Revision B May 2016

SoftStop® System End Terminal

Product Description Assembly Manual





SoftStop® System

Tangent End Terminal

The SoftStop® System Tangent End Terminal ("SoftStop® System") has been tested to American Association of State and Highway Transportation Officials ("AASHTO") Manual For Assessing Safety Hardware ("MASH") criteria, and is eligible for Federal-aid reimbursement for use on the National Highway System as a Test Level 1, 2, & 3.

Product Description Assembly Manual



2525 N. Stemmons Freeway Dallas, TX 75207



Important: These instructions are to be used only in conjunction with the assembly, maintenance, and repair of the SoftStop® System. These instructions are for standard assemblies specified by the appropriate highway authority only. In the event the specified system assembly, maintenance, or repair would require a deviation from standard assembly parameters, contact the appropriate highway authority engineer. This system has been deemed eligible for reimbursement by the Federal Highway Administration ("FHWA") for use on the national highway system under criteria utilized by that agency. Trinity Highway Products, LLC ("Trinity Highway") representatives are available for consultation if required.

This Manual must be available to the worker overseeing and/or assembling the product at all times. For additional copies, contact Trinity Highway directly at (888) 323-6374 or visiting www.trinityhighway.com.

The instructions contained in this Manual supersede all previous information and Manuals. All information, illustrations, and specifications in this Manual are based on the latest SoftStop® System information available from the designers of the System to Trinity Highway at the time of printing. We reserve the right to make changes to this Manual at any time. Please contact Trinity Highway to confirm that you are referring to the most current instructions.



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Customer Service Contacts

Trinity Highway is committed to the highest level of customer service. Feedback regarding the SoftStop® System, its assembly procedures, supporting documentation, and performance is always welcome. Additional information can be obtained from the contact information below:

Trinity Highway

Telephone:	(888) 323-6374 (USA) +1 214 589 8140 (International)
Fax:	(800) 770-6755 (USA) +1 214 589 8423 (International)
E-mail:	product.info@trin.net
Website:	www.trinityhighway.com

Trinity Highway Products, LLC 2525 N. Stemmons Freeway Dallas, Texas 75207

Limitations and Warnings

Trinity Highway, in compliance with AASHTO MASH, contracts with FHWA approved testing facilities to perform crash tests, evaluate tests, and submit the test results to the FHWA for review.

The SoftStop® System has been deemed eligible for reimbursement by FHWA as meeting the requirements and guidelines of MASH. A component of MASH eligibility requirements include a variety of crash tests to evaluate product performance by simulating certain impact conditions involving lightweight cars (approx. 1100 kg [2420 lb.]) and full size pickup trucks (approx. 2270 kg [5000 lb.]).

The SoftStop® System is eligible for reimbursement at the following test levels:

MASH Test Level 1: 50 km/h [31 mph] MASH Test Level 2: 70 km/h [44 mph] MASH Test Level 3: 100 km/h [62 mph]

The SoftStop® System 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.

Trinity Highway 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 Trinity Highway or by third parties.

The SoftStop® System is intended to be assembled, delineated, and maintained in accordance with specific state and federal guidelines. It is the responsibility of the highway authority specifying the use of a highway product to select the most appropriate product configuration for its site specifications. A highway authority'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 occurs, the debris from the impact must be removed from the area immediately and the specified highway product must be evaluated and restored to its original specified condition or replaced as the highway authority determines as soon as possible. Product selection, approval, proper installation, and maintenance of any highway product is the sole responsibility of the specifying highway authority and the state DOT.



Safety Alert Symbols appear throughout this manual and indicate Danger, Warning, Important or Caution. Failure to read and follow these warnings could result in serious injury or death.

WARNING: Do not assemble, maintain, or repair the SoftStop® System 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 Trinity Highway at (888) 323-6374 if you do not understand any portion of these instructions or this manual.

WARNING: Safety measures incorporating appropriate traffic control devices and personal protective equipment (PPE) specified by the highway authority must be used to protect all personnel while at the assembly, maintenance, or repair site.

WARNING: Ensure that your assembly meets all appropriate Manual on Uniform Traffic Control Devices ("MUTCD") and local standards.

WARNING: Use only Trinity Highway parts that are specified by Trinity Highway for use with the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are other Trinity Highway 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.

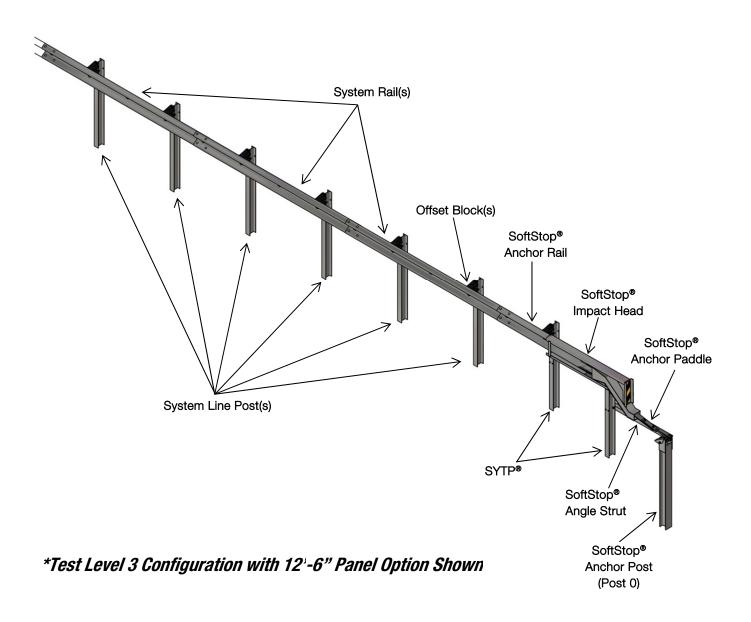
WARNING: Do NOT modify the SoftStop® System in any way.

IMPORTANT: Trinity Highway makes no recommendation whether use or reuse of any part of the SoftStop® System is appropriate or acceptable following an impact. It is the sole responsibility of the local highway authority and its engineers to make that determination. It is critical that you inspect the SoftStop® System after assembly is complete to make certain that the instructions provided in this Manual have been strictly followed.

SoftStop® System Overview

The SoftStop® System is a tangent, single-sided, energy-absorbing, redirective and gating end terminal system. The SoftStop® System is the first end terminal to meet the evaluation criteria set forth in the AASHTO MASH. The SoftStop® System is a 31" [787 mm] high (measured from top of rail to finished grade) end terminal used to shield 31" [787 mm] high strong post w-beam guardrail. The SoftStop® System may be used to terminate strong post W-beam guardrail measuring between 27 ¾" [705 mm] to 31" [787 mm] with state approved transition (see Appendix for example).

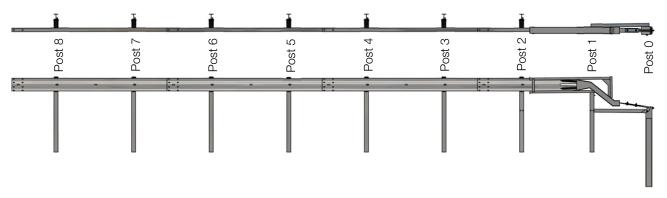
The SoftStop® System contains a SoftStop® Impact Head, SoftStop® Anchor Rail, SoftStop® Anchor Post (Post 0), SoftStop® Angle Strut, two (2) Steel Yielding Terminal Posts ("SYTP®") (Posts 1 & 2) and required hardware accessories. The remaining length of the system beyond Post 2 uses System Line Posts, Offset Blocks and System Rail.



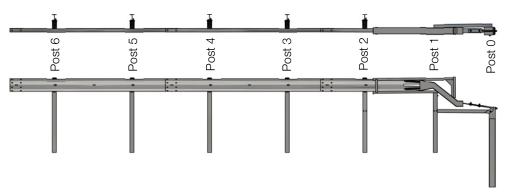
The SoftStop® System can be assembled in a MASH Test Level 1, Test Level 2 or Test Level 3 configuration.

Test Level	Design Speed	Required System Length	Posts
Test Level 3	62 mph [100 km/h]	50'-9 1/2" [15.48 m]	Posts 0-8
Test Level 2	44 mph [70 km/h]	38'-3 1/2" [11.67 m]	Posts 0-6
Test Level 1	31 mph [50 km/h]	25'-9 1/2" [7.86 m]	Posts 0-4

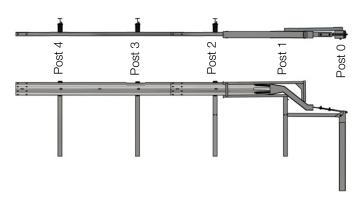
Test Level 3 (50'-9 1/2") [15.48 m]



Test Level 2 (38'-3 1/2") [11.67 m]



Test Level 1 (25'-9 1/2") [7.86 m]



Inspect Shipment (12'-6" Panel Options)

Before assembling the SoftStop® System, carefully unpack and inspect all components for signs of damage. Check the received parts against the packing list supplied with the system to verify that all parts were received. If parts are damaged or missing from the shipment or unspecified parts were part of the shipment, do not attempt to assemble the system; contact Trinity Highway immediately.

