



## **2026 WEAO OPERATIONS CHALLENGE**

### **Niagara Falls Convention**

### **Centre**

**April 12-14, 2024**

### **COLLECTIONS EVENT**

**During the event, your team will complete the following:**

The event simulates connecting a 4-inch PVC lateral sewer to an 8-inch PVC sewer pipe; replacing a leaking section of existing 8-inch PVC sewer pipe while in service; and the construction of the Victaulic Pipe Tower per defined procedures.

#### **SET-UP**

Please refer to the "Collection System Simulator Layout"

The event includes the following:

- The "wet pipe" table and pipe. This pipe starts with a small leak in the pipe and represents the in-service pipe.
- The "dry pipe" table and pipe. This pipe is the surplus material pipe and is used to make the repairs on the wet pipe.
- A toolbox with tools
- A 6X6 designated area for constructing the Victaulic Pipe Tower assembly with a battery powered impact gun and deep impact socket set.
- All parts and tools needed to assemble the Victaulic Pipe Tower will be and must remain inside in the designated area. There will not be any stacking or preassembly of any pieces of the Victaulic Pipe Tower allowed during set up. (Setting a single piece or tool on the 36" X 36" base is not considered stacking.)

#### **WHAT YOU WILL PROVIDE**

Hard hat, safety glasses or goggles, safety boots or shoes, safety gloves. (Safety gloves must be cut resistant. Latex and rubber gloves are not sufficient)

#### **EVENT ORDER**

**The event should be conducted in a similar order to this:**

1. Drill a 4.5-inch diameter hole in the dry PVC pipe.
2. Install an Inserta Tee in the 4.5-inch hole, and secure with a hose clamp.

3. Cut out and remove a measured length of pipe from both the wet and dry PVC pipes. (Two hand saw cuts required per pipe). The section cut from the dry pipe will include the Inserta Tee and will be used to replace the section removed from the wet pipe.
4. Install the replacement length of dry PVC pipe (complete with Inserta Tee) into the wet PVC pipe, and secure with flexible repair couplings and hose clamps.
5. Construct the Victaulic Pipe Tower assembly in the designated area with the couplings, fittings and valves in the order as shown on the drawing in this procedure.
6. End with all tools in the toolbox or designated area, as required for the specific tool. Drill and Sockets used for Victaulic Tower assembly will remain inside the 6' X 6' designated area at the end of the event.

### **EVENT SIMULATOR**

**The provided Collection Event Simulator includes the following items:**

1. "Wet Pipe" - A 6-foot length of 8-inch SDR 35 PVC pipe strapped to a steel table, ready for cutting. Water will be flowing through this length of pipe during the event (the wet pipe). This pipe will start with a small hole, representing a leak.
2. "Dry Pipe" - A 6-foot length of 8-inch SDR 35 PVC pipe strapped to another steel stand, ready for cutting (the dry pipe).
3. Toolbox. The toolbox is made out of 3/4" plywood and is 19" H X 22" W X 39" L.

**The toolbox will contain:**

- a. Hand drill (non-ratcheting brace) with a LENOX 4.5-inch circular cutting blade (model 72L), or equivalent. Brace is a McMaster-Carr Ratchet-Bit Brace Hand Drill.
- b. One 4-inch IPS Sch 40 Inserta Tee, to include a rubber sleeve (ASTMF477), PVC hub (ASTM D3034), and stainless steel band
- c. Spray bottle with lubrication soap solution (1 tsp of liquid dish soap and 16 oz of water)
- d. Block of wood (Standard pine approximately 2-inch x 4-inch x16-inch).
- e. Four-pound mallet/sledge hammer (Stanley Fatmax 4 lb anti-vibrate, or similar) (Approximate dimensions: 14.3-inch x 5-inch x 1.9-inch).
- f. A short piece of pipe already installed in the Inserta Tee outlet so that the plug will seat properly.
- g. Two flexible repair couplings with four bands (Model #B602 ALL 300 SS by Pipconx when ordering with the coupling OR Dynaflo Size 152 10, 51-224mm ALL SS), attached loosely around couplings. The bands are not quick release.
- h. Two LENOX saw handles with two 18-inch PVC saw blades (model HS F180), or equivalent.
- i. Two speed wrenches with sockets.

j. Tape measure and marker. Teams must use the supplied tape measure (Stanley Fat Max Keychain Tape Rule, 1/2-inch x 6 feet FMHT33706W) and marker (Sharpie fine point original 30001). Teams have the option to either carry the tape measure and marker into the event on their body or have the items placed in the toolbox during the three-minute set-up period. However, whichever way the team decides, the tape measure and marker must end the event in the toolbox.

