

# TREND<sup>®</sup> MEDIAN

Median Attenuating TREND<sup>®</sup> Terminal

## *Product Manual*



Release 05/24

**MASH** COMPLIANT

[www.ingalcivil.co.nz](http://www.ingalcivil.co.nz)

## Introduction

The TREND MEDIAN™ is a tangent, double-sided, re-directive/gating and energy absorbing attenuator/end terminal, for use with various longitudinal highway barriers, in either unidirectional or bidirectional traffic applications, to include roadside, shoulder, median and gore installations.

The TREND MEDIAN™ has been tested to the American Association of State and Highway Transportation Officials ("AASHTO") Manual for Assessing Safety Hardware, 2nd Edition-2016, 2020 Errata ("MASH") criteria, as a Test Level 3 ("TL-3") device.

### MASH TL3 COMPLIANT



**WARNING:** The local highway agency, distributors, owners, and contractors are **RESPONSIBLE** for the assembly, maintenance, and repair of the TREND MEDIAN™. Failure to fulfill these **RESPONSIBILITIES** with respect to the assembly, maintenance, and repair of the TREND MEDIAN™ could result in serious injury or death.

**IMPORTANT:** These instructions are for standard assembly specified by the appropriate highway agency. In the event the specified system assembly, maintenance, or repair would require a deviation from standard assembly parameters, contact an Ingal Civil Products representative.

This manual must be available to the worker overseeing and/or assembling the product at all times.

For additional copies, contact Ingal Civil Products at 021 2464 997 or visit

<https://www.ingalcivil.co.nz/products/road-safety-barriers/MASH-end-terminals/>.

The instructions, illustrations, and specifications are based on the latest TREND® MEDIAN information available to Ingal Civil Products at publication. We reserve the right to make changes at any time. Please visit

<https://www.ingalcivil.co.nz/products/road-safety-barriers/terminals> to confirm the latest revision.

## Customer Service Contacts

Ingal Civil Products is committed to the highest level of customer service. Feedback regarding the TREND MEDIAN™, its assembly procedures, supporting documentation, and performance is always welcome. Additional information can be obtained from the contact information below:

### Ingal Civil Products

North Island:	021 2464 997
South Island:	021 1983 311
E-mail	<a href="mailto:sales@ingalcivil.co.nz">sales@ingalcivil.co.nz</a>
Internet	<a href="http://www.ingalcivil.co.nz">www.ingalcivil.co.nz</a>

## TREND MEDIAN™ Acronyms And Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
CFR	Code of Federal Regulation
CR	Cable Release (Ref: CRP®)
FHWA	Federal Highway Administration
Nm	Newton-Meters
MASH	Manual for Assessing Safety Hardware 2ND Edition, published in 2016, (Errata in 2020)
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NHS	National Highway System
OSHA	Occupational Safety & Health Administration
PPE	Personal Protective Equipment
SYTP®	Steel Yielding Terminal Post®
TL-3	Test Level-3

## Limitations and Warnings

TREND MEDIAN™ was tested to MASH-2nd Edition (with 2020 Errata) TL-3 criteria and may be used in Test Level 1, Test Level 2, and Test Level 3 applications – when installed at the full Test Level 3 system length of 10.477m. These tests typically evaluate product performance defined by MASH involving a range of vehicles on roadways, approximately 1,100kg and full size pickup trucks approximately 2,270 kg at 100 km/h.

**The TREND MEDIAN™ is tested pursuant to the test matrix criteria of MASH as designated by AASHTO and FHWA. The FHWA/AASHTO tests are not intended to represent the performance of systems when impacted by every vehicle type or in every impact condition existing on the roadway. Every departure from the roadway is a unique event.**

Ingal Civil Products expressly disclaims any warranty or liability for injury or damage to persons or property resulting from any impact, collision or harmful contact with its products, other vehicles, or nearby hazards or objects by any vehicle, object or person, whether or not the products were assembled in consultation with Ingal Civil Products or by third parties.

The TREND MEDIAN™ is intended to be assembled, delineated, and maintained within the state/specifying agency and federal guidelines. It is important for the state/specifying agency to select the most appropriate product configuration for site specifications.

The state/specifying agency's careful evaluation of the site layout, vehicle population type and speed, traffic direction, and visibility are some of the elements that require evaluation in the selection of a highway product. For example, curbs could cause an untested effect on an impacting vehicle.

After an impact with the system, all debris must be removed from the area immediately in compliance with the most applicable state/specifying agency policy. The specified TREND MEDIAN™ must be evaluated and restored to its original specified condition or replaced as the state/specifying agency determines/requires, as soon as possible. Product selection, approval, proper installation, and maintenance of any highway product is the sole responsibility of the state/specifying agency.

**WARNING: Under NO circumstances shall the rail within the TREND MEDIAN™ be curved between Post 1 and Post 6.**

**Safety Alert Symbols appear throughout this manual and indicate Danger, Warning, Caution or Important statements. Failure to read and follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.**



**WARNING: Do not assemble, maintain, or repair the TREND MEDIAN™ until you have read this manual thoroughly and completely understand it. Ensure that all Danger, Warning, Caution, and Important statements within the manual are completely followed. Please call Ingal Civil Products at 1300 446 425 if you have any questions about instructions in this manual.**

**WARNING: Safety measures incorporating appropriate traffic control devices and personal protective equipment ("PPE") specified by the state/specifying agency must be used to protect all personnel while at the assembly, maintenance, or repair site. Work gloves, apron, eye protection, safety-toe shoes, and back protection shall be used.**

**WARNING: Ensure the assembly site meets all appropriate Manual on Uniform Traffic Control Devices ("MUTCD") and the state/specifying agency standards.**

**WARNING: Use only Ingal Civil Products parts that are specified by Ingal Civil Products for use with the TREND MEDIAN™ for assembling, maintaining, or repairing the TREND MEDIAN™. Do not utilize or otherwise commingle parts from other systems even if those systems are other Ingal Civil Products or Systems. Such configurations have not been tested, nor have they been approved for use. Assembly, maintenance or repairs using unspecified parts or accessories is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with such an UNACCEPTED system.**

**WARNING: Do NOT modify the TREND MEDIAN™ in any way.**

**IMPORTANT: Ingal Civil Products makes no recommendation whether use or reuse of any part of the TREND MEDIAN™ is appropriate or acceptable after system impact. It is the responsibility of the state/specifying agency and its engineers to make that determination.**

**IMPORTANT: It is the responsibility of owner, state/specifying agency, or specifier to inspect the TREND MEDIAN™ after assembly is complete to ensure the instructions provided in this manual have been strictly followed.**

## 1.0 Overview

The TREND MEDIAN™ has a system length of 10.477m long and is a tangent, 787mm [+25/-0mm] high, double-sided, re-directive/gating and energy absorbing attenuator/end terminal available for use with various longitudinal highway barriers, in either unidirectional or bidirectional traffic applications.

The TREND MEDIAN™ consists of TREND MEDIAN™ 3.4mm and 2.7mm BMT slotted guardrail, TREND MEDIAN™ 2.7mm BMT transition guardrail with an integrated fin and TREND MEDIAN™ 2.7mm BMT slotted guardrail with an integrated fin, TREND MEDIAN™ 3.4mm BMT head rail, TREND MEDIAN™ impact head, TREND MEDIAN™ CR top and bottom posts, TREND MEDIAN™ SYTP® with soil plate, TREND MEDIAN™ system line post with soil plate, TREND MEDIAN™ angle strut, TREND MEDIAN™ cable assembly, TREND MEDIAN™ spacers, composite offset blocks and various other required hardware accessories.

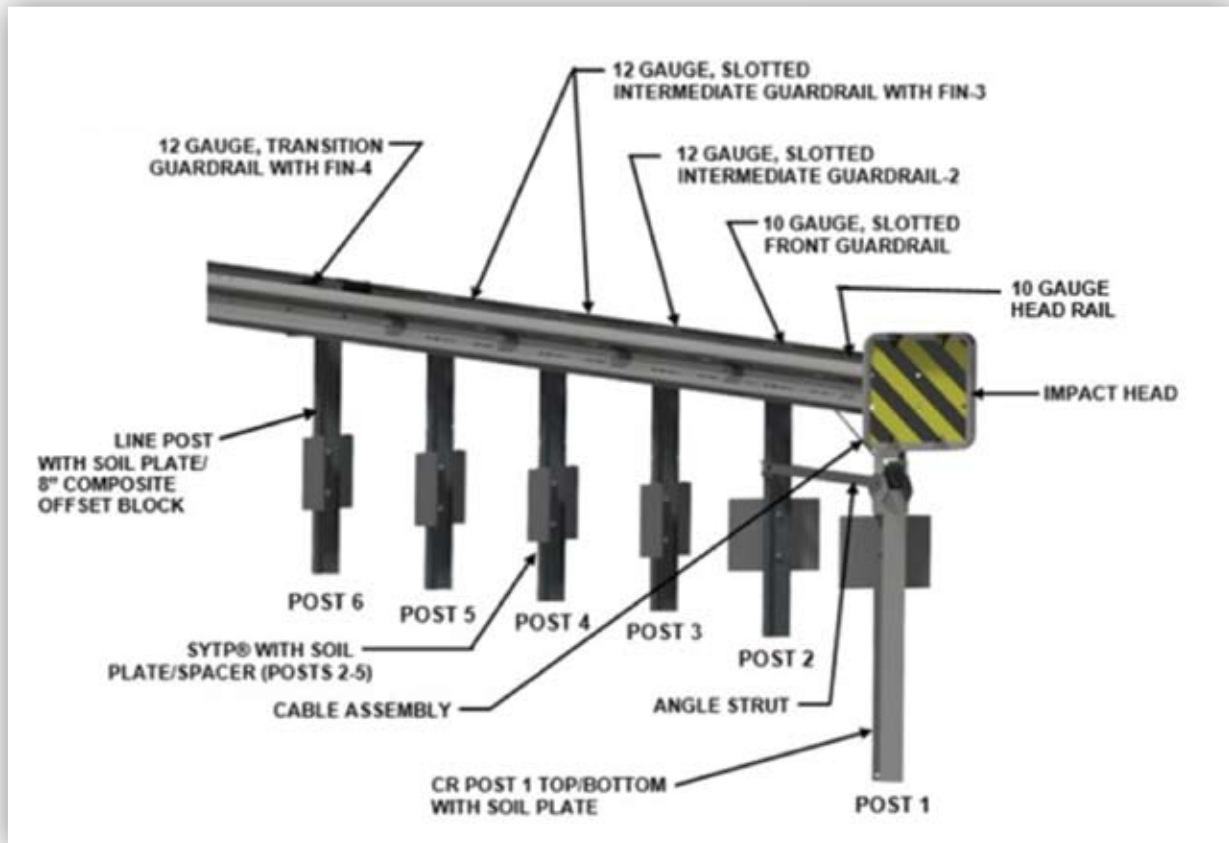
When connecting the TREND MEDIAN™ to Ezy-Guard 4 or Ezy-Guard HC – refer to the drawings to the end of this manual for appropriate transition details.

### GAUGE CONVERSIONS

10 Gauge	3.43mm
12 Gauge	2.67mm

### Specifications

System Weight	692 kg
System Length	10.48 m
System Width (at impact head)	737 mm
System Height (except impact head)	787 mm, +25 mm/-0 mm
Beginning Length-of-Need ("BLON") established during MASH Test 3-35 at Post #3,	3.81 m from Post 1



TREND MEDIAN™ Reference Drawing: SS-6288



## 2.0 Recommended Tools

### Documentation

- Manufacturer's TREND MEDIAN™ Product Description Assembly Manual (Current Version).
- TREND MEDIAN™ Drawing(s) SS-6288 (Current Version).

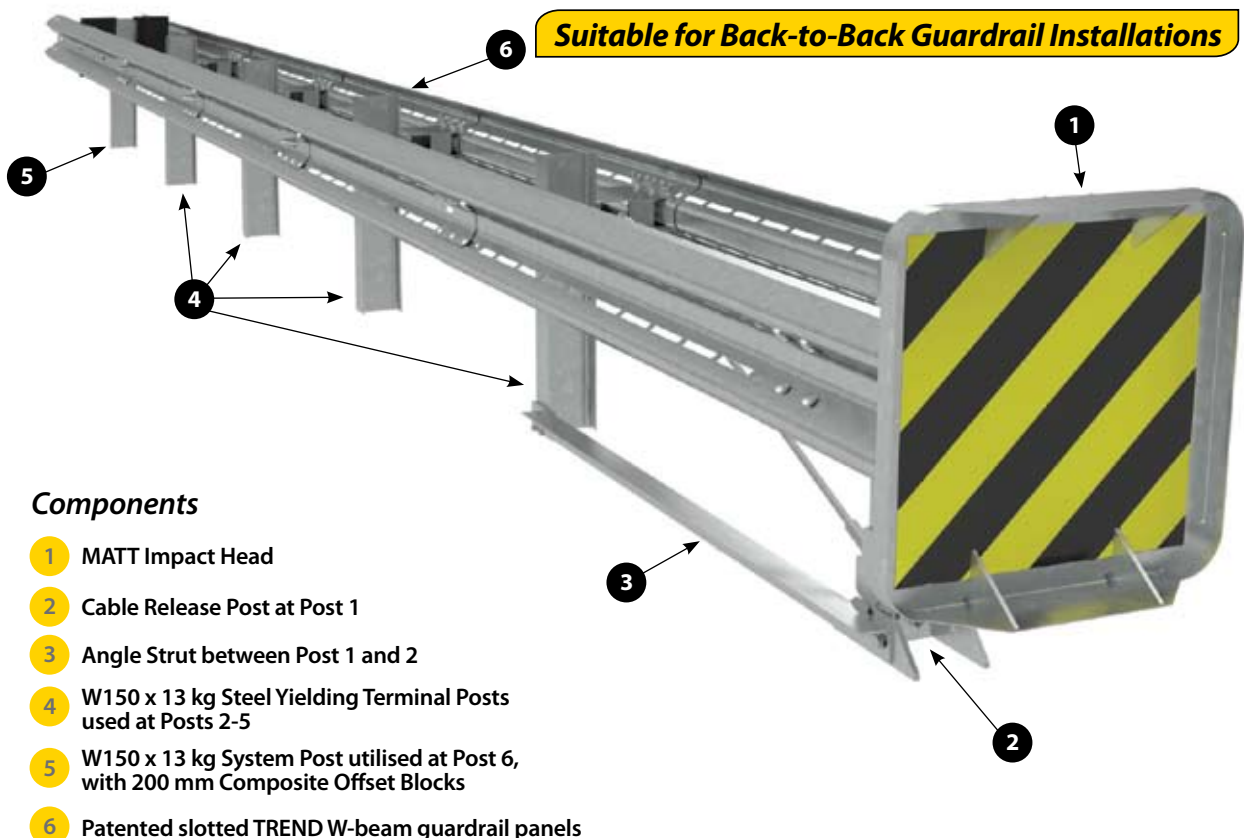
### Personal protective equipment (PPE)

- Eye Protection
- Work Gloves
- Safety-Toe Shoes
- Back Protection
- Hard Hat
- Reflective Vest
- Apron

### Miscellaneous

- Traffic Control Equipment and Plan per state/ specifying agency standards and the MUTCD.
- SAE Combination Wrench Set
- Socket Set & Socket Wrench
- Hammer
- Chalk Line
- Tape Measure
- Marking Paint and Pen
- Straight Edge
- Level
- Plumb Line
- Post Pounder (commonly used for driving posts)
- Auger
- Soil Tamper
- 5/8" Alignment Tool (Drift Pin), used to help align panels
- Locking Pliers and/or Pipe Wrench
- Calibrated Torque Wrench, capable of measuring 88 Nm.

Note: The provided list of tools is a general recommendation and should not be considered an extensive list. Depending on specific site conditions and the complexity of the assembly, the required tools may vary. Decisions as to what tools are needed to perform the job are entirely the responsibility of the state/specifying agency and the selected contractor performing the assembly of the system at the state/specifying agency's site.



### 3.0 Site Preparation

The TREND MEDIAN™ has a system length of 10.477m, long and is a tangent, 787mm [+25 mm, -0 mm] high, double-sided, re-directive/gating and energy absorbing attenuator/end terminal available for use with various longitudinal highway barriers, in either unidirectional or bidirectional traffic applications.

It may be specified for use by the state/specifying agency in conjunction with strong post W-beam guardrail systems on the NHS or other roadway. The decision to specify the TREND MEDIAN™ for a particular project is the responsibility of the state/specifying agency design engineer who must ensure that the most appropriate end treatment has been selected for the specific site conditions.

The TREND MEDIAN™ is designed to be attached directly to double sided W-beam guardrail systems that have been accepted under MASH or NCHRP Report 350 crash test criteria.



**IMPORTANT:** Under NO circumstances shall the rail within the TREND MEDIAN™ be curved, between Post 1 and Post 6. Ensure all TREND MEDIAN™ post spacings are 1.905m on center.



**IMPORTANT:** When used with rigid barriers, (i.e. concrete barrier, wall or bridge pier) a semi to rigid barrier transition will be required (see state/specifying agency standards).



**IMPORTANT:** Ensure that the TREND MEDIAN™ application conforms to the AASHTO Roadside Design Guide, current edition to include appropriate grading details.



**IMPORTANT:** Ingal Civil Products does not direct grading. Proper site grading must be accomplished before assembly of the TREND MEDIAN™ in accordance with local guidelines OR the AASHTO Roadside Design Guide (see Appendix A and B), whichever is more stringent. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with the system.



**IMPORTANT:** The Beginning Length of Need ("BLON") for the TREND MEDIAN™ was established during MASH Test 3-35 at Post 3, which is 3.810m from Post 1.



**IMPORTANT:** Only 200 mm composite offset blocks can be used at Post 6 and only the supplied special TREND MEDIAN™ spacers/double spacers at all other post locations.