ID	COMPONENT	PN	TL-3 QTY	TL-2 QTY	TL-1 QTY
Α	SoftStop® Impact Head	15208A	1	1	1
В	SoftStop® Anchor Rail 12'-6" [3.810 m]	15200G	1	1	1
С	System Rail 12'-6" [3.810 m]	11G	3	2	1
D	SoftStop® Anchor Post (Post 0)	15205A	1	1	1
Е	SoftStop® SYTP® 4'-9 1/2" [1460 mm]	15203G	1	1	1
F	SYTP® Post 6'-0" [1830 mm]	15000G	1	1	1
G	System Line Post 6'-0" [1830 mm]	533G	6	4	2
Н	Offset Block	6777B	7	5	3
1	SoftStop® Anchor Paddle	15204A	1	1	1
K	SoftStop® Keeper Plate	15207G	1	1	1
L	SoftStop® Plate Washer	15206G	1	1	1
М	SoftStop® Anchor Angle	15201G	2	2	2
N	SoftStop® Angle Strut	15202G	1	1	1
0	5/16" x 2.5" Hex Bolt	105285G	2	2	2
Р	5/16" x 1.5" Hex Bolt	105286G	1	1	1
Q	3/4" x 2.5" Hex Bolt	3717G	2	2	2
R	5/8" x 9" Hex Bolt	4489G	1	1	1
S	5/8" x 1.75" Hex Bolt	3391G	1	1	1
Т	5/8" x 10" GR Bolt	3500G	7	5	3
U	5/8" x 1.25" GR Bolt	3360G	32	24	16
V	1" Round Washer	4902G	1	1	1
W	3/4" Round Washer	3701G	4	4	4
Х	5/8" Round Washer	4372G	4	4	4
Υ	5/16" Round Washer Wide	3240G	6	6	6
Z	1" Heavy Hex Nut	3908G	1	1	1
AA	3/4" Heavy Hex Nut	3704G	2	2	2
BB	5/8" GR Hex Nut	3340G	41	31	21
CC	5/16" Hex Nut	3245G	3	3	3

Inspect Shipment (25'-0" Panel Option)

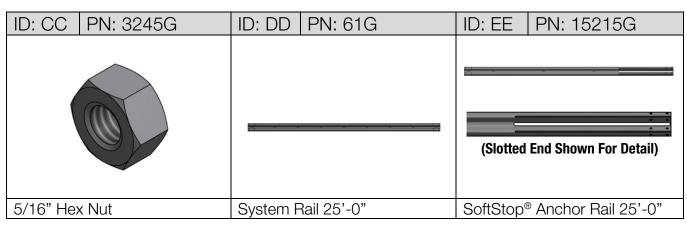
Before assembling the SoftStop® System, carefully unpack and inspect all components for signs of damage. Check the received parts against the packing list supplied with the system to verify that all parts were received. If parts are damaged or missing from the shipment or unspecified parts were part of the shipment, do not attempt to assemble the system; contact Trinity Highway immediately.

ID	COMPONENT	PN	TL-3 QTY
Α	SoftStop® Impact Head	15208A	1
EE	SoftStop® Anchor Rail 25'-0" [7.62 m]	15215G	1
DD	System Rail 25'-0" [7.62 m]	61G	1
D	SoftStop® Anchor Post (Post 0)	15205A	1
Е	SoftStop® SYTP® 4'-9 1/2" [1460 mm]	15203G	1
F	SYTP® Post 6'-0" [1830 mm]	15000G	1
G	System Line Post 6'-0" [1830 mm]	533G	6
Н	Offset Block	6777B	7
I	SoftStop® Anchor Paddle	15204A	1
K	SoftStop® Keeper Plate	15207G	1
L	SoftStop® Plate Washer	15206G	1
М	SoftStop® Anchor Angle	15201G	2
Ν	SoftStop® Angle Strut	15202G	1
0	5/16" x 2.5" Hex Bolt	105285G	2
Р	5/16" x 1.5" Hex Bolt	105286G	1
Q	3/4" x 2.5" Hex Bolt	3717G	2
R	5/8" x 9" Hex Bolt	4489G	1
S	5/8" x 1.75" Hex Bolt	3391G	1
Т	5/8" x 10" GR Bolt	3500G	7
U	5/8" x 1.25" GR Bolt	3360G	16
V	1" Round Washer	4902G	1
W	3/4" Round Washer	3701G	4
Χ	5/8" Round Washer	4372G	4
Υ	5/16" Round Washer Wide	3240G	6
Z	1" Heavy Hex Nut	3908G	1
AA	3/4" Heavy Hex Nut	3704G	2
BB	5/8" GR Hex Nut	3340G	25
CC	5/16" Hex Nut	3245G	3





ID: Z PN: 3908G	ID: AA PN: 3704G	ID: BB PN: 3340G
1" Heavy Hex Nut	3/4" Heavy Hex Nut	5/8" GR Hex Nut



Recommended Tools

Documentation

- Assembly Manual (Most Current Version)
- System Drawing (Most Current Version)

Personal protective equipment (PPE)

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

Miscellaneous

- Traffic Control Equipment
- 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
- Come-Along Puller
- 5/8" Alignment Tool (Drift Pin)
- Cutting Device
- Locking Pliers
- C-Clamps

Note: The above list of tools is a general recommendation only and should not be considered an exhaustive list. Depending on specific site conditions and the complexity of the assembly (or repair) 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.

SoftStop® System Site Preparation

The SoftStop® System is a tangent, single-sided, energy-absorbing, redirective and gating end terminal system that state/specifying agency specify for use as specified by the appropriate state/specifying authority in conjunction with strong post W-beam guardrail on the shoulder or median of a roadway. The decision to specify the SoftStop® System for a particular project is the responsibility of the state/specifying agency design engineer who must ensure that the most appropriate end terminal has been selected for the specific site conditions.

The SoftStop® System is designed to be attached to strong post W-beam guardrail systems that have been accepted under MASH crash test criteria that use either no offset blocks, 8" [203 mm] offset blocks or 12" [305 mm] offset blocks.



Important: The SoftStop® System must not be attached directly to a weak post W-beam guardrail system without an approved weak-post-to-strong-post transition plus a minimum of 12'-6" [3.810 m] strong post W-beam guardrail with 6'-3" [1905 mm] post spacing. The 12'-6" [3.810 m] strong post W-beam guardrail must be placed between the SoftStop® System and the weak-post-to-strong-post transition.



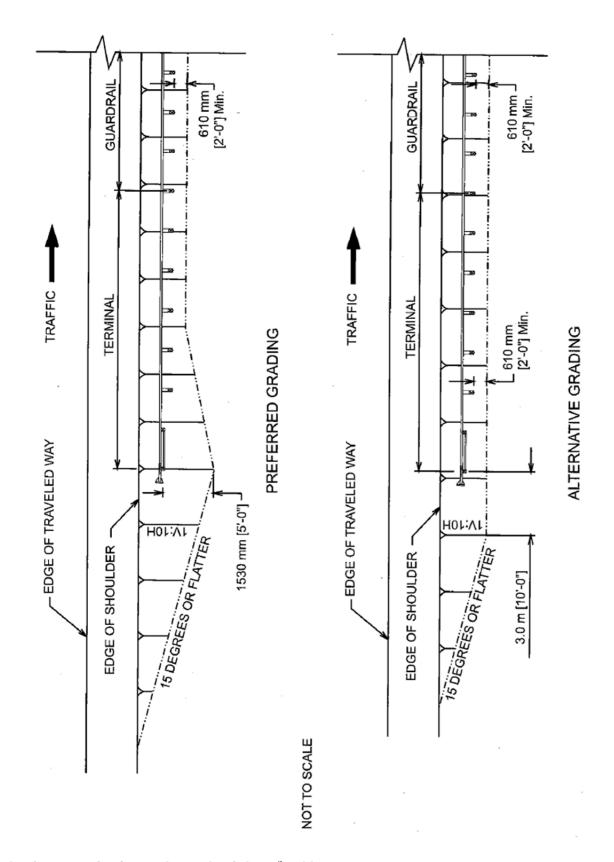
Important: Do not attach the SoftStop® System directly to a rigid barrier (i.e. concrete barrier, wall or bridge pier) without the use of a state/specifying agency approved transition.



Important: Ensure that the SoftStop® System assembly conforms to the AASHTO Roadside Design Guide.



Important: Trinity Highway does not direct grading. Proper site grading must be accomplished before assembly of the SoftStop® System in accordance with local specifying agency guidelines and the AASHTO Roadside Design Guide. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact or collision.



