



QUEST[®] System

DPA ANCHORAGE

ASSEMBLY MANUAL ADDENDUM

QUEST[®] System

DPA Anchorage

Assembly Manual Addendum



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Important: These instructions are to be used only in conjunction with the assembly, maintenance, and repair of the QUEST[®] System. These instructions are for standard assembly 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 accepted by the Federal Highway Administration for use on the national highway system under strict criteria utilized by that agency. Valtir 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 Valtir at (888) 356-2363 or download copies from the website below.

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 QUEST[®] System information available to Valtir at the time of printing. We reserve the right to make changes at any time. Please contact Valtir to confirm that you are referring to the most current instructions.

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Customer Service Contacts

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

Energy Absorption Systems, Inc. dba Valtir

Telephone:	(888) 323-6374 (USA) (312) 467-6750 (International)
E-mail:	www.Valtir.com/Contact
Website:	www.Valtir.com

Important Introductory Notes

Proper assembly of the QUEST® System is critical to achieve performance that has been evaluated and accepted by the Federal Highway Administration (FHWA) per NCHRP Report 350. These instructions should be read in their entirety and understood before assembling the QUEST® System. These instructions are to be used only in conjunction with the assembly of the QUEST® System and are for standard assemblies only as specified by the applicable highway authority. If you need additional information, or have questions about the QUEST® System, please contact the highway authority that has planned and specified this assembly and, if needed, contact Valtir's Customer Service Department. This product must be assembled in the location specified by the appropriate highway authority. If there are deviations, alterations, or departures from the assembly protocol specified in this Manual, the device may not perform as it was tested and accepted. In the event your system assembly requires or involves deviation from standard parameters or, during the assembly process a question arises, please contact the appropriate highway authority that specified this system at this particular location for guidance.

This system, like other Valtir systems, has been crash tested pursuant to NCHRP Report 350 mandated criteria.



Important: DO NOT use any component part that has not been specifically crash tested and/or approved for this system during assembly, repair, or maintenance of this system.

This product has been specified for use by the appropriate highway authority and has been provided to that user who has unique knowledge of how this system is to be assembled. No person should be permitted to assist in the assembly, maintenance, or repair of this system that does not possess the unique knowledge described above. These instructions are intended for an individual who is qualified to both read and accurately interpret them as written. These instructions are intended only for an individual experienced and skilled in the assembly of highway products that are specified and selected by the highway authority.

A manufacturer's drawing package will be supplied by Valtir upon request. Each system will be supplied with a specific drawing package unique to that system. Such drawings shall be studied thoroughly by a qualified individual who is skilled in interpreting them before the start of any product assembly.



Important: Read safety instructions thoroughly and follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing the QUEST® System. Failure to follow this warning can result in serious injury or death to workers and/or bystanders. It further compromises the acceptance of this system by the FHWA. Please have these instructions available for later use and reference by anyone involved in the assembly of the product.



Warning: Ensure that all of the QUEST® System Danger, Warning, Caution, and Important statements within the QUEST® System Manual are completely followed. Failure to follow this warning could result in serious injury or death in the event of a collision.

Safety Rules for Assembly

*** Important Safety Instructions ***

This Manual must be kept in a location where it is readily available to persons who assemble, maintain, or repair the QUEST® System. Additional copies of this Manual are immediately available from Valtir by calling (888) 323-6374 or by email at www.Valtir.com/Contact. Please contact Valtir if you have any questions concerning the information in this Manual or about the QUEST® System. This Manual may also be downloaded directly from the website listed below.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or the QUEST® System components. Gloves, safety goggles, safety-toe shoes, and back protection should be used.

Safety measures incorporating traffic control devices specified by the highway authority must be used to provide safety for personnel while at the assembly, maintenance, or repair site.

Safety Symbols

This section describes the safety symbols that appear in this QUEST® System Addendum Manual. Read the Manual for complete safety, assembly, operating, maintenance, repair, and service information.

Symbol

Meaning



Safety Alert Symbol: Indicates Danger, Important, Warning, or Caution. Failure to read and follow the Danger, Warning, Important, Caution, or Important indicators could result in serious injury or death to workers and/or bystanders.

