



**REPUBLIC OF GHANA
MINISTRY OF TRANSPORTATION
GHANA HIGHWAY AUTHORITY**

**Guidelines for the
SIGNING AT ROAD WORKS**



FINAL DRAFT
September 2007

INTRODUCTION

The purpose of these guidelines is to inform, warn and guide the road users safely past the works area and in that way protecting the road users and the workforce.

All road works, no matter how small, must be properly signed. To keep the respect of the road users for the signing of road works, and with it the road safety, it is also important to continuously maintain and adjust the signing to the current work situation. If some or all of the signing are no longer needed, it must be removed.

Contractors and supervising engineers have an important responsibility to make sure, that road works are safe. These guidelines are intended to assist in ensuring the road safety when works are being carried out.

PLANNING

The contractor must make a plan that shows how the road works will be signed. The plan has to be approved by the Regional Manager of GHA before starting the road works.

When working in junctions, signs should be set out for traffic approaching from all directions.

Existing traffic signs that aren't valid during the road works must be removed or covered efficiency.

SUPERVISION

When the signing has been put up, drive through the road works and view it from the driver's perspective. The key question contractors and supervising engineers must ask themselves is:

“Will someone coming along the road from any direction understand exactly what is happening and what is expected of them?”

The contractor should supervise and maintain the signing at least 2 times on working days and at least 1 time on other days. Keep signs clean.

WORKING CLOTHES

For the sake of their own safety, all workers and supervising engineers should wear reflective clothing (e.g. vests) in the colours lime, yellow, orange or red.

ROAD WORK SIGNS

Road work signs must be standard traffic signs - don't design your own. All signs must be reflective. Make sure to place the signs in a visible place for the drivers. On dual carriageway roads the warning signs must be duplicated on the central reservation.

Signs and guarding equipment must be secured against being blown over or out of position by the wind or passing traffic. For this purpose, use sandbags or – alternatively - equipment having ballasting as a part of its construction.

The most important traffic signs used at road works are (based on the new Draft Signs and Markings Manual prepared under the Road Safety Sub-Component, August 2007):



“Road works”

The first sign a driver should see when approaching a road work is the road works sign. ALWAYS USE IT and put it out first.

Place it about 150 m before the lead-in taper. (400 m on motorways)

Length of the triangle sides = 90 cm. (110 cm on motorways)



“Road narrows on left”

Use this sign to warn the road users if the road narrows on their left.

Add a “Traffic control” sign when appropriate.

Place it about 100 m before the lead-in taper.

Length of the triangle sides = 90 cm.



“Road narrows on right”

Use this sign to warn the road users if the road narrows on their right.

Add a “Traffic control” sign when appropriate.

Place it about 100 m before the lead-in taper.

Length of the triangle sides = 90 cm.



“Maximum speed”

Introduce a mandatory speed limit during the working period, typically 30, 40 or 50 km/h.

Place it with the road works sign and repeat it for every 500 m.

Diameter = 70 cm. (90 cm on motorways)



“End of speed restriction”

The sign ends the mandatory speed limit introduced before the works area.

Place it about 50 m after the works area.

Diameter = 70 cm. (90 cm on motorways)



“Keep left”

Use the sign to mark any obstacles, the road users must past to the left.

When erecting the sign, be careful to make the arrow slope 45°.

Diameter = 70 cm. (90 cm on motorways)



“Keep right”

Use the sign to mark any obstacles, the road users must past to the right.

When erecting the sign, be careful to make the arrow slope 45°.

Diameter = 70 cm. (90 cm on motorways)



Keep right

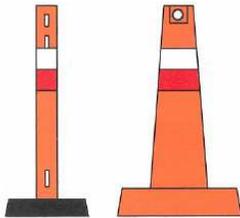
Keep left

“Roadside hazard plates”

Use the plates to mark the lead-in taper and along the works area, when the road works are of long duration.

When erecting the plates, be careful to make the stripes tilt against the side the road users shall pass by.

Height = 110 cm. Width = 25 cm.



“Traffic cones”

Use the cones to mark the lead-in taper and along the works area, when the road works are of short duration.

When using traffic cones to mark the road works, they must be complemented with “keep left” and “keep right” signs.

Height = about 100 cm.



Turn left

“Sharp deviation of route to left” (right if chevrons reversed)

Use this sign as a barrier across the carriageway only when the road user has to make an essential change of direction (turn left or right).

Height = 50 cm. Width = 250 cm.



“Lane closed”

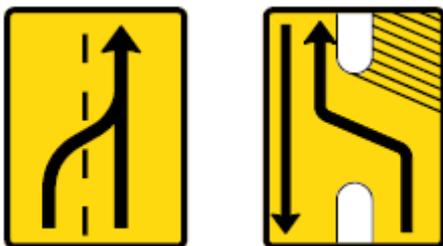
Use this sign as a barrier across the carriageway to close a lane.

Height = 50 cm. Width = 250 cm.

If introducing a mandatory speed limit of 40 km/h or less at road works in urban areas, and the works area ends within the 50 km/h zone, then use a 50 km/h speed limit sign to end the speed limit at the works area.

On motorways the mandatory speed limit should be reduced by steps of 20 km/h for every 200 m, e.g. 90 → 70 → 50 km/h.

