



# REACT 350<sup>®</sup>

**NARROW SYSTEM CRASH CUSHION  
DPA ANCHORAGE**

**ASSEMBLY MANUAL ADDENDUM**

**PN 115321**

REVISION B FEBRUARY 2023

# REACT 350®

## Narrow 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 REACT 350® Narrow 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) 323-6374 or download from websites 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 REACT 350® Narrow 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 REACT 350® Narrow system, its assembly procedures, supporting documentation, and performance is always welcome. Additional information can be obtained from the contact information below:

### **Valtir:**

Telephone:	(888) 323-6374 (USA Only) (214) 589-8140 (USA or International)
E-mail:	<a href="http://www.Valtir.com/Contact">www.Valtir.com/Contact</a>
Internet:	<a href="http://www.Valtir.com">www.Valtir.com</a>

## **Important Introductory Notes**

Proper assembly of the REACT 350® Narrow system is essential to achieve performance of the system under appropriate federal and state criteria. These instructions should be read in their entirety and understood before assembling the REACT 350® Narrow system. These instructions are to be used only in conjunction with the assembly of the REACT 350® Narrow system and are for standard assemblies only as specified by the applicable highway authority. 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. Valtir is available for consultation with that agency. These instructions are intended for an individual who is qualified to both read and accurately interpret them as written. They are intended for the individual who is experienced and skilled in the assembly of highway products which are specified and selected by the highway authority.

A set of product and project shop drawings will be supplied by Valtir. The shop drawings will be for each section of the assembly. These drawings should be reviewed and studied thoroughly by a qualified individual who is skilled in interpreting them before the start of any assembly.



**Important:** Read safety instructions thoroughly and follow the assembly directions and suggested safe practices before assembling, maintaining, or repairing the REACT 350<sup>®</sup> Narrow 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 keep these instructions for later use.



**Warning:** Ensure that all of the REACT 350<sup>®</sup> Narrow system Warnings, Cautions, and Important Statements within the REACT 350<sup>®</sup> Narrow system Manual are completely followed. Failure to follow this warning could result in serious injury or death in the event of a collision.

## **Recommended Safety Rules for Assembly**

### **\* Important Safety Instructions \***

This Manual must be kept in a location where it is readily available to persons who are skilled and experienced in the assembly, maintenance, or repair of the REACT 350<sup>®</sup> Narrow system. Additional copies of this Manual are immediately available from Valtir by calling (888) 323-6374 or by visiting [Valtir.com](http://Valtir.com). This Manual may also be downloaded directly from the websites indicated below. Please contact Valtir if you have any questions concerning the information in this Manual or about the REACT 350<sup>®</sup> Narrow system.

Always use appropriate safety precautions when operating power equipment, mixing chemicals, and when moving heavy equipment or the REACT 350<sup>®</sup> Narrow system components. Gloves, safety goggles, steel toe boots, and back protection shall 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 REACT 350® Narrow System Addendum Manual. Read the Manual for complete safety, assembly, operating, maintenance, repair, and service information.

### Symbol Meaning



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

## Warnings and Cautions

Read all instructions before assembling, maintaining, or repairing the REACT 350® Narrow system.



**Warning:** Do not assemble, maintain, or repair the REACT 350® Narrow system until you have read this Manual thoroughly and completely understand it. Ensure that all Warnings, Cautions, and Important Statements within the Manual are completely followed. Please call Valtir at (888) 323-6374 if you do not understand these instructions. Failure to follow this warning could result in serious injury or death in the event of a collision.



**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. Failure to follow this warning could result in serious injury or death in the event of a collision.



**Warning:** Use only Valtir parts that are specified herein for the REACT 350® Narrow system for assembling, maintaining, or repairing the REACT 350® Narrow system. Do not utilize or otherwise comeingle 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 REACT 350® Narrow system in any way. Failure to follow this warning could result in serious injury or death in the event of a collision.