4. The Victaulic Pipe Tower Assembly includes the following items:

- a. The assembly will be built vertically on a fixed base that consists of an 8" grooved by flanged pipe and shall match drawing provided.
- b. Qty of one - 8" Victaulic QuickVic Coupling
- c. Qty of six – 4" Victaulic QuickVic Couplings
- d. Qty of one – 8" x 4" Victaulic Concentric Reducer No.50
- e. Qty of three – 4" Sch 40 roll grooved carbon steel pipe sections
- f. Qty of one – 4" Victaulic VIC-300 Masterseal Butterfly Valve
- g. Qty of one – 4" Victaulic Series 779 Check Valve
- h. Qty of one – 4" Victaulic 90 Degree Elbow No.10
- i. Qty of one – Milwaukee Impact gun with sockets

### **SCORING**

**The event scoring will be based on the following:**

- The time taken to complete the event.
- The leakiness of the wet pipe after being repaired.
- The wet pipe connections will be checked for water tightness at 3 psig for 30 seconds.
- The accuracy of the construction of the Victaulic Pipe Tower assembly.
- Compliance with all provided instructions.
- Ability to perform the event safely.

### **REQUIRED PROCEDURES**

1) A three-minute event set-up period is provided to ensure that all necessary tools and equipment are provided and satisfactory.

**It is the team's responsibility during this time to complete the following:**

- Check and confirm that all equipment, including bands, to be used in the event are in satisfactory condition.
- Check and confirm that all equipment to be used for the Victaulic Pipe Tower construction are in satisfactory condition:
  1. Check and confirm that all hardware for the couplings are together with the coupling housing.

2. Check and confirm that the impact gun is working and has sufficient battery life.
3. Check and confirm correct sockets are in satisfactory condition.

- Mark the wet pipe, if desired (only the wet pipe).
- Bands will already be placed loosely around couplings.
- Confirm the pipe table and clamps are appropriate for the team and modify as needed.
- Inform judges of desired handle orientation for the hand saws and oversee lubrication of the saw blades and hole saw, if desired. Lubrication will be performed by judges.
- The Inserta Tee must be completely put together (this is how the Inserta Tee will start) (defined by the PVC being seated in the rubber coupling appropriately to the noted insertion point with the stainless band around the rubber coupling without falling off) or completely apart inside the tool box.
- Pre-lubrication of the Inserta Tee is not allowed.
- At the end of the three-minute set-up period, all tools and equipment must be placed flat (free standing with its own support) in the toolbox. None of the tools can be stacked on top of each other (No overlapping of any component in the toolbox, whether touching or not) or left leaning against the toolbox. The toolbox lid is to be closed and latched with the padlock. Latching is defined in bullet 10 below. The judges will confirm the toolbox is set appropriately at the end of this set-up period. If it is not set appropriately, a penalty will be assessed, and the Team Captain will be asked to reset the box and latch the padlock.
  1. "Leaning" is defined as support of the vertical walls of the toolbox or other equipment is necessary to keep the item in the current position.
  2. "Overlap" occurs when the tool/equipment cannot be lifted straight out without impacting another tool or equipment.

2) Each team member is required to wear all the required safety gear throughout the event and compete in a safe manner, including the 3 minute set-up/walkthrough and the actual running of the event.

3) The PVC pipe sections strapped to the tables may not be moved laterally by the competitors.

4) The 4.5-inch hole must be drilled in the section originating from the dry PVC pipe, using the hole saw provided.

5) Install the Inserta Tee using the following steps. (The order is not dictated.) All steps must be completed to be considered a proper procedure:

- Core a 4.5-inch hole with the hole saw provided and clean the edges.
- Install the rubber sleeve with the gold band perpendicular to the pipe. Check to be sure the inside and outside segments are flush to the pipe.
- Place the stainless steel band over the rubber sleeve, but do not tighten.
- Spray the soap solution inside the sleeve and on the plastic hub.
- Align vertical red line on the plastic hub with the gold line on the sleeve and insert by hand.
- Place a wood block on the plastic hub and drive the hub into the sleeve with the hammer.
- The hub should be installed so that the horizontal red line is at the top of the rubber sleeve.
- Tighten the stainless steel band, near the top of the rubber sleeve.