Drawing Source: AASHTO Roadside Design Guide, 4th Edition 2011

SoftStop® System Offset Requirements

The SoftStop® System is a tangent guardrail end treatment that is assembled parallel to the edge of shoulder. At the sole discretion of the state/specifying agency design engineer, the SoftStop® System may be offset away from the shoulder over the length of the entire system (from center of last splice location of SoftStop® System to center of Post 0) per the following designer approved offsets:

Test Lev	rel 1 (TL-	1)	Test Lev	el 2 (TL-2)		Test Lev	vel 3 (TL-3)
6" [152 m	m] Maxin	num	1' [304 mn	n] Maximu	ım	2' [609 m	m] Maximum
			Entire Length	Of System _			
<u> </u>	Ā	<u>.</u> Ħ	Ā	<u>.</u> Ħ	Ā	<u> </u>	V
							Without Offset
J.			- Entire Length	Of System –			
<u> </u>	Ā .	. Ā	Ā	<u>.</u>	Ā	, Ā	· ·
							With Offset



Caution: Under no circumstances shall the rail within the SoftStop® System be curved.

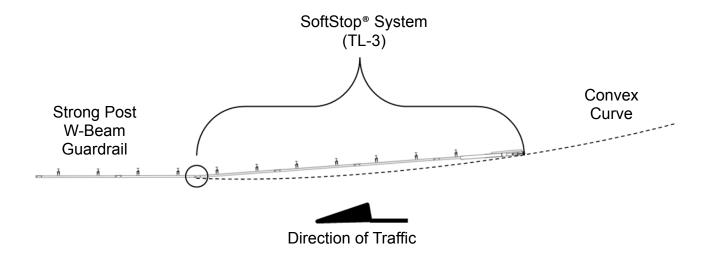
Offset Requirements Within A Curve

When the guardrail is terminated within a curve (convex or concave) and a SoftStop® System is attached, the following instructions must be followed to ensure proper offset requirements within a curve for the SoftStop® System are met. If the conditions below cannot be achieved, it is recommended that the guardrail be extended past the curve until the conditions can be met. The offset requirements in a curve are calculated for the TL-3 SoftStop® System. If assembling a TL-1 or TL-2 SoftStop® System, an overall straight length of 50'-9 1/2" [15.48 m] must be obtained (SoftStop® System + Strong Post W-Beam Guardrail) for calculating offset requirements in a curve.

Note: Using an offset closer to 0 feet [0 m] on tighter curves (radii) will cause the terminal to encroach onto the shoulder.

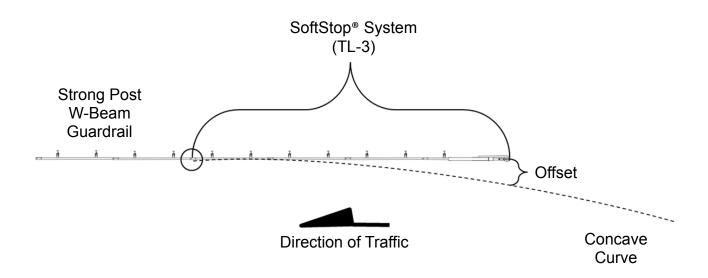
Convex Curve

For radii of 650 feet [198 m] or greater (flatter), the offset is 0 feet [0 m] to 2 feet [609 mm].



Concave Curve

For radii between 500 feet [152 m] and 750 feet [228 m], the offset is 0 feet [0 m] to 1.5 feet [457 mm]. For radii greater (flatter) than 750 feet [228 m], the offset is 0 feet [0 m] to 2 feet [609 mm].



SoftStop® System Post Placement

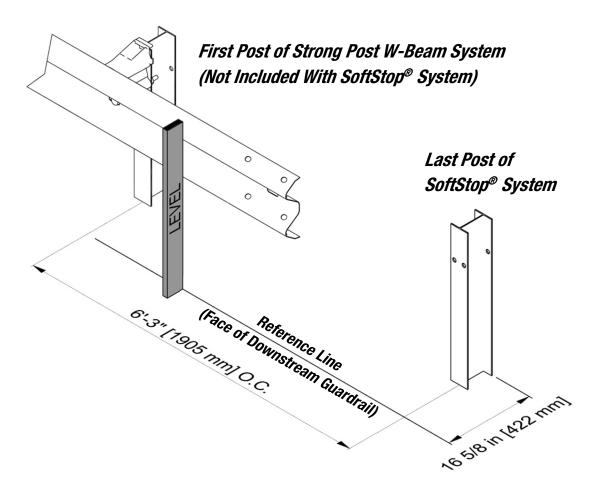


Danger: Ensure all above & below ground utilities are located, marked, and identified prior to using auger or post pounding equipment in accordance with local specifying agency guidelines. Failure to follow this warning could result in serious injury or death.

Determine Post Locations

Place a level or straight edge on the face of downstream guardrail (i.e. traffic side) to the finished grade to create a reference line for face of guardrail. The reference line will be used to determine post location for the last post of the SoftStop® System.

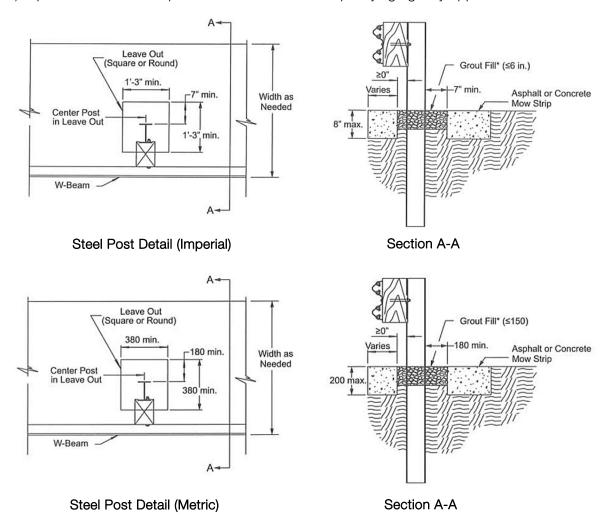
The last post of the SoftStop® System will be located 16 5/8" [422 mm] from face of downstream guardrail to back of the last post of the SoftStop® System to accommodate an 8" [203 mm] nominal offset block and be spaced 6'-3" [1905 mm] (typical) on center from the first post of the strong post wbeam system (see drawing below). Refer to the post placement diagrams in this manual for remaining post locations.



The SoftStop® System posts may be inserted into the soil using an auger or post pounding equipment used for the placement of guardrail posts. If an auger is used, ensure diameter is large enough to allow for proper compaction of state/specifying agency approved fill material. All SoftStop® System posts are to be assembled plumb. Proper compaction must be accomplished for all posts in accordance with state/specifying agency guidelines.

If rock is encountered at post locations 2-8, refer to the local specifying agency guidelines and the AASHTO Roadside Design Guide for requirements for embedment depth into the rock and size of the hole. If rock is encountered at post locations 0-1, auger a hole in the rock large enough for full post embedment and proper compaction of approved fill material.

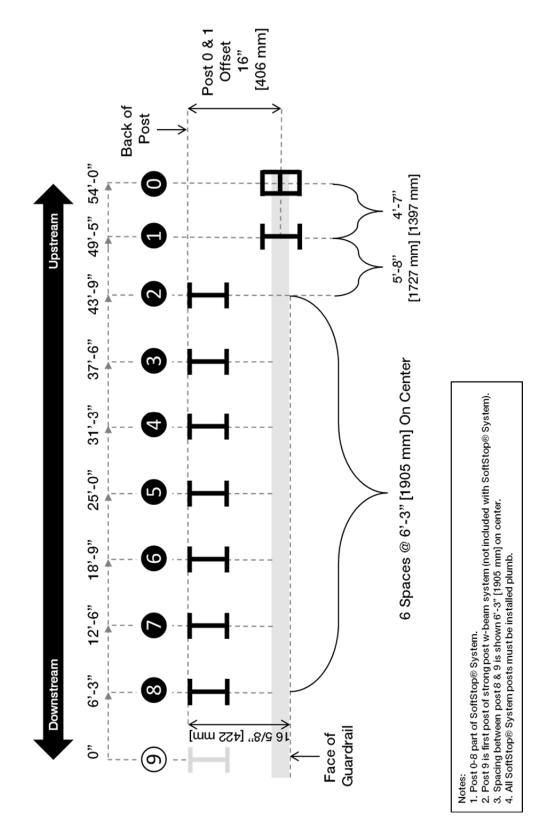
If rigid pavement (e.g. concrete or asphalt) of <u>any thickness</u> is encountered at post locations 0-8, ensure a proper "leave-out" area (the specified size of open space as defined in the AASHTO Roadside Design Guide) is provided around the posts and filled with state/specifying agency approved backfill material.



^{*}Grout fill material must have a 28-day compressive strength of 120 psi (0.85 Mpa) or less.

