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Transport Infrastructure Ireland

TII Publications

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The Location and Layout of Garda Enforcement Areas, Garda Observation Areas, Emergency Refuge Areas, Maintenance Bays and Location Markers

DN-GEO-03052

September 2025

DN Design

Standards

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TII Publications

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1. Introduction

1.1 Scope

This Standard outlines the design principles and factors which should be considered by Designers for the layout and location of Garda Enforcement Areas, Garda Observation Areas, Emergency Refuge Areas and Maintenance Bays on national roads. It also includes requirements for the provision of location signs and markers on national roads.

This Standard does not cover the design of Service Areas, but should be read in conjunction with DN-GEO-03028 *'The Location and Layout of Service Areas'*.

1.2 Implementation

This Standard shall be used for the design of all new or improved Motorways and all-purpose dual carriageways and divided roads. The Standard should be applied to the design of schemes already being prepared unless, in the opinion of the Transport Infrastructure Ireland (TII), application would result in significant additional expense or delay progress. In such cases, the designer should confirm the application of this Standard to particular schemes with TII.

1.3 Definitions

For definitions of the general road terms used in this Standard such as components of the road cross-section, refer to DN-GEO-03036.

Particular terms used in this Standard are defined as follows:

- **Designer:** The organisation responsible for undertaking and/or certifying the design.
- **Emergency Refuge Area:** A short stopping area adjacent to the hard shoulder or hard strip which provides safe refuge for vehicles stranded in emergencies.
- **Garda Enforcement Areas**: An extended lay-by for use by An Garda Síochána as an enforcement area on motorways only.
- **Garda Observation Area:** Parking area off-carriageway to enable the Gardaí to stop and observe road users.
- **Location Marker:** A symbol on the road edge identifying the road user location for emergency purposes.
- **Maintenance Bay:** A restricted parking bay, adjacent to the carriageway, from which maintenance activities can be undertaken.
- **Maintaining Organisation:** The organisation with responsibility for the maintenance of the road after construction.
- **Motorway:** A divided multi-lane road as defined in Section 43 of the Roads Act.
- **Type 1 Service Area:** A large scale service area providing an amenity building (including a convenience shop, restaurant, washrooms and tourist information), fuel and electric vehicle charging facilities, parking and picnic area, intended to be the normal provision on Motorways and Type 1 Dual Carriageways.

- **Type 2 Service Area:** A small-scale service area providing parking, picnic and toilet facilities, but without a main amenity building or fuel facilities.
- **Type 1 Dual Carriageway:** A divided all-purpose road with a minimum of two lanes and hard shoulder in each direction constructed to the geometric standards of DN-GEO-03031 and CC-SCD-00006.
- **Type 2 Divided Road:** A divided all-purpose road with two lanes and hard strip in each direction constructed to the geometric standards of DN-GEO-03031 and CC-SCD-00005.
- **Type 3 Divided Road:** A divided all-purpose road with two lanes in one direction of travel and one lane in the other direction, constructed to the geometric standards of DN-GEO-03031 and CC-SCD-00004. The two-lane section alternates with a one-lane section at intervals of 2km approximately.

2. General Principles

2.1 Non-Emergency Stopping Provision

2.1.1 Context

Transport Infrastructure Ireland (TII) is charged with providing a safe and efficient network of National Roads. It is accepted that a safe road network includes the provision of sufficient parking areas to allow drivers to stop and rest. This need has been given legal standing by the European Union Regulations under the Trans-European Transport Networks (TEN-T) Regulation [1], the Road Infrastructure Safety Management (RISM) Directive[2], as well as other national policies and guidelines.

As part of the development and expansion of the Irish Motorway Network over time, many lay-bys were constructed along sections of the motorway and dual carriageway network, with these typically intended to serve as Garda Enforcement Areas (GEAs) to support a traffic and law enforcement function. However, in the absence of proper dedicated Service Areas at sufficient intervals, many of these GEAs were opened for public (non-emergency) use, providing parking areas for short duration stops. A typical example of a lay-by opened for non-emergency use is shown in Figure 2.1.



Figure 2.1 - Garda Enforcement Area Lay-by opened for public (non-emergency) use

Lay-bys opened for public use allow traffic to pull in off the mainline carriageway but have no welfare facilities and very limited parking capacity. It is not permitted for road users to exit their vehicles at these lay-bys and as such, these lay-bys provide a very limited service to road users.

In recent years, TII has conducted usage monitoring surveys and Road Safety Inspections at existing lay-bys open to public use along the motorway and dual carriageway network. These reviews have identified several safety and operational concerns associated with the siting and usage of these lay-bys, including the following observations:

- Surveys indicated a significant usage of lay-bys by Heavy Goods Vehicles (HGVs).