**TREND MEDIAN** was tested to MASH-2nd Edition (with 2020 Errata) Test Level 3 criteria and may be used in Test Level 1, Test Level 2, and Test Level 3 applications – when installed at the full Test Level 3 system length of 10.477m.



## 4.0 Post Placement

The TREND MEDIAN™ posts are inserted into the soil using an auger or post pounding equipment for placement. If an auger is used, ensure diameter is large enough to allow for proper compaction of state/specifying agency approved fill material. All TREND MEDIAN™ posts must be assembled within established standard construction tolerances, including being plumb. Compaction for all posts must be within the state/specifying agency guidelines.



**DANGER: It is the responsibility of the installer to ensure all above & below ground utilities as well as drainage structures are located, marked, and identified prior to using an auger or post pounding tool in accordance with state/ specifying agency guidelines. Failure to follow this warning could result in serious injury or death.**

### Rigid Pavement and Rock

If rigid pavement (e.g. concrete or asphalt) of any thickness is encountered within the system, ensure a proper “leave-out” area (the specified size of open space as defined in the AASHTO Roadside Design Guide) and/or per the state/ specifying agency is provided around the posts and filled with the state/ specifying agency approved backfill material.

If solid rock is encountered at post locations 3-6, refer to the state/specifying agency guidelines and/or the AASHTO Roadside Design Guide for requirements for embedment depth into the rock and size of the hole. If solid rock is encountered at post locations 1-2, auger a hole in the rock large enough for full post embedment and proper compaction of approved fill material.



## 5.0 Inspect Shipment

Carefully unpack and inspect all components for damage. Check the received parts against the packing list supplied with the system. If any parts are damaged, missing, or unspecified; do not attempt to assemble the system and contact Ingal Civil Products immediately (p. 4).



**WARNING:** Use only Ingal Civil Products parts that are specified by Ingal Civil Products for use with the TREND MEDIAN™ for assembling, maintaining, or repairing the TREND MEDIAN™. Do not utilize or otherwise commingle parts from other systems even if those systems are other Ingal Civil Products or Systems.

ID	TREND MEDIAN™ COMPONENTS/HARDWARE	PN	QUANTITY
A	TREND MEDIAN™ Impact Head	628342A	1
B	TREND MEDIAN™ 2.7mm BMT Transition Guardrail With Fin-4, 2.858m	628289A	2
C	TREND MEDIAN™ 2.7mm BMT, Slotted Intermediate Guardrail With Fin-3, 1.905m	628337A	4
D	TREND MEDIAN™ 2.7mm BMT, Slotted Intermediate Guardrail-2, 1.905m	628274G	2
E	TREND MEDIAN™ 3.4mm BMT, Slotted Front Guardrail-1, 1.905 m	628347G	2
F	TREND MEDIAN™ 3.4mm BMT Head Rail, 552mm	628339A	2
G	TREND MEDIAN™ Single Spacer	628281A	6
H	TREND MEDIAN™ Double Spacer	628280A	2
I	TREND MEDIAN™ Head Tube	628275A	1
J	TREND MEDIAN™ Backing Plate	628338G	8
K	TREND MEDIAN™ CR Post 1 Top	628285A	1
L	TREND MEDIAN™ CR Post 1 Bottom – used with soil plate	628276A	1
M	TREND MEDIAN™ SYTP® 1.83m – used with soil plate	628271G	4
N	TREND MEDIAN™ System Line Post 1.83m – used with soil plate	628270G	1
O	TREND MEDIAN™ Angle Strut	628279G	1
P	TREND MEDIAN™ Cable Assembly 19 mm x 2.260m	119506G	1
Q	Cable Anchor Bracket Angle	33909G	1
R	TREND MEDIAN™ Strut Adapter Plate	628348G	1
S	5/16" x 1.75" Hex Bolt [8 mm x 44 mm]	4211G	2
T	Hex Bolt M16 x 45 G8.8 HDG AS1252	3391G	6
U	M16 x 32 Splice Bolt G8.8	3360G	16
V	Hex Bolt M16 x 50 G8.8 HDG AS1252	3403G	6
W*	M16 x 50 Post Bolt G8.8 HDG AS1252	118614G	62
Y	M8 Hex Nut CL8 HDG AS1112.1	3245G	2
Z*	M16 Nut CL8 HDG AS1252	3361G	66
AA	M16 Round Washer AS1237.1	4372G	8
BB	M16 Oversize Nut CL8	3340G	36
CC	1" Flat Washer [25 mm]	4902G	10
DD	1" Hex Nut [25 mm]	3910G	2
EE	5/8" Flat Washer (1/4" Thick) [16 mm] [6 mm thick]	118615G	62
FF	M12 x 45 N/B/W 8.8 CL8 HDG	113457G	4
GG	M12 Round Washer HDG	118009G	8
HH	M12 Hex Nut CL8 HDG	115939G	4
JJ	5/16" Flat Washer	3240G	2
KK	King Offset Block	10001397	2
MM	TREND MEDIAN™ Soil PL, 6 mm x 457 mm x 610 mm for Posts 1-2	628273G	2
NN	TREND MEDIAN™ Soil Plate W-Shaped (Multi-Directional) for Posts 3-6	628269G	4
OO	M16 x 90 Hex Bolt G8.8	113660G	10
TT	M16 x 250mm Terminal Bolt	3500G	2



ID	Optional Delineation Available From Ingal Civil Products	PN	QUANTITY
UU	Trend Median - Yellow & Black Reflector for Gore Area	10010591	1
VV	Trend Median - Yellow & Black NZ Reflector for Median area	10010762	1

- Fastener combinations at 62 locations of "W", M16 x 50 Post Bolt and "Z", M16 Nut DH require the Nuts to be torqued to 88 Newton-Meters "Nm", [+/- 4 Nm]. See Step 16 for the 62 locations.

GAUGE CONVERSIONS	
10 Gauge	3.43mm
12 Gauge	2.67mm

## 6.0 TREND MEDIAN™ Components/Hardware

Below is a pictorial depiction of the components/hardware for TREND MEDIAN™. Please see the Ingal Civil Products drawings and page 10 of this manual for specific lists of components/hardware and quantities required for TREND MEDIAN™ selected to be assembled.

**Note:** The following components/hardware are not shown to scale.





TREND MEDIAN™ Backing Plate  
ID: J PN: 628338G



TREND MEDIAN™ CR Post 1 Top  
ID: K PN: 628285A



TREND MEDIAN™ CR Post 1 Bottom  
ID: L PN: 628276A



TREND MEDIAN™ SYTP® 1.83m  
ID: M PN: 628271G



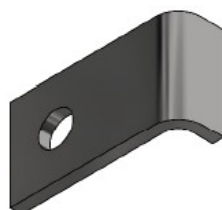
TREND MEDIAN™ Line Post 1.83m  
ID: N PN: 628270G



TREND MEDIAN™ Angle Strut  
ID: O PN: 628279G



TREND MEDIAN™ Cable Assembly  
ID: P PN: 119506G



Cable Anchor Bracket Angle  
ID: Q PN: 33909G



TREND MEDIAN™ Strut Adapter Plate  
ID: R PN: 628348G



M8 mm x 45 mm  
ID: S PN: 4211G



Hex Bolt M16 x 45 G8.8  
ID: T PN: 3391G



M16 x 32 Splice Bolt G8.8  
ID: U PN: 3360G



Hex Bolt M16 x 50 G8.8  
ID: V PN: 3403G



M16 x 50 Post Bolt G8.8  
ID: W PN: 118614G



M8 Hex Nut CL8  
ID: Y PN: 3245G



M16 Nut CL8  
ID: Z

PN: 3361G



M16 Round Washer  
ID: AA

PN: 4372G



M16 Oversize Nut  
ID: BB

PN: 3340G



1" Flat Washer [ 25 mm]  
ID: CC

PN: 4902G



1" Hex Nut [ 25 mm]  
ID: DD

PN: 3910G



M16 Flat Washer [6 mm thick]  
ID: EE

PN: 118615G



M12 x 45 Hex Bolt  
ID: FF

PN: 113457G



M12 Flat Washer  
ID: GG

PN: 118009G



M12 Hex Nut CL8  
ID: HH

PN: 115939G



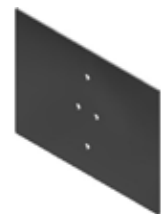
M8 Flat Washer  
ID: JJ

PN: 3240G



200mm King Offset Block  
ID: KK

PN: Various



TREND MEDIAN™ Soil Plate Posts 1 & 2  
ID: MM

PN: 628273G



TREND MEDIAN™ Soil Plate W-Shaped Posts 3-6  
ID: NN

PN: 628269G



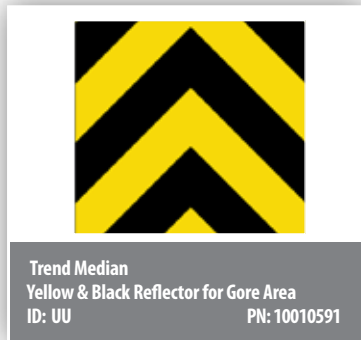
M16 x 90 Hex Bolt G8.8  
ID: OO

PN: 113660G



M16 x 250mm Terminal Bolt  
ID: TT

PN: 3500G



## 7.0 ASSEMBLY STEPS



To ensure an accurate assembly of the TREND MEDIAN™ Terminal, it is recommended that steps be completed in order. **ALL STEPS MUST BE COMPLETED.**



Below ground portions in some assembly steps are not shown for clarity.



See Step 16 for bolt/nuts combinations that must be torqued to 88 Nm [ $\pm$  4 Nm].



After the system is fully assembled, for Steps 5A and 5B, tighten the double/single spacers to a snug position with a minimum of two (2) bolt threads protruding beyond the nut for all hardware that was assembled loosely, ensuring bolt is seated for these steps.

### TREND MEDIAN™ GUARDRAIL IDENTIFICATION/ORIENTATION

Note: The rail panel splice holes and fin are always located upstream (towards the impact head)



E

TREND MEDIAN™ 3.4mm BMT, Slotted Front Guardrail Without Fin-1, 1.905m PN 628347G



D

TREND MEDIAN™ 2.7mm BMT, Slotted Intermediate Guardrail Without Fin-2, 1.905m PN 628274G



C

TREND MEDIAN™ 2.7mm BMT, Slotted Intermediate Guardrail WITH Fin-3, 1.905m PN 628337A

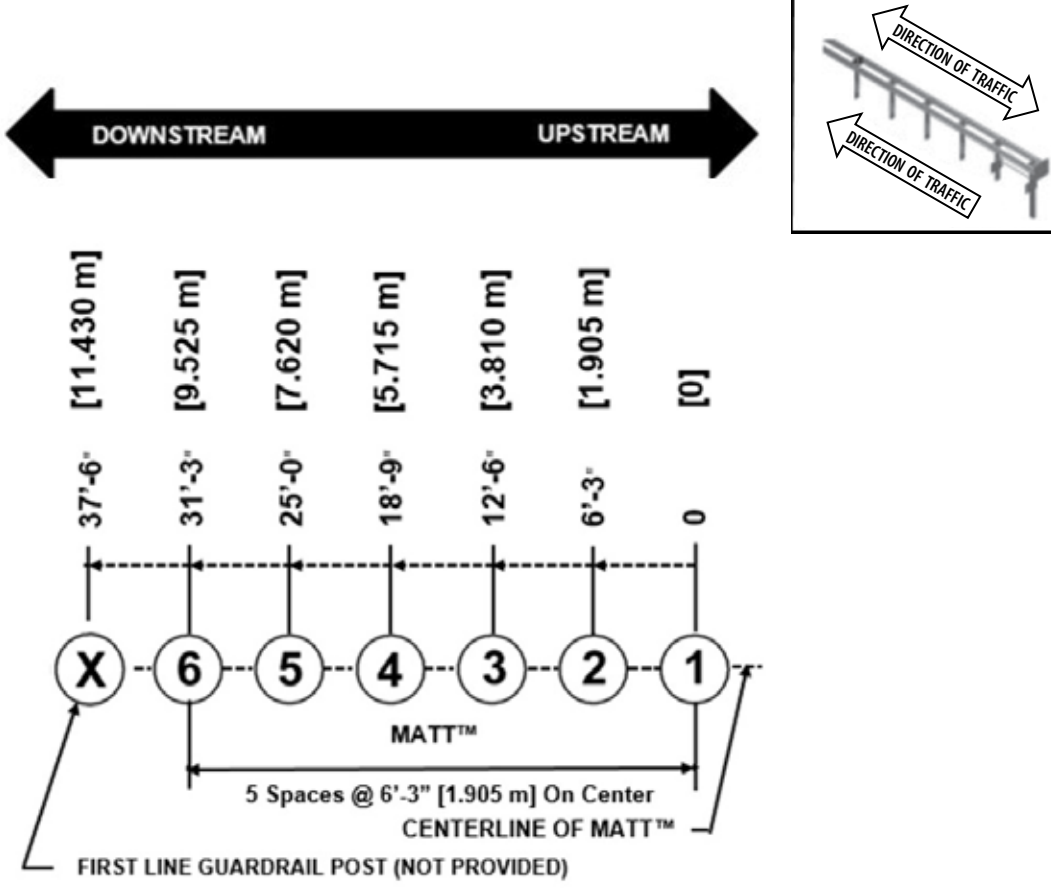



B

TREND MEDIAN™ 2.7mm BMT, Transition Guardrail WITH Fin-4, 2.858m PN 628289A



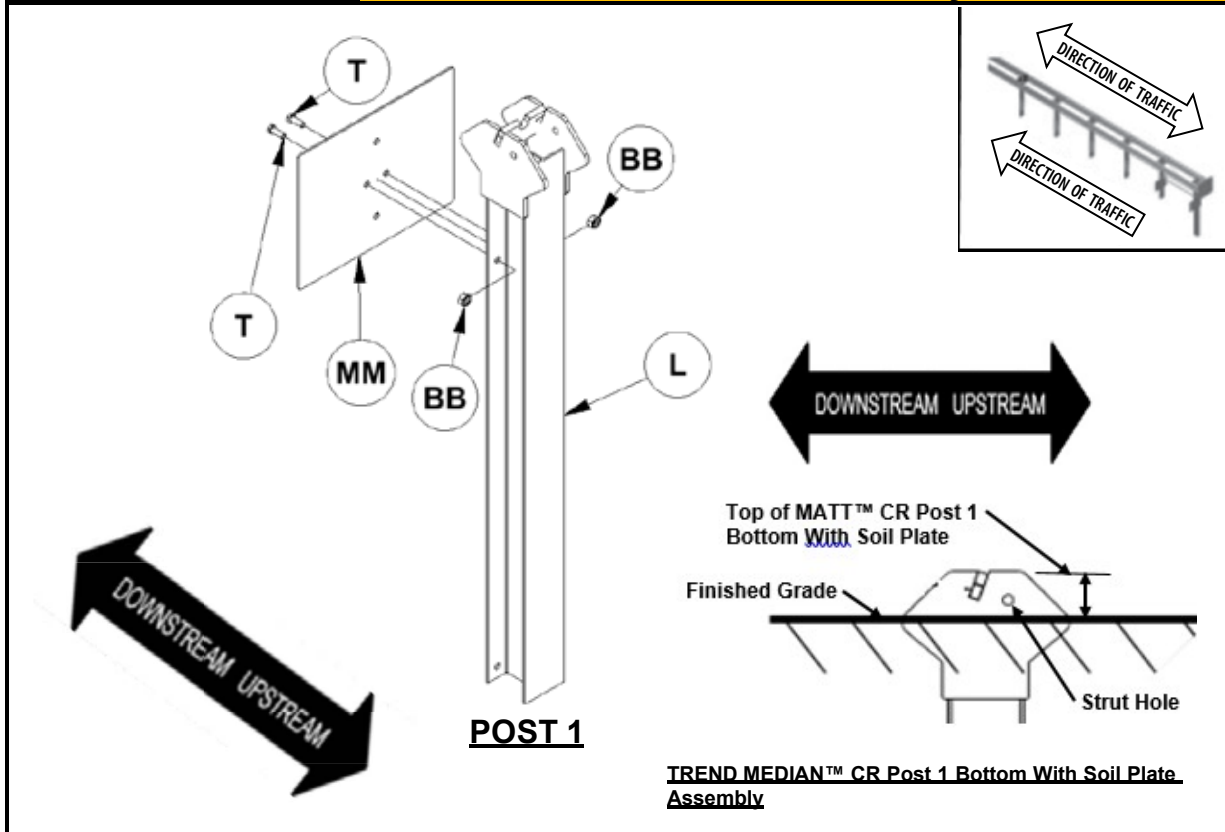
## 8.0 INSTALLATION PROCEDURE


STEP 1			TREND MEDIAN™ Post Layout (Posts 1-6)
			
			INSTRUCTIONS
			<p>Reference: TR-MED-001</p> <ol style="list-style-type: none"> <li>1. Layout the post locations as shown above.</li> <li>2. Layout and placement of the posts are critical to the assembly of the TREND MEDIAN™.</li> <li>3. All TREND MEDIAN™ posts are spaced at 1.905m on center and installed reasonably plumb.</li> <li>4. TREND MEDIAN™ Posts 2-6 heights are 813mm [+25 mm, -0 mm] above finished grade.</li> <li>5. The height of the TREND MEDIAN™ CR Post 1 Bottom is 100 mm [+25mm, -0 mm] above finished grade.</li> </ol>
<p>Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.</p>			WARNINGS
			 <p>Ensure proper site grading in accordance with the state/specifying agency guidelines and/or the AASHTO Roadside Design Guide, whichever is more stringent. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with the system.</p>



