

PINE STREET CULVERT BRIDGE AND PEDESTRIAN WALKWAY

**PUBLIC INFORMATION SESSION
AUGUST 24, 2022 6:00 – 8:00 pm
IGNACE SILVER TOPS, 300 PINE ST.**

Presentation by JML Engineering

- Sponsored by Township of Ignace
- Introductions:
 - Staff:
 - Lynda Colby, Clerk
 - Roxanne Cox, Deputy Clerk
 - Christy McIntomney, Treasurer
 - Petrina Taylor, Communications
 - Dan Arbour, By-Law Enforcement
 - JML Engineering Staff:
 - John Lorenowich
 - Bill Warren



Background from Township perspective:

- This past winter we had a tremendous amount of snow.
 - 67.1cm of snow on the ground on Apr. 20th
 - 58.0cm on Apr. 27th
 - 36.7 cm on May 2nd
 - no snow by May 9th
- Agimac lake was full. The dam was opened as per protocol.
- The ground started thawing.
- Followed by torrential rainfall of 133 mm of rain in May which is double the average precipitation for that timeframe.
- West St. culverts were at maximum capacity with the addition of Lily Pad diversion waters down the west side of West. St. into Agimac Creek.
- We were worried about the water washing out West St. (culverts and street)
- May 18th declared a State of Emergency
- Set up pumps to divert the water over the road to Agimac Creek to the East side of West Street. Looking pretty good.
- The culverts at Pine Street were much larger and could take all the water.
- We survived. Next step – call in the Engineers to help us determine if there was anything else we could have done/should be doing and to inspect our culverts.



West side of West Street – culverts completely under water – maximum capacity – May 18th

- **July 18, 2022 Council approved the following:**

- Consulting Engineering proposal priorities:
 - Structural Inspection Three Twin Culvert Sites - Ontario Structure Inspection Manual (OSIM)
 - Hydraulic Analysis Two Twin Culvert Sites
 - Options Analysis Replacement West Street Twin Culverts
 - Assessment of the West Ditch Along West Street

Initial Site Visit and Observations by JML:

On May 12, 2022 JML Engineering travelled to Ignace to walk through the town, with assistance from Lynda Colby and MNDMNR's Kelvin Davenport. Some of the key observations included:

- Agimak River was high and fast flowing.
- Freeboard at the culverts were as follows:
 - Lakeshore Drive twin culverts – 150 mm
 - West Street twin culverts – 0 mm
 - Pine Street 2400 dia. twin culverts – 800 mm, and
 - Hwy 17 3000 dia. twin culverts – 1500 mm.
- West ditch along West Street was backed up significantly.
- Basement residences along West Street and Spruce Crescent had reported flooding.
- Several pumps were in place to move water across West Street.
- The stream had overtopped the embankment between Lakeshore Drive and West Street.
- Water levels were reported high at both Davey Lake and Lilypad Lake.
- MNDMNR were facing challenges releasing stored water at Lake Agimak.
- High water and groundwater levels were likely accentuated by the recent storms and rapid snow meltdown prevalent throughout the region.

Recommended Follow-up Work

After further review, JML Engineering recommended the following initial works be done to evaluate damages caused by the high waters and to guard against future flooding:

- Complete an OSIM structural inspection of the three twin culvert sites.
- Conduct a ditch inlet survey along the west side of West Street, and include basements of residences across the street.
- Complete a bathymetry survey and hydraulic analysis of the Agimak River between the Dam and West Street to establish theoretical flood limits and design flows at the culvert sites.
- Pending results of the hydraulic analysis, complete an Options Analysis report for creating enlarged openings at the West Street culverts.
- Review stream improvement options, such as a raised embankment along the south side of the Agimak River.
- Undertake a study to incorporate and evaluate all data gathered during the flood period.
- Review the Agimak River Dam Operation Plan.

The first four items were approved. JML Engineering completed the field exercise the week of August 8, 2022. They are currently in the process of working on the required reports and supporting documents.

