

T&W Enterprises
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Re: Tara Arena Brine Circulating System

Staff report brine seeping from connections where the rink pipe is connected to the header pipes. Header trench opened fully to expose the complete header pipe system.

The lower header pipe that feeds the rink floor, located across the Olympia entrance, was found to be severely corroded, with weeping nipple/rink pipe connections. Given the condition of the pipe in general and the connection nipples it would be advisable to replace about 16 feet of this pipe.

Inspection of the remaining headers, both feed and return, showed one other section of pipe that should be replaced at the opposite end to the engine room about 6 feet in length.

Header pipe inspection also showed about 50 of the 4" nipples, which are welded to the header pipe, to be severely corroded at the area of the weld. These should be removed and refitted with a socket weld flange, designed for such repairs, and new 3/4" schedule 80, 4" nipples be welded to the flange fitting. Provision has been made for 60 such replacements anticipating additional sites as work progresses.

The welding sub trade has reviewed the site and conditions and concurs with our findings. He also feels that although the trench presents some very cramped working conditions they will have no difficulty in installing the new pipe sections.

In the engine room the discharge pipe from the brine pump to the chiller after the butterfly valve is corroded and should be replaced.

The inlet pipe on the suction side of the pump should be replaced from the butterfly valve to the brine pump including the air trap.

Both pipe replacements inside the engine room would be of PVC plastic pipe and fittings.

Failure of any of the components listed would constitute an extremely significant condition most likely resulting in considerable brine loss. Loss of useable facility time and although not impossible it would be extremely difficult to repair during the season resulting in much higher costs.

As a matter of information, the header pipes were replaced about 10 years ago by another contractor. The pipes leading from the engine room to the headers were not. About 12' feet of pipe was replaced many years ago on the old header pipe at the opposite end of the

engine room. It would appear by this history that a pattern exists and therefore some effort should be made to shield these pipes from unnecessary water conditions that have caused this corrosion, starting with multiple coats of quality paint and possibly a shield to deflect water away from the header pipes.

In order to carry out this repair work it will be necessary to drain the entire brine system of an estimated 1500 gallons and store it on site in barrels. The chiller will have to be protected from exposure to air as the repair process would leave it empty for too long a period promoting internal corrosion of the ammonia/brine tubes. Chiller is 20 years old and warrants the extra attention to preserve it. To accomplish this 2 butterfly valves and flanges will be immediately installed on the inlet and discharge ports of the chiller allowing it to be temporarily flooded thereby eliminating exposure to air.

Cost to carry out this work including welding sub-trade, materials, shop fabrication of replacement headers and their installation, replacement of pipes in engine room, connecting about 100 rink pipes with new braided hose and h/d clamps (not gear clamps), insulating pipes using as much existing material as is practical and using new where required. Note an allowance of \$ 1,700.00 for insulating is included in the costing and will be reduced based on the number of fittings we can salvage and install with reliability.

\$ 18,472.00 plus HST

We and our sub-trades and suppliers are on stand by to carry out this work on your authorization.