**Warning:** Ensure that the REACT 350® Narrow system and delineation used meet all federal, state, specifying agency, and local specifications. Failure to follow this warning could result in serious injury or death in the event of a collision.



**Warning:** Ensure that your assembly meets all appropriate Manual on Uniform Traffic Control Devices (MUTCD) and local standards. Failure to follow this warning could result in serious injury or death in the event of a collision.

## **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 Federal Highway Administration for review.

The REACT 350® Narrow 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. A product can be certified for multiple Test Levels. The REACT 350® Narrow system is certified to the Test Level(s) as 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.**

These tests are not intended to represent the performance of products when impacted by every vehicle type or every impact condition.

Valtir does not represent nor warrant that the results of these controlled tests show that vehicle impacts with the products in other conditions would necessarily avoid injury to person(s) or property. Impacts that exceed criteria capabilities of the product may not result in acceptable impact performance as outlined in NCHRP Report 350, relative to structural adequacy, occupant risk, and vehicle trajectory. Valtir expressly disclaims any warranty or liability for injury or damage to persons or property resulting from any impact, collision, or harmful contact with products, other vehicles, or nearby hazards or objects by any vehicle, object or person, whether or not the products were assembled by or in the presence of Valtir representatives or by third parties.

The REACT 350® Narrow system is intended to be assembled, delineated, and maintained in accordance with specific state and federal guidelines. It is important to select the most appropriate product configuration for a site. The customer should be careful to properly select, assemble and maintain the product. Careful evaluation of the site geometry, vehicle population type, speed, traffic direction, and visibility are some of the elements that require evaluation in the proper selection of a safety appurtenance. For example, curbs could cause an untested effect on an impacting vehicle.

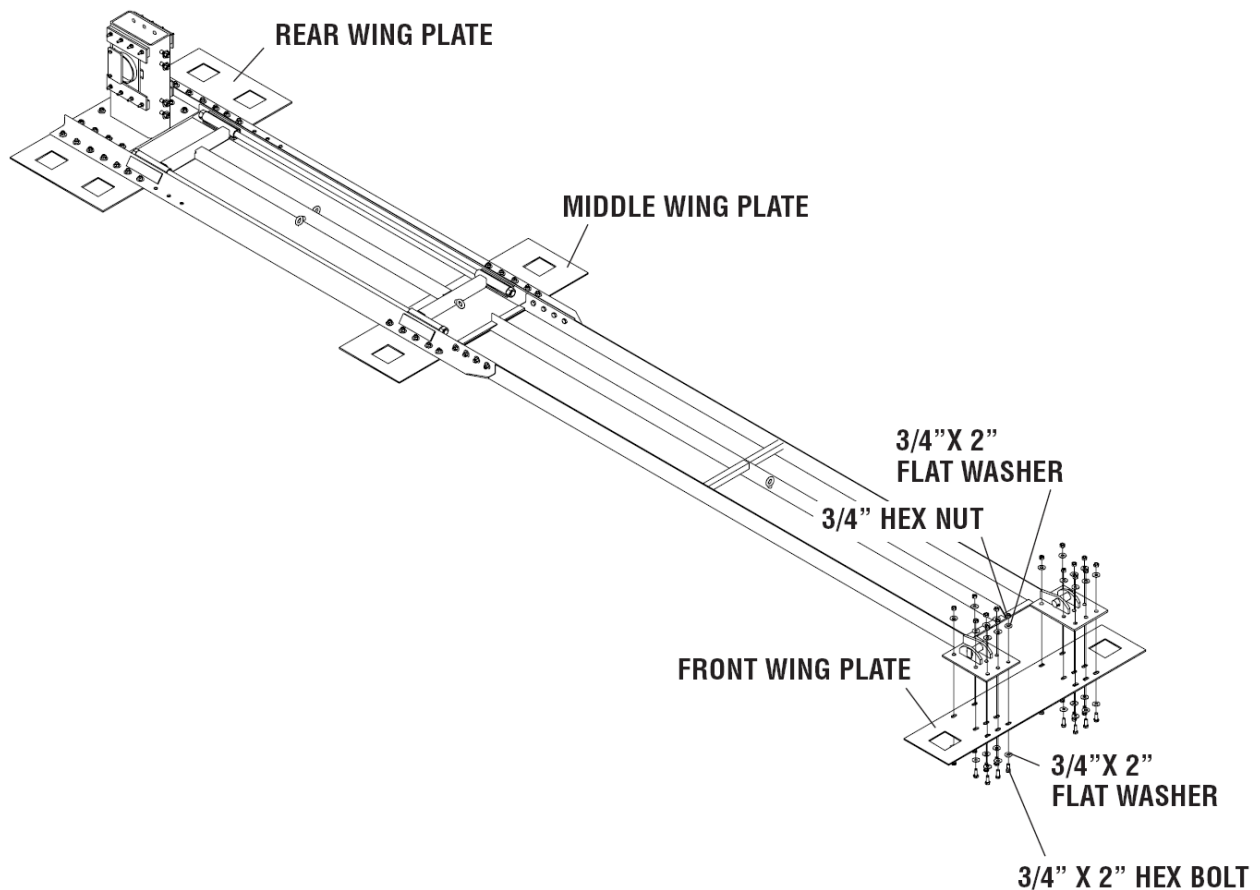
After an impact occurs, the product should be restored to its original condition as soon as possible. When a reusable safety product is impacted, it is still necessary to restore the product to its original length and inspect all the components as necessary.

