

Duggan Bridge Replacement and Slope Restoration

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Outline

- **Construction - Partners & Schedule**
- **Location**
- **Bridge History**
- **Site Challenges and Solutions, including**
 - **Native forest slope restoration**



Construction - Partners & Schedule

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Owner: City of Edmonton

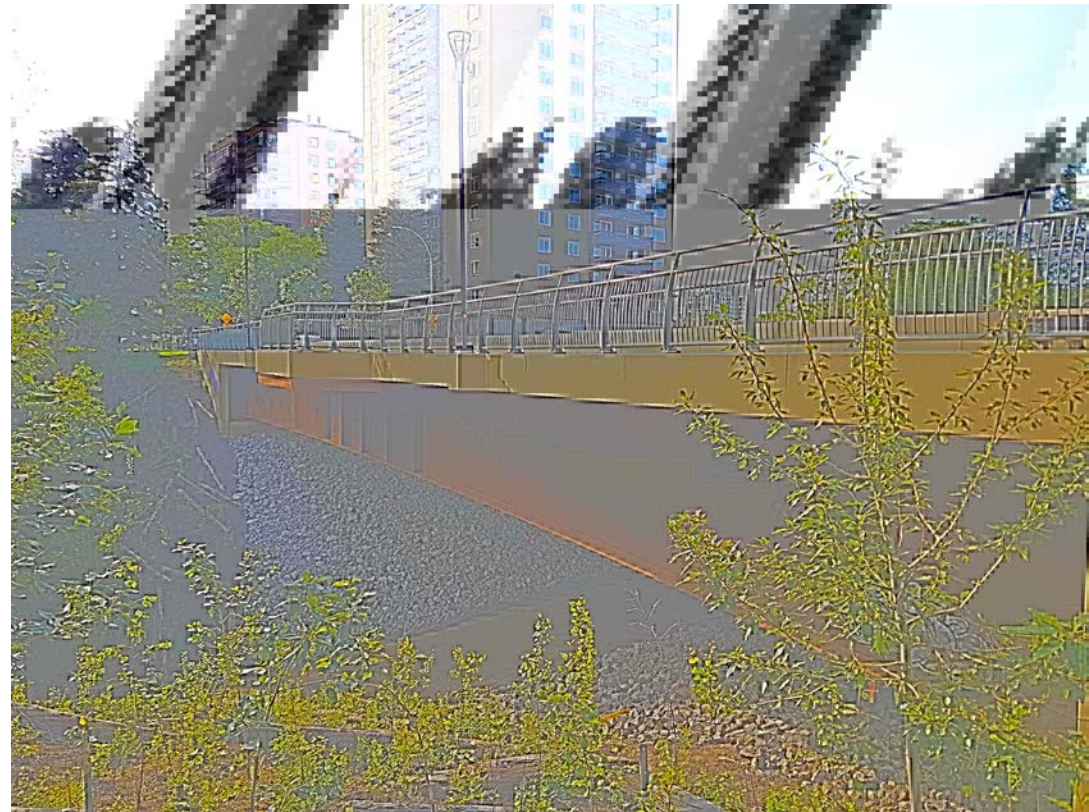
Consultant: Associated Engineering

Contractor: PCL

Construction:

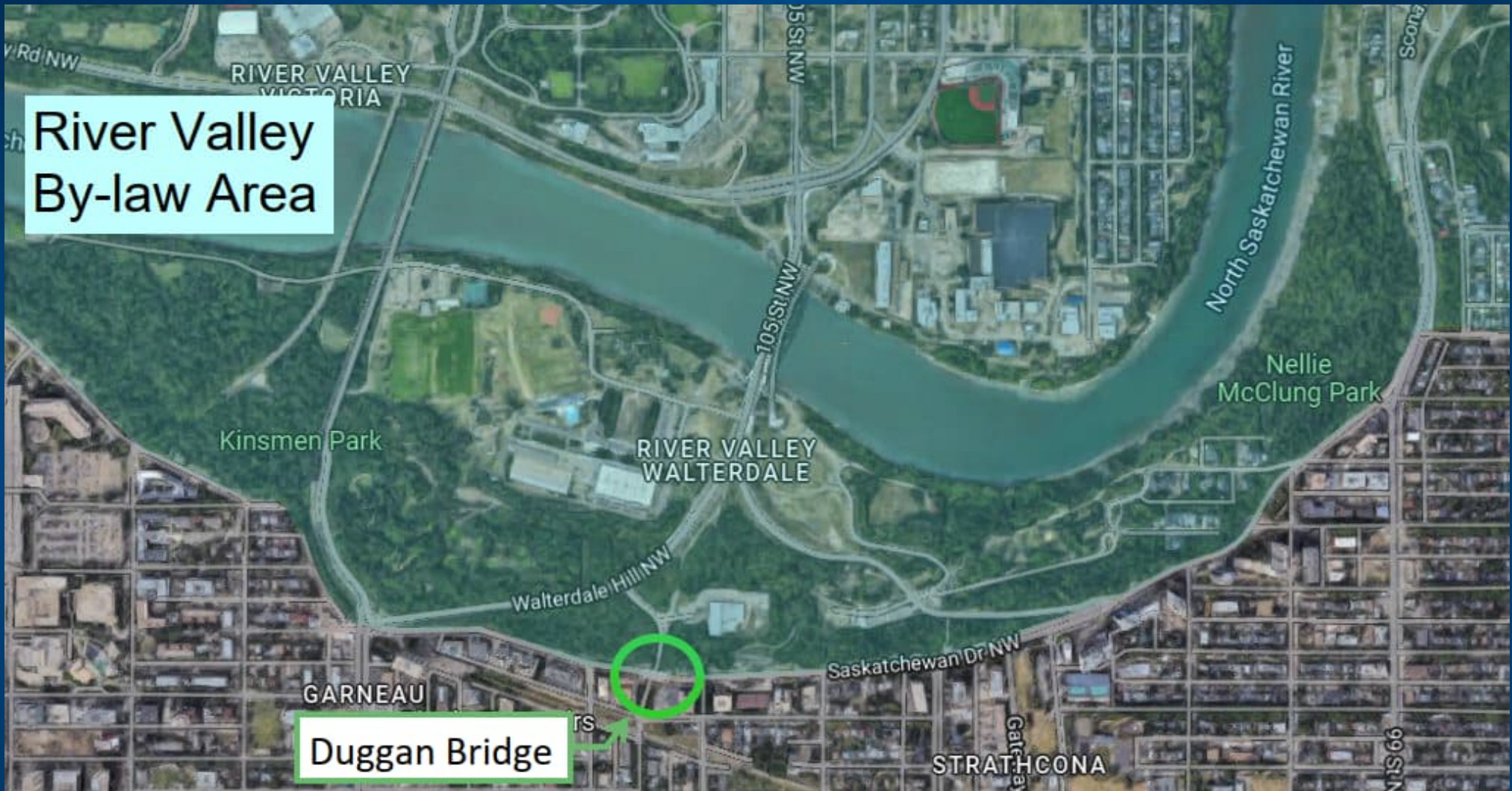
Award: Dec 2020

Completion: Nov 2021

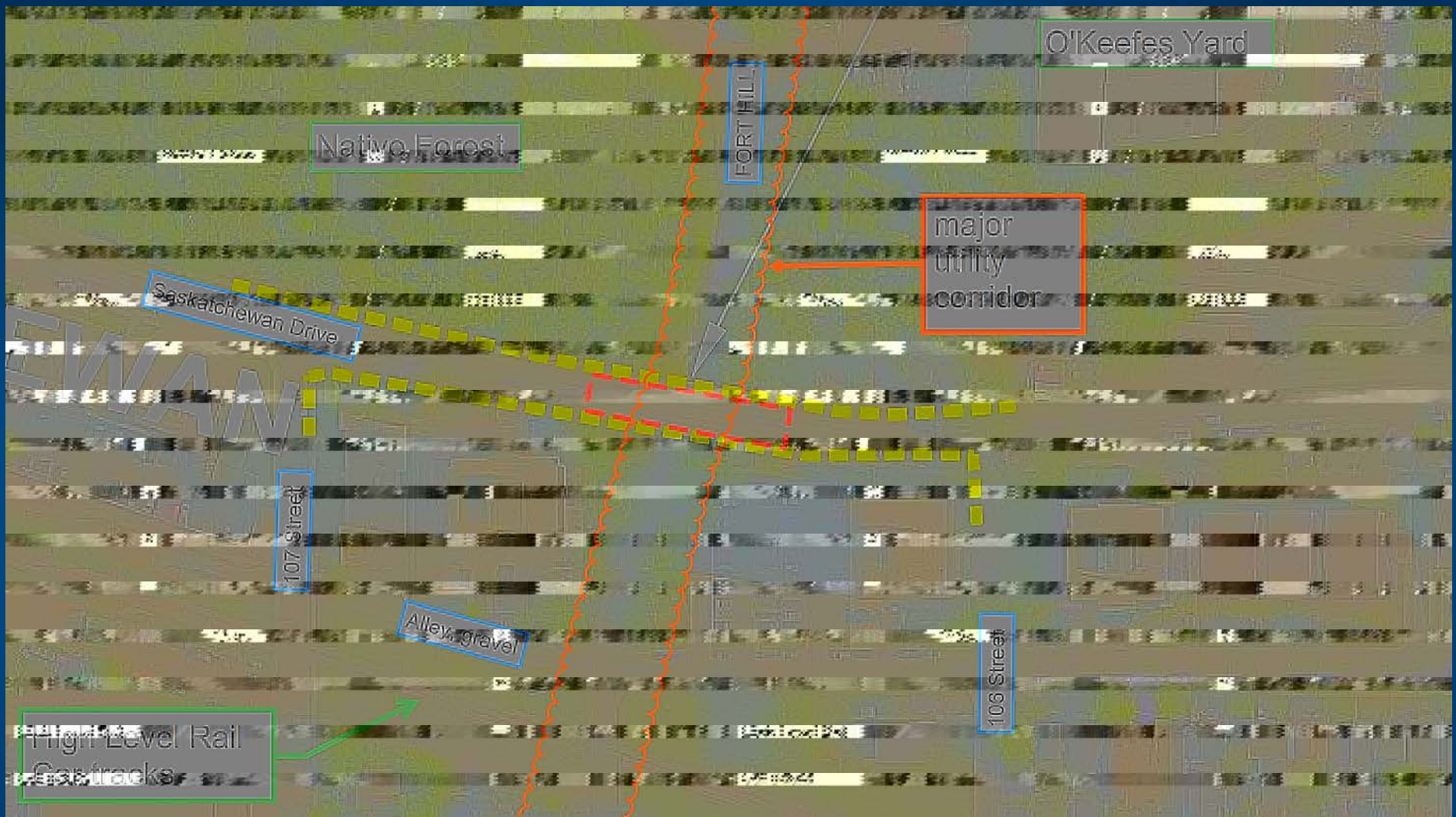


Location

North Saskatchewan River Valley - Edmonton



Bridge History



Duggan Bridge – Saskatchewan Drive over Fort Hill



1958 – Concrete Spandrel Arch

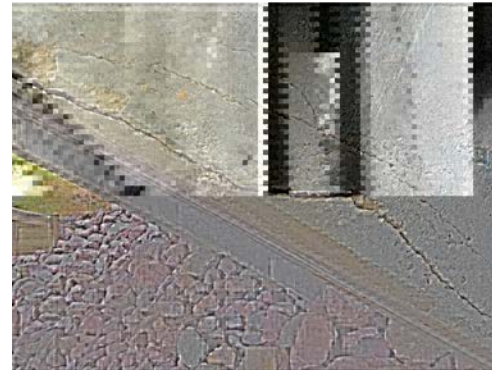
Bridge History

- Repeated Repairs and Rehabilitations
- Drainage – low point in road above west abutment with 0.5% slope
 - erosion behind the west abutment
 - flooding of the bridge deck



Bridge Replacement

- Structural Condition & Load Capacity
- Road Alignment / Drainage
- Bridge widening for 4.2 m wide Shared-use-path (SUP)



Site Challenges & Solutions

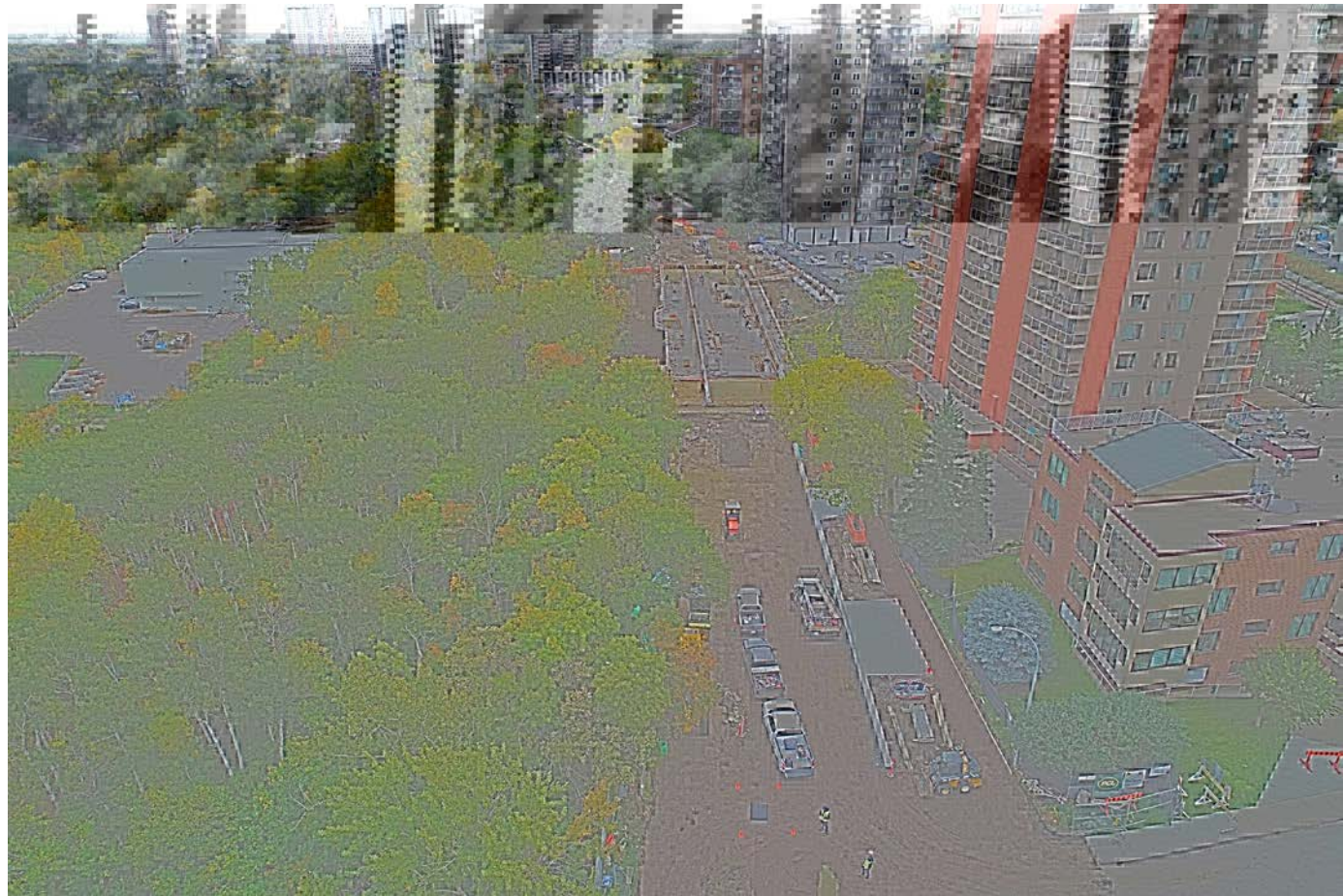
Drainage

Challenge:

Ponding / Flooding at the west bridge abutment

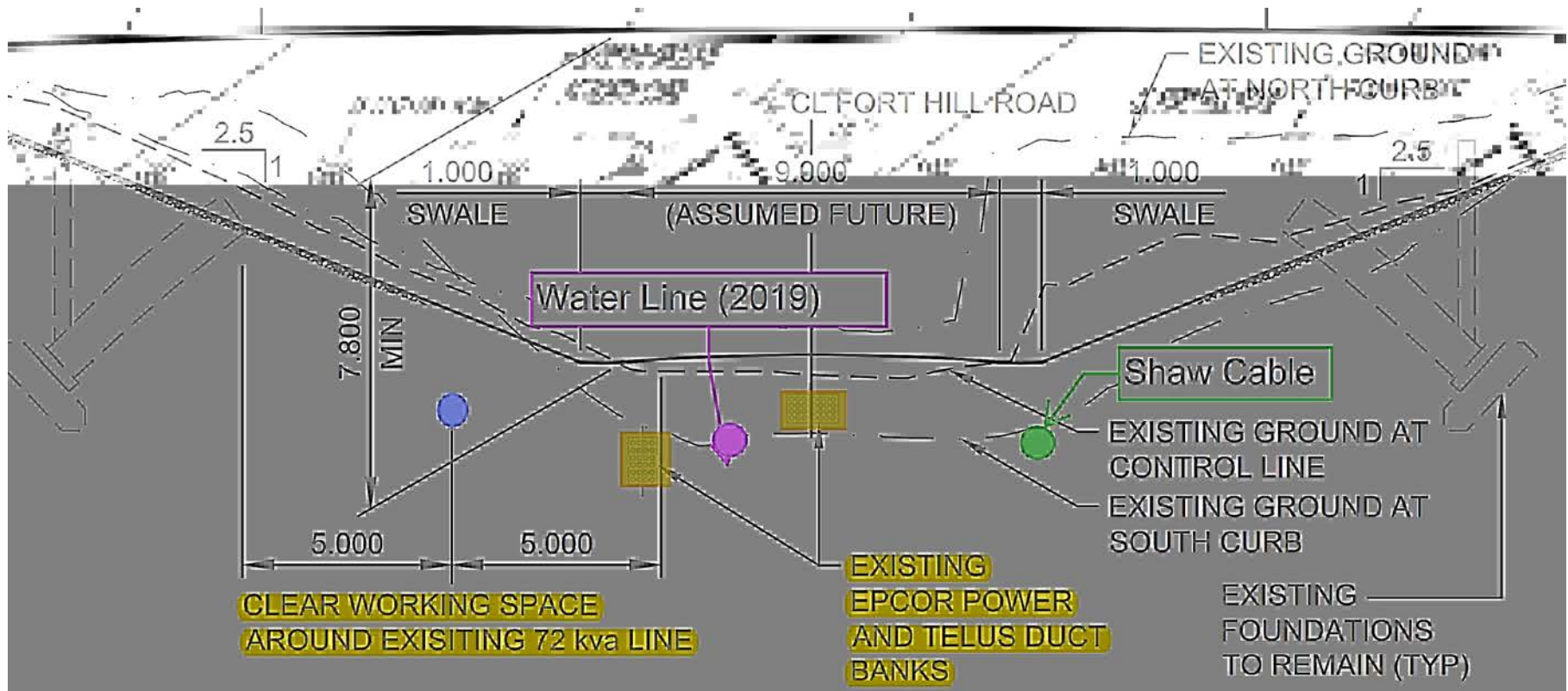
Solution:

Roadway Renewal of Saskatchewan Drive from 106 to 107 Street and Upgrade CBs & leads



Utilities

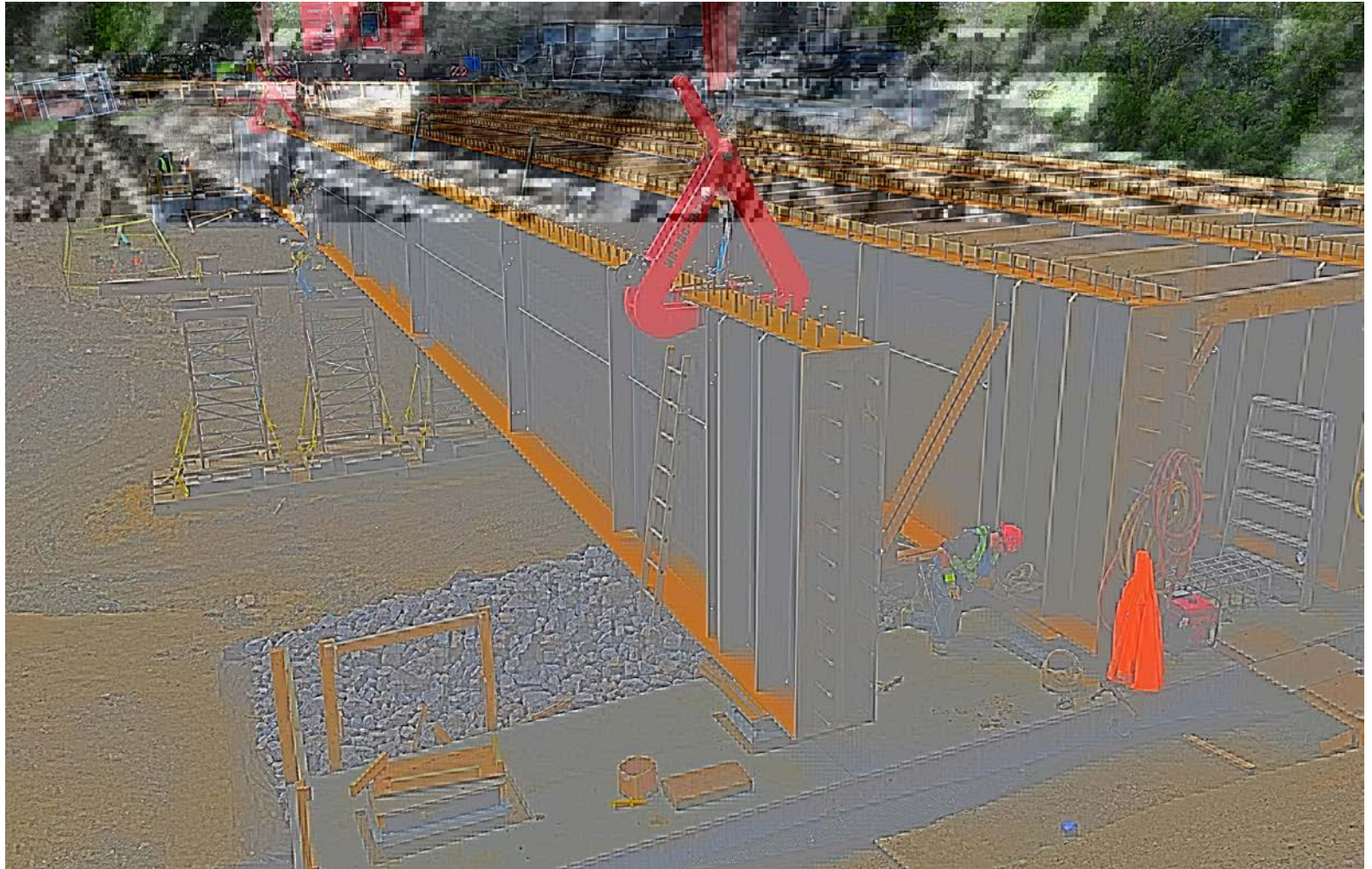
Challenge: Fort Hill is a Utility Corridor



Utilities

Solution:

48 m clear span bridge



Pedestrian / Cyclist - Traffic Accommodation

Issue:

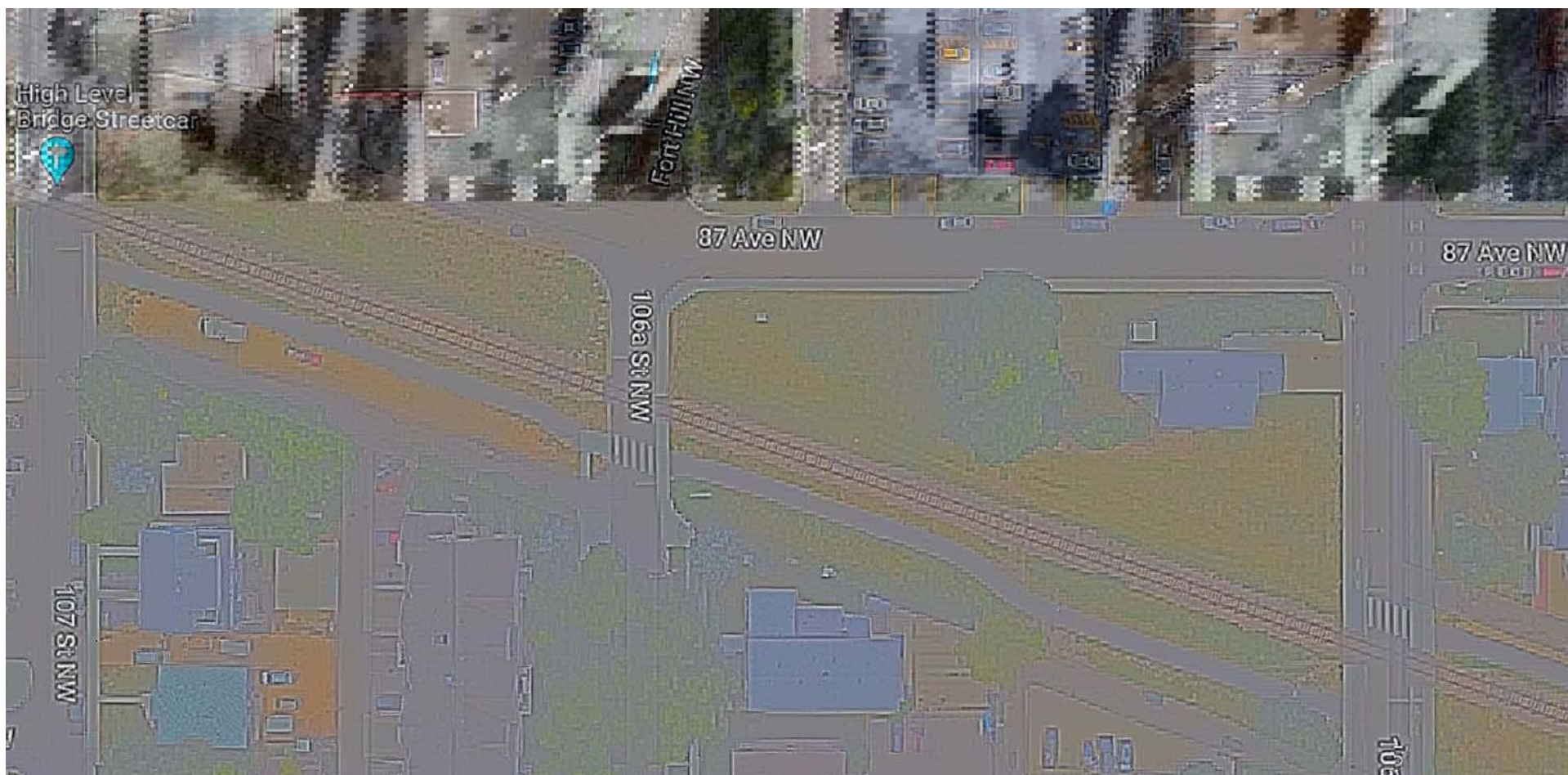
- Detour on existing routes too long

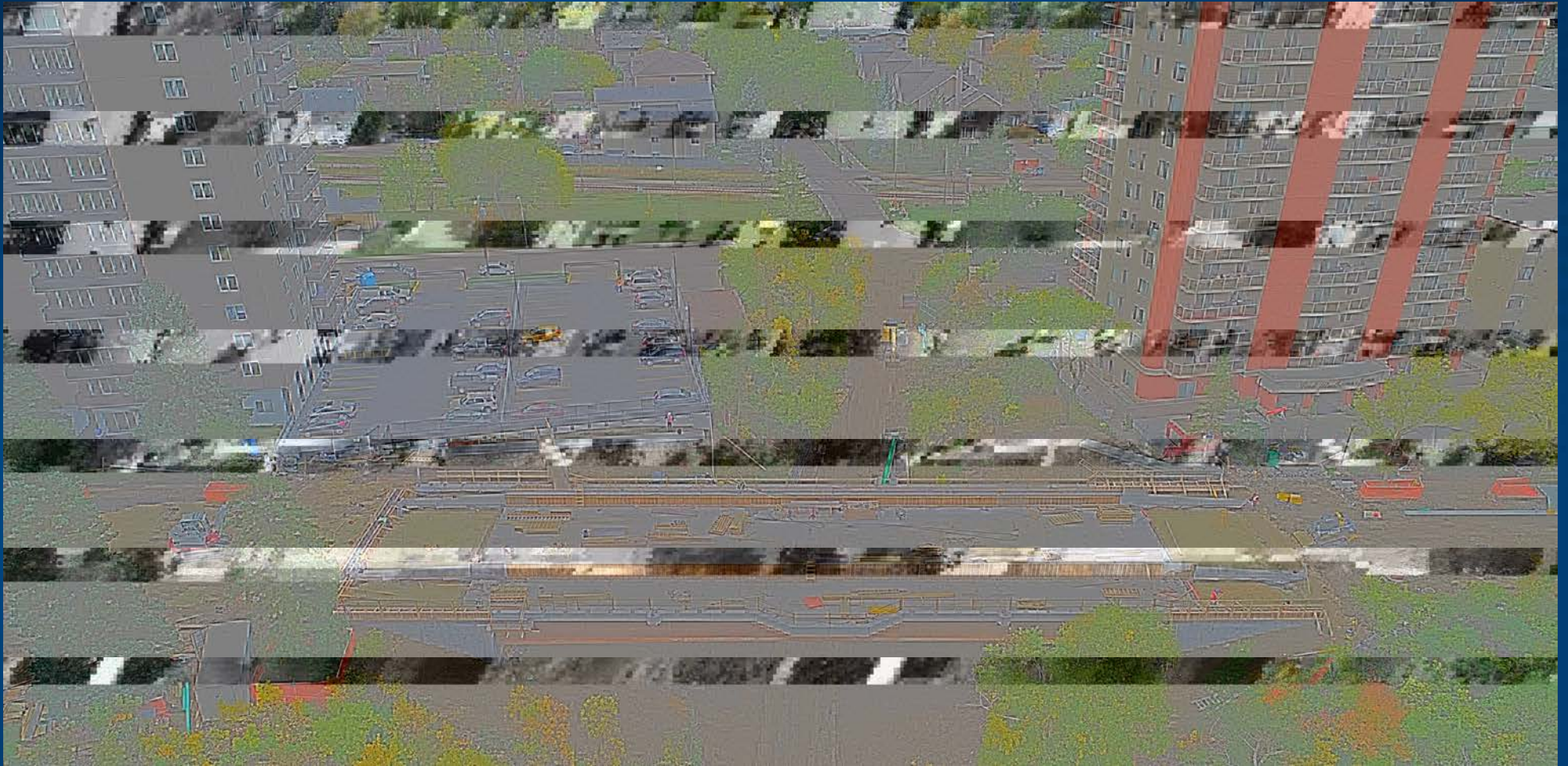
Solution:

- Build new permanent SUP



Pedestrian / Cyclist - Traffic Accommodation





Duggan Bridge Replacement – Construction 2021

Proximity to Apartment Buildings

Challenge:

- Risk of impact to buildings because of construction activities.

Solution:

- Building assessments
- Vibration monitoring



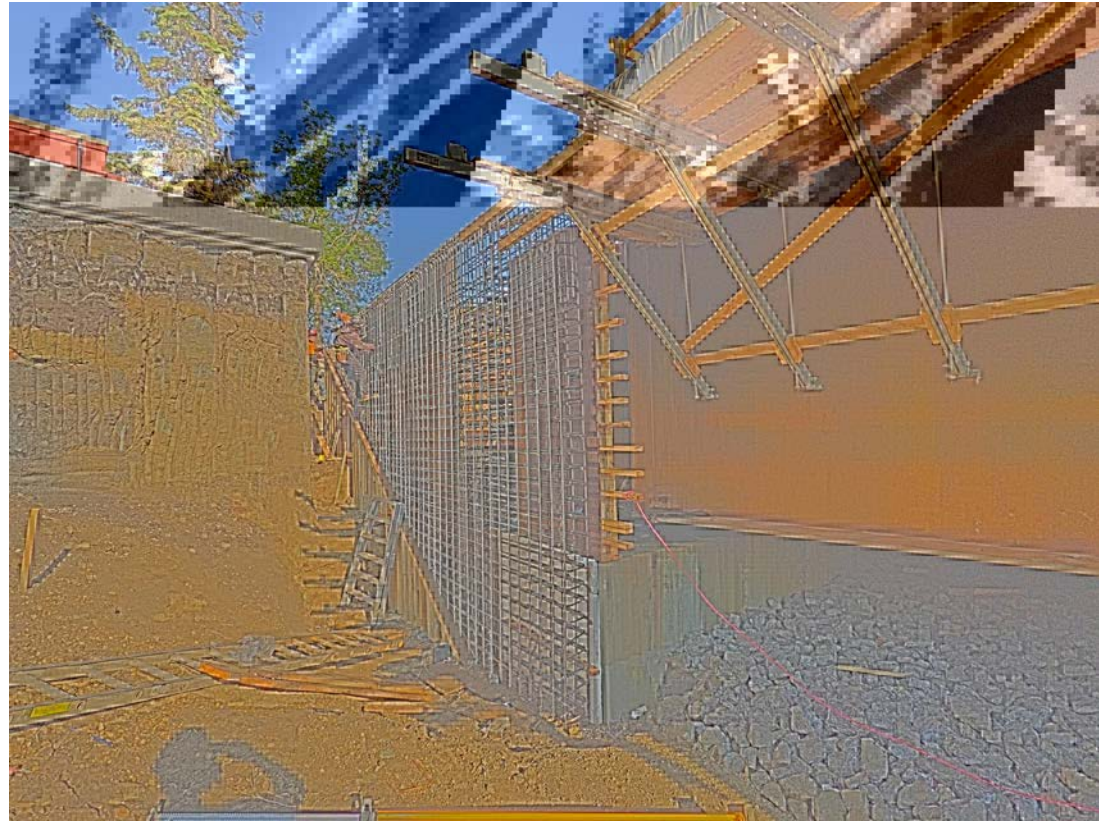
Proximity to Apartment Buildings

Challenge:

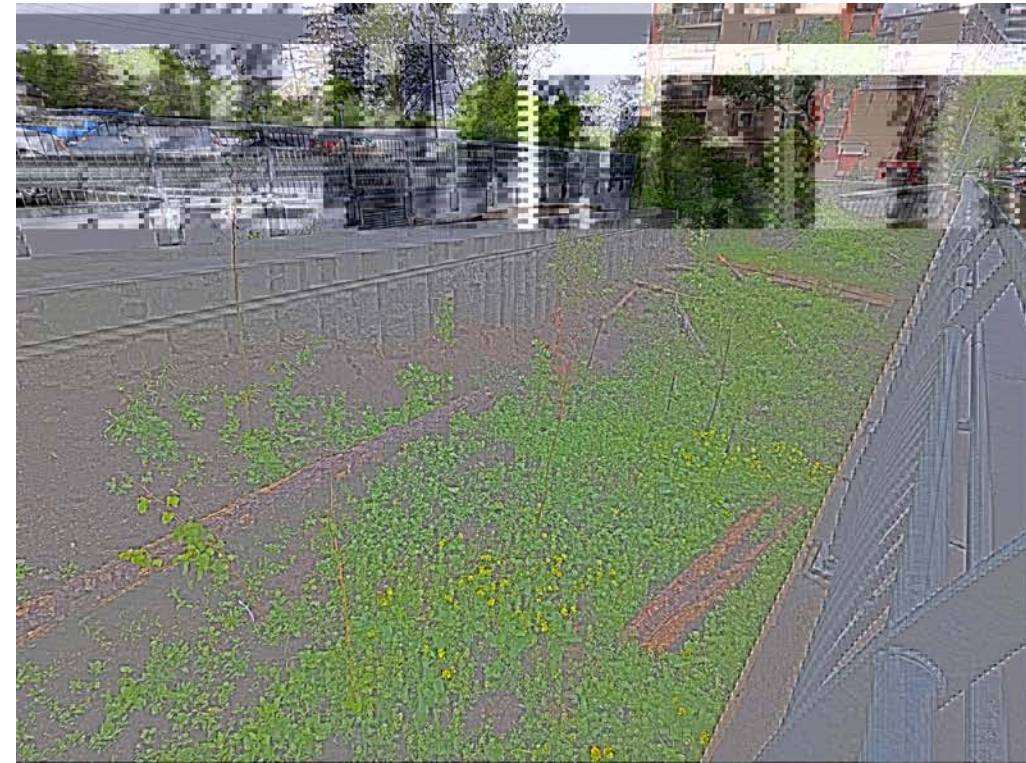
- Construction area directly adjacent to building foundations

Solution:

- Construct retaining walls before slope excavation:
 - protect the building foundations
 - allows steep slopes to be excavated to install the bridge abutments



Proximity to Apartment Buildings



Slope Revegetation

Challenge:

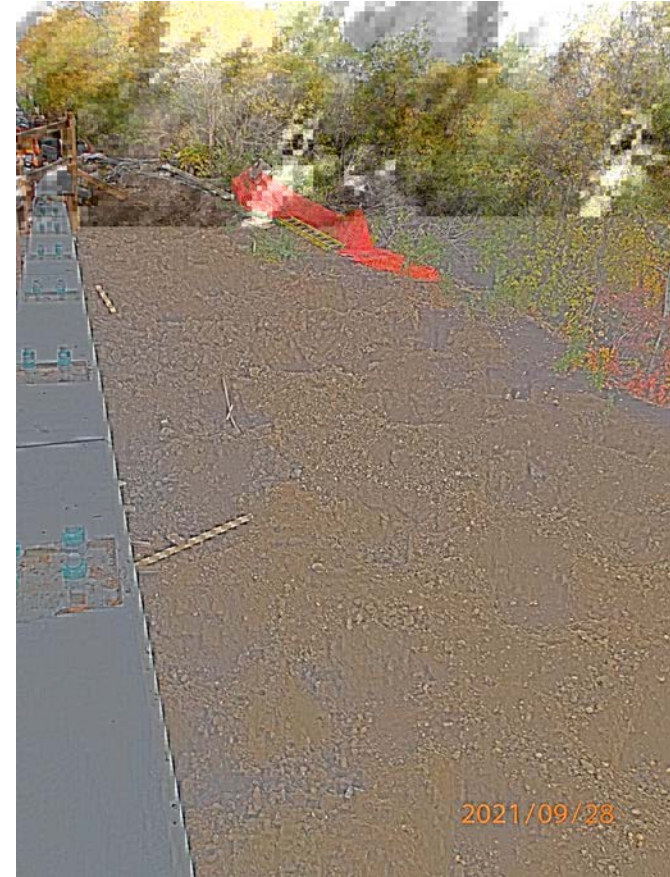
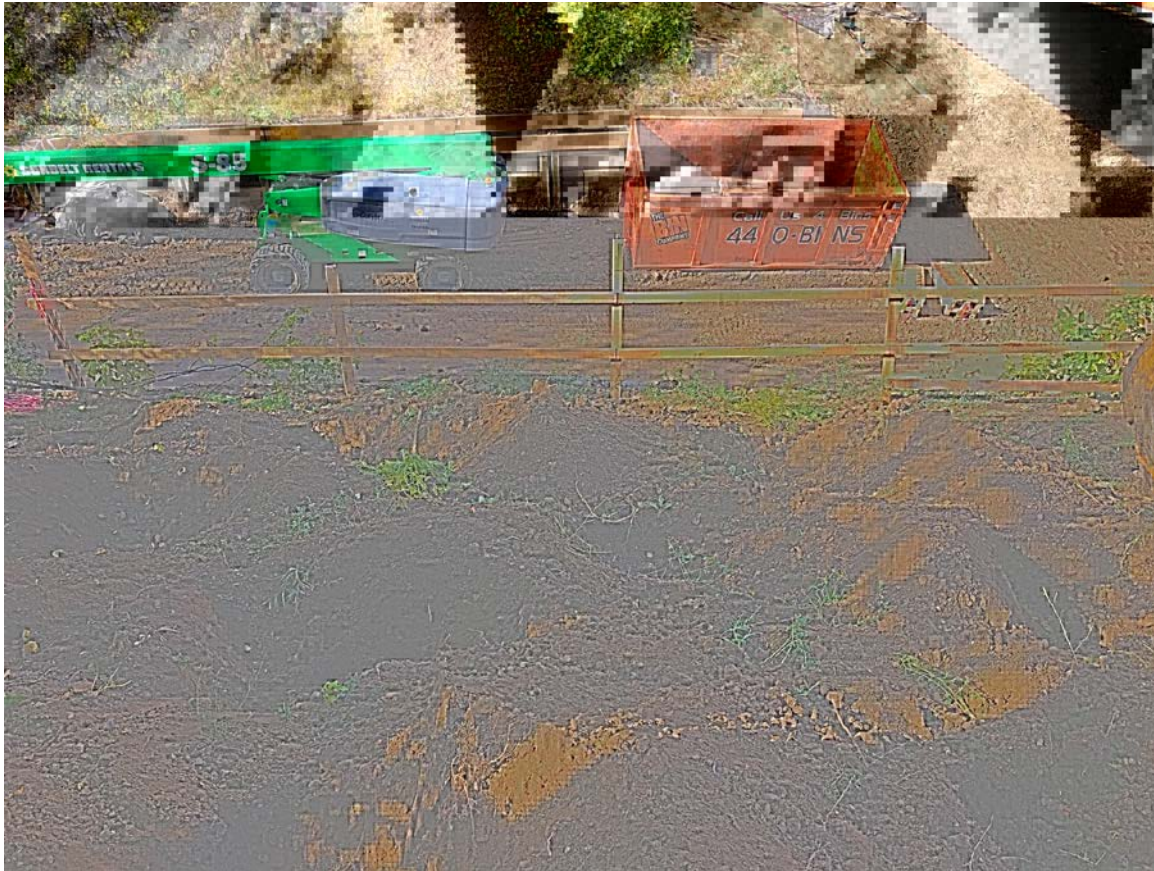
- Steep slope and erosion
- Native forest establishment

