



Saferoads T-Lok Barrier



*Portable Safety Barrier System
For Speeds up to 100km/h (TL3)*

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Installation Manual

Saferoads T-Lok Barrier

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Important Introductory Notes

Proper design, deployment and maintenance of the Saferoads T-Lok Barrier is essential to assure maximum performance.

It is critical for any users of the Saferoads T-Lok Barrier to be fully familiar with the manufacturer's instructions for use.

Take the time to review this manual before performing the necessary work.

Do not attempt to install any longitudinal barrier without the proper plans and installation manual from the manufacturer.

If you need additional information, or have questions about the Saferoads T-Lok Barrier, **please call Saferoads P/L Customer Service Department at 1800 060 672.**

System Overview

Saferoads T-Lok Barrier provides several unique advantages over traditional portable concrete barriers, or other styles of portable safety barriers:

- * Energy-absorbing
- * Quick and easy development and retrieval
- * Economical
- * Variety of deployment and end terminal options

Saferoads T-Lok Barrier is crashworthy and has been thoroughly tested to NCHRP 350 testing procedures.

Saferoads T-Lok Barrier has achieved Test Level 3 (TL-3) as a redirecting longitudinal safety barrier for speeds up to 100km/h.

Function

Saferoads T-Lok Barrier functions as a portable longitudinal barrier to prevent errant vehicle penetration, vaulting, or under riding. Traffic is kept from entering the work area or from hitting exposed objects or excavations. Unlike cones or barricades, Saferoads T-Lok Barrier provides positive protection for roadside workers.

Impacting vehicles are redirected at a shallow angle in the vicinity of the impact area, thereby reducing the potential for dangerous secondary impacts. Saferoads T-Lok Barrier absorbs impact energy and cushions vehicular impacts while significantly reducing the risk to occupants of the impacting vehicle.

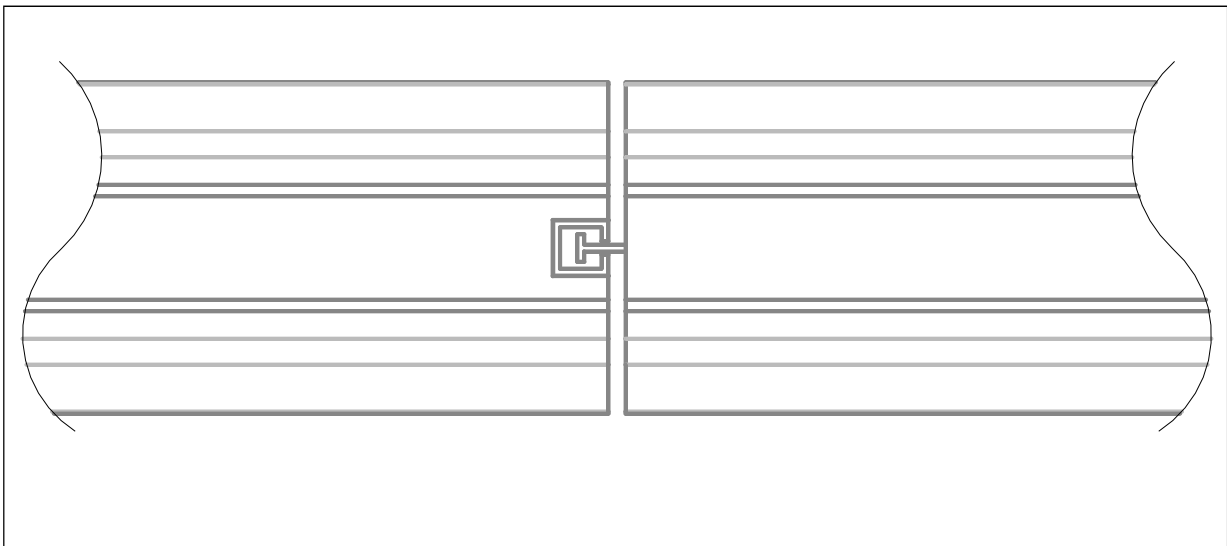
Saferoads T-Lok Barrier

Construction

A Saferoads T-Lok Barrier is constructed from a series of individual barrier sections. See figure 1 for approximate physical dimensions and items included with each section.