Drawing Source: AASHTO Roadside Design Guide, 4th Edition 2011

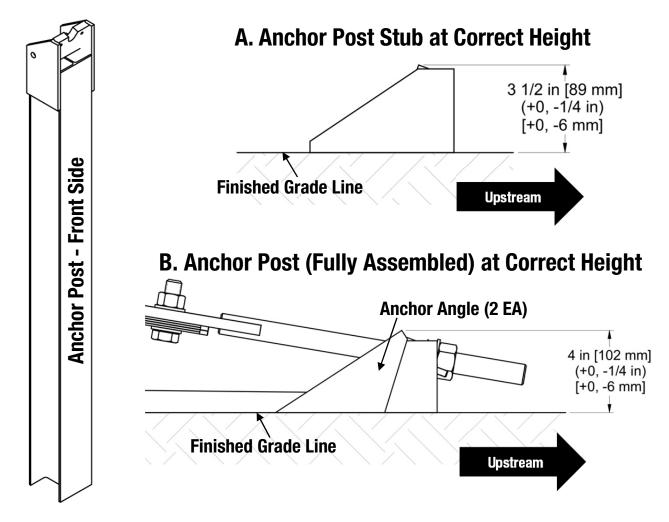
SoftStop® System (Test Level 3) - Post Placement Diagram



SoftStop® System Anchor Post (Post 0) Placement

The SoftStop® System Anchor Post (15205A) is the first post of the SoftStop® System and is designated as Post 0. The SoftStop® System Anchor Post is to be assembled plumb and oriented with the front side of post facing towards the upstream end.

- A. When assembled to the correct depth, the SoftStop® System Anchor Post stub will protrude 3 1/2" [89 mm] above the finished grade line (see Step 2 of this Assembly Manual).
- B. When fully assembled, the SoftStop® System Anchor Post (with Anchor Angles) will protrude 4" [102 mm] above the finished grade line (see Step 12 of this Assembly Manual).

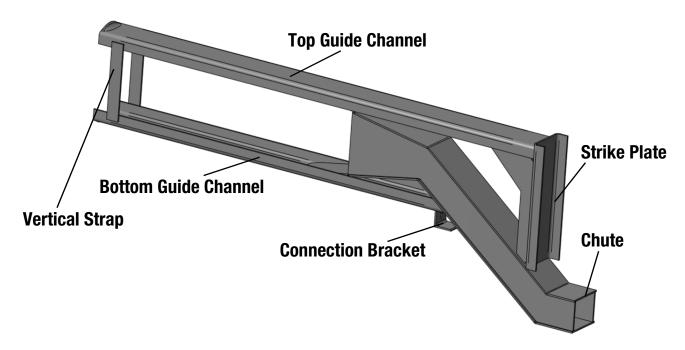




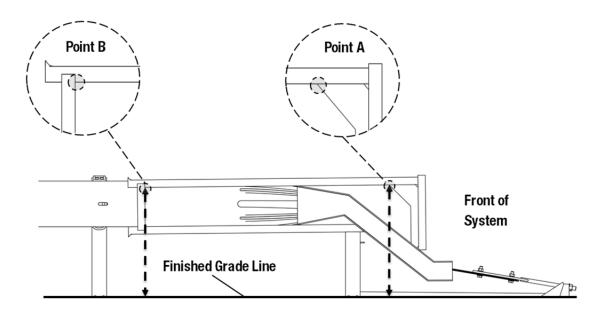
Caution: Ensure the SoftStop® System Anchor Post is assembled in the orientation shown above. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact or collision with the system.

SoftStop® System Impact Head

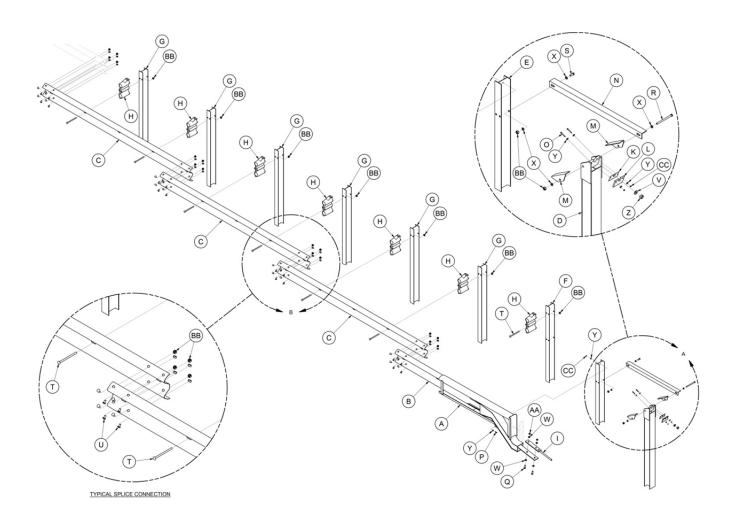
The SoftStop® Impact Head (15208A) component is symmetrical and can be assembled on the left or right shoulder. The diagram below lists some of the subcomponents of the Impact Head.



When properly assembled, the SoftStop® Impact Head shall only be assembled parallel to the finished grade line or have an upward tilt (towards front of the system). The elevation of the Impact Head can vary a maximum of 2 1/4" [58 mm] higher at Point A relative to Point B. Point A is measured from the finished grade line to where the corner of the side plate connects with the top guide channel and Point B is measured from the finished grade line to where the inside corner of the vertical strap connects with the top guide channel.



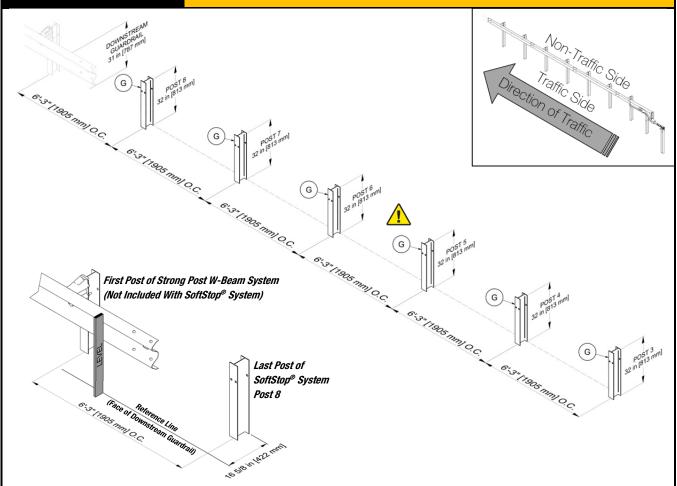
TEST LEVEL 3 ASSEMBLY STEPS





Important: Always use safety precautions when performing assembly, maintenance, repair and/or moving heaving equipment. Ensure proper personal protective equipment (PPE) is worn. Failure to follow this warning could result in serious injury or death.

System Line Post Assembly (Posts 3-8)



	PARTS	
G	533G	6 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation as shown in the above diagram.
- 2. The SoftStop® System must be attached to strong post w-beam guardrail that has been properly transitioned to 31" [787 mm] rail height per state/specifying agency (see Appendix for transition drawing example).
- 3. Establish the location of the last post of the SoftStop® System (Post 8) by placing a level on the face of downstream guardrail to the finished grade and applying offset and post spacing requirements shown above.
- 4. Ensure proper post spacing and post height is achieved for Posts 3-8 (Part G) per shown dimensions above.

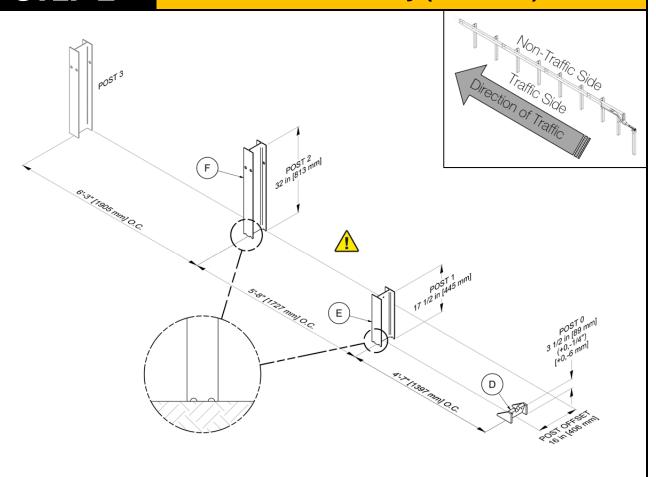
Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.



WARNINGS

Proper site grading must be accomplished in accordance with local specifying agency guidelines and the AASHTO Roadside Design Guide. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact or collision with the system.

Post Assembly (Posts 0-2)



	PARTS	
F	15000G	1 EA
Е	15203G	1 EA
D	15205A	1 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Ensure proper offset for Post 0 (Part D) & Post 1 (Part E) is obtained per shown dimension above (offset measured from back of Post 2 (Part F) to center of Post 0 & 1.
- 3. Ensure center of yielding holes for Post 1 & 2 are approximately at finished grade, as shown.
- 4. Ensure Post 0 stub height does not exceed 3 1/2" [89 mm] above finished grade.
- 5. Ensure proper post spacing and post height is achieved per shown dimensions above.

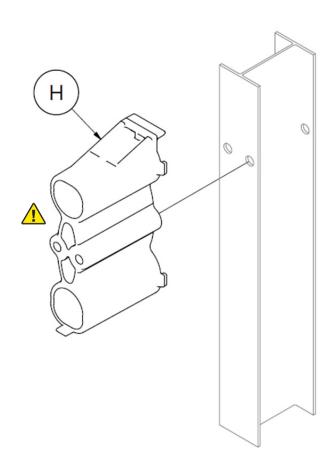
Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.