Culvert Inspections At Pine Street

During the culvert inspections at Pine Street, our field crew observed significant structural deficiencies along several sections of both barrels:

- Over ten (10) holes of various sizes were observed near the waterline at both sides of the two barrels, with holes in the barrel ranging up to 200 mm wide and 300 mm tall.
- Some of the voids measured behind the culvert at the holes were over 500 mm deep.
- Over ten (10) linear tears (resembling a zipper line) were observed near the waterline at both sides of the two barrels at different locations, with the longest crack over ten (10) meters in length, and three of the long cracks directly beneath the roadway.
- In between the ‘zipper’ tears, are similar deficiencies of a lesser level of deterioration, but these areas are easily punctured by tapping with a hammer.
- The level of deterioration observed appears to have occurred over several years.

Description:
Pine Street Bridge Culverts



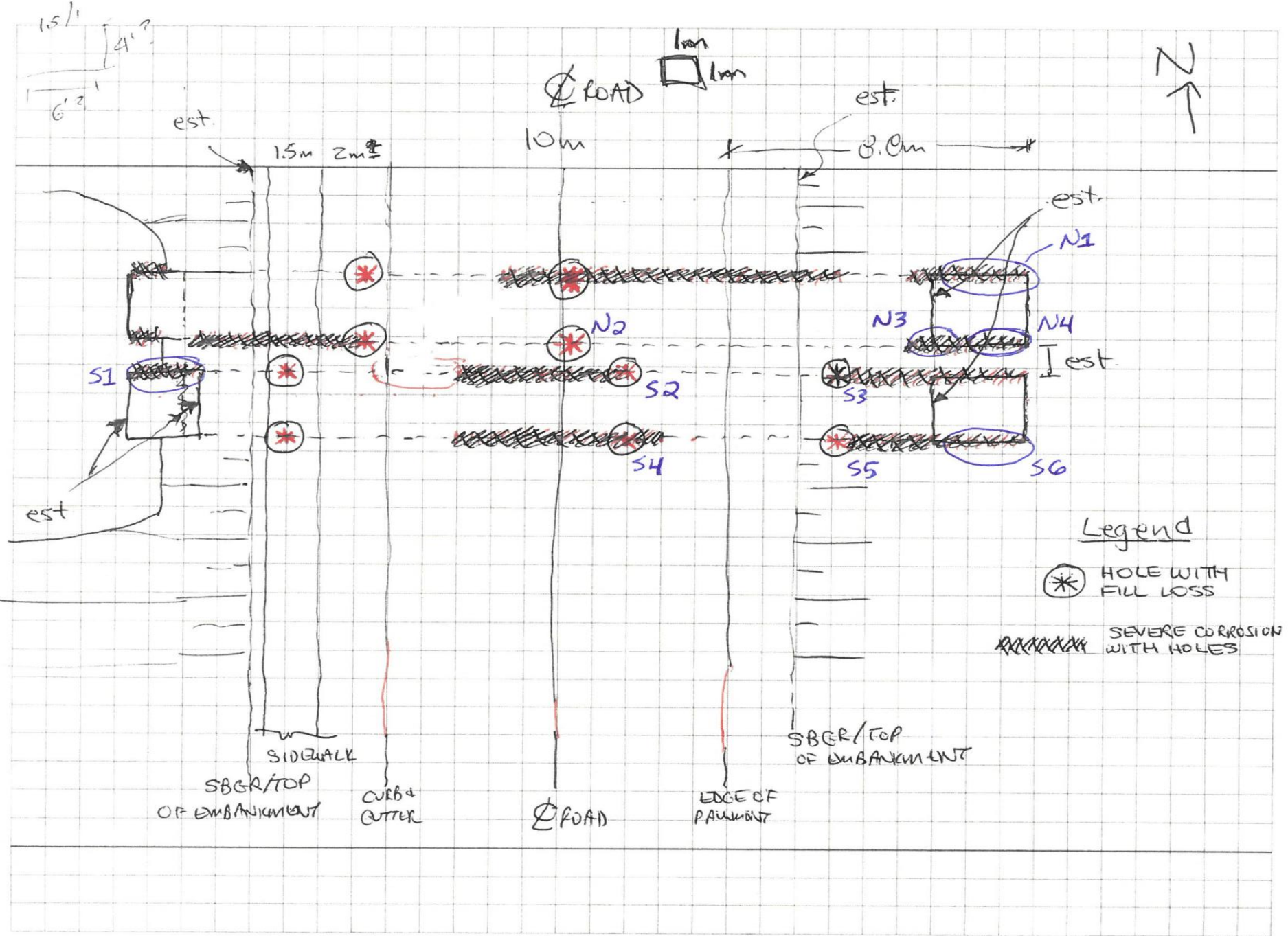
Possible Hazards At Pine Street Crossing

There is a strong possibility of either a sudden collapse to a sidewall section at one of the culvert walls, or a sudden settlement of the roadway above the culverts where voids of unknown size and location exist.