The ends of each sections are constructed with T & C Connections.

Their unique design allows for easy assemble as well as angled adjustment to achieve up to 7 degrees radius curving for tapers and corners



*Figure 1
Saferoads T-Lok Barrier
T & C Connection*

Saferoads T-Lok Barrier

System Design

Application

The Saferoads T-Lok Barrier can be used in many applications.

Some examples are:

- * General road maintenance performed by road authorities, contractors, local municipalities etc.
- * Road construction
- * Lane closures
- * Toll plazas
- * Road Resurfacing
- * Excavation or culvert protection
- * Detours or diversions
- * Bridge Repairs
- * Temporary or permanent installations
- * Median or verge installations

In order to design the most appropriate Saferoads T-Lok Barrier System for a given site, this manual helps to answer the following questions:

- * Is the Saferoads T-Lok Barrier appropriate for my site?
- * What is the application? What warrants use of the Saferoads T-Lok Barrier?
- * How long must the barrier be? Refer to the length of need and beginning of length of need for Saferoads T-Lok Barrier installation options.
- * How much clear zone is available, and how much is required for the correct functioning of the system?
- * Are there curves, slopes or kerbs present which may not suit the Saferoads T-Lok Barrier?
- * Is a fully tested end treatment available to suit my particular requirement? Refer to end terminal section of this manual.

The purpose of this manual is to supply some basic application information about the Saferoads T-Lok Barrier and to detail its performance when tested to NCHRP 350.

If you would like further assistance, please contact **Saferoads P/L Customer Service Department 1800 060 672.**

Saferoads T-Lok Barrier

System Design (con'td.)