When reducing the number of lanes on dual carriageway roads, temporary roadside signs showing the actual course of the lanes must be used in stead of the “road narrows” signs.



Examples of temporary roadside signs on dual carriageway roads

When the road works are of long duration, it is recommended that road users are informed by temporary information signs.



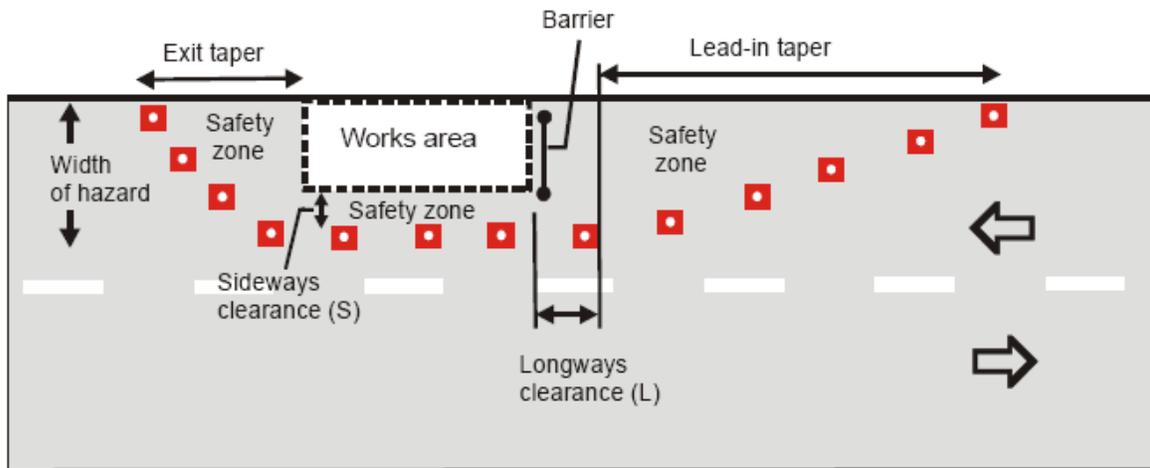
Example of temporary information sign

SITE LAYOUT

The works area is the excavation etc., at which the road works are being carried out. It is also the space around the works for tools, excavated material, equipment and plant etc.

The safety zone is provided to protect the workforce from traffic and to protect the road users from crashing into the works area. The safety zone is made up by:

- The *lead-in taper*. When traffic control is provided, the lead-in taper must be 45° to the roadside. Otherwise the length of the lead-in taper must be 20 times the width of hazard.
- The *longways clearance* (distance between the end of the lead-in taper and the works area).
- The *sideways clearance* (the width between the works area and the moving traffic).
- The *exit taper* is always 45° to the roadside.



Approach speed (km/h)	50	60	80	100	110
Longways clearance + lead-in taper (m)	55	75	120	170	210

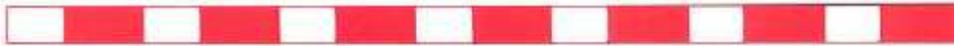
The lead-in taper and the exit taper must be supplied with flashing road danger lamps at night.



Pedestrians must be protected from both the works area and the moving traffic. If the footway has to be closed, a safe route for pedestrians must be provided and signed with the “footpath” sign (diameter = 50 cm) if not clear visible. Safe routes should always provide a minimum unobstructed width of 1,0 m, increased wherever possible to 1,5 m or more.



Pedestrians must be separated from the works by barrier planks in red and white.



Barrier plank

When closing one carriageway on a dual carriageway road and traffic is lead into one lane of the opposite carriageway, it should be separated from the oncoming vehicles by traffic cones and roadside hazard plates. Also a safety zone must be provided between the lead-in taper for the oncoming vehicles and the crossover. Use the values according to the safety zone before the works area.

If the site of the plant is outside the works area, warning signs must be put up on both sides of the crossing (distance 50 m in urban areas and 150 m in rural areas):



PROTECTING THE WORKS AREA

The choice of equipment along the carriageway to guard the workforce from the traffic and the road users from the excavation etc. is depending on the speed limit and the sideways clearance:

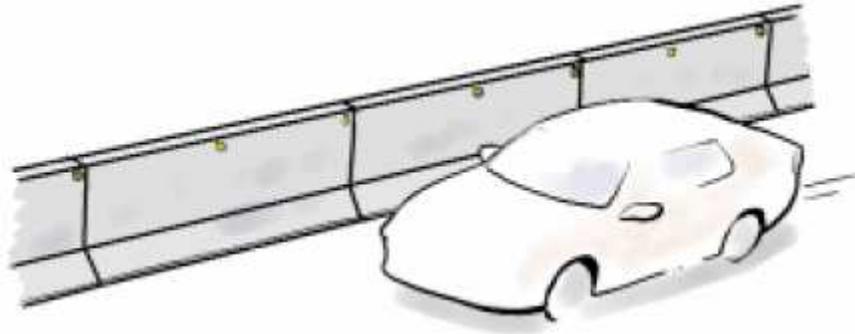
		Sideways clearance (m)		
		0 - 1	1 - 2	2 - 3
Speed limit (km/h)	30 km/h	D	D	-
	40 km/h	B	D	-
	50 km/h	B	C	C
	60 km/h	A	C	C
	70 km/h	A	A	C