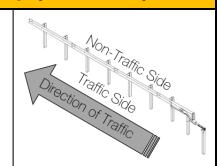


WARNINGS

Proper site grading must be accomplished in accordance with local specifying agency guidelines and the AASHTO Roadside Design Guide. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact or collision with the system.

Offset Block Assembly (Posts 3-8)





PARTS			
Н	6777B	6 EA	

INSTRUCTIONS 1. Assemble all parts in the configuration & orientation shown above.

2. Attach (1 EA) Offset Block (Part H) on traffic side of Posts 3-8. The Offset Block is equipped with a self-hanging mounting tab.

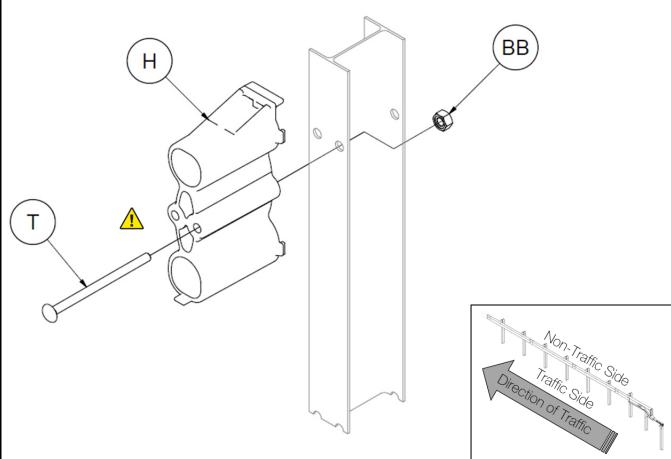
Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.



WARNINGS

Do not use any Offset Block (Part H) if they show signs of damage. Seek replacement from Trinity Highway prior to assembly.

Offset Block Assembly (Post 2)



	PARTS	
Η	6777B	1 EA
Т	3500G	1 EA
BB	3340G	1 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Attach (1 EA) Offset Block (Part H) on traffic side of Post 2. The Offset Block is equipped with a self-hanging mounting tab.
- 3. Secure Offset Block to post with shown hardware.
- 4. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.

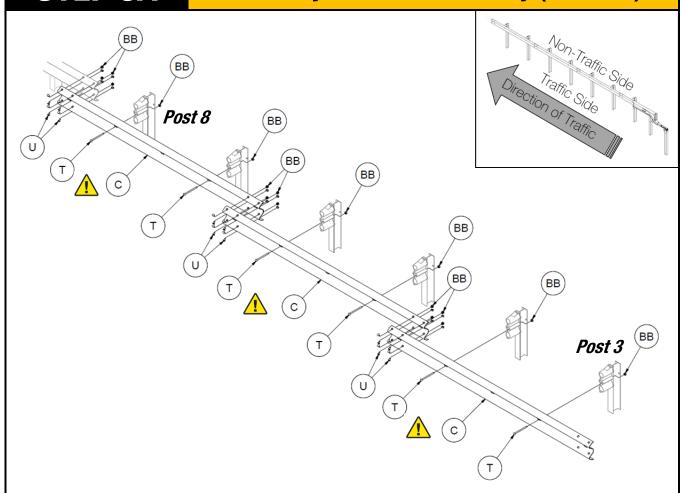


WARNINGS

Do not use any Offset Block (Part H) if they show signs of damage. See replacement from Trinity Highway prior to assembly.

STEP 5A

12'-6" System Rail Assembly (Post 3-8)



	PARTS	
С	11G	3 EA
Т	3500G	6 EA
J	3360G	24 EA
BB	3340G	30 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Place all System Rail panels (Part C) on the traffic side of the posts and lap all System Rail panels in the direction of traffic as shown above using shown hardware.
- 3. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.

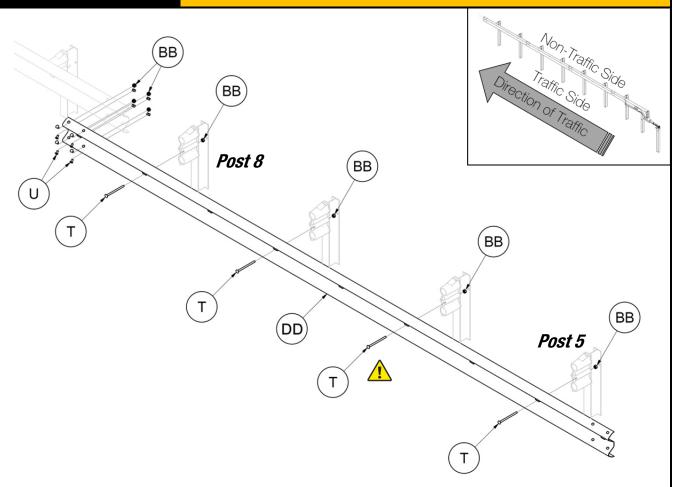


WARNINGS

Do not place anything between any post bolt head and the SoftStop® System Rail that would prevent the bolt from pulling through (i.e. no rectangular washers or delineators). Failure to follow this warning could result in serious injury or death in the event of a collision.

STEP 5B

25'-0" System Rail Assembly (Post 5-8)



PARTS		
DD	61G	1 EA
Т	3500G	4 EA
U	3360G	8 EA
BB	3340G	12 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Place all System Rail panels (Part DD) on the traffic side of the posts and lap all System Rail panels in the direction of traffic as shown above using shown hardware.
- 3. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.



WARNINGS

Do not place anything between any post bolt head and the SoftStop® System Rail that would prevent the bolt from pulling through (i.e. no rectangular washers or delineators). Failure to follow this warning could result in serious injury or death in the event of a collision.

Anchor Rail Shipping Tabs Removal REMOVE REMOVE REMOVE REMOVE

	PARTS		
В	15200G	1 EA	
EE	15215G	1 EA	

INSTRUCTIONS

1. The SoftStop® Anchor Rail is manufactured with three (3) shipping tabs. These shipping tabs shall be removed with a cutting device to assist in the assembly process. The SoftStop® Anchor Rail is available in two lengths: 12'-6" (Part B) or 25'-0" (Part EE).

Note: Only one (1) SoftStop® Anchor Rail is used per assembly, 12'-6" (Part B) or 25'-0" (Part EE).

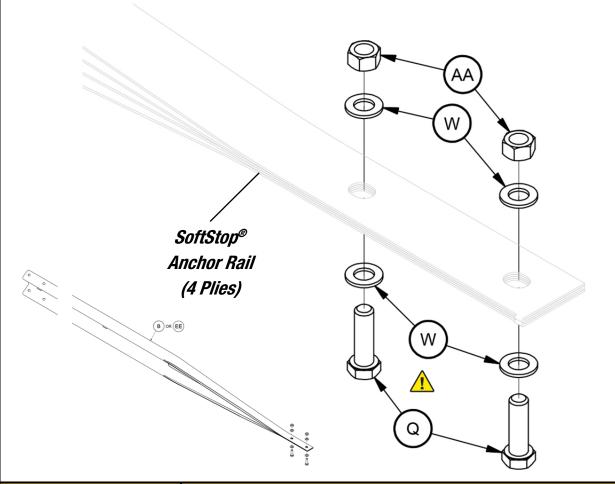
Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.



WARNINGS

Keep body parts clear of cutting device. Ensure proper personal protective equipment (PPE) is worn. Failure to follow this warning could result in serious injury or death.

Anchor Rail Hardware Assembly



PARTS		
В	15200G	1 EA
Q	3717G	2 EA
W	3701G	4 EA
AA	3704G	2 EA
EE	15215G	1 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Insert both hex bolts (Part Q) through the bottom side of the four (4) plies of the SoftStop® Anchor Rail (Part B or Part EE). The bottom side is determined by the final assembled position on the SoftStop® System. The use of locking pliers or c-clamps will aid the assembly process.
- 3. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

Note: Only one (1) SoftStop $^{\otimes}$ Anchor Rail is used per assembly, 12'-6" (Part B) or 25'-0" (Part EE).

WARNINGS

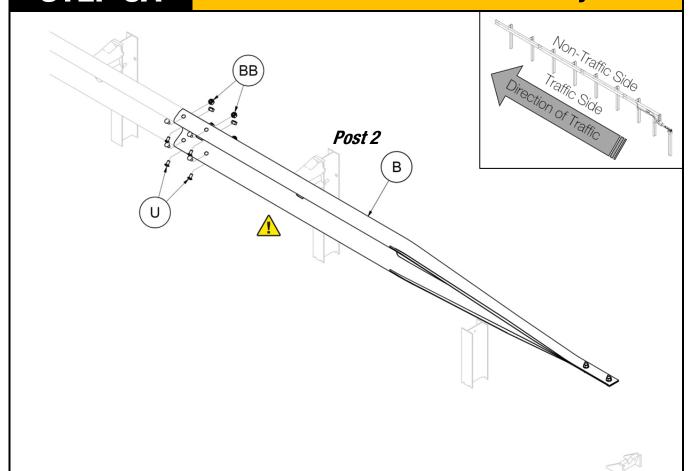
Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.



Insert the SoftStop® Anchor Paddle Bolts (Part Q) from the bottom of the SoftStop® Anchor Rail. Failure to follow this warning could result in serious injury or death in the event of a collision.