Solution:

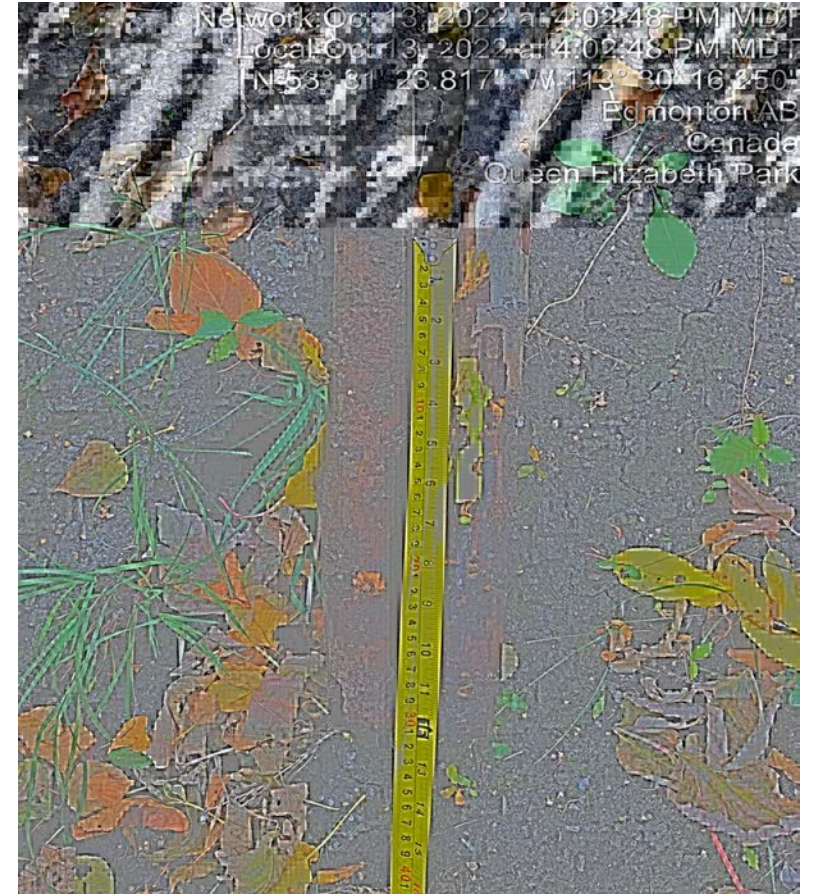
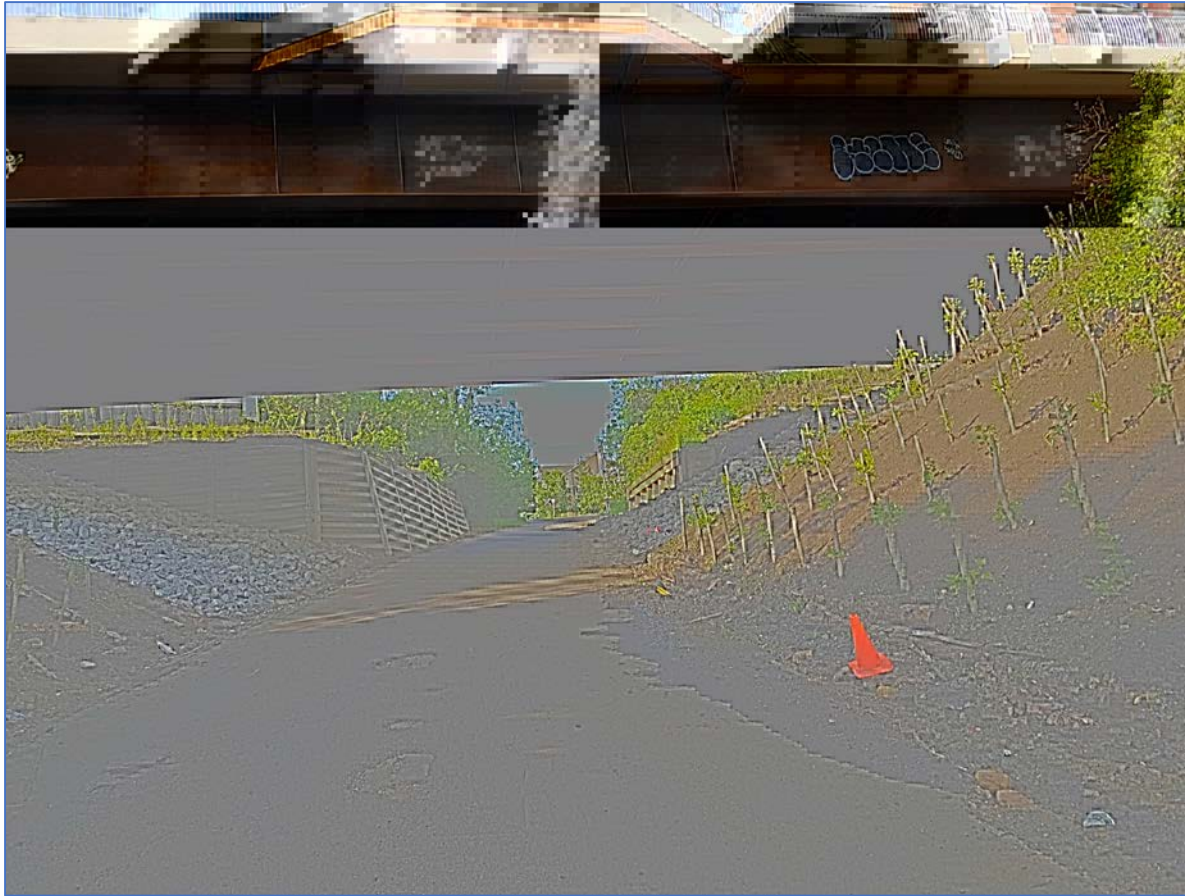
- Soil bioengineering
 - Rough & loose soils
 - Large woody debris
 - Live staking
- Topsoil salvage and replacement
 - Native species propagules



