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SALLY FOX PARK SPLASHPAD
PROJECT ID. 2014-91412-14387

All structures and equipment listed in this manual have been manufactured or assembled by:

Vortex Aquatic Structures International Inc.

VORTEX
Aquatic Play Solutions

Splashpad®

with Water Distribution System

Installation Manual

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Vortex WDS Installation Manual

REV.05 Feb. 2012

Table of Contents

1.0 Introduction

About this manual

The purpose of this manual is to provide detailed information for the installation of your Vortex Splashpad equipment. It is recommended that this manual be reviewed before you start to install and operate the Splashpad and its components.

Use the table of contents to find information and familiarize yourself with the organization of this manual.

Always observe the following symbols:

WARNING!

THE BLACK EXCLAMATION MARK IN THE LIGHT TRIANGLE ALERTS YOU TO POTENTIAL HAZARDS THAT CAN RESULT IN PERSONAL INJURY. FOLLOW THE ACCOMPANYING INSTRUCTIONS TO AVOID HAZARDS.

CAUTION!

THE WHITE EXCLAMATION MARK IN THE BLACK TRIANGLE ALERTS YOU TO HAZARDS THAT CAN DAMAGE YOUR SPLASHPAD EQUIPMENT. FOLLOW THE ACCOMPANYING INSTRUCTIONS TO AVOID HAZARDS.

NOTICE

THE INFORMATION SYMBOL IN THE CIRCLE ALERTS YOU TO IMPORTANT DETAILS ABOUT INSTALLATION AND YOUR SPLASHPAD.

Splashpad overview

The Splashpad is a fully automated aquatic play environment designed for use in recreational areas.

The automated components of the Splashpad are the Activator, the Controller and the distribution manifold.

Activator

Located in the Splashpad play area, the activator allows Splashpad users to initiate play events with a touch of a hand or foot.

Controller & distribution manifold

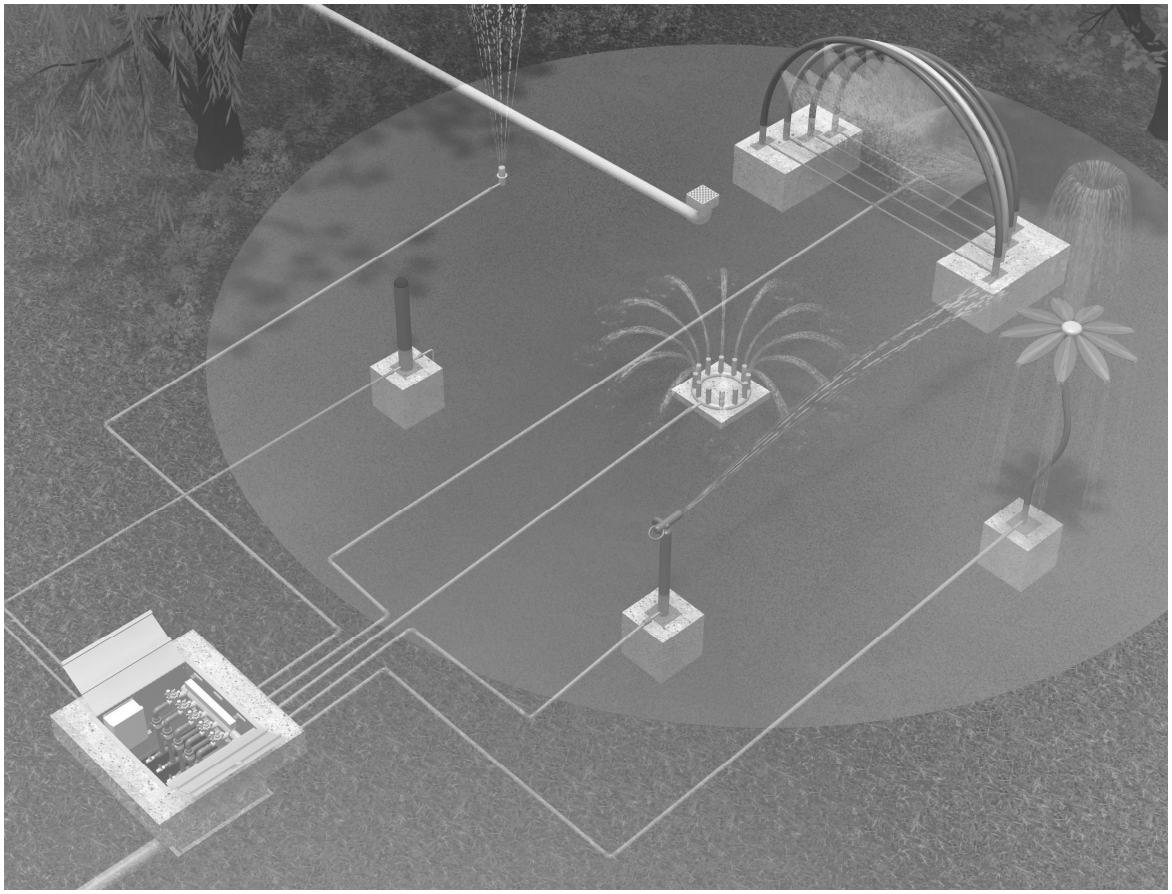
The Controller responds to the Activator by opening and closing solenoid valves along the distribution manifold in accordance with one of several preprogrammed spray sequences. The Controller is equipped with a 7-day, 24 hour programmable time clock that controls Splashpad operation during the operating hours of the facility.

Splashpad safety

Designed in accordance with ASTM and CSA standards for playgrounds in public play areas, Vortex Splashpads are the safest and most reliable aquatic play environments available. They are built from the highest quality materials to ensure maximum structural integrity, durability, corrosion resistance, ongoing safety and an extended play life.

Always remember that child safety is priority number one!

Sample layout of a Splashpad with WDS



2.0 Pre-construction site requirements

A survey of the site must be performed to locate:

- The potable water line
- Storm & sanitary drain lines
- Electrical service
- Activity deck (play surface) layout
- WDS skid or vault location
- Points of access to Splashpad

You should determine ground level elevations before commencing excavation work for the Splashpad's activity deck.

Potable water line

A potable water source is required for a Splashpad installation. Typically, for the WDS system, the size of the water line required ranges from 2" to a 3".

Drain system

Access to a municipal storm water or sanitary drain system is required. Generally, for a WDS system the drain line ranges from 6" to 8" in diameter. A catch basin at the drain is used to help trap debris before it flows into the drain system.

Electrical service

Current requirement

For a WDS, a 120vac, 10 amps/240vac, 5 amps service is required to operate the entire Splashpad.

Grounding

For security reasons, it is important to properly ground the WDS and all of the Splashpad play products in accordance with the standards approved by the authority having jurisdiction.

3.0 Splashpad construction guidelines

The following are guidelines for the construction of a typical Splashpad. These guidelines are not meant to provide all of the information necessary for proper construction and installation.

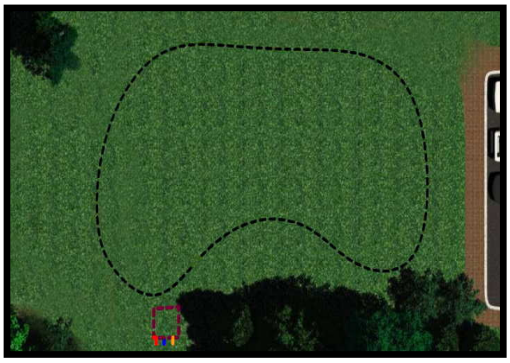
Before and during installation, consult the appendix of this manual for installation drawings and excavation/installation specifications for the WDS and individual play events/products.

Phase 1 - Major excavations

Step 1: Mark component locations

Following the site survey, mark the desired location of the Splashpad and Water Drain System

Once the site layout is complete, the excavation work can begin.



Step 2: Excavate soil for Splashpad

Excavate the soil within the perimeter of the Splashpad to a depth that will accommodate the subsurface granular material and the concrete slab for the activity deck.

To avoid settlement problems, any disturbed soil should be removed and replaced with the sub-base granular material.

Step 3: Excavate soil for play products

Excavate holes for the concrete bases of the Splashpad's play products. Ensure that the holes are large enough to form the concrete bases and deep enough to respect local frost levels. Refer to the installation drawings in the appendix for specific requirements.

Step 4: Excavate trenches for the drain lines, play event/product lines and make-up water line.

Trenches for the drain line, play event/product lines and the make-up water line should be excavated at depths corresponding to inlets and outlets of the play products and the WDS system. The specifics for each play product and WDS system can be found on their installation drawings (see Appendix).

All water feed lines to play events/products should drain with a minimum of 1-2 percent towards the water distribution manifold (or separately constructed drain pit) to ensure that all water can be removed from the lines during the winterization procedure

	NOTICE
	SPLASHPADS SUBJECT TO FREEZING CONDITIONS MUST HAVE A SUITABLE LINE SLOPE FOR EFFECTIVE WINTERIZATION.

Phase 2 – Installing the WDS

The Water Distribution System is designed to separate and channel the water source to each of the spray features and to create the liaison between the controller and the spray features on the Splashpad. The WDS consists of distribution manifold, solenoid valves and drain valves and other basic components that are required for an automated system. There are two types of WDS's available: The Equipment Vault and the Wall Mounted Manifold.

Above ground installation

The wall mounted manifold is a WDS that is generally installed on a wall or in the basement of a building near the location of the Splashpad.

Step 1 - Anchoring System

The manifold and controller are fastened to a stainless steel frame that is anchored to a concrete wall or other structurally sound wall. Use 4 stainless steel mechanical anchor bolts for anchoring to a concrete wall. The unit should be installed in a location near the electrical source and water source.

Step 2 - Openings for Water Lines

With this type of installation the water lines for the individual spray features must pass through the concrete wall and out to the features. An opening to accommodate the plumbing line is required.

Step 3 - Backflow Preventer and Pressure Regulator

The backflow preventer and pressure regulator {if applicable} are shipped separate from the manifold. This provides flexibility for the installation and location of these pieces of equipment to best accommodate the site conditions.

Step 4 - Drainage

For winterizing, the water lines are drained into the building or a drain pit, thus, an adequate drain is required.

Step 5 - Electrical

Refer to wiring diagram in the appendix of this manual for the electrical connection details.

Subterranean equipment vault

This unit consists of a subterranean enclosure designed to house the WDS equipment.

STEP 1 - Sub Base Material and Drainage

The equipment vault can be installed on a compacted bed of crushed stone or a cast in-place concrete slab (see installation drawing). It is essential to provide adequate drainage for any infiltration of water due to heavy rain or high water table levels. A sufficient diameter drain line connected to the storm water system or into a drainage pit is recommended.

STEP 2 - Excavation and Backfill

Excavate a hole large enough and deep enough to accommodate the installation of the equipment vault including the main water line connection, the individual play product water line connections, the drain line, the electrical connection and the sub-base material. The backfill material along the sides of the vault should be compacted granular.

STEP 3 - Plumbing Connections

The main water line connection is made outside the vault to a 2" NPT male inlet. The inlet size may vary according to the design requirements. The water lines to the individual features are connected to the threaded adaptors (1" or 1-1/2" NPT). Connecting the play products to the proper outlet is very important in order to respect the spray sequences. Refer to the legend located in the controller for guidance. For drainage purposes, the individual plumbing lines should be sloped from the play product to the vault. A static pressure test should be performed on all the plumbing equipment prior to backfilling.

STEP 4 - Concrete Curb

For safety and to provide additional stability, a concrete curb is cast in-place after backfilling. The curb is 12" square and is flush with the stainless steel frame around the top of the vault. (Refer to installation drawing)

Installation of Controller

Electrical conduits

In order to maintain the Controller's UL listed status and to protect the internal equipment from corrosion, all electrical connections and conduits penetrating through the enclosure must be water-tight.

Electrical Power Supply Connection

There are three terminal blocks identified as the Line, Neutral and Ground. The electrical service wires are connected to these terminal blocks. The electrical service supply is 120vac with a minimum of 10 amps/240vac with 5 amps. The ideal conductor size is 12 gauge wire or what local codes specify.

Electrical Connection to Solenoid Valves

Each solenoid valve is connected to a specific terminal block indicated in the Controller. The suggested conductor size is 16 AWG. Although each valve has 2 lead wires, a common wire can be used for up to 10 valves, thus reducing the number of wires required.

Electrical Connection for the Activator

Wiring for the activators require 2- 14 AWG shielded in an under ground conduit with all splices or connections to be water tight, refer to Phase 7 Electrical Connections which give the options for connections based on the type of controller ordered for your system.

Phase 3 - Form work and concrete bases

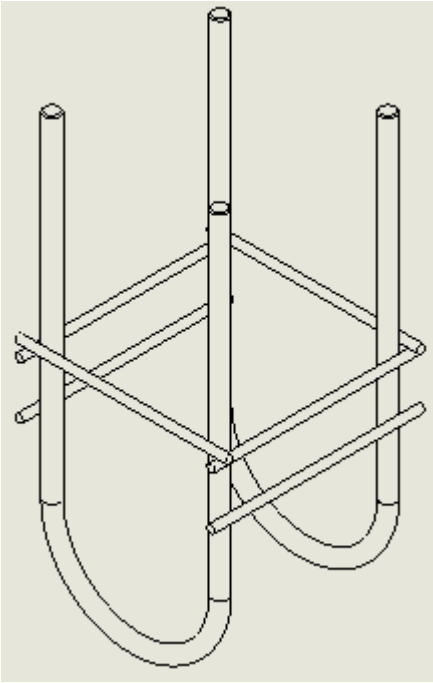
Please refer to the play product installation drawings in the appendix for specific details of concrete bases and anchoring systems for each play product.

Step 1: Construct the concrete formwork

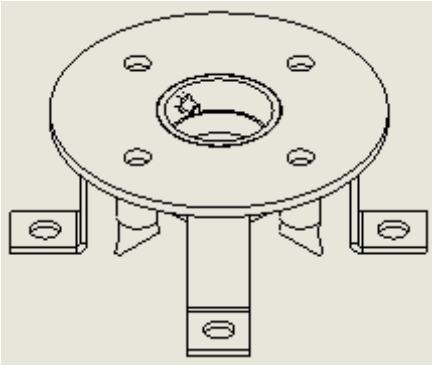
Construct concrete formwork using wood or round sono tubes. The standard concrete base size is 2ft x 2ft or 2ft diameter.

Step 2: Embed anchor bolts

Anchoring systems are available in two different configurations: below grade and surface mount. Refer to the installation drawings in the appendix of this manual for specifics on the anchoring system that was ordered with your project.



Below Ground Anchoring System



Safe swap Anchor

Dependant Safe swap Anchoring Systems Installation

For products requiring two or more safe swap anchoring systems, angle irons are provided in the tool kit it to ensure correct spacing of the anchoring systems. The number of angle irons provided will depend on the number of anchoring systems and on the layout.

Installation Steps:

1. Position and set U-bolt assemblies into the formwork using angle iron template. The template sits on the concrete form; therefore its vertical position (with respect to the u-Bolts) is critical as it determines the depth of the U-Bolts in the concrete. Refer to install drawings for details.

   Note: Template comes with 2 sets of holes, use holes on leg stamped with the letter "U".

2. a. Pour concrete into formwork and let concrete cure before removing formwork and angle irons. Be certain not to embed the leveling hex nut in the concrete

   b. Make necessary water and grounding connections.

3. Position and set safeswap using angle iron template. Ensure safeswap is level and plumb with respect to top grade. If Anchoring system includes ground sprays, then ground sprays should be covered with winter cap during installation.

   Note: Use holes on unstamped leg.

4. Place and compact 0-3/4" granular aggregate around the concrete bases.

5. Pour final grade concrete and let concrete cure before removing formwork and angle irons. Ensure top face of safeswap is clean of concrete.

Example:

To demonstrate the above installation instructions, we will use the Splash palace as an example. The splash palace is set on 4 safeswap anchoring systems, placed in a square, 84" X 84", pattern. The tool kit includes 5 angle irons, 4 to be used in a horizontal/vertical fashion and 1 in a diagonal fashion

Installation of Splash palace:

Step one, Positioning of U-Bolt assemblies using 5 angle irons:

Position the four u-bolt assemblies using all 5 angle irons as shown in figure 1.
Use Holes on Angle Iron legs stamped with the letter "U".

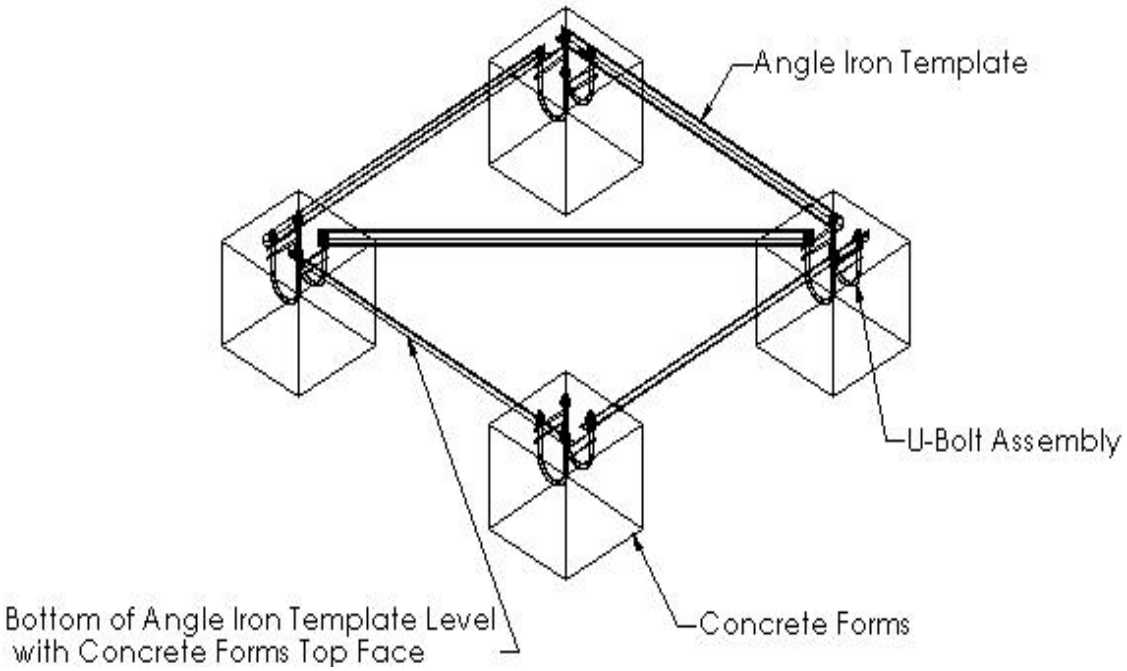


Figure 1, Installation of U-Bolts using Angle Iron Template.

Step 2a, Embedding of U-bolts

Pour concrete into formwork and let concrete cure before removing formwork and angle irons. Be certain not to embed the leveling hex nut in the concrete

Step 2b, Connections

Make necessary water and grounding connections.

Step 3, Installation of removable anchoring using 4 angle irons:

Position and set removable anchoring using 3 angle irons as shown in figure 2. Ground sprays should be covered with winter caps during installation. Ensure safeswap is level and plumb with respect to top grade. Use Holes on unstamped leg of Angle Irons.

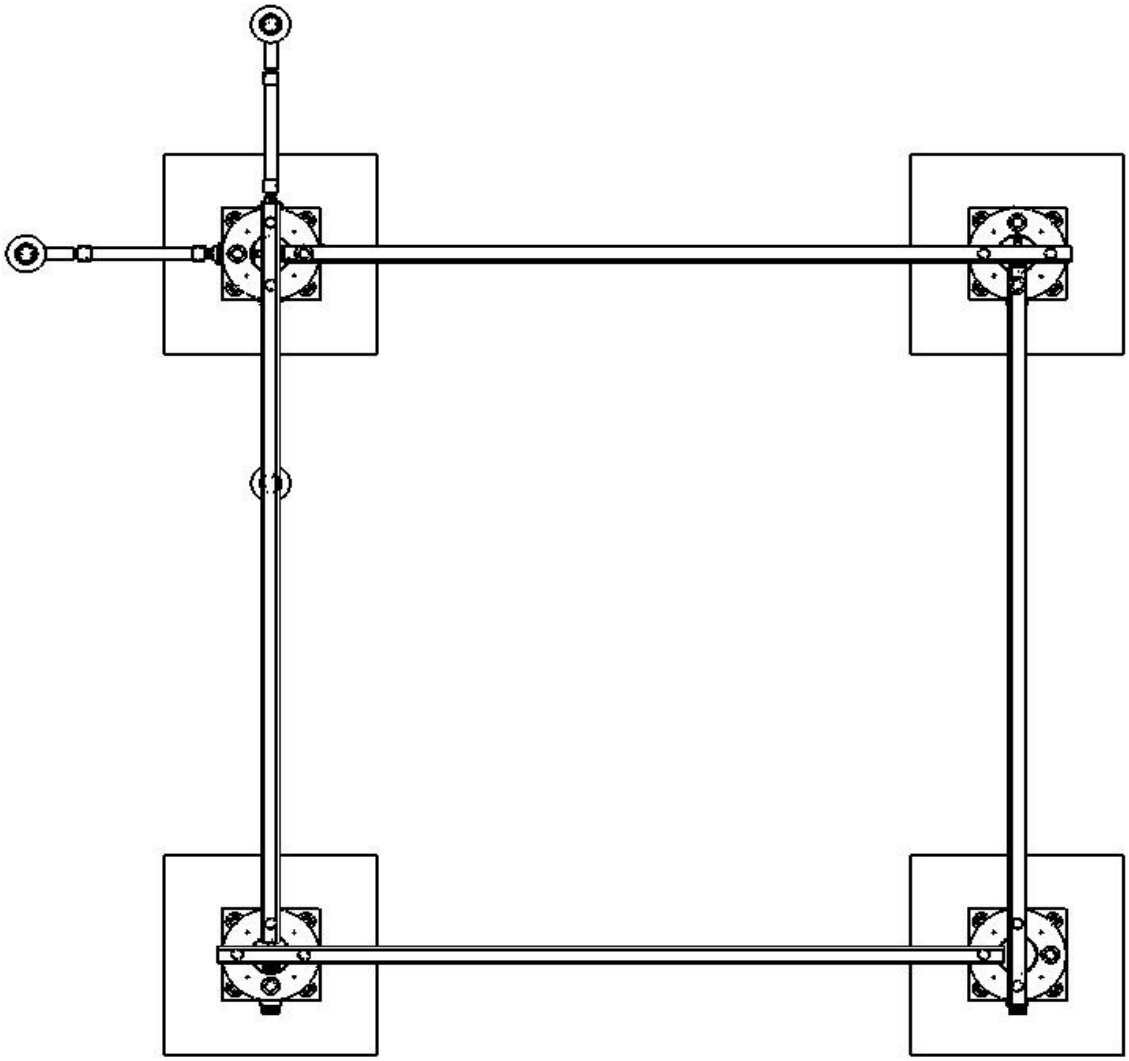


Figure 2, Installation of Removable Anchoring System Using Angle Iron Template.

Steps 4 & 5, Embedding of Removable anchoring:

Complete the installation by pouring the compact granular aggregate and the final grade concrete. Ensure top face of safeswap is clean of concrete.

Step 3: Pour concrete

Pour concrete into formwork, set template and anchoring system and let concrete cure before removing formwork and wooden template.

Be certain not to embed the leveling hex nuts in the concrete.

Step 4: Backfill the concrete bases

Once the concrete has cured, place and compact 0-3/4" granular aggregate around the concrete bases.

Phase 4 - Installation and preparation of lines for play events/products

Install water lines from the WDS distribution manifold to the Splashpad's play products.
When laying out the pipes, Vortex recommends using 45° angle elbows instead of 90°.

NOTICE

IT IS MANDATORY IN CERTAIN AREAS TO PERFORM AN AIR PRESSURE TEST ON EMBEDDED PIPES. CHECK LOCAL REGULATIONS AND CODES AND, IF REQUIRED, PERFORM THIS TEST PRIOR TO THE FINAL CONNECTION OF THE PLAY EVENTS TO THE WDS.

Pressure testing

We strongly recommend using water for pressure testing. Water pressure will not react to temperature variations and water leaks will help to identify points from which pressure is escaping.

WARNING!

CIRCULATION SYSTEMS HAVE THE POTENTIAL TO STORE ENERGY WHEN PRESSURE TESTED DUE TO THE ELASTIC NATURE OF THE MATERIALS USED IN CONSTRUCTION AND THE COMPRESSIBILITY OF AIR THAT MAY BE CONTAINED IN THE SYSTEM. IMPROPERLY PRESSURE TESTING OF THE CIRCULATION SYSTEM CAN INVOLVE SIGNIFICANT RISK OF PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

The following outlined pressure testing procedure should only be considered a guide. As each installation is unique, you should carefully examine the risks specific to your site before pressure testing pipes.

To pressure test play product lines:

1. Install ball valve on the play product side of the line and leave ball valve open.
2. Install ball valve on the distribution manifold side and leave ball valve open.
3. Close the winterization drain ball valve.
4. Use a hydrostatic pump to inject water into the distribution manifold side of the pipe until water comes out of the ball valve on the play product side.
5. Close the ball valve on the play product side of the line.
6. Bring water pressure to 30 psi.
7. Close the ball valve on the distribution manifold side of the line.
8. Disconnect the hydrostatic pump from the line.
9. Leave the line pressurized for at least 2 hours and monitor pressure drop.
10. If no pressure drop occurs, proceed with pipe flushing procedure.
11. If pressure drop is evident, visually inspect the pipe and locate the water leak. Correct the leak and repeat the pressure test for that pipe.
12. Repeat the above procedure for each individual line.

Line flushing

Line flushing should be performed prior to making the final connections of the play products. Once all play products are installed, another flushing of the lines will ensure the removal of any remaining debris.

CAUTION!

IT IS CRITICAL THAT ALL LINES BE CLEAN OF DEBRIS AND RESIDUE IN ORDER FOR THE SPLASHPAD AND WDS TO FUNCTION PROPERLY.

WHEN FLUSHING LINES, NOTE THAT A MAXIMUM OF 30 PSI SHOULD BE SUPPLIED TO THE MANIFOLD AT ANY GIVEN TIME.

As the WDS is non-functional during this phase, you should connect a hydrostatic pump or garden hose to the drain valve at the base of the manifold. This will supply the water and pressure needed to properly flush the lines.

To flush the lines before connecting the play products

1. Open the solenoid valve on the play product side of line.
2. Close the winterization drain ball valve.

(Line flushing continue)

3. Use a hydrostatic pump or garden hose to start the flow of water into the WDS distribution manifold.
4. Flush water through the line until all construction debris is purged from the line.

5. Repeat for each individual line.
6. Connect the water line to the play product.
7. Connect the water line to the WDS distribution manifold.

To flush the lines after connecting play events/products and the WDS

1. Remove all spray nozzles and spray caps from the play events/products.
2. Locate the solenoid valves that are mounted to the WDS distribution manifold and adjust the solenoid diaphragm to the maximum open position by rotating the valve stem completely counter clockwise.
3. If ball valves are present {if ordered as an option} ensure that they are all closed.
4. Connect a hydrostatic pump or garden hose to the drain valve located at the end of the WDS distribution manifold.
5. Open the ball valve {if ordered as an option} associated with line # 1 on the WDS distribution manifold.
6. Turn on the water supply connected to the distribution manifold and flush out all debris.
7. Once the debris has been purged close the water supply connected to the distribution manifold {close the associated ball valve if ordered as an option}
8. Repeat steps 5 to 7 for all other lines.

Phase 5 - Connecting the water main and drainage lines

	**NOTICE** ALL LINE SIZES ARE PROVIDED IN THE INSTALLATION DRAWINGS IN THE APPENDIX OF THIS MANUAL.

Step 1: Connect the make-up water line from the potable water source to the WDS system. Connect the drainage and overflow lines for the WDS. See Appendix for specific details on WDS installation.

Step 2: Install the deck drains and connect them to the WDS system.

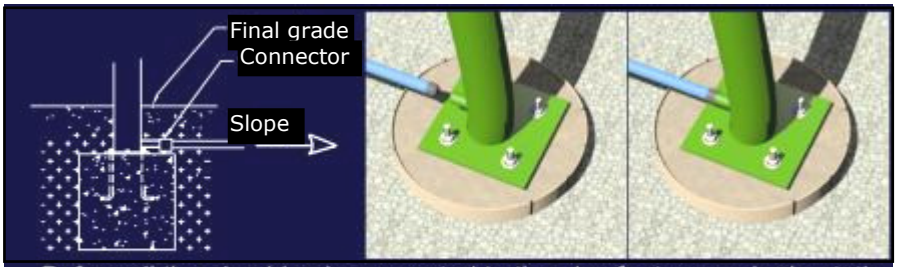
See Appendix for more details on deck drains.

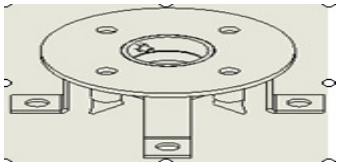
Phase 6 - Installation of play products

Install the Splashpad's play events/products in accordance with installation instructions.

Step 1: Follow the pressure testing and line flushing procedures described in the section *Installation and preparation of lines for play products* to verify the quality of all connections.

Bolting play products to concrete bases





Safeswap Anchor System

Step 2: Bolt the play products to their concrete bases, if the play products are surface mounted or safeswap anchors, they should only be bolted once the pad surface is poured and set.

Ensure that the play products are installed vertically straight and in accordance to the installation information provided.

Step 3: Connect water lines to the play products.

Phase 7 – Electrical connections

Vortex has mounted the Controller directly to the WDS skid and provided all wiring from the Controller to the WDS. You must connect the user activators (activation bollards) and the main electrical service.

⚠	**CAUTION!** THE MAIN ELECTRICAL SERVICE MUST BE CONNECTED AND TESTED BY A CERTIFIED ELECTRICIAN. IMPROPER HOOKUP CAN BE DANGEROUS AND MAY CAUSE DAMAGE TO YOUR WDS SYSTEM. IF YOUR AREA HAS OPEN DELTA (HIGH PHASE) CONDITIONS, YOU MUST CONTACT VORTEX BEFORE POWERING UP THE SYSTEM.

Step 1: Connect the main 120 volt/240 volt electrical service to the Vortex controller.

Input 120 volt/240 volt

Step 2: Install the electrical conduit from the Controller to the activator running #14 AWG 2 conductor wires using water tight connectors. For more details, refer to the wiring diagram in the appendix of this manual.

Step 3: Ground all of the play products prior to pouring the concrete slab.

Testing electrical connections and voltage

Prior to applying power to the system, you should perform a voltage confirmation test to avoid any possible damage.

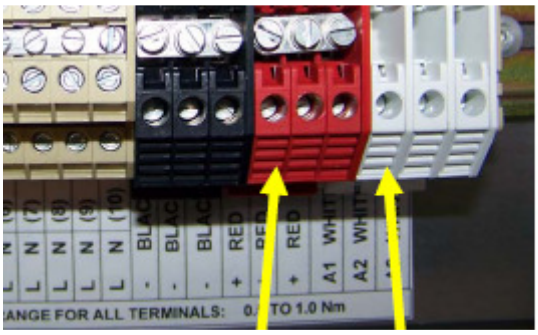
Turn the main breaker ON and verify that all electrical connections are sound and operating at the correct voltage. Note that the main breaker is not located on, or supplied with, the Vortex WDS system.

Electrical Connection to a VORTEX controller for:

Bollard Activators No.2 and No.3
and Water Garden Activators No.1 and No.2

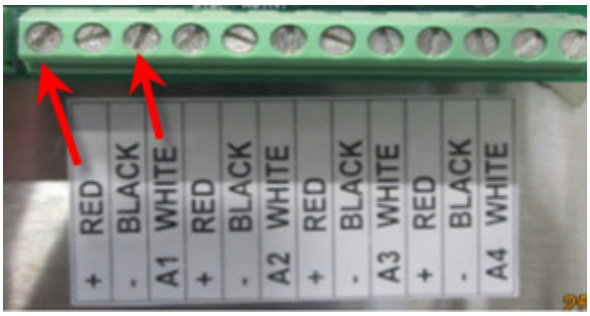
The Bollard Activators are a **2 wire connection**. Simply connect the 2 wires from your activator to the location indicated below, depending on the type of controller associated with your project.
*** There is no polarity on the connections. ***
Note: Extension cable from the activator to the controller is not supplied by Vortex.
Examples for 3 different controller options..

Smart Touch Controller



SMARTFLOW 2 Controller

SMARTFLOW Controller



Use a 2 conductor #14 AWG wire for final connection. (Note: No calibration of the switch is required)
Important: Please ensure that all connections to the controller and activator are water tight. (IP67)

Phase 8 - Placing and finishing concrete for the activity deck

Concrete work

Step 1: Place deck forms around the Splashpad activity deck.

Step 2: Place 0”-3/4” granular material on the Splashpad and compact.

Step 3: Place reinforcing steel wire mesh over the Splashpad activity deck.

Step 4: Following industry standards for all concrete work, pour and trowel the concrete for the Splashpad activity deck.

Step 5: Apply a broom finish to the concrete to ensure a slip resistant surface. Vigorously brush the surface of the concrete slab with a stiff bristled broom just before the concrete hardens. This will give the surface of the activity deck a rougher texture and small ridges that will prevent slipping and enhance safety.

Safety surfacing

Rubber surfacing can be placed on top of the concrete slab to further enhance safety. The installation of this material should be performed in accordance with the recommendations of the manufacturer.

Adding color

The addition of color to the surface of the activity deck can add to the overall attractiveness of the Splashpad. Coloring the concrete deck can be accomplished using concrete colorant or concrete paint.
Concrete colorant is a low maintenance coloring solution. If concrete paint is to be used on the activity deck, ensure that it is an approved anti-slip paint.

4.0 Final system preparation

Before performing the procedures on the final system preparation checklist, you should complete a thorough cleanup of the Splashpad and surrounding areas. Ensure that the activity deck and WDS are free of all debris, obstructions, landscaping materials and tools. You should verify that:

☑

- All electrical connections to the WDS have been tested. (Refer to the *Splashpad construction guidelines* section.) ☐
- All water lines to and from the Splashpad. ☐
- The solenoid valves are clear of all debris and dirt. ☐
- The deck drains are clear of all debris and dirt. ☐

Final system preparation checklist

☑

1. Ensure that the water distribution manifold drain valve is closed. ☐
2. Ensure that the water distribution solenoid valves are open. ☐
3. Set all control switches to the OFF position. ☐
4. Ensure that all play product nozzles are properly installed. ☐
5. Rotate directional nozzle to allow water to spray. ☐
6. Ensure that the activator has been wired correctly. (see *WDS Splashpad guideline – Phase 7 – Electrical connections* section in this manual). ☐
7. Follow power up procedure in the WDS Owner/Operator Manual (see *WDS startup procedure - Power up procedure* section in the WDS Owner/Operator Manual). ☐

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Splashpad®

with Water Distribution System

Owner/Operator Manual

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Vortex WDS Owner/Operator Manual

REV.07 Mar. 2012

Table of Contents

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The automated components of the Splashpad are the Activator, the Controller and the distribution manifold.

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Controller & distribution manifold

The Controller responds to the Activator by opening and closing solenoid valves along the distribution manifold in accordance with one of several preprogrammed spray sequences. The Controller is equipped with a 7-day, 24 hour programmable time clock that controls Splashpad operation during the operating hours of the facility.

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Always remember that child safety is priority number one!

2.0 Prior to startup

Verifying contractor connections

Electrical connections

For a WDS system, a 120vac, 15 amp/240vac, 7.5amp service is required to operate the entire Splashpad.

Prior to startup, you should verify that all connections were made and tested by a certified electrician. You can refer to Vortex's Installation Manual for more details on electrical installation.

CAUTION!

THE MAIN ELECTRICAL SERVICE MUST BE CONNECTED AND TESTED BY A CERTIFIED ELECTRICIAN. IMPROPER HOOKUP CAN BE DANGEROUS AND MAY CAUSE DAMAGE TO YOUR WDS SYSTEM.

Preparing the Splashpad water features

At the start of each season you must remove the winter caps from the Splash pad's water features and attach the appropriate spray nozzles to each feature.

Before installing spray nozzles on the water features, you should clean and lubricate with petroleum jelly all threads to prevent stripping and cross threading.
Store the winter caps for future use.

3.0 Operator controls overview

Splashpad control system

The Splashpad control system consists of a Vortex Controller, a water distribution manifold, and one up to three activators. The Vortex Controller responds to the Activator by opening and closing solenoid valves along the distribution manifold in accordance with several pre-programmed spray sequences. The spray sequences are factory programmed to respect the hydraulic requirements of your Splashpad while creating high levels of anticipation, surprise and entertainment for Splashpad users. A typical sequence follows a set order and will run between 4 to 16 minutes. These sequences determine the number of water features activated at any given time, promoting moderate water consumption as well as greatly enhancing the Splashpad's overall play value.

The Activator

Located in the Splashpad play area, the activator allows Splashpad users to initiate the water features with the touch of a hand or foot.

The Activator will have no effect on a running sequence until the sequence is complete. Upon completion of each sequence, the Splashpad user can re-activate the system by simply touching the activator.

Distribution manifold

The water distribution system consists of a stainless steel manifold, and solenoid valves with integrated flow control adjustment. You can use the flow control adjustment on the solenoid valves to adjust the spray zone of the water features.

4.0 Command Center startup procedure

Start up procedure

- Open all the solenoid valves on the water distribution manifold and close the drain valve.

- Verify that all Splashpad water features have been prepared for operation. Refer to section *2.0 Prior to startup – Preparing the Splashpad water features* for details.

Commissioning and operation

The following are a few reminders when commissioning or re-opening the Splashpad for operation.

Once all plumbing connections to the features and from the city supply are completed, the following testing and adjustment procedures may be executed:
(Refer to your Command Center drawing.)

