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From Design to Construction: Lessons Learned from Contractor Inexperience During Implementation of Erosion Mitigation at the Oshawa Landfill

Robin McKillop, M.Sc., P.Geo.

TRIECA conference

March 20, 2019

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DURHAM REGION

Contractor made up for inexperience in the implementation of naturalized in-stream/riparian works with an openness to direction, adjustment and field-fit refinements

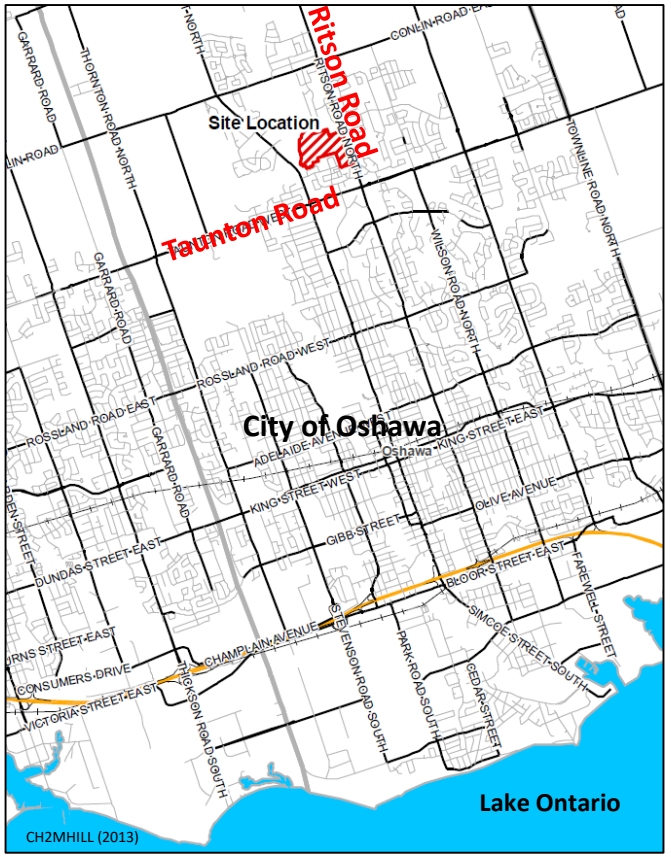
Outline

- Project Overview
- Low Bid Implications
- Site Inspection Allowance
- Project Team Communication

