

Manual

Heavy Vehicle Interception Site – Design Manual

July 2021

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1 Introduction

This document provides technical guidance for design requirements of Heavy Vehicle Interception Sites (HVISs) which are designed to provide a safe area outside the road carriageway for the following purposes:

- weighing and inspecting heavy vehicles
- inspecting other vehicles
- checking the vehicle is being operated in accordance with various legislation, for example, dangerous goods, load security and fatigue
- undertaking other enforcement activities (for example, random breath testing, traffic offences) conducted by police, or other authorised officials
- motorists use for short stops to inspect their own vehicles (provided the site is not being used for official purposes), and
- emergency vehicles use as required.

HVISs comprise different design requirements depending on their location and the local traffic environment; however, they are broadly categorised as:

- motorways, freeways or expressways HVIS
- highway HVIS, and
- rural road HVIS.

This document outlines the general requirements applicable to all HVISs, as well as the specific design requirements for each category. This document does not provide guidance for the determination of warrants nor to the site selection process for the placement of new HVISs.

2 Legislation and standards

Designers must comply with the requirements of the *Professional Engineers Act 2002* (Qld).

Completed HVIS designs must comply with the following Queensland legal frameworks:

- workplace health and safety legal framework, and
- electrical safety legal framework.

Geometric design criteria for HVISs are to be in accordance with the *Road Planning and Design Manual (RPDM) Vol. 3: Guide to Road Design* and associated Transport and Main Roads documents.

Additional relevant standards that apply to this document are listed following in Table 2.

Table 2 – Referenced documents

Reference	Title
AGPT	Austrroads Guide to Pavement Technology
AS/NZS 1158	Lighting for roads and public spaces
AS/NZS 3000	Electrical installations (known as Wiring Rules)
AS/NZS 4836	Safe working on or near low-voltage electrical installations and equipment
AS/NZS ISO 31000	Risk management – Principles and guidelines
BCA	Building Code of Australia
ES Regulation	Electrical Safety Regulation 2013 (Qld)

Reference	Title
ES Act	<u>Electrical Safety Act 2002 (Qld)</u>
ES Code of Practice	<u>Electrical Safety Code of Practice 2021 – Managing electrical risk in the workplace</u>
EPA	<u>Environmental Protection Act 1994 (Qld)</u>
EP Regulation	<u>Environmental Protection Regulation 2008 (Qld)</u>
FSRD Vol 2	<u>Fauna Sensitive Road Design Volume 2</u>
Manage and Control Asbestos COP	<u>How to Manage and Control Asbestos in the Workplace – Code of Practice 2020</u>
MRTS200	Transport and Main Roads <u>Technical Specification</u> MRTS200 <i>General Requirements for Intelligent Transport Systems Infrastructure</i>
MRTS225	Transport and Main Roads <u>Technical Specification</u> MRTS225 <i>Imaging</i>
MRTS227	Transport and Main Roads <u>Technical Specification</u> MRTS227 <i>Provision of Changeable Message Signs</i>
MRTS229	Transport and Main Roads <u>Technical Specification</u> MRTS229 <i>Electronic Traffic Control Signs</i>
MRTS245	Transport and Main Roads <u>Technical Specification</u> MRTS245 <i>ITS Telecommunications Network (ITS TN)</i>
MRTS263	Transport and Main Roads <u>Technical Specification</u> MRTS263 <i>Standalone Solar (PV) Power Systems</i>
MRTS38	Transport and Main Roads <u>Technical Specification</u> MRTS38 <i>Pavement Drains</i>
MRTS96	Transport and Main Roads <u>Technical Specification</u> MRTS96 <i>Management and Removal of Asbestos</i>
MUTCD	Queensland <u>Manual of Uniform Traffic Control Devices (MUTCD)</u>
NTMR	<u>National Trade Measurement Regulations 2009(Cth)</u>
PDS-18	Transport and Main Roads <u>Pavement Design Supplement</u>
RA MCV and PBS	Transport and Main Roads <u>Guideline Route Assessment for Multi-Combination Vehicles (MCV) and Performance Based Standards (PBS) Vehicles in Queensland 2020</u>
RDPM Vol 3	Transport and Main Roads <u>Road Planning and Design Manual (2nd Edition) Volume 3 Guide to Road Design</u>
RPDM Vol 6	Transport and Main Roads <u>Road Planning and Design Manual (2nd Edition) Volume 6 Lighting</u>
TN115	Transport and Main Roads <u>Technical Note</u> TN115 <i>Signing and linemarking for heavy vehicle interception sites</i>
TN158	Transport and Main Roads <u>Technical Note</u> TN158 <i>Guide to the Use of LED Road Lighting Luminaire</i>
TNM Code of Practice	Transport and Main Roads <u>Transport Noise Management Code of Practice</u>
TRUM Vol 4 Part 3	Transport and Main Roads <u>Traffic and Road Use Management (TRUM) manual Volume 4 Part 3 Electrical Design for Roadside Devices</u>
WHS Act 2011	<u>The Work Health and Safety Act 2011 (Qld)</u>
WHS Regulation 2011	<u>The Work Health and Safety Regulation 2011</u>

Reference	Title
WHS COP	The Work Health and Safety Codes of Practice

3 Terms and definitions

For the purposes of this manual, the following definitions apply.

Table 3 – Definitions of terms

Term	Definitions
AADT	Annual Average Daily Traffic
ALD	Average Least Dimension (Pavement)
ANPR	Automatic Number Plate Recognition
As-of-right vehicles	Heavy vehicle combinations that are permitted to operate through gazettes or notices
A-triple	A heavy vehicle combination comprising a prime mover and three semi-trailers connected by converter dollies
B-double	A heavy vehicle combination comprising a prime mover, lead trailer and semi-trailer connected by a fifth-wheel coupling
B-triple	A heavy vehicle combination comprising a prime mover, two lead trailers and a semi-trailer connected by fifth-wheel couplings
CCTV	Closed Circuit TV
CMS	Changeable Message Sign
Department	Department of Transport and Main Roads
End-and-end measurement	A measurement method of vehicle mass by adding separate measurements of the mass of the vehicle, supported singly or in combination, by different axles of the vehicle
Entry	Entry to the HVIS (or exit from the road)
Exit	Exit from the HVIS (or entry into the road)
FSRD	Fauna Sensitive Road Design
HSS2-H	High Stress Single / Single Seal for heavy traffic loadings
HSS2-M	High Stress Single / Single Seal for medium traffic loadings
HVIS	Heavy Vehicle Interception Sites
ITS	Intelligent Transport System
LG	Local Government
LHS	Left Hand Side
Long (Short) Duration Sites	HVIS where enforcement personnel spend more (less) than two hours at a time
LRR	Limited Road Reserve
MCV	Multi-Combination Vehicle
MRTS	Main Roads Technical Specification
MTBF	Mean time between failures
MVIU	Motor Vehicle Inspection Unit

Term	Definitions
NHVR	National Heavy Vehicle Regulator
NMI	National Measurement Institute
Operational Separation	A separation zone that separates the main work area of the interception site from the adjacent traffic lane. Transport Inspectors are instructed not to enter inside this zone (refer to Technical Note TN115)
OSOM	Oversize and over-mass vehicles
Physical Separation	A barrier system, concrete median or a grassed verge separating the work area of an HVIS from the through traffic lane. A 1.2 m flush painted median is not considered as physical separation (refer to Technical Note TN115)
PBS	Performance Based Standard – Australia’s alternative regulatory scheme for heavy vehicles, where access is granted on the basis of the vehicle’s performance in a set of safety and infrastructure standards
PIN	Penalty Infringement Notice
PMB	Polymer Modified Bitumen
QPS	Queensland Police Service
RMPC	Road Management Performance Contract
RPDM	<i>Road Planning and Design Manual (2nd Edition)</i>
RRPM	Reflective raised pavement markers
Screener	A special weighing device placed in a narrow slot in a concrete pad, over which the vehicles being screened are driven at about 5 km/h
TI	Transport Inspector
Type 1 road train	A group of heavy vehicles that comprise two or three trailers, connected by a converter dolly, including A-doubles and B-triples, with a maximum overall length of 36.5 m
Type 2 road train	A group of heavy vehicles that comprise three or more trailers, connected by a converter dolly, including A-triples, AB-triples, and various quad-trailer combinations, with a maximum overall length of 53.5 m
VEH SIM	A vehicle performance software
vpd	Vehicles per day
VMS	Variable Message Sign
WHS	Workplace health and safety
WIM	Weigh-in-Motion
WRR	Wide Road Reserve
XSS	Extreme Stress Double / Double Seal

4 General site layout and components

4.1 Road classification

Below are the road classifications relevant to HVIS design.

Table 4.1 – Road classification

Road class	HVIS sub-class	Description
Motorway	Option 1	An HVIS in a motorway environment which has adequate space for vehicle queuing, storage and separation between the worksites and bypass lane
	Option 2	An HVIS in a motorway environment with limited space for vehicle queuing and office complex
Highway	Limited Road Reserve	An HVIS on a limited road reserve highway
	Wide Road Reserve	An HVIS on a wide road reserve highway
Rural	Based on AADT	Rural Road HVIS subclasses include those with: <ul style="list-style-type: none"> • AADT < 2500 • 2500 ≤ AADT < 5000 • AADT ≥ 5000

4.2 Typical HVIS layout

Figure 4.2 – HVIS layout (typical)

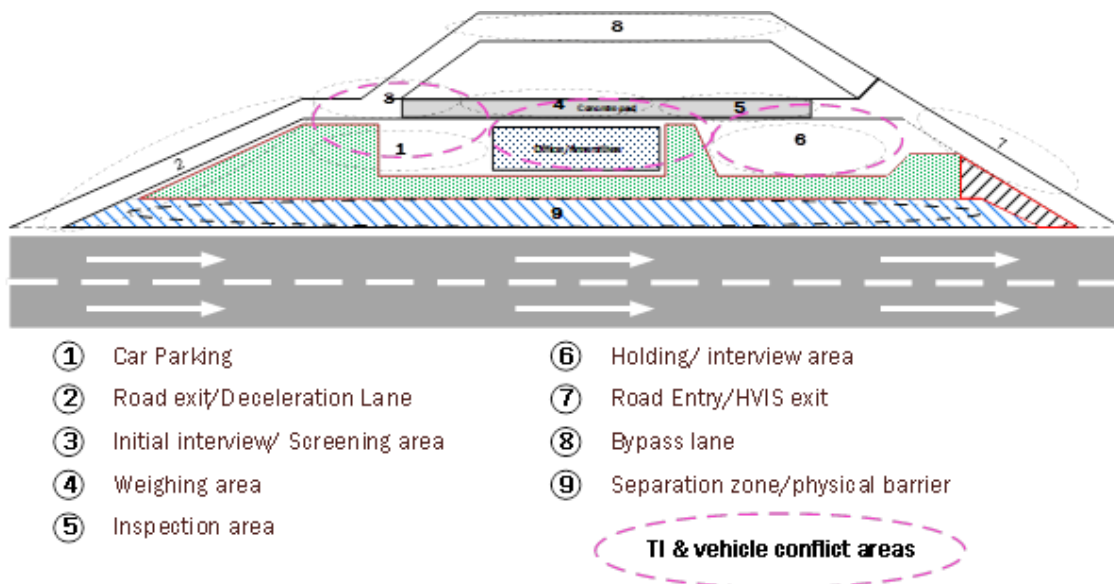


Figure 4.2 shows a typical layout of an HVIS. Although the illustration features are based on the Motorway HVIS, they are general HVIS illustration. Specific layout details based on application (motorway, highway or rural road), are shown in the appendices (A – C). Following is a brief description of each zone in the layout:

1. The car park zone. Refer to Section 6.4 for details.
2. The Road Exit / Deceleration Lane (HVIS entry) is described in Section 6.1.4.

3. This area is where vehicles are pre-examined before full inspection is warranted. The initial interview activity is described in Section 5.1, and screening (where applicable) is explained in Section 6.2.1.
4. The weighing area is a purpose-built area where the weight of heavy vehicles can be measured with certified equipment, such as scales or weighbridge. This area is detailed in Section 6.2.2.
5. The Inspection area refers to the area where Transport Inspectors (TIs) inspect vehicles, interview the driver and gather data about the vehicle and the driver, to complete either a Penalty Infringement Notice (PIN) or to prepare a case for later prosecution. Inspection area requirements are defined in Section 6.2.3. This area may be used for Motor Vehicle Inspection Unit (MVIU) (Section 6.2.3.1) or may overlap in functions with the holding / interview area.
6. The Holding / interview area refers to the area where TIs may hold vehicles temporarily for further actions or for grounding of vehicles. Detailed activities are described in Section 5.1.
7. The Road entry / HVIS exit is described in Section 6.1.4.
8. On roads with an Annual Average Daily Traffic (AADT) greater than 2500 vpd, a bypass lane needs to be considered. Refer to Section 5.1 for details.
9. The separation zone provides a buffer between the worksite and adjacent traffic lane. Depending on the traffic volume and site risk assessment, the separation zone may be fitted with a barrier system and/or a traffic island. The separation zone is detailed in Section 6.1.5.

4.3 HVIS equipment

An HVIS must be equipped with different types of devices depending on the specific site requirements. These devices are detailed in Section 6.2.

5 Design considerations

The design considerations that determine the requirements for the site include:

- the space requirements of the activities on the site
- the dimensions of the heavy vehicles using the route
- the storage space required, and
- the traffic volume.

