

EXPRO National Manual for Projects Management

Volume 11, Chapter 3

Project Road Works Procedure



Document No. EPM-KSS-PR-000034 Rev 003



Project Road Works Procedure

Document Submittal History:

Revision:	Date:	Reason For Issue
000	19/10/2017	For Use
001	03/12/2017	For Use
002	04/12/2018	For Use
003	09/08/2021	For Use



Project Road Works Procedure

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1.0 PURPOSE

The purpose of this Procedure is to provide information that allows construction to perform work safely when working around live traffic areas. This is an essential part of highway construction and maintenance operations. Since conditions and requirements of work sites may change often, traffic control measures must be frequently reviewed to assure the measures are appropriate.

For more detailed information relating to this Procedure can be found in the Manual on Uniform Traffic Control Devices Ministry of Communications (Kingdom of Saudi Arabia).

2.0 SCOPE

The scope of this procedure applies to all works performed under all Government Construction Contracts executed throughout the Kingdom of Saudi Arabia.

3.0 DEFINITIONS

Definitions	Description
Approach Speed	The speed at or below which 85 percent of vehicles are observed to travel under the free-flowing conditions past a nominated point.
High-Speed Road	Roads on which the posted or general speed limit is above 60 Km/h.
High-Volume Roads	Roads carrying more than 1500 vehicles per day
Low-Speed Roads	Roads on which the posted or general speed limit is 60km/h or less.
Long-Term	The description which applies when a traffic guidance scheme is required to operate both day and night and may be left unattended.
MUTCD	Manual on Uniform Traffic Control Devices
STARRT	Safe Task Analysis and Risk Reduction Talk
JHA	Job Hazard Analysis
WMS	Work Method Statements
PPE	Personal Protective Equipment
vpd	vehicles per day

4.0 REFERENCES

- Manual on Uniform Traffic Control Devices. Ministry of Communications (Kingdom of Saudi Arabia)
- EPM-KSS-PR-000001 Project General Safe Working Requirements Procedure
- EPM-KSS-PR-000006 Project Barricades and Signs Procedure
- EPM-KSS-PR-000010 Project Night Works Procedure

5.0 RESPONSIBILITIES

5.1 Contractor Site Manager

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

5.2 Contractor Supervisor

It is the Contractor's responsibility to sign, guard, illuminate (light) and maintain the work areas safely. Time shall be taken to properly plan how the contractor will do this and to decide on what equipment the contractor will require to use.

Contractor Supervisor shall ensure that the plans developed are specific for the type of road condition and design. Speed limits are to be reduced in the work area.

Supervisor is to ensure that the plans are checked and communicated to the crew prior to work commencing work, and that all controls have been implemented.



6.0 RISK ASSESSMENT

An integral aspect of the work planning process is the performance of a proper risk assessment. Risk Assessments must be conducted to analyze all safety risks likely to arise during roadworks which includes the setting up, operating, changing and ultimate dismantling of a traffic guidance scheme.

The Risk Assessments that shall be conducted at the Planning Stage are as follows:

- Project Risk Assessment.
- Work Method Statements (WMS)
- Job Hazard Analysis (JHA).
- Safety Task Analysis and Risk Reduction Talk (STARTR).

It is imperative that prior to beginning any work activity, a STARTR briefing occurs to discuss the contents of the WMS/JHA which includes mitigations for any other hazards noted by the crew at the jobsite. The discussion shall also include job steps, expected hazards associated with the activity, and the mitigation and protection methods that shall be implemented to prevent incidents.

If circumstances change by way of the environment, other work crews are in the area, additional hazards are now present, change of methodology of the task etc..... another STARTR briefing shall occur.

The Hierarchy of control shall be used to reduce the likelihood of an incident occurring.

- **Elimination** (Remove the Hazard)
- **Substitution/Isolation** (Replacing material, process or hazard with a lower risk one/ separate people from the hazard (such as suitable guarding, distance, etc.)
- **Engineering Controls** (Redesign or replacement of plant and equipment)
- **Administration Controls** (Procedures, training, signage)
- **PPE - PERSONAL PROTECTIVE EQUIPMENT**

No work is to commence until the above has been implemented and signed by the relevant Supervisor in charge.

