# Pile Supported Roads

Construction Techniques for Alberta Wetlands

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# Who is Landmark?

- Established in 1999
- Professional, full service, multi-disciplined
- Project Management, Engineering & Construction, Environmental Enhancement, Forestry Services
- Practical bunch, … *Solutions-oriented*

***From concept to completion, we design, develop and deliver …***

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# What we do …


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# Open Water – End of the Road?

- Solution requires …
  - Single heading construction
  - Maintenance of wetland function & environmental values
  - Competitive Cost & Favourable Timing

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# Open Water – End of the Road?

- Conventional construction methods not possible
- Options?

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# History of Pile Supported Construction

- Long history of pile use – foundations, footings
- More recently – embankments
- Simple process
  - Find some wood
  - Drive some piles
  - Build something on top of it … like a road!

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# History of Pile Supported Construction

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# History of Pile Supported Construction

*Santa Maria della Salute*
Completed in 1681
1.1 million timber piles

*St. Mark's Bell Tower*
Collapsed in 1902
1000 yr old piles in perfect condition

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# Open Water Crossing – Case Study

- Describes the challenge and solution for constructing an elevated road across open water using single heading construction.
- Step by Step
- Materials
- Equipment
- Next Steps …


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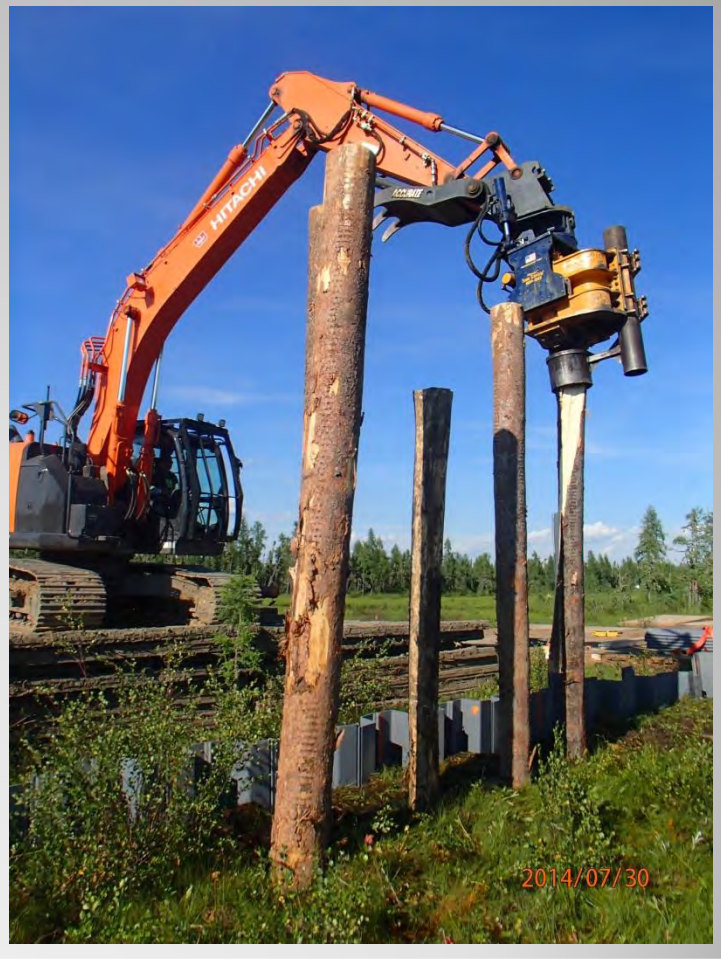


