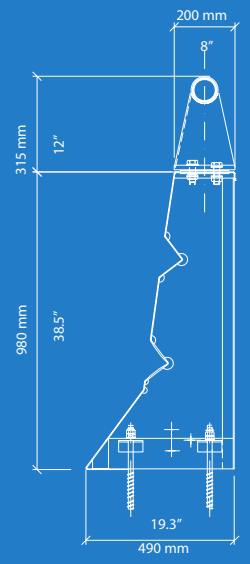
MDS® BARRIERS



SERGARD MDS® TL4

SERGARD
MDS® TL4

Road & Bridge Steel Safety Barrier System
Product Description & Installation Manual

Temporary and Permanent Road Work

PRODUCT MANUAL

MVN-TL4 2.8.15

SERGARD MDS® TL4 BARRIERS

SAFETY INTRUCTIONS

This Manual follows the Guidelines set forth in ANSI Z535.4-1998 for alerting you to possible hazards and their potential severity

This is the safety alert symbol. This manual uses this symbol to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

NOTICE used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

SERGARD MDS® TL4 BARRIERS

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SECTION 1
INTRODUCTION

SERGARD MDS® BARRIERS TL4

1. Safety Performance Review

Read and follow safety instructions thoroughly. Follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing the MDS® Barrier system. Failure to follow this warning can result in serious injury or death to the worker and/or bystanders. Therefore, the contractor who performs the MDS® Barrier installation must have approval by the owner and must be trained and certified by MDS® Barrier as a certified MDS® Barrier installer. A certification card will be issued to the installer(s) after the completion of the training course.

MDS® Barriers require proper assembly according to the design specifications to meet the intended system performance. These instructions should be read in their entirety and understood before assembling the MDS® Barrier system. In the event the system assembly requires or involves deviation from standard design during the assembly process it is recommended to contact the appropriate transportation authority and MDS® Barriers for guidance. It is critical for any users of the MDS® Barrier systems to be fully familiar with the Manufacturer's instructions for use.

Improper installation can result in serious injury or death.

Always review the Limitations and Warnings thoroughly before performing the necessary work. Do not attempt to install any longitudinal barrier without the proper plans and installation manual from the manufacturer or approval from the relevant Road Authority. If you need additional information, or have questions about the MDS® Barrier system please contact MDS® Barrier or an Authorized MDS® service center for assistance.

Contact Tel:
MDS® Barriers USA Tel: 860.289.8033
APAC Road Barriers Pty Ltd PH: 1300 00 APAC
Australia Tel: +61.(0) 409.331.871 or 1300 00 APAC

The instructions contained within this Manual supersede all previous information and Manuals. All information, illustrations, and specifications in this Manual are based on the latest MDS® Barrier system information available from MDS® BARRIERS. MDS® Barriers reserves the right to make updates and changes at any time. For more information regarding technical questions and products please contact MDS® Barriers.

To ensure the manual is the current issue, verify that the Manual Version Number (MVN) is the latest release located at the bottom right of each page in the manual.

Contact MDS® Barriers directly at **+ 61 (0)409 331 871** or verify the document release numbers on the MDS® Barriers web site www.MDSbarriers.com Support page.

SERGARD MDS® TL4 BARRIERS

2. System Overview

SERGARD MDS® TL4 Barriers is a lightweight easy transportable road and bridge barrier system that has been developed to provide full TL4 Minimal Deflection impact protection. Lightweight TL4 weighs only 60 kg per meter and requires no through deck anchoring. Designed for use on bridges as median barrier and bridge parapets as well as phase construction for temporary lane changes due to its high level of crash worthyness. MDS® Barriers keep traffic from entering work zones or from hitting exposed objects and excavations while providing positive protection for roadside workers.

SERGARD MDS® TL4 Barriers have been tested extensively and approved in accordance with NCHRP 350, and MASH-08, as well as the European standards EN 1317-5:2007+A1:2008. The testing has shown that SERGARD MDS® TL4 Barrier is acceptable for use on roadways throughout the world including the USA, European national highways and various other national highways.

3. Construction

MDS® Barrier is constructed from a series of individual barrier sections. Manufactured using an all steel safety shape profile that is designed around a NJ shape and F shape concrete barrier. **See Figure 1**

Barrier Identification

Each SERGARD MDS® TL4 barrier marked with a CE Identification stamp No. Example: 1301 where 13 = year 2013, 01 = batch number **See Figure 2**

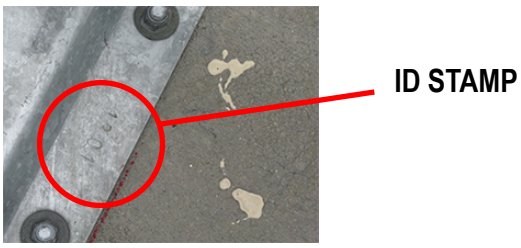


Figure 2

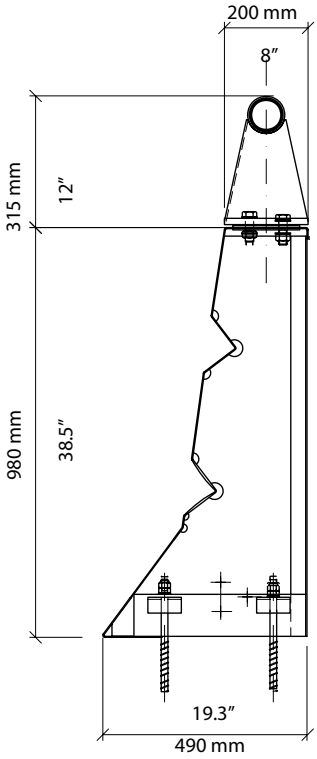


Figure 1

An upper steel tubular top rail is also an integral component of the MDS® Barrier System. The steel safety shape and tubular rail interact with an impacting vehicle in a way that resists penetration and overriding. **See Figure 3**

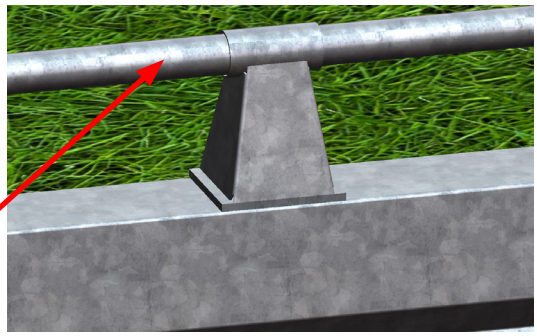


Figure 3

SERGARD MDS® TL4 BARRIERS

MDS® Barrier standard sections are available in both 2.95 m and 5.90 m long sections. Custom lengths can be provided if required. **See Figure 4**

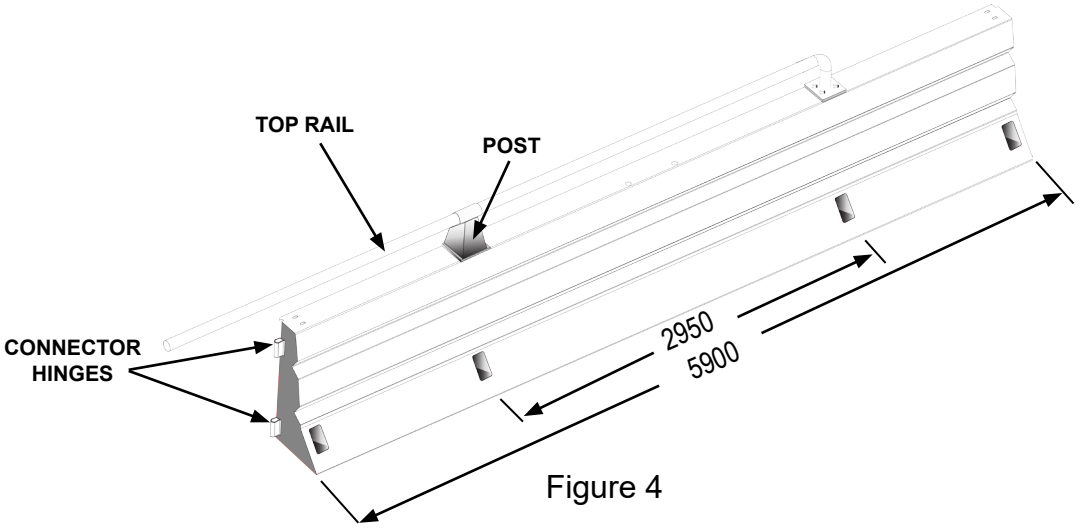


Figure 4

The ends of each MDS® section are constructed with vertically aligned loop connector hinges that interlock with each individual barrier using a steel connecting pin. **See Figure 5**

Vertical hinges

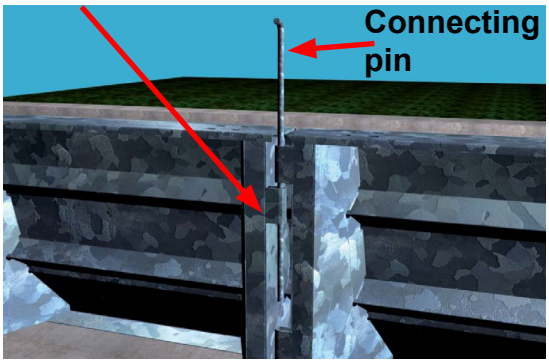


Figure 5

The pin securely joins the sections together while each MDS® section is held together by the splice plate. **See Figure 6**

Splice plate

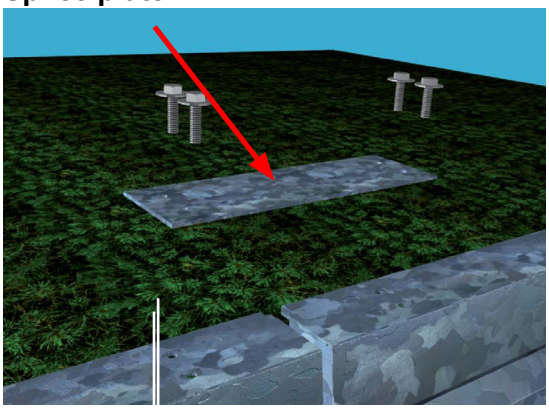


Figure 6

SERGARD MDS® TL4 BARRIERS

SECTION 2
SYSTEM PERFORMANCE & DESIGN

4. Minimal Deflection System (MDS)

SERGARD MDS® TL4 minimum deflection system is anchored every 2950 mm. Each 5900 mm barrier section is anchored at two locations as shown in **Figure 7**

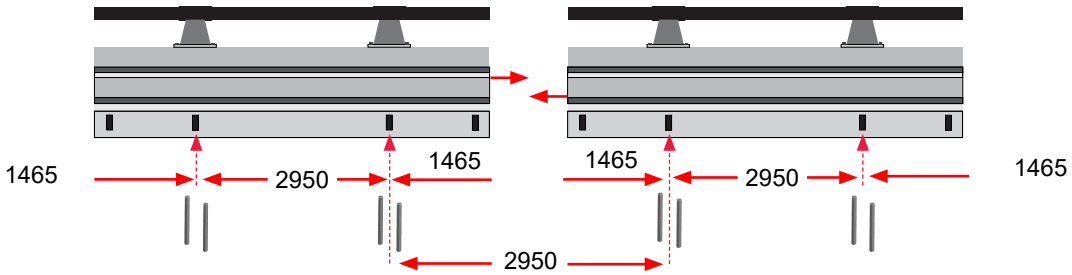
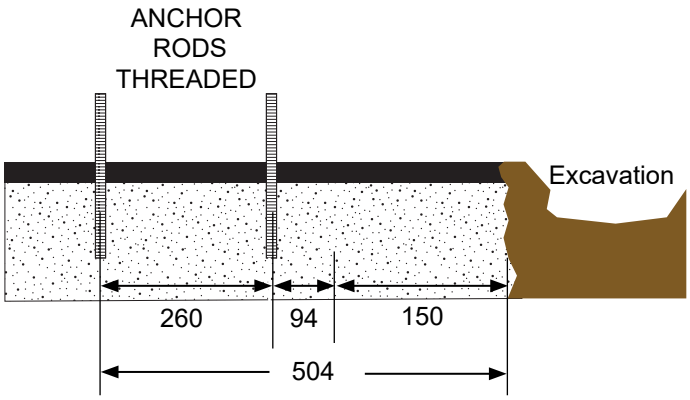


Figure 7

Details on the configuration, anchoring and deflections of the system are shown in Drawing No. 15-AUST-1R1 located in Annex A. This configuration has been tested to EN-1317-5:2007+A1:2008 in accordance with NCHRP 350, and MASH-08. The minimum run length of the minimum deflection system is 66m, (contact manufacturer for anchoring details on shorter run lengths). The normalised deflections for the minimum deflection system are shown in Drawing No. 15-AUST- 2R1. For installation of the MDS next to excavations, soil profiles and properties will need to be detailed and taken into account for location of barrier and anchors. This installation must be detailed by an installation designer to determine the suitability of barrier location to ensure ground would not fail under impact and cause deflection to increase above that expected from this system. For details on the installation within the proximity of changes in terrain (eg kerbing, excavations, bridge decks etc) refer to Drawing No. 15-AUST-3R2 within Annex A. In general, the installation of SERGARD MDS® TL4 should not have the back side of the barrier within 150mm of an excavation or drop-off unless previously authorised by the manufacturer.

Note: The reference of 150 mm proximity to an excavation is in reference to the back side of the barrier. The anchorage will be approx. 504 mm from this excavation on the traffic side of the installation. **See Figure 8**

Figure 8



5. End Treatments

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)"*.

6. Transition Types

Sergard MDS® TL4 has several types of transition elements that connect the following traffic devices:

1. W-Beam guard rail. **See Figure 9**
2. Portable and formed concrete barriers (PCB). **See Figure 10**
3. Sergard MDS® TL4 back to back into PCB. **See Figure 11**
4. Crash Attenuators. **See Figure 12**

Guard Rail Transition

Sergard MDS® TL4 transitions into standard and W-Beam and or Thrie-Beam guard rail. **See Figure 9**

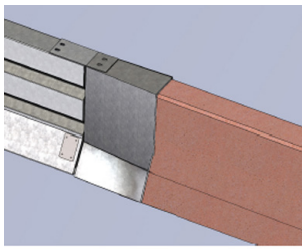
Sergard MDS® TL4 guard rail transition element provides a positive connection between the two longitudinal barrier systems eliminating the possibilities of snagging and clipping through internal anchoring.

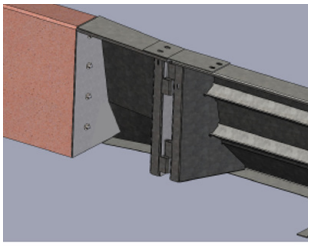
Figure 9

SERGARD MDS® TL4 BARRIERS

Portable Concrete Barrier Transition
Sergard MDS® TL4 transitions into 800 mm, 1000 mm PCB (32” and 42”) and formed concrete. **See Figure 10**

Portable Concrete Barrier
Sergard MDS® TL4 direct transition into standard and F shape PCB provides a positive connection between two longitudinal barrier systems eliminating the possibilities of snagging and clipping through internal anchoring.



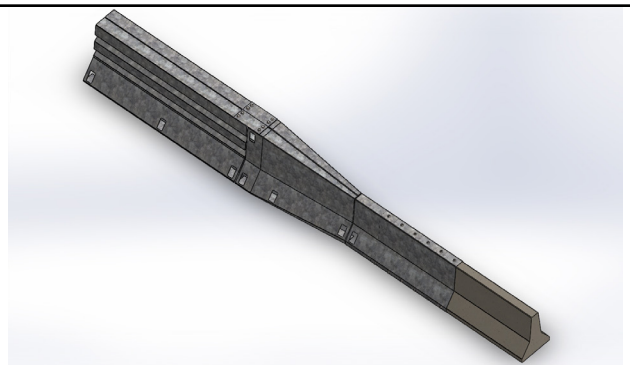


Formed Concrete Transition
Sergard MDS® TL4 transition element onto formed concrete parapet and guardrail.

Figure 10

Back to Back Transition
Sergard MDS® TL4 for median barrier installations with PCB and Guard Rail. **See Figure 11**

Back to Back onto PCB
Sergard MDS® TL4 back to back installation sleeve onto PCB provides a positive connection between the two longitudinal barrier systems eliminating the possibilities of snagging and clipping through internal anchoring.



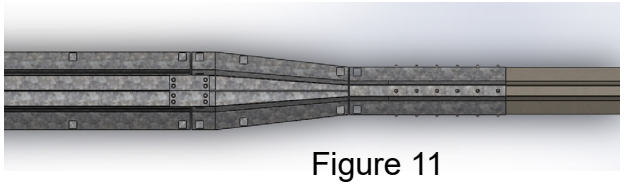


Figure 11

SERGARD MDS® TL4 BARRIERS

7. Crash Cushions

When the Sergard MDS® TL4 barrier is used as a stand alone barrier such as a work zone it must have a crash cushion attached to the end to ensure that adequate protection is provided for both approach and departure ends for all installations. The QuadGuard CZ cushions (**See Figure 12** below) can be used with the Sergard MDS® TL4 depending on the intended use and also the design speed for the location. The QuadGuard CZ accomodates speeds from 40 to 100 km/h (25 to 62 mph). **See Annex 3 for drawings**

Figure 12

7.1 End Conditions in Unidirectional Traffic Flow

In unidirectional traffic flows, the approach end of the Sergard MDS® TL4 barrier should be shielded as required by the governing requirements. The two most common methods will be the use of a crash cushion, and flaring the run out of the clear zone.

Crash cushion transitions are shown in Annex B, Drawing No. 15-QS2406- 15-QS6906

7.2 End Conditions in Bidirectional Traffic Flow

In bidirectional traffic flows, both ends of the Sergard MDS® TL4 barrier must be shielded as required by the governing requirements. The most common methods will be the use of a crash cushion.

Crash cushion transitions are shown in Annex B, Drawing No. 15-QS2406- 15-QS6906. It is recomended to consult with the crash cushion manufacturer if there are any concerns regarding the surface anchoring of the attenuator.

NOTICE

It is recommended to always check the current approvals for any element of a crash attenuator system. For the installation and arrangement of the crash cushions, please consult the manufacturers of the crash cushion to ensure all installations and set-ups are correct.

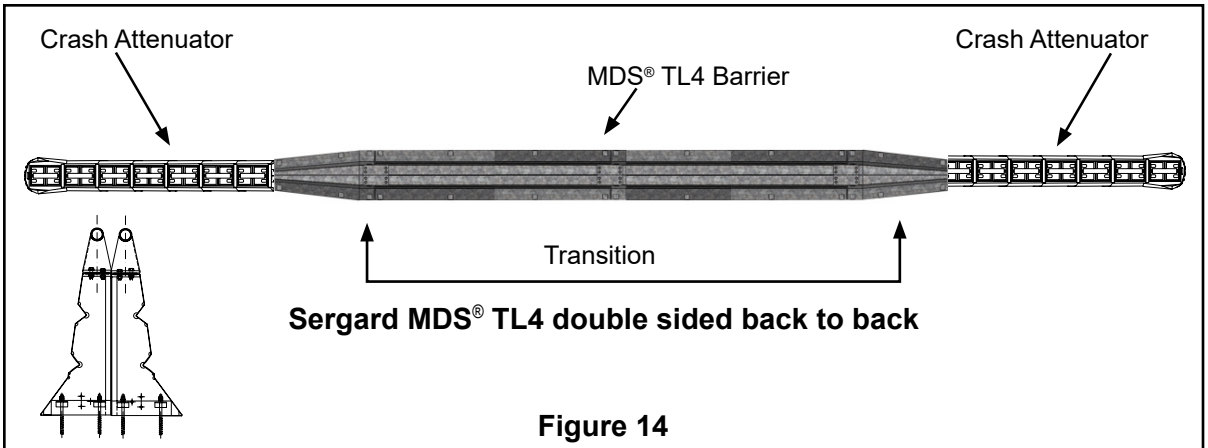
SERGARD MDS® TL4 BARRIERS

7.3 Example of End Treatments in Work Zones

Sergard MDS® TL4 barriers when used in a work zone may require a crash attenuator as indicated by the governing transportation authority. **Figure 13** below illustrates a single row of MDS ® TL4 barrier, **Figure 14** illustrates MDS® TL4 barrier installed back to back and **Figure 15** illustrates MDS® TL4 barrier spaced apart with a maximum separation distance of 685mm to accommodate QuadGuard model No. QS6906**.**

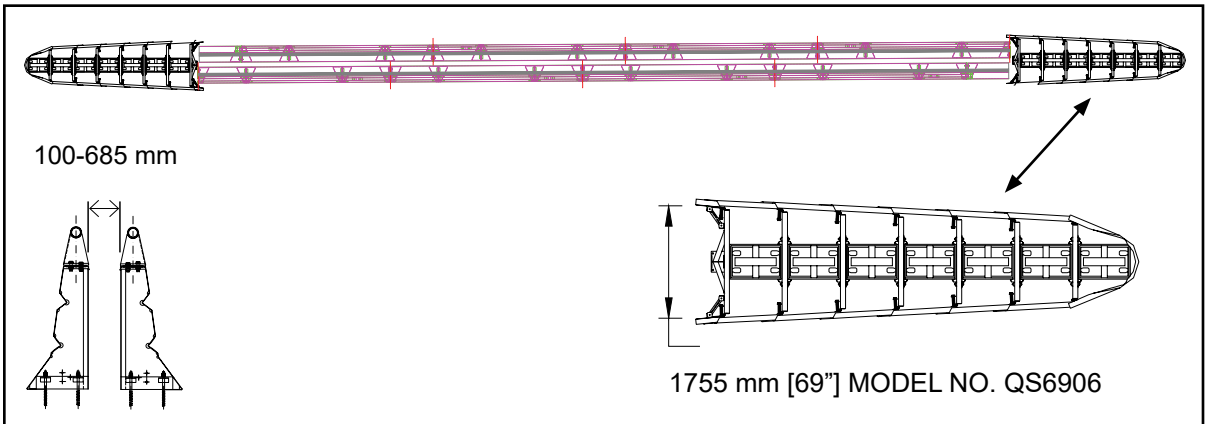
Single row Sergard MDS® TL4 with end treatment of End Treatments

Figure 13



Sergard MDS® TL4 double sided back to back

Figure 14



Sergard MDS® TL4 double row with center space row back to back

Figure 15

SERGARD MDS® TL4 BARRIERS

8. Delineation

PASSIVE REFLECTORS
Delineation requirements vary between government authorities and special applications. In most circomstances "L-type" stick on reflectors can be used (**See Figure 16 below**). These reflectors can be attached to the top and side of the Sergard MDS® TL4.

SOLAR LED LIGHTS
Advanced delineation solutions with LED's are available for increased visibility such as the solar LED object marker for rail mount. (**See Figure 17 below**)

All delineation is to be applied in accordance with local authorities' guidelines. If stick on delineation is not allowable, consult the manufacturer. DO NOT drill holes for any reason. Where clear direction cannot be found for the local state authority, please contact MDS Barriers for directions on delineation.

Figure 16

L-Type Reflectors

Material: ABS
Colors: White, Yellow, Red, Green, Blue

Figure 17

Solar LED with passive reflective film

Solar LED rail markers. Available in single or double sided.
Material: ABS
Flash rate: 75 FPM
Colors: White, yellow, red
LED intensity: 30 MCL per side
Visibility: 1 km

REFERENCE	PART No.	TYPE	DESCRIPTION	DIM. METRIC
80	2I-RM1-color	LED	Single sided LED with reflective film	98 x 47 x 117
	2I-RM2-color - color	LED	Double sided LED with reflective film	

SERGARD MDS® TL4 BARRIERS

9. Sound and Site Walls

Noise barriers reduce the sound which enters a community from a busy highway by either absorbing the sound, reflecting it back across the highway, or forcing it to take a longer path over and around the barrier. A noise barrier must be tall enough and long enough to block the noise of a highway from the area that is to be protected.

Sergard MDS® TL4 barriers are pre-designed to integrate sound & noise protection barriers, site walls, wind breakers and fencing within a single barrier system providing considerable savings in terms of occupied space, supporting substructures and overall cost. The special backward positioning of the noise-protection barrier requires less lateral space on the bridge deck or road side.

Sound Walls

Site Walls

Dissuasive Wind Walls

Fencing Grid Walls

Modular Construction

Sergard MDS® TL4 system can accommodate panels up to 4 meters high. **See Figure 18**
Panels are designed to easily slide and stack between support beams. **See Figure 19**

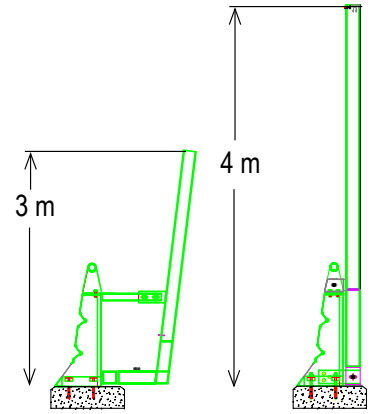
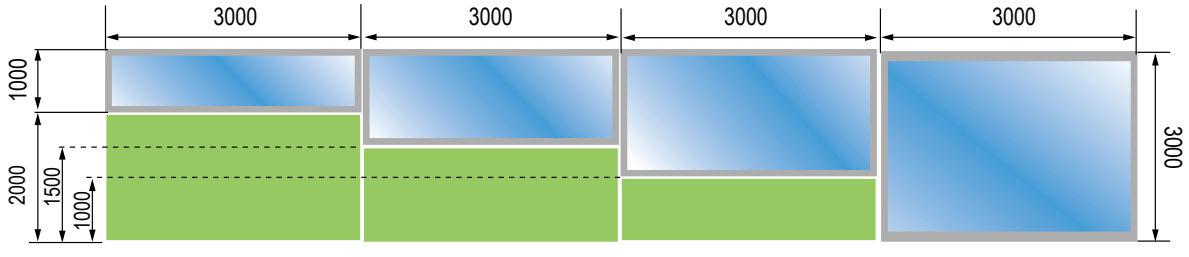


Figure 18



Dimensions in Millimeters

Figure 19

See Annex 4

SERGARD MDS® TL4 BARRIERS

Impact Performance
The backward positioning of the sound walls do not effect the performance of the barrier under impact as the walls displace with the dynamic movement of the barrier. **See Figure 20**



Figure 20

9.1 Sound Panel Types

According to FHWA *"To effectively reduce the noise coming around its ends, a sound barrier should be at least eight times as long as the distance from the home or receiver to the barrier"*. Sergard MDS® TL4 barriers have two types of sound panels, aluminum and glass. **See Figure 21**

Dissuasive wind breakers walls protect motorcyclists and vehicle operators from being blown off course from strong wind gusts as they pass through bridges, valleys, mountain roads or gaps in open areas especially in slippery road conditions. **See Figure 22**

Chain link fence provides containment from falling roadside rock as well as added safety for work zones. **See Figure 23**

Aluminum Sound Panels
Reduce high noise levels from highway traffic while reducing potentially harmful sound pressure.

Transparent Sound Panels
Laminated glass panels maintain excellent transparency in all weather conditions and guarantee maximum noise protection in any location where noise pollution is an issue.

Figure 21

Dissuasive Wind Breakers
Wind breakers louvers for wind reduction

Figure 22

Fence & Grids
Protect overpasses and work sites from projectiles and vandalism encouraging safe passageway for pedestrians.

Figure 23

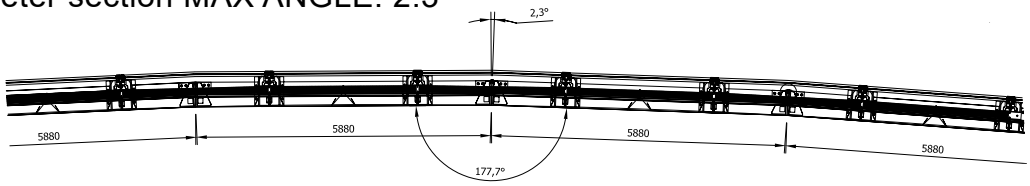
Sound panels have been tested in compliance with UNI EN 1793-1,2:2008 and UNI EN 1794-1,2:2003, metal sound panels are CE certified and belong to A4 sound absorption category and to B3 sound insulation category. The transparent sound panel are CE Certified and belong to B3 sound insulation category. **See Annex 4**

10. Installation on Curves

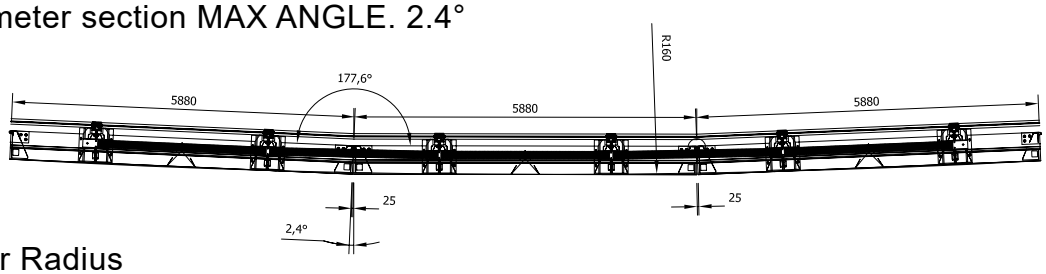
10.1 Horizontal Curves

Sergard MDS® TL4 Barriers using standard 5.90 m sections can be curved down to a inner radius of 150 meters at 2.3°. For tighter curves, Sergard MDS® units can be supplied in shorter 2.95 m sections which will allow installation on curved down to 73 meter inner radius at 2.3°. The outer radius can be curved down to 160 meters at 2.4°. **See Figure 24**. It is recommended to consult manufacturer for other special lengths to accommodate tighter radii. For turning small arc length curves, custom fabricated radius units are available from 2.5 to 90 degree angle units. **See Drawing No. H2-6000-IR23, H2-6000-OR23, H2-3000-IR24 and H2-3000-OR24** in Annex 2 for details of both uni-directional and bi-directional applications.