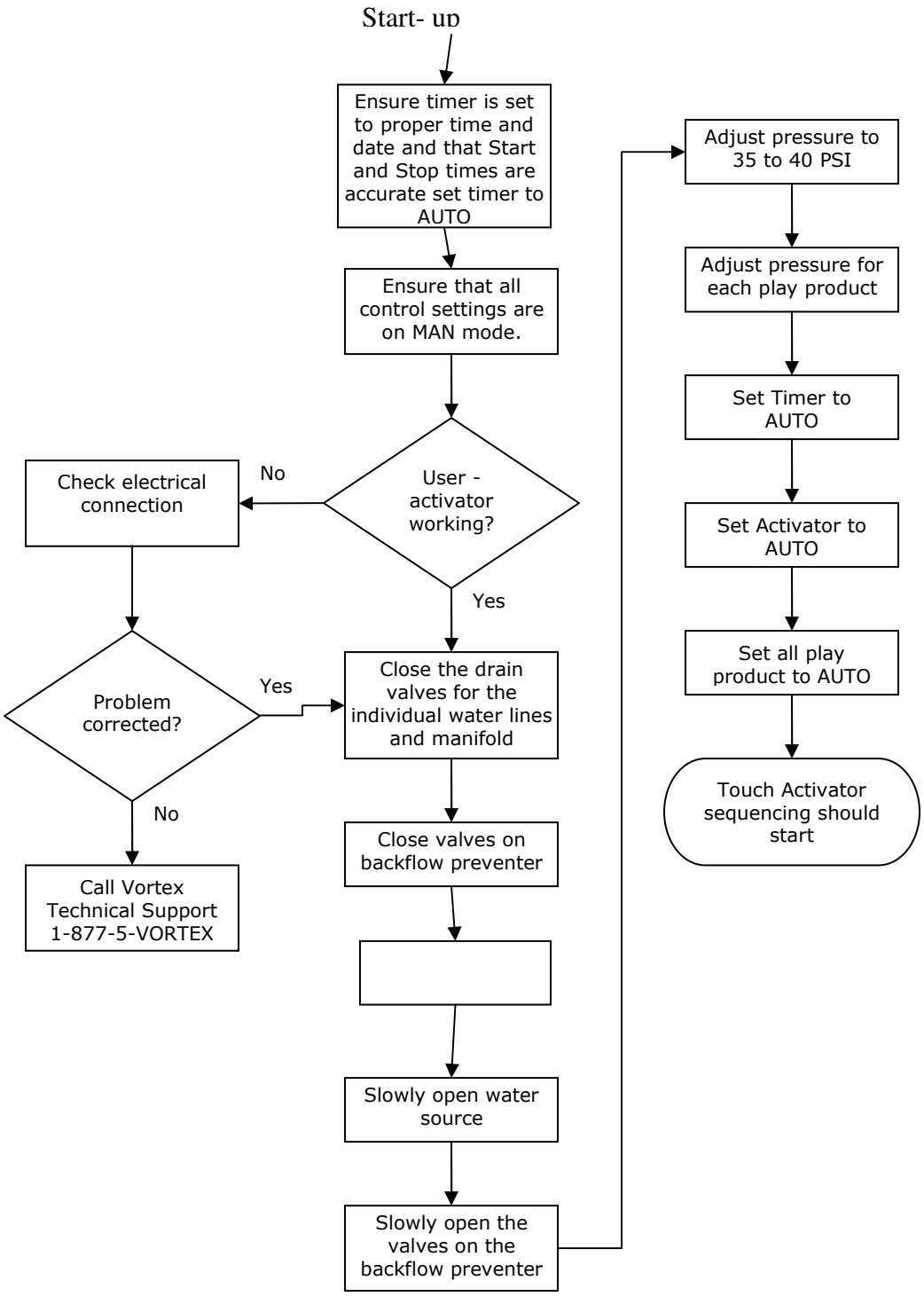
1. Close valve handles on the backflow preventer
2. Slowly open the city water supply line or other water source.
3. Slowly open the valve handles on the backflow preventer.
4. Observe the pressure gauge on the manifold to see if the pressure increases.
5. Adjust the pressure regulator up or down until the gauge reads 30PSI
6. Close the drain valves on the feature lines and the manifold.
7. Turn the power switch on the controller to the ON position.
8. Set the operational hours on the controller {see section 3}
9. Remove all winter caps and spray nozzles from water features and open the features 1 by 1 manually to flush all debris from the lines.
10. Install all spray caps and nozzles on the features and turn them on 1 by 1 to adjust the flow.{see instructions below}
11. Set the controller to Auto mode and touch the activator to verify if operational and that the sequence works.

Pressure and flow adjustments

Due to the potential variation in city water pressure and volume, an inspection should be performed to ensure that the features are functioning properly and adjust the pressure regulator accordingly. An increase or decrease in pressure and flow may cause the spray pattern to exceed the desired spray zone and ultimately the water features performance. Pressure and flow may be adjusted on the solenoid valves linked to each of the features. Although, the features with spray nozzles are less sensitive to pressure differentiation, an inspection is still recommended. To adjust the pressure, manually activate the spray feature using the controller. Adjust the flow by using the wing valve handle on the respective solenoid valve.

System and water feature inspection

When re-opening the splashpad for the season inspect all electrical connections to ensure they are tight and there is no corrosion from water or humidity {to be done before turning on power} Inspect all splashpad water features for any broken parts or loose hardware and lubricate any features that have been assembled with bearings.


Start- up
Ensure timer is set to proper time and date and that Start and Stop times are accurate set timer to AUTO
Ensure that all control settings are on MAN mode.
User - activator working?
No
Check electrical connection
Yes
Problem corrected?
Yes
No
Call Vortex Technical Support 1-877-5-VORTEX
Close the drain valves for the individual water lines and manifold
Close valves on backflow preventer
Slowly open water source
Slowly open the valves on the backflow preventer
Adjust pressure to 35 to 40 PSI
Adjust pressure for each play product
Set Timer to AUTO
Set Activator to AUTO
Set all play product to AUTO
Touch Activator sequencing should start

5.0 Winterization procedure

It is important to properly winterize the Splashpad in environments where temperatures fall below the freezing point. The following is a list of key points to remember when winterizing your Splashpad:

- Ensure that main water supply line is turned off and drained.
- Manually open all solenoid valves by turning the coil counter clockwise and open all drain valves located at the bottom of each supply line{if applicable} for the individual water features to allow water to drain by gravity. Open all bleeders on backflow preventer and pressure regulator {if applicable} allow to drain. Compressed air can be used to blow out the system if desired.
- Replace spray caps with winter caps on flush mounted features where provided (i.e. ground geysers, water jellies, split stream etc.) To prevent water and debris from infiltrating into plumbing system.
- For features like water tunnels, cylinder directional water jets rotate directional spray nozzles to the closed position and re-secure locking ring.
- Spray nozzles on above ground play products and activator caps may be left in place.
- Ensure that all drain systems are free of debris and are properly functioning to allow for drainage during spring thaw.
- Turn power switch off in controller.
- Shut-down main power source to controller

6.0 Periodic maintenance

As with any play equipment it is imperative that a reasonable periodic maintenance schedule be implemented by the owner / operator of the splashpad equipment. Splashpads vary in their specific maintenance requirements due to differentiating factors such as splashpad size, bather load, operating environment, and climate. The schedule should include monthly and seasonal check points. In some instances weekly verification may be required depending on the equipment and frequency of use. It is the responsibility of the owner / operator to ensure the safety of the user.

General Important Points

- Ensure that all anchoring hardware is tight at all times.
- Check that all other hardware is secure. Tighten when necessary.
- Disassemble and lubricate moving parts and inspect for wear. Replace when necessary.
- If necessary, use mild cleaners that do not harm plastic, paint or fiberglass.

Daily

- Remove debris from the deck drain and basket.
- Keep the Splashpad area clean of any debris, dirt, grass and leaves.

Monthly

- Clean spray nozzles and spray heads from hair, grass and dirt.
- Inspect and clean if necessary solenoid valves following the procedure described in this manual.
- Inspect all hardware to ensure they are tight.

Beginning of season

- Inspect all major components, water features and piping for signs of wear or damage. Inspect all hardware to ensure they are tight.
- Clean the Splashpad area of any debris, dirt, grass and leaves.

End of season

- Inspect all water features and operating system and begin winterization process.
- Make a note of all requirements and repairs that should be addressed prior to system startup next spring.

Note: Refer to the assembly drawings provided for disassembly / assembly and part number ordering information.

7.0 Component maintenance

Basic supplies and tool requirements

General tool kit

The following is a suggested list of tools and materials that you may want to have on hand in your equipment room

- Small flat screwdriver
- Medium flat screwdriver
- Philips screwdriver
- Strap wrench
- PVC primer
- PVC glue
- Multi meter
- Socket set
- Wire stripper/cutter
- Electrical wire (#14AWG, #16AWG)
- Heat shrink tubing and heat gun/torch
- Butt connectors and crimper
- Petroleum Jelly{Vaseline}

Vortex tool kit

As supplied with your Splashpad.

Solenoid valves

Solenoid valve maintenance requirements

Solenoids are valves that use an electromagnetic coil for actuation. The lower section of the valve is sealed by a diaphragm. This diaphragm allows liquid line pressure to pass through when the valve is open and stops the flow when the valve is closed. The main valve opens when the coil is energized. When the coil is de-energized, a spring triggers pressurization and the valve closes again.

As with any mechanical apparatus, proper maintenance and care of solenoid valves can extend their lives and ensure predictable operation. Maintenance of solenoid valves generally implies cleaning or replacing diaphragms and replacing coils that have cracks in their encapsulations.

CAUTION!

BEFORE REPAIRING A SOLENOID VALVE, ALWAYS DISCONNECT THE POWER SOURCE AND DEPRESSURIZE THE SYSTEM. BEFORE SERVICING, CLOSE THE BALL VALVE LOCATED ABOVE THE SOLENOID VALVE.

Cleaning and replacing diaphragms

Note: The Hunter valve has proven during testing the ability to flush out small debris that has affected its performance

If problems persist 1st check coil to see if it is seated properly and not leaking if OK use the following method to clean an obstructed diaphragm or replace a diaphragm:

1. Remove all 10 screws from the valve body.
2. Carefully remove the lid.
3. Inspect the diaphragm for debris or damage.
4. Clean the diaphragm or replace damaged component.
5. Seat the diaphragm in its proper position.
6. Secure the lid with 10 screws tightening in a cross pattern.

Coil replacement

Cracks in a solenoid valve's coil encapsulation can allow moisture to penetrate the coil and result in valve failure. Periodically check connections to the coil for damage or corrosion and replace the coil if you find cracks in the coil housing. When removing the coil, be careful not to damage the spring that controls the plunger.

CAUTION!

NEVER POWER UP A 24VAC COIL WITHOUT FIRST ENSURING THAT THE COIL IS PROPERLY INSTALLED ON THE VALVE'S SLEEVE OR STEM. THE RESULTING HIGH INRUSH OF CURRENT MAY RESULT IN A COIL BURNOUT.

Activator

Activator maintenance requirements

Located in the Splashpad play area, the Activator allows Splashpad users to initiate play events with a touch of a hand or foot. It is designed to be virtually maintenance free.

Testing the Activator

After connecting the activator to the designated terminal blocks inside the controller {1 red wire to positive to red terminal block and 2nd red wire to the white terminal block A1 there is no polarity} to test the activator set all controller functions to AUTO set the operational hours and then touch the activator, the sequence should start.

Pressure regulator

A pressure regulating valve maintains a constant outlet pressure over a wide range of inlet supply pressure{Factory set and adjusted by Vortex}. Maintenance of pressure regulator generally implies cleaning or cartridge replacing.

Maintenance Instructions

- To clean strainer; remove strainer plug (2), remove and clean strainer.
- To replace seat disc; shut off supply, loosen nut (51) and back off adjusting screw (53) remove spring cage (3), spring (52) and washer (62). Remove bottom plug (12) and gasket (101). Insert and hold screw driver in slot on top of stem while loosening seat disc holder (47) from bottom of stem (27).
- To replace diaphragm; loosen lock nut (48) and remove lock washer (46), diaphragm plate (60) and diaphragm (20).
- When reassembling apply a drop of low strength thread lock to disc holder.

Adjustment

Regulator is factory preset to 50psi (344 kPa). To adjust pressure setting, loosen the lock nut and turn the adjusting bolt clockwise to increase pressure, counter clockwise to decrease pressure.

Note: Use a pressure gauge downstream to adjust and verify the pressure setting.

By-Pass Feature*

This regulator has a built-in thermal expansion by-pass feature. This feature prevents downstream pressure from rising to more than 10psi above the supply pressure.

* By-Pass will not work if inlet pressure is above 150psi (10.3 bars).

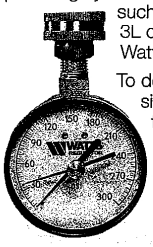
Troubleshooting

High System Pressure

If the downstream system pressure is higher than the set pressure under no flow conditions, the cause could be thermal expansion, pressure creep or dirt/debris on the seat.

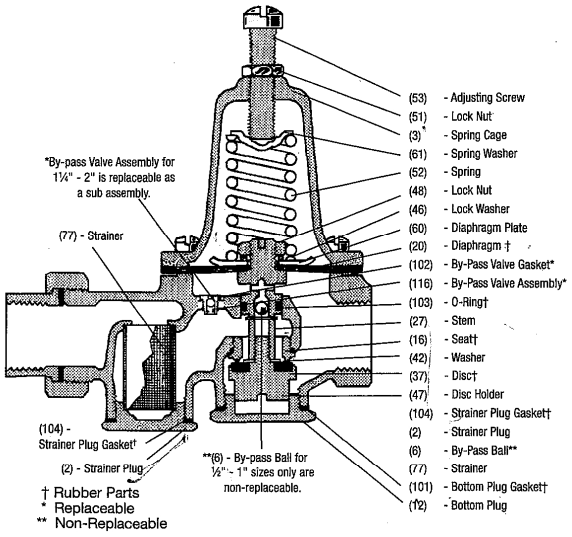
Thermal expansion occurs whenever water is heated in a closed system. The system is closed when supply pressure exceeds 150psi, or a check valve or backflow preventer is installed in the supply piping.

You must make provisions for pressure relief protection of your plumbing system and components. The use of a relief valve such as the Watts 530C, BRV, Governor 80, or 3L or potable water expansion tank such as the Watts DET, PLT or DETA may be required.



Watts 276H300

To determine if this is the result of thermal expansion, try briefly opening the cold water tap. If the increased pressure is caused by thermal expansion, the pressure will immediately be relieved and the system will return to the set pressure. Watts offers a pressure test gauge, model 276H300 to assist you in determining if you have high water pressure. The 276H300 when attached to a hose bibb registers the highest pressure reading over the period of time it is left on the system.



† Rubber Parts
* Replaceable
** Non-Replaceable

Repair Kits

† Kit for Series 25AUB-Z3 includes all items shown above.

ORDERING CODE	KIT NO.	SIZE (IN)	
		in	*mm*
0864941	½" 25AUB-RK	½	15
0864943	¾" 25AUB-RK	¾	20
0864942	1" 25AUB-RK	1	25
0864944	1¼" 25AUB-RK	1¼	32
0864945	1½" 25AUB-RK	1½	40
0864946	2" 25AUB-RK	2	50

When Ordering, Specify:

1. Ordering Code
2. Size of Valve
3. Type Number
4. Model shown on Nameplate

WARNING!
For valves with CPVC or PEX end connections do not exceed the tubing manufacturers pressure and temperature ratings. Refer to the tubing manufacturers product specifications for that information.

CALIFORNIA PROPOSITION 65 WARNING
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. (California law requires this warning to be given to customers in the State of California.)
For more information: www.watts.com/prop65

Limited Warranty: Watts Regulator Company warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge. This shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication or improper installation of the product. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** Any implied warranties that are imposed by law are limited in duration to one year.

Some States do not allow limitations on how long an implied warranty lasts, and some States do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights.

CAUTION!

BEFORE REPAIRING A PRESSURE REGULATOR, ALWAYS DISCONNECT THE POWER SOURCE AND DEPRESSURIZE THE SYSTEM. BEFORE SERVICING, CLOSE THE BALL VALVE LOCATED ABOVE THE PRESSURE REGULATOR.

Backflow Preventer

Servicing the relief valve

Service, Replacement Parts and Maintenance

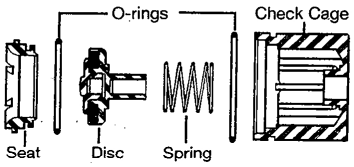
Servicing the First and Second Check Valves

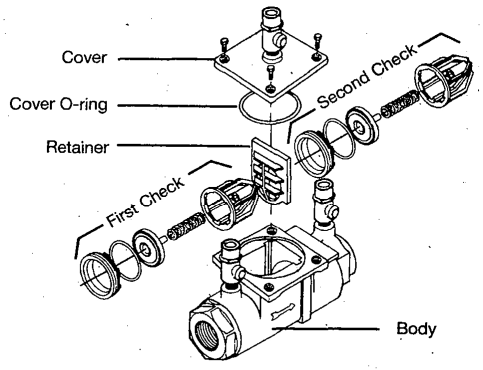
NOTE: Before servicing be certain water is turned off or shut-off valves are closed

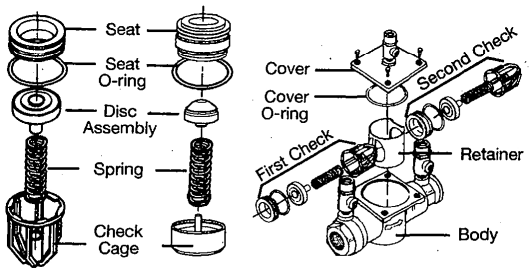
1. After removing the cover, remove the retainer for the body bore. The check valve modules can now be removed from the valve by hand or with a screwdriver.

Note: For Series 007 sizes ½" - 2", the seats and springs of the first and second check modules are not interchangeable. The heavier spring and smaller diameter seat belong with the first check module. Series 007M1 sizes ¾" - 1" and Series 007M2 ¾" have interchangeable seats and springs.

2. The check seats are attached to the cage with a bayonet type locking arrangement. Holding the cage in one hand, push the seat inward and rotate clockwise against the cage, for ¾" Series 007M2 pull apart seat and cage. The seat, cage, spring and disc assembly are now individual components.
3. The disc assembly may now be cleaned and reassembled or, depending on its condition, it may be discarded and replace with a new assembly from the repair kit. O-rings should be cleaned or replaced as necessary.
4. Reassemble the check valve module in the reverse order. Check modules are installed in the valve body with the seats facing the valve inlet. The modules must be securely in place before the retainer can be replaced. On the ¾" - 1" size, this retainer may have to be tilted slightly into place. Replace cover.







½" - 2" Replacement Parts

When ordering, specify ordering code number, kit number and valve size

Check Kits: 1st or 2nd Check

ORDERING CODE NO.	KIT NO.	SIZE
0887193	RK 007 CK4	½"
0887026	RK 007M1 CK4	¾" - 1"
0887377	*RK SS007 CK4	½"
0888070	*RK SS007M3 CK1	½" - ¾"
0888071	*RK SS007M3 CK2	½" - ¾"
0887393	*RK SS007M2 CK1	¾"
0887397	*RK SS007M2 CK2	¾"
0887373	*RK SS007M1 CK4	1"
1st Check		
0887023	RK 007 CK1	¾" - 1"
0887045	RK 007M2 CK1	¾"
0888550	RK 007M3 CK1	¾"
0887025	RK 007 CK1	1½" - 2"
0887186	RK 007M1 CK1	1½" - 2"
0887719	RK 007M2 CK1	1¼" - 1½"
2nd Check		
0887024	RK 007 CK2	¾" - 1"
0887046	RK 007M2 CK2	¾"
0888551	RK 007M3 CK2	¾"
0887028	RK 007 CK2	1½" - 2"
0887187	RK 007M1 CK2	1½" - 2"
0887720	RK 007M2 CK2	1¼" - 1½"
Stainless Steel 1st or 2nd Check		
0887022	RK 007 CK1 SS	¾" - 1"
0887030	RK 007 CK2 SS	¾" - 1"
0887032	RK 007M1 CK4 SS	¾" - 1"
0887031	RK 007 CK1 SS	1½" - 2"
0887035	RK 007 CK2 SS	1½" - 2"
0887189	RK 007M1 CK1 SS	1½" - 2"
0887190	RK 007M1 CK2 SS	1½" - 2"

Kit includes: Seat, seat o-ring, disc assembly, spring, check cage, cover o-ring.

Cover Kit

0887195	RK 007 C	½"
0887036	RK 007 C	¾" - 1"
0887038	RK 007M1 C	¾" - 1"
0887039	RK 007M2 C	¾"
0888553	RK 007M3 C	¾"
0887037	RK 007 C	1½" - 2"
0887191	RK 007M1 C	1½" - 2"
0887722	RK 007M2 C	1¼" - 1½"
0887379	*RK SS007 C	½"
0887380	*RK SS007M2 C	¾"
0888073	*RK SS007M3 C	½" - ¾"
0887381	*RK SS007M1 C	1"

Kit includes: Cover and cover o-ring

Complete Rubber Parts

0887194	RK 007 RT	½"
0887040	RK 007 RT	¾" - 1"
0887042	RK 007M1 RT	¾" - 1"
0887043	RK 007M2 RT	¾"
0888552	RK 007M3 RT	¾"
0887041	RK 007 RT	1½" - 2"
0887188	RK 007M1 RT	1½" - 2"
0887721	RK 007M2 RT	1¼" - 1½"
0887378	*RK SS007 RT	½"
0887394	*RK SS007M2 RT	¾"
0888072	*RK SS007M3 RT	½" - ¾"
0887374	*RK SS007M1 RT	1"

Kit includes: Cover o-ring, two seat discs and two seat o-rings.

*SS prefix denotes stainless steel body.

Valve is located on the top of the backflow preventer. (The body bore)

8.0 Troubleshooting guide

The following guide is intended to help you identify and correct potential problems with the Command Center and its components.

If after following the steps below you are unable to resolve the problem please contact Vortex Technical Support: 877.5VORTEX (877.586.7839) (US/Canada)/514.694.3868 (others).

Problem	Possible cause	Recommended Solution
Activator not working	1 Electrical Connection 2 Controller Settings	1 Make sure the 2 wires from the activator are securely connected to the Red & White terminal blocks 2 Verify that the activator is in the AUTO position and that the system is within programmed operating hours..
Feature not turning OFF or turning ON	1. The feature setting may be in the OFF or MANUAL position. 2 Solenoid valve may be restricted by debris.	1 Check to make sure the feature in question is in the AUTO position. 2 Disassemble the solenoid valve and rinse with clean water.
No power at the controller	1. Breaker on the smart Touch Controller has tripped. 2. 2or4 Amp fuse has blown on the Smart Flow 2 Controller.	1 Verify the breaker inside the controller panel and reset if necessary. 2 Using a multimeter check fuse to see if burnt if so replace with the appropriate amperage and voltage.

WARRANTY
AQUATIC PLAY PRODUCTS

Vortex Aquatic Structures International warrants that all its products will conform in kind and quality to the specifications set forth in the specifications sheet for the products, and will be free of defects in manufacturing and material; under normal use and service for the periods set forth below:

25 Year Warranty on stainless steel structures, stainless steel anchoring systems and aluminum spheres.

5 Year Warranty on brass components including; spray nozzles, spray caps and spray heads, high-density polyethylene components, polyurethane components and ultra high molecular weight polyethylene components.

2 Year Warranty on color coating, all moving parts, stainless steel hardware, fiberglass products, Seeflow™ polymer products, and the Toeguard™, made of soft-touch elastomers.

All the warranties start on the date of the Seller's invoice. Replacement parts will be warranted for the balance of the original warranty. With regards to defects covered by this warranty, Vortex shall repair or replace the defective part or parts at no charge.

Within 120 days of the invoice date, warranted items will be shipped no charge. After 120 days all freight costs are the responsibility of the purchaser. At all times, all costs for removal and installation required to perform repairs or replacements, including any labor, travel and rental equipment costs, shall be the responsibility of the purchaser.

The warranty stated above is valid only if the structures and/or equipment are erected and/or installed in conformance with Vortex's installation and assembly instructions and maintained according to the maintenance procedures furnished by Vortex; have been subjected to normal use for the purpose for which the products were designed; have not been subject to misuse, negligence, vandalism, or accident; have not been subjected to addition or substitution of parts; and have not been modified, altered, or repaired by persons other than Seller or Seller's designees in any respect which, in the judgment of the Seller, affects the condition or operation of the structures and or components.

To make a claim, please contact your local representative or send your written statement of claim, along with the original project number and/or project name to:

Vortex Aquatic Structures International
328, Avro Street, Pointe-Claire (Montreal) Quebec, Canada H9R 5W5
or you may fax us at 514.335.5413

To contact Vortex with any questions or comments, call:
Toll-free (US/Canada): 877.5VORTEX (877.586.7839) / (outside North America) 514.694.3868
Email: support@vortex-intl.com

Appendices

Pre-startup checklist

	☑
1. Ensure that water distribution manifold drain valves are closed	☐
2. Set all Play Products to the OFF position	☐
3. If applicable to your system, set Rain diverter valve to AUTO position	☐
4. Replace winter caps on flush mounted play products with spray caps	☐
5. Rotate directional nozzle to allow water to spray	☐
6. Follow power up procedure to start the system	☐

Winterization checklist

	☑
1. Turn power switch off on operating system	☐
2. Shut down main breaker to power down WDS	☐
3. Ensure that the main water line is turned off and drained	☐
4. Drain all lines by opening valves in drain pit	☐
5. Drain manifold by opening the valve at the bottom	☐
6. Replace spray caps on flush mounted feature with winter caps	☐
7. Rotate directional nozzle to block water entry	☐

PLC input list

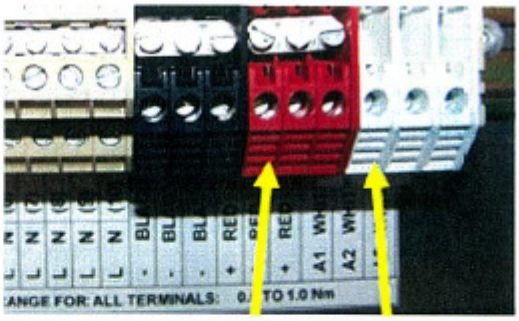
The following is a list of all the inputs of the PLC controller. Inputs may vary between systems. For more information please contact the Vortex Technical Support team at 1-877-5-VORTEX (1-877-586-7839) (toll free USA/CND) or 001-514-694-3868 (others).

Inputs Addresses	Description
I0.0	Activator #1
I0.1	Activator #2
I0.2	Activator #3

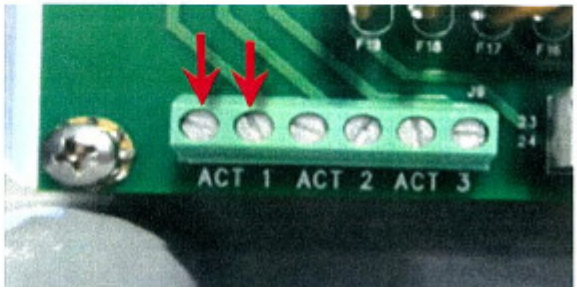
Electrical Connections to the Vortex Controllers

The activators are a 2 wire connection, based on the type of controller on your system, Smart Touch or SmartFlow 2 connect the 2 wires to the appropriate terminals or terminal blocks{ see examples below} there is no polarity on these connections.

Smart Touch Controller



SMARTFLOW 2 Controller



Note: Extension cable from activator to controller not supplied by Vortex. Use a 2 conductor #14 AWG wire for final connections and ensure that they are water tight.

SMARTFLOW™ Logics Controller

User Manual

Vortex SMARTFLOW™ Logics Controller User Manual

REV.03 Feb. 2012

Table of Contents

1. Introduction

Your Vortex Splashpad includes multiple play features with one or more activators that a user can touch in order to start the water flow. During operational hours, by default a pre-determined spray sequence manages the flow of water to the play features in your Splashpad. A sequence sheet for your Splashpad has been provided to you with details of your play features, activators and the sequence. The programmed sequence can be changed if needed by contacting Vortex.

The SMARTFLOW™ Logics Controller uses the sequence programmed for your Splashpad in conjunction with the operational hours you define to manage the operation of your Splashpad. To prepare your Splashpad for operation, you must program the following using your SMARTFLOW™ Logics Controller:

- Local time and date.
- Operational hours. Note that the activators will only trigger the sequences to start during your operational hours.

To accommodate your preferences you can modify many of the pre-set default values for your Splashpad. The SMARTFLOW™ Logics Controller gives you the option to make changes including the following:

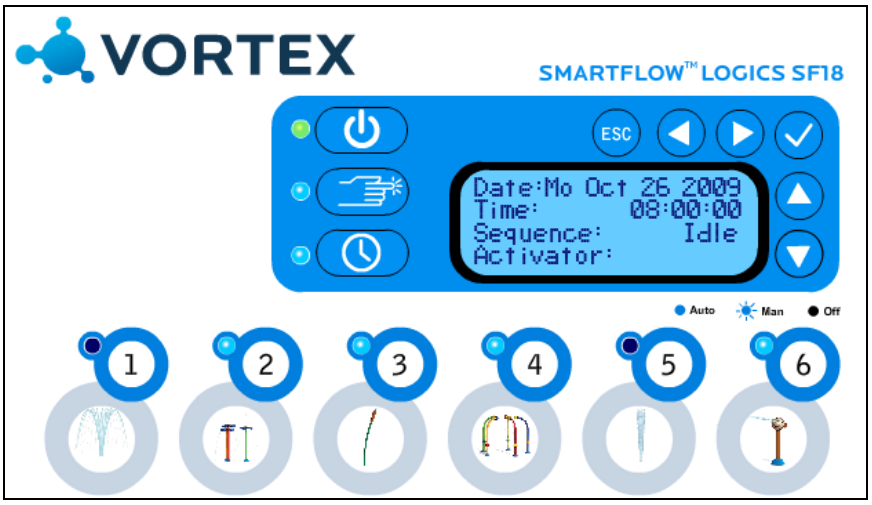
- Set one or several play features to run continuously, regardless of the programmed sequence (for example on a busy day, or to create an active welcoming atmosphere at the entrance).
- Turn off one or more play features for maintenance.
- Randomize the activation pattern instead of following the sequence.

This manual covers the SF10 (10 output) and SF18 (18 output) versions of the SMARTFLOW™ Logics Controller. The following information is included in this manual:

- Overview of the main controls, menu controls and menu architecture.
- Local time and operational hour's setup procedure.
- Flow pattern variation management.
- Administrator functions including uploading a new sequence from a memory key.
- Technical support including installation and troubleshooting.

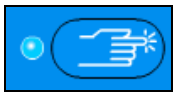
Overview

The main controls are located on the front of your SMARTFLOW™ Logics Controller.

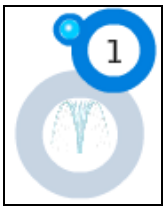


Main Controls

 **Power**

 **Activator**

 **Timer**



Numbered Play Features

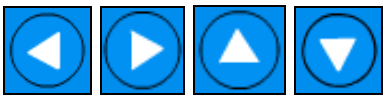
Menu Controls

```
Date:  Mo Oct 26 2009
Time:        08:00:00
Sequence:        Idle
Activator:
```

Main Menu

Escape

Enter



Navigation

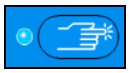
Using the Main Controls

The **Power** button is used to turn the Controller on and off.

Green LED on: power is on. **LED off:** power is off.

Note that after turning on the controller, the Liquid Crystal Display (LCD) backlight will turn on, and then turn off after a few minutes, but the LCD will remain active.

The **Activator** button is used to determine whether or not water will flow to the Splashpad when a user touches an activator.



Blue LED on steady = Auto Mode (Default). If an activator is touched during operational hours, the controller will start the pre-programmed sequence.

Blue LED flashing = Manual Mode. By pressing the Activator button once so that the LED is flashing, the controller will keep the sequence running whether or not an activator is touched. This function can only be used during operational hours or if the timer is set to Manual.

LED off = Off Mode. The sequence will not start, even if an activator is touched. Used for maintenance.

The **Timer** button is used to temporarily bypass the operational hours.

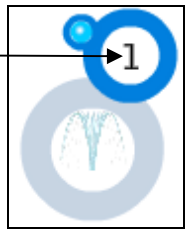
Blue LED on steady = Auto Mode (Default). The Controller will follow the operational hours.

Blue LED flashing = Manual Mode. By pressing the Timer button once so that the LED is flashing, the controller will allow the sequence to start outside the operational hours. This option is used for maintenance and troubleshooting.

LED off = Off Mode. The sequences will not start, even if an activator is touched. Used for maintenance.

The **Numbered** buttons are used to control activation of the individual play features represented in the corresponding picture. The SF10 model includes play features 1-10. The SF18 model includes play features 1-18.

Press the number, not the picture.



Blue LED on steady = Auto Mode (Default). If an activator is touched during operational hours, the controller will start the pre-programmed sequence for that play feature.

Blue LED flashing = Manual Mode. By pressing the corresponding Number button once so that the LED is flashing, that feature will simply remain on even if outside the set operational hours.

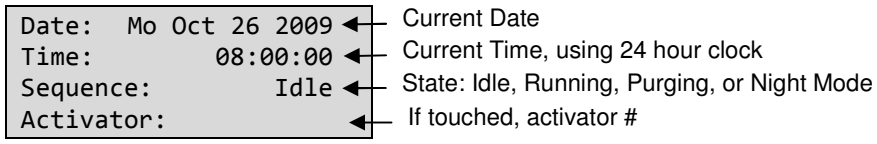
LED off = Off Mode. The sequence will not start for that play feature, even if an activator is touched. Used for maintenance.

Note

- Some buttons will not respond if the screen is not at the Main Menu. To get back to the Main Menu, press the ESC button several times.

Using the Menu Controls

Main Menu

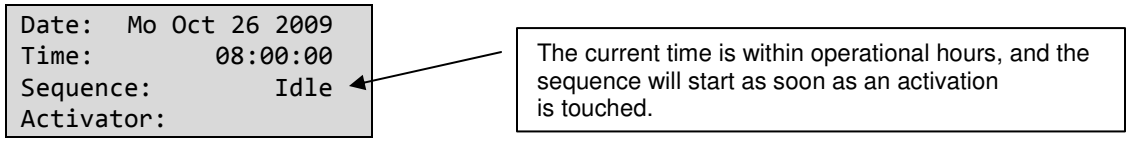


The Main Menu is the starting point for all controller functions. To get back to the Main Menu at any time, press the ESC button several times.

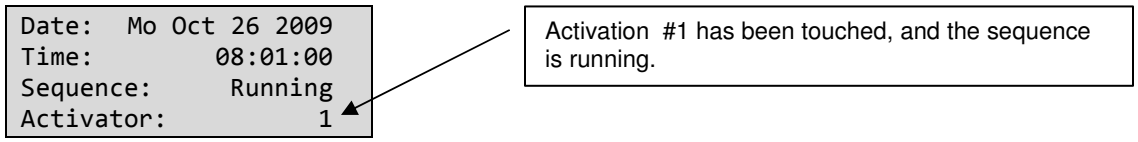
The Main Menu displays the current state of the Splashpad.

The following examples illustrate common scenarios:

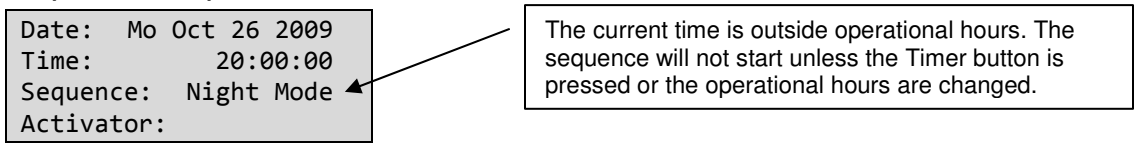
Example 1: Ready



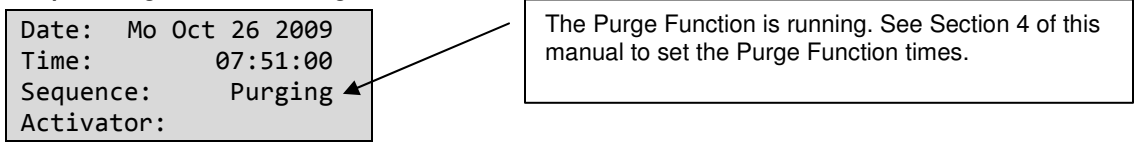
Example 2: Sequence Running



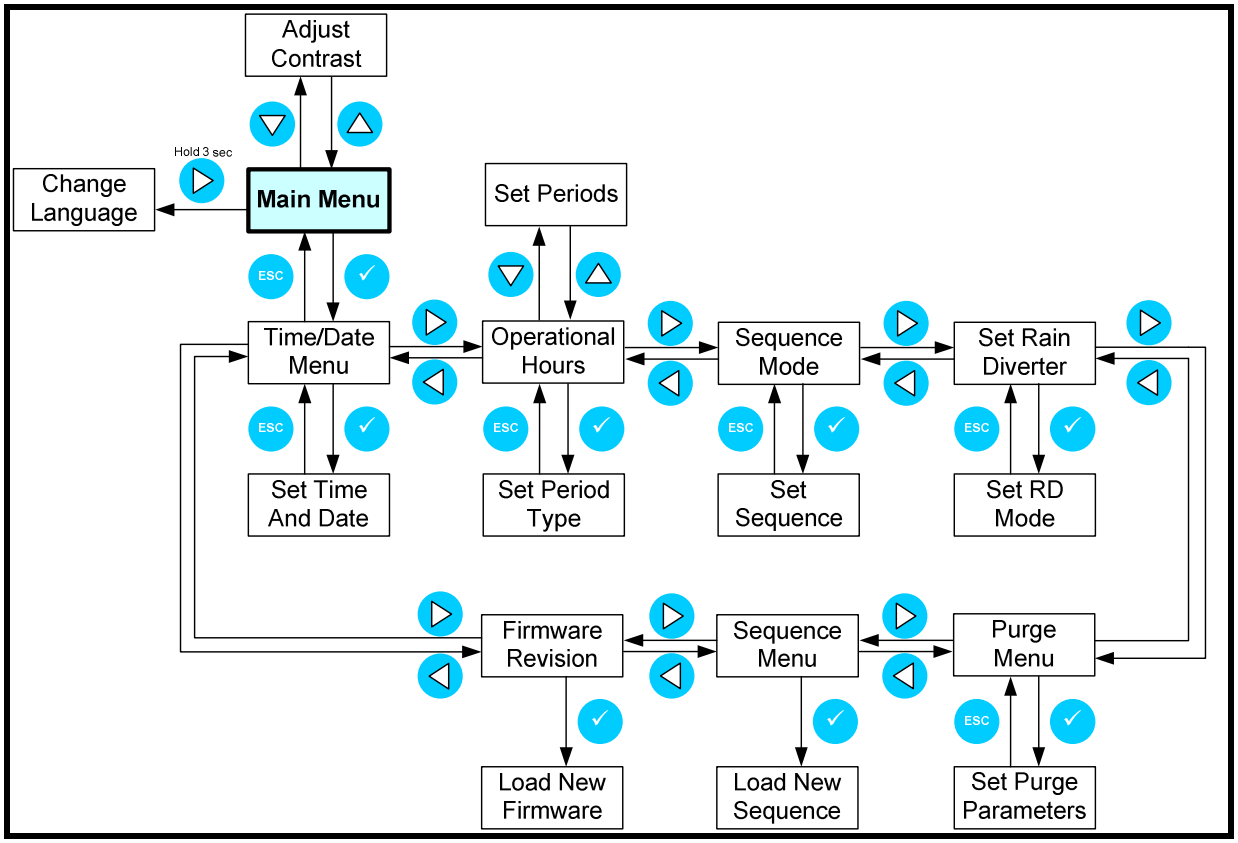
Example 3: Outside Operational Hours



Example 4: Purge Function Running



Menu Architecture



Menu Navigation

The **Escape** button is used to navigate backward through the Menus until eventually reaching the Main Menu.


The **Enter** button is used to navigate forward through the Menus and to input selections.