STEP 8A

12'-6" Anchor Rail Assembly



PARTS		
В	15200G	1 EA
U	3360G	8 EA
BB	3340G	8 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Place SoftStop® Anchor Rail (Part B) on the traffic side and lap in the direction of traffic as shown above using shown hardware.
- 3. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.

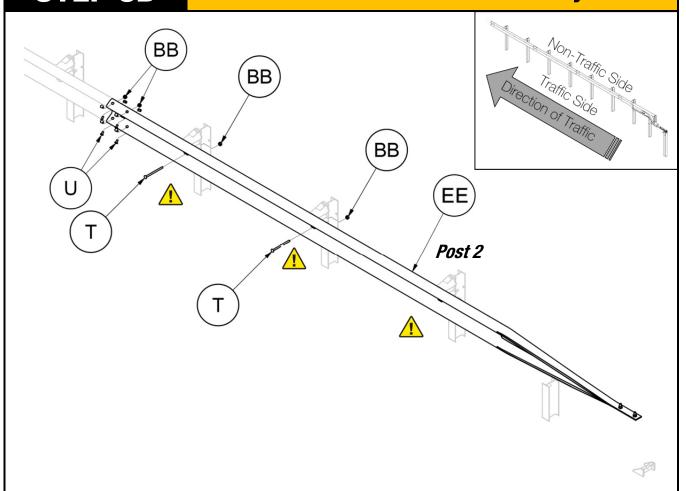


WARNINGS

Do not bolt the SoftStop® Anchor Rail to Post 2. Failure to follow this warning could result in serious injury or death in the event of a collision.

STEP 8B

25'-0" Anchor Rail Assembly



PARTS		
Т	3500G	2
U	3360G	8
BB	3340G	10
EE	15215G	1

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Place SoftStop® Anchor Rail (Part EE) on the traffic side and lap in the direction of traffic as shown above using shown hardware.
- 3. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.



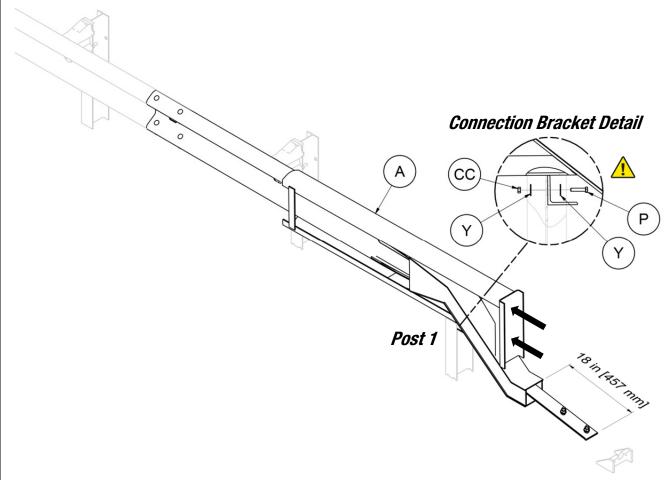
WARNINGS

Do not bolt the SoftStop® Anchor Rail to Post 2.

Do not place anything between any post bolt head and the SoftStop® System Rail that would prevent the bolt from pulling through. Failure to follow this warning could result in serious injury or death in the event of a collision.

STEP 9A

Impact Head Assembly (12'-6" Anchor Rail)



PARTS		
А	15208A	1 EA
Р	105286G	1 EA
Υ	3240G	2 EA
CC	3245G	1 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Mechanically push the SoftStop® Impact Head (Part A) until its Connection Bracket rests against Post 1 and a minimum 18" [457 mm] of the SoftStop® Anchor Rail is protruding out the Chute.
- 3. Fasten Post 1 and the Connection Bracket together with shown hardware (Parts P, Y, & CC). See Connection Bracket detail.
- 4. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.

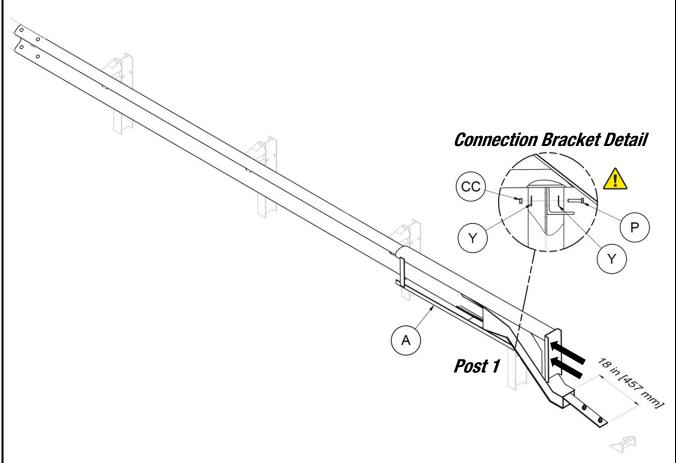


WARNINGS

The SoftStop® Impact Head Connection Bracket must rest against the front side of Post #1 (between Posts 0-1) as shown in the Connection Bracket Detail above.

STEP 9B

Impact Head Assembly (25'-0" Anchor Rail)



PARTS		
Α	15208A	1 EA
Р	105286G	1 EA
Υ	3240G	2 EA
CC	3245G	1 EA

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Mechanically push the SoftStop® Impact Head (Part A) until its Connection Bracket rests against Post 1 and a minimum 18" [457 mm] of the SoftStop® Anchor Rail is protruding out the Chute.
- 3. Fasten Post 1 and the Connection Bracket together with shown hardware (Parts P, Y, & CC). See Connection Bracket detail.
- 4. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.

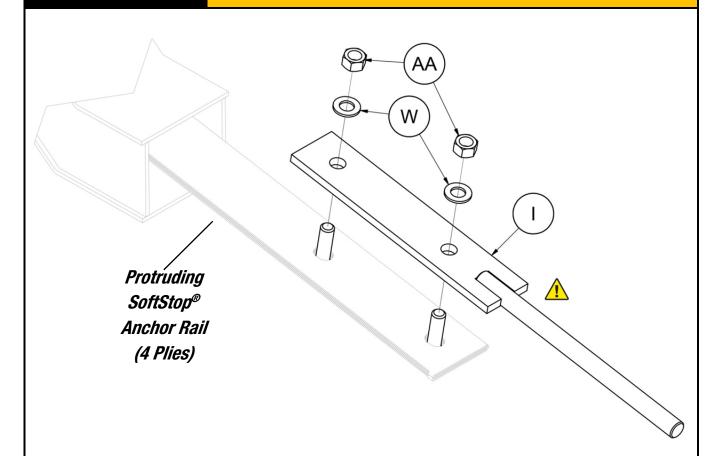


WARNINGS

The SoftStop® Impact Head Connection Bracket must rest against the front side of Post #1 (between Posts 0-1) as shown in the Connection Bracket Detail above.

STEP 10

Anchor Paddle Assembly



PARTS			
I	15204A	1 EA	
W	3701G	2 EA	
AA 3704G		2 EA	

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Remove the nuts (Part AA) and top washers (Part W) and place the SoftStop® Anchor Paddle (Part I) onto the hex bolts. The SoftStop® Anchor Paddle is assembled on the top side of the four (4) plies of the protruding SoftStop® Anchor Rail. Reassemble the top washers and nuts onto the hex bolt as shown above. The use of locking pliers or c-clamps will aid the assembly process.
- 3. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

WARNINGS

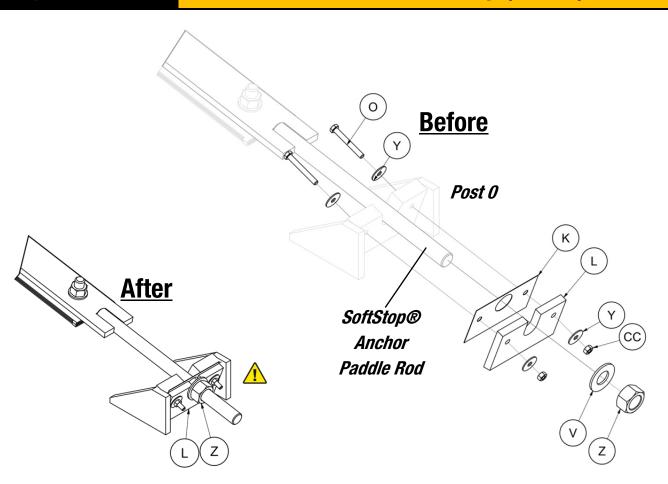
Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.



The SoftStop® Anchor Paddle (Part I) must be placed on the topside of the SoftStop® Anchor Rail. Failure to follow this warning could result in serious injury or death in the event of a collision.