This section provides details of design considerations. Geometric requirements, including dimensions, storage space and traffic volumes, are detailed in Sections 6 and 7.

5.1 Operational considerations (activities in HVIS)

The heavy vehicle interception process may involve the following activities

- initial screening of vehicles
- weighing vehicles
- checking vehicle dimensions, brakes and suspensions, and
- interviewing drivers and checking documentation.

Operational factors to be considered in design are as follows:

1. The Transport Inspector (TI) issues a directive for the driver of a vehicle to enter the HVIS. This can be done manually or by using an approved mechanical / electronic device. The major issues that must be considered are:
 - a) the installation of Intelligent Transport System (ITS) capability to allow the TI to direct the driver of an approaching vehicle to enter the site, or
 - b) the movement of the TI from the facilities area to the position adjacent to the traffic lane, to issue the directive manually. The following safety issues must be addressed:
 - i. mutual sight distance (from the TI on the site to an approaching vehicle)
 - ii. risk of tripping if the area is not level, or has hardware such as reflective raised pavement markers (RRPM) in a painted traffic island, or
 - iii. movement of other vehicles through the site.
2. Trucks exiting the through carriageway require a deceleration lane with sufficient distance after the exit point to allow the vehicles to stop before any queued vehicles.
3. Depending on the type of HVIS and available space, the TI undertaking the initial interview may require storage for several vehicles on the approach-side of the weighing area for vehicles waiting to be weighed. Refer to Section 6.1.2 for storage requirements. On roads with an AADT greater than 2500 vpd, a bypass lane shall be considered. Prior to determining if the vehicle should be weighed, TIs may check each truck for logbook compliance, load restraint, dangerous goods and vehicle compliance with dimensions and permits. Empty vehicles are often instructed to exit the site from the line of trucks via the bypass lane. There are also occasions when passenger vehicles enter with trucks and must be directed back out into the traffic lane. This additional movement creates the risk of injury to the TI.
4. When undertaking a compliance check, the TI requires space for mass screening, weighing, vehicle inspection, driver interviewing (such as logbooks, traffic offences and breaching check) and vehicle storage. The actual weighing process depends on the operational requirements of the site. These are determined during the scoping phase of the HVIS design.
 - a) Screening for axle weights: Using purpose-built screening devices (known as a screener) to determine whether to perform accurate weighing using certified scales, or
 - b) Weighing without initial screening: This often applies where a site is equipped with a weighbridge. Refer to Section 6.2 for further details regarding weighing and screening.

The enforcement activity may also involve the use of MVIU which requires additional space for its operation. This is an optional function and is restricted to certain sites.

Refer to Section 6.2.3, for further details regarding the MVIU.

5. Detained vehicles require a holding bay on the departure side of the weighing device, unless there is a suitable holding area near the site where vehicles can be directed to go. Ideally, this area should allow for any necessary offloading to be undertaken. In addition, the area shall allow for safe access to both sides of the vehicle by TIs to complete their records. The TIs will use this area for interviewing the driver, while preparing the breach report or completing the PIN. This area should have sufficient space and width to permit exiting vehicles to safely bypass any stationary vehicles and TI / driver adjacent to the vehicle.
6. The safe departure from the site involves the provision of an acceleration lane and merge taper appropriately designed to enable the heavy vehicle to safely merge with through-traffic. The acceleration lane should allow the design heavy vehicle to accelerate to a speed of no less than 20km/h below the mean free speed of the through-traffic. Refer to RPDM Vol 3

Part 4A *Unsignalised and Signalised Intersections*. In the absence of local data, the mean free speed can be assumed to be the posted speed limit.

7. Office and/or amenities are located so that the distance between the major activities area and the office area is reduced to a minimum. It is recommended that this area is located adjacent to the weighing area, but away from through-traffic. In most sites, the office and/or amenities area includes the provision for car parking. A simple shelter, or shed with tables, should be provided where the function is of long duration operations. Full office accommodation shall be provided for HVISs at motorway sites. Refer to Appendix A for typical site layouts. Refer to Section 6.6 for further details on the provision of amenities.
8. Where enforcement sites are required for both sides of the road to cover each travel direction, they need not be located directly opposite each other, although this is desirable to simplify the logistics of providing personnel for both directions. If they are not located opposite each other, the first one encountered should be for that direction of travel, to avoid drivers being alerted by those who have already been intercepted or have passed the site.

5.2 Workplace health and safety considerations

The department is responsible for providing a safe environment for all HVIS users.

Workplace health and safety procedures for HVIS works, are to be in accordance with the *Work Health and Safety Act 2011* (Qld) and the safety standards required by the department.

5.2.1 Operators (Transport Inspector / worker) safety

The interception site is a workplace and, as such, the designer must be aware of the various safety issues. It is important that the conflict areas, circled in Figure 4.2, are accommodated in the design, and the clearances outlined in the relevant road type sections of this document are achieved to facilitate a safe working environment.

The TIs are issued with site specific operating instructions that incorporate any design considerations regarding how the site was intended to be used and what risks were (or were not) mitigated in the design phase. This is typically in the form of a work method statement and may include a risk register for the site.

The method of activating and deactivating signs requires consideration by the designer. A TI is required to open and close these signs at night and under traffic. Some locations may necessitate the provision of a small amount of earthwork to provide for a parking area for the TI's vehicle.

Visibility to the start of the exit tapers and the end of the entrance taper should be greater than the heavy vehicle stopping-distance based on comfortable deceleration and should be carefully considered in the context of the traffic volume and design speed of the major road.

The transition from the through-road to the HVIS is also a significant consideration. The relative slopes and crossfalls of the pavements of each will generally be different. It will be necessary to ensure that a safe transition between the two is provided.

Where the HVIS is exposed to extreme noise level caused by heavy traffic volume and noise barriers are required for mitigation, these shall be designed in accordance with the department's *Transport Noise Management Code of Practice*.

5.2.2 Pedestrian safety

Appropriate fencing or barriers must be provided around the perimeter of Motorway HVIS, to prevent pedestrians accidentally accessing other carriageways. Fencing should be designed and located such that it does not constitute a hazard for road traffic. This fence is not to be placed across the entry and exit carriageways.

Catch fencing shall be provided in conjunction with the barrier system where the site is located, adjacent to a road with an AADT of more than 50,000 vpd, or if a risk has been identified in the risk assessment.

Fencing in Highway and Rural Road HVISs is optional and is subject to safety assessment and consultation with the department.

5.2.3 Driver safety

Provision of a sight screen shall be considered in Motorway HVIS to avoid drivers on the through-traffic from being distracted by the activities in the HVIS.

5.2.4 Variations and modifications

Designers and constructors should ensure that any variation or modification to the site does not compromise the standard of safety detailed in this manual and that variations and modifications are captured in a satisfactory risk register, with risks mitigated and that the site-specific safety procedures reflect these. All variations and modifications shall be recorded in accordance with RPDM Vol 3 Part 8 *Process and Documentation*.

5.3 Environmental considerations

All environmental considerations shall be in accordance with the requirements of the *Environmental Protection Act 1994* (Qld), the *Environmental Protection Regulation 2008* (Qld) and the RPDM Vol 3: *Guide to Road Design Part 6B: Roadside Environment*.

There is a likelihood that asbestos may be present on a site being designed. Consequently, designers should flag this in their design documentations, by including an instruction or recommendation that the contractors check for asbestos in accordance with Transport and Main Roads Technical Specification MRTS96 *Management and Removal of Asbestos* and approved departmental processes.

Where there is a potential impact on fauna in the vicinity of a proposed HVIS, it may be necessary to collect run-off from the site and process it in the appropriate way to avoid contamination of waterways. Further, it may be necessary to provide for the containment of spillage that may occur on the site. Traps and retention basins should be designed into the scheme where appropriate. For additional specific guidelines relating to design in a fauna environment, refer to *Fauna Sensitive Road Design Vol 2*.

6 General design requirements

This section defines the general requirements for HVIS design and the common aspects of site geometry, layout, equipment and surfacing.

Specific HVIS requirements are defined in Section 7.

6.1 Geometric design requirements

6.1.1 Design vehicle and check vehicle

The designer shall determine the design vehicle for an HVIS in consultation with the Principal. It should be the largest Multi-Combination Vehicle (MCV) currently permitted and envisaged to operate on the adjacent state-controlled road. The choice of design vehicle must consider requirements for future vehicles approved under the *National Heavy Vehicle Regulator's Performance Based Standards* (PBS) scheme. For guidance on the department's design requirements and PBS vehicle design parameters and other characteristics, refer to the department's webpage *Assessing routes for multi-combination vehicles in Queensland* or guideline *Route Assessment for Multi-Combination Vehicles (MCV) and Performance Based Standards (PBS) Vehicles in Queensland 2020*. The design for the site will also need to consider oversize and over-mass (OSOM) vehicles along the route (typical OSOM length and width limits are 35 m and 5.5 m respectively although vehicles may exceed these dimensions with an approved permit).

An appropriate checking vehicle (usually the next largest design vehicle) should be used to ensure satisfactory operation of an occasional larger vehicle. Checking vehicles may operate with reduced clearances. Refer to the department's RPDM Vol 3 Part 4 *Intersections and Crossings – General*, for further guidance.

The following overall lengths and swept path template information has been sourced from the department's webpage *Assessing routes for multi-combination vehicles* and is summarised here for ease of reference. For vehicle length requirements, the upper length limit for PBS Class B vehicles should be adopted to enable future weighing and safe operation of these vehicles within the HVIS.

Table 6.1.1 – Length limits of PBS vehicles

PBS vehicle access class	Vehicle combination upper length limits (m)	
	Class A	Class B
Level 1	20.0	
Level 2	26.0	30.0
Level 3	36.5	42.0
Level 4	53.5	60.0

Based on previous research, the following 'as of right' combinations may be substituted for PBS level vehicles:

- The 26-metre B-double template can be used to assess the suitability of routes for B-doubles and PBS Level 2 vehicles.
- The 36.2-metre A-double and 35.4-metre B-triple templates can be used to assess the suitability of routes for A-doubles, B-triples, AB-triples, and PBS Level 3 vehicles.
- The 53.4-metre A-triple template can be used to assess the suitability of routes for A-triples, AAB-quads, and PBS Level 4 vehicles. It may also be used as a substitute for quad combinations, as such combinations are expected to have equal or better swept path performance.

6.1.2 Site access geometry (Motorway and Highway HVIS)

Motorways or Highways HVISs shall be designed to allow for the following:

- two or more crews for extended periods
- one vehicle being weighed
- one vehicle being inspected, and
- minimum of one, up to four vehicles in the queue.

Lengths shall be calculated based on the guidelines in Section 6.1.1.

The width required for these sites must allow for the operating area, plus a bypass lane for vehicles to bypass the vehicle being inspected, plus adequate space to park the TI's or QPS vehicles. The minimum width (excluding the area for parking) should be 12.7 m. Parking space for four cars should be provided, typically 30m long by 2.3m wide for parallel parking.

All Motorway and Highway HVISs shall have provisions for the use of the MVIU, unless departmental motor vehicle inspection centres are in proximity. Refer to Sections 7.1.6 and 7.2.6 for further details for MVIU in Motorway and Highway HVISs respectively.

The bypass lane shall have a physical separation from the work area. The treatment will vary according to the risk assessment carried out for each site. However, it must cater for the risk of motorists confusing an exit ramp to the local road network, resulting in motorists speeding through the bypass lane adjacent to where the TIs are working and/or truck drivers are walking.

Fencing in Motorway HVISs shall be provided as a WHS measure, whereas fencing in the Highway HVIS is subject to a safety assessment by the designer (refer to Section 5.2.2). Any treatment deemed relevant by the designer (for example, a barrier system) shall be in accordance with the department's RPDM, Standard Drawings and Technical Specifications. Catch fencing shall be provided in conjunction with the barrier system where the site is located adjacent to a road with AADT more than 50,000 vpd, or if a risk has been identified in the risk assessment.

Provision of sight screening shall be considered as a safety measure to the drivers on motorway (refer to Section 5.2.3).

Catch fencing is designed to catch debris for the safety of people within the HVIS (that is, tyres, debris from a crash).

A sealed shoulder of the appropriate width (typically 0.3m) shall be provided around the outside perimeter of the site. This shoulder will be constructed concurrently with the HVIS and is separate from the roadway shoulder. The HVIS shoulder shall be constructed to the same standard as the HVIS pavement, so that the shoulder and site pavement are homogenous.

Table 6.1.2 is a summary of Motorway and Highway HVIS site and access geometry minimum requirements. The highway values apply to both wide reserve and limited reserve HVISs.

