Operations Challenge 2015

Collection System Event

What we want you to do:

The event simulates connecting a 4-inch PVC lateral sewer to an existing 8-inch PVC sewer pipe while in service and the programming of an automatic sampler.

- Drill a 4.5-inch diameter hole in the dry PVC pipe.
- Cut out and remove a measured length from both the wet and dry PVC pipes. The section cut from the dry pipe will include the 4.5-inch hole, and will be used to replace the section removed from the wet pipe.
- Install a service saddle connection in the 4.5-inch hole, and secure with hose clamps.
- Install the replacement length of 8-inch PVC pipe SDR 35 (complete with service saddle) into the wet PVC pipe, and secure with flexible repair couplings and hose clamps.
- Program the automatic sampler per the defined procedure.

What we will provide:

- A 6-foot length of PVC pipe strapped to a steel stand, ready for cutting. Water will be flowing through this length of pipe during the event (the wet pipe).
- A 6-foot length of PVC pipe strapped to another steel stand, ready for cutting (the dry pipe).
- Toolbox.
- Hand drill (non-ratcheting brace) with a LENOX 4.5-inch circular cutting blade (model 72L), or equivalent.
- One 4-inch service saddle with attached gasket.
- Two quick (push) release bands for the service saddle.
- Two flexible repair couplings with four bands/clamps, attached loosely around couplings.
- Two LENOX saw handles with two 18" PVC saw blades (model HS F180), or equivalent.
- Two speed wrenches with sockets.
- Tape measure and marker. Teams have the option to use their own tape measure and marker. Additionally, 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 tool box during the three minute set-up period. However, whichever way the team decides, the tape measure and marker must end the event in the same manner, either on the body or in the tool box.
- Hach Model AS950 automatic sampler with all required accessories.
- Automatic sampler PROGRAMMING INSTRUCTIONS sheet.

What you will be judged on:

- The time taken to complete the event.
- The tightness of the repaired sections. The wet pipe connections will be checked for water tightness at 3 psig for 30 seconds.

- The accuracy of the automatic sampler programming and the drawn sample.
- Compliance with all provided instructions.
- **Ability to perform the event safely and in accordance with all standard field safety guidelines.**

Required procedures:

- It is the responsibility of the team during the three minute event set-up period to ensure that all necessary tools are provided, and that all the tools and equipment to be used in the event are in satisfactory condition. Only the wet may be marked during this pre-event set-up period.
- At the end of the three minute set-up period all tools and equipment must be placed flat in the toolbox. None of the tools can be stacked on top of each other or left leaning against the toolbox.
- Each team member is to wear all of the approved safety gear throughout the event, and compete in a safe manner.
- The team member(s) programming the sampler may remove their gloves, but only while working within the designated boundaries for the sampler. Gloves may not be removed upon approach to the sampler outside the boundary and must be put back on prior to leaving the designated boundary of the sampler.
- The straps holding the PVC pipe to the stands may not be loosened during the event.
- The PVC pipe sections strapped to the stands may not be moved laterally by the competitors.
- The 4.5-inch hole must be drilled in the section originating from the dry PVC pipe, using the hole saw provided.
- 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.
- The saddle must be mounted to the appropriate replacement PVC pipe section and properly secured in place with the hose clamps provided.
- The automatic sampler must be programmed correctly using the data provided on the attached instruction sheet. Teams 1 through 9 must remember to enter a 0 before their team number, for example; 01, 02, 03 and so on.
- All tools must be placed (not dropped or thrown) in the toolbox after use. When replacing tools in the toolbox, the tools must be placed in the tool box and not thrown or dropped from a level above the height of the sides of the box. The toolbox lid is to be closed and latched with the padlock. 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.**
- 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 4 team members have exited the event area regardless of the signal from the team captain.
- After the event ends, the team captain should remain just outside of the event area.
- The team captain will witness the pressure test.
- The team captain will be presented with the event time, along with any penalties.
- The team captain will sign the score sheet to conclude the event.

The judges will then:

- 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 valve will be

closed and the pressure increased to 3 psi. Time penalties will be added for any leakage that occurs within 30 seconds. The team captain will be asked to witness the leak test.

- Check the accuracy of the programming of the automatic sampler and verify that a proper sample was taken.
- Any penalties and the associated penalty times must be approved and signed by all of the judges.
- Add any penalty times to the raw time on the score sheet.
- Meet with the team captain to discuss the raw time and any penalties.
- Sign the score sheet with the team captain.

What you will provide:

- Hard hat, safety glasses or goggles, safety boots or shoes, protective gloves.
- Enthusiasm!

Rules:

- 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.
- All of the procedures listed above must be fully completed. Any team found to be in violation of this rule known as "short-cutting" will be given a penalty time of 3 minutes (180 sec).
- While sawing and drilling activity is occurring on a pipe table, no other activity is permitted on the same table. This means no touching the pipe, the pipe table or the person cutting the pipe.
- 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).
- Team members may not place their hand inside the hole created by the hole saw while the dry pipe is still being cut.
- No punching of the 4.5 inch hole saw coupon in any way.
- No running or jumping.
- No collisions between team members.
- Kicking or the use of one's feet to move tools, equipment or material (including the coupon) will not be permitted.
- 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. i.e., 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 cross the end of the pipe.

Hach AS950 Sampler Programming Instructions

1. Press **ON** key on keypad	
2. Press **MENU** key on keypad	
3. Navigate to **Hardware Setup**	Use arrow keys to navigate
4. Select **Hardware Setup**	Press black soft key

5. Navigate to and select **Sampler**	Navigate with arrow keys and select by pressing black soft key
6. Navigate to and select **Site ID**	
7. Enter your team number in the site ID field	Use arrow keys
8. Select **OK**	
9. Select **Retries**	
10. Enter "**1**"	
11. Select **OK**	
12. Select **Sampler Rinses**	
13. Enter "**0**"	
14. Select **OK**	
15. Press **MENU** key on keypad	
16. Navigate to **Programming**	
17. Select **Programming**	
18. Navigate to and select **Sampler Programming**	
19. Select **Total Bottles** enter "**1**" and select **OK**	
20. Select **Bottle Volume** enter "**3 gallon**" and select **OK**	
21. Select **Tubing** enter "**6 feet**" and select **OK**	
22. Select **Pacing** then select **Time Weighted,** select "**NEXT**"	
23. With **Time Weighted** highlighted select **Edit,** enter "**1 minute**" select "**OK**"	
24. Select **Take First**. Select **Edit**, select **Immediately** select **Back**	
25. Select **Sample Volume,** select **Fixed**	
26. Select **Volume** enter "**1000 ml**", select **OK,** select **Back**	
27. Select **Program Start**, select **Immediately on 'Run'**, select **Next**	
28. Select **Program End**, select **Edit**, select **After Samples**, press **Select**	
29. Highlight **Samples**, select **Edit**, enter "**1**" select **OK,** select **Back**	
30. Select **RUN/HALT** key on keypad	
31. Select **Start Program**	
32. If warned about clearing data, affirm by selecting **OK**	
33. Sampler is now Running	

The purpose of this procedure is to create a sampling program for a composite sample (1 bottle), with a volume of 3 gallons, with an intake tube length of **6**ft, intake tube type 3/8" Vinyl, with no Program Lock (Disabled), with no program delay, type of sampling or collection Time-Proportional, at an interval of 1 minute, taking the sample immediately, and stopping after the last sample, samples to collect 1, and a sample volume of **100**ml, 0 intake rinses, 1 sample retry, and Select Site ID by entering your team number. No Advanced options are needed.

After the sampling sequence is completed the sampling history will show Sampling Complete.