Warnings and Cautions

Read all instructions before assembling, maintaining, or repairing the QUEST® System.



Warning: Do not assemble, maintain, or repair the QUEST® 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 Valtir at (888) 323-6374 if you do not understand these instructions.



Warning: Safety measures incorporating appropriate traffic control devices specified by the highway authority must be used to protect all personnel while at the assembly, maintenance, or repair site.



Warning: Use only Valtir parts that are specified herein for the QUEST® System for assembling, maintaining, or repairing the QUEST® System. **Do not utilize or otherwise combine parts from other systems even if those systems are other Valtir systems.** Such configurations have not been tested, nor have they been accepted 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 an UNACCEPTED system.



Warning: Do NOT modify the QUEST® System in any way.



Warning: Ensure that the QUEST® System and delineation used meet all federal, state, local and specifying agency requirements.



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



Warning: Use only Valtir parts on the QUEST® System for assembly, maintenance, or repair. **The assembly or comingling of unauthorized parts is strictly PROHIBITED.** The QUEST® System and its component parts have been accepted for state use by the FHWA. However, a comingled system has not been accepted within the applicable criteria.



Important: Valtir makes no recommendation whether use or reuse of any part of the 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 this product after assembly is complete to make certain that the instructions provided in this Manual have been strictly followed.



Warning: Ensure that this assembly conforms with the guidance provided by the AASHTO Roadside Design Guide, including, but not limited to, those regarding placement on or adjacent to curbs.

Limitations and Warnings

Valtir, in compliance with the National Cooperative Research Highway Program 350 (NCHRP Report 350) “Recommended Procedures for the Safety Performance of Highway Safety Features”, contracts with FHWA approved testing facilities to perform crash tests, evaluation of tests, and submittal of results to the FHWA for review.

The QUEST® System has been approved by FHWA as meeting the requirements and guidelines of NCHRP Report 350 TL-2 and TL-3. These tests typically evaluate product performance by closely simulating actual impacts involving a typical range of vehicles on our roadways, from lightweight cars (approx. 820kg [1800 lb.]) to full size pickup trucks (approx. 2000 kg [4400 lb.]) as specified by the FHWA. The QUEST® System certified to the Test Level(s) shown below:

Test Level 2: 70 km/h [43 mph]

Test Level 3: 100 km/h [62 mph]

These FHWA directed tests are not intended to represent the performance of systems when impacted by every vehicle type or every impact condition existing on the roadway. This system is tested only to the test matrix criteria of NCHRP 350 as approved by FHWA.

Valtir neither represents nor warrants that the impact results of these federally established test criteria prevent or reduce the severity of any injury to person(s) or damage to property. These tests only demonstrate the occurrence of certain results following an impact within NCHRP Report 350 criteria. Every departure from the roadway is a unique event.

The QUEST® System is intended to be assembled, delineated, and maintained within specific state and federal guidelines. It is important for the highway authority specifying the use of a highway product to select the most appropriate product configuration for its site specifications. Careful evaluation of the site lay out, vehicle population type; 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 should be removed from the area immediately and the specified highway product should be evaluated and either restored to its original, specified condition, or replaced, as the highway authority determines, as soon as possible.

DPA Anchorage Addendum

The QUEST® System is now available with a Drivable Pile Anchor (DPA) Anchorage option allowing the system to be assembled in strong soil conditions. The following assembly steps are to be used in combination with the steps previously outlined for permanent deployments (see the QUEST® (36") System Assembly Manual for details).

A) Attach Wing Plates to Front Anchors and Backup

Lift and hold the QUEST® System with a fork lift. Place the forks under Bay two Fender Panels and carefully lift the system and hold in a safe position.

Using 3/4" hex bolts, washers, and nuts, attach the Front Wing Plate to the front anchors and the Rear Wing Plate to the Backup (see Figure 1).