Table 6.1.2 – Motorway and Highway HVIS – site and access geometry

Features and dimensions	Motorway HVIS		Highway HVIS		Comment
	Length (m)	Width (m)	Length (m)	Width (m)	
Physical separation from adjacent traffic lane	–	≥ 6	–	≥ 3	For Motorway HVIS, a physical barrier must be provided if there is a ramp to the site that resembles an exit ramp for a motorway. Catch fencing should be provided in conjunction with a barrier system if AADT > 50,000 or risk is identified. For Highway HVIS, the width of separation (grass or concrete median) must be determined to suit site layout, AADT and method of operation. The preferred width is 5 m.
Bypass lane	–	≥ 4.8	–	≥ 4	Must have physical separation between bypass lane and work area. Bypass lane shall be wide enough to allow for wide loads. For Highway HVIS, default widths are 4 m or 4.5 m. The width may need to be increased in consultation with the Principal.
Weighing area (including weighbridge) 5m deck weighbridge Nil weighbridge	≥ 90* –	≥ 4.8*	≥ 90* ≥ 80# or ≥ 50^	≥ 4.8* ≥ 3.5#^	Should have adequate clearance around the weighbridge, to allow wide loads to pass. The length of the weighing area of Motorway HVIS, is based on 42 m long design vehicle and 5 m deck weighbridge. Where the design vehicle varies, or a different dimension weighbridge is used, the length of the weighing area will need to be recalculated. Refer to Table 6.2.2.1. A weighbridge is optional in Highway HVIS. * with weighbridge. # without weighbridge, screener option provided. ^ without weighbridge, screener option not provided.
Inspection area	≥ 50	≥ 4.5	≥ 50	≥ 4.5	If the HVIS is designed to accommodate the use of MVIU, the width shall be adequate to accommodate the unit and the supporting facilities, or at least 4.8 m. Refer to Table 6.2.3.1.1.

Features and dimensions	Motorway HVIS		Highway HVIS		Comment
	Length (m)	Width (m)	Length (m)	Width (m)	
Heavy vehicle holding interview area	≥ 80	≥ 6	≥ 50* or ≥ 80#	≥ 4.5* or ≥ 6#	Processing and standing area, to allow for a Level 3B vehicle and B-double trailers to be parked and for long interviews and grounding. The width for accessing the parking area should be verified in V-path. * HVIS with Limited Road Reserve. # HVIS with Wide Road Reserve.
Storage lane for queuing	≥ 60	≥ 3.5	≥ 60	≥ 3.5	For Motorway HVIS: 180 m length is preferred to allow for four Level 3B vehicles to be queued with a 2 m gap between each vehicle. For Highway HVIS: 90 m length is preferred.
Sealed shoulder	–	0.3	–	0.3	Must be provided around the outside perimeter of entire site.
MVIU	–	4.8	–	4.8	Note: MVIU is optional for Highway HVIS. The MVIU should be placed such that the wheel paths are lined up with the weighing path, to minimise steering adjustments required to manoeuvre the vehicle onto and off the unit. The concrete pad width needs to be increased to 4.8 m on all sites with an MVIU.
Car parking (parallel)	30	≥ 2.3	30	≥ 2.3	Accommodate up to four cars. Width and length assume parallel parking; however, this may vary for different parking style. Extra width may be required to accommodate TI's vehicle which may have varying width requirements, for example, ute canopies.
Typical site width	–	~23		~12.7* ~20#	Excluding parking for heavy vehicles and cars. * HVIS with Limited Road Reserve. # HVIS with Wide Road Reserve.

~ approximate

6.1.3 Site access geometry (Rural Road HVIS)

Site access geometry for Rural Road HVIS shall be in accordance with Section 7.3.2.

6.1.4 Entry and exit

In this section, the term 'exit' denotes vehicles exiting the traffic stream and entering the HVIS.

Conversely, the term 'entry' denotes vehicles exiting the HVIS and entering the traffic stream.

6.1.4.1 Exit requirements

An exit ramp or deceleration lane is required to enable vehicles to safely diverge from the through-lane/s and enter the HVIS without impeding on the through-traffic. Sufficient deceleration length is required, to allow the design heavy vehicle to safely decelerate and stop, prior to any queued vehicles within the HVIS. Heavy vehicles require longer distances than cars do to come to a complete stop and, therefore, deceleration lengths need to be based on design heavy vehicle deceleration rates. The design of exit ramps must be in accordance with RPDM Vol 3 Part 4C *Interchanges*. The design of deceleration lanes and deceleration lengths must be in accordance with RPDM Vol 3 Part 4A *Unsignalised and Signalised Intersections*, using a maximum rate of deceleration of 2.5 m/s² to allow for the increased braking distance required for heavy vehicles.

Swept path analysis for the design and check vehicles must be undertaken to optimise ingress and egress, achieve minimum clearances and ensure that these vehicles can manoeuvre onto the weighing and testing facilities within the site.

The 'design vehicle' and 'check vehicle' are common terms used in road design. The design vehicle will be the largest vehicle that regularly uses the site and the check vehicle will be the next largest vehicle that may occasionally use the site.

6.1.4.2 Entry requirements

An entry ramp or acceleration lane is required to enable vehicles to safely exit the HVIS and re-enter the traffic stream on the through-road. Heavy vehicles require very long acceleration distances, which may not be practical to accommodate for an HVIS. Acceleration lanes should allow the design heavy vehicle to accelerate to a speed no less than 20 km/h below the mean free speed of the through-traffic. Refer to RPDM Vol 3 Part 4A. In the absence of local data, the mean free speed can be assumed to be equal to the signposted speed limit. The design of the entry ramp must be in accordance with RPDM Vol 3 Part 4C. Acceleration lengths must be in accordance with RPDM Vol 3 Part 4A, using acceleration rates appropriate for the design heavy vehicle. Vehicle performance software, such as the department's VEH SIM program, must be used to ensure the design heavy vehicle achieves the minimum required speed prior to merge taper.

6.1.5 Separation zone

The separation zone is the area located between the road edge line and HVIS (refer to Figure 4.2). It includes the shoulder of the adjacent road and enough additional width to achieve a safety buffer between the HVIS and adjacent traffic lane. Depending on the traffic volume and site risk assessment, the separation zone shall be fitted with a barrier system and/or a traffic island (painted or raised). The separation zone needs to maintain the shoulder width requirements for the functional classification of the road that the HVIS is being constructed on.

In determining the separation zone, the designer must consider the following:

- relevant geometric parameters of the adjacent road including design speed, width of traffic lanes and sealed shoulder, degree of crossfall, longitudinal gradient and so on
- differences in crossfall and longitudinal grade between the HVIS and adjacent road – any crown lines or changes in crossfall that may be traversed by vehicles will need to be carefully designed and located, to ensure that vehicle stability is maintained, especially for those with a high centre of gravity and motorcyclists
- safety barrier requirements and appropriate clearances to the adjacent road, HVIS and its work areas
- where a safety barrier is determined as not being required, the separation zone will need to be designed to provide sufficient width (safety buffer) between work areas and adjacent traffic lanes
- risk of workers tripping if the separation zone adjacent to a work area is not level or has hardware such as kerbing or RRPM in a painted traffic island, and/or
- the HVIS geometric requirements specified elsewhere in this document.

The separation zone shall incorporate all the relevant design parameters, such that the resulting design is in accordance with the department's RPDM, Standard Drawings and Technical Specifications and workplace health and safety requirements.

6.2 Screening, weighing and inspection requirements

Screening, weighing and inspection shall be performed at purpose-built areas having 0.0% longitudinal slope. Crossfall of the areas shall comply with Section 6.3.4.

6.2.1 Screening

Screening refers to the preliminary selection process of identifying potential overloaded heavy vehicles, before formally weighing the vehicles. Apparent non-compliances identified in the screening process are not enforceable, due to less achievable accuracies; however, screening allows TIs time to be mostly spent on clearly overloaded vehicles.

For sites that have weighbridges in operation, typically Motorway HVIS, screening is not warranted. Screening is predominantly prescribed for Highway and Rural Road HVIS.

Appendix D *Concrete Screening Pad* illustrates the construction details of a screening pad in a typical Rural Road HVIS.

As technology keeps evolving, designers shall keep abreast of suitable screening technologies to be applied in HVIS design; for example, using approach mats instead of a screener will make constructing the two recesses (refer to Section 6.2.1.2.3) unnecessary. Designers shall identify the type of screener to be used when determining recess dimensions or whether recess is required.

Figure 6.2.1 illustrates the set-up of a screener, with further detail following in sections 6.2.1.1 and 6.2.1.2.

Figure 6.2.1 – Screener

6.2.1.1 Typical screening process

Screening is carried out by using a special weighing device, known as a screener, placed in a narrow slot in a concrete pad, over which the vehicles being screened are driven at about 5 km/h. The results are logged by a computer in the TI's vehicle and a decision is then made as to whether the vehicle should be weighed using certified scales. It takes approximately one minute to screen a B-double, compared with 15–30 minutes to weigh with scales.

If the screening process indicates that a vehicle is potentially overloaded, then the vehicle is directed to the weighing / inspection area to be accurately weighed and thoroughly inspected, as well as the driver being interviewed. The weighing area and inspection areas are provided immediately beyond the screening area.

6.2.1.2 Screening area requirements

The screening area shall be designed as a concrete pad.

Screening is mostly relevant to Rural Road HVIS and, in some cases, to Highway HVIS in instances where there are:

- long durations for completing activities at the sites
- short duration sites with an AADT greater than 1,000 vpd, and
- roads having freight traffic with a high likelihood of overloading.

Sections 6.2.1.2.1 to 6.2.1.2.3 detail the typical design of screening area in HVIS.

6.2.1.2.1 Dimensions

The department is currently using the screener of dimensions being 1000 mm x 490 mm x 11 mm. The dimensions of the concrete screening pad, required to support a screener of these dimensions, are detailed in Table 6.2.1.2.1.

Table 6.2.1.2.1 – Concrete screening pad dimensions

Dimension	Value
Screening pad width	≥ 3.1 m
Screening pad length	≥ 40 m (to suit design vehicle)
Screening pad depth	200 mm
Large recess length	510 mm
Large recess width	= Screening pad width
Large recess depth	= A constant value between 11 mm and 15 mm over the entire surface of the recess
Square groove (cable recess)	510 mm (L) x 25 mm (W) x 25 mm (D) parallel to the large recess

In addition, the irregularities on the surface of the concrete pad will cause the screener to measure inaccurately (up to 20% for tri-axle groups with steel suspension). As such, a construction vertical tolerance of +/- 3 mm is to be applied to the critical tolerance areas of the concrete pad, using a 5 m stringline to verify. The critical tolerance areas are the two wheel-paths along the outer 1 m of the pad for a length of 10 m, covering 5 m either side of the screener recess, as shown by the shaded area in Figure 6.2.1.2.1(a). Figure 6.2.1.2.1(b) illustrates the screening area in use.

Figure 6.2.1.2.1(a) – Critical tolerance area on screening pad

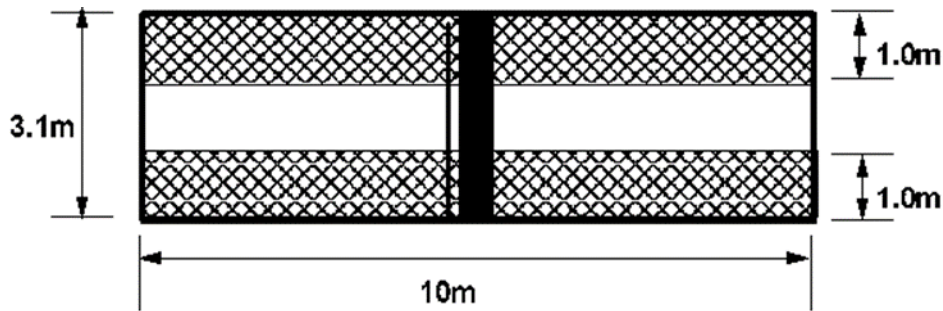


Figure 6.2.1.2.1(b) – Completed screening area with adjacent seal (prior to linemarking)



6.2.1.2.2 Design requirements

The following design requirements are applicable:

- a 75 mm seal overlap on the edge of the screening pad to stop water ingress and prevent adjacent pavement failures
- a spoon drain may be required to allow any water ponding in the recess to drain off the screening pad (refer to Figure 6.2.1.2.2(a))
- longitudinal slope and crossfall shall be consistent with the entire site
- pavement to a level of 10 mm below the screening pad to achieve a smooth transition from the sealed surface to the pad for safety and drainage purposes
- concrete for screening pad to be 30 Mpa to ensure durability and low permeability, and
- no bedding sand is required when a strong subbase and subgrade is achieved.

Figure 6.2.1.2.2(a) – Spoon drain at the outlet of the recess



Figure 6.2.1.2.2(b) – Pad and pavement level



6.2.1.2.3 Screener recesses

The screening pad requires two recesses cast into the surface. Refer to Table 6.2.1.2.1 for dimensions of these recesses.

The large recess accommodates the screener and requires tight tolerances, because of the critical operational needs of the screening devices. Any high spots will adversely affect the accuracy of the screener. The following requirements apply:

- recess depth to be between 11 mm and 15 mm to place the screener level with, or just below the surface of the pad. The depth must be constant (that is, if the depth is 12 mm, it needs to be 12 mm across the entire surface), and
- the screeners must not rock, or twist, or have high points on the surface they are sitting on.

The other recess is a 25 mm x 25 mm groove for carrying computer cables from one side of the pad to the other. There is no vertical tolerance requirement on this recess. The critical operational requirement is to withstand truck tyre damaging the cable. It is recommended that a 25 mm square piece of Rectangular Hollow Section steel be used to form this recess during construction. Refer to Figure 6.2.1.2.3(a) and Figure 6.2.1.2.3(b).

Figure 6.2.1.2.3(a)

– Screener parts in the recess



Figure 6.2.1.2.3(b)

– Screener parts (close up)



6.2.2 Weighing

Weighing in HVIS is performed by using either one of the following equipment:

- weighbridges, or
- portable scales.

In accordance with project requirements and relevant departmental standards, weighbridges will be designed for the relevant road type and heavy vehicles using the route.