## STEP 2A

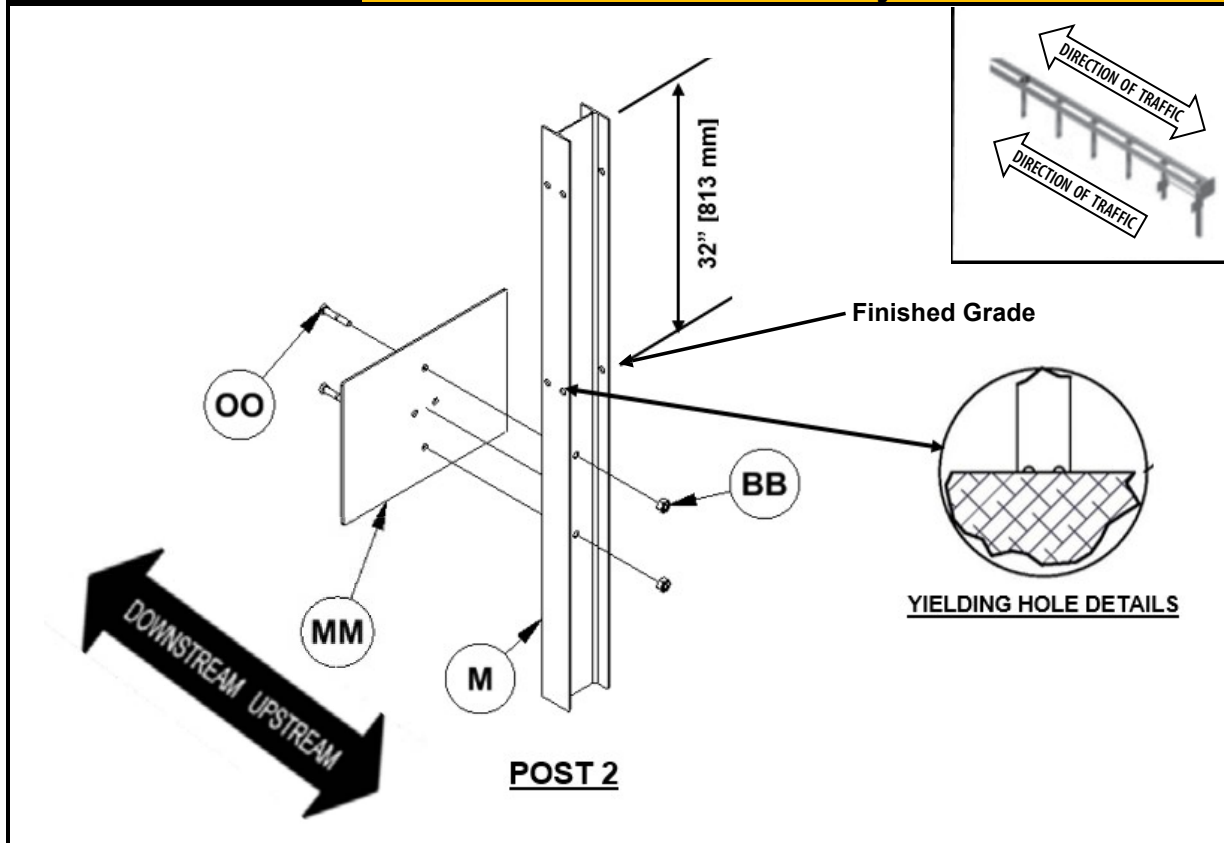
### TREND MEDIAN<sup>™</sup> CR Post 1 Bottom With Soil Plate Assembly




PARTS			INSTRUCTIONS
L	628276A	1 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN <sup>™</sup> Soil Plate (Part MM) to the <u>downstream</u> side of the 1.83m TREND MEDIAN <sup>™</sup> CR Post 1 Bottom (Part L) as shown above using specified hardware (Parts T, BB). 2. Tighten all threaded hardware to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. 3. Assemble the 1.83m TREND MEDIAN <sup>™</sup> CR Post 1 Bottom With Soil Plate as shown above at location established in Step 1. 4. Ensure that the TREND MEDIAN <sup>™</sup> Strut Hole is assembled on the <u>upstream</u> side of the post. 5. Ensure the top of the TREND MEDIAN <sup>™</sup> CR Post 1 Bottom With Soil Plate is 100mm [+25mm, -0mm] above finished grade.
T	3391G	2 EA	
BB	3340G	2 EA	
MM	628273G	1 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			Ensure the TREND MEDIAN <sup>™</sup> Soil Plate is on the <u>downstream</u> side of the CR Post 1 Bottom and Strut Hole is <u>upstream</u> . Ensure threaded hardware is tightened to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. Ensure the top of the TREND MEDIAN <sup>™</sup> CR Post 1 Bottom With Soil Plate is 100 mm [+25 mm, -0 mm] above finished grade. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 2B

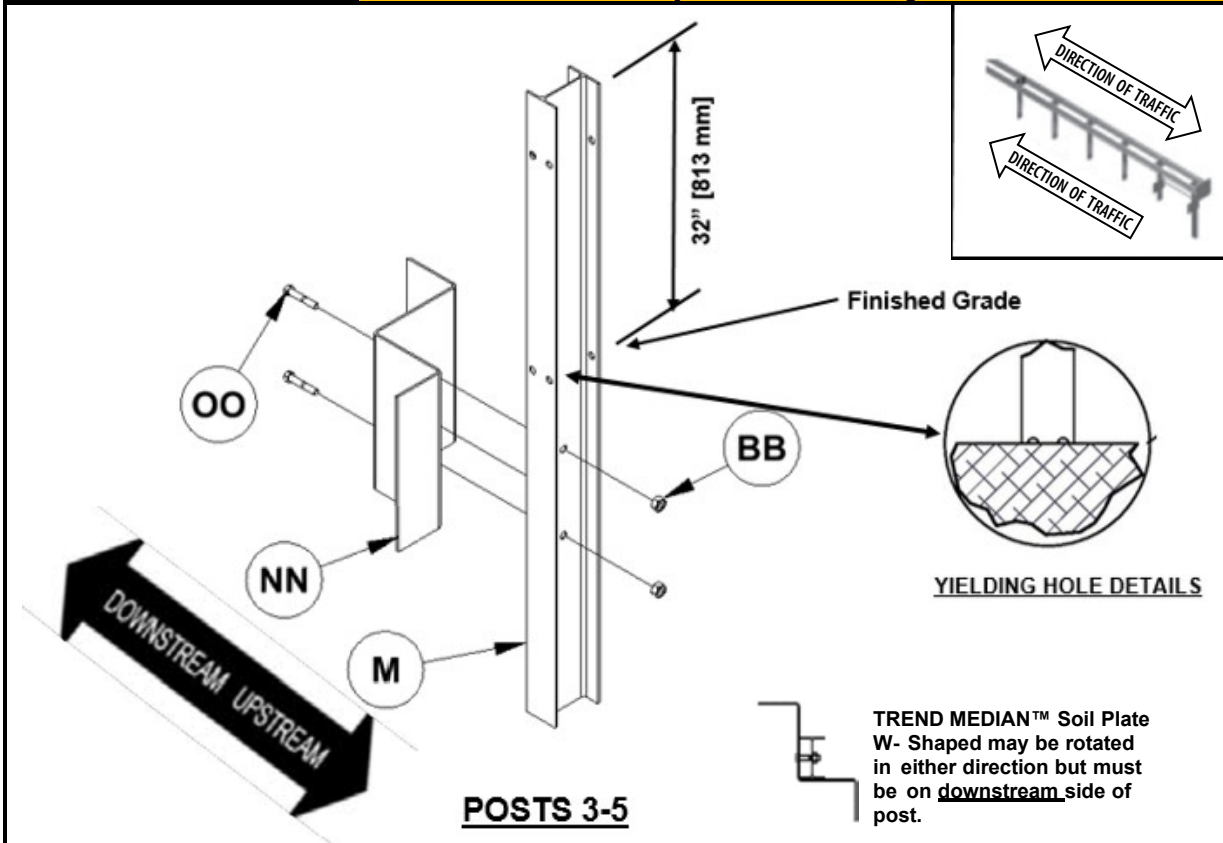
### TREND MEDIAN™ SYTP® With Soil Plate Assembly Post 2




PARTS			INSTRUCTIONS
M	628271G	1 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ Soil Plate (Part MM) to the <u>downstream</u> side of the 1.83m TREND MEDIAN™ SYTP® (Part M) as shown above using specified hardware (Parts BB, OO). 2. Tighten all threaded hardware to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. 3. Assemble the 1.83m TREND MEDIAN™ SYTP® with Soil Plate on the <u>downstream</u> side of the post as shown above for Post 2 at location established in Step 1. 4. Ensure the center of the SYTP® Holes are approximately at finished grade [+25 mm, -0 mm].
BB	3340G	2 EA	
MM	628273G	1 EA	
OO	113660G	2 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			 Ensure the TREND MEDIAN™ Soil Plate is on the <u>downstream</u> side of the TREND MEDIAN™ SYTP®. Ensure the center of the SYTP® Holes are approximately at finished grade [+25 mm, -0 mm]. Ensure the Post spacing is as established in Step 1. Ensure threaded hardware is tightened to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 2C

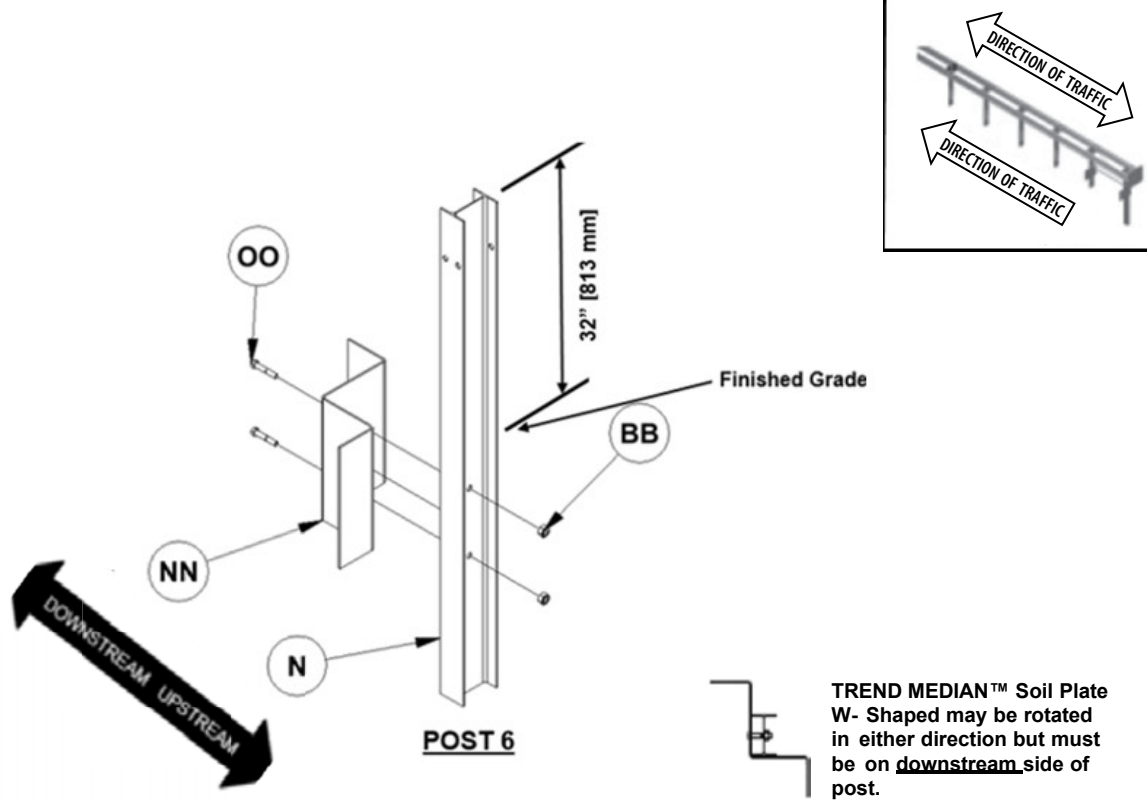
### TREND MEDIAN™ SYTP® With Soil Plate W-Shaped Assembly for Posts 3 to 5




PARTS			INSTRUCTIONS
M	628271G	3 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ Soil Plate W-Shaped (Part NN) to the <u>downstream</u> side of the 1.83m TREND MEDIAN™ SYTP® (Part M) as shown above using specified hardware (Parts BB, OO). 2. Tighten all threaded hardware to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. 3. Assemble the 1.83m TREND MEDIAN™ SYTP® with Soil Plate W-Shaped on the <u>downstream</u> side of the post as shown above for Posts 3-5 at location established in Step 1. 4. Ensure the center of the SYTP® Holes are approximately at finished grade [+25 mm, -0 mm].
BB	3340G	6 EA	
NN	628269G	3 EA	
OO	113660G	6 EA	
			WARNINGS
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			 Ensure the TREND MEDIAN™ Soil Plate W-Shaped is on the <u>downstream</u> side of TREND MEDIAN™ SYTP® 3-5. Ensure the center of the SYTP® Holes are approximately at finished grade [+25 mm, -0 mm]. Ensure the Post spacing is as established in Step 1. Ensure threaded hardware is tightened to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 2D

### TREND MEDIAN™ Line Post With Soil Plate W-Shaped Assembly for Post 6

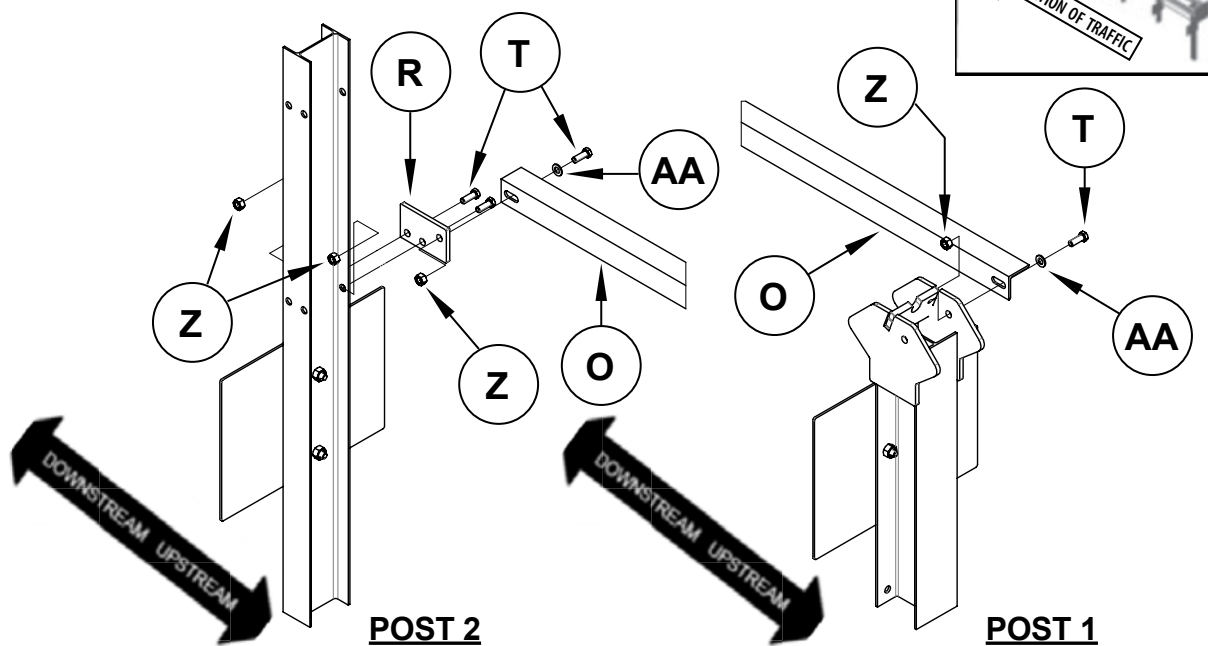



PARTS			INSTRUCTIONS
N	628270G	1 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ Soil Plate W-Shape (Part NN) to the <u>downstream</u> side of the 1.83m TREND MEDIAN™ System Line Post 6 (Part N) as shown above using specified hardware (Parts BB, OO). 2. Tighten all threaded hardware to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. 3. Assemble the 1.83m TREND MEDIAN™ System Line Post with Soil Plate W- Shaped on the <u>downstream</u> side of the post 813 mm [+25 mm, -0 mm] from finished grade as shown above for Post 6 at location established in Step 1.
BB	3340G	2 EA	
NN	628269G	1 EA	
OO	113660G	2 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			 Ensure the TREND MEDIAN™ Soil Plate W-Shaped is on the <u>downstream</u> side of TREND MEDIAN™ System Line Post 6. Ensure the Post spacing is as established in Step 1. Ensure threaded hardware is tightened to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 3

## TREND MEDIAN™ Angle Strut Assembly

**Place the TREND MEDIAN™ Strut Adapter Plate (on Post 2) and TREND MEDIAN™ Angle Strut on the side of Posts 1 & 2 OPPOSITE from the closest traffic, when assembled in a Median or Roadside application. When assembled in a Gore application, it is acceptable to place them on either side of the post.**