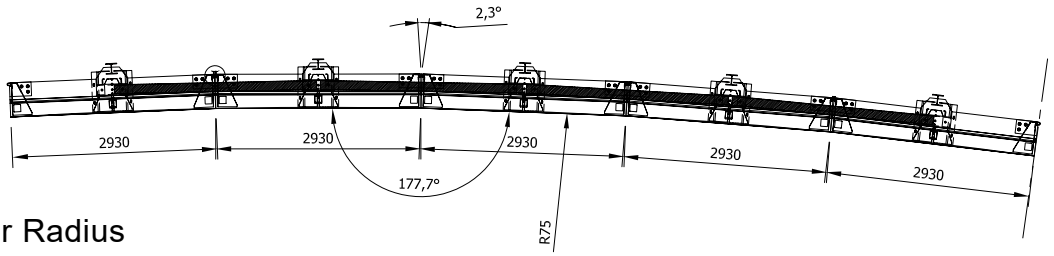
Inner Radius
5.9 meter section MAX ANGLE. 2.3°



Outer Radius
5.9 meter section MAX ANGLE. 2.4°



Inner Radius
2.95 meter section MAX ANGLE. 2.3°



Outer Radius
2.95 meter section MAX ANGLE. 2.4°

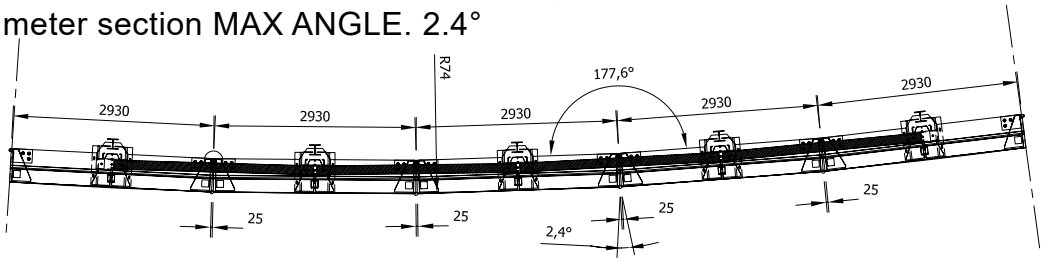


Figure 24

SERGARD MDS® TL4 BARRIERS

10.2 Cross-Slopes

Cross-Slopes

The MDS® Barrier may be placed on cross-slopes up to 5% or 3 degrees. **See Figure 25**

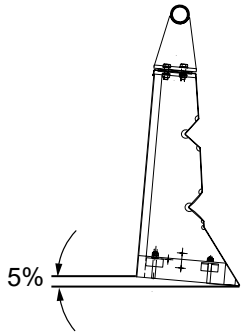


Figure 25

10.3 Longitudinal Slopes

The MDS® Barrier may be placed on various longitudinal slopes up to 2 degrees. **See Figure 266**

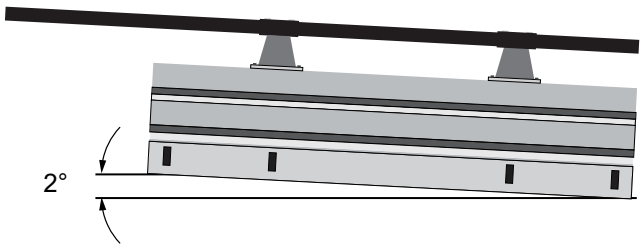


Figure 23

10.4 Curbs

MDS® Barrier shall NOT be placed directly against curbs that can prevent its lateral movement. **See Figure 27**

MDS® Barrier system can be placed on bridge curbing no higher than 165 mm (6 1/2”), with a minimum curb width of 482 mm (19”) for TL4.

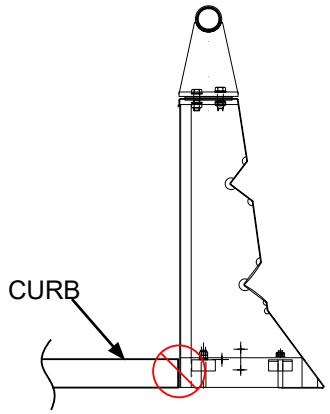


Figure 27

10.5 Vertical Alignment

Crest

MDS® Barrier has the ability to conform to a hill up to 2 degrees. **See Figure 28**

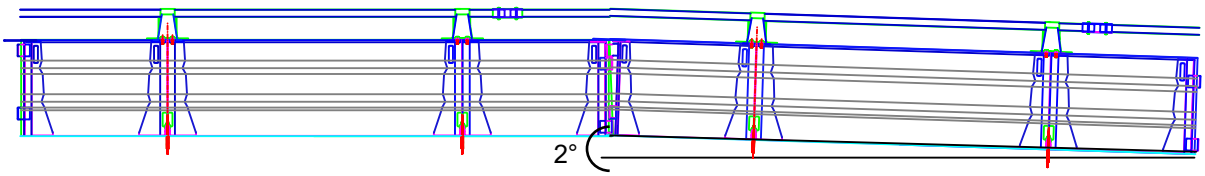


Figure 28

Ditch

MDS® Barrier has the ability to conform to a ditch up to 2 degrees. **See Figure 29**

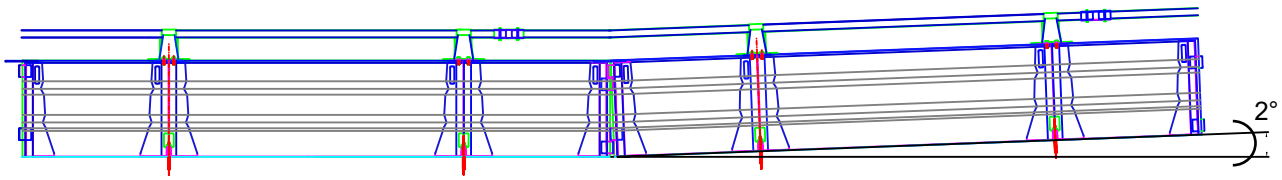


Figure 29

SERGARD MDS® TL4 BARRIERS

11. Design Deflections

Sufficient space between the work zone side of the barrier and the Work Zone or Workers needs to be available to allow for the deflection of the barrier during an impact. The Deflection Table below (**Table 1**) shows the minimum deflections derived from interpolating crash test results, this area required behind the barrier is also known as the Clear Zone. **See Figure 30**

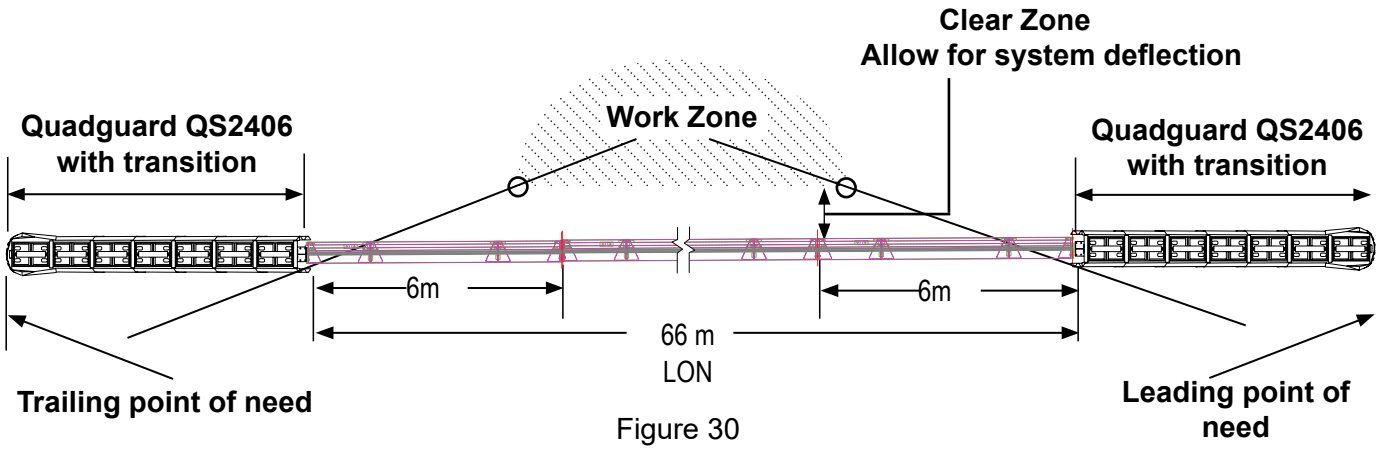


Figure 30

11.1 Length of Need (LON)

LON 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 as detailed in **Figure 30**.

11.2 Deflection Table

Test No.	Speed km/h	Vehicle weight kg	Impact angle	Max Dynamic Deflection m	Max Permanent Deflection m
TB11	102.9	924	20	0.16	0.12
TB51	71.6	13120	20	0.50	0.32

SERGARD MDS® TL4, TEST REFERENCE TB51 EN1317				
Speed (km/ h)	70	60	50	40
Permanent deflection (m)	0.32	0.235	0.163	0.104

SERGARD MDS® TL4, TEST REFERENCE TB11 EN1317							
Speed (km/ h)	100	90	80	70	60	50	40
Permanent deflection (m)	0.12	0.097	0.077	0.059	0.043	0.030	0.019

SERGARD MDS® TL4 BARRIERS

SECTION 3
SYSTEM INSTALLATION

12. Pre-Installation Planning

Prior to travelling to the job site, ensure that:

- You have enough units to complete the installation.
- Trucks can carry up to 24 x 5.90 m sections for a total of 141.6 m of Sergard MDS® Barriers per truck.
- Project site to be contacted to ensure acceptable truck load height before loading truck.
- You have enough of the required anchors for the system being installed.
- Your lifting equipment can lift this weight properly in the extended position for unloading and placing each unit. Each 5.90 m unit weighs approximately 360 kg (See Table 1 below for unit weights). Careful consideration must be given to the width available on site and the width needed for lifting equipment.
- Your lifting equipment can accommodate the required heights for loading/unloading.
- All chains and slings are certified to lift the required weight.
- All MDS® Barrier sections are aligned the same way on every truck.
- The crew leader is properly trained and certified for installation of Sergards MDS® Barriers.
- All DBYD must be organised prior to installation.
- All weight and identification markings is clear and visible on all required parts of the barrier.

12.1 Sergard MDS® TL4 Weight Chart

Sergard MDS® TL4 weight chart	
Base Section per meter	53 kg
Hand Rail per meter	5.5 kg
Rail Post each	10 kg

Table 1

13. Site Approach & Setup

Prior to work zone entry, ensure that

- Traffic management is in place
- The work area is safe and all crews are wearing appropriate PPE
- The truck is properly identified with equipment required by governing specifications, such as beacons, signage, etc.

Establish the location for the beginning of the run, and ensure that there is enough lateral width for the truck and lifting equipment

14. Unloading Preparation

Before unloading Sergard MDS® Barriers review Drawing No. 15-AUST-2R1 in Annex 1 for lifting points. Prior to each relocation of the truck, check for overhead cables. Prior to unloading, ensure that all slings and chains are certified and in good order, and that the vehicle and load are stable and level.

Do Not

- **Initiate lifts near overhead cables**
- **Swing lift over personnel**
- **Allow personnel to walk under lift**
- **Allow lift to swing over live traffic lane**
- **Exceed safe working load of equipment**

15. Assembly

Begin preparing for assembly by thoroughly reviewing the specified barrier location, layout, and orientation according to the approved traffic management plan. Consideration must be given to determine if an end treatment is required and allow for the length of the treatment in determining required segments. A visual inspection should be carried out to confirm the suitability of all segments. Should visible damage from delivery be evident in any segments, they should be sent for inspection and refurbishment prior to use.

Warning: The correct safety equipment and approved traffic management must be used as required for any MDS® Barrier system assembly.

16. Installation Tools

Recommended Tools	Dimensions
	Millimeters
Ratchet Drive	12, 16, 20
Torque Wrench	12, 16, 20
Drive Sockets	6, 12, 16, 20
Wrenches	6, 12, 16, 20
Carbide Drill Bits	16 & 18
Rotary Hammer Drill	Standard
Drill Socket Extention	1000
Hammer	Standard
Tape Measure	Standard
Crane / Forklift	According to project weight specifications
Lifting Straps	According to project weight specifications
Pry Bar	1 meter

Note: The above list of tools is a general recommendation. Depending on specific site conditions and the complexity of the assembly specified by the appropriate highway authority, additional or fewer tools may be required. Decisions as to what tools are needed to perform the job are entirely within the discretion of the specifying highway authority, and the authority's selected contractor performing the assembly of the system at the authority's specified site.

SERGARD MDS® TL4 BARRIERS

Please refer to all layout drawings that show assembly details in this Manual.
Verify placement and measurements on-site prior to placement of anchor bolts or base plates.
SERGARD MDS® TL4 Barrier system can be assembled on bridge curbing that is no higher than 165 mm (6.5”) with a minimum curb width of 483 mm (19”).
You will need to assemble the anchor bolts before setting the barriers in position unless the Quick release plate is used. (Part No: T45-QR4-G)

17. Barrier Stacking, Storage & Transport

Sergard MDS® TL4 Barrier system is designed to be nested and stacked on top for storage and freighting purposes. When transporting it is recommended that MDS® TL4 Barrier be stacked no more then two high.

Caution should be used when freighting that the lower level is strapped down and secured properly before loading the second level. **See Figure 31**

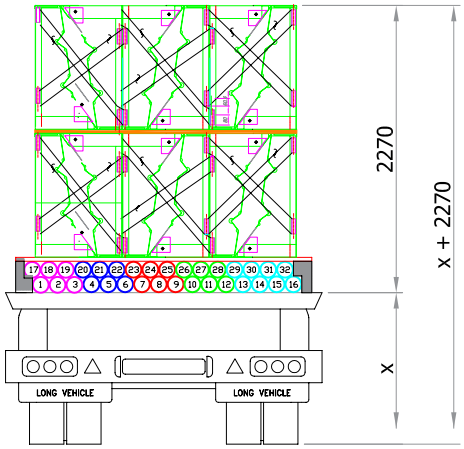


Figure 31

WARNING

Use caution when rigging units, use tag lines.

17.1 Barrier Lifting

Each section of MDS® TL4 Barrier can be lifted with a crane or front end loader utilizing a cable or chain. Attach the proper weight rated chain at each end of a segment section providing a central balance lifting point. *Please refer to state requirements for training and certification of crane or forklift operators.* **See Figure 32**

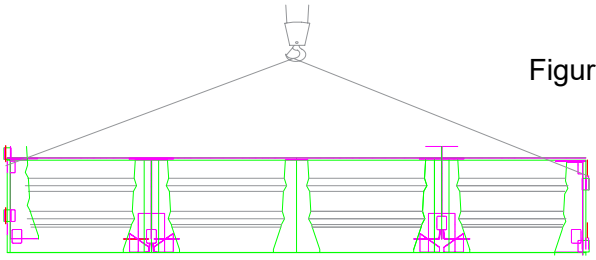


Figure 32

17.2 Unloading Sequence

Each section of MDS® TL4 Barrier can be unloaded seperatly or in sections of 2 if the units are prestapped together during loading. **See Figure 33**

WARNING

Use caution when rigging units.
Lifting from 2 points is recommended. Tag lines should also be used to control the unit.

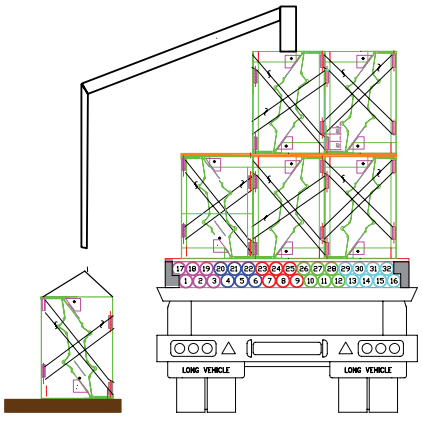


Figure 33

17.3 Righting Inverted Units

Rig the lift using chains of hoists, and attach tag link to the end. Ensure that the lift is properly balanced, and that the drop area is clear. When turning MDS® units, there is a danger of the top rail kicking away from the direction of rotation. The amount of movement should be controlled by offloading onto timber blocking immediately adjacent to the tire of the truck. **See Figure 34 & 35**

Continue lowering the unit and at the same time, slide the unit away from the tires so that free access can be gained to the top rail. Attach the slings/chains for lifting upright. **See Figure 33**

Figure 34

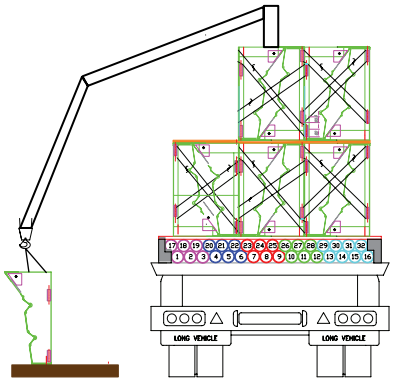
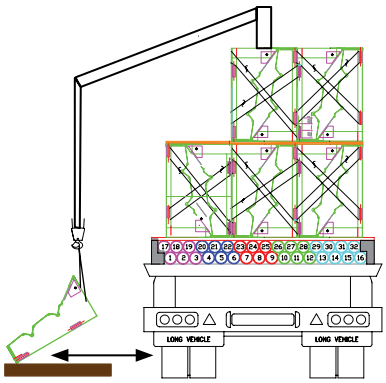


Figure 35



With barrier placed horizontal on timber, relocate chains to top of the barrier and hoist upright.
See Figure 36 & 37

Figure 36

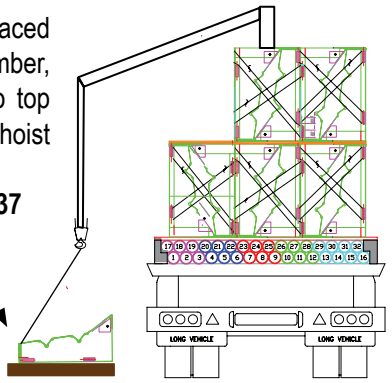
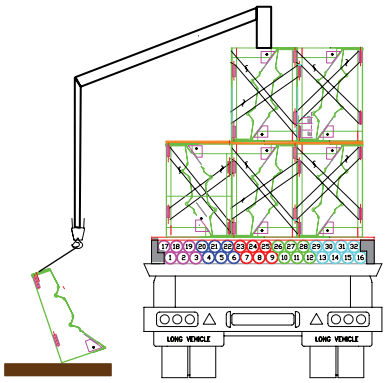
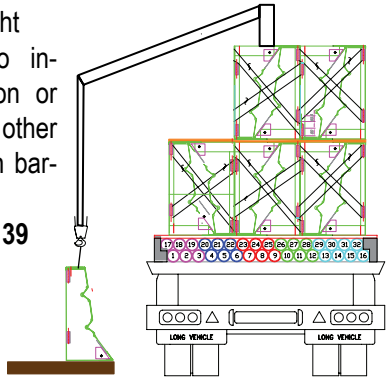


Figure 37



With barrier upright place directly to installation possition or use fork lift to or other equipment to join barriers.
See Figure 38 & 39

Figure 38



18. Barrier Relocation

Forklifts can be used for placing barriers for joining an attachment when available.

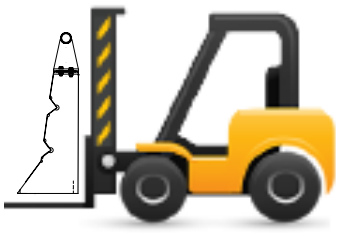


Figure 39

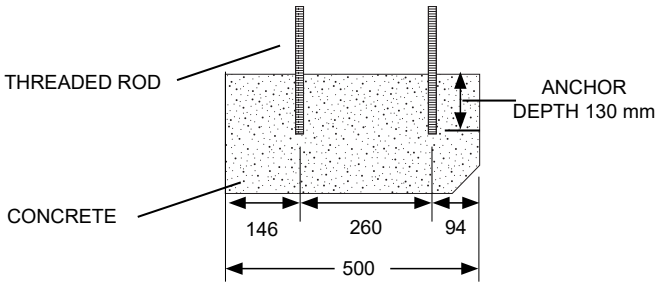
19. Deployment

- 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 the 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.
- Align the segments according to the specified configuration and lay out in the traffic control plan.
- Caution: refer to the deflection graph in Section 11.2 contained in this manual when determining minimum clearance between barrier and hazard.

- Caution:
  Do not place barrier up against curbing as it may affect the deflection characteristics of the barrier under impact.

20. Anchoring Types

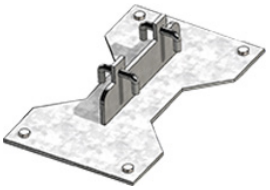
MDS® TL4 Barriers are considered a Minimal Deflection System, therefore they must be anchored. You will need to install the anchor rods before setting the barrier in position unless you are utilizing the Quick Release Anchor Plate. There are 2 types of anchoring: **See Figure 40 and 41**.



INTERNAL ANCHORING
FOR PERMANENT
INSTALLATIONS

Figure 40

Quick Release Anchor Plate



EXTERNAL ANCHORING
FOR TEMPORARY
INSTALLATIONS

Figure 41

21. Internal Anchoring Procedure

MDS® TL4 INTERNAL ANCHORING

Internal anchoring requires 2 each M16 x 180 mm threaded rods pre-installed before the barrier is set into place. **See Figure 42**

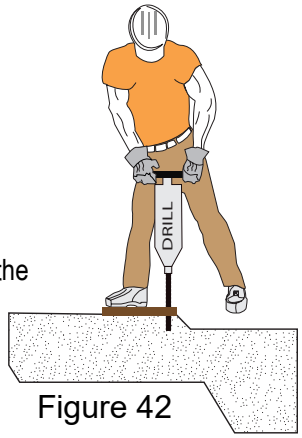


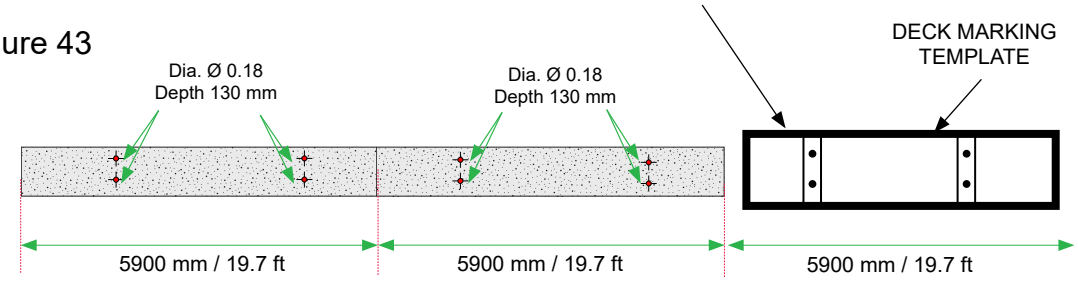
Figure 42

The first phase consists of deck drilling utilizing a "template" that accurately reflects the dimensions of the barrier and the center-to-center spacing of the anchorage holes. **See Figure 43, 44 and 45**

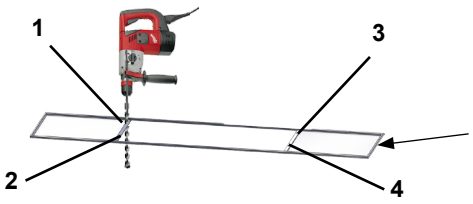
Referring to the layout place the template in a starting position.

STEP 1 Place the template on the deck and mark its initial start position.

Figure 43



STEP 2 After placement, drill a 1 cm deep Ø16 pilot holes in each of the 4 holes through the template. Move the template to the next position until the installation track has been completed.



Template
Part # T4-TP-1

Figure 44

STEP 3 Finish drilling Ø18 hole 130 mm deep with carbide drill bit.

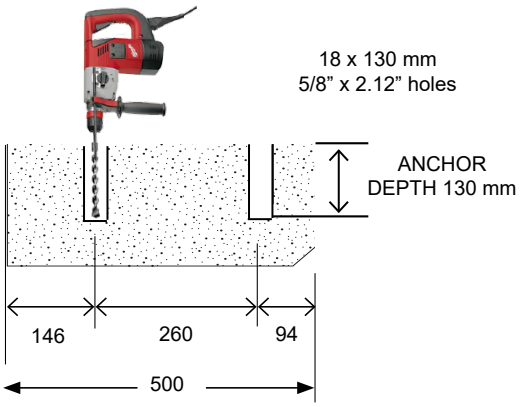


Figure 45

STEP 4 Blow out all holes with compressed air gun. **See Figure 46**

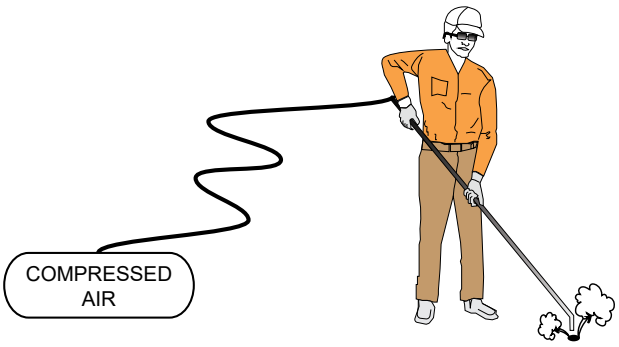


Figure 46

STEP 5 Once the debris from the holes is removed, inject HILTI HIT RE-500 resin into the two anchor bolt holes following the resin manufacturer's recommendation for application. **See Figure 47**

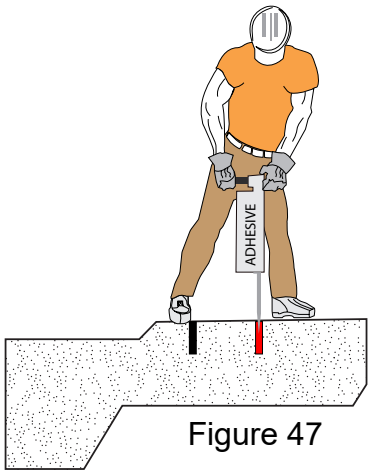


Figure 47

STEP 6 Insert the two M16 x 290 mm threaded anchor rods. Rotating movement will stir the resin in order to mix it with the residue dust in the hole ensuring a sufficient thread contact. **See Figure 48**

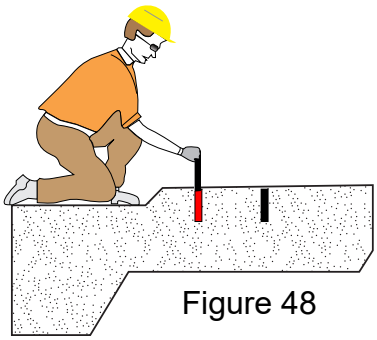


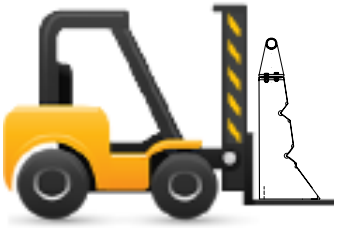
Figure 48

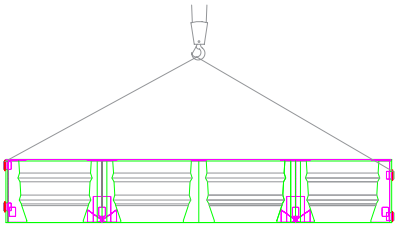
NOTE: Allow the resin to harden (see the resin data sheet for curing times and temperatures). These steps may vary from the anchor manufacturer. If the installation steps differ, please follow manufacturers instructions.

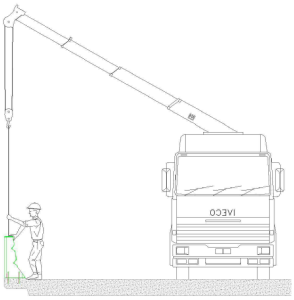
22. Barrier Sections Placement

Once the threaded anchor rods are in place, all the barrier sections are lifted up by a truck-crane or fork truck with the assistance of an installation staff guiding the barrier up over the protruding anchorage rods while the barrier is dropped into place.

See Figure 49 and 50







NOTE: Different types of equipment can be used to unload and place barriers in place. Always ensure that the equipment being used is capable to support the weight of the barrier for safety.

Figure 49

Figure 50

Sergard MDS® Barrier sections can be installed Back to Back **See Figure 51**

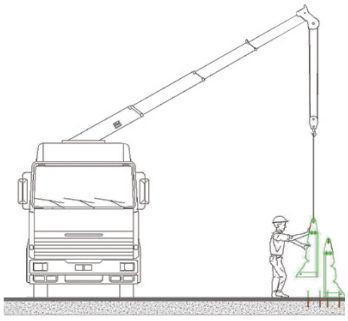


Figure 51

WARNING

ATTENTION

- Ensure hand, fingers and feet are clear of joint when making connection.
- Wear suitable PPE.

23. Barrier Sections Attachment

After placing the MDS® Barriers side-by-side pin the two sections together from the back, with the long Connecting Pin (Part # T4-CP1-G). **See Figure 52**

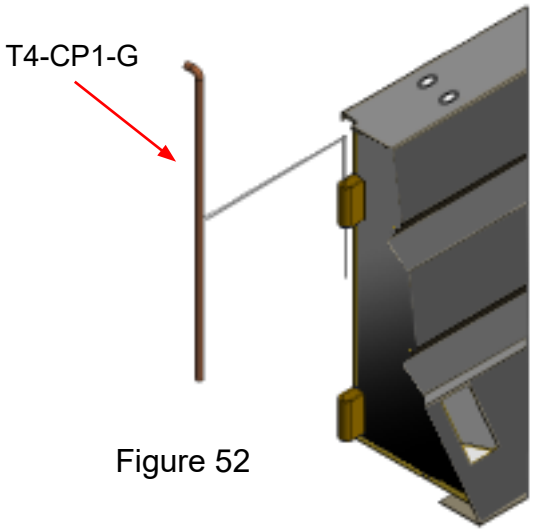


Figure 52

On the front side, join the two sections utilizing the access holes in the lower front panel using one M16 x 120 mm bolt, one M16 nut and two M16 washers. **See Figure 53**

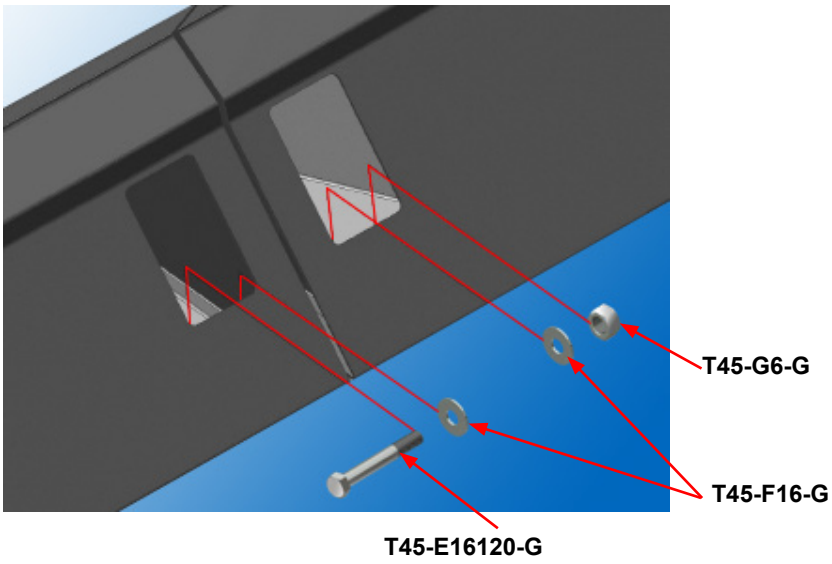


Figure 53

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
4E	T45-E16120-G	Hex bolt	M16 x 120	5/8 x 4 3/4	1
4F	T45-F16-G	Washer	M16	5/8	2
4G	T45-G6-G	Hex nut	M16	5/8	1

The two adjacent sections can now be joined together with the Splice Plate (Part # T4-SP1-G) using four M20 x 60 mm bolts, four M20 nuts and eight M20 washers. **See Figure 54**

DO NOT TIGHTEN THE FASTENERS AT THIS TIME

Once all barriers have been attached all bolts can be tightened

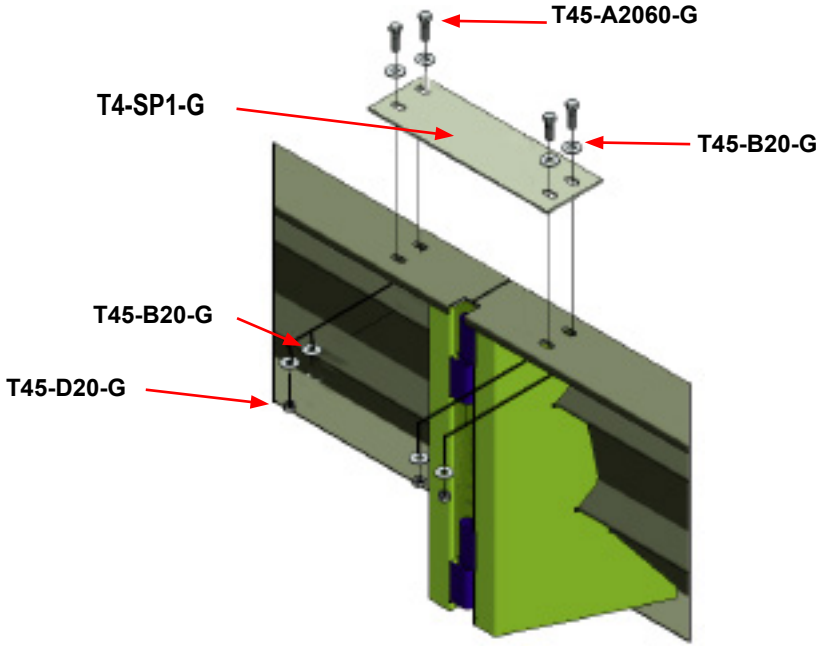


Figure 54

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
4A	T45-A2060-G	Hex bolt	M20 x 60	0.75 x 2.5	4
4B	T45-B20-G	Washer	M20	0.75	8
4D	T45-D20-G	Hex nut	M20	0.75	4

24. Barrier Anchoring to Roadway / Deck

Fasten each barrier section with upper anchor rib (Part # T4-K34050-G**) See Figure 55 - 56**
Utilizing the front access ports on the barrier, place the upper anchor rib over the two protruding M16 anchor threaded rods utilizing the following fasteners through the front access ports.