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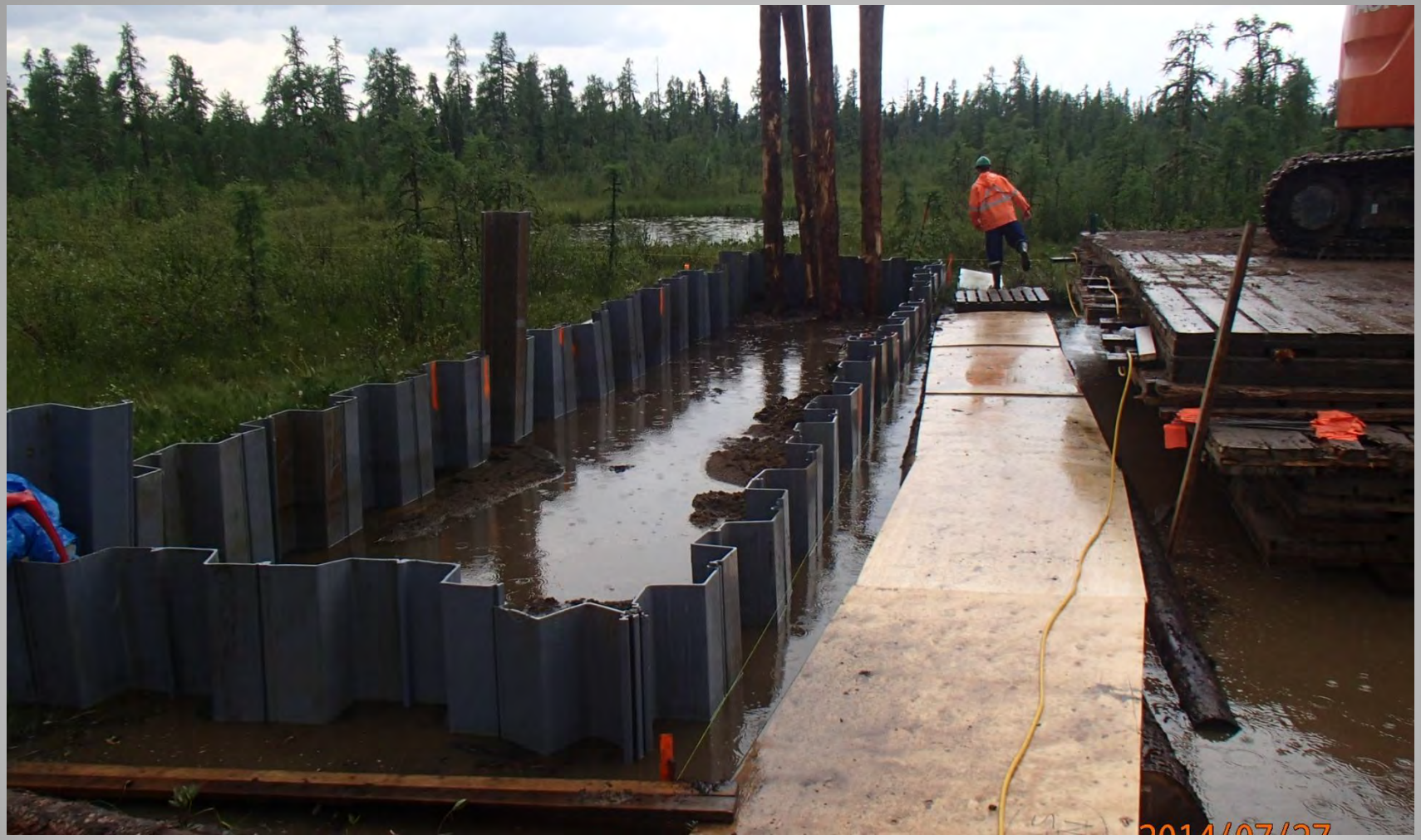


