



CLOSE DOWN AND START-UP PROCEDURES MANUAL

*5th Avenue
Rideau Canal
Comfort Station*

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5th Avenue Rideau Canal Comfort Station

The following is a set of instructions for close-down, start-up and commissioning procedures and shall be used as a minimum guide for preventive Mechanical and Electrical maintenance plan for the 5th Avenue Rideau Canal Comfort Station.

The procedures shall be reviewed with maintenance staff and modified according to site specific fact-findings and staff observations and recommendations.

The preventive Mechanical and Electrical maintenance plan for the 5th Avenue Rideau Canal Comfort Station shall recognize different work surroundings and shall be tailored with focus on the following:

- 1) **Close down procedure** must be sensitive to:
 - a) Since the structure is located on the ice and services are connected to amenities on the shore protection of the environment is crucial. All work that may cause sewage or chemical leaks must be closely monitored and avoided. The emergency procedure to deal with possible leaks must be in place.
 - b) Work will most likely commence at the outdoor temperatures below freezing point. Prevention against pipe, tanks and fixture damage due to freeze up is imperative. All chambers (pipes, tanks, p-traps, etc.) must be drained or filled with anti-freeze solution. Service heat for shore connections has to be maintain for duration of the operation , set-up and close down.
 - c) Due to the service time and location of the 5th Avenue Rideau Canal Comfort Station during the close-down procedure, adequate cleanup and disinfection procedures is not possible. A great deal of attention is required to clean services with basic disinfection precautions after Station is stored.

- 2) **Start-up procedure** must be scheduled when structure is placed on dry canal to perform work while outdoor temperature is above zero:
- a) Power connection is to be arranged. The cable designated to serve Comfort Station has to be visually inspected prior to connection to Power Bollards. The heat shall be maintained for 48 hr. prior to start of any mechanical work.
 - b) Adequate cleanup and disinfection procedures must be performed during start-up procedure.
 - c) All Mechanical & Electrical services must be tested. Any damages and deficiencies must be recorded for further improvement of preventive Mechanical and Electrical maintenance plan.
 - d) Upon completion of all tasks the 5th Avenue Rideau Canal Comfort Station will be ready for operation on the Rideau Canal. The Station will remain powered and heated until the completion of Winterlude at which time the shut-down procedure will be implemented.

Close-down before shipping to storage yard

1. Flush plumbing fixtures with water.
2. Fill toilet bowl with 10% chlorine solution (Javex) and flush. Replete procedure twice.



3. Close water valves in service chamber on the shore.



4. Evacuate water from the bowl and turn on all taps until water stops running.
5. Pour ½ gal of plumbers anti-freeze in each sink and urinal.
6. Pour ½ gal of plumbers anti-freeze in each toilet and flush.
7. Drain sewage sump tanks, switch pump to operation on “HAND” mode to force sump pump to “run dry”, wash down interior of the sump, fill sump with 5% chlorine solution (Javex/water) up to 1/3 of the tank depth, drain in same manner.



8. Close force flow sanitary line valves in service chamber on the shore.



9. Disconnect and remove water line and sewer force flow pipe connection.



10. Make sure sewer pipe drain back to sanitary sump tank inside Service Station.
11. Drain water lines.
12. Turn breakers off for water pumps, heat tracing and electric water heaters.

13. Drain electric water heater, leave drain valve in open position. (this is clean water, it can be evacuated outside).



14. Use shop-vac to evacuate remaining sewage from sump pump tank. Transfer waste to holding tank. Use pumping truck to empty holding tank to dispose sewage in appropriate manner.
15. Pour 2 gallons of plumbers anti-freeze into sump pump tank.
16. Visually inspect water and force flow hoses and prepare for transport and storage.
17. Perform a full visual inspection of all visible exterior vents, louvers and service connections for any signs of damage.
18. Check for any physical damage to the light fixtures.
19. Disconnect all emergency lighting from batteries for storage.
20. Ensure main disconnect switches are in the off position before disconnecting the outdoor power cables.
21. Check that the power cables are not damaged in any way.
22. Check that all disconnect switches and panel covers are closed and locked and that all fixture covers are secure before transporting the chalet.
23. Perform a full visual inspection of visible exterior wiring for any signs of damage.
24. Disconnect outdoor power cables.



