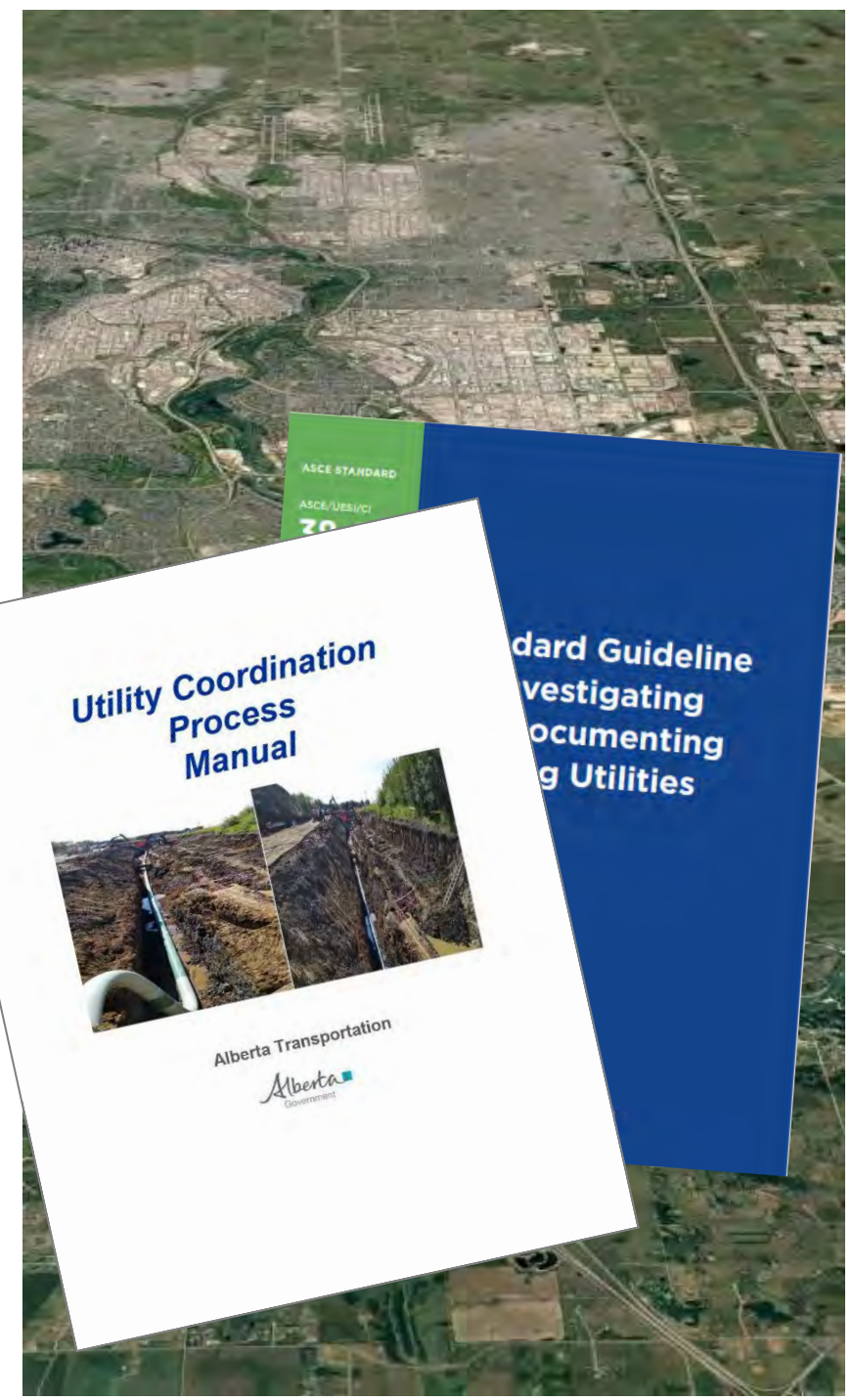




ASCE 38 and the Alberta Transportation Utility Coordination Manual Applied to the Deerfoot Trail Improvement Project



Utility Coordination Process Manual



Alberta Transportation
Alberta Government

Standard Guideline Investigating Documenting Utilities

Presentation Resources

[Deerfoot Trail Improvements \(calgary.ca\)](http://calgary.ca)

[Deerfoot Trail Improvements - Deerfoot Trail Improvements \(deerfootimprovements.ca\)](http://deerfootimprovements.ca)

Project 61001796

Abstract

The ASCE 38-22 Standard Guideline for Investigating and Documenting Existing Utilities has a successful history working on large transportation projects within Canada. This presentation will look at the successful strategies to implement Subsurface Utility Engineering (SUE) following the ASCE 38-22 and the Alberta Transportation Utility Coordination Process Manual.

Key takeaways from this presentation will include:

- Discussing The ASCE 38-22 and its benefits to the project
- The Alberta Transportation Utility Coordination Process Manual from the perspective of a Utility Engineer.
- Specific examples of the ASCE 38-22 and the Alberta Transportation Utility Coordination Process Manual applied to the Deerfoot Trail Improvements Project
- And lessons learned from the Deerfoot Trail Improvements Project.

Presenters

Sinclair Slusariuc P.Eng, Western Canadian Branch Manager, T2ue

- Professional engineer with over 12 years of experience in the utility engineering and consulting engineering industries. Sinclair is a graduate of the University of Alberta Masters of Business Administration program and she specializes in risk and project management.