[1] Regulation (EU) 2024/1679
[2] Directive 2008/96/EC

- Evidence of misuse was observed, including motorists exiting parked vehicles and placing users at risk of passing vehicles both on the mainline or those entering and exiting the lay-by.
- Many parking areas, originally designed and intended to serve a Garda enforcement function only, lacked adequate (or consistent) provision of lighting, signage and road markings to serve a public use function, particularly during the hours of darkness.
- Risks associated with abrupt or late braking of vehicles on the mainline, to accommodate vehicles entering/exiting the lay-by, were observed.

2.1.2 TII Policy for Non-Emergency Stopping Provision

Since 2014, there has been a significant expansion in Service Area provision along the motorway and dual carriageway national primary network. These include both on-line facilities accessible only from the motorway and dual carriageway network (via a dedicated junction) and off-line facilities located adjacent to but accessible off the mainline network.

All on-line Service Area facilities provided thus far meet the requirements of the Type 1 Service Area as defined in DN-GEO-03028. These are large scale Service Areas, providing an amenity building (including convenience shop, restaurant, washrooms and tourist information), fuel and vehicle maintenance facilities, electric vehicle charging points, picnic areas, sufficient parking and sanitary facilities that meet the needs of a diverse user profile. Additionally, many off-line Service Areas meet similar requirements in terms of providing extensive services and fulfilling certain criteria in respect of opening hours and accessibility to the network.

The expansion of dedicated Service Areas has reduced the need for public use lay-bys on motorway and dual carriageway routes. Furthermore, existing public use lay-bys have been highlighted through Road Safety Inspections (undertaken in accordance with the RISM Directive) as an area of concern on safety grounds (as described above). Accordingly, it is preferred that road users avail of dedicated Service Areas (on-line or off-line) for non-emergency stops of any duration or purpose on Motorways and Type 1 Dual Carriageways.

Unless otherwise agreed with TII, new or improved Motorways, all-purpose dual carriageways and divided roads shall not include provision of non-emergency public use lay-bys, unless otherwise agreed with TII.

2.2 General Design Requirements

This standard shall be used for the design of the following:

- The provision, siting and design of Garda Enforcement Areas on motorways.
- The provision, siting and design of Garda Observation Areas on motorways, dual carriageways and divided roads.
- The provision, siting and design of Emergency Refuge Areas on Type 2 and Type 3 Divided Roads.
- The provision, siting and design of Maintenance Bays on motorways, dual carriageways and divided roads

General design requirements for each of these facilities are noted in this Section 2.2, with specific design requirements noted in Sections 3 to 6.

2.2.1 Non-Motorised Users

On all-purpose roads, non-motorised users must be considered in the design of Garda Observation Areas, Emergency Refuge Areas and Maintenance Bays, as necessary.

Where a non-motorised user facility is segregated from the mainline, then this facility must be continued around the outside of any Garda Observation Areas, Emergency Refuge Areas and Maintenance Bays, ensuring sufficient lateral clearances in accordance with DN-GEO-03036.

2.2.2 Pavement and Construction

Where a sealed pavement is required, the pavement must be designed for the anticipated traffic loading.

2.2.3 Lighting

Where the mainline has road lighting, the proposed layout must be illuminated to the same standard as the carriageway.

Lighting columns shall not be located on segregation islands separating Garda Enforcement Areas from mainline traffic.

2.2.4 Footways and Kerbing

Where a footway is required, as shown in the layout of the Garda Enforcement Area, a 2m wide footway must be provided adjacent to the parking area. This will encourage parking close to the kerb edge and provide a surfaced area to walk on.

Where a footway is provided, it must be separated from the parking bay area by a full height kerb with a show of 125mm to improve safety for those using the footway.

If a segregation island is provided as part of the layout, it shall be fully kerbed with a 45° splay kerb with a show of no more than 80mm.

Where a layout requires kerbs along the outside edge of the widening, excluding the kerb adjacent to the parking bay area, a kerb with a 45° splay and a show of no more than 80mm shall be provided. This will facilitate drainage, define the edge of the paving clearly and dissuade parking on the verge adjacent to the tapers.

A 1.0m minimum grass verge must be maintained at the back of the footway.

2.2.5 Drainage

The crossfall of all layouts should generally fall away from the mainline carriageway. Any footway, where provided, should slope towards the parking area.

Within a cut situation any surface water runoff should be intercepted before reaching the footway.

Where raised kerbs are provided, a closed kerb and gully drainage system connected into the mainline drainage system must be provided.

Where over-the-edge drainage is utilised, this should be consistent with the mainline drainage and in accordance with DN-DNG-03022.

Sub-surface drainage must follow the outside edge of any Garda Enforcement Area, Garda Observation Area, Emergency Refuge Area or Maintenance Bay.

Where an unsealed surface is used, an impermeable membrane within the foundation must be included to direct any accidental spillage towards the sub-surface drainage system.

2.2.6 Siting and Spacing

There are a number of factors that should be taken into account when considering the siting of Garda Enforcement Areas, Garda Observation Areas, Emergency Refuge Areas and Maintenance Bays on rural Motorways and rural all-purpose dual carriageways and divided roads. Table 2.1 gives some guidance.