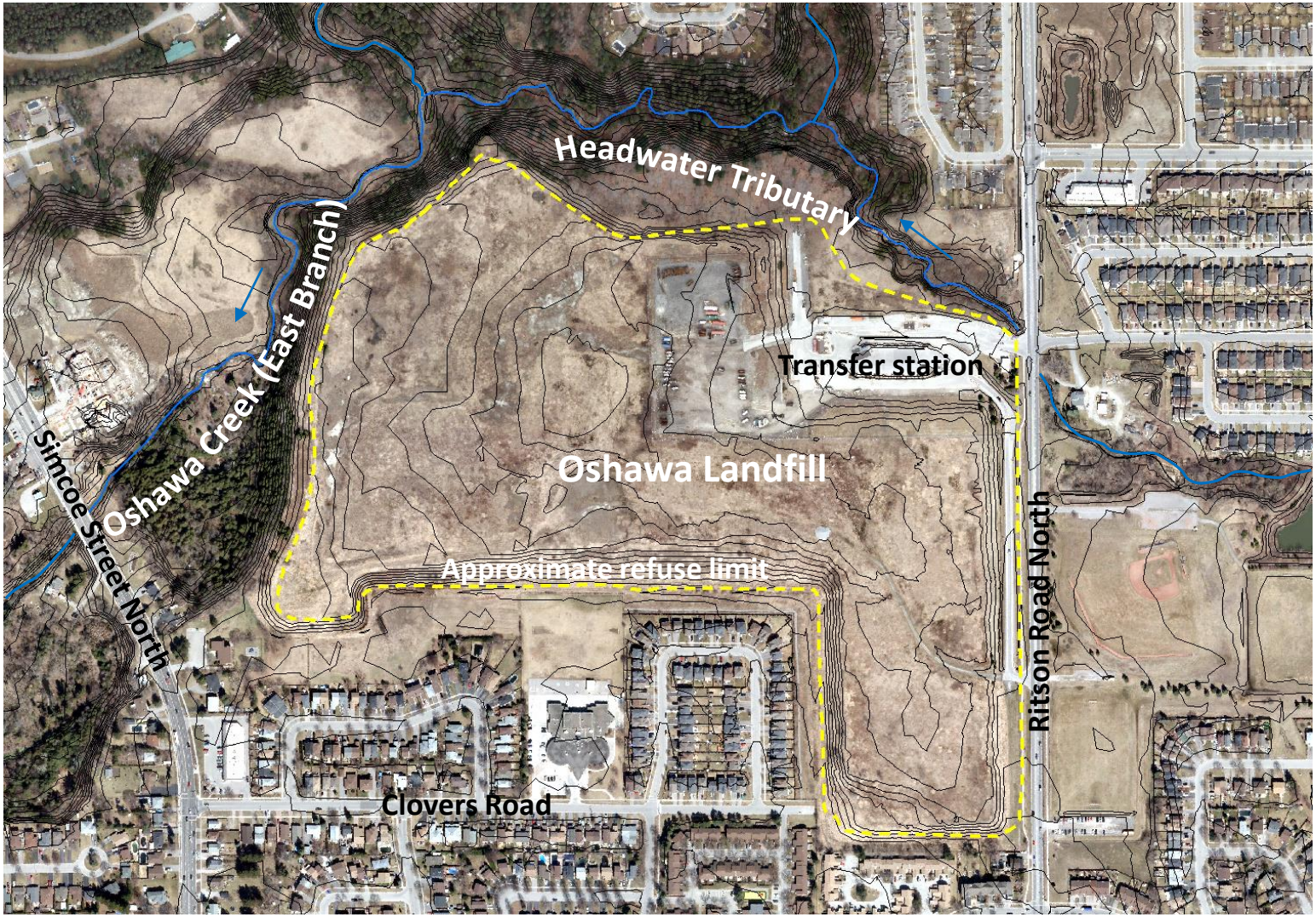
PROJECT OVERVIEW

Oshawa Landfill

- Operational from 1960s until 1979
- Located in former sand/gravel pit
- Capped in 1980; now just site of transfer station



Oshawa Landfill



Erosion!