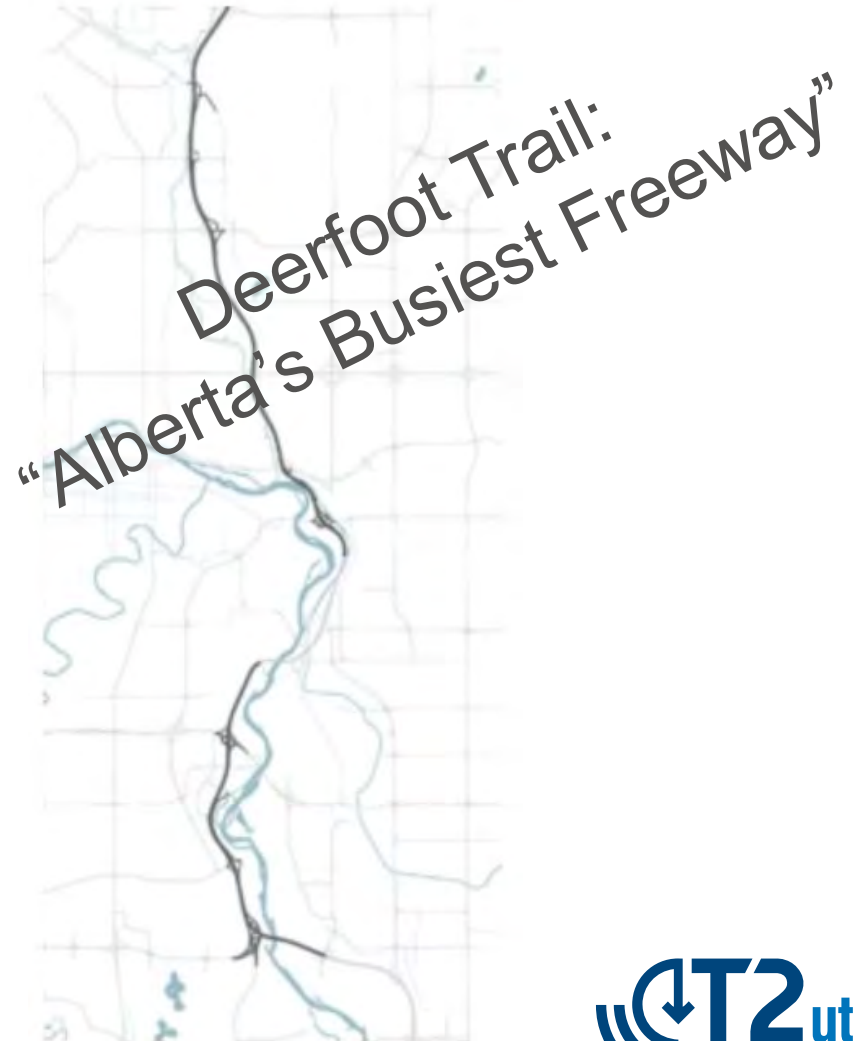
Laurie LeBlanc, Business Development Manager, T2ue

- OACETT recognized Certified Technician with over 11 years' experience in Utility Engineering. Laurie's experience with project management, QA/QC, and geophysical utility locating techniques in Subsurface Utility Engineering has exposed him to hundreds of projects where Utility Engineering has benefited projects across Canada.



Agenda

- The ASCE 38-22 - Standard Guideline for Investigating and Documenting Existing Utilities
- The Alberta Transportation Utility Coordination Manual
- The Project
- Examples of these Standards Applied to the project
- Lessons Learned

