic lane is less than 1.2 m and the speed limit is 40 km/h or less.
- Where these requirements cannot be met or where observance of the speed limit is likely to be poor (85th Percentile speed more than 10 km/h above the speed limit) a safety barrier shall be provided.
- Surfacing shall provide for prams, strollers and wheelchairs, and for the visually impaired.
- Lighting shall be not less than the level provided on the original footpath or crossing. Lighting shall be provided if the associated works reduce either the site distance to, or the prominence of, the crossing.
- Crossings shall be located as near as practicable to established pedestrian routes, and shall be to the same standard as regards width and surface smoothness as the crossings they replace, including provisions for the

visually impaired. Crossings should be signalized if the crossings they replace were signalized

4.2 Methods of traffic control

- **Manual Traffic Control**
  Manual traffic control becomes necessary when work zones are at high traffic locations and signalized intersections. Trained police officers and certified flaggers provide manual traffic control. Traffic Control Persons / Flaggers should be utilized before needing Police Control.
- **Police Control**
  Police control is required at busy intersections when the lanes of travel have been reduced or when the traffic signal cannot be operated due to the construction activity. Police officers can visually assess conditions and direct traffic accordingly. On-duty police officers are only available for use during emergency conditions. Request for police control must be made through Regina Police Services
- **Traffic Control Persons / Flaggers**
  If traffic congestion warrants or if Traffic Branch determines it necessary, the contractor Shall provide Traffic Control Persons (TCP).
- **TCP are required where**
  Workers or equipment intermittently block a traffic lane and there is only one remaining lane for both directions of travel to use; and A higher level of safety is deemed necessary

  TCP are responsible for directing traffic through work zones, protecting the workers from traffic dangers and addressing motorists' work zone concerns. TCP are provided at work areas to stop traffic intermittently as required by work progress or to maintain traffic flow past a work area at reduced speeds to help protect the workers. For both of these functions, TCP must be clearly visible to approaching motorists for a distance sufficient to permit proper response by the motorist All TCP shall wear Personal Protective Equipment (PPE) at all times when directing traffic. PPE, such as safety vests, hard hats, and steel toe work boots, are required at all job sites

4.3 Necessary tools and equipment’s

- STOP/SLOW paddle
- Two way radio when visibility is restricted between TCP
- Horn or whistle (optional item)
- book and pencil for recording traffic violations
- Suitable outerwear for prevailing conditions (rainwear)

4.4 Tcp Rules To Follow

- TCP must be stationed far enough from the work area to slow down or stop traffic before they enter the work area. All warning signs shall be placed well in advance of the TCP and flagging stations shall be adequately protected.
- TCP shall take a position so that the motorist's vision of the TCP is not impaired by curves, hills, parked vehicles, traffic control signs or delineators. No vehicles shall be parked less than 15 meters in front of the flagging station.
- TCP shall stand alone, and shall not mix with other workers. TCP should be relieved periodically, where possible every two hours, during the course of work; rest breaks are important to maintain effective flagging operations.

- **TCP Shall Not:**
  - ✓ Wave the paddle to stop or move traffic
  - ✓ Leave the flagging station unattended or mix with the crew. The safety of both the work crew and motorists depends on being easily seen at a safe distance from other workers
  - ✓ Leave the STOP/SLOW paddle standing on a post, acting as a STOP or SLOW sign
  - ✓ Leave a vehicle or other obstruction near the flagging station as this may cause a distraction and prevent a quick exit in an emergency
  - ✓ Wear headphones while on duty
  - ✓ Sit down at the flagging station

Self-Check -4

Directions: Answer the questions listed below. Use the Answer sheet provided in the next page:

1. The traffic guidance scheme provide for the safety of worker. **(3points)**

   A .True B. False

2. Passage of traffic through a work area shall only be permitted where both the traffic and the work can be adequately controlled? **(2 points)**

   A .True B. False

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-5	Applying environmental protection

5.1 Environmental protection policies

- Relevant principles of this act, which could impact on the contract, include:
  - ✓ That pollution and degradation of the environment must be avoided or, where they cannot be altogether avoided, are kept to a minimum and corrected.
  - ✓ The waste is avoided, or where it cannot be altogether avoided, minimized.
  - ✓ The negative impacts of the contract, on the environment and the people in the environment, are prevented and where they cannot be altogether prevented, are kept to a minimum and corrected.

5.2 Environmental protection requirements

- Relevant principles of this act, which could impact on the contract, include:
  - ✓ That pollution and degradation of the environment must be avoided or, where they cannot be altogether avoided, are kept to a minimum and corrected.
  - ✓ That waste is avoided, or where it cannot be altogether avoided, minimized.
  - ✓ That negative impacts of the contract, on the environment and the people in the environment, are prevented and where they cannot be altogether prevented, are kept to a minimum and corrected.

Self-Check -5	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. That pollution and degradation of the environment must be avoided. **(2 points)**

   A .True B. False

2. The waste of material should place in working area? **(2 points)**

   A .True B. False

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Reference

- ✓ Building Rural Roads, Bjorn Johannessen
- ✓ SADC Guideline on Low-volume Sealed Roads
- ✓ Quality Assurance Handbook for Rural Roads, Volume I & II, National Rural Roads Development Agency, India
- ✓ Contractor's Handbook, Roads Training School, Zambia
- ✓ Guideline for Quality Assurance Procedures and Specifications for Labor-Based Road Works
- ✓ "Design and Appraisal of Rural Transport Infrastructure: Ensuring Basic Access for Rural
- ✓ "Overseas Road Note 1: Maintenance Management for District Engineers (2nd Edition)",
- ✓ Transport and Road Research Laboratory, UK, 1997
- ✓ "Overseas Road Note 2: Maintenance Techniques for District Engineers (2nd Edition)",
- ✓ Transport and Road Research Laboratory, UK, 1997
- ✓ "Gravel Roads, Maintenance and Design Manual", US Department of Transportation, Federal
- ✓ Highway Administration, 200
- ✓ Rural Road Maintenance Handbook, TRANSPORT PUBLISHING HOUSE Ha Noi-2003

Basic Infrastructure Operations

NTQF Level I

Learning Guide # 38

Unit of Competence: Controlling Traffic with a Stop Slow Bat
Module Title: Controlling Traffic with a Stop-Slow Bat
LG Code: CON BIO1 M10 LO2- LG-38
TTLM Code: CON BIO1 TTLM 1019v1

LO 2: Coordinate Traffic

Instruction Sheet	Learning Guide #38

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Temporary traffic sign and barriers
- Site traffic plan
- Controlling vehicle and pedestrian traffic
- Monitoring traffic flow
- Using hand held stop or slow bat.
- Using hand signal.
- Reporting and approving traffic offenders

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- confirm temporary traffic signs Position
- Direct site traffic from services or areas of potential damage or danger
- Control vehicles and pedestrian traffic
- Monitor traffic.
- Use hand held stop/slow bats
- Use hand signals
- Report traffic offenders in accordance with regulatory authority approved procedures

Learning Instructions:

1. Read the specific objectives of this Learning Guide.

2. Follow the instructions described below 3 to 6.

3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 Sheet 4, Sheet 5, Sheet 6 and Sheet 7

4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 Self-check 4, Self-check t 5, Self-check 6 and Self-check 7” in page -28, 32, 35,40,43,48, and 50 respectively.

5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, ” in page -36.

6. Do the “LAP test” in page – 51(if you are ready).

Information Sheet-1	Positioning Temporary traffic sign and barriers

1.1 Basic concept of Temporary Warning (TW) signs and Barriers

- **Temporary Warning (TW) signs**

  Temporary Warning signs are used to give notice of conditions that are potentially hazardous to public traffic and workers. They should be used only when such conditions exist and are particularly important when the hazard is not obvious. All traffic control and traffic control devices shall be as specified in the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD). If required by the County, the Project Engineer shall submit temporary traffic control plans for review and approval.

  During the progress of the work, barriers and warning signs shall be erected and maintained by the contractor as necessary or as directed by the County Engineer for the protection of the traveling public. The barriers shall be properly lighted when necessary.

- **Barriers**

  Traffic barriers keep vehicles within their roadway and prevent vehicles from Colliding with dangerous obstacles. Traffic barriers installed at the road side also prevent errant vehicles from traversing steep (non-recoverable) slopes. Traffic barriers installed at the medians of divided highways are also referred to as median barriers. The latter also prevent errant vehicles from entering the opposing carriageway of traffic and help to prevent head-on collisions.

