



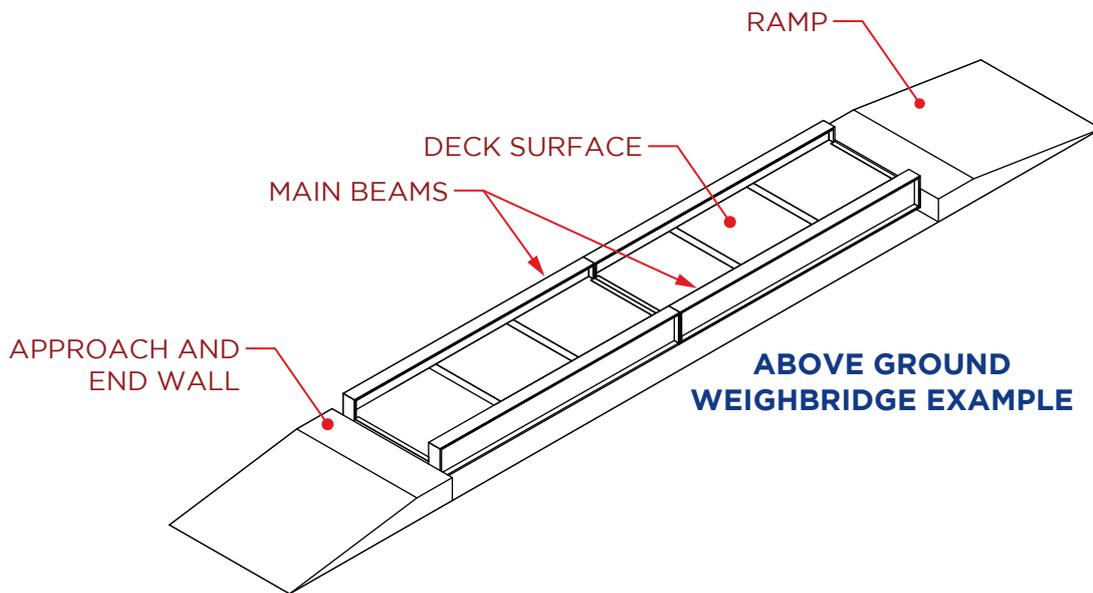
WEIGHBRIDGE FORMAT SPECIFICATIONS



TABLE OF CONTENTS

	PAGE
WEIGHBRIDGE TERMINOLOGY	2
ABOVE GROUND WEIGHBRIDGE CONSIDERATIONS	3
SEMI-PIT WEIGHBRIDGE CONSIDERATIONS.....	4
CUSTOM SEMI-PIT WEIGHBRIDGE CONSIDERATIONS	5
CUSTOM SEMI-PIT VARIATION	6
FULLY INGROUND WEIGHBRIDGE CONSIDERATIONS.....	7
MULTIPLE-DECK WEIGHBRIDGE CONSIDERATIONS.....	8
RELOCATABLE WEIGHBRIDGE CONSIDERATIONS	9
ADVANTAGES AND DISADVANTAGES	11
WEIGHBRIDGE ALTERNATIVES	15

WEIGHBRIDGE TERMINOLOGY AND LEGISLATIVE REQUIREMENTS



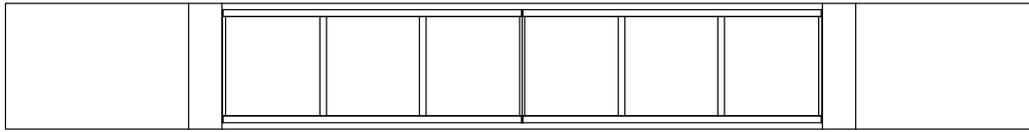
SEMI-PIT WEIGHBRIDGE EXAMPLE

There are legal requirements for trade weighbridges that are usually catered for during the installation stage of the weighbridge. However, you should be aware of these requirements when planning a weighbridge site, as well as preventing future modifications to an installation that may nullify these requirements.

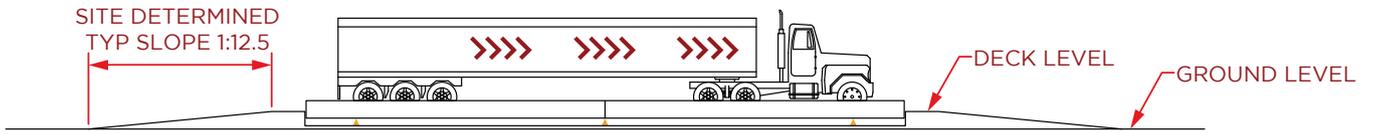
- The approaches must be level and in good condition (not pitted or rutted).
- The first 3m (for a weighbridge less than 18m long) or first 1m (for a weighbridge 18m or longer) of each approach must be constructed of concrete.
- The foundation must be free from a build up of water and debris.
- The digital weight indicator must be 6m or less from the weighbridge deck. [Therefore, do not locate the indicator further than 6m unless an application for exemption is made to the Trade Measurement Authority and accepted].
- If a fully inground weighbridge, all sumps and/or drainage pipes must be fully functional.
- If a portable weighbridge, the ground beneath the deck must be treated to prevent growth of foliage.
- If an above ground weighbridge, there must be a 0.75m clear space along both sides of the weighbridge deck. The clearance must be of the same level as the foundation floor or lower, but never higher. [Therefore, never install structures within the 0.75m clear space unless an application for exemption is made to the Trade Measurement Authority and accepted].

Any enquiries can be made to the appropriate Trade Measurement Authority, or to Diverseco. Enquiries are welcomed by both organisations.

ABOVE GROUND WEIGHBRIDGE INSTALLATION CONSIDERATIONS

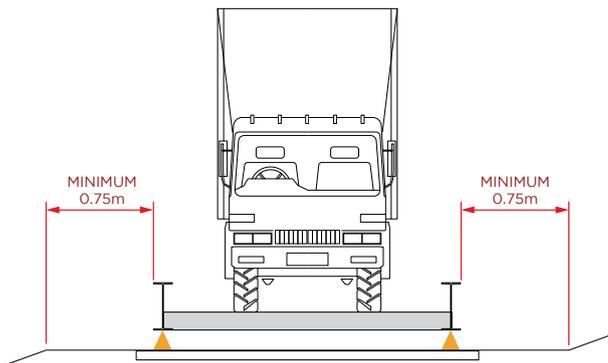


TOP VIEW

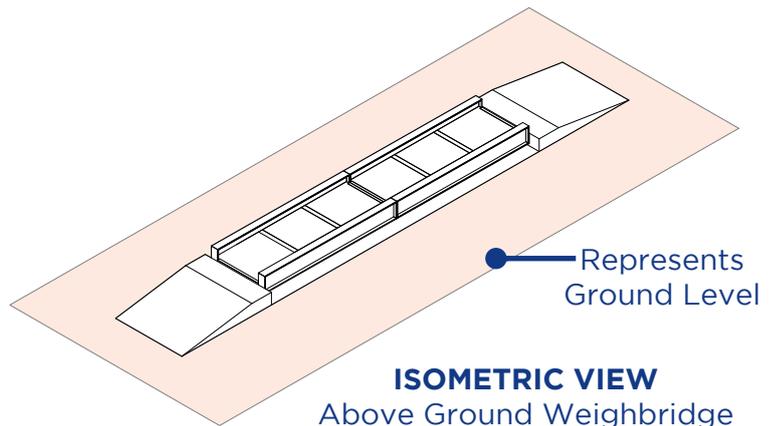


FRONT VIEW

When planning for an above-ground weighbridge, always include ramps and 0.75m “clear-spaces” along both sides of the weighbridge deck, as shown below. This clear-space must be a minimum of 0.75m wide and must be of the same plane as the foundation floor or lower. If either clear-space includes bare ground, treat the ground to prevent growth of foliage within the clear-space. Assuming the approach ramps are a 1:12.5 incline, and the site is level from end to end, each ramp will be a minimum of 5m long. Add to this any vehicle’s turning circle requirements before and after each ramp, if any, and you will soon realise that above ground weighbridges claim the most surface area of a site than would any other type of weighbridge.

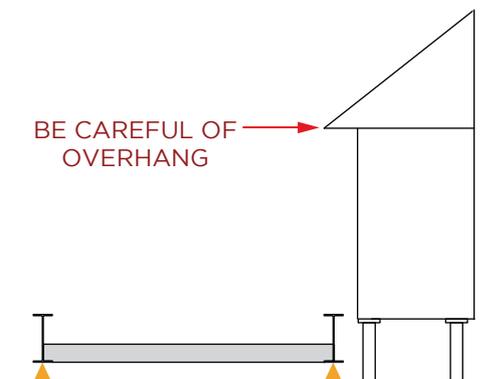


CROSS-SECTIONAL VIEW

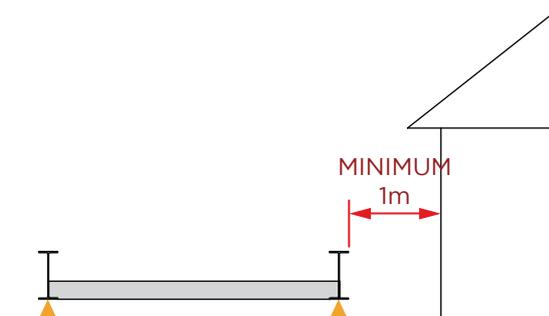


ISOMETRIC VIEW
Above Ground Weighbridge

The location of the weighbridge office or hut should also be considered. If it is to be located close to the weighbridge, it may need to be constructed on stumps. In this case, be careful of the office overhanging the bridge. Keep supports for the office at least 0.5m away from any nearby load cell locations. Also ensure load cells can be easily accessed by service personnel, if ever required.