Siting affects the safety and operation of the Garda Enforcement Areas, Garda Observation Areas, Emergency Refuge Areas and Maintenance Bays and the land-take requirements for the scheme; consequently, it is best considered at an early stage in the design process to reach a balanced solution.

Siting of Garda Enforcement Areas, Garda Observation Areas, Emergency Refuge Areas and Maintenance Bays should particularly be avoided on the inside of curves and at locations near junctions and signage.

There is no need for Garda Enforcement Areas and Emergency Refuge Areas on opposing carriageways to be located opposite each other. It is better to separate them, so as to reduce the likelihood of pedestrians crossing the road.

For the purposes of considering Relaxations in the geometric standards of DN-GEO-03031 on the immediate approach to a Garda Enforcement Area, the Garda Enforcement Area shall be regarded as a ‘junction’. Thus, the scope for Relaxations is severely restricted, in accordance with DN-GEO-03031, from a distance of 1.5 times the Desirable Minimum stopping sight distance upstream of the start of the diverge taper to the end of the merge taper.

For the purposes of considering Relaxations in the geometric standards of DN-GEO-03031, it is not necessary to regard Garda Observation Areas, Emergency Refuge Areas or Maintenance Bays as a ‘junction’. Notwithstanding this, sites where visibility may be impaired by structures, signs, vehicle restraint systems or landscape planting should be avoided.

Table 2.1 - Siting Considerations

Factor	Avoid	Preferred	Reason
Vertical and horizontal alignment of carriageway in vicinity of Garda Enforcement Areas, Garda Observation Areas, Emergency Refuge Areas and Maintenance Bays.	• Inside of curves (or immediately downstream) • Sharp crests (or immediately downstream) • Bridges and other structures	• Carriageway visibility standards as contained in DN-GEO-03031 for desirable minimum or higher for GEAs • Visibility at entry and exit should conform to DN-GEO-03060 for GEAs	To ensure adequate visibility for vehicles entering and leaving the facility and for traffic on the mainline if the facility is in the line of visibility.

Factor	Avoid	Preferred	Reason
Proximity of junctions	Location after any Advance Direction Signing or within countdown signs for exits off the main carriageway or near an entry from another road.	Location clear of junctions and signing	To avoid confusion of the facility with a junction exit or entry, particularly at night.
Environment	Locations close to houses, woods and adjacent ground cover	Open aspect	• For security and to avoid nuisance to households • To avoid noise intrusion • To avoid visual intrusion • To discourage pollution and soiling
Earthworks	• Locations which require extensive earthworks • High embankments	• Locations requiring minimal changes to the earthworks • Locations which are not visually prominent	• To minimise cost • To minimise visual intrusion
On-line improvement	Use of redundant carriageway as a facility without reference to design standards.	Use of standard layout	• To ensure basic safety requirements of all facilities • To avoid misuse

2.2.7 Traffic Signs and Road Markings

All signage and road markings shall be undertaken in accordance with the Traffic Signs Manual (TSM).

Carriageway markings should have reflectorised studs in accordance with the TSM.

Bifurcation arrows must not be used thereby avoiding road user confusion with junction exits.

3. Garda Enforcement Areas

3.1 General

Garda Enforcement Areas (GEAs) are for the sole use of Gardaí undertaking traffic enforcement on motorways only. Access to and from the area is controlled by the installation of physical barriers located at either end of the area. This limits its use as an unauthorised lay-by.

The physical barrier shall be a lockable, manually operated lifting barrier spanning the width of the entrance and exit of the lay-by. The barrier shall have retroflective markings on both sides of the beam and shall be subject to the approval of TII. The barrier shall be located in order to avoid introducing a hazard within the clear zone.

3.2 Layout and Design

The Garda Enforcement Area layout for use on rural Motorways is presented in Figure A.1.

The length of the GEA parking area is 150m.

An auxiliary deceleration lane of 80m must be provided at the entry to the GEA to enable vehicles to decelerate clear of the main carriageway. Similarly, an auxiliary acceleration lane of 80m must be provided at the exit from the GEA to allow for acceleration. The layouts of the entry and exit must be as indicated in Figure A.1, with the lane and taper lengths as shown.

Kerbs shall be provided along the length of the facility including the tapers, auxiliary lanes, merges and diverges.

Segregation islands are provided at GEAs as a safety feature to separate mainline traffic from the operation of the facility. The segregation island shall be 1.9m minimum wide.

It is important to ensure that the segregation island is conspicuous to drivers on the mainline and those entering the GEA. Hard surfaces are required for ease of maintenance, to allow for occasional over-riding by long vehicles and to avoid possible obstruction of visibility by uncut grass.

The island must be surfaced in a colour that contrasts with the surfacing of the GEA and mainline.