Where an HVIS is not equipped with a weighbridge, weighing is performed using certified portable scales. The drawback is that using portable scales is labour intensive and time-consuming, compared to using weighbridges; therefore, the sites which rely on portable scales would prefer having screeners. The choice between portable scales and weighbridges in each HVIS is subject to the operational needs of the site to be confirmed in consultation with the Principal.

6.2.2.1 Weighbridge requirements

As a minimum, a 4.5 m wide x 5 m long single-deck pit weighbridge, suitable for weighing axles in group, as approved by the departmental representative, will be set into a concrete pad (in the centre of the weighing area) with a level approach and departure to accommodate the relevant road type and heavy vehicles using the route. The weighing surface of a pit weighbridge shall be flush with the surface of the concrete pad. The dimensions, especially the length, of the concrete pad shall be adequate so that no part of the design vehicle lies outside the pad during the weighing process. The concrete pad, together with the weighbridge, is identified as the weighing area of the HVIS. The weighing area shall comply with National Trade Measurement Regulations 2009, Part 3 Weighbridges used for trade.

The specific design requirements are stipulated within the relevant road type sections of this document.

The following are general considerations in using weighbridges:

- Single-deck 4.5 m (W) x 5 m (L) weighbridge is the smallest permitted unit, capable of performing end-and-end measurement. It can only weigh one axle group, instead of a whole vehicle at a time and therefore requires repeating the weighing steps to complete the process. As such, it provides data granularity down to individual axle group that are useful information for road design. The concrete pad areas leading to and trailing from the weighbridge, also need to be longer to keep the whole vehicle at level, while weighing axle groups one by one. Table 6.2.2.1 illustrates this requirement.
- Multi-deck weighbridge, which can be achieved by stacking multiple single-deck weighbridges, allows for weighing multiple axle groups, or even the whole vehicle in one weighing step, reducing weighing times and increasing accuracy; however, this also increases the calibration and maintenance costs.
- Single-deck 4.5 m (W) x 5 m (L) weighbridge is the standard option. Use of a multi-deck weighbridge should first be discussed with the Principal.
- Kerbing and other infrastructure around a weighbridge can constitute a tripping hazard. The area around the weighbridge must have treatments that mitigate possible conflict between the enforcing authority and vehicles using the adjacent bypass lane, as well as reduction of the risk of a trip hazard to pedestrians.
- Weighbridge deck shall be perfectly horizontal after installation, that is, 0.0% crossfall and 0.0% longitudinal slope.
- The concrete pad surfaces on both the approach and departure sides of the weighbridge shall be 0.3% crossfall to allow for rainwater to shed. The longitudinal gradient of the concrete pad shall be 0.0%.
- Proper transitions in terms of crossfall rotation shall be provided for heavy vehicles to move safely.
- Weighbridge accuracy and display resolution shall be better than +/-10 kg and 20 kg respectively, with full scale range weighing capability of 50 tons per deck, or greater.
- The result of the measurement shall be displayed on an indicator allowing the drivers and TIs to read easily.

Table 6.2.2.1 – Concrete weighing area minimum length by truck and weighbridge deck

Truck length	42 m ^(a)	42 m ^(a)	60 m ^(b)	60 m ^(b)
Weighbridge deck length	5 m ^(c)	20 m ^(d)	5 m ^(c)	20 m ^(d)
Weighbridge deck width	4.5m			
Length on approach-side of the weighbridge	≥ 42 m	≥ 27 m	≥ 60 m	≥ 45 m
Length on departure-side of the weighbridge	≥ 42 m	≥ 27 m	≥ 60 m	≥ 45 m
Weighing area length	≥ 90 m	≥ 74 m	≥ 125 m	≥ 110 m
Weighing area width	≥ 4.8 m			

Notes:

- (a) 42 m based on PBS Level 3B vehicle
- (b) 60 m based on PBS Level 4B vehicle
- (c) single-deck weighbridge
- (d) multi-deck weighbridge (for illustration only)

As there are different sizes in deck length and width, the minimum unit stipulated in this document (that is, 5 m long and 4.5 m wide) will be the reference dimensions and should be used as a standard in projects. The single deck unit is the most suited for axle group weighing and therefore the preferred option by the department.

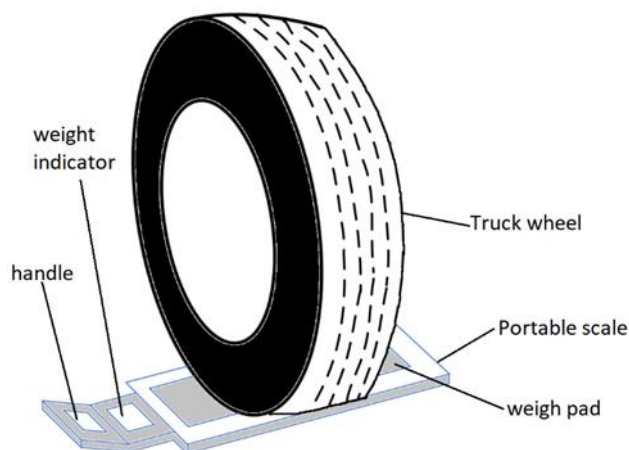
6.2.2.2 Portable scales requirements

Where there are no weighbridges, portable scales certified by the National Measurement Institute (NMI) shall be used in the HVIS.

The weighing process is performed by placing portable scales in front of each wheel in the choke position and then the truck is driven slightly to the front so that the wheels are positioned above the scales, for the weight readings from each scale to be recorded.

Desirable features of portable scales include:

- weight of each scale: the weight must be within the limits of safe manual handling
- set-up time: the time to make the system ready for use in each weighing activity and particularly successive weighing activities
- high mean time between failures (MTBF): a high MTBF will ensure that the device will have minimal issues for its design life, thus reducing downtime
- accuracy: weighing is for enforcement purposes, therefore accuracy of reading is paramount
- calibration: the scale must be regularly calibrated to perform in accordance with the accuracy specification, and
- certification: the scale must be NMI-certified per relevant legislation requirements.

Figure 6.2.2.2 – Features of a typical portable scale

6.2.2.3 Weighing area requirement

The specific design requirements for the weighing area are stipulated within the relevant road type sections of this document, however, the following general considerations apply.

- The area is provided immediately beyond the screening area if the screening area is provided.
- Surface tolerances in this area must be achieved during construction. The longitudinal gradient must be 0.0% allowing the full length of the vehicle to be on a flat ground, so that the vehicle being weighed, or under inspection, will not roll with brakes released. The crossfall of the weighing area shall comply with Section 6.3.4 to maintain measurement error within legal limit, while allowing the discharge of rainwater over it.
- The crossfall is to be consistent, stable and properly shaped, to ensure accurate weighing and associated enforcement activities are carried out, as well as rainwater being drained.
- The pavement structure must be appropriately designed to withstand the loads expected and allowance be made for occasional excessive loads to cater for grossly overloaded vehicles.
- If a separate inspection area is not provided, the weighing area may also be used for vehicle inspections (including the use of MVIU), as well as for interviewing the driver and gathering data about the vehicle and the driver, in order to complete either a PIN or to prepare a case for later prosecution. Therefore, it is important that the weighing area is clear of the screening area and allows adequate space for other vehicles to leave without placing anyone in a dangerous position.
- If the weighing area is also to be used for inspection using MVIU, it shall be designed per requirements detailed in Section 6.2.3.1.
- Concrete is a compulsory material when constructing weighing areas where a weighbridge is installed.
- Where there is no weighbridge to be installed, the minimum total weighing area length shall be design vehicle length plus additional clearance adequate to cover operational needs and safety requirements.

6.2.3 Inspection

Inspection activities include interviewing drivers and conducting other measurements such as vehicle length and height. Inspection may involve the use of MVIU for brake and suspension tests if required. Refer to Section 6.2.3.1.

Where an HVIS is close to the department's motor vehicle inspection centre, for example, Burpengary, the TI may issue a note to the driver directing the vehicle to be inspected in one of these inspection centres. In this case, MVIU is not needed.

6.2.3.1 Motor Vehicle Inspection Unit (MVIU) requirements

MVIUs are used to undertake brake and suspension testing of heavy vehicles. They are mobile equipment that can be set up at the site when deployed and removed after use. Figure 6.2.3.1 depicts an MVIU. MVIU is required on long-duration sites located on major freight routes.

Figure 6.2.3.1 – MVIU



Following are the general departmental requirements for the MVIU. The specific design requirements for specific road types are stipulated in Section 7.

6.2.3.1.1 MVIU features

The following general considerations apply regarding the MVIU.

- Where an MVIU is provided, sufficient space is required as a hard stand for the MVIU truck to be parked outside the clear zone for the relevant design speed of the major road. This may not be required if the MVIU is trailer-mounted.
- The MVIU must be in line with the screening area, so that the vehicle being tested can approach in a straight line.
- The vehicle being tested must remain in a straight line, as it travels over the test unit.
- The area around the unit needs to be reasonably level and free from tripping hazards.

Figure 6.2.3.1.1 depicts an example of positioning an MVIU in a Rural Road HVIS.

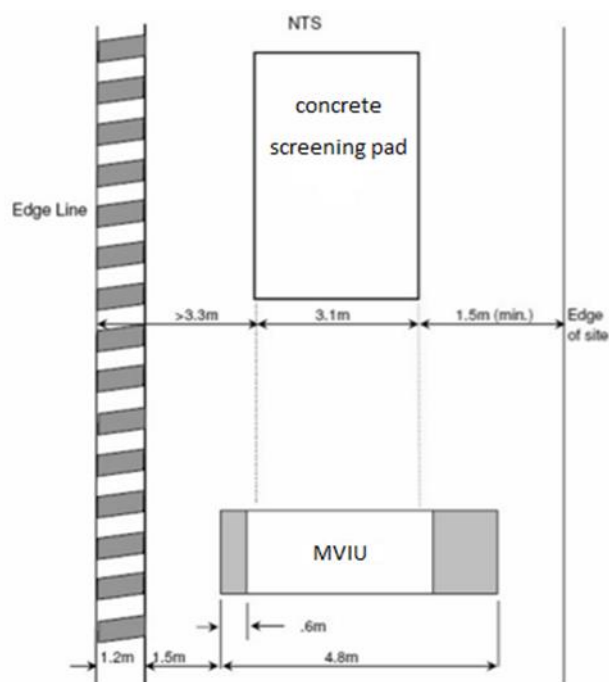
Figure 6.2.3.1.1 – Example of positioning MVIU in Rural Road HVIS

Table 6.2.3.1.1 summarises the geometric requirements for deploying an MVIU.

Table 6.2.3.1.1 – MVIU minimum requirements

Dimension	Value
MVIU width (inspection unit only)	4.8 m
MVIU site width (for MVIU and supporting truck)	8.5 m
Distance of unit from screener or weighbridge	45 m
Space required for largest vehicle to bypass the test unit	5 m
Distance of the unit from the start of the exit taper	25 m
Screening area distance from the edge line	3.3 m

6.2.3.2 Inspection area requirements

The specific design requirements for an inspection area are stipulated within the relevant road type sections of this document, however, the following general considerations apply:

- the inspection area shall be used for vehicle inspections, as well as interviewing the driver and gathering data about the vehicle and the driver, in order to complete either a PIN, or to prepare a case for later prosecution, and
- an area for inspection purposes shall be clear of the screening area and allow enough space for other vehicles to leave the site, without placing anyone in a dangerous position.

If the HVIS is designated for the use of an MVIU, the inspection area shall comply with Table 6.2.3.1.1, in terms of geometric design.

6.3 Surface profile and pavement design

6.3.1 General

Pavements are to be designed and constructed in accordance with the department's *Pavement Design Supplement* and associated technical standards.

Where the HVIS is formed by widening an existing pavement, the pavement layers (materials and thicknesses) should be consistent with the adjoining traffic lane, to avoid interface drainage issues. Where this cannot be achieved, then a pavement drain (Transport and Main Roads Technical Specification MRTS38 *Pavement Drains*) should be provided at the interface of the different pavements.

6.3.2 Surfacing type

6.3.2.1 General

As scales are only 13 mm thick, the site surface needs to be smooth to protect the scales from damage. For this reason, asphalt, concrete or sprayed seal surfacing is recommended; however, this will depend on the existing adjacent surfacing.

The surfacing within the HVIS (excluding the concrete pad), will generally be of the same broad type as the through-traffic lanes; that is, where the through-traffic lanes comprise a sprayed seal surface, then a sprayed seal surface should be used in the HVIS. Where the through-traffic lanes comprise an asphalt surface, then an asphalt surface (typically dense graded asphalt) should be used in the HVIS.

6.3.2.2 High stress areas

Particular attention must be paid to the surfacing selection for high shear areas (due to heavy vehicle braking and cornering), and areas where heavy vehicles are slow moving or stationary. Areas that are subject to high shear forces will generally be surfaced with dense graded asphalt, containing a polymer modified binder, as this surfacing type is more resistant to the effects of high shear forces when compared to sprayed seals and other asphalt types.

6.3.3 Sprayed seals

6.3.3.1 Treatment selection

A double / double polymer modified binder seal, such as a HSS2-M, HSS2-H or XSS treatment would typically be used to reduce the risk of the following:

- flushing / bleeding of the seal during hot weather
- pick-up of the seal on vehicle tyres, and
- damage to the seal, resulting from high shear forces being applied by heavy vehicles.

The type of treatment used on a specific project will depend on the traffic loading and environmental conditions present at the site.