6) The lengths of PVC pipe must be cut out using the LENOX saws provided. All cuts must be completed within the framework of the pipe table. Two hand saw cuts per table are required.

7) The PVC repair segment with the Inserta Tee should be moved to the wet table to begin the repair process with the flexible couplings. The Inserta Tee must be installed in a perpendicular position from the table, pointing straight up, with the opening in the Inserta Tee facing the ceiling. See "Inserta Tee Installation Schematic" on Page 8.

8) The Victaulic Pipe Tower must be assembled according to the steps provided in the event simulator and in the order listed on the pipe tower diagram.

- a. The Victaulic Pipe Tower Assembly shall be completed in the designated area.
- b. Use the parts provided for the assembly of the Victaulic Pipe Tower. All couplings must be installed with pad-to-pad contact – no gaps should be visible.
- c. Complete the Victaulic Pipe Tower Assembly in the following order as shown on the "Victaulic Pipe Tower Schematic" on Page 9. During assembly, if any part of the tower (coupling, spool piece, valves, etc.) falls, it will be considered unsafe and a penalty will be assessed.
- d. Connect the reducer fitting to the base using the correct coupling and impact driver to secure fitting.
- e. Insert specified spool piece of pipe and fitting and secure with impact driver.
- f. Insert Check valve and install with the direction of flow as stated on the drawing.
- g. Insert specified spool piece of pipe and fitting and secure with impact driver.
- h. Insert the Butterfly valve in the "Open Position" and secure with impact driver. If installed in the closed position, it will be a penalty. Be sure that all couplings installed up to this point are tight and secured with the impact driver prior to closing the Butterfly valve.
- i. Close Butterfly Valve before installing any other components. Then verbalize "Valve Closed".
- j. Insert specified spool pieces of pipe and fittings and secure with impact driver.
- k. Insert 90-degree elbow and fitting, secure with impact driver. Orient open end of 90-degree elbow fitting towards the Wet Table. The elbow alignment must be pointed within the framework of the Wet Table.
- l. After the Victaulic Pipe Tower Assembly is constructed, open the Butterfly valve and verbalize: "Valve Open".

9) Place tools in the toolbox or designated area at the end of the event, returning them to where they started. The tools must be placed in the toolbox and not thrown or dropped from a level above the height of the sides of the box. The tools in the designated area must be placed and not dropped. The toolbox lid is to be closed and latched with the padlock. Latching the lock is the free end of the lock shackle must be placed through the hasp and over the body of the lock. A majority of the shackle's free end must be within the plane of the lock body. Do not close the lock.

10) The team captain will determine the end of the event by signaling the judges both visually and audibly. The event time will continue until all four (4) team members have exited the event area regardless of the signal from the team captain.

11) After the event ends, the team captain should remain just outside of the event area.

12) The team captain will witness the pressure test and review the Victaulic Pipe Tower assembly inspection. Any couplings that have a visible gap on the bolt pads will be given a penalty. If the valve procedures are not followed; a penalty will be added to the score for each incorrect step.

13) The team captain will be presented with the event raw time, along with any penalties.

14) The team captain will sign the score sheet to conclude the event.

**The judges will:**

- Record the elapsed time. The average of the stopwatches will be used to set the raw time.
- Check the sewer service replacement section for water tightness. The wet PVC pipe will be allowed to fill until water flows from the outlet end. At this point, the discharge/drain valve will be closed, the pipe will fill, and the pressure increased to 3 psi. Time penalties will be added for any leakage that occurs within 30 seconds. Leakage penalties will be evaluated at each connection point (two flexible couplings and the Inserta Tee). The team captain will be asked to witness the leak test.
- Check the Victaulic Pipe Tower for correct assembly and correctly following all required procedures.
- Meet with the team captain to discuss the raw time and any penalties.
- Any penalties and the associated penalty times must be agreed by all judges.
- Add any penalty times to the raw time on the score sheet.
- Event coordinator will approve and sign the score sheet.