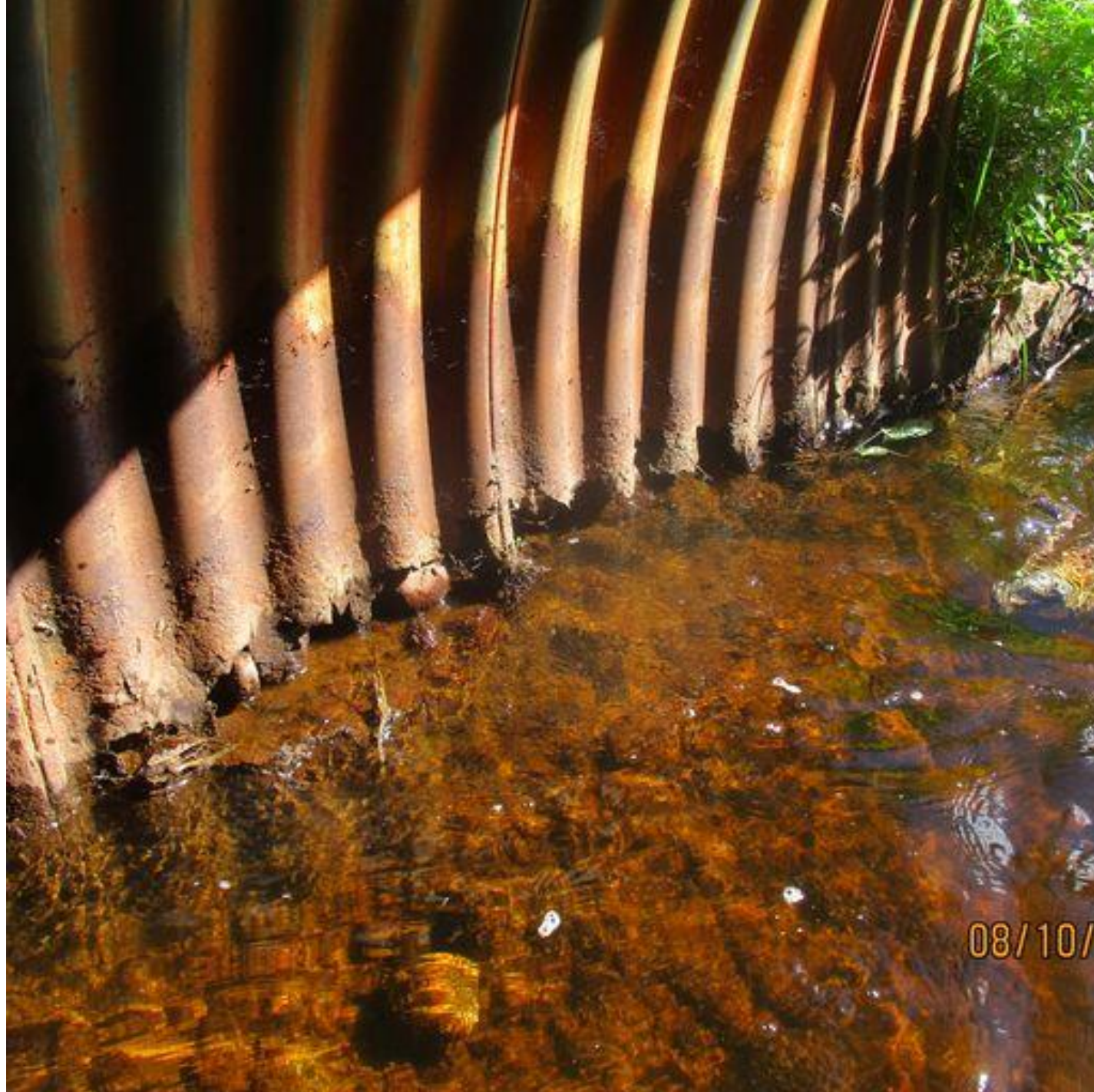
Any sudden drop due to the above would result in a sinkhole, which would be hazardous for any vehicle using the crossing at that time, or hazardous for a person walking across.