The **Arrow** buttons are used to adjust the LCD, to access the Language Change function, to navigate through a level of Menu options and to scroll through options.

Language Selection

From the Main Menu, press the right arrow button ►and hold it for three seconds to access the Change Language function. Release the button when the desired language has been selected. **Note**: after resetting the micro controller unit, the language will revert back to English as a default.

LCD Contrast Control

From the Main Menu, press the up or down arrows▲▼ to increase or decrease the brightness and visibility of the LCD. **Note:** ambient temperature will impact the LCD contrast. Hot temperatures will darken the screen and cold temperatures will fade it.

2. Local Time and Operational Hours Setup

The SMARTFLOW™ Logics Controller allows you to define operational hours during which the activators on the Splashpad will trigger the sequence to start. If the current time is outside the operational hours, the Main Menu will show "Sequence: Night Mode."

To run the Splashpad during off-hours as an exception, you may use the Timer button to put the SMARTFLOW™ Controller into Manual mode.

Outside Operational Hours

```
Date:  Mo Oct 26 2009
Time:        20:00:00
Sequence:  Night Mode
Activator:
```

Before setting the operational hours, you must set the current local date and time.

Setting the Local Date and Time

The time and date must be set correctly in order to operate the Splashpad during operational hours. Note that the SMARTFLOW™ Logics Controller does not compensate for Daylight Savings Time. You will have to manually change the time as necessary.

To set the time and date

1. From the Main Menu, Press **Enter** twice ✓✓to access the Date and Time change function.
2. Use the up and down arrow buttons▲▼ to scroll through the available values where the cursor is flashing, and then press the right arrow key ►to move to the next field.
3. When finished, press **Enter** ✓. A "Save Success" message will appear and the Main Menu will show the Date and Time you just entered.

Set Date and Time

```
Set Date & Time

Date:  ▒▒▒ 29, 2009
Time:        21:02:00
```

Notes:

- To get back to the Main Menu at any time, press the **ESC** button several times.
- If the time is reset whenever the power goes off, the battery needs to be replaced. The battery type is a 3v Lithium - CR2032.

Setting the Operational Hours

To define Operational Hours, first select from two time modes and then define the hours.

Two Operational Periods P1 and P2 Mode: the SMARTFLOW™ Logics Controller will repeat the same pattern every day of the week. One period can be used to set up a full day, for example from 08:00 to 17:00. Or the periods P1 and P2 can be used to stop during lunch, for example P1: 08:00 to 12:00, P2: 13:00 to 17:00. If only one period is used, simply define both P1 and P2 with the same hours, for example 08:00 to 17:00.

Weekday/Weekend Mode: the SMARTFLOW™ Logics Controller will allow one operational period to be defined for weekdays, and another for weekends. For example: Monday to Friday 08:00 to 17:00 and Saturday/Sunday 08:00 to 20:00.

To set the operational hours

1. From the Main Menu, press **Enter** ✓and then the right arrow ►to access the Operational Time Setup screen.
2. To change the Operational Time Mode, press **Enter** ✓so that the mode is flashing and then press the right and left arrow buttons ► ◄ to switch modes.
3. When the desired mode is shown, press **Enter** ✓. A "Save Success" message will be displayed and then the Operational Time Setup screen will show the selected mode.
4. To set the hours within the time mode, from the Operational Time Setup screen use the down arrow button ▼ to see the hours. Press **Enter** ✓ to change the hours
5. Use the up and down arrow buttons ▲▼ to scroll through the available values where the cursor is flashing, and then press the right arrow button ►to move to the next field.
6. When finished, press **Enter** ✓. A "Save Success" message will appear. To return to the Main Menu, press **ESC** several times.

Two Operational Periods P1 & P2 Mode

```
Operational Time
Setup
Two Operational
Period P1 & P2
```

Option 1: defining a break between periods

```
P1:    Start     Stop
       06:00     12:00
P2:    Start     Stop
       13:00     17:00
```

Option 2: defining a full day with no break

```
P1:    Start     Stop
       08:00     17:00
P2:    Start     Stop
       08:00     17:00
```

Weekday & Weekend Mode

```
Operational Time
Setup

Weekday & Weekend
```

Weekday & Weekend Hours

```
Week   Start   Stop
Days:  08:00   17:00
Week   Start   Stop
End:   08:00   20:00
```

3. Sequence Variations

By default, the Splashpad follows the programmed sequence during operational hours. In cases where a large group has arrived, to adapt to heavy traffic in certain areas, or to perform maintenance, you have several options to change how the Splashpad play features activate.

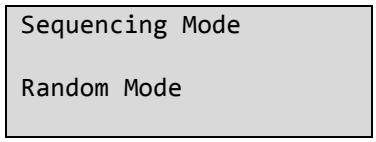
Randomizing the Pattern

To provide a change from the pre-programmed sequential pattern, you can change the sequencing mode from Regular (the default) to Random. In Random mode, the SMARTFLOW™ Logics Controller will change the sequence of play event activation following an unpredictable pattern. The controller will continue to ensure that the random pattern adheres to the flow limits, thresholds and other necessary parameters.

To randomize the pattern

1. From the Main Menu, press **Enter** ✓and then the right arrow twice ► ►to access the Sequencing Mode function.
2. To change the Sequencing Mode, press **Enter** ✓so that the mode is flashing and then press the right or left arrow buttons ► ◄ to switch between Random and Regular modes. To set a random pattern, select Random Mode.
3. When finished, press **Enter** ✓. A "Save Success" message will appear and the Sequencing Mode will show the mode you just selected.

Change Sequencing Mode to Random



Notes

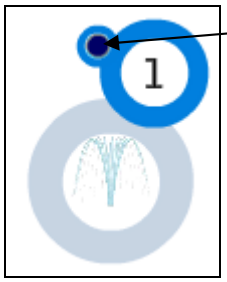
- The regular sequence stays saved in the SMARTFLOW™ Logics Controller's memory.
- To change the pattern back to the regular sequence, follow the above steps, but in step 2 select Regular Mode.
- To get back to the Main Menu at any time, press the **ESC** button several times.

Manually Activating One or More Play Features

Instead of requiring an activator to be touched, you can set one or more play features to stay activated according to the sequence. This function is useful to create a welcoming atmosphere or to keep play features running in a play area that is particularly busy.

To manually activate one or more play features

- With the Main Menu showing, press the number button that corresponds to the selected play feature so that the LED is flashing.



If the LED is flashing, the play feature is in Manual Mode and will stay activated even if an activator is not touched.

If the LED is off, the play feature will not activate, even if an activator is touched.

Notes

- The controller will keep the play feature running whether or not an activator is touched.
- In Manual Mode, a play feature will stay activated, even outside operational hours.
- To return to regular activation (Auto Mode), press the number button so the LED is on.
- To de-activate a play feature, press the number button that corresponds to the play feature so the LED is off.

To manually activate the play features sequence

- With the Main Menu showing, press the Activation button so that the LED is flashing.

If the Activator LED is flashing, the Splashpad is in Manual Mode and the sequence will stay activated during operational hours even if an activator is not touched.

If the Activator LED is off, none of the play features will activate, even if an activator is touched.

Note

- To get back to the Main Menu at any time, press the **ESC** button several times.

4. Administrator Functions

In addition to managing the day-to-day operation of the Splashpad, the SMARTFLOW™ Logics Controller allows you to perform many advanced functions. The following administrator functions are included in this section of the manual:

- Setting the Purge Function Times
- Managing the Rain Diverter Options
- Enabling Password Protection
- Changing the Password
- Disabling Password Protection
- Inserting a New Memory Key
- Uploading a New Sequence
- Updating the Firmware
- Resetting the Micro Controller Unit

Setting the Purge Function Times

The Purge Function ensures that fresh water is used for the first sequence of the day. When set correctly, the purge function will start a few minutes before the operational hours start time and purge all the lines of stagnant water.

The Purge Function can also start a purge cycle during the day if the Splashpad is not used for a long period. This mid-day purge is especially useful in hot areas where stagnant water in the pipes could reach high temperatures.

Setup Time: Time when the daily purge will occur. It should be set a few minutes before the operational hours start.

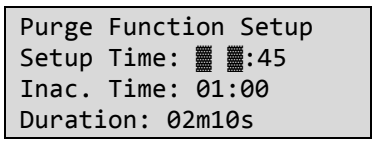
Inac. Time: Duration in hours and minutes of the Inactivity Timer. If the Splashpad is not used for this period of time, the purge will automatically start. Format - HH:MM
Note: Do not set the Inactivity time to 00:00 or else the SMARTFLOW™ Logics Controller will constantly try to run the purge, and not allow the sequence to run.

Duration: Default duration is 2 minutes. You may change the default as necessary. Format - MM:SS
Note: To **disable** the purge function, set the **duration** to 00:00.

To set the purge function times

1. From the Main Menu, press **Enter** ✓and then press the right arrow four times ► ► ► ►to access the Purge Function Setup screen.
2. To change the Purge Function Setup times, press **Enter** ✓. Use the up and down arrow buttons ▲▼ to scroll through the available values where the cursor is flashing, and then press the right arrow key ►to move to the next field.
3. When finished, press **Enter** ✓. A Save Success message will appear and then the Purge Function Setup screen will show the times you just set.

Change Purge Function Setup Times



Note

- To get back to the Main Menu at any time, press the ESC button several times.

Managing the Rain Diverter Options

The optional Rain Diverter device (not included with the SMARTFLOW™ Logics Controller) is used to prevent rain water from going into the sanitary drain when the Splashpad is not in use. The rain diverter uses an electrical-mechanical valve to deflect the water from the sanitary drain to the storm water drain. If your Splashpad is equipped with a Rain Diverter device, follow the procedure in this section to select from the two available options. If no Rain Diverter device is used on your Splashpad, leave the Default setup (Signal after 30 minutes Inactivity).

Signal after 30 Minutes of Inactivity: This is the default setting. The position of the electrical-mechanical valve will be changed if the sequence is not activated for 30 minutes. This mode will allow rain water to be redirected during the day. The valve will automatically return to its original position once the sequence is activated.

Signal at End of Day until Next Sequence: In this mode, the electrical-mechanical valve will only change at the end of the day and stay in this position until the sequence is started the next day. This mode can be used to minimize the wear of the electrical-mechanical valve.

To manage the rain diverter options

1. From the Main Menu, press **Enter** ✓and then press the right arrow three times ► ► ►to access the Rain Diverter Setup function.
2. To change the Rain Diverter Setup mode, press **Enter** ✓so that the mode is flashing and then press the right and left arrows ► ◄ to switch between modes.
3. When finished, press **Enter** ✓**.** The Rain Diverter Setup screen will show the mode you just selected.

Change Rain Diverter Setup

```
Rain Diverter Setup

Signal at End of Day
Until Next Sequence
```

Notes

- The Controller has a dedicated output for the rain diverter signal. It uses a 24Volts AC signal with a maximum current capacity of 0.25Amp to control the electrical-mechanical valve. This control signal current will NOT be sufficient to drive the valve directly. It must be used to control a contactor or relay that will commute the higher power required to control the valve. The valve interface is not included with the SMARTFLOW™ Logics Controller but can be supplied by Vortex if required.
- During normal operation, the rain diverter signal is disabled (0 Volt AC). At the end of the day, or after 30 minutes of inactivity, the rain diverter signal is enabled, and the output delivers 24 Volts AC.
- If required, a different inactivity time can be programmed. Contact Vortex for assistance.

Enabling Password Protection

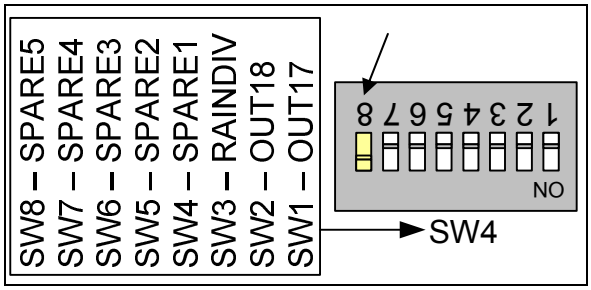
By default, password protection is not enabled on the SMARTFLOW™ Logics Controller.

To enable password protection

1. Turn off the power to the SMARTFLOW™ Logics Controller.
2. Open the controller box and set the SW8 – SPARE5 switch on the Dipswitch SW4 to ON (down position).
3. Close the controller box.
4. Turn on the power to the SMARTFLOW™ Logics Controller. The screen will prompt you to enter a 4-digit password to continue.
5. Enter the default password 1 2 3 4 using the numbered buttons (play feature buttons) 

and then press **Enter** ✓. The Main Menu will appear.

Enable Password Protection



Changing the Password

When password protection has been enabled, a Change Password function is made available

To change the password

1. From the Main Menu, press **Enter** ✓
2. Enter the current password using the numbered buttons of the play features and then press **Enter** ✓.
3. From the Main Menu, press **Enter** ✓, then press the left arrow ◄ to access the Change Password screen.
4. To change the password, press **Enter** ✓. Use the numbered buttons by the play feature pictures to enter the old password. When finished, press **Enter** ✓
5. Use the numbered buttons by the play feature pictures to enter the new password. When finished, press **Enter** ✓.
6. A "Save Success" message will appear.

Change Password

Note

- Do not forget the password. It can only be reset to the factory password by entering the master password code. Contact Vortex Technical Support for assistance.
- The #10 button can be used as a 0 in the password.

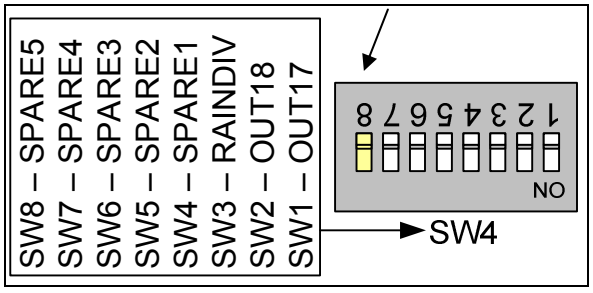
Disabling Password Protection

To disable password protection, the current password must be 1 2 3 4. If necessary, change the password to 1 2 3 4.

To disable password protection

1. Turn off the power to the SMARTFLOW™ Logics Controller.
2. Open the controller box and set the SW8 – SPARE5 switch on the Dipswitch SW4 to OFF (up position).
3. Close the controller box.
4. Turn on the power to the SMARTFLOW™ Logics Controller. The screen will display the Main Menu with no password required.

Disable Password Protection



Note

- If the password was not set to 1 2 3 4 before changing the switch position to ON, password protection will not be disabled.

Inserting a New Memory Key

The SMARTFLOW™ Logics Controller comes with a pre-loaded sequence and firmware that can only be changed by using a special memory key. To request a sequence change or a firmware upgrade on a memory key, contact Vortex Customer Service.

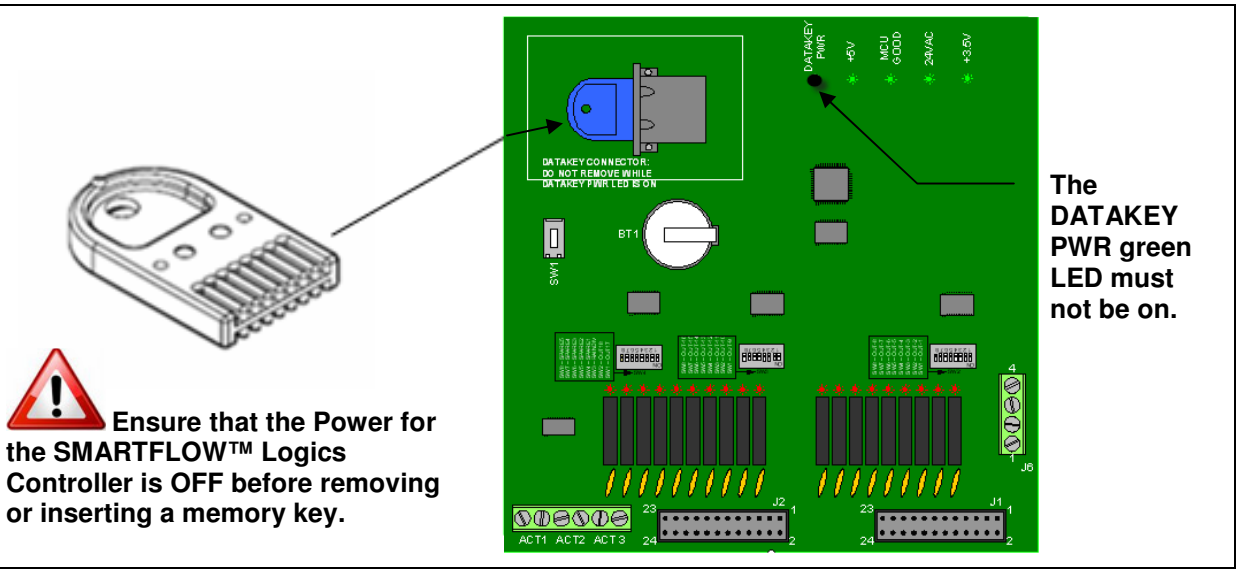
After inserting the new memory key you may then upload the new sequence and/or update the firmware by following the procedures given in this section of the manual.

Important! Before inserting or removing a memory key ensure that the power for the SMARTFLOW™ Logics Controller is OFF. The DATAKEY PWR green LED must not be on. Failure to comply with this instruction may cause damage to the controller and void all warranties.

To insert a new memory key

1. **Turn OFF the power to the SMARTFLOW™ Logics Controller**.
2. Open the controller box. If removing an old memory key, ensure that the DATAKEY PWR green LED is OFF.
3. Remove the old memory key (if present) and then insert the new memory key. Note that the memory key can be inserted either side up.
4. Close the controller box.
5. Turn on the power to the SMARTFLOW™ Logics Controller.

Replace Memory Key



Uploading a New Sequence

The SMARTFLOW™ Logics Controller comes with a pre-loaded sequence that can only be changed by using a special memory key. To request a sequence change and a memory key, contact Vortex Customer Service.

To upload a new sequence

1. Follow the instructions to insert a new memory key.
2. From the Main Menu, press **Enter** ✓and then press the left arrow twice ◄ ◄ to access the Setup File /Load Setup File from Key screen. Press **Enter** ✓. The screen will flash "Enter to Execute." Press **Enter** ✓.
3. The screen will display the message "Loading" and then "Save Successful" before returning to the Main Menu.

Upload Sequence

```
Setup File
Load Setup File From
Key
Enter to Execute
```

Notes

- If no valid memory key is inserted in the datakey connector receptacle, the message "No Key Present" will flash when attempting to access the Setup File menu.
- If the "No Key Present" message is shown while a memory key is inserted, turn OFF the power to the controller. Open the controller box and ensure that the memory key had been inserted properly, and then follow the instructions to Reset the Micro Controller Unit.

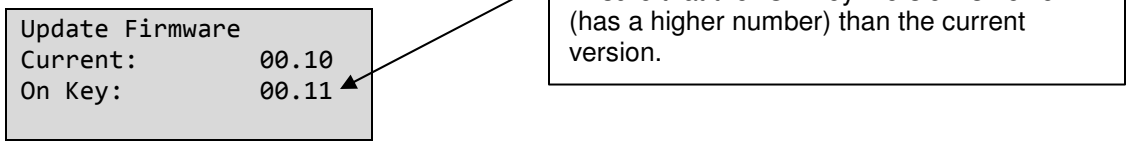
Updating the Firmware

Any necessary firmware updates will be supplied to you on a memory key from Vortex.

To update the firmware

1. Follow the instructions to insert a new memory key.
2. From the Main Menu, press **Enter** ✓and then press the left arrow once ◄ to access the Update Firmware screen.
3. Ensure that the version on the key is newer (has a higher number) than the current version. Press **Enter** ✓. The screen will flash "Enter to Execute." Press **Enter** ✓.
4. The screen will display the message "Loading" and then "Save Successful" before returning to the Main Menu.

Update Firmware



Notes

- **Do not turn off the power while the firmware is loading.** An incomplete firmware update will render the SMARTFLOW™ Logics Controller unusable; it will have to be sent to Vortex to be updated.
- An older version of firmware should not be installed unless an exceptional case has been approved by Vortex. Updating back to the newer version will require another memory key.
- If no valid memory key is inserted in the datakey connector receptacle, the message "No Key Present" will flash when attempting to access the Setup File menu.
- If the "No Key Present" message is shown while a memory key is inserted, turn off the power to the controller, ensure that the memory key had been inserted properly, and then follow the instructions to Reset the Micro Controller Unit.

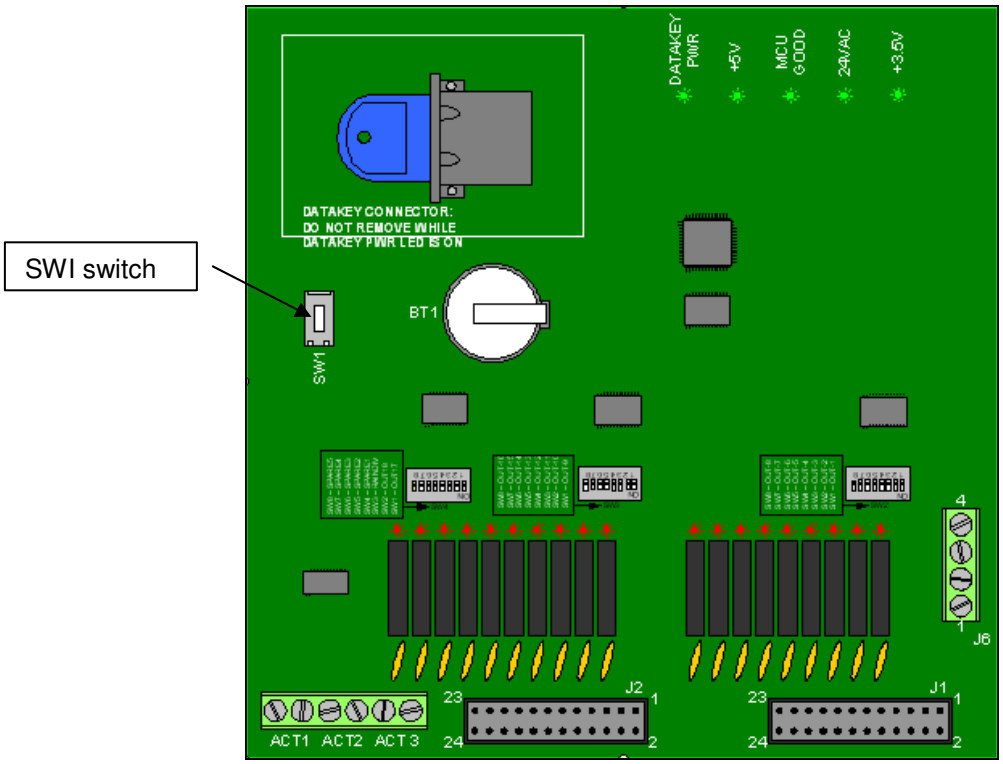
Resetting the Micro Controller Unit

If a “No Key Present” message is shown while a memory key is properly inserted, follow the instructions below to reset the Micro Controller Unit.

To Reset the Micro Controller Unit

1. Open the controller box to access the Printed Circuit Board in the left side of the door.
2. Press the white SW1 switch on the left of the battery backup.

Micro Controller Unit Reset



Note

- After resetting the micro controller unit, the language will revert back to English as a default. To change the language, from the Main Menu, press the right arrow button ► and hold it for three seconds to access the Change Language function. Release the button when the desired language has been selected.

5. Technical Support

Use the Troubleshooting guide provided below to assist in solving any issues. If necessary, you can bypass an output by following the procedure given in this section of the manual. If further assistance is required, please contact a Vortex Customer Service Technical Representative at 1-877-5-VORTEX (1-877-586-7839) (USA/CND) or 001-514-694-3868 (others).

Troubleshooting

Issue	Resolution
SMARTFLOW™ Logics Controller will not turn on.	• Check if unit is ON, Green LED should be ON • Check AC Power Supply • Check 120VAC/240VAC Fuse (2 amps/1 amp) • Check 24VAC Fuse (1 amp) • Validate that the transformer is supplying 24VAC on the secondary side with a voltmeter. • Check 24VAC connection on side of the printed circuit board. Validate voltage with voltmeter. • Press the MCU Reset Switch SW1
RED output LEDs are ON, but no power Output (Output LEDs are on the printed circuit board inside the controller)	• Check for good connections of the multi-conductor cable on the rectangular connector J1 and J2. • Investigate for a damaged solenoid coil possibly causing a short circuit. • Output is disabled, check corresponding blue LED on membrane. • 24VAC
Unit does not retain Date and Time	• Replace battery backup with a new battery. Model 3v Lithium CR2032 or equivalent
Activator is pressed, but no sequence is started	• Make sure the Activator LED on the membrane is steady blue. • Make sure the Timer LED on the membrane is steady blue. • Make sure the actual time is properly set and that you are within operational hours. • Make sure the activator(s) are connected properly • Check Activator(s) functionality by disconnecting the activator and measure continuity while pressing the activator button.
One or several outputs are always ON	• Manual override on the Membrane is active and blue LED are blinking, change to Automatic (Steady LED) • Switch on the Dipswitch are in the ON position, change to OFF position. • Solenoid valves may have dirt. Clean the solenoid valves.
Sequence does not follow sequence sheet	• Change sequence mode from Random to Regular • Upload sequences again from the memory key.
LCD is very dark or clear	• Return to the Main Menu by pressing the ESC button several times and then adjust contrast by pressing the UP and DOWN arrow buttons.
Nothing happens when pressing the buttons on the membrane.	• Return to the Main Menu by pressing the ESC button several times.

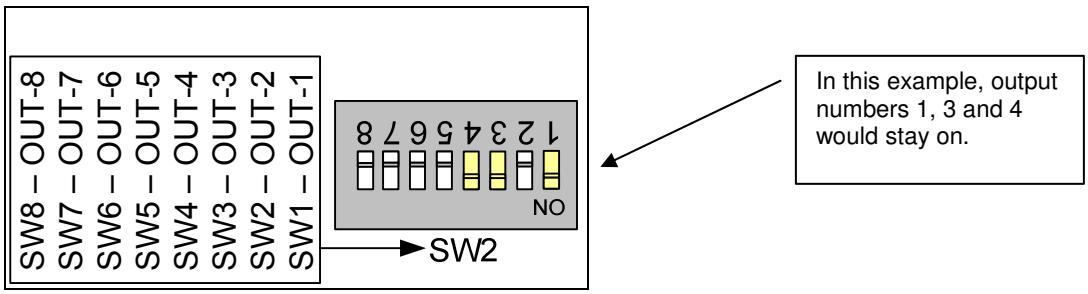
Bypassing an Output

For troubleshooting, or if the electronic board should cease functioning, an output can be bypassed to stay ON.

To bypass an output

1. Locate the dipswitch components on the printed circuit board.
2. Change the switch position to ON (Switch Down) to enable the output.

Output Bypass



Note

- The output bypass is not affected by operational hours. A switch that has been manually changed to ON will stay on until it is manually changed back to OFF.

Connecting Power and Wiring the Activator(s)

Most wiring is factory installed. The only field wires left to install are the Activator wires and the power supply:
120VAC 2Amps 60hz for North American installations.
240VAC 1Amp 50hz for European installations.

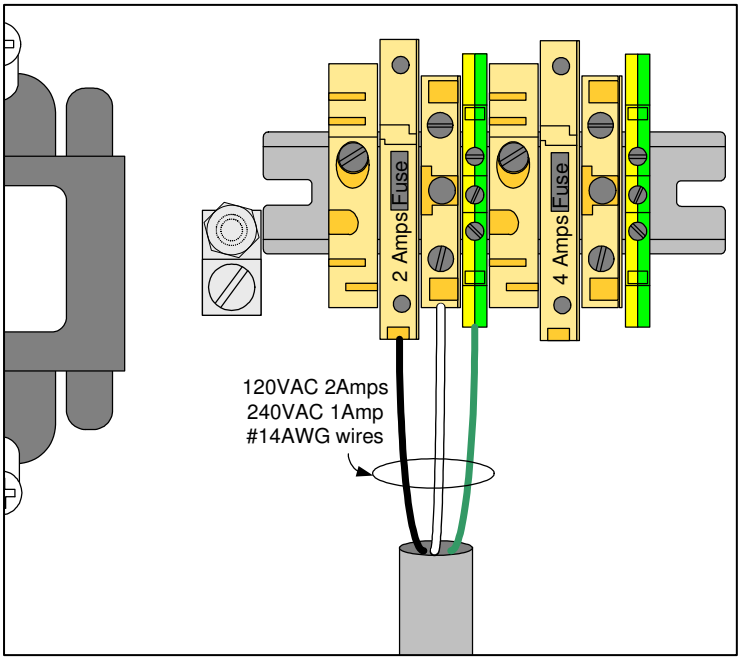
Connecting Power

Power connections must be performed by a licensed Electrician. Follow Local Electrical Code and NEC guidelines for wiring and grounding.

The SMARTFLOW™ Logics Controller power requirement is 120VAC 2Amps for North American installations and 240VAC 1Amp for European installations. In both cases, single phase systems are required. Although 2 amps is the minimum current requirement, Vortex strongly suggests dedicating 15 amps to the controller in the event that an upgrade would require more power.

Power Field wiring should be sized #14AWG 3 conductors per cable.

Power Connection



Wiring the Activators

Each activator must be properly wired to the SMARTFLOW™ Logics Controller.

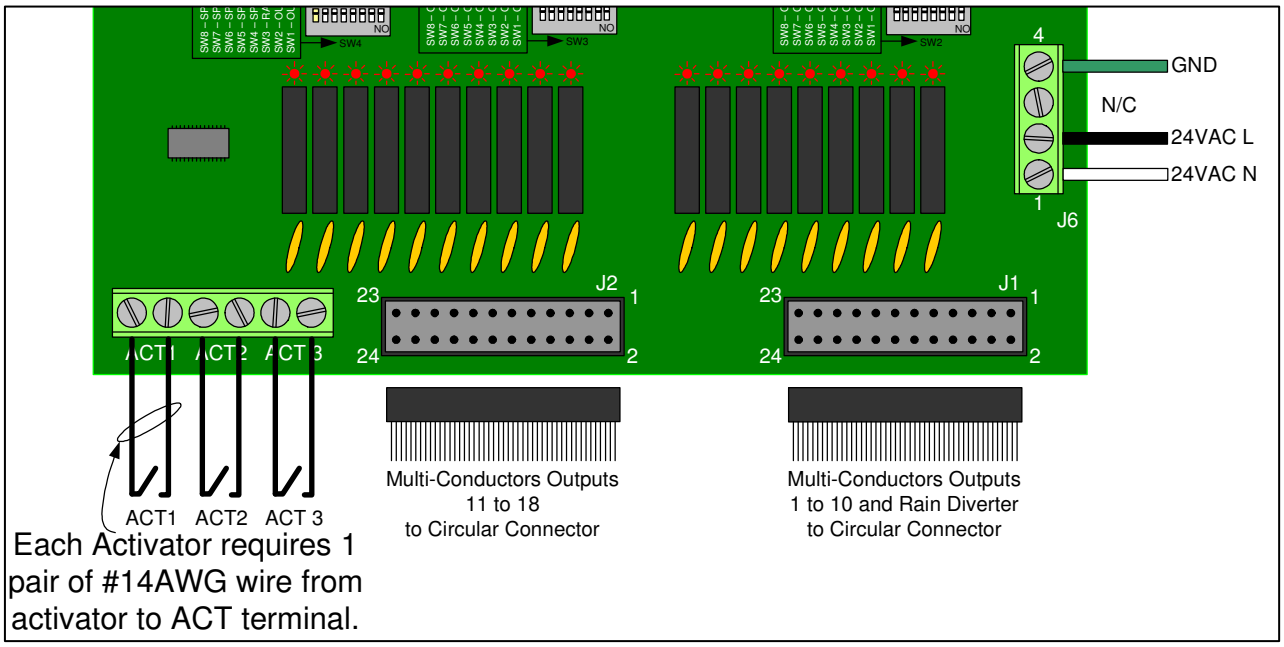
To connect activator wires

1. Prepare one pair of field wires from each activator. They should be paired #14AWG wires. There is no polarity on the activator wiring.

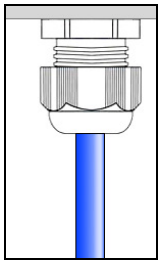
Activator wire length should not exceed 150 ft (45 meters).

2. Use the supplied Cable Gland to securely feed the activator cable to each activator. Make sure the Cable Gland is well tightened to preserve the enclosure's waterresistant integrity. Only use one cable per Cable Gland.

Activator Wire Connection



Cable Glands



Warranty

Vortex Aquatic Structures International warrants that all its products will conform in kind and quality to the specifications set forth in the specifications sheet for the products, and will be free of defects in manufacturing and material; under normal use and service for the periods set forth below:

10 Year Warranty on reinforced fiberglass skid, sand filter fiberglass tank and cartridge filter fiberglass tank.

5 Year Warranty on subterranean vault (enclosure and access hatches), stainless steel manifold, drain boxes, hair and lint strainers, electrical enclosures and chemical controllers and polyurethane components.

2 Year Warranty on holding tank, circulation pumps, chemical injection pumps, chlorinator, acid feed system, poly vinyl chloride (PVC); piping, fittings and ball valves.

Check valves, cartridge elements, pressure gauges, chemical sensing probes, motor starters, electrical relays, terminal blocks, solenoid valves, programmable logic controller (PLC), printed circuit board (PCB), time switches, manual switches, transformers, breakers, electrical wiring and connections.

All the warranties start on the date of the Seller's invoice. Replacement parts will be warranted for the balance of the original warranty. With regards to defects covered by this warranty, Vortex shall repair or replace the defective part or parts, F.O.B. Vortex. All costs for removal and installation required to perform repairs or replacements shall be the responsibility of the purchaser.

The warranty stated above is valid only if the equipment is installed in conformance with Vortex's installation and assembly instructions and maintained according to the maintenance procedures furnished by Vortex; have been subjected to normal use for the purpose for which the products were designed; have not been subject to misuse, negligence, vandalism, or accident; have not been subjected to addition or substitution of parts; and have not been modified, altered, or repaired by persons other than Seller or Seller's designees in any respect which, in the judgment of the Seller, affects the condition or operation of the structures and or components. To make a claim, please contact your local representative or send your written statement of claim, along with the original project number and/or project name to:

Vortex Aquatic Structures International
328, Avro Street, Pointe-Claire (Montreal) Quebec, Canada H9R 5W5

Or you may fax us at 514.335.5413.

To contact Vortex with any questions or comments with regards to this warranty, call:

514.694.3868

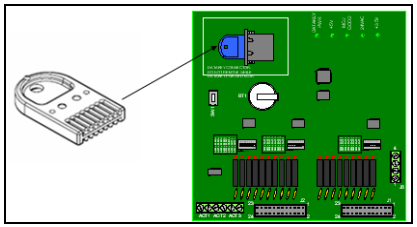
Vortex Aquatic Structures International 328, Avro Street, Montreal (Quebec), Canada H9R 5W5
Phone 514.694.3868 **Internet** www.vortex-intl.com **E-mail** info@vortex-intl.com
(USA/(ND) 1.877.5 VORTEX (867839)

INSERT A NEW MEMORY KEY

The SMARTFLOW™ Logics Controller comes with a pre-loaded sequence and firmware that can only be changed by using a memory key provided by Vortex.

To insert a new memory key, **turn OFF the power to the SMARTFLOW™ Logics Controller**. Open the controller box. If removing an old memory key, **ensure that the DATAKEY PWR green LED is OFF**. Remove the old memory key (if present) and then insert the new memory key. Note that the memory key can be inserted either side up.

Important! Before inserting or removing a memory key ensure that the power for the SMARTFLOW™ Logics Controller is OFF. The DATAKEY PWR green LED must not be on. Failure to comply with this instruction may cause damage to the controller and void all warranties.



After inserting the new memory key you may then upload the new sequence and/or update the firmware.

UPLOAD A NEW SEQUENCE

Press **Enter** ✓ then ◄ ◄ then ✓

```
Setup File
Load Setup File From
Key
Enter to Execute
```

Press **Enter** ✓

UPDATE THE FIRMWARE

Press **Enter** ✓ then ◄ then ✓

```
Update Firmware
Current:        00.10
On Key:         00.11
```

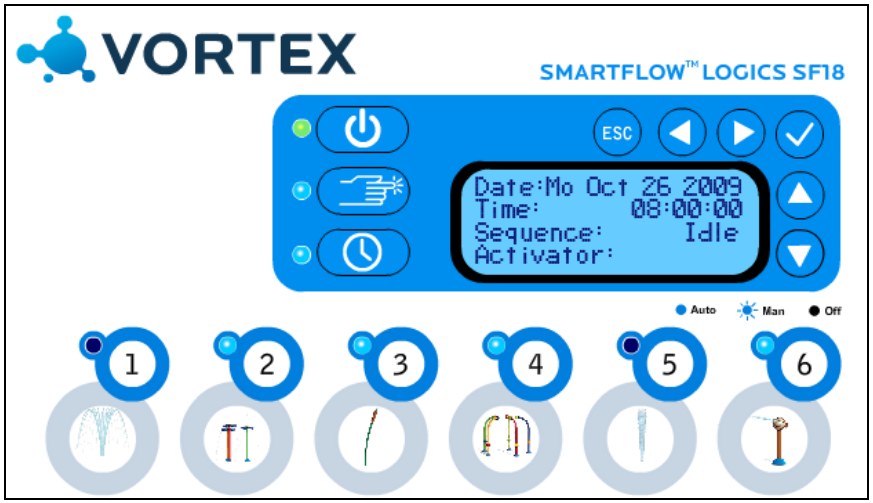
Ensure that the "On Key" version is newer (has a higher number) than the current version.

Press **Enter** ✓

VORTEX Splashpad®

SMARTFLOW™ Logics Controller

Quick Reference Guide



MAIN MENU

```
Date:      Mo Oct 26 2009
Time:           08:00:00
Sequence:        Running
Activator:             1
```

State: Idle, Running, Purging, or Night Mode (outside operational hours)

Activator bollard touched

SELECT LANGUAGE

From the Main Menu, press ►and hold 3 seconds.
Release when desired language is shown.

CONTROL LCD CONTRAST

From the Main Menu, press ▲▼ to adjust.

SMARTFLOW™ LOGICS CONTROLLER BUTTONS

ACTIVATOR

Blue LED on steady = Auto (Default). If an activator bollard is touched during operational hours, the controller will start the pre-programmed sequence.

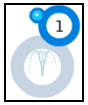
Blue LED flashing = Manual. The controller will run the sequence whether or not an activator is touched. This only works during operational hours or if the Timer is on Manual.

TIMER

Blue LED on steady = Auto (Default). The controller will follow operational hours.