7.0 PROCESS

7.1 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.

Planning at all levels requires a procedure to be followed whereby all essential aspects of the plan are considered in an ordered way. The following matters should be considered in turn 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.

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



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- Type of signs and markings to be used.
- Plans to use based on the type of road. (single lane, dual 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.

7.2 Traffic Management

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

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

7.3 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 the site at night apply:

General

The following requirements and recommendations apply to all night-time road closures whether workers or plant are on site:

- Wherever practicable, any part of the normal roadway which is closed during the day and can be opened at night, should be opened if, by so doing, either travel conditions or safety both for night traffic, can be improved.
- Temporary traffic route lighting through a work site 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 path through the site 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. 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.
- 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.

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:
 - o Traffic control station and locations where workers or plant might encroach on traffic lanes.
 - o 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.



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- 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.

7.4 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.

7.5 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 1.0 m. Elsewhere, a width of at least 2.0 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:
 - o 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.
 - o 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.

8.0 DEVICE REQUIREMENTS

8.1 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.



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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.

8.2 Delineation

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

Delineation should be considered for both long and short range purposes. The former should provide drivers approaching the work site with an advance view of the site indicating the general location and direction of the trafficable path, whilst the latter should guide drivers through the works once they have entered the work area or side track. 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 below).

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.

Value of Dimensions "D"	
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

8.3 Night Conditions

Signs shall be floodlit if outside the headlight beams. Delineating devices shall comprise or incorporate retroreflectors. Flashing lamps may be used to draw attention to certain advance signs. 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 reflectorizing paint using drop-on beads, retroreflective preformed materials or raised retroreflective pavement markers.

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 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.

8.4 Safety Barriers

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

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



8.5 Maintenance of Devices

Ineffective signs and devices shall be replaced by similar items in good condition, if they cannot be made effective by cleaning or repairing.

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

Water in water-filled safety barrier elements shall be maintained at the required level.

8.6 Use of High Visibility Clothing

All personnel shall wear high visibility clothing while on or adjacent to the travelled path, or in other potentially hazardous areas, e.g. on or adjacent to construction haul roads.

8.7 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.

9.0 TRAINING

Personnel working on roads must be trained in the following:

- Risk Assessments.
- Method Statements
- Night Conditions.
- Delineation.
- Types of Safety Barriers and when to use
- Traffic Control that includes:
 - o Installation of Signage.
 - o Road Closure Design.
 - o Speed Limits.
 - o Adjusting of work area.