STEP 11

Anchor Post Assembly (Post 0)



PARTS			
Υ	3240G	4 EA	
CC	3245G	2 EA	
Z	3908G	1 EA	
V	4902G	1 EA	
L	15206G	1 EA	
K	15207G	1 EA	
0	105285G	2 EA	

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. Place the rod portion of the SoftStop® Anchor Paddle in the notch of Post 0.
- 3. Place the SoftStop® Keeper Plate (Part K) and SoftStop® Plate Washer (Part L) onto the SoftStop® Anchor Paddle Rod and fasten to Post 0 using shown hardware (Part O, Y, CC).
- 4. Place washer (Part V) then nut (Part Z) on the SoftStop® Anchor Paddle Rod.
- 5. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

WARNINGS

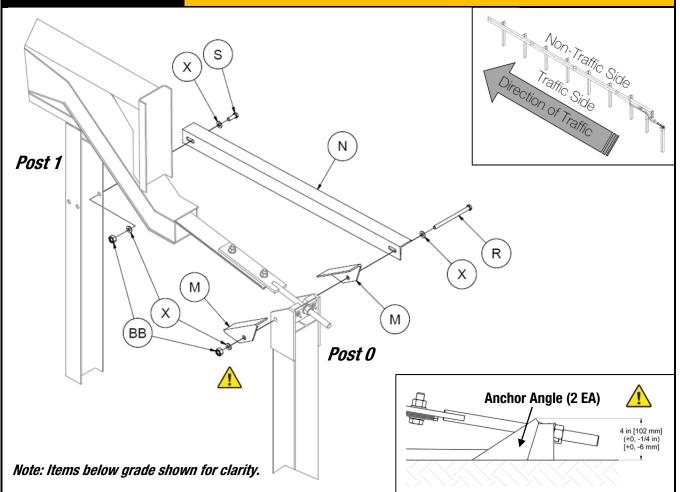
^ E



Ensure the 1" Hex Nut (Part Z) has been fully tightened against the SoftStop® Plate Washer (Part L). Failure to follow this warning could result in serious injury or death in the event of a collision.

STEP 12

Angle Strut Assembly (Posts 0-1)



PARTS			
BB	3340G	2 EA	
Χ	4372G	4 EA	
R	4489G	1 EA	
М	15201G	2 EA	
Ν	15202G	1 EA	
S	3391G	1 EA	

Use only Trinity Highway parts that are specified herein for the SoftStop® System for assembling, maintaining, or repairing the SoftStop® System. Do not utilize or otherwise comingle parts from other systems even if those systems are Trinity Highway systems.

INSTRUCTIONS

- 1. Assemble all parts in the configuration & orientation shown above.
- 2. It will be necessary to make a shallow valley/trough between Post 0 & 1 for the SoftStop® Angle Strut (Part N) and SoftStop® Anchor Angles (Part M), since a portion will be below the finished grade.
- 3. Position the SoftStop® Anchor Angles (Part M) onto Post 0 and place SoftStop® Angle Strut on the non-traffic side with short leg down and fasten to Post 0 & 1 using shown hardware (Part R, S, X, BB).
- 4. Tighten all threaded hardware to a snug position with an appropriately sized wrench or socket.

WARNINGS



Ensure fully assembled SoftStop® Anchor Post height (with SoftStop® Anchor Angles) does not exceed 4" [102 mm] above finished grade line.

Delineation Assembly Traine Side Traine Side Traine Side

PARTS	INSTRUCTIONS		
By Others	1. Assemble all parts in the configuration & orientation shown above.		
	Note: Manufacturer suggests that user provide delineation (reflective sheeting) of the terminal.		
Use only Trinity Highway parts that	WARNINGS		
are specified herein for the SoftStop® System for assembling,			

System meets state/specifying agency's MUTCD for proper delineation. Use of steel delineator posts are not permitted

within 3'-0" of the SoftStop® System.

Trinity Highway systems.

maintaining, or repairing the SoftStop® System. Do not utilize or

otherwise comingle parts from other systems even if those systems are

Assembly Checklist (Complete & File With Project Folder)

Perfor	ned by:
Date:	
Locati	n:
	Ensure required traffic control is in place to conduct SoftStop® System assembly.
	Ensure only Trinity Highway SoftStop® System parts are used for the assembly of SoftStop® System and that all parts are free of damage.
	Ensure proper site grading complies with state/specifying agency guidelines a AASHTO Roadside Design Guide.
	Ensure that soil around all posts is properly compacted and posts are free to rotate a only state/specifying agency approved backfill material is within the leave-out area.
	Ensure SoftStop® System offset does not exceed max allowed by test level and radii.
	Ensure that no rail panels within the SoftStop® System are curved.
	Ensure the center of the SYTP $^{ ext{@}}$ yielding holes are approximately centered at finisl grade line for Post 1 $\&$ 2.
	Ensure the fully assembled SoftStop $^{\circ}$ Anchor Post (Post 0) has a maximum height of 102 mm] and a minimum height of 3 3/4" [96 mm] above finished grade line.
	Ensure that the SoftStop® Anchor Rail is <u>not</u> bolted to Post 2 (SYTP®).
	Ensure offset blocks are properly in place and not rotated.
	Ensure that the SoftStop® System Rail height is approximately 31" [787 mm] above inished grade.
	Verify that rails are properly lapped in the direction of traffic.
	Ensure the SoftStop $^{\circ}$ Impact Head Connection Bracket is attached to the front side SoftStop $^{\circ}$ Post 1 (SYTP $^{\circ}$) with required 5/16" hardware.
	Ensure SoftStop® Impact Head has no more than 2 1/4" [58 mm] of upward tilt.
	Ensure that the SoftStop $^{ ext{@}}$ Keeper Plate and Plate Washer are properly positioned vequired hardware.
	Ensure the 1" Hex Nut has been fully tightened against the SoftStop® Plate Washer.
	Ensure that both SoftStop® Anchor Angles are properly positioned.
	Ensure the SoftStop® Angle Strut is properly attached on the non-traffic side with short leg down.
	Ensure that <u>all</u> fasteners of the SoftStop® System are tightened to a snug position.
	Ensure delineation is placed on SoftStop® Impact Head Strike Plate per MUTCD and state/specifying agency.

Repair Checklist (Complete & File With Project Folder)

Perfor	rmed by:	
Date:		
Locat	tion:	
	Ensure required traff	ic control is in place to conduct SoftStop® System repair.
	Ensure only Trinity	Highway SoftStop® System parts are used for the repair of that all parts are free of damage.
	Ensure proper site AASHTO Roadside I	grading complies with state/specifying agency guidelines a Design Guide.
		and all posts is properly compacted and posts are free to rotate a agency approved backfill material is within the leave-out area.
	Ensure SoftStop® Sy	stem offset does not exceed max allowed by test level and radii.
	Ensure that no rail p	anels within the SoftStop® System are curved.
	Ensure the center of grade line for Post 1	of the SYTP® yielding holes are approximately centered at finish $\&2.$
	<u>•</u>	embled SoftStop® Anchor Post (Post 0) has a maximum height of imum height of 3 3/4" [96 mm] above finished grade line.
	Ensure that the Soft	Stop® Anchor Rail is <u>not</u> bolted to Post 2 (SYTP®).
	Ensure offset blocks	are properly in place and not rotated.
	Ensure that the Soft finished grade.	Stop® System Rail height is approximately 31" [787 mm] above t
	Verify that rails are p	roperly lapped in the direction of traffic.
		$^{\circ}$ Impact Head Connection Bracket is attached to the front side YTP $^{\circ}$) with required 5/16" hardware.
	Ensure SoftStop® Im	pact Head has no more than 2 1/4" [58 mm] of upward tilt.
	Ensure that the Sof required hardware.	tStop® Keeper Plate and Plate Washer are properly positioned w
	Ensure the 1" Hex N	ut has been fully tightened against the SoftStop® Plate Washer.
	Ensure that both So	ftStop® Anchor Angles are properly positioned.
	Ensure the SoftStop short leg down.	o® Angle Strut is properly attached on the non-traffic side with t
	Ensure that <u>all</u> faster	ners of the SoftStop® System are tightened to a snug position.
	Ensure delineation is state/specifying age	s placed on SoftStop® Impact Head Strike Plate per MUTCD and/

Inspection Checklist (Complete & File With Project Folder)

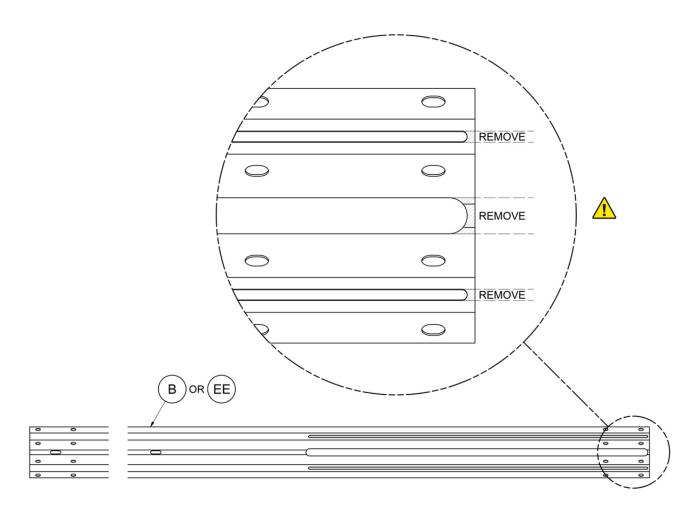
Performed by:
Date:
Location:
Inspections by the appropriate highway authority are recommended as needed based or volume of traffic and impact history. Visual drive-by inspections are recommended at least once every month. Walk-up inspections are recommended at least twice a year
Important: The SoftStop® System and all of its components should be inspected for damage after every impact. Repair using only Trinity Highway parts that are specified for use within the SoftStop® System.
Visual Drive-By Inspections (Recommended Frequency: Monthly)
□ Check for damage caused by vehicle impacts.
□ Check for damage caused by impacts from snowplow or mowing operations.
☐ Check for misalignment.
☐ Check for missing system components.
□ Check for vandalism.
$\hfill\Box$ Check for damage caused by adverse weather conditions (i.e. erosion).
Walk-Up Inspections (Recommended Frequency: Twice A Year)
□ Ensure required traffic control is in place to conduct walk-up inspection.
☐ Check for damage caused by vehicle impacts.
☐ Check for damage caused by impacts from snowplow or mowing operations.
□ Check for misalignment.
☐ Check for missing system components.
☐ Check for vandalism.
☐ Clear and dispose of any debris on site.
□ Check that fasteners are fully tight.
☐ Check for erosion to the site grading around the system.
☐ Check for damage caused by adverse weather conditions (i.e. erosion).