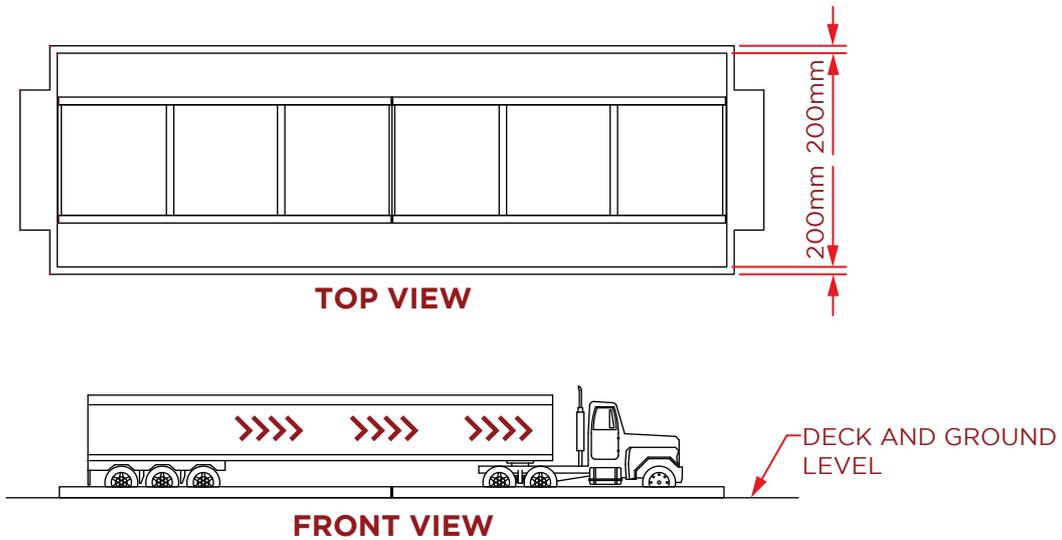


OPTION A
Office Constructed on Stumps



OPTION B
Office Constructed Away from the Deck

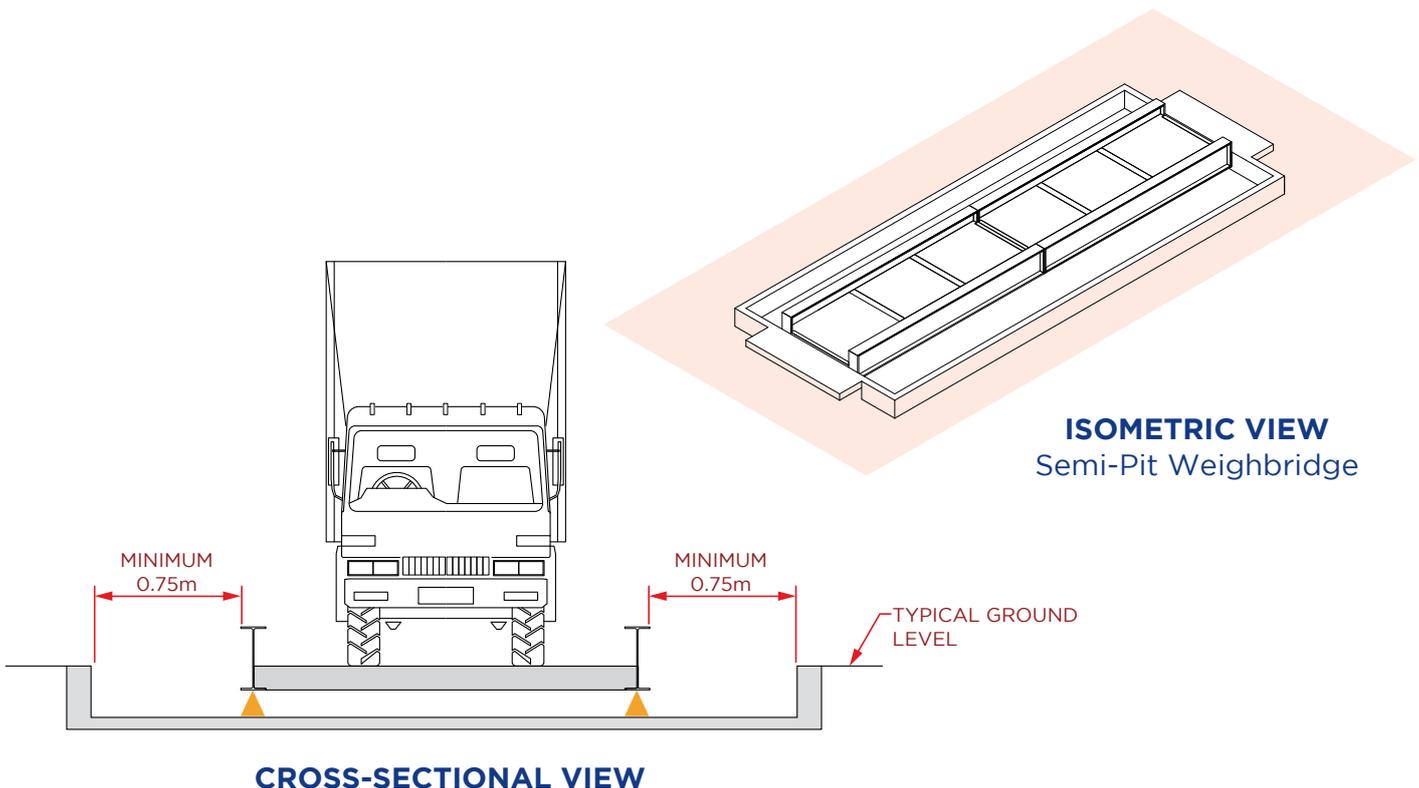
SEMI-PIT WEIGHBRIDGE INSTALLATION CONSIDERATIONS



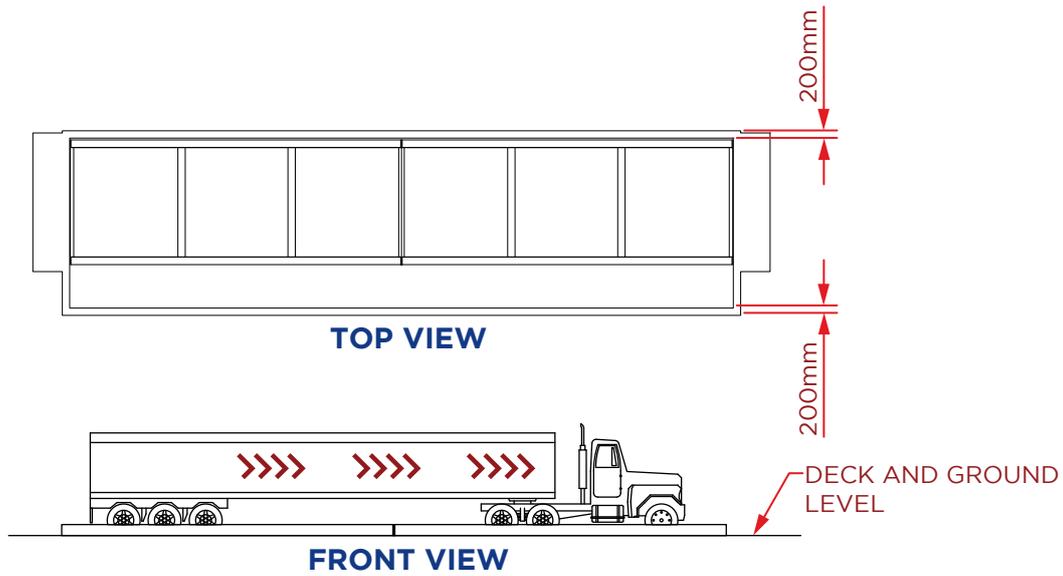
Semi-pit weighbridges have side walls that act as retaining walls. They may be block-filled walls or poured concrete walls and are located at least 0.75m from the side of the deck. Note that additional reinforcement may be required in the side walls if you intend to allow vehicular traffic to travel adjacent to the side walls.

Since the deck is at ground level, no ramps are required. This may be important where a site is limited with available space for a weighbridge. Drainage is also another important consideration. Either a sump pump or drainage pipe must be installed, and must be located where most effective and appropriate for the site.

Health and safety requirements also tend to require mesh walkways to be installed along side the deck at either deck level or at beam height level to maximise safety for vehicle drivers and site personnel. The walkway may extend the full length of the deck or just part of it. In this instance, keep supports for the walkway at least 0.5m away from any nearby load cell locations. Also ensure load cells can be easily accessed by service personnel, if ever required. If a walkway extends the full length of the deck, some walkway mesh panels will need to be made removable to allow service personnel to access load cells.