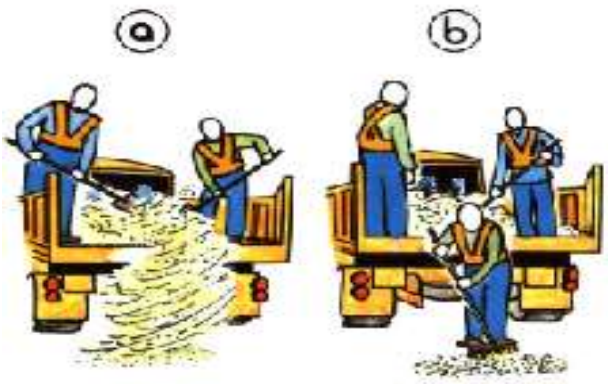
1.2 Temporary Signposting

Traffic signs conforming to the regulations must be correctly placed before starting any work. This is to ensure the safety:

- ✓ of the road users,
- ✓ of the personnel working on the site,
- ✓ of the vehicles and equipment to be used on the site.

The signs are:

- ✓ located on the shoulder on the side of the approaching traffic, 100 m ahead of each end of the road works:
- 1 "Men Working" sign,
- ✓ located along the length of the road works:
- to 10 traffic cones, as required to clearly separate the traffic from the road works.



- ✓ located on the shoulder on the side of the departing traffic, at each end of the site:
- 1 "End of Restriction" signs.
- **Rakes and Spreaders**

- In selecting and positioning temporary road signs, the following principles should be applied:-
  - ✓ Only standard signs should be used,
  - ✓ The signs must be clean and in good condition,
  - ✓ The standard signs should be displayed in a standard layout,
  - ✓ The layout used must give drivers time to understand and respond to the information which the signs convey.

1.3 Need and placement of Traffic barriers

Traffic barriers constitute hazards themselves and should only be used when the obstacle poses a greater threat than the barrier itself. In all cases, roadside hazards must be assessed for the danger they pose to traveling motorists based on size, rigidity and distance from the edge of travel way. For instance, small roadside signs and some large signs (ground-mounted breakaway post) often do not merit roadside protection as the barrier itself may pose a greater threat to general health and wellbeing of the public than the obstacle it intends to protect. In many regions of the world, the concept of clear zone is taken into account when examining the distance of an obstacle or hazard from the edge of travel way. Clear zone also known as clear recovery area or horizontal clearance defined (through study) as a lateral distance in which a motorist on a recoverable slope may travel outside of the travel way and return their vehicle safely to the roadway. This distance is commonly determined as the 85th percentile in a study comparable to the method of determining speed limits on roadways through speed studies and varies based on the classification of a roadway. In order to provide for adequate safety in roadside conditions, hazardous elements, whether they are obstacles or steep slopes can be placed outside of the clear zone in order to reduce or eliminate the need for roadside protection.

Common sites for installation of traffic barrier:

- ✓ Bridge ends
- ✓ Near steep slopes from roadway limits
- ✓ At drainage crossings or culverts where steep or vertical drops are present
- ✓ Near large signs/illumination poles or other roadside elements which may pose hazards

When barrier is needed, careful calculations are completed to determine length of need take into account the aforementioned factors. Specifically, the traffic volumes and therefore, the classification of the roadway in addition to the distance of the hazard from the edge of travel way and the distance or offset of the barrier to be placed or installed from the edge of travel way. It is the case in current times, that barrier or rail that is to be used in construction and maintenance operations has undergone extensive testing in both government and private research facilities in order to determine proper 'crash-worthiness' and effectiveness in conditions which are prescribed for its use. In particular, most roadside protection, whether it be a

concrete barrier or rail, or a metal beam fence will perform properly only when placed in adequate proximity to the travel way so as to prevent vehicle impacts at large (obtuse) angles. The method in which a barrier protects motorists from roadside hazards is in how it dissipates the energy of an impact.

- **Barrier types and performance**

  Traffic barriers are categorized in two ways: by the function they serve and by how much they deflect when a vehicle crashes into them.

✓ **Barrier functions**

Roadside barriers are used to protect traffic from roadside obstacles or hazards, such as slopes steep enough to cause rollover crashes, fixed objects like bridge piers, and bodies of water. Roadside barriers can also be used wide medians, to prevent vehicles from colliding with hazards within the median.

✓ **Median barriers**

Median barriers are used to prevent vehicles from crossing over a median and striking an oncoming vehicle in a head-on crash. Unlike roadside barriers, they must be designed to be struck from either side.

✓ **Bridge barrier**

Bridge barrier is designed to restrain vehicles from crashing off the side of a bridge and falling onto the roadway, river or railroad below. It is usually higher than roadside barrier, to prevent trucks, buses, pedestrians and cyclists from vaulting or rolling over the barrier and falling over the side of the structure. Bridge rails are usually multi-rail tubular steel barriers or reinforced concrete parapets and barriers

✓ **Work zone barriers**

Work zone barriers are used to protect traffic form hazards in work zones. Their Distinguishing feature is they can be relocated as conditions change in the road works. Two common types are used: temporary concrete barrier and water-filled barrier. The latter is composed of steel-reinforced plastic boxes that are put in place where needed, linked together to form a longitudinal barrier, then ballasted with water. These have an advantage in that they can be assembled without heavy lifting equipment, but they cannot be used in freezing weather.

✓ **Barrier stiffness**

Barriers are divided into three groups, based on the amount they deflect when a vehicle and the mechanism the barrier uses to resist the impact forces. In the States, traffic barriers are tested and classified according to the AASHTO Man Assessing Safety Hardware (MASH) standards, which recently superseded Highway Administration NCHRP Report 350 from crash tests with a 2000 a 25 degree angle.

✓ **Flexible barriers**

Flexible barriers include cable barriers. These are referred to as flexible barriers because they will deflect 1.6 m to 2.6 m when struck by a typical passenger car or light truck. Impact energy is dissipated through tension in the rail elements, bodywork and friction between the rail and vehicle.

Self-Check -1

Directions: Answer the questions listed below. Use the Answer sheet provided in the next page:

1. ---------- used to prevent vehicle from crossing over a median and striking vehicle? **(3 points)**

   A. bridge barrier
   B**.** median barrier
   C. for vehicle and equipment
   D. All

2. Temporary sign posting is to be ensure the safety of? **(2 points)**

   A. for the road user
   B. personal working on the site
   C. for vehicle and equipment
   D. All is answer

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-2	directing Site traffic plan

2.1 Directing Site traffic plan

Principles

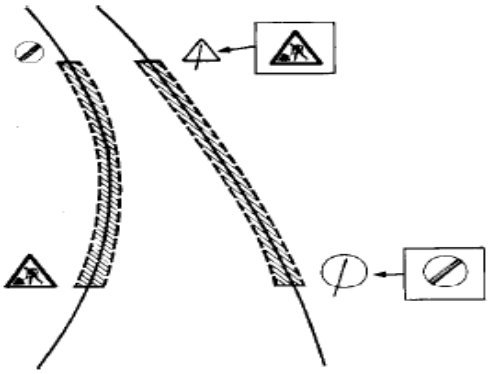
When work is being carried out on or close to the carriageway, it is the Maintenance Engineer's/technician responsibility to see that adequate measures are taken to warn and protect road users and maintenance workers. He should instruct all supervisors and foremen in safety measures, including traffic control, and the use of temporary road signs.

- ***Safety measures***
  - ***Edge-working***

Where road works are being carried out on road edge which do not affect the carriageway, or where works such as grading or dragging are being carried out, the sign layout shown Warning signs should be placed before work starts and must be placed in the following order:

- ✓ 'Men working' signs should be placed at the approaches to the work area.
- ✓ 'Road clear' signs should be placed at the ends of the work area.