Ongoing, future vehicle travel over this crossing will undoubtedly disturb the soils beneath, eventually causing soil to leach out of the holes observed, and creating a sinkhole.

Soil disturbance is made worse by heavy transports, and to a lesser degree cars and pickup trucks.



N1

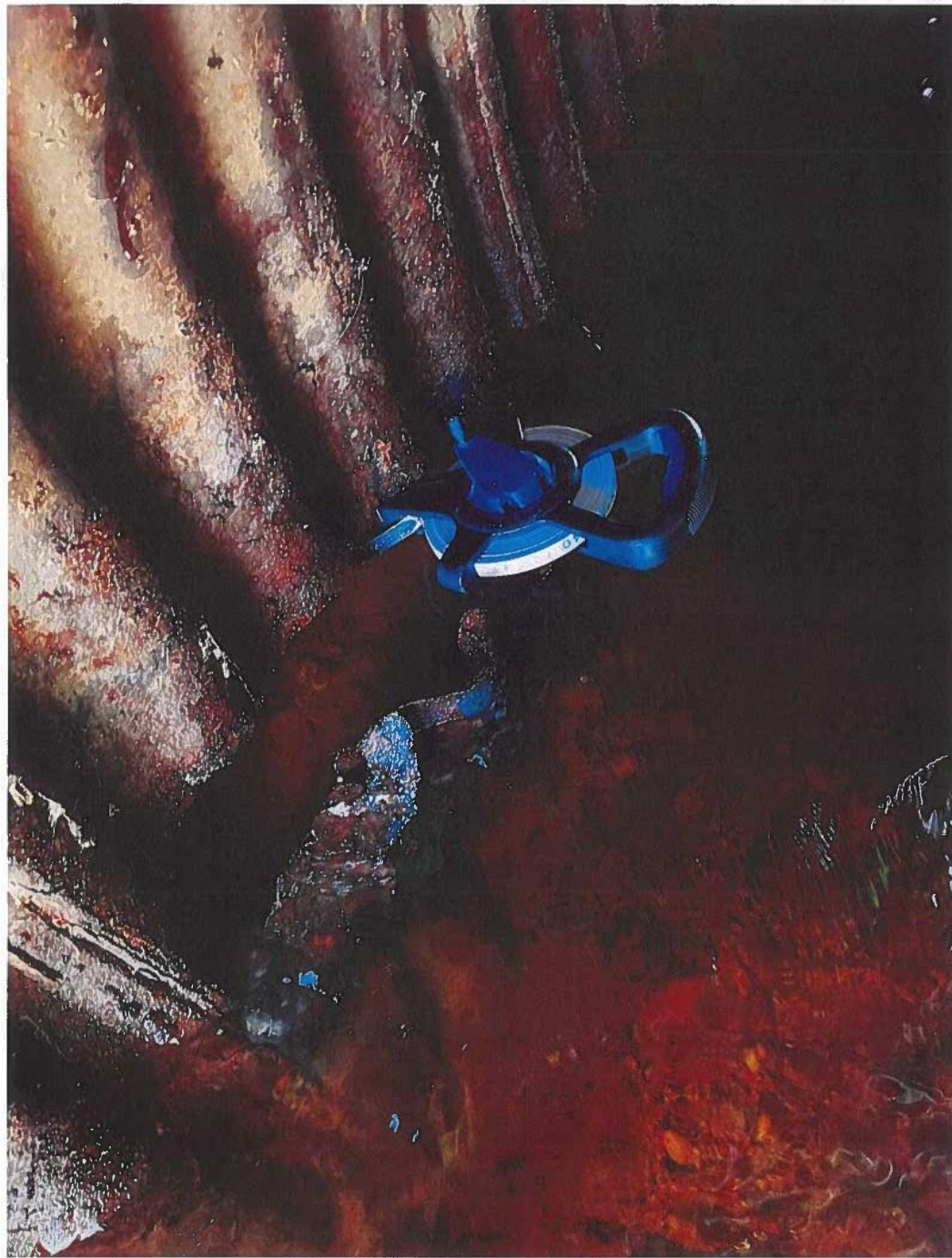


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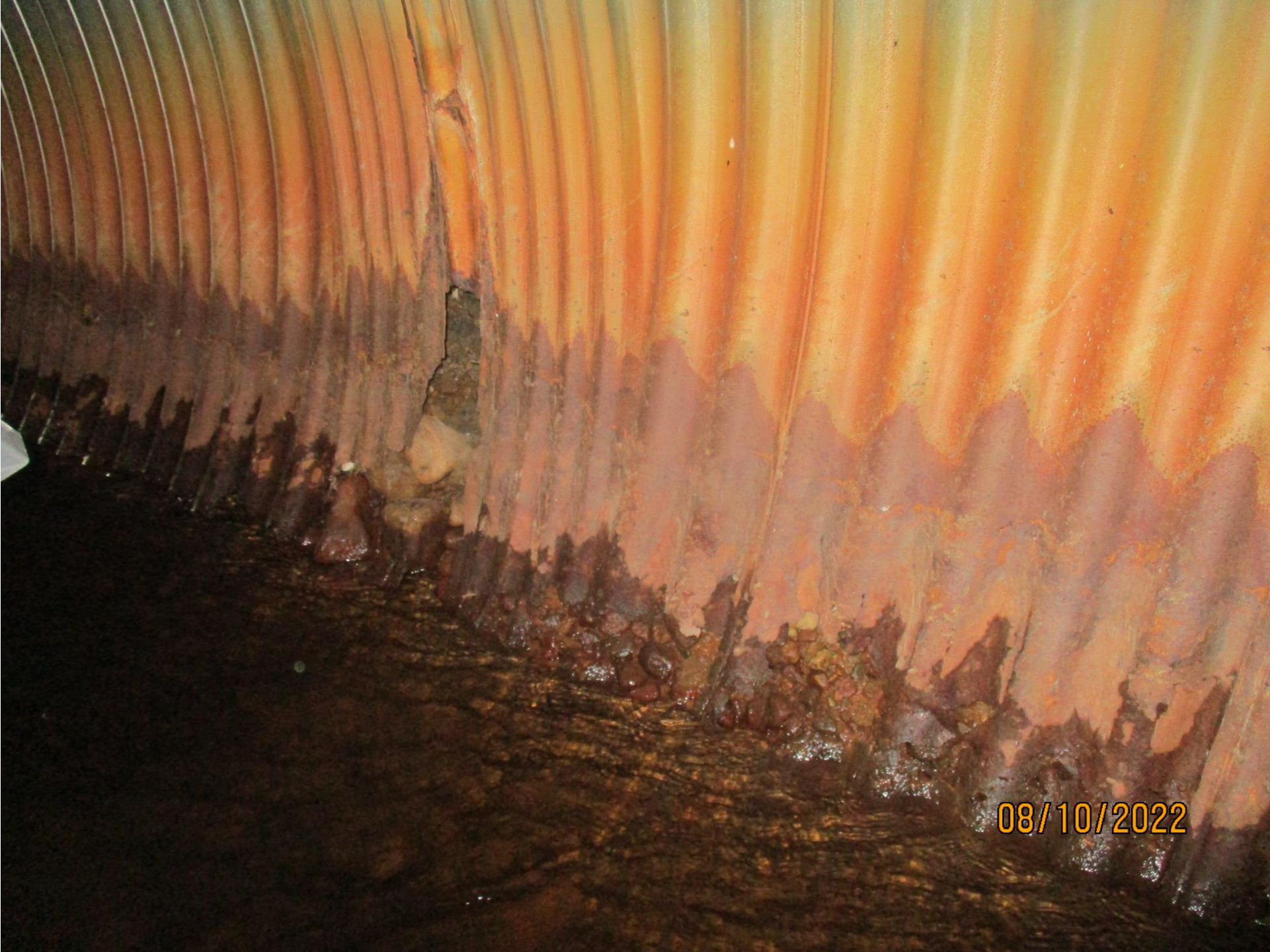
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S1



S2



08/10/2022

S3



S4a



S4b



S4d



08/10/2022

S4c



S5



Recommendations At Pine Street Crossing

Based on the size and number of holes observed and the measured deep voids, combined with the large lengths of corroded and/or failed steel at the waterline at both barrels, JML Engineering recommends the Township consider closing the road above the Pine Street twin culverts to all vehicle traffic as soon as possible.