CUSTOM SEMI-PIT WEIGHBRIDGE INSTALLATION CONSIDERATIONS

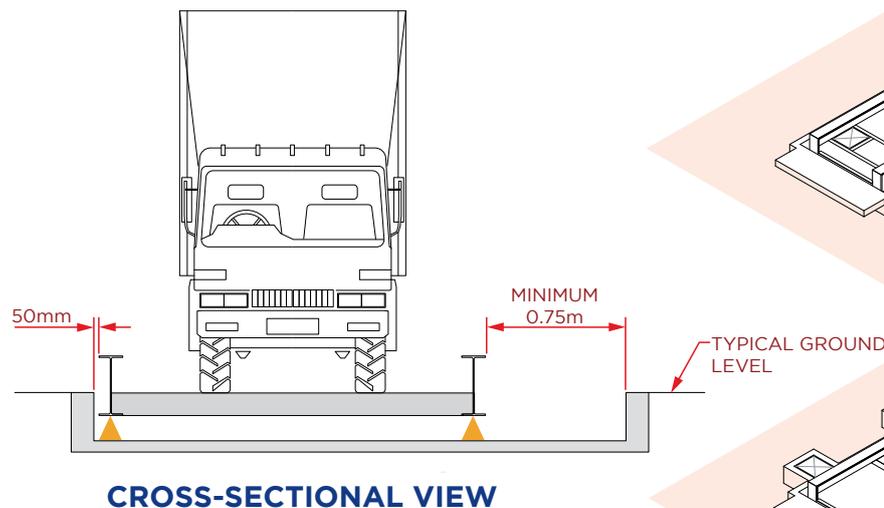


The custom semi-pit weighbridge is an adaption of the typical semi-pit weighbridge design. The design is modified to accommodate site limitations, for example, width limitations, building arrangements, etc. One or both of the side walls' clearance width is decreased. In this circumstance, access to some load cells is reduced or altogether prevented. Access holes must then be installed adjacent to each obscured load cell location, either in the deck or as part of the side wall, to facilitate servicing and maintenance to those load cells (see the corresponding isometric drawing at the end of this Weighbridge Format Specification).

If access holes are installed as part of the side wall, and vehicular traffic is expected to use this area, then the access hole covers must be correctly designed and constructed to take the expected loadings of vehicles. The side walls will also require additional reinforcing.

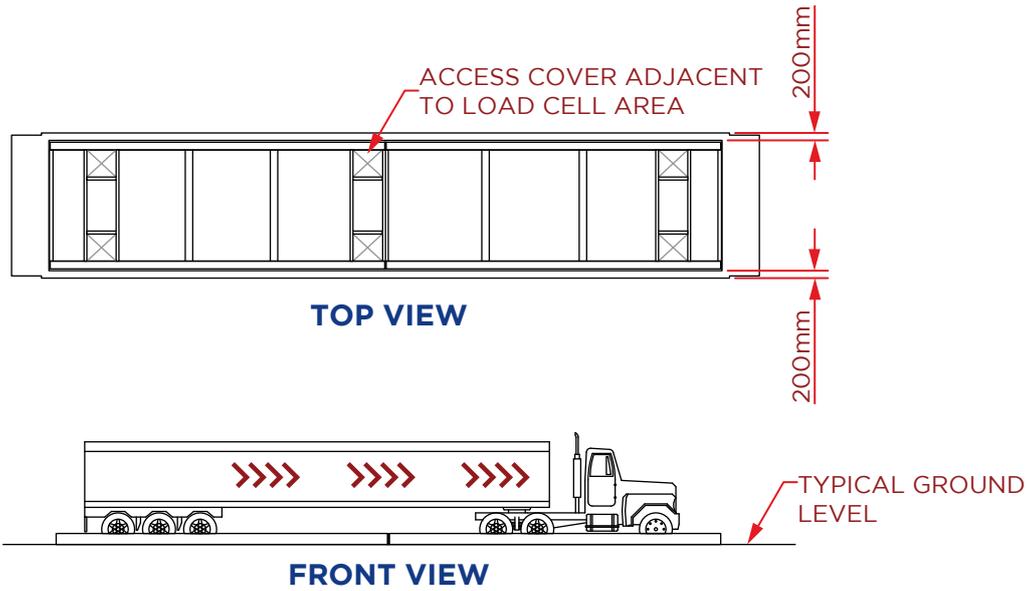
As with the standard semi-pit weighbridge, drainage must also be considered.

ISOMETRIC VIEW
Custom Semi-Pit Weighbridge
Access Holes Constructed as
Part of Weighbridge Deck

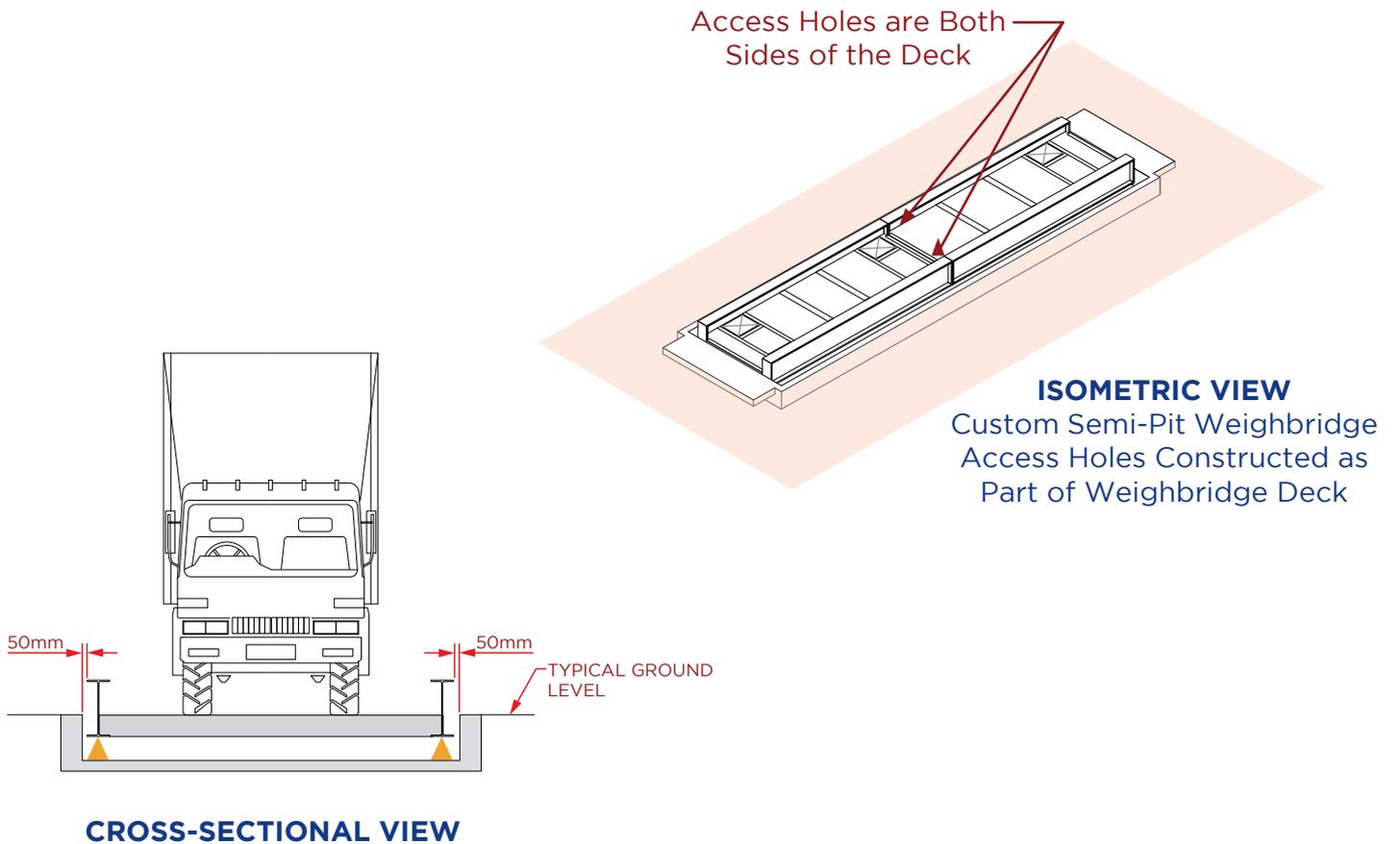


ISOMETRIC VIEW
Custom Semi-Pit Weighbridge
Access Holes Constructed as
Part of Weighbridge Foundation

