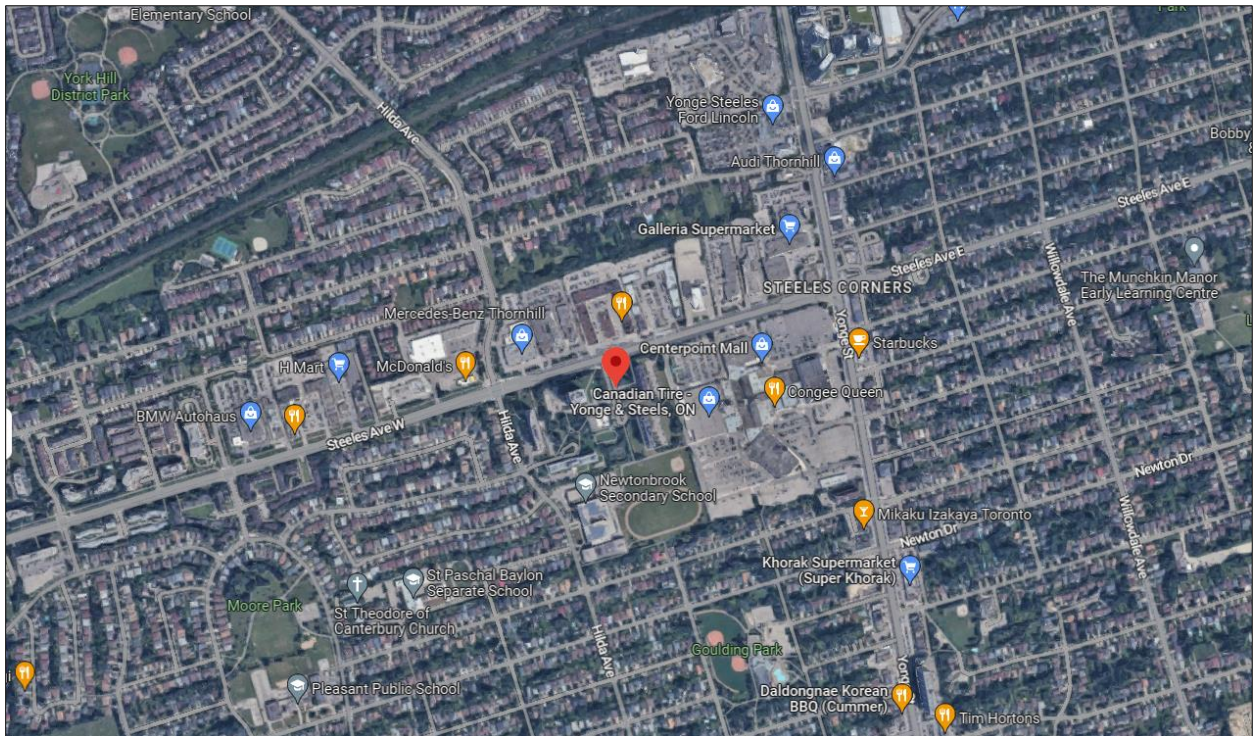



Subsurface Utility Engineering Investigation Report

**Tangreen Court,
North York, Ontario**



Prepared for:

 CENTRE COURT	Ian Veloso
---	-------------------

Submitted by: Telecon Design Inc.

Date: March 08, 2023

Project #: 139315

Prepared by Maryam Ahmadi, CAD Technician - Telecon Design Inc.

Reviewed by Shabnam Yasrebi, Project Coordinator - Telecon Design Inc.

Approved by Wamid Shamon, P. Eng., Telecon Design Inc.



Table of Contents

Scope of Work	3
2 Equipment.....	5
2.1 General.....	5
2.2 Field Tools & Technology	5
3 Methodology	6
3.1 SUE Quality Level “D”	6
3.2 SUE Quality Level “C”	6
3.3 SUE Quality Level “B”	6
3.4 SUE Quality Level “A”	6
4 Health and Safety.....	7
5 Summary.....	7
6 Test Pit Key Plan:	8
7 Test Pit Photographs and Notes:	9
Test Pit 1:	9
Test Pit 2:	10
Test Pit 3A:	11
Test Pit 3B:.....	12
Test Pit 3C:.....	13
Test Pit 4:	14
Test Pit 5:	15
Test Pit 6:	16
Test Pit 7:	17
Test Pit 8:	18
Test Pit 8: Continued	19
Test Pit 9:	20
Test Pit 10:	21
Test Pit 11:	22
Test Pit 12:	23
Test Pit 13A:.....	24
Test Pit 14:	25
Test Pit 15:	26
Test Pit 16:	27
Test Pit 17:	28
Test Pit 19:	29
Test Pit 20:	30
Test Pit 21:	31
Test Pit 22:	32
Test Pit 23:	33
Test Pit 24:	34
Test Pit 25:	35
Test Pit 26:	36
<i>APPENDIX A – Subsurface Utility Engineering Investigation Plans</i>	
<i>APPENDIX B – Subsurface Utility Engineering Test Pit Invert Table</i>	

Scope of Work

Telecon Design Inc. (TDI) was engaged by CAPREIT 2 Limited Partnership to complete a “Utility Investigation” in support of the proposed works for Tangreen Court, North York, Ontario.

The purpose of this investigation is to generate an accurate and reliable drawing showing the location of the current underground utility infrastructure.

Refer to Figure 1 for the project location and investigation limits (shaded in red).