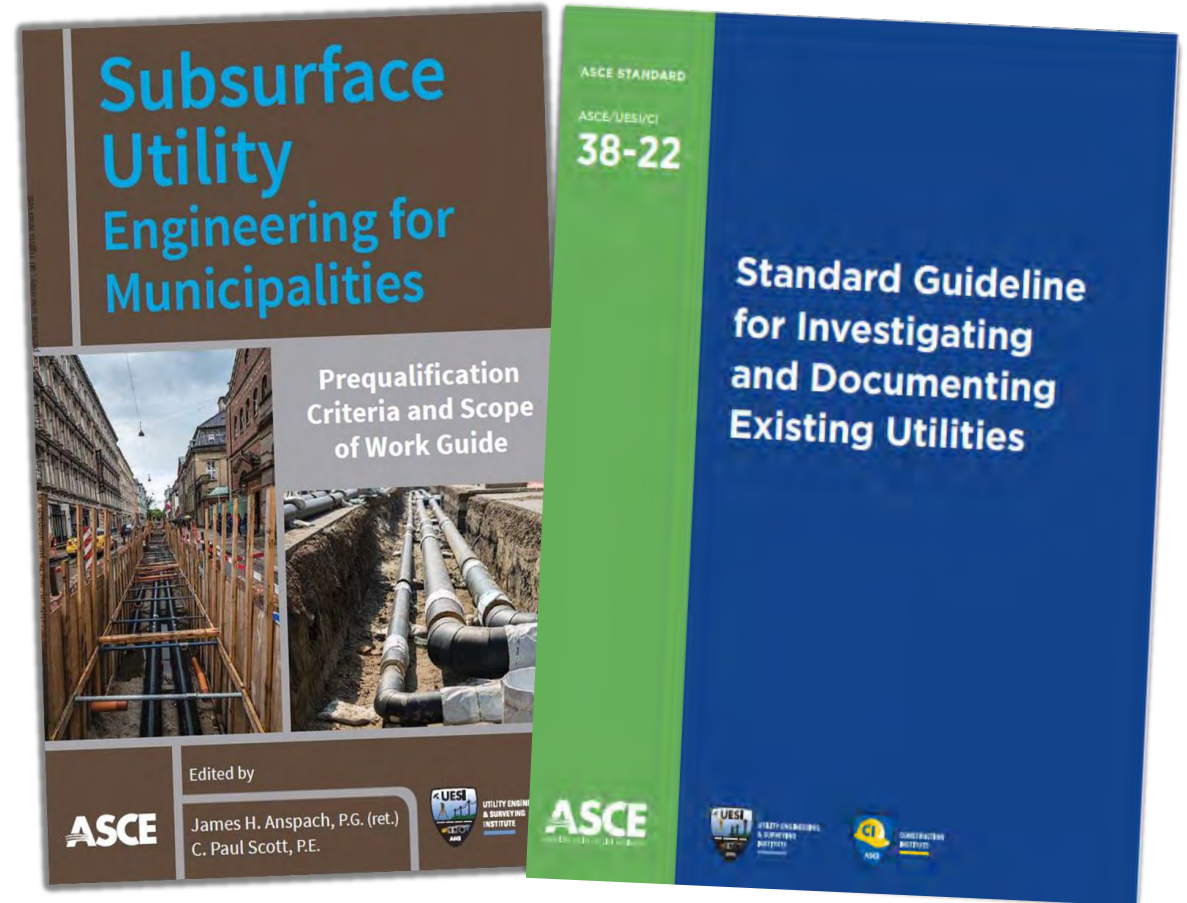


ASCE 38-22

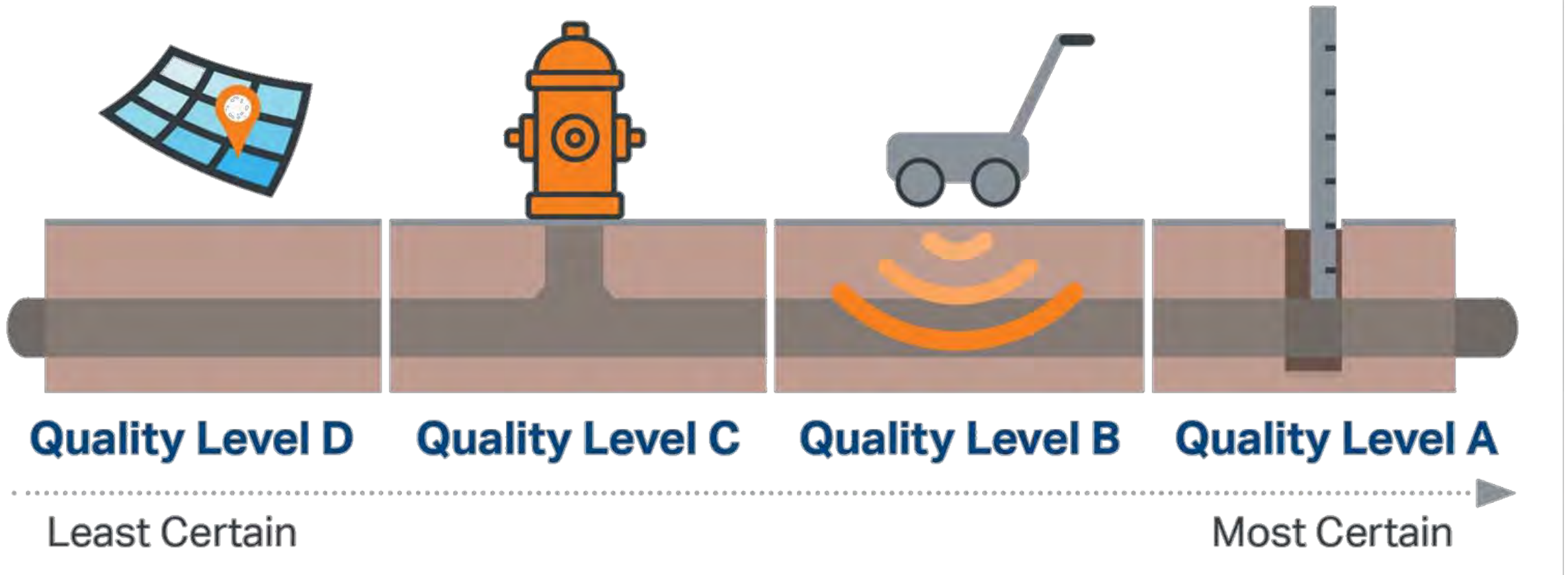


ASCE 38-22

- American Society of Civil Engineers (ASCE-UESI)
 - ASCE 38-22 Standard Guideline for Investigating and Documenting Existing Utilities
 - Subsurface Utility Engineering for Municipalities
- We wrote the books...literally.
 - T2ue Associates were part of original and ongoing ASCE 38 Committee:
 - Jim Anspach, PG, F.ASCE
 - T2 Utility Markets & Practice Development
 - Chair of committee since 1996
 - Paul Scott, PE
 - T2 USA Utility Liaison
 - At T2ue all Subsurface Utility Engineering services are delivered compliant with ASCE 38



ASCE 38-22: Quality Levels



ASCE 38-22 - Quality Level D

Definition: A value assigned to a Utility Segment or Utility Feature not visible at the ground surface whose estimated position is judged through Utility records, information from others, or from visual clues such as pavement cuts, obvious trenches, or existence of service.

Records Research:

- As-built records
- Utility system drawings
- Oral recollections
- One-Call
- Visual site inspection

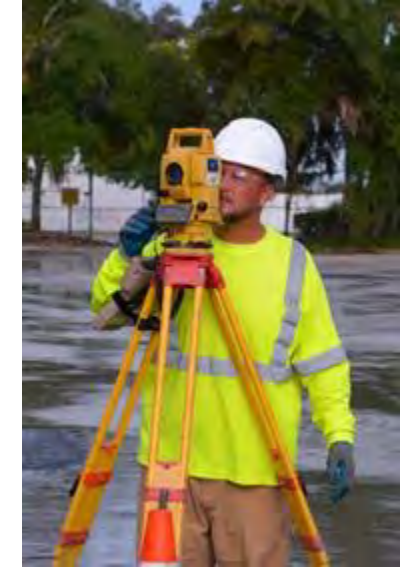


ASCE 38-22 - Quality Level C

Definition: A value assigned to a Utility Segment not visible at the ground surface whose estimated position is judged through correlating Utility records or similar evidence to Utility Features, visible aboveground and/or underground. The Utility Anchor Point on the Utility Features shall be tied to the Project Survey Datum with an accuracy of 60 mm horizontal.