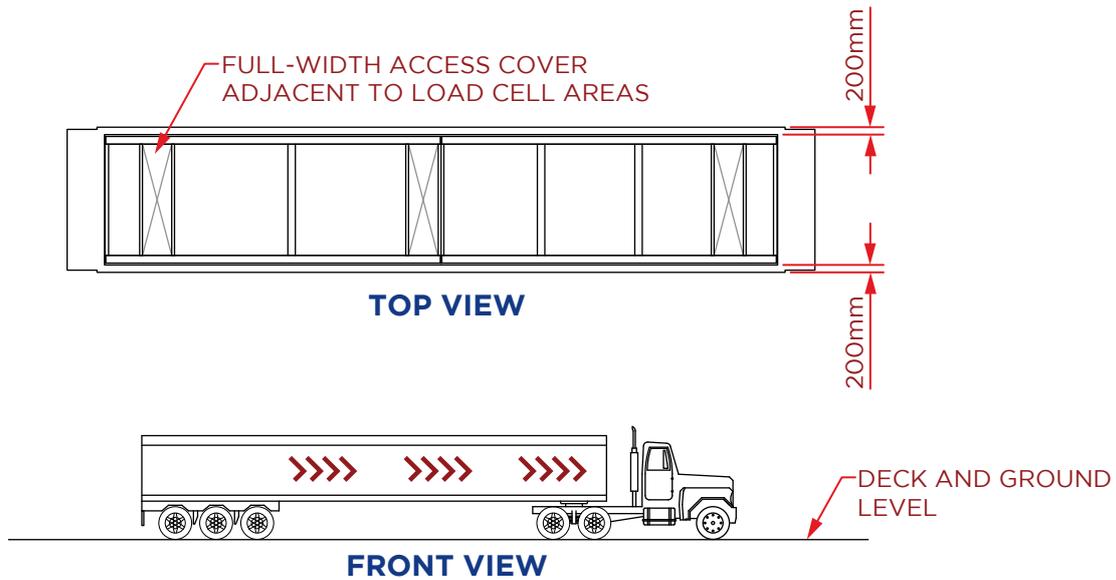
CUSTOM SEMI-PIT WEIGHBRIDGE INSTALLATION CONSIDERATIONS



This design is similar to Type C1. All considerations for Type C1 apply to this design. Access holes must be provided both sides of the deck.



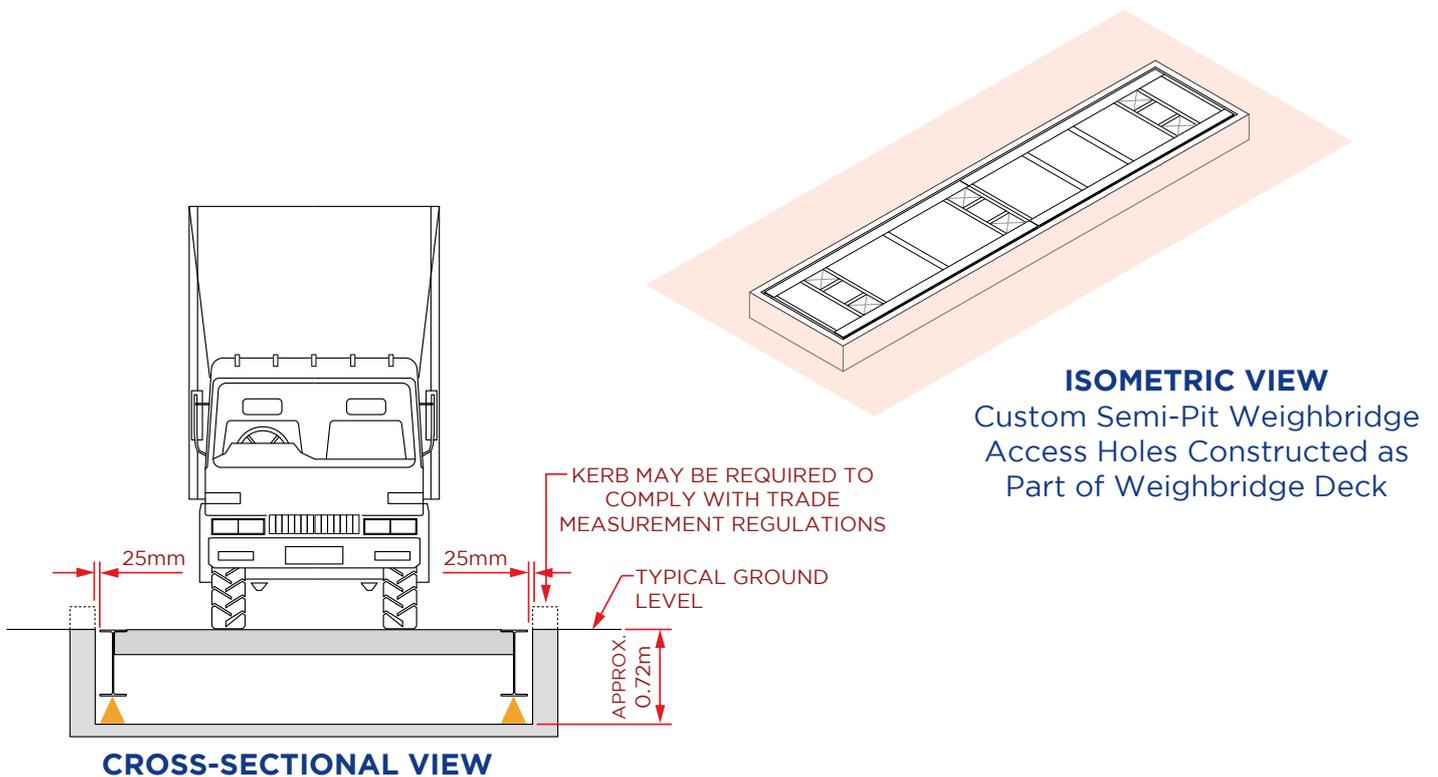
CUSTOM SEMI-PIT WEIGHBRIDGE INSTALLATION CONSIDERATIONS



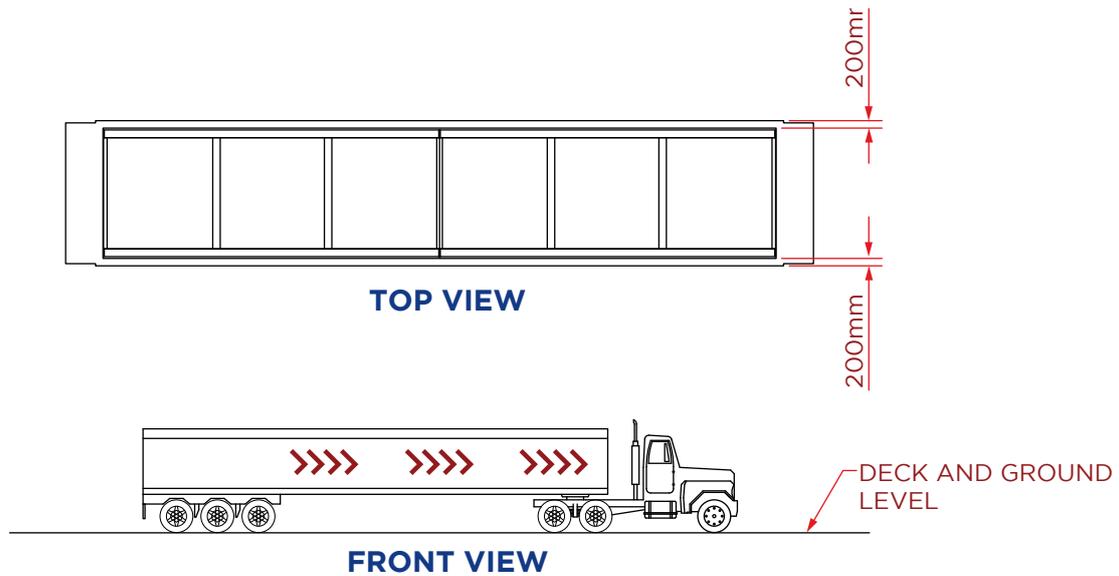
This design is similar to Type C2. All considerations for Type C1 and Type C2 apply to this design. Access holes must be provided both sides of the deck.

This design differs to Type C2 in that the top of the deck is completely flush with the typical ground level. This design also differs to Type D in that the depth of the pit is not as deep. This design may therefore be suitable for some sites that require a fully inground weighbridge, but wish to reduce or eliminate the risks involved with a confined space.

As an alternative to a single access cover for each load cell area, one full-width access cover may be used for each load cell area pair (load cell areas on opposite sides of the deck to each other), as shown in the Top View above. The benefit of this is that a single access cover can be removed to allow access to two load cells.



