December 5, 2018

Worksafe BC

Deepak Chadda

2045 Enterprise Way

Kelowna, BC, V1Y 9T5

RE: Alternate Measures for The City of Penticton Sewer Lift Stations

Dear Deepak,

On behalf of The City of Penticton find below our submission for Alternate Measures for entry into the sewer lift stations located within the city as required under section 9.22 of the OHSR.

Northwest Safework Solutions has delivered Confined space entry and rescue training including completing rescue exercises annually to city staff over the past 10 years. The city has asked us to assist in updating their confined space entry and rescue procedures for Sewer Lift Stations and apply for Alternative Measures.

The City of Penticton operates and maintains several Sewer Lift Stations. There are two categories of stations; ones with platforms above the wet well and second with no platforms.

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| **Lift Stations with Platforms** |
| Name | Diameter/Dimensions(m) | Depth to Grating(m) | Depth(m)  | Volume(m3) | Gravity Size(mm) | Forced Main Size (mm) |
| Lee | 3.76  |  | 6.0  | 66.6  |  |  |
| Wilson | 2.438  | 2.15 | 4.4  | 20.5  | 100 /300 | 150 |
| Marina | 2.438  | 2.2 | 4.6 | 21.5 | 250 | 150 |
| SOEC | 3.0 | 1.71 | 7.76 | 54.9 | 525 | 200 |

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| **Lift Stations – NO Platform** |
| Name | Diameter/Dimensions(m) | Depth (m) | Volume(m3) | Gravity Size(mm) | Forced Main Size(mm) |
| Sorel | 0.9  | 2.0 | 1.8 |  |  |
| Lakeside North | 2.44 x 2.09 | 3.063 | 15.6 |  |  |
| Lakeside South | 1.829 | 5.54 | 14.5 |  |  |
| Airport | 3.8 | 4.32 | 49.0 | 200 /200 | 100 |
| Warren | 0.9 | 2.0 | 1.8 |  |  |
| Fairview | 1.8 | 3.7 | 9.4 | 200 | 150 |
| Yacht Club | 2.1 | 2.0 | 6.9 |  |  |

The attached confined space entry and rescue procedures describes 2 types of entries:

1. To perform basic maintenance including exercising check valves and maintaining equipment above the grating or from a ladder in stations with no Grating.
2. To perform work on the base of the station (below the grating or stations with no grating) such as re-attaching pumps rails.

**Lift Stations with Mid-Level Platform - Entry above grating**

A minimum of 2 workers will be on site during this type of entry. The entrant will stay attached to a Type 3 SRL throughout the entry including while entering and exiting on the ladder.

In the event the entrant requires assistance exiting the space the attendant will switch the Type 3 SRL to the winch mode and lift the entrant out of the space.

The pumps will remain energized during this entry to control sewage levels. The entrant and standby person will monitor the sewage level and, in the event the sewage level rises to within 2 feet of the mid-level grating, the entry will be aborted.

**Lift Stations with Mid-Level Platform - Entry below grating (wet well)**

If work requires access below the grating into the wet well a vacuum truck will be utilized to pump out and clean the station prior to entry.

A plug will be installed into the influent pipe(s) in the station to stop flow (Cherne Pneumatic Plugs). Vacuum truck(s) or bypass piping and pumps will situated / installed at a manhole(s) upstream of the lift station and pump out any sewage to minimize the chance of pressure building on the plug(s) and it becoming dislodged while entrants occupy the station.

The pump being worked on will be de-energized and the isolation valve closed. The second pump will remain operational (energized). This will allow, in the event the engineered plug, bypass pumping or vacuum truck fails, for the operational pump to pump down the wet well. The entrant will immediately exit the station if this occurs.

A minimum of 5 workers will be on site during this type of entry (Entrant, Rescuer, Attendant, 2 workers with the vacuum truck / Bypass piping and pump). The entrant will stay attached to a Type 3 SRL throughout the entry including while entering and exiting on the ladder.

In the event the entrant requires assistance exiting the space the rescuer will enter attached to a separate Type 3 SRL and assist the worker through the hatch in the mid-level grating while the attendant lifts with the Type 3 SRL in the winch mode.

**Lift Stations without Mid-Level Grating – Entry above the wet well**

A minimum of 2 workers will be on site during this type of entry. The entrant will stay attached to a Type 3 SRL throughout the entry including while entering and exiting on the ladder. The entrant will remain on the ladder while performing work above the wet well.

The pumps will remain energized throughout this entry to control sewage levels. The entrant and standby person will monitor the sewage level and, in the event the sewage level rises to within 2 feet of the entrant, the entry will be aborted.

In the event the entrant requires assistance exiting the space the attendant will switch the Type 3 SRL to the winch mode and lift the entrant out of the station.

**Lift Stations without Mid-Level Grating – Entry into the wet well**

If work requires access below into the wet well a vacuum truck will be utilized to pump out and clean the station prior to entry.

A plug will be installed into the influent pipe(s) in the station to stop flow (Cherne Pneumatic Plugs). Vacuum truck(s) or bypass piping and pumps will situated / installed at a manhole(s) upstream of the lift station and pump out any sewage to minimize the chance of pressure building on the plug(s) and it becoming dislodged while entrants occupy the station.

