

Township of Melancthon



Bridge Inventory Update (Specific to Bridge 11 and 13)
January 21, 2021

Agenda

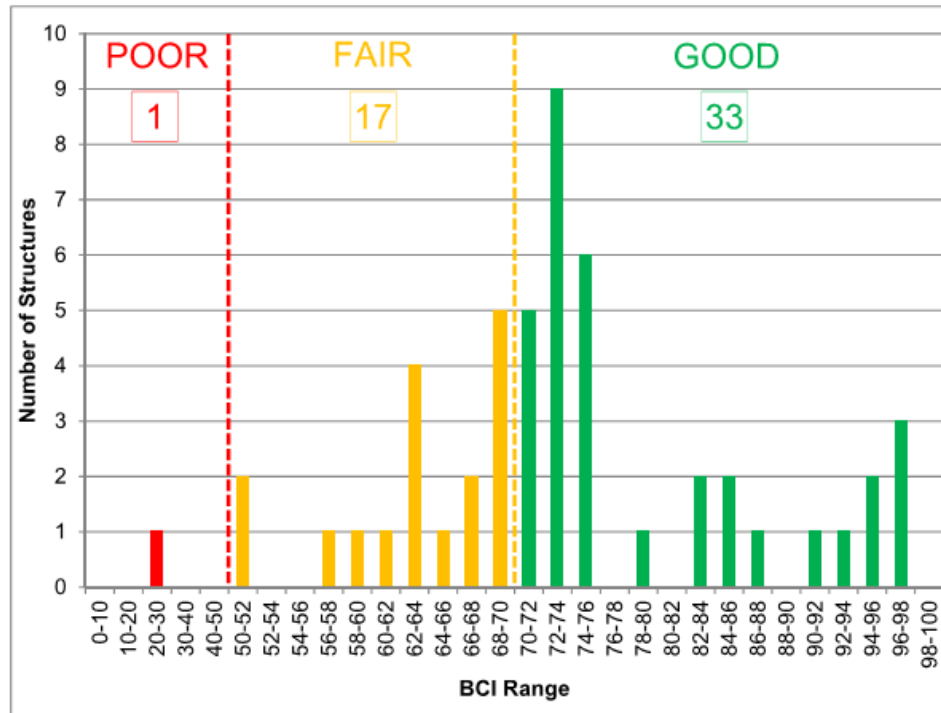
- Structure Inventory and Condition (2019)
- Recent Bridge and Culvert Capital Work
- Bridge 13 (Riverview)
- Bridge 11 (8th Line SW)
- Recommendation and Options for Tendering

Structure Inventory

- The Township has 51 structures over 3 metres in span (17 classified as Bridges, 34 Culverts).
Structure No. 004 on 5th Sideroad (east of Hwy 10) was closed to through traffic in 2019.
- R.J. Burnside & Associates Ltd. (Burnside) completed the biennial bridge and culvert inspections in 2015 and 2019 (K Smart in 2017).

Bridge and Culvert Inventory Condition

Figure 2: Bridge Condition Index Distribution (2019)



- 2015 – 66% Good, 26% Fair and 8% Poor (avg. BCI 71.4)
- 2019 – 65% Good, 33% Fair and 2% Poor (avg. BCI 73.2)

Recent Bridge & Culvert Capital Work

2014 – Culvert No. 2027 (Replacement)

2015 – Culvert No. 2028 (Replacement)

2016 – Culvert No. 2010, 2020 & 2024 (Replacements)

2017 – Bridge No. 15 (Rehabilitation)

2018 – Bridge No. 10 (Rehabilitation)