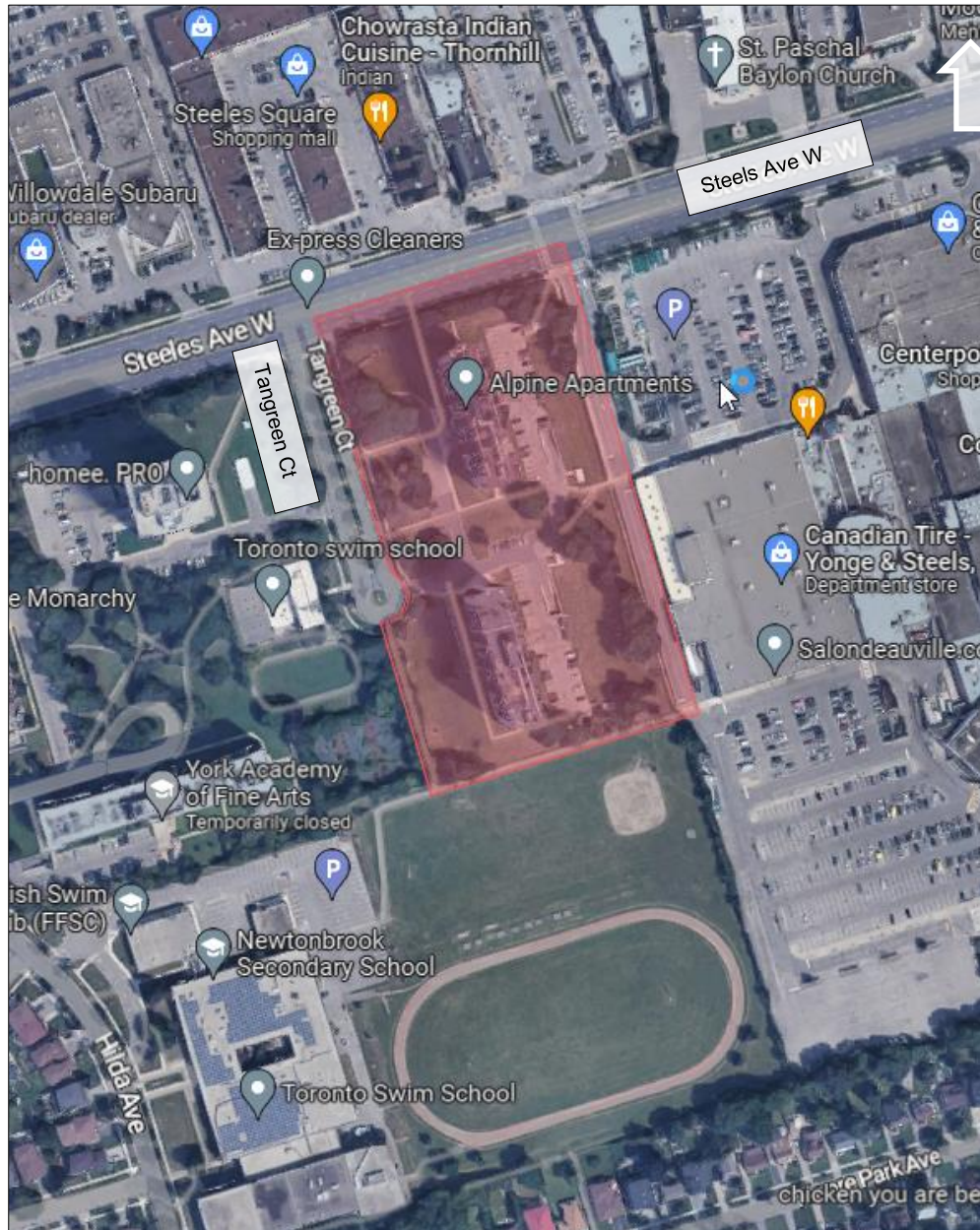


Figure 1 – QLA Investigation Limits

The scope of work is to complete an investigation using methodologies conforming to Subsurface Utility Engineering (SUE) standards CI/ASCE 38-22, "Standard Guideline for the collection and depiction of existing subsurface utility data.

Subsurface Utility Engineering Services:

- Complete utility records request from applicable utility companies and the municipality to obtain and analyze necessary utility information within the requested project work area.
- Physically designate underground facilities using geophysical locating techniques and equipment. This is to correlate, confirm, and document the approximate horizontal positioning of existing subsurface utilities (electromagnetic (EM) hook-up, trace, and mark facility routing) within the project limits of investigation. SUE Technicians to complete field sketches and document collected field data prior to the office review.
- QC the field results with the survey file and correlates utility references and records with the field results.
- Draft and record additional field notations onto the deliverable in AutoCAD format. Apply line-type and layering processes following ASCE 38-22 SUE Standards.
- Management & Coordination of SUE QL-A Work – HydroVac Test Pits.
- Deliverables:
 - ✓ Preliminary Deliverable (SUE Plan Drawing) at 90% Completion
 - ✓ Final Deliverable at 100% Completion:
 - ✓ AutoCAD (DWG Format)
 - ✓ SUE Plan Drawing(s) (PDF Format)
- The SUE Final Deliverables are reviewed by a Professional Engineer (within Telecon Design Inc.) licensed to practice in Ontario. This ensures the reliability of data based on SUE Quality Level Designations and Industry Best Practices.

2 Equipment

2.1 General

TDI field technicians are equipped with vehicles with laptops that have utility records loaded on their hard drive, internet connectivity for real time uploads and downloads, paperwork, drawing software for field notes, on site printing capabilities, and GPS tracking devices for vehicle monitoring. The Technicians carry cell phones for instant field contact.

2.2 Field Tools & Technology

TDI uses Radio detection type locating equipment. This equipment provides accurate horizontal location of toneable utilities. Depth measurements should be accurate to $\pm 5\%$ if conditions are suitable. The multifunctional RD8000 range represents Radio detection's most advanced pipe, cable, offering a wide choice of locate functions and advanced connectivity options. The RD8000 improves on speed, accuracy and reliability yet remains a cost-effective solution delivering unique user features powered by digital architecture.

Equipment used:

Figure A.

RD7000 PL+ Receiver(s) & RD8000 PXL + Receiver(s), RD7000/8000, TX10 Transmitter, 4" Transmitter Clamp w/ Carry Bag, 7K/8K Rechargeable, TX Li-ion Battery Pack.



Figure A



Figure B



Figure C

Figure B.

Traceable Duct Rodders - Jameson Duct Rodder.

Figure C.

P340 Flexiprobe– Pipeline Video Inspection System with Sonde.

Figure D.

Hemisphere S321 GNSS Smart Antenna and XF3 Hemisphere GNSS Data Collector with Carlson Software.



Figure F



Figure D

Figure E.

GPR - Noggin 250 SmartCart.

Figure F.

Total station - 1 Leica TCA1100 (Robotic, 3"); 1 Hi-target ZTS-121R (2")



Figure E

3 Methodology

The SUE process is based on ASCE Standard 38-22 – “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data”.

3.1 SUE Quality Level “D”

Analysis of current utility records obtained from internal TDI resources, utility owners and from the existing plans provided by the client, *CAPREIT 2 Limited Partnership*. This includes the correlation and collection of available records requested from the City of Toronto.

3.2 SUE Quality Level “C”

During the site investigation, the TDI team correlated surface features with the electronic files provided by *CAPREIT 2 Limited Partnership*, relevant to the scope of work. Using professional judgement, TDI confirmed the alignment of sewer lines referencing record information and the results of the invert investigations.

3.3 SUE Quality Level “B”

The SUE technicians used electromagnetic technologies (pipe and cable locate equipment) to determine the existence and the approximate horizontal and vertical position of live and abandoned utilities and structures indicated within the project areas.

The SUE technicians utilized paint marks, (in pink color corresponding to the APWA Marking Standard) on the ground surface in the field to indicate the facility’s horizontal position. Mainline utilities investigated include telecommunications, gas, Hydro, watermains, etc. Utilities not identified by records, or utilities that cannot be owner determined are noted as “undocumented”.

3.4 SUE Quality Level “A”

TDI hired a Hydrovac contractor to use non-intrusive vacuum excavation method to expose the targeted utilities to determine their exact horizontal and vertical location. TDI coordinated and scheduled “Super Sucker HydroVac Service Inc.” to excavate, backfill and reinstate all Test Pit locations as per the City of Toronto Standard TS 4.70 “Construction Specification for Keyhole Excavation and Reinstatement of Keyhole Cores” and in accordance with Metrolinx and HONI requirements.

TDI coordinated with survey team to survey and plot SUE Quality Level “A” information onto the electronic files in the required format. Alignment of utilities in Test Pit areas is adjusted according to SUE Quality Level “A” results on the final SUE QL-A plans.

4 Health and Safety

During field operations TDI followed Ontario OH&S rules and regulations to provide a safe environment to company personnel, the public, and any other personnel involved in the SUE process.

TDI obtained all necessary permits and approvals from the City of Toronto prior to the commencement of the field activities associated with HydroVac Excavation work. TDI managed Ontario One Call. Telecon obtained all required locate clearances from ON1Call before proceeding with HydroVac work.

Traffic planning & management was conducted as per OTM Book 7.

All workers involved in the field work operations have completed safety training requirements, including but not limited to:

- Standard Health and Safety Training in compliance with OHSA.
- WHMIS and SDS training.
- First-Aid Training.