A: New Jersey Barriers or crash barriers with reflectors

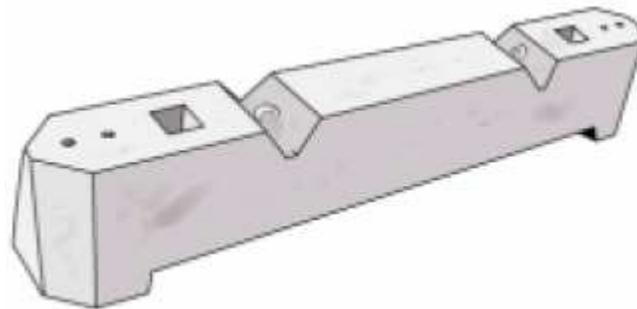
B: Heavy barriers (e.g. concrete barriers) with roadside hazard plates

C: Roadside hazard plates or traffic cones with barrier planks or reflectors on a string.

D: Roadside hazard plates or traffic cones.



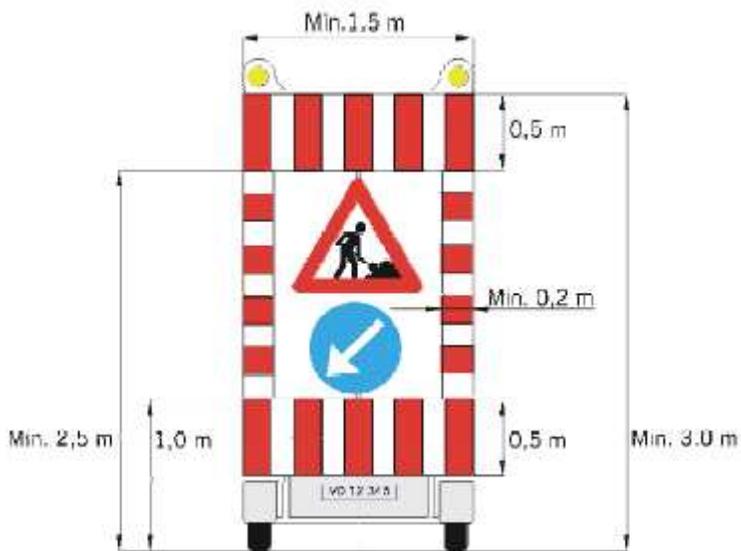
New Jersey Barriers



Concrete barrier

Distance between barriers, hazard plates or traffic cones should be ≤ 6 m.

At **mobile road works** it is recommended to use mobile barriers with flashing road danger lamps. The mobile barrier should be placed about 50 m before works area.



Example of a mobile barrier

CARRIAGEWAY WIDTHS

Minimum widths are

- 3,0 m for single lane
- 6,0 m for two-way traffic

If the remaining carriageway width is $< 3,0$ m, the road shall be closed and a diversion or even a provisional road must be provided. It must be maintained throughout the working period.

Mark the diversion route with temporary direction signs:



TRAFFIC CONTROL

When there is insufficient width remaining to allow two-way traffic, reduce the available width to 3,7 m and provide traffic control.

Traffic control by **'Give and Take'** system can be used only when ALL of the following apply:

- The speed limit is ≤ 50 km/h
- The length of the works from the start of the lead-in taper to the end of the exit taper is ≤ 50 m
- Drivers approaching from either direction can see 50 m beyond the end of works
- Two-way traffic flow is less than 20 vehicles counted over 3 minutes (400 veh/h)
- Less than 20 heavy goods vehicles pass the works per hour.

Manually operated Stop/Go boards or portable traffic signals must be used when the conditions for using 'Give and Take' system is not met.

When using traffic control by **Stop/Go boards**, the length of the works should not exceed 500 m. If the operators are not clear visible to each other, two-way radio control must be applied. At night the operators and their Stop/Go boards should be illuminated.



