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Roadway and Traffic Control Procedure

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1.0 PURPOSE

Traffic control is an essential part of highway, landscaping, parks and recreation facilities, and parking lots/areas during both Construction, and Operations and Maintenance activities. Working around live vehicular and equipment traffic is highly dangerous due to hazards such as inattentive drivers, size and maneuverability of heavy equipment. Therefore, it is mandate for Entities, and/or their facility management contractors, to implement a procedure to control roadside and traffic hazards.

2.0 SCOPE

The scope of this procedure is to provide means to the user to create a custom roadway and traffic control procedure outlining and detailing the requirements and responsibilities for the identification of hazards and the management of controls for traffic hazards. This procedure applies to Operations and Maintenance functions and activities performed on and near roadways and in/near government owned facilities where public and private vehicular and heavy equipment traffic exists throughout the Kingdom of Saudi Arabia.

This procedure further addresses illumination and signage during inclement weather and night time conditions.

3.0 DEFINITIONS

Definitions	Description
MUTCD	Manual on Uniform Traffic Control Devices
Retroflective	A device, material, coating, or surface that reflects radiation (usually light) back to its source with minimum scattering.
vpd	vehicles per day

4.0 REFERENCES

- Manual on Uniform Traffic Control Devices. Ministry of Communications (Kingdom of Saudi Arabia)
- EOM-KSS-PR-000001 A&FM General Safe Work Requirements Procedure
- EOM-KSS-PR-000006 Barricades and Signs Procedure
- EOM-KSS-PR-000010 Night Works Procedure

5.0 RESPONSIBILITIES

5.1 Contract Manager

The Contract Manager is responsible for ensuring the resources and arrangements are available for the implementation and management of this procedure.

5.2 Supervisor

The supervisor is responsible to ensure the planning accounts for how the work/activities will be completed, and to decide on what equipment and materials will be required. The plans which are developed are specific for the type of road condition and design and that hazard controls (e.g., such as traffic speed limits, signage) are identified.

It is the Supervisor's responsibility to ensure that signs, guards, and illumination (light) is installed and maintained in the work areas. Supervisor is to ensure that the plans are checked and communicated to the crew prior to work commencing, and that specified controls have been implemented.

6.0 PROCESS

6.1 Planning

It is recommended that early communication with the local road authority is established to ensure that any specific requirements are included in the Traffic Management Plan.

Performance of road works and associated activities require planning to ensure coordination and safety are considered, and hazard controls are implemented. The following elements should be considered and incorporated into the plan where relevant:

- Traffic demand.
- Traffic routing.
- Traffic control.
- Other road users.
- Special Vehicle requirements.

Only personnel who have been trained in Traffic Management shall design/decide which plan suits the requirements for the road closure or modifications to the traffic flow. It is important to note that, the MUTCD (Manual on Uniform Traffic Control Devices) are the guidelines that are required to be used when planning such an event.

The MUTCD manual shall be used in all cases to determine the following:

- Type of signs and markings to be used
- Plans to use based on the type of road (e.g., single lane, duel lane, etc.)
- Guidance on type of barriers to use
- Training requirements
- Use of Traffic Devices
- Spacing of devices based on speed and design of road.
- Guidance for working at night.
- Letter and Numeral Sizes design guidelines.
- Traffic Control around School Areas.

6.2 Traffic Management

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

- Past 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 single side track, or an existing road.

6.3 Night Conditions

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

6.3.1 General

The following requirements and recommendations apply to all night-time road closures regardless of worker presence:

- Wherever practicable, any part of the normal roadway which is closed during the day and can be opened at night, should be opened if either travel conditions or safety for night traffic can be improved.
- Temporary traffic route lighting may be required in open road areas if there is a substantial deviation of the travel path from normal, the posted speed limit is greater than 70 km/h, AND the traffic volume exceeds 10,000 vehicles per day (vpd).
- Temporary lighting may also be required to supplement existing lighting on arterial roads in built-up areas where the traffic path could be difficult to follow.
- Lighting from other sources, especially glare sources, should be considered when assessing the need for temporary traffic route lighting.

- Uncontrolled single lane operation shall not be permitted except for very short lengths (e.g., in residential streets).
- 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.
- Signs and devices shall be provided.
- Illuminated flashing arrow signs and similar devices having light emitting elements should be dimmed for night use where necessary to avoid glare.

6.3.2 Work in progress at night

The following requirements and recommendations applicable to works being carried out at night are additional to those given above:

- Lighting at a work site shall, as a minimum requirement, illuminate the following areas:
  - Traffic control station and locations where workers or equipment might encroach on traffic lanes.
  - Intersections in which works are taking place.
- Wherever practicable, it is recommended that the entire work area and immediate approach be lit.
- Workers shall wear high visibility garments.
- Floodlighting 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.

6.4 Provision for Pedestrians and Bicycles

Where pedestrians, including school children and people with disabilities or visual impairment, must 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.