Field Inspection:

- Correlating underground utility segments to the visible surface features, such as :
 - Valves
 - Sewer maintenance holes
 - The end of QL-B segments
- Reconciled to ASCE Quality Level D
- Primarily used for sewer and large pipe networks



ASCE 38-22 - Quality Level B

Definition: A value assigned to a Utility Segment or subsurface Utility Feature whose existence and horizontal position is based on Geophysical Methods combined with professional judgment and whose location is tied to the Project Survey Datum

Geophysics:

- Utility detected through appropriate geophysical methods
- The geophysical signal was judged to be reliable
- The interpreted position was judged based on knowledge and use of geophysical science, Utility design and installation practices, available records, visual features, and influence of site conditions
- The source Designation has been tied to the Project Survey Datum with an accuracy of 60 mm horizontally



ASCE 38-22 - Quality Level A

Definition: A value assigned to a portion of a Utility Segment or subsurface Utility Feature that is directly exposed and measured and whose location and dimensions are tied to the Project Survey Datum. The Utility Segment or subsurface Utility Feature shall be tied to the Project Survey Datum with an accuracy 30 mm vertical and 60 mm horizontal for the measurements of the outside limits of the Utility Feature or Utility Segment that is exposed

Utility Exposure:

- Physically expose & visually verify the utility
- Record utility size and material information
- Note survey location in 3D (X,Y & Z)



ASCE 38-22 - Deliverables

- Quality Level D



- Quality Level C



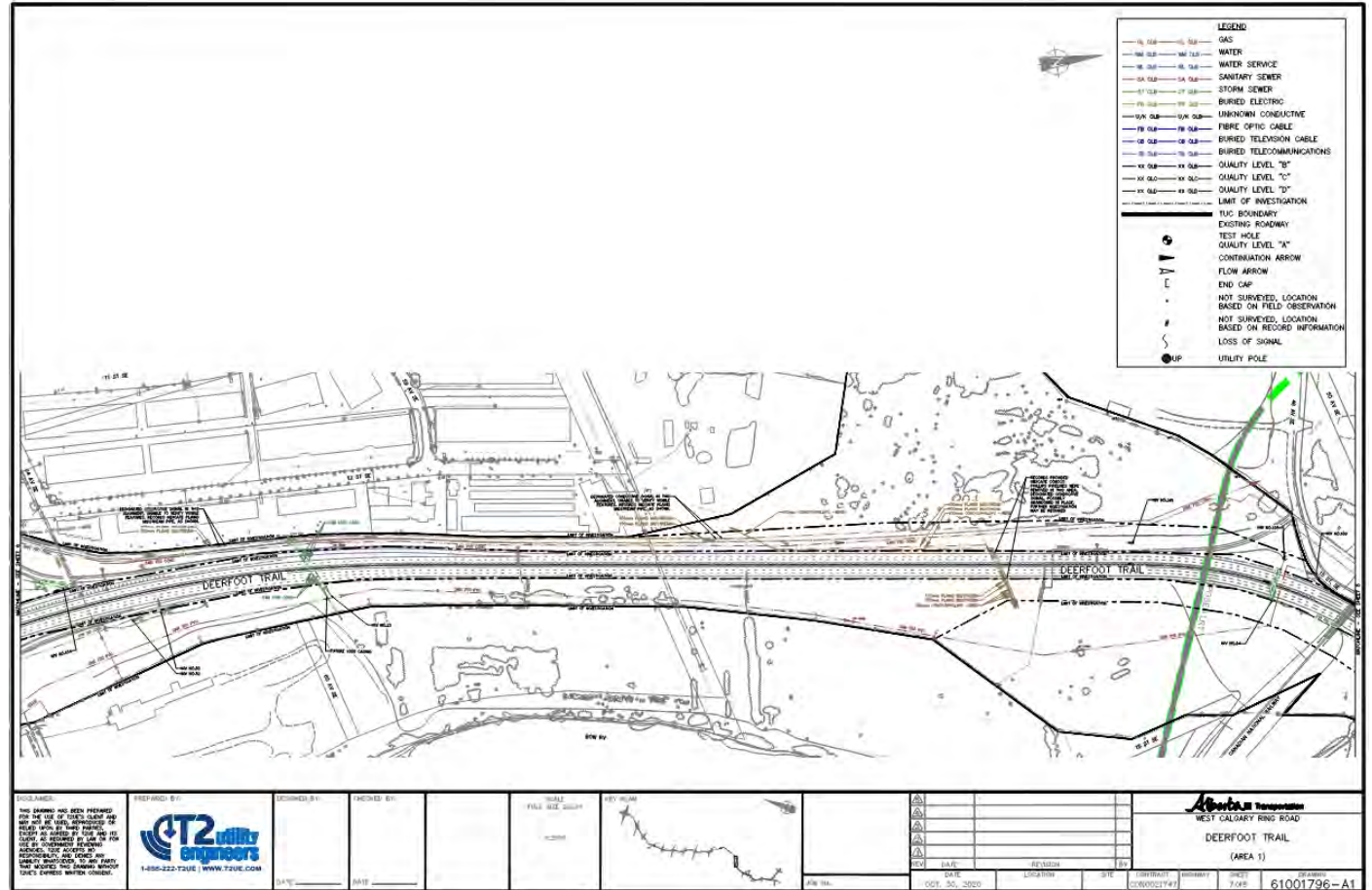
- Quality Level B



- Quality Level A






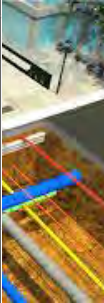
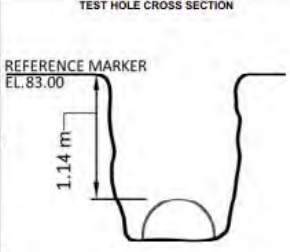
- Notes/Comments