## DPA Anchorage Addendum

The REACT 350® Narrow 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 REACT 350® Narrow system (36") system Assembly Manual for details).

### **A) Attach Wing Plates to the Base Track**

Place the fully assembled REACT 350® Narrow system on top of several saw horses or other type of adequate table support. Using 3/4" hex bolts, washers and nuts, attach the front, middle and rear Wing Plates to the Front Cable Anchor Plates, the Base Track Connection Point and the Backup respectively (See Figure 1).



**Figure 1**  
**Wing Plate Attachment**



## B) Determine the Basepoint and Centerline

Typically the Basepoint of the REACT 350<sup>®</sup> Narrow system will be the midpoint of the hazard at its front face.

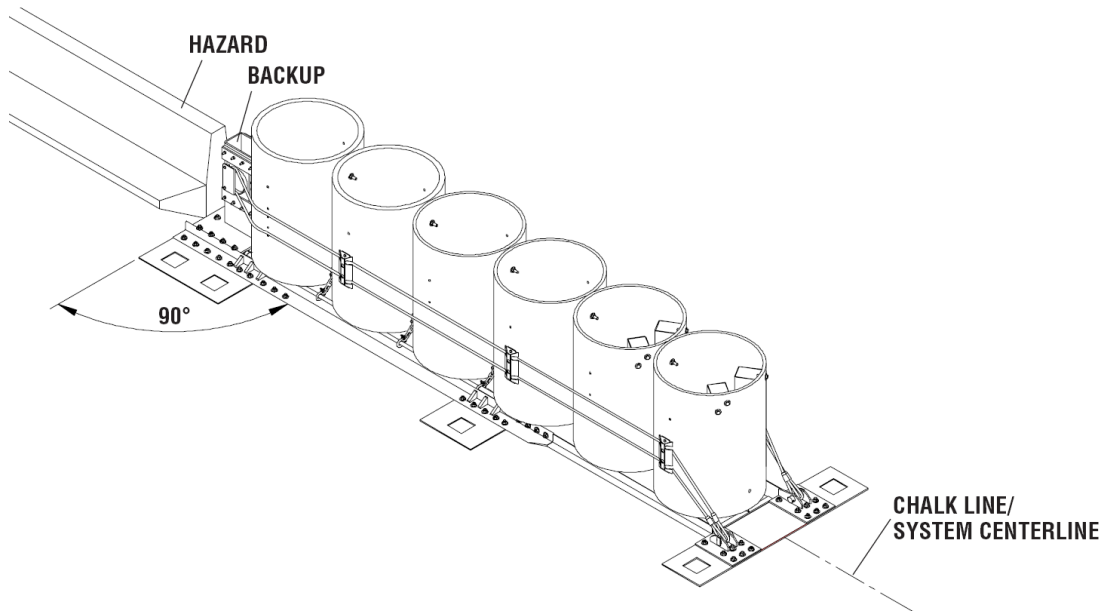
Extend the chalk line from the Basepoint, perpendicular to the hazard face, or as determined by project engineer, to a distance greater than the maximum length of the REACT 350<sup>®</sup> Narrow system (See drawings provided).