FULLY INGROUND WEIGHBRIDGE INSTALLATION CONSIDERATIONS



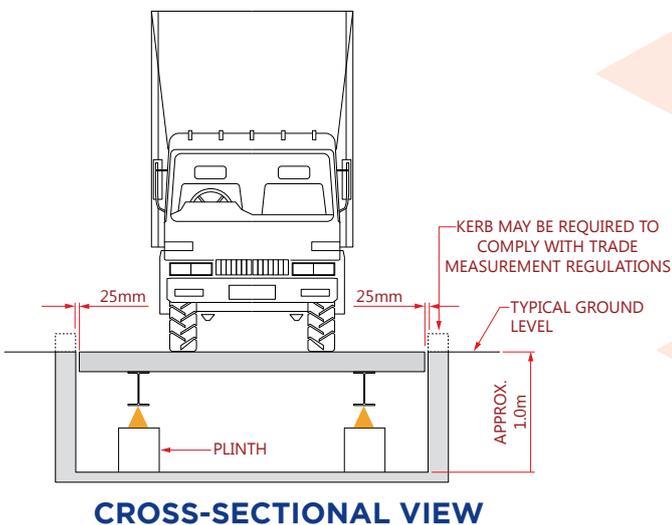
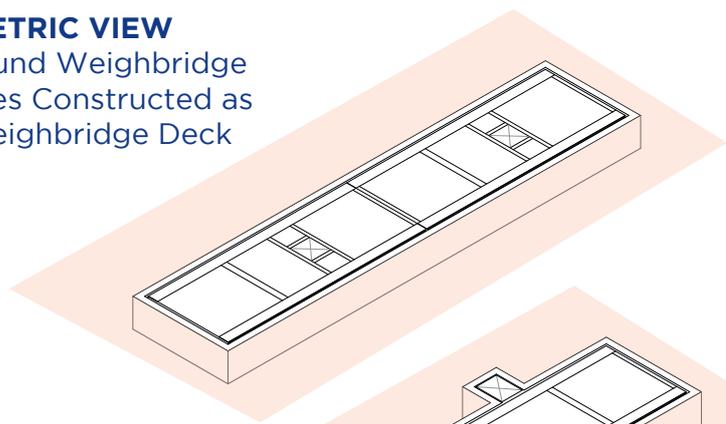
Fully inground weighbridges provide a completely level weighing surface with the surrounding ground level. Access to the load cells must be made either by including access holes in the deck or to the side of the deck as part of the foundation design. Since vehicular traffic often travels adjacent to the deck, the access hole covers are designed and constructed to take the expected vehicle loadings.

Drainage must be considered, either as a sump or as a drainage pipe, and must be located where most effective and appropriate for the site.

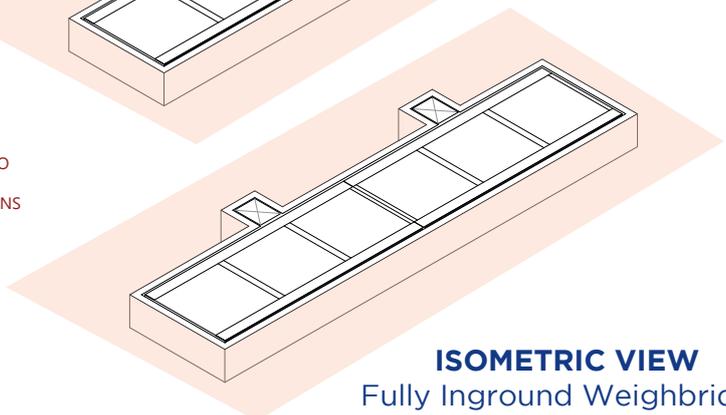
Fully inground weighbridges claim the least surface area of a site than any other weighbridge type. However, they are the most expensive weighbridge type to construct due to the extensive excavation work required and slightly more concrete and reinforcing required.

Health and safety often defines the inground weighbridge pit as a confined space. As such, personnel cannot enter the pit to service the weighbridge without special confined space entry training and equipment (including a gas detector and harnesses). Service personnel are therefore typically charged out as a higher hourly rate. A minimum of two service personnel is required with one acting as a safety look-out for those entering the confined space.

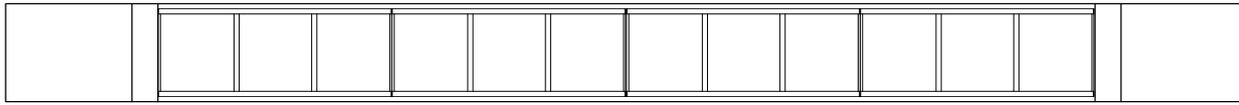
ISOMETRIC VIEW
Fully Inground Weighbridge
Access Holes Constructed as
Part of Weighbridge Deck



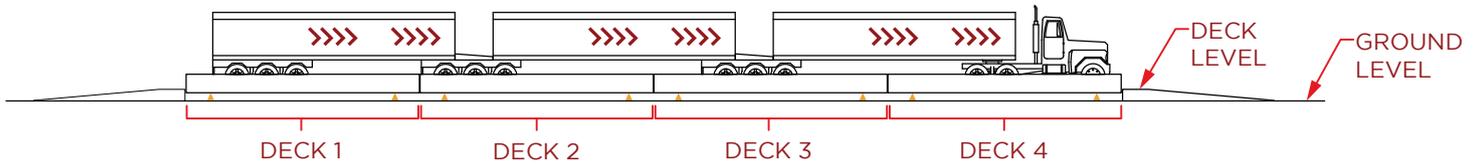
ISOMETRIC VIEW
Fully Inground Weighbridge
Access Holes to Constructed
as Part of Side Wall



MULTIPLE DECK WEIGHBRIDGE INSTALLATION CONSIDERATIONS



TOP VIEW



FRONT VIEW

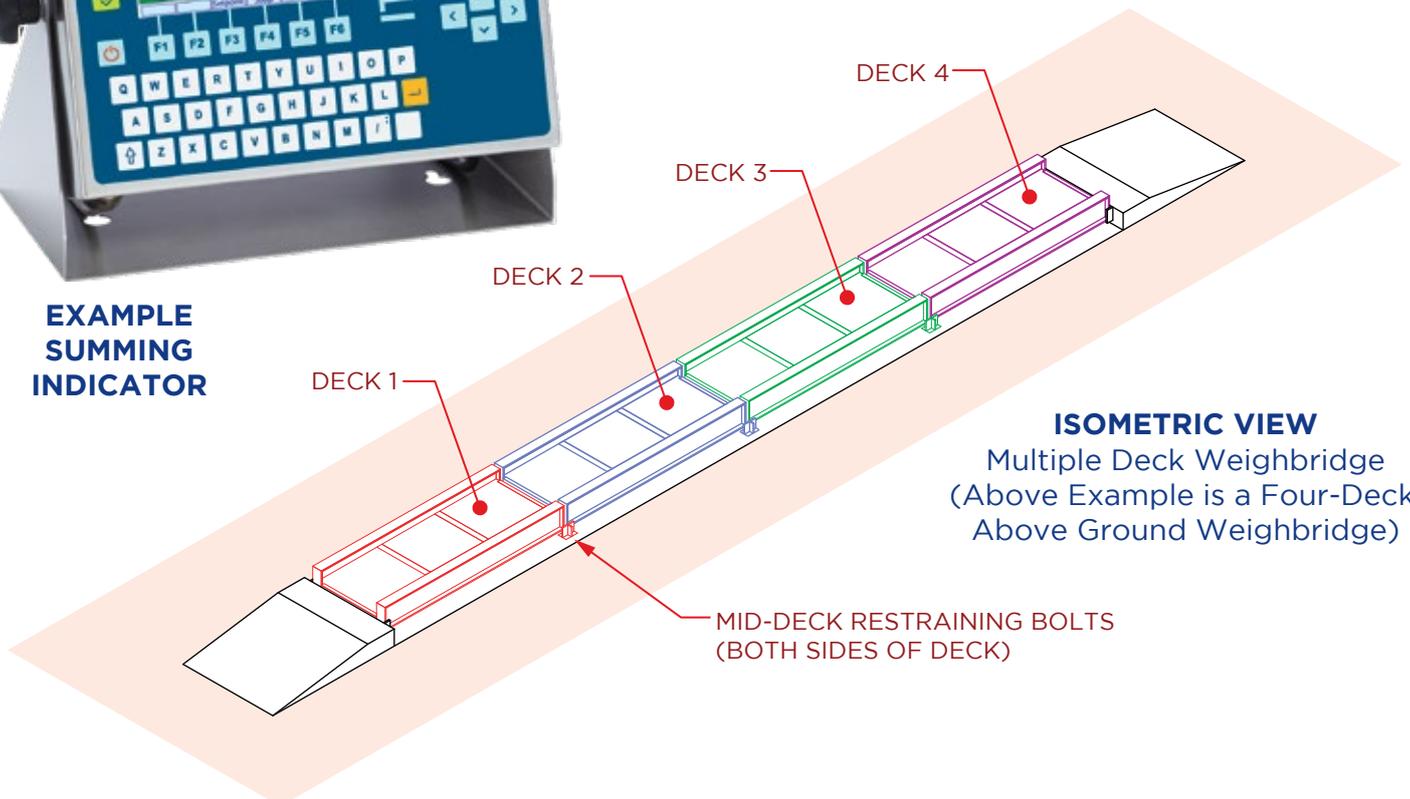
Multiple deck weighbridges are really a variation of a design, rather than another weighbridge type. For example, multiple deck weighbridges may be an above ground, a semi-pit, or a fully inground design. The number and length of the decks vary according to your requirements. Decks need not be of the same length.

The advantage of multiple deck weighbridges is that individual axles, or axle groups, are weighed individually and simultaneously. This is ideal for weighbridges that will be used to record axle breakdown weights as its primary function.