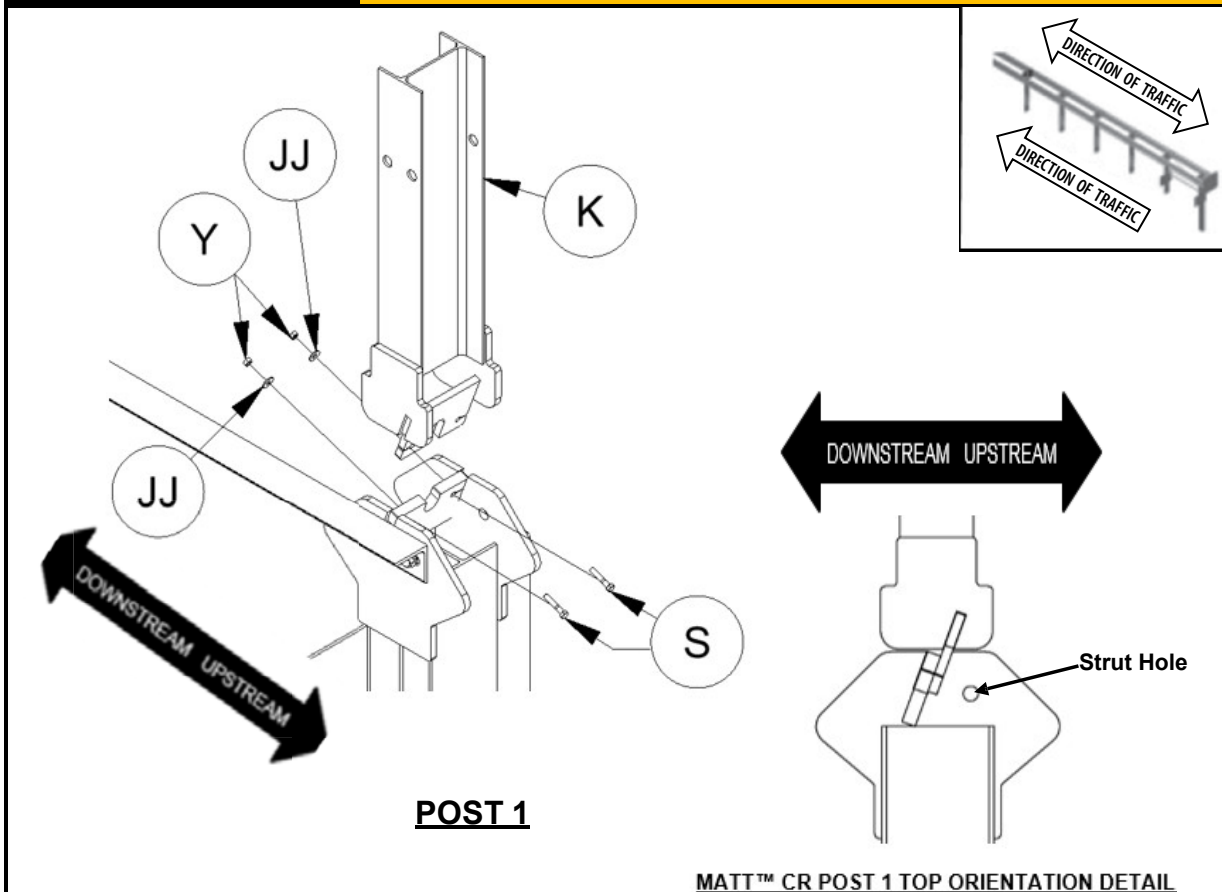



PARTS			INSTRUCTIONS
O	628279G	1 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ Strut Adapter Plate (Part R) to Post 2 as shown above using specified hardware (Parts T, Z). 2. Assemble the TREND MEDIAN™ Angle Strut (Part O) with the "toe" of the vertical leg down and fasten to Posts 1 and the TREND MEDIAN™ Adapter Plate at Post 2, using shown hardware (Parts T, Z, AA) 3. Tighten all threaded hardware to a snug position with a minimum of two (2) bolt threads protruding beyond the nut.
R	628348G	1 EA	
T	3391G	4 EA	
Z	3361G	4 EA	
AA	4372G	2 EA	
			WARNINGS
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			 Ensure the flat washer is between the bolt head and the strut at Post 1 and 2. Ensure the "toe" of the vertical leg of the TREND MEDIAN™ Angle Strut is positioned down. Ensure threaded hardware is tightened to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.



## STEP 4

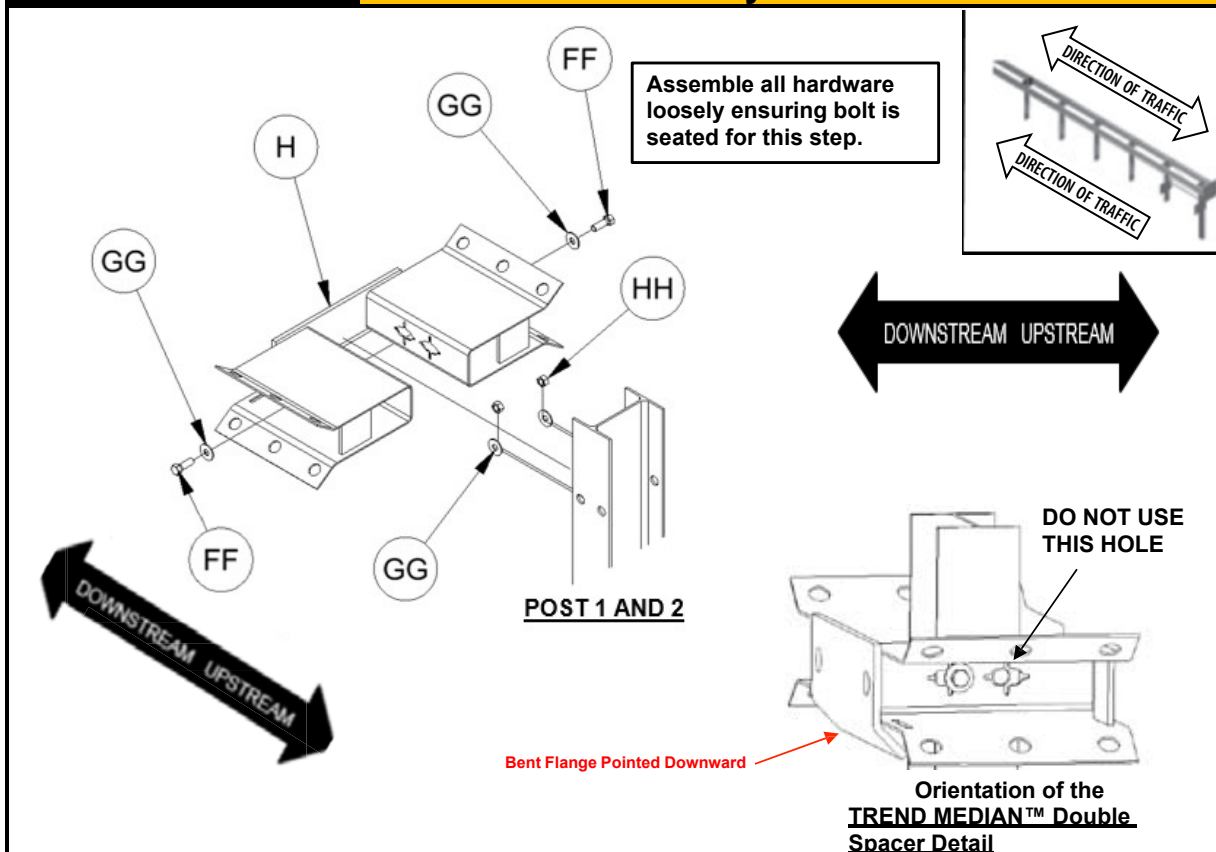
## TREND MEDIAN™ CR Post 1 Top Assembly



PARTS			INSTRUCTIONS
K	628285A	1 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ CR Post 1 Top (Part K) to the TREND MEDIAN™ CR Post 1 Bottom as shown in the "TREND MEDIAN™ CR POST 1 TOP ORIENTATION DETAIL" using specified hardware (Parts S, JJ, Y). 2. Tighten all threaded hardware to a snug position with a minimum of two (2) bolt threads protruding beyond the nut.
S	4211G	2 EA	
Y	3245G	2 EA	
JJ	3240G	2 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			Ensure the TREND MEDIAN™ CR Post 1 Top is oriented according to the detail above. Ensure the Strut Hole in the TREND MEDIAN™ CR Post 1 Bottom was installed <b>upstream</b> . See Step 2A Ensure threaded hardware is tightened to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 5A

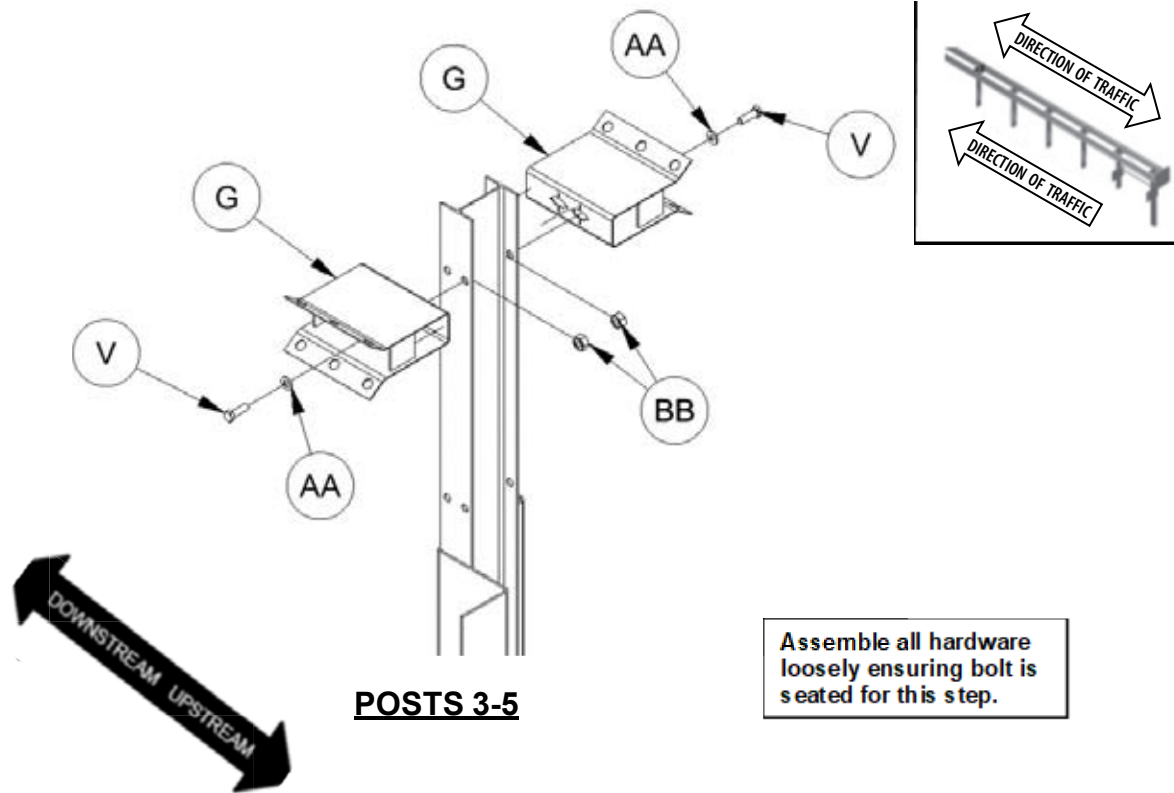
## TREND MEDIAN™ Double Spacer Assembly Post 1 and 2




PARTS			INSTRUCTIONS
H	628280A	2 EA	<p>Reference: TR-MED-001</p> <ol style="list-style-type: none"> <li>1. Assemble the TREND MEDIAN™ Double Spacer (Part H) to the TREND MEDIAN™ SYTP® (Post 2) and TREND MEDIAN™ CR Post 1 as shown above with the <b>Bent Flange, Pointed Downward</b> using specified hardware (Parts FF, GG, HH).</li> <li>2. Ensure the <b>downstream</b> slotted holes in the TREND MEDIAN™ Double Spacer is bolted to the TREND MEDIAN™ CR Post 1 and TREND MEDIAN™ SYTP® with Soil Plate (Post 2) using the <b>downstream</b> holes in the post.</li> </ol>
FF	113457G	4 EA	
GG	118009G	8 EA	
HH	115939G	4 EA	
<p>Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.</p>			WARNINGS
			<p>Ensure the <b>downstream</b> slotted holes in the TREND MEDIAN™ Double Spacer is bolted to the TREND MEDIAN™ CR Post 1 and TREND MEDIAN™ SYTP® with Soil Plate (Post 2) using the <b>downstream</b> holes in the post. Ensure the TREND MEDIAN™ Double Spacer is orientated correctly with the <b>Bent Flanged, Pointed Downward</b> for Posts 1 and 2.</p> <p>Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.</p>

## STEP 5B

### TREND MEDIAN™ Single Spacer Assembly Posts 3-5



**POSTS 3-5**

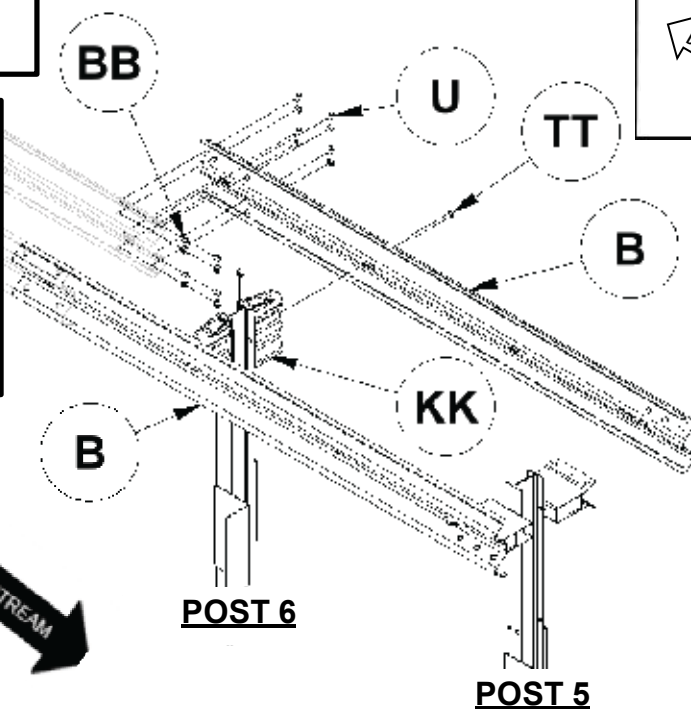
PARTS			INSTRUCTIONS
G	628281A	3 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ hardware (Parts V, AA, BB). 2. Ensure the <u>upstream</u> slotted hole in the TREND MEDIAN™ Single Spacer is bolted to the TREND MEDIAN™ SYTP® with Soil Plate using the <u>upstream</u> hole in the post. 3. Ensure all hardware is assembled loosely ensuring bolt is seated for this step.
V	3403G	6 EA	
AA	4372G	6 EA	
BB	3340G	6 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			 Ensure the <u>upstream</u> slotted hole in the TREND MEDIAN™ Single Spacer is bolted to the TREND MEDIAN™ SYTP® with Soil Plate using the <u>upstream</u> hole in the post. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with the system.


## STEP 6

### TREND MEDIAN<sup>™</sup> 2.7mm BMT Transition Guardrail with Fin-4, 2.858m

**Note:** The assembly shown for one side of the post is required for both sides of the post.

**Note:** At post location **6 only**, lap the TREND MEDIAN<sup>™</sup> 2.7mm BMT Transition Guardrails With Fin-4 to the line guardrail system in the direction of the adjacent traffic. Position the fins upstream.

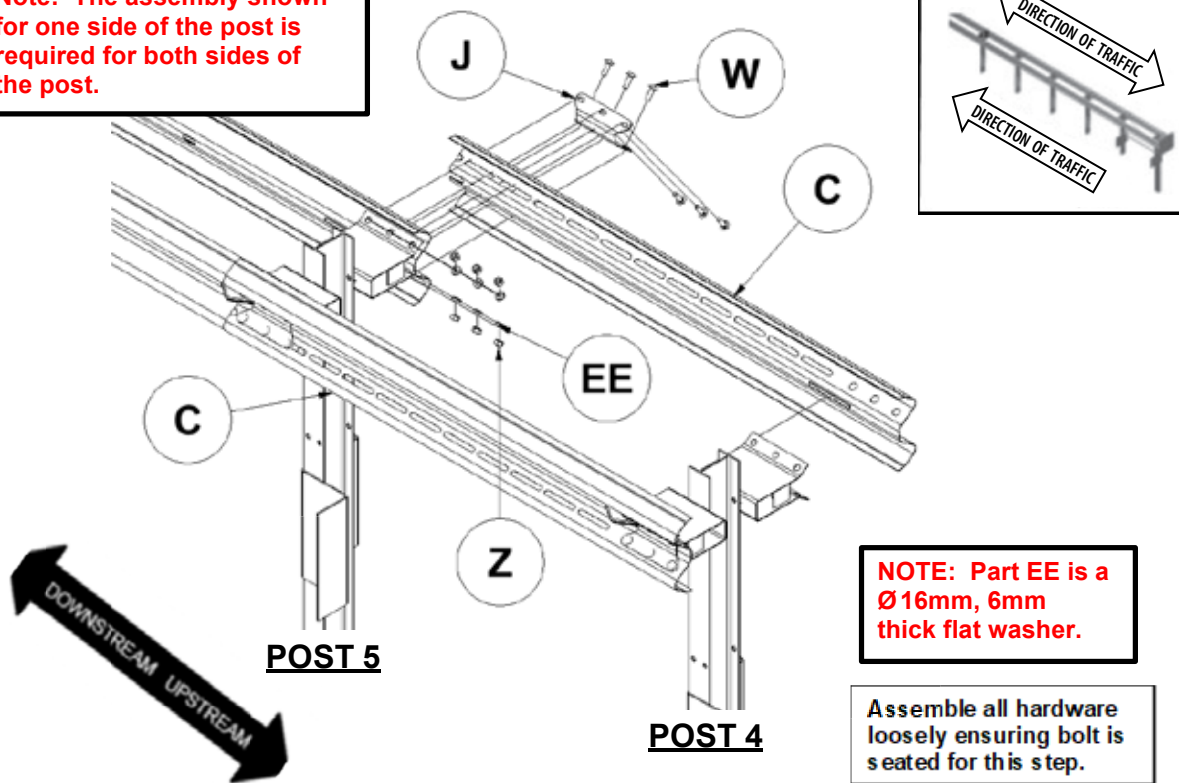



PARTS			INSTRUCTIONS
B	628289A	2 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN <sup>™</sup> 2.7mm BMT Transition Guardrail With Fin-4 (Part B), 2.858m as shown above for both sides using specified hardware (Parts U, BB, TT). 2. At this location <b>ONLY</b> , lap the TREND MEDIAN <sup>™</sup> 2.7mm BMT Transition Guardrail With Fin-4 with the line guardrail system in the <b>direction of the adjacent traffic</b> . <b>Position the fins upstream</b> . 3. Tighten all threaded hardware to a snug position with a minimum of two (2) bolt threads protruding beyond the nut. 4. Guardrail height to be 787 mm, [+25 mm, -0 mm] above finished grade.
U	3360G	16 EA	
BB	3340G	18 EA	
KK	Various	2 EA	
TT	3500G	2 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			 <p>Ensure the TREND MEDIAN<sup>™</sup> 2.7mm BMT Transition Guardrail With Fin-4 at this location <b>ONLY</b> is lapped with the line guardrail in the <b>direction of adjacent traffic</b>.  <b>Ensure the fins are positioned upstream.</b>            Ensure only 200mm Composite Offset Blocks are used. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.</p>