25. Disconnect heat trace cable on water supply pipes, outside Comfort Station, and store them inside the structure.



26. Prepare and submit report(s) detailing asset condition and recommendations, as per Section 7 of the RCS Chalets Operations and Maintenance contract.
27. Structure is ready for transfer.

Start-up procedure on dry canal

1. This procedure is to be performed shortly after transporting the structures onto the dry canal.
2. Visually inspect the building and points of entry for power, water and sewage services.
3. Ensure power cables are not damaged.
4. Ensure that the main disconnect switches are in the off position before connecting the outdoor power cables.



5. Open the main disconnect switches and ensure the fuses are still in place and in the proper positions.
6. Make sure heat trace cables and supply water pipes that are stored inside the structure are not damaged.
7. Slowly open valves on water supply valve in the chamber on the shore, outside Comfort Station, and let it spill onto the ice surface to verify that the shore pipe is not damaged, close this valve.

8. Verify the heater inside valve chamber on the shore is connected and operational and make repairs if required.



9. Connect water supply pipes and heat trace cable.
10. Connect force flow sanitary sewer discharge line and heat trace cable to shore services.
11. Slowly open water supply valve in service chamber outside check for leaks.
12. Verify plumbing fixtures operation, check faucets, drain lines, toilet flashing action.
13. Make sure all breakers are on and not tripped.

14. Verify that all heating units are operational and increase the temperature to ensure thermostats are still functional. If not, verify the breaker, thermostat and the manufacturer installed built-in high limit switches.



15. Connect all emergency lighting to batteries.
16. Perform emergency lighting test: Press test button for 30 seconds and verify that the lamps come on. Check for any physical damage on each unit and the alignment of the light beams. Perform a 90 minute full functional test as well, checking the battery and leads for corrosion. Test both battery and charging circuit voltages and clean the unit.
17. Turn on heating for 48 hr. prior to mechanical services commissioning.
18. Turn on breaker energizing sewer sump pumps.
19. Close and tighten all loose and disconnected sanitary pipe joints. Inspect tank gaskets. Make sure the tanks are airtight
20. Spray inside of sewage sump tank with 2gal of 10% chlorine solution.
21. Flush all toilets several times, run all taps for several minutes and pour approximately 2 gal of water into each urinal. Check for leaks.
22. Make sure sewage sump tanks are full with enough liquid for pumps to turn on. Once pumps turn on, check for leaks. Verify floats operation.
23. Connect and energize water heaters, verify operation. Set thermostat to 90 deg.
24. Verify exhaust fan operation.