Manually operated temporary STOP and GO signs

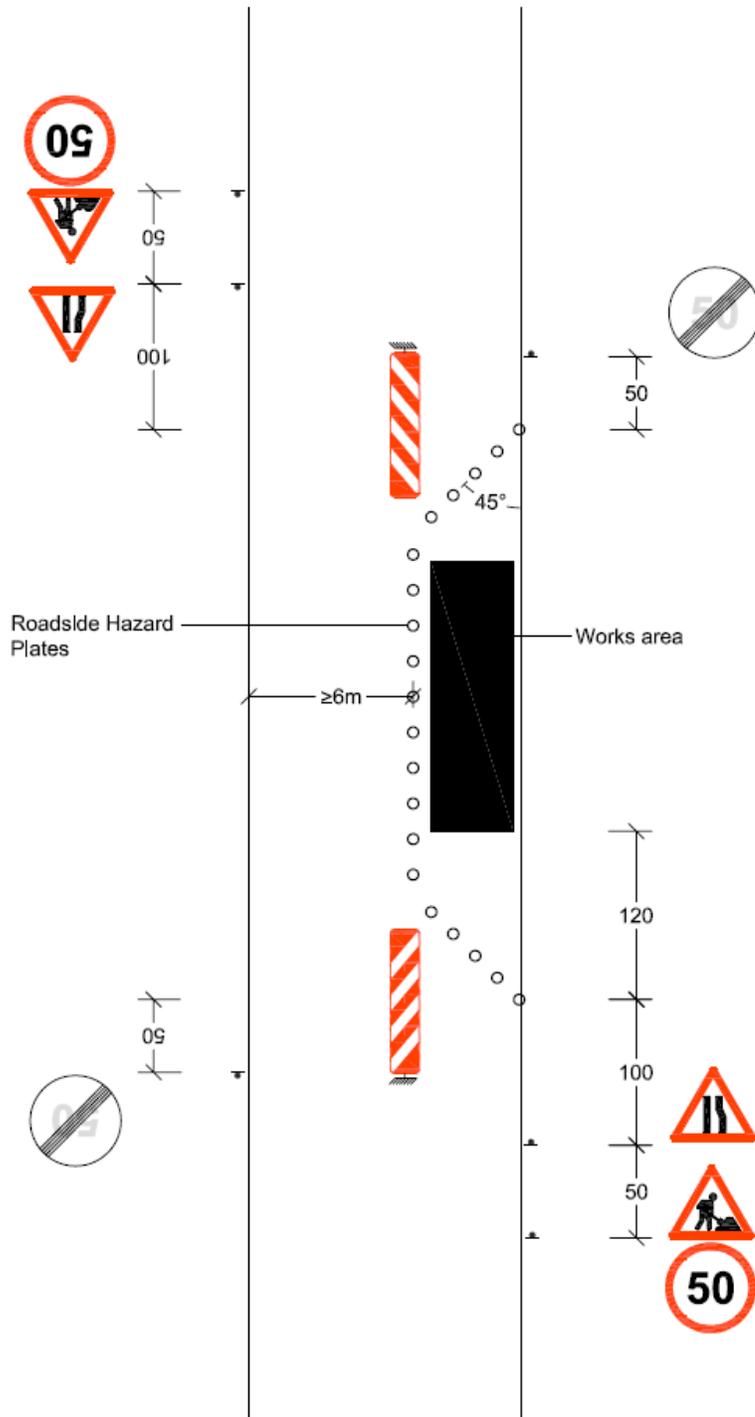
Red and green flags can be used as an alternative to Stop/Go boards.

Portable traffic signals can be used at most sites up to 300 m long. Stop/Go boards or red and green flags must be available in case the portable traffic signals break down.