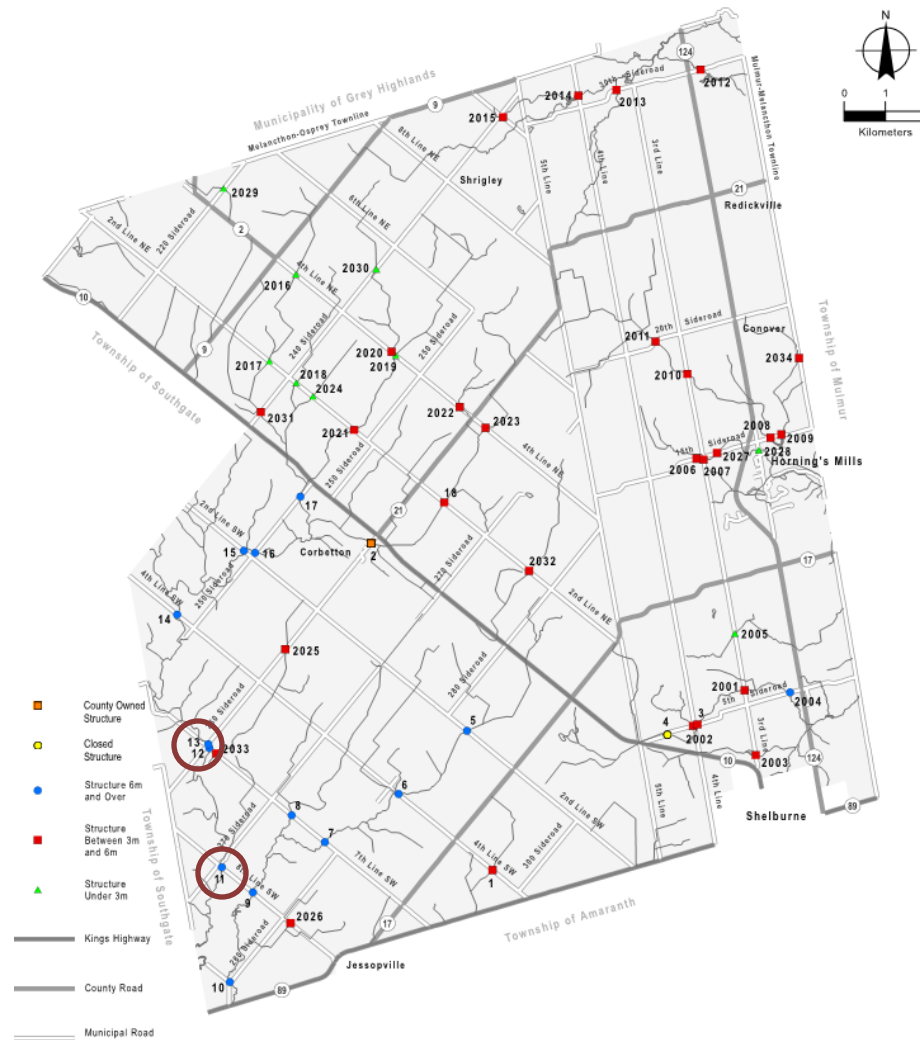
2019 – Culvert No. 2003 (Rehabilitation)

2020 – Culvert No. 2013 (Replacement)

- Culvert No. 2021 (Repair)

- 30 Sideroad Culvert (Emergency Replacement)

Bridge Locations



Bridge 13 (Riverview)

1.12 Structure No. 13

2019 BCI: 63.7

<u>Structure Name:</u>	Structure 013		
<u>Road Name:</u>	260 Sideroad		
<u>Location:</u>	200 m East of 7th Line SW (Lot 21 & 22, Con. 6 & 7 SW)		
<u>Structure Type:</u>	Precast Concrete I-Girder		
<u>Number of Spans:</u>	1	<u>Span Lengths:</u>	17.8 m
<u>Overall Structure Width:</u>	10.7 m	<u>Roadway Width:</u>	8.6 m
<u>Year of Construction:</u>	1968	<u>Current Load Limit:</u>	N/A

Recommendation: Major Rehabilitation is recommended within 2 years.



Estimated Replacement Cost: \$1,300,000 (2019)

Bridge 13 (Riverview)

- **Nov/19** – Deck Condition Survey (DCS), including core samples completed by Bridge Check Canada (BCC)
- **Jan/20** – Burnside asked to proceed with detailed design and tender for rehabilitation
- **Nov/20** – Secured permits (i.e. GRCA, DFO, etc.) and design completed
- On track to tender project **Feb, 2021**



Bridge 13 (Riverview)

Scope of Work

- Remove existing asphalt
- Structural concrete patch repairs to entire structure (corrosion inhibitors in deck)
- Reconstruct joints
- Repair and paint barrier railing
- Waterproof and pave
- Stabilize slopes and restoration work



Full closure, estimated construction duration 6-8 weeks
Construction Cost Estimate: \$200k

Bridge 11 (8th Line SW)

1.10 Structure No. 11

2019 BCI: 69.6

<u>Structure Name:</u>	Structure 011		
<u>Road Name:</u>	8th Line SW		
<u>Location:</u>	3.4 km North of HWY 89 (Lot 16, Con. 8 & 9 SW)		
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame		
<u>Number of Spans:</u>	1	<u>Span Lengths:</u>	16.2 (skew = 19.8) m
<u>Overall Structure Width:</u>	8.5 m	<u>Roadway Width:</u>	7.3 m
<u>Year of Construction:</u>	1960	<u>Current Load Limit:</u>	N/A