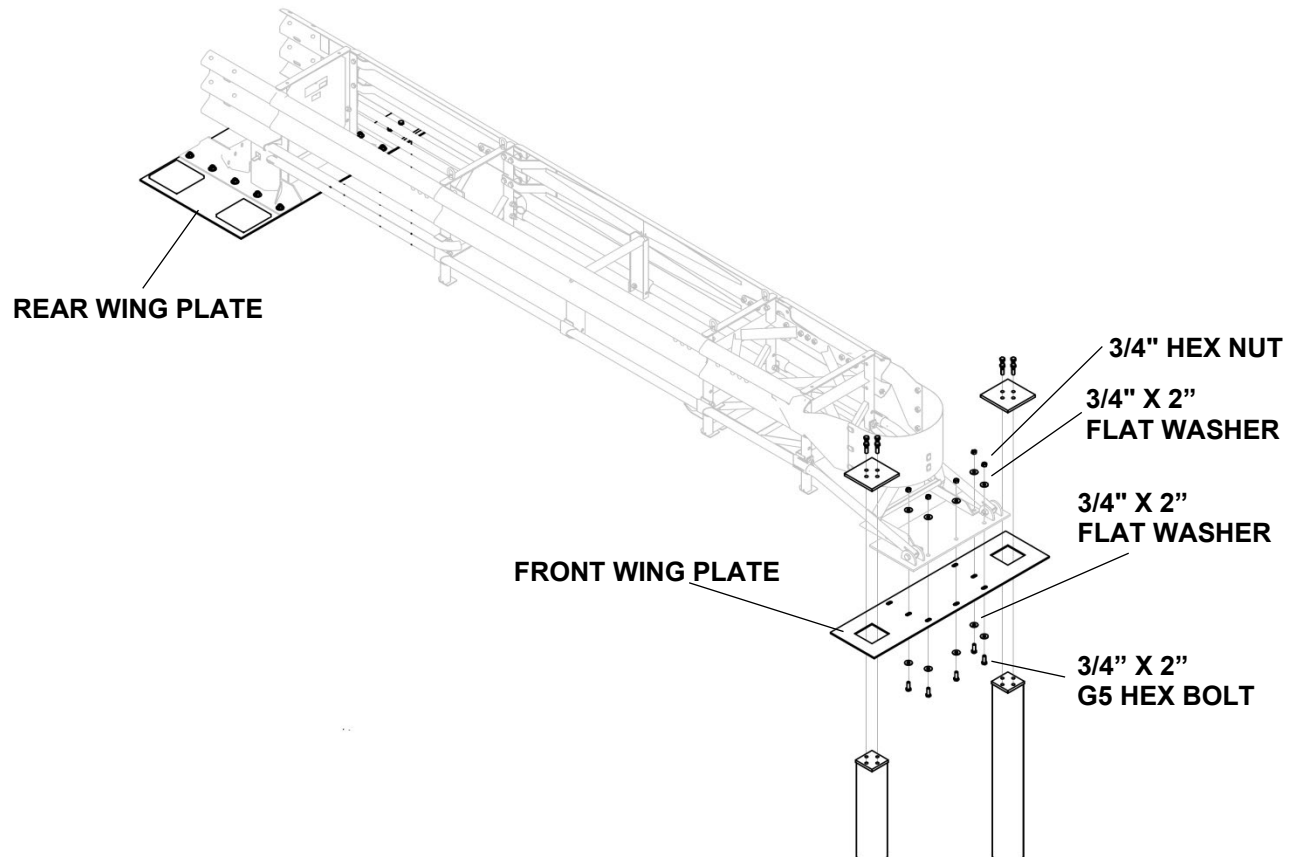


Figure 1
Wing Plate Attachment

B) Determine the Basepoint and Centerline

Typically the Basepoint of the QUEST® System will be the midpoint of the roadside obstacle at its front face.

Extend the chalk line from the Basepoint, perpendicular to the fixed obstacle face, or as determined by project engineer, to a distance greater than the maximum length of the QUEST® System (see provided drawings).

This chalk line will become the centerline for the QUEST® System (see Figure 2).

Note: The QUEST® System, when properly deployed, appears to be an extension of the object it is shielding (see Figure 3).



Warning: Location of the system with respect to the fixed object is critical and dependent on the type of Transition Panel used. See the project plans supplied with the system for details.