- Two M16 nuts
- Two M16 washers

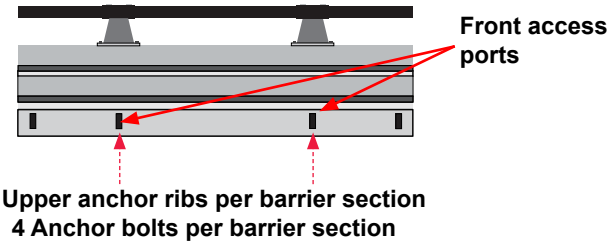


Figure 55

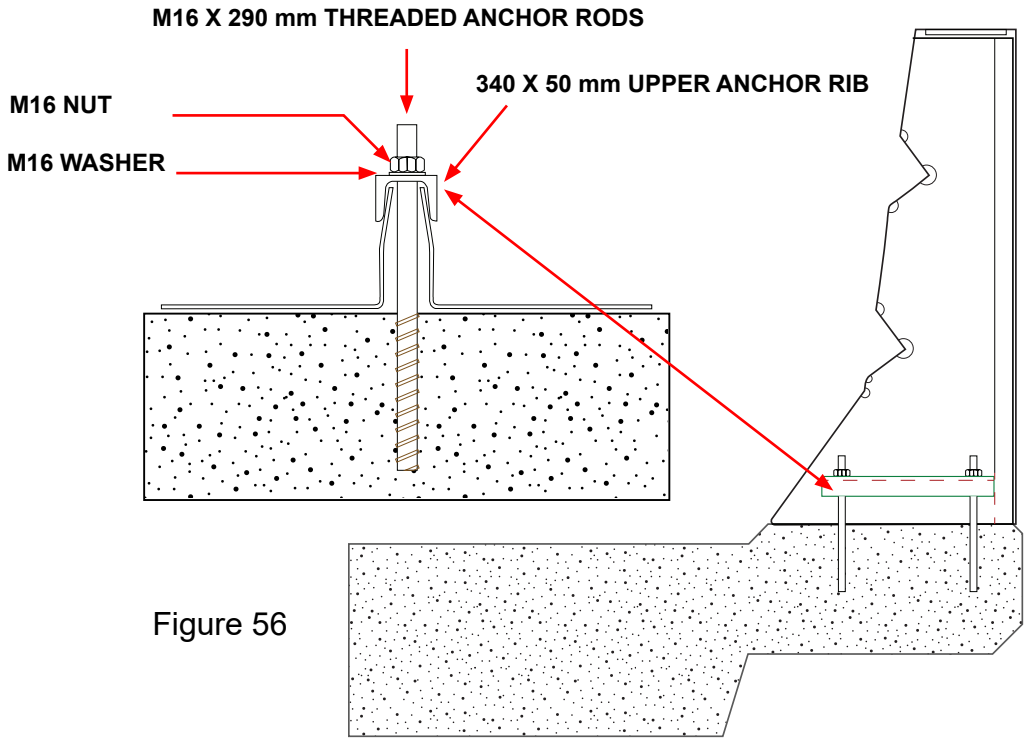


Figure 56

REF	Part No.	TYPE	DIM. METRIC	DIM US	QUANTITY
10	T4-34050-G	Upper anchor rib	340 x 50	13.5 x 2	1
10A	T4-A16290-G	Threaded Rod	M16 x 290	5/8 x 12	2
10B	T4-B16-G	Washer	M16	5/8	2
10C	T4-C16-G	Hex nut	M16	5/8	2

BARRIER ANCHORING TO ROADWAY CONTINUED

To fasten the barrier section to the roadway / deck, tighten the nuts on the upper anchor rib.

1. Tighten the rear nut through the top access hole utilizing a 1 meter socket extension arm. **See Figure 57**
2. Tighten the front nut through the front access holes in the lower front panel onto the threaded anchor rods. **See Figure 58**

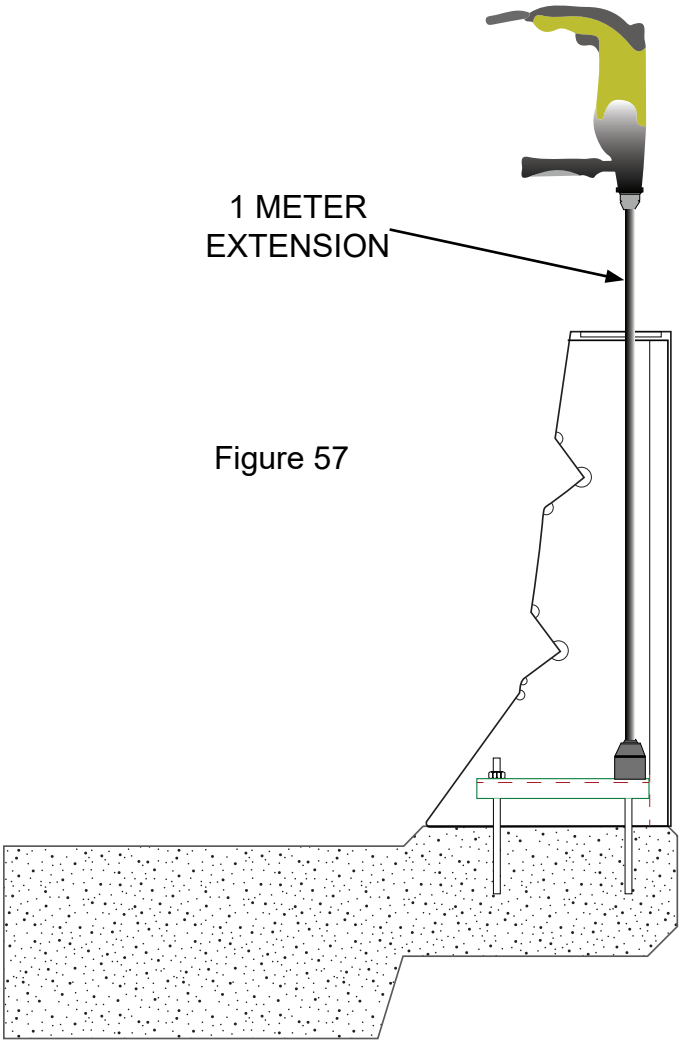


Figure 57

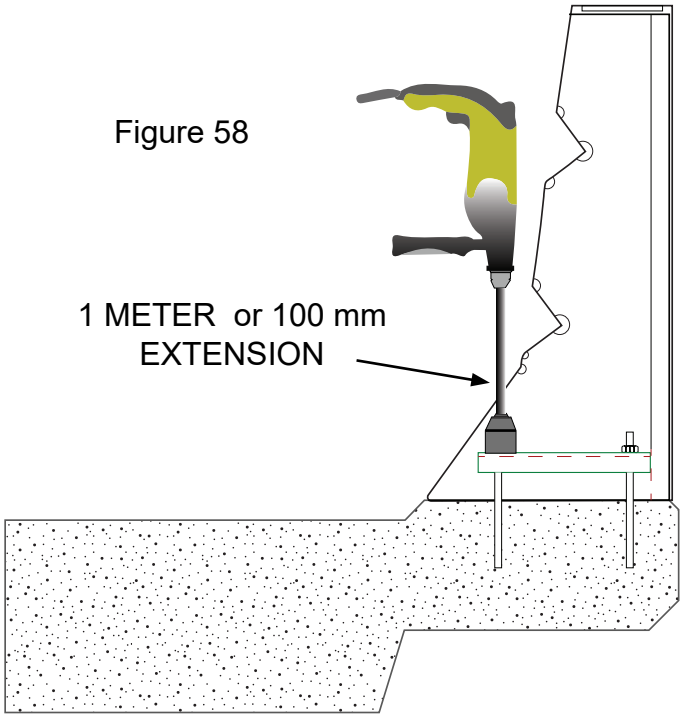


Figure 58

25. Top Rail Assembly

Top Rails are installed by sliding through the Top Rail Post which are mounted on each barrier. **See Figure 59 - 60**

Top Rail Post Part No. T4-SRP-G
Top Rail Part No. T4-TRS-G

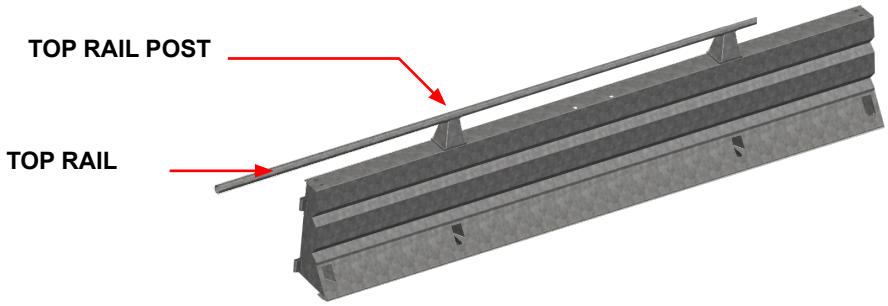


Figure 59

Rail Post Installation
Once barriers are anchored in position, place the rail posts on top of each barrier section.

Utilizing four M20 x 60 mm bolts, four M20 nuts and eight M20 washers, fasten the top rail post to the barrier.
See Figure 60

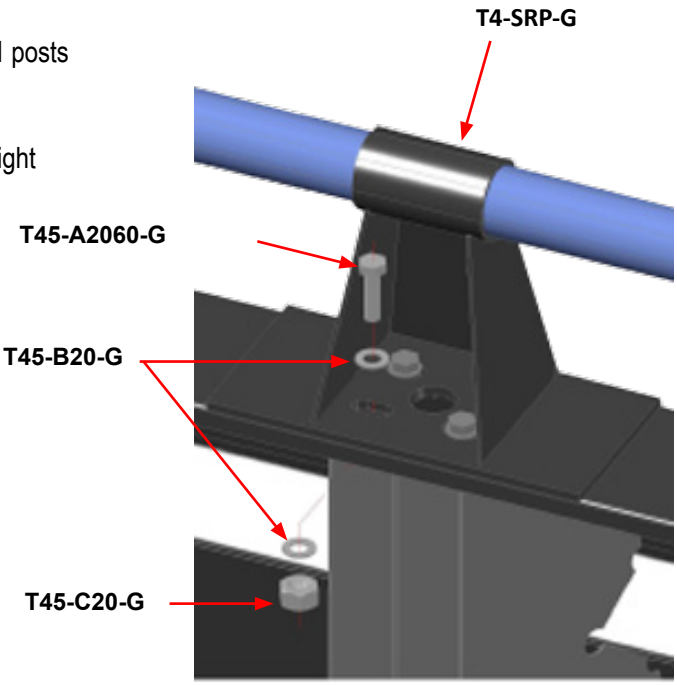


Figure 60

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
6A	T45-A2060-G	Hex bolt	M20 x 60	0.75 x 2.5	4
6B	T45-B20-G	Washer	M20	0.75	8
6C	T45-C20-G	Hex nut	M20	0.75	4

TOP RAIL ASSEMBLY CONTINUED

With all the top rail posts fastened, insert the rail through the Top Rail Post. Where the rails join together, utilize the Top Rail Connector with two M12 x 110 mm bolts, four M12 mm washers and two M12 nuts.
See Figure 61

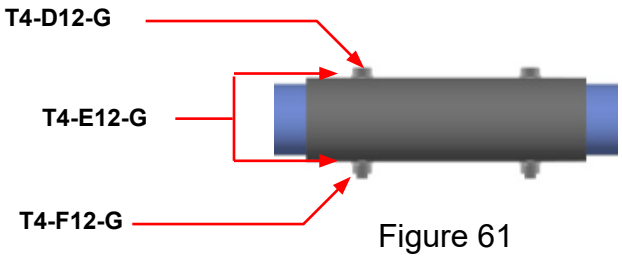


Figure 61

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
6D	T4-D12-G	Hex bolt	M12 x 110	1 x 4.5	2
6E	T4-E12-G	Washer	M12	1	4
6F	T4-F12-G	Hex nut	M12	1	2

End of Run Rail Ends

At the end of a barrier run curved rail posts are used to tie in the rails on the end barrier.
See Figure 62 for left hand and **Figure 63** for right hand.

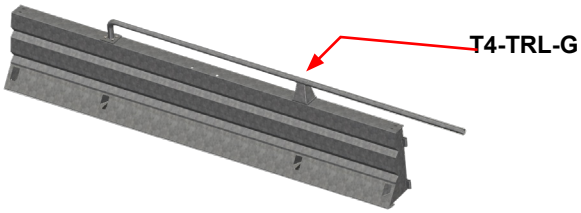


Figure 62

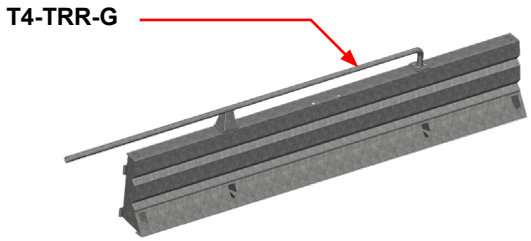


Figure 63

FULL ASSEMBLY

After all the MDS® Barrier system components have been assembled and positioned correctly, verify and tighten each bolt assembly throughout the system. **See Figure 64**

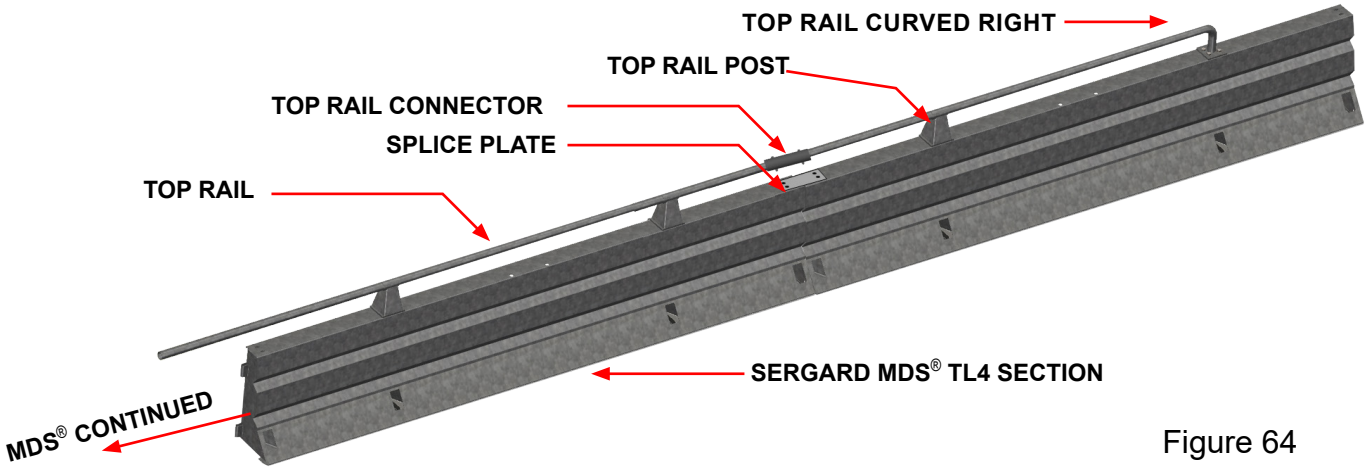


Figure 64

26. Access Hole Cover

Attach the MDS® Barrier access hole cover plates to cover the access holes at the lower section of the barrier wall. **See Figure 65**

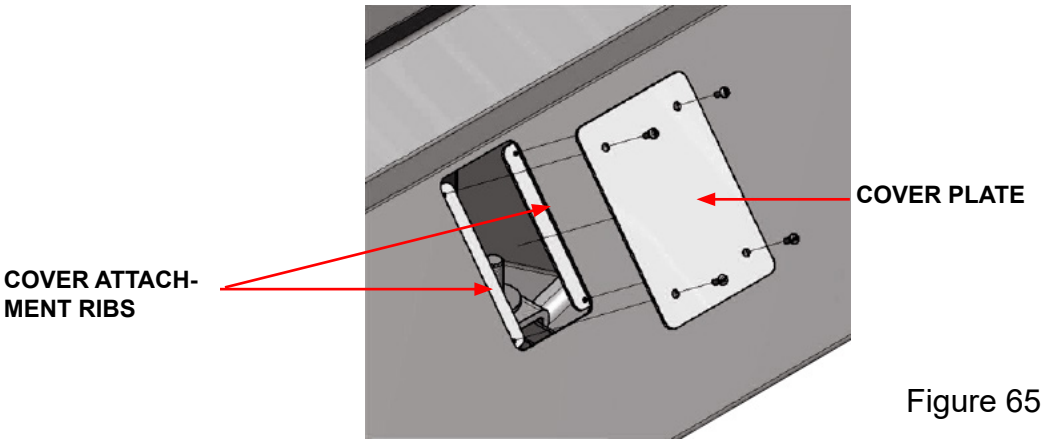


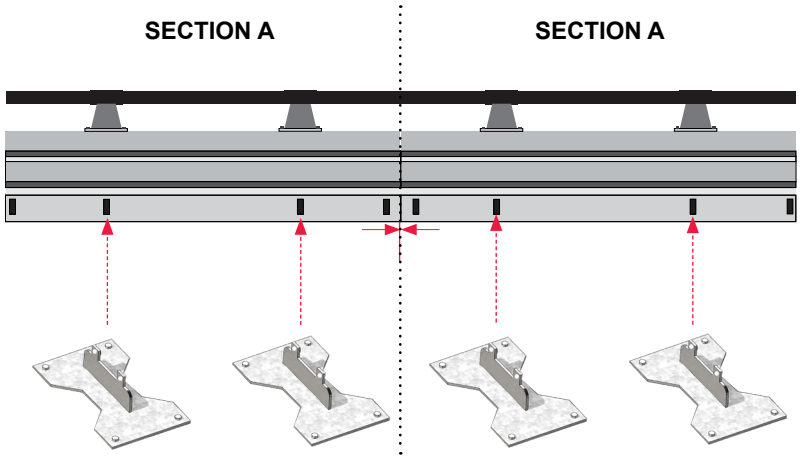
Figure 65

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
9A	T45-ACP-ST	Cover plate			1
9B	T45-BCP-ST	Cover attachment rib			2
9C	T45-C630-ST	Machine screw	M6	1/4	4

SERGARD MDS® TL4 BARRIERS

27. MDS® TL4 External Anchor Plate Installation

Each MDS® Barrier section requires two external anchor plates. **See Figure 66**



Note: External anchoring most often used for temporary installations / workzones

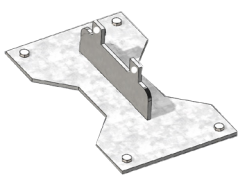
Figure 66

27.1 External Anchor Plate Main Components

The Quick Release Anchor Plate is designed to allow the MDS® Barriers to quickly detach from the plate for relocation. The plate has 3 parts: **See Figure 67**

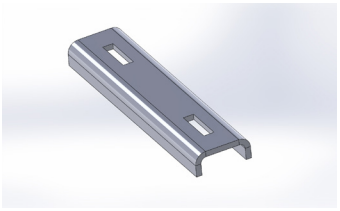
1. Quick Release Plate
2. Upper anchor rib
3. U-pins

1. Quick Release Plate



Part # T45-QRP-G

2. Upper anchor rib



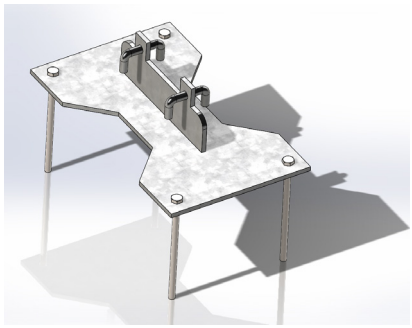
Part # T45-D34073-G

3. U-pins

Part # T45-EPIN1-G

Figure 67

The External anchoring Quick Release Anchor Plate may be pre-attached to the barrier before placement to the surface or be placed into position while the barrier is being set in place. Each plate requires four M16 x 165 mm threaded rods that can be installed after the barrier has been placed in position.
See Figure 68



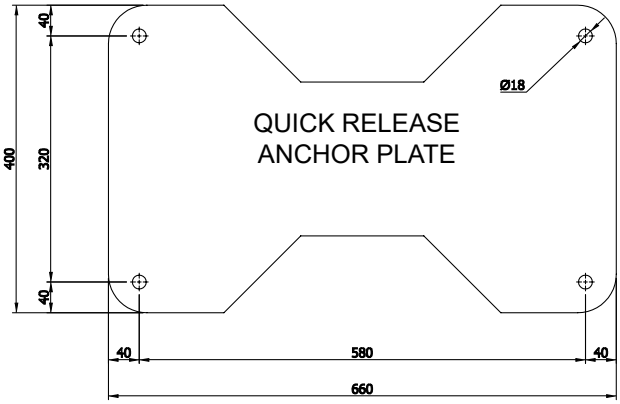
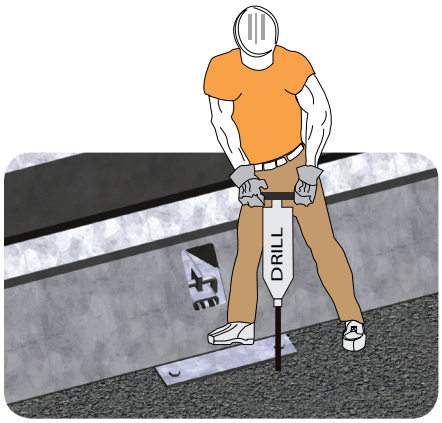


Figure 68

27.2 External Anchoring Procedure

STEP 1 Once the barrier is in place, drill four Ø18 mm holes 130 mm deep through the Quick Release Anchor Plate. **See Figure 69**



Front

Rear

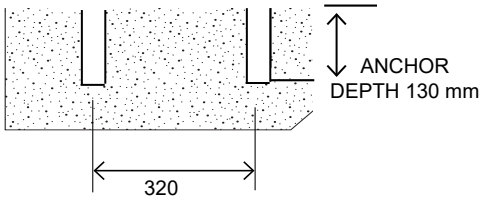


Figure 69

STEP 2
After drilling is completed: blow out holes removing all debris with compressed air gun. **See Figure 70**

Figure 71

STEP 3
Inject resin with a pump gun. **See Figure 72**

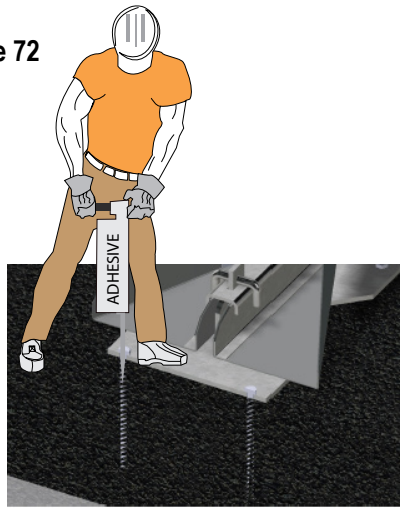


Figure 72

STEP 4
Insert the M16 x 165 mm threaded anchor rods. With a rotating movement stir the resin in order to mix it with the residue dust in the hole ensuring a sufficient thread contact. **See Figure 73**

NOTE:
Allow the resin to harden (see the resin data sheet for curing times and temperatures).

These steps may vary from the anchor manufacturer. If the installation steps differ, please follow manufacturers instructions.

Figure 73

SERGARD MDS® TL4 BARRIERS

STEP 5

Once all holes are fitted with threaded rods, use four M16 washers and four M16 nuts to fasten the Quick Release Anchor Plate to the ground. **See Page 74**

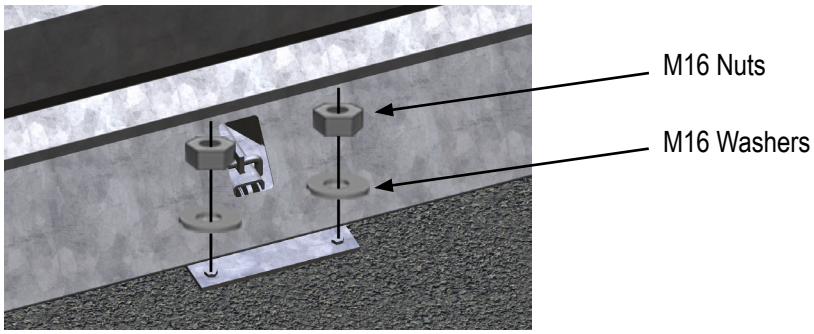
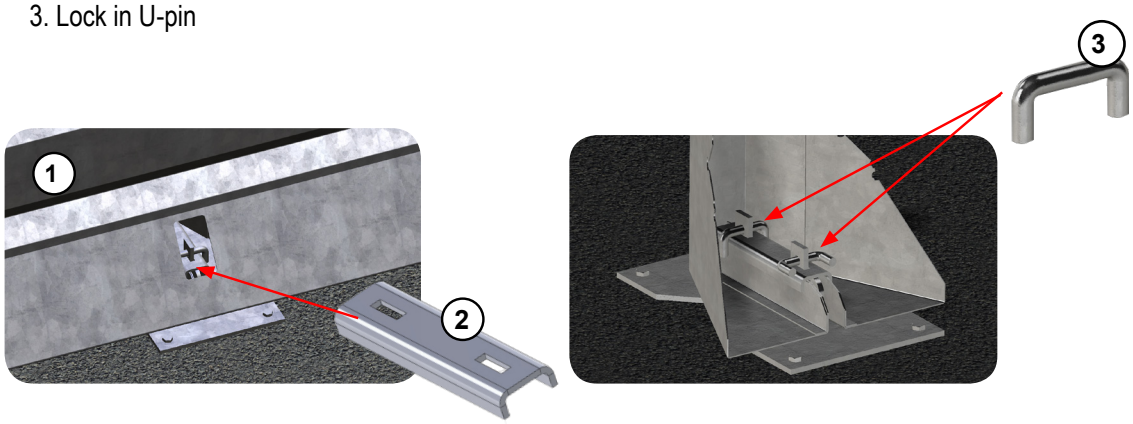


Figure 74

STEP 6

Connect the Quick Release Anchor Plate to the SERGARD MDS® TL4 Barrier.
See Figure 75

1. Place barrier onto quick release anchor plate
2. Insert upper anchor rib through front access hole
3. Lock in U-pin



Front View

Rear View

Figure 75

28. Access Hole Cover

Attach the MDS® Barrier access hole cover plates to cover the access holes at the lower section of the barrier wall.
See Figure 76

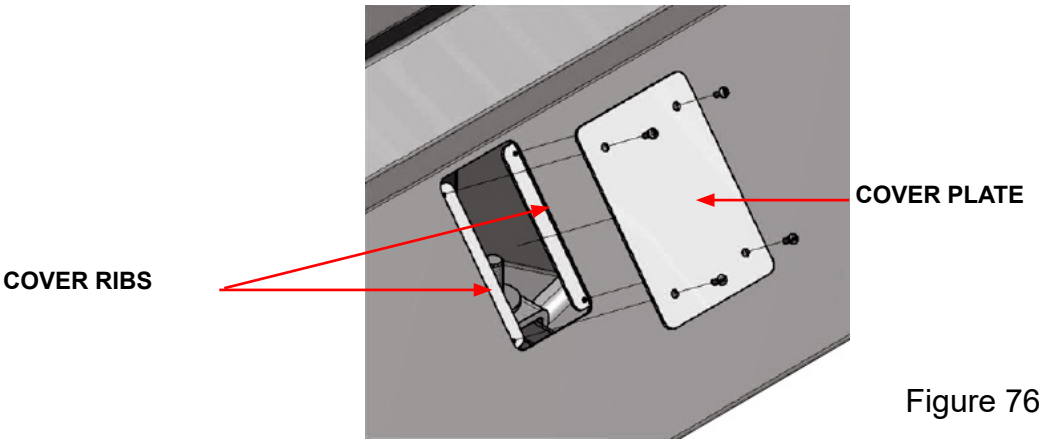


Figure 76

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
9A	T45-ACP-ST	Cover plate			1
9B	T45-BCP-ST	Cover attachment rib			2
9C	T45-C630-ST	Machine screw	M6	1/4	4

CONTINUE TO PAGE 27 TO CONTINUE WITH BARRIER ASSEMBLY

29. Anchorage Types and Ground Conditions

SERGARD MDS® Barriers can be installed in a number of differing ground conditions. Each condition has a minimum embedment depth of the required anchor type and each anchor type may have multiple applications. **Figure 77** below illustrates a list of the possible foundations typically found on project sites with the appropriate anchorages for each situation. If alternate foundations/anchorages are required, please contact MDS® Barriers for recommendations.

Concrete Foundation
Requires minimum anchor depth of 130 mm depth with a total minimum concrete thickness of 200 mm.

Bridge Deck
Requires minimum anchor depth of 130 mm depth with a total minimum concrete thickness of 200 mm.

Asphalt Only
Requires a minimum of 300 mm.

Asphalt over Compact Subbase
Requires a minimum of 500 mm.

Unbound Granular Surface with Concrete Base
Requires concrete footing at each anchor location sized at 700 mm x 700 mm x 2000 mm deep. Anchors require a minimum depth of 130 mm.

Unbound Granular Surface with Steel Beam
Requires steel earth anchor beam 2 meters in length.