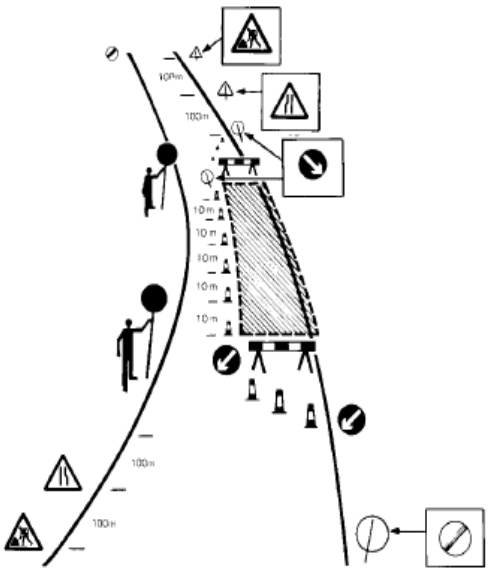
When the work has been completed, signs should be removed in reverse order. Signs must not be left on the road or at the roadside overnight. They should be removed and returned to the depot.



For repairs to the carriageway such as patching which requires closure of one lane the sign layout shown in Fig. below is recommended.

Before work starts, warning signs, barriers and cones must be placed around the work area. Work will be carried out on one side of the road at a time allowing traffic to pass on the other. Signs must be placed in the following order:

a. 'Men working' signs should be placed 200 meters in front of the work area.
b. 'Road narrows' signs should be placed 100 meters in front of the work area.
c. 'Keep left/right' arrows should be placed at the start of the work area.
d. Barriers should be placed at each end of the work area.
e. 'Keep left/right' arrows should be placed next to the barriers.



f. Cones should be placed in a taper at the approaches to the work area and at a spacing of 10 meters along the middle of the road next to the work area.
g. 'Road clear' signs should be placed 200 meters beyond the work area.

Traffic controllers should stand opposite the barriers on the other side of the road holding reversible 'stop/go' signs. One controller should be appointed by the supervisor as the leader. He should decide when to change the direction of the signs and the other controller should follow his lead. In this way, the controllers work closely together to ensure that only traffic from one direction is allowed to pass at a time. When the work area is short, only one traffic controller may be needed. The Maintenance Engineer should train these men in the use of the signs and only the trained men should be allowed to operate them. Police assistance in training may be helpful.

On low traffic roads, the Maintenance Engineer/technician may approve the use of a simpler system of traffic control.

Patching work should not be left unfinished over-night but, if this sign layout is being used for repairs to a culvert or a washout, then at night the approaches must be adequately lit. Kerosene lanterns may be adequate on lightly-trafficked roads or where speeds are low, but high-intensity lamps should, if possible, be used on heavily trafficked roads. A watchman should always be in attendance to ensure that the lamps are working and are not interfered with or stolen. Lamps should show a yellow light. Flashing lamps are best as they consume less power and are more easily seen. When the work has been completed, signs should be removed in reverse order.

- ***Centre Line Working***

When painting center line considerable care must be taken and it is most important to pay a great deal of attention to safety measures. The sign layout shown in Fig. is recommended.

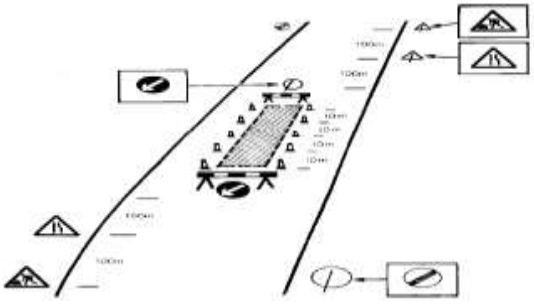
Before work starts, warning signs, barriers and cones must be placed around the work area. They must be placed in the following order:

a. 'Men working' signs should be placed 200 meters in front of the work area at the side of the road.
b. 'Road narrows' signs should be placed 100 meters in front of the work area at the side of the road.
c. 'Keep left' arrows* should be placed in the center of the road at the start of the work area.
d. Barriers should be placed behind the 'keep left' signs.
e. Cones should be placed at a spacing of 10 meters on either side of the work area.
    - Assumes driving on the left.
f. 'Road clear' signs should be placed 200 meters beyond the ends of the work area at the side of the road.

When the work has been completed, signs should be removed in reverse order. Signs must not be left on the road or at the roadside overnight. They should be removed and returned to the depot.

- ***Diversions***

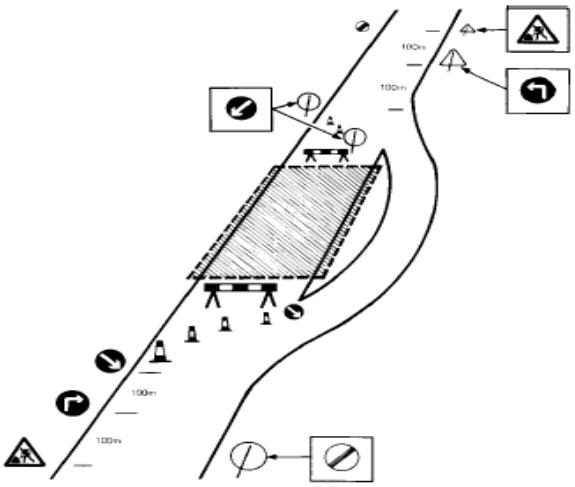
A diversion will enable maintenance work to be carried out more efficiently and more safely. In particular, diversions are needed for re gravelling



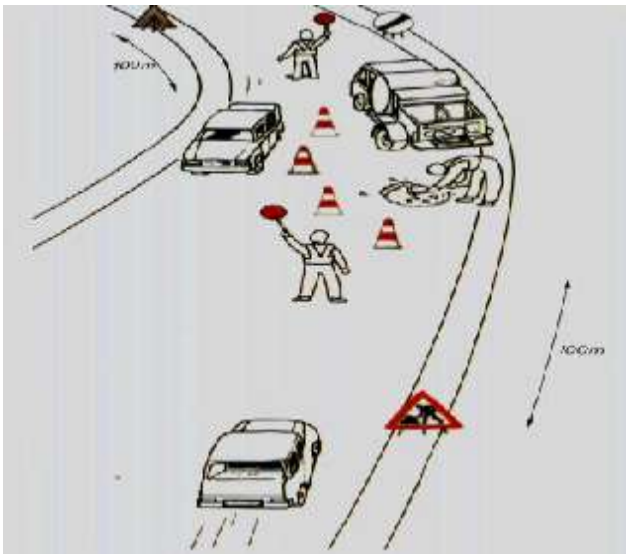
work and major culvert repairs. If traffic is to be diverted for more than a day or two, or the work is being carried out during the wet season, the diversion should be constructed with an adequate base and surfaced with gravel. A small gang should be allocated to keep the diversion in good condition. Diversions should be wide enough to allow two Lorries to pass.

After the diversion has been completed and before work starts, warning signs, barriers and cones must be placed around the work area. The layout shown in Fig below is recommended. Signs must be placed in the following order:

a. 'Men working' signs should be placed 200 meters in front of the work area.
b. 'Turn left/right ahead' arrows should be placed 100 meters in front of the work area.
c. Cones should be placed diagonally across the road to lead into the diversion.
d. 'Keep left/right' arrows should be placed at both ends of the lines of cones.
e. Barriers should be placed behind the lines of cones.
f. 'Road clear' signs should be placed 200 meters beyond the ends of the diversion.



Diversions will usually be in operation at night as well as by day and the approaches must be adequately lit.



Kerosene lanterns may be adequate on lightly-trafficked roads or where speeds are low but high-intensity lamps should if possible be used on heavily trafficked roads. A watchman should always be in attendance to ensure that the lamps are working and are not interfered with or stolen. Lamps should show a yellow light. Flashing lamps are best as they consume less power and are more easily seen.

When the work has been completed, signs should be removed in reverse order.

Self-Check -2

Directions: Answer the questions listed below. Use the Answer sheet provided in the next page:

1. Men working sign should be placed at----------? **(3 points)**

   A. approach to the work
   B**.** end of the work
   C. at the centre
   D. All

2. Road clear sign should be placed at ----------? **(2 points)**

   A.beyond the work area.
   B. end of the work
   C. approach to the work
   D. All

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-3	Controlling vehicle and pedestrian traffic

3.1 Traffic rules and regulations

The traffic controller has no power at law. The legal authority does not rest with the person, but with the STOP sign when it is displayed to drivers. While engaged in construction or maintenance work and when operating a STOP/SLOW bat, the traffic controller is empowered to stop vehicles by displaying a STOP sign. The driver is required to stop the vehicle before reaching the sign and as near as practicable to the sign. The driver must not proceed beyond the sign while it is displayed in the drivers' direction. The law in this regard only applies to the STOP sign, which is regulatory in nature, and not to the SLOW sign, which is an advisory sign and only used for guidance.