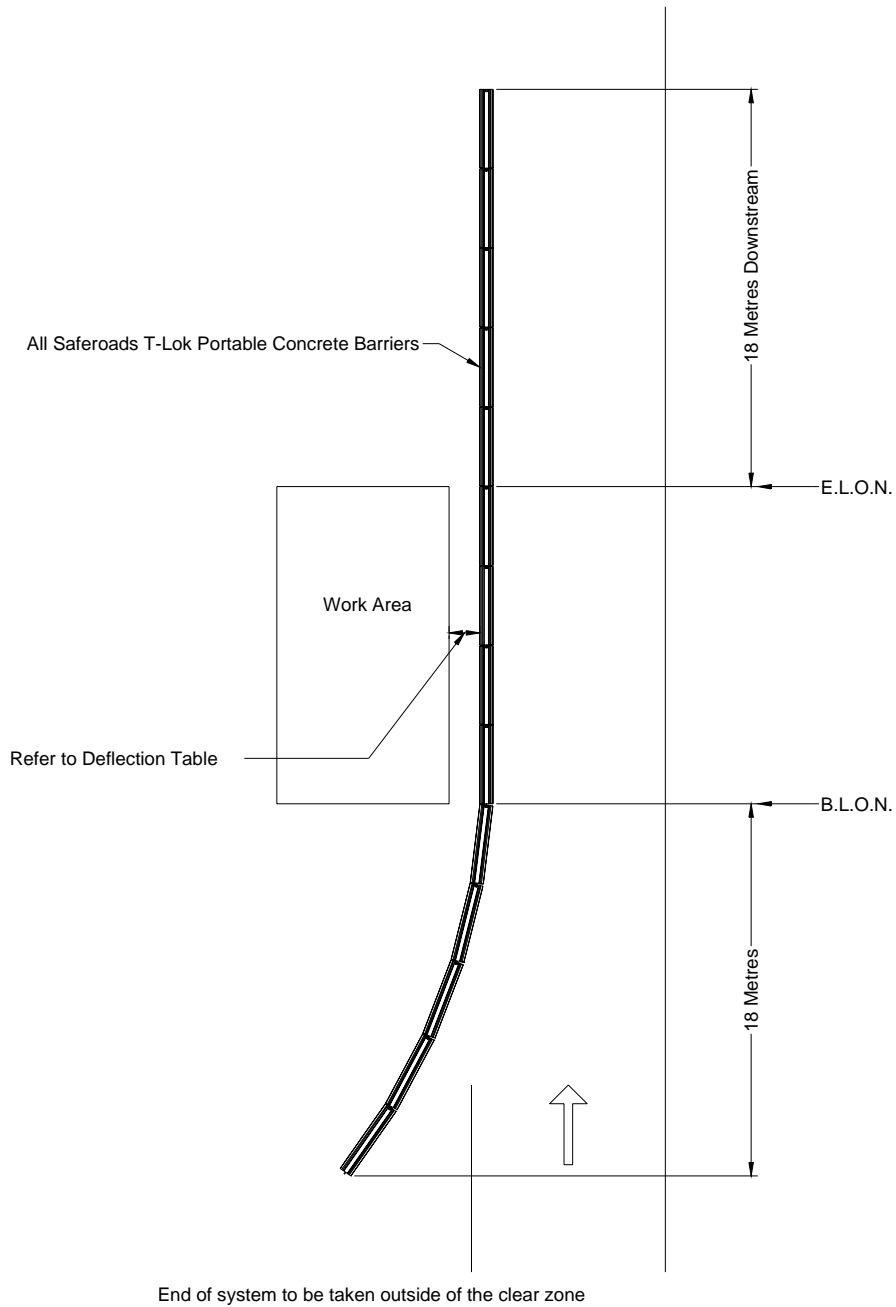


Figure 2

Saferoads T-Lok Barrier

System Design (con'td.)