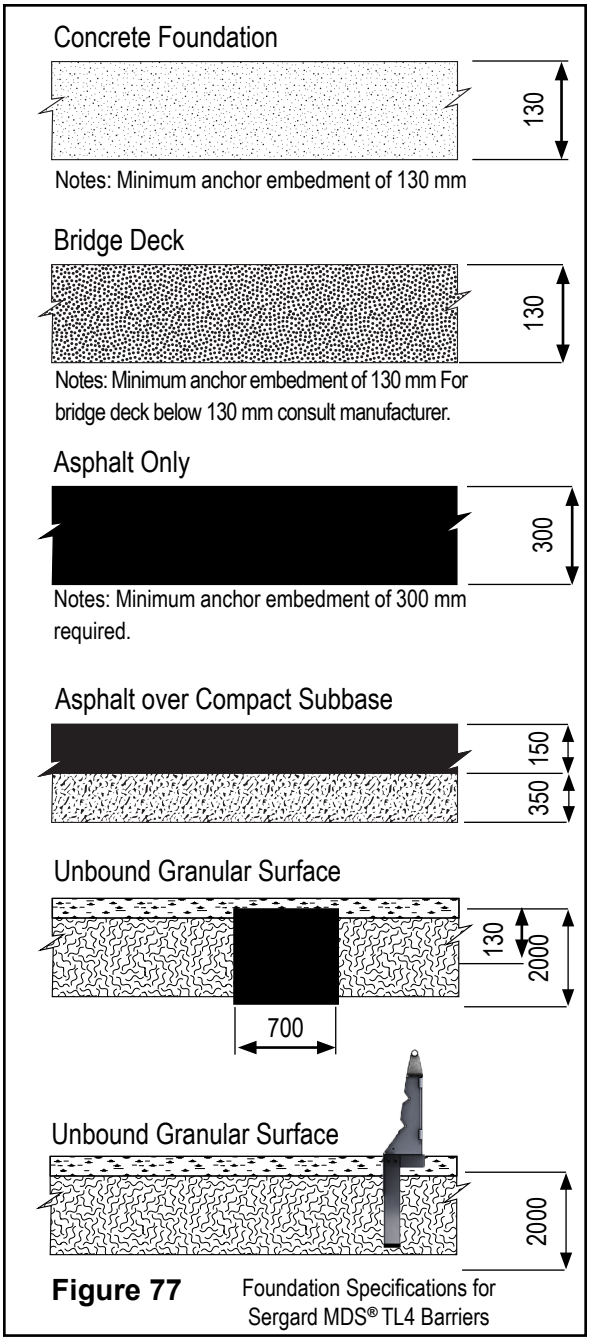


Figure 77 Foundation Specifications for Sergard MDS® TL4 Barriers

29.1 Internal Anchoring Using Threaded Rods

For Concrete Foundations and Bridge Decks

Determine anchor locations as per drawings H2-6000-AP1 and H2-6000-AT2 in Appendix A for the Minimum Deflection Systems respectively. Guidelines for earth anchor installation can be found in drawing H2-6000-AE4 Annex A.

WARNING

DANGER

Ensure proper PPE is worn at all times when drilling holes and when handling, mixing and placing resin.
Ensure locations of utilities are determined prior to drilling holes.

THREADED ROD
T4-A16290-G

SPECIFICATIONS
Steel grade: 8.8
Specification: ASTM A325 or equivalent

Rod diameter: 16 mm
Rod length: 290 mm
Can be used with the following foundations
- Concrete Pad
- Concrete Deck

Drill hole diameter: 18 mm
Drill hole depth: 130 mm
Can be used with the following foundations
- Concrete Pad
- Concrete Deck

NOTE:
The use of other chemically set anchors is allowable. These equivalent anchorages must be able to withstand the following forces:
- Min. Tensile Strength: 800 MPa
- Min. Yield Strength: 640 MPa

Internal installation process for the threaded rod is as follows

- Determine the anchor rod locations using the above listed drawings in Appendix A.
- Using the drilling template (Part # T4-TP-1) drill two holes per anchor location 18 mm x 130 mm deep.
- Remove the debris from the hole and area.
- Check the depth of the hole to ensure proper embedment.
- Inject resin as per manufacturer's instructions.
- Insert threaded rod.
- Allow resin to cure as per manufacturer's instructions.
- Place barrier on top of threaded rods.
- Install upper anchor rib (Part # T4-34050-G) onto M16 threaded rods and place two M16 washers and two M16 nuts on the rods.
- Using a socket drill tighten down barrier.

Should minimum foundations not be present for required depth for installation of threaded rod, please contact the manufacturer for assistance

29.2 External Anchoring Using Threaded Rods

For Concrete Foundations and Bridge Decks

Determine anchor locations as per drawings H2-6000-AP1 and H2-6000-AT2 in Appendix A for the Minimum Deflection Systems respectively. Guidelines for earth anchor installation can be found in drawing H2-6000-AE4 Annex A.

WARNING

DANGER

Ensure proper PPE is worn at all times when drilling holes and when handling, mixing and placing resin.
Ensure locations of utilities are determined prior to drilling holes.

THREADED ROD
T45-A16165-G

SPECIFICATIONS
Steel grade: 8.8
Specification: ASTM A325 or equivalent

Rod diameter: 16 mm
Rod length: 165 mm
Can be used with the following foundations
- Concrete Pad
- Concrete Deck

Drill hole diameter: 18 mm
Drill hole depth: 130 mm
Can be used with the following foundations
- Concrete Pad
- Concrete Deck

NOTE:
The use of other chemically set anchors is allowable. These equivalent anchorages must be able to withstand the following forces:
- Min. Tensile Strength: 800 MPa
- Min. Yield Strength: 640 MPa

External installation process for the threaded rod is as follows

- Install temporary / external base plate (Part # T45-QRP-G).
- Place barrier in final roadway position.
- Drill four holes per anchor location (2 front and 2 rear)18 mm x 130 mm deep.
- Remove the debris from the hole and area.
- Check the depth of the hole to ensure proper embedment.
- Inject resin as per manufacturer's instructions.
- Insert threaded rod.
- Allow resin to cure as per manufacturer's instructions.

Should minimum foundations not be present for required depth for installation of threaded rod, please contact the manufacturer for assistance

29.3 External Anchoring on Asphalt

For <u>Asphalt and Asphalt over Compact Subbase</u>

Determine anchor locations as per drawings H2-6000-AP1 and H2-6000-AT2 in Appendix A for the Minimum Deflection Systems respectively. Guidelines for anchor installation can be found in drawing H2-6000-AA4 Appendix A.

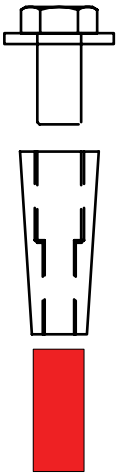
WARNING Ensure proper PPE is worn at all times when drilling holes and when handling, mixing and placing resin.

DANGER Ensure locations of utilities are determined prior to drilling holes.

<u>THREADED BAR</u>
<u>T45-E15500-G</u>

SPECIFICATIONS
Steel grade: DYWIDAG St 900/1100

Bar diameter: 15 mm
Bar length: 500 mm
Can be used with the following foundations
- Asphalt
- Asphalt over Compact Subbase



Drill hole diameter: 30 mm
Drill hole depth: 500 mm
Can be used with the following foundations
- Concrete Pad
- Concrete Deck
- Max Load: 195 kN
- Working Load: 90 kN

Adhesive: BASF MasterFlow 960

External installation process for the threaded rod is as follows
- Install temporary / external base plate (Part # T45-QRP-G).
- Place barrier in final roadway position.
- Drill four holes per anchor location (2 front and 2 rear)18 mm x 500 mm deep.
- Remove the debris from the hole and area.
- Check the depth of the hole to ensure proper embedment.
- Inject resin as per manufacturer's instructions.
- Insert threaded bar.
- Allow resin to cure as per manufacturer's instructions.
- Place positioning cone onto threaded rod with screw washer.

Should minimum foundations not be present for required depth for installation of threaded bar, please contact the manufacturer for assistance

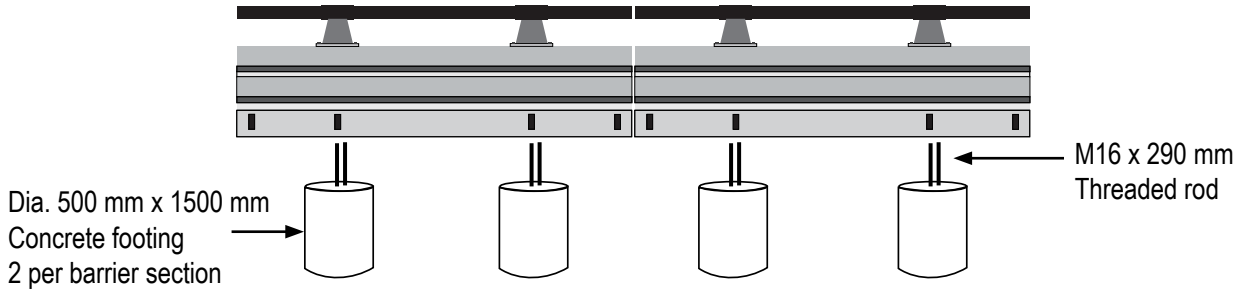
29.4 Anchoring in Unbound Cohesionless Soil With Concrete

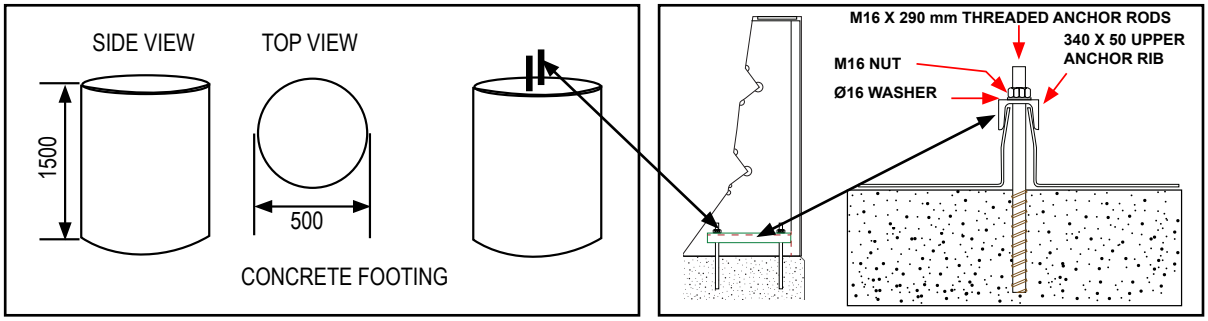
MDS® Barriers are a minimal deflection system therefore requiring a concrete footing that the barrier can be anchored to (See drawing H2-6000-AC3) or by using an earth beam which resembles an eyebeam on a guard rail. (See drawing H2-6000-AE4).

WARNING

DANGER

Ensure proper PPE is worn at all times when drilling holes and when handling, mixing and placing resin.
Ensure locations of utilities are determined prior to drilling holes.



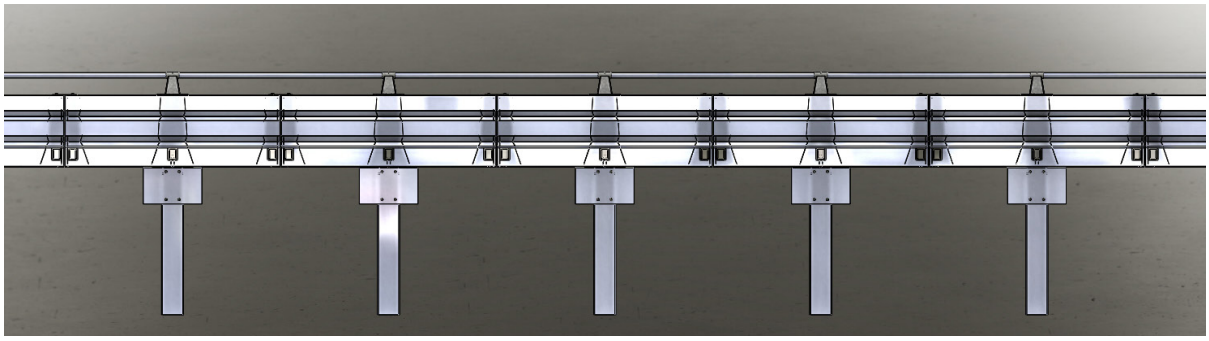


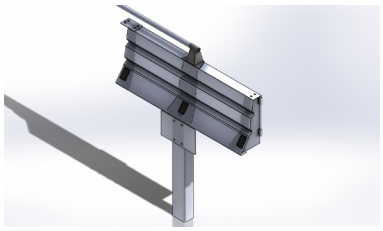
Achoring in unbound granular soil with concrete base

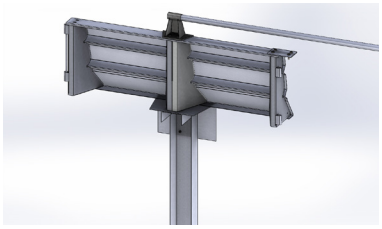
- Determine the anchor rod locations using the above listed drawing H2-6000-AP1 in Appendix A.
- Remove earth and fill a diameter 500 mm x 1500 mm deep cavity with rebar and concrete.
- Once concrete is cured use the drilling template (Part # T4-TP-1) and drill two holes per anchor location 18 mm x 130 mm deep.
- Remove the debris from the hole and area.
- Check the depth of the hole to ensure proper embedment.
- Inject resin as per manufacturer's instructions.
- Allow resin to cure as per manufacturer's instructions.
- Place barrier on top of threaded rods.
- Install upper anchor rib (Part # T4-34050-G) onto M16 threaded rods and place two M16 washers and two M16 nuts on the rods.
- Using a socket drill tighten down barrier.

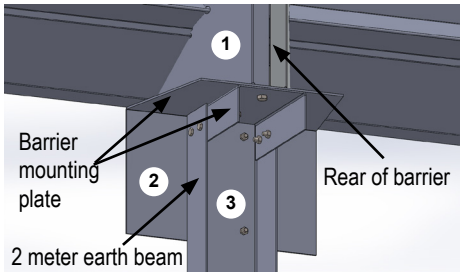
29.5 Anchoring in Unbound Cohesionless Soil with Steel

MDS® Barriers are a minimal deflection system therefore requiring a concrete footing that the barrier can be anchored to (See drawing H2-6000-AC3) or by using an earth beam which resembles an eyebeam on a guard rail. (See drawing H2-6000-AE4).









EARTH MOUNTING SUPPORT
1. SERGARD MDS® TL4 Barrier
2. Base anchor plate
3. 2 meter long earth support beam

Installation process for 2 meter earth beam

- Determine the anchor rod locations using the above listed drawing H2-6000-AP1 in Appendix A.
- Drive 2 meter earth beam flush to surface alignment with adjacent earth beams.
- Clear any debris from area to allow the installation of barrier mounting plate.
- Place barrier on top of barrier mounting plates.
- Install upper anchor rib (Part # T4-34050-G) onto M16 threaded rods and place two M16 washers and two M16 nuts.
- Using a socket drill tighten down barrier.

Should minimum soil characteristics not be adequate, please consult the manufacturer for advice on how best to proceed. In the event that unbound loose soil conditions exist, an extended earth beam may be required.

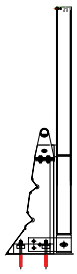
29.6 Attaching Site and Sound Walls

MDS® Barriers are are pre-designed to integrate noise-protection sound, wind and site walls within a single barrier system providing considerable savings in terms of occupied space, supporting substructures and overall cost in addition to requiring less lateral space on the bridge deck. The special backward positioning of the noise-protection barrier does not anchor to the road structure and does not alter or effect the preformance of the barrier during impact. The system is designed to move with the deformation of the barrier during impact.
See drawing H2-6000-7DA and H2-6000-7DAS for assembly details.

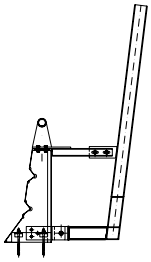
Attach I-beam

Secure and Tighten

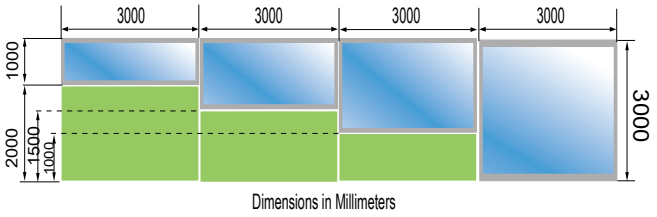
Slide in Panels



MODEL
H2-6000-7DA



MODEL
H2-6000-7DAS



STANDARD PANEL DIMENSIONS
MODEL H2-6000-7DA Maximum allowable height 4 meters
MODEL H2-6000-7DAS Maximum allowable height 3 meters

Installation of sound and site panels

- Install MDS® Barriers according to specifications and drawings in Appendix A.
- Place I-beam behind the barrier and bolt onto top rail post.
- Attach I-beam base to barrier base using attachment plate.
- Install all I-beams according project design.
- Using a fork lift or other lifting equipment, slide in sound, site or wind panels between I-beams.
- Lock panels into place with mounting clips.

⚠WARNING

Use caution when rigging units. Lifting from 2 points is recommended.
Tag lines should also be used to control the unit.

30. Inspection

Once the installation is complete, inspect the run and ensure that each of the following points are inspected

- Alignment of barrier is correct
- Approach/departure end of the run is protected as per the governing specifications
- Anchors are properly tightened according to the system being installed
- All joints are properly aligned
- Attachments and assemblies are properly engaged and bolts tightened at all connections

NOTE: Periodic inspections should be performed to check for damage to the units as well as to ensure that units are properly aligned.

31. Barrier Maintenance

After an impact with the barrier, there is potential maintenance to be conducted. The barrier should be checked to determine the extent of the damage to the barrier. In most instances, the barrier will not require to be replaced. If any of the following has occurred the barrier and or top rail post will require replacement:

- Barrier skin bent/pierced/broken revealing the inside of the barrier.
- Attachment joints dislodged and or broken resulting in incomplete locking of adjacent barrier.
- Top rail is bent, disconnected or damaged.

If any of the above damage has occurred, then possible replacement of the barrier section/unit and or top rail will be required. If the barrier needs to be replaced then the following steps should be conducted:

- Detach all appropriate connecting plates and screws from adjacent barriers.
- Lift out and remove the damaged barrier.
- Remove and clear any damaged parts from the area.
- Replace gap in the system with a new MDS® Barrier unit.
- Attach all appropriate connecting plates and screws to ensure system compliance.

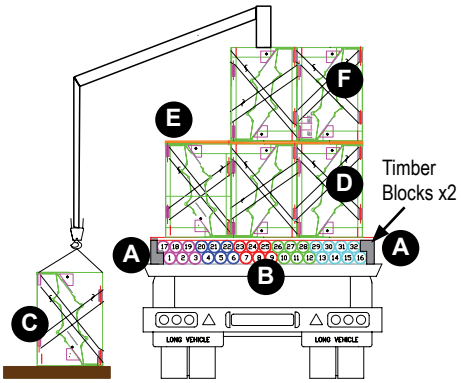
SERGARD MDS® TL4 BARRIERS

32. Removal and Loading

Before removing installed MDS® Barriers make sure to disconnect all attachment assemblies. As the barrier units are removed, the following loading sequence is recommended:

A. Place timber blocks to secure top rails.
B. Layer top rails up to 2 levels high.
C. Seat and strap barrier together.
D. Load first barrier layers 1, 2, 3.
E. Place timber blocks.
F. Load second barrier layer 4, 5, 6.

Refer to drawing H2-6000-LD12 Appendix A.



WARNING Failure to properly detach assemblies prior to removal of units may cause damage to units.

NOTICE Ensure all panels are correctly aligned during loading and tied down for safe transport.

33. Anchor Removal and Repair of Holes

For installations using all thread rod, remove nuts from the all thread rods, and uplift the barrier. Follow governing specifications for treatment of remaining all thread rod. All thread rod may be cut off. See drawing H2-6000-ACH1 for suggested repair methods once anchors are removed.

WARNING Ensure proper PPE is worn at all times when cutting and removing anchors.

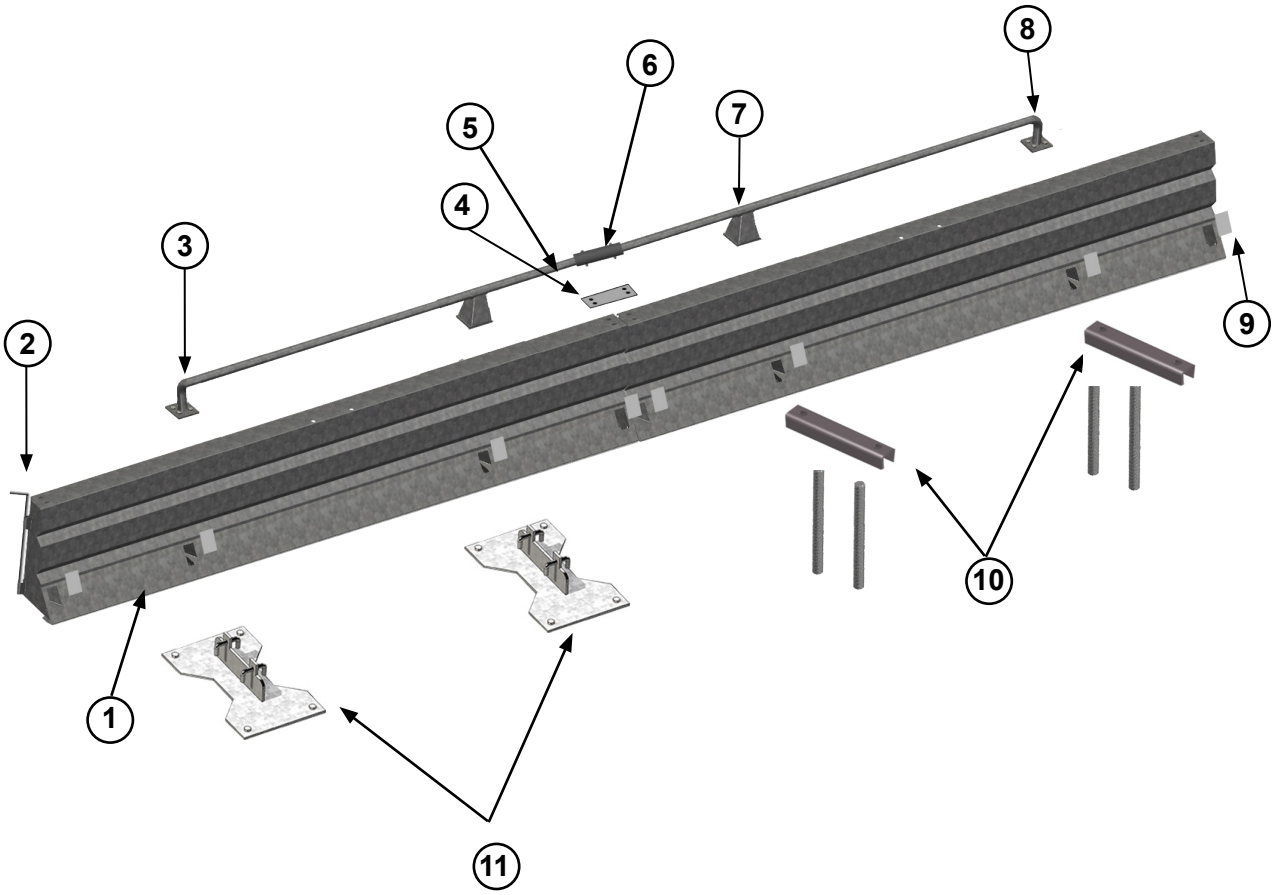
SERGARD MDS® TL4 BARRIERS

SECTION 4
SERGARD MDS® TL4 PARTS LIST

SERGARD MDS® TL4 BARRIERS

SECTION 6

SERGARD TL4 MDS® PARTS LIST



REF	Description
1	SERGARD MDS® TL4 WALL
2	Connecting pin
3	6 Meter top rail curved left
4	Splice plate
5	6 Meter top rail
6	Top rail connector
7	Top rail post
8	6 Meter top rail curved right
9	Access hole cover plate
10	Upper anchor rib
11	Quick release anchor plate

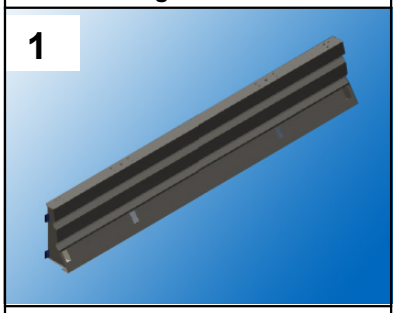
SERGARD MDS® TL4 BARRIERS

PARTS LIST

MAIN COMPONENTS

6 Meter Sergard MDS TL4 Wall

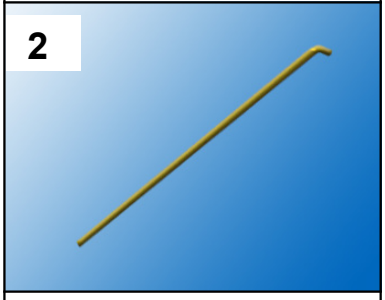
1



Part No: T4-620-G

Connecting Pin

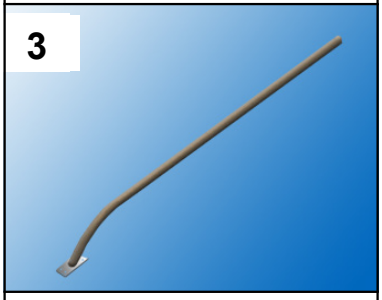
2



Part No: T4-CP1-G

6 Meter Top Rail Curved Left

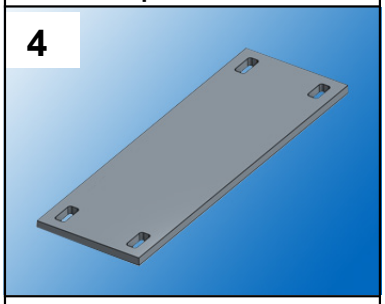
3



Part No: T4-TRL-G

Splice Plate

4



Part No: T4-SP1-G

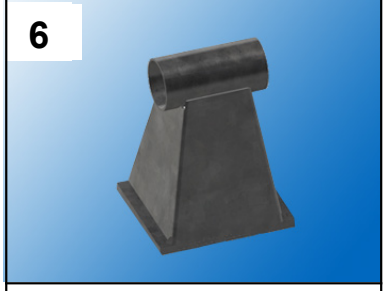
6 Meter Top Rail

5

Part No: T4-TRS-G

Top Rail Post

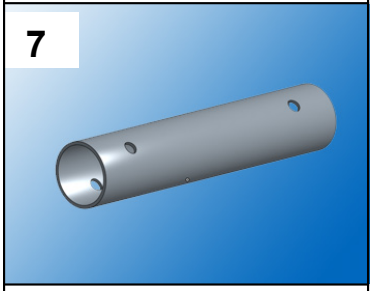
6



Part No: T4-SRP-G

Upper Top Rail Connector

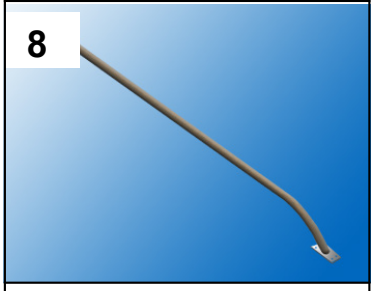
7



Part No: T4-DR-G

6 Meter Top Rail Curved Right

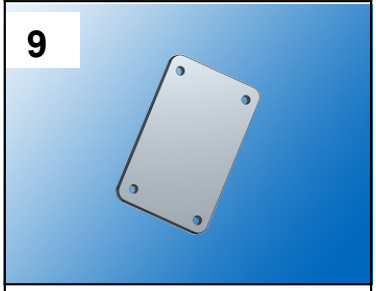
8



Part No: T4-TRR-G

Access Hole Cover Plate

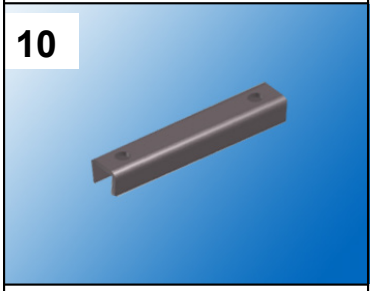
9



Part No: T45-CP-ST

Upper Anchor Rib

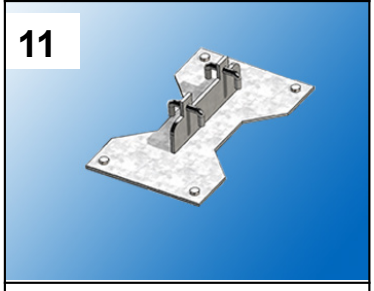
10



Part No: T4-34050-G

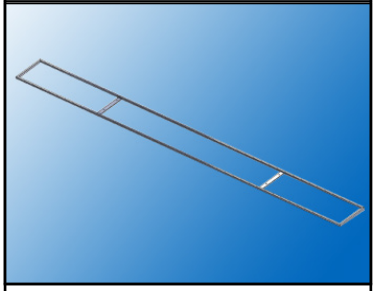
6 Meter Top Rail Curved Right

11



Part No: T45-QRP-G

3 Meter Instalation Template

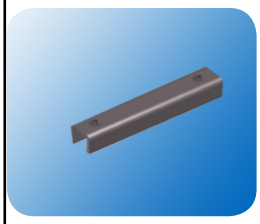


Part No: T4-TP-1

SERGARD MDS® TL4 BARRIERS

MAIN COMPONENT

ASSEMBLY HARDWARE

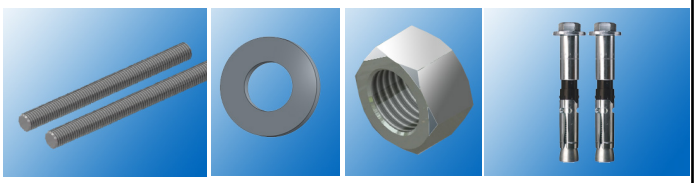


REFERENCE 10
Upper Anchor Rib

Anchor rib requires 2 anchors when installing to surface

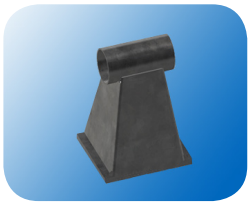
Part No: T4-34050-G

Concrete-Adhesive | **Concrete-DRY**



Ref 10A **Ref 10B** **Ref 10C** **Ref 10D**

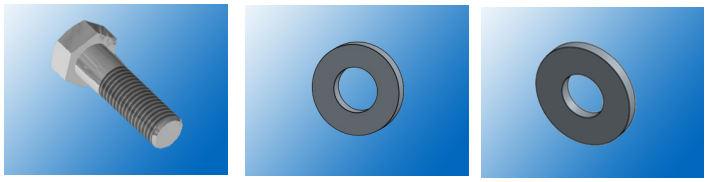
REF	Part No.	TYPE	Installation	DIM. METRIC	DIM US	QUANTITY	ADHESIVE
10A	T4-A16290-G	Threaded Rod	Concrete	M16 x 290	5/8 x 6.5	2	Yes
10B	T4-B16-G	Washer		M16	5/8	2	
10C	T4-C16-G	Hex nut		M16	5/8	2	
10D	T45-D16165-G	Expansion anchor	Concrete	M16 x 165	5/8 x 6.5	2	No



REFERENCE 6
Top Rail Post

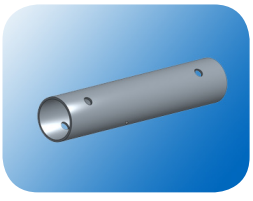
Top rail support assembly hardware

Part No: T4-SRP-G



Ref 6A **Ref 6B** **Ref 6C**

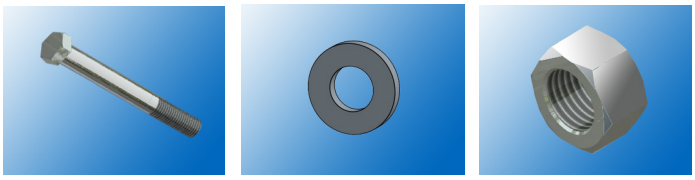
REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
6A	T45-A2060-G	Hex bolt	M20 x 60	0.75 x 2.5	4
6B	T45-B20-G	Washer	M20	0.75	8
6C	T45-C20-G	Hex nut	M20	0.75	4