Traffic controllers have no authority to control or direct traffic by hand signals alone or by giving oral instructions to vehicle drivers; the control method is use of the STOP sign. Hand signals by the traffic controller only enhance the use of the STOP/SLOW bat.

If an offence occurs, such as a vehicle failing to stop after a traffic controller has displayed the STOP sign, the controller should not attempt to stop the vehicle. The traffic controller should immediately attempt to warn the workers ahead and then if possible write down the registration number, body type, color, and make of the vehicle, the time, date and location of the offence, and pass this on to the supervisor. The supervisor is required to pass on the information without delay directly to Police for processing.

3.2 Controlling Traffic

There are four important conditions that must be in place prior to the traffic controller commencing work with the Stop/Slow bat:

- The maximum speed allowable for approaching traffic is 60 km/h;
- The traffic controller must have an escape path;
- The traffic controller should be separated from the worksite by 30 meters or more;
- The traffic controller must have a sight distance to the approaching traffic of more than 1½ times the approach speed of the traffic to enable adequate braking distance for the slowing traffic (eg. if approach speeds are 80 km/h then the traffic controller should be able to see 120 m along the road).

Prior to stopping traffic, the traffic controller should stand on the kerb or shoulder, clear of the travelled path. It may not always be possible to have in view the worksite due to site conditions but the traffic controller must be in clear view of the oncoming traffic.

To stop traffic, the traffic controller should watch for a suitable gap in the traffic. The STOP bat should then be extended high over the carriageway at an angle of approximately 45o so that the STOP banner is facing approaching traffic. After ensuring all traffic has stopped, and with the bat extended and STOP banner clearly visible to

approaching traffic, the traffic controller may step onto the carriageway and walk confidently to a position in front of the driver with the palm of the free hand indicating the STOP gesture. The traffic controller should maintain a vigilant watch of the traffic but not take any posture that could be construed as intimidating or distracting.

If the traffic controller has stopped a large vehicle and visibility to approaching traffic is obscured, the traffic controller should project the Stop/Slow bat out past the stationary vehicle for other drivers to see as they slow to a stop.

At the conclusion of the stopped period, to allow traffic to proceed, the traffic controller must check that the road ahead is clear, move over to the side of the road, then turn the bat to display the SLOW banner to the traffic, and with the free hand give the TO GO gesture with a deliberate motion across the body.

Self-Check -3

Directions: Answer the questions listed below. Use the Answer sheet provided in the next page:

1. The traffic controller has a power at law. **(3 points)**

   A. True **B.** False

2. Prior to stopping traffic, the traffic controller should stand on ----------? **(2 points)**

   A. carriage.
   B. shoulder
   C. kerb
   D. A&B is answer

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Operation Sheet 1	Controlling vehicle and pedestrian traffic

Operation sheet1

Controlling vehicle and pedestrian traffic

Step 1 stands on the curb or shoulder in clear view of the oncoming traffic

Step 2 To stop traffic stop bat should then be extended high over the carriageway at an angle of approximately 45^0.

Step 3 After ensuring all traffic has stopped, and with the bat extended and STOP banner clearly visible to approaching traffic, step onto the carriageway and walk confidently to a position in front of the driver with the palm of the free hand indicating the STOP gesture.

STEP 4 to allow traffic to proceed, must check that the road ahead is clear, move over to the side of the road, then turn the bat to display the SLOW banner to the traffic, and with the free hand give the TO GO gesture with a deliberate motion across the body.

Information Sheet-4	Monitoring traffic flow

4.1 Locating the Traffic Controller

The traffic controller should be positioned approximately 30 m in advance of the work area. The distance should be sufficient to separate the controller from the works, but also allow the controller to converse with the workers regarding traffic flow requirements. If a vehicle proceeds beyond the STOP sign, there should be some additional space for it to stop before the work area.

The traffic controller should stand facing the traffic from a position outside the travelled path so that approaching traffic can see the controller from at least 1½ times the approach speed of the traffic. Where sight distance is limited and/or traffic volumes are high it may be necessary to use a second controller in advance of the traffic control position to slow down or stop traffic approaching the end of the queue.

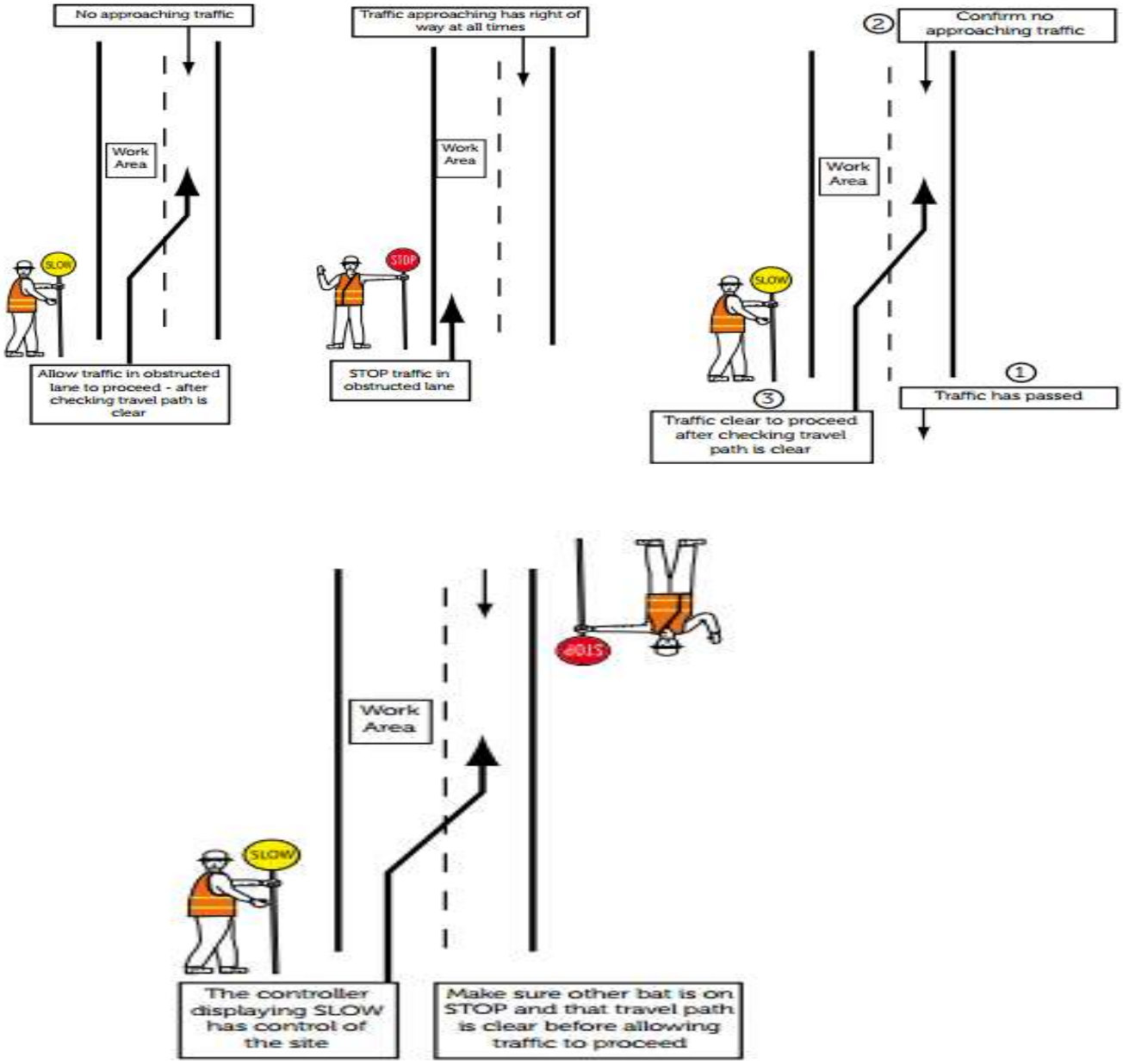
Where multiple traffic controllers are employed and they do not have line-of-sight to each other, radio contact or an intermediate communicator must be used. Traffic controllers must always stand in a position so that a clear escape path is available. Traffic controllers should never turn their backs to traffic. When traffic has stopped under a STOP banner instruction, the traffic controller may change position so as to be clearly visible to traffic further along the approach road. The traffic controller should, however, always stay at the head of the traffic queue and not permit other persons to gather at his or her position. The traffic controller must be mindful to ensure a clear escape is available for any new position assumed.