6.3.3.2 Rolling requirements

Seals used in this application will require additional rolling, as there is inadequate traffic to achieve the required aggregate orientation (that is, with the least dimension of the aggregate being vertical). In conventional reseals and seals, the heavy vehicle traffic provides most of the rolling required to reorient the aggregate. This is not the case with interception sites, where experience has shown the

seal will strip after two years, unless special consideration is given to achieving correct aggregate orientation.

6.3.3.3 Seal around concrete pad

Every concrete pad should have approximately 75 mm of seal overlap, to provide waterproofing for the adjacent pavement material. The following steps provide an example of how this can be achieved (refer to Figure 6.3.3.3(a) to Figure 6.3.3.3(d)):

- place the paper around the perimeter of the concrete pad
- place some screenings on the edges of the paper, to stop it blowing off as the sprayer passes by
- spray the binder for the first seal coat, remove the paper, spread the aggregate and sweep off any loose aggregate, and
- repeat the above steps for the second coat seal.

Figure 6.3.3.3(a) – Immediately prior to first spray run



Figure 6.3.3.3(b) – Immediately before placing paper for second spray run



Figure 6.3.3.3(c) – Immediately after placing paper for second spray run



Figure 6.3.3.3(d) – Immediately after placing aggregate for second spray run



6.3.4 Longitudinal slope and crossfall

Requirements for longitudinal slope and crossfall on all HVIS are as per Table 6.3.4.

Table 6.3.4 – Longitudinal slope and crossfall for all HVIS

Parameter	Value
Longitudinal grade over the entire screening / weighing / inspection areas	0.0%
Crossfall over the concrete screening area	-0.3%
Crossfall over the weighing area and inspection area (depends on materials used):	
• concrete	-0.3%
• asphalt	-2.5%
• spray seal	-3.0%
Crossfall elsewhere	Refer to RPDM Vol 3

Any changes in pavement crossfall, must be designed in accordance with RPDM Vol 3 Part 3 *Geometric Design*, using a maximum rate of rotation of 2.5% per second (0.025 radians/sec). The pavement transition on the HVIS from normal crossfall (-3%) on the approach and departure side of an area (screening / weighing / inspection area) of different crossfall value, shall be carefully designed to ensure that the resultant longitudinal grade does not create a tripping hazard and the stability of heavy vehicles is not compromised. Drainage checks should also be performed to ensure that there are no water ponding issues.

6.4 Car parking

Car parking shall be provided and designed for the relevant road type in accordance with the department's RPDM and the relevant clauses on parking in the RPDM Vol 3 Part 6B.

The general design requirements are defined following.

6.4.1 General car parking requirement

The following is applicable for car parking at all HVIS:

- A parking area suitable for at least four compliance vehicles for Motorway HVIS is to be provided. For other HVIS, a parking area for at least two compliance vehicles shall be provided.
- The parking is to be on the side furthest away from the roadway.
- If a screener is provided, then:
 - parking space must be provided for a compliance vehicle to be parked adjacent to the screener, and
 - 1.4 m spacing is to be provided between the parking bay and the screener.

Figure 6.4.1(a) – Parking



Often the issue arises where trailers have been disconnected from the prime-mover and left on the HVIS for an extended period (refer to Figure 6.4.1(b)). This can render the site unsuitable for enforcement activities. To manage this situation, Traffic Control (TC) sign TC 1387 (Figure 6.4.1(c)) may be used (see the department's [MUTCD-Q and TC signs web page](#) for current signs database).

Figure 6.4.1(b) – Abandoned trailer



Figure 6.4.1(c) – TC 1387



6.5 Supporting technologies

6.5.1 General

Whenever possible, existing technology may be used to facilitate the operations and activities of the HVIS.

Where ITS and lighting technologies are used, the electrical design shall be in accordance with the requirements of the department's *TRUM Volume 4 Part 3 Electrical Design for Roadside Devices*, and the AS/NZS 3000 *Wiring Rules*.

6.5.2 ITS

ITS will be designed for the relevant road type and heavy vehicles using the route. This design will be in accordance with the relevant sections of Transport and Main Roads Technical Specification MRTS200 *General requirements for Intelligent Transport Systems Infrastructure* and the associated departmental standards. ITS network condition must be assessed and issues, such as latency, must be addressed.

In general, sites may be required to accommodate some of, or all the following ITS componentry:

- Changeable message signs designed to Transport and Main Roads Technical Specification MRTS227 *Changeable Message Signs*, or electronic traffic control signs designed to Transport and Main Roads Technical Specification MRTS229 *Electronic Traffic Control Signs* and variable message signs, shall be controlled locally from the HVIS in advance of each entry, to direct heavy vehicles to enter the HVIS.
- CCTV cameras designed to Transport and Main Roads Technical Specification MRTS225 *Imaging*, for monitoring and directing approaching vehicles, as well as possible use for site security.
- Secure remote, real-time access to the supporting Weigh-in-Motion (WIM) and Automatic Number Plate Recognition (ANPR) system.
- Where required, the connection to the Principal's telecommunications network in accordance with the requirements of Transport and Main Roads Technical Specification MRTS245 *ITS Telecommunications Network (ITS TN)*.

6.5.3 Lighting

All lighting consideration shall be in accordance with Section 7.8 Vehicle Interception Site, of the *Road Planning and Design Manual (2nd Edition) Vol 6 Lighting*.

Where mains supply is used, power to the site shall be via a metered supply.

Lighting design and/or upgrades shall be conducted in consultation with the district TIs who use the HVIS and in accordance with the relevant departmental documents.

Where there is no availability of mains power, the interception sites shall be powered from an appropriately-sized generator, or a standalone power source as set out in the requirements of MRTS263 *Standalone Solar (PV) Power Systems*.

Where a new HVIS is designed using LED lights, or an existing HVIS requires replacement of high-intensity discharge lights with LED, these shall be in accordance with Technical Note *TN158 Guide to the use of LED road lighting luminaires*. All lighting designs shall be completed in consultation with the HVIS TIs.

In rural areas, most of the HVISs are used on an irregular basis, some as little as two hours per fortnight. The region using HVIS will need to decide if the site is to be lit continuously at night (as per route lighting), or on an 'as needs' basis. Factors to be considered are:

- volume of traffic
- proximity to residential housing
- opportunity for travelling public and industry to stop and check vehicles and loads, and
- cost of providing power.

6.6 Amenities

6.6.1 General

Amenities will be designed for the relevant road type and heavy vehicles using the route. The specific design requirements are stipulated within the relevant road type sections of this document; however, the following general considerations apply:

- amenities should be located so that the distance and number of paths between the major activities and the office area are reduced to a minimum
- it is recommended amenities are located adjacent to the weighing area, but away from through-traffic
- the designer shall examine the number and location of conflicts between worker / pedestrian traffic and vehicle traffic
- all toilets, if provided, and grey water discharge must comply with *Environmental Protection Act 1994* (Qld) and Local Government requirements and provide equitable access for all potential users of the facility in accordance with the department's accessibility and inclusion strategy – smell can be an issue with some types of toilets; if so, the toilet shall be located away from the work area
- when a site has only a shaded area and no office accommodation, then the toilet is to be located away from the work area and incorporated into the location as part of a rest area facility – the toilet shall be located on the departure-side of the site
- a minimum level of shade should be provided, the erection of simple 'picnic-style' bench seats and table with an open shelter shed is recommended (as shown in Figure 6.6.1), and shade trees should be provided where practicable to improve long-term amenity and provide shade to larger extents of the site, allowing the TIs to interview the drivers in an area that is conducive to completing the necessary documentation – the exact location should be determined in consultation with the local TIs
- a combined lunch and interview room should be provided at sites with a very high usage rate; if a sink is provided, then approval for the discharge of grey water will be required from the local council
- 10 amp/3-pin power outlets should be provided where mains power has been provided for overhead lighting; it is preferable to have a stable power supply with surge protection, and
- every site is to have at least one rubbish bin. The bins are to be located away from the work area.

Figure 6.6.1 – Bench seat and table with shade

Only a few interception sites will warrant the installation of a site office. The main driver will be the installation and security of computers, weighbridge equipment, ITS components and networking. The building must also provide a safe and efficient working environment and accommodation for the site's users.

6.6.2 Site office general specifications

Where a site office is required at HVISs, the site office building must comply with the following requirements:

- be located approximately 25 m from the weigh platform, as measured in the direction of travel through the HVIS; the major factors to be considered in locating the site office are:
 - the office should be on the right-hand side of the weighbridge, as seen from the driver of the vehicle being weighed, allowing the TI operating the weighbridge to communicate with the driver
 - the distance from the end of the weighbridge should not be more than 25 m unless special provision is made to overcome signal loss in the cabling, and
 - the driver of the vehicle should be able to see a display of the weighbridge reading – this may require the use of a remote mounted display, and the actual location of the display will vary depending on whether the weighbridge is a single-deck or multi-deck installation
- have plan dimensions of not less than 6.0 m x 3.0 m
- have a finished floor level which is not less than 1.0 m above the finished ground level immediately adjacent to, and around, the building – this height is based on the need to access the office plumbing and visibility of the weighbridge area
- comply with the requirements of the Building Code of Australia and all relevant codes and standards
- be weatherproof and insulated with the environmental conditions fully accounted
- include a fully enclosed unisex toilet cubicle, complete with a door, a toilet roll holder, wall mounted exhaust fan and a towel holder

- be fitted with:
 - a reverse cycle air conditioner of sufficient capacity to maintain the interior temperature at 21°C
 - electrical and communications services including:
 - interior and exterior lighting
 - 10 double general-purpose power outlets, which must be located in positions approved by a departmental representative
 - earthing connections from the building
 - one wall-mounted telephone socket and four PC network sockets, which must be located in positions approved by a departmental representative, and
 - all other infrastructure necessary for the connection and operation of the electrical and communications services is to be finalised during scoping
 - plumbing and drainage services including:
 - one sink which must be set into the benches and must be provided with one water tap set and one hot water heater above the sink
 - one pan and cistern, one hand basin and one floor waste in the toilet cubicle, and
 - roof drainage and all other infrastructure necessary for connecting and operating the plumbing and drainage services
 - fire extinguishers
 - an external door which includes:
 - a single heavy-duty Colorbond™ (or equivalent) steel clad leaf which is 2040 mm (H) x 820 mm (W), and
 - all framing and furniture necessary for opening, closing and locking of the leaf, including a keyed lock
 - a double-sliding sash window which must:
 - be not less than 1300 mm wide
 - be on the wall facing the weighing platform and
 - include a lockable security panel that can be used to prevent viewing of the interior of the building when it is unattended, but not restrict the visibility of the TIs or their ability to communicate with the driver of the vehicle on the weighbridge
 - benches along each internal wall (except at the external door and the toilet cubicle door) which must be 750 mm wide and finished with a laminate top
 - anti-static vinyl floor covering, which must be welded at all joints, not less than 2 mm thick and seamless in the toilet cubicle
 - access stairs, complete handrails and concrete landing at the base, and
 - security screens to all windows, and
- in addition to these, there may also be special requirements for the installation and operation of Intelligent Transport System, the ANPR system and the WIM system. These requirements are very site-specific and are driven by developments in technology. It is recommended the latest released version of MRTSs are obtained from the relevant business units in the department.

Table 6.6.2 – Summary of features and Amenities by Road Classification

Road classification / HVIS features	Motorway		Highway		Rural Road		
	Option 1	Option 2	Wide Road Reserve	Limited Road Reserve	5000–10,000 AADT	2500–5000 AADT	<2500 AADT
Surface and geometry							
Sealed	Y	Y	Y	Y	Y	Y	Y
Deceleration provision	Y	Y	Y	Y	Y	Y	Y
Capacity and equipment							
Number of B-doubles	4	4	4	4	3	3	2
Weighbridge	Y	Y	Optional	Optional	Optional		
Concrete screening pad			Y ⁽¹⁾	Y ⁽¹⁾	Y ⁽¹⁾	Y	Y
MVIU brake testing – in line	Y	Y	Y	Y	Y	Y	Optional
MVIU brake testing – separate lane	Optional	Optional					
Level of service							
24/7 long periods	24/7	24/7	24	24	24	24	24
Number of inspectors	10	10	8	8	6	6	4
All weather	Y	Y					
Full lighting	Y	Y	Optional	Optional			
Light operating area			Y	Y	Y	Y	Y
Amenities / facilities							
Permanent office accommodation	Y	Y	Optional	Optional			
Toilets	Y	Y	Optional	Optional	Optional ⁽²⁾	Optional ⁽²⁾	
Interview room	Y	Y	Optional	Optional	Optional	Optional	
Lunchroom	Y	Y	Optional	Optional	Optional	Optional	
Shower / eye wash	Y ⁽³⁾	Y ⁽³⁾					

Road classification / HVIS features	Motorway		Highway		Rural Road		
	Option 1	Option 2	Wide Road Reserve	Limited Road Reserve	5000–10,000 AADT	2500–5000 AADT	<2500 AADT
Rubbish bin	Y	Y	Y	Y	Y	Y	Y
Bench seat table and shade			Y ⁽⁴⁾	Y ⁽⁴⁾	Y	Y	Y
Data connection / electricity	Y ⁽⁵⁾	Y ⁽⁵⁾	Optional ⁽⁵⁾	Optional ⁽⁵⁾			
240V power points	Y	Y	Y	Y	Y	Y	Y
Direct access to server	Y	Y	Optional	Optional			
Indirect access to server			Y	Y	Y	Y	Y
Auxiliary features							
Speed reduction when in use	If applicable	If applicable	If applicable	If applicable	Y	Y	Y
Static signage / VMS / CMS activation control	Refer to TN115	Refer to TN115	Refer to TN115	Refer to TN115			
ANPR screening	Y	Y	Optional	Optional			
WIM screening	Y	Y	Optional	Optional			

Notes:

- (1) Concrete screening pad not required if weighbridge is provided.
- (2) May only be possible as part of a rest area facility.
- (3) Emergency drench shower and eye wash station.
- (4) Seat table and shade not required if permanent office is provided.
- (5) Need sufficient data and electrical capability to operate as a standalone office.