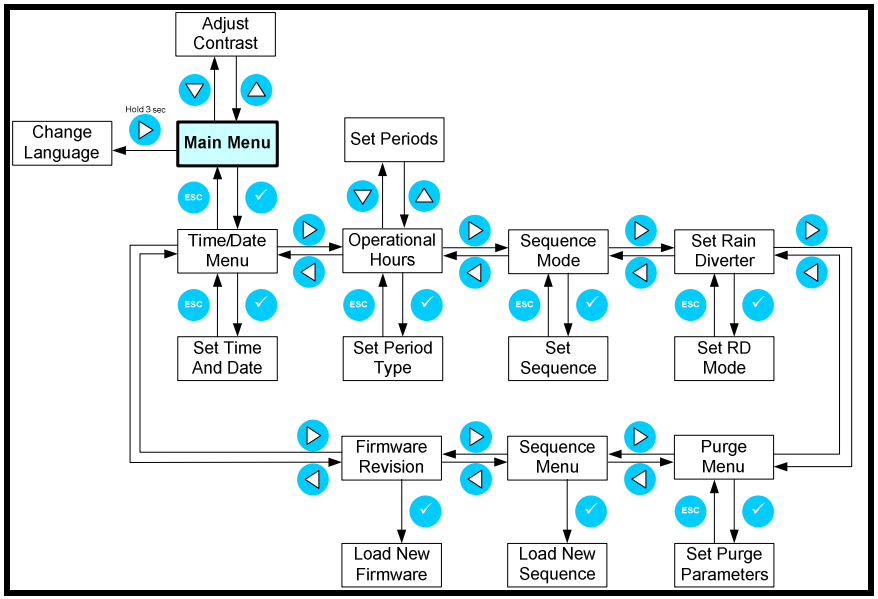
Blue LED flashing = Manual. The controller will allow the sequence to start outside operational hours.

NUMBERED PLAY FEATURE *Press the number, not the picture.*



Blue LED flashing: Manual. Play feature will run continuously at all hours whether or not an activator is touched.

SMARTFLOW™ LOGICS CONTROLLER MENU ARCHITECTURE



- **Always start from the Main Menu.**
- Press **ESC** several times to return to the Main Menu.
- After pressing **Enter** ✓ to save a selection, a "Save Success" message will appear.

SET LOCAL DATE AND TIME

Press **Enter** twice ✓✓

```
Set Date & Time

Date:   ▓ ▓ ▓29, 2009
Time:         21:02:00
```

Press ▲▼ to scroll Press ►to move Press **Enter** ✓ to save

SET OPERATIONAL HOURS

Press **Enter** ✓ then ► then ✓

Set Mode

Two Operational Periods P1 & P2 Mode

```
Operational Time
Setup
Two Operational
Period P1 & P2
```

Weekday & Weekend Mode

```
Operational Time
Setup

Weekday & Weekend
```

Choose Mode with ► Press **Enter** ✓ to save

Set Hours

Press ▼ then ✓

Option 1: break between

```
P1: Start     Stop
    06:00     12:00
P2: Start     Stop
    13:00     17:00
```

Weekday & Weekend Hours

```
Week   Start   Stop
Days:  08:00   17:00
Week   Start   Stop
End:   08:00   20:00
```

Option 2 full day with no break

```
P1: Start     Stop
    08:00     17:00
P2: Start     Stop
    08:00     17:00
```

Press ▲▼ to scroll Press ►to move Press **Enter** ✓ to save

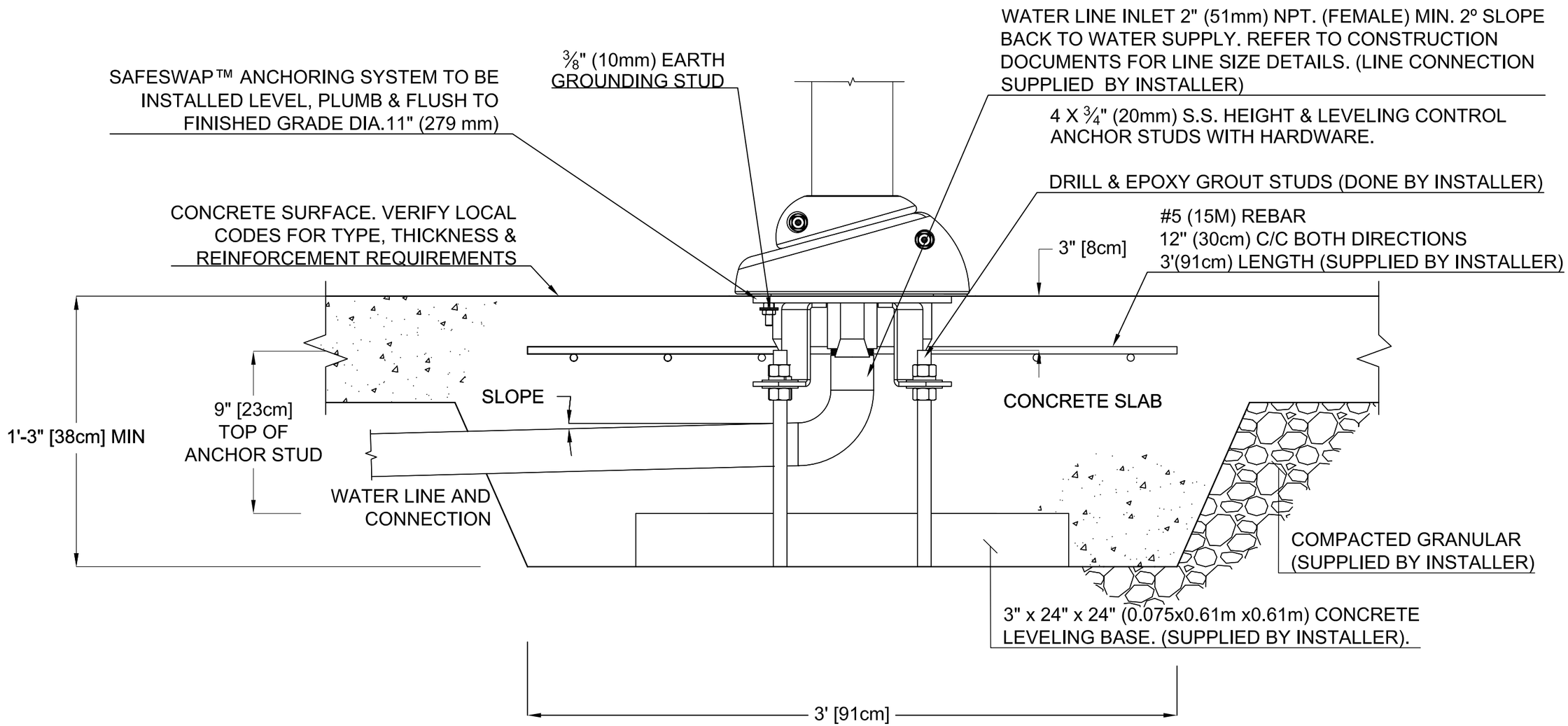
CHANGE SEQUENCE FROM REGULAR TO RANDOM

Press **Enter** ✓ then ► ► then ✓

```
Sequencing Mode

Random Mode
```

Choose Mode with ► Press **Enter** ✓ to save



SAFESWAP N° 1 (Construction Detail)
LARGE

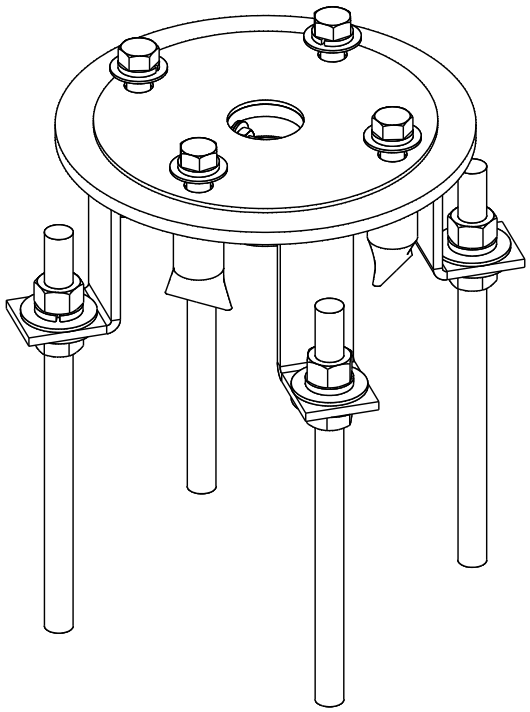
PRODUCT NAME: SAFESWAP Nº1	PRODUCT INFORMATION		
PRODUCT NUMBER: 55000.0430	DATE: 04/06/12	SHEET NO: 1/1	11"x17" SHEET SIZE

VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.
3. ENSURE THREADING INSERTS ARE INSERTED INTO HOUSING AND ARE FLUSH.
4. ENSURE TO APPLY "RIT- LOK TL 71" TO THREADS FOR THREADED INSERTS (ITEM # 12) BEFORE ASSY. R4

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-03	INCREASE BOLT LG.	-----	07/29/09	MKHALIL	DC
REL-04	MODIFY NOTE # 4	-----	09/21/10	MKHALIL	DC
REL-05	LABEL POSITION ADDED	----	08/21/12	AM	DC



ITEM NO.	Default/QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66029.078	ASSEMBLY FOR 55000.043			REL-01
2	1	33500.471	REMOVABLE ANCHORING SYSTEM 2" INLET, WELDING		-	REL-02
3	8	11155.013	FLAT WASHER 3/4"		STAINLESS STEEL 304	REL-01+
4	4	11155.009	FLAT WASHER 5/8"		STAINLESS STEEL 304	REL-01+
5	4	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	4	11155.000	LOCK WASHER 3/4"		STAINLESS STEEL 304	REL-01+
7	4	11155.011	LOCK WASHER 5/8"		STAINLESS STEEL 304	REL-01+
8	8	11150.000	NUT 3/4"-10UNC		STAINLESS STEEL 304	REL-01+
9	2	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
10 R2	1	22061.039	GASKET FOR ANCHORING SYSTEM (55000.036)		EPDM, DURO 60	REL-01
11 R3	4	11145.074	HEX BOLT 5/8"-11UNC X 2"LG		STAINLESS STEEL 304	REL-01+
12	4	11700.062	THREADED INSERT-5/8"-11 INT THREAD-7/8"-9 EXT THREAD		STAINLESS STEEL	REL-01
13	4	11145.053	3/4" ANCHOR STUD 12" LG		STAINLESS STEEL 304/304L	REL-01

VORTEX

APPROVALS	DATE
DESIGNED AMOISE	05/11/06
DRAWN AMOISE	05/11/06
CHECKED DC	

COMMENTS

PRODUCT NAME: SAFESWAP No 1

DRAWING TYPE: ASSEMBLY

SIZE FORMAT: A

ASSY NO.: 55000.043REL-02

DWG REV.: REL-05

UNITS: INCH

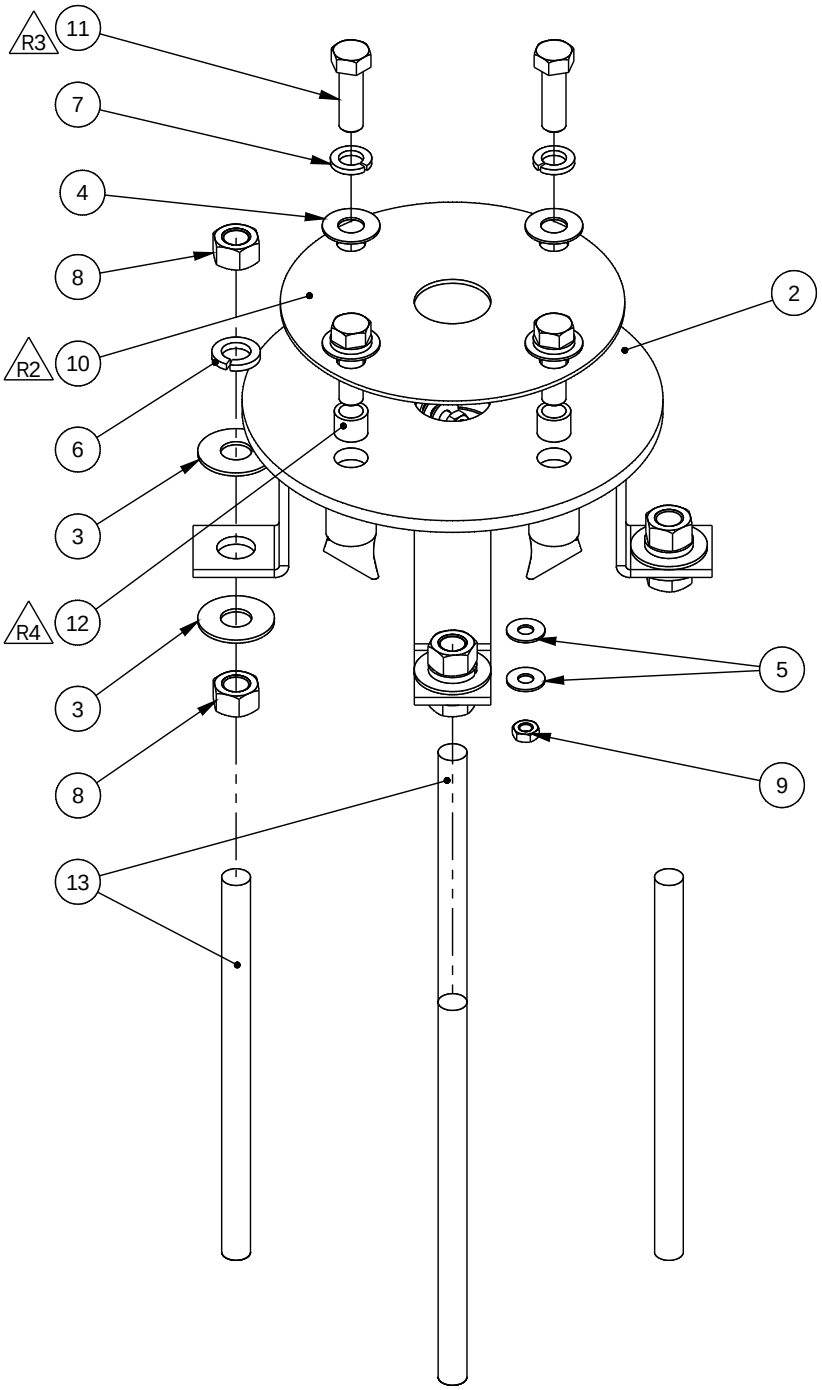
SCALE: ---

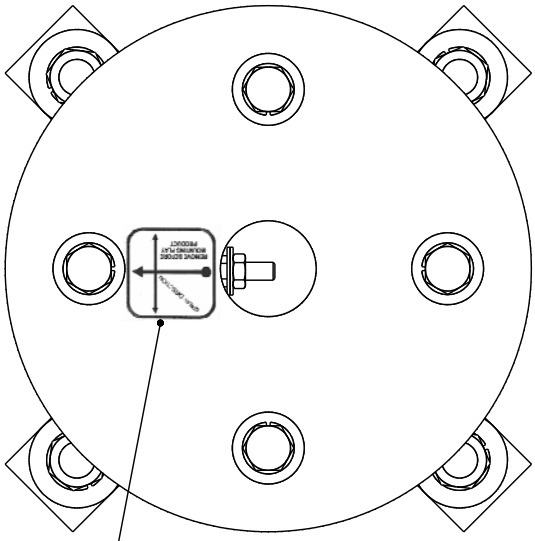
SHEET: 1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.
3. ENSURE THREADING INSERTS ARE INSERTED INTO HOUSING AND ARE FLUSH.
4. ENSURE TO APPLY "RIT- LOK TL 71" TO THREADS FOR THREADED INSERTS (ITEM # 12) BEFORE ASSY. R4

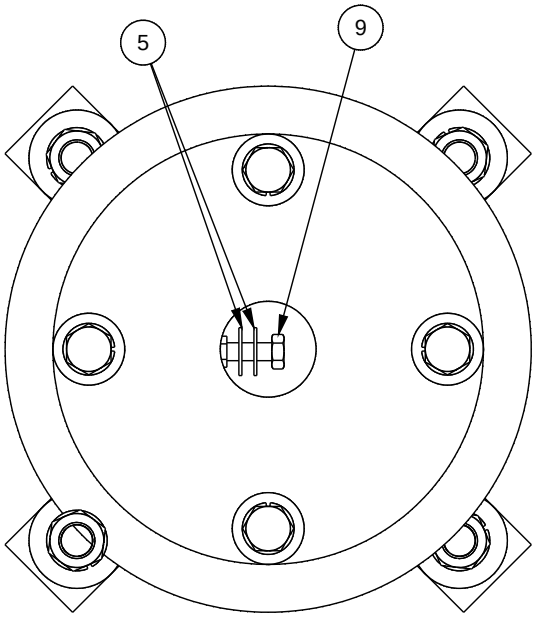
REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-03	INCREASE BOLT LG.	-----	07/29/09	MKHALIL	DC
REL-04	MODIFY NOTE # 4	-----	09/21/10	MKHALIL	DC
REL-05	LABEL POSITION ADDED	----	08/21/12	AM	DC





R5

LABEL "SPRAY DIRECTION" TO BE INSTALLED ON ITEM 2 (33500.4710), ARROW POINTING TOWARDS OUTSIDE



VORTEX

APPROVALS	DATE
DESIGNED AMOISE	05/11/06
DRAWN AMOISE	05/11/06
CHECKED DC	

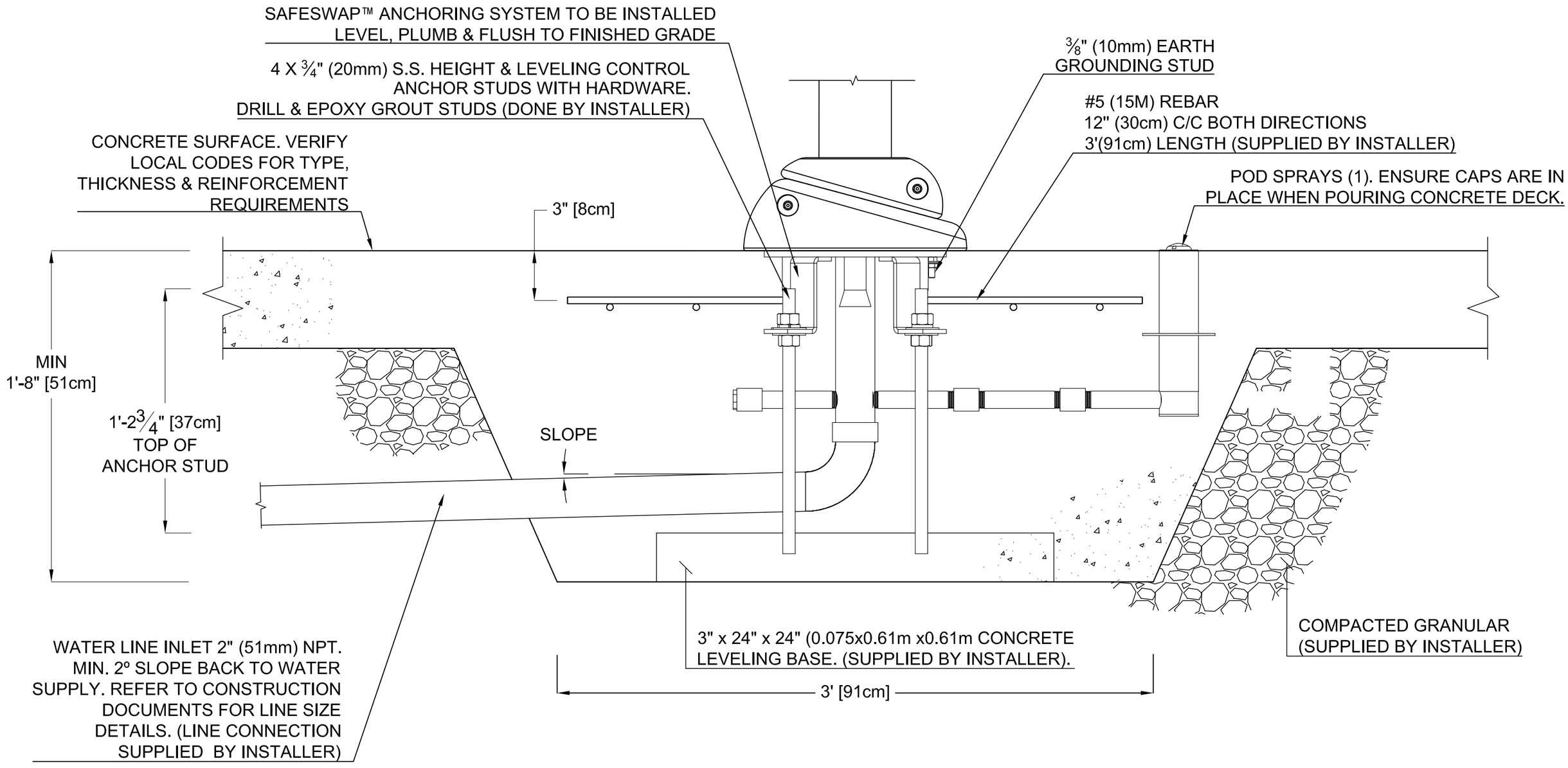
COMMENTS

PRODUCT NAME: SAFESWAP No 1

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	55000.043REL-02	REL-05

UNITS	SCALE	SHEET
INCH	---	2 OF 2



55000.0560 SAFESWAP N° 19 (Construction Detail)

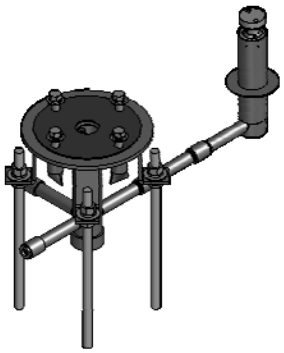
PRODUCT NAME: SAFESWAP Nº19	PRODUCT INFORMATION		
PRODUCT NUMBER: 55000.0560	DATE: 02/27/14	SHEET NO: 1/1	11"x17" SHEET SIZE

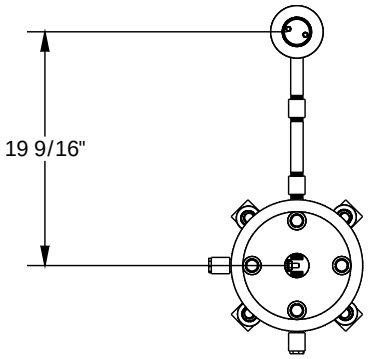
VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.
3. ENSURE THREADING INSERTS ARE INSERTED INTO HOUSING AND ARE FLUSH.
4. ENSURE THREADING LACK MATERIAL IS PRESENT ON INSERTS ELSE EQUIRE NEW UNIT

REV	DESCRIPTION	ECR	DATE	BY	APP.





ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66159.274	ASSEMBLY FOR 55000.0560			REL-01+
2	1	33500.515	2" REMOVABLE ANCHORING SYSTEM W/ POD SPRAY WELDING		STAINLESS STEEL 304	REL-02
3	8	11155.013	FLAT WASHER 3/4"		STAINLESS STEEL 304	REL-01+
4	4	11155.009	FLAT WASHER 5/8"		STAINLESS STEEL 304	REL-01+
5	4	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	4	11155.000	LOCK WASHER 3/4"		STAINLESS STEEL 304	REL-01+
7	4	11155.011	LOCK WASHER 5/8"		STAINLESS STEEL 304	REL-01+
8	8	11150.000	NUT 3/4"-10UNC		STAINLESS STEEL 304	REL-01+
9	2	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
10	1	22061.039	GASKET FOR ANCHORING SYSTEM (55000.036)		EPDM, DURO 60	REL-01
11	4	11145.022	HEX BOLT 5/8"-11UNC X 1 1/2"LG		STAINLESS STEEL 304	REL-01+
12	4	11700.062	THREADED INSERT-5/8"-11 INT THREAD-7/8"-9 EXT THREAD		STAINLESS STEEL	REL-01
13	1	30020.000	DIRECTIONAL GROUND SPRAY		-	REL-01
14	1	22160.012	POD SPRAY NOZZLE SLEEVE		BRASS, LEAD FREE	REL-01+
15	1	22136.025	PLUG 2" PIPE SIZE POD SPRAY		BRASS, LEAD FREE	REL-01+
16	1	22126.005	WINTER CAP SPRAY 2" PIPE SIZE CUSTOM THREAD (LONG) BRASS		BRASS, LEAD FREE	REL-01+
17	4	11145.177	3/4" ANCHOR STUD 16" LG		STAINLESS STEEL 304/304L	REL-01
18	4	11120.002	COUPLING SCH40 3/4"(FPT-FPT)		STAINLESS STEEL 304	REL-01+
19	2	11109.005	PLUG 3/4" MPT		PVC	REL-01+
20	1	11100.000	NIPPLE SCH40 3/4" PIPE SIZE 6"LG		STAINLESS STEEL 304	REL-01+
21	1	22055.561	POD SPRAY PROJECTION NOZZLE 1 HOLE PATTERN		UHMW - BLUE	REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	07/12/06
DRAWN SJIE	7/22/2008
CHECKED DC	

COMMENTS

PRODUCT NAME: INSTALLATION KIT #SW LARGE 2" LEVEL STUDE 1 JET w/ POD SPRAY

DRAWING TYPE: ASSEMBLY

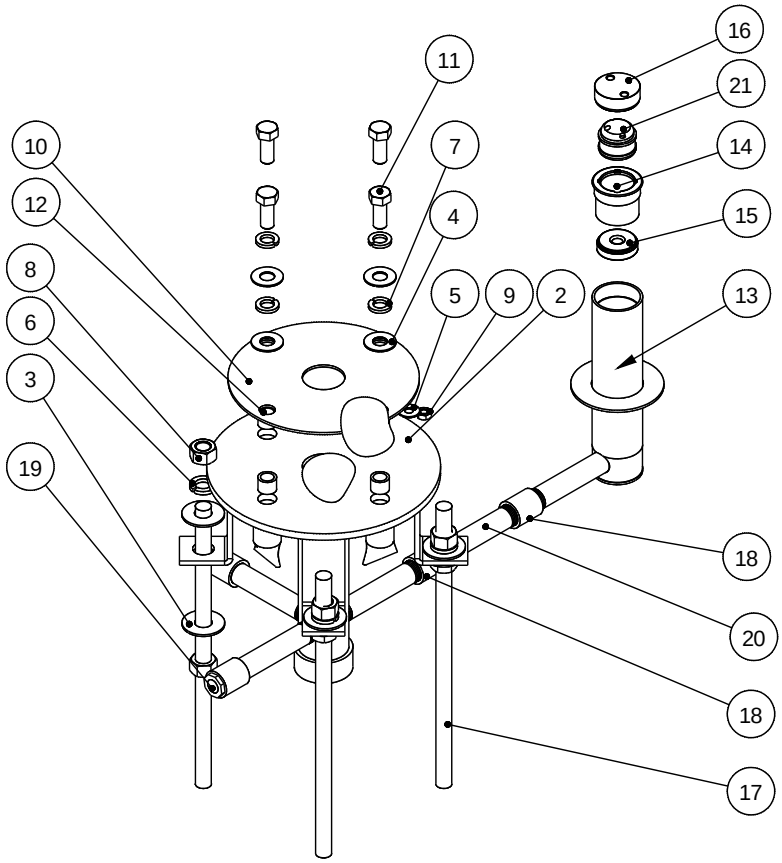
SIZE FORMAT	ASSY NO.	DWG REV.
A	55000.0560REL-01	REL-01

UNITS	SCALE	SHEET
INCH	---	1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.
3. ENSURE THREADING INSERTS ARE INSERTED INTO HOUSING AND ARE FLUSH.
4. ENSURE THREADING LACK MATERIAL IS PRESENT ON INSERTS ELSE EQUIRE NEW UNIT

REV	DESCRIPTION	ECR	DATE	BY	APP.



VORTEX

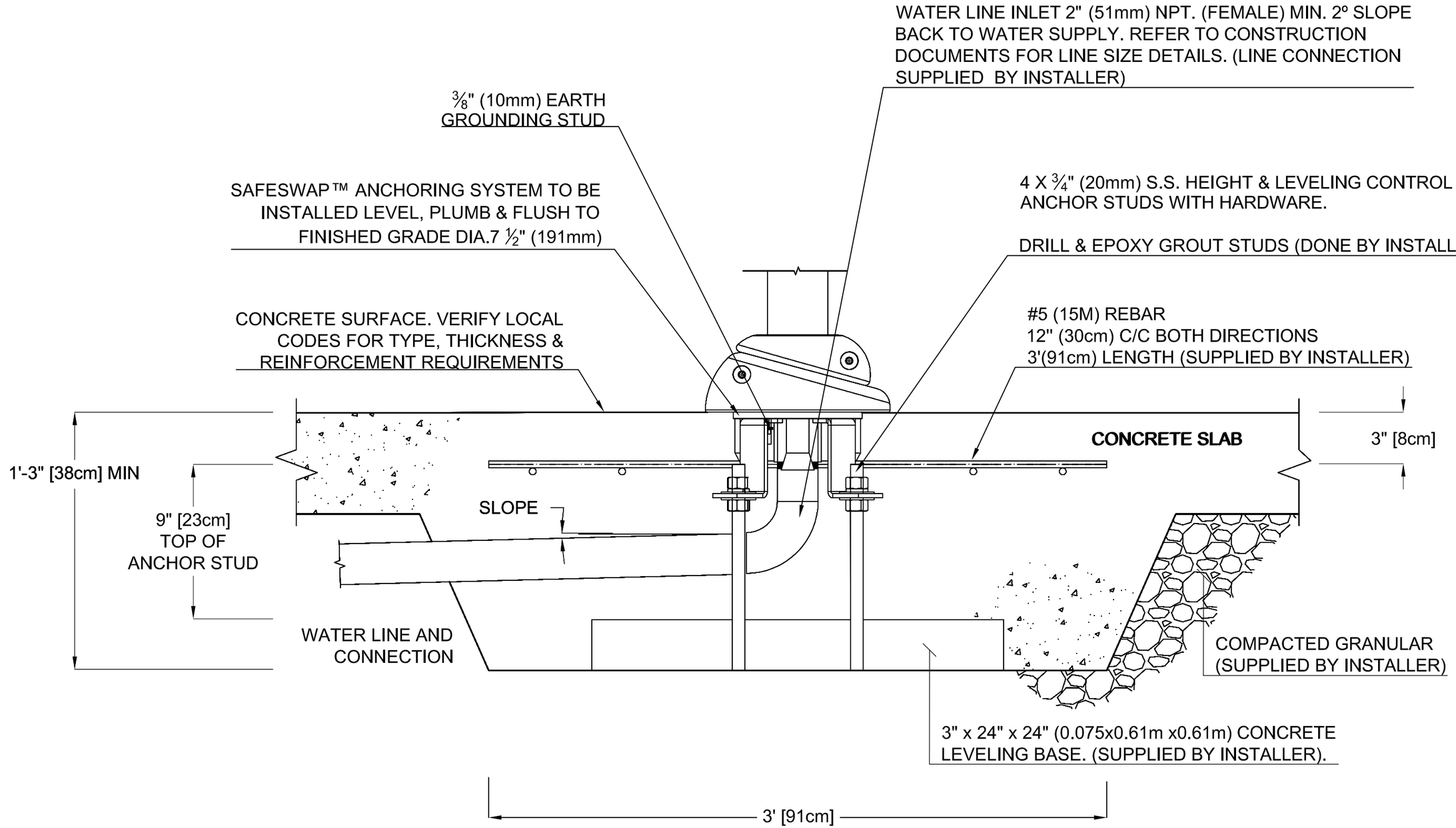
APPROVALS	DATE
DESIGNED SJIE	07/12/06
DRAWN SJIE	7/22/2008
CHECKED DC	

COMMENTS

PRODUCT NAME: INSTALLATION KIT #SW LARGE 2" LEVEL STUDE 1 JET w/ POD SPRAY

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.		DWG REV.
A	55000.0560REL-01		REL-01
	UNITS: INCH	SCALE: ---	SHEET: 2 OF 2



VOR-55000-0570 SAFESWAP Nº2 MEDIUM (Construction Detail)

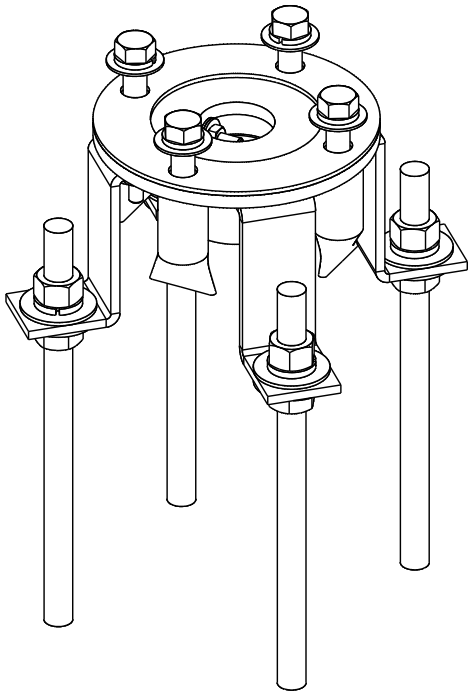
PRODUCT NAME: SAFESWAP Nº2 MEDIUM	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-55000-0570	DATE: 05/12/11	SHEET NO: 1/1	11"x17" SHEET SIZE

VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.
3. ENSURE THREADING INSERTS ARE INSERTED INTO HOUSING AND ARE FLUSH.
4. ENSURE THREADING LACK MATERIAL IS PRESENT ON INSERTS ELSE EQUIRE NEW UNIT

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	LABEL POSITION ADDED		08/21/12	AM	DC



ITEM NO.	Default/QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66159.302	ASSEMBLY FOR 55000.057			REL-01+
2	1	33501.0176	ANCHORING SYSTEM SW MEDIUM WELDING			REL-01
3	8	11155.013	FLAT WASHER 3/4"		STAINLESS STEEL 304	REL-01+
4	4	11155.009	FLAT WASHER 5/8"		STAINLESS STEEL 304	REL-01+
5	4	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	4	11155.000	LOCK WASHER 3/4"		STAINLESS STEEL 304	REL-01+
7	4	11155.011	LOCK WASHER 5/8"		STAINLESS STEEL 304	REL-01+
8	8	11150.000	NUT 3/4"-10UNC		STAINLESS STEEL 304	REL-01+
9	2	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
10	1	22061.090	GASKET 7 1/2"OD X 4 1/2" ID X 1/8"TH		EPDM, DURO 60	REL-01
11	4	11145.074	HEX BOLT 5/8"-11UNC X 2"LG		STAINLESS STEEL 304	REL-01+
12	4	11700.062	THREADED INSERT-5/8"-11 INT THREAD-7/8"-9 EXT THREAD		STAINLESS STEEL	REL-01
13	4	11145.053	3/4" ANCHOR STUD 12" LG		STAINLESS STEEL 304/304L	REL-01

VORTEX

APPROVALS	DATE
DESIGNED AMOISE	08/13/08
DRAWN AMOISE	08/13/08
CHECKED DC	

COMMENTS

PRODUCT NAME: SAFESWAP No 2

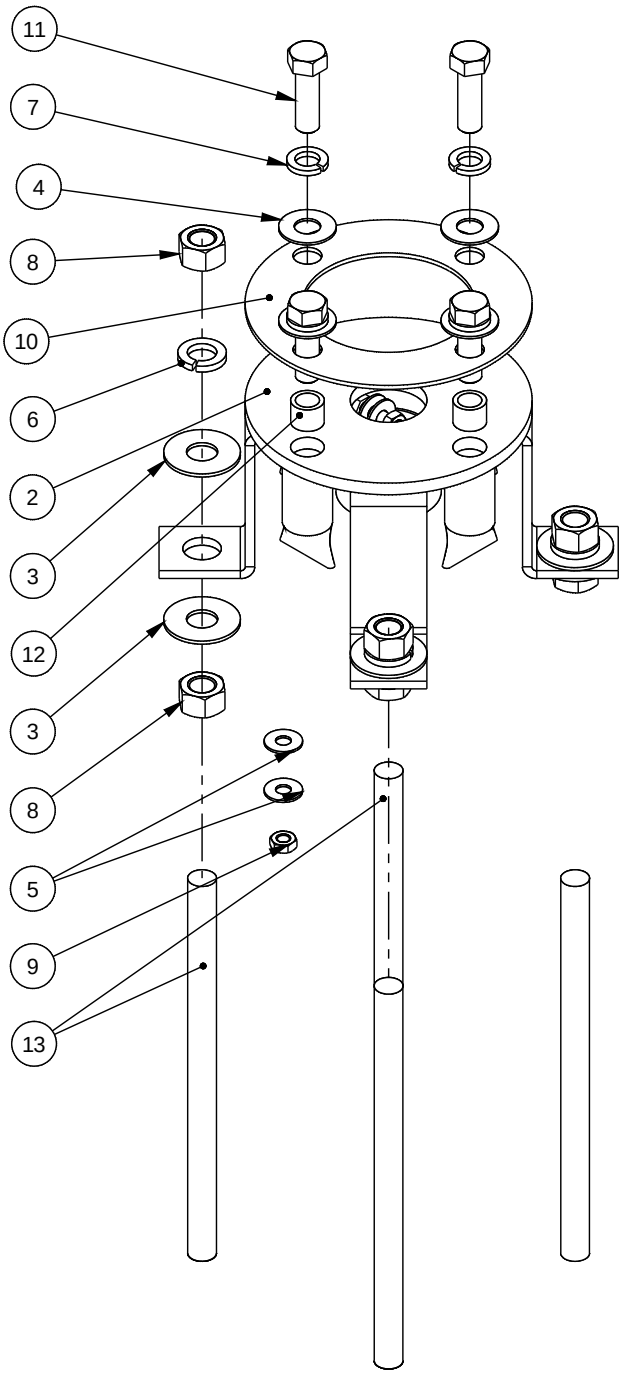
DRAWING TYPE: ASSEMBLY

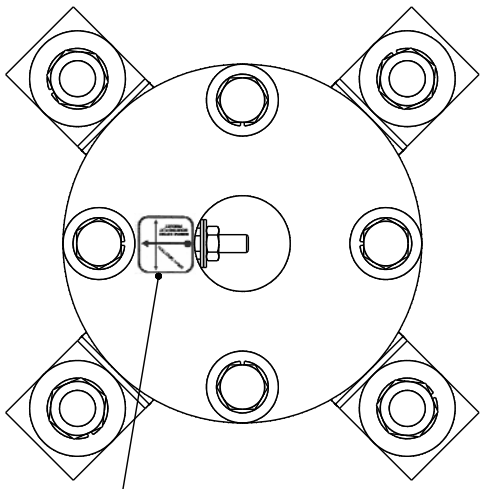
SIZE FORMAT	ASSY NO.		DWG REV.
A	55000.057REL-01		REL-02
	UNITS: INCH	SCALE: ---	SHEET: 1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.
3. ENSURE THREADING INSERTS ARE INSERTED INTO HOUSING AND ARE FLUSH.
4. ENSURE THREADING LACK MATERIAL IS PRESENT ON INSERTS ELSE EQUIRE NEW UNIT