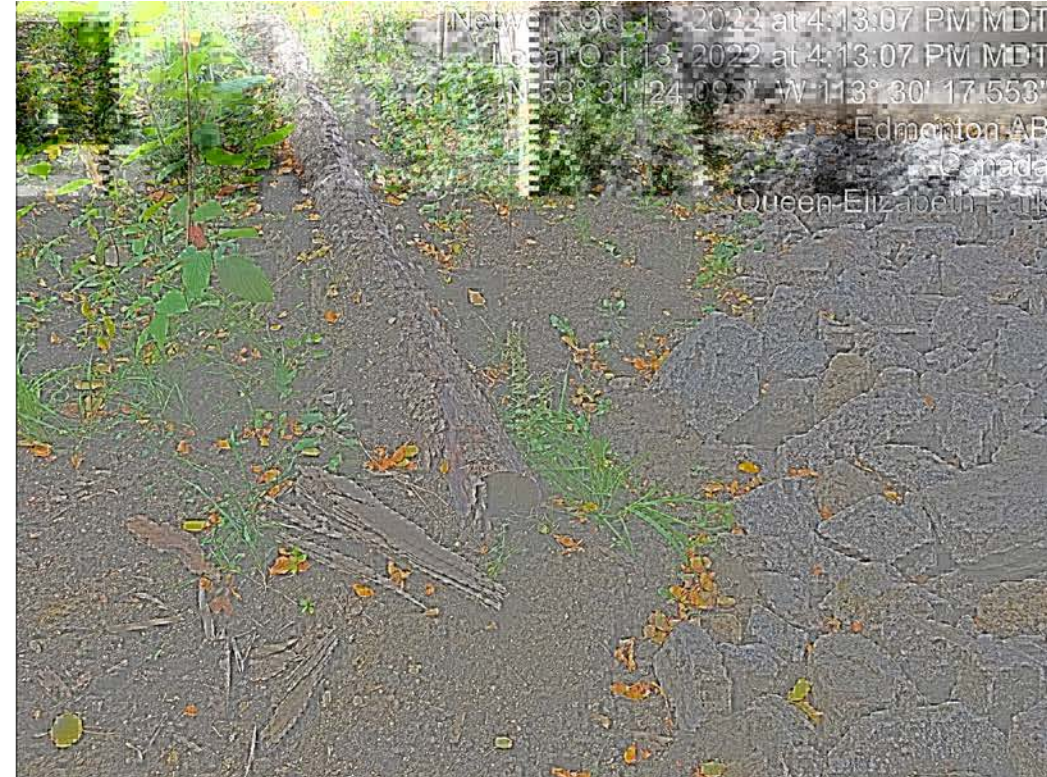
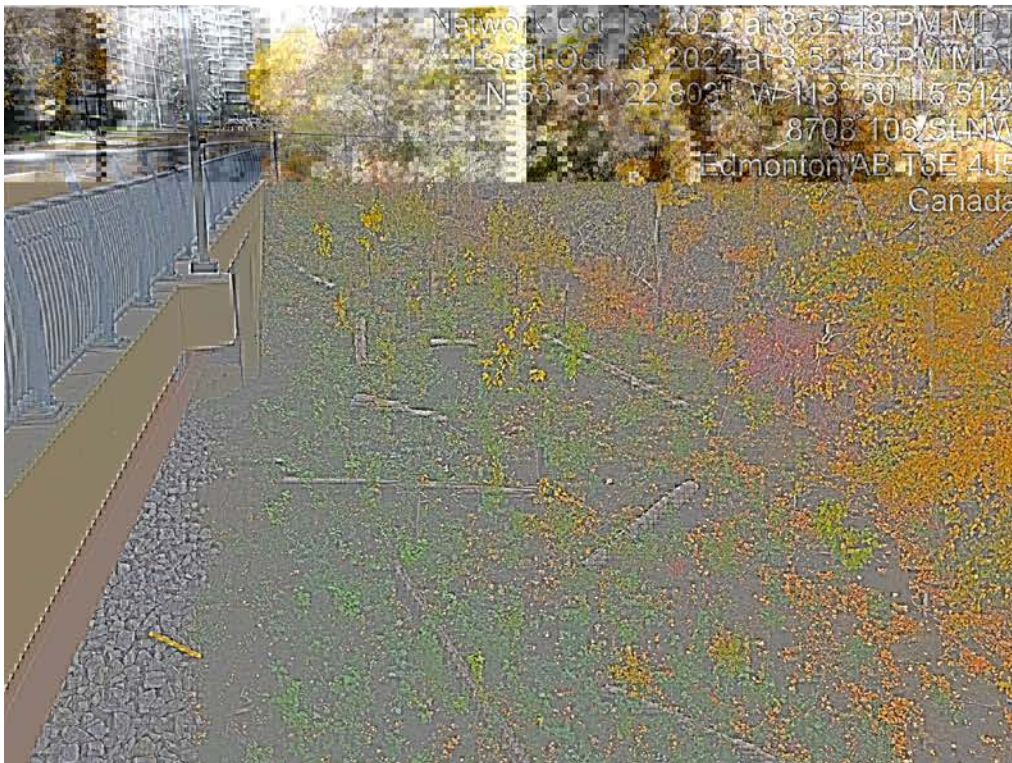
Rough and loose soil – erosion control, microsities



Live staking - root depth and canopy closure



Large woody debris – microsites and soil quality



Topsoil salvage/replacement versus dig and dump

Issue:

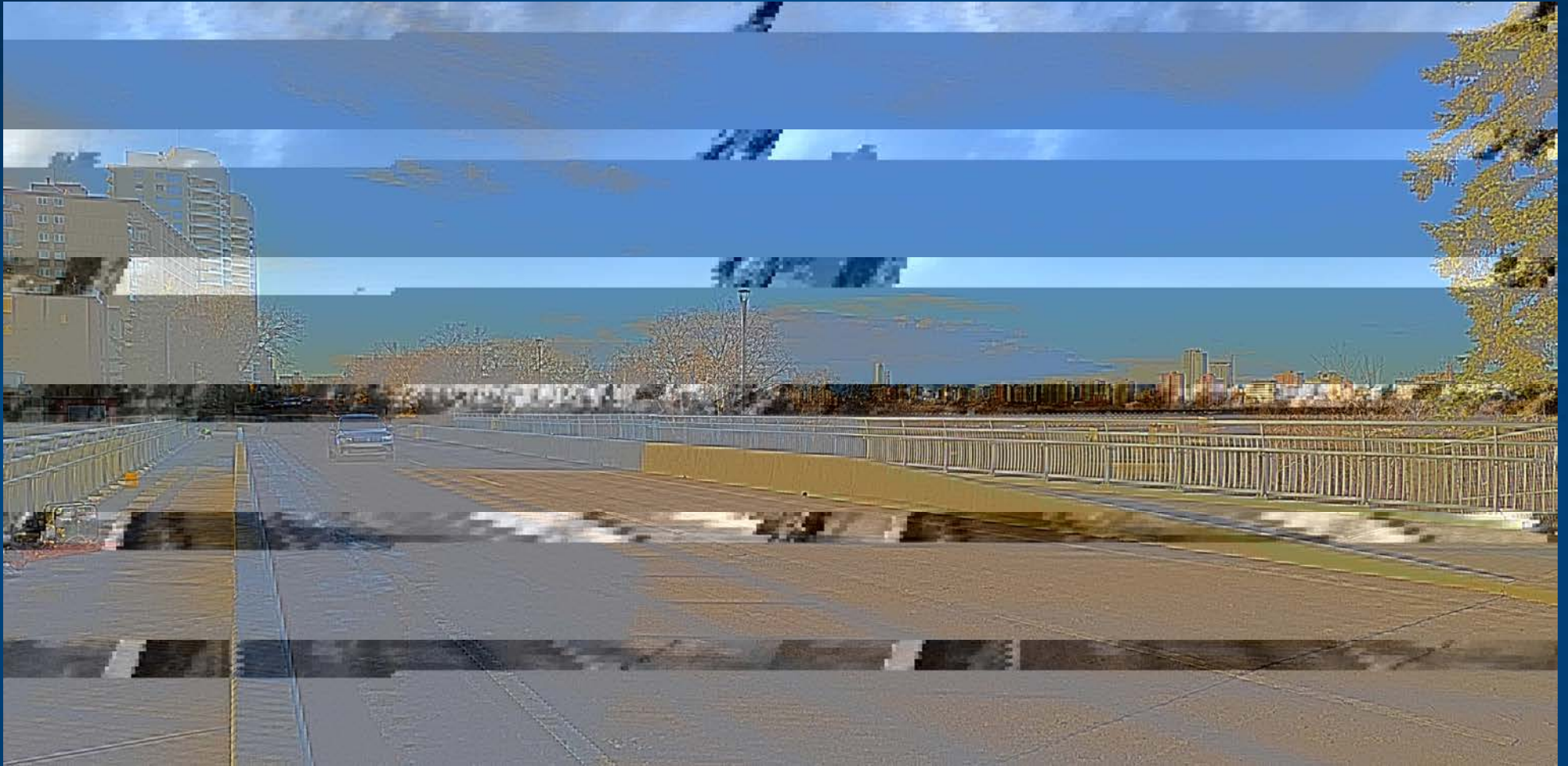
- Weed seed in imported soil

Solution:

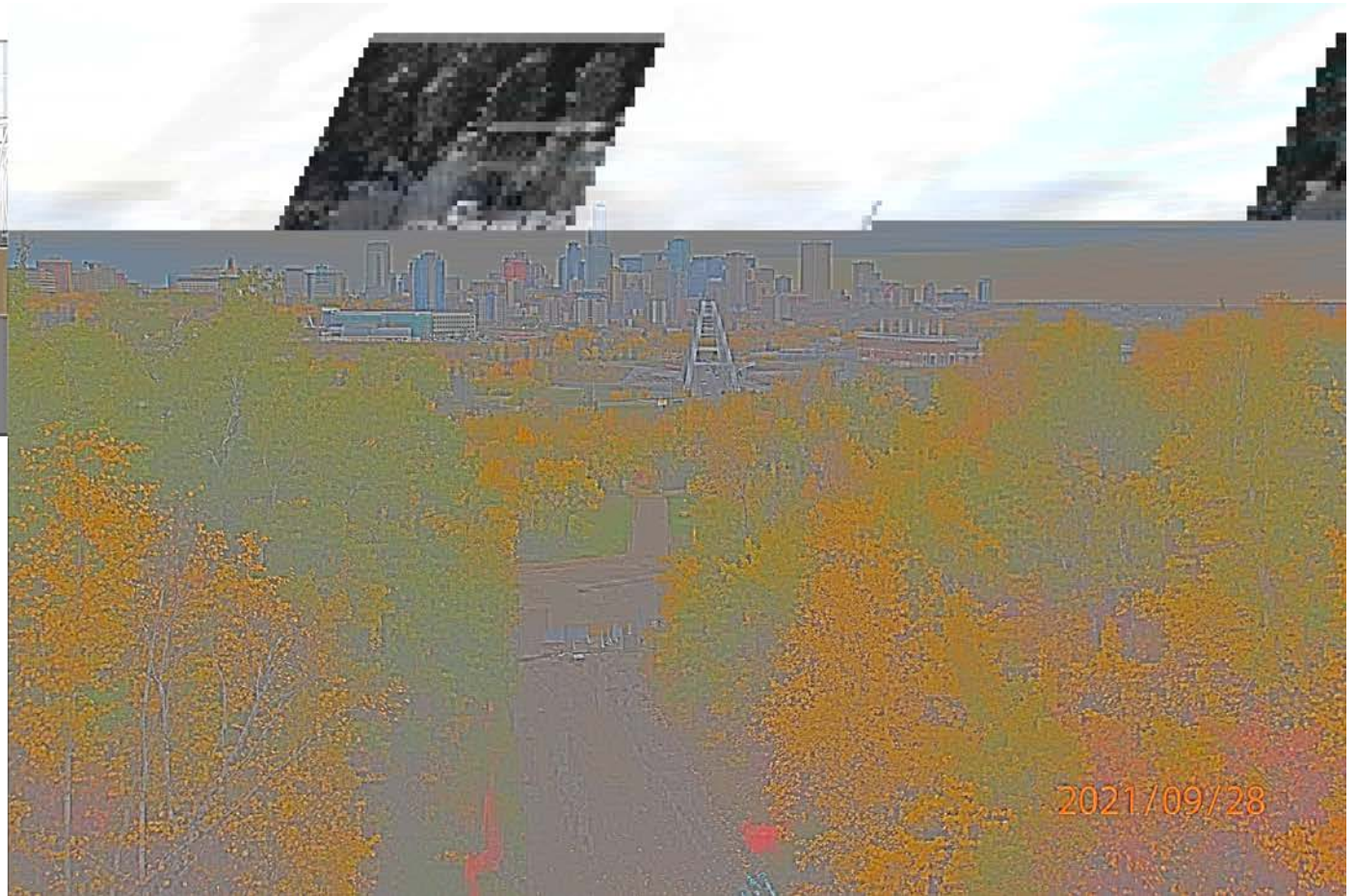
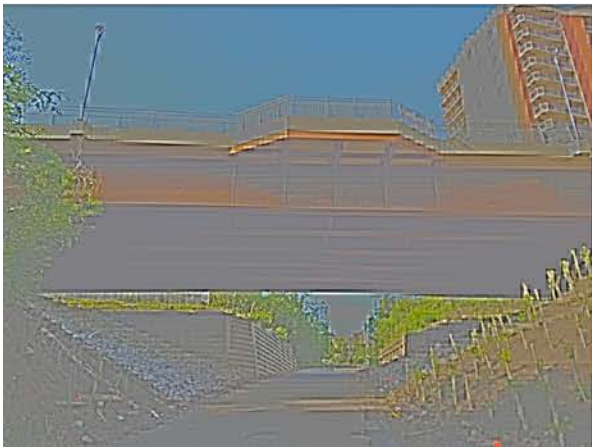
- Avoid dig and dump, replace salvaged soil
- Canopy closure

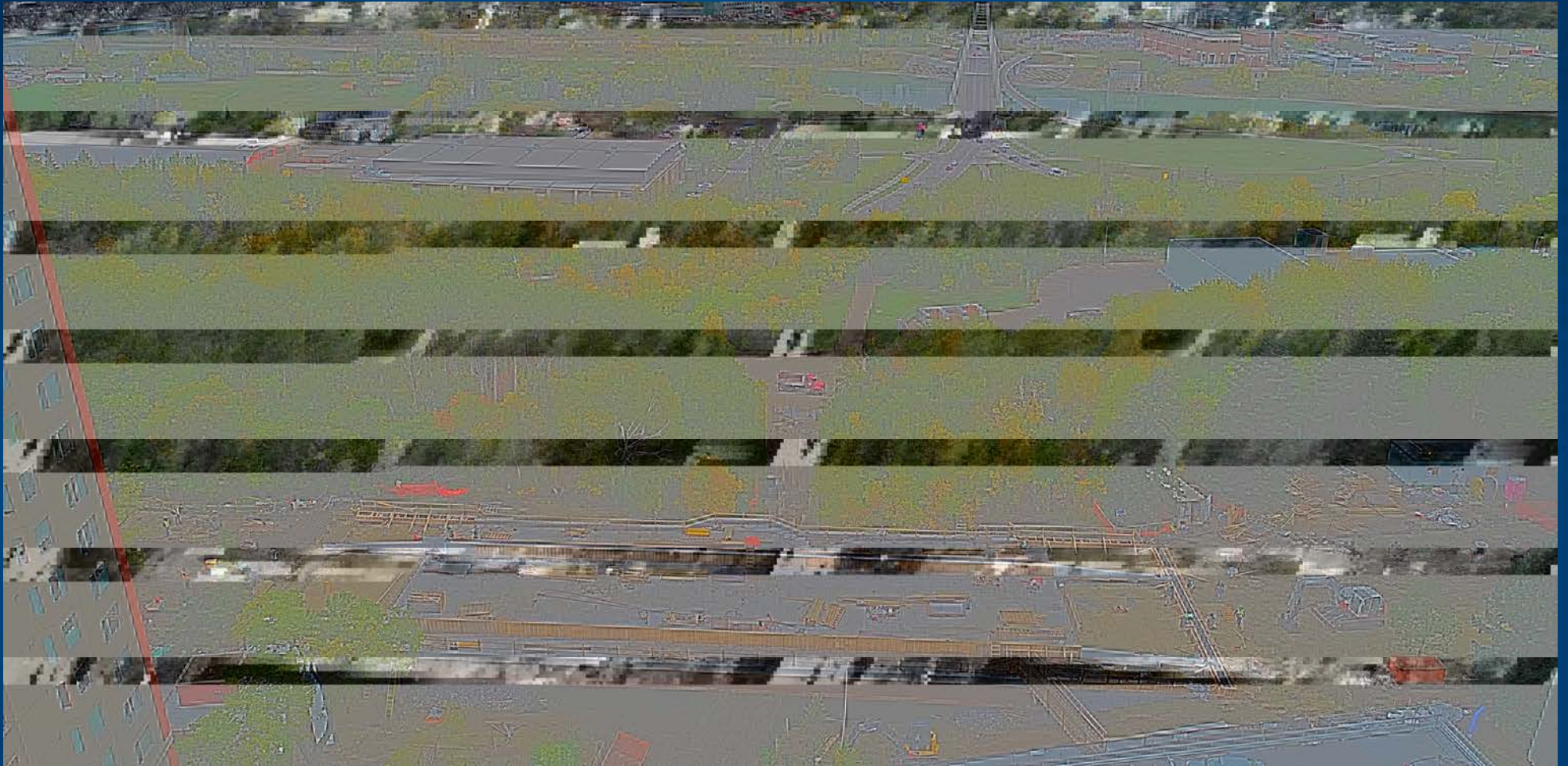


Questions?



River Valley View - Look-out





Duggan Bridge Replacement – Construction 2021