7 Specific design requirements

7.1 Motorways HVIS minimum design requirements

In addition to the general requirements in Section 6, the minimum design standard for HVIS on a motorway is prescribed in the following sections. Depending on availability of space, Motorway HVIS designs may have options for a full-size office complex, full-size weighbridge and longer vehicle queuing lane. Diagrams on Appendix A *Motorway HVIS (Options 1 and 2)* exhibit typical designs.

7.1.1 Heavy vehicle considerations

In general, motorways facilitate high volumes of heavy vehicle traffic between major distribution hubs and cities; therefore, the design of HVIS on motorways shall accommodate the following:

- a high volume of heavy vehicles
- multi-combination vehicles typically up to 42 m in length
- authorised vehicles issued with oversize and over mass permit (typical length limit 35 m / width limit 5.5 m, though vehicles may exceed these dimensions depending on the permit), and
- design and check vehicle requirements specified in Section 6.1.1.

7.1.2 Site access geometry

The site access geometry requirements described in Section 6.1.2 apply.

7.1.3 Screening / weighing / inspection area

A screener is not required on Motorway HVIS, as it is a mandatory requirement that Motorway HVIS shall be provisioned with a weighbridge unless the department has expressly advised that it is not necessary.

The weighing / inspection area shall be designed as a concrete pad.

The weighing area comprises an approach to the weighbridge, the weighbridge and the departure from the weighbridge. A single-deck 5 m long x 4.5 m wide weighbridge is the minimum requirement for Motorway HVIS and is preferred by the department.

The length of the weighing area is dependent on the length of the weighbridge used in the site and the length of the design vehicle. The general requirements in Section 6.2.2 apply.

Inspection area locates after the weighing area. The inspection area shall cater for the use of MVIU. Refer to the inspection area requirement in Section 7.1.6.

The pavement structure and relevant seal in the weighing area must be appropriately designed to withstand the loads expected and allowance made for occasional excessive loads to cater for those grossly overloaded vehicles. Refer to Section 6.3 for details.

Grade and crossfall of the weighing / inspection area shall comply with requirements at Section 6.3.4.

7.1.4 Screener

A screener is not required at HVIS where a weighbridge is provided.

7.1.5 Weighbridge

A weighbridge shall be installed on all Motorway HVIS, unless the department has advised that it is not necessary. As a minimum of a 5 m long x 4.5 m wide pit-type weighbridge, as approved by a departmental representative, will be set into the middle of the weighing area on the concrete pad. Refer to Section 6.2.2 for design parameters for using a 5 m long x 4.5 m wide weighbridge.

7.1.6 Motor Vehicle Inspection Unit (MVIU)

Space for an MVIU is mandatory at all Motorway HVISs, except where the HVIS is located sufficiently close to a departmental motor vehicle inspection centre. Where there is a requirement to allow provision for an MVIU, Section 6.2.3.1 and the following apply:

- The test unit must be in line with the weighbridge or screener so that the vehicle being tested can approach in a straight line.
- The vehicle being tested must remain in a straight line as it travels over the test unit.
- The MVIU support vehicle is parked close to the unit and the area, around the vehicle, needs to be reasonably level and free from tripping hazards. The support vehicle itself shall not pose any hazard for any person, nor restrict the movement of traffic through the site.

7.1.7 Car parking

The requirements on car parking in Section 6.4 apply.

7.1.8 Exit and entry

The requirements on exit and entry in Section 6.1 apply.

7.1.9 Surface profile and pavement design

The requirements on surface profile and pavement design in Section 6.3 apply.

7.1.10 Amenities

The requirements on amenities in Section 6.6 apply.

A summary of HVIS features and amenities requirements, based on road classification, is outlined in Table 6.6.2.

7.1.11 Signing and linemarking

Signing and linemarking of all HVIS on motorways shall be in accordance with the department's Technical Note *TN115 Signing and linemarking for heavy vehicle interception sites* and the *Queensland Manual of Uniform Traffic Control Devices (MUTCD)*.

7.1.12 ITS and lighting

All ITS and lighting designs shall be in accordance with Section 6.5 and the relevant departmental standards and specifications.

7.2 Highway HVIS minimum design requirements

In addition to the general requirements in Section 6, the minimum design standard for HVIS on a highway is prescribed in the following sections. Diagrams on Appendix B *Highway HVIS (Limited Road Reserve and Wide Road Reserve)* exhibit typical designs. Highway HVIS with Wide Road Reserve allow the inclusion of an office, as well as a separate heavy vehicle holding area.

7.2.1 Heavy vehicle considerations

In general, highways facilitate high volumes of heavy vehicle traffic between major distribution hubs and cities. This is similar to motorways and therefore the design considerations listed in Section 7.1.1 apply.

In addition, designers shall also consider the following:

- sites located closer to major hubs and ports may need to accommodate more traffic from multi-combination vehicles such as B-triples and OSOM vehicles, and
- sites in rural areas with lower AADTs may have more consistent Type 2 road train / PBS Level 4B traffic and seasonal over-width agricultural implements.

7.2.2 Site access geometry

The site access geometry requirements in Section 6.1.2 apply here.

7.2.3 Screening / weighing / inspection areas

A screener is preferred in Highway HVIS, unless a weighbridge is provided. Where a screener is required, the requirements specified in Section 6.2.1 apply.

The screening / weighing area shall be designed as a concrete pad.

Table 7.2.3 shows typical dimensions of the concrete pad on Highway HVIS for screening and weighing functions.

Table 7.2.3 – Highway HVIS concrete pad dimensions

Parameter	Screening / weighing area minimum dimensions (m)	
	Limited Road Reserve	Wide Road Reserve
Concrete pad length	80	90
Concrete pad width	3.5	5

The length of the screening / weighing area assumes that the design vehicle will move to where the portable scales are placed. The area should therefore be able to accommodate the weighing process of a vehicle.

Inspections can be undertaken with or without an MVIU. If the site is designated for the use of MVIU, the inspection area of the site shall need to be wide enough to accommodate the equipment and its supporting facilities.

The pavement structures and relevant seals in the screening / weighing area and the inspection area must be appropriately designed to withstand the loads expected and allowance made for occasional excessive loads to cater for grossly overloaded vehicles. Refer to Section 6.3.

Refer to Appendix B *Highway HVIS (Limited Road Reserve and Wide Road Reserve)* design drawings.

7.2.4 Screener

A screener is optional and is a preferred option at HVIS where a weighbridge is not provided. The designer should consult with the TIs and/or the Principal regarding site-specific requirements.

7.2.5 Weighbridge

A weighbridge is desirable but not mandatory for highways, though installation is recommended on sites that have a history of overloading, or on sites adjacent to roads with a traffic flow greater than 50,000 vehicles per day. If the department has advised that it is not necessary, a weighing area that is suitable for the use of portable scales (with or without a screener) is required (refer to Section 6.2.2).

A screener is not needed for an HVIS with a weighbridge located on a highway. The site layout should be like Motorway Option 2 as shown in Appendix A.

7.2.6 Motor Vehicle Inspection Unit (MVIU)

Space for MVIUs is preferred at all highway sites. Where there is a requirement to allow provision for an MVIU, the requirements of Section 6.2.3 shall apply.

Following are further points to consider:

- The test unit must be in line with the screening, weighing and inspection areas so that the vehicle being tested can approach in a straight line.
- The vehicle being tested must remain in a relatively straight line as it travels over the test unit.
- The support vehicle is parked close to the unit. The area around the vehicle needs to be reasonably level and free from tripping hazards. The support vehicle itself shall not pose any hazard for any person, nor restrict the movement of traffic through the site.

7.2.7 Car parking

The requirements on car parking in Section 6.4 apply.

7.2.8 Exit and entry requirements

The requirements on exit and entry in Section 6.1.4 apply.

7.2.9 Surface profile and pavement design

The requirements on surface profile and pavement design in Section 6.3 apply.

7.2.10 Amenities

The requirements on amenities in Section 6.6 apply.

A summary of HVIS features and amenities requirements, based on road classification, is outlined in Table 6.6.2.

7.2.11 Signing and linemarking

Signing and linemarking of all HVIS on highways shall be in accordance with the department's Technical Note TN115 *Signing and linemarking for heavy vehicle interception sites* and the Queensland *Manual of Uniform Traffic Control Devices* (MUTCD).

7.2.12 ITS and lighting

All ITS and lighting designs shall be in accordance with Section 6.5 and the relevant departmental standards and specifications.

7.3 Rural Road HVIS minimum design requirements

In addition to the general requirements in Section 6, the minimum design standard for HVIS on rural roads is prescribed in the following sections.

Typical designs for Rural Road HVIS are provided in diagrams in Appendix C. These designs differ based on the traffic conditions of the roads where the HVISs are built.

To support activities performed in Rural Road HVIS, suitable areas should be provided for screening vehicles with a screener, weighing with certified portable scales and inspecting with or without using MVIU; however, a screener is not required if the site is equipped with a weighbridge.

7.3.1 Heavy vehicles considerations

The design of HVIS on rural roads shall accommodate the following design features:

- a high volume of heavy vehicles AADT
- sites may have more consistent Type 2 Road Trains and PBS Level 4B traffic
- agricultural implements and OSOM vehicles (maximum dimensions vary according to area of operation), and
- design and check vehicle requirements specified in Section 6.1.1.

7.3.2 Site access geometry

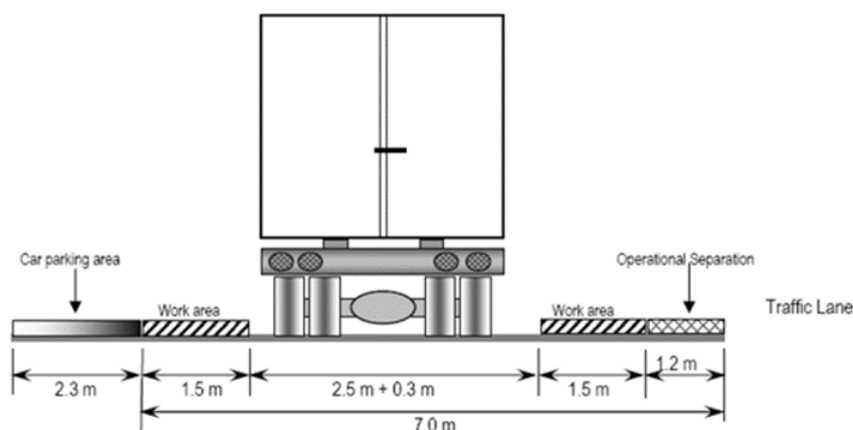
This section details the overall minimum width for Rural Road HVIS by AADT.

Where required, site-specific vehicle storage requirements should be considered in consultation with the TIs and the operational requirements for the site

7.3.2.1 Minimum width for AADT <2500

Transport Inspectors need an operating space of 1.5 m on each side of the vehicle to lay the scales and manoeuvre around them. Vehicles are normally 2.5 m wide. A 0.3 m allowance for parking the vehicle is allowed for in the calculations, as the driver will not position the unit exactly in the 2.5 m zone. For safety reasons, there is a 1.2 m wide operational buffer separating the work area from the traffic lane. Refer to Section 6.1.5. An additional area of 2.3 m wide by 30 m long is added for parking the TI's vehicle near the middle of the site. Figure 7.3.2.1 demonstrates this.

Figure 7.3.2.1 – Minimum width



7.3.2.2 Minimum width for AADT 2500–5000

As an additional precaution, because the speed of vehicle entry is often higher and the time available to position the vehicles is less than for the lower volume links, an additional 1.5 m has been added to the 1.2 m operational buffer between the work area and the traffic lane.

7.3.2.3 Minimum width for AADT >5000

A separate 3.5 m wide bypass lane is added over the abovementioned minimum width for AADT 2500–5000 (refer to Section 7.3.2.2) to allow vehicles and cars to clear the queue and re-join the traffic flow. It is not uncommon for cars in high traffic flows to come into the site and queue between heavy vehicles. There are also times when empty vehicles are in the queue and these do not have to pass over the screening device once the logbooks have been checked. These vehicles are cleared from the queue by using the bypass lane.

All the required widths shown in the drawings in Appendix C are referenced to the centreline of the road. Where the lane is less than 3.5 m, the site width measured from the adjacent edgeline of the road will increase accordingly. Some rural roads still have traffic lanes of 3.0 m. This arrangement enables these traffic lanes to be widened to 3.5 m, without needing to relocate the existing HVIS.

Table 7.3.2.3 provides details on Rural Road HVIS dimensions.

Table 7.3.2.3 – Rural Road HVIS dimensions (by AADT)

Parameter	AADT <2500	AADT 2500-5000	AADT >5000
Minimum site width (including separation zone but excluding car parking)	7 m	8.5 m	12 m
Screening pad dimensions	≥ 40 m (L) x 3.1 m (W)	≥ 40 m (L) x 3.1 m (W)	≥ 40 m (L) x 3.1 m (W)
Length of weighing / inspection area	90 m	90 m	90 m
Total site length	≥ 310 m	≥ 340 m	≥ 440 m

7.3.3 Screening / weighing / inspection areas

Where the Rural Road HVIS is not equipped with a weighbridge, as is usually the case, the HVIS shall have suitable infrastructure to screen, weigh and inspect heavy vehicles.