The traffic controller should not obstruct road users 'view of signs, nor should they be obscured by signs when viewed by approaching traffic.

The visibility of a traffic controller to motorists can be affected by the position of the sun, the background conditions (including lighting), the location of the controller in shade or darkened areas, or by oncoming headlight illumination. These factors should be considered when positioning a traffic controller.

For sprayed bituminous surfacing works, the location of the traffic controller may be varied to suit the different traffic flows that often develop in this operation. Prior to work commencing, it is essential that the traffic controller and the supervisor decide the appropriate location and procedures for this operation.

The following diagrams illustrate the use of One Traffic Controller and Two Traffic Controllers under various traffic conditions.



- **Sign Placement**

Signs are generally placed within the work area to warn, regulate or guide anyone past roadway construction or maintenance operation. Signs shall be installed before work is to commence and removed promptly to accommodate rush hour traffic whenever possible. The following considerations shall be used when deciding on sign placement: Traffic lanes may be narrowed to a minimum of 3 meters in width;

- A buffer of at least 3 meters shall be provided beside any excavation greater than 1 meter in depth. If there is insufficient space, the excavation must be closed in by a form of a barrier;
- Traffic may be shifted onto part of a shoulder, providing that portion can be used by any vehicle without any pavement failure;
- Two-way traffic operations are always preferred over detouring traffic to another route; and

Traffic may be detoured, providing that the detour route is not already affected by another construction or maintenance project. When work is carried out at night or under adverse weather conditions, certain signs may require supplementary flashing or steady lights for added visibility. On streets with more than one driving lane separated by a median wider than 1.0 meter, all signs shall be doubled by the provision of a second

4.3 Advance Signing on Curves/Crests

Sight and stopping distance are important near crests or curves where an approaching vehicle does not have adequate advance warning of the approaching works to safely stop at the end of the queue.

Traffic controllers should stand where they can see both ends of the work area and must be able to see approaching vehicles for a distance of at least one and half times the speed limit in meters (e.g. if the speed limit is 60 km/h, the traffic controller should be able to see at least 90m).

If the sight distance is inadequate before approaching the worksite, consideration should be given to:

- ✓ lowering the speed limit, or
- ✓ erecting additional advance warning signs, or
- ✓ Using an additional traffic controller at the end of the queue.

Lowering the speed limit, or erecting additional advance warning signs, or using an additional traffic controller at the end of the queue.

Self-Check -4

Directions: Answer the questions listed below. Use the Answer sheet provided in the next page:

1. The traffic controller should be positioned----------m. in the advance of the work area. **(3 points)**

   A. 100m
   B. 10m
   C. 30m
   D**.** 20m

2. Signs are generally placed within the work area to ----------? **(2 points)**

   A.regulate traffic
   B. guide traffic
   C. warn
   D. all is answer

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

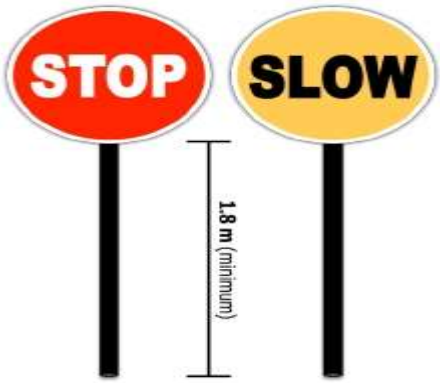
Score = _____

Rating: _____

Information Sheet-5	Using hand held stop or slow bat

5.1 Stop slow bat

An essential item of equipment for a traffic controller is the stop-slow bat. This is a double-sided hand held sign with STOP on one side and SLOW on the other. The handle should be a minimum of 1.8m long. Traffic control bats should be made of retro-reflective material, clean and in good repair. Damaged or defaced bats should be repaired or replaced properly. For night operations, an illuminated wand should be used as well as the bat.



5.2 Using hand held stop or slow bat

1. To Stop Traffic –
The TCP will stand outside the traffic lanes, and in a stationary position while facing traffic, extend the STOP sign over the traffic lane. Hold the STOP sign in a vertical position at arm's length. For greater emphasis, the free arm may be raised with the palm toward approaching traffic.

2. When it is Safe for Traffic to Proceed –
The TCP shall face the traffic, and with the SLOW sign held in a vertical position, motion traffic ahead with the free arm.

3. Where it is desired to Alert or Slow Traffic –
The TCP shall face traffic and hold the SLOW sign in a vertical position at arm's length. For added emphasis, the TCP may slowly raise and lower the free hand with the palm down

Figure 1: TO STOP

Figure 2 to slow

Figure 3. To go

Self-Check -5

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. ---------- is used to define the traffic path part or around the work area **(3points)**

   A .stop low bat C. barrier

   B traffic cone D .none

2. ----------Is a double sided hand held sign? **(2 points)**

   A cone

   B. stop low bat

   C. barrier

   D. All

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-6	Using hand signal

6.1 Definition of traffic signals.

Traffic signals are designed to operate manually, electrically and/or mechanically to aid the flow of vehicular and pedestrian traffic by alternatively controlling the stopping and proceeding of the traffic flow the overall objective of the traffic signal is to facilitate the safe movement of traffic through an intersection with minimum delay

6.2. Advantage and disadvantage of traffic signal

- **Advantages.** Traffic signals provide for orderly movement of traffic and reduce certain types of accidents, particularly right angle collisions. When they are properly coordinated with other signals, they permit almost a continuous flow of traffic at reasonable speeds. In addition, they provide for the safe crossing or entering gaps by interrupting heavier traffic flow and are more efficient and economical than manual control.
- **Disadvantages**. Traffic lights can have disadvantages for if they are unwarranted, ill-designed, ineffectively placed, improperly operated, or poorly maintained, they can cause excessive delays, traffic violations, use of alternate, less adequate routes and an increase in accidents, especially the rear-end type.

6.3 Traffic-control signal indications

Whenever traffic is controlled by traffic-control signals, other than lane direction control signal indications provided in section eleven hundred sixteen, exhibiting different colored lights, or colored lighted arrows, successively, one at a time or in combination, only the colors green, yellow and red shall be used, and said lights shall indicate and apply to drivers of vehicles and to pedestrians as follows:

Fig5.1 traffic signal

- **Green indications**:
  - ✓ Traffic, except pedestrians, facing a steady circular green signal may proceed straight through or turn right or left unless a sign at such place prohibits either such turn. Such traffic, including when turning right or left, shall yield the right of way to other traffic lawfully within the intersection or an adjacent crosswalk at the time such signal is exhibited.
  - ✓ Traffic, except pedestrians, facing a steady green arrow signal may cautiously enter the intersection only to make the movement indicated by such arrow, or such other movement as is permitted by other indications shown at the same time, except that a U-Turn may be made by traffic facing a left green arrow signal unless a sign prohibits such U-Turn or such U-Turn is in violation of any other provision of law. Such traffic shall yield the right of way to other traffic lawfully within the intersection or an adjacent cross walk at the time such signal is exhibited.
  - ✓ Unless otherwise directed by a pedestrian-control signal as provided in section eleven hundred twelve, pedestrians facing any steady green signal, except when the sole green signal is a turn arrow may proceed across the roadway within any marked or unmarked crosswalk.
- **Yellow indications**:
  - ✓ Traffic, except pedestrians, facing a steady circular yellow signal may enter the intersection; however, said traffic is thereby warned that the related green movement is being terminated or that a red indication will be exhibited immediately thereafter.
  - ✓ Traffic, except pedestrians, facing a steady yellow arrow signal may cautiously enter the intersection only to complete the movement indicated by such arrow or make such other movement as is permitted by other indications shown at the same time; however, said traffic is thereby warned that the related green arrow movement is being terminated or that a red indication will be exhibited immediately thereafter.
- **Red indications:**

Traffic, except pedestrians, facing a steady circular red signal, unless to make such other movement as is permitted by other indications shown at the same time, shall stop at a clearly marked stop line, but if none, then shall stop before entering the crosswalk on the near side of the intersection, or in the event there is no crosswalk, at the point nearest the intersecting roadway where the driver has a view of the approaching traffic on the intersecting roadway before entering the intersection and shall remain standing until an indication to proceed is shown except as provided in paragraph two of this subdivision.