## STEP 7

### TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Rail with Fin-3, 1.905m Post 4-5

**Note:** The assembly shown for one side of the post is required for both sides of the post.



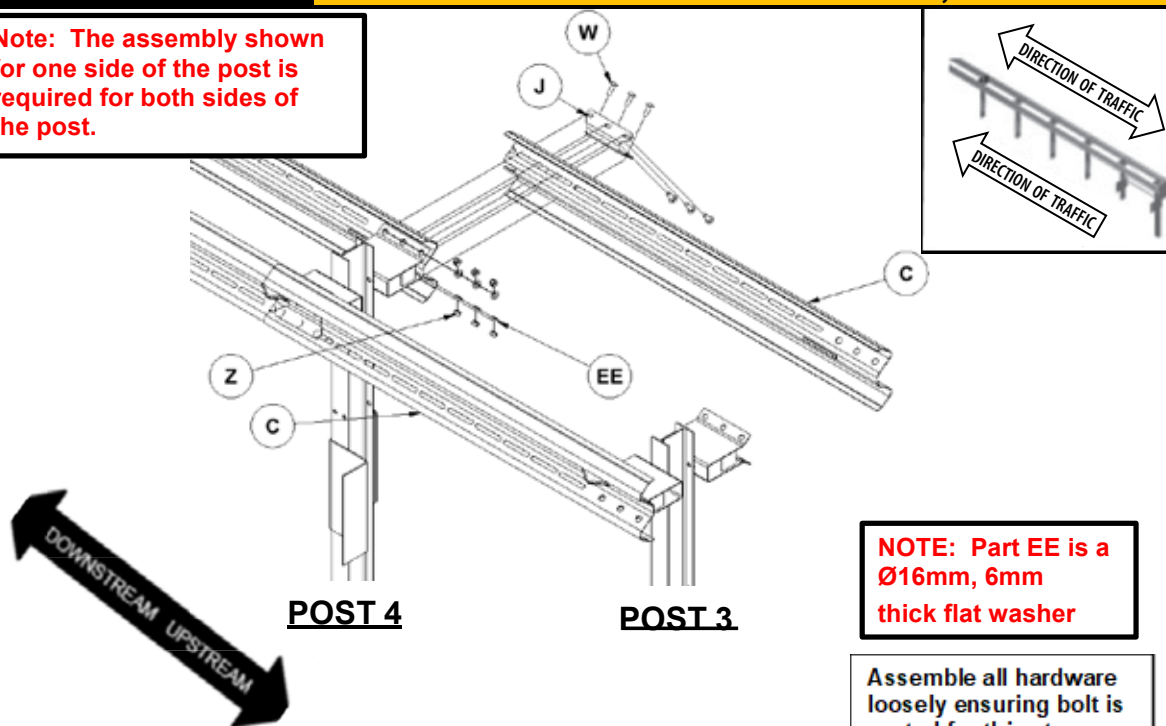
PARTS			INSTRUCTIONS
C	628337A	2 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3 (Part C), 1.905m as shown above for both sides using specified hardware (Parts J, W, Z, EE). 2. Ensure the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3 installed between Posts 4 and 5 <b>is lapped to the outside</b> of the TREND MEDIAN™ 2.7mm BMT Transition Guardrail With Fin-4 and fins are <b>positioned upstream</b> . 3. Ensure the TREND MEDIAN™ Backing Plate (Part J) <b>is on the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3. 4. Assemble all hardware loosely ensuring bolt is seated for this step.
J	628338G	2 EA	
W	118614G	12 EA	
Z	3361G	12 EA	
EE	118615G	12 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			 Ensure the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3 installed between Posts 4 and 5 <b>is lapped to the outside</b> of the TREND MEDIAN™ 2.7mm BMT Transition Guardrail With Fin-4. Ensure the TREND MEDIAN™ Backing Plate <b>is on the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3. Ensure the fins are positioned upstream as shown. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.




## STEP 8

### TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3, 1.905m

**Note:** The assembly shown for one side of the post is required for both sides of the post.

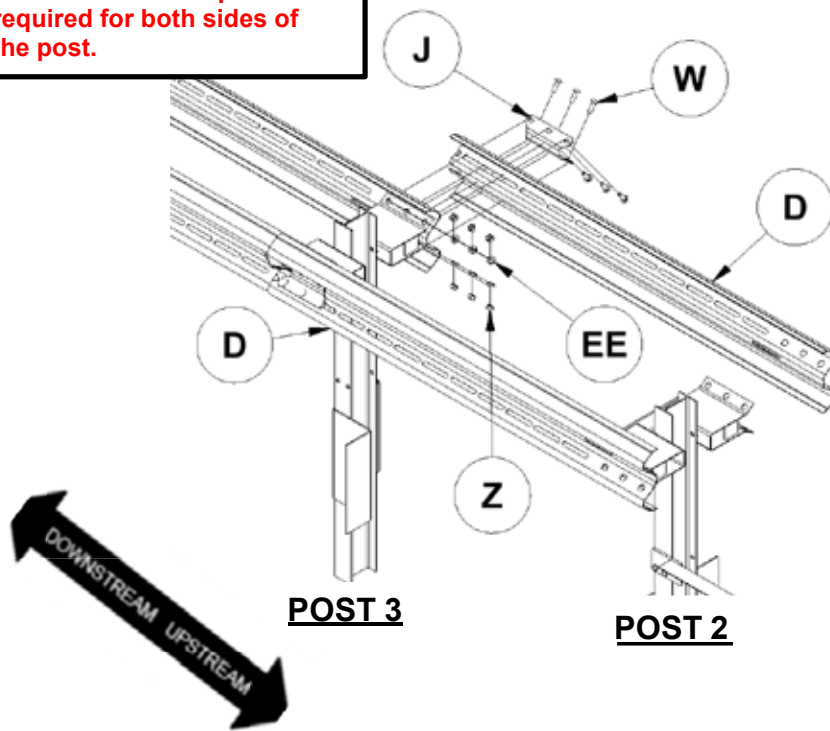


PARTS			INSTRUCTIONS
C	628337A	2 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail with Fin-3 (Part C), 1.905m as shown above for both sides using specified hardware (Parts J, W, Z, EE). 2. Ensure the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate With Fin-3 installed between Posts 3 and 4 <b>is lapped to the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3 installed between posts 4 and 5 3. Ensure the TREND MEDIAN™ Backing Plate (Part J) <b>is on the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate With Fin-3. 4. Assemble all hardware loosely ensuring bolt is seated for this step.
J	628338G	2 EA	
W	118614G	12 EA	
Z	3361G	12 EA	
EE	118615G	12 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			 <p>Ensure the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate With Fin-3 installed between Posts 3 and 4 is <b>lapped to the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3 installed between posts 3 and 4. Ensure the TREND MEDIAN™ Backing Plate <b>is on the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3.            Ensure fins are positioned upstream as shown.            Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.</p>

## STEP 9


### TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2, 1.905m

**Note:** The assembly shown for one side of the post is required for both sides of the post.



**NOTE:** Part EE is a Ø16, 6mm thick flat washer.

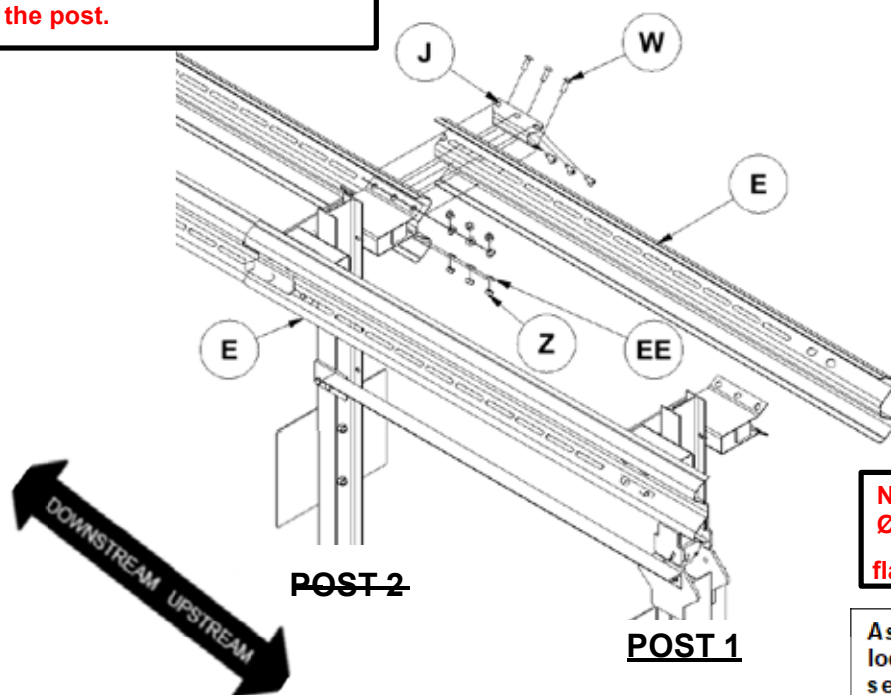
Assemble all hardware loosely ensuring bolt is seated for this step.

PARTS			INSTRUCTIONS
D	628274G	2 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2 (Part D), 1.905m as shown above for both sides using specified hardware (Parts J, W, Z, EE). 2. Ensure the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2 installed between Posts 2 and 3 <b>is lapped to the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3 installed between posts 3 and 4. 3. Ensure the TREND MEDIAN™ Backing Plate (Part J) <b>is on the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2. 4. Assemble all hardware loosely ensuring bolt is seated for this step.
J	628338G	2 EA	
W	118614G	12 EA	
Z	3361G	12 EA	
EE	118615G	12 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			 Ensure the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2 installed between Posts 2 and 3 <b>is lapped to the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail With Fin-3 installed between posts 3 and 4. Ensure the TREND MEDIAN™ Backing Plate (Part J) <b>is on the outside</b> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2. Ensure fins are positioned upstream as shown. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 10


### TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1 1.905m

**Note:** The assembly shown for one side of the post is required for both sides of the post.



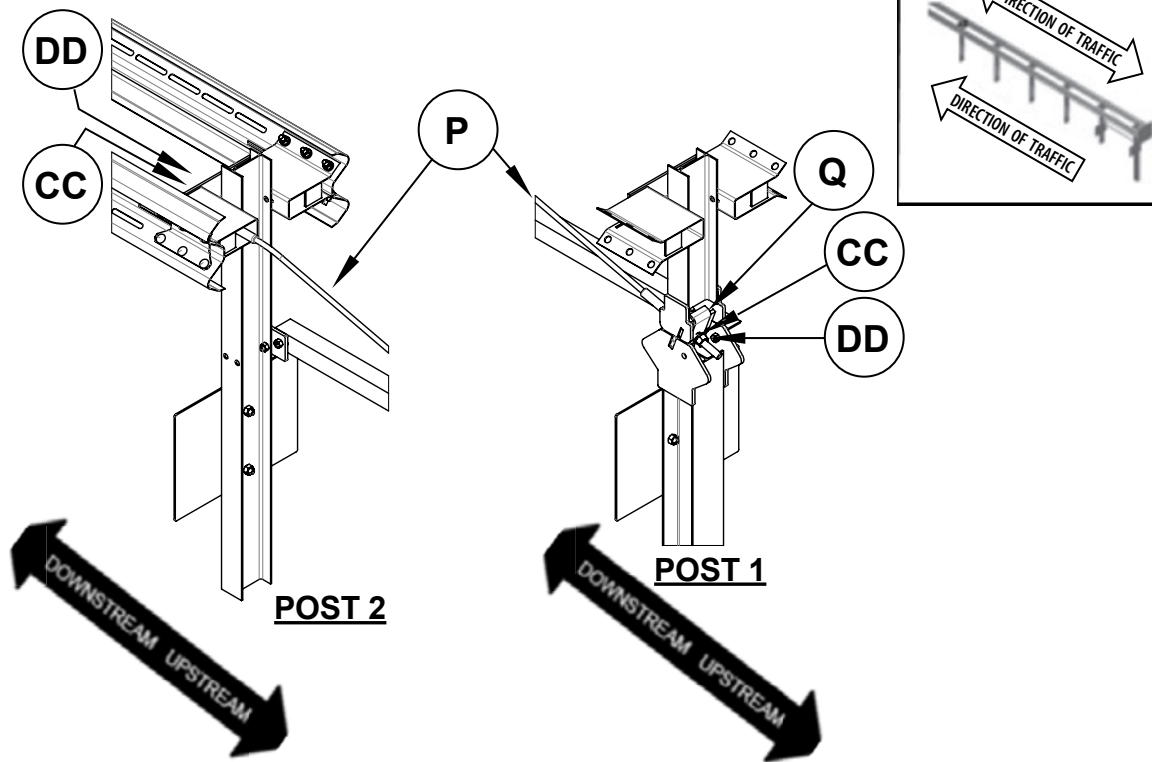
**NOTE:** Part EE is a Ø16, 6mm thick flat washer.


Assemble all hardware loosely ensuring bolt is seated for this step.

PARTS			INSTRUCTIONS
E	628347G	2 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ Backing Plate (Part J) and TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1 (Part E), 1.905m to the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2 as shown above for both sides using specified hardware (Parts W, Z, EE). 2. Ensure the TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1 <u>is lapped to the outside</u> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2. 3. Ensure the TREND MEDIAN™ Backing Plate <u>is on the outside</u> of the TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1. 4. Assemble all hardware loosely ensuring bolt is seated for this step.
J	628338G	2 EA	
W	118614G	12 EA	
Z	3361G	12 EA	
EE	118615G	12 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			Ensure the TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1 <u>is lapped to the outside</u> of the TREND MEDIAN™ 2.7mm BMT Slotted Intermediate Guardrail-2. Ensure the TREND MEDIAN™ Backing Plate <u>is on the outside</u> of the TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 11

## TREND MEDIAN™ Cable Assembly

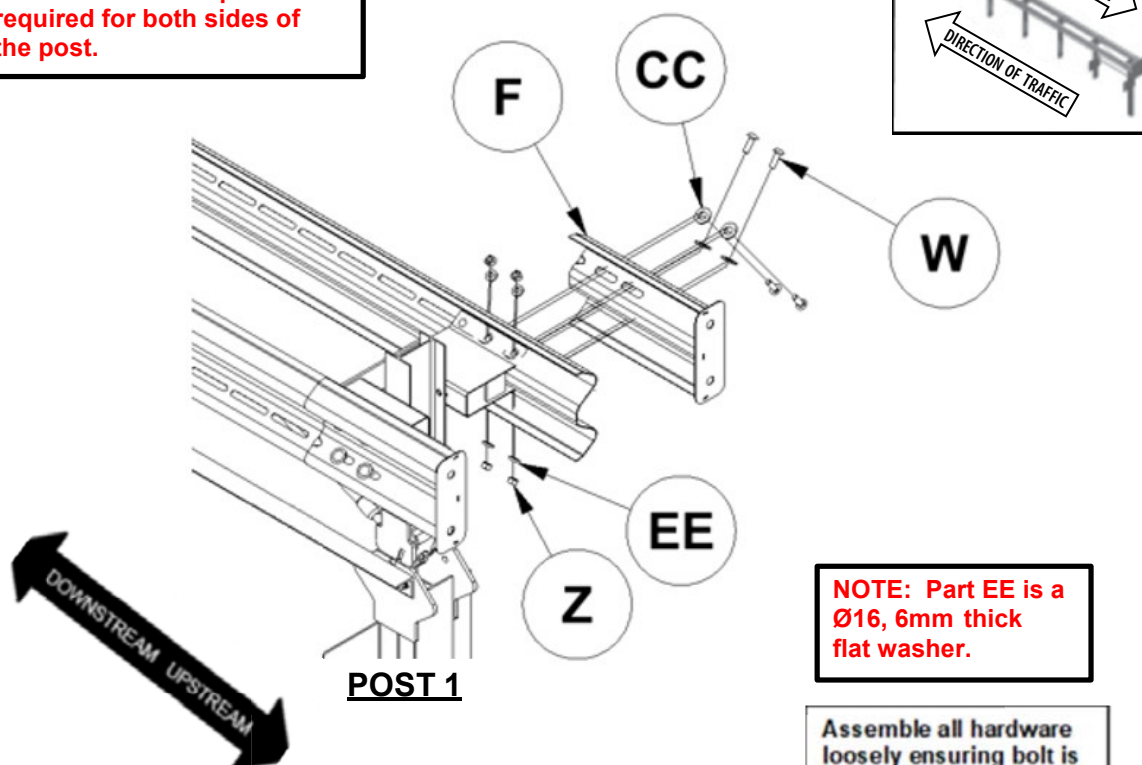


PARTS			INSTRUCTIONS
P	3012G	1 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ Cable Assembly [Part P] as shown above using specified hardware (Parts Q, CC, DD), remove excess slack from the cable. 2. Ensure that the bent portion of the Cable Anchor Bracket Angle [Part Q] at CR Post 1 is up and hooked over the TREND MEDIAN™ CR Post 1 Top.
Q	33909G	1 EA	
CC	4902G	2 EA	
DD	3910G	2 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
 Ensure the Cable Anchor Bracket Angle is hooked over the TREND MEDIAN™ CR Post 1 Top. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.			