**RULES**

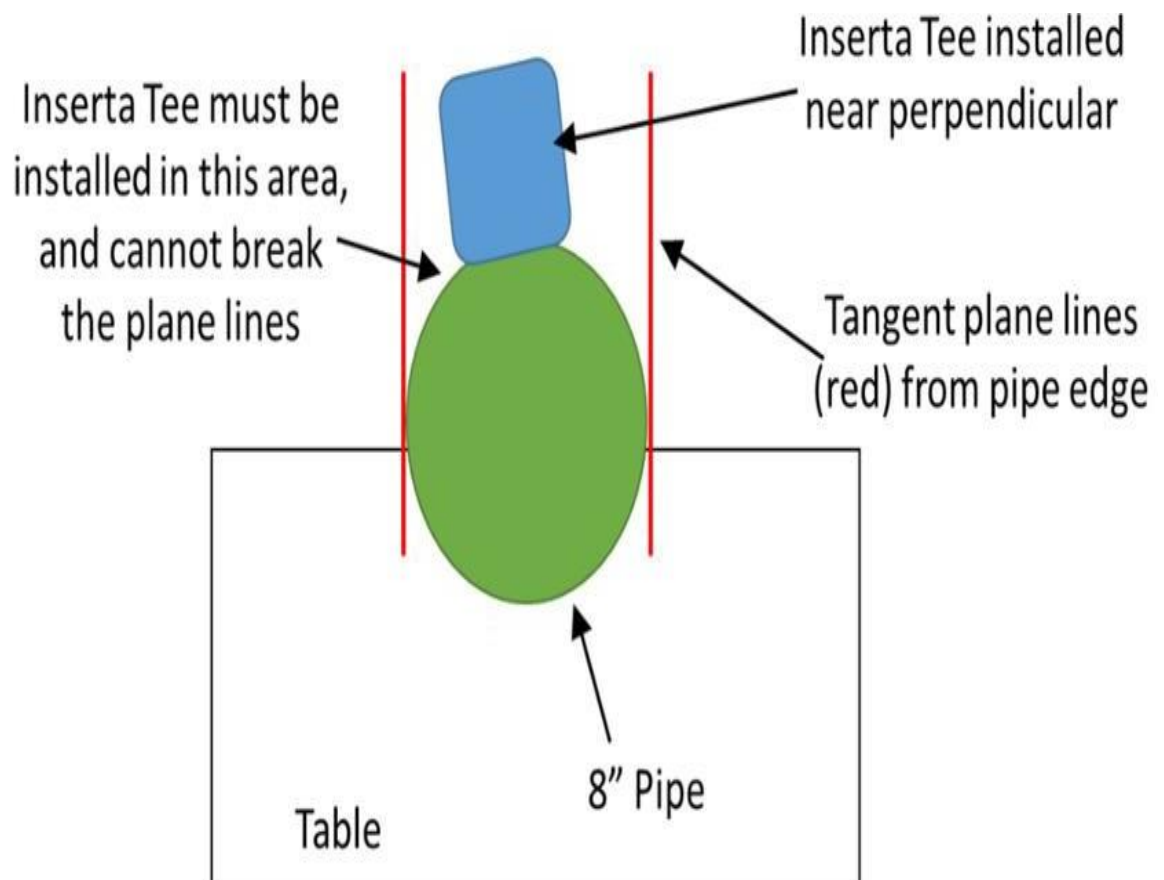
1) If a team member is injured during the event due to their own actions, the event will come to an immediate end so that aid can be provided to the injured team member. The team will then be given a default time of 8 minutes (480 sec) and will not be allowed to restart or rerun the event.

2) All of the procedures listed above must be fully completed, including the Inserta Tee and the Victaulic Pipe Tower. If the procedures are not followed, it will be considered "short-cutting" and is a violation that will be given a penalty time of five minutes (300 seconds).

3) While sawing, drilling and hammering activity is occurring on a pipe table by one team member, no other activity is permitted on the same table. This means no touching the pipe, the pipe table, the pipe clamps, or the person doing the activity on the pipe. This includes not setting tools on the table while active cutting or hammering is occurring.