25. Place cartridges in waterless urinals.



26. Clean all fixtures and mechanical equipment.

27. Start-up is now complete.

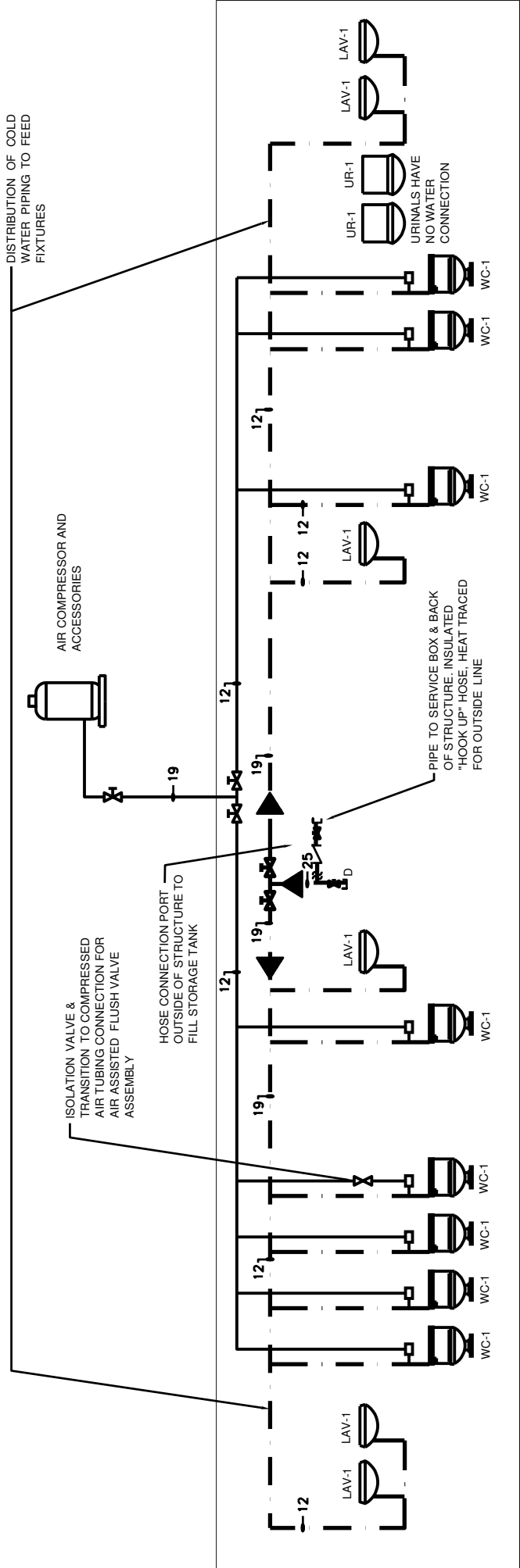
Typical Troubleshooting Guide

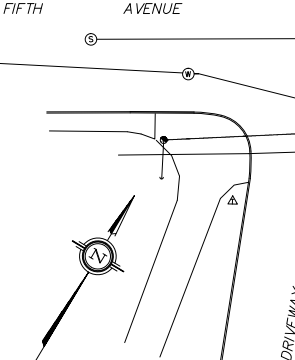
Toilet won't flush	Check if water supply valves are open and fill tank.
	Test flush valve action, repair or replace as required
Sewage sump tank fills up	Check breakers to make sure power is being supplied to sewage pumps
	Check floats
	Check valves between sewage sump tank and valve chamber on the shore to make sure they are in the open position
Sewage smell present in mechanical room	Check integrity of gaskets on sewage sump tanks
No water flow at the tap.	Check if water supply valves are open.
	Check spring inside tap
	Replace tap if necessary
Lights are not on	Check breakers to make sure power is being supplied to lighting
	Replace light(s) if necessary
Leak found in water or sewer piping	Check any joints near where leak is found, tighten any loose joint
No hot water.	Check if water supply valves are open and fill tank.
	Check breakers to make sure power is being supplied to water heater.
	Check thermostat and heating element connection and operation.
	Replace water heater if necessary
No heat.	Check breakers to make sure power is being supplied to heaters.
	Check thermostat and heating element connection and operation.
	Replace heaters if necessary

Operations Checklist

Operation	Daily	Weekly	Annually	Procedure	Troubleshooting
Check operation of all fixtures	✓			Flush all toilets, activate all taps and pour approx. 1L of water into urinals.	See list.
Check sewage level in sewage sump tank	✓			Visually inspect.	See list.
Visually check for leaks for all piping	✓			Visually inspect.	If leak is found, call maintenance contractor. Plumbing contractor may be required.
Check lighting	✓			Visually inspect for burnt out or flickering lights.	If indoor lighting is burned out, call maintenance contractor to replace.
Check emergency lighting		✓		Unplug emergency lights and verify that the lights turn on.	If lights don't turn on, call maintenance contractor. Electrical contractor may be required.
Check breakers		✓		Visually inspect that no breakers are tripped to the off position.	If breaker is in the off position, move to on position.
Check float alarms		✓		Lift and observe strobe light	Check connection, call maintenance contractor
Check fan			✓	Turn on/off.	Repair/replace.
Check heating cable			✓	Plug and feel.	Replace.
Check water heaters			✓	See Maintenance Manual for detailed procedure.	Call maintenance contractor.
Check space heaters			✓	See Maintenance Manual for detailed procedure.	Call maintenance contractor.