Pedestrian and bicycle paths should be provided on the same scale and to the same width as any facilities for pedestrian or bicycle traffic that were existing prior to the works.

6.5 Temporary Footpaths and Pedestrian Crossings

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

- The unobstructed width at local constrictions shall be not less than 1 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 shall be separated from vehicular traffic. A mesh fence may be used if:
  - The clearance to the delineated edge of the traffic lane is at least 1.2 m and the speed limit is 60 km/h or less.
  - 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 traffic speeds are more than 10 km/h above the speed limits given in Items above, a road safety barrier system shall be provided. In addition:

- Surfacing should provide for prams, strollers and wheelchairs, and other mobility aids.
- Lighting shall be not less than the level provided on the original footpath or crossing.
- Crossings shall be located as near as practicable to established pedestrian routes, and shall have the same level of function as the crossings they replace, including provisions for the people with a vision impairment.
- Crossings should be signalized if the crossings they replace were signalized.

7.0 DEVICE REQUIREMENTS

7.1 Selection and Use

The Manual on Uniform Traffic Control Devices (MUTCD) specifies the optimum number of signs and devices required:

- To provide advance warning.
- To guide traffic through, around or past the work area.
- To minimize the possibility of confusion and misinterpretation of the intended instructions.

Advance warning signs and devices should allow adequate time for correct response under the anticipated worst conditions. Advance warning signs shall be installed on all approaches to the work area, including any side roads. Approval for erection or removal of regulatory traffic control devices shall be obtained from the appropriate road authority.

Standard signs shall be used wherever a suitable sign for the purpose exists. However, there will be instances where there is no suitable standard sign. In such cases, the sign developed shall comply with the format requirements specified in the MUTCD.

7.2 Delineation

The travelled path on the approaches and past the work area shall be delineated to define which part of the roadway is available to road users, or the path that traffic is required to follow, under reasonably expected weather and atmospheric conditions, day or night.

Delineation should be considered for both long and short range purposes. Long range delineation should begin to provide advance guidance at the start of the work site. Short range delineation should indicate a continuous path for at least D meters in front of the vehicle (see Table 1).

Long-range delineation will be mostly achieved by post mounted devices. Short range will usually rely on a combination of retroreflective line marking, other pavement based devices, and traffic cones or bollards.

Speed Limit (km/h)	Dimension D (m)
40 or less	5 to 10
50	10 to 15
60	15 to 45
70, 80	60 to 80
90, 100	80 to 100
110	100 to 120

Table 1: Value of Dimensions “D”

7.3 Night Conditions

Hazards or barriers may require floodlighting to make them more conspicuous. Care should be taken that floodlighting, undimmed illuminated flashing arrow signs, matrix type variable message signs and other similar devices do not cause disability glare for approaching drivers. Except in an emergency, floodlighting should not be provided by use of vehicle headlights. Signs shall be floodlit if outside the reach of vehicle headlight beams. Delineating devices shall comprise or incorporate retroreflectors. Flashing lamps may be used to draw attention to certain advance signs, however flashing lamps shall not be used for delineation.

Pavement markings through the work site shall be retroreflective. This may be achieved by means such as retroreflective paint using drop-on beads, retroreflective preformed materials, or raised retroreflective pavement markers.

Signs required to be fluorescent by day and retroreflective at night (e.g., the Workers (symbolic) sign), shall have a sign face background comprising combination fluorescent/retroreflective material. Signs and equipment (e.g., Workers (symbolic) sign) and high visibility clothing worn by traffic controllers, which comprise combination fluorescent/retroreflective material, do not require illumination (i.e., floodlighting).

7.4 Safety Barriers

Safety barriers shall be required for situations where any of the following are cause for concern:

- Inadequate safe clearances between moving traffic and workers and equipment
- Hazardous traffic conflicts (e.g. where head-on collisions might be likely).
- Collisions with hazardous fixed objects, works, or falls into excavations close to the travelled path.
- Inadequate separation of temporary footpaths, shared paths or bicycle paths from vehicular traffic paths.

7.5 Maintenance of Devices

Signs and devices which are damaged, ineffective, or otherwise no longer in good condition should be either refurbished to new condition or replaced. Non-repairable signs should be destroyed and disposed so that they are not inadvertently reused.

Water levels in water-filled safety barrier devices shall be maintained per the manufacturer.

7.6 Use of High Visibility Clothing

Personnel shall wear high visibility clothing while in the work area, on or adjacent to the travelled path, or in other potentially hazardous areas, (e.g., on or adjacent to haul roads, traffic paths).

7.7 Hazard Avoidance

Machinery should not be parked, materials stored, or buildings erected in positions where they may create a hazard, obscure signs, or block approaching drivers' lines of sight.

8.0 TRAINING

Personnel working on roads must be trained in the following:

- Night Conditions.
- Traffic Control that includes:
    - Types and usage of safety barriers, signage and other delineation
    - Road Closure Design
    - Speed Limits
    - Adjusting of work area