Estimated Replacement Cost: \$1,300,000 (2019)

Bridge 11 (8th Line SW)

- **Nov/20** – DCS, including core samples completed by BCC
- **Jan/21** – Burnside summarized findings to Township including option to tender Bridge 11 and 13 under one contract
- Bridge 11 has been surveyed, but approval to proceed with detailed design and tender not yet in place



Bridge 11 (8th Line SW)

Proposed Scope of Work

- Structural concrete patch and crack repairs to entire structure (corrosion inhibitors in deck)
- Replace deck drains
- Waterproof and pave
- Replace barrier
- Install approach guide rail
- Site restoration work



Full closure, estimated construction duration 6-8 weeks

Construction Cost Estimate: \$350k (\$230k if no barrier replacement of guide rail work)

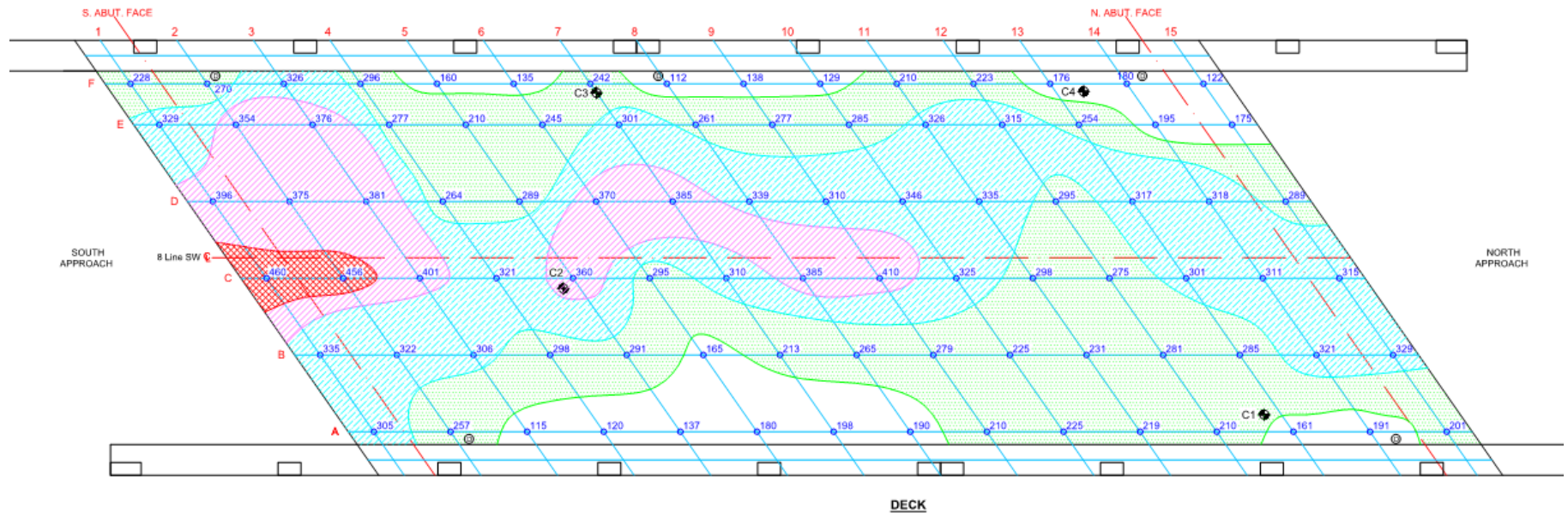
Deck Condition Survey Findings

	Asphalt Thickness (mm)	Waterproofing Present	Compressive Strength (MPa)	Corrosion Potential (% of deck)			Corrected Chloride Content (%)	
				0.00V to -0.199V (likely no corrosion)	-0.200V to -0.349V (uncertain low corrosion)	-0.350V or Greater (probable active corrosion)		
Bridge 11	N/A	No	40	21.1%	64.5%	14.4%	Core 1 0	Core 2 0.158
Bridge 13	20-60	No	62	16.7%	70.5%	12.8%	Core 2 0.077	Core 7 0.026

If the chloride content is greater than **0.05%** by mass, there is an indication that the chloride contamination has extended to the steel reinforcing in that particular area.