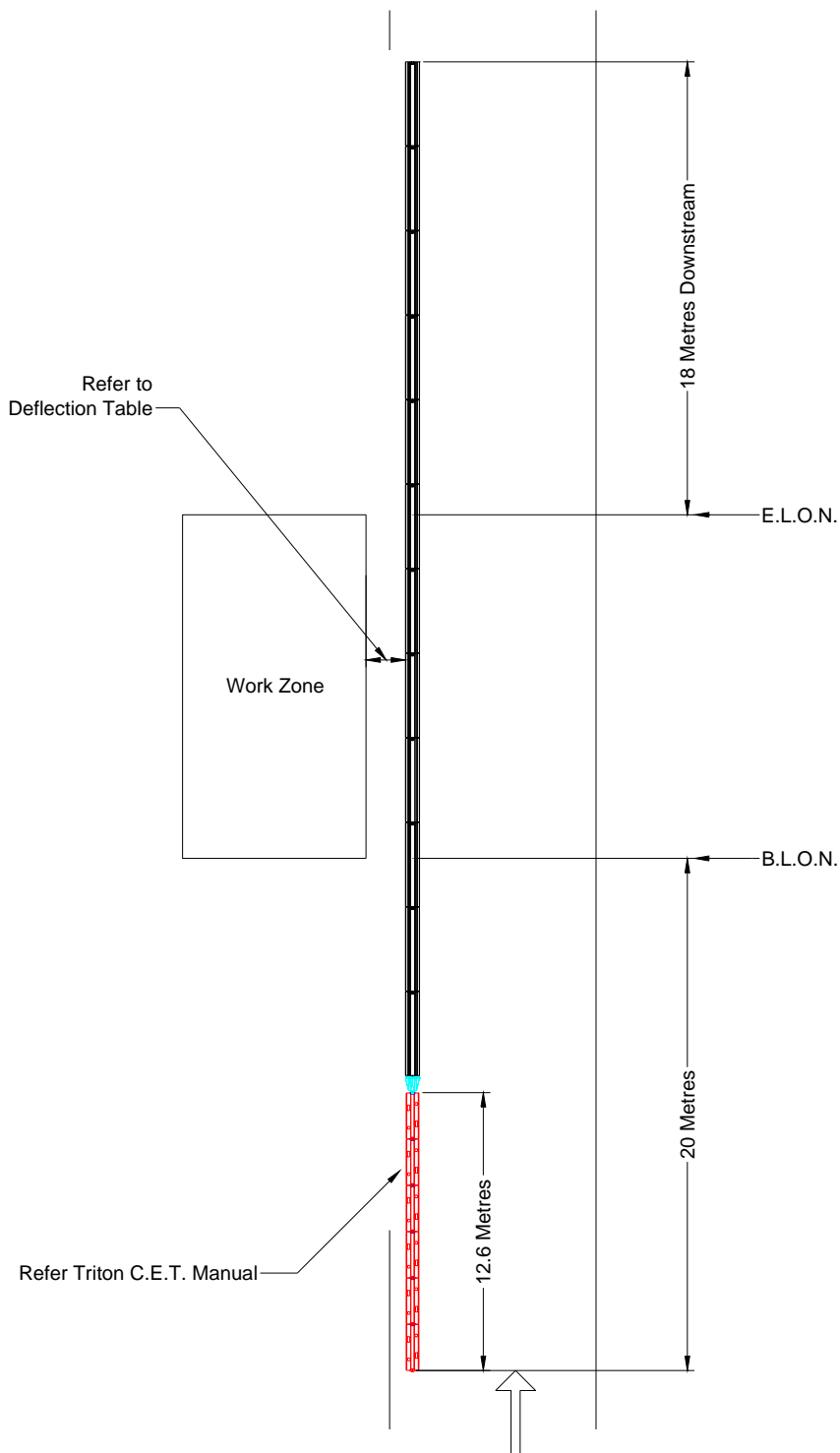


Figure 3

Saferoads T-Lok Barrier

System Design (con'td.)