The segregation island is offset from the running edge of the carriageway by 2.5m. This maintains the mainline hard shoulder through the GEA.

3.3 Siting and Spacing

Reference is made to the general design requirements included in Section 2.2.

To identify the need for and location of GEAs, consultation with An Garda Síochána, representatives from the appropriate authorities and the Maintaining Organisation shall take place during the early stages of scheme development. The final selection of GEA sites is likely to require more detailed assessments of earthworks, visibility, proximity to junctions, intended use and cost. Where provided, the required frequency for a GEA is approximately every 25 kilometres for each carriageway.

GEAs are typically included within service areas as per DN-GEO-03028. Type 2 Service Areas are located on average, every 50 – 60 kilometres. Type 1 Service Areas are located as necessary. The inclusion of GEAs within service areas should be considered when siting additional GEAs on the motorway network.

3.4 Traffic Signs and Road Markings

Reference is made to the general design requirements included in Section 2.2.

The recommended road marking and signage layout for the GEA is given in Figure A.1.

There are no road markings to indicate the presence of a GEA. When in use Gardaí will set up temporary traffic signs and cones, as necessary, to direct traffic.

The continuous yellow line edge marking continues throughout the lay-by and can only be crossed under Garda instruction or in emergencies.

'Garda Only' traffic signs as shown in Figure 3.1 (sign F 261 as per the TSM) shall be located at either end of the GEA and installed parallel to the running carriageway.

Segregation islands must have collapsible hazard marker poles to Figure 3.2 installed along the island to increase conspicuity, at intervals of no more than 10m.



Figure 3.1 - Indicative 'Garda Only' Traffic Sign (TSM ref. F 261)

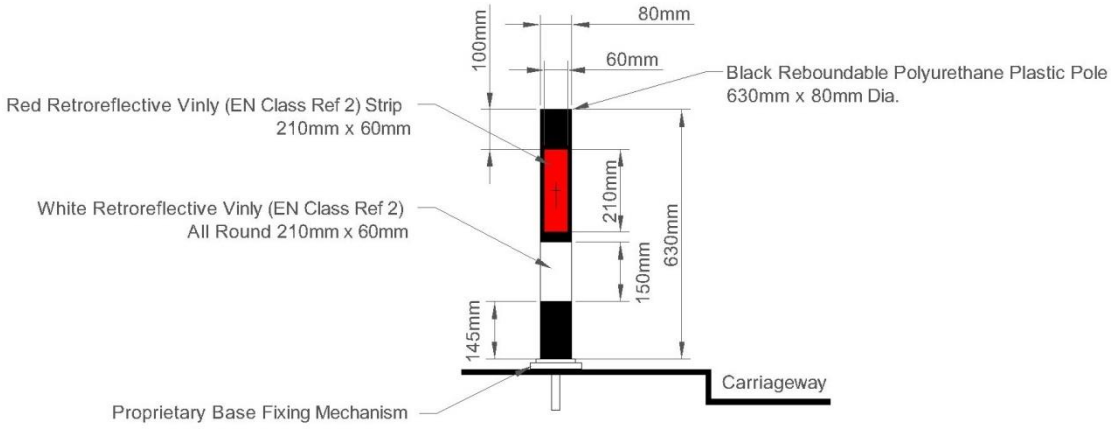


Figure 3.2 - Collapsible Hazard Marker Pole

4. Garda Observation Areas

4.1 General

Garda Observation Areas (GOAs) are used solely by An Garda Síochána for the purposes of providing a vantage point where patrol vehicles can stop clear of the carriageway and hard shoulder or hard strip. This makes the presence of the Gardaí more conspicuous to drivers, thereby improving the general standard of driving and speed limit compliance.

The use of GOAs is typically restricted to the rural motorway, dual carriageway and divided road network.

4.2 Layout and Design

GOAs shall be located on the nearside of the carriageway behind the hard shoulder or hard strip. The GOA layout for use on rural motorways, dual carriageways and divided roads is presented in Figure A.2

The reverse-in layout affords protection to parked Garda vehicles and is less likely to be abused by the public.

The principal design features which should be incorporated wherever possible are:

- The platform should be 1m or more above the level of the adjacent carriageway.
- The parking area should be relatively flat and have adequate surface water drainage.
- The dimensions of the at-grade entry/exit to the GOA shall be sufficient to enable authorised vehicles to drive in forwards and reverse back parallel to the edge of the hard shoulder or hard strip.
- A safety barrier should be provided upstream of all types of platforms.
- Underground services such as drains, electricity and telecommunications cables may pass under observation platforms. These services may require structural protection depending on their locations relative to the finished levels of the platform type used.

4.3 Siting and Spacing

4.3.1 Consultation

Reference is made to the general design requirements included in Section 2.2.

To identify the need for and location of observation areas, consultation with An Garda Síochána, representatives from the appropriate authorities and the Maintaining Organisation shall take place during the early stages of scheme development. The final selection of observation area sites is likely to require more detailed assessments of earthworks, visibility, proximity to junctions, intended use and cost.