- ✓ Except in a city having a population of one million or more, unless a sign is in place prohibiting such turn:
- ✓ Traffic facing a steady circular red signal may cautiously enter the intersection to make a right turn after stopping as required by paragraph one of this subdivision, except that right turning traffic is not required to stop when a steady right green arrow signal is shown at the same time. Such traffic shall yield the right-of-way to pedestrians within a marked or unmarked crosswalk at the intersection and to other traffic lawfully using the intersection;
- ✓ Traffic, while on a one-way roadway, facing a steady red signal may cautiously enter the intersection to make a left turn onto a one-way roadway after stopping as required by paragraph one of this subdivision. Such traffic shall yield the right-of-way to pedestrians within a marked or unmarked crosswalk at the intersection and to other traffic lawfully using the intersection. Notwithstanding any other provision of law, any city having a population of one million or more, is hereby authorized and empowered to adopt a local law authorizing subparagraph a or b of this paragraph to be applicable within such city. Upon the adoption of such local law the exception provided herein for a city having a population of one million or more shall no longer be applicable within such city.
- ✓ On or after the effective date of this subparagraph, the sign which prohibits such turn shall be prominently displayed from all newly installed traffic signals where possible.
- ✓ Traffic, except pedestrians, facing a steady red arrow signal may not enter the intersection to make the movement indicated by such arrow and, unless entering the intersection to make such other movement as is permitted by other indications shown at the same time, shall stop at a clearly marked stop line, but if none, then shall stop before entering the crosswalk on the near side of the intersection, or in

the event there is no crosswalk at the point nearest the intersecting roadway where the driver has a view of the approaching traffic on the intersecting roadway before entering the intersection and shall remain standing until an indication to proceed is shown.

- ✓ Unless otherwise directed by a pedestrian-control signal as provided in section eleven hundred twelve, pedestrians facing any steady red signal shall not enter the roadway. Notwithstanding the provision of paragraph two of this subdivision, no school bus, while transporting pupils for any purpose, shall be permitted to proceed when facing a steady red signal.
- ✓ Traffic shall obey signs requiring obedience to traffic-control signals at intersections other than those at which such signals are located. No intersection not controlled by such signs prior to the effective date of this section shall hereafter be made subject to such method of control and no ordinance, order, rule or regulation requiring such obedience shall hereafter be adopted.
- ✓ In the event an official traffic-control signal is erected and maintained at a place other than an intersection, the provisions of this section shall be applicable except as to those provisions which by their nature can have no application. Any stop required shall be made at a sign or marking on the pavement indicating where the stop shall be made, but in the absence of any such sign or marking the stop shall be made at the signal.

Self-Check -6	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Traffic signals are designed **(3points)**
   A .manually C. electrically
   B .mechanically D .all is answer
2. Which colour indication used for stop car? **(2 points)**

   A green indication
   B. yellow indication
   C. red indication
   D. All

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-7	Reporting and approving traffic offenders

7.1 Definition of traffic offender

- A habitual traffic offender is defined person who whose department of high way safety and motor vehicles records shown an accumulation of three or more of the following convictions
  - ✓ Driving under the influence
  - ✓ Voluntary or involuntary manslaughter
  - ✓ Any felony resulting from the use of a motor or vehicle
  - ✓ Driving while a license was suspended or revoked
  - ✓ Failing to stop and render aid in the event of vehicle crash
  - ✓ Driving a commercial motor vehicle while disqualified
  - ✓ Speeding
  - ✓ failing to use a seat belt
  - ✓ failing to stop at a red traffic light
  - ✓ drink-driving
  - ✓ drug-driving
  - ✓ not wearing a crash helmet
  - ✓ using a forbidden lane
  - ✓ Use of a mobile phone device whilst driving.

7.2 Report traffic offender's procedure

- All road traffic collisions reported to the Police will be
  - ✓ Time and date of the crash;
  - ✓ Location;
  - ✓ Clear language description of crash including type of vehicle(s), Vehicle
  - ✓ Registration Mark , direction of travel and supposed cause;
  - ✓ Driver(s) details;
  - ✓ Additional information in respect of damage to third party property, including animals, where the owner has not been notified at the time.

Self-Check -7	Written Test

Directions: Answer the question below. Use the Answer sheet provided in the next page:

1. A habitual traffic offender is defined a person who whose? **(4 points)**

   A falling to use a seat belt
   B. driving under influence
   C. drinks driving
   D. All is answer

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 3points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hour -4h.

Task 1: Control vehicle and pedestrian traffic

Reference

- ✓ Building Rural Roads, Bjorn Johannessen
- ✓ SADC Guideline on Low-volume Sealed Roads
- ✓ Quality Assurance Handbook for Rural Roads, Volume I & II, National Rural Roads Development Agency, India
- ✓ Contractor's Handbook, Roads Training School, Zambia
- ✓ Guideline for Quality Assurance Procedures and Specifications for Labor-Based Road Works
- ✓ "Design and Appraisal of Rural Transport Infrastructure: Ensuring Basic Access for Rural
- ✓ "Overseas Road Note 1: Maintenance Management for District Engineers (2nd Edition)",
- ✓ Transport and Road Research Laboratory, UK, 1997
- ✓ "Overseas Road Note 2: Maintenance Techniques for District Engineers (2nd Edition)",
- ✓ Transport and Road Research Laboratory, UK, 1997
- ✓ "Gravel Roads, Maintenance and Design Manual", US Department of Transportation, Federal
- ✓ Highway Administration, 200
- ✓ Rural Road Maintenance Handbook, TRANSPORT PUBLISHING HOUSE Ha Noi-2003

Basic Infrastructure Operations

NTQF Level I

Learning Guide # 39

Unit of Competence: Controlling Traffic with a Stop Slow Bat

Module Title: Controlling Traffic with a Stop-Slow Bat

LG Code: CON BIO1 M10 LO3-LG39

TTLM Code: CON BIO1 TTLM 1019v1

LO 3: Operate Radio

Instruction Sheet	Learning Guide #39

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Adjusting radio control
- Transmitted message
- Maintaining radio power
- Checking radio contact

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Adjust radio controls for optimum reception/ transmission results
- Transmit concisely messages
- Maintained radio power supply
- Check radio contact

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” in page -57, 59, 63 and 65 respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 ” in page -60.
6. Do the “LAP test” in page – 66 (if you are ready).

Information Sheet-1	Adjusting radio control

1.1 Hand held radio operation

Situations can arise at worksites where traffic controllers may need to use radios to ensure adequate communication over long work lengths, or due to limited sight distances.

If the work is to occur over a long period of time, the capacity of the battery in the radio should be carefully monitored. When using hand-held radios, traffic controllers should ensure that the standard of hand signals in support of the STOP/SLOW bat is not adversely affected.

Fig 1.1 hands held radio

A neck or shoulder strap, attached to the radio, should be used to maintain a free hand for signaling. It is not recommended to use two-way radios operating on CB (citizen band) frequencies, as interruptions or interference may be caused by other operators using the same frequency.

1.2 Operate a CB Radio

Citizen Band Radio, or CB radio, is short-distance radio communication system commonly used by truckers or state officials like police. It has lost its popularity in the 21st century due to the influx of modern communication devices. It still has a valid communication system between a group of pals or for emergency contact using CB radio.

- **Method One of Two:**

Setting Up a CB Radio

Understand CB technology. For many in today's world of communication, CB radio seems like an outdated method of contact. CB radio still has many benefits depending on how you use the device. For desolate environments, like mountains or deserts, CB radio can be the most effective device to contact people.

The radio signal is short wave, so you can only contact those in a 40 to 100 mile radius, depending on the device/antenna you have.

Another use for CB radio is for safety contacts. If you are going on a long road trip through desolate areas, CB radio can be a vital tool to connect with the police.

Mount your device. The most common place to mount a CB radio is in the car. It is important to mount the radio in a location that won't impinge to safety while driving. A common place to place the radio is underneath the driver's seat. This ensures that you won't mess with the radio while driving.

Some CB radios come with mounting hardware that will require you to modify your vehicle. Only the larger, older models require you to do this type of installation.