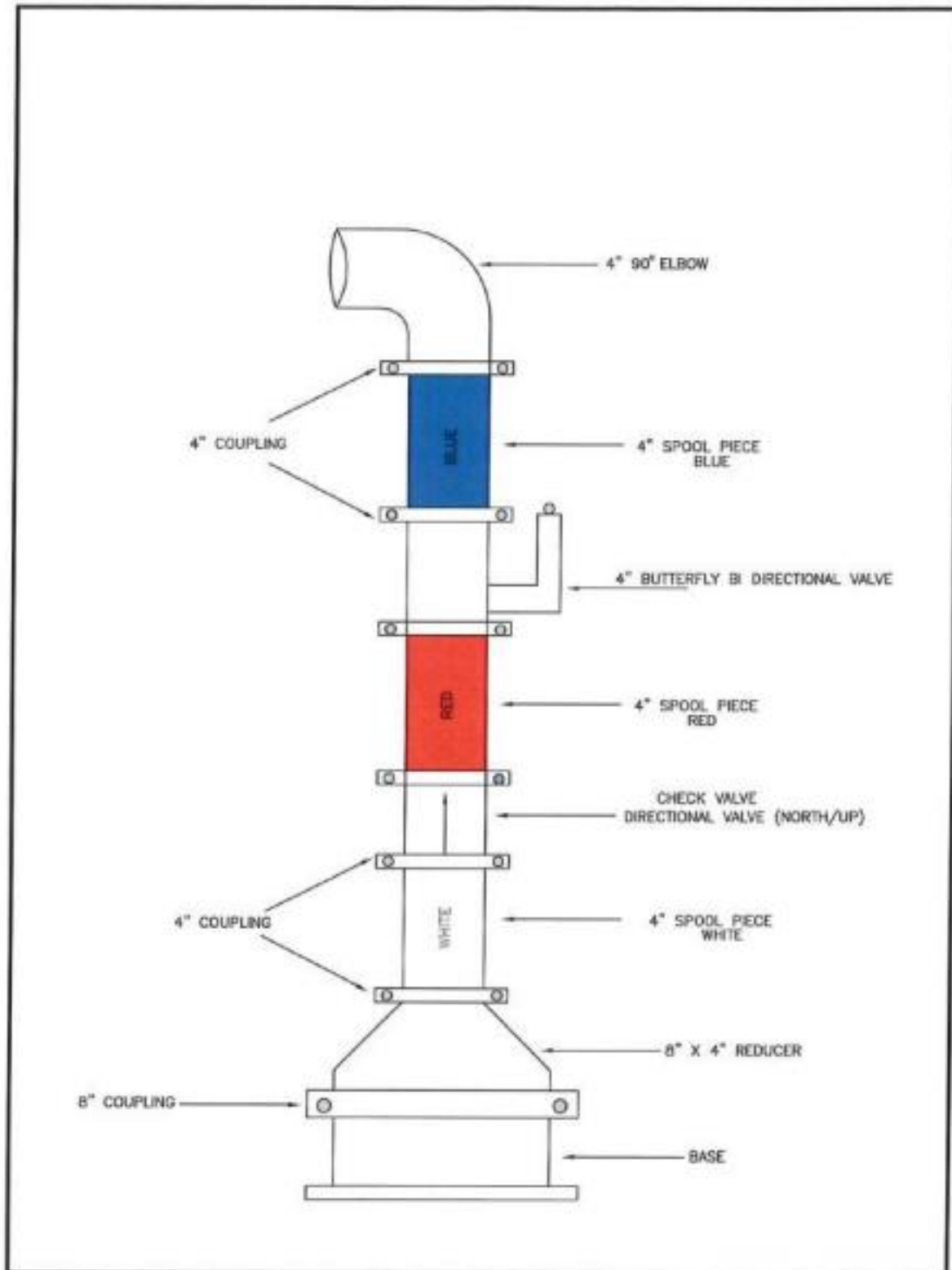
- 4) Only one person (at a time) may operate the brace and bit assembly used to drill the 4.5-inch hole, with no additional forces being transmitted to the tool in use by any other team member(s).
- 5) Team members may not place their hand inside the hole created by the hole saw while the dry pipe is still being cut.
- 6) No punching of the 4.5-inch hole saw coupon in any way.
- 7) No running or jumping.
- 8) No collisions between team members.
- 9) Kicking or the use of one's feet to move tools (even on accident), equipment or material (including the coupon) is not permitted.
- 10) Sliding tools to a team member or from table to table across the floor is not permitted.
- 11) Stepping on a tool is considered tool misuse.
- 12) You may adjust the pipe clamps during the run, if necessary, but no other activity can occur on the table while the clamps are being adjusted. The Team is responsible for the clamps being tight enough to hold the pipe during the pressure test. The judges will not adjust the clamps. Clamps may not be adjusted after the run is complete.
- 13) The Inserta Tee must be installed with the opening facing the ceiling, straight up. The edge of the Inserta Tee must not break the plane of the pipe, drawing perpendicular from the table, as a tangent to the pipe. This arrangement is perpendicular, or very near perpendicular. See schematic attached.
- 14) Team members may reach under and over the wet pipe and table, but no body part may cross the cut ends of the wet pipe. The pipe is considered continuous, with no ends. Team members are allowed to be at the ends of the wet table as long as they do not cross the end of the pipe or any plane of the pipe.
- 15) When the wet pipe cuts are complete, the team must invert the wet pipe 90 degrees in an attempt to remove water from the pipe while over the wet table. Large spillage of water is not allowed and a penalty will be assessed.
- 16) Teams are not allowed to lubricate the inserta tee during the 3-minute walkthrough.
- 17) All items in the toolbox or in the Victaulic Tower designated area are considered to be tools.
- 18) The inserta tee must be properly inserted.