The design and consultation process for the provision of GOAs should consider the following:

- Cost – sites at a cutting/embankment interface and/or at-grade locations can minimise additional landtake and keep earthworks to a minimum.
- Visibility requirements – the visibility from parked Garda vehicles in a GOA should be unobstructed for a distance of at least 1.6km both upstream and downstream. Shorter distances may be accepted, but visibility should not be less than 0.8km in both directions and priority should be given to the upstream view. Sites where the visibility is impaired by new structures, signs, vegetation growth or future landscape planting should be avoided.
- Access from the GOA to and from the mainline carriageway, to enable authorised vehicles to safety access and egress from the GOA.
- Radio Communications – sites should have good radio reception for those frequencies used by authorised personnel.
- Unauthorised used – GOAs should not be placed where the public may be encouraged to use them, for example, near an emergency telephone.
- Intrusion – GOAs should not normally be sited where the vehicles using them would overlook or intrude on the privacy of nearby residents.
- Intended usage – consultations should ascertain whether the GOA will be used for a vehicle detection or speed enforcement function. GOAs to be used in conjunction with a speed detection system should not be located close to a diverge off-slip, which can allow offending vehicles to leave the road.

4.3.2 Spacing and Provision of GOAs

Regular spacing of GOAs is not necessary, it is more important to identify the most suitable sites for the intended purpose.

Typically, newly designed off-line schemes should consider the provision of at least one GOA in each direction of travel.

No more than one GOA shall be provided along a 5km length of the mainline in each direction of travel.

4.4 Traffic Signs and Road Markings

A sign to Figure 3.1 (sign F 261 as per the TSM) indicating that the platform is only for Garda use shall be placed in advance of the platform and installed parallel to the running carriageway. The sign should be sited to discourage unauthorised use, but not to impair visibility from a Garda vehicle parked on the platform. Where GOAs are provided on non-motorway routes, the background sign colour shall reflect the classification of the road.

Marker posts with reflectors shall be located at the back and side of the platform.

5. Emergency Refuge Areas

5.1 General

Emergency Refuge Areas (ERAs) provide a short stopping area for use in the event of emergencies and breakdowns along Type 2 and 3 Divided Roads where no hard shoulders are present. ERAs are not intended to be used as short duration rest stops, which should be directed to Service Areas if available or alternatively, facilities in adjacent towns or villages.

5.2 Layout

The ERA layout for use on Type 2 and Type 3 Divided Roads is given in Figure A.3

The layout is immediately adjacent to the mainline and shall include a 45m entry diverge taper and 25m entry merge taper.

When the mainline is kerbed, these shall continue around the Emergency Refuge Area, otherwise flush kerbs shall be provided to support the pavement edge whilst facilitating over-the-edge drainage.

5.3 Siting and Spacing

Reference is made to the general design requirements included in Section 2.2.

On Type 2 and Type 3 Divided Roads, the required frequency for Emergency Refuge Areas is approximately every 1 – 1.5 kilometres in each direction (dependent on site constraints).

5.4 Traffic Signs and Road Markings

An advance warning sign indicating that the ERA is ahead, as shown in Figure 5.1, shall be installed 500m in advance of the ERA. A further traffic sign, as shown in Figure 5.2, shall be installed on the verge at the start of the entrance to the ERA. The background colour of the signs shall reflect the classification of the road.

The yellow edge marking shall continue past the ERA. In addition, a continuous yellow edge line (RRM 007 as per the TSM) shall be provided at the nearside edge of the ERA as shown in Figure A.3.



Figure 5.1 – Emergency Refuge Area Advanced Warning Traffic Sign



Figure 5.2 – Emergency Refuge Area Traffic Sign

6. Maintenance Bays

6.1 General

A number of roadside features require periodic maintenance, such as petrol interceptors, gantries and ITS equipment. It may be necessary to provide a safe area for maintenance operatives to park their vehicles to perform maintenance operations.

Research has shown that there is a much higher risk of a vehicle being involved in an accident when it is parked at least partially on the running lanes compared with being parked in a maintenance bay.

Health and Safety legislation requires that consideration be given to the safety of maintenance operations and all who may be required to work on or near trafficked roads.

6.2 Layout

The Maintenance Bay layout for use on Motorways, Type 1 Dual Carriageways and Type 2 and 3 Divided Roads, as necessary, is given in Figure A.4.

The length of the Maintenance Bay should be designed to accommodate the largest vehicle or vehicles expected to use them whilst allowing for safe access and egress of that vehicle or vehicles. As guidance, a minimum of 2.5 times the length of the typical vehicle expected to use the facility should be sufficient. There should also be enough space around the parked vehicle to allow free movement of maintenance personnel.

The layout shown in the Figure A.4 is for guidance only. The Maintenance Bay should be appropriate to its location and intended use. The Design Organisation should consult with TII and the Maintaining Organisation on the positioning and layout of the maintenance bay.