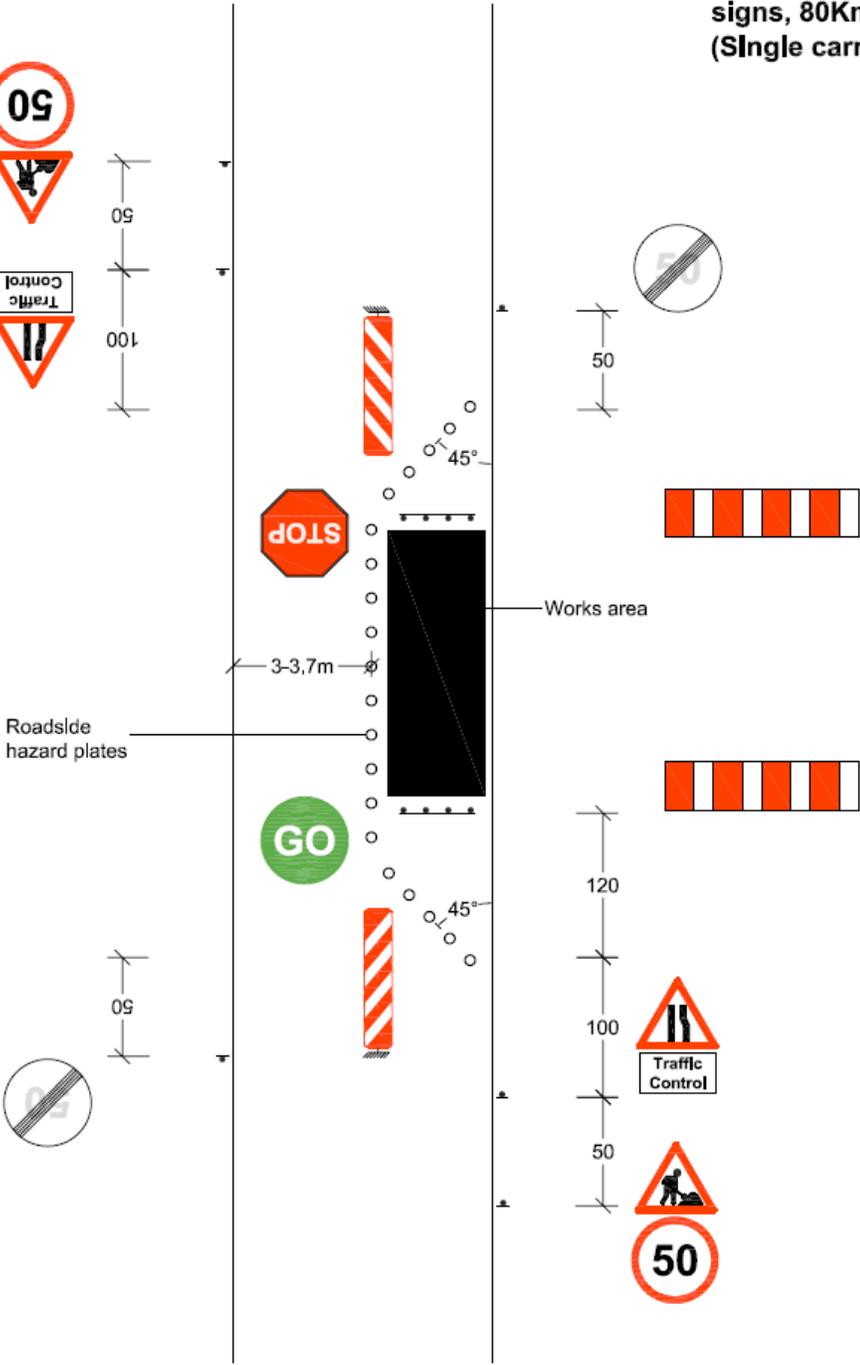


EXAMPLES

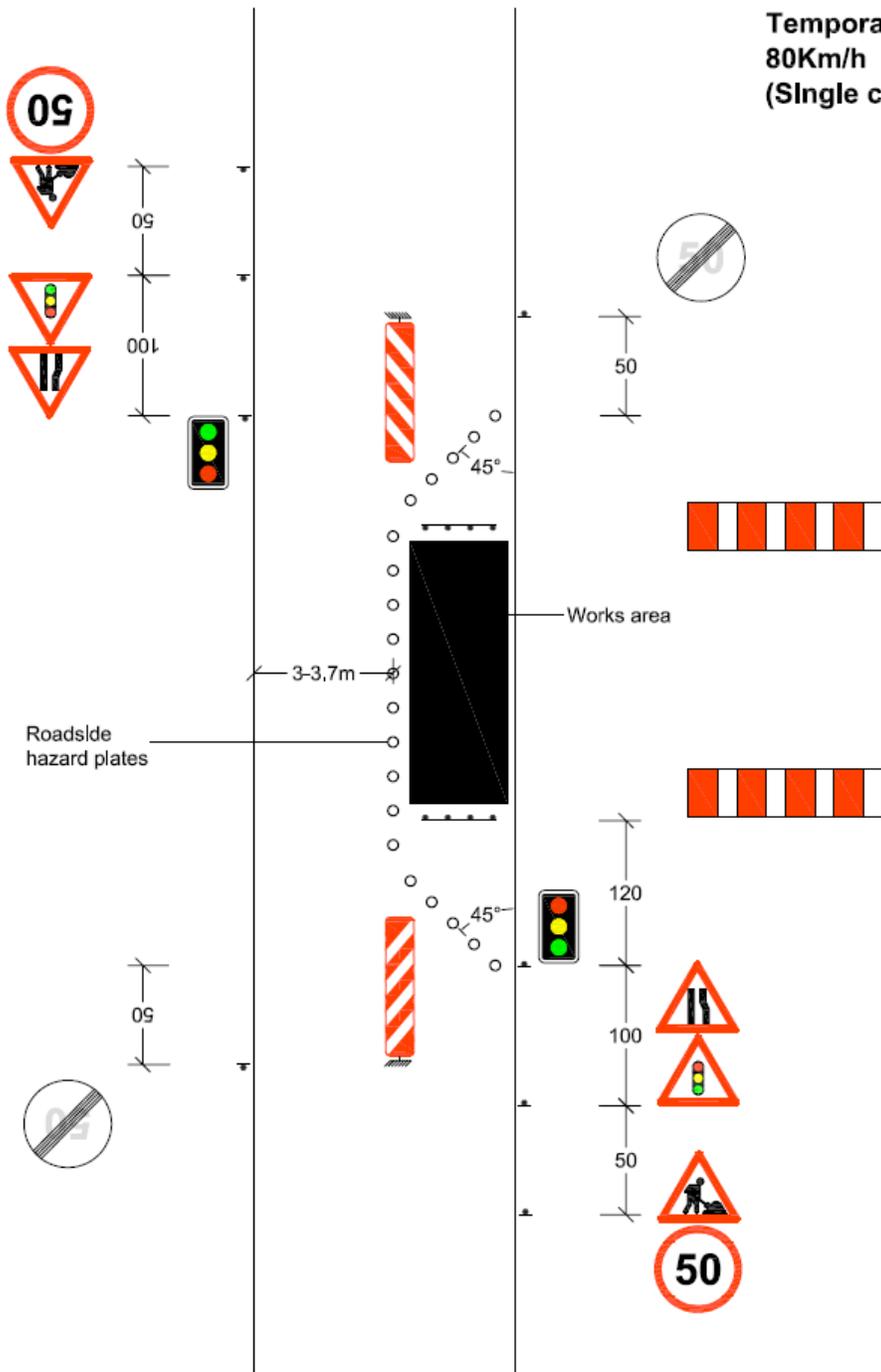
Layout 1
Work In roadway (Single
carriageway)
Speed limit 80Km/h



