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Jessica Arguin
Chief Adminstrative Office Operations Manager
Resort Village of Shields
8 Procter Drive
Shields, SK S7C 0A1

Re: RESORT VILLAGE OF SHIELDS
LOW PRESSURE SEWER
SHALLOW TANK INSTALLATION

Dear Jessica:

As the Low Pressure Sewer project has progressed into the Village completing work on private properties under the main construction contract, concerns have recently been identified with some of the depths of the tanks that the sewer service lines will potentially be installed into will not be below the frost level. To prevent freezing, it is recommended that the sewer service line be cored through the concrete collar at a minimum depth of 2.5m. It has been understood since the onset of the project, that not all tanks will be deep enough to achieve this. As such, properties that are unable to achieve installation at the recommended depth will require improvements to prevent freezing so the homeowners tank can operate their system as intended. The tank assessments are still ongoing and the tank depths will be shared with the Village once they are all complete.

Lowering the tank so the discharge line enters into the collar at a depth of 2.5m is one way to prevent freezing, however, as we understand that it is likely not feasible to lower all of the tanks in the Village to the recommended depth. There are a number of different frost mitigation measures that could be implemented for sewer lines that are installed above the frost line, however it must be recognized these are only preventative measures and there will remain a risk of freezing. Since each property will differ, it is therefore recommended that the Property Owners consult with the installation contractors on the preferred method of implementing any improvements to the system to reduce the risk of freezing.

Some of the options they can consider are noted below:

1. The first option would involve the Contractor directionally drilling the service line up to the septic tank at or below the minimum recommended depth and then bring the line to the surface outside of the tank. This will require an open excavation to complete the installation of the service line into the tank at a later date. Many of the typical frost mitigation strategies require an open excavation

and therefore this strategy will allow the homeowner to implement these strategies during the initial installation. This option could include the following:

- Achieve the recommended depth much closer to the tank compared to directional drilling.
- Allow for the installation of an external heat trace on the pipe through the collar extending into the tank.
- Place rigid insulation above the service line for any portions where the line is less than the recommended depth.
- Insulate the tank lid which will involve the installation of insulation on the inside of the tank lid.
- Other measures that may be deemed necessary by the installation contractor.

2. The second option would involve the Contractor to continue with the directional drilling directly into the collar. The frost mitigation strategies for this option are limited and may include the following:
    - Installation of an in-line heat trace cable to a point where the minimum cover is achieved.
    - Excavating and placing rigid insulation above the service line for any portions where the line is less than the recommended depth.
    - Raising the grade around the septic tank by adding additional collars achieve the minimum recommended cover.
    - Insulate the tank lid which will involve the installation of insulation on the inside of the tank lid.
    - Other measures that may be deemed necessary by the installation contractor.

The risk of freezing when the sewer line is above the frost line will always exist. The shallower the depth, the greater the risk in freezing and these strategies are only options to reduce the overall risk and will not eliminate it. Depending on each situation, it may be necessary to combine these strategies. It may also be that the homeowner will be comfortable accepting the risk when they compare their alternatives. Directionally drilling directly into the tank involves minimal disruption in the yards and can be very attractive compared to open excavation, however in our opinion, open excavation allows for more typical frost mitigation strategies as compared to directional drilling and it is important that the homeowner is comfortable that they have considered the risk of freezing specific to their situation.

The Property Owners are encouraged to review the depth of their tank and the height of the collar and make an informed decision with the installation contractors as they proceed with the work, understanding that there will be additional expenses for these improvements.

Yours truly,

Ryan McDowell, Engineering Licensee
Project Manager

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