ASCE 38-22 - Deliverables

- Report
 - Objective
 - Methodology
 - Analysis & Results
- Test Hole Data Sheets
 - Visually Verification
 - Horizontal & Vertical Alignment
 - Utility Material
 - Size
 - Comments
- Additional Investigations
 - Invert Depth Report, Chamber Investigations, Photos, CCTV

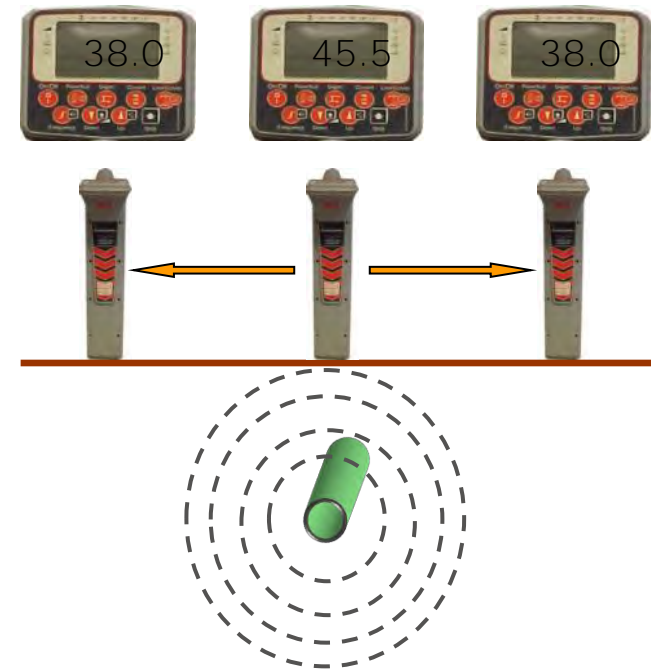
Subsurface Utility Engineering Report

Project No: E1001747 Client: TMG Project Name: TMG - CoT - YONGE ST VM & SEWER	 TEST HOLE DATA SHEET	TEST HOLE No.: TH112																																									
																																											
<table border="1"><tr><td>TH Date (m/d/yyyy)</td><td>8/17/23</td></tr><tr><td colspan="2">Utility Description</td></tr><tr><td>Utility Type</td><td>GAS</td></tr><tr><td>Utility Material</td><td>PL</td></tr><tr><td>Utility Width (Field)</td><td>110 mm</td></tr><tr><td>Utility Width (Record)</td><td>100 mm</td></tr><tr><td>Utility Direction</td><td>N-S</td></tr><tr><td colspan="2">Elevation of Utility</td></tr><tr><td>Top of Utility</td><td>81.86 m</td></tr><tr><td>Bottom of Utility</td><td>- m</td></tr><tr><td colspan="2">Depth From Grade</td></tr><tr><td>Top of Utility</td><td>1.14 m</td></tr><tr><td>Bottom of Utility</td><td>- m</td></tr><tr><td>Depth of Excavation</td><td>1.50 m</td></tr><tr><td colspan="2">Reference Marker</td></tr><tr><td>Easting</td><td>314644.78</td></tr><tr><td>Northing</td><td>4834126.89</td></tr><tr><td>Reference Elevation</td><td>83.00 m</td></tr><tr><td>Location</td><td>Center of Utility</td></tr><tr><td>ID'd By</td><td>Cut X</td></tr><tr><td>Surface Type</td><td>AC</td></tr></table>	TH Date (m/d/yyyy)		8/17/23	Utility Description		Utility Type	GAS	Utility Material	PL	Utility Width (Field)	110 mm	Utility Width (Record)	100 mm	Utility Direction	N-S	Elevation of Utility		Top of Utility	81.86 m	Bottom of Utility	- m	Depth From Grade		Top of Utility	1.14 m	Bottom of Utility	- m	Depth of Excavation	1.50 m	Reference Marker		Easting	314644.78	Northing	4834126.89	Reference Elevation	83.00 m	Location	Center of Utility	ID'd By	Cut X	Surface Type	AC
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Revision Notes:																																											



ASCE 38-22 - QL-B Field Investigation Tools

- **Electromagnetic Methods**
- Electromagnetic Sondes
- CCTV
- Laser Scanning (LiDAR)
- Ground Penetrating Radar (GPR)
- Advanced Geophysics
 - Multi frequency GPR
 - EM 31/61