Considerations for the corresponding weighbridge type (above ground, semi-pit, and fully inground) still apply. Mid deck restraining assemblies are typically installed between decks to limit deck movement. A purpose-built, intelligent digital weight terminal is provided which can sum the weight of all decks and can display the total weight or individual deck weights.



**EXAMPLE
SUMMING
INDICATOR**



ISOMETRIC VIEW

Multiple Deck Weighbridge
(Above Example is a Four-Deck,
Above Ground Weighbridge)

RELOCATABLE WEIGHBRIDGE INSTALLATION CONSIDERATIONS

Relocatable weighbridge decks are typically constructed of all steel making them light weight and modular for easy transport and relocation. These decks can be positioned on to an existing concrete slab (assuming that the load ratings are acceptable) or a new concrete foundation can be constructed, either to suit an above ground installation or as a pit for an inground installation.

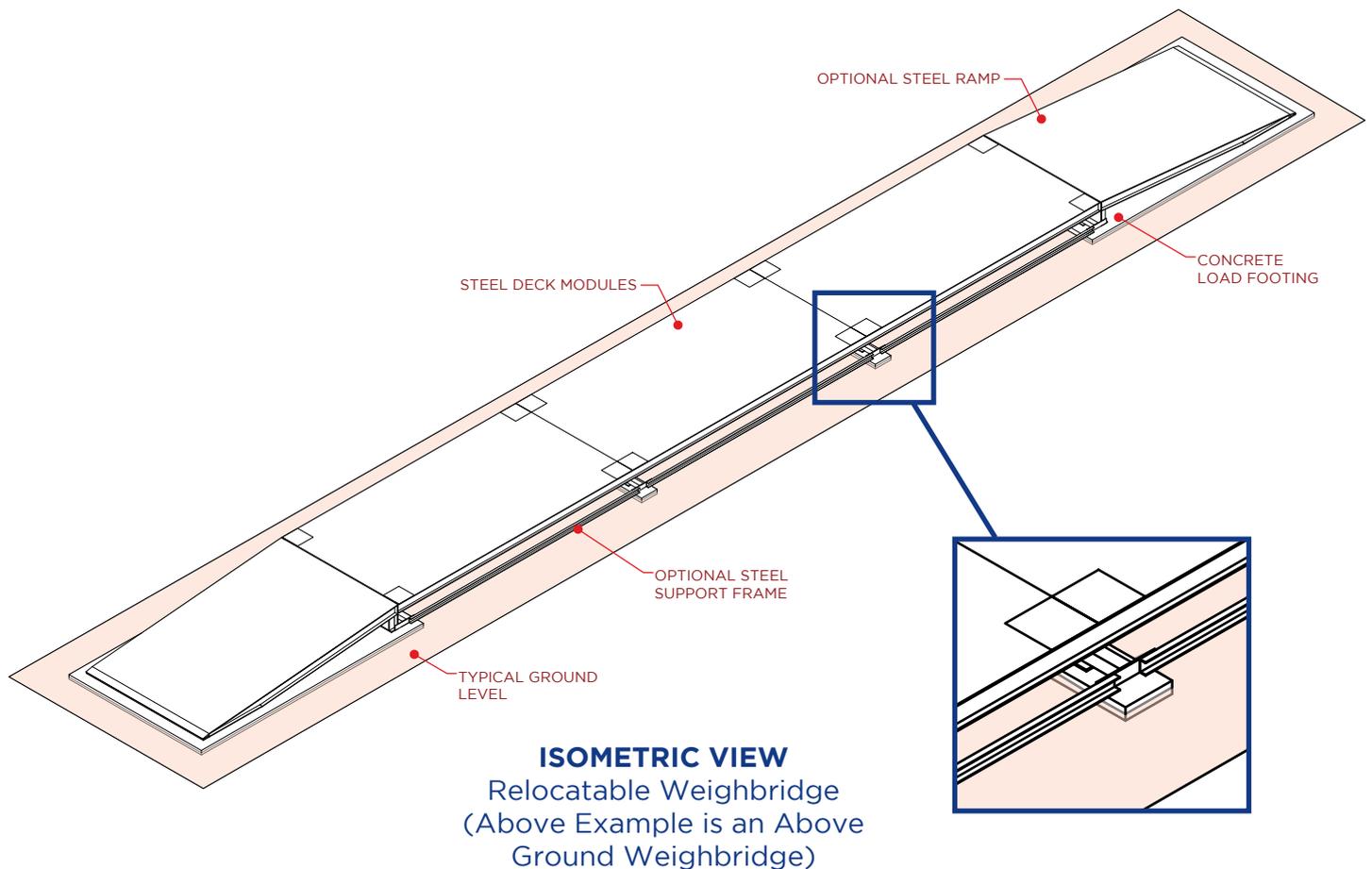
The all-steel deck construction means that these decks expand and contract with the weather which can affect the life span of the load cells. The lighter weight of the decks (as opposed to the heavier steel/concrete decks) means the rocking motion of the weighbridge (when vehicles enter and exit the weighbridge) is much more uninhibited which again can affect the life span of the load cells. For these reasons, all-steel weighbridge decks are recommended for temporary or short-term sites (up to five years).

We can offer many options such as:

- Load footings rather than full foundation constructions to minimise costs.
- Steel sub-frames under the load cells to make this a truly relocatable design.
- Steel approaches and ramps which can taken from installation to installation to eliminate concrete approaches and ramps which are permanent to each site.
- Load cells can be fitted with connectors (prior to supply) to assist assembly and disassembly.
- The digital indicator can be mounted in an enclosure that bolts to the side of the deck.

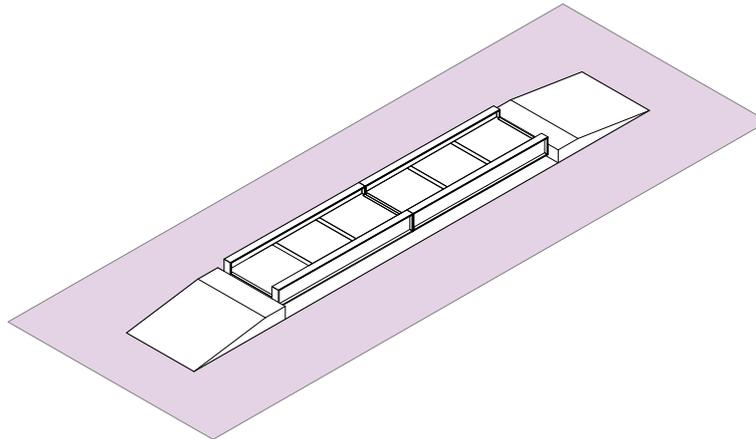
The steel sub-frame is assembled from components, forming a rigid support base for the load cells and deck. For non-trade applications, earth ramps could be constructed to access the deck.

Assuming that concrete load footings are used instead of a full concrete slab, the ground beneath the deck (between concrete load footings) must be treated to prevent growth of foliage. If the weighbridge is required to be used for trade purposes, concrete end walls will need to be constructed.

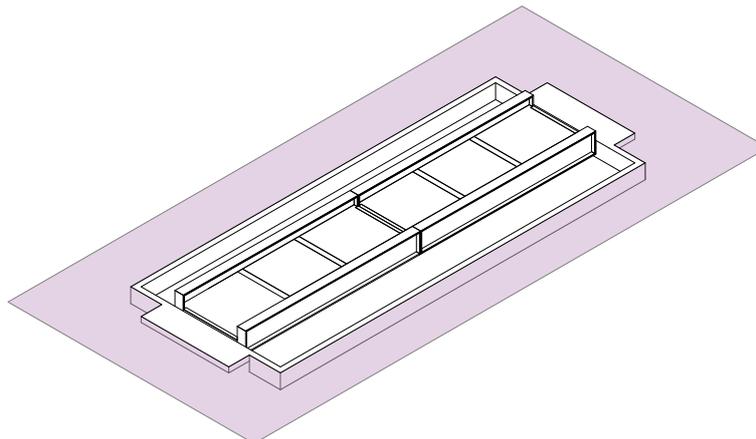


ADVANTAGES AND DISADVANTAGES

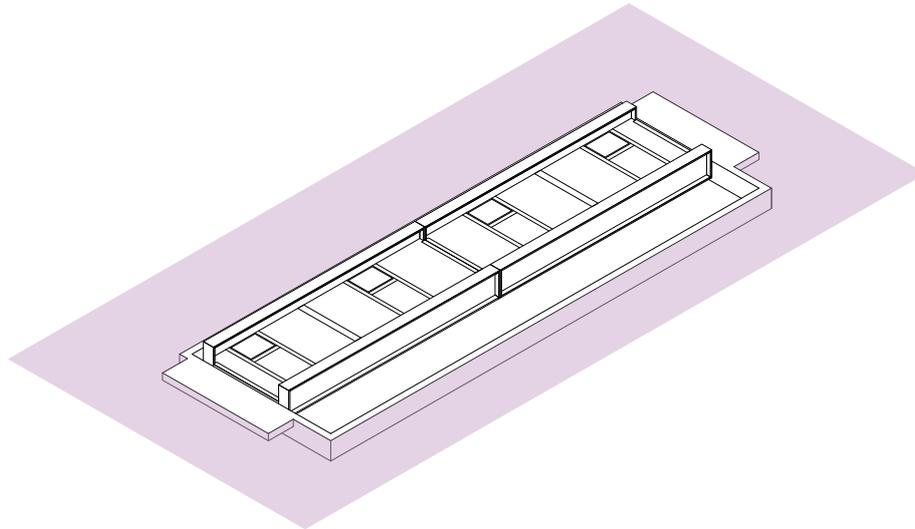
TYPE	ADVANTAGES	DISADVANTAGES
TYPE A Above-Ground Weigh-bridge	<ul style="list-style-type: none"> + Least expensive weighbridge option + Least site preparation required before construction + Most common type of weighbridge supplied 	<ul style="list-style-type: none"> - Requires the largest site footprint of all the options