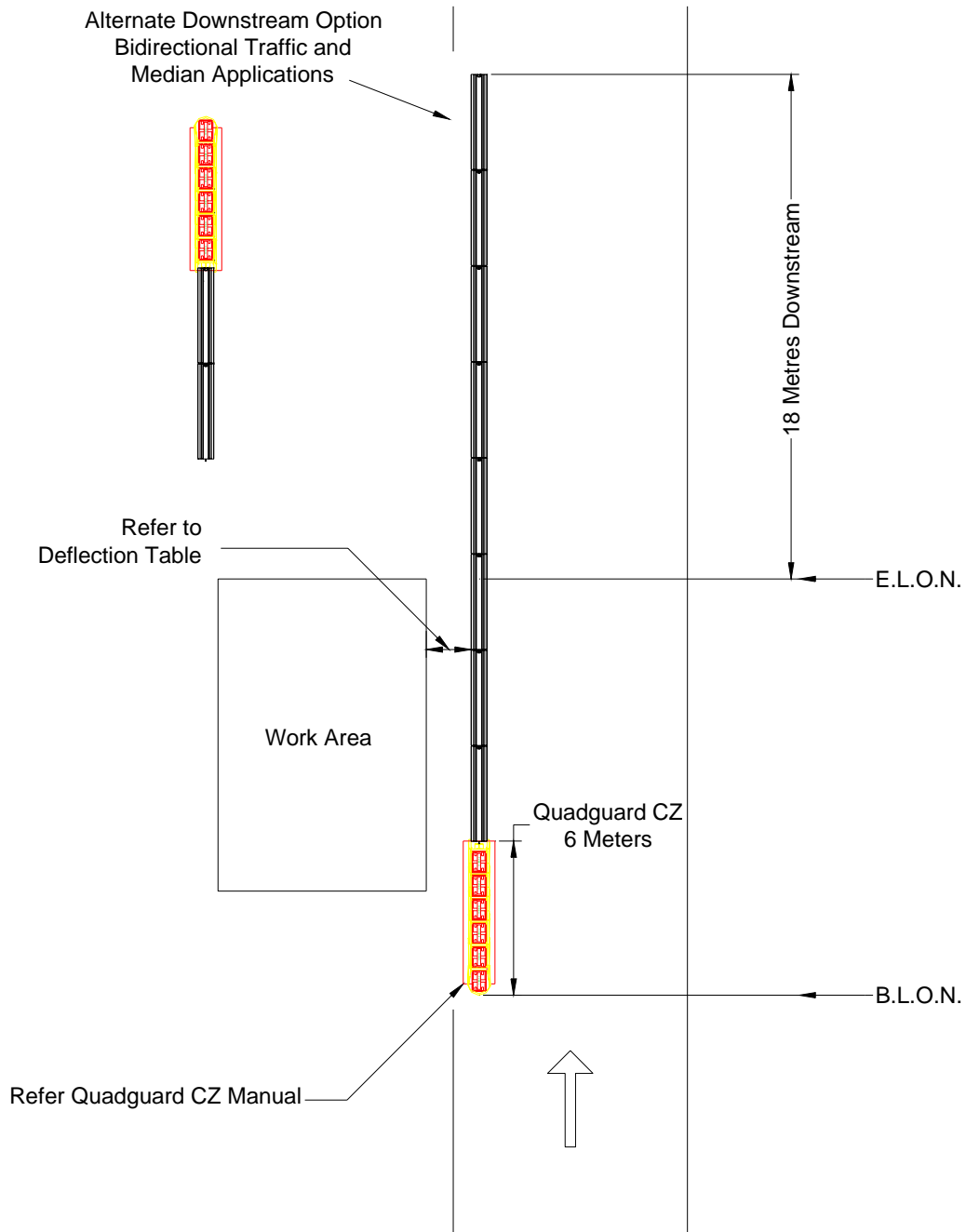


Figure 4

Saferoads T-Lok Barrier

System Design (con'td.)

Length of Need

Length of Need (L.O.N) is defined as the total length of a longitudinal barrier needed to shield an area of concern.

It is also described as that part of a longitudinal barrier or terminal designed to contain and redirect an errant vehicle.

The **beginning of length of need** (B.L.O.N) differs depending on how the Saferoads T-Lok Barrier is deployed.

If the Saferoads T-Lok Barrier is deployed as a safety barrier which can be tapered through the clear zone without the need for an approved end terminal, the B.L.O.N. is 18 metres from the beginning of the system.

If the Saferoads T-Lok Barrier is deployed longitudinally and incorporates the TRITON CET as an end terminal, then the B.L.O.N is 20 metres from the beginning of the TRITON end terminal.

If the Saferoads T-Lok Barrier is deployed longitudinally and incorporates the QuadGuard cz as an end terminal, which is tethered to the ground, then the B.L.O.N is at the very beginning of the QuadGuard crash cushion.

Minimum Length

The minimum length of a T-Lok Barrier installation should be 48m

End Treatment

A terminal is defined by NCHRP 350 as:

“A device designed to treat the end of a longitudinal barrier. A terminal may function by (a) decelerating a vehicle to a safe stop within a relatively short distance, (b) permitting controlled penetration of a vehicle behind the device, (c) containing and redirecting the vehicle, or (d) a combination of (a), (b) and (c).”

The Saferoads T-Lok Barrier has been crash tested to NCHRP 350 as a Test Level 3 (TL3/100 km/h [62 m ph] redirective longitudinal barrier, and when deployed and tapered through the clear zone, does not require a separate end treatment.

If the site specific conditions require a longitudinal barrier and won't allow tapering of the end, then the following fully tested end terminals may be considered:

The TRITON Concrete End Terminal (CET) is suitable for speeds up to TL-3/100km/h. Refer to the TRITON CET manual for specific detail.

The QuadGuard cz end terminal is suitable for posted speeds up to TL-3/100 km/h. As this terminal requires tethering to the pavement, it will offer the shortest Saferoads T-Lok Barrier deployment. The QuadGuard cz is suitable for use where the length of need occurs at or near the beginning of the terminal. Refer to the QuadGuard manual for specific detail.

Should the nature of the site not provide adequate area for a clear zone, the Saferoads T-Lok Barrier, when deployed longitudinally, may also be shielded by using a geometric array of Energite sand barrels. Refer to the Energite manual for specific detail of the array required for the speed zone in which the device will be placed.

Saferoads T-Lok Barrier

System Deflection

System Deflection
100 kmh = 1.2m 80 kmh = 750mm 60 kmh = 450mm
Figures quoted are based on N.C.H.R.P 350 testing using 2000kg Pick Up at an impact angle of 25 degrees. Figures quoted are maximum Dynamic Deflections.