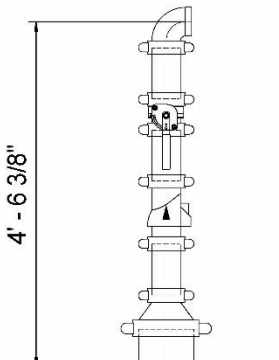
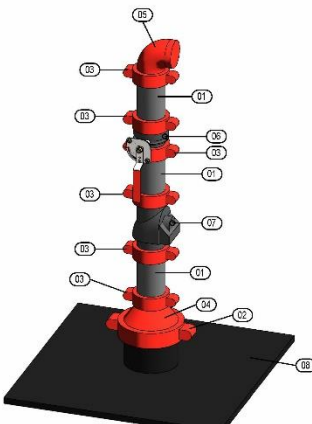
INSERTA TEE INSTALLATION SCHEMATIC






### VICTAULIC PIPE TOWER SCHEMATIC



Mark	Qty	Size	Description	End Prep	Length
01	3	4"	PIPE: ASTM A-106, SMLS, BLACK STEEL, SCH 40	(OGSxOGS)	0'-8"
02	1	8"	VIC QUICKVIC COUPLING STYLE 107V (RIGID)		
03	6	4"	VIC QUICKVIC COUPLING STYLE 107V (RIGID)		
04	1	8"x4"	VIC CONCENTRIC REDUCER No 50		
05	1	4"	VIC 90 DEG ELBOW No V10		
06	1	4"	VIC-300 MASTERSEAL BUTTERFLY VALVE LH&MS		
07	1	4"	VIC CHECK VALVE SERIES 717		
08	1	8"	BASE PLATE 36"x36" w/ 8" PIPE (6" LENGTH)		



**VITAUALIC**  
VIRTUAL DESIGN AND  
CONSTRUCTION

Rev	Description	Date
A	ISSUED FOR REVIEW, COMMENT, AND APPROVAL	11/3/23

NOTE: Customer is first verify all equipment and quantities, match existing dimensions and check for compliance to virtual design drawings (P&ID, 3D, 2D, etc.) before any construction. Virtual design is for construction (owner) for construction (owner) only. All dimensions are in feet and inches (F&I).

All virtual drawings are piping engineering. Virtual design is for construction (owner) only. All dimensions are in feet and inches (F&I).

Company is not responsible for design for engineering of any 2D, 3D, or 4D. Virtual design is for construction (owner) only. All dimensions are in feet and inches (F&I).