- Surface runoff (gullying)
- Fluvial scour
- Slope instability

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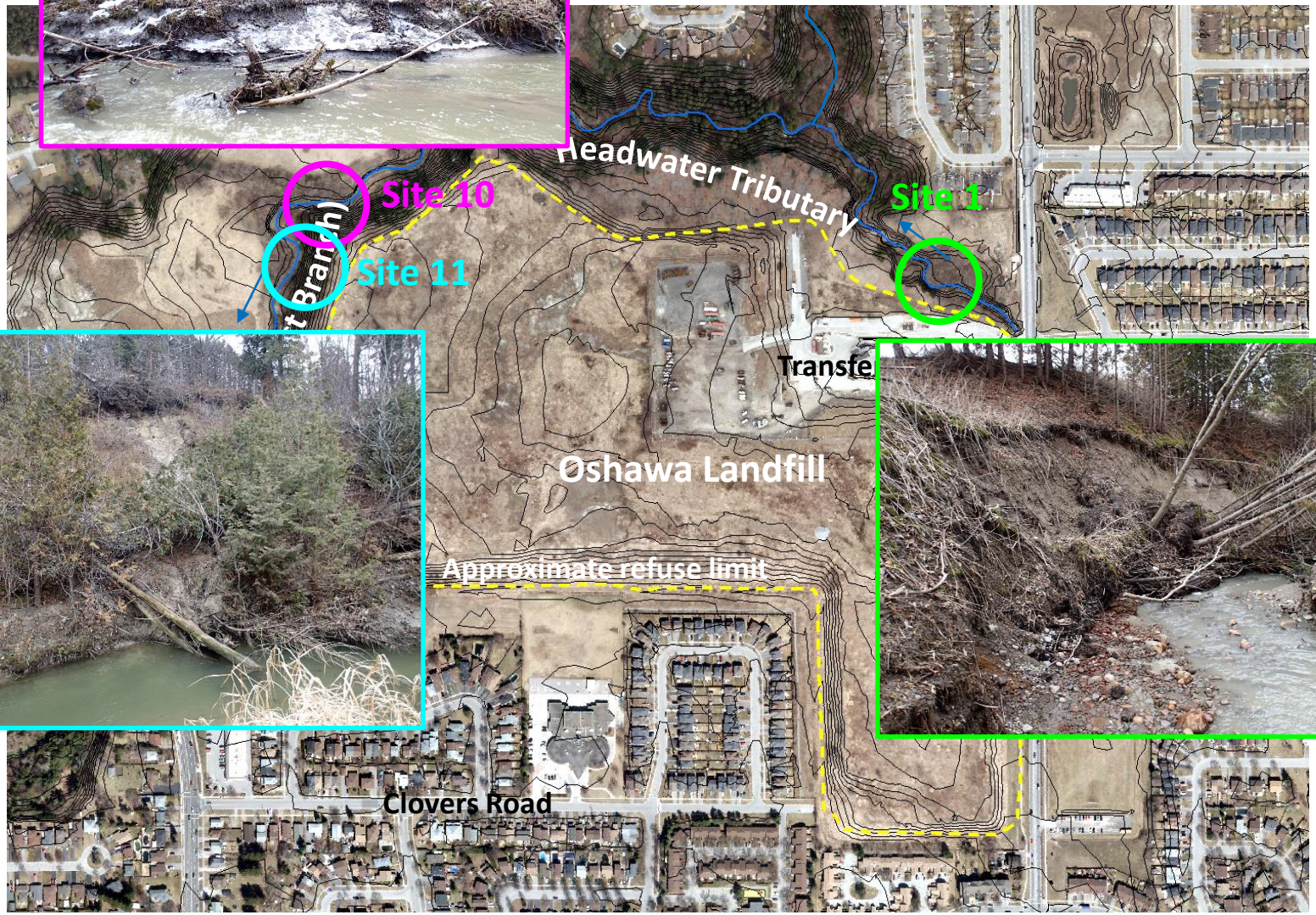
Greck

Erosion assessment, design & permitting

1. Erosion inventory
   - 18 erosion sites
2. Erosion risk evaluation
   - 5 prioritized for mitigation
3. Erosion mitigation design
   - 5 conceptual designs ➔ 3 detailed designs
4. Erosion mitigation permitting
   - CLOCA, DFO (LoA), MNRF

Oshawa Landfill



5. Tendering

- Region tendered implementation of Sites 1, 10 and 11, with support from Palmer/Greck team

- Lowest bid tendering process!
  - Original lowest bid disqualified (reference checks)
  - Next lowest bid awarded contract

6. Construction

- Erosion mitigation implemented successfully at all three sites in July-August 2018
- Region assumed Contract Admin role
  - ~Daily site inspections
- Palmer/Greck design team conducted limited site inspections
  - 3-5 per site, at strategic times


Site 1
Embedded woody debris
Riparian shrub plantings along regraded slope toe
Pool
Benched inner bank (improved floodplain accessibility)
Cobble riffle
Pool


Site 10
Salmon in lee of woody debris structure


Site 11
Living cedars retained in slope-toe protection
Embedded woody debris

LOW BID IMPLICATIONS

Risks of accepting low bids

- Region's obligation to award construction to lowest (qualified) bid risks compromising quality and efficiency
  - More guidance required to compensate for inexperience in bioengineering along streams
  - Less precise implementation (equipment, method, sequence)
  - Slower (suboptimal coordination, need for revisions)

Erosion & sediment control issues

- Coffer dams
  - Poor seal & outflanking
  - Few ideas to improve
- Sediment control
  - Silt fence across channel
- Dam-and-pump
  - Incomplete isolation of work area; no sump
  - Clean upstream water discharged downstream into filter bag in channel
- Fuel tank storage
  - <5 m from creek, without spill protection