ASCE 38-22 - QL-B Field Investigation Tools

- Electromagnetic Methods
- **Electromagnetic Sondes**
- CCTV
- Laser Scanning (LiDAR)
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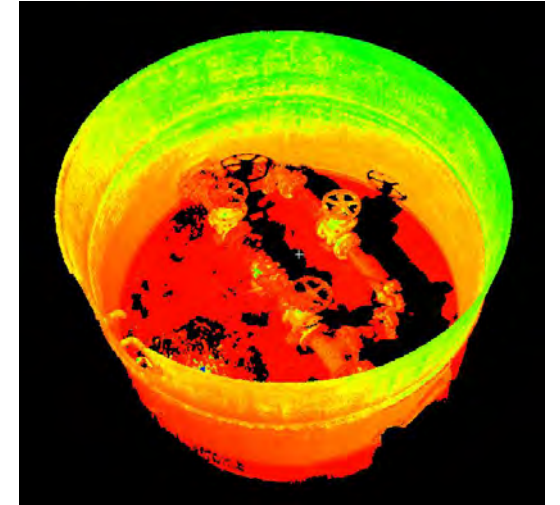
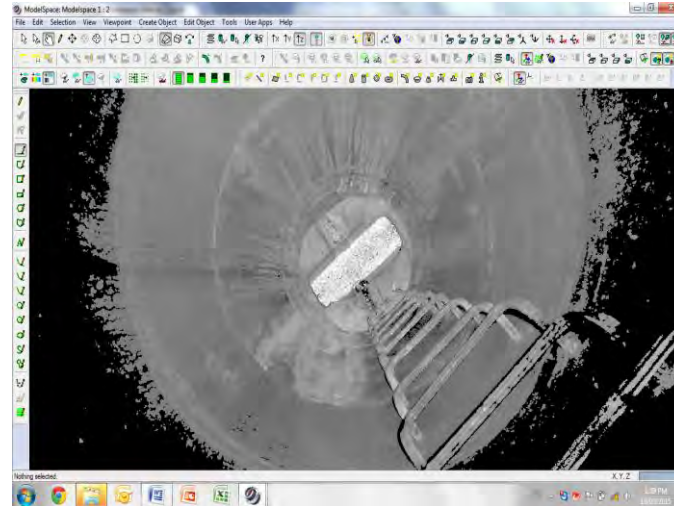
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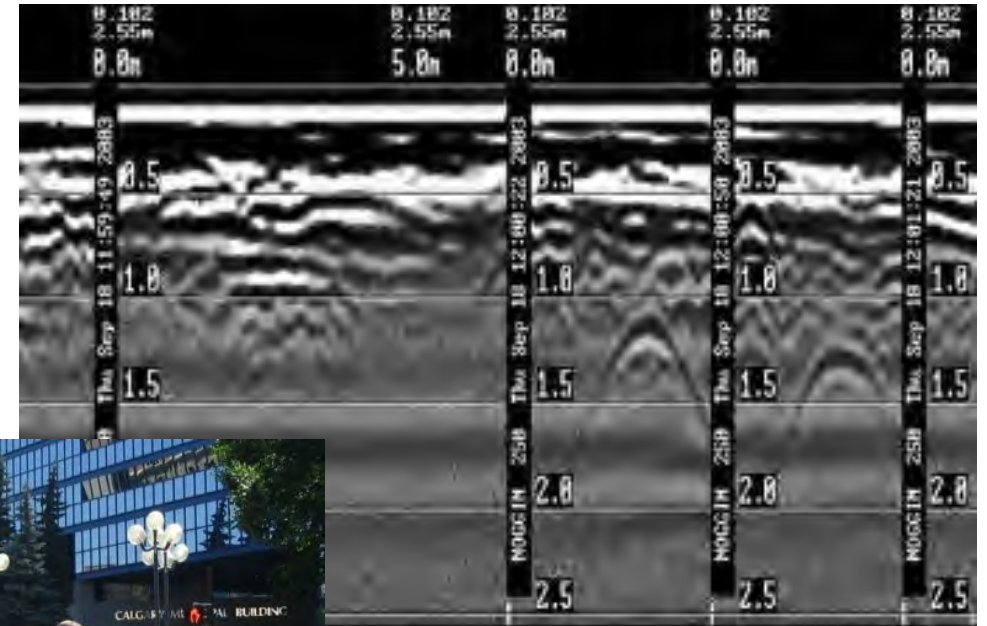
ASCE 38-22 - QL-B Field Investigation Tools

- Electromagnetic Methods
- Electromagnetic Sondes
- CCTV
- **Laser Scanning (LiDAR)**
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ASCE 38-22 - QL-B Field Investigation Tools

- Electromagnetic Methods
- Electromagnetic Sondes
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ASCE 38-22 - QL-B Field Investigation Tools

- Electromagnetic Methods
- Electromagnetic Sondes
- CCTV
- Laser Scanning (LiDAR)
- Ground Penetrating Radar (GPR)
- **Advanced Geophysics**
 - Multi-Channel GPR (STREAM)
 - EM 31/61