This chalk line will become the centerline for the REACT 350<sup>®</sup> Narrow system (See Figure 2).

Note that the REACT 350<sup>®</sup> Narrow system, when properly deployed, appears to be an extension of the object it is shielding (See Figure 2).



**Warning:** Location of the system with respect to the hazard 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**

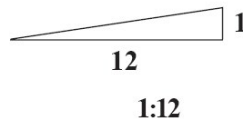
### C) Anchor the System

**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 3).

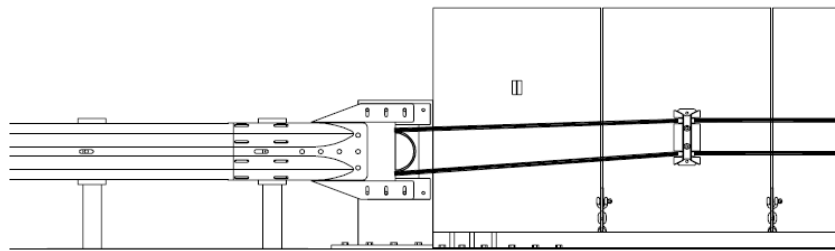
Only use parts supplied by Valtir.

REACT 350® Narrow systems assembled on asphalt or soil must be inspected to ensure the system is properly anchored following each impact. Refurbish and re-anchor as necessary.

1. Lift the system into place at the marked location. If required, attach the system to the hazard/barrier via Transition Panel(s) (See Figure 4).

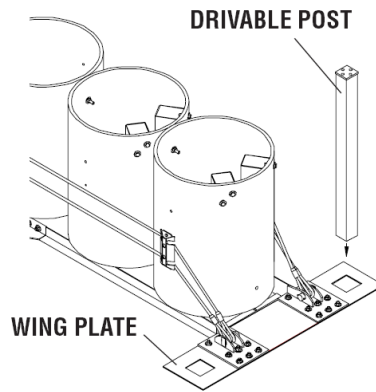


**Figure 3**  
**Max. Allowable Cross Slope**



**Figure 4**  
**Transition Connection**

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 72 3/4" x 6" x 6" 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).

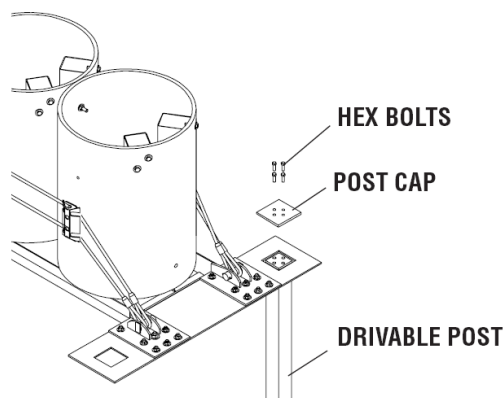
**Note:** Walk-up inspections are recommended at least once every six months.

#### **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 4's under the Base Track and work down the length of the system until the system is completely free. Follow the procedures outlined in the REACT 350® Narrow System (36") Assembly Manual to move the system into place.

#### **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.



**Figure 6**



**Warning:** The 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.

**Repeat this procedure until system is completely anchored.**

**Notes:**

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For more complete information on Valtir products and services, visit us on the web at [www.valtir.com](http://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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