The maintenance bay appearance should be such that it discourages the general public from using the facility. As such, the cellular type construction that allows grass to grow through the surface is suggested. The selected form of construction for the Maintenance Bay should be appropriate for the vehicles/plant intended to use the facility.

Maintenance Bays may incorporate paths to nearby roadside equipment. Reference is made to TII Standard Construction Detail CC-SCD-01524.

6.3 Siting and Spacing

Reference is made to the general design requirements included in Section 2.2.

Maintenance Bays are for use on Motorways, Type 1 Dual Carriageways and Type 2 and 3 Divided Roads, as necessary to undertake maintenance operations.

The Maintenance Bay location and spacing must be agreed with TII and the Maintenance Organisation.

6.4 Traffic Signs and Road Markings

No road markings are used for Maintenance Bays. The yellow edge line marking continues past the facility.

A traffic sign, as shown in Figure 6.1 (sign F 904 as per the TSM), must be positioned centrally in the verge as shown in Figure A.4 . This sign informs the road user that parking in this maintenance bay is for authorised vehicles only. The background colour of the sign shall reflect the classification of the road.

Marker poles to Figure 6.2 must be installed in the verge surrounding the Maintenance Bay at intervals of no more than 5m, at least 0.5m offset from the lay-by surfacing.



Figure 6.1 - Indicative 'Authorised Vehicles Only' Traffic Sign (TSM ref. F 904)

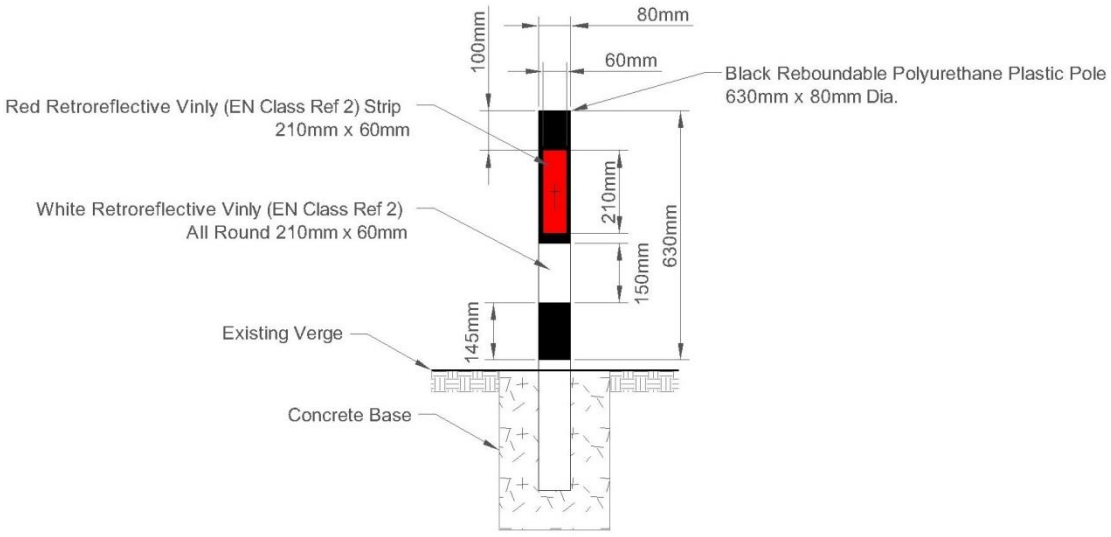


Figure 6.2 Marker Pole

7. Location Signs and Markers

7.1 General

Location Reference Indicator (LRI) signs are to be included on all rural motorway, dual carriageway and divided road schemes, unless otherwise agreed with TII. In the event of an emergency or breakdown, road users can relay the information on the LRI sign to describe their exact location. LRI signs shall comply with the requirements of Chapter 4 of the TSM (sign F 905).

Chainage markings are painted labels on the road surface which indicates route number, direction, chainage and direction to the nearest emergency phone if appropriate. Chapter 7 of the TSM details the label.

The location marker scheme is administered by TII and as such all schemes must be submitted to and approved by TII prior to marking.

To avoid confusion when providing location information to emergency services, the chainage for each carriageway must be measured from the same end of the road.

The location marker is to be painted on the hard shoulder or hard strip, adjacent to the verge, to avoid traffic wearing. It must be orientated towards the carriageway.

7.2 Frequency

LRI signs shall be provided at 500m intervals on each carriageway as per the requirements of the TSM.

Chainage markings must be provided at intervals of 100m on each carriageway as per the TSM.

Location markers should be provided at each Emergency Refuge Area located centrally on the road side of the ERA.

8. References

DN-GEO-03031 – Rural Road Link Design

DN-GEO-03028 – The Location and Layout of Service Areas

DN-GEO-03036 – Cross-sections and Headroom

DN-GEO-03060 – Geometric Design of Junctions

DN-DNG-03022 – Drainage Systems for National Roads

Roads Act, 1993.