Comfort Station - Flow Diagram





1. NEW 75MM DIA. FORCE FLOW SEWER AND 25MM DIA. DOMESTIC WATER UNDERGROUND SERVICES, FOR CONTINUATION SEE DRAWING S8-1
2. DOUBLE COMPARTMENT VALVE CHAMBER WITH LID AND ACCESS COVER, FOR DETAILS SEE 604-01
3. DOUBLE COMPARTMENT PIPE ENCLOSURE WITH LID, FOR DETAILS SEE 604-01
4. WATER STOP VAULT BY SITE SERVICES CONTRACTOR, FOR DETAILS SEE DRAWING S8-1
5. NEW 75MM DIA. INCOMING FORCE FLOW DR D/S SERVICE LINE, PROVIDE PIPE SLEEVE AT PIPE PENETRATION INTO VALVE CHAMBER, TERMINATE PIPE APPROX 75MM ABOVE BOTTOM OF THE CHAMBER WITH FLANGED PIPE CONNECTION.
6. NEW 75MM DIA. OUTGOING FORCE FLOW DR U/S SERVICE LINE, PROVIDE PIPE SLEEVE AT PIPE PENETRATION INTO VALVE CHAMBER, TERMINATE PIPE APPROX 75MM ABOVE BOTTOM OF THE CHAMBER WITH FLANGED PIPE CONNECTION.
7. NEW 75MM DIA. FORCE FLOW SEWER AND 25MM DIA. DOMESTIC WATER UNDERGROUND SERVICES, FOR CONTINUATION SEE DRAWING S8-1

7. TYPICAL 50MM DIA. BALL VALVE.
8. TYPICAL 50MM DIA. CHECK VALVE.
9. PROVIDE 50MM DIA CAPPED TEE FOR FUTURE USE. INSTALL TO ASSURE EASY ACCESS AND CONNECTION OF FUTURE SERVICES IF REQUIRE.
10. COMPATIBILITY OF FABRICATED PIPE SUPPORT SECURED TO VALVE CHAMBER STRUCTURE. ASSURE SUPPORT AND PIPING MATERIAL.
11. PROVIDE EXTERIOR PIPE SERVICE TIE, JOINTS WITH WATER RESISTANT MASTIC. COORDINATE LOCATION OF SLEEVE AND PIPE ENTERING TANK WITH UNDERGROUND SERVICES INSTALLER AND ELECTRICAL CONTRACTOR. PROVIDE PIPE SPECIFIC INTERFERENCE DRAWINGS INDICATING SERVICES LAYOUT AND FITUP DIMENSIONS.
12. PROVIDE 150MM DIA. TRANSFER PIPE SLEEVE. COORDINATE LOCATION OF SLEEVE IN BOTH VALVE CHAMBER AND PIPE ENCLOSURE. SEAL OPENINGS WITH REMOVABLE PLUGS.
13. UNION FOR FUTURE PIPE CONNECTION. PROVIDE GALVANIZED PLUG.
14. PROVIDE 75MM DIA. TRANSFER PIPE SLEEVE. COORDINATE LOCATION OF SLEEVE IN BOTH VALVE CHAMBER AND PIPE ENCLOSURE. SEAL OPENINGS WITH REMOVABLE PLUGS.
15. NEW 25MM DIA. INCOMING COPPER WATER LINE. PROVIDE PIPE SLEEVE AT PIPE PENETRATION INTO VALVE CHAMBER. TERMINATE PIPE APPROX 4MM ABOVE BOTTOM OF THE CHAMBER. REDUCT PIPE SIZE INSIDE VALVE CHAMBER TO 15MM DIA.
16. TYPICAL 15MM DIA. BALL VALVE.
17. PROVIDE 15MM DIA CAPPED TEE FOR FUTURE USE. INSTALL TO ASSURE EASY ACCESS AND CONNECTION OF FUTURE SERVICES IF REQUIRE.
18. EXISTING SIDEWALK CURB. RESTORE TO CURRENT CONDITIONS AFTER PIPE SLEEVES INSTALLATION.