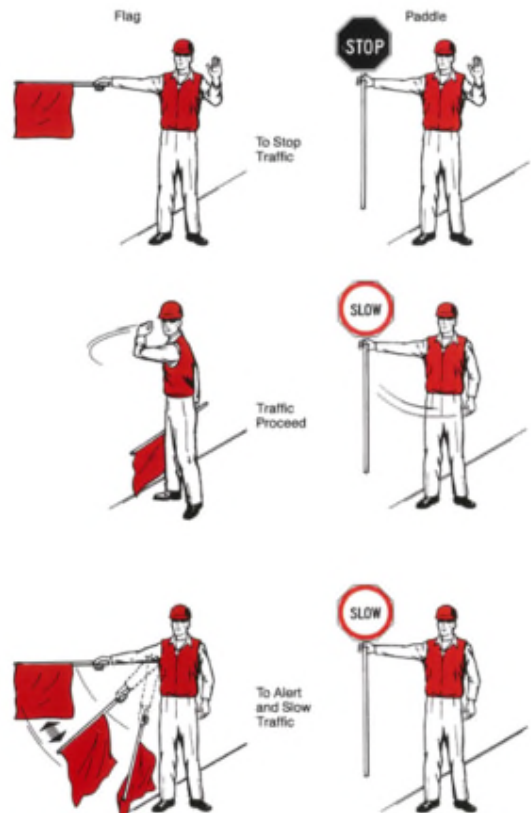
10.0 ATTACHMENTS

1. Use of Hand Signaling Devices by Flagman
2. Road Closure Plan Examples



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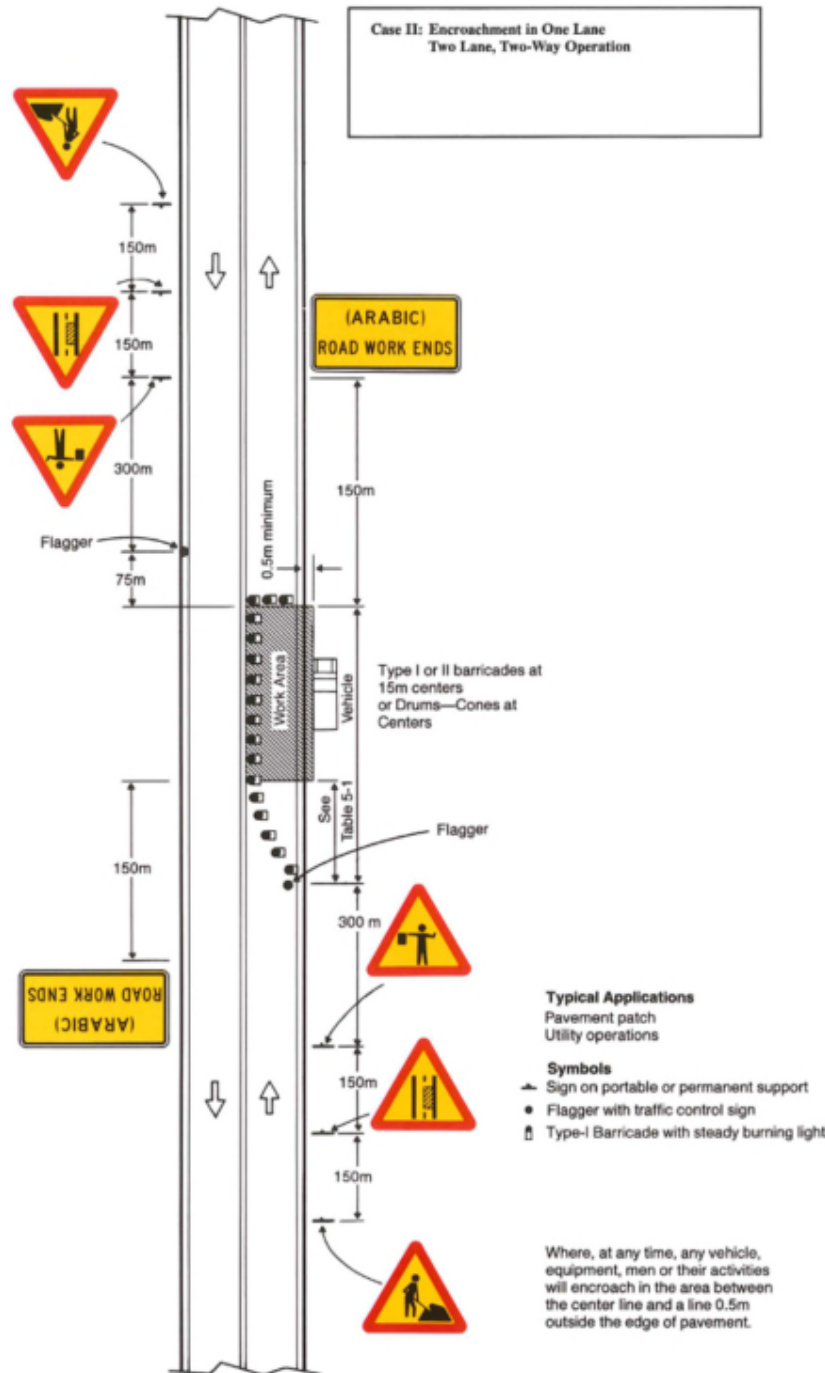
Attachment 1 - Use of Hand Signaling Devices by Flagman