Road Traffic (Signs) Regulations, 1997 (SI No. 181 of 1997).

Traffic Signs Manual, Department of the Environment and Local Government.

Appendix A - Layout Details

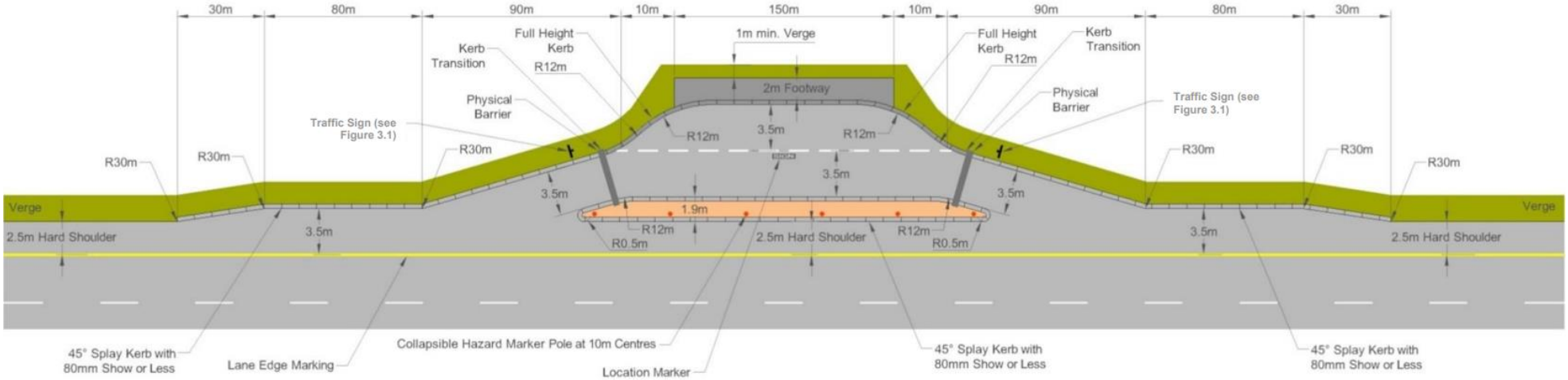


Figure A.1 - Geometric Layout of Garda Enforcement Area

Notes:

1) R is the kerb radius indicated
2) See section 2.2 for general details
3) See sections 3.1 to 3.4 for specific details
4) The physical barrier shall be detailed so as to avoid introducing a hazard within the clear zone
5) Drawing not to scale