10. FOR REQUIREMENTS RELATED TO EXCAVATION, BEDDING, BACK FILLING AND SURFACE RESTORATION SEE M02.
20. EXISTING JOINT SURFACE. ASSURE PIPE ENCLOSURE LID IS FLAT WITH THE SURROUNDING PAVEMENT WITHOUT ANY VOIDS, CAPS OR BUMPS.
21. EXISTING RAILING. PROVIDE SUFFICIENT SAFETY HOARDING THROUGHOUT DURATION OF THE CONTRACT. PROTECT STRUCTURE FROM DAMAGES. REPAIR ANT.
22. CUSTOM MADE DOUBLE COMPARTMENT CONCRETE VALVE CHAMBER. DIMENSION ARE APPROXIMATE. PROVIDE SHOP DRAWINGS FOR REVIEW PRIOR TO TANK FABRICATION.
23. INTERNAL TANK DIVIDING WALL.
24. GASKEITED CONCRETE LID DESIGN FOR LIGHT TRAFFIC. PROVIDE GALVANIZED STEEL FLUSH WITH LID SURFACE ACCESS HANDLE FOR LID REMOVAL.
25. CUSTOM MADE DOUBLE COMPARTMENT CONCRETE PIPE ENCLOSURE. DIMENSION ARE APPROXIMATE. PROVIDE SHOP DRAWINGS FOR REVIEW PRIOR TO TANK FABRICATION.
26. GASKEITED CONCRETE LID DESIGN FOR LIGHT TRAFFIC. IF LID IS DESIGN IN SECTION ASSURE IT TIGHT AND SEAL. FIT BETWEEN SECTIONS. PROVIDE GALVANIZED STEEL FLUSH WITH LID SURFACE ACCESS HANDLE FOR LID REMOVAL.
27. APX. 500 X 300 SERVICE ACCESS COVER IN PIPE ENCLOSURE LID. MATERIAL AND DESIGN REQUIREMENTS SAME AS FOR MAIN LID.
28. ELECTRICAL DISTRIBUTION FOR DETAIL SEE E-01.
29. SPACE ALLOCATED FOR ELECTRICAL SERVICES. FOR DETAIL SEE DRAWING E-01.
30. 50mm THICK HIGH DENSITY STYROFOAM INSULATION. ADHERE TO 100% OF COVER SURFACE. USE WATERPROOF ADHESIVE COMPATIBLE WITH INSULATION MATERIAL.
31. 100mm THICK HIGH DENSITY STYROFOAM INSULATION. ADHERE TO BOX WALL SURFACE. USE WATERPROOF ADHESIVE COMPATIBLE WITH INSULATION MATERIAL. SEAL JOINTS.
32. PROVIDE TEMPORARY EXPANDABLE TEST PULG IN EACH OPENING OF TRANSFER SLEEVES.
33. CUSTOM FABRICATED STAINLESS STEEL BOX WITH BRASS GASKEITED REMOVABLE COVER. BOX DIMENSIONS 600X320X48. INSERT BOX AND SECURE INTO CANAL WALL. SEAL ALL JOINTS. EXTENDING PIPE SLEEVES INTO THE BOX. SECURE AND SEAL BOX MANUFACTURED BY ALLOY FOUNDRY TELFORDH (613) 269-4757 (CALL). SUBMIT SHOP DRAWINGS PRIOR TO FABRICATION.
34. WATER METER CHAMBER INSTALLED TO CITY OF OTTAWA STANDARDS. SEE DETAIL ON M01.
35. EXTEND TO WATER METER CHAMBER.