## STEP 12


### TREND MEDIAN™ 3.4mm BMT Head Rail Assembly 552 mm

**Note:** The assembly shown for one side of the post is required for both sides of the post.



**NOTE:** Part EE is a Ø16, 6mm thick flat washer.

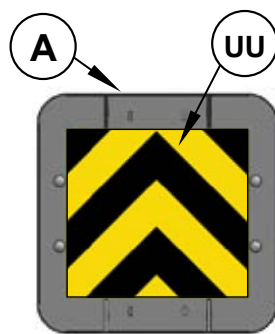
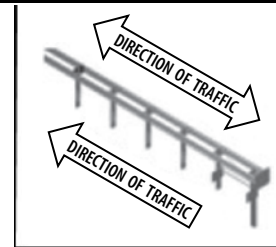
Assemble all hardware loosely ensuring bolt is seated for this step.

PARTS			INSTRUCTIONS
F	628339A	2 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ 3.4mm BMT Head Rail (Part F), 552mm to the TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1 as shown above for both sides using specified hardware (Parts W, CC, EE, Z). 2. Ensure the two <b>Upstream</b> holes in the TREND MEDIAN™ Double Spacer are used to assemble the TREND MEDIAN™ 3.4mm BMT Head Rail and TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1. 3. Ensure the TREND MEDIAN™ 3.4mm BMT Head Rail <b>is lapped to the outside</b> of the TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1. 4. Assemble all hardware loosely ensuring bolt is seated for this step.
W	118614G	8 EA	
Z	3361G	8 EA	
CC	4902G	8 EA	
EE	118615G	8 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			Ensure the TREND MEDIAN™ 3.4mm BMT Head Rail <b>is lapped to the outside</b> of the TREND MEDIAN™ 3.4mm BMT Slotted Front Guardrail-1. Ensure the two <b>Upstream</b> holes in the TREND MEDIAN™ Double Spacer are used to assemble the TREND MEDIAN™ 3.4mm BMT Head Rail. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with the system.

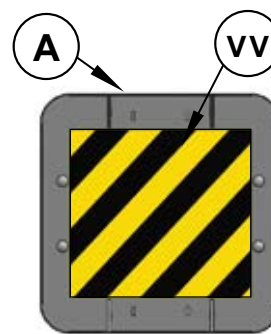


## STEP 13


## TREND MEDIAN™ Delineation Assembly



Gore

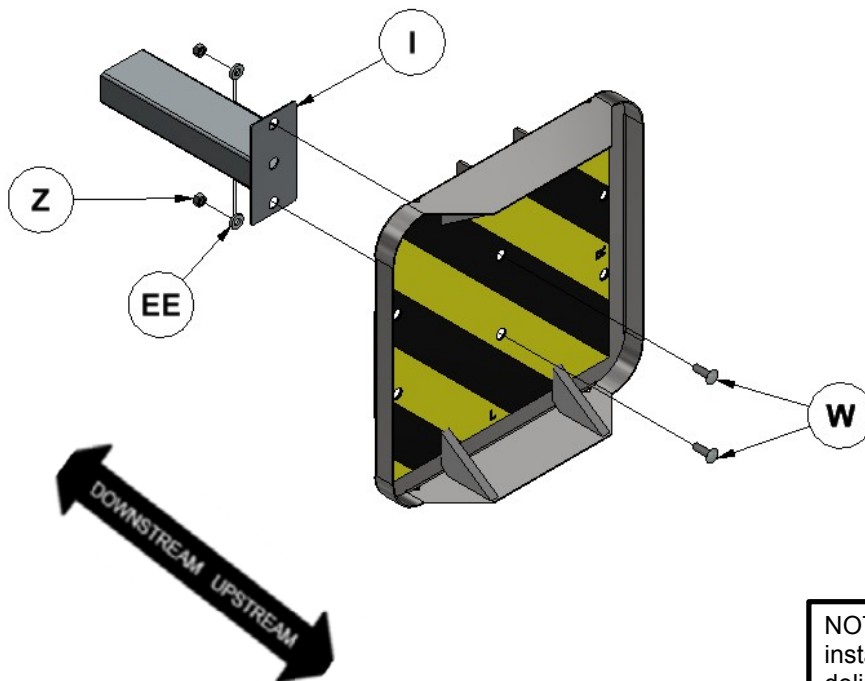


Median


PARTS			INSTRUCTIONS
A	628342A	1 EA	<b>Reference: TR-MED-001</b>  1. For gore application, attach the Delineation Sheeting (Part UU) to the TREND MEDIAN™ Impact Head (Part A).  2. For median application, attach the Delineation Sheeting (Part VV) to the TREND MEDIAN™ Impact Head (Part A) as shown above. Rotate as appropriate.  Note: Manufacturer suggests that user provide delineation (reflective sheeting) as required by the state/specifying agency for terminals.  Note: Ingal Civil Products offers two (2) specific reflective sheeting options for an additional charge. Ingal Civil Products makes no guarantees they meet the minimum specifications, comply with MUTCD requirements or comply with state/specifying agency requirements.
UU	10010591	1 EA	
OR			
VV	10010762	1 EA	
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			<b>WARNINGS</b>   Ensure delineation (reflective sheeting) used on the TREND MEDIAN™ Impact Head meets state/specifying agency's MUTCD for proper delineation. Ensure steel delineator posts are a minimum of 1m in front (upstream) of the TREND MEDIAN™. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 14

## TREND MEDIAN™ Head Tube Assembly

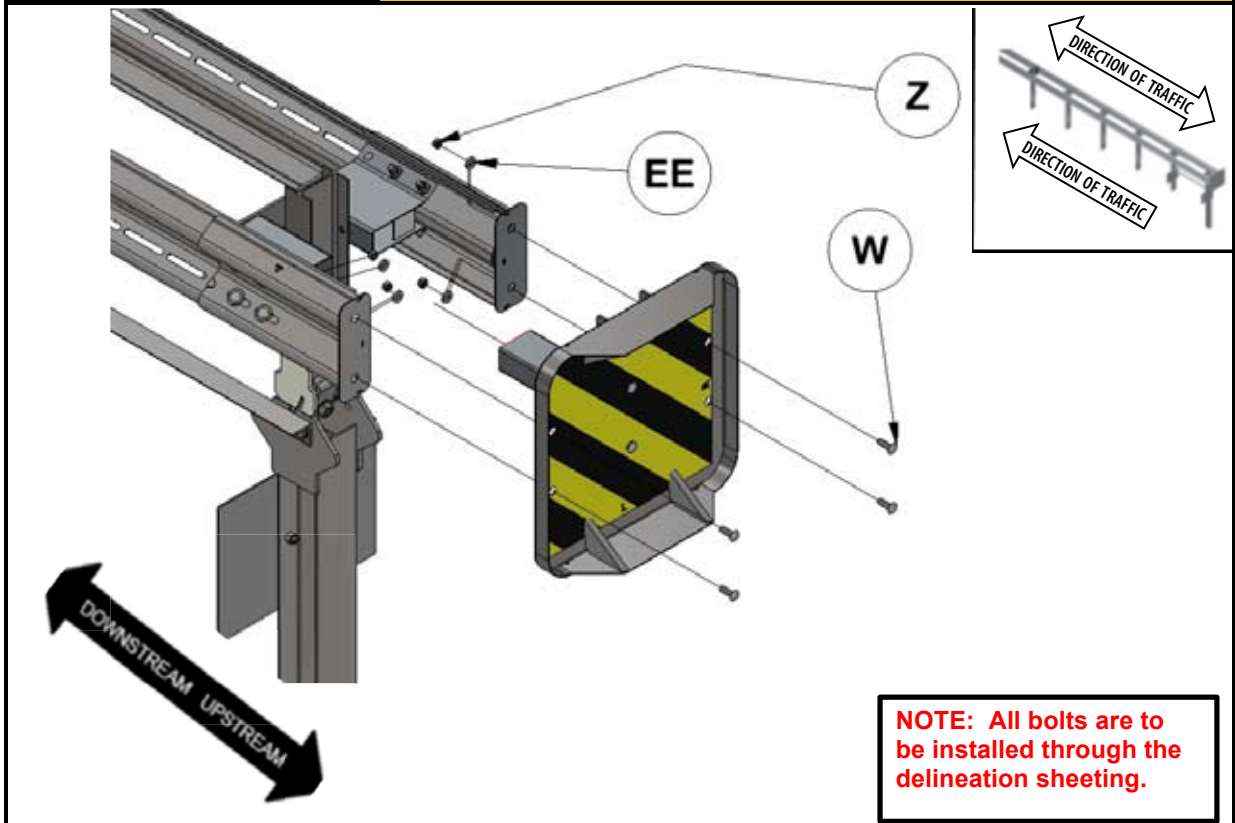



NOTE: All bolts are to be installed through the delineation sheeting.

PARTS			INSTRUCTIONS
I	628275A	1 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ Head Tube (Part I) to the TREND MEDIAN™ Impact Head as shown above using specified hardware (Parts W, Z, EE).  2. Insert M16 x 50 GR Bolt through the delineation sheeting and tighten the M16 Heavy Hex Nut used to assemble the TREND MEDIAN™ Head Tube to the TREND MEDIAN™ Impact Head to <b><u>88 Nm [+/- 4 Nm]</u></b> using a calibrated torque wrench.
W	118614G	2 EA	
Z	3361G	2 EA	
EE	118615G	2 EA	
628342A, from Step 13			
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			<b>WARNINGS</b>
			 Ensure the M16 Heavy Hex Nut used to assemble the TREND MEDIAN™ Head Tube to the TREND MEDIAN™ Impact Head is tightened to a <b><u>torque of 88 Nm [+/- 4 Nm]</u></b> using a calibrated torque wrench. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 15

## TREND MEDIAN™ Impact Head Assembly

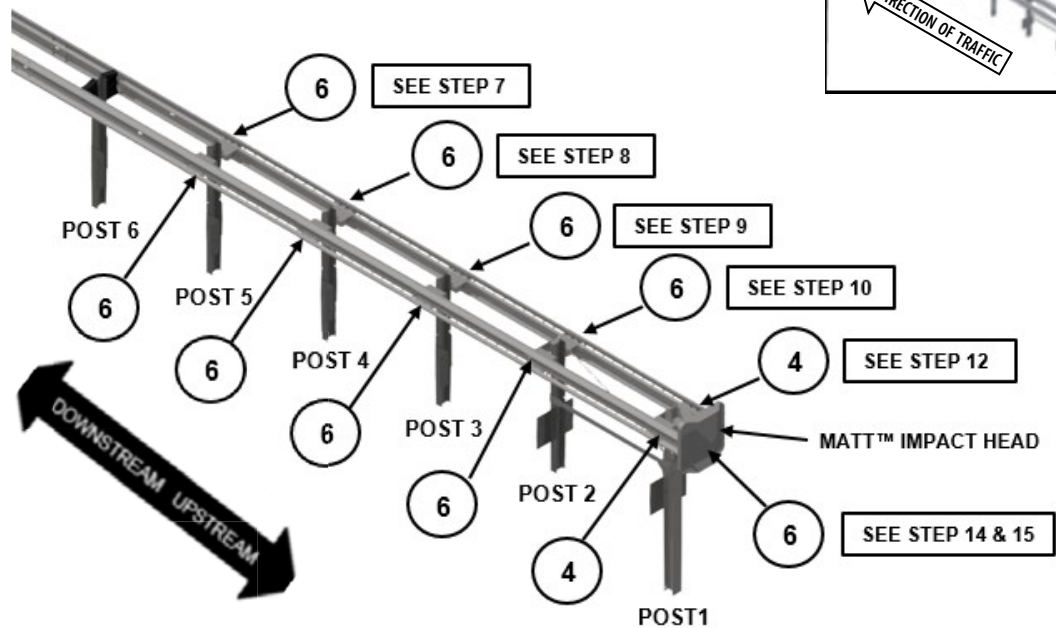



PARTS			INSTRUCTIONS
W	118614G	4 EA	<b>Reference: TR-MED-001</b>  1. Assemble the TREND MEDIAN™ Impact Head to the TREND MEDIAN™ 3.4mm BMT Head Rail as shown above using specified hardware (Parts W, Z, EE). 2. Insert M16 x 50 GR Bolt through the delineation sheeting and tighten the M16 Heavy Hex Nut used to Assemble the TREND MEDIAN™ Head Tube to the TREND MEDIAN™ Impact Head, to <b>88 Nm [+/- 4 Nm]</b> using a calibrated torque wrench. 3. Ensure the TREND MEDIAN™ Head Tube is touching the TREND MEDIAN™ CR Post 1 Top by pushing the TREND MEDIAN™ Impact Head and the TREND MEDIAN™ 3.4mm BMT Head Rails back evenly.
Z	3361G	4 EA	
EE	118615G	4 EA	
628342A, from Step 13			
Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.			WARNINGS
			 Ensure 5/8" Heavy Hex Nuts attaching the TREND MEDIAN™ Impact Head to the TREND MEDIAN™ 3.4mm BMT Head Rail are <b>torqued to 88 Nm [+/- 4 Nm]</b> using a calibrated torque wrench. Ensure the TREND MEDIAN™ Head Tube is touching the TREND MEDIAN™ CR Post 1 Top. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.

## STEP 16

### TREND MEDIAN™ Nuts To Be Torqued And Cable Tensioning

Number in balloon represents the number of "W", M16 x 50 G8.8 GR Bolts, and "Z", M16 Oversize Nuts, that are torqued to 88 Nm, [+/- 4 Nm], at each location.



PARTS			INSTRUCTIONS
			<p>Reference: TR-MED-001</p> <ol style="list-style-type: none"> <li>1. Ensure all bolts identified above and installed loosely ensuring bolt is seated for this step in earlier Steps are <b>torqued to 88 Nm [+/- 4 Nm]</b> using a calibrated torque wrench.</li> <li>2. Ensure the 1" flat washers installed in Step 14 under the bolt head attaching the TREND MEDIAN™ 3.4mm BMT Head Rail are centered on the bolt head before tightening.</li> <li>3. Ensure that the bent portion of the Cable Anchor Bracket Angle (See Step 11) at CR Post 1 is up and hooked over the TREND MEDIAN™ CR Post 1 Top.</li> <li>4. Restrain the cable with locking pliers and/or a pipe wrench while tightening nut with a wrench, at the end being tightened to avoid twisting the cable.</li> <li>5. Tighten the cable until it is taut. The cable is considered taut when it does not deflect more than 25 m] when pressure is applied by hand in an up or down direction.</li> </ol>
			WARNINGS
<p>Use only Ingal Civil Products parts that are specified herein for the TREND MEDIAN for assembling, maintaining, or repairing the TREND MEDIAN. Do not utilise or otherwise commingle parts from other systems even if those systems are Ingal Civil Products' systems.</p>			 <p>Ensure all bolts identified above and installed loosely ensuring bolt is seated for this step in earlier Steps are <b>torqued to 88 Nm [+/- 4 Nm]</b> using a calibrated torque wrench. Ensure the 1" flat washers installed in Step 14 under the bolt head attaching the TREND MEDIAN™ 3.4mm BMT Head Rail are centered on the bolt head before tightening. Ensure cable is taut. Failure to follow these warnings could result in serious injury or death in the event of a vehicle impact with the system.</p>

## 9.0 TREND MEDIAN™ Assembly/Repair Checklist (File with Project/Maintenance Records)

Performed by: \_\_\_\_\_

Date: \_\_\_\_\_

Location: \_\_\_\_\_

Ensure proper site grading complies with state/specifying agency guidelines and/or Austroads Guide to Road Design, whichever is more stringent (p 8).	<input type="checkbox"/>
Ensure only Ingal Civil Products provided parts are used for the assembly of the terminal and that all parts are free of damage (p 5).	<input type="checkbox"/>
Under NO circumstances shall the rail within the terminal be curved.	<input type="checkbox"/>
Ensure the soil around all posts is properly compacted and posts are free to rotate. When leave outs are necessary, use only state/specifying agency approved backfill material within the leave out area (p 9).	<input type="checkbox"/>
Ensure the Strut Hole of the CR Post 1 Bottom with Soil Plate is upstream and the Post is 100 mm [+25 mm, -0 mm] above the finished grade (pp 17, 21-22).	<input type="checkbox"/>
Ensure Soil Plates are installed on the downstream side of Posts 1-6 (pp 17-20).	<input type="checkbox"/>
Ensure the center of the SYTP® yielding holes at Posts 2-5 are approximately centered at finished grade (pp 18-19).	<input type="checkbox"/>
Ensure the Angle Strut is installed between Post 1 and 2 on the post side OPPOSITE the closest traffic, when assembled in a Median or Roadside application. When assembled in a Gore application, it is acceptable to place them on either side of the post(s). Ensure the toe of the Strut's vertical leg is pointed down (p 21).	<input type="checkbox"/>
Ensure the downstream slotted holes in the Double Spacer is bolted to the downstream hole of the CR Post 1 Top and the SYTP® (Post 2) (p 23).	<input type="checkbox"/>
Ensure the upstream slotted hole in the Spacer (Posts 3-5) is bolted to the SYTP® with Soil Plate using the upstream hole in the post (p 24).	<input type="checkbox"/>
Ensure all W-beam rails are installed 787mm [+25 mm, -0 mm] from finished grade (pp various).	<input type="checkbox"/>
Ensure all 2.7mm BMT Transition Guardrails With Fin-4, at post location 6, are lapped in the direction of the nearest adjacent traffic and fins are positioned upstream (p 25).	<input type="checkbox"/>
Ensure the 2.7mm BMT, Slotted Intermediate Guardrails With Fin-3 are lapped to the outside of the 2.7mm BMT Transition Guardrails with Fin-4 (p 26).	<input type="checkbox"/>
Ensure the 2.7mm BMT, Slotted Intermediate Guardrails With Fin-3 are lapped to the outside of the 2.7mm BMT, Slotted Intermediate Guardrails With Fin-3 (p 27).	<input type="checkbox"/>
Ensure the 2.7mm BMT, Slotted Intermediate Guardrails-2 are lapped to the outside of the 2.7mm BMT, Slotted Intermediate Guardrails With Fin-3 (p 28).	<input type="checkbox"/>
Ensure the 3.4mm BMT, Slotted Front Guardrails-1 are lapped to the outside of the 2.7mm BMT, Slotted Intermediate Guardrails-2 (p 29).	<input type="checkbox"/>
Ensure the 3.4mm BMT Head Rails are lapped to the outside of the 3.4mm BMT Slotted Front Guardrails-1 (p 31).	<input type="checkbox"/>
Ensure the Backing Plate is assembled on the outside of the Guardrail Panels at Posts 2, 3, 4 and 5 (pp 26-29).	<input type="checkbox"/>
Ensure the M16 heavy flat washers (6mm thick) are placed between the nut and spacers at Posts 1-5. (pp 26-29)	<input type="checkbox"/>
Ensure the Head Tube is attached to the Impact Head and it is up against the CR Post 1 Top (pp 33-34).	<input type="checkbox"/>
Ensure all fasteners identified in Step 16 are torqued to 88 Nm, [+/- 4 Nm] (p 35).	<input type="checkbox"/>
Ensure all fasteners that are NOT required to be torqued are tightened to a snug position with a minimum of two (2) bolt threads protruding beyond the nut (Various pp).	<input type="checkbox"/>
Ensure the Cable Anchor Bracket Angle is hooked over the CR Post 1 Top and the cable is taut (pp 30-35).	<input type="checkbox"/>



## 10.0 TREND MEDIAN™ Routine Inspection Checklist (File with Project/Maintenance Records)

Performed by: \_\_\_\_\_

Date: \_\_\_\_\_

Location: \_\_\_\_\_

Ingal Civil Products recommends the state/specifying agency develop and administer their own end terminal inspection program, based on location of unit, volume of traffic and impact history.