Saferoads T-Lok Barrier

System Design (con'td.)

Other considerations

Certain conditions may effect the performance of the Saferoads T-Lok Barrier. Since every job site is unique, the designer needs to consider the following conditions when incorporating the Saferoads T-Lok Barrier in the design.

Curves

The ends of each section are constructed with unique T & C Connection design that interlocks all segments together.

The sections can swivel up to seven degrees at the connection for easy positioning around work areas or following road contours. See figure 5.

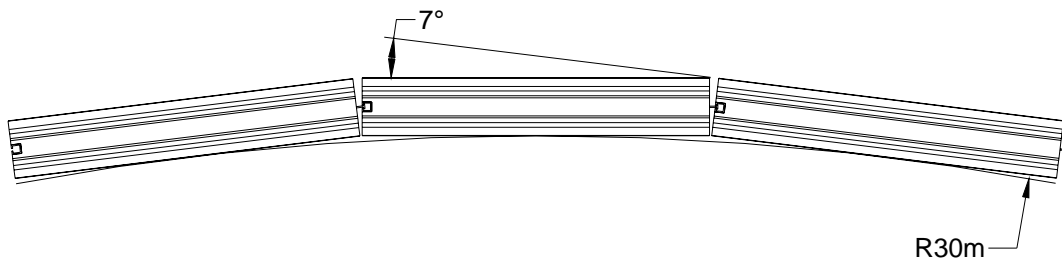


Figure 5

Slopes

Cross Slopes

The Saferoads T-Lok Barrier can be placed on cross slopes up to 5% (3deg.) (Figure 6)

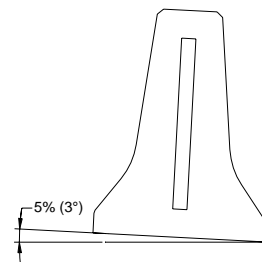


Figure 6

Longitudinal Slopes

The Saferoads T-Lok Barrier can be placed on longitudinal slopes up to 5% (3 deg.) (Figure 7).

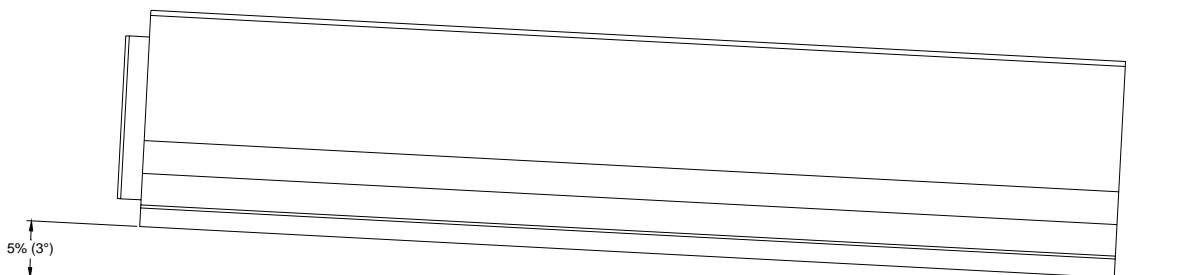


Figure 7

Saferoads T-Lok Barrier

System Design (con'td.)

Crest

The Saferoads T-Lok Barrier has the ability to conform to a crest up to 20:1 (See figure 8.). Please note the maximum longitudinal slope in figure 7.

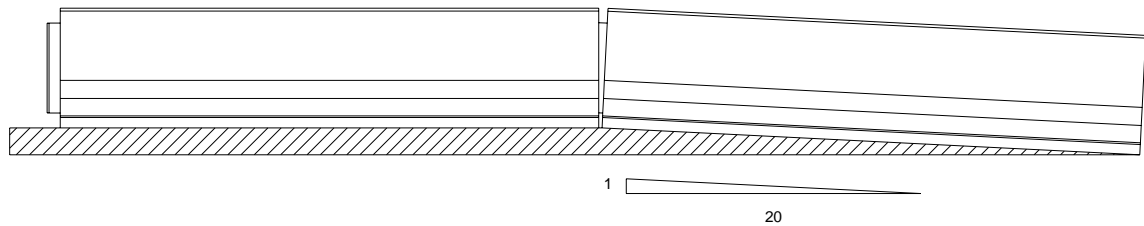


Figure 8

Ditch

The Saferoads T-Lok Barrier has the ability to conform to a ditch up to 20:1(See figure 9). Please note the maximum longitudinal slope in Figure 7.