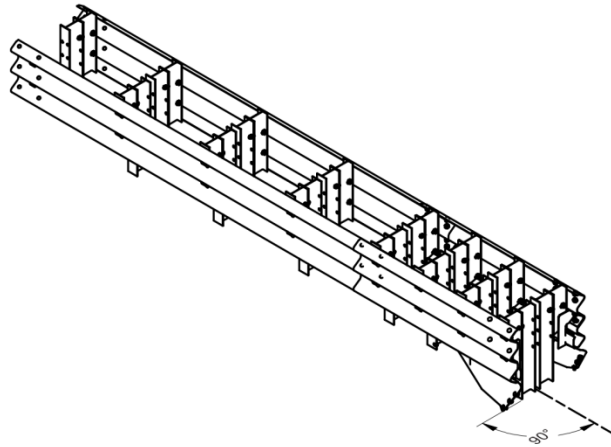


Figure 2
Backup Location

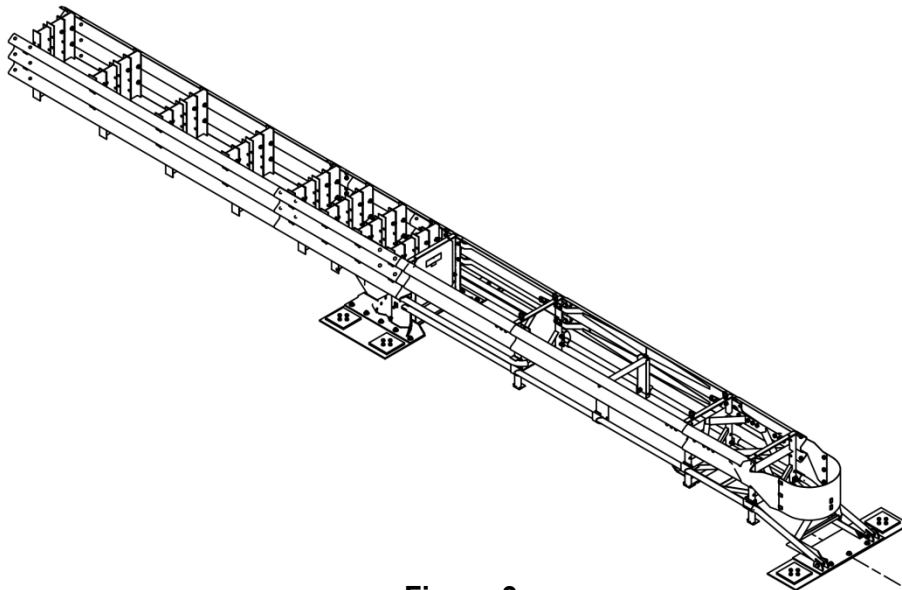


Figure 3
QUEST Placement

C) Anchor the System

Note: The system is not to be used on cross-slopes that exceed 8% or vary (twist) more than 2% from front to back. For these conditions, a leveling pad or grading is required (see Figure 4).

Only use parts supplied by Valtir specific for this product.

QUEST® Systems assembled on asphalt or soil must be inspected to ensure the system is properly anchored following each impact. Refurbish and re-anchor the system as necessary.

1. Lift the system into place at the marked location. If required, attach the system to the roadside feature via Transition Panel(s) (see Figure 3).

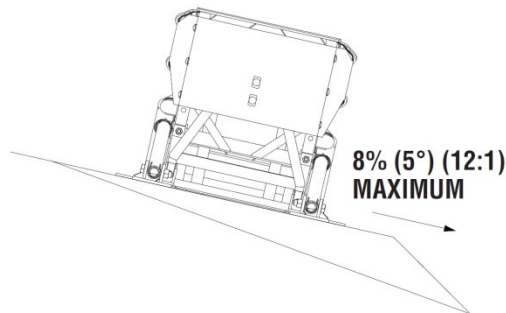


Figure 4
Max. Allowable Cross-Slope

2. Once the system is in place, position pile driving equipment over a square hole in the outboard Wing Plate (see Figure 5).
3. Place the 6" x 6" x 72 3/4" Drivable Post into the square hole in the Wing Plate (see Figure 5). Use a small level to ensure the Post is straight for pile driving. Drive Post into the ground until the Post's Top Plate is flush with the top of the Wing Plate.