Pedestrian traffic may be able to use the existing concrete sidewalk at the site, as the sidewalk would offer some protection to bridge a sinkhole if one were to suddenly occur. However, this would require monitoring to ensure there are no progressions of settlement at the site, including probing the ground along the sidewalk to test for voids.

Monitoring of the crossing should continue until a rehabilitation solution is designed and implemented. A feasibility study should be considered to explore rehabilitation/replacement options to determine the most cost effective solution to reinstate the integrity of this crossing.

South Barrel Looking East

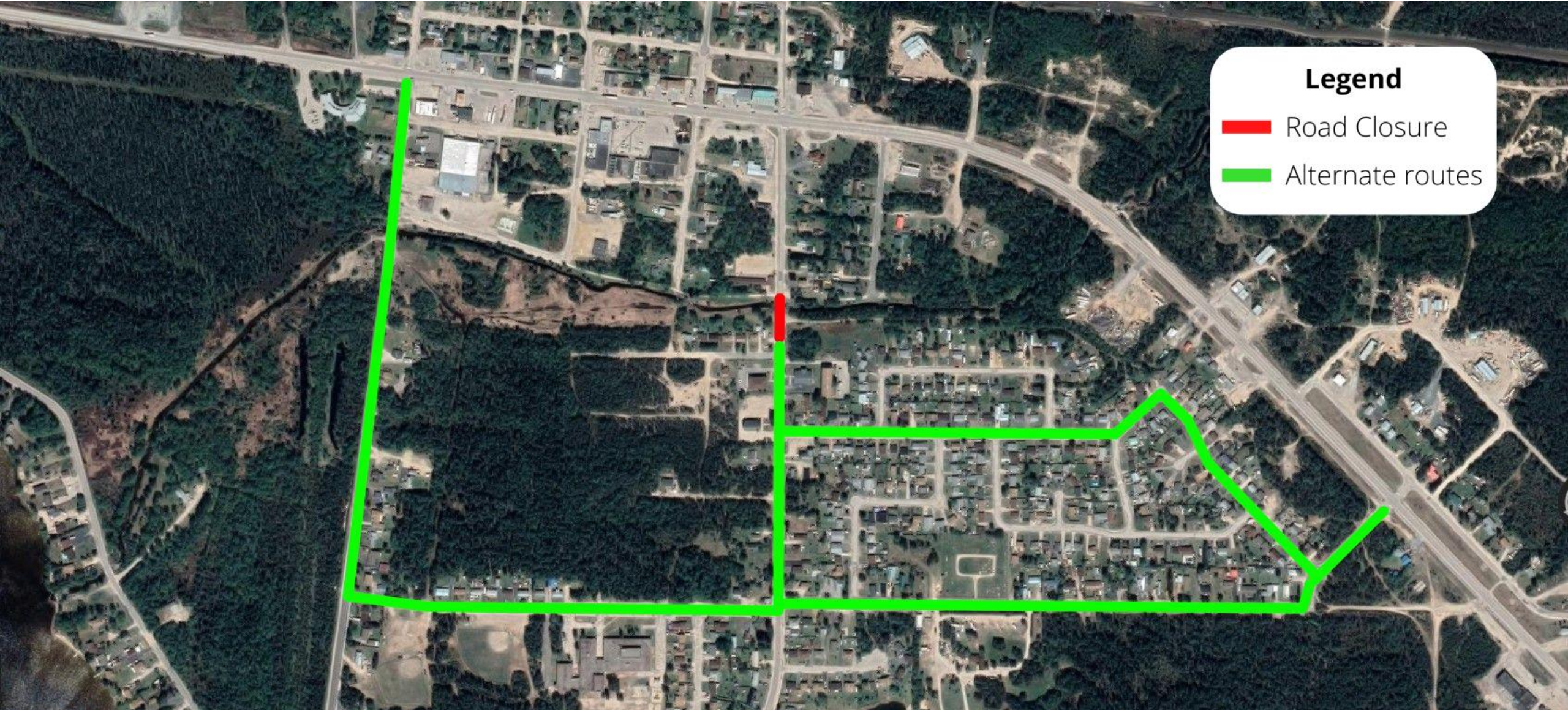


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Questions from the Public

Next Steps

MAP



Legend

- █ Road Closure
- █ Alternate routes

Thank you for your participation