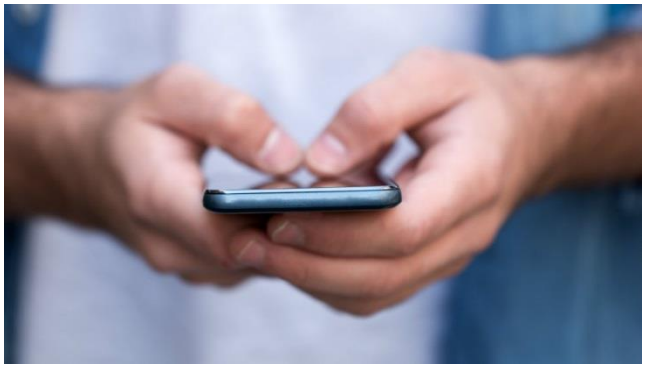
Design implementation issues

- Riparian plantings installed on wrong (inner) bank
- Native clay/silt fill placed along toe of bank at downstream tie-in
  - Shared responsibility – e.g. too few XSs

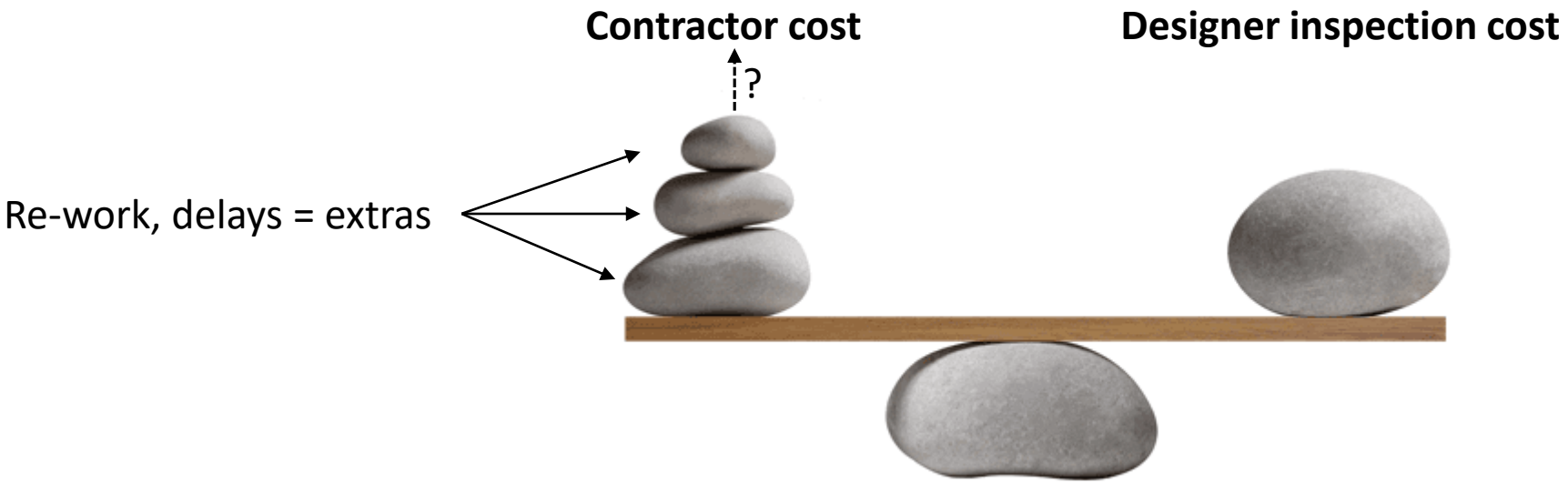
SITE INSPECTION ALLOWANCE

Frequency & duration of site inspections

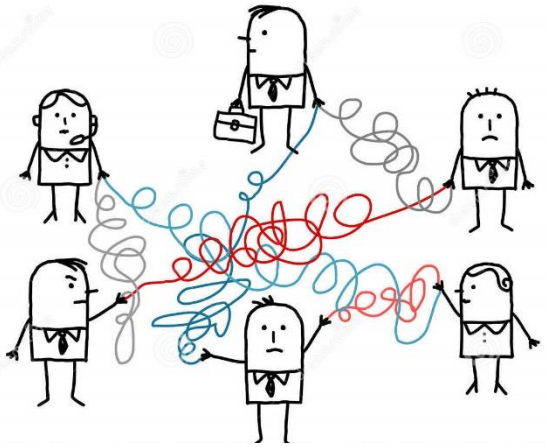
- Time allocated to inspections by design team should be commensurate with contractor (in)experience
  - Also consider Contract Admin expertise
- Insufficient time available in budget to provide contractor guidance required (*as reaffirmed by him!*)
  - Questions arise, but no real-time, onsite feedback
  - Phone, text and email risk miscommunication or work delays



Cost-benefit analysis



PROJECT TEAM COMMUNICATION



Lines of communication

Client:
PM, Contract Admin

Subconsultant(s)?

Subcontractor(s)?

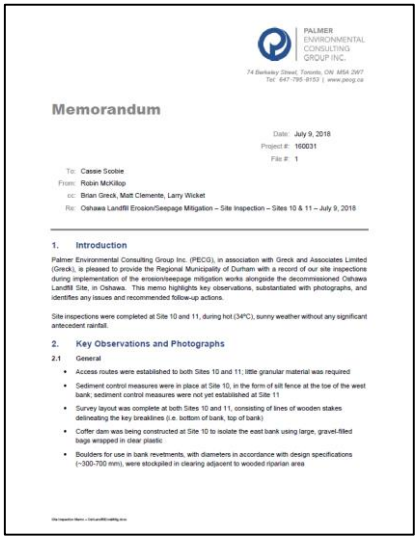
Designer:
PM, lead designer(s),
site inspector(s)

Contractor:
PM, foreman,
crew/labourers

Supplier(s)?

Avoiding miscommunication

- Site inspection logs
  - Initially sent to Region (approver); didn't always reach contractor promptly
  - Later distributed among entire project team in order to avoid delay/miscommunication



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Memorandum

Date: July 9, 2018
Project #: 160031
File #: 1

To: Cassie Scobie
From: Robin McKillop
cc: Brian Greck, Matt Clemente, Larry Wicket
Re: Oshawa Landfill Erosion/Seepage Mitigation – Site Inspection – Sites 10 & 11 – July 9, 2018

1. Introduction