The screening area is designed as a concrete pad. Further requirements to support the screening process are specified separately in Section 6.2.1.

The weighing / inspection area for frequently used HVIS shall be designed as a concrete pad for better weighing accuracy and less maintenance requirement. Longitudinal slope and crossfall of the area shall comply with Section 6.3.4.

Typical weighing / inspection area dimensions for Rural Road HVIS are as shown in Table 7.3.3.

Table 7.3.3 – Weighing / inspection area dimensions (Rural Road HVIS)

Parameter	Value
Weighing / inspection area length	90 m
Weighing / inspection area width (excluding operational separation zone)	5.8 m

To cater for grossly overloaded vehicles, the pavement structure and relevant seal in the weighing area must be appropriately designed to withstand the loads expected, with allowance made for occasional excessive loads (refer to Section 6.3).

A weighbridge is optional in Rural Road HVIS. Refer to Section 7.3.5 if a weighbridge is to be provided in site.

Inspections can be undertaken with or without using an MVIU. Refer to Section 7.3.6 for sites where MVIUs are likely to be deployed.

7.3.4 Screener

The requirements on screeners in Section 6.2.1 apply.

7.3.5 Weighbridge considerations

A weighbridge is desirable but not mandatory for Rural Road HVIS, though installation of a weighbridge is recommended on sites that have a history of overloading cases being detected. The site layout adopted for a Rural Road HVIS containing a weighbridge should be like Motorway Option 2 layout with design parameters adjusted to suit the site. Refer to Appendix A.

If a weighbridge is to be used, Section 6.2.2.1 applies and a screener is not required.

Rural installation does not have the same level of infrastructure as the urban weighbridges. If a Rural Road HVIS is to have a weighbridge installed, the design needs to incorporate the following safety considerations:

- the weighbridge is isolated from site traffic by means of physical barriers, and
- the work area between the bypass lane and the weighbridge is delineated.

7.3.6 Motor Vehicle Inspection Unit (MVIU) requirements

Space for MVIU is preferred at all rural road sites. Where there is a requirement to allow provision for an MVIU, the dimensions for the Rural Road HVIS shall be in accordance with the requirements of Section 6.2.3.

The following are further considerations:

- The unit must be aligned with the screening, weighing and inspection areas so that the vehicle being tested can approach in a straight line.
- The vehicle being tested must remain in a straight line as it travels over the test unit.
- The support vehicle is parked close to the unit and the area around the vehicle needs to be reasonably level and free from tripping hazards. The support vehicle itself shall not pose any hazard for any person, nor restrict the movement of traffic through the site.

7.3.7 Car parking

The requirements on car parking in Section 6.4 apply.

7.3.8 Exit and entry requirements

The requirements on exit and entry in Section 6.1.4 apply.

7.3.9 Surface profile and pavement design

The requirements on surface profile and pavement design in Section 6.3 apply.

7.3.10 Amenities

The requirements on amenities in Section 6.6 apply.

A summary of HVIS features and amenities requirements, based on road classification, is outlined in Table 6.6.2.

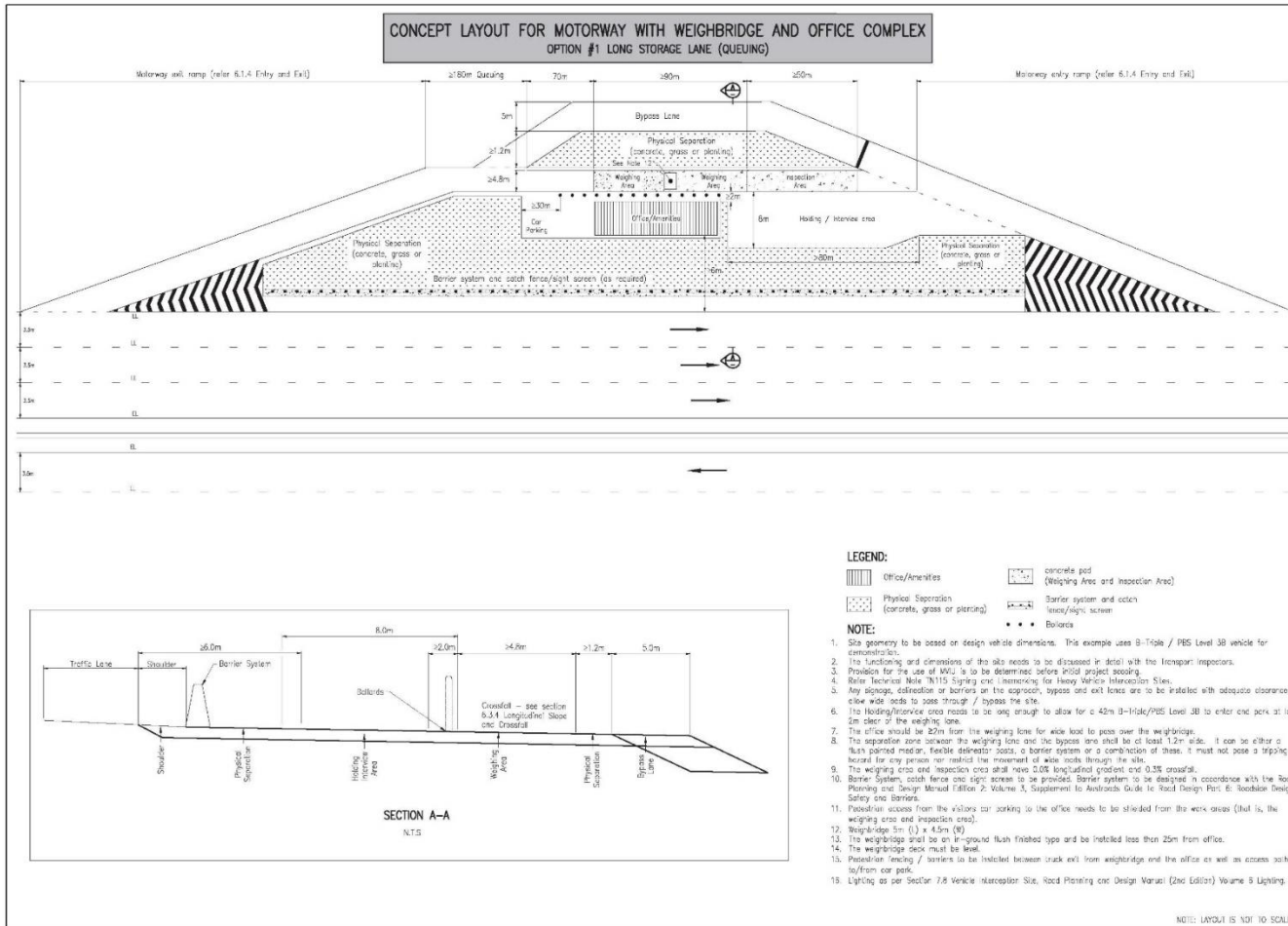
7.3.11 Signing and linemarking

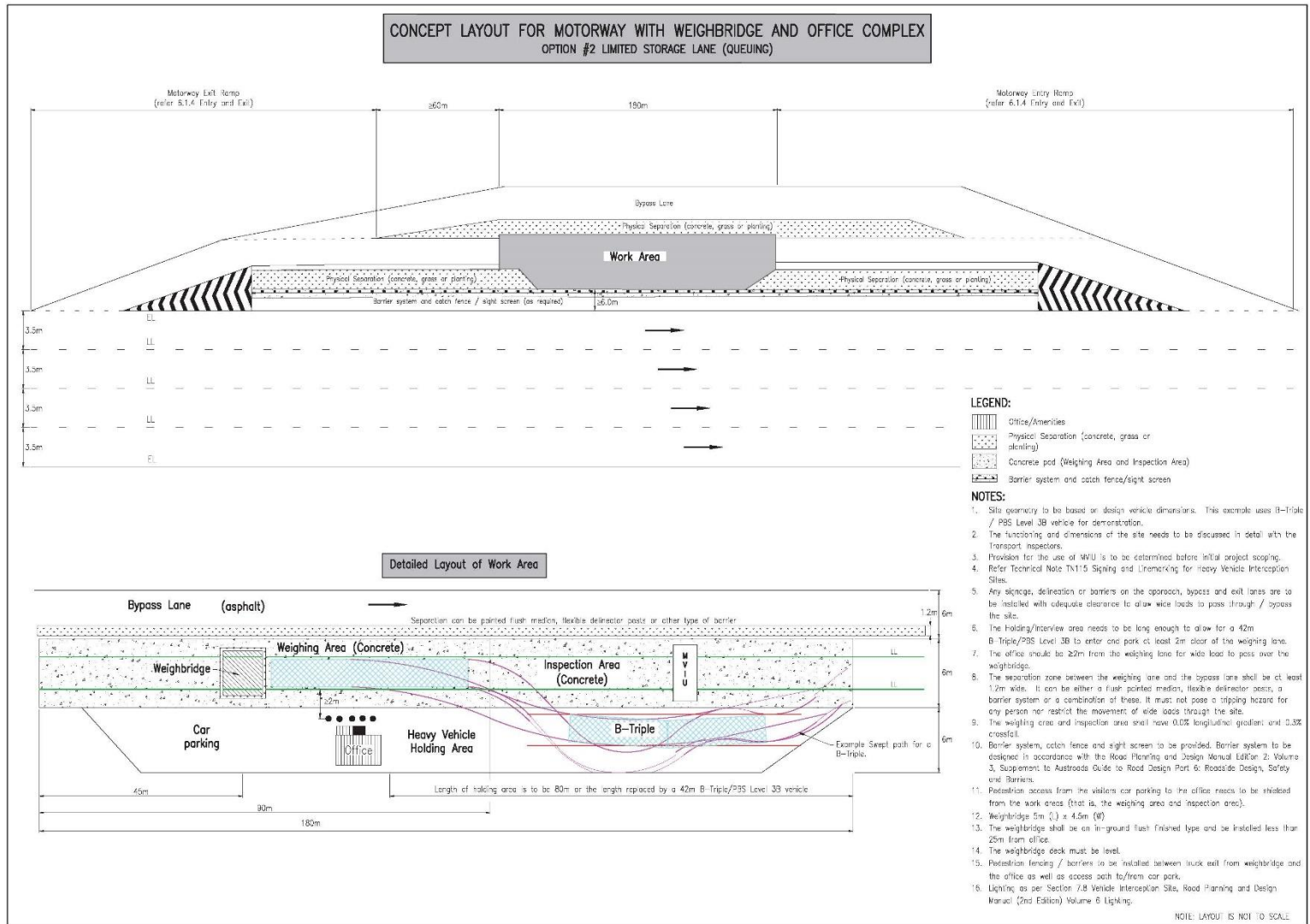
Signing and linemarking of all HVIS on rural roads, shall be in accordance with the department's Technical Note TN115 *Signing and linemarking for heavy vehicle interception sites* and the Queensland *Manual of Uniform Traffic Control Devices (MUTCD)*.

7.3.12 ITS and lighting

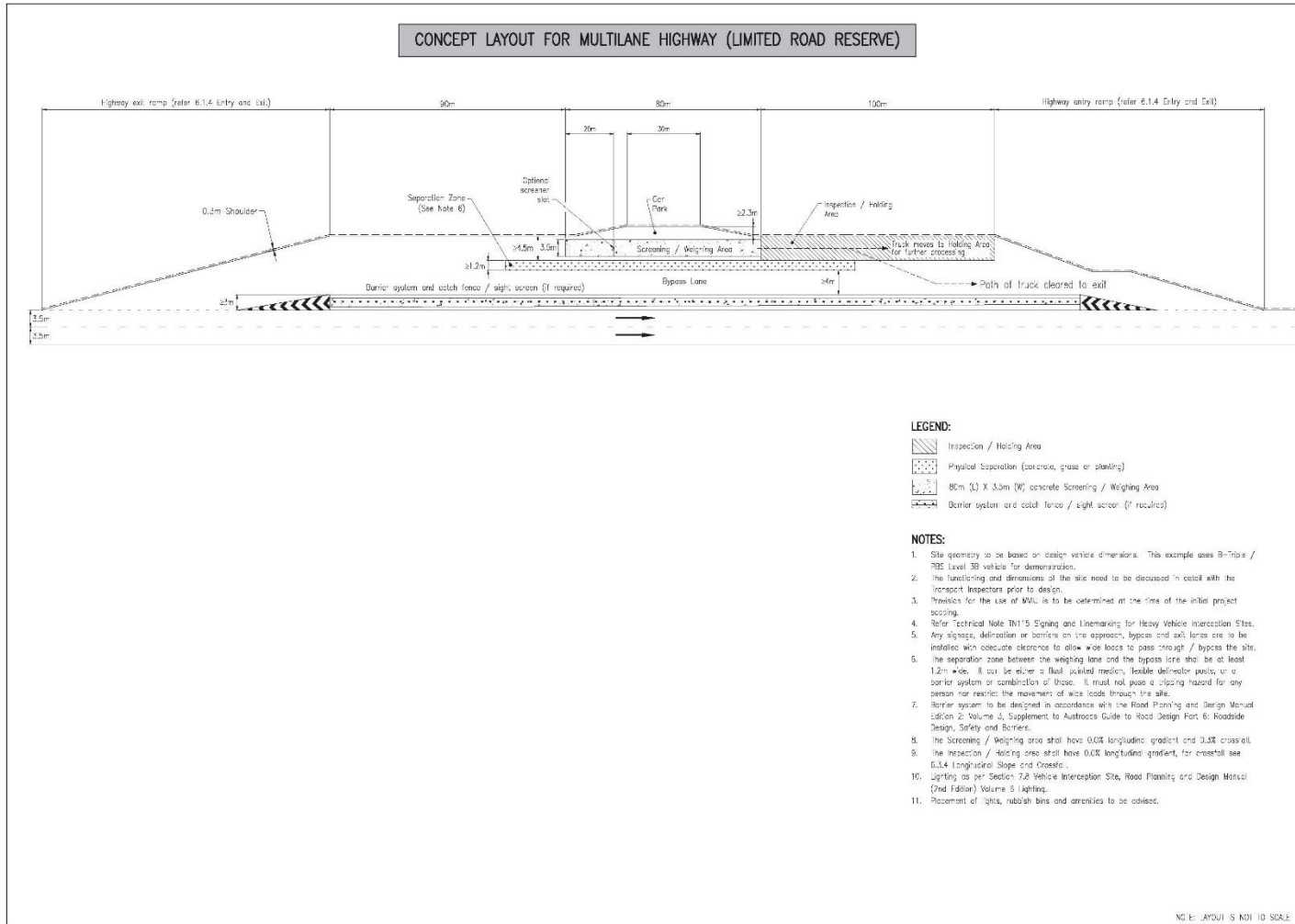
All ITS and lighting designs shall be in accordance with Section 6.5 and the relevant departmental standards and specifications.