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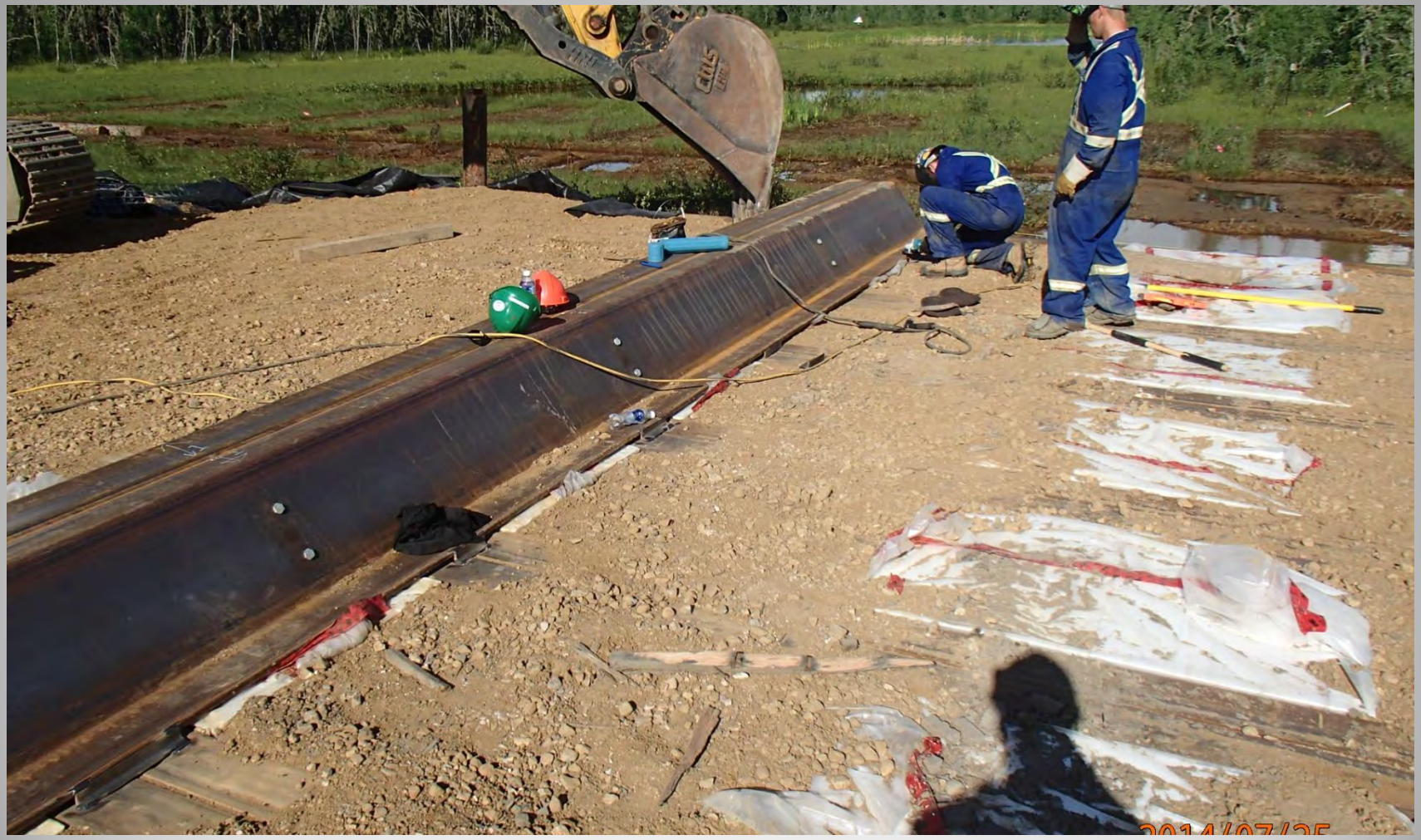


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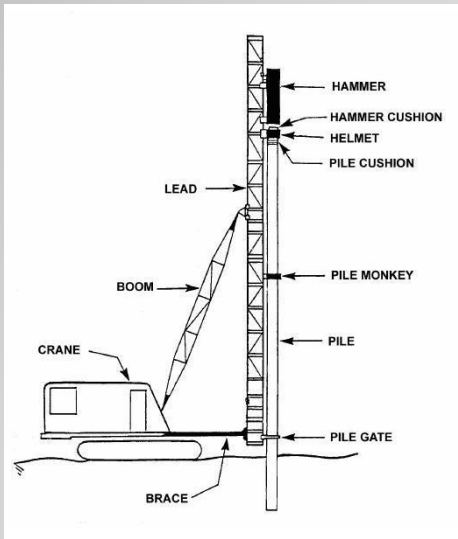
# Next Steps

- Develop relationship between vibratory driven and drop hammer driven piles





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# Next Steps

- Test under a variety of conditions
  - Soil type
  - Pile spec (species, diameter, quality)
  - Depth
  - Pattern (# per mat)
- Operational testing on an ongoing basis for all projects requiring piles
- Develop "playbook" for pile supported roads and structures to improve cost effectiveness

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# Next Steps

- Cost Considerations
  - Scale of project (mob/demob)
  - Width (single lane with pull-outs vs double-lane)
  - Depth and availability of granular fill,
  - Depth of peat,
  - Availability of timber

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# Other Possibilities

- Retrofit existing roads with pile supported culverts/bridges
- Refine designs for floating road (EPS foam)
- Refine design for deep peat conditions

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MEGAFLOW

# Summary - Pile Supported Roads

- Minimization technique
- Hydrology is minimally impacted
- Continuous “causeway” possible in peat up to 4-5 m deep
- Range of techniques available depending on peat depth
- Locally available timber piles combined with GRS exceeds CL 800 load rating
- Reversible process
- Restoration is possible for existing roads

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