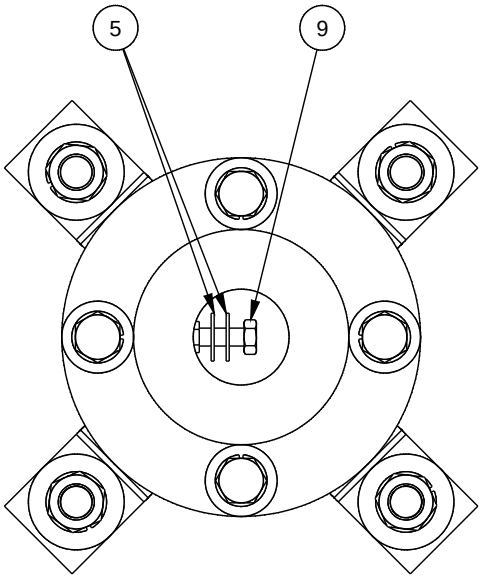
REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	LABEL POSITION ADDED		08/21/12	AM	DC





R2

LABEL "SPRAY DIRECTION" TO BE INSTALLED ON ITEM 2 (33501.0176), ARROW POINTING TOWARDS OUTSIDE



APPROVALS	DATE
DESIGNED AMOISE	08/13/08
DRAWN AMOISE	08/13/08
CHECKED DC	

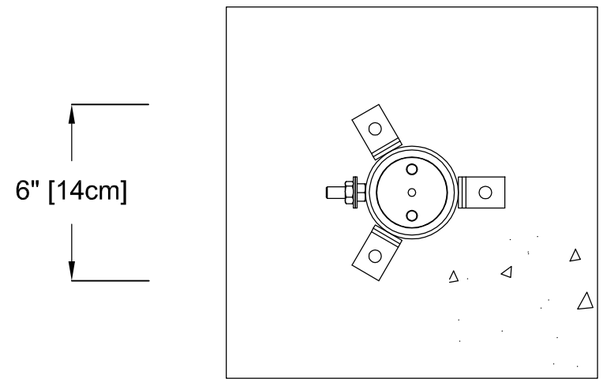
COMMENTS

PRODUCT NAME: SAFESWAP No 2

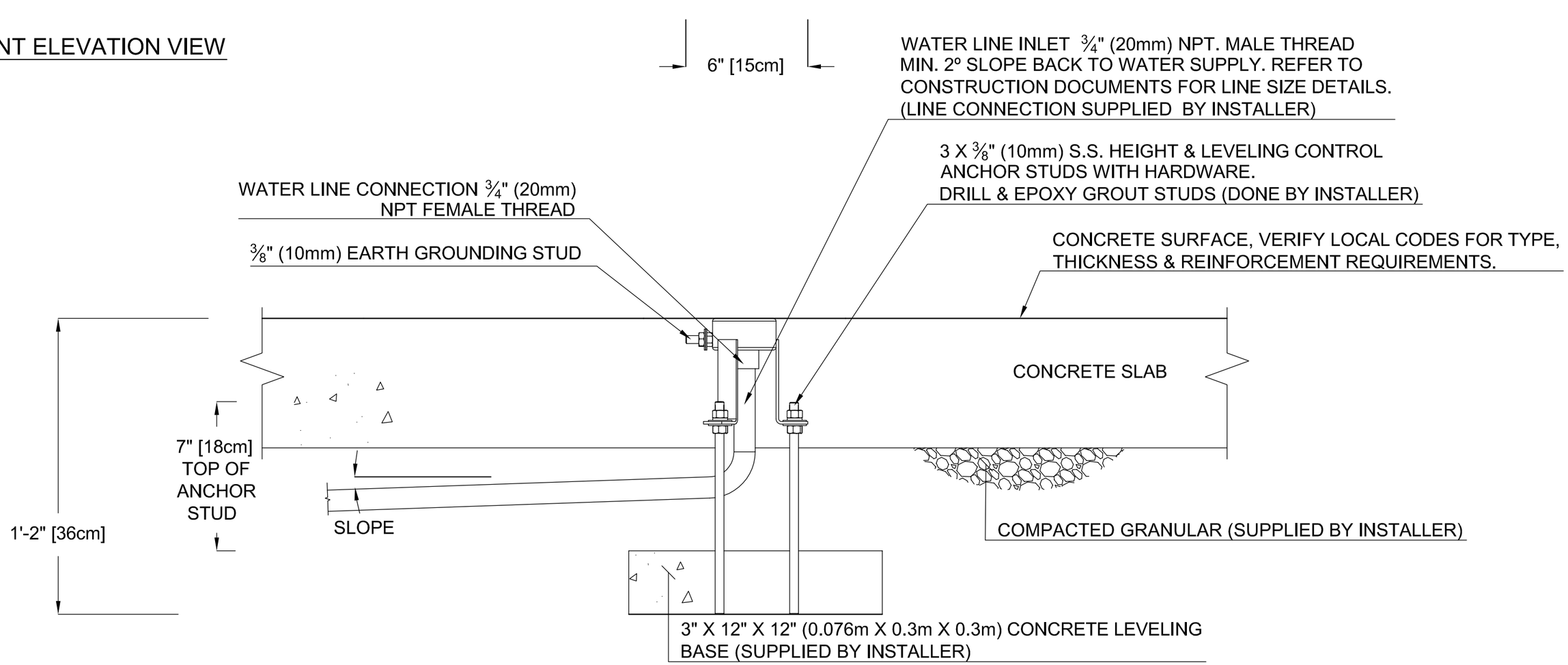
DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.		DWG REV.
A	55000.057REL-01		REL-02
	UNITS: INCH	SCALE: ---	SHEET: 2 OF 2

PLAN VIEW



FRONT ELEVATION VIEW



VOR-7512.0XXX JET STREAM (Construction Detail)

PRODUCT NAME: JET STREAM	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7512.0XXX	DATE: 03/26/13	SHEET NO: 1/1	11"x17" SHEET SIZE

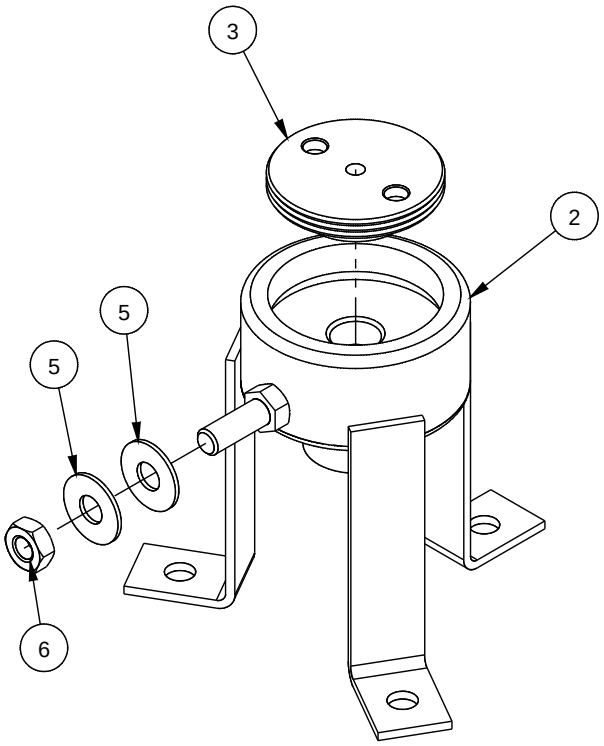
VORTEX

NOTES :

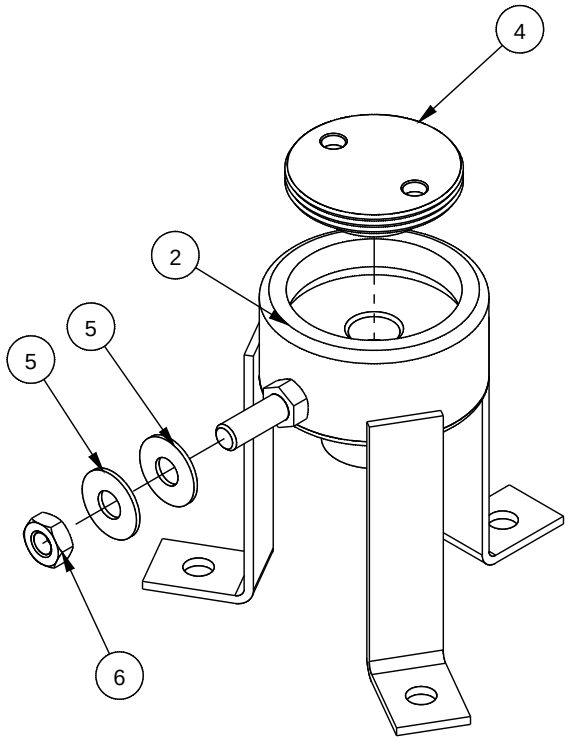
1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



SUMMER CONFIGURATION



WINTER CONFIGURATION
(TO BE SHIPPED IN THIS POSITION)

ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66029.127	ASSEMBLY OF JET STREAM (VOR-7512.0000)			REL-01
2	1	33500.395	SMALL INTERCHANGEABLE GROUND SPRAY BASE		STAINLESS STEEL 304	REL-02
3	1	22136.179	JET STREAM NOZZLE		BRASS	REL-02
4	1	22136.178	SMALL WINTER CAP		BRASS	REL-02
5	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+

VORTEX

APPROVALS	DATE
DESIGNED apreda	05/25/06
DRAWN apreda	05/25/06
CHECKED	

COMMENTS

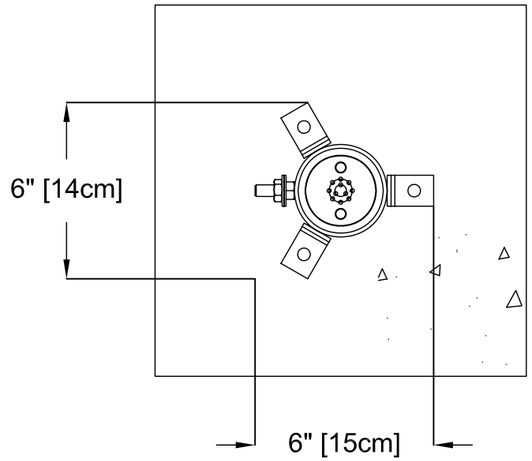
PRODUCT NAME: JET STREAM

DRAWING TYPE: ASSEMBLY

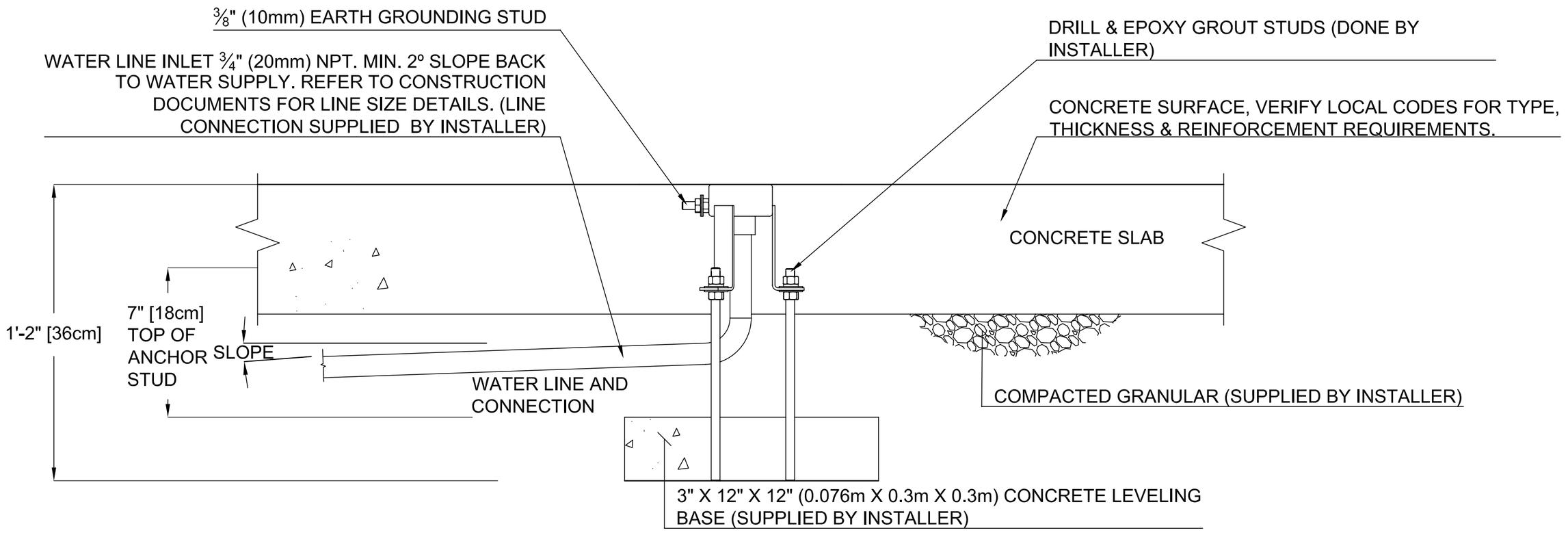
SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7512.0000REL-01	REL-02

UNITS	SCALE	SHEET
INCH	---	1 OF 1

PLAN VIEW



FRONT ELEVATION VIEW



VOR-7513.0XXX FOUNTAIN SPRAY (Construction Detail)

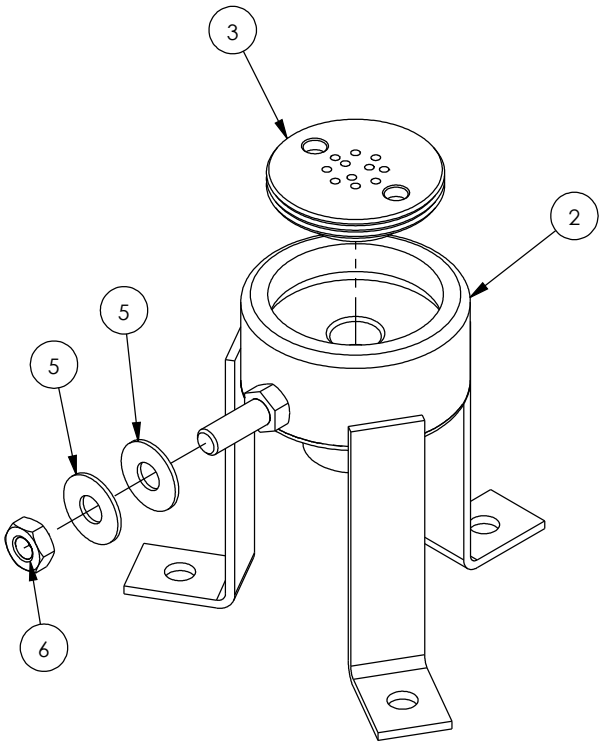
PRODUCT NAME: FOUNTAIN SPRAY	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7513.0XXX	DATE: 06/16/09	SHEET NO: 1/1	11"x17" SHEET SIZE

VORTEX

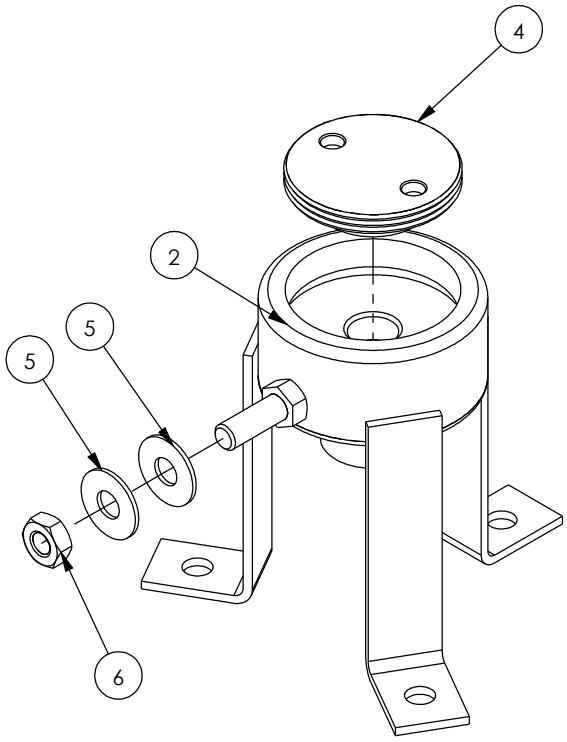
NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



SUMMER CONFIGURATION



WINTER CONFIGURATION
(TO BE SHIPPED IN THIS POSITION)

ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66029.128	ASSEMBLY OF FOUNTAIN SPRAY (VOR-7513.0000)			REL-01
2	1	33500.395	SMALL INTERCHANGEABLE GROUND SPRAY BASE		STAINLESS STEEL 304	REL-02
3	1	22136.180	FOUNTAIN SPRAY CAP		BRASS	REL-02
4	1	22136.178	SMALL WINTER CAP		BRASS	REL-02
5	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+

VORTEX

APPROVALS	DATE
DESIGNED apreda	05/25/06
DRAWN apreda	05/25/06
CHECKED	

PRODUCT NAME: FOUNTAIN SPRAY

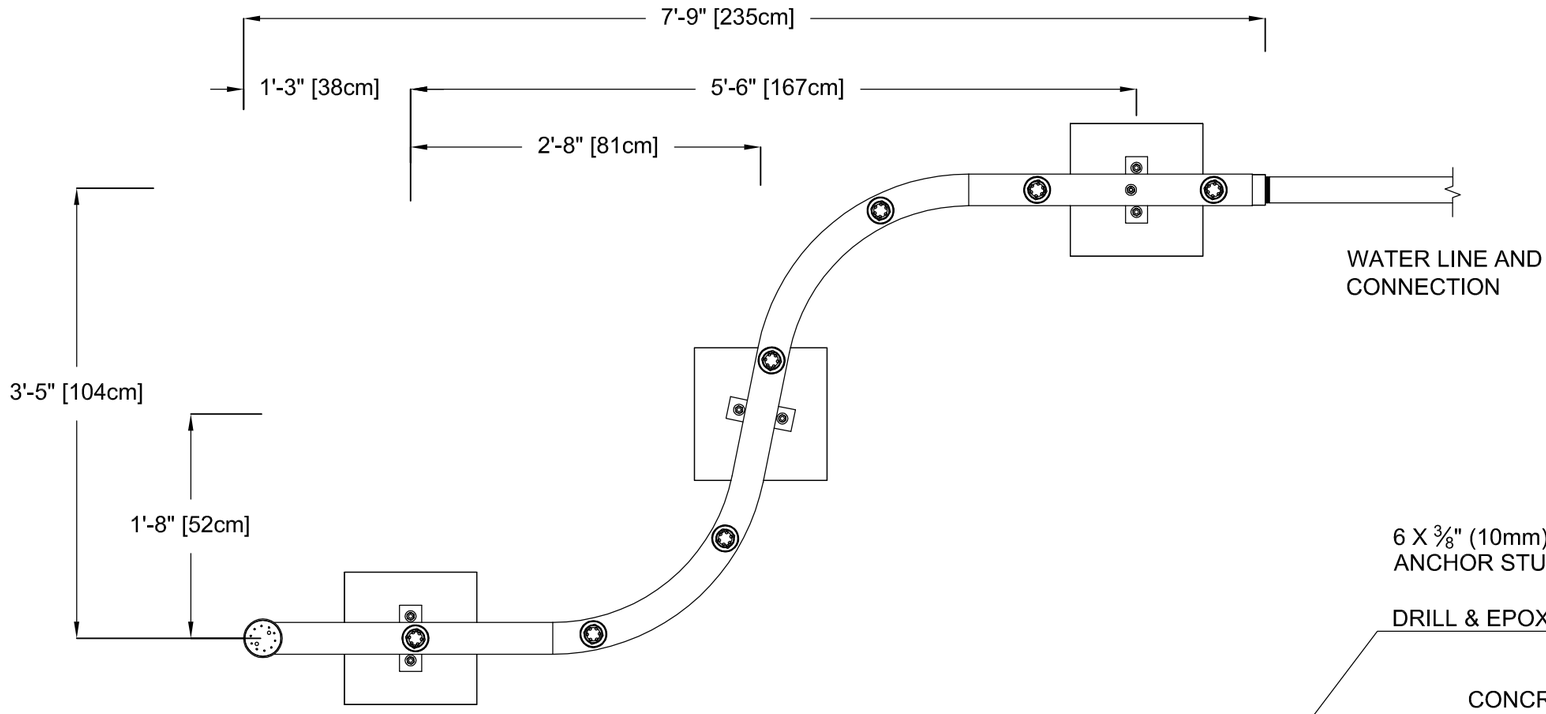
DRAWING TYPE: ASSEMBLY

COMMENTS

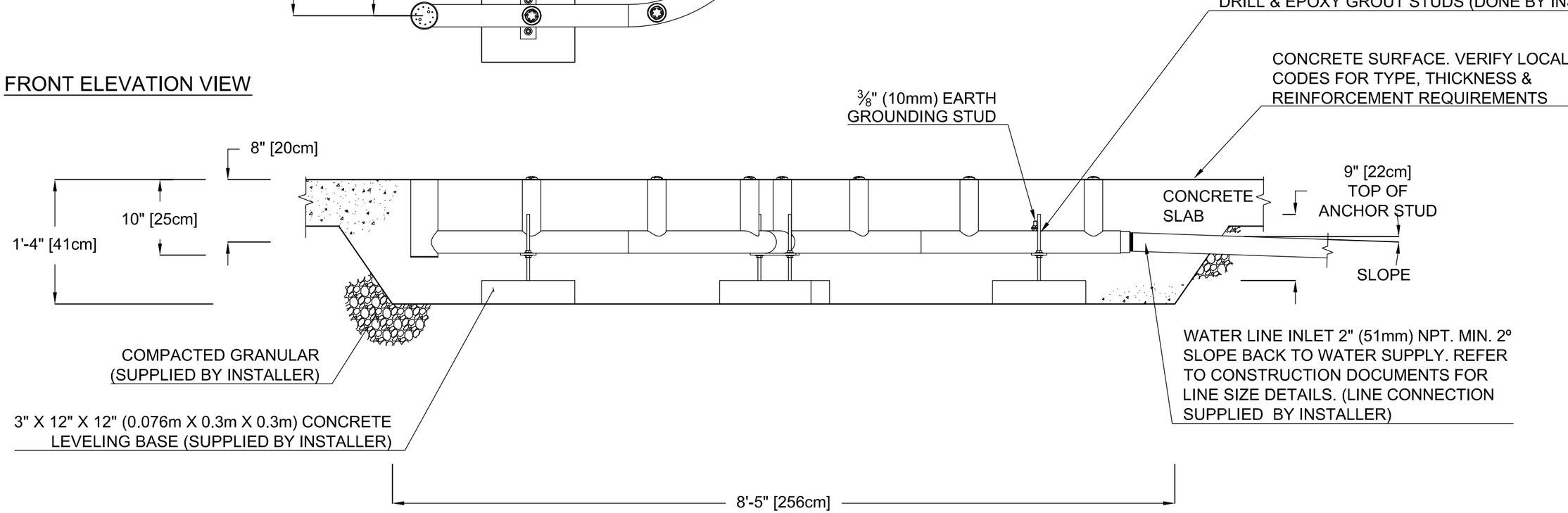
SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7513.0000REL-01	REL-02

UNITS	SCALE	SHEET
INCH	---	1 OF 1

PLAN VIEW



FRONT ELEVATION VIEW



VOR-7640.0XXX TEAM SPRAY Nº1 (Construction Detail)

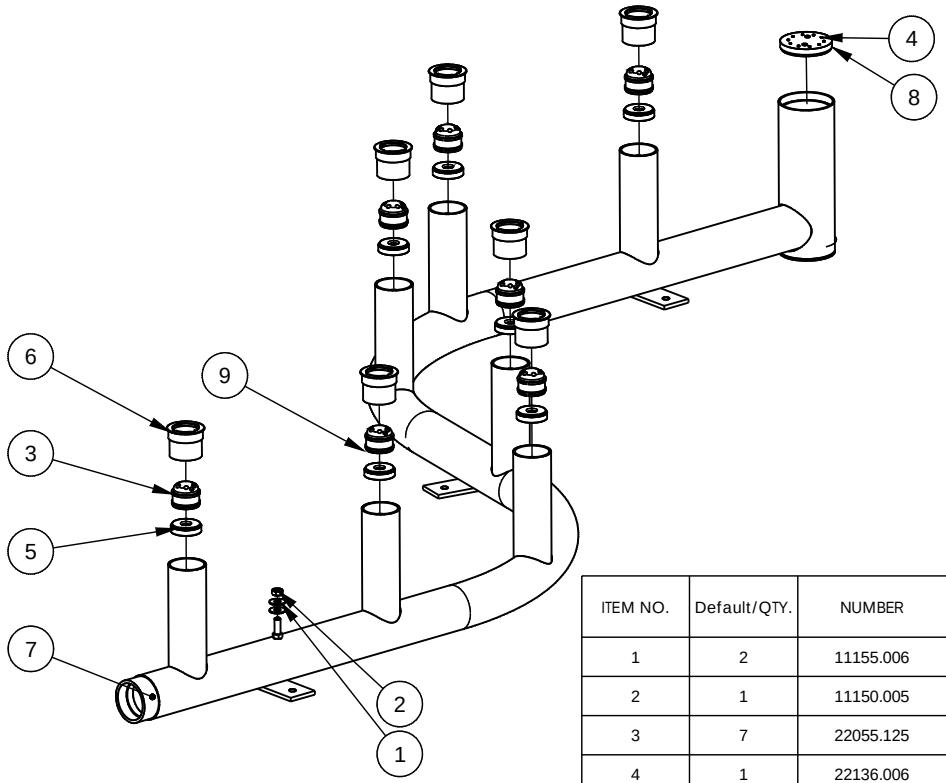
PRODUCT NAME: TEAM SPRAY 01	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7640.0XXX	DATE: 11/03/11	SHEET NO: 1/1	11"x17" SHEET SIZE

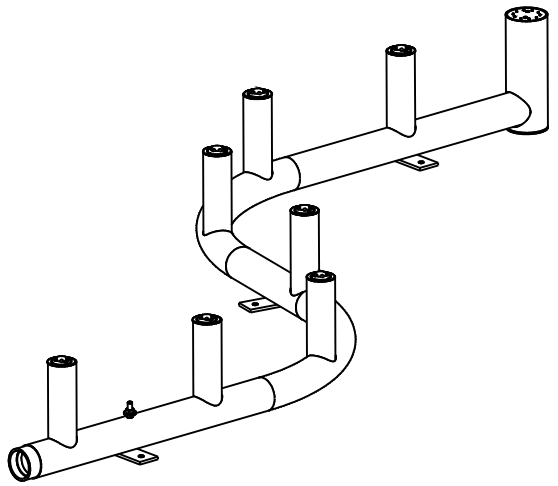
VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	COST REDUCTION	N/A	04/13/07	AP	DC
REL-03	MAJOR REVISION (R3)FOR 33500.139	1362	07/07/09	AP	DC
REL-04	CHILD REV.	1592	01/25/13	SJ	DC





R4 R3

ITEM NO.	Default/QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
2	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
3	7	22055.125	POD SPRAY PROJECTION NOZZLE 6 HOLE PATTERN		UHMW - BLUE	REL-01+
4	1	22136.006	DISK 3 1/4"OD X 1/2"TH CAP 3" SPRAY 10 HOLES		BRASS	REL-01+
5	7	22136.025	PLUG 2" PIPE SIZE POD SPRAY		BRASS	REL-01+
6	7	22160.012	POD SPRAY NOZZLE SLEEVE		BRASS	REL-01+
7	1	33500.139	TEAM SPRAY 01 WELDING			REL-04
8	1	22136.004	DISK 3 1/4"OD X 1/2"TH CAP 3" WINTER		BRASS	REL-01+
9	7	22126.005	WINTER CAP SPRAY 2" PIPE SIZE CUSTOM THREAD (LONG) BRASS		BRASS, LEAD FREE	REL-01+
10	1	66019.467	ASSEMBLY FOR VOR-7640.0000			REL-01

VORTEX

APPROVALS	DATE
DESIGNED APREDA	05/24/05
DRAWN SJIE	05/24/05
CHECKED DC	
COMMENTS	

PRODUCT NAME: TEAM SPRAY 01

DRAWING TYPE: ASSEMBLY

SIZE FORMAT: A

ASSY NO.: VOR-7640.0000REL-02

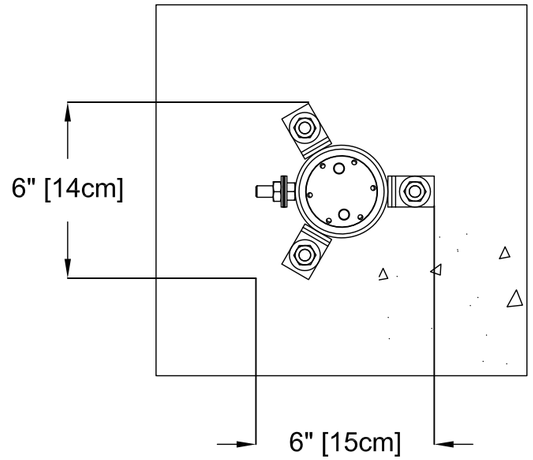
DWG REV.: REL-04

UNITS: INCH

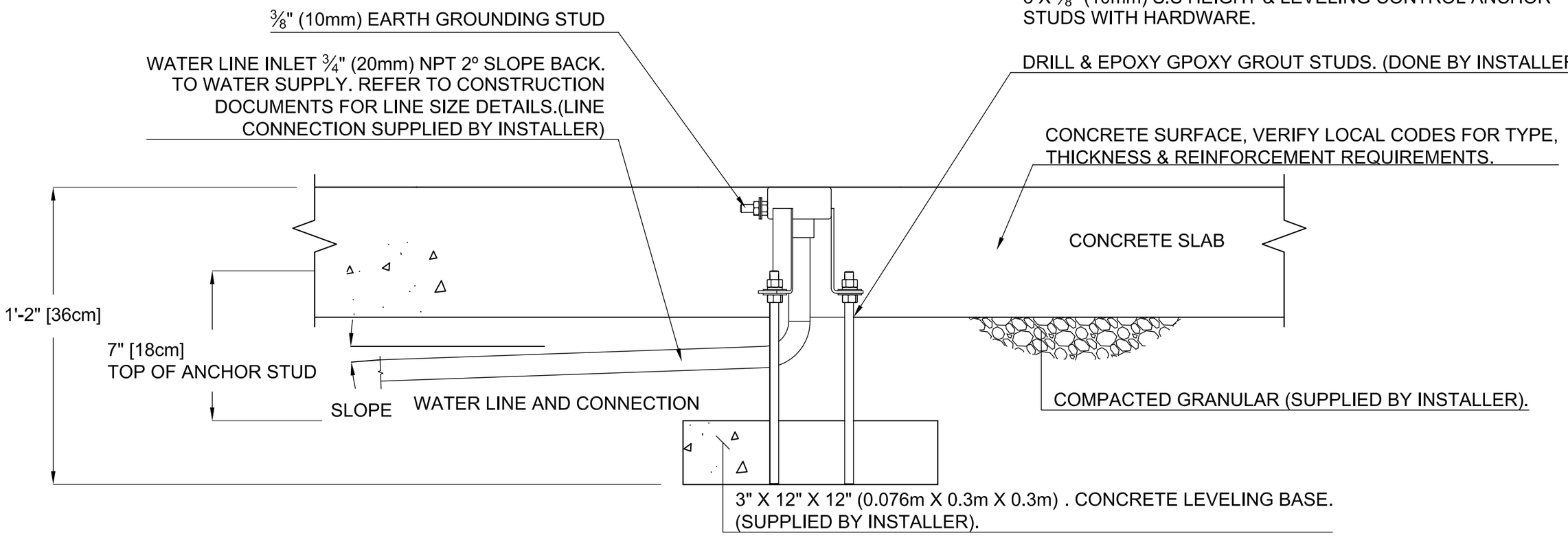
SCALE: ---

SHEET: 1 OF 1

PLAN VIEW



FRONT ELEVATION VIEW



VOR-0301.4xxx GROUND GEYSER (Construction Detail)

PRODUCT NAME: GROUND GEYSER	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-301.4XXX	DATE: 06/16/09	SHEET NO: 1/1	11"x17" SHEET SIZE

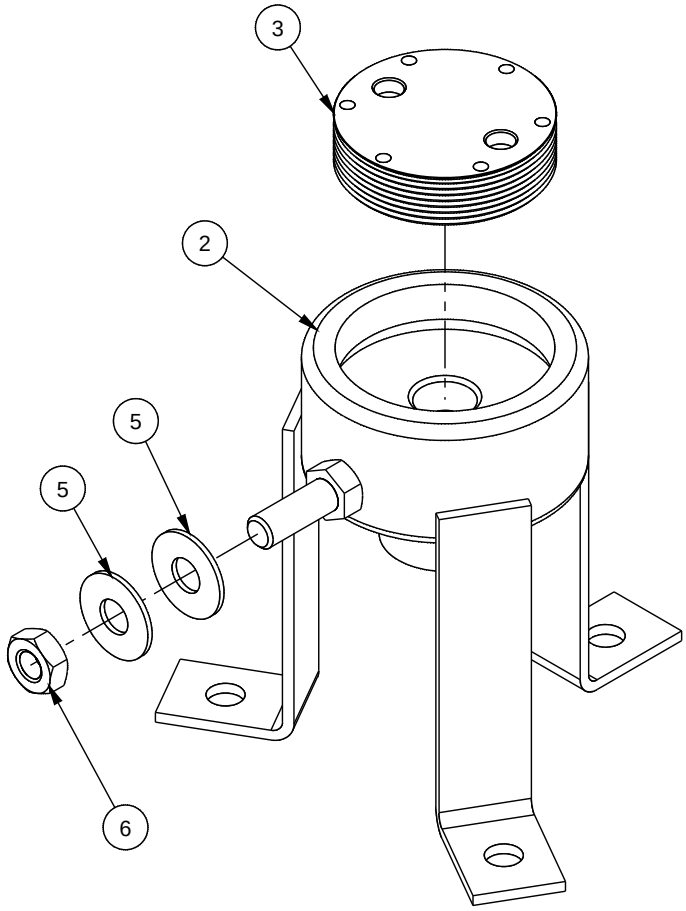
VORTEX

NOTES :

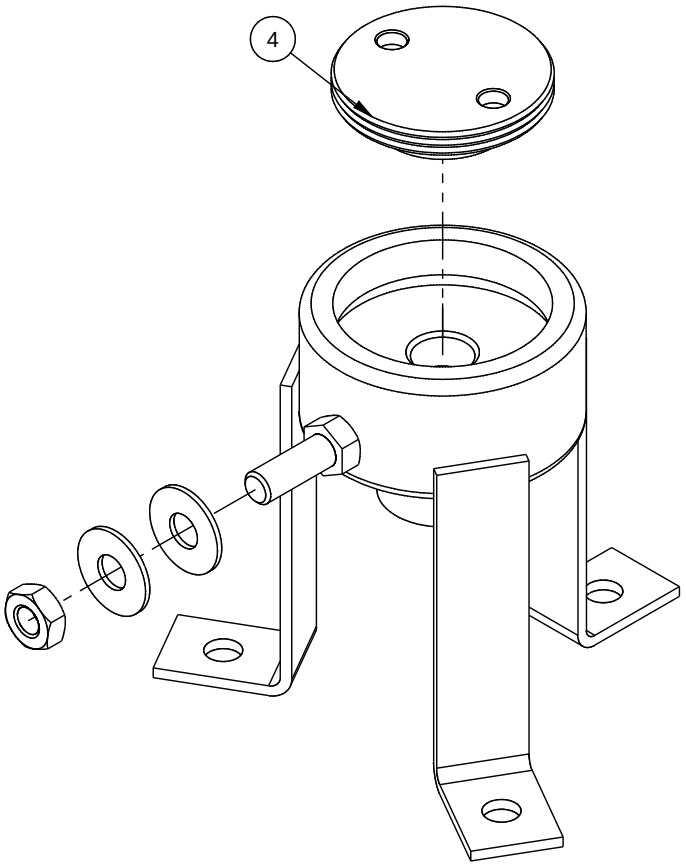
1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



SUMMER CONFIGURATION



WINTER CONFIGURATION (TO BE SHIPPED IN THIS POSITION)

ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66029.107	ASSEMBLY OF GROUND GEYSER-LOW CONSUMPTION (VOR-0301.4100)			REL-01
2	1	33500.395	SMALL INTERCHANGEABLE GROUND SPRAY BASE		STAINLESS STEEL 304	REL-02
3	1	22136.176	DIRECTIONAL LOW FLOW-GROUND GEYSER NOZZLE		BRASS	REL-01
4	1	22136.178	SMALL WINTER CAP		BRASS	REL-02
5	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+

VORTEX

APPROVALS	DATE
DESIGNED apreda	05/17/06
DRAWN SJIE	05/17/06
CHECKED	

PRODUCT NAME: GROUND GEYSER-LOW CONSUMPTION

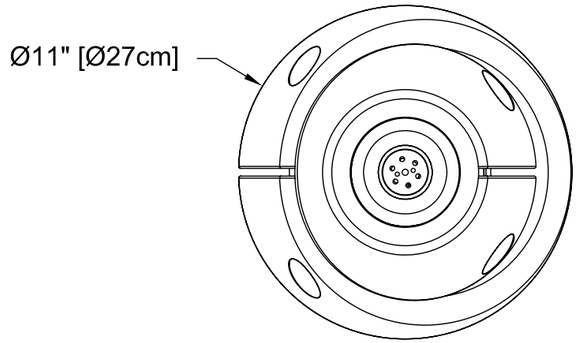
DRAWING TYPE: ASSEMBLY

COMMENTS

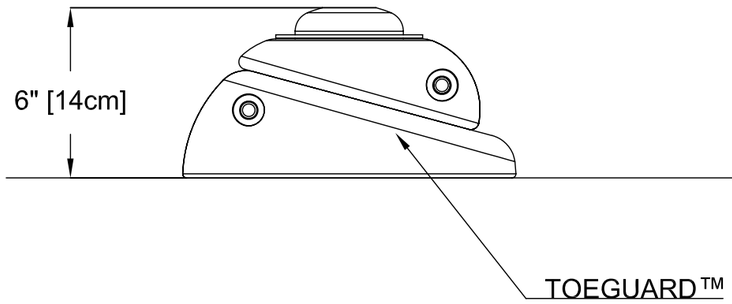
SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-0301.4100REL-03	REL-04

UNITS	SCALE	SHEET
INCH	---	1 OF 1

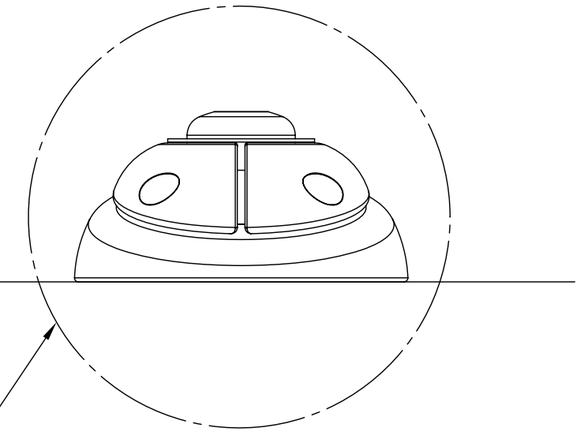
PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



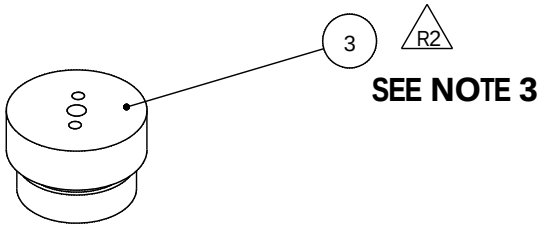
VOR-1339.2XXX VOLCANO (Construction Detail)

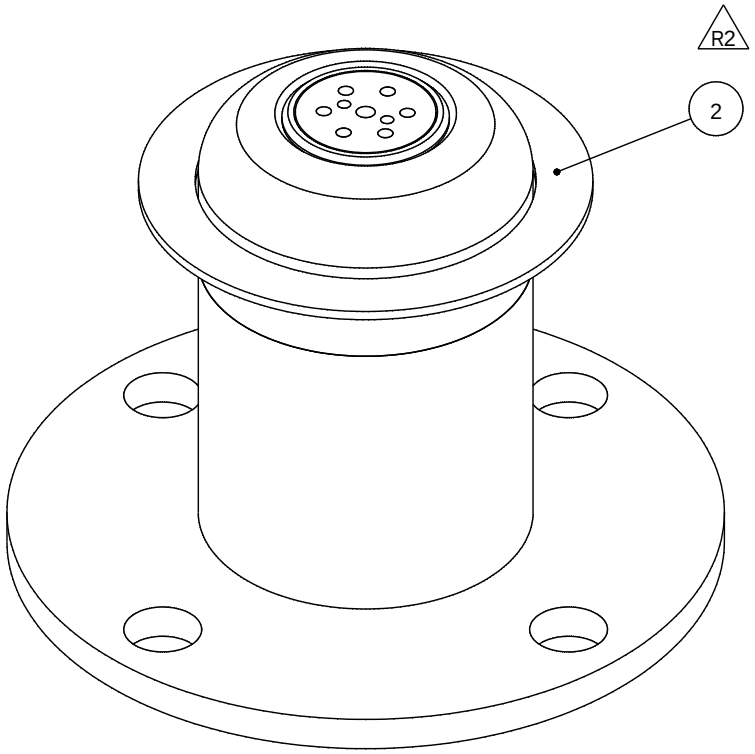
PRODUCT NAME: VOLCANO	PRODUCT INFORMATION		VORTEX
PRODUCT NUMBER: VOR-1339.2XXX	DATE: 06/18/09	SHEET NO: 1/1	11"x17" SHEET SIZE

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.
3. DON'T INSTALL THE WINTER CAPS BUT INSURE THE ITEM WITH THE PRODUCT.