TOP RAIL CONNECTOR

Connecting element for joining rails together

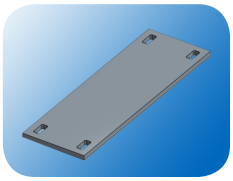
Part No: T4-DR-G



Ref 6D **Ref 6E** **Ref 6F**

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
6D	T4-D12-G	Hex bolt	M12 x 110	1 x 8	2
6E	T4-E12-G	Washer	M12	1	4
6F	T4-F12-G	Hex nut	M12	1	2

SERGARD MDS® TL4 BARRIERS

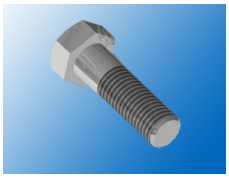


Part No: T4-SP1-G

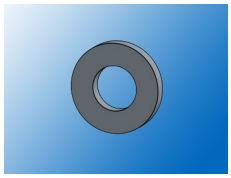
REFERENCE 4

Splice Plate

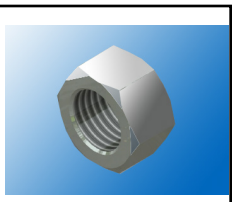
Attaches two MDS® TL4 barrier sections together



Ref 4A

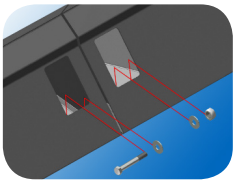


Ref 4B



Ref 4D

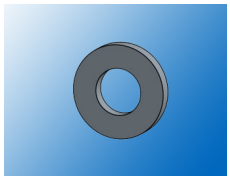
REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
4A	T45-A2060-G	Hex bolt	M20 x 60	0.75 x 2.5	4
4B	T45-B20-G	Washer	M20	0.75	8
4D	T45-D20-G	Hex nut	M20	0.75	4



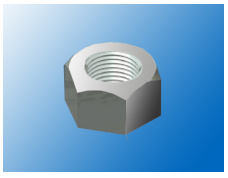
FRONT BOLT CONNECTOR

Attaches two MDS® TL4 barrier sections together front side

Ref 4E



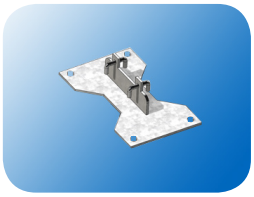
Ref 4F



Ref 4G

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
4E	T45-E16120-G	Hex bolt	M16 x 120	5/8 x 4 3/4	1
4F	T45-F16-G	Washer	M16	5/8	2
4G	T45-G16-G	Hex nut	M16	5/8	1

SERGARD MDS® TL4 BARRIERS

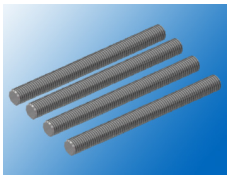


Part No: T45-QRP-G

REFERENCE 11
Quick Release Anchor Plate

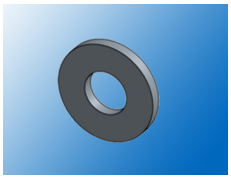
Anchor plate requires 4 anchors when installing to surface

Concrete-Adhesive



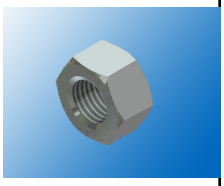
Ref 11A

Concrete-DRY



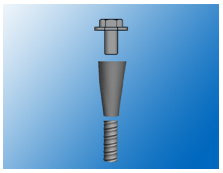
Ref 11B

Asphalt



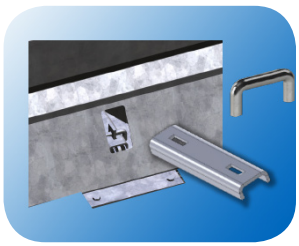
Ref 11C

Ref 11D



Ref 11E

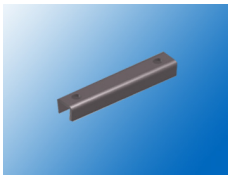
REF	Part No.	TYPE	Installation	DIM. METRIC	DIM US	QUANTITY	ADHESIVE
11A	T45-A16165-G	Threaded Rod	Concrete	M16 x 165	5/8 x 6.5	4	Yes
11B	T45-B16-G	Washer		M16	5/8	4	
11C	T45-C16-G	Hex nut		M16	5/8	4	
11D	T45-D16165-G	Expansion anchor	Concrete	M16 x 165	5/8 x 6.5	4	No
11E	T45-E15500-G	DYWIDAG	Asphalt	M15 x 500	5/8 x 20	4	Yes



REFERENCE 11
Quick Release Anchor Plate Hardware

Anchor plate requires Rib and U-pins

Upper Anchor Rib



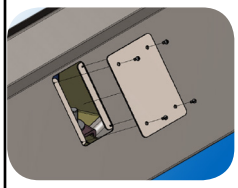
Ref 11D

U-pins

Ref 11E

REF	Part No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTI-TY
11F	T45-F34073-G	Upper anchor rib	340 x 73	13.5 x 2.8	1
11G	T45-GPIN1-G	U-pins			2

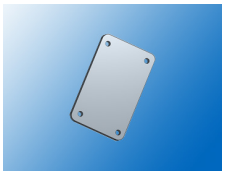
SERGARD MDS® TL4 BARRIERS



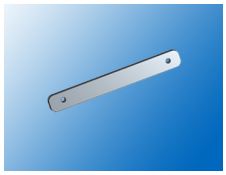
Part No: T45-CP-ST

Access Hole Cover Plate

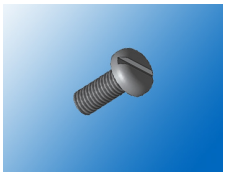
Front anti-debris access cover



Ref 14



Ref 15

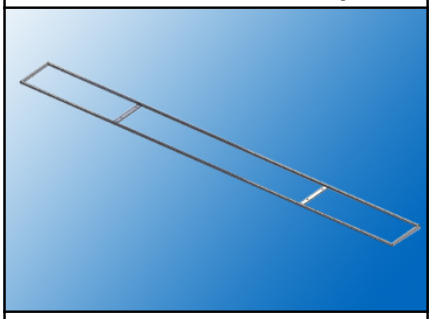


Ref 50

REF	PART No.	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
9A	T45-ACP-ST	Cover plate			1
9B	T45-BCP-ST	Cover attachment rib			2
9C	T45-C630-ST	Machine screw	M6	1/4	4

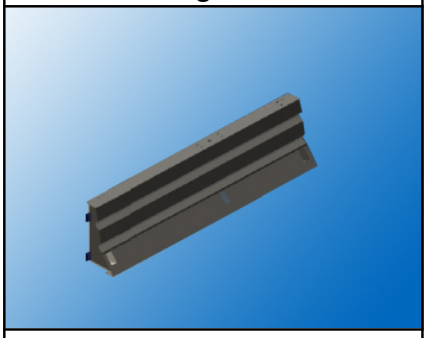
Accessories

3 Meter Installation Template



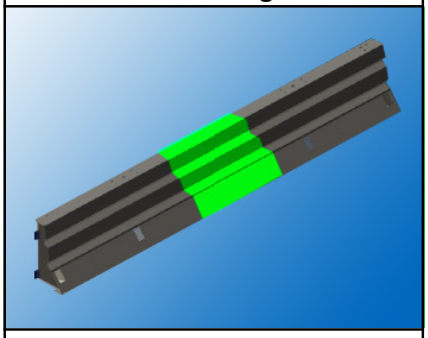
Part No: T4-TP-1

3 Meter Sergard MDS TL4

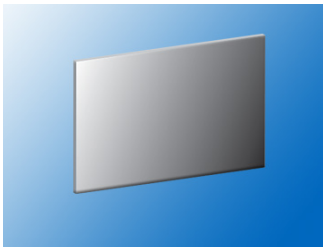


Part No: T4-310-G

MDS Variable Length Barrier



Part No: T4-VLB620-068M-G



Back Panel

The design of the MDS® BARRIER has an open back. Some applications may want to close the space by utilizing back panels for aesthetics. Different materials are available based on project integration and land scape such as solid panels, and perforated steel.
Contact MDS® Barriers for more information and material choices.

REF	PART No.	TYPE	DESCRIPTION	DIM. METRIC	DIM US	QUANTITY
55	M45-1M2-G	Plate	Galvanized panel	J		1
57	M45-1M2-ST	Plate	Stainless steel	J		1

SERGARD MDS® TL4 BARRIERS

ANNEX DRAWING LIST

ANNEX 1

REF	Drawing Number	Drawing Description	SURFACE ANCHORING		
			Concrete	Asphalt	Earth
1	H2-6000-AP1	Minimal Deflection System Permanent Installation	X		
2	H2-6000-AT2	Minimal Deflection System Temporary Installation	X		
3	H2-6000-AA4	Minimal Deflection System Temporary Asphalt Installation		X	
4	H2-6000-AC3	Minimal Deflection System Unbound Gravel Installation	X		
5	H2-6000-AE4	Minimal Deflection System Earth Beam Installation			X
6	H2-6000-AP1-2	TL4 MINIMUM Deflection Values			
7	H2-6000-AP1-3	Permanent Anchor Details			

ANNEX 2

REF	Drawing Number	Drawing Description
11	H2-6000-IR23	Maximum Inner Radius 6 meter section
12	H2-6000-OR24	Maximum Outer Radius 6 meter section
13	H2-3000-IR23	Maximum Inner Radius 3 meter section
14	H2-3000-OR24	Maximum Outer Radius 3 meter section

ANNEX 3

REF	Drawing Number	Drawing Description
15	H2-6000-VLB-T1	Variable Length Barrier for Bridge Expansion Joints
16	H2-2000-TQG-610	Attenuators
17	H2-6000-TWB-350	MDS to W-beam transition

ANNEX 4

REF	Drawing Number	Drawing Description
20	H2-6000-7DA	Sound Wall Maximum Allowable Height 4 Meters
21	H2-6000-7DAS	Sound Wall Maximum Allowable Height 3 Meters
22	H2-6000-ACH1	Recommended Repair Methods once anchors are removed

ANNEX 5

REF	Drawing Number	Drawing Description
30	H2-6000-SHIPPING-LV1	Truck Loading and Stacking

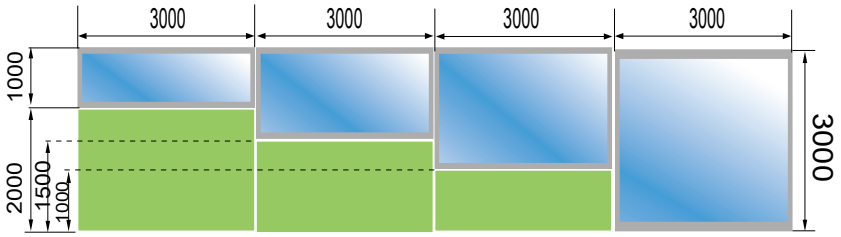
ANNEX 6

REF	Document	Document Description
40	SWMS	Safe Working Method Statement

Sound & Site Wall Part Reference

MDS® BARRIERS are pre-designed to integrate modular noise-protection and site walls within a single barrier system providing considerable savings in terms of occupied space, supporting substructures and overall cost. The special backward positioning of the noise-protection barrier requires less lateral space on the bridge deck. Modular site and sound panels have been crash tested with Sergard MDS® TL4 Barriers. The panel design does not effect the performance of the barrier while being impacted. 6 Panel sizes to accommodate visual and sound solutions.

STANDARD PANEL DIMENSIONS



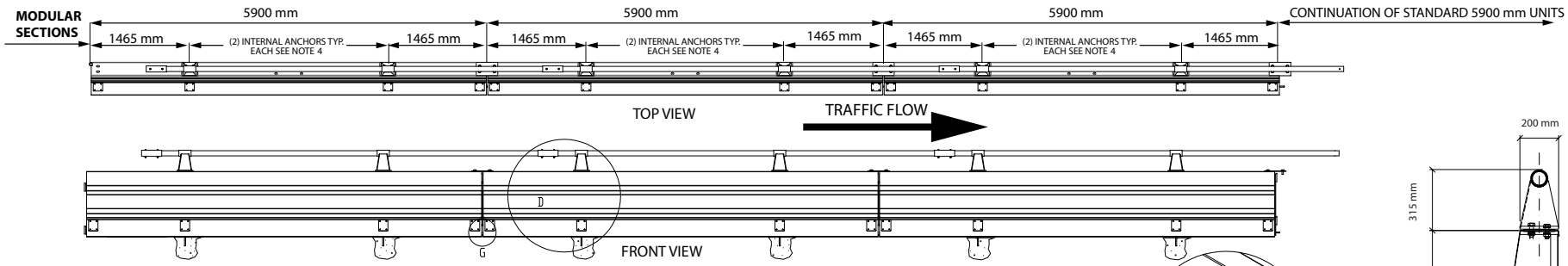
Dimensions in Millimeters

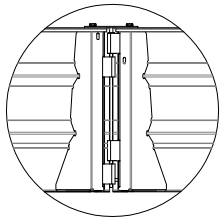
REF	PART No.	TYPE	DESCRIPTION	SIZES Length	Size Height	COLOR
80	M45-G52	Site	Laminated glass panel	3000 mm 3000 mm 3000 mm	1000 mm 1500 mm 2000 mm 3000 mm	Transparent / *Frosted
82	M45-GS52	Sound	Galvanized sound panel			Yes
84	M45-SS52	Sound	Stainless steel sound panel			Yes
86	M45-AL52	Sound	Aluminum sound panel			Yes
88	M45-DWL52	Wind	Dissuasive wind louvers			Yes
89	M45-CLF-2	Fence	2 inch chain link fence			Standard

* For flying bird protection, transparent glass panels are available with sand blasted lines or bird figures unless custom templates are used.

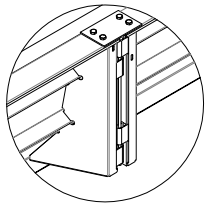
ANNEX 1
Standard Barrier Sections

REF	Drawing Number	Drawing Description	SURFACE ANCHORING		
			Concrete	Asphalt	Earth
1	H2-6000-AP1	Minimum Deflection System Permanent Installation	X		
2	H2-6000-AT2	Minimum Deflection System Temporary Installation	X		
3	H2-6000-AA4	Minimum Deflection System Temporary Asphalt Installation		X	
4	H2-6000-AC3	Minimum Deflection System Unbound Gravel Installation	X		
5	H2-6000-AE4	Minimum Deflection System Earth Beam Installation			X
6	H2-6000-AP1-2	SERGARD MDS® TL4 MINIMUM Deflection Values			
7	H2-6000-AP1-3	Permanent Anchor Details			

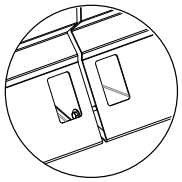




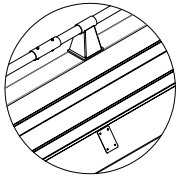
CONNECTION DETAIL STEP 1
PIN JUNCTION



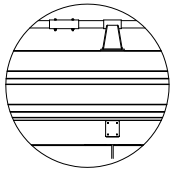
CONNECTION DETAIL STEP 2
TOP SPLICE PLATE



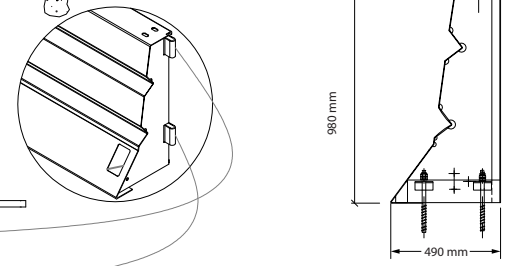
CONNECTION DETAIL STEP 3
FRONT PANEL UNION BOLT

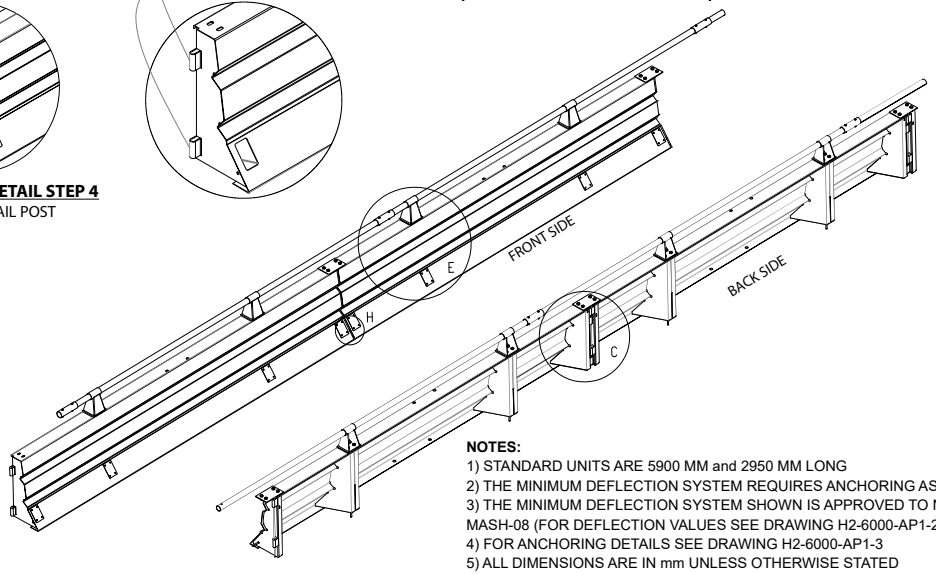


CONNECTION DETAIL STEP 4
TOP TUBE RAIL POST



CONNECTION DETAIL STEP 5
TOP RAIL JUNCTION





INTERNAL ANCHORING

NOTES:
1) STANDARD UNITS ARE 5900 MM and 2950 MM LONG
2) THE MINIMUM DEFLECTION SYSTEM REQUIRES ANCHORING AS SHOWN
3) THE MINIMUM DEFLECTION SYSTEM SHOWN IS APPROVED TO NCHRP 350 TL-4 AND MASH-08 (FOR DEFLECTION VALUES SEE DRAWING H2-6000-AP1-2)
4) FOR ANCHORING DETAILS SEE DRAWING H2-6000-AP1-3
5) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
6) SYSTEM SHOULD NOT BE PLACED ON A CROSS SLOPE OF MORE THEN 5%
7) 5900 mm UNITS CAN BE PLACED ON HORIZONTAL CURVES DOWN TO 160 METER RADIUS
8) 2950 mm UNITS CAN BE PLACED ON HORIZONTAL CURVES DOWN TO 73 METER RADIUS
9) 5900 mm UNITS CAN ACCOMMODATE A CHANGE IN GRADE OF 2% OVER ITS LENGTH

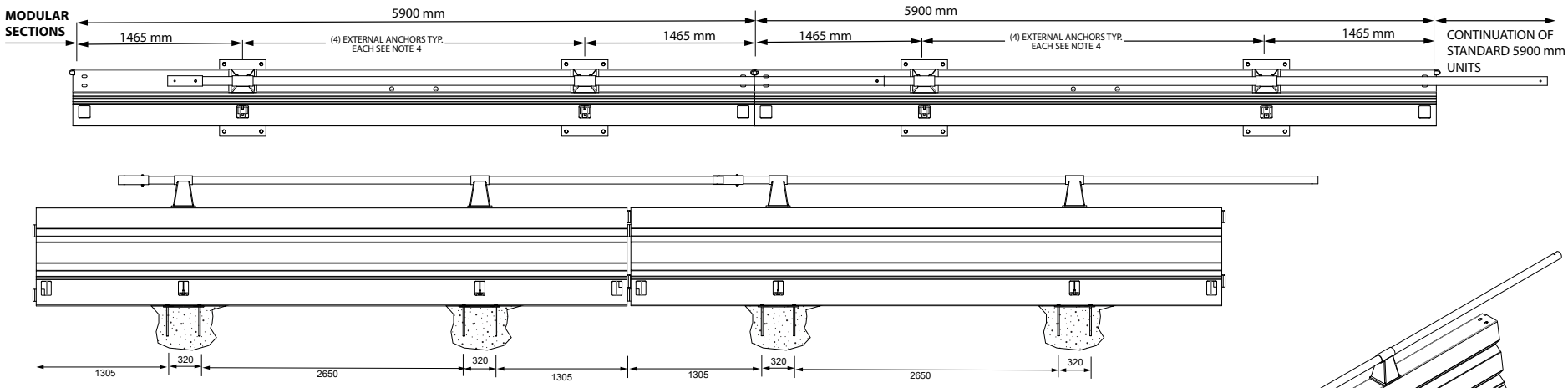
Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

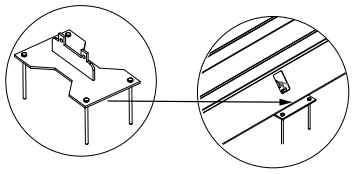
Description
SERGARD MDS® TL4
BARRIER
PERMANENT INSTALLATION
MINIMUM DEFLECTION SYSTEM
INSTALLATION DETAILS

UNCONTROLLED WHEN PRINTED

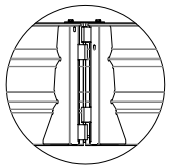
MDS® BARRIERS
43 Franklin St
East Hartford CT 06108
Tel: 860.289.8033
Fax: 860.289.8035
www.MDSBARRIERS.com

Drawing No.
H2-6000-AP1

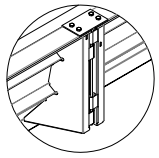




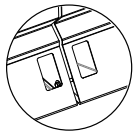
CONNECTION DETAIL STEP 1
ATTACH PLATE TO BARRIER BASE (2 BASES PER BARRIER)



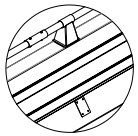
CONNECTION DETAIL STEP 2
PIN JUNCTION



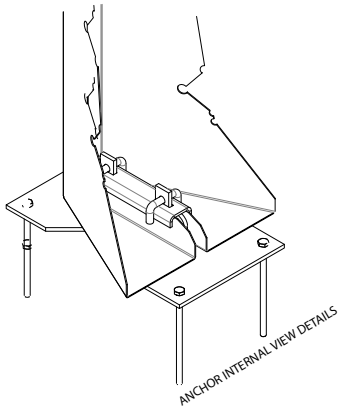
CONNECTION DETAIL STEP 3
TOP SPLICE PLATE



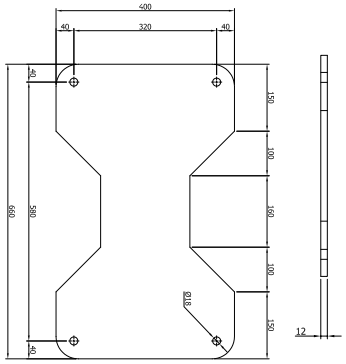
CONNECTION DETAIL STEP 4
FRONT PANEL UNION BOLT

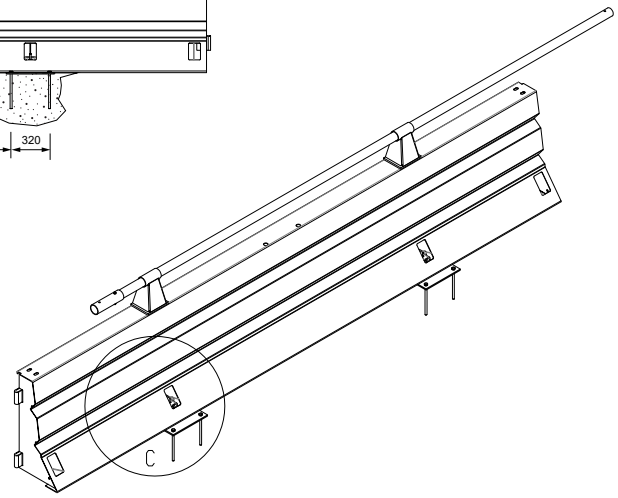


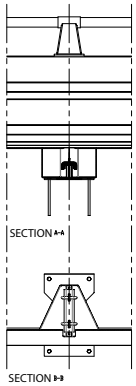
CONNECTION DETAIL STEP 5
TOP TUBE RAIL POST

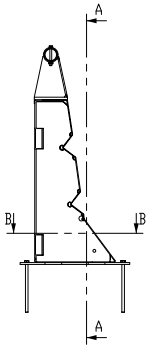


ANCHOR INTERNAL VIEW DETAILS









NOTES:
1) STANDARD UNITS ARE 5900 MM and 2950 MM LONG
2) THE MINIMUM DEFLECTION SYSTEM REQUIRES ANCHORING AS SHOWN
3) THE MINIMUM DEFLECTION SYSTEM IS APPROVED TO NCHRP 350 TL-4 AND MASH-08 (FOR DEFLECTION VALUES SEE DRAWING H2-6000-AP1-2)
4) FOR ASPHALT ANCHORING DETAILS SEE DRAWING H2-6000-AA4
5) FOR CONCRETE ANCHORING DETAILS SEE DRAWING H2-6000-API-3
5) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
6) SYSTEM SHOULD NOT BE PLACED ON A CROSS SLOPE OF MORE THEN 5%
7) 5900 mm UNITS CAN BE PLACED ON HORIZONTAL CURVES DOWN TO 160 METER RADIUS
8) 5900 mm UNITS CAN ACCOMMODATE A CHANGE IN GRADE OF 2% OVER ITS LENGTH

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description
SERGARD MDS® TL4
BARRIER
Minimum Deflection System Temporary Installation

UNCONTROLLED WHEN PRINTED

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43 Franklin St
East Hartford CT 06108
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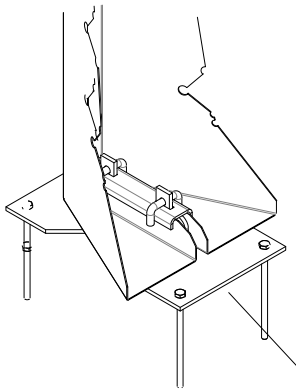
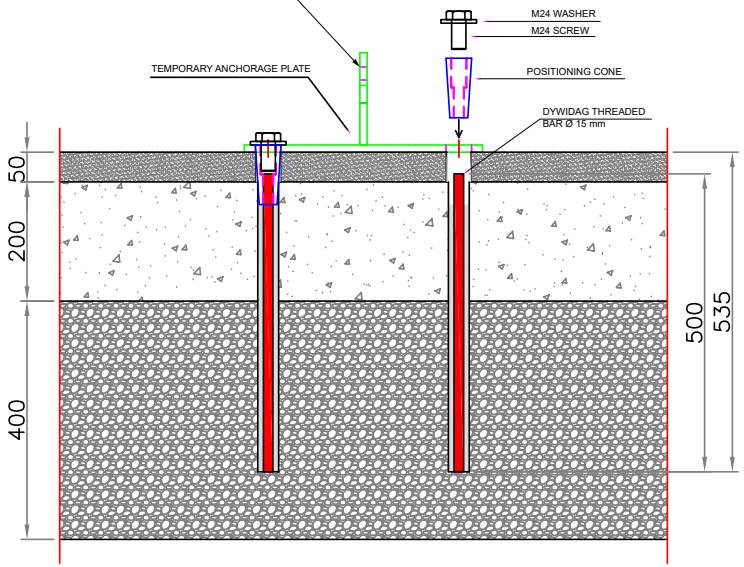
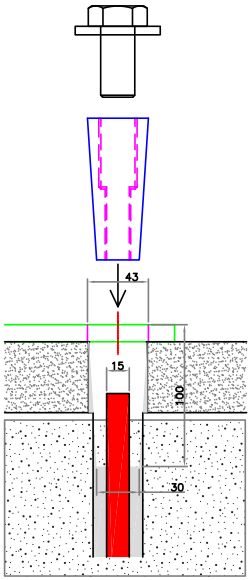
Drawing No.
H2-6000-AT2

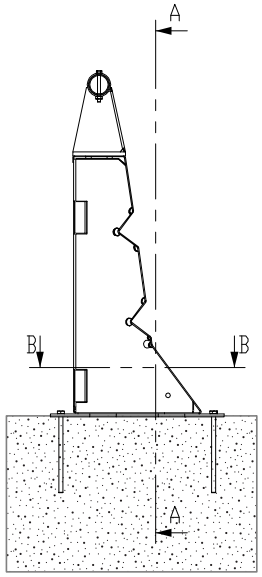


DANGER

ALLWAYS ENSURE UTILITY LOCATIONS ARE DETERMINED BEFORE DRILLING HOLES







PLACE BARRIER ON TEMPORARY ANCHORAGE PLATE AND LOCK IN PLACE WITH U-LOCKS. ONCE BARRIERS ARE PLACED ON ROADWAY DRILL 4 HOLES DIA. 30 x 535 mm DEEP. REMOVE DEBRIS, INSTALL DYWIDAG THREADED BAR.

NOTES:

1) ANCHOR LOCATIONS REFER TO DRAWING H2-6000-AT2.
2) ANCHORING ON ASPHALT REQUIRES DYWIDAG OR EQUAL DIA. 15 X 500 mm THREADED BAR AS SHOWN .
3) FOR ANCHORING ON ASPHALT WITH LESS THAN 200 mm OF ASPHALT CONSULT MANUFACTURER.
4) ALTERNATIVE ANCHOR DESIGNS CERTIFIED BY THE MANUFACTURER MAY BE USED TO PROVIDE EQUAL OR GREATER ANCHORAGE STRENGTH TO ACCOMMODATE INSTALLATIONS ON SURFACES NOT SPECIFIED IN THE MANUAL.
5) FOR ADDITIONAL ANCHORING ALTERNATIVES AND INFORMATION CONSULT INSTALLATION MANUAL.
6) ALL NUMBERS SHOWN IN mm UNLESS OTHERWISE SPECIFIED.

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description

SERGARD MDS® TL4
BARRIER
TEMPORARY ASPHALT
ANCHOR DETAILS

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MDS® BARRIERS
43 Franklin St
East Hartford CT 06108
Tel: 860.289.8033
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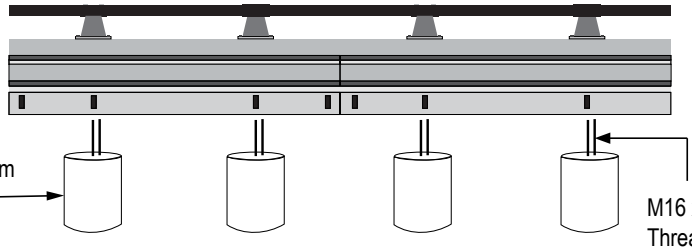
www.MDSBARRIERS.com

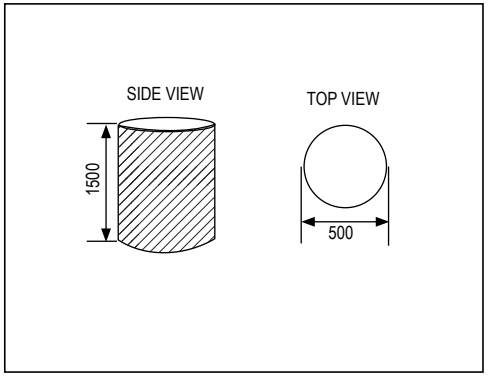
Drawing No.