Select and mount an antenna. You can get large antennas for a wider range in service, but will require more time to install. There are small profile antennas that are only 2 feet, like the Walcott, which can even be used on motorcycles. The best place to mount your antenna is on the center of your roof. If you want an easier installation process, you can invest in a magnetic antenna. [5]

Issue a radio check. Listen to the channel for a few moments. If there are people talking, politely wait for a break. When you're sure it's clear, ask for a radio check. Wait for a response. If no one responds, re-issue a radio check, but wait patiently before doing so. When another operator responds, interpret their response.

Many operators are truck drivers who aren't looking for conversation. Others are enthusiasts that can not wait to chat. Follow the tone of the other person/people.

Self-Check -1	Written Test

Directions: Answer the question below. Use the Answer sheet provided in the next page:

1. What is purpose of hand held radio? **(5points)**

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-2	Transmitting message with radio

2.1 Using a Radio

Using a radio is mostly common sense but it takes time and lots of practice to learn the codes, protocols, etiquette and conduct. Much of this is outlined by specific police department policy. The best way to begin learning how to use a police radio is to monitor radio traffic. You can start by using a police scanner and listen to local police frequencies at your leisure to get an idea of the flow of radio traffic. This will get you acquainted to some extent. The problem with police scanners is that depending where you live certain departments use scramblers and other technology that makes it hard to monitor two-way radio traffic. Also, without a list of police 10 codes and police signal codes for particular departments there is only so much you can learn using a police scanner. A better way to monitor police radio traffic is by actually riding with a police officer. Many police departments have ride-along programs that allow you to actually sit through part of a police shift with an officer. During the ride-along you can ask the officer if they have a list of radio codes that you can study. This is sometimes called a police radio code cheat sheet or 10 Code cheat sheet. After several ride-along you are guaranteed to have a better understanding of radio codes, procedures and ma

Fig2.1 two way radio

2.2 Conduct and Basic Radio manners

Police officers utilize radios to send and receive messages and vital information. Only essential information should be communicated. Transmissions should be brief yet descriptive enough for the receiver to fully understand. The best approach for transmitting a message is to plan the message before sending it. Always take a moment before transmitting to construct your message by briefly talking yourself through it--sort of like a short mental rehearsal. Using this approach will help you to transmit concise messages while conveying a professional image.

Self-Check -2	Written Test

Directions: Answer the question below. Use the Answer sheet provided in the next page:

1. How to transmit message using hand held radio? **(5 points)**

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Operation Sheet 1	Transmitting message with radio

1.1 Instructions for Transmitting a Message:

Step 1 Plan your message!
Step 2 Make sure the radio is clear before transmitting. You can do this by asking dispatch if the radio is clear.
Step 3 If the radio is clear, press the transmit button and keep it pressed for 1-2 seconds before speaking.
Step 4 Speak directly into the microphone
Step 5 Preface your first transmission as follows, "(Your call sign) to (intended Receiver's call sign)"
Step 6 End your message by releasing the transmission button.
Step 7 Listen for a response.

Information Sheet-3	Maintaining radio power

3.1 Handheld Battery Information

Handheld radios work using a variety of battery options. It is important for the user to understand these options and the pros and cons of each type of battery. There are basically three types of batteries that can be used on a handheld radio: NiCad Rechargeable Battery, AA alkaline battery case (Clamshell), and disposable alkaline batteries. Each handheld radio should be issued with two batteries.

3.2 Types of Battery

Nicad Rechargable Batteries: This is the most common and practical type of battery in use on the forest. It is designed for long life (with proper maintenance) and repeated charge/discharge cycles. This battery requires a basic knowledge to insure proper use and function. A key element to using rechargeable batteries is to always fully charge a battery and then completely discharge the unit before recharging. NEVER partially use a rechargeable battery and then drop it in a charger to “top it off”. This will create what is called a “memory” in the battery and shorten its life span dramatically. With proper care a rechargeable battery will last in excess of 10 years, if improper charging is done it may not last through one field season. Rechargeable batteries come in several capacity sizes. This is referred to as the MaH (MilliAmp Hour) rating. Our batteries range from 800 Mah to 1400 Mah. The larger the rating the potential longer cycle between charges. All rechargeable batteries should go through an evaluation and condition check once a year. Telecom team members each have access to a battery conditioner/analyzer and will perform this function before each field season to insure that all of the batteries are in good condition.

- **Alkaline Battery Case (Clamshell):** The clamshell is used extensively on fires and other situations. Clamshells are essentially a case that looks like a NiCad battery. It will hold either nine or ten AA batteries that can be replaced as needed. There are three very important things to remember about clamshell batteries:
  - ✓ NEVER use a clamshell with a high power (over 2 watts) radio. The AA batteries do not supply enough amperage to maintain the 5 watt output and will not function in the transmit mode for more than a few minutes. Leave radios with a HI/LOW toggle switch in the LOW position when using a clamshell.
  - ✓ ALWAYS use the appropriate 9 or 10 AA battery clamshell with the appropriate type of radio. There are actually two types of clamshells, the 9 and 10 battery shells. NEVER remove the retaining band from the 10th slot in a 9 battery shell. Usually, the LPH series handheld will use the 10 Cell clamshells and the EPH series radio will use the 9 cell clamshell. Using a 10 cell clamshell on a EPH series radio will eventually damage the radio transmitter circuits.

- ✓ NEVER place a clamshell into a charger or conditioner/analyzer. The battery, charger/analyzer, will be destroyed and the risk of a fire is severe due to the high temperatures and battery elements involved. Always check the bottom of the battery case for the four silver or gold charging tabs before placing in a charger unit. It is recommended that you carry a clamshell (and additional AA batteries) for emergency purposes but not as a primary power source.

- **Disposable Alkaline Battery**: We are trying to eliminate the use of this type of battery due to its high cost, short usefulness and disposal problems. These batteries look exactly like the NiCad batteries except that they do not have the four silver or gold tabs on the bottom. NEVER place a alkaline battery in a charger or conditioner as a fire or damage to the charger unit may result. The only advantage to these batteries is there relatively long shelf life (several months). If you have an alkaline battery we suggest you keep it in your backpack or vehicle glove box for emergency use only.

Self-Check -3

Directions: Answer the question below. Use the Answer sheet provided in the next page:

1. Write a verity of hand held radio battery **(5 points)**

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-4	Checking radio contact

4.1 Radio (signal) checks

When your radio requires, radio checks , follow this procedure

1. Call another station and request a radio check
2. The radio check consist of
    - ✓ Radio check 1,2,3,4,5 how do you read me? Over[
3. Your call sign should be transmitted during test transmission
4. Radio check should not last more than 10 seconds

Self-Check -4

Directions: Answer the question below. Use the Answer sheet provided in the next page:

1. How to check radio signal? **(5 points)**

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 30min.

Task 1: Transmit message with radio

Reference

- ✓ Building Rural Roads, Bjorn Johannessen
- ✓ SADC Guideline on Low-volume Sealed Roads
- ✓ Quality Assurance Handbook for Rural Roads, Volume I & II, National Rural Roads Development Agency, India
- ✓ Contractor's Handbook, Roads Training School, Zambia
- ✓ Guideline for Quality Assurance Procedures and Specifications for Labor-Based Road Works
- ✓ "Design and Appraisal of Rural Transport Infrastructure: Ensuring Basic Access for Rural
- ✓ "Overseas Road Note 1: Maintenance Management for District Engineers (2nd Edition)",
- ✓ Transport and Road Research Laboratory, UK, 1997
- ✓ "Overseas Road Note 2: Maintenance Techniques for District Engineers (2nd Edition)",
- ✓ Transport and Road Research Laboratory, UK, 1997
- ✓ "Gravel Roads, Maintenance and Design Manual", US Department of Transportation, Federal
- ✓ Highway Administration, 200
- ✓ Rural Road Maintenance Handbook, TRANSPORT PUBLISHING HOUSE Ha Noi-2003

Basic Infrastructure Operations

NTQF Level I

Learning Guide # 40

Unit of Competence: Controlling Traffic with a Stop-Slow Bat

Module Title: Controlling Traffic with a Stop-Slow Bat

LG Code: CON BIO1 M10 LO4 LG-40

TTLM Code: CON BIO1 TTLM 1019v1

LO 4: Clean up

Instruction Sheet	Learning Guide #40

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Removing sign and device
- Safe keeping of equipment's

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Remove or cover sequentially signs and devices to provide warning to motorists during shutdown,

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information "Sheet 1,and Sheet 2, ".
4. Accomplish the "Self-check 1, Self-check 2" in page 72 and 75 respectively.
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 " in page -.
6. Do the "LAP test" in page – (if you are ready).