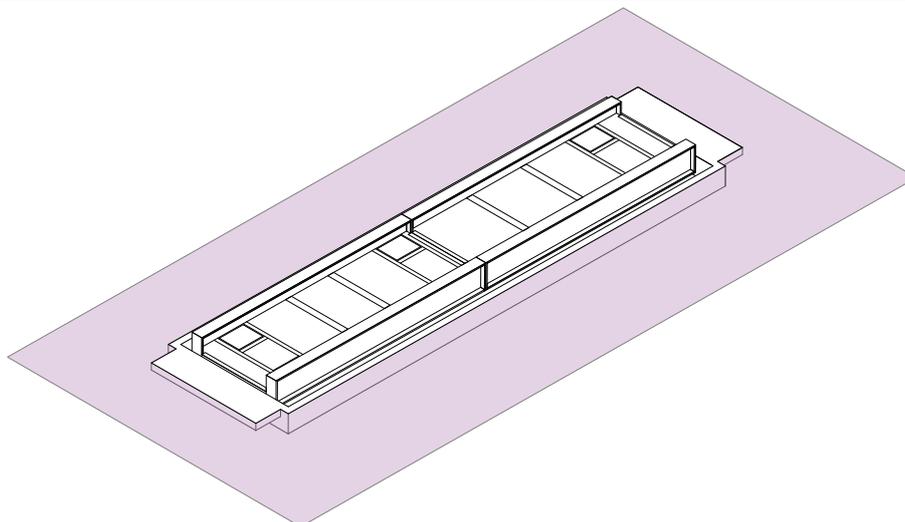
TYPE	ADVANTAGES	DISADVANTAGES
TYPE B Standard Semi-Pit Weigh-bridge	<ul style="list-style-type: none"> + Second least expensive weighbridge option + Common type of weighbridge supplied + Smaller site footprint required than the above ground weighbridge option 	<ul style="list-style-type: none"> - Some excavation required before construction - Requires drainage considerations



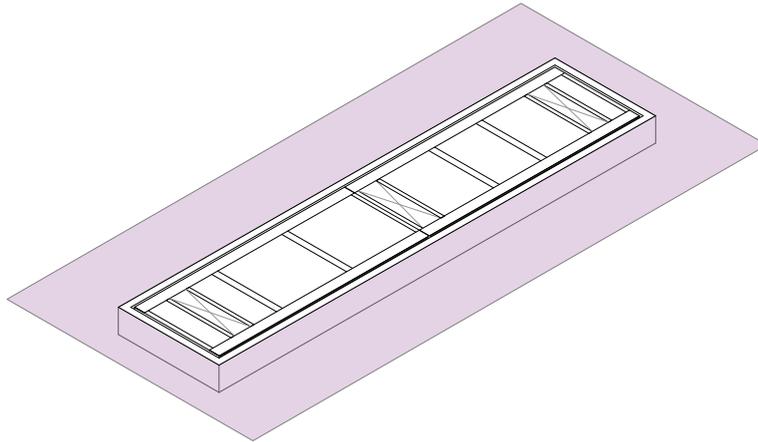
TYPE	ADVANTAGES	DISADVANTAGES
<p>TYPE C1</p> <p>Single Clear-Space Semi-Pit Weigh-bridge</p>	<ul style="list-style-type: none"> + Ideal for sites with a weighbridge bypass road adjacent to one side of the weighbridge + Ideal for sites with an office or building adjacent to one side of the weighbridge + Smaller site footprint required than the semi-pit weighbridge option 	<ul style="list-style-type: none"> - Some excavation required before construction - Requires access holes (typically in the deck) to access the load cells for servicing purposes - Access holes make this option slightly more expensive than the semi-pit weighbridge option - Trade Measurement Authority exemption in writing required - Requires drainage considerations



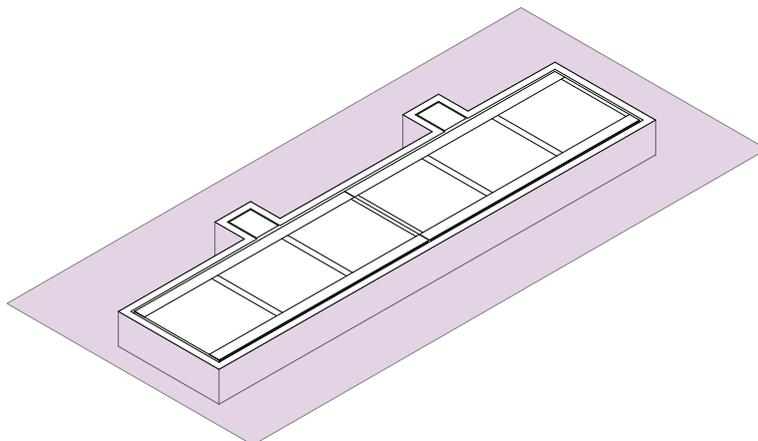
TYPE	ADVANTAGES	DISADVANTAGES
<p>TYPE C2</p> <p>No Clear-Space Semi-Pit Weigh-bridge</p>	<ul style="list-style-type: none"> + Ideal for sites with two weighbridge bypass roads adjacent to both sides of the weighbridge + Ideal for sites with offices or buildings adjacent to both sides of the weighbridge + Smaller site footprint required than the semi-pit weighbridge option 	<ul style="list-style-type: none"> - Some excavation required before construction - Requires access holes (typically in the deck) to access the load cells for servicing purposes - Access holes make this option more expensive than the semi-pit weighbridge option - Trade Measurement Authority exemption in writing required - Requires drainage considerations



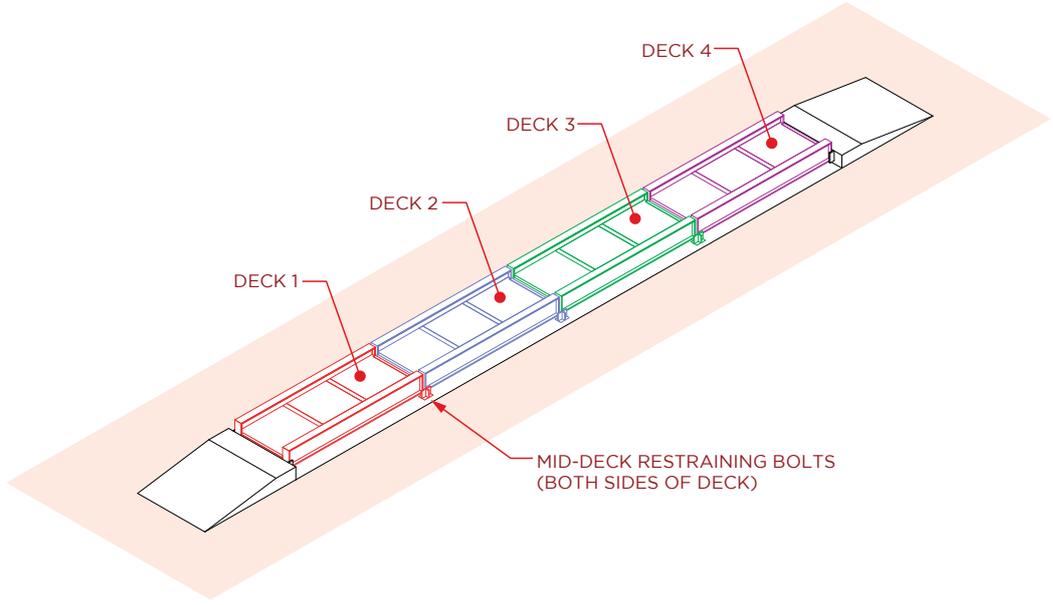
TYPE	ADVANTAGES	DISADVANTAGES
<p>TYPE C3</p> <p>No Clear-Space Semi-Pit Weigh-bridge</p>	<ul style="list-style-type: none"> + Ideal for sites with two weighbridge bypass roads adjacent to both sides of the weighbridge + Ideal for sites with offices or buildings adjacent to both sides of the weighbridge + Smaller site footprint required than the semi-pit weighbridge option 	<ul style="list-style-type: none"> - Some excavation required before construction - Requires access holes (typically in the deck) to access the load cells for servicing purposes - Access holes make this option more expensive than the semi-pit weighbridge option - Trade Measurement Authority exemption in writing required - Requires drainage considerations