Palmer Environmental Consulting Group Inc. (PECG), in association with Greck and Associates Limited (Greck), is pleased to provide the Regional Municipality of Durham with a record of our site inspections during implementation of the erosion/seepage mitigation works alongside the decommissioned Oshawa Landfill Site, in Oshawa. This memo highlights key observations, substantiated with photographs, and identifies any issues and recommended follow-up actions.

Site inspections were completed at Site 10 and 11, during hot (34°C), sunny weather without any significant antecedent rainfall.

2. Key Observations and Photographs

2.1 General

- Access routes were established to both Sites 10 and 11; little granular material was required
- Sediment control measures were in place at Site 10, in the form of silt fence at the toe of the west bank; sediment control measures were not yet established at Site 11
- Survey layout was complete at both Sites 10 and 11, consisting of lines of wooden stakes delineating the key breaklines (i.e. bottom of bank, top of bank)
- Coffer dam was being constructed at Site 10 to isolate the east bank using large, gravel-filled bags wrapped in clear plastic
- Boulders for use in bank revetments, with diameters in accordance with design specifications (~300-700 mm), were stockpiled in clearing adjacent to wooded riparian area

- Lag in responses to identified issues (e.g. silt fence maintenance) resolved

- Prompt, informal email communication better than formal logs?

Key takeaways

- Avoid low-bid tenders, where possible, or at least scrutinize experience and references and ensure designs are sufficiently detailed
- Allow for adequate site inspections by design team for ultimate cost savings
- Communicate issues promptly and broadly with entire project team
- Establish an open, collaborative working relationship with contractor to optimize design implementation

Questions?

robin@pecg.ca

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