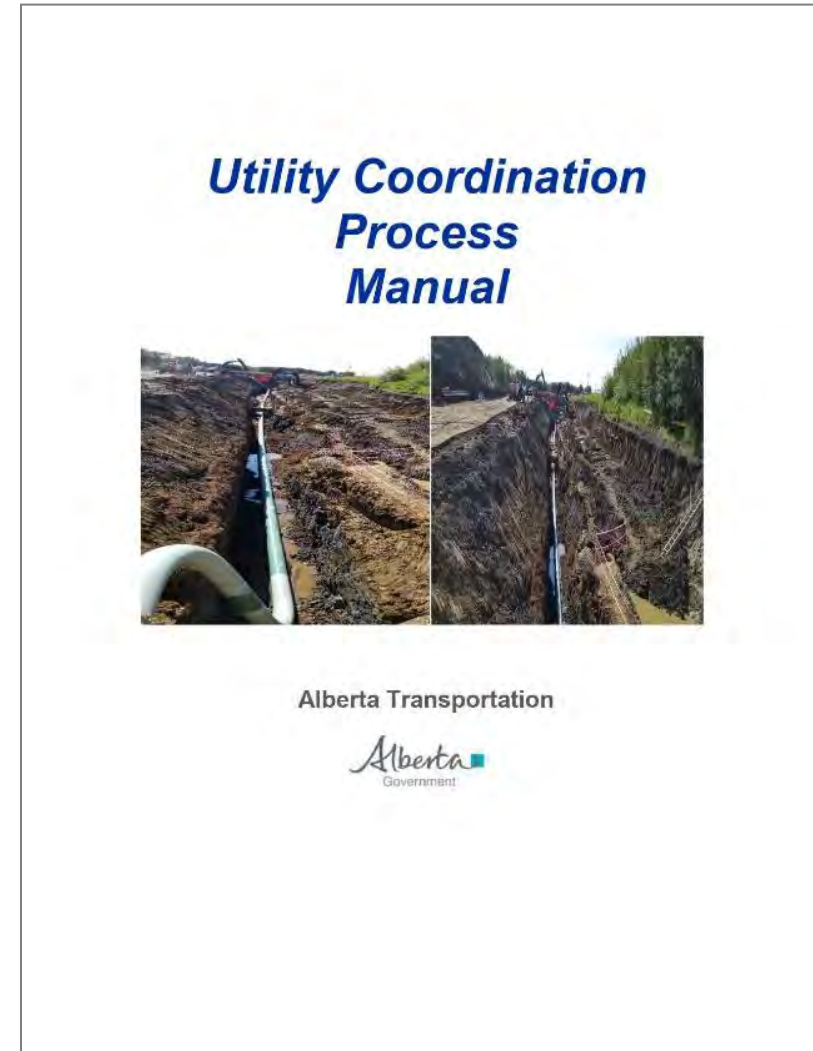


Alberta Transportation Utility Coordination Process Manual



Alberta Transportation Utility Coordination Process Manual

- Published in 2020
- Guides project teams through:
 - Early Planning
 - Scope Definition
 - Design Tender
 - Construction Phases



Alberta Transportation Utility Coordination Process Manual

EXISTING								Conflict Identification					RCD Conflicts and Test Holes				Conflict Resolution		
Conflict#	Utility Type	Section	Location Description	STA. (Start)	STA. (Finnish)	Size or Configuration (Size or mm)	Material	Conflict Type	URA	Conflict (Y/N)	SUE Quality Level	Comments	Conflicts with RCD	Test Hole Required (Y/N)	Test Hole#	Resolution	Design Received (Y/N)	Resolved (Y/N)	Last Updated
1	ENBRIDGE GAS	1	High St (south of project limit)	10+724	10+882	200 IP	SC	□	-	Y	QLB	Gas found at 1.08m. No conflict with RCD.	Road Widening, Sub drain	Y	TH1	Cleared by TH	N	N	8-Aug-17
2	ALECTRA	1	Park St	10+760	10+800	UNK	-	□	-	Y	QLB	Relocate	Pole zone	N	-	Abandon or Relocate	N	N	19-Mar-18
3	WM	1	High St (south of project limit)	10+765	-	300	PVC	□	-	Y	QLB	TH21 not completed in the field.	Sub drain	Y	TH21	No Action	N	N	8-Aug-17
4	UNK	1	High St (south of project limit)	10+781	-	300	MET	□	-	Y	QLB	Unknown utility found at 1.08m. No conflict with RCD	Road Widening, Sub drain	Y	TH2	To be abandoned or removed by ProjectCo	-	Y	8-Aug-17
5	ENBRIDGE GAS	1	Park St	10+802	-	200 IP	SC	□	-	Y	QLB	Gas found at 0.69m. No conflict with RCD. No Road Cut in this area.	Road Widening, Sub drain	Y	TH4	Cleared by TH	N	N	8-Aug-17
6	ENBRIDGE GAS	1	Park St	10+806	-	200 IP	SC	□	-	Y	QLB	Gas found at 0.97m. No conflict with RCD.	Sub drain, Future Sidewalk	Y	TH3	Cleared by TH	N	N	8-Aug-17
7	BELL	1	Park St	10+810	-	1 Duct	-	□	-	Y	QLB	Bell found at 0.69m. No conflict with RCD	Road Widening, Sub drain, Future Sidewalk	Y	TH5	Bell Abandoning	Y	Y	4-Apr-18
8	ROGERS	1	Park St	10+811	-	FOC	Fiber	□	-	Y	QLB	Rogers found at 0.50m. No Conflict with RCD.	Road Widening, Sub drain	Y	TH6	Cleared by TH	N	Y	8-Aug-17
9	WM	1	Park St	10+812	-	150	-	□	-	Y	QLD	TH11 not complete. No signal found in field.		Y	TH11	-	N	N	8-Aug-17
10	WM	1	Park St	10+822	-	300	-	□	-	Y	QLB	WM found at 1.92m. No conflict with RCD		Y	TH10	Cleared by TH	N	Y	8-Aug-17
11	ENBRIDGE GAS	1	Park St	10+826	-	200 IP	SC	□	-	Y	QLB	Utility found at 1.16m. No conflict with RCD	Road Widening, Sub drain, Future Sidewalk	Y	TH7	Cleared by TH	N	N	8-Aug-17

- Standardizes utility conflict identification and resolution on projects
- Guides the engagement with utility owners and other stakeholders early in the project lifecycle.