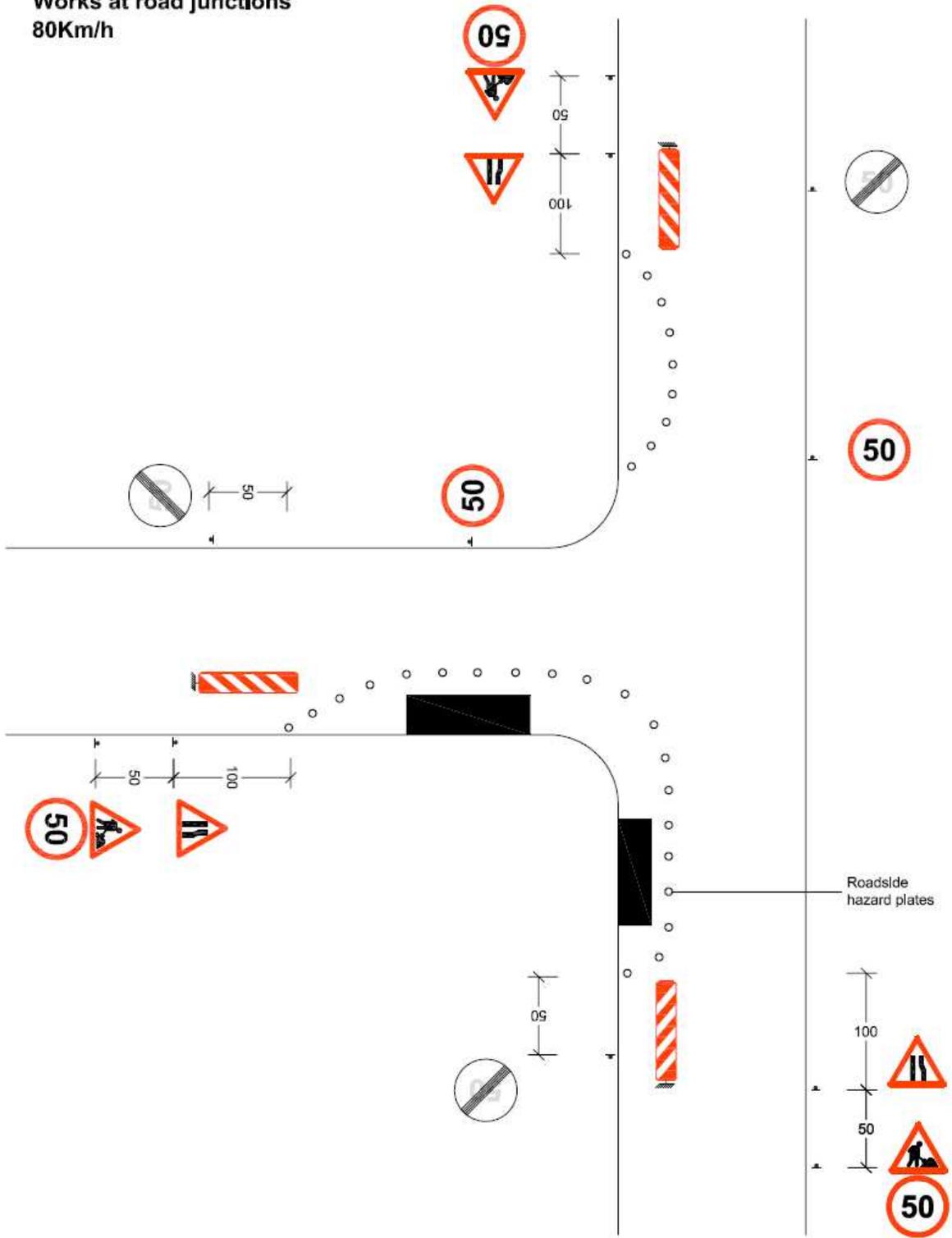
Layout 2
Traffic control with STOP, GO
signs, 80Km/h
(Single carriageway)