H2-6000-AA4

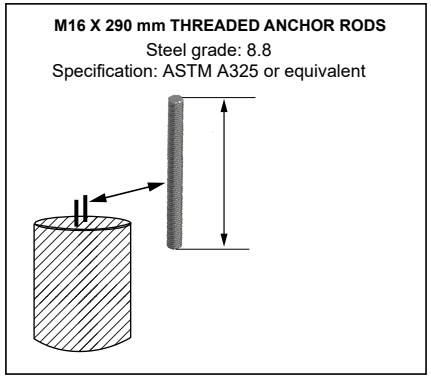


DANGER

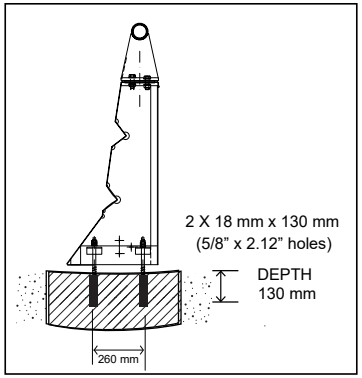
ALLWAYS ENSURE UTILITY LOCATIONS ARE DETERMINED BEFORE DRILLING HOLES



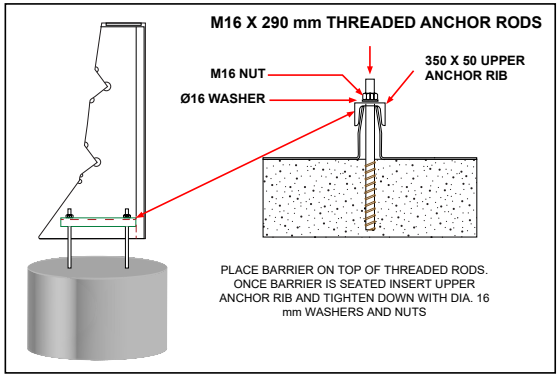
STEP 1 CONCRETE FOOTING
Dimensions Dia. 500 mm x 1500 mm



STEP 2 ANCHOR INSTALLATION
Install threaded Rod



STEP 3 BARRIER PLACEMENT
Anchor barrier to concrete footing



STEP 4 BARRIER TIGHTENING
Align all barriers and secure all the bolts

NOTES:

1) ANCHOR LOCATIONS REFER TO DRAWING H2-6000-AP1.
2) REMOVE EARTH AND FILL A DIAMETER 500 mm X 1500 mm DEEP CAVITY WITH REBAR AND CONCRETE.
3) ONCE CONCRETE IS CURED USE THE DRILLING TEMPLATE (PART # T4-TP-1) AND DRILL TWO HOLES PER ANCHOR LOCATION 18 mm X 130 mm DEEP.
4) REMOVE THE DEBRIS FROM THE HOLE AND AREA.
5) CHECK THE DEPTH OF THE HOLE TO ENSURE PROPER EMBEDMENT.
6) INJECT RESIN AS PER MANUFACTURER'S INSTRUCTIONS.
7) ALLOW RESIN TO CURE AS PER MANUFACTURER'S INSTRUCTIONS.
8) PLACE BARRIER ON TOP OF THREADED RODS.
9) INSTALL UPPER ANCHOR RIB (PART # T4-34050-G) ONTO THREADED RODS AND PLACE TWO M16 WASHERS AND TWO M16 NUTS ON THE RODS.
10) USING A SOCKET DRILL TIGHTEN DOWN BARRIER.
11) ALL NUMBERS SHOWN IN mm UNLESS OTHERWISE SPECIFIED.

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description

SERGARD MDS® TL4
BARRIER
ANCHORING IN UNBOUND
GRANULAR OR COHESIONLESS
CONDITIONS

UNCONTROLLED WHEN PRINTED

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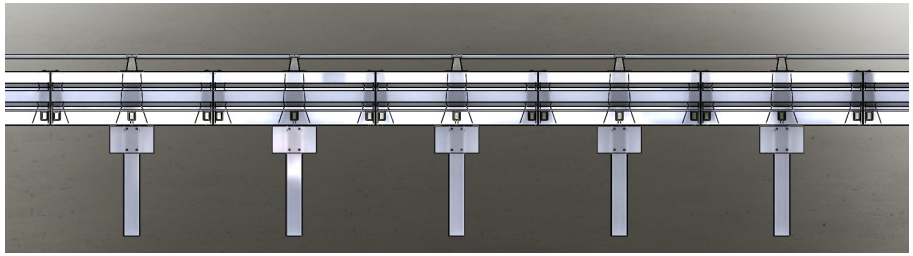
East Hartford CT 06108
Tel: 860.289.8033
Fax: 860.289.8035
www.MDSBARRIERS.com

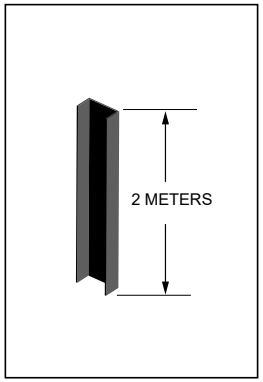
Drawing No.

H2-6000-AC3

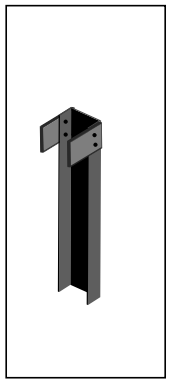


DANGER

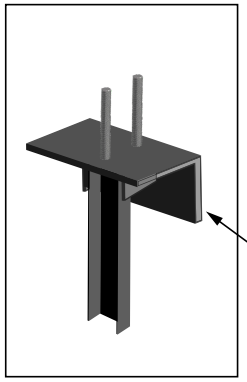
ALLWAYS ENSURE UTILITY LOCATIONS ARE DETERMINED BEFORE DRILLING HOLES



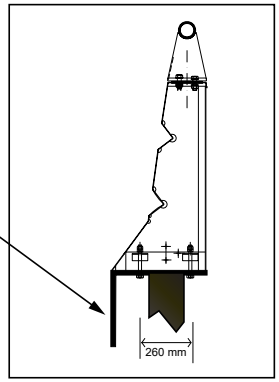
STEP 1
EARTH BEAM
Drive Earth Beam 2 meters into soil

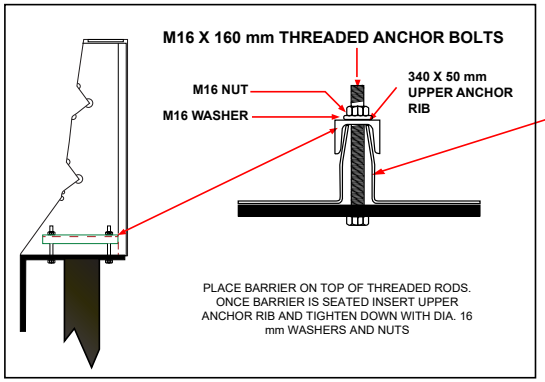


STEP 2
ATTACH BRACKETS

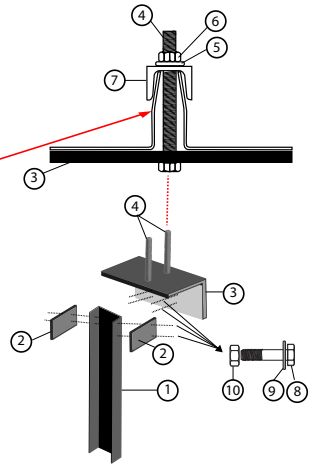


STEP 3
MOUNT TOP PLATE AND ANCHOR BOLTS





STEP 4 ANCHOR INSTALLATION
Anchor barrier to top of earth beam



NOTES:

1) ANCHOR LOCATIONS REFER TO DRAWING H2-6000-AP1.
2) DRIVE 2 METER EARTH BEAM FLUSH TO SURFACE ALIGNMENT WITH ADJACENT EARTH BEAMS.
3) CLEAR ANY DEBRIS FROM AREA TO ALLOW THE MOUNTING OF BARRIER MOUNTING PLATE.
4) ATTACH TWO M16 X 160 MM BOLT TO THE TOP PLATE.
5) ATTACH THE SIDE BRACKETS AND TOP MOUNTING PLATES USING M20 X 60 MM HEX BOLTS.
6) PLACE BARRIER ON TOP OF BARRIER MOUNTING PLATES.
7) INSTALL UPPER ANCHOR RIB (PART # T4-34050-G) AND PLACE M16 WASHERS AND TWO M16 NUTS ON THE ANCHOR BOLTS.
8) USING A SOCKET DRILL TIGHTEN DOWN BARRIER.
9) ALL NUMBERS SHOWN IN mm UNLESS OTHERWISE SPECIFIED.

REF	PART	DESCRIPTION	QUANTITY
1	T4-EB2M-G	2 METER EARTH BEAM	1
2	T4-EBSB-G	SIDE BRACKETS	2
3	T4-EBTP-G	TOP PLATE	1
4	T45-A16160-G	M16 X 160 MM HEX BOLT	2
5	T4-B16-G	M16 WASHER FOR UPPER ANCHOR RIB	2
6	T4-C16-G	M16 HEX NUT FOR UPPER ANCHOR RIB	2
7	T4-34050-G	UPPER ANCHOR RIB	1
8	T45-A2060-G	M20 X 60 MM HEX BOLT	8
9	T45-B20-G	M20 WASHER	8
10	T45-C20-G	M20 HEX NUT	8

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description

SERGARD MDS® TL4 BARRIER EARTH BEAM INSTALLATION

UNCONTROLLED WHEN PRINTED

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43 Franklin St
East Hartford CT 06108
Tel: 860.289.8033
Fax: 860.289.8035
www.MDSBARRIERS.com

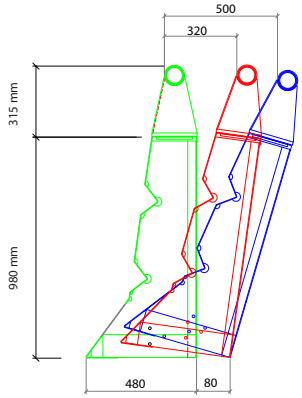
Drawing No.

H2-6000-AE4

SERGARD MDS® TL4 Barriers have been tested extensively and approved in accordance with NCHRP 350, and MASH-08, as well as the European standards EN 1317-5:2007+A1:2008. The testing has shown that SERGARD MDS® TL4 Barrier is acceptable for use on roadways throughout the world including the USA.

LEVEL	Parameter	Report 350	MASH-08	EN1317
TL-4	Test Vehicle Type Vehicle Mass (kg) Vehicle c.g. height (mm) Impact Velocity (km/hr) Impact Angle (deg) Impact Severity (kj)	4-10/5-10 Passenger Car 820 550 100 20 37	4-10/5-10 Passenger Car 1100 100 25 76	TB-11 Passenger Car 900 490 100 20 41
TL-4	Test Vehicle Type Vehicle Mass (kg) Vehicle c.g. height (mm) Impact Velocity (km/hr) Impact Angle (deg) Impact Severity (kj)	4-12 Single Unit Truck 8,000 1,250 80 15 132	4-12 Single Unit Truck 10,000 1,700 90 15 209	TB-51 Bus 13,000 1,400 70 20 287

TEST TB 51



Test No.	Speed km/h	Vehicle weight kg	Impact angle	Max Dynamic Deflection m	Max Permanent Deflection m
TB11	102.9	924	20	0.16	0.12
TB51	71.6	13120	20	0.50	0.32

TEST TB 11 - SERGARD MDS® TL4							
Speed (km/h)	100	90	80	70	60	50	40
Permanent deflection (m)	0.12	0.097	0.077	0.059	0.043	0.030	0.019

TEST TB 51 - SERGARD MDS® TL4				
Speed (km/h)	70	60	50	40
Permanent deflection (m)	0.32	0.235	0.163	0.104

TEST TB 11

Maximum dynamic deflection 0.16 m
Maximum permanent deflection 0.12 m
Normalised dynamic deflection 0.16 m

TEST TB 51

Maximum dynamic deflection 0.50 m
Maximum permanent deflection 0.32 m
Normalised dynamic deflection 0.49 m

NOTES:
1) ALL DEFLECTION VALUES SHOWN IN TABLES ARE DYNAMIC DEFLECTIONS OF THE BARRIER.
2) ALL NUMBERS SHOWN ARE IN mm UNLESS NOTED

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description
SERGARD MDS® TL4
BARRIER
DEFLECTION DETAILS

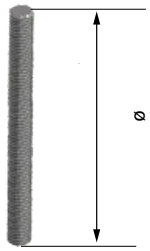
UNCONTROLLED WHEN PRINTED

MDS® BARRIERS
43 Franklin St
East Hartford CT 06108
Tel: 860.289.8033
Fax: 860.289.8035
www.MDSBARRIERS.com

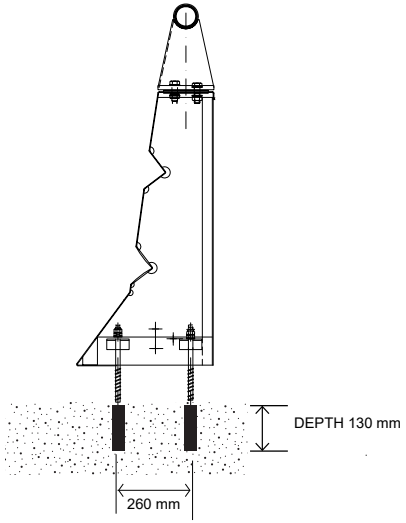
Drawing No.
H2-6000-AP1-2

DANGER

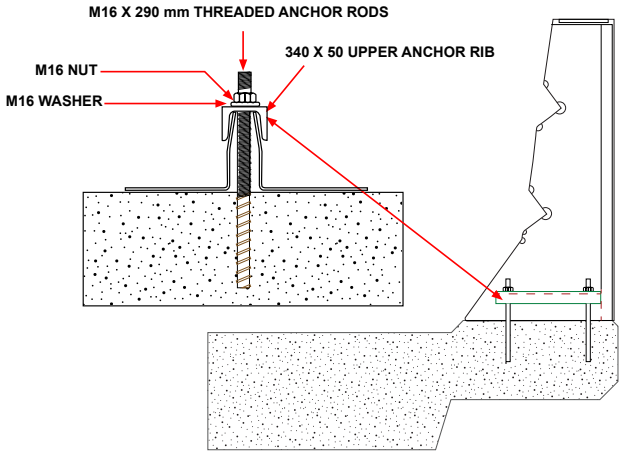
ALLWAYS ENSURE UTILITY LOCATIONS ARE DETERMINED BEFORE DRILLING HOLES



M16 THREADED ROD
Steel grade: 8.8
Specification: ASTM A325 or equivalent



DRILL 2 HOLES DIA. 18 mm X 130 mm
CLEAN DEBRIS FROM HOLE, INJECT RESIN
(5/8" x 2.12" holes)



PLACE BARRIER ON TOP OF THREADED RODS. ONCE BARRIER IS SEATED INSERT UPPER ANCHOR RIB AND TIGHTEN DOWN WITH M16 WASHERS AND NUTS

NOTES:

1) ANCHOR LOCATIONS REFER TO DRAWING H2-6000-AP1.
2) ANCHORING IN CONCRETE REQUIRES M16 X 290 mm THREADED RODS AS SHOWN WITH A MINIMUM EMBEDMENT DEPTH OF 130 mm.
3) FOR ANCHORING ON A BRIDGE DECK WITH LESS THAN 130 mm EMBEDMENT DEPTH AND 94 mm MINIMUM EDGE DISTANCE CONSULT MANUFACTURER.
4) ALTERNATIVE ANCHOR DESIGNS CERTIFIED BY THE MANUFACTURER MAY BE USED TO PROVIDE EQUAL OR GREATER ANCHORAGE STRENGTH TO ACCOMMODATE INSTALLATIONS ON SURFACES NOT SPECIFIED IN THE MANUAL.
5) FOR ADDITIONAL ANCHORING ALTERNATIVES AND INFORMATION CONSULT INSTALLATION MANUAL.
6) ALL NUMBERS SHOWN IN mm UNLESS OTHERWISE SPECIFIED.

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description
SERGARD MDS® TL4
BARRIER
CONCRETE ANCHOR
DETAILS

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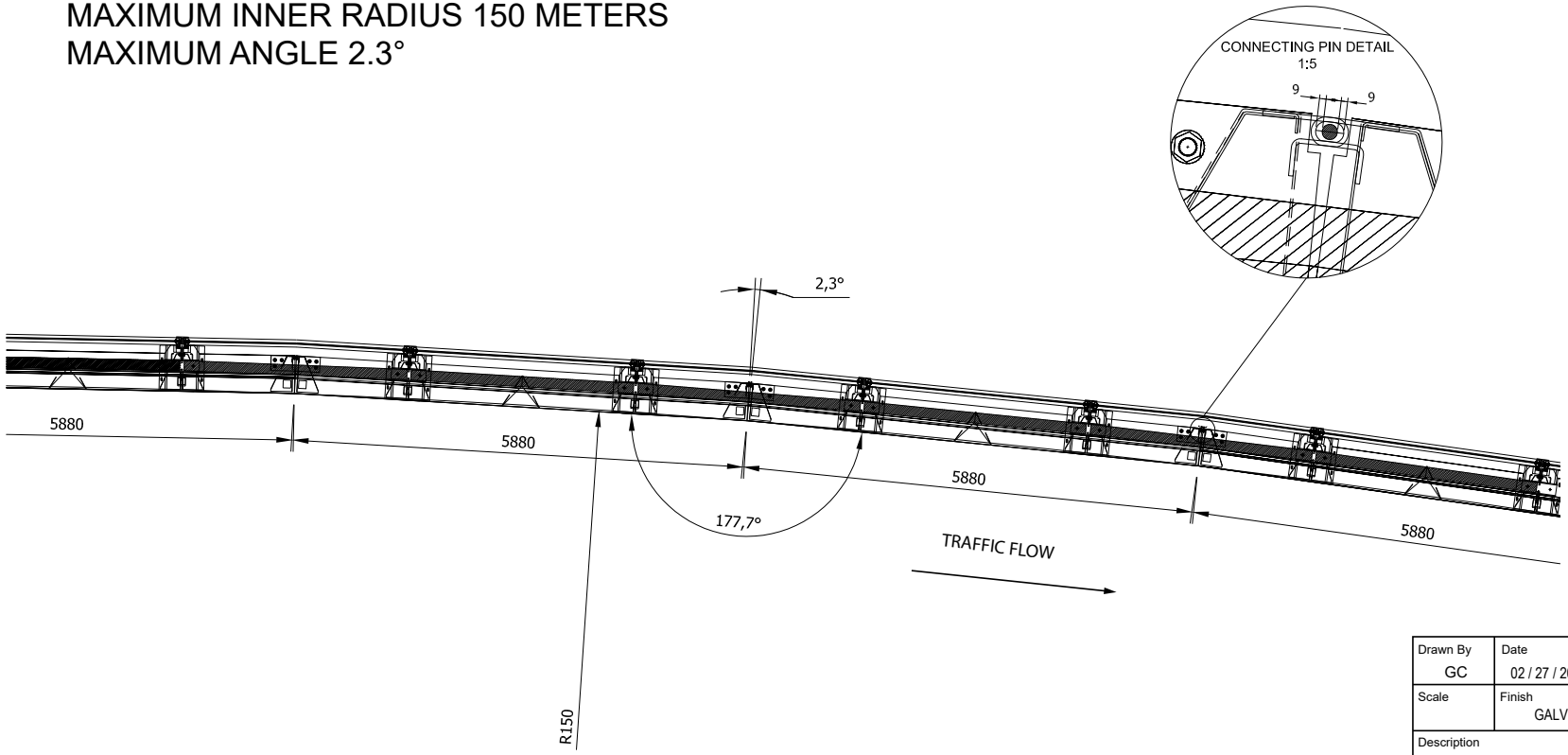
Drawing No.
H2-6000-AP1-3

ANNEX 2
Barrier Radius Curvature

REF	Drawing Number	Drawing Description
11	H2-6000-IR23	Maximum Inner Radius 6 meter section
12	H2-6000-OR24	Maximum Outer Radius 6 meter section
13	H2-3000-IR23	Maximum Inner Radius 3 meter section
14	H2-3000-OR24	Maximum Outer Radius 3 meter section

5900 mm SERGARD MDS® TL4 BARRIER
MAXIMUM INNER RADIUS 150 METERS
MAXIMUM ANGLE 2.3°



NOTES:
1) MAXIMUM INNER RADIUS IS 150 METERS UTILIZING 5900 mm LONG SECTIONS
2) THE MINIMUM DEFLECTION SHOWN REQUIRES ANCHORING AS SHOWN
3) THE MINIMUM DEFLECTION SYSTEM SHOWN IS APPROVED TO NCHRP 350 TL-4 AND MASH-08 (FOR DEFLECTION VALUES SEE DRAWING H2-6000-AP1-2
4) FOR ANCHORING DETAILS SEE DRAWING H2-6000-AP1-3
5) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
6) SYSTEM SHOULD NOT BE PLACED ON A CROSS SLOPE OF MORE THEN 5%
7) 5900 mm UNITS CAN ACCOMMODATE A CHANGE IN GRADE OF 2% OVER ITS LENGTH
8) RADIUSES WITH CURVATURES GREATER THAN 2.3 DEGREES CAN BE FITTED WITH PRE-FABRICATED ANGLE SECTIONS AVAIABLE IN 2.5, 5, 7.5 AND 10 DEGREE RADIUSES

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish: GALV.	Weight

Description
SERGARD MDS® TL4 BARRIERS
PORTABLE TRAFFIC BARRIER
MAXIMUM INNER RADIUS 6 METER SECTION

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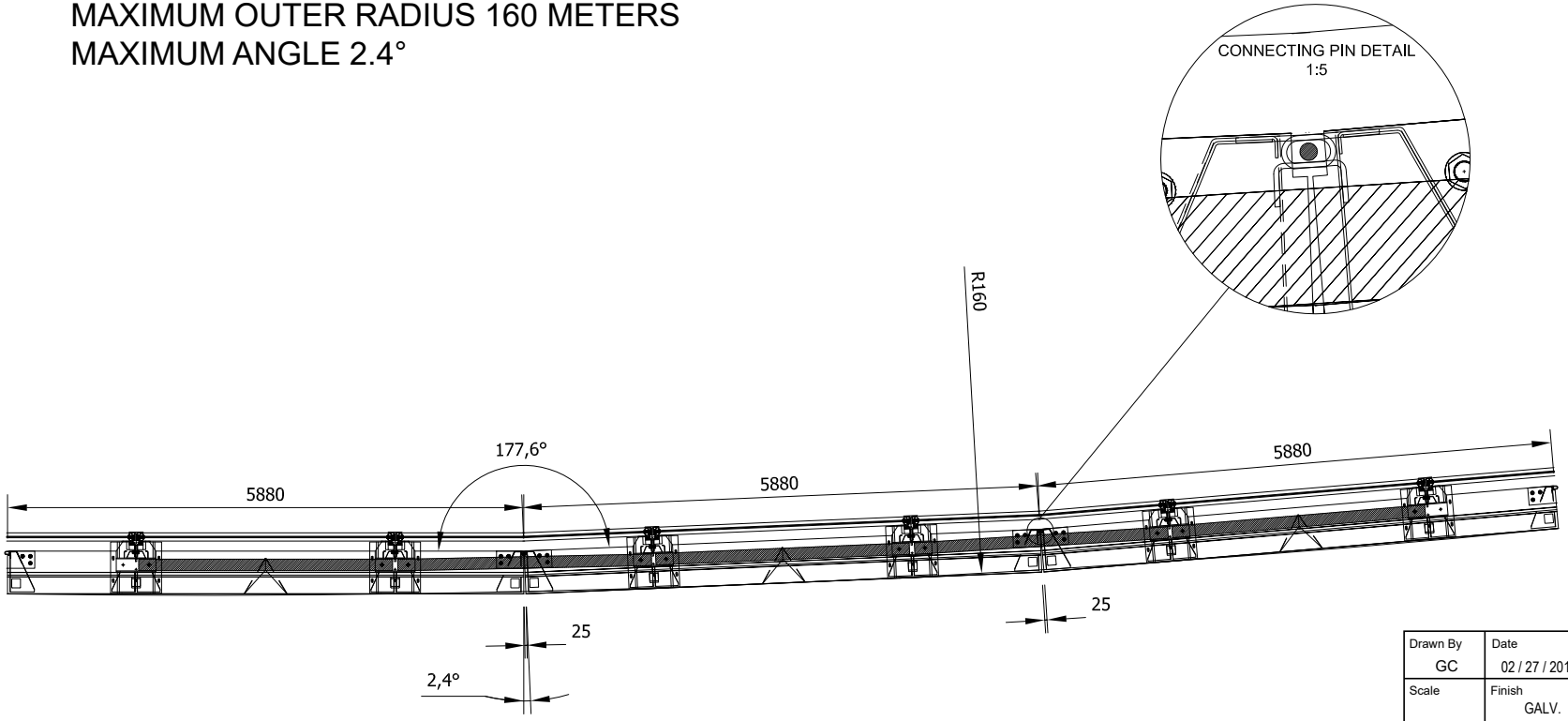
Drawing No.
H2-6000-IR23

5900 mm SERGARD MDS® TL4 BARRIER
MAXIMUM OUTER RADIUS 160 METERS
MAXIMUM ANGLE 2.4°



NOTES:
1) MAXIMUM OUTER RADIUS IS 160 METERS UTILIZING 5900 mm LONG SECTIONS
2) THE MINIMUM DEFLECTION SHOWN REQUIRES ANCHORING AS SHOWN
3) THE MINIMUM DEFLECTION SYSTEM SHOWN IS APPROVED TO NCHRP 350 TL-4 AND MASH-08 (FOR DEFLECTION VALUES SEE DRAWING H2-6000-AP1-2
4) FOR ANCHORING DETAILS SEE DRAWING H2-6000-AP1-3
5) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
6) SYSTEM SHOULD NOT BE PLACED ON A CROSS SLOPE OF MORE THEN 5%
7) 5900 mm UNITS CAN ACCOMMODATE A CHANGE IN GRADE OF 2% OVER ITS LENGTH
8) RADIUSES WITH CURVATURES GREATER THAN 2.4 DEGREES CAN BE FITTED WITH PRE-FABRICATED ANGLE SECTIONS AVAIABLE IN 2.5, 5, 7.5 AND 10 DEGREE RADIUSES

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description
SERGARD MDS® TL4 BARRIERS
PORTABLE TRAFFIC BARRIER
MAXIMUM OUTER RADIUS 6
METER SECTION

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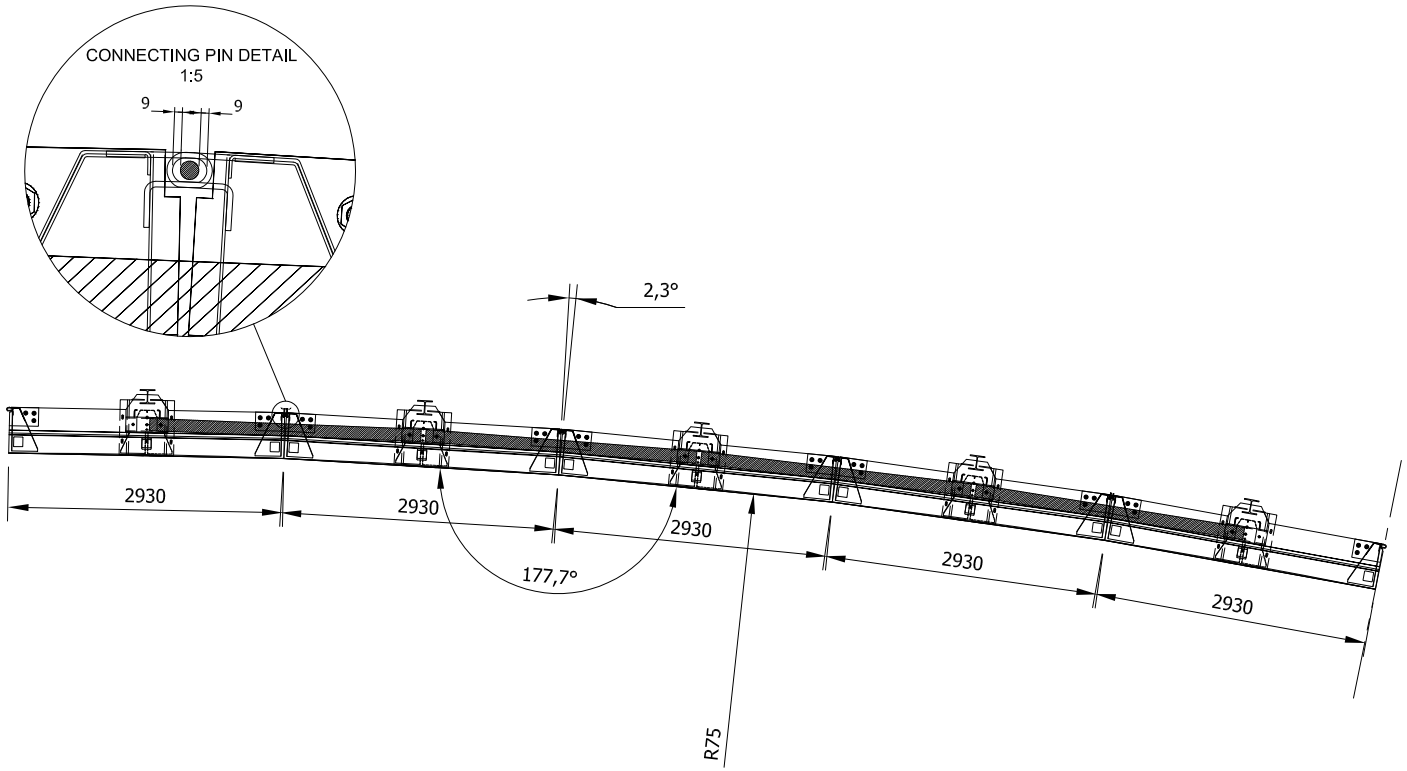
www.MDSBARRIERS.com

Drawing No.
H2-6000-IR23

2950 mm MDS® SERGARD TL4 BARRIER
MAXIMUM INNER RADIUS 75 METERS
MAXIMUM ANGLE 2.3°



NOTES:
1) MAXIMUM INNER RADIUS IS 75 METERS UTILIZING 2950 mm LONG SECTIONS
2) THE MINIMUM DEFLECTION SHOWN REQUIRES ANCHORING AS SHOWN
3) THE MINIMUM DEFLECTION SYSTEM SHOWN IS APPROVED TO NCHRP 350 TL-4 AND MASH-08 (FOR DEFLECTION VALUES SEE DRAWING H2-6000-AP1-2
4) FOR ANCHORING DETAILS SEE DRAWING H2-6000-AP1-3
5) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
6) SYSTEM SHOULD NOT BE PLACED ON A CROSS SLOPE OF MORE THEN 5%
7) 2950 mm UNITS CAN ACCOMMODATE A CHANGE IN GRADE OF 2% OVER ITS LENGTH
8) RADIUSES WITH CURVATURES GREATER THAN 2.3 DEGREES CAN BE FITTED WITH PRE-FABRICATED ANGLE SECTIONS AVAIABLE IN 2.5, 5, 7.5 AND 10 DEGREE RADIUSES

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description
SERGARD MDS® BARRIERS
PORTABLE TRAFFIC BARRIER
MAXIMUM INNER RADIUS 3
METER SECTION