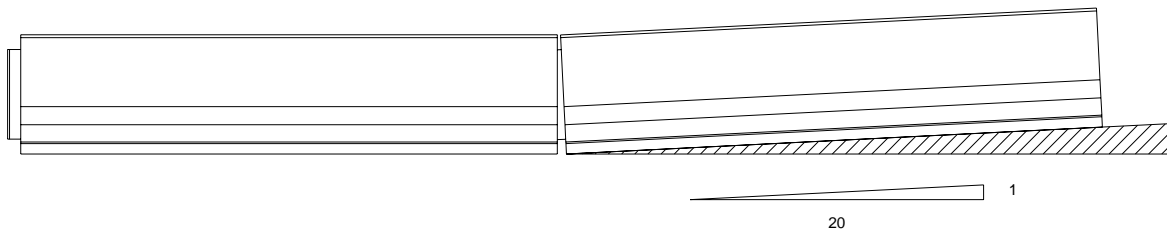


Figure 9

Kerbs

The Saferoads T-Lok Barrier should NOT be placed directly against a kerb that can prevent it's lateral movement. (See figure 10)

Trenches

The Saferoads T-Lok Barrier should NOT be placed directly up to the trenches or excavations where the necessary deflection of the system in the event of an impact may result in barrier failure. Reference to safe working widths is detailed in the deflection summary.

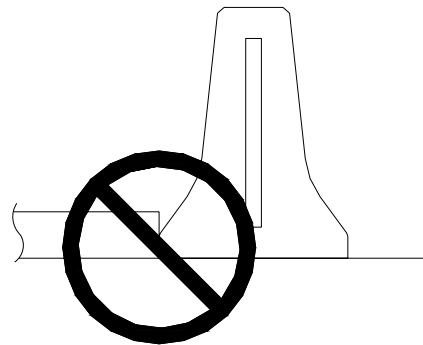


Figure 10

Saferoads T-Lok Barrier

Installation

Preparation

Begin preparing for the installation by thoroughly reviewing the specified barrier location, layout and orientation as per the approved traffic management plan.

Determine the number of segments required for the installation. The installed length of each Saferoads T-Lok Barrier segment is 5.4 or 3.6 metres. Consideration must be given to determine if an end treatment is required and allow for the length of the treatment in determining segments required. A visual inspection should be carried out to confirm the suitability of all segments. Should visible damage be evident in any segments, they should be sent for inspection and refurbishment prior to use.

Caution: Refer to the minimum installed lengths as illustrated in this manual to ensure compliance to NCHRP 350.

WARNING!

The correct safety equipment and approved traffic management must be used as required for any installation using the Saferoads T-Lok Barrier.

Required Tools

For a typical installation, the recommended tools and equipment are:

1. Saferoads T-Lok Barrier Installation Manager
2. Traffic control plan and approval (as required)
3. Traffic control equipment (as required)
4. A truck mounted crane or forklift suited to a minimum 4000kg lift and appropriate slinging gear.

Deployment

1. Begin deployment at the upstream traffic end of the site and work downstream. Work from the non-traffic side of the installation whenever possible. Unloading proceeds much faster if one person remains on truck and two people work on the ground. If site conditions permit, a fourth person can drive the truck so that segments can be unloaded continuously as the installation is progressing.
2. Align the segments according to the specified configuration and layout in the traffic control plan.

Caution: The existence of any cross slopes in excess of 5% (3 deg.) or kerbs may create a vaulting effect on the impacting vehicle.

Saferoads T-Lok Barrier

Installation (cont'd)

Caution: When deploying the Saferoads T-Lok Barrier, care must be taken not to exceed the maximum recommended taper angle as detailed in this manual.