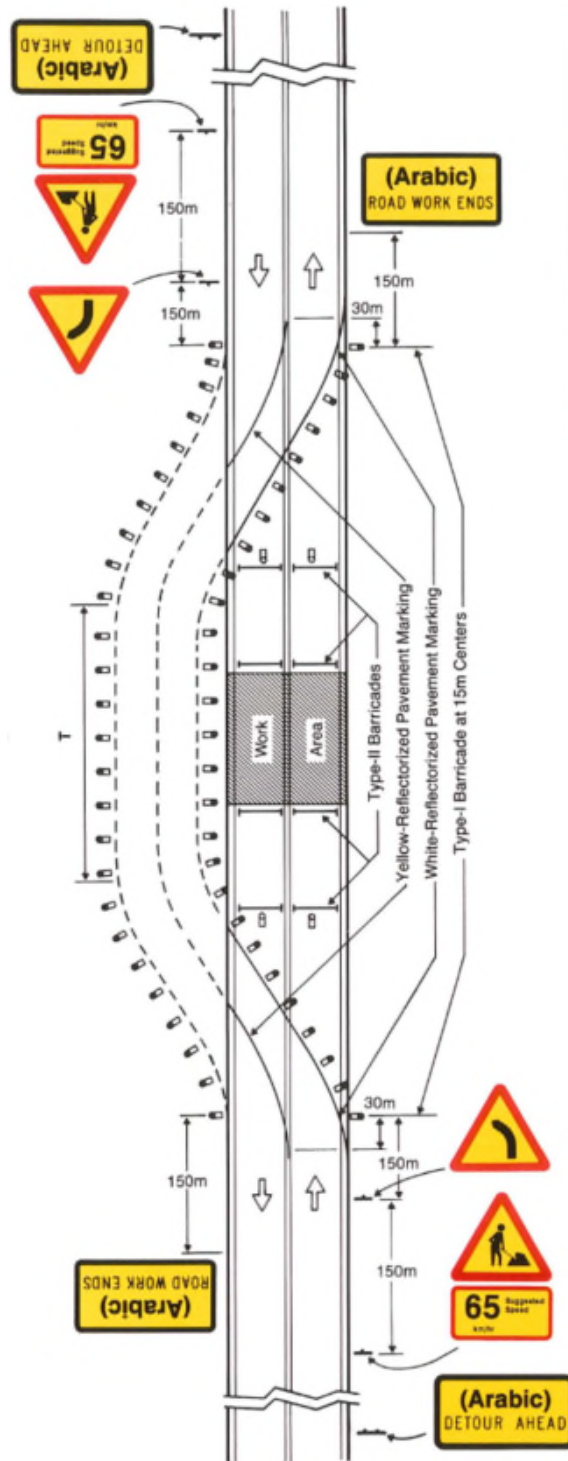
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Attachment 2 - Road Closure Plan Examples





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Case VI: Closure of Both Lanes and Use of a Temporary Detour

1. Pavement markers on paved detours shall be used when the closure time is of longer duration or when the normal posted speed outside the area of operations exceeds 80 km/h. Temporary pavement marking materials shall be used for marking new center lines and edge lines on the existing pavement. All existing markings conflicting with the revised traffic pattern shall be removed. Reflectorized pavement markings shall be used on paved detours.
2. Where the tangent distance (T) on the temporary detour exceeds 180 m, spacing between barricades may be increased to 30 m within the limits of the tangent. Within these same limits, the white reflectorized marking used to indicate the center line of the traveled way may be a dashed pattern, if sight distance is adequate for passing.
3. The suggested safe speed to be shown below the Reverse Bend signs shall be determined at the site and approved by the Engineer.

Typical Applications

Bridge construction
Culvert construction

Symbols

- Sign of portable or permanent support
- ☺ Type-I Barricade with steady burning light.
- ☺ Type-I Barricade with flashing light.

Two-lane, two-way traffic, rural temporary runaround day or night operations.

Where, at any time, any vehicle, equipment, men or their activities require the closure of both lanes and a temporary runaround is constructed.



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