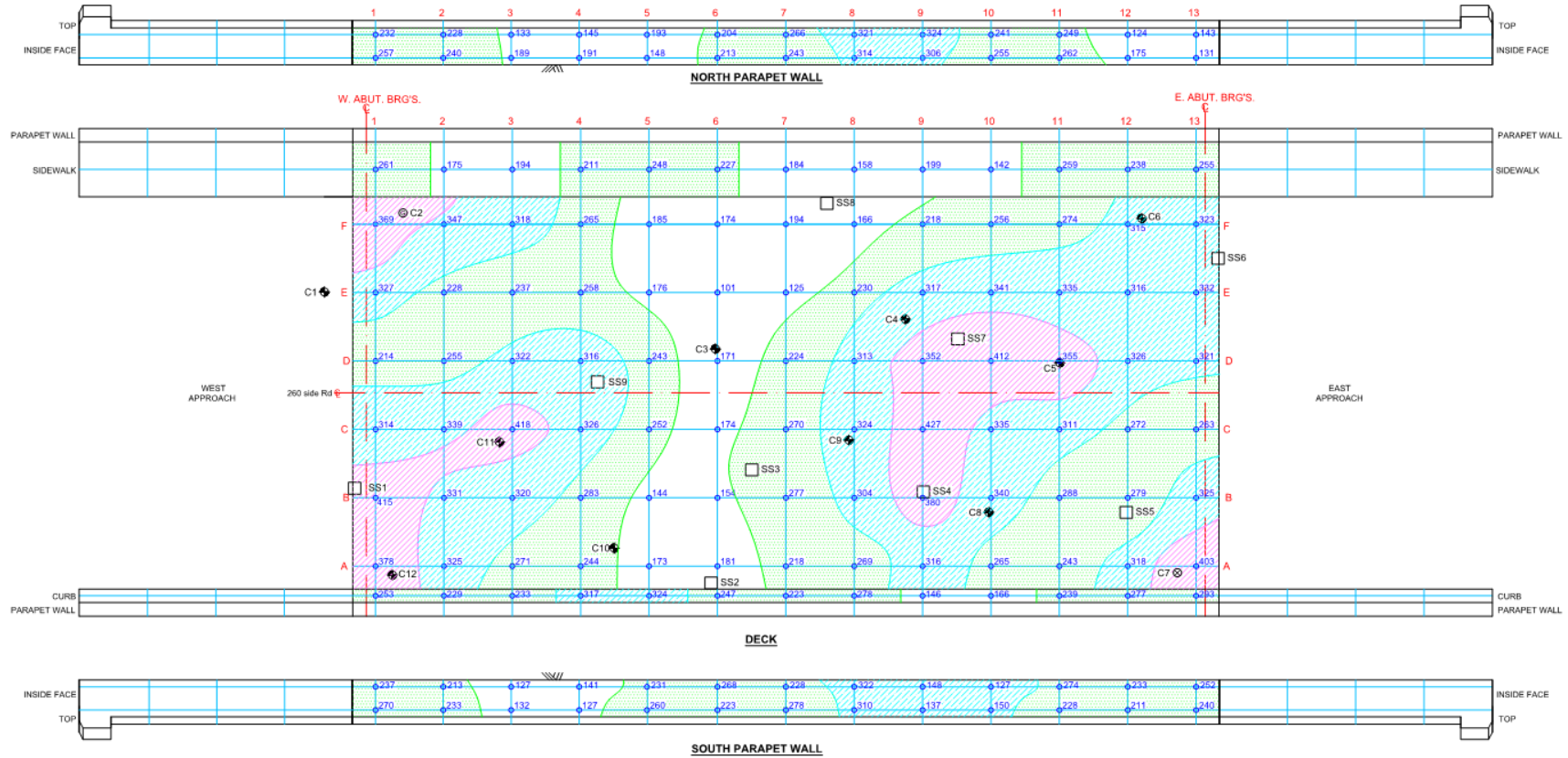
The **good news** was that the existing concrete at both sites are suitable to rehabilitate, full deck replacement not required.

Corrosion Potential (Bridge 11)



MTO Structural Rehab Manual recommends removing sound concrete in areas with high corrosion potential (pink areas) **and** heavily chloride contamination, as they are at risk for continued corrosion activity

Corrosion Potential (Bridge 13)



Tender Options

Option 1

- Proceed with tendering Bridge 13 in February, construction 2021 (**\$200k +/-**)
- Complete detailed design of Bridge 11 in 2021, tender and construct in 2022 or 2023
- Township to confirm Bridge 11 scope (\$350k, or \$230k if no barrier replacement of guide rail work)

Option 2

- Combine Bridge 11 and Bridge 13 rehabilitation in one tender (late Spring 2021), construction 2021
- Township to confirm scope (total estimate of **\$550k, or \$430k** if no barrier replacement of guide rail work at Bridge 11)
- Potential for cost savings if tendered together (approx. \$50k) given the economy of scale and proximity

Thank You
Questions?



BURNSIDE