If any of the above items are identified during the inspection process, swift action should be taken to correct and return the SoftStop® System to proper condition outlined in this assembly manual.

Appendix

Offsite Anchor Rail Pre-Assembly Method

Step A: The SoftStop® Anchor Rail is manufactured with three (3) shipping tabs. These shipping tabs shall be removed with a cutting device to assist in the assembly process. The SoftStop® Anchor Rail is available in two lengths: 12'-6" (Part B) or 25'-0" (Part EE).

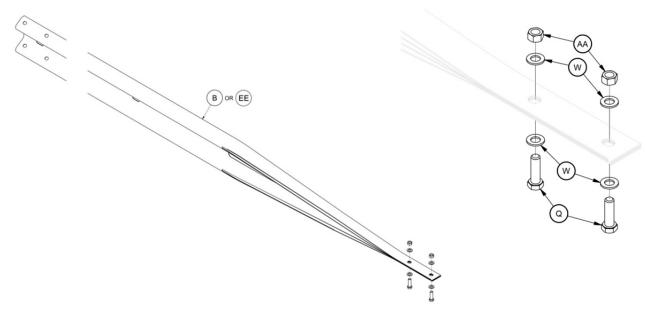


Note: Only one (1) SoftStop® Anchor Rail is used per assembly, 12'-6" (Part B) or 25'-0" (Part EE).

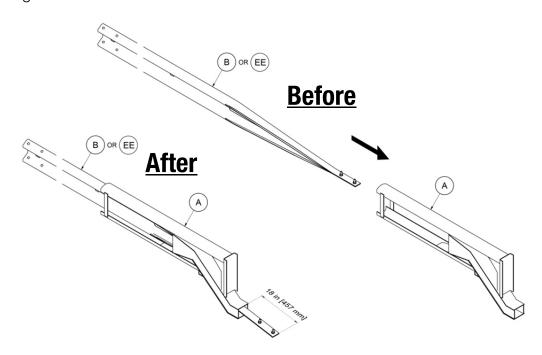


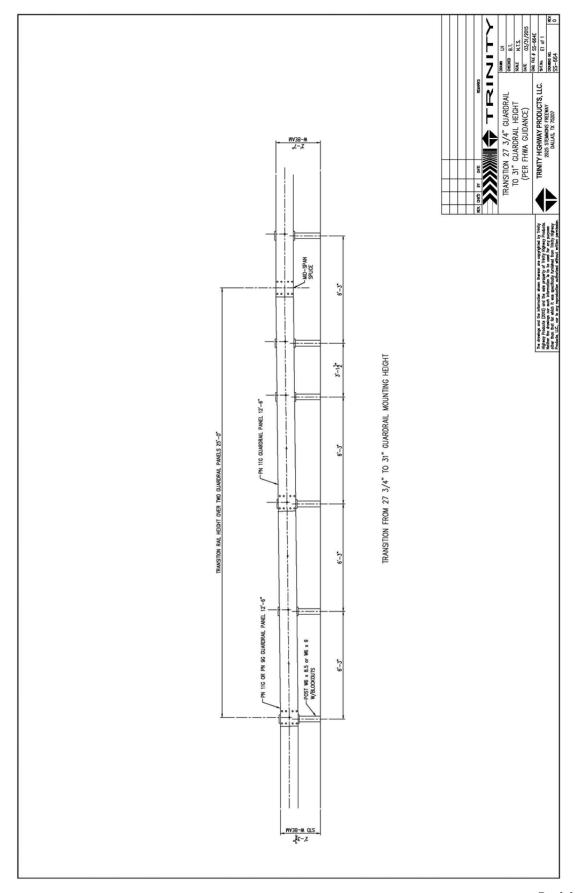
Warning: Keep body parts clear of cutting device. Ensure proper personal protective equipment (PPE) is worn. Failure to follow this warning could result in serious injury or death.

Step B: Assemble all parts in the configuration & orientation shown below. Flatten the (4) plies of the SoftStop® Anchor Rail together and insert both hex bolts (Part Q) through the bottom side of the four (4) plies of the SoftStop® Anchor Rail (Part B or Part EE) with washers and nuts (Parts W & AA). The bottom side is determined by the final assembled position of the SoftStop® System (nuts are on top side of Anchor Rail). The use of locking pliers or c-clamps will assist the assembly process.



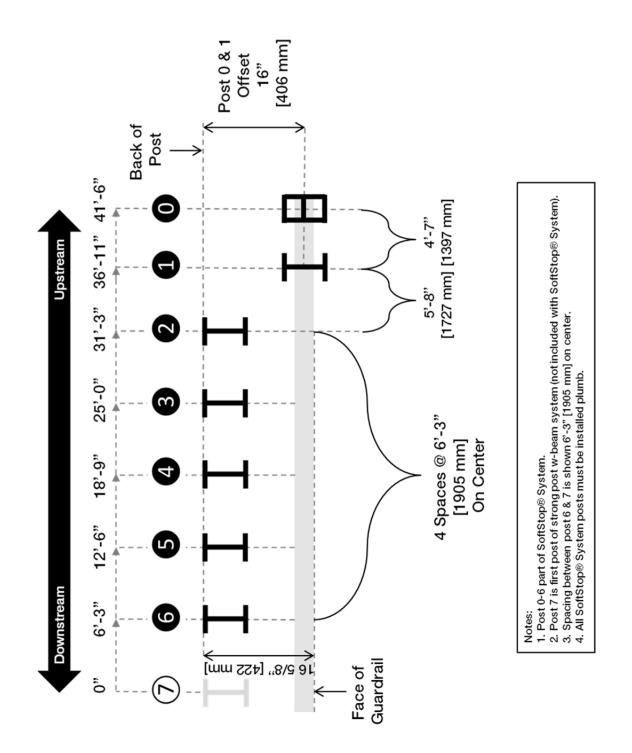
Step C: Feed the flattened slotted end of the SoftStop® Anchor Rail (Part B or Part EE) into the SoftStop® Impact Head (Part A) until a minimum 18" [457 mm] of the SoftStop® Anchor Rail is protruding out the Chute of the SoftStop® Impact Head. This can be achieved by the use of a come-a-long or other mechanical means.



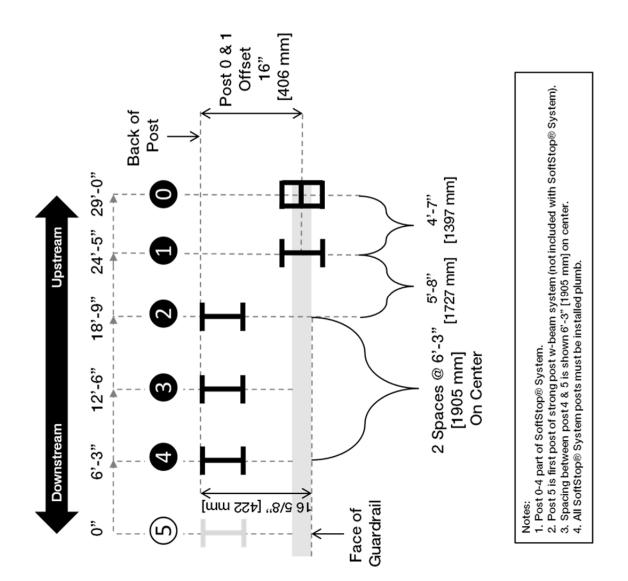


Rail Height Transition (27 3/4" to 31") [705 mm to 787 mm]

SoftStop® System (Test Level 2) - Post Placement Diagram



SoftStop® System (Test Level 1) - Post Placement Diagram



Notes	

Notes

NOTES					



For more complete information on Trinity Highway products and services, visit us on the web at www.trinityhighway.com. Materials and specifications are subject to change without notice. Please contact Trinity Highway to confirm that you are referring to the most current instructions.