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East Hartford CT 06108
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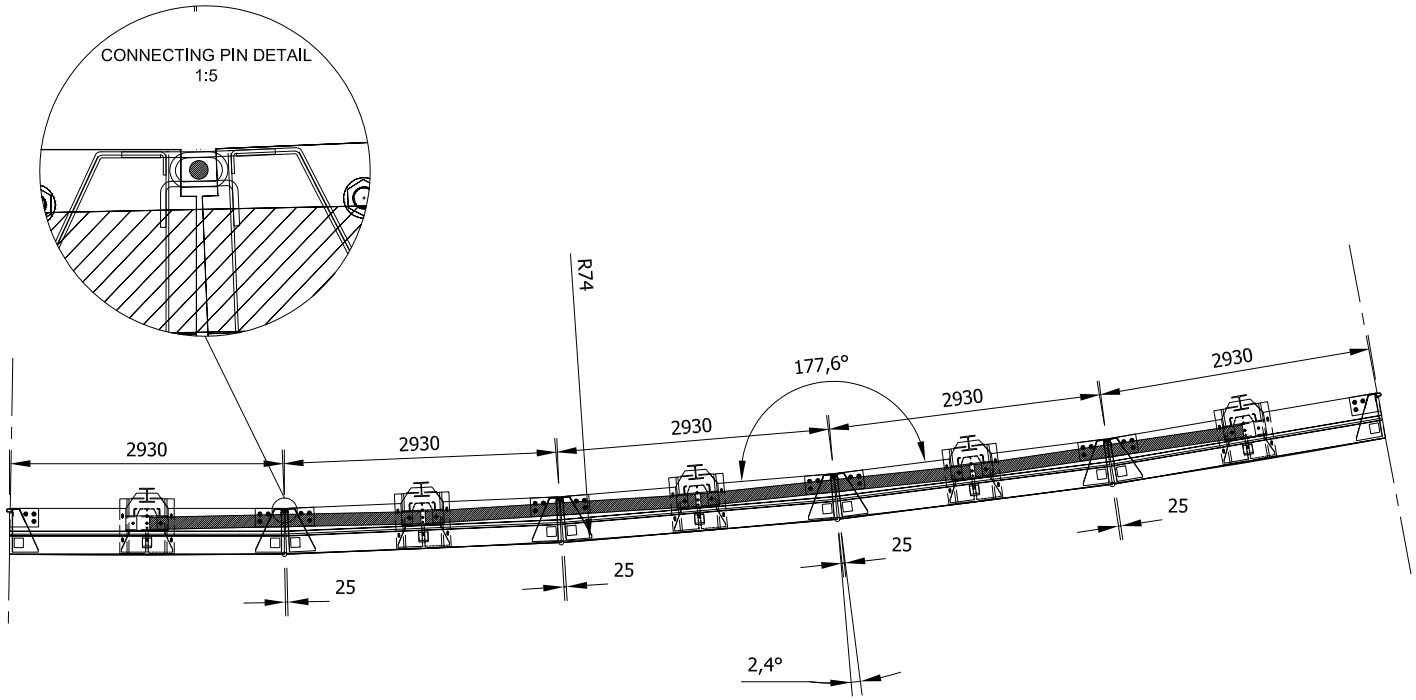
Fax: 860.289.8035
www.MDSBARRIERS.com

Drawing No.
H2-3000-IR23

2950 mm MDS® SERGARD TL4 BARRIER
MAXIMUM OUTER RADIUS 74 METERS
MAXIMUM ANGLE 2.4°



NOTES:
1) MAXIMUM OUTER RADIUS IS 74 METERS UTILIZING 2950 mm LONG SECTIONS
2) THE MINIMUM DEFLECTION SHOWN REQUIRES ANCHORING AS SHOWN
3) THE MINIMUM DEFLECTION SYSTEM SHOWN IS APPROVED TO NCHRP 350 TL-4 AND MASH-08 (FOR DEFLECTION VALUES SEE DRAWING H2-6000-AP1-2
4) FOR ANCHORING DETAILS SEE DRAWING H2-6000-AP1-3
5) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
6) SYSTEM SHOULD NOT BE PLACED ON A CROSS SLOPE OF MORE THEN 5%
7) 2950 mm UNITS CAN ACCOMMODATE A CHANGE IN GRADE OF 2% OVER ITS LENGTH
8) RADIUSES WITH CURVATURES GREATER THAN 2.4 DEGREES CAN BE FITTED WITH PRE-FABRICATED ANGLE SECTIONS AVAIABLE IN 2.5, 5, 7.5 AND 10 DEGREE RADIUSES

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description
SERGARD MDS® BARRIERS
PORTABLE TRAFFIC BARRIER
MAXIMUM OUTER RADIUS 3
METER SECTION

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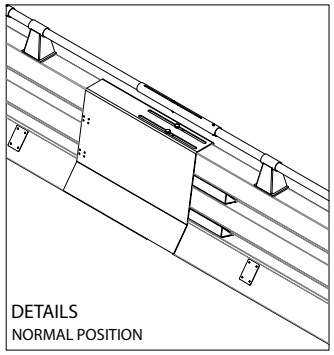
Fax: 860.289.8035
www.MDSBARRIERS.com

Drawing No.
H2-3000-OR24

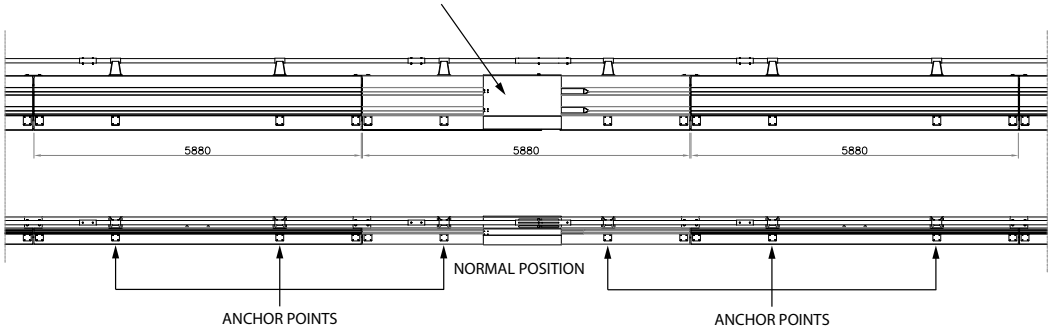
ANNEX 3
Attenuators and Transitions

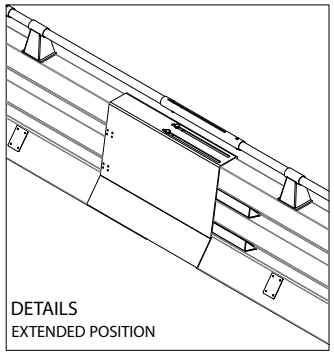
REF	Drawing Number	Drawing Description
15	H2-6000-VLB-T1	Variable Length Barrier for Bridge Expansion Joints
16	H2-2000-TQG-610	Attenuators
17	H2-6000-TWB-350	MDS to W-beam transition

VARIABLE LENGTH BARRIER

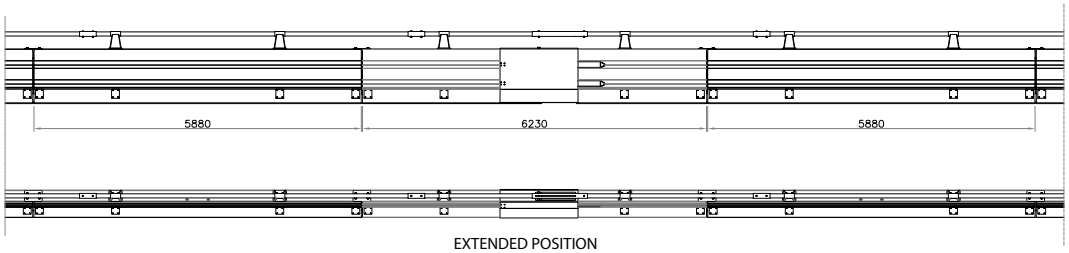


DETAILS
NORMAL POSITION

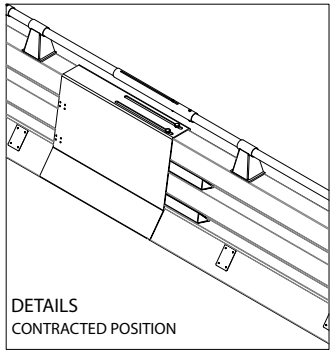




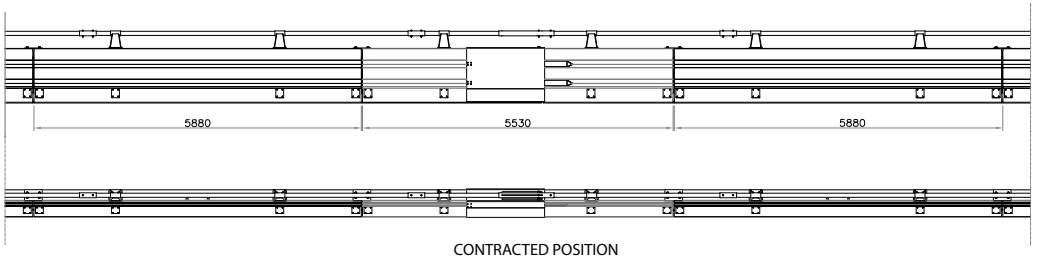
DETAILS
EXTENDED POSITION



EXTENDED POSITION



DETAILS
CONTRACTED POSITION



CONTRACTED POSITION

NOTES:
1) VARIABLE LENGTH BARRIERS HAVE A STANDARD LENGTH OF 5880 mm.
2) STANDARD VARIABLE LENGTH BARRIERS HAVE A MAXIMUM EXTENDED LENGTH 6230 mm.
3) VARIABLE LENGTH BARRIERS HAVE 700 MM OF MOVABLE EXPANSION.
4) FOR EXPANSION MOVEMENT GREATER THEN 700 MM CONSULT MANUFACTURER.

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish: GALV.	Weight

Description

SERGARD MDS® TL4
VARIABLE LENGTH BARRIER
SECTION

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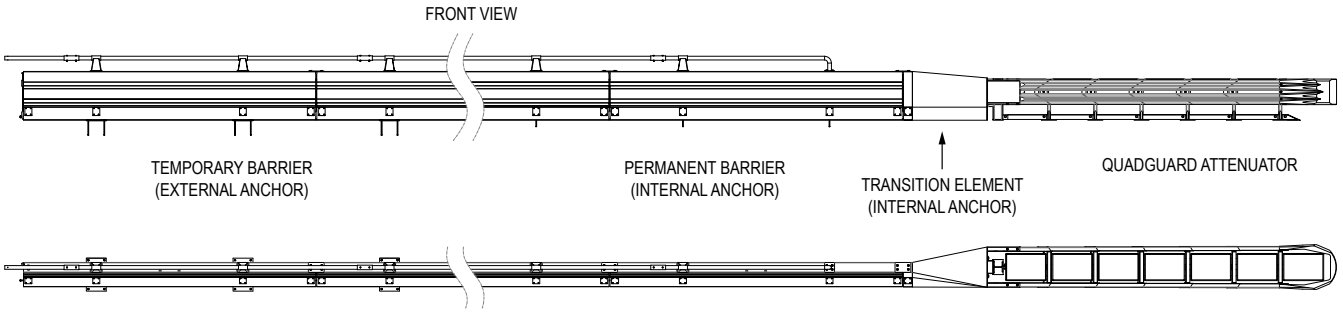
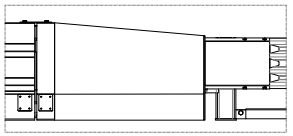
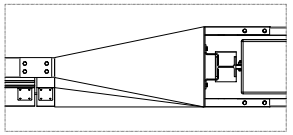
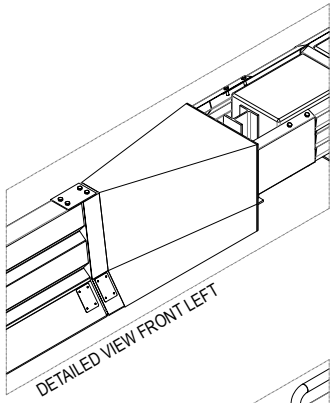
Drawing No.

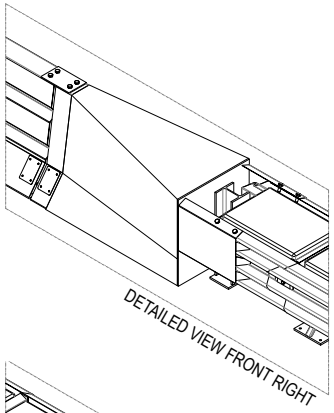
H2-6000-VLB-T1

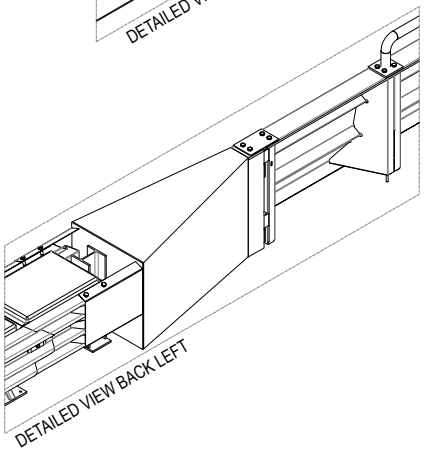


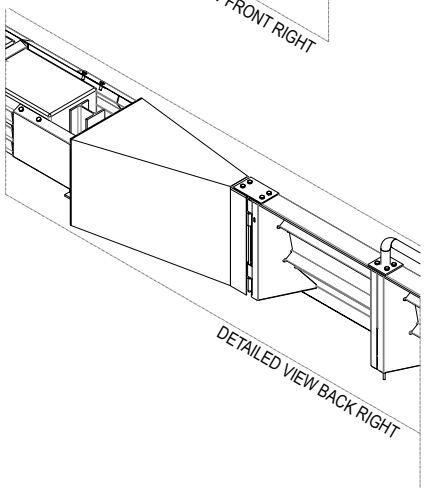




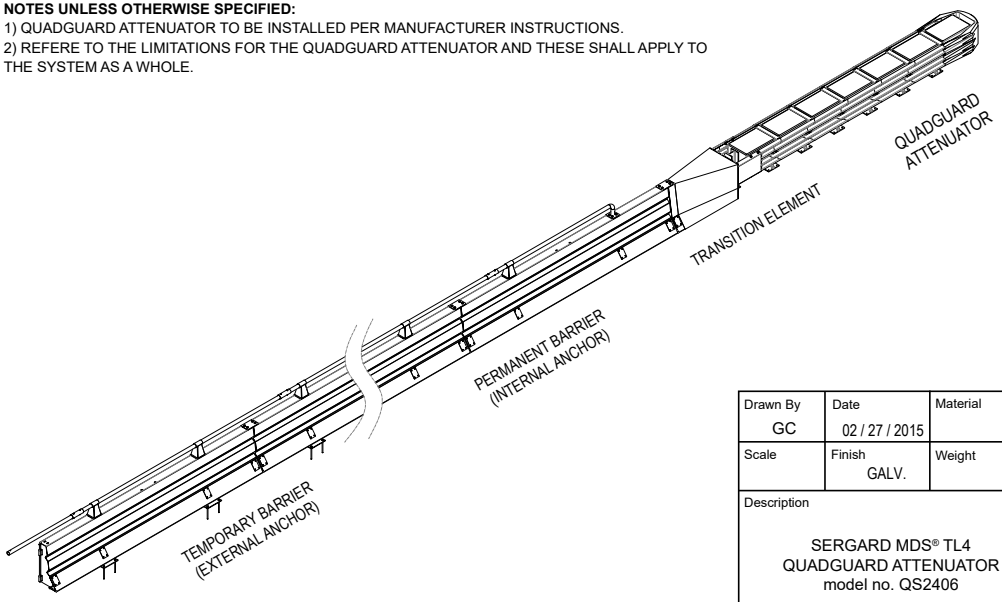


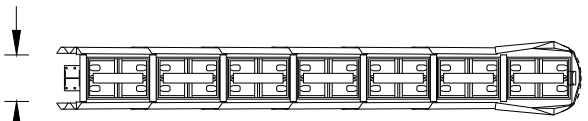






NOTES UNLESS OTHERWISE SPECIFIED:
1) QUADGUARD ATTENUATOR TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS.
2) REFERE TO THE LIMITATIONS FOR THE QUADGUARD ATTENUATOR AND THESE SHALL APPLY TO THE SYSTEM AS A WHOLE.





QUADGUARD ATTENUATOR
610 mm [24"] MODEL NO. QS2406

Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description

SERGARD MDS® TL4
QUADGUARD ATTENUATOR
model no. QS2406

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Fax: 860.289.8035
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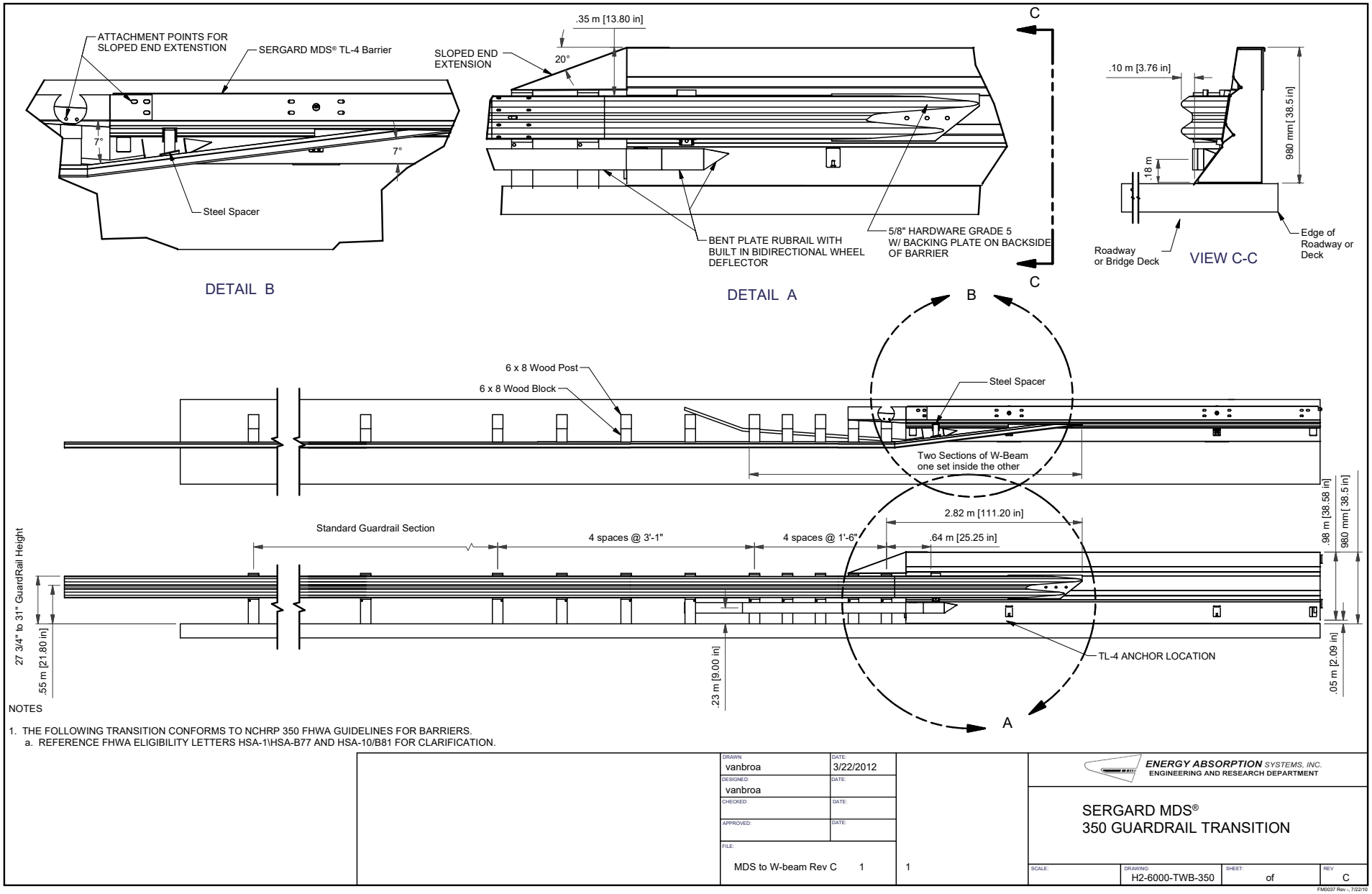
Drawing No.
H2-2000-TQG-610



NOTES

1. THE FOLLOWING TRANSITION CONFORMS TO NCHRP 350 FHWA GUIDELINES FOR BARRIERS.
   a. REFERENCE FHWA ELIGIBILITY LETTERS HSA-1\HSA-B77 AND HSA-10/B81 FOR CLARIFICATION.

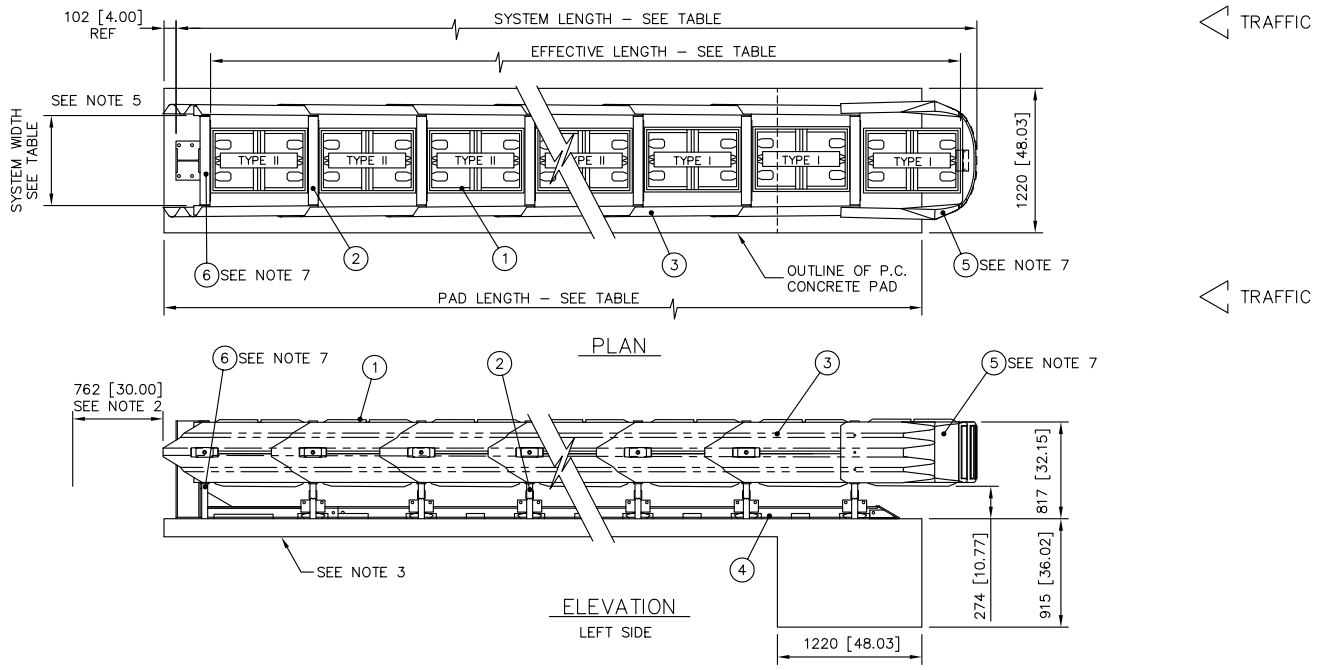
DRAWN: vanbroa	DATE: 3/22/2012	
DESIGNED: vanbroa	DATE:	
CHECKED:	DATE:	
APPROVED:	DATE:	
FILE: MDS to W-beam Rev C 1		1

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

SERGARD MDS®
350 GUARDRAIL TRANSITION

SCALE:	DRAWING:	SHEET:	REV
	H2-6000-TWB-350	of	C

FM0037 Rev -, 7/22/10



* G = GREY or Y = YELLOW

BAYS	610 [24"] WIDTH MODEL#	762 [30"] WIDTH MODEL#	914 [36"] WIDTH MODEL#	SYSTEM LENGTH m	SYSTEM LENGTH ft–in	EFFECTIVE LENGTH m	EFFECTIVE LENGTH ft–in	PAD LENGTH m	PAD LENGTH ft–in	MAX DESIGN SPEED km/h [MPH]	# OF CARTRIDGES TYPE I	# OF CARTRIDGES TYPE II
1	QS2401*	QS3001*	QS3601*	2.16	[7'–1"]	1.73	[5'–8"]	2.74	[9'–0"]	40 [25]	2	0
2	QS2402*	QS3002*	QS3602*	3.08	[10'–1"]	2.64	[8'–8"]	2.74	[9'–0"]	60 [37]	2	1
3	QS2403*	QS3003*	QS3603*	4.00	[13'–1"]	3.56	[11'–8"]	3.66	[12'–0"]	70 [44]	3	1
4	QS2404*	QS3004*	QS3604*	4.91	[16'–1"]	4.47	[14'–8"]	4.57	[15'–0"]	80 [50]	3	2
5	QS2405*	QS3005*	QS3605*	5.83	[19'–1"]	5.38	[17'–8"]	5.49	[18'–0"]	90 [56]	4	2
6	QS2406*	QS3006*	QS3606*	6.74	[22'–1"]	6.30	[20'–8"]	6.40	[21'–0"]	△100 [62]	4	3
7	QS2407*	QS3007*	QS3607*	7.65	[25'–1"]	7.21	[23'–8"]	7.32	[24'–0"]	△105 [65]	4	4
8	QS2408*	QS3008*	QS3608*	8.57	[28'–1"]	8.13	[26'–8"]	8.23	[27'–0"]	△110 [68]	4	5
9	QS2409*	QS3009*	QS3609*	9.49	[31'–1"]	9.04	[29'–8"]	9.14	[30'–0"]	△115 [71]	4	6
10	QS2410*	QS3010*	QS3610*	10.40	[34'–1"]	9.96	[32'–8"]	10.06	[33'–0"]	△120 [75]	5	6
11	QS2411*	QS3011*	QS3611*	11.32	[37'–1"]	10.87	[35'–8"]	10.97	[36'–0"]	△120 [75]	5	7
12	QS2412*	QS3012*	QS3612*	12.23	[40'–1"]	11.79	[38'–8"]	11.89	[39'–0"]	△120 [75]	5	8

NOTES:
1. IN COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
2. PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 762 [30.00] MIN.
3. 150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 200 [8.00] MIN. NON–REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY, MEASURING AT LEAST 3.66 m [12'–0"] WIDE BY 15.24 m [50'–0"] LONG.
4. SEE THE "QUADGUARD SYSTEM PRODUCT MANUAL", FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT A GIVEN SITE. INFORMATION AND COPIES OF ABOVE MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT (888) 323–6374.
5. WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY AN ADEQUATE TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
6. UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES], UNLESS OTHERWISE NOTED.
7. BACKUP AND NOSE ASSEMBLIES NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
8. THE NUMBER OF BAYS INDICATED IN THE TABLE IS BASED ON CALCULATED VALUES TO ENSURE ADEQUATE SYSTEM CAPACITY TO DISSIPATE THE LONGITUDINAL IMPACT ENERGY OF A 2000 kg VEHICLE TRAVELING AT THE SPEED INDICATED.
△9. THE SIX BAY SYSTEM HAS BEEN FULLY TESTED AT 100 km/h UNDER THE FULL 8 TEST MATRIX OF NCHRP 350 TL–3. SYSTEMS LONGER THAN SIX BAYS SHALL ALSO BE CAPABLE OF MEETING THE OCCUPANT RISK CRITERIA AS RECOMMENDED IN NCHRP 350 FOR VEHICLES WEIGHING 2000 kg IMPACTING HEAD ON AT THE SPEED INDICATED IN THE TABLE.