**IMPORTANT: The TREND MEDIAN™ and all of its components shall be inspected for damage after every impact. Repair using only Ingal Civil Products parts that are specified for use within this TREND MEDIAN™ Product Description Assembly Manual.**

If no end terminal inspection program exists, Trinity Highway recommends visual drive-by inspections at least once every month and walk-up inspections every six (6) months. These inspections shall, at a minimum, consist of:

### Walk-Up Inspections (Recommended Frequency: Every Six (6) Months)

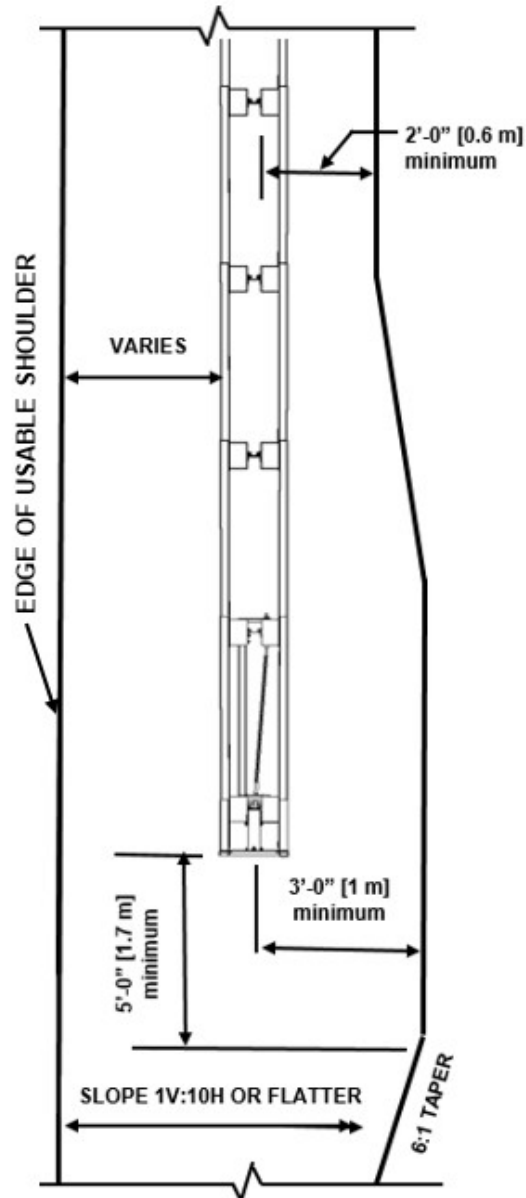
**Walk-Up Inspections include ALL Visual Drive-By Inspection items (listed above) as well as the items listed below.**

Ensure required traffic control is in place to conduct walk-up inspection.	<input type="checkbox"/>
Clear and dispose of any debris or trash found on the TREND MEDIAN™ site, which may interfere with the performance of the TREND MEDIAN™.	<input type="checkbox"/>
Check that fasteners are fully tightened. See Step 16 for torqued nut locations. All other locations are to be tightened to a snug position with a minimum of two (2) bolt threads protruding beyond the nut.	<input type="checkbox"/>
Check for erosion to the site grading around the system.	<input type="checkbox"/>
Ensure that the TREND MEDIAN™ Anchor Cable is taut and the Bearing Plate is properly positioned.	<input type="checkbox"/>
Ensure the TREND MEDIAN™ Panels are lapped correctly to allow them to telescope.	<input type="checkbox"/>

If any of the above items are identified during the inspection process, swift action shall be taken to correct and repair the TREND MEDIAN™ to working condition as outlined in the TREND MEDIAN™ Product Description Assembly Manual, latest edition.

## 11.0 Appendix A

### AASHTO Roadside Design Guide Roadside (Shoulder) Grading Detail



**NOTE:** Refer to AASHTO Roadside Design Guide, 4th Edition 2011, Section 8.3.3 Site Grading Consideration for Terminals, pp 8-4 through 8-6.

### TREND MEDIAN™ Roadside (Shoulder) Grading Detail

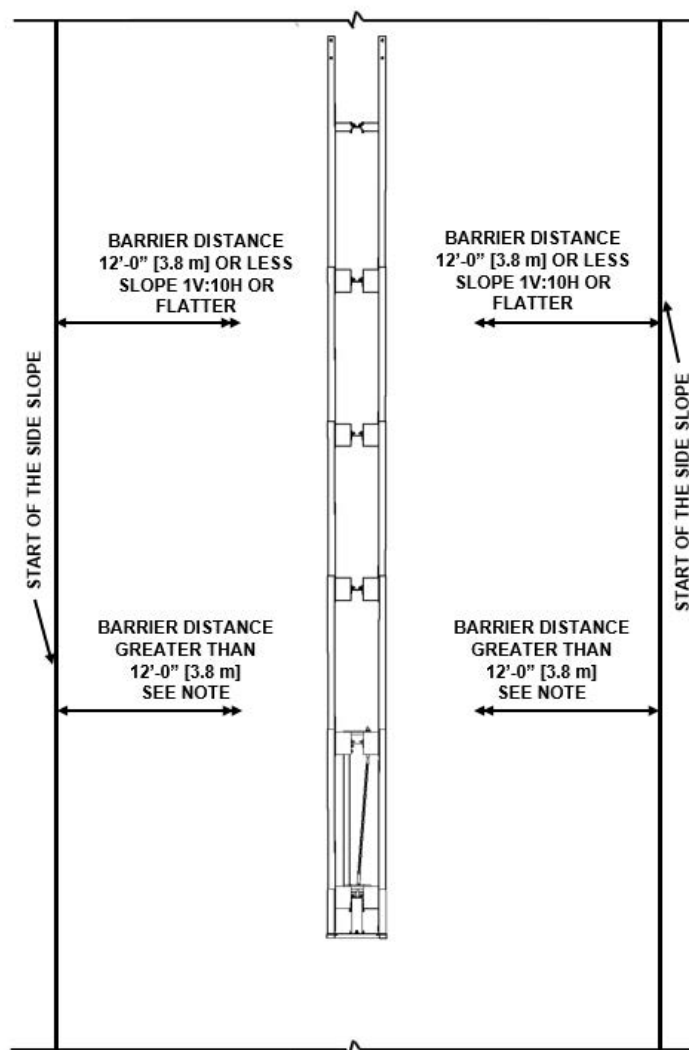
Detail derived from information contained in the AASHTO Roadside Design Guide, 4th Edition 2011



**IMPORTANT:** Ingal Civil Products does not direct grading. Proper site grading must be accomplished before assembly of the MATT™ System in accordance with state/specifying agency guidelines or the AASHTO Roadside Design Guide, whichever is more stringent. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with the system.

## 12.0 Appendix B

### AASHTO Roadside Design Guide Median Grading Detail



**NOTE:** Refer to AASHTO Roadside Design Guide, 4th Edition 2011, Section 5.6.2.2 Slopes, pp 5-46 through 5-48 for slope criteria.

### TREND MEDIAN™ Median Grading Detail

Detail derived from information contained in the AASHTO Roadside Design Guide, 4th Edition 2011



**IMPORTANT:** Ingal Civil Products does not direct grading. Proper site grading must be accomplished before assembly of the MATT™ System in accordance with state/specifying agency guidelines or the AASHTO Roadside Design Guide, whichever is more stringent. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with the system.

## 13.0 Appendix C

### Alternate Foundations for Installations

The MATT™ posts are inserted into the soil using an auger/drill or post pounding equipment for placement. If an auger is used, ensure diameter is large enough to allow for proper compaction of state/specifying agency approved fill material. All MATT™ posts are to be assembled within established standard construction tolerances, including being plumb. Compaction must be accomplished for all posts in accordance with state/specifying agency guidelines.

#### 13.1 Alternative Installations for MATT™ Post 1-6, when encountering solid rock during assembly.



**For ALL options/steps indicating a hole is made into soil or rock and the post inserted into the hole, the hole must be filled, to grade, with compactible materials and appropriately tamped/consolidated, after post installation.**

- The standard installation for posts 1-6 may be completed for ANY/ALL posts, even if encountering solid rock, if the contractor chooses to install as specified.

##### Post 1

- If **solid** rock is encountered within 0 mm – 610 mm below grade make a 220 mm – 300 mm diameter hole into the rock to allow the full 1829 mm embedment of the post **without** a soil plate.
- If solid sock is encountered between 610 mm – 1829 mm below grade, make a 220 mm – 300 mm diameter hole into the rock to allow the full 1829 mm embedment of the post utilising the soil-plated post 1.

##### Post 2

- If **solid** rock is encountered within 0 mm – 610 mm below grade make a 200 mm – 300 mm hole to allow the full 1016 mm embedment of the post **without** a soil plate.
- If solid rock encountered between 610 mm – 1016 mm below grade, make a 200 mm – 300 mm diameter hole into the rock to allow the full 1016 mm embedment of the post utilising the soil-plated post 2.

##### Posts 3-6

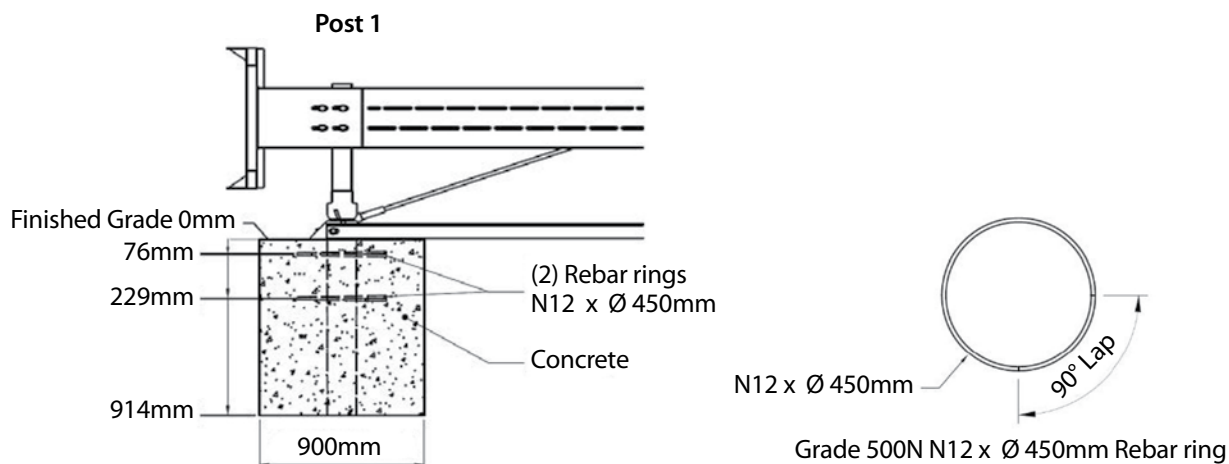
- If **solid** rock is encountered within 0 mm – 457 mm below grade:
  - Make a 210 mm – 550 mm oval or rectangular hole 610 mm deep from grade. In the center at the bottom of the hole, make a 200 mm – 300 mm diameter hole, 406 mm deep to allow the full 1016mm embedment of the post.
- If **solid** rock is encountered between 457 mm – 1016 mm below grade, make a 200 mm – 300 mm diameter hole to allow the full 1016 mm length post installation embedment. Install post **without** a soil plate.

## 13.2 Alternative Installations for MATT™ Post 1, when encountering any below grade obstacle which conflicts with the full depth installation of Post 1, such as utilities, solid rock, or an underground structure:

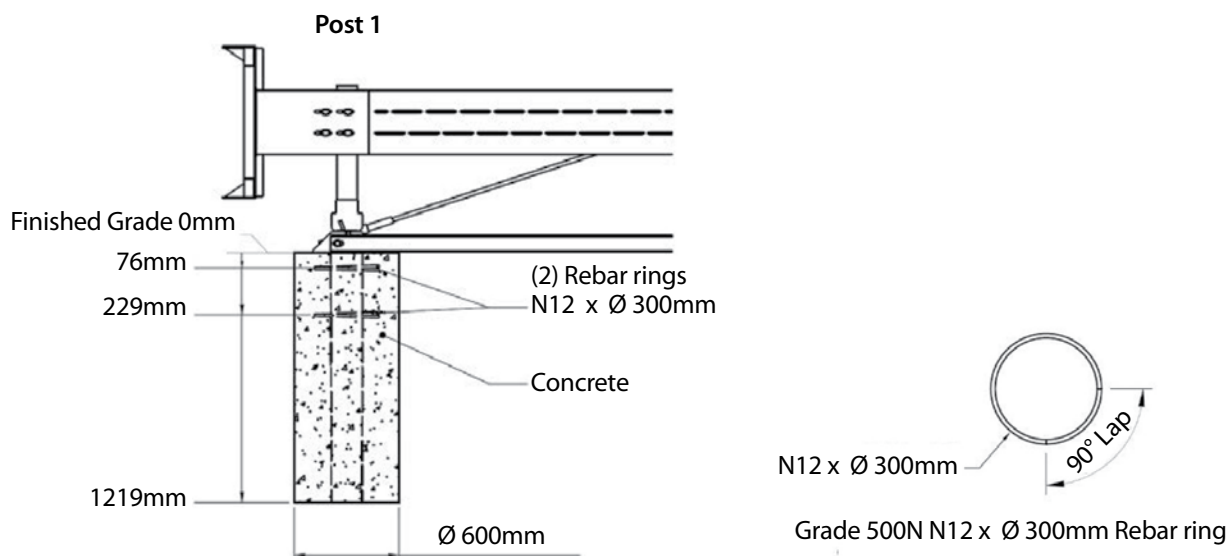


**WARNING:** All three (3) alternative Post 1 foundation options shown below REQUIRE the concrete to cure to a minimum of 32 MPa PRIOR to attaching the MATT™ CR Post 1 Top (ID: K) or in any way moving or loading the MATT™ CR Post 1 Bottom (ID:L).