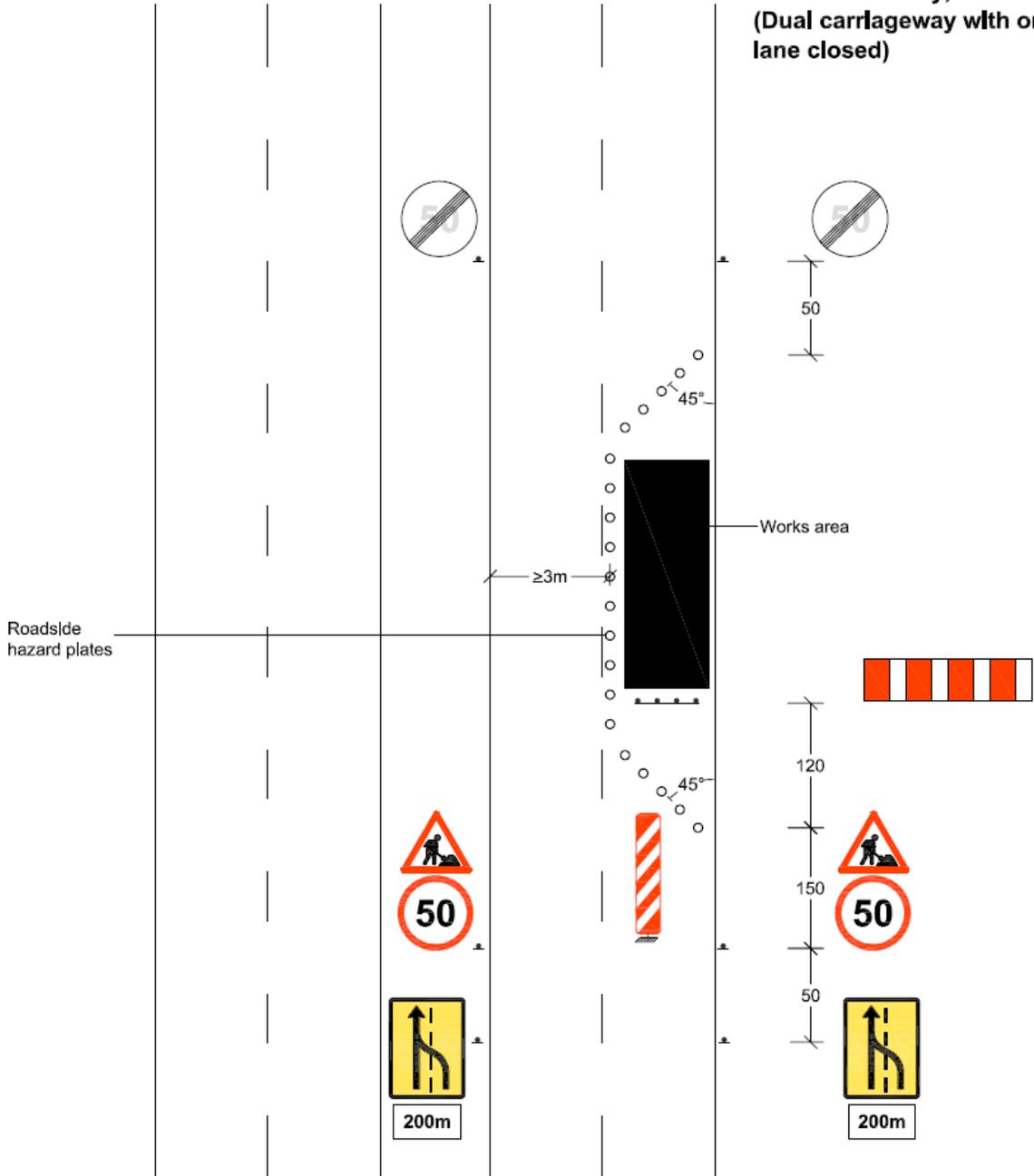
Layout 3
Traffic control with
Temporary traffic signals,
80Km/h
(Single carriageway)