Information Sheet-1	Removing sign and device

1.1 Installation and Removal Of Device

- **Order of Installation**

  Traffic control devices should be placed in the order that drivers will encounter them, starting with the sign or device farthest upstream from the work area and the others successively as the work area is approached.

  If traffic in both directions will be affected, such as with work in the center lane of a multilane roadway, the devices can be placed in both directions at the same time, starting at each end farthest from the work.

  When signs or channelizing devices are to be installed and removed several times during the work operation, spots can be painted to mark device locations, so that the installation can be repeated quickly and with proper placement assured.

  The devices should be stored off the roadway, out of sight, or transported to another location when not required.

  Motorists do not expect to encounter workers in the roadway setting up a traffic control zone. Since the goal is to make the entire operation safe, high level warning devices, traffic control persons, or flashing vehicle lights should be used to warn the drivers of the presence of workers. Flashing arrow boards are valuable to assist the workers during placement or removal of channelizing devices for lane closures.

1.2 Order of Removal

- ✓ As soon as the work is completed and traffic control devices are no longer needed, they should be removed.
- ✓ Any cones and channelizing devices on the traveled roadway should be removed first, followed by the signs.
- ✓ Flashing arrow boards, high level warning devices, traffic control persons and/or flashing vehicle lights should be used in the removal process.
- ✓ No workers shall ride on the rear outside of a vehicle while it is reversing.
- ✓ On low volume roadways, devices should be removed in the opposite order of installation by first removing those closest to the work area and continuing progressively upstream away from the area.
- ✓ On high volume roadways, devices may be removed as for low volume or they may be removed with the flow of traffic provided there is a buffer vehicle, which may be equipped with a rear-mounted impact attenuator.

- **Pavement Marking Removal**

  Motorists use pavement markings as a primary source of guidance.

  Temporary pavement markings, using preformed adhesive-backed traffic tape or raised pavement markers can be used with channelizing devices to provide guidance in work zones. Any pavement markings that are not applicable, and which may confuse drivers, should be removed as soon as practicable for long duration work.

- Typical methods of removal include
  - ✓ grinding,
  - ✓ burning,
  - ✓ chemical treatment,
  - ✓ sandblasting,
  - ✓ shot blasting and
  - ✓ high pressure water jetting.

Painting over inappropriate markings with black paint or bituminous material has proved unsatisfactory as the original lines eventually reappear when overlying material wears away under traffic. In addition, lines which are covered in this way are still visible under certain conditions (low angles of illumination or in wet weather).

Self-Check -1

Directions: Answer the question below. Use the Answer sheet provided in the next page:

1. Write typical method of sign and device removal **(5 points)**

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 4 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-2	Safe keeping of equipment's

2.1Safe keeping of equipment's

The Occupational Health and Safety Regulations require that Traffic Control Persons (TCP) be given written instructions on the performance of their duties.
The instructions should include but not be limited to the Regulations.
The following points should be emphasized in the training of TCPs:

- ✓ Importance of their job.
- ✓ Need for a courteous but firm manner.
- ✓ Personal protective equipment which conforms to Occupational Health and Safety Regulations for high visibility apparel and safety headgear
- ✓ Signals made by TCPs to control traffic must conform to the W.C.B. Occupational Health and Safety Regulations.
- ✓ Proper positioning in relation to the work area in order to be effective and ensure the safety of the public, workers, equipment and the TCP.
- ✓ Awareness.

Discipline to prevent others from loitering near the TCP position and not to leave the position until relieved or the conflict being controlled no longer exists.
Requirement to remove C-28 Traffic Control Person Ahead signs whenever TCPs are not in position.

2.2 Sign Maintenance

Sign maintenance plays an important role in traffic safety. All signs should be kept clean, legible, and in proper position at all times. Damaged signs should be repaired as soon as possible. Well-maintained signs have more credibility as traffic control devices. Damaged, defaced or dirty signs are less effective, discredit the City, and may increase exposure to litigation.

To ensure adequate maintenance, a suitable schedule for inspection, cleaning, and replacement of signs should be established, including inspection at night to determine the effectiveness of sign reflectivity. Care should be taken to remove weeds, construction materials, or snow obscuring the sign face. All inspections must be recorded.

Signs should also be covered or removed when the condition they are warning about does not exist. Unnecessary signs create frustration and motorists will lose respect for all construction signs. This poses a risk to both work crews and road users. When the signs in work zones are current and accurate, they will achieve the desired effect of warning, guiding, and regulating traffic.

2.3 Clean, check and store tools and equipment

- ✓ High quality and appropriate tools should be provided for works.
- ✓ Tools should be issued every morning to the level men and labors by the storekeeper and record must be kept of the tools issued in the site issue book. Tools should be returned at the end of the day and signed off by the storekeeper.
- ✓ Equipment must be kept clean as the work progresses as well as at the end of the day, when it should be returned and signed off by the storekeeper.

- ✓ Use transport to move instruments for safety if possible.
- ✓ Step away the instruments and materials from machine and transport to protect from damaging.
- ✓ Keep the work area clear of off-cuts and loose materials.
- ✓ Being responsible person for :-
- ✓ the site tidiness
- ✓ the daily maintenance
- ✓ Cleanliness of materials in accordance with the manufacturer’s instructions as applicable.
- ✓ handling tools and equipment with extra care
- ✓ Cleaning after use, storing neatly, slightly greasing if necessary and regular maintenance.

Self-Check -2

Directions: Answer the question below. Use the Answer sheet provided in the next page:

1. cleaning of tools and equipment is performed _____
   A. Before use
   B. After use
   C. During work
   D. All is answer

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Answer key

Controlling Traffic with a Stop-Slow Bat
LO1. Plan and Prepare
LO2. Coordinate Traffic
LO3. Operate Radio
LO4. Clean up
Answer for LO1: Plan and Prepare

Self-check 1

1. D all is answer

2. D all is answer

Self-check 2

1. B helmet

2. D all is answer

Self-check 3

1. B. traffic cone

2. B. stop low bat

Self-check 4

1. A .True

2. A .True

Self-check 5

1. A true

2. B False

Answer for LO2. Coordinate Traffic

Self-check 1

1. B.median barrier

2. D. All is answer

Self-check 2

1. A. approach to the work
2. B. end of the work

Self-check 3

1. B. False
2. D. A&B is answer

Self-check 4

1. C. 30m
2. D. all is answer

Self-check 5

1. B traffic cone
2. B. stop low bat

Self-check 6

1. D .all is answer
2. C. red indication

Self-check 7

1. D. All is answer

Answer for LO 3 Operate Radio

Self-check 1

1. for transitions of message

Self-check 2

1. A. The best approach for transmitting a message is to plan the message before sending.

Self-check 3

- Disposable Alkaline Battery
- Alkaline Battery Case (Clamshell)
- Nicad Rechargable Batteries

Answer for LO 4 clean up

Self-check 2

1. Grinding,
Burning,
Chemical treatment,
Sandblasting,
Shot blasting and
High pressure water jetting

Self-check 2

1. B After use

Reference

- ✓ Building Rural Roads, Bjorn Johannessen
- ✓ SADC Guideline on Low-volume Sealed Roads
- ✓ Quality Assurance Handbook for Rural Roads, Volume I & II, National Rural Roads Development Agency, India
- ✓ Contractor's Handbook, Roads Training School, Zambia
- ✓ Guideline for Quality Assurance Procedures and Specifications for Labor-Based Road Works
- ✓ "Design and Appraisal of Rural Transport Infrastructure: Ensuring Basic Access for Rural
- ✓ "Overseas Road Note 1: Maintenance Management for District Engineers (2nd Edition)",
- ✓ Transport and Road Research Laboratory, UK, 1997
- ✓ "Overseas Road Note 2: Maintenance Techniques for District Engineers (2nd Edition)",
- ✓ Transport and Road Research Laboratory, UK, 1997
- ✓ "Gravel Roads, Maintenance and Design Manual", US Department of Transportation, Federal
- ✓ Highway Administration, 200
- ✓ Rural Road Maintenance Handbook, TRANSPORT PUBLISHING HOUSE Ha Noi-2003

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