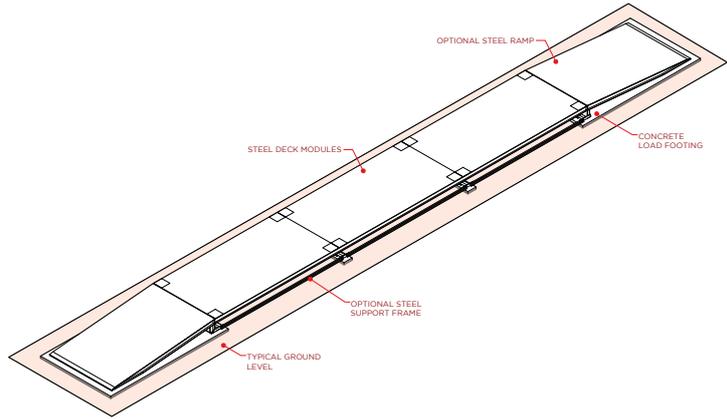
TYPE	ADVANTAGES	DISADVANTAGES
<p>TYPE D</p> <p>Fully Inground Weigh-bridge</p>	<ul style="list-style-type: none"> + Requires the smallest site footprint of all the options + Ideal for sites with extreme space restrictions + Ideal for sites with shared weighing and traffic areas + Ideal for sites where vehicles are weighed during loading by forklifts 	<ul style="list-style-type: none"> - Most expensive weighbridge option due to extensive excavation work required - Most preparation required before construction - Requires drainage considerations - Confined space to access the load cells requiring special training for service personnel (typically charged as a higher hourly rate)



TYPE	ADVANTAGES	DISADVANTAGES
TYPE E Multi-Deck Weigh-bridge	<ul style="list-style-type: none"> + Weigh individual axles or axle groups to maximise vehicle loading and minimise legal axle overloading for road transport 	<ul style="list-style-type: none"> - More expensive than a single deck option

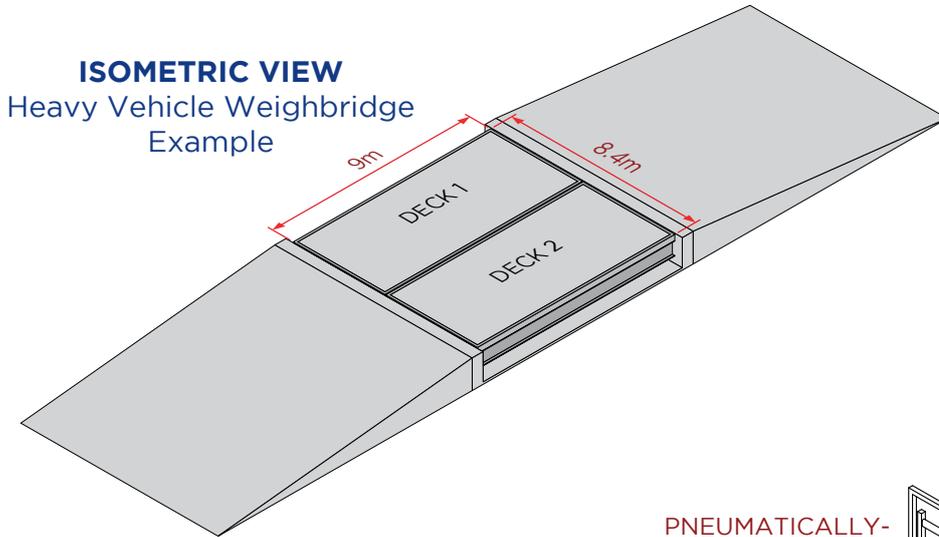


TYPE	ADVANTAGES	DISADVANTAGES
TYPE F Relocatable Weigh-bridge	<ul style="list-style-type: none"> + Relocatable deck + Ideal for temporary sites (six months to five years) 	<ul style="list-style-type: none"> - Sites operating longer than five years should consider a steel/concrete deck installation for load cell longevity

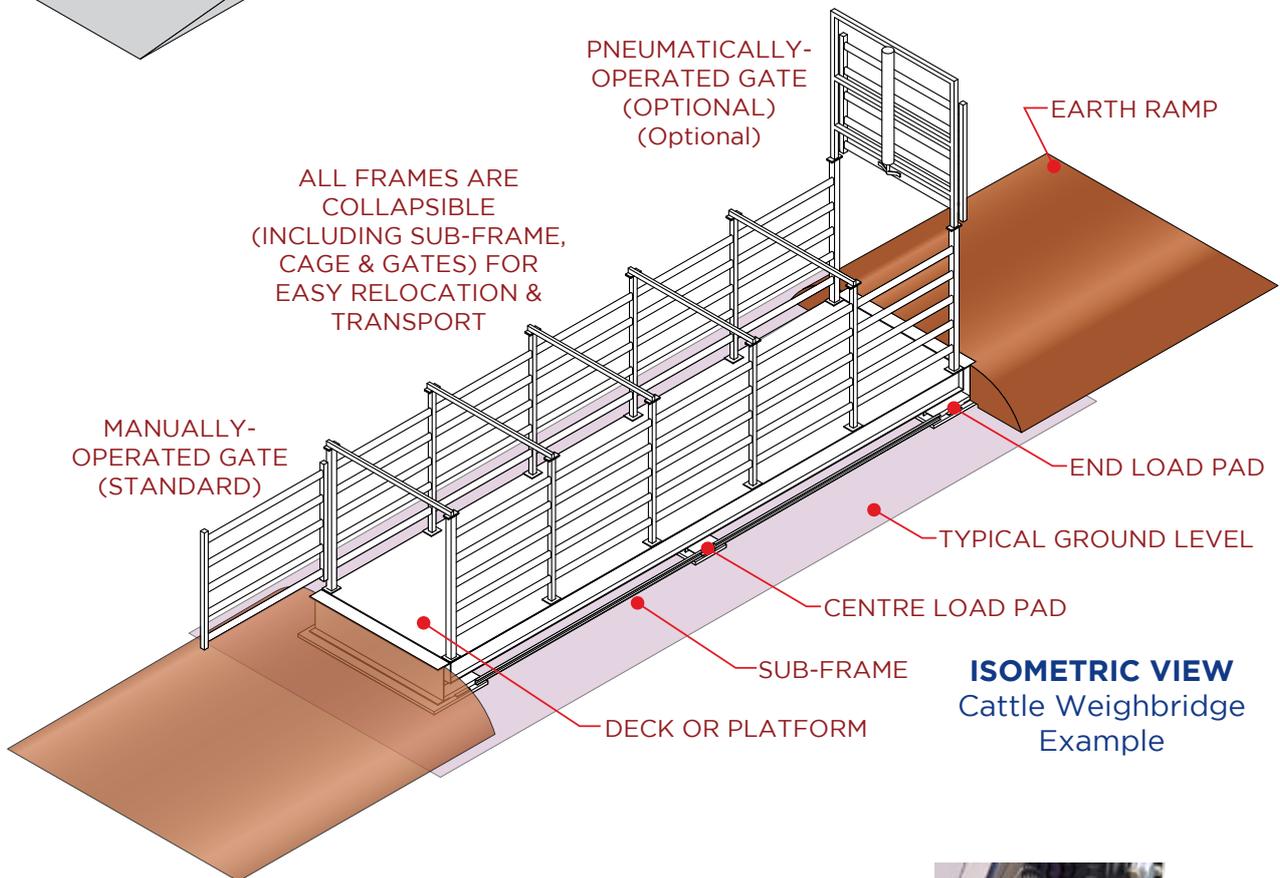


WEIGHBRIDGE ALTERNATIVES

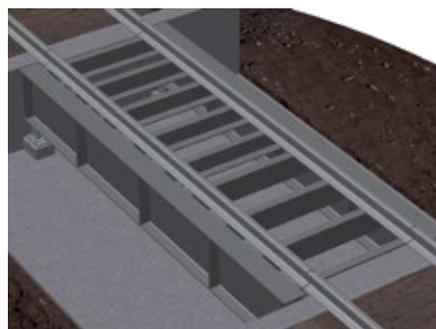
Diverseco also supplies heavy vehicle weighbridges (ideal for mine sites), cattle weighbridges, rail weighbridges, in-motion weighbridges, axle weighbridges and wheel weighers.



In-Motion Axle Weighbridge Example



ISOMETRIC VIEW
Cattle Weighbridge Example



Rail Weighbridge Example



Wheel Weigher Example

A variety of onboard vehicle weighing systems are also available. Though not as accurate as full-length weighbridges, they do produce an accurate approximation of vehicle loads.



AIR-SUSPENDED VEHICLES



RIGID VEHICLES AND TIPPERS



SKELETAL TRAILERS



CRANES AND HIABS



WASTE COLLECTION VEHICLES



SKIP BIN VEHICLES



HOOK TRUCKS



VANS AND LIGHT COMMERCIAL



END LOADERS AND FORKLIFTS



AXLE WEIGHERS



WHEEL WEIGHERS



IN-MOTION WEIGHBRIDGES

Diverseco can perform weighbridge calibration visits with its Weighbridge Test Rig Unit, as well as perform regular preventative maintenance visits.