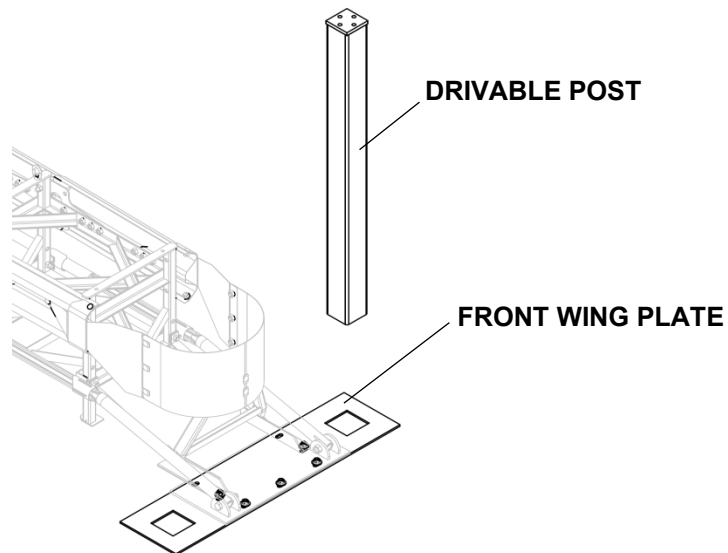


Figure 5

4. Use the 3/4" x 2 1/2" hex bolts to fasten the 3/4" x 10" x 10" Post Cap to the top of the Post (see Figure 6).

Note: Walk-up inspections are recommended at least once every six months.

D) Moving the System

Unfasten all Post Caps, inspect for damage, and set aside for next assembly. Replace all damaged parts. Free the system from Anchor Posts. To accomplish this, start at the Nose of the system and use pry bars to gradually raise the system off the Posts. Place blocks, such as 2 x 4s, under the Base Track and work down the length of the system until the system is completely free. Follow the procedures outlined in the QUEST® System (36") Assembly Manual to lift and place the system into its new location.

E) Extracting Drivable Pile Anchors

Fasten 3/4" threading lifting rings or eyes into the holes at the top of the Post. Attach a hoist or crane to the rings and pull the Post from the ground. Remove Posts as necessary and backfill holes created by extraction.



Caution: Extracted Posts will be filled with soil and extremely heavy. Handle with caution.

F) DPA Refurbishment

Remove all soil and other material from inside of the Post, being careful not to damage the side walls of the tubing. The bottoms of the Posts may be damaged from initial pile driving. Cut the damaged portion of tubing from the Post so that side walls are straight for the next assembly. If the side walls of the post are damaged at more than 12" from the bottom of the post, scrap the post and replace it with a new one.

Reassemble system per instruction A through C.

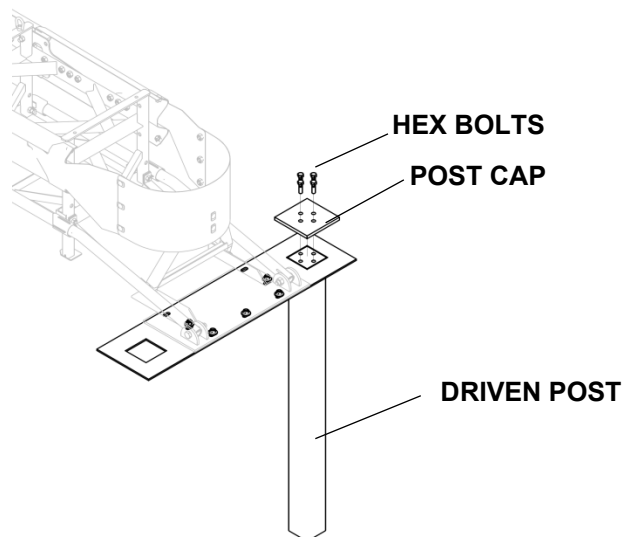


Figure 6

Repeat this procedure until system is completely anchored.



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

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