4. If an end treatment is specified for the layout, follow the instructions provided by the manufacturer and install it at this time.

Caution: A crashworthy end treatment must be supplied where warranted to ensure proper crash performance.

Deployment is now complete. Take the time to double check the integrity of the system as to confirm functionality.

Retrieval

Retrieval is a reverse of the instructions for deployment.

Inspection

A visual inspection of each barrier segment is required prior to shipping.

Barrier segments which show evidence of prior impact should be thoroughly inspected for any sign of distortion or disfigurement.

Limitations and Warnings

The Saferoads T-Lok Barrier has been fully tested and evaluated as per the recommendations of NCHRP 350.

The Saferoads T-Lok Barrier is capable of decelerating and redirecting an errant vehicle (820kg and 2000kg) at speeds up to 100 km/h (Test Level 3).

To ensure adequate performance in the event of an impact, the Saferoads T-Lok Barrier must be deployed and maintained in accordance with the manufacturer's instructions, NCHRP 350, and local authority guidelines.

Impacts that exceed the design capabilities described in this manual (vehicle weight, speed and impact angle) may not result in acceptable crash performance as described in NCHRP 350 relative to structural adequacy, occupant risk and vehicle trajectory factors.

Higher than reported deflections can be expected in the B.L.O.N section.

*** Do not affix anything to the T-Lok Barrier without first confirming suitability with the manufacturer.**

Saferoads T-Lok Barrier

Important Notes Regarding Lifting Using Swift Lifts Provided

Each T-Lok Barrier segment is fitted with 2 5000kg rated Swift Lifts placed at either end of each module. When slinging it is of great importance to adhere to the following points so as to avoid lifting lug failure.

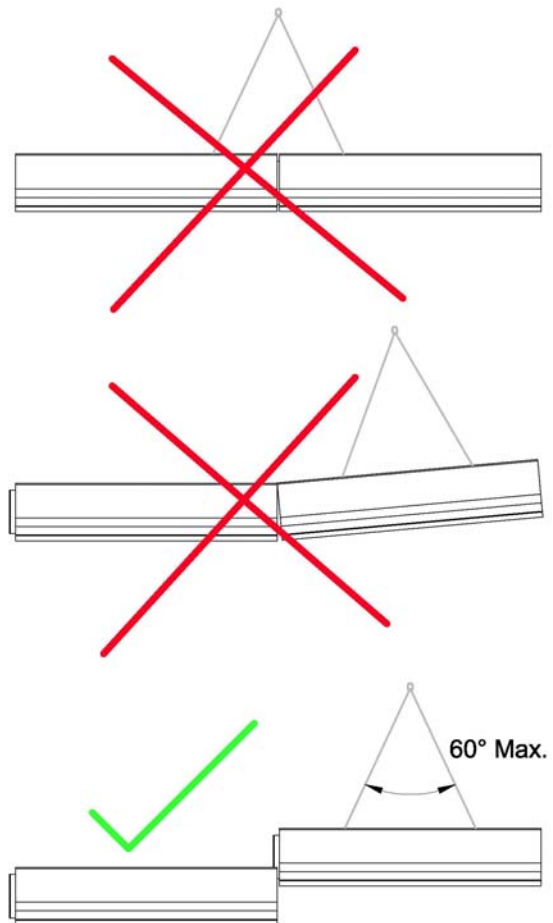
Prior to attempting any lift, inspect barrier for any signs of cracking in concrete or corrosion or fatigue in Swift Lift fitting.

DO NOT LIFT BARRIER WITH SWIFT LIFTS if any evidence of fatigue, corrosion or cracking is found.

Barrier must then be lifted from beneath.

Lifting Procedure with Swift Lifts

- Lift one T-Lok segment only at a time.
- If binding of the connection occurs, stop lift and re-adjust sling gear.
- Sling angle 60° maximum.
- Chain/sling length SL= 3.5m (2 off tied to one ring). Shorter slings than recommended will overload lifting lugs.
- Lifting to be vertical only.



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