UNIDIRECTIONAL

KEY
1. QUADGUARD CARTRIDGE
2. DIAPHRAGM
3. FENDER PANEL
4. MONORAIL
5. NOSE ASSEMBLY
6. BACKUP

Revisions	Date	Rev.	By	Ckd.	App.
AASHTO WAS 1996	12/01/03	I	SDC	STT	ACF
CHANGED NOTES 4,5 & 7	12/15/04	J	RGC	STT	ACF
REVISED NOTE 3	9/25/01	H	DDW	STT	SPT

REFERENCES

SERIAL#		DIAPHRAGM ASSY.	35–40–07
SALES ORDER#		NOSE ASSY.	35–40–05
EH PROJECT#		FENDER PANEL ASSY.	35–40–04
DESIGN SPEED	SEE CHART ABOVE	BACKUP ASSY.	35–40–03
NOSE COLOR		MONORAIL ASSY.	35–40–06
NUMBER OF UNITS		CONCRETE PAD	35–40–11
		TRANSITION ASSY.	N/A
		WHEEL DEFLECTOR ASSY.	N/A

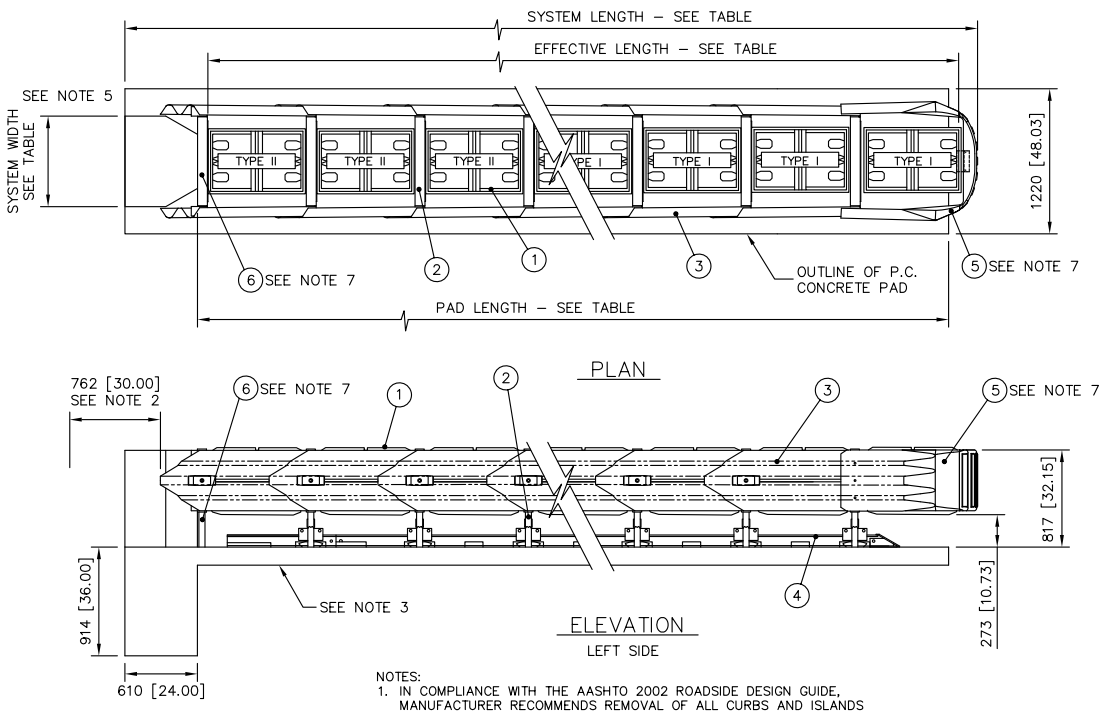
DRAWN: S. LEWIS	DATE: 03/21/96	
DESIGNED: JMV/MHO	DATE: 03/21/96	
CHECKED: S. TRAGESER	DATE: 6/07/96	
APPROVED J. MACHADO	DATE: 6/07/96	
CAD FILE: QSTSCVR–U.dwg		

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® SYSTEM
W/ TENSION STRUT BACKUP

SCALE	DWG.	SHEET	REV
1=40	QSTSCVR–U	1 OF 1	J

QuadGuard® System



* G = GREY or Y = YELLOW

BAYS	610[24] WIDTH MODEL#	762[30] WIDTH MODEL#	915[36] WIDTH MODEL#	SYSTEM LENGTH m	SYSTEM LENGTH ft-in	EFFECTIVE LENGTH m	EFFECTIVE LENGTH ft-in	PAD LENGTH m	PAD LENGTH ft-in	MAX DESIGN SPEED km/h [MPH]	# OF CARTRIDGES TYPE I	# OF CARTRIDGES TYPE II
1	QS2401*	QS3001*	QS3601*	2.59	[8'-6"]	1.73	[5'-8"]	1.68	[5'-6"]	40 [25]	2	0
2	QS2402*	QS3002*	QS3602*	3.51	[11'-6"]	2.64	[8'-8"]	2.59	[8'-6"]	60 [37]	2	1
3	QS2403*	QS3003*	QS3603*	4.42	[14'-6"]	3.56	[11'-8"]	3.51	[11'-6"]	70 [44]	3	1
4	QS2404*	QS3004*	QS3604*	5.33	[17'-6"]	4.47	[14'-8"]	4.42	[14'-6"]	80 [50]	3	2
5	QS2405*	QS3005*	QS3605*	6.25	[20'-6"]	5.38	[17'-8"]	5.33	[17'-6"]	90 [56]	4	2
6	QS2406*	QS3006*	QS3606*	7.16	[23'-6"]	6.30	[20'-8"]	6.25	[20'-6"]	△100 [62]	4	3
7	QS2407*	QS3007*	QS3607*	8.08	[26'-6"]	7.21	[23'-8"]	7.16	[23'-6"]	△105 [65]	4	4
8	QS2408*	QS3008*	QS3608*	8.99	[29'-6"]	8.13	[26'-8"]	8.08	[26'-6"]	△110 [68]	4	5
9	QS2409*	QS3009*	QS3609*	9.91	[32'-6"]	9.04	[29'-8"]	8.99	[29'-6"]	△115 [71]	4	6
10	QS2410*	QS3010*	QS3610*	10.82	[35'-6"]	9.96	[32'-8"]	9.91	[32'-6"]	△120 [75]	5	6
11	QS2411*	QS3011*	QS3611*	11.73	[38'-6"]	10.87	[35'-8"]	10.82	[35'-6"]	△120 [75]	5	7
12	QS2412*	QS3012*	QS3612*	12.65	[41'-6"]	11.79	[38'-8"]	11.74	[38'-6"]	△120 [75]	5	8

NOTES:

1. IN COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
2. PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 762 [30.00] MIN.
3. 150 [6.00] MIN. REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE PAD OR 200 [8.00] MIN. NON-REINFORCED 28 MPa [4000 PSI] P.C. CONCRETE ROADWAY, MEASURING AT LEAST 3.66 m [12'-0"] WIDE BY 15.24 m [50'-0"] LONG.
4. SEE THE "QUADGUARD SYSTEM PRODUCT MANUAL", FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT A GIVEN SITE. INFORMATION AND COPIES OF ABOVE MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT (888) 323-6374.
5. WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY AN ADEQUATE TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
6. UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES], UNLESS OTHERWISE NOTED.
7. BACKUP AND NOSE ASSEMBLIES NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
8. THE NUMBER OF BAYS INDICATED IN THE TABLE IS BASED ON CALCULATED VALUES TO ENSURE ADEQUATE SYSTEM CAPACITY TO DISSIPATE THE LONGITUDINAL IMPACT ENERGY OF A 2000 kg VEHICLE TRAVELING AT THE SPEED INDICATED.
9. △ THE SIX BAY SYSTEM HAS BEEN FULLY TESTED AT 100 km/h UNDER THE FULL 8 TEST MATRIX OF NCHRP 350 TL-3. SYSTEMS LONGER THAN SIX BAYS SHALL ALSO BE CAPABLE OF MEETING THE OCCUPANT RISK CRITERIA AS RECOMMENDED IN NCHRP 350 FOR VEHICLES WEIGHING 2000 kg IMPACTING HEAD ON AT THE SPEED INDICATED IN THE TABLE.

UNIDIRECTIONAL

KEY

1. QUADGUARD CARTRIDGE
2. DIAPHRAGM
3. FENDER PANEL
4. MONORAIL
5. NOSE ASSEMBLY
6. BACKUP

REFERENCES

SERIAL#		DIAPHRAGM ASSY.	35-40-07
SALES ORDER#		NOSE ASSY.	35-40-05
EH PROJECT#		FENDER PANEL ASSY.	35-40-04
DESIGN SPEED	SEE CHART ABOVE	BACKUP ASSY.	35-40-08, 14
NOSE COLOR		MONORAIL ASSY.	35-40-06
NUMBER OF UNITS		CONCRETE PAD	35-40-09
		TRANSITION ASSY.	N/A
		WHEEL DEFLECTOR ASSY.	N/A

Revisions	Date	Rev.	By	Ckd.	App.
AASHTO WAS 1996	11/25/03	J	SDC	STT	ACF
CHANGES WITH NOTES 4,5 & 7	12/15/04	K	RGC	STT	ACF
REVISED NOTE 3	2/14/02	I	DDW	STT	SPT

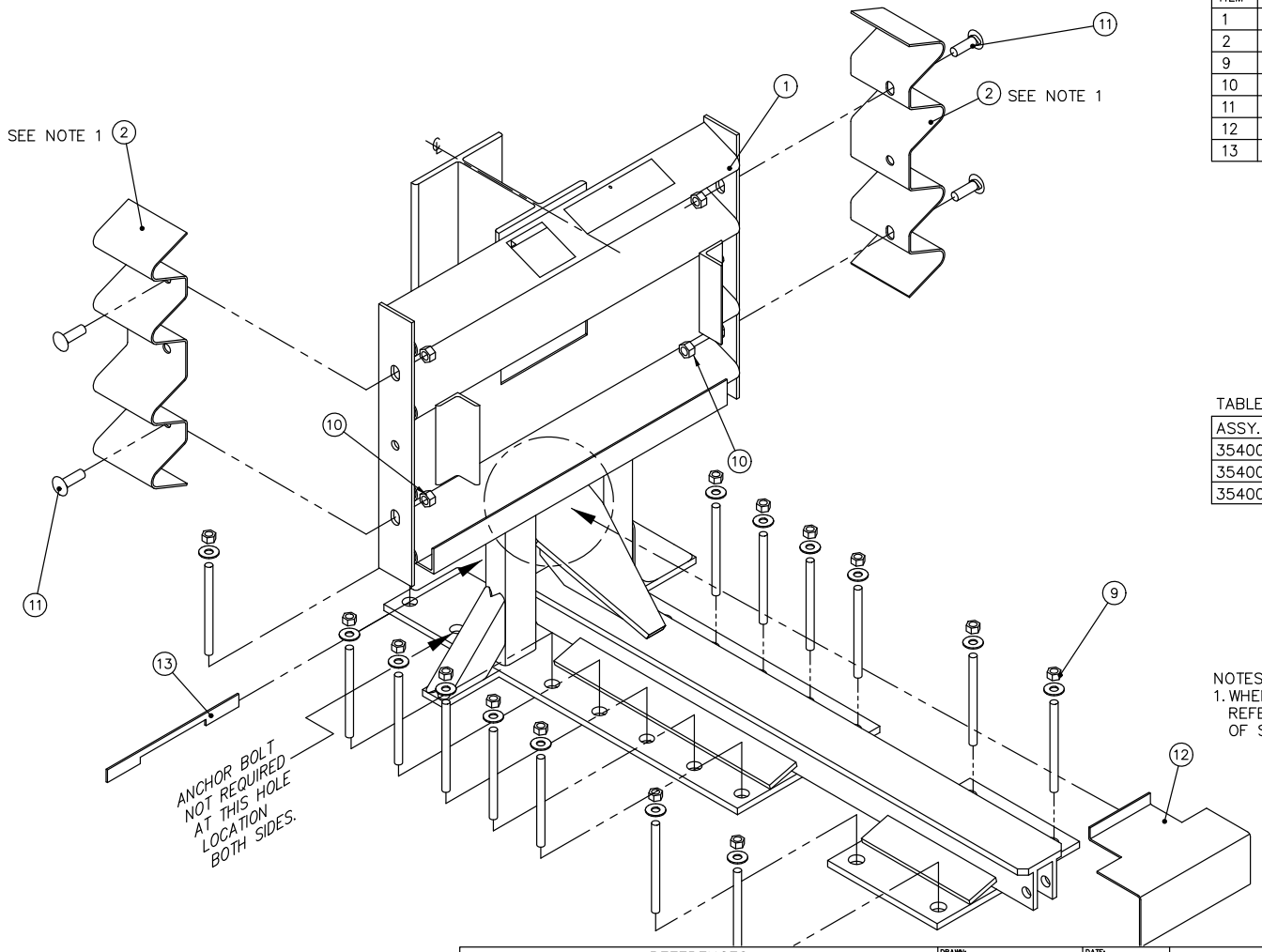
DRAWN: T. BUSSE	DATE: 8/08/96	
DESIGNED: JVM/MHO	DATE: 3/01/96	
CHECKED: BB	DATE: 8/13/96	
APPROVED: J. MACHADO	DATE: 8/13/96	
CAD FILE: QSCBCVR-U.dwg		

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® SYSTEM
W/ CONCRETE BACKUP

SCALE	DWG.	SHEET	REV
1=40	QSCBCVR-U	1 OF 1	K

QuadGuard® System



PARTS LIST

ITEM	STOCK NO.	DESCRIPTION	REQ'D
1	SEE TABLE A	BACKUP,TS,QG,G	1.00
2	2760141-0000	PANEL,SIDE,QG,G	2.00
9	3525300-0000	ANCHOR,MP-3,PT-KIT,3/4X7,VT	3.00
10	2704191-0000	NUT,HX,5/8,G,RAIL	4.00
11	2699341-0000	BOLT,RAIL,5/8X2,G	4.00
12	2760293-0000	BRACKET,CARTRIDGE SUPPORT,TS B/U	1.00
13	2760294-0000	LOCKING BAR,CARTRIDGE SUPPORT	1.00

TABLE A

ASSY. NO.	STOCK NO.	DESCRIPTION	WIDTH
3540031-0000	2760011-0000	BACKUP,TS,24,QG,G	610 [24.00]
3540032-0000	2760021-0000	BACKUP,TS,30,QG,G	760 [30.00]
3540033-0000	2760031-0000	BACKUP,TS,36,QG,G	915 [36.00]

NOTES:
1. WHEN TRANSITIONING QUADGUARD SYSTEM TO EXISTING BARRIER REFER TO THE TRANSITION ASSEMBLY DRAWINGS FOR PROPER USE OF SIDE PANEL PART NO. 2760141-0000.

Revisions	Date	Rev.	By	Ckd.	App.
DEL ITEMS 3,5,6,7,&8,ADDED ITEMS 12 & 13, UPDATED RAIL END HOLES	10/21/97	E	RGC	KRM	DLJ
REMOVED 1 ANCHOR BOLT & ADDED NOTE	03/19/99	F	LWC	KM	SPT
QTY #8 WAS 4	07/08/97	D	JF	BB	SPT

REFERENCES

DRAWN: S. LEWIS	DATE: 4-22-96	
DESIGNED: JVM/MHO	DATE: 3-1-96	
CHECKED: S. Trageser	DATE: 5/16/96	
APPROVED J. Machado	DATE: 5/16/96	
CAD FILE: 354003.dwg		
NEXT ASSEMBLY:		

ASSEMBLY NO. SEE TABLE A

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® SYSTEM

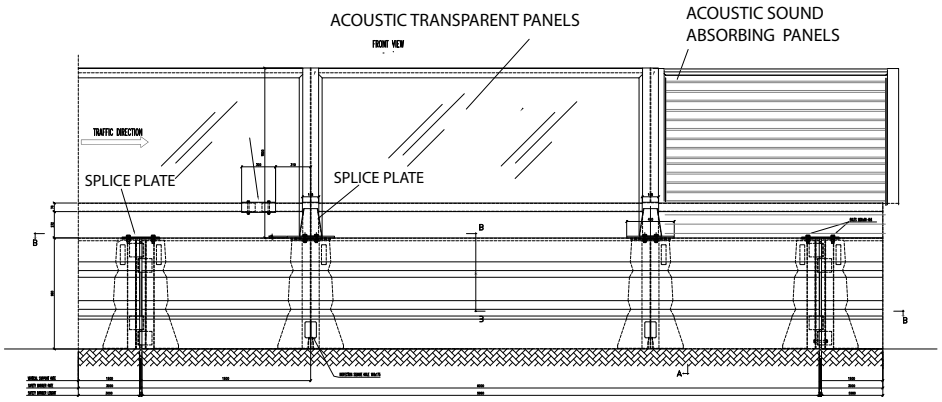
BACKUP ASSY, TS, QG

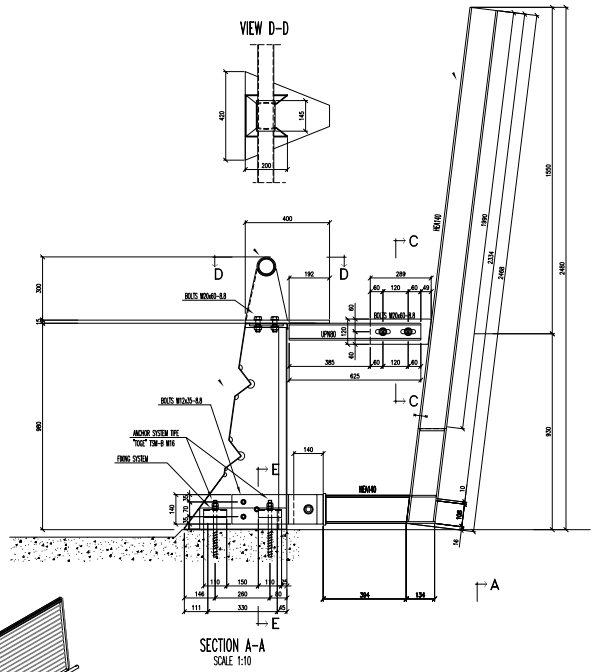
SCALE	DWG.	SHEET	REV
N.T.S.	35-40-03	1 of 1	F

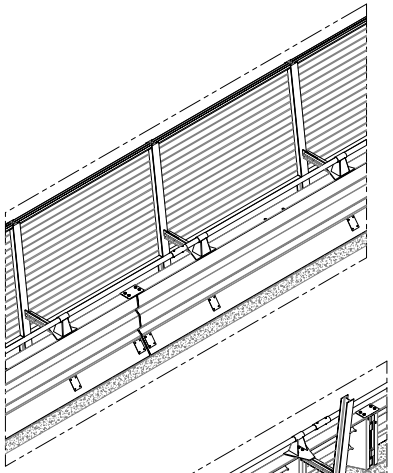
QuadGuard® System

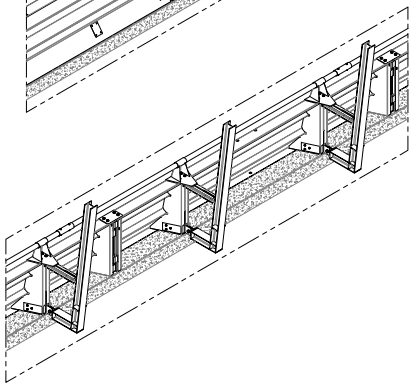
ANNEX 4
Sound Walls

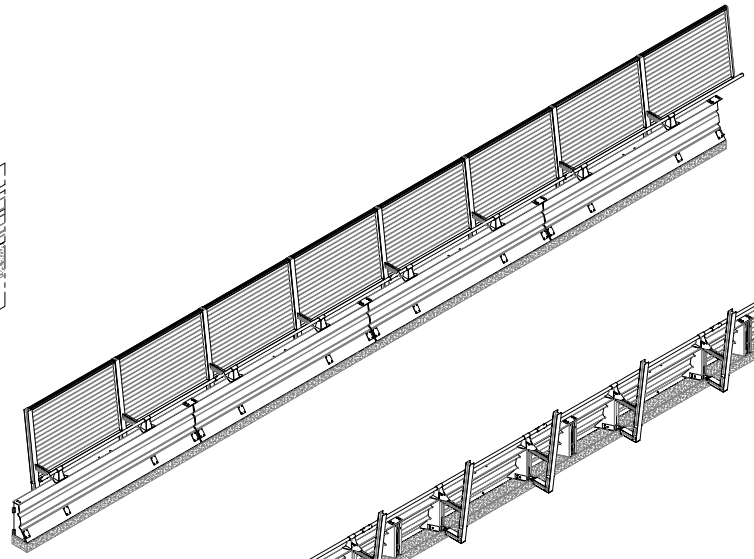
REF	Drawing Number	Drawing Description
20	H2-6000-7DA	Sound Wall Maximum Allowable Height 4 Meters
21	H2-6000-7DAS	Sound Wall Maximum Allowable Height 3 Meters
22	H2-6000-ACH1	Recommended Repair Methods once anchors are removed











Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish: GALV.	Weight

Description

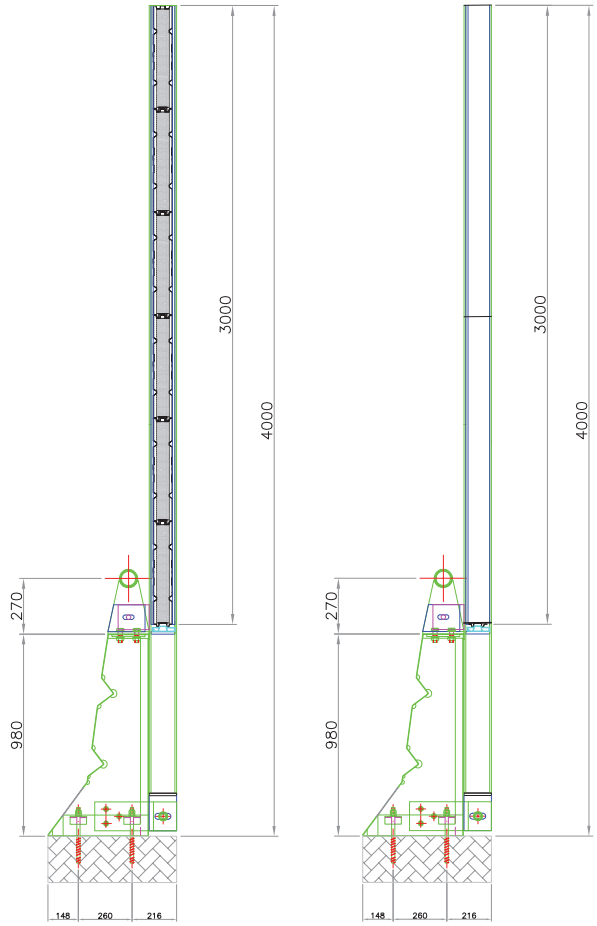
SERGARD MDS® TL4 BARRIER
INTERGRATED WITH
SOUND WALL
TYPE 7DAS

UNCONTROLLED WHEN PRINTED

MDS® BARRIERS
43 Franklin St
East Hartford CT 06108
Tel: 860.289.8033
Fax: 860.289.8035
www.MDSBARRIERS.com

Drawing No.

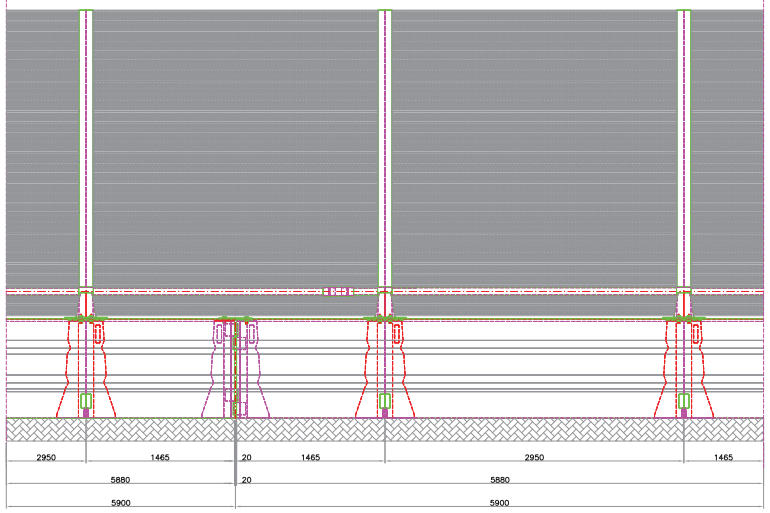
H2-6000-7DAS-3



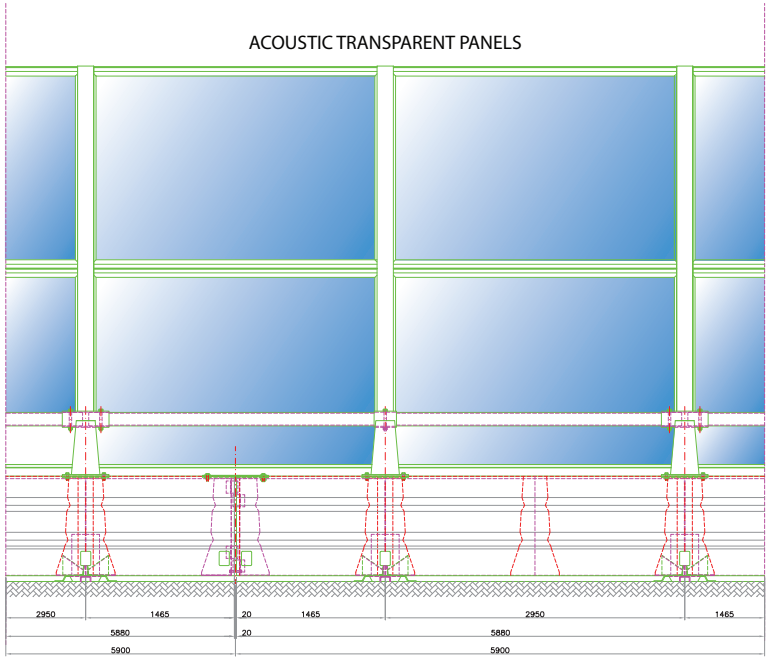
ACOUSTIC SOUND
ABSORBING PANELS

ACOUSTIC
TRANSPARENT PANELS

ACOUSTIC SOUND
ABSORBING PANELS



ACOUSTIC TRANSPARENT PANELS



Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description

SERGARD MDS® TL4 BARRIER
INTERGRATED WITH
SOUND WALL
TYPE 7DA

UNCONTROLLED WHEN PRINTED

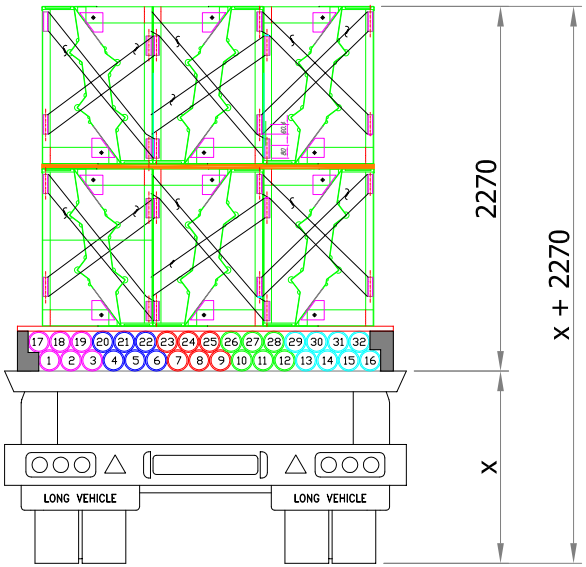
MDS® BARRIERS
43 Franklin St
East Hartford CT 06108
Tel: 860.289.8033
Fax: 860.289.8035
www.MDSBARRIERS.com

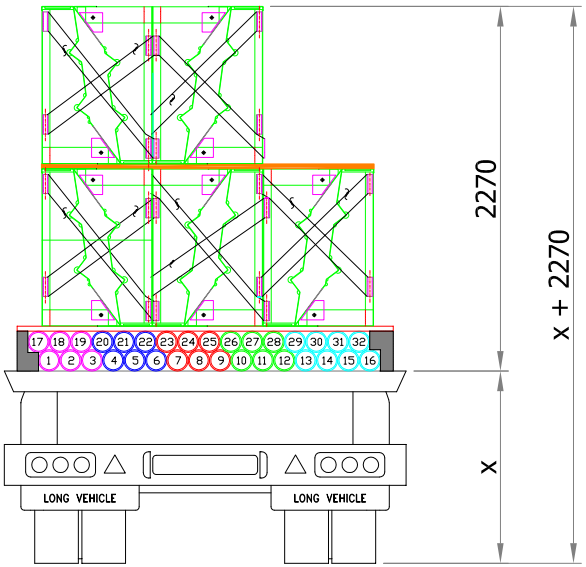
Drawing No.

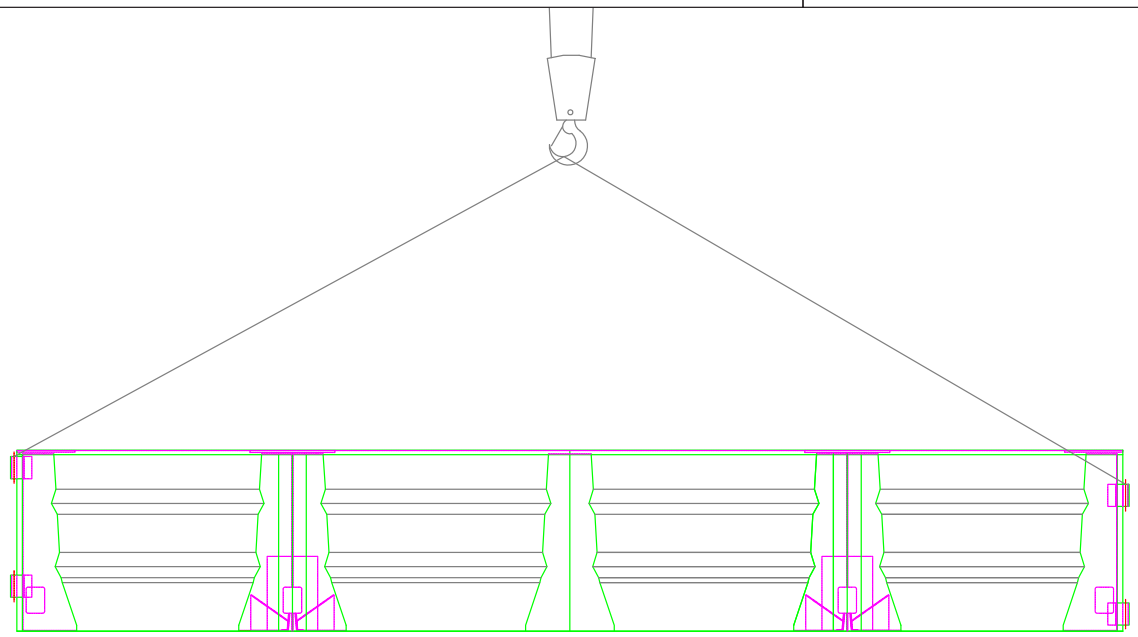
H2-6000-7DA-4

ANNEX 5
Truck Loading

REF	Drawing Number	Drawing Description
30		Truck Loading and Stacking







Drawn By	Date	Material
GC	02 / 27 / 2015	
Scale	Finish	Weight
	GALV.	

Description

SERGARD MDS® TL4 BARRIER
TRUCK LOADING DETAIL

UNCONTROLLED WHEN PRINTED

MDS® BARRIERS
43 Franklin St
East Hartford CT 06108
Tel: 860.289.8033
Fax: 860.289.8035
www.MDSBARRIERS.com

Drawing No.

H2-6000-SHIPPING-LV1

ANNEX 6
Safe Working Statement

REF	Document	Document Description
40	SWMS	Safe Working Method Statement

SERGARD MDS® TL4 BARRIERS

Safe Working Method Statement

Hazard Identified	Control Required	Assessed Risk Before Controls	Person Responsible	Residual Risk Score	Installer / Operator Sign Off\
Refused entry to project site for lack of PPE	Ensure all delivery drivers are aware of the project site PPE requirements and are physically wearing them (eg. reflective vests, hard hats, eye and ear protection, long sleeve shirt and safety shoes)	M	X	L	X
All cranes to be properley maintained and certificates to be available	Cranes must have valid certificates as well as operator to have appropriate qualifications to operate crane	M		L	
	Lift chains to be in good service and tagged condition	M		L	
Contact with overhead obstructions	Always “LOOK UP AND LIVE”	H		L	
	Stick to the designated routes	H		L	
	Never operate a crane without assessing potential overhead obstructions	H		L	
	If uncertain or if view is obstructed arrange for a spotter	H		L	
Injuries to pedestrians or collisions with vehicles	Maintain speed according to posted speed limits and reduce speed in work zones	M		L	
	Give priority way to other traffic	M		L	
	Always ensure traffic management / controller is aware of offloading to ensure a safe working environment	M		L	
	Ensure delivery trucks have flashing safety lights, reverse alarm and are in road worthy condition. Truck and vehicle inspection must be conducted before any start of work				

MDS® Barrier	FORM SAFE WORKING METHOD STATMENT	AUTHORISED BY:	ISSUE 1	February 2. 2015

Hazard Rating Assessment H - High Risk M - Medium Risk L - Low Risk

SERGARD MDS® TL4 BARRIERS

Safe Working Method Statement

Activity	Hazard Identified	Control Required	Assessed Risk Before Controls	Person Responsible	Residual Risk Score	Installer / Operator Sign Off\
Unloading and placement of MDS® Barrier		Site to provide instructions as per location for barriers to be installed in accordance with the approved traffic management plan and/ or the approved method of compliance and safe working proceedures	L	X	L	X
		MDS® Barriers to be installed in accordance with the MDS® Barriers installation manual	L		L	
		Traffic management to be supplied by site safety operations to ensure general public and vehicles stay clear of any lifting zone	M		L	
	Truck tips over	Set up on a firm level surface	M		L	
		Out riggers are to be used and spacers must be used to provide level surface	M		L	
	Driver falls	Driver to only work over 2 m if wearing suitable fall arrest equipment, and to use steps or ladder to access equipment or barriers above this height	M		L	
	Hazard due to weather conditions	Weather conditions must be taken into account and assessed prior to commencing placement of MDS® Barriers. Do not commence work where wind, rain, heat, cold or other inclement conditions exist	L		L	
	Personnel crushed by load	Driver /operator must not get in between load and another solid object	M		L	
		If required, barricade off the work area	M		L	
	Crushing body while raising or lowering MDS® Barrier	Operator to ensure all site personnel to stay clear of the MDS® Barrier	M		L	
	Crushing of pinch points between MDS® Barrier connections	Alert crew and all workers to ensure hands, fingers and other body parts are to be clear when connecting two barriers together	L		L	
		Hands, fingers and other body parts to be kept clear when installing or lowering connecting pins	L		L	

Hazard Rating Assessment H - High Risk M - Medium Risk L - Low Risk