Alberta Transportation Utility Coordination Process Manual

- Identifies a list of tools to assist in the Utility Coordination Process:
 - SUE Selection Criteria Form
 - Utility Base Plan
 - Utility Conflict Matrix
 - Composite Utility Plan
 - Utility Adjustment Matrix
 - Utility Coordination Plan
 - Utility Assessment Outline
 - Stakeholder Register and Communication Plan

Tool Type & Name	Description
Subsurface Utility Engineering (SUE) Selection Criteria Form (Excel Template)	<p>The Subsurface Utility Engineering (SUE) Selection Criteria Form provides guidelines and asks a number of questions that direct the user in determining the Quality Level of SUE information that will be required during various phases of a project lifecycle. Using this form during each Phase, helps determine whether utilities may be a concern, and indicates what Quality Level should be attained to address those concerns.</p> <p>See Appendix B: SUE Quality Levels – Excerpt from ASCE 38-02 Standard Guidelines, for the Collection and Depiction of Existing Subsurface Utility Data.</p> <p>The SUE Selection Criteria Form is included in Appendix F.</p>
Utility Base Plan	<p>A plan prepared by the project Consultant showing the existing utility infrastructures (aboveground and underground) and locations in relation to the highway/bridge alignment (existing or proposed) within the project limit. A sample deliverable is included in Appendix F.</p> <p>The Utility Base Plan Checklist indicates the minimum requirements of what to include in the Utility Base Plan. However, the Consultant should contact the AT PM to establish and agree on the information that will be required for the conflict analysis.</p> <p>While preparing this plan, Consultants are to follow the latest version of the Utility Coordination Process Manual, American Society of Civil Engineers (ASCE) 38-02 Standard Guidelines and Alberta Transportation's Engineering Drafting Guidelines for Highway and Bridge Projects (EDGHBP). The EDGHBP can be found in the link below. http://www.transportation.alberta.ca/Content/docType30/Production/C_ADDguidelines.pdf.</p>

Example from the Manual

Alberta Transportation Utility Coordination Process Manual

- Benefits:
 - Alberta Transportation's authority and interests
 - The Consultant's interests
 - The Utility Owners' interests
 - The public interest



The Project

T2ue.com



The Deerfoot Trail Improvements Project

- 46.4 Kilometer Freeway
- Located in Calgary
- Daily influx of over 180,000 vehicles
- Critical to Calgary's transportation grid



The Deerfoot Trail Improvements Project

- Underground utilities within the project area include:
 - ENMAX, Alberta Transportation and City of Calgary electric power,
 - Telus, Shaw (including Envision), ENMAX and the City of Calgary telecommunications,
 - ATCO natural gas mains,
 - ATCO, Conoco Phillips and Plains Midstream natural gas/oil pipelines,
 - City of Calgary watermains,
 - Alberta Transportation and City of Calgary sanitary and storm sewers.



The Deerfoot Trail Improvements Project

- Preliminary Design Project
 - One core lane northbound and southbound
 - Interchange Improvements
- SUE Objective:
 - Identify mainline utilities
 - Identify utility crossings
 - Identify sizes and materials
 - Reduce the uncertainty that existing utilities imposed
- SUE Scope:
 - Records Research
 - Utility Designating
 - Invert Investigations
 - Vacuum Excavation

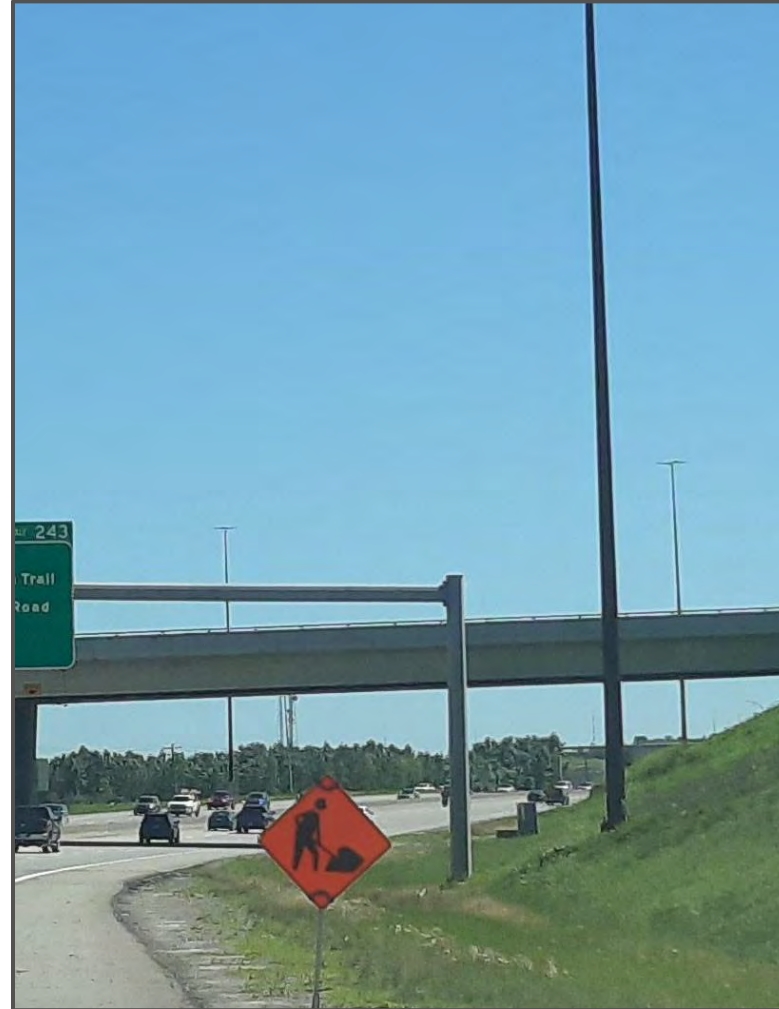


Examples

The Deerfoot Trail Improvements Project



The Deerfoot Trail Improvements Project



Field Work:
Traffic Considerations

The Deerfoot Trail Improvements Project



The Deerfoot Trail Improvements Project



Lessons Learned

Lessons Learned

- Project Delivery
 - Following a prescribed utility coordination process
- Incomplete Records Responses
 - Discussions with utility owners
- Up to Date Engineering Base Drawings
 - Accuracy and missing information

Thank you

For More Information visit us at Booth #52

OR contact us

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