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	REMOVE TOE GUARD & UPDATE SUB-ASSY.	1268	11/18/08	MKHALIL	DC





	ITEM NO.	Default/ QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
	1	1	66159.070	ASSEMBLY FOR VOR-1339.2000			REL-01+
R2	2	1	33900.848	POWER VOLCANO 01 w/ MED. FLANGE ASSEMBLY			REL-01
R2	3	1	22160.026	WINTER CAP 1 1/2"		BRASS, LEAD FREE	REL-01

VORTEX

APPROVALS	DATE
DESIGNED MKHALIL	11/18/08
DRAWN MKHALIL	11/18/08
CHECKED DC	

PRODUCT NAME: VOLCANO (SW)

DRAWING TYPE: ASSEMBLY

COMMENTS

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-1339.2000REL-02	REL-02

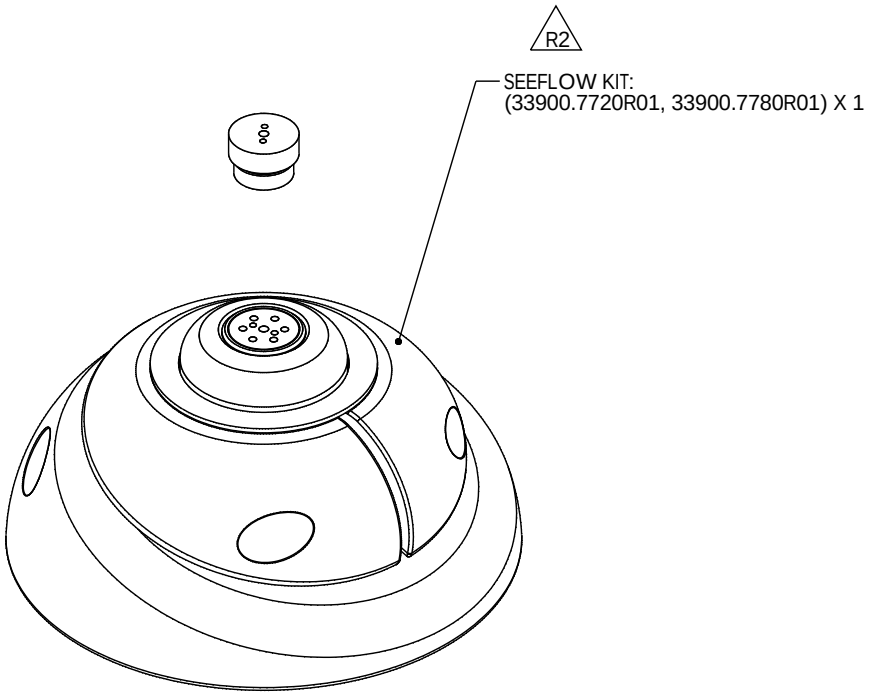
UNITS	SCALE	SHEET
INCH	---	1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	REMOVE TOE GUARD & UPDATE SUB-ASSY.	1268	11/18/08	MKHALIL	DC



APPROVALS	DATE
DESIGNED MKHALIL	11/18/08
DRAWN MKHALIL	11/18/08
CHECKED DC	

COMMENTS

PRODUCT NAME: VOLCANO (SW)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-1339.2000REL-02	REL-02

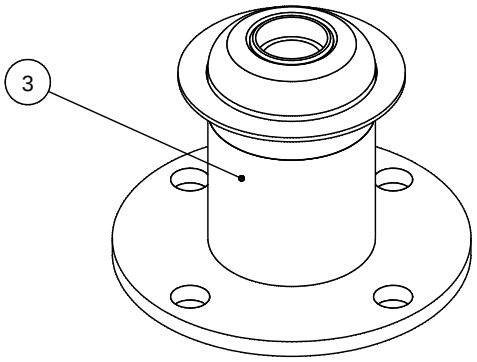
UNITS	SCALE	SHEET
INCH	---	2 OF 2

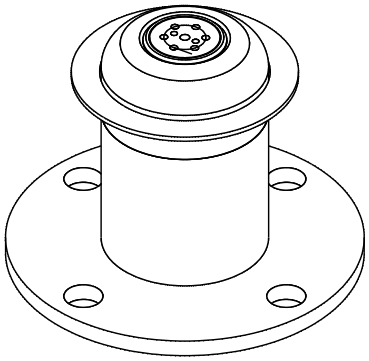
NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.





ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66159.427	ASSEMBLY FOR 33900.848			REL-01+
2	1	22160.003	NOZZLE 1 1/2"		BRASS, LEAD FREE	REL-02
3	1	33000.845	POWER VOLCANO 01 w/ MED. FLANGE PAINTING			REL-01

VORTEX

APPROVALS	DATE
DESIGNED MKHALIL	10/06/08
DRAWN MKHALIL	10/06/08
CHECKED DC	

PRODUCT NAME: POWER VOLCANO 01 w/ MED. FLANGE ASSEMBLY

DRAWING TYPE: ASSEMBLY

COMMENTS

SIZE FORMAT: A

ASSY NO.: 33900.848REL-01

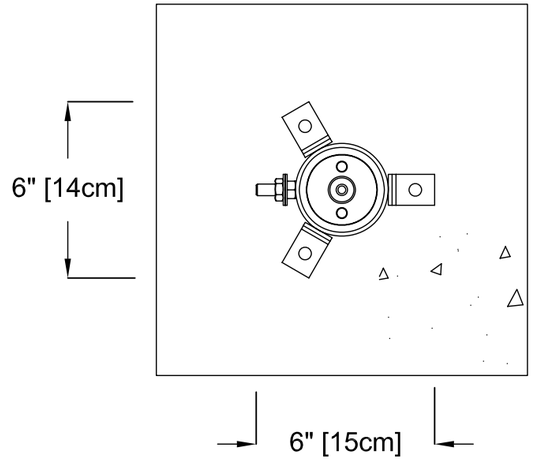
DWG REV.: REL-01

UNITS: INCH

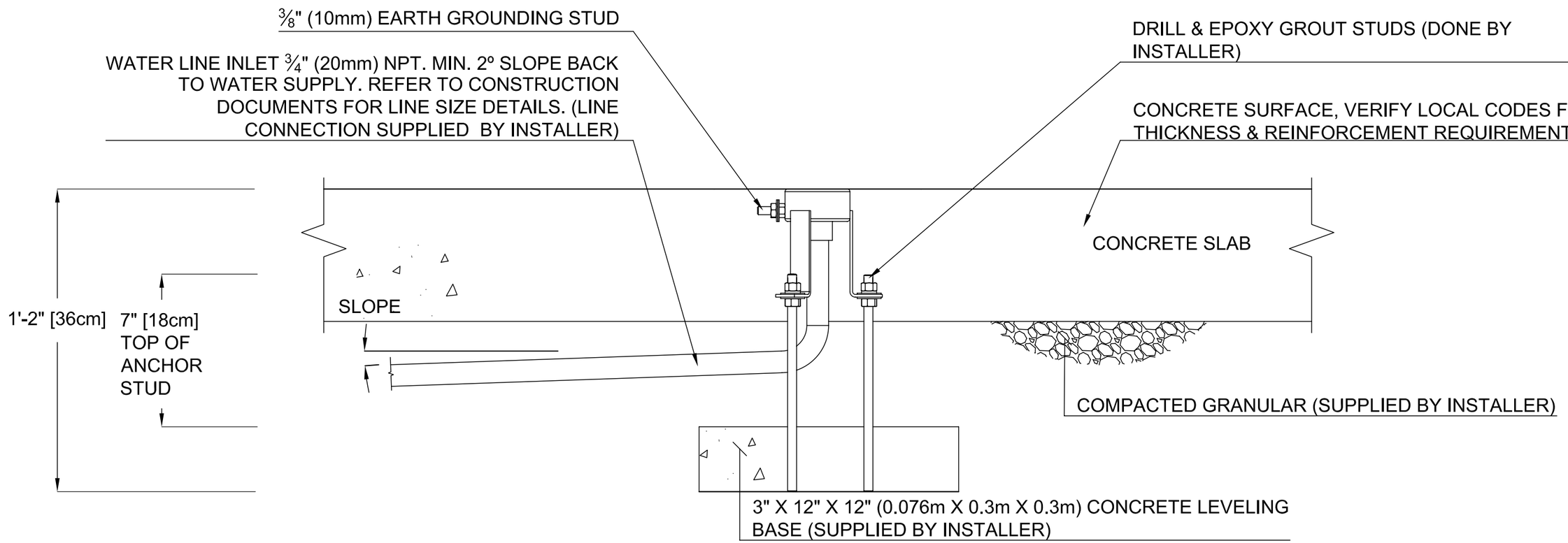
SCALE: ---

SHEET: 1 OF 1

PLAN VIEW



FRONT ELEVATION VIEW



VOR-0305.4XXX DIRECTIONAL WATER JET (Construction Detail)

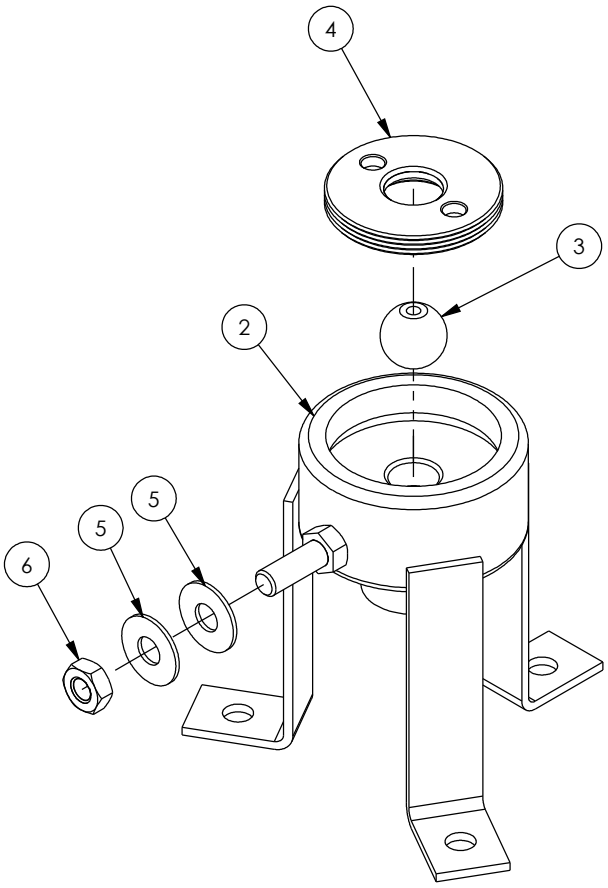
PRODUCT NAME: DIRECTIONAL WATER JET	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-0305.4XXX	DATE: 06/18/09	SHEET NO: 1/1	11"x17" SHEET SIZE

VORTEX

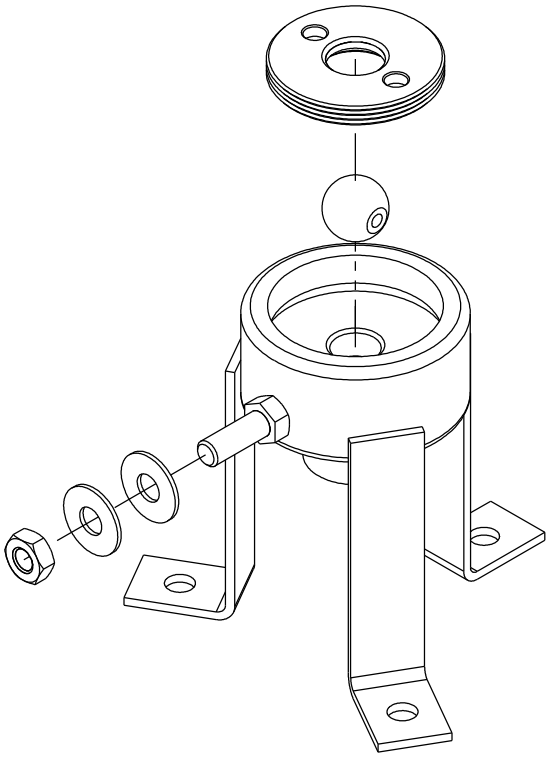
NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



SUMMER CONFIGURATION



WINTER CONFIGURATION

DIRECTIONAL SHOULD BE SET ON WINTER CONFIGURATION BEFORE SHIPPING.

ITEM NO.	Default/QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66029.327	ASSEMBLY FOR VOR-0305.4100			REL-01
2	1	33500.395	SMALL INTERCHANGEABLE GROUND SPRAY BASE		STAINLESS STEEL 304	REL-02
3	1	22140.001	BALL 0.870 BRASS WITH HOLE 0.19"		BRASS	REL-01
4	1	22136.151	UPPER RING 2"NPSH 0.30"TH		BRASS	REL-01
5	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+

VORTEX

APPROVALS	DATE
DESIGNED apreda	09/26/06
DRAWN SJIE	09/26/06
CHECKED	

COMMENTS

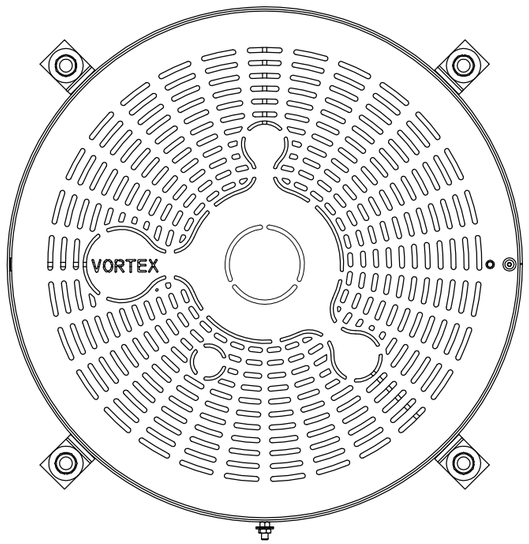
PRODUCT NAME: DIRECTIONAL WATER JET/INTERCHANGEABLE/Low Consumption

DRAWING TYPE: ASSEMBLY

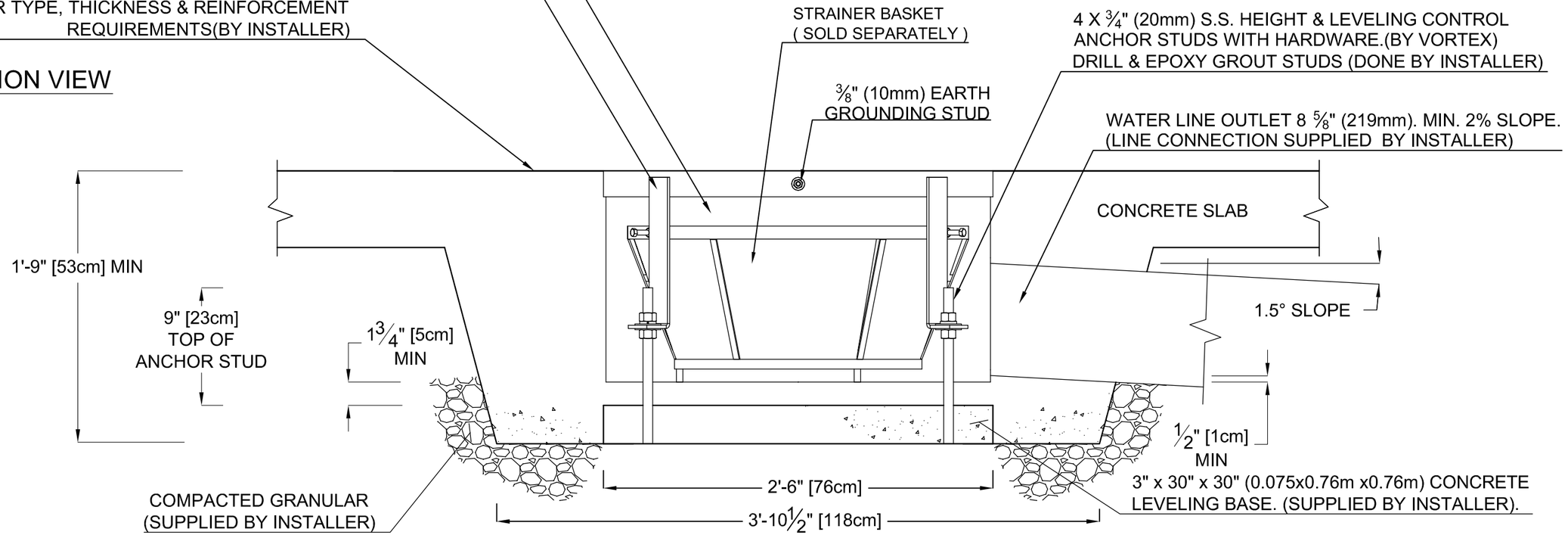
SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-0305.4100REL-01	REL-01

UNITS	SCALE	SHEET
INCH	---	1 OF 1

PLAN VIEW



FRONT ELEVATION VIEW



VOR-1001.4000 PLAYSAFE DRAIN, No1 (Construction Detail)

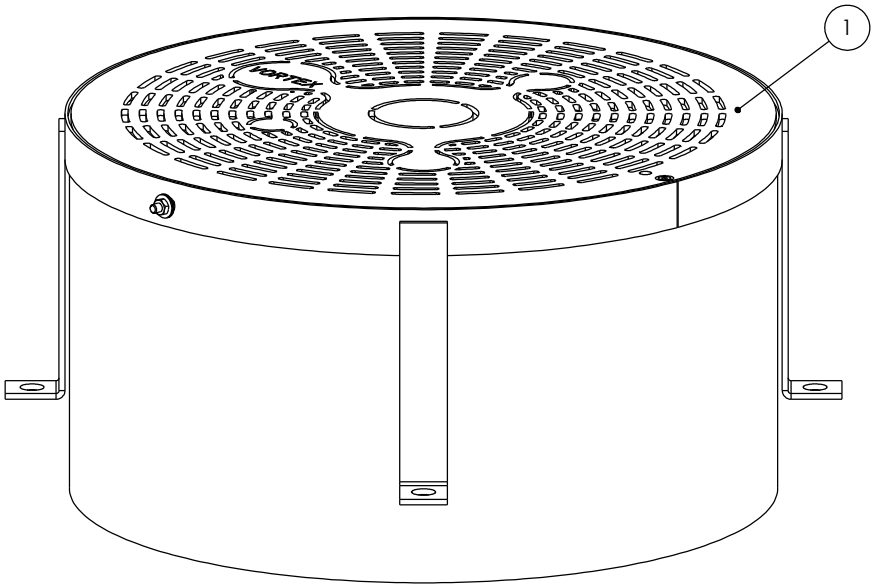
PRODUCT NAME: PLAYSAFE DRAIN, No1	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-1001.4000	DATE: 07/29/11	SHEET NO: 1/1	11"x17" SHEET SIZE

VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	NEW ASSEMBLY		03/12/11	SJ	DC



	ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
R2	1	1	33903.0297	DECK DRAIN No 1 (EXPANSION), ASSEMBLY			REL-01

APPROVALS	DATE
DESIGNED SJIE	03/10/10
DRAWN SJIE	03/11/10
CHECKED DC	

PRODUCT NAME: DECK DRAIN No 1

DRAWING TYPE: ASSEMBLY

COMMENTS

SIZE FORMAT: A

ASSY NO.: VOR-1001.4000REL-02

DWG REV.: REL-02

UNITS: INCH

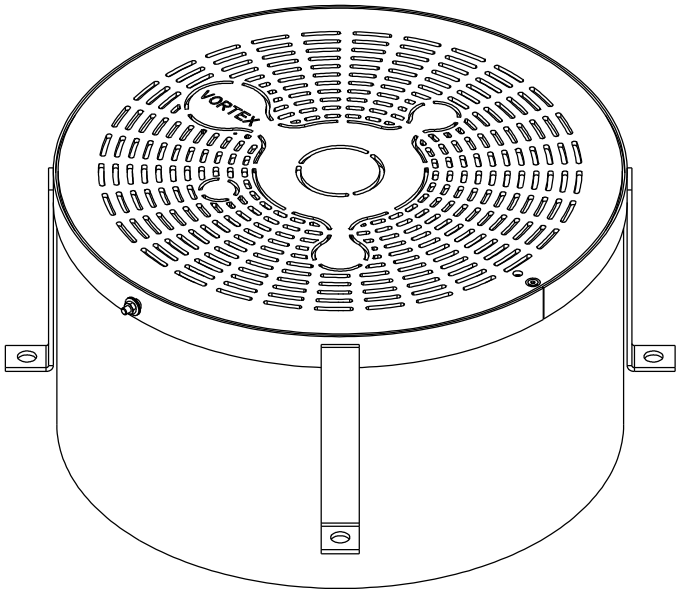
SCALE: ---

SHEET: 1 OF 1

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66179.345	ASSEMBLY FOR 33903.0297			REL-01+
2	1	33501.1228	DECK DRAIN No 1 FRAME (EXPANSION), WELDING			REL-01
3	1	33001.0720	DECK DRAIN No1 COVER (EXPANSION), PAINTING			REL-01
4	1	11147.0300	FLAT HEAD SOCKET CAP SCREW 3\8"-16UNC X 2" LG SS316		STAINLESS STEEL 316	REL-01+
5	2	11156.0000	FLAT WASHER 3/8" SS316		STAINLESS STEEL 316	REL-01+
6	1	11152.0000	NUT 3/8"-16UNC SS316		STAINLESS STEEL 316	REL-01+
7	1	11055.0693	EPS BLANC 1.0 PCF (EXPANDED POLYSTYRENE) 29 5/8" DIA X 15"HEIGHT		EXPANDED POLYSTYRENE (EPS BLANC 1.0 PCF)	REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	01/14/11
DRAWN SJIE	01/17/11
CHECKED DC	

PRODUCT NAME: DECK DRAIN No 1 (EXPANSION), ASSEMBLY

DRAWING TYPE: ASSEMBLY

COMMENTS

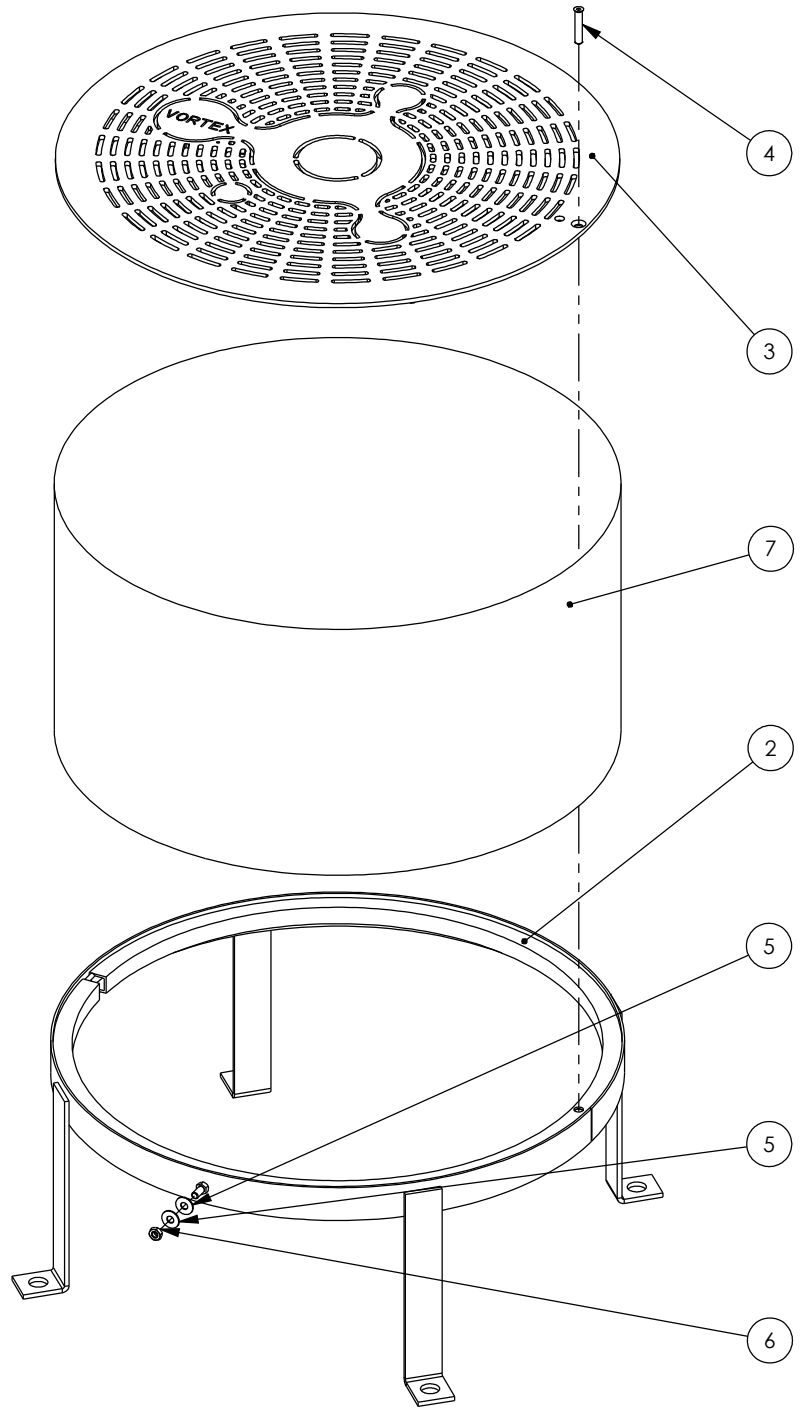
SIZE FORMAT	ASSY NO.	DWG REV.
A	33903.0297REL-01	REL-01

UNITS	SCALE	SHEET
INCH	---	1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



APPROVALS	DATE
DESIGNED SJIE	01/14/11
DRAWN SJIE	01/17/11
CHECKED DC	
COMMENTS	

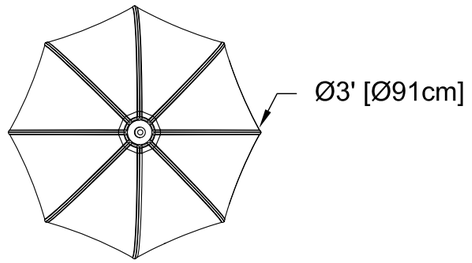
PRODUCT NAME: DECK DRAIN No 1 (EXPANSION), ASSEMBLY

DRAWING TYPE: ASSEMBLY

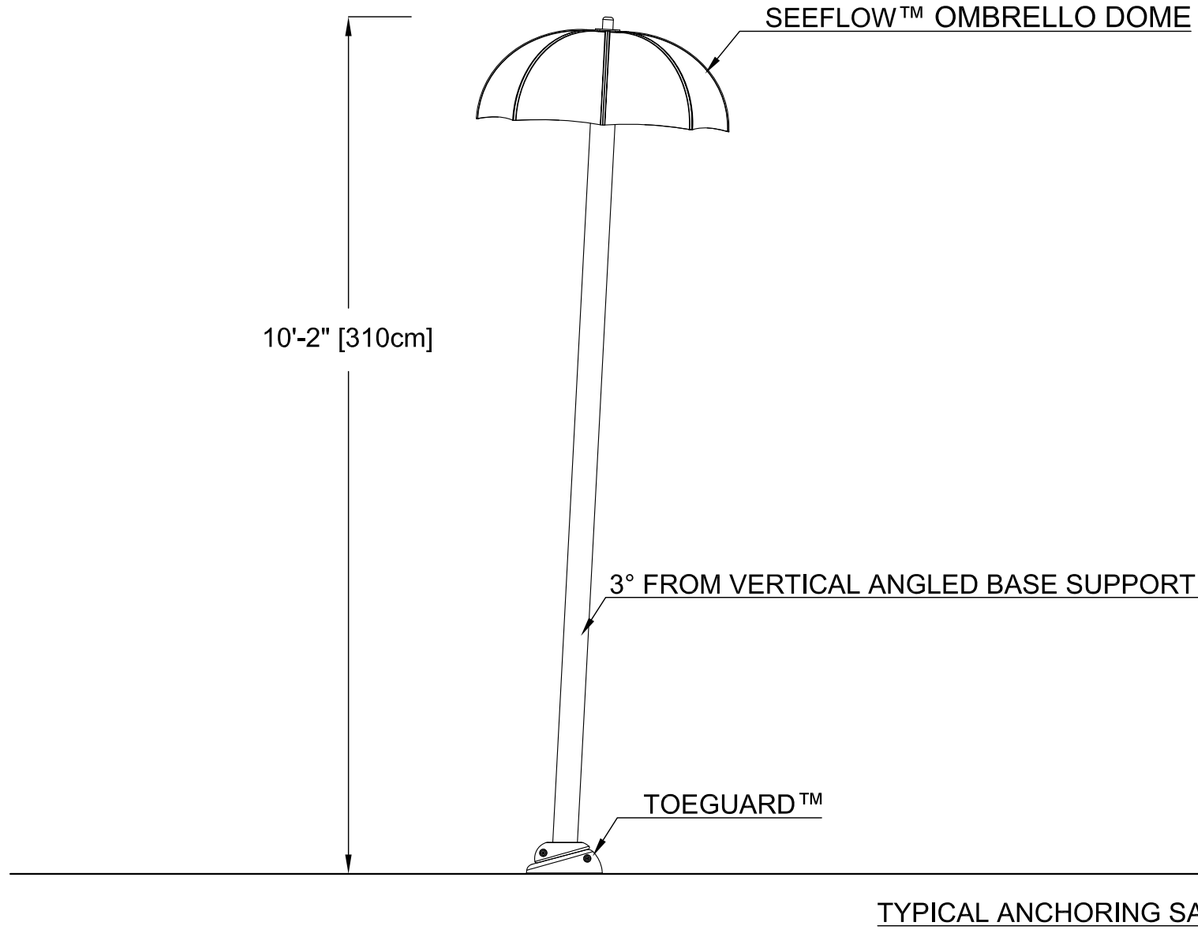
SIZE FORMAT	ASSY NO.	DWG REV.
A	33903.0297REL-01	REL-01

UNITS	SCALE	SHEET
INCH	---	2 OF 2

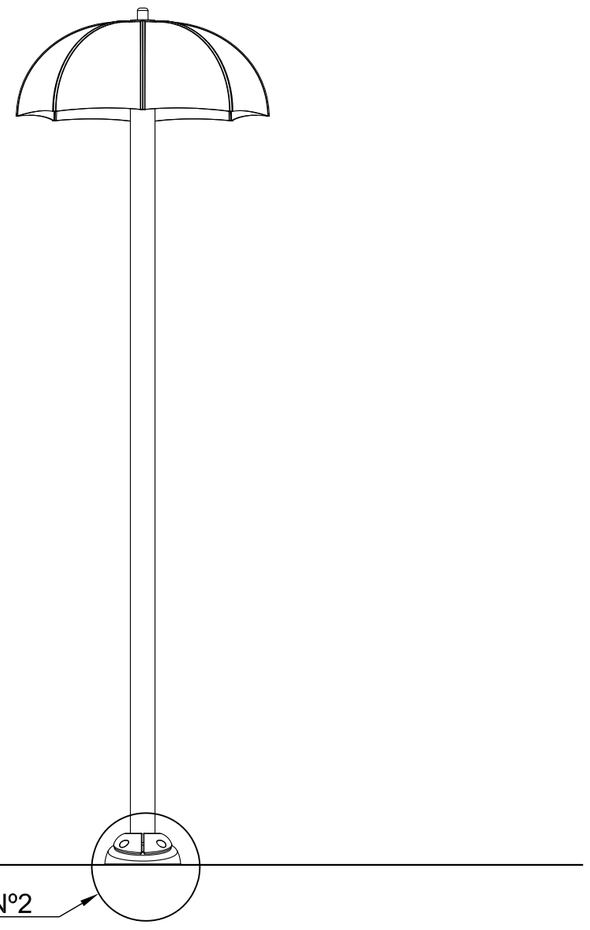
PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



VOR-7440.2XXX OMBRELLO Nº2 (Construction Detail)

PRODUCT NAME: OMBRELLO Nº2	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7440.2XXX	DATE: 10/17/12	SHEET NO: 1/1	11"x17" SHEET SIZE

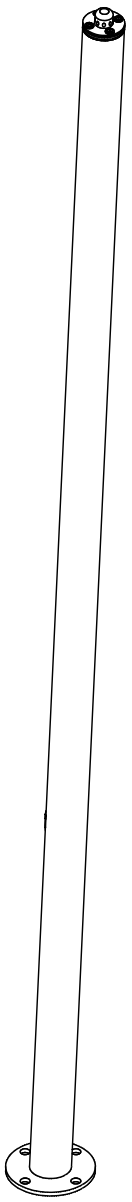
VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	FPE		05/14/13	SJ	DC



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	33903.0697	OMBRELLO No2 (SW,SF) ASSEMBLY			REL-01

R2

VORTEX

APPROVALS	DATE
DESIGNED SJIE	08/03/12
DRAWN SJIE	08/03/12
CHECKED DC	

COMMENTS

PRODUCT NAME: OMBRELLO No2 (SW,SF)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT: A

ASSY NO.: VOR-7440.2009REL-02

DWG REV.: REL-02

UNITS: INCH

SCALE: ---

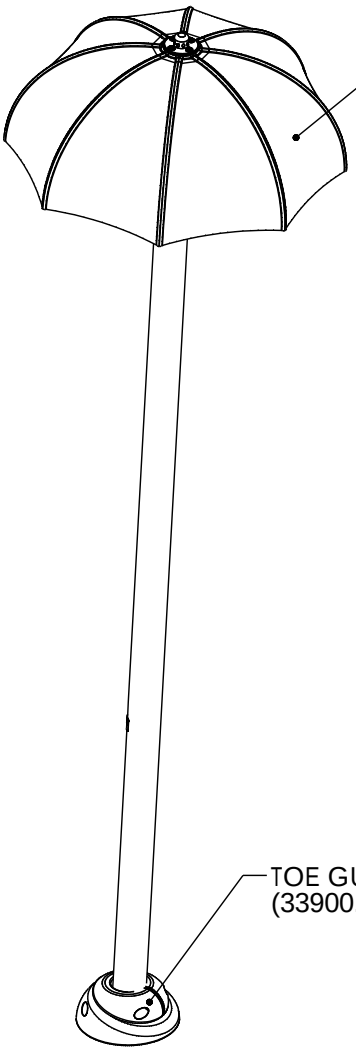
SHEET: 1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	FPE		05/14/13	SJ	DC



SEEFLOW:
(22055.6628R01,22055.6633R01,
22055.6696R01,22055.6697R01,
22055.6698R01) X 1

TOE GUARD:
(33900.7720R01, 33900.7780R01) X 1

VORTEX

APPROVALS	DATE
DESIGNED SJIE	08/03/12
DRAWN SJIE	08/03/12
CHECKED DC	

COMMENTS

PRODUCT NAME: OMBRELLO No2 (SW,SF)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7440.2009REL-02	REL-02

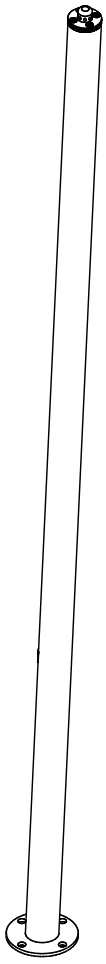
UNITS	SCALE	SHEET
INCH	---	2 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	2	22061.1024	CUSTOM UMBRELLA SPINNER TOP GASKET		EPDM DURO 60	REL-01
2	4	11145.006	SECURITY BUTTON HEAD SCREW 1/4"-20UNC X 1"LG		STAINLESS STEEL 304	REL-01+
3	4	11155.005	FLAT WASHER 1/4"		STAINLESS STEEL 304	REL-01+
4	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
5	4	11155.010	LOCK WASHER 1/4"		STAINLESS STEEL 304	REL-01+
6	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
7	4	22135.3822	COLLAR FOR SEEFLOW WATER FLOWER		SS 304	REL-01
8	1	33400.1950	OMBRELLO No2 POST PASSIVATION			REL-01
9	1	33400.1936	OMBRELLO REGULAR FLOW SPRAY CAP PASSIVATION			REL-01
10	1	11704.024	O-RING #2-219 1/8"WD X 1 5/16"ID X 1 9/16"OD		VITON	REL-01+
11	1	22900.1680	NAME PLATE VORTEX		3M ALUMINUM #7940	REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	05/14/13
DRAWN SJIE	05/14/13
CHECKED DC	

PRODUCT NAME: OMBRELLO No2 (SW,SF) ASSEMBLY

DRAWING TYPE: ASSEMBLY

COMMENTS

SIZE FORMAT: A

ASSY NO.: 33903.0697REL-01

DWG REV.: REL-01

UNITS: INCH

SCALE: ---

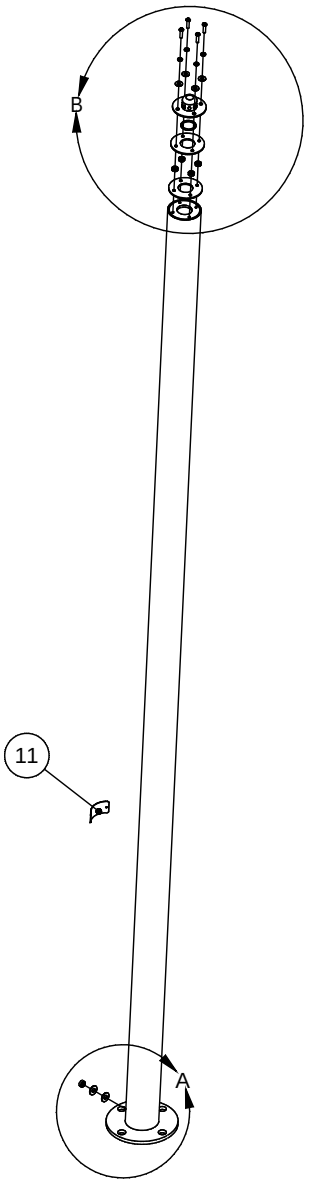
SHEET: 1 OF 2

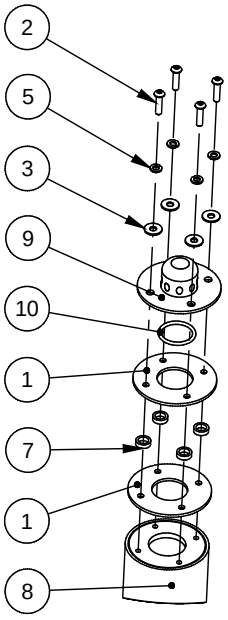
NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

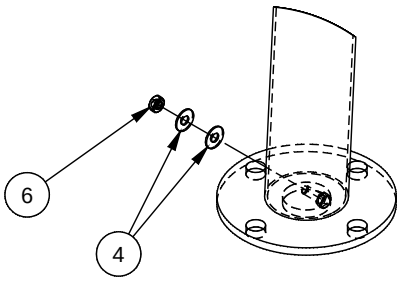
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.