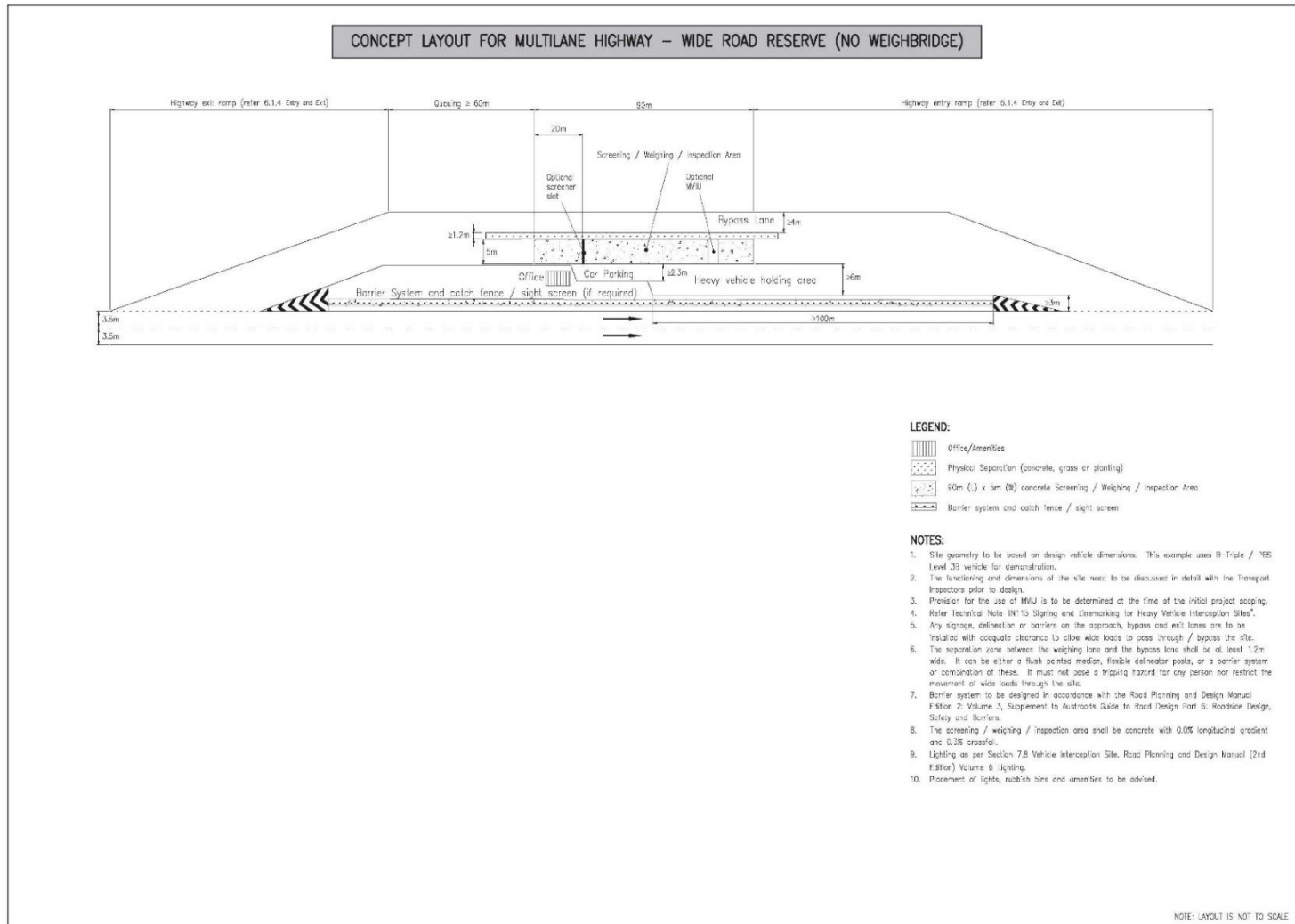
Appendix A – Motorway HVIS (Options 1 and 2)



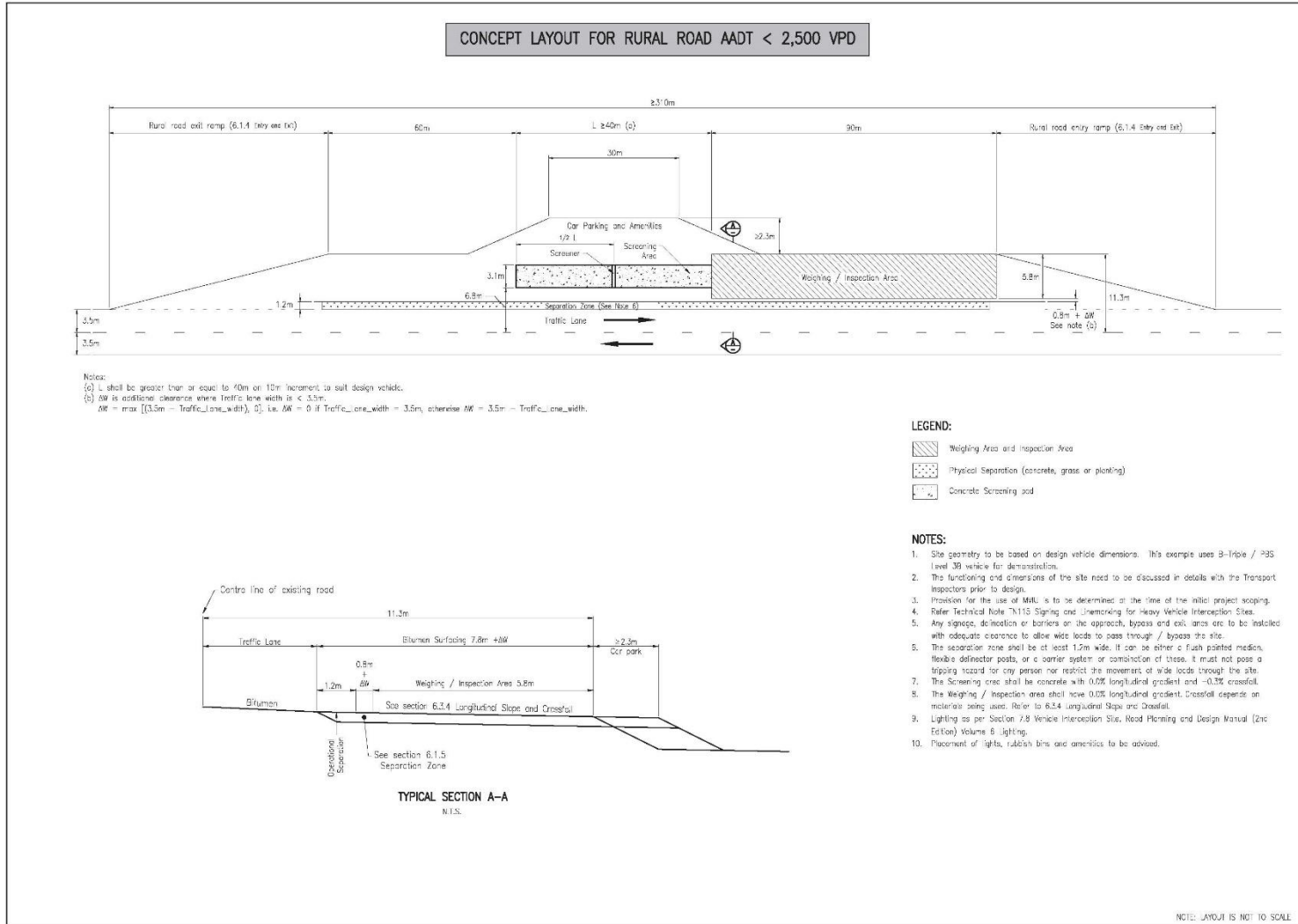


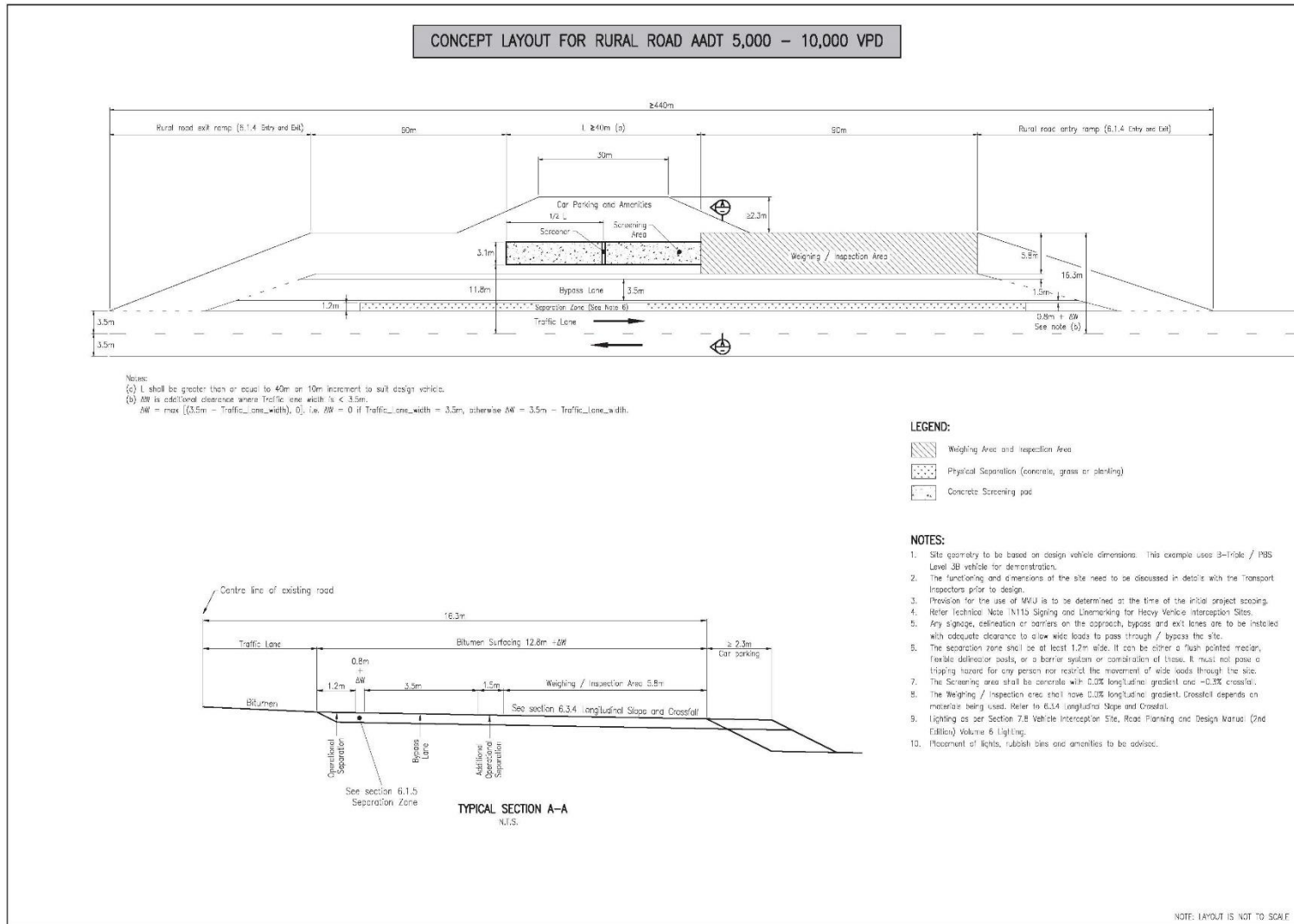
Appendix B – Highway HVIS (Limited Road Reserve and Wide Road Reserve)





Appendix C – Rural Road HVIS (AADT<2500, 2500-5000 and >5000)





Appendix D – Concrete Screening Pad