### Case 1: Below grade obstacles between 914 mm and 1219 mm.

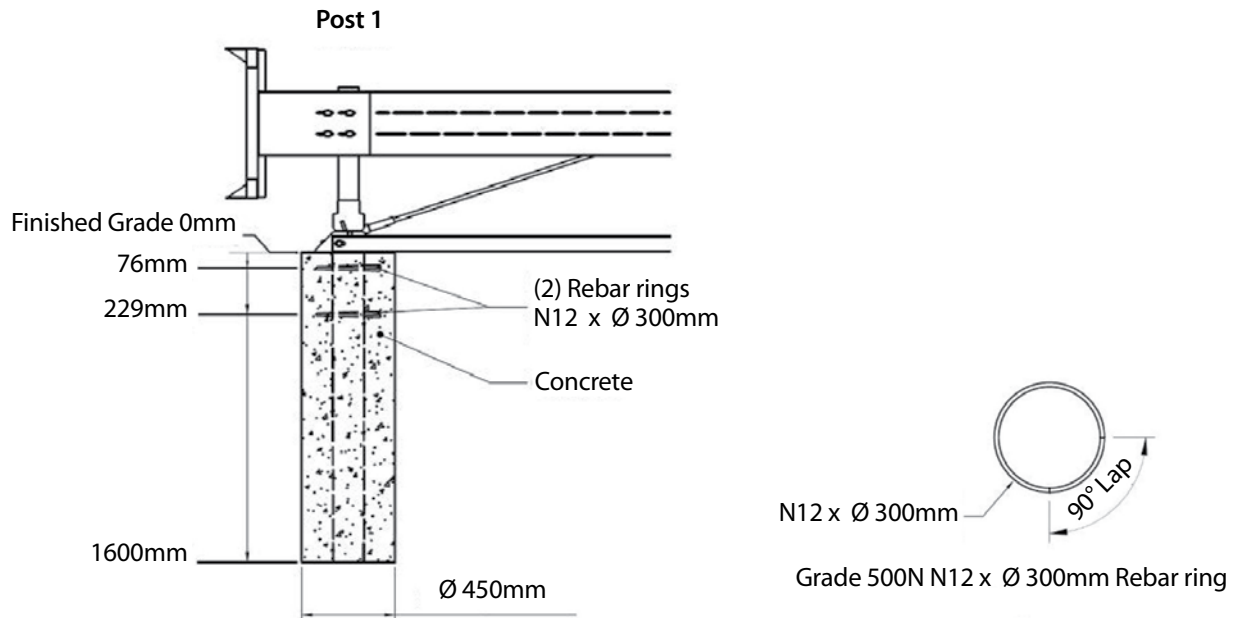


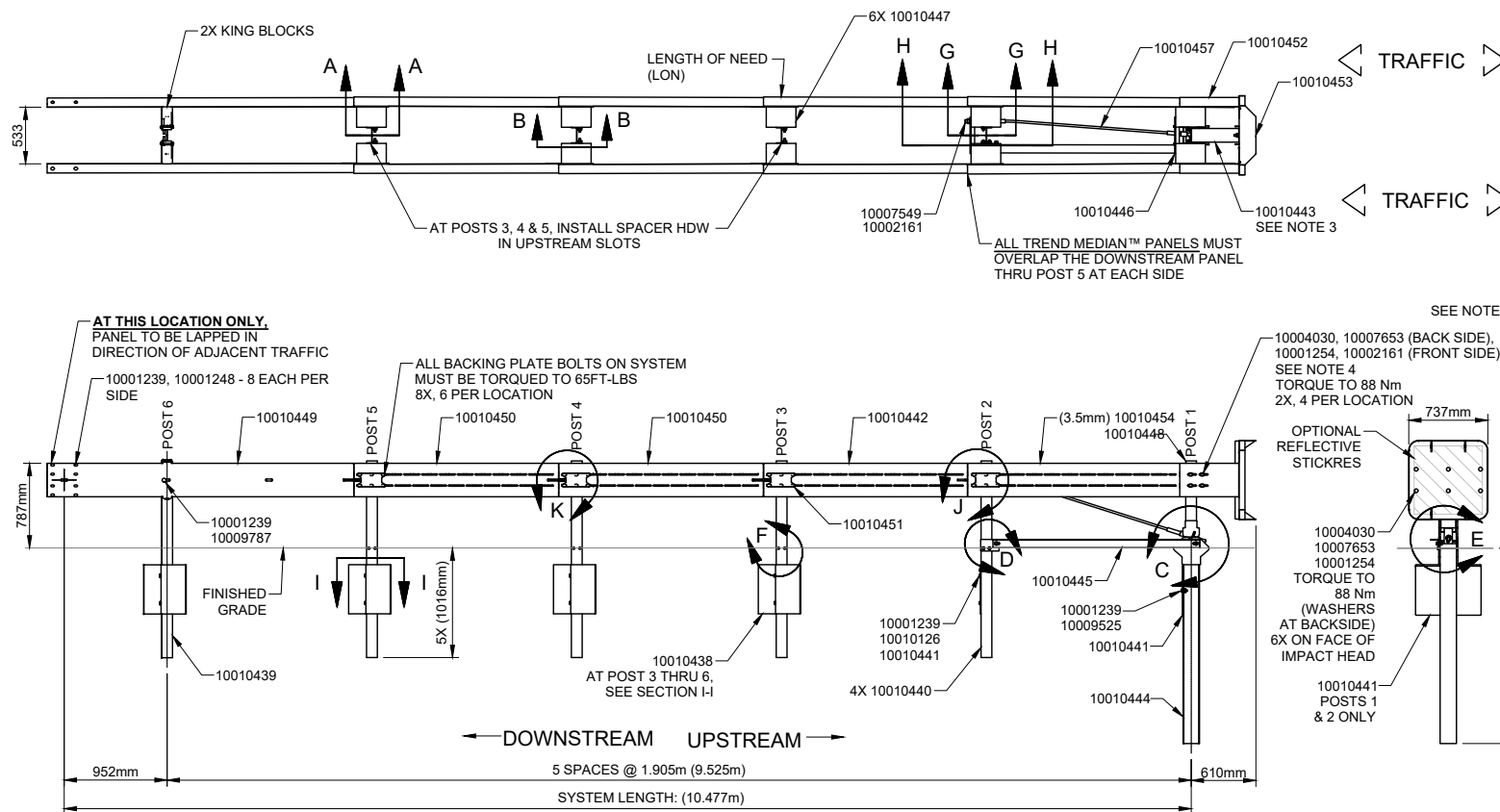
### Case 2: Below grade obstacles between 1219 mm and 1524 mm.





**Case 3: Below grade obstacles between 1600 mm and 1839 mm.**





PARTS LIST		
PART NO.	DESCRIPTION	QTY.
10010444	CR POST #1 BOTTOM	1
10010440	1.83m POST/W6X8.5/7/S PL/SYT	4
10010448	TREND MEDIAN CR POST #1 TOP	1
10010446	TREND MEDIAN DOUBLE SPACER	2
10010447	TREND MEDIAN SINGLE SPACER	6
10010445	TREND MEDIAN ANGLE STRUT	1
10001239	M16 GR OVERSIZE HEX NUT	36
10010456	CRP-CBL BRKT FOR CRP PST	1
10010457	2.286m ANCHOR CABLE	1
10007549	1\"	2
10010449	2.7mm BMT TRANS,W FIN-4	2
10010450	2.7mm BMT INT,W FIN-3	4
10010442	2.7mm BMT,W/O FIN-2	2
10010453	TREND MEDIAN IMPACT HEAD	1
10010443	TREND MEDIAN HEAD TUBE	1
10010452	TREND MEDIAN 3.4mm HEAD RAIL	2
10010451	TREND MEDIAN BACKING PLATE	8
10004030	M16 x 50 POST BOLT G8.8	62
10007653	M16 X 6mm THICK WASHER	62
10001254	M16 Nut CL8	66
10001248	M16 x 32 SPLICE BOLT G8.8	16
10009525	HEX BOLT M16 x 45 G8.8	6
10010125	M8 x 45 HEX BOLT G8.8	2
10001305	M8 FLAT WASHER	2
10009443	M8 HEX NUT CL8	2
10010455	STRUT ADAPTER PLATE	1
10010454	3.4mm FRONT RAIL,W/O FIN-1	2
10002161	1\"	10
10009527	M16 ROUND WASHER	8
10004062	HEX BOLT M16 x 50 G8.8	6
10010439	1.83m POST/W6X8.5/7/S PL	1
10009787	M16 x 250mm TERMINAL BOLT	2
10010126	M16 x 90 HEX BOLT G8.8	10
10010441	6 x 457 x 610mm SOIL PL/4 H	2
10010438	6 x 380 x 430 SOIL PL/MULT	4
10001727	M12 ROUND WASHER	8
10001727	M12 HEX NUT	4
10001727	M12 X 45 HEX BOLT	4
10001397	KING BLOCK	2
SEE TABLE	OPTIONAL DELINEATION	REF


## NOTES:

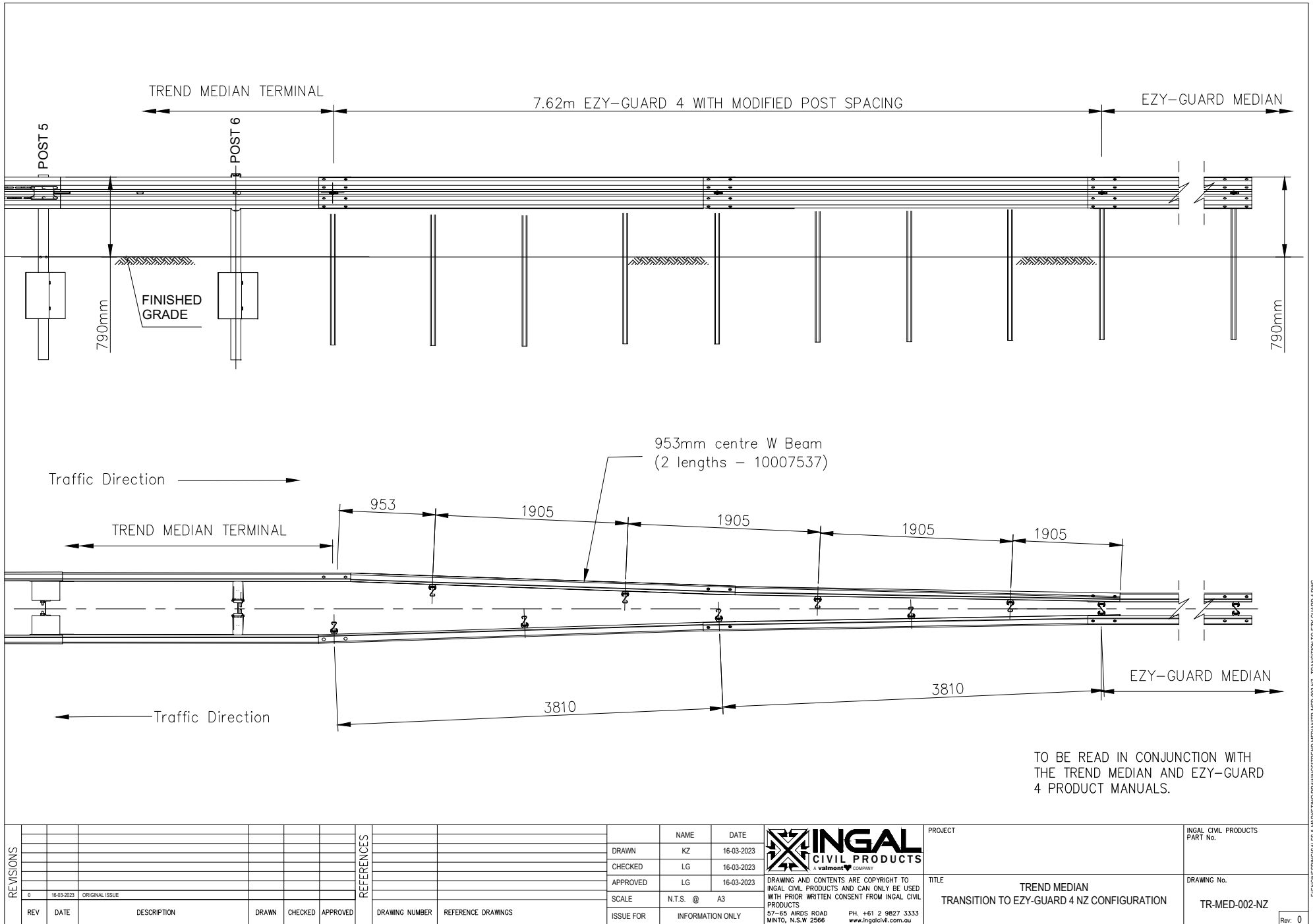
1. PROPER SITE GRADING MUST BE ACCOMPLISHED BEFORE ASSEMBLY AND IN ACCORDANCE WITH STATE/SPECIFYING AGENCY GUIDELINES AND/OR THE AASHTO ROADSIDE DESIGN GUIDE.
2. GUARDRAIL INSTALLATION HEIGHT TO BE 787mm (+25/-0) ABOVE FINISHED GRADE.
3. PRIOR TO TIGHTENING HARDWARE PUSH IMPACT HEAD UNTIL P/N 10010443 TOUCHES UPPER PORTION OF POST 1.
4. ENSURE 10002161 IS APPROXIMATELY CENTERED WITH P/N 10004030 PRIOR TO TIGHTENING
5. THE INTEGRATED FINS IN THE PROVIDED TREND MEDIAN™ GUARDRAIL PANELS ARE ALWAYS POSITIONED UPSTREAM.
6. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL PANELS WITHIN THE TREND MEDIAN™ BE CURVED OR RADIUSSED.
7. ALL 62 LOCATIONS OF 10004030 MUST BE TORQUED TO 88Nm.
8. ALL FASTENERS NOT REQUIRED TO BE TORQUED SHALL BE TIGHTENED TO A SNUG POSITION WITH A MINIMUM OF 2 BOLT THREADS PROTRUDING BEYOND THE NUT.

TABLE	
PART NO.	DESCRIPTION
105379	REF 25X25 BLK/YEL MEDIAN
105380	REFL 25X25 BLK/YEL GORE

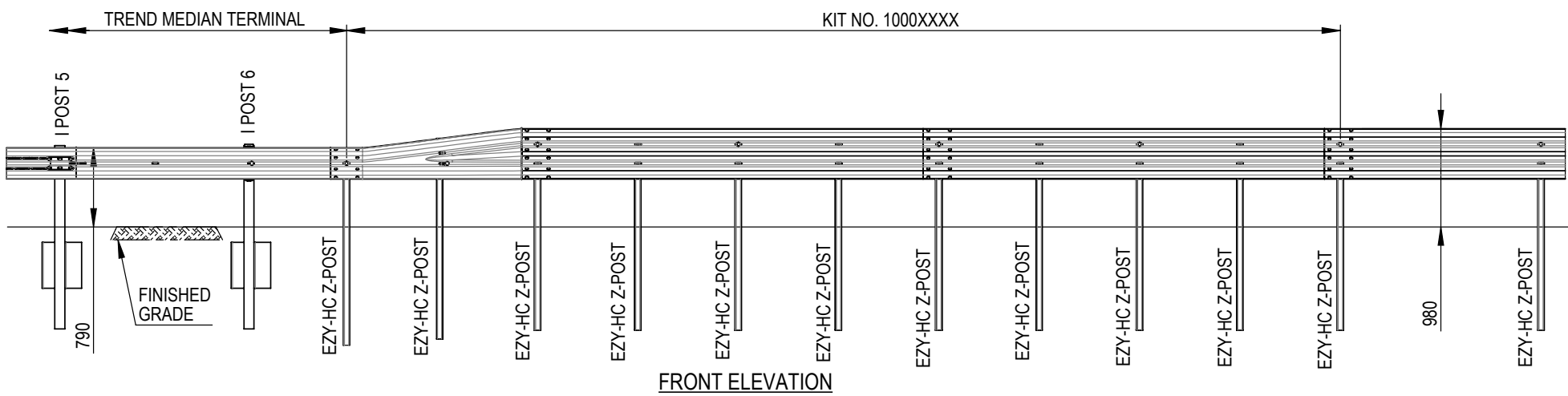
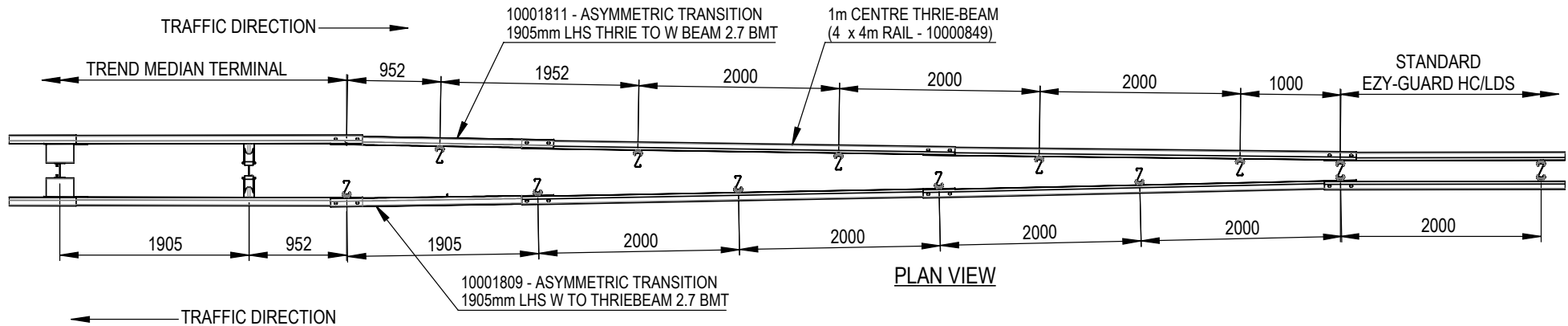
REVISIONS						REFERENCES		NAME		DATE		PROJECT	INGAL CIVIL PRODUCTS PART No.
2	15-03-2024	UPDATED ANNOTATION FOR REFLECTOR	KZ	LB	KZ			DRAWN	TRIN	16-02-2022			
								CHECKED	LG	16-02-2022			
1	21-07-2023	PART NUMBER UPDATE	LG	KZ	LG			APPROVED	LG	16-02-2022			
REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	SCALE	N.T.S. @	A3		TITLE	
								ISSUE FOR	INFORMATION ONLY		DRAWING AND CONTENTS ARE COPYRIGHT TO INGAL CIVIL PRODUCTS AND CAN ONLY BE USED WITH PRIOR WRITTEN CONSENT FROM INGAL CIVIL PRODUCTS 57-65 AIROS ROAD MINTO, N.S.W 2566 PH. +61 2 9827 3333 www.ingalcivil.com.au	TREND MEDIAN ASSEMBLY DETAIL SHEET 1 OF 2	DRAWING No.  TR-MED-001-1



REVISIONS							REFERENCES					NAME	DATE	 <div>INGAL CIVIL PRODUCTS <small>a valmont COMPANY</small></div> <div>DRAWING AND CONTENTS ARE COPYRIGHT TO INGAL CIVIL PRODUCTS AND CAN ONLY BE USED WITH PRIOR WRITTEN CONSENT FROM INGAL CIVIL PRODUCTS</div> <div>57-65 AIRDS ROAD WINTER, N.S.W. 2556 PH. +61 2 9827 3333 WWW.INGALCIVIL.COM.AU</div>	PROJECT	TREND MEDIAN ASSEMBLY DETAIL SHEET 2 OF 2		INGAL CIVIL PRODUCTS PART No.	
									DRAWN	TRIN	16-02-2022								
									CHECKED	LG	16-02-2022								
									APPROVED	LG	16-02-2022								
									SCALE	N.T.S. @	A3								
	0		ORIGINAL ISSUE							ISSUE FOR	INFORMATION ONLY								
REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS							TITLE		DRAWING No.			
														TR-MED-001-2		Rev.			



ENGINEERING SALES & MARKETING DRAWINGS/TREND MEDIAN TR-MED-002-NZ - TRANSITION TO EZY-GUARD 4 NZ



TO BE READ IN CONJUNCTION WITH THE  
TREND MEDIAN AND EZY-GUARD HC  
PRODUCT MANUAL

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