DETAIL B
SCALE 1 : 8



DETAIL A
SCALE 1 : 8

VORTEX

APPROVALS	DATE
DESIGNED SJIE	05/14/13
DRAWN SJIE	05/14/13
CHECKED DC	

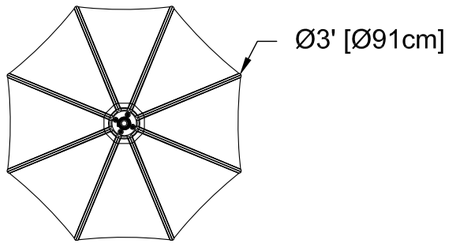
COMMENTS

PRODUCT NAME: OMBRELLO No2 (SW,SF) ASSEMBLY

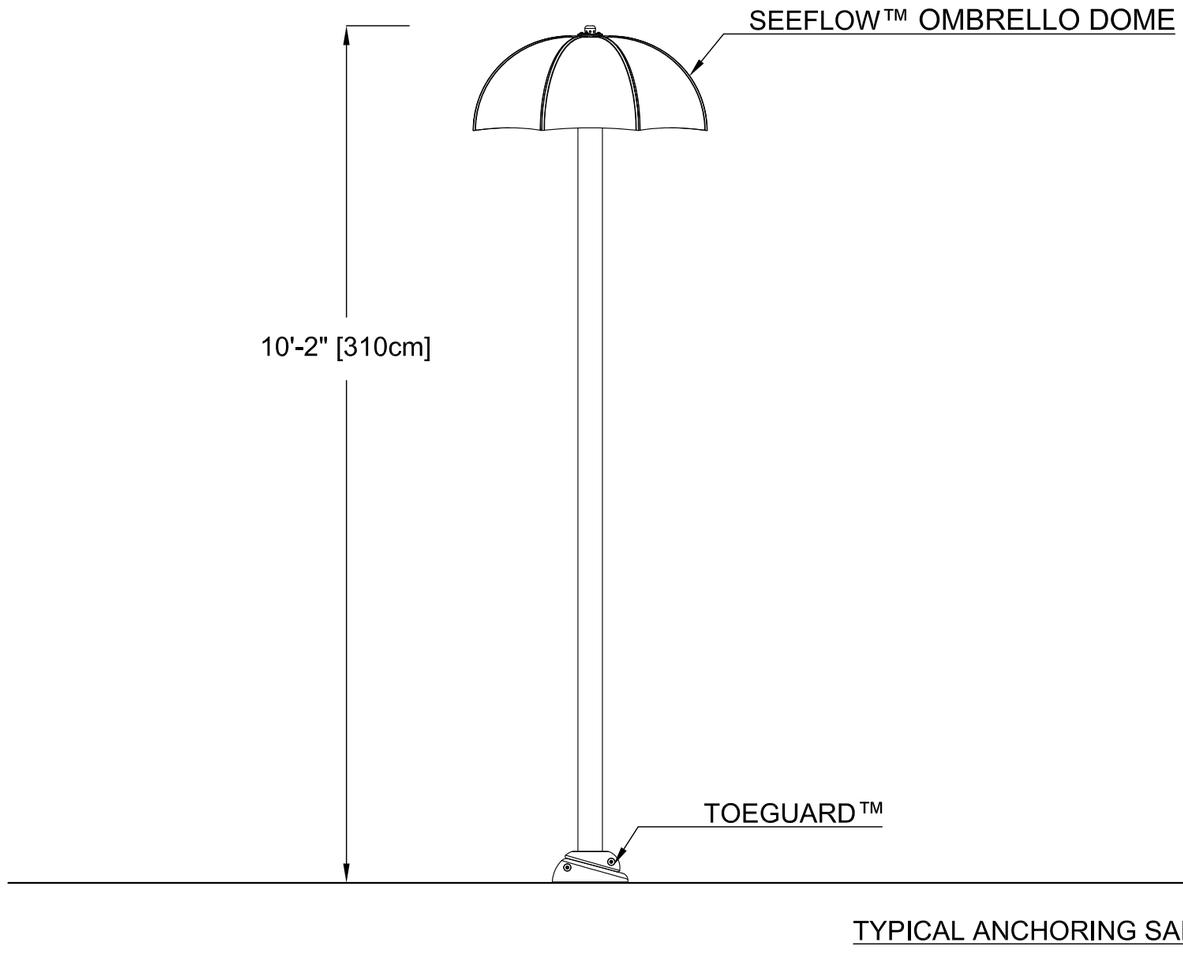
DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.		DWG REV.
A	33903.0697REL-01		REL-01
	UNITS: INCH	SCALE: ---	SHEET: 2 OF 2

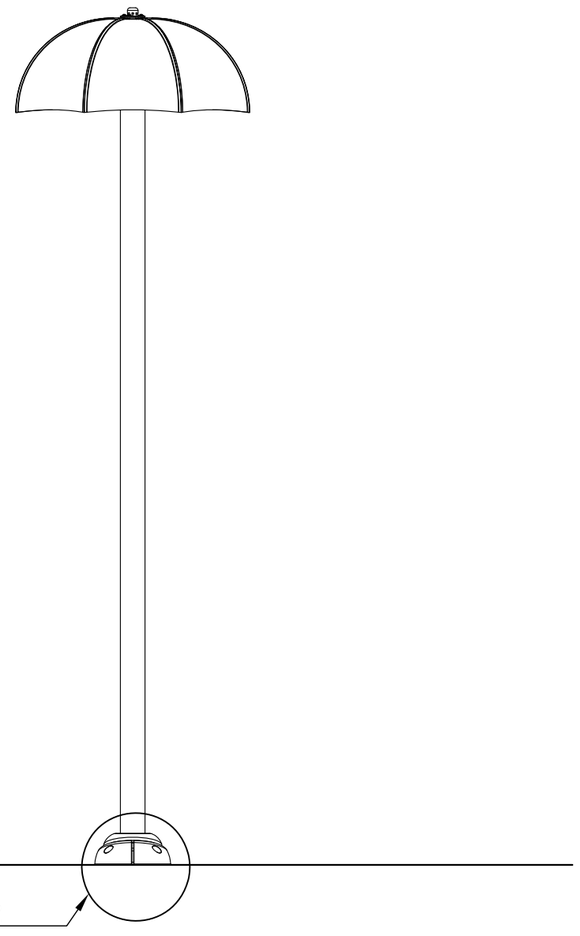
PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



VOR-7445.2XXX OMBRELLO Nº1 (Construction Detail)

PRODUCT NAME: OMBRELLO Nº1	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7445.2XXX	DATE: 10/15/12	SHEET NO: 1/1	11"x17" SHEET SIZE

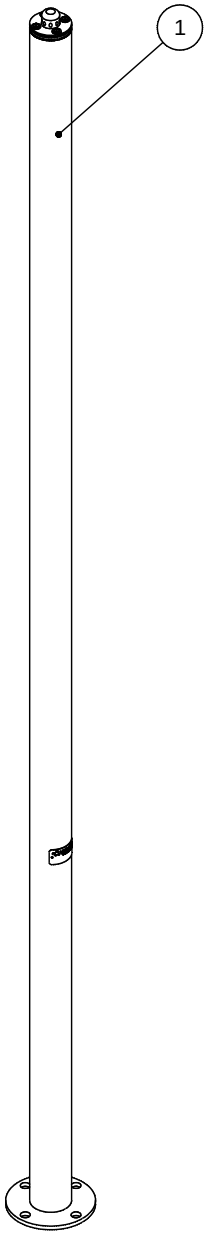
VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	33903.0683	OMBRELLO No1 (SW,SF) ASSEMBLY			REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	03/26/13
DRAWN SJIE	03/26/13
CHECKED DC	

PRODUCT NAME: OMBRELLO No1 (SW,SF)

DRAWING TYPE: ASSEMBLY

COMMENTS

SIZE FORMAT: A

ASSY NO.: VOR-7445.2009REL-01

DWG REV.: REL-01

UNITS: INCH

SCALE: ---

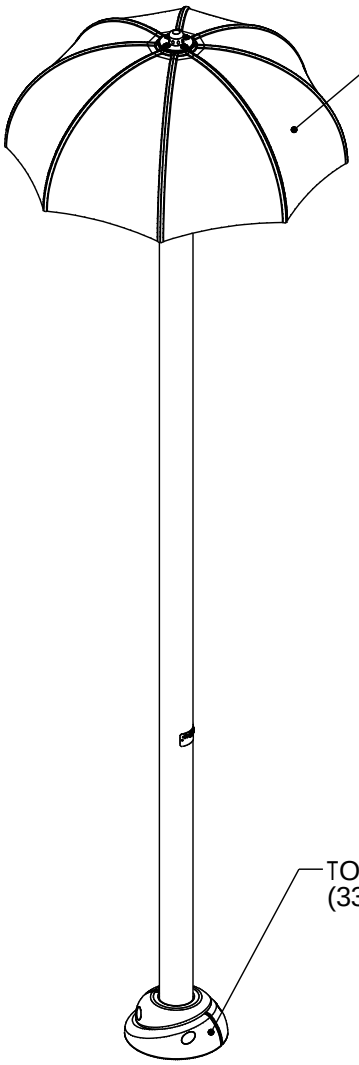
SHEET: 1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



SEEFLOW:
(22055.6628R01,22055.6633R01,
22055.6696R01,22055.6697R01,
22055.6698R01) X 1

TOE GUARD:
(33900.7720R01, 33900.7780R01) X 1

VORTEX

APPROVALS	DATE
DESIGNED SJIE	03/26/13
DRAWN SJIE	03/26/13
CHECKED DC	

COMMENTS

PRODUCT NAME: OMBRELLO No1 (SW,SF)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7445.2009REL-01	REL-01

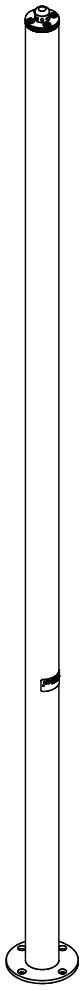
UNITS	SCALE	SHEET
INCH	---	2 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	2	22061.1024	CUSTOM UMBRELLA SPINNER TOP GASKET		EPDM DURO 60	REL-01
2	4	11145.006	SECURITY BUTTON HEAD SCREW 1/4"-20UNC X 1"LG		STAINLESS STEEL 304	REL-01+
3	4	11155.005	FLAT WASHER 1/4"		STAINLESS STEEL 304	REL-01+
4	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
5	4	11155.010	LOCK WASHER 1/4"		STAINLESS STEEL 304	REL-01+
6	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
7	4	22135.3822	COLLAR FOR SEEFLOW WATER FLOWER		SS 304	REL-01
8	1	33400.1942	OMBRELLO No1 POST PASSIVATION			REL-01
9	1	33400.1936	OMBRELLO REGULAR FLOW SPRAY CAP PASSIVATION			REL-01
10	1	11704.024	O-RING #2-219 1/8"WD X 1 5/16"ID X 1 9/16"OD		VITON	REL-01+
11	1	22900.1680	NAME PLATE VORTEX		3M ALUMINUM #7940	REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	03/26/13
DRAWN SJIE	03/26/13
CHECKED DC	

COMMENTS

PRODUCT NAME: OMBRELLO No1 (SW,SF) ASSEMBLY

DRAWING TYPE: ASSEMBLY

SIZE FORMAT: A

ASSY NO.: 33903.0683REL-01

DWG REV.: REL-01

UNITS: INCH

SCALE: ---

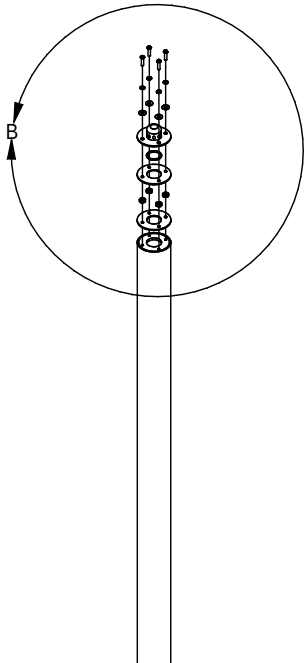
SHEET: 1 OF 2

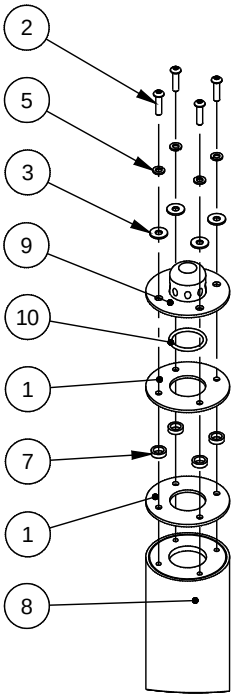
NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

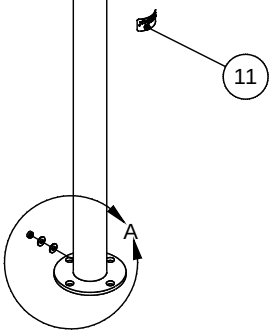
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

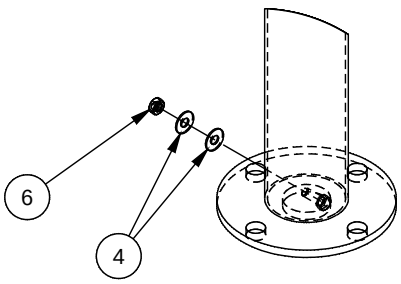
REV	DESCRIPTION	ECR	DATE	BY	APP.





DETAIL B
SCALE 1 : 8

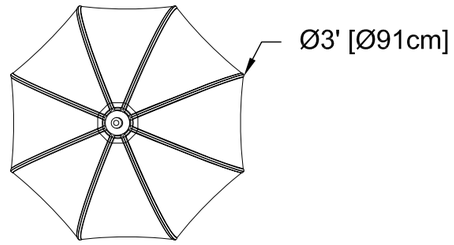




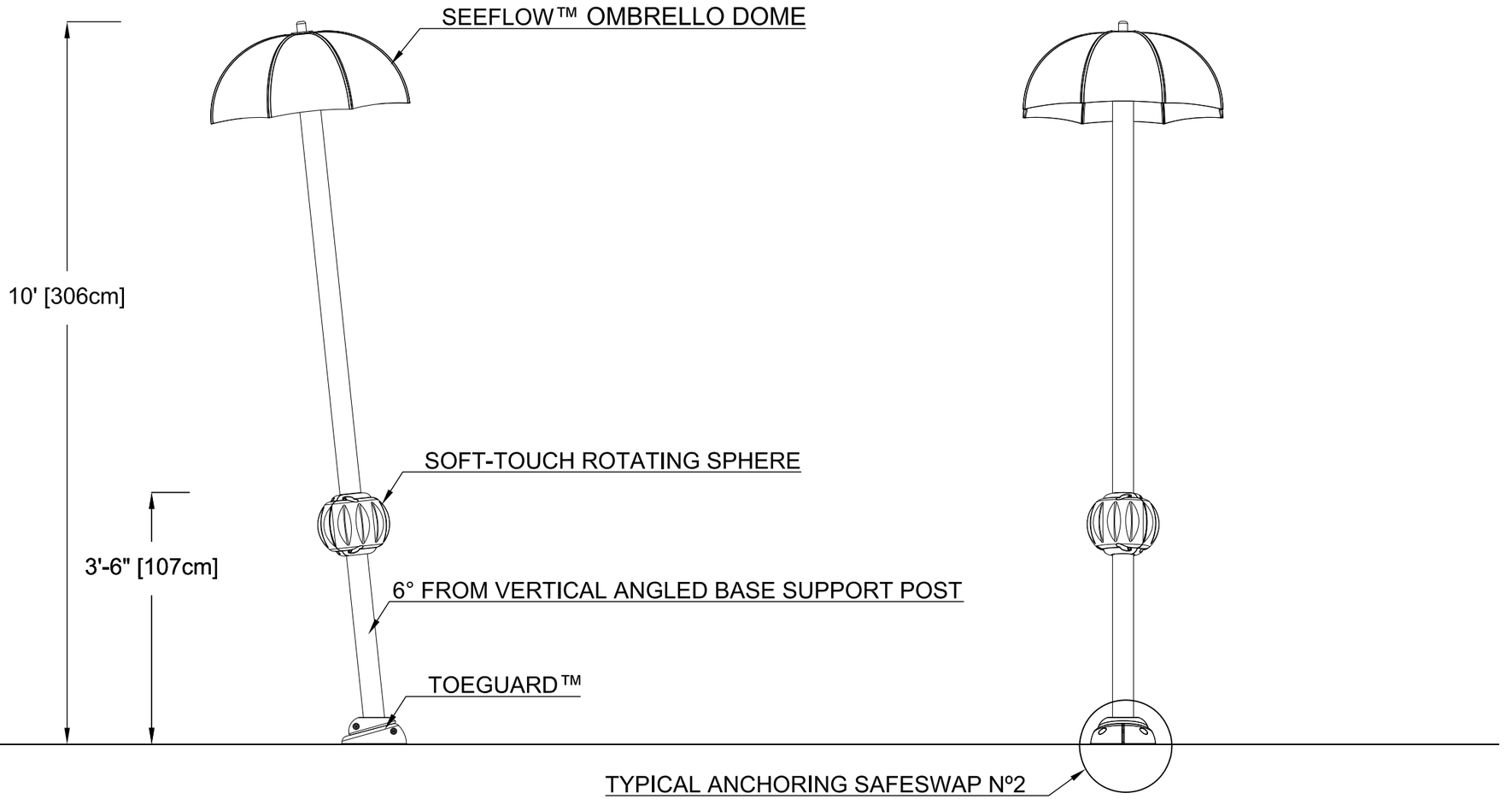
DETAIL A
SCALE 1 : 8

	APPROVALS	DATE	PRODUCT NAME
VORTEX	DESIGNED SJIE	03/26/13	OMBRELLO No1 (SW,SF) ASSEMBLY
	DRAWN SJIE	03/26/13	
	CHECKED DC		DRAWING TYPE: ASSEMBLY
	COMMENTS		SIZE FORMAT: A; ASSY NO.: 33903.0683REL-01; DWG REV.: REL-01; UNITS: INCH; SCALE: ---; SHEET: 2 OF 2

PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW

VOR-7447.200X OMBRELLO TWIRL Nº2 (Construction Detail)

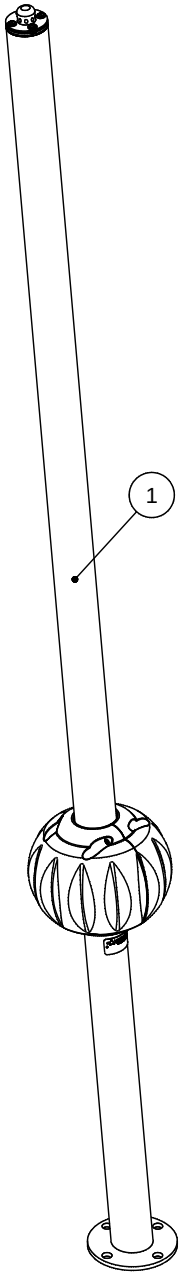
PRODUCT NAME: OMBRELLO TWIRL Nº2	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7447.200X	DATE: 10/17/12	SHEET NO: 1/1	11"x17" SHEET SIZE

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	33903.0529	OMBRELLO TWIRL No2 (SW,PC) ASSEMBLY			REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	03/19/13
DRAWN SJIE	03/19/13
CHECKED DC	

PRODUCT NAME: OMBRELLO TWIRL No2 (SW,PC)

DRAWING TYPE: ASSEMBLY

COMMENTS

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7447.2008REL-01	REL-01

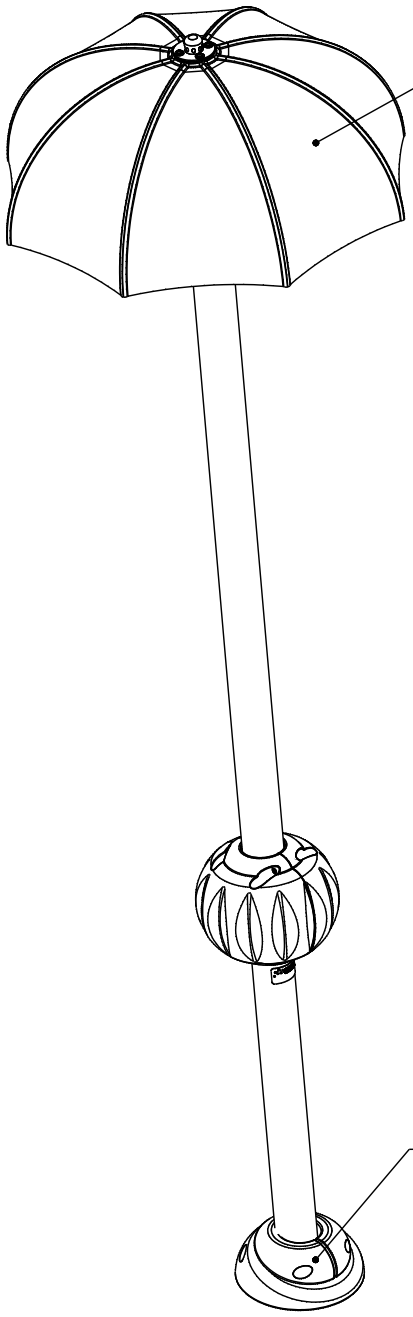
UNITS	SCALE	SHEET
INCH	---	1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



SEEFLOW:
(22055.6628R01,22055.6633R01,
22055.6696R01,22055.6697R01,
22055.6698R01) X 1

TOE GUARD:
(33900.7720R01, 33900.7780R01) X 1

VORTEX

APPROVALS	DATE
DESIGNED SJIE	03/19/13
DRAWN SJIE	03/19/13
CHECKED DC	

COMMENTS

PRODUCT NAME: OMBRELLO TWIRL No2 (SW,PC)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7447.2008REL-01	REL-01

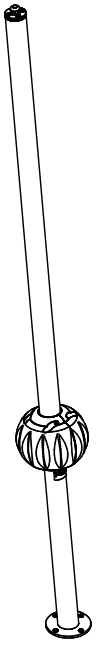
UNITS	SCALE	SHEET
INCH	---	2 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	33001.1100	OMBRELLO TWIRL No2 POST PAINTING			REL-01
2	1	11990.2406	BEARING SS 6010-2RS(OD 80mm,ID 50mm,B 16mm)			REL-01
3	1	11990.2407	BEARING SS 6208-2RS(OD 80mm,ID 40mm,B 18mm)			REL-01
4	1	33400.1931	CUSTOM UMBRELLA SPINNER HOUSING, PASSIVATION			REL-01
5	1	33001.1101	OMBRELLO TWIRL TOP POST PAINTING			REL-01
6	2	22061.1024	CUSTOM UMBRELLA SPINNER TOP GASKET		EPDM DURO 60	REL-01
7	1	11704.001	O-RING #2-214 1/8"WD X 1"ID X 1 1/4"OD		VITON	REL-01+
8	4	11145.006	SECURITY BUTTON HEAD SCREW 1/4"-20UNC X 1"LG		STAINLESS STEEL 304	REL-01+
9	4	11145.084	SECURITY BUTTON HEAD SCREW 3/8"-16UNC X 1 1/4"LG		STAINLESS STEEL 304	REL-01+
10	4	11145.218	SECURITY BUTTON HEAD SCREW 3/8"-16UNC X 1.75"LG		STAINLESS STEEL 304	REL-01+
11	4	11155.005	FLAT WASHER 1/4"		STAINLESS STEEL 304	REL-01+
12	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
13	4	11155.010	LOCK WASHER 1/4"		STAINLESS STEEL 304	REL-01+
14	8	11155.001	LOCK WASHER 3/8"		STAINLESS STEEL 304	REL-01+
15	1	11990.2402	EXTERNAL RETAINING RING FOR 40mm SHAFT DIA.		STAINLESS STEEL	REL-01
16	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
17	4	11145.093	SECURITY BARREL NUT 3/8"-16UNC X 5/8"LG		STAINLESS STEEL 304	REL-01+
18	1	11990.197	BEARING SSR16 2RS (2"OD X 1"ID X 1/2"WD) STAINLESS STEEL		SS	REL-01
19	2	22900.1747	SOFT-TOUCH ROTATING SPHERE		RUBBER EPDM DURO 080 (PANTONE 285C)	REL-02
20	4	22135.3822	COLLAR FOR SEEFLOW WATER FLOWER		SS 304	REL-01
21	1	33001.1137	OMBRELLO REGULAR FLOW SPRAY CAP PAINTING			REL-01
22	1	11704.024	O-RING #2-219 1/8"WD X 1 5/16"ID X 1 9/16"OD		VITON	REL-01+
23	1	22900.1680	NAME PLATE VORTEX		3M ALUMINUM #7940	REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	03/19/13
DRAWN SJIE	03/19/13
CHECKED DC	

COMMENTS

PRODUCT NAME: OMBRELLO TWIRL No2 (SW,PC) ASSEMBLY

DRAWING TYPE: ASSEMBLY

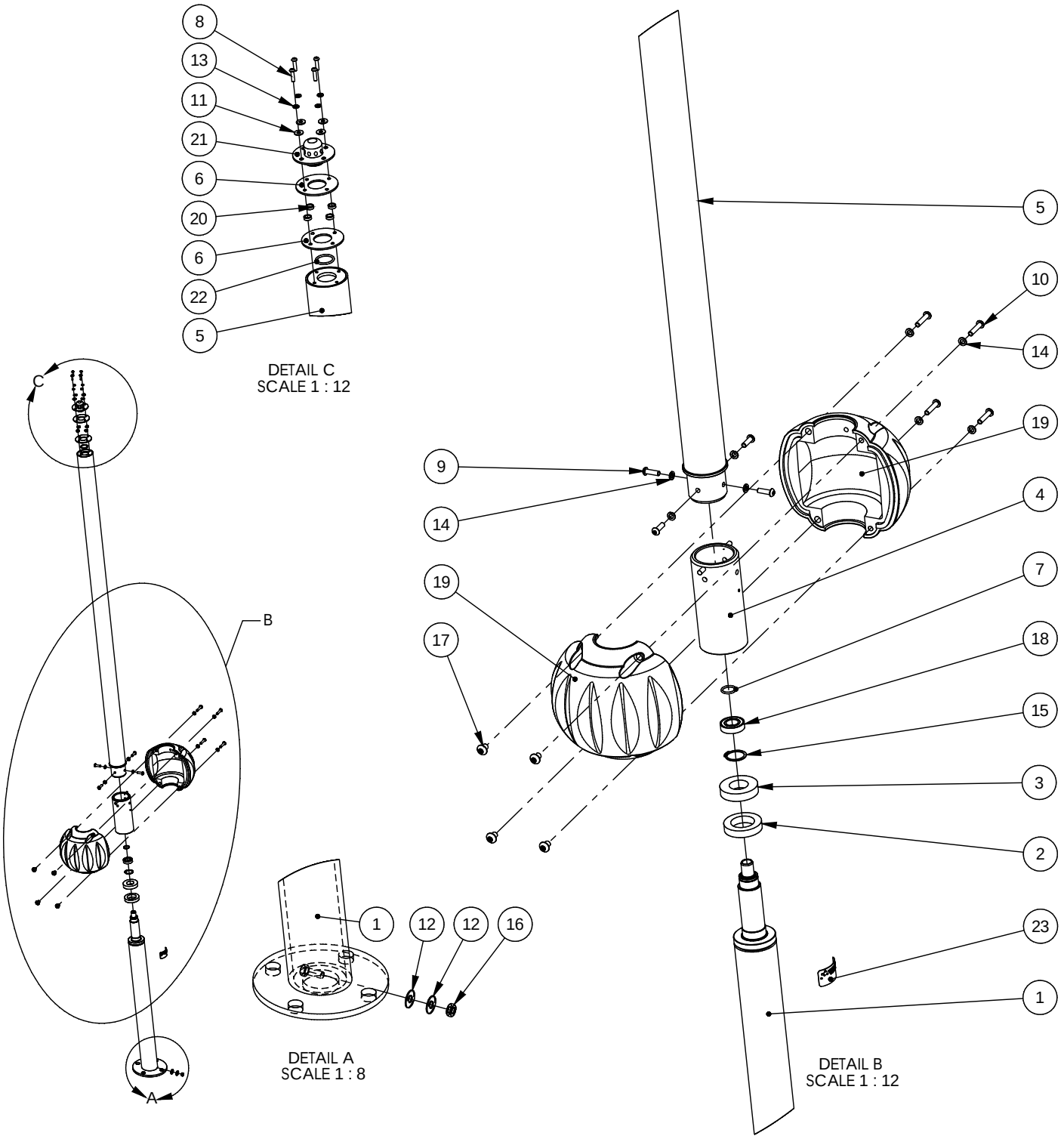
SIZE FORMAT	ASSY NO.		DWG REV.
A	33903.0529REL-01		REL-01
	UNITS: INCH	SCALE: ---	SHEET: 1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



APPROVALS	DATE
DESIGNED SJIE	03/19/13
DRAWN SJIE	03/19/13
CHECKED DC	

COMMENTS

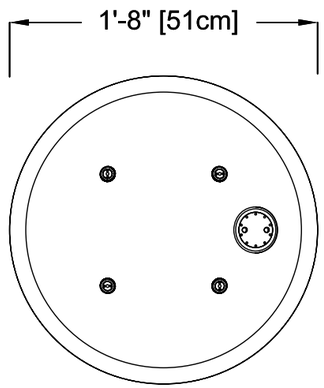
PRODUCT NAME: OMBRELLO TWIRL No2 (SW,PC) ASSEMBLY

DRAWING TYPE: ASSEMBLY

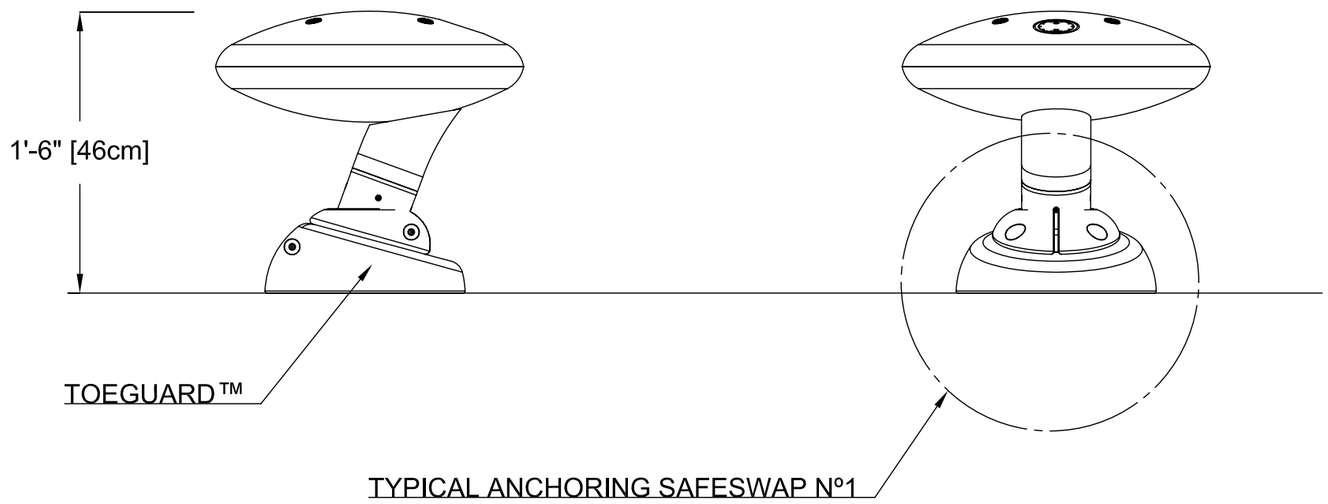
SIZE FORMAT	ASSY NO.	DWG REV.
A	33903.0529REL-01	REL-01

UNITS	SCALE	SHEET
INCH	---	2 OF 2

PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW

VOR-7582.2XXX WATERBUG Nº3 (Construction Detail)

PRODUCT NAME: WATERBUG Nº3	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7582.2XXX	DATE: 06/17/09	SHEET NO: 1/1	11"x17" SHEET SIZE

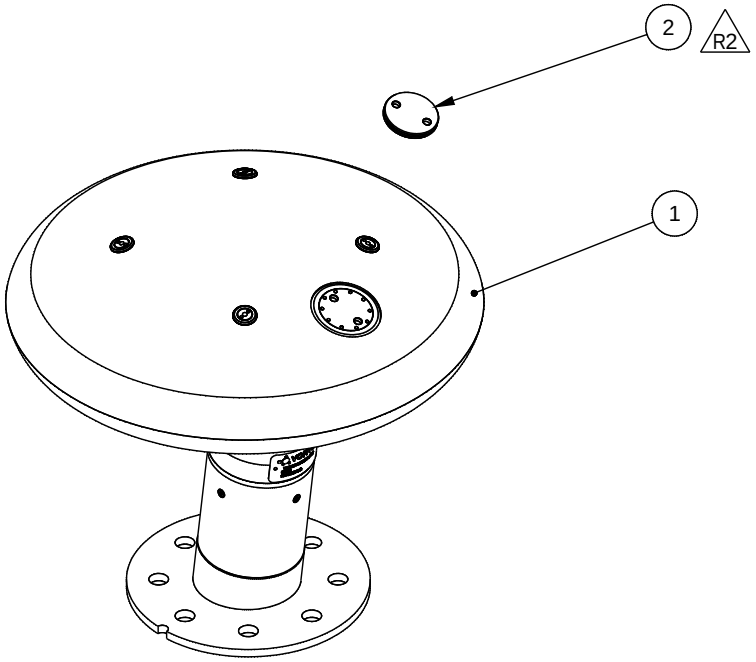
VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	ADD WINTER CAP	1326	12/15/08	MKHALIL	DC
REL-03	R02 FOR 33900.766 & ADD SEEFLOW KIT FPE		12/23/08	APREDA	DC
REL-04	EN 13451 STANDARD		07/21/11	SJ	DC



	ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
R4	1	1	33903.0413	WATERBUG No3 (SW,PC) ASSEMBLY			REL-01
R2	2	1	22136.178	SMALL WINTER CAP		BRASS	REL-02

VORTEX

APPROVALS	DATE
DESIGNED SJIE	05/15/08
DRAWN SJIE	05/15/08
CHECKED DC	

PRODUCT NAME: WATERBUG No3(SW,PC)

DRAWING TYPE: ASSEMBLY

COMMENTS

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7582.2008REL-02	REL-04

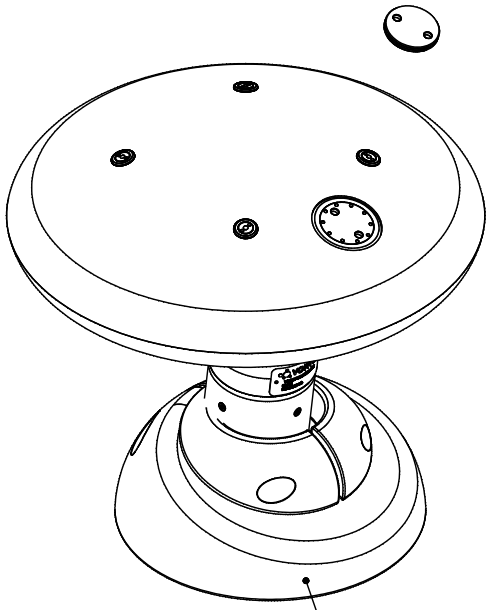
UNITS	SCALE	SHEET
INCH	---	1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.
REL-02	ADD WINTER CAP	1326	12/15/08	MKHALIL	DC
REL-03	R02 FOR 33900.766 & ADD SEEFLOW KIT FPE		12/23/08	APREDA	DC
REL-04	EN 13451 STANDARD		07/21/11	SJ	DC



SEEFLOW KIT:
(33900.7730R01,33900.7770R01) X 1

APPROVALS	DATE
DESIGNED SJIE	05/15/08
DRAWN SJIE	05/15/08
CHECKED DC	

COMMENTS

PRODUCT NAME: WATERBUG No3(SW,PC)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7582.2008REL-02	REL-04