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INITIALS	FABRICATION STEPS
	Cut
	Groove
	Assembly
	Paint to P&ID/Torque Req.
	Built Same as Spool
	Inspection

PROJ# 21U-3254

AREA: LML DATE: 11/03/2023

CHK BY: DATE: SEQ:

FAB NUMBER

**Water Challenge Kit**

P.O.# 00000000-0000

LEVEL: Level 1

SYSTEM: Other

REV. A

Contact for Regional Representative to purchase the Vitaualic Pipe Tower Assembly:

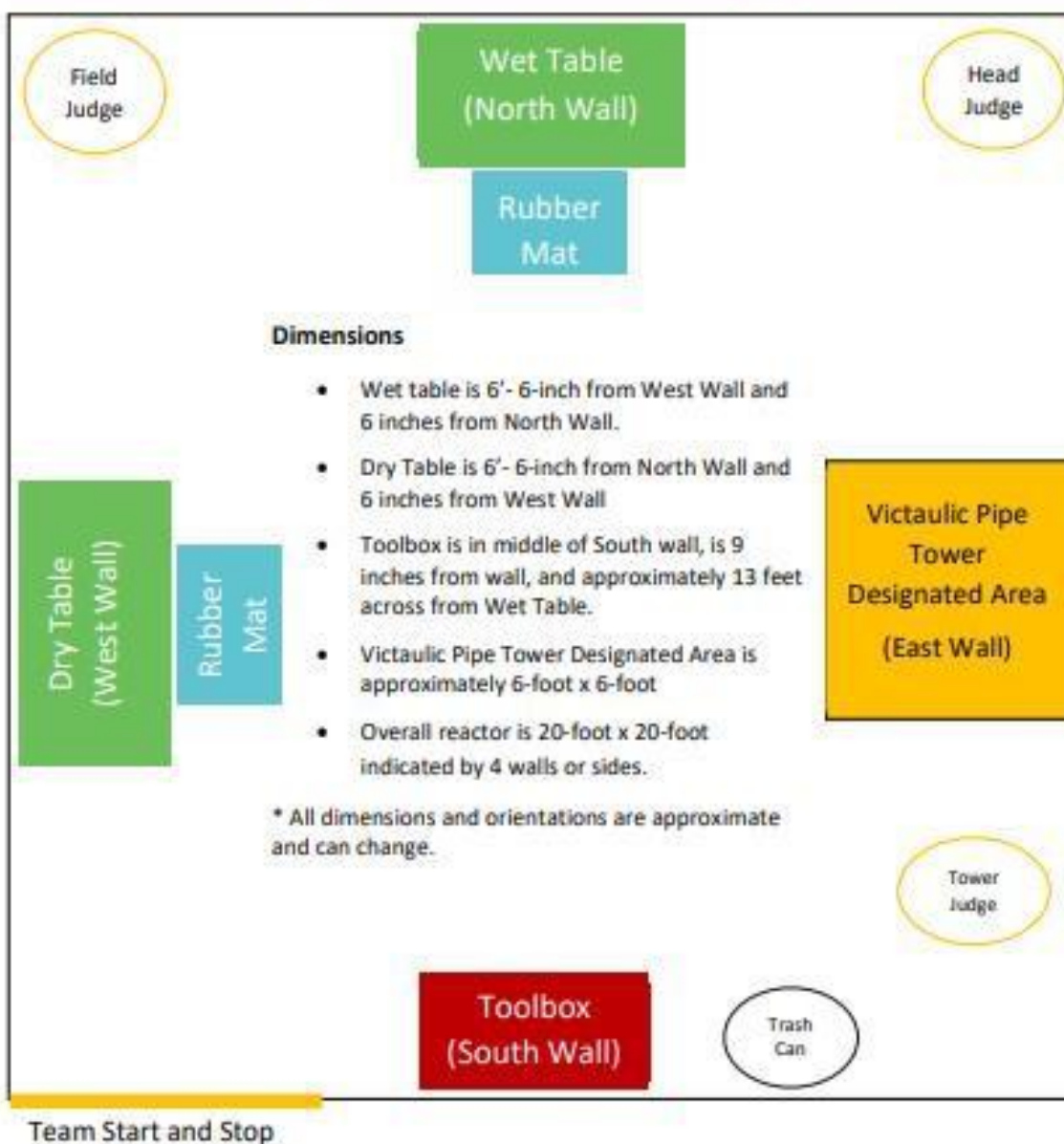
Chris Davies

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Mobile: 647-921-8809

Email: [chris.davies@vitaualic.com](mailto:chris.davies@vitaualic.com)

## Collection System Simulator Layout



For any questions, please contact the WEAO Collections Event Coordinator:

David Fulton [david.w.fulton@toronto.ca](mailto:david.w.fulton@toronto.ca)