The pump being worked on will be de-energized and the isolation valve closed. The second pump will remain operational (energized). This will allow, in the event the engineered plug, bypass pumping or vacuum truck fails, for the operational pump to pump down the wet well. The entrant will immediately exit the station if this occurs.

A minimum of 5 workers will be on site during this type of entry (Entrant, Rescuer, Attendant, 2 workers with the vacuum truck / Bypass piping and pump). The entrant will stay attached to a Type 3 SRL throughout the entry including while entering and exiting on the ladder.

In the event the entrant requires assistance exiting the space the attendant will switch the Type 3 SRL to the winch mode and lift the entrant out of the station.

**Control Measures**

Historic atmospheric monitoring data indicates normal atmospheric conditions (20.9% O2, 0% LEL (CH4), 0 ppm H2S, 0 ppm CO) in all the stations. The spaces have been assigned a Moderate Atmospheric risk due to the potential of sewer gases, spills or dumping of chemicals and bioaerosols in the sewer system.

Atmospheric monitoring with a calibrated, bump tested detector will be conducted throughout the entry to ensure there is clean respirable air being delivered to the entrant.

Sufficient ventilation will be supplied to maintain a positive pressure inside the station to minimize the infiltration of gases into the station. The table below lists the Air Exchanges per hour in each station. The ventilation equipment will result in a minimum of 20 air Exchanges per hour in the station to ensure clean respirable air to the entrant. In stations with a volume larger than 40 m3 ventilation will be done with a blower which supplies a minimum of 65 m3/ min of free air (Americ 3000) which results in air delivered in the space with one 900 bend and 15 feet of 12” ducting of 39 m3 / min. In stations with a volume less than less than 40 m3 ventilation willbe done with a blower which supplies a minimum of 21.5 m3/min (Allegro STFJ-08B) which results in air delivered in the space with one 90o bend and 15 feet of ducting of 11 m3/min.

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| **Stations with Platforms** |
| Name | Volume(m3) | Blower Capacity(m3) | Air ExchangesPer hour  |
| Lee | 66.6 | 65  | 35 |
| Wilson | 20.5 | 21.5 | 32 |
| Marina | 21.5 | 21.5 | 30 |
| SOEC | 54.9 | 65 | 42 |

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| **Stations with NO Platform** |
| Name | Volume(m3) | Blower Capacity(m3) | Air ExchangesPer hour |
| Sorel | 1.8 | 21.5  | 366 |
| Lakeside North | 15.6 | 21.5 | 42 |
| Lakeside South | 14.5 | 21.5 | 45 |
| Airport | 49.0 | 65 | 47 |
| Warren | 1.8 | 21.5 | 366 |
| Fairview | 9.4 | 21.5 | 70 |
| Yacht Club | 6.9 | 21.5 | 95 |

The ventilation system will be placed upwind of the entry point and away from roads to reduce the chances of re-circulation of purged air or pick up of vehicle exhaust. Any equipment (generators) that could generate exhaust will also be positioned down wind of the space.

Traffic Control will be set up to protect workers and ensure no vehicle exhaust is inadvertently blown into the space.

Information required in OSHR 9.22 for submission of an Alternate Measure is listed below and in the Confined Space Entry and Rescue Procedure.

1. Description of the space: See Section A & B of the Confined Space Entry and Rescue Procedure (CSE & RP) and the description above.
2. Isolation as per OSHR 9.18 is not possible as there are no isolation valves in the gravity flow influent pipes into the stations. All the stations contain 2 pumps in the wet well which pump the sewage through forced mains. Backflow check valves and isolation valves are installed on both pipes leading from the pumps to the forced main.
3. Confined Space Administrator

Jason Jeffrey

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1. Qualified Person

Randy Craig

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1. Hazards to be addressed by these Alternate Measures: See section F of the CSE & RP.

Control measures & equipment to be in place during the entry include:

* Ventilation – Americ 3000 / Allegro STFJ-08B
* Atmospheric Monitoring – 2 x ISE Ventis MX4 gas detectors (1 with pump)
* Fall Protection / Rescue – Pelsue Davit Arm / Tripod & Type 3 SRL & Winch. Equipment will be inspected & set up prior to entry and the entrant will stay attached to the SRL throughout the entry.
* Personal Protective Equipment
	+ Fullface Mask respirator with Multi Contaminant / P 100 cartridges.
	+ CSA Rubber boots
	+ Nitrile rubber gloves
	+ Coveralls for entries above the wet well
	+ Tyvek Suits for entries into the wet well
	+ Hardhat with chin strap
* Clean up / Decontamination supplies – water and soap
* Intrinsically safe lighting if required
* Traffic Control as required
1. The Occupational Health and Safety Representative has been consulted during the development of these procedures. Workers will be informed of the proposed measures to be taken for entry during safety talks and at the pre-entry tailboard meeting prior to performing work in the lift station.
2. Supervision of the Confined Space work will be performed by the responsible supervisor in charge of the entry. This person will be stationed at the entrance to the confined space for the entire duration of the entry.
3. This submission is proposing that the Alternate Measures be in place for 3 years.

We look forward to discussing this submission with you in the near future.

Yours truly,



Kelly Kaye