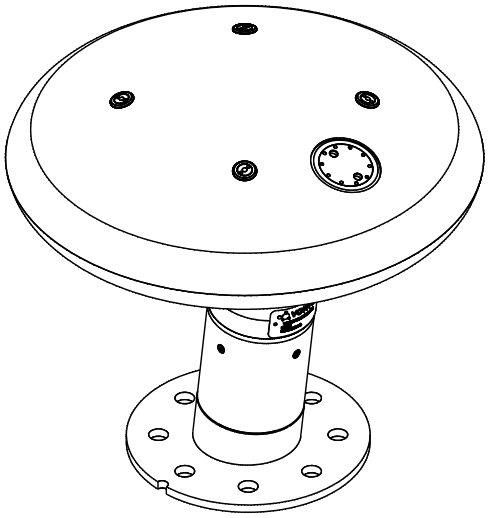
UNITS	SCALE	SHEET
INCH	---	2 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	33001.1000	WATERBUG No2 POST PAINTING			REL-01
2	1	22055.415	UHMW DISK 3 3/4"OD X 2.316"ID X 3/16"TH		UHMWPE WHITE	REL-01
3	1	22135.284	DISK 3 3/4"OD X 2.316"ID X 1/8"TH		STAINLESS STEEL 304/304L	REL-01
4	1	11990.131	EXTERNAL RETAINING RING FOR 2 1/4" SHAFT DIAMETER			REL-01
5	2	11704.005	O-RING #2-229 1/8"WD X 2 3/8"ID X 2 5/8"OD		VITON	REL-01+
6	1	11704.000	O-RING #2-239 1/8"WD X 3 5/8"ID X 3 7/8"OD		VITON	REL-01+
7	1	22041.001	BUSHING BRONZE 4" - 360°		BUSHING SAE 660 BEARING BRONZE	REL-02
8	4	11145.118	SECURITY SET SCREW 3/8"-16UNC X 3/4"LG		STAINLESS STEEL 304	REL-01+
9	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
10	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
11	1	22136.168	GROUND GEYSER NOZZLE		BRASS	REL-02
12	4	33400.077	RIVET NUT 1/2-13UNC,PASSIVATION			REL-01
13	4	33400.101	RIV-VOZZLE WITH ONE HOLE, PASSIVATION			REL-01
14	4	11704.063	O-RING #018 (SILICONE) .070"WD X .739"ID X .879"OD		SILICONE	REL-01
15	1	33001.1002	WATERBUG No3 TOP PAINTING			REL-01
16	1	22900.1680	NAME PLATE VORTEX METAL TACK		STAINLESS STEEL 316	REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	07/21/11
DRAWN SJIE	07/21/11
CHECKED DC	

COMMENTS

PRODUCT NAME: WATERBUG No3 (SW,PC) ASSEMBLY

DRAWING TYPE: ASSEMBLY

SIZE FORMAT: A

ASSY NO.: 33903.0413REL-01

DWG REV.: REL-01

UNITS: INCH

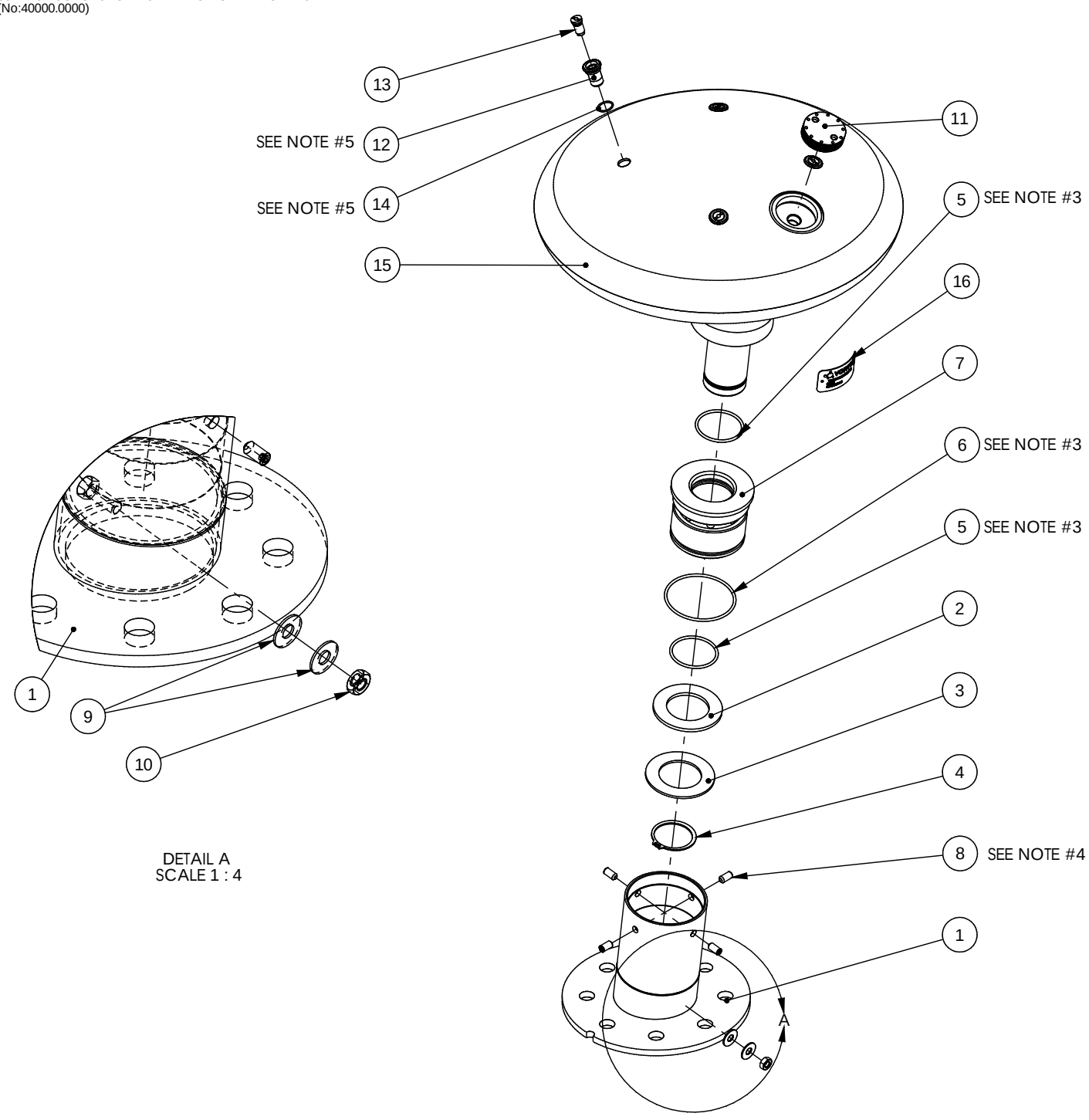
SCALE: ---

SHEET: 1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.
3. APPLY "GUNK" LITHIUM BASED GREASE OR EQUIVALENT TO ALL O-RINGS.
4. APPLY LOCTITE #262 TO THREADS BEFORE ASSEMBLY
5. USE "INSTRUCTIONS FOR INSTALLATION OF RIV-VOZZLE'S" (No:40000.0000)

REV	DESCRIPTION	ECR	DATE	BY	APP.



DETAIL A
SCALE 1 : 4

APPROVALS	DATE
DESIGNED SJIE	07/21/11
DRAWN SJIE	07/21/11
CHECKED DC	
COMMENTS	

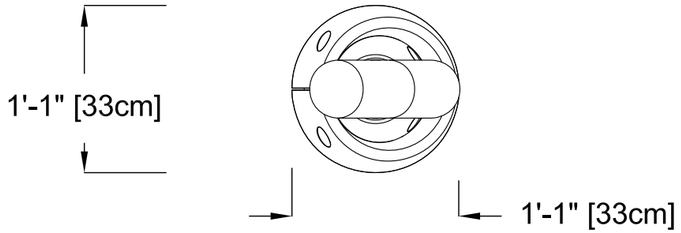
PRODUCT NAME: WATERBUG No3 (SW,PC) ASSEMBLY

DRAWING TYPE: ASSEMBLY

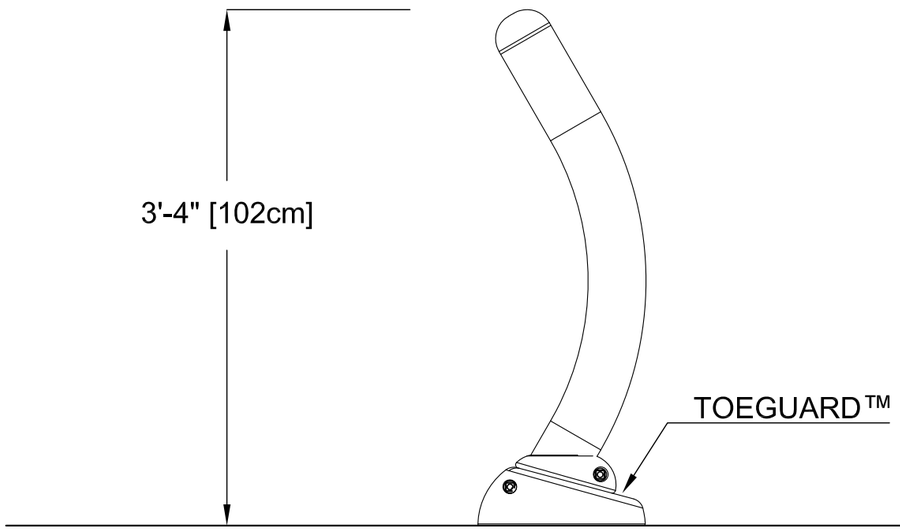
SIZE FORMAT	ASSY NO.	DWG REV.
A	33903.0413REL-01	REL-01

UNITS	SCALE	SHEET
INCH	---	2 OF 2

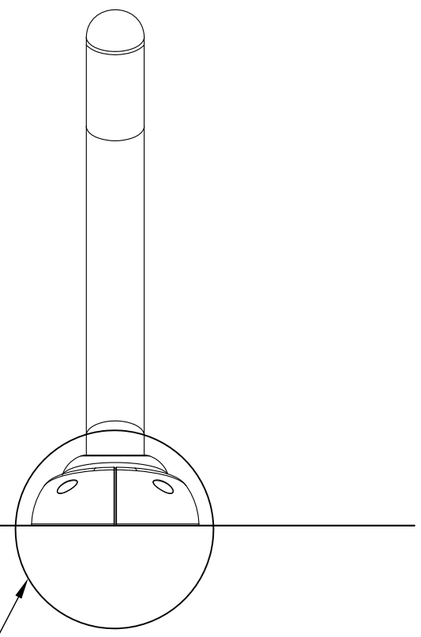
PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



VOR-7772.2XXX CURVED POST Nº1 (Construction Detail)

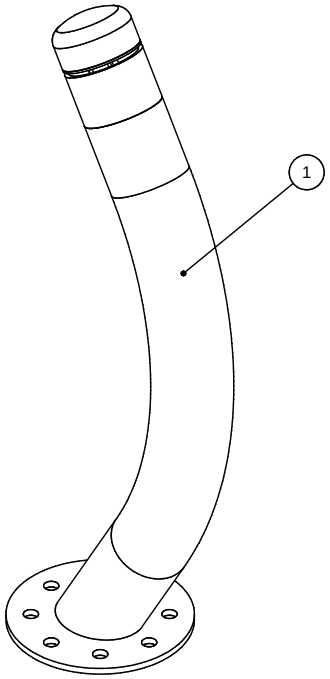
PRODUCT NAME: CURVED POST Nº1	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7772.2XXX	DATE: 09/25/13	SHEET NO: 1/1	11"x17" SHEET SIZE

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	Material	REVISION
1	1	33903.0815	CURVED POST NO 1 (SW,PC) ASSEMBLY			REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	01/09/14
DRAWN SJIE	01/09/13
CHECKED DC	

COMMENTS

PRODUCT NAME: CURVED POST NO 1 (SW,PC)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7772.2008REL-01	REL-01

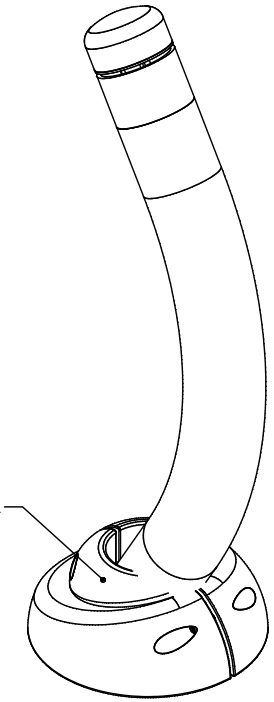
UNITS	SCALE	SHEET
INCH	---	1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



VORTEX

APPROVALS	DATE
DESIGNED SJIE	01/09/14
DRAWN SJIE	01/09/13
CHECKED DC	
COMMENTS	

PRODUCT NAME: CURVED POST NO 1 (SW,PC)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7772.2008REL-01	REL-01

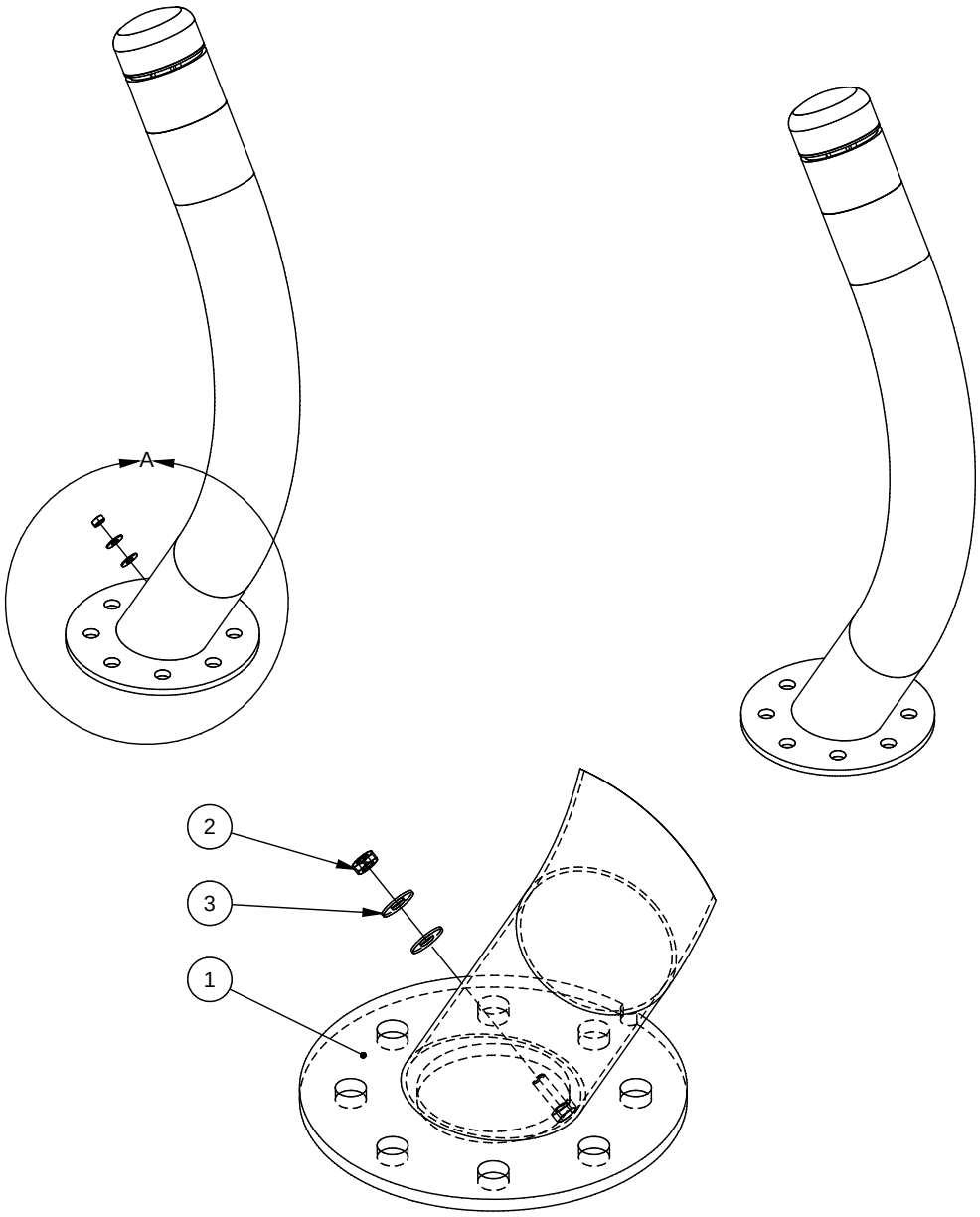
UNITS	SCALE	SHEET
INCH	---	2 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



DETAIL A
SCALE 1 : 5

ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	33001.1787	CURVED POST NO 1 PAINTING			REL-01
2	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
3	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+

VORTEX

APPROVALS	DATE
DESIGNED SJIE	01/09/14
DRAWN SJIE	01/09/14
CHECKED DC	

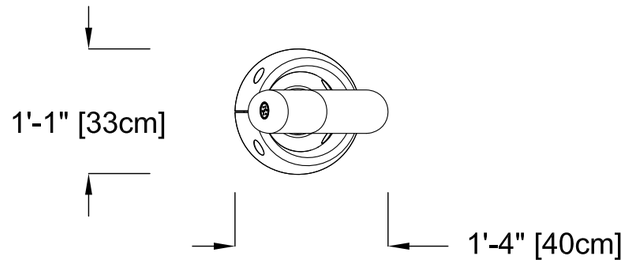
COMMENTS

PRODUCT NAME: CURVED POST NO 1 (SW,PC) ASSEMBLY

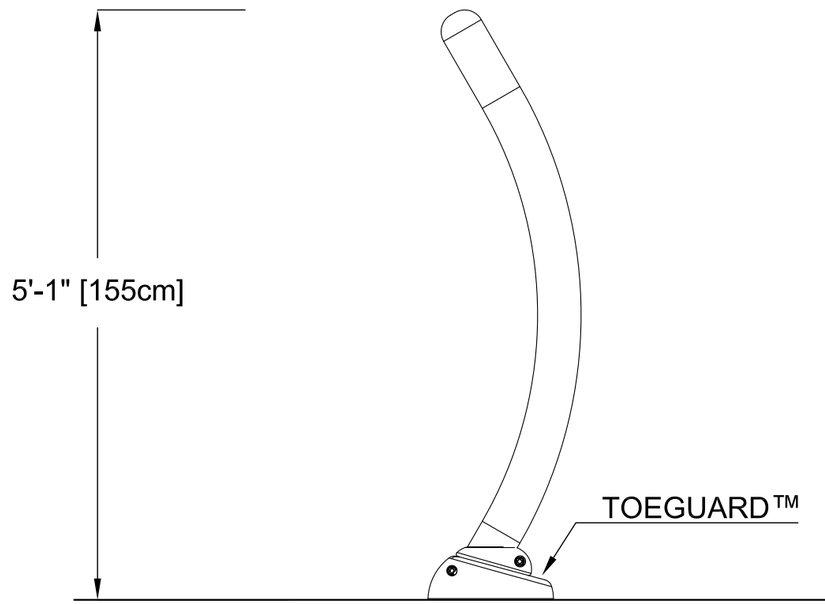
DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.		DWG REV.
A	33903.0815REL-01		REL-01
	UNITS: INCH	SCALE: ---	SHEET: 1 OF 1

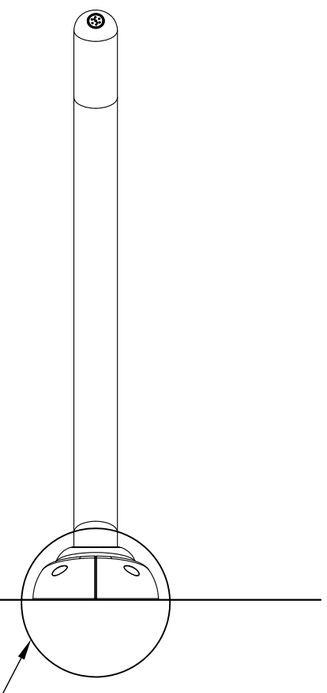
PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



PRODUCT NAME: CURVED POST Nº2	PRODUCT INFORMATION		
PRODUCT NUMBER: VOR-7773.2XXX	DATE: 02/25/14	SHEET NO: 1/1	11"x17" SHEET SIZE

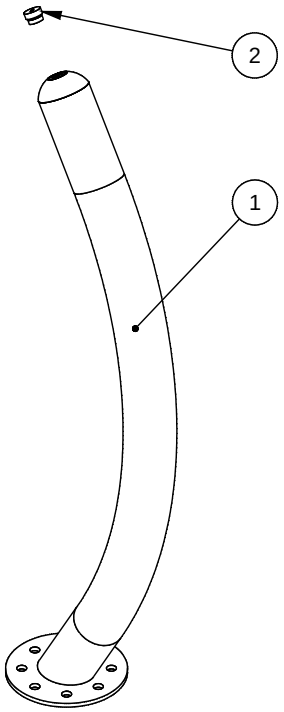
VORTEX

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	Material	REVISION
1	1	33903.0924	CURVED POST NO 2 (SW,SF) ASSEMBLY			REL-01
2	1	22160.026	WINTER CAP 1 1/2"		BRASS, LEAD FREE	REL-01

VORTEX

APPROVALS	DATE
DESIGNED SJIE	05/05/14
DRAWN SJIE	05/05/14
CHECKED DC	

COMMENTS

PRODUCT NAME: CURVED POST NO 2 (SW,SF)

DRAWING TYPE: ASSEMBLY

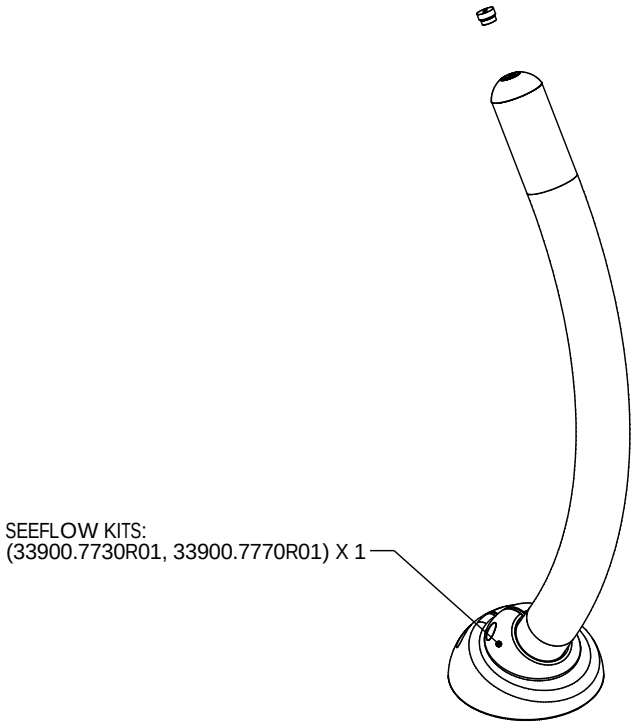
SIZE FORMAT	ASSY NO.		DWG REV.
A	VOR-7773.2009REL-01		REL-01
	UNITS: INCH	SCALE: ---	SHEET: 1 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



APPROVALS	DATE
DESIGNED SJIE	05/05/14
DRAWN SJIE	05/05/14
CHECKED DC	

COMMENTS

PRODUCT NAME: CURVED POST NO 2 (SW,SF)

DRAWING TYPE: ASSEMBLY

SIZE FORMAT	ASSY NO.	DWG REV.
A	VOR-7773.2009REL-01	REL-01

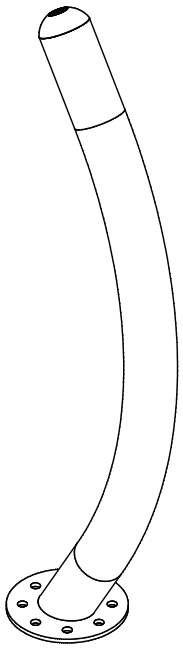
UNITS	SCALE	SHEET
INCH	---	2 OF 2

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	11150.005	NUT 3/8"-16UNC		STAINLESS STEEL 304	REL-01+
2	2	11155.006	FLAT WASHER 3/8"		STAINLESS STEEL 304	REL-01+
3	1	33400.1970	CURVED POST NO 2 PASSIVATION			REL-01
4	1	22160.003	NOZZLE 1 1/2"		BRASS, LEAD FREE	REL-02

VORTEX

APPROVALS	DATE
DESIGNED SJIE	05/05/14
DRAWN SJIE	05/05/14
CHECKED DC	

COMMENTS

PRODUCT NAME: CURVED POST NO 2 (SW,SF) ASSEMBLY

DRAWING TYPE: ASSEMBLY

SIZE FORMAT: A

ASSY NO.: 33903.0924REL-01

DWG REV.: REL-01

UNITS: INCH

SCALE: ---

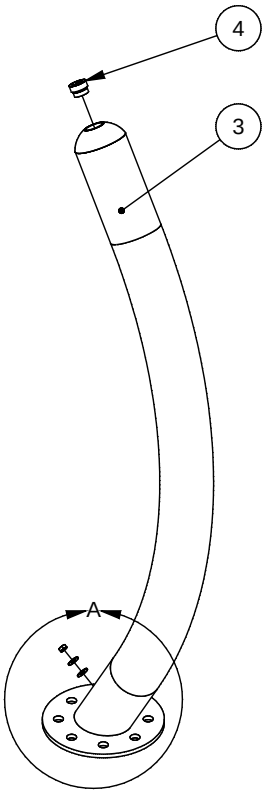
SHEET: 1 OF 2

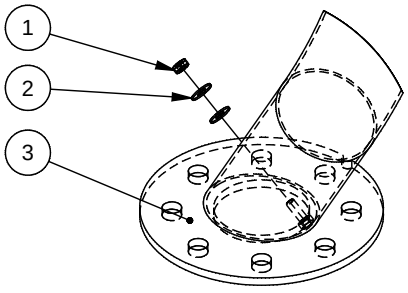
NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.

2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.





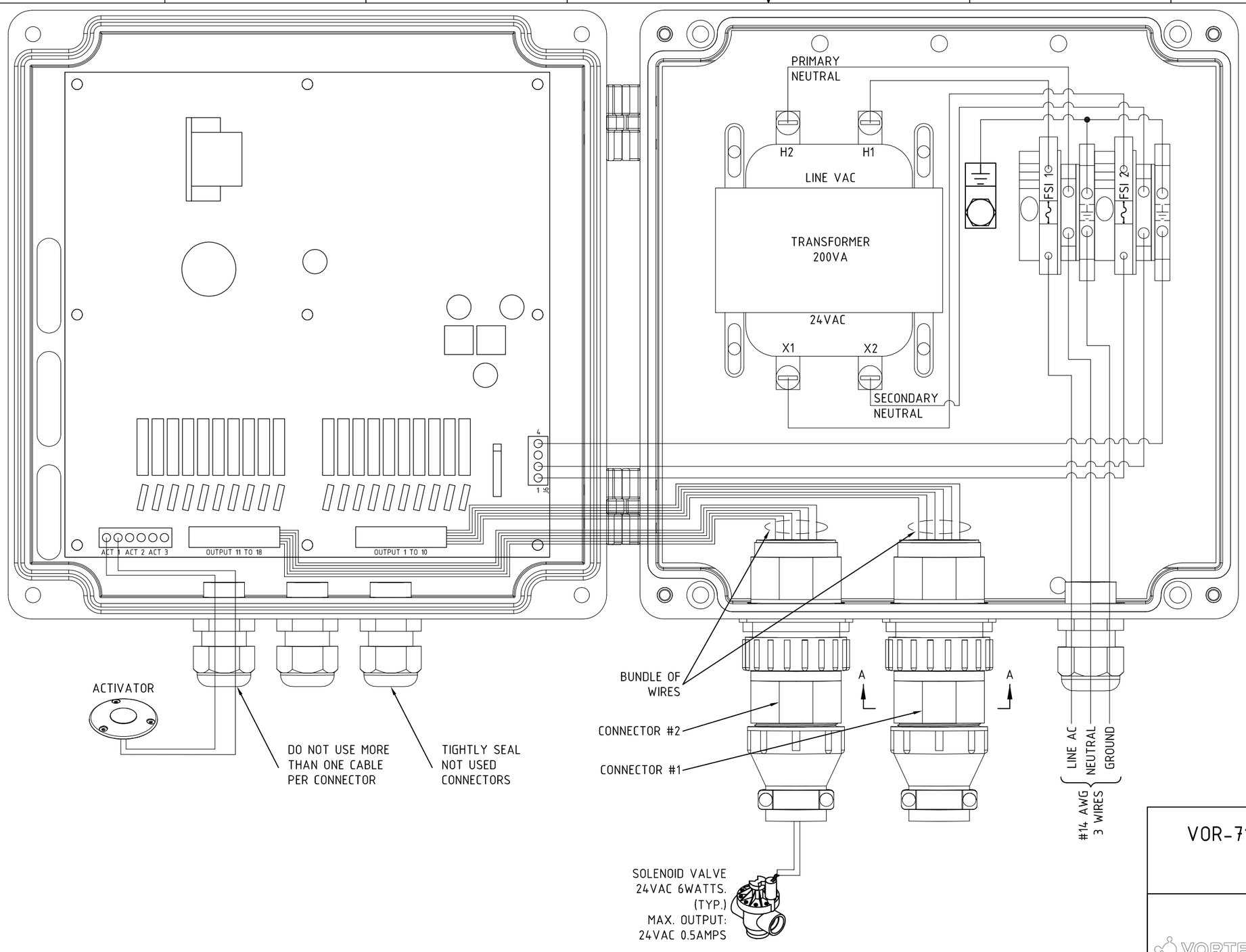
DETAIL A
SCALE 1 : 8

APPROVALS	DATE
DESIGNED SJIE	05/05/14
DRAWN SJIE	05/05/14
CHECKED DC	
COMMENTS	

PRODUCT NAME: CURVED POST NO 2 (SW,SF) ASSEMBLY

DRAWING TYPE: ASSEMBLY

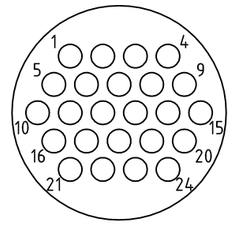
SIZE FORMAT	ASSY NO.		DWG REV.
A	33903.0924REL-01		REL-01
	UNITS: INCH	SCALE: ---	SHEET: 2 OF 2



NOTE:

FSI 1 - TERMINAL FUSE BLOCK
2 AMPS 120 VAC TYPE GDC-2A
1 AMPS 240 VAC TYPE GDC-1A

FSI 2 - TERMINAL FUSE BLOCK
4 AMPS 240 VAC TYPE GDC-4A



VIEW A-A

PIN	CONNECTOR	SIGNAL
1-2	1	OUTPUT 1
3-4	1	OUTPUT 2
5-6	1	OUTPUT 3
7-8	1	OUTPUT 4
9-10	1	OUTPUT 5
11-12	1	OUTPUT 6
13-14	1	OUTPUT 7
15-16	1	OUTPUT 8
17-18	1	OUTPUT 9
19-20	1	OUTPUT 10
21-22	1	RAIN DIVERTER
23-24	1	N/A
1-2	2	OUTPUT 11
3-4	2	OUTPUT 12
5-6	2	OUTPUT 13
7-8	2	OUTPUT 14
9-10	2	OUTPUT 15
11-12	2	OUTPUT 16
13-14	2	OUTPUT 17
15-16	2	OUTPUT 18
17-18	2	OUTPUT 16
19-20	2	OUTPUT 17
21-22	2	OUTPUT 18
23-24	2	N/A

VOR-718.600X

SELECTION

120VAC 60HZ 10AMP SERVICE 0 ☐
240VAC 50HZ 8AMP SERVICE 1 ☐

VORTEX

PRODUCT NAME

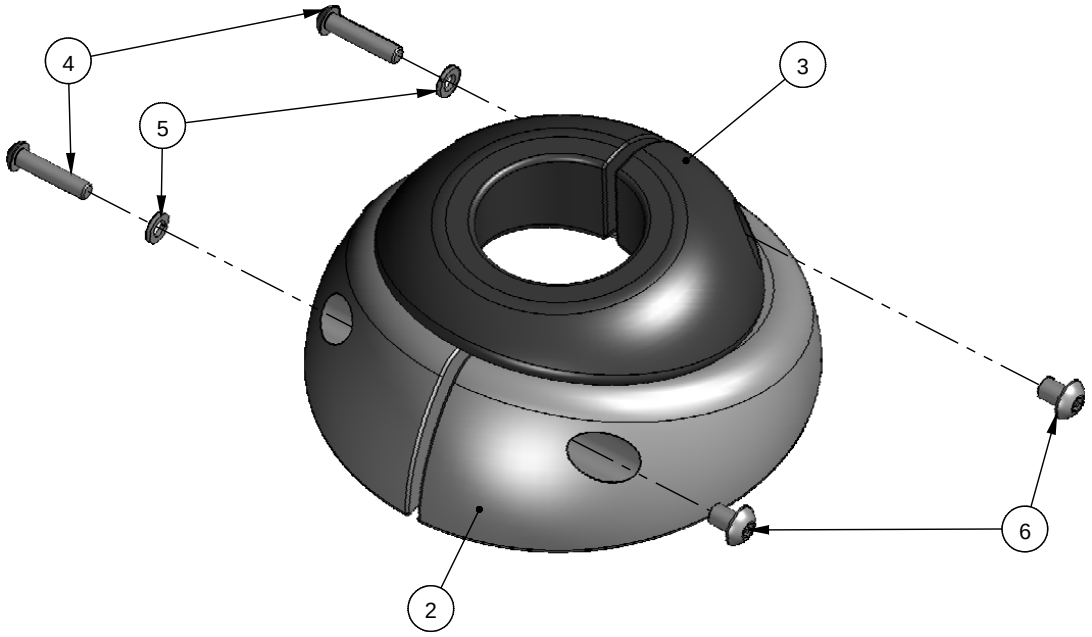
Smart Flow 2™ CONTROLLER FT 18 OUTPUT (120/240VAC) WIRING DIAGRAM

DATE	SIZE	AUTHOR	PRODUCT REV	DWG REV
09-30-2009		MAB	VOR-0718.600XR01	REL-01
	SCALE N.T.S.		SHEET	1 OF 1

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	Default/QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66159.111	ASSY FOR 33900.7720			REL-01+
2	1	22900.125	BOTTOM OF SHOE COVER MEDIUM, BLUE		RUBBER EPDM DURO 080 (PANTONE 285C)	REL-01
3	1	22900.089	TOP OF SHOE COVER, 3" PIPE, BLUE		RUBBER EPDM DURO 080 (PANTONE 285C)	REL-02
4	2	11145.218	SECURITY BUTTON HEAD SCREW 3/8"-16UNC X 1.75"LG		STAINLESS STEEL 304	REL-01+
5	2	11155.001	LOCK WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	2	11145.093	SECURITY BARREL NUT 3/8"-16UNC X 5/8"LG		STAINLESS STEEL 304	REL-01+

VORTEX

APPROVALS	DATE
DESIGNED MKHALIL	05/21/08
DRAWN MKHALIL	05/21/08
CHECKED	
COMMENTS	

PRODUCT NAME: NEW TOE GUARD 3" PIPE ASSEMBLY

DRAWING TYPE: ASSEMBLY

SIZE FORMAT: A

ASSY NO.: 33900.772REL-01

DWG REV.: REL-01

UNITS: INCH

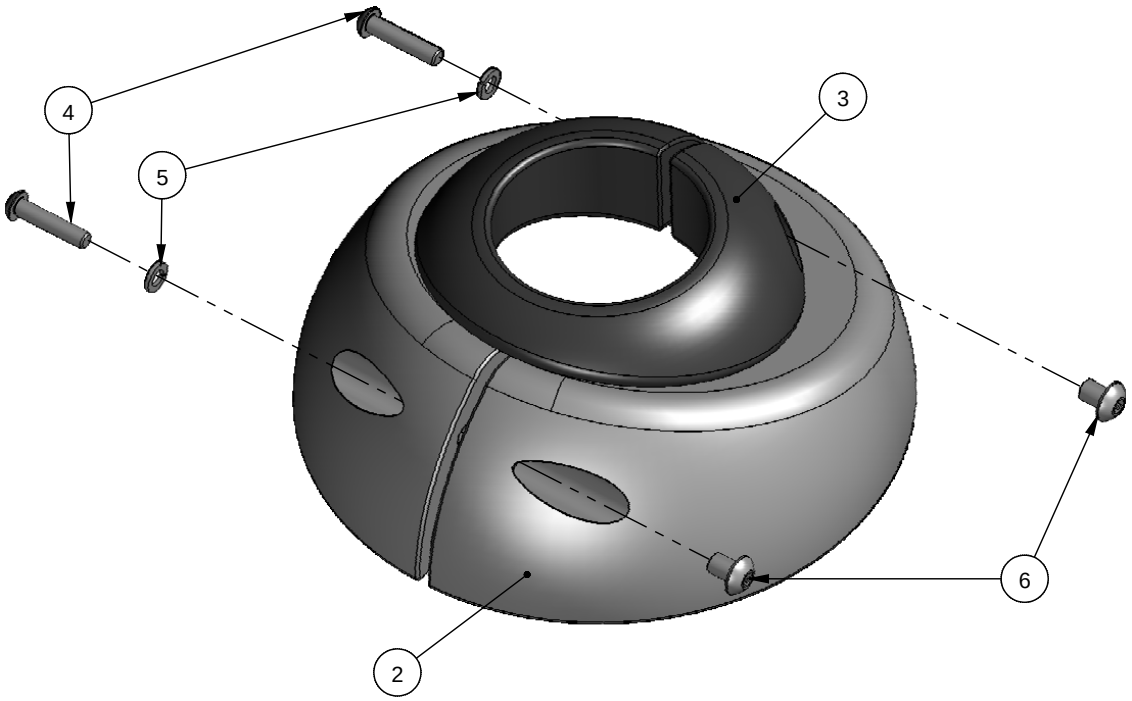
SCALE: ---

SHEET: 1 OF 1

NOTES :

1. COMPONENT TO BE MANUFACTURED PER VORTEX WORKMANSHIP STANDARD VOR-WM-01.
2. (*) INDICATES KEY PRODUCT CHARACTERISTICS FOR INSPECTION PURPOSE.

REV	DESCRIPTION	ECR	DATE	BY	APP.



ITEM NO.	Default/QTY.	NUMBER	DESCRIPTION	LENGTH	MATERIAL	REVISION
1	1	66159.105	ASSY FOR 33900.7680			REL-01+
2	1	22900.091	BOTTOM OF SHOE COVER LARGE, BLUE		RUBBER EPDM DURO 080 (PANTONE 285C)	REL-01
3	1	22900.090	TOP OF SHOE COVER, 4" PIPE		RUBBER EPDM DURO 080 (PANTONE 285C)	REL-01
4	2	11145.218	SECURITY BUTTON HEAD SCREW 3/8"-16UNC X 1.75"LG		STAINLESS STEEL 304	REL-01+
5	2	11155.001	LOCK WASHER 3/8"		STAINLESS STEEL 304	REL-01+
6	2	11145.093	SECURITY BARREL NUT 3/8"-16UNC X 5/8"LG		STAINLESS STEEL 304	REL-01+

VORTEX

APPROVALS	DATE
DESIGNED MKHALIL	05/22/08
DRAWN MKHALIL	05/22/08
CHECKED	
COMMENTS	

PRODUCT NAME: NEW TOE GUARD 4" PIPE ASSEMBLY

DRAWING TYPE: ASSEMBLY

SIZE FORMAT: A

ASSY NO.: 33900.773REL-01

DWG REV.: REL-01

UNITS: INCH

SCALE: ---

SHEET: 1 OF 1