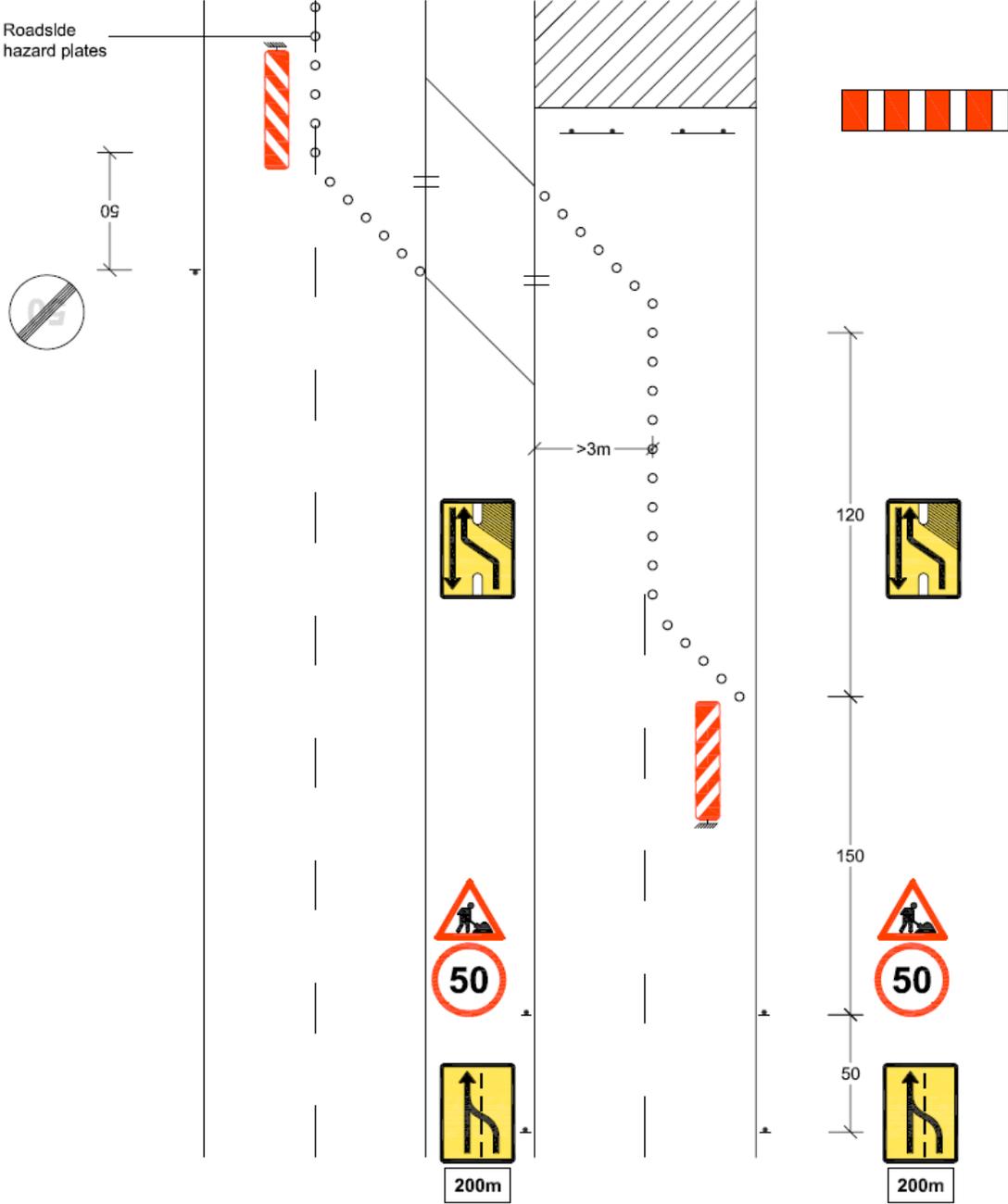
Layout 4
Works at road junctions
80Km/h



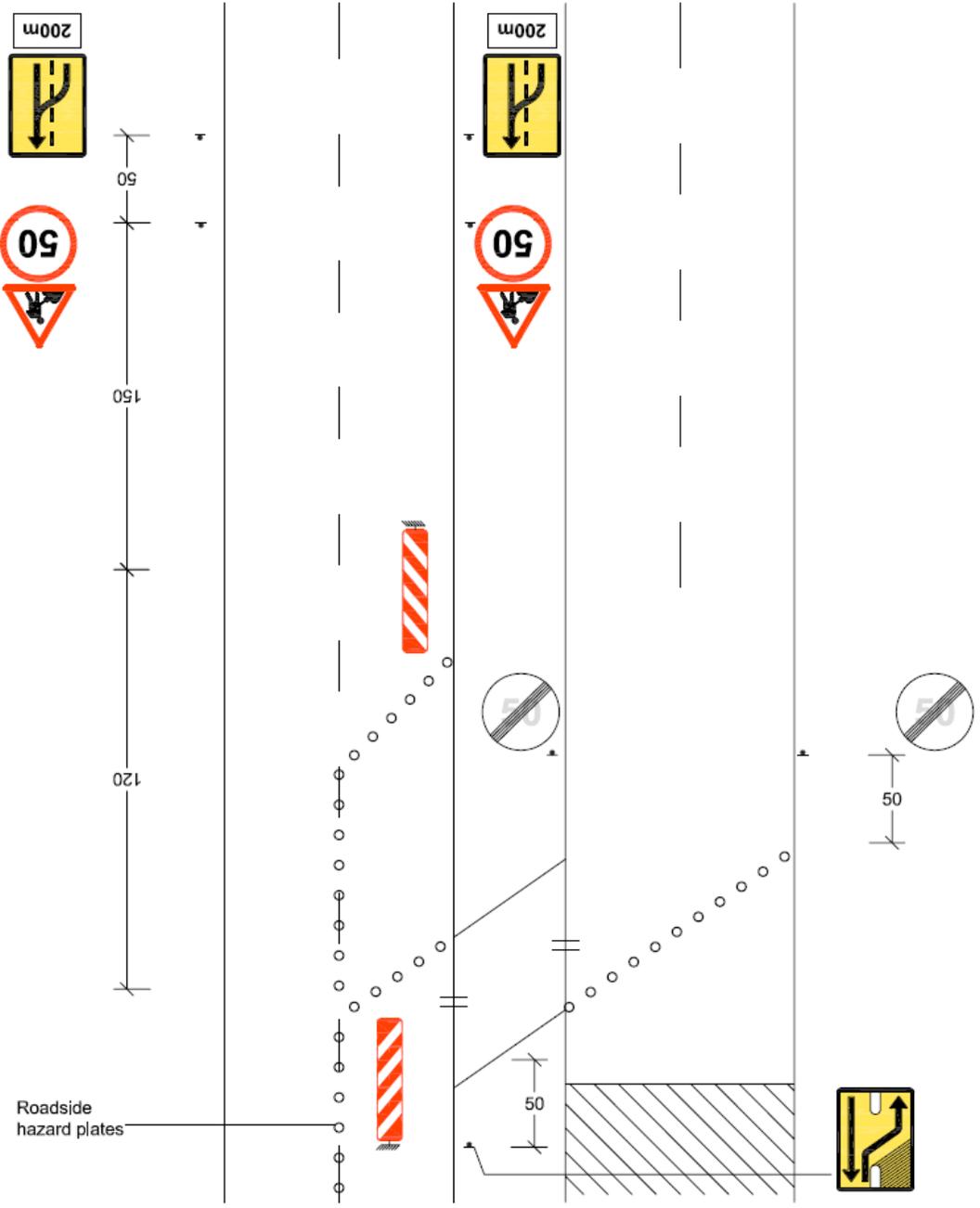
Layout 5
Work in roadway, 80Km/h
(Dual carriageway with one lane closed)



Layout 6
One carrlageway closed
Start of contraflow on
second carrlageway, 80Km/h
(Dual carrlageway)



Layout 7
One carriageway closed
End of contraflow, 80Km/h
(Dual carriageway)



Layout 8
Diverslon of traffic In a
built- up area