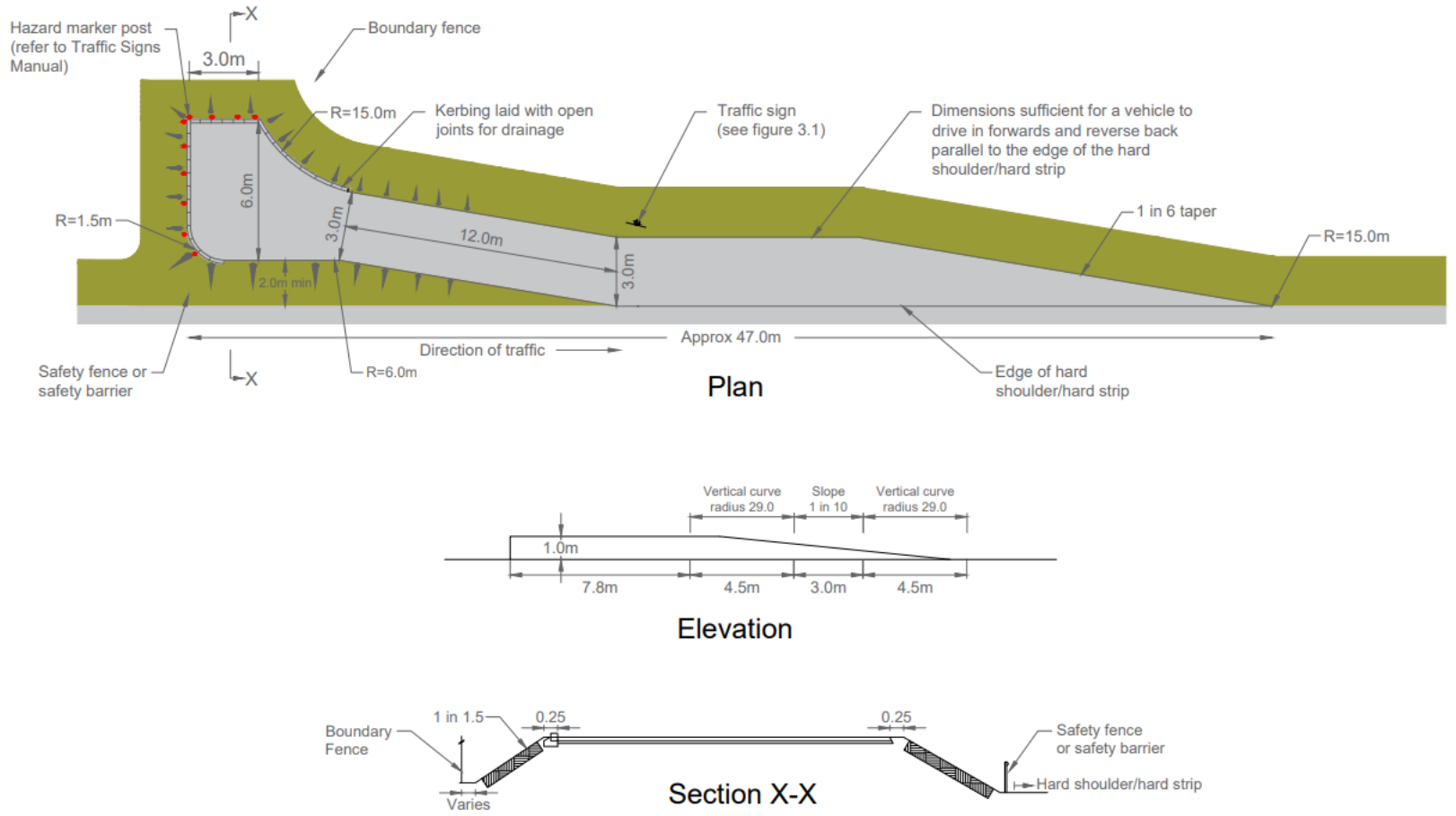


Figure A.2 - Geometric Layout of Garda Observation Area

Notes:

1) See Section 2.2 for general design requirements

2) See Section 4.1 to 4.4 for specific details

2) Drawing not to scale

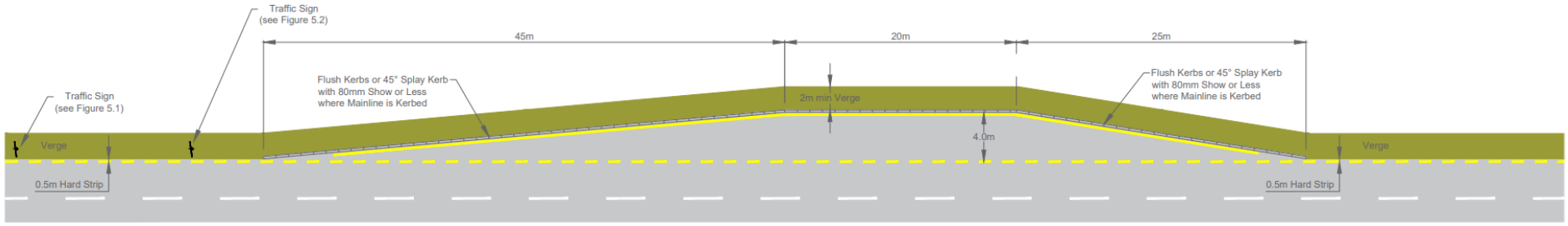


Figure A.3 - Geometric Layout of Emergency Refuge Area

Notes:

1) See Section 2.2 for general design requirements
2) See Section 5.1 to 5.4 for specific details
3) Drawing not to scale

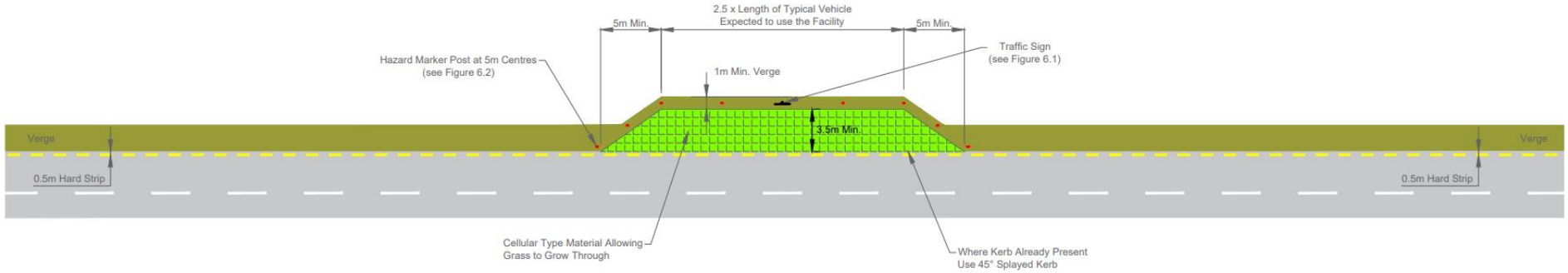


Figure A.4 - Geometric Layout of Maintenance Bay

Notes:

1) See Section 2.2 for general design requirements.

2) See Sections 6.1 to 6.4 for specific details.

3) Drawing not to scale.

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