5 Summary

Subsurface Utility Engineering Quality Level D, C, B Investigation was completed in October 2022 for work area

Subsurface Utility Engineering Quality Level A Investigation was completed in February 2023 and included excavation of (27) Test Pits and Test Trenches labelled as TP-1, TP-2, TP 3A, TP 3B, TP 3C TP-4, TP-5, TP-6, TP-7, TP-8, TP-9, TP-10, TP-11, TP-12, TP-13A, TP-14, TP-15, TP-16, TP-17, TP-19, TP-20, TP-21, TP-22, TP-23, TP-24, TP-25, TP-26.

- ✓ SUE Investigation Plan can be referred to in **Appendix A**.
- ✓ All information collected during the SUE Quality Level “A” Investigation and the Survey process can be referred to in **Appendix B** (Test Pit Invert Table).

Photographs of the utilities exposed in Test Pits and Trenches can be referred to on Page 9 of this Report.

All photographs in the report were taken facing Project North, unless otherwise noted.

- The Preliminary Deliverables were sent to client on March 3rd, 2023.
- The Final Deliverables were sent to client on March 9th, 2023.

6 Test Pit Key Plan:

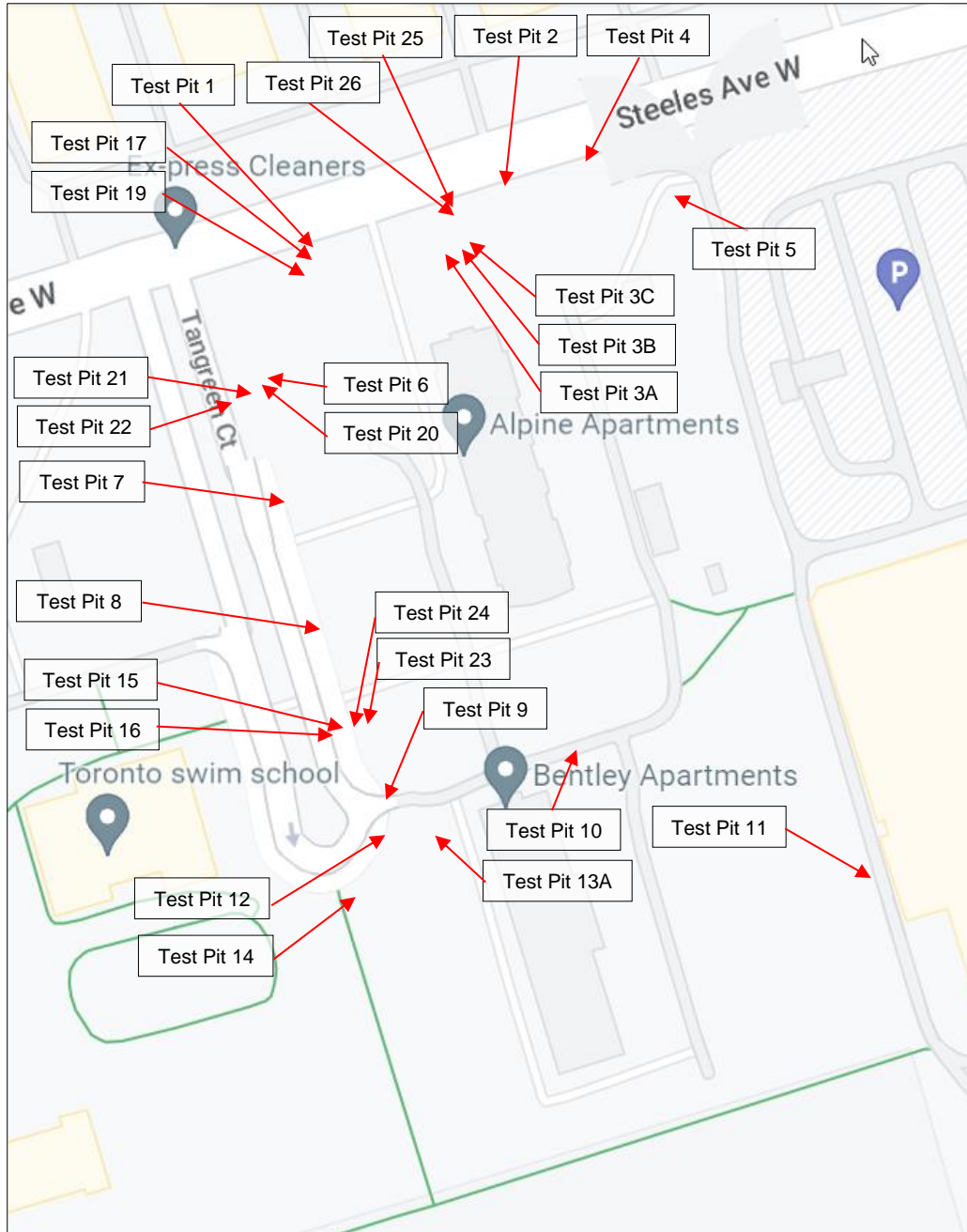


Figure 2- Test Pit Key Plan

7 Test Pit Photographs and Notes:

Test Pit 1:



Figure 3 – Overview



Figure 4 – Exposed structure

Test Pit 2:



Figure 5 – Overview

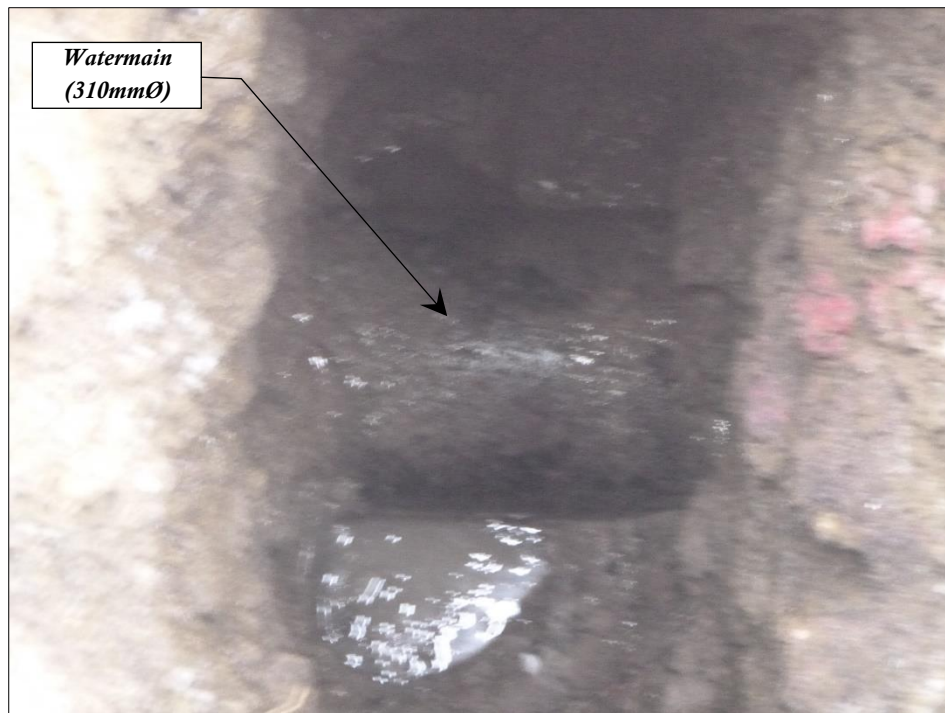


Figure 6 – Exposed structure

Test Pit 3A:



Figure 7 – Overview



Figure 8 – Exposed structure

Test Pit 3B:



Figure 9 – Overview



Figure 10 – Exposed structure

Test Pit 3C:



Figure 11 – Overview

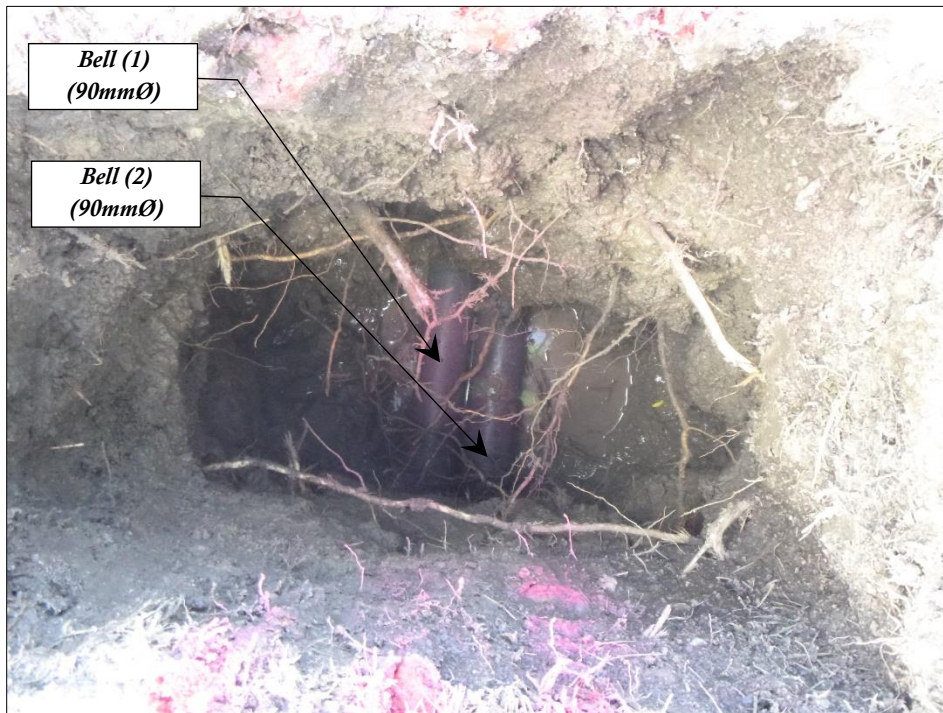


Figure 12 – Exposed structure

Test Pit 4:



Figure 13 – Overview

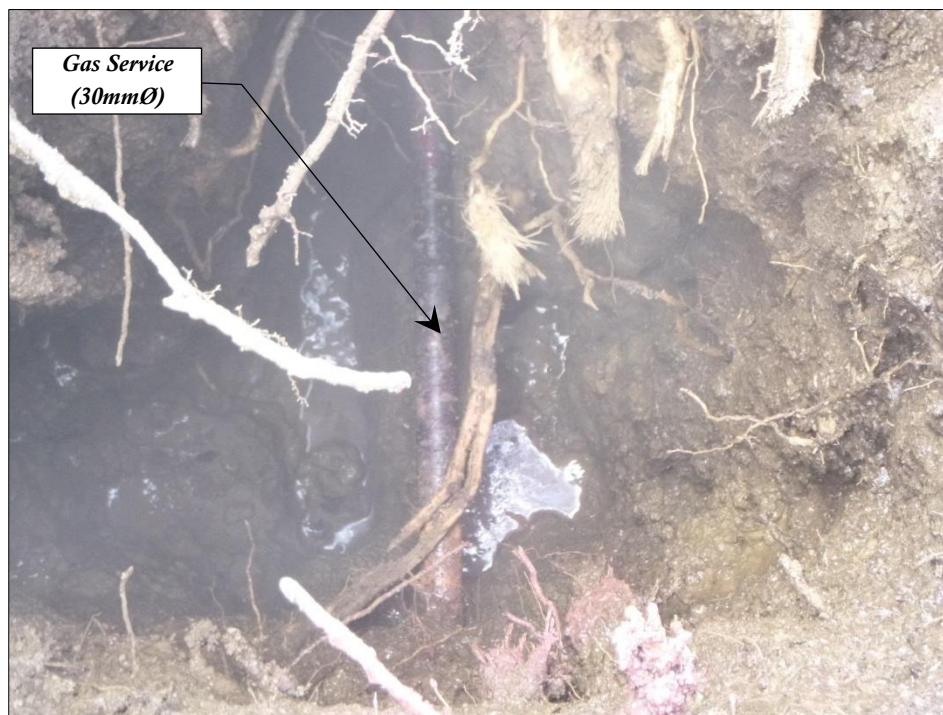


Figure 14 – Exposed structure

Test Pit 5:



Figure 15 – Overview

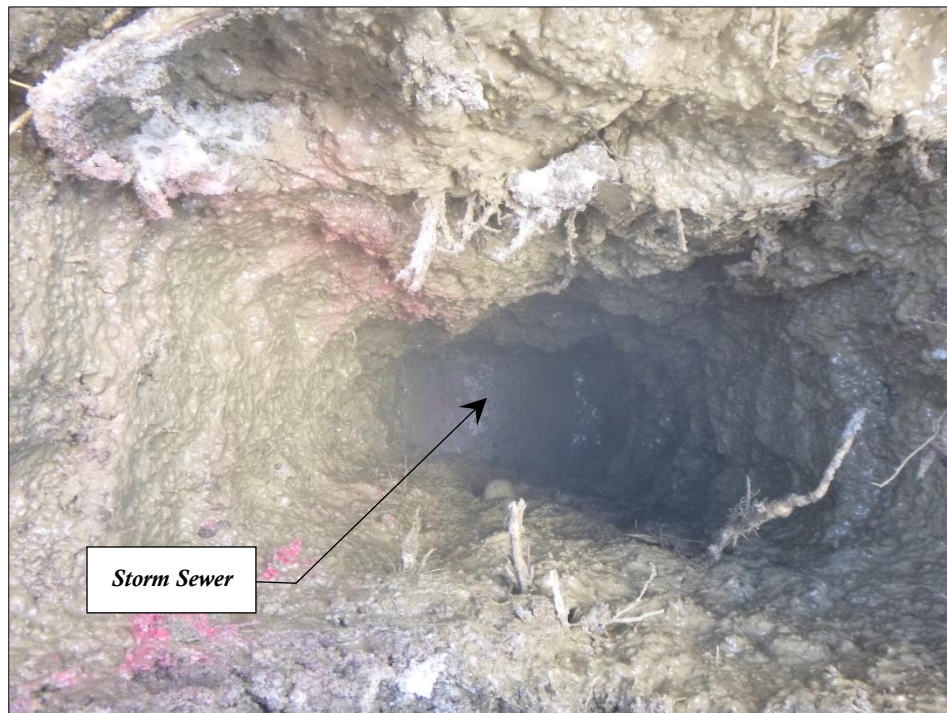


Figure 16 – Exposed structure

Test Pit 6:



Figure 17 – Overview



Figure 18 – Exposed structure

Test Pit 7:



Figure 19 – Overview

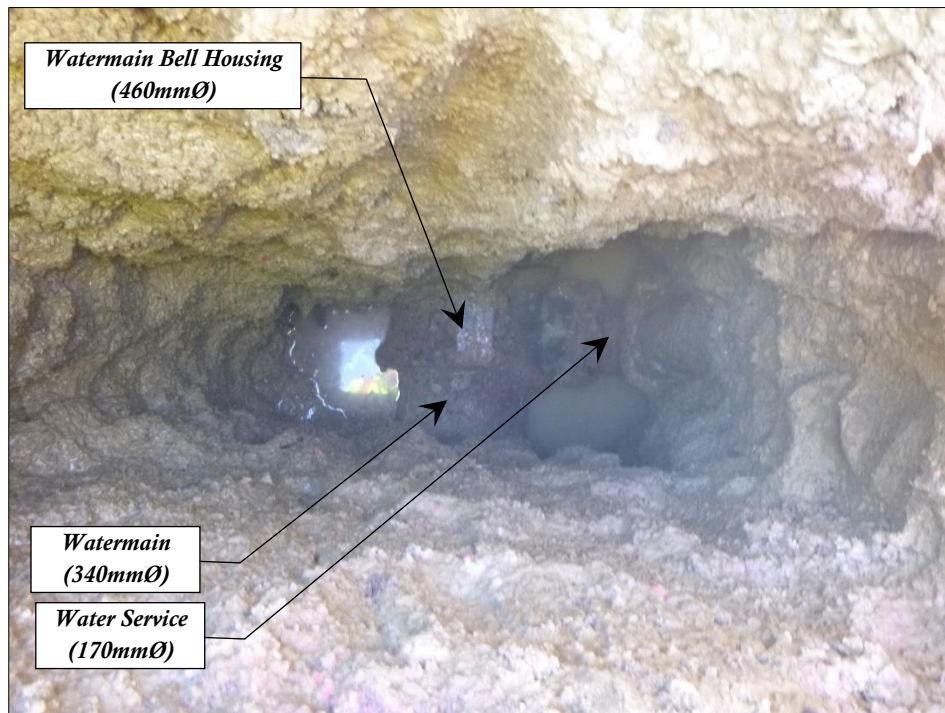


Figure 20 – Exposed structure

Test Pit 8:



Figure 21 – Overview



Figure 22 – Exposed structure

Test Pit 8: Continued



Figure 23 – Exposed structure (Facing East)

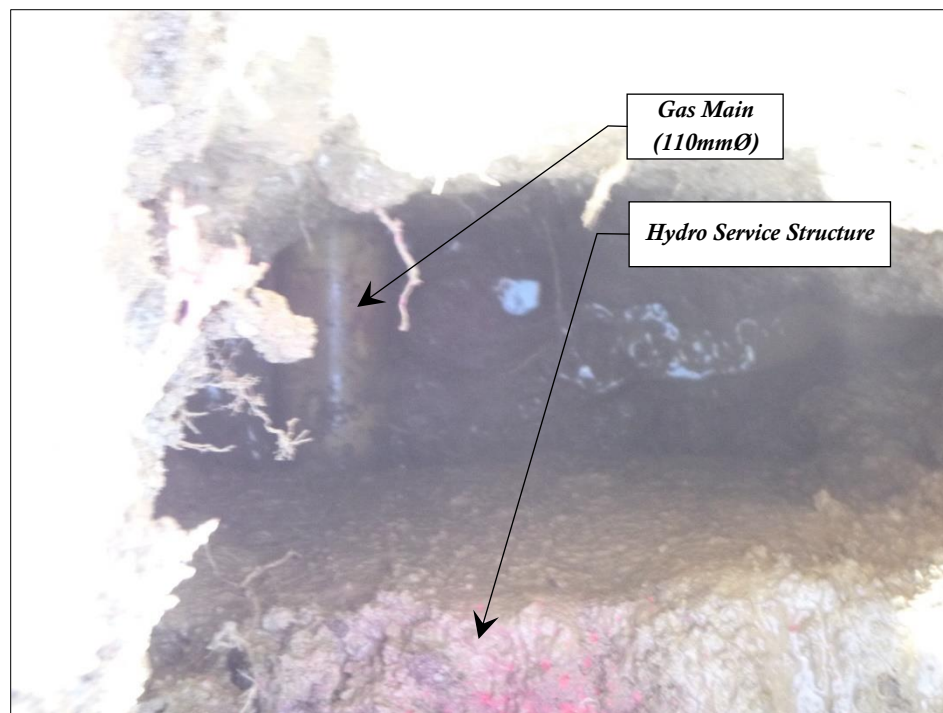


Figure 24 – Exposed structure

Test Pit 9:



Figure 25 – Overview

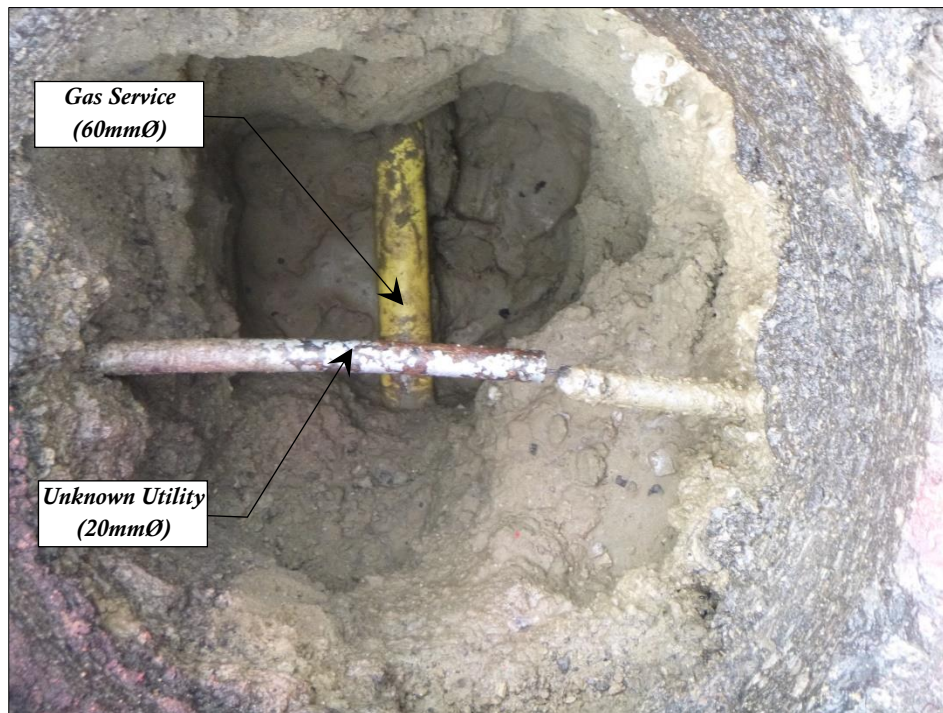


Figure 26 – Exposed structure

Test Pit 10:



Figure 27 – Overview



Figure 28 – Exposed structure

Test Pit 11:



Figure 29 – Overview



Figure 30 – Exposed structure

Test Pit 12:



Figure 31 – Overview

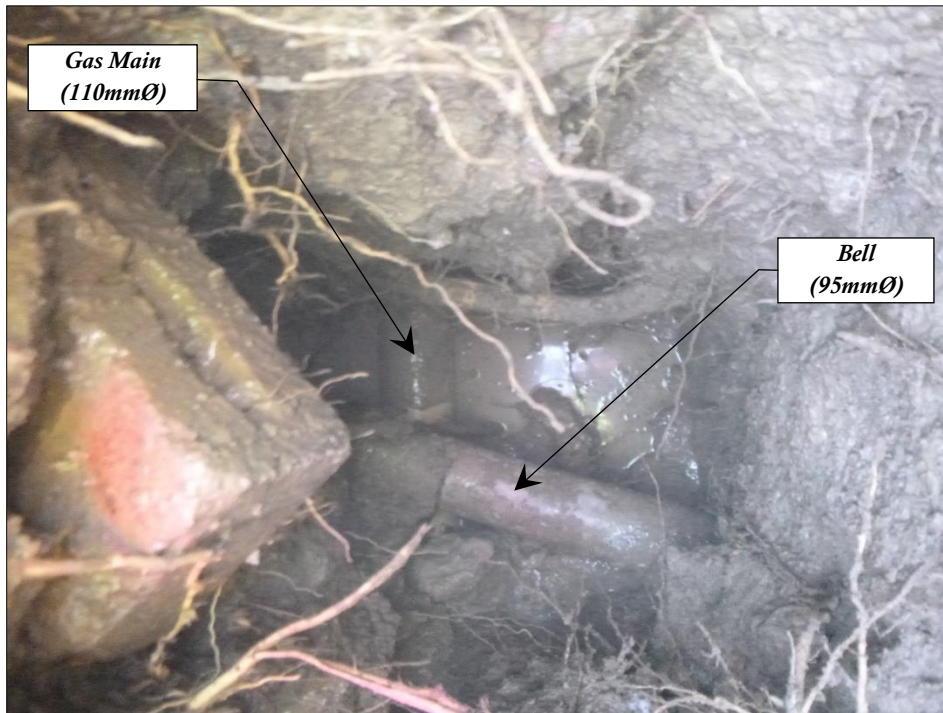


Figure 32 – Exposed structure

Test Pit 13A:



Figure 33 – Overview



Figure 34 – Exposed structure

Test Pit 14:



Figure 35 – Overview

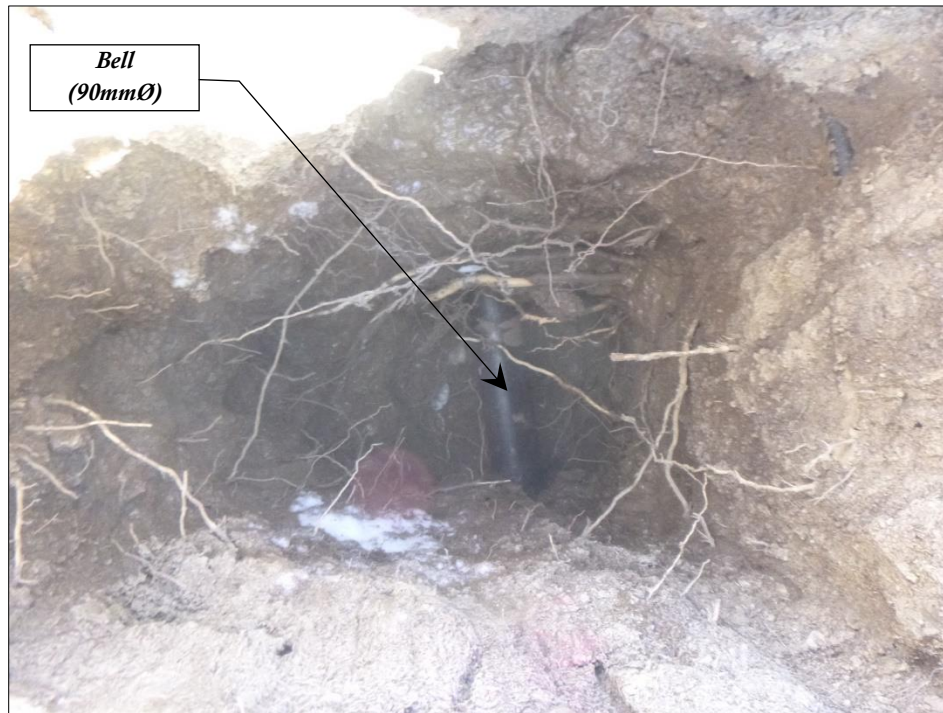


Figure 36 – Exposed structure

Test Pit 15:



Figure 37 – Overview



Figure 38 – Exposed structure

Test Pit 16:



Figure 39 – Overview



Figure 40 – Exposed structure

Test Pit 17:



Figure 41 – Overview

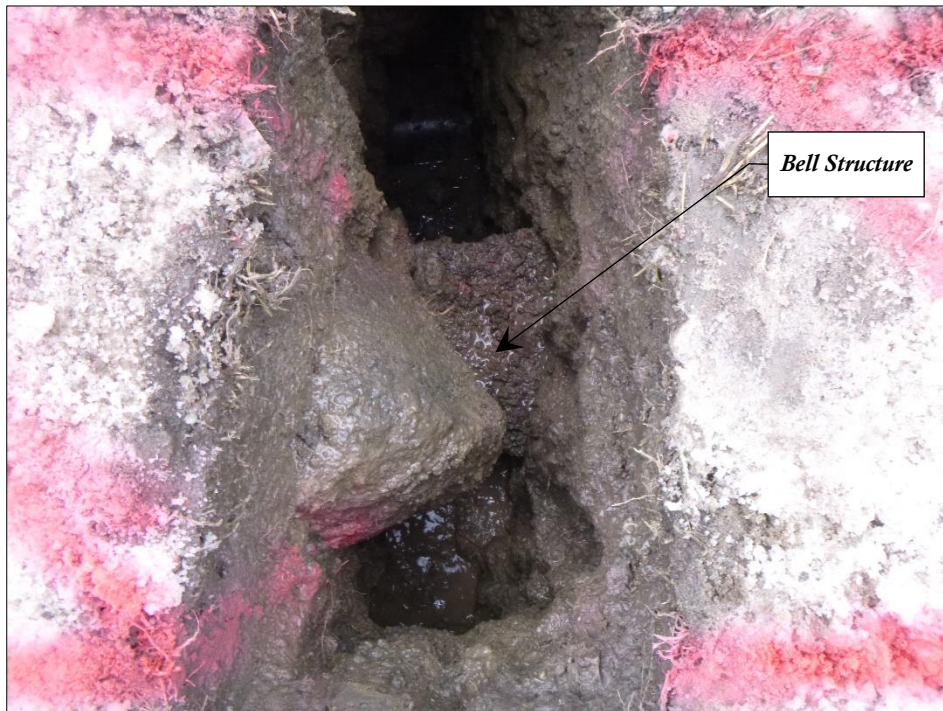


Figure 42 – Exposed structure

Test Pit 19:



Figure 43 – Overview

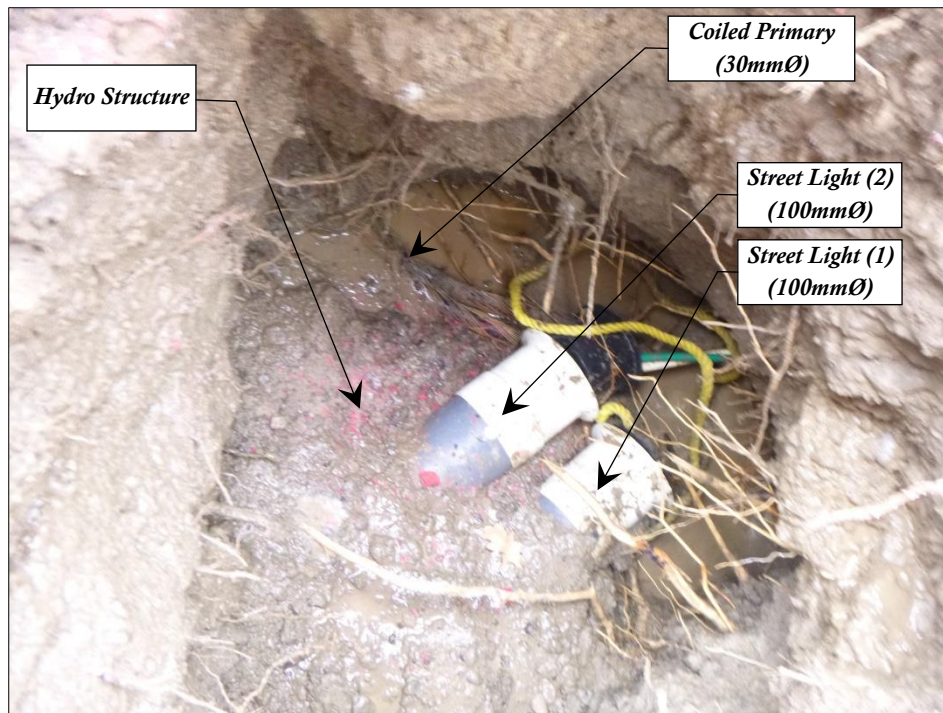


Figure 44 – Exposed structure

Test Pit 20:



Figure 45 – Overview



Figure 46 – Exposed structure

Test Pit 21:



Figure 47 – Overview



Figure 48 – Exposed structure

Test Pit 22:



Figure 49 – Overview



Figure 50 – Exposed structure

Test Pit 23:



Figure 51 – Overview

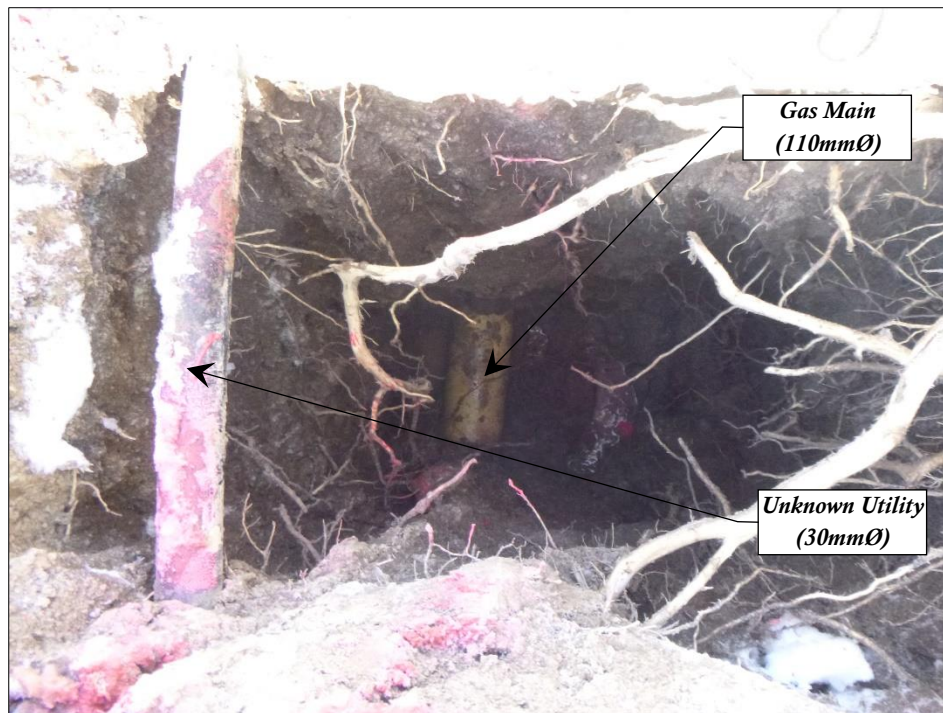


Figure 52 – Exposed structure

Test Pit 24:



Figure 53 – Overview



Figure 54 – Exposed structure

Test Pit 25:



Figure 55 – Overview



Figure 56 – Exposed structure

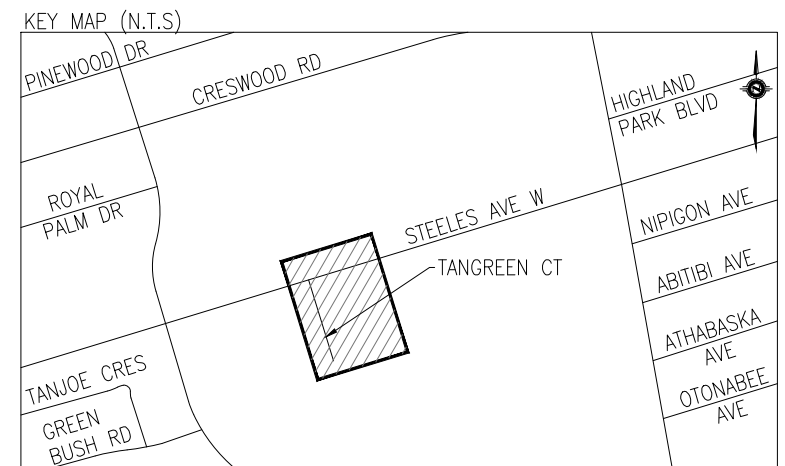
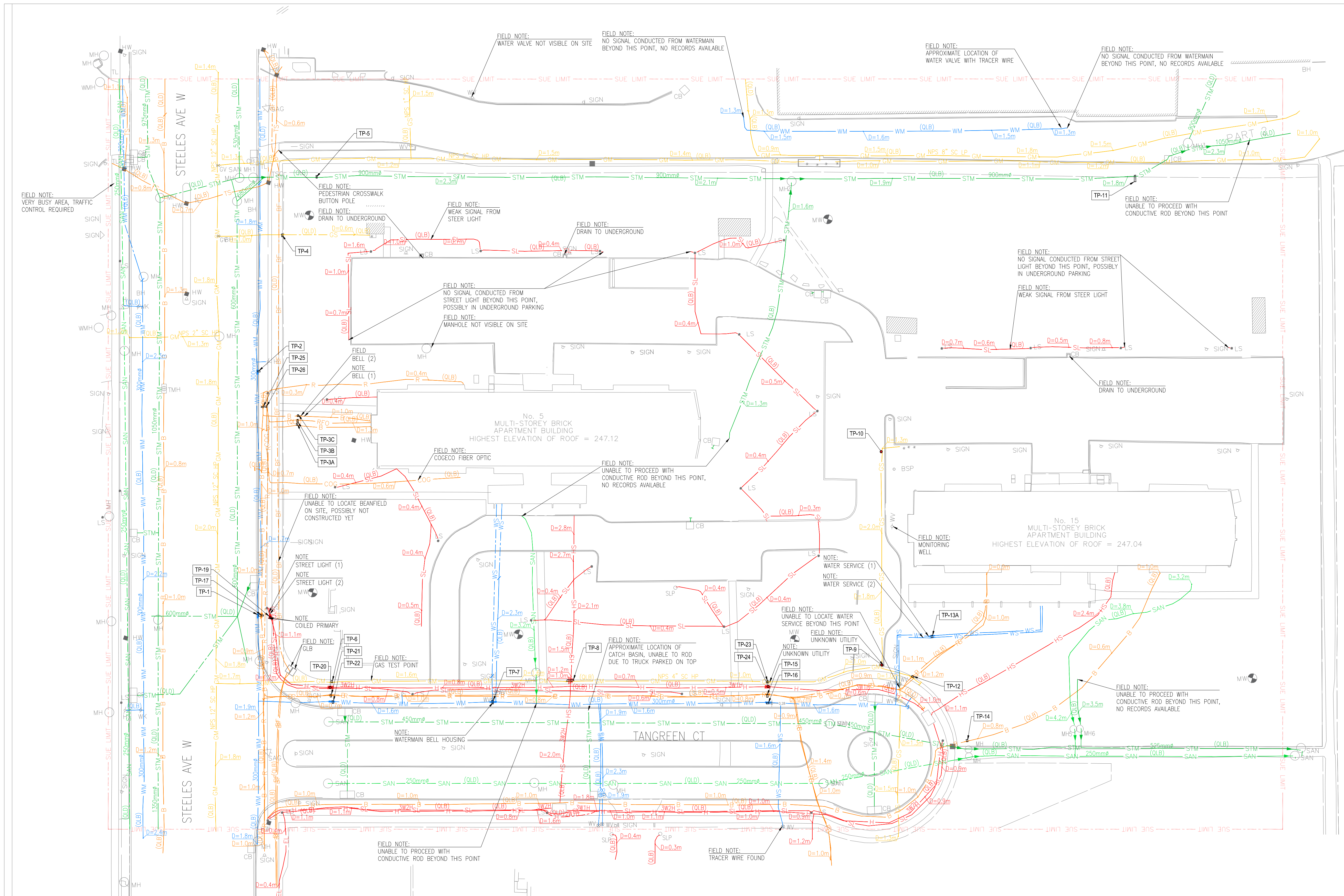
Test Pit 26:



Figure 57 – Overview



Figure 58 – Exposed structure



- GENERAL NOTES:**
- THE SUE FIELD INVESTIGATION WAS COMPLETED IN FEBRUARY 2023 BY TELECON DESIGN INC. (TDI).
 - THE FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.
 - TELECON USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES. TELECON IS NOT RESPONSIBLE FOR INDICATING ALL UNDOCUMENTED UTILITIES UNLESS PROVIDED, SHOWN AND/OR RECEIVED DIGITALLY OR BY HARD COPY.
 - THE TOPOGRAPHIC BASE PLAN IS PROVIDED BY OTHERS, AND IS NOT A PART OF THIS SUE INVESTIGATION COMPLETED BY TDI.
 - UTILITY, MATERIAL, SIZE AND FLOW DIRECTION SHOWN ON THIS DRAWING ARE BASED ON RECORDS, PROFESSIONAL JUDGEMENT AND FIELD INVESTIGATIONS.

REVISIONS			
REV	DATE	DRAWN BY	APPROVED BY

telecon
design • build • connect

SUBSURFACE UTILITY ENGINEERING
7777 WESTON ROAD, 5TH FLOOR
VAUGHAN, ONTARIO L4L 0G9

TELECON CLIENT

CAPREIT 2 LIMITED PARTNERSHIP

SUE PROJECT
TANGREEN COURT, NORTH YORK, ON

PROJECT/ WO#:	139315	
SURVEYED BY: R.YOGANATHAN	DATE:MAR.02.2023	
DRAWN BY: M.AHMADI	DATE:MAR.03.2023	
CHECKED BY: S.YASREBI	DATE:MAR.03.2023	
APPROVED BY: W.SHAMON	DATE:MAR.08.2023	
DRAWING SCALE:	DRAWING NUMBER:	
1:400	UG-1	

TDI SURVEY LEGEND		LEGEND:	
MH	SAN/STORM MANHOLE	GM	GAS MAIN
WV	WATER VALVE CHAMBER	GS	GAS SERVICE
SLP	STREET LIGHT POLE	H	HYDRO SERVICE
		HS	HYDRO SERVICE
		E	ELECTRICAL
		SL	STREET LIGHT
		WM	WATERMAIN
		WS	WATER SERVICE
		BF	COMMUNICATION BEANFIELD
		B	COMMUNICATION BELL
		R	COMMUNICATION ROGERS
		COG	COMMUNICATION COGECO
		ZAYO	COMMUNICATION ZAYO
		TELUS	COMMUNICATION TELUS
		GT	COMMUNICATION GT
		FO	FIBER OPTIC CABLE
		TS	TRAFFIC SIGNAL
		SA	SANITARY SEWER
		ST	STORM SEWER
		CS	COMBINED SEWER
		U	UNKNOWN UTILITY
		END CAP	(APPROXIMATE LOCATION)
		FD	FLOW DIRECTION
		DL	DROP LEAD
		TP	TEST PIT LOCATION
		CH	CHANGE OF SUE QUALITY LEVEL
		AD	APPROXIMATE DEPTH MEASUREMENT FROM LOCATE EQUIPMENT

- TDI PROJECT NOTES:**
1. THE SUE QUALITY LEVEL "A" INVESTIGATION WAS COMPLETED IN FEBRUARY, 2023 BY SUPER SUCKER HYDROVAC SERVICE INC.
 2. ALIGNMENT OF UTILITIES IN TEST PIT AREA ADJUSTED ACCORDING TO SUE QUALITY LEVEL "A" RESULTS.

SURVEY NOTE:
THE GEODETIC ELEVATION LAYER IS TURNED OFF FOR PRESENTATION PURPOSES ONLY. ALL RELATIVE ELEVATIONS ARE SHOWN IN THE AUTOCAD DIGITAL FILE (.DWG).

DISCLAIMER:
THIS DOCUMENT HAS BEEN PREPARED FOR THE NOTED TELECON CLIENT(S) REFERENCE AND USE, AND WHEN REQUIRED BY LAW, APPROPRIATE GOVERNMENT REVIEWING AGENCIES. THE DRAWING HAS BEEN PREPARED FOR THE USE OF TELECON'S CLIENT AND MAY NOT BE USED, REPRODUCED OR RELIED UPON BY THIRD PARTIES, UNLESS WRITTEN CONSENT HAS BEEN GRANTED.
CONTACT TELECON ONE CALL 1-800-400-2255 AND THE APPROPRIATE UTILITIES FOR EXCAVATION LOCATES.

SUBSURFACE UTILITY ENGINEERING (SUE) QUALITY LEVEL A - TEST PIT INVERT TABLE													
Test Pit	Utility / Facility	Material	Ground Elevation (m)	Utility Depth Top (m)	Utility Depth Bottom (m)	Utility Dimensions (mm)			Utility Top Elevation (m)	Utility Bottom Elevation (m)	Direction	Surface Type	Remarks
						Width (mm)	Height (mm)	Diameter (mm)					
Test Pit 1	Watermain	Metal	191.86	1.86	2.17	N/A	N/A	310	190.00	189.69	E-W	Soil	Final depth of excavation = 2.02m
Test Pit 2	Watermain	Metal	191.83	1.94	2.25	N/A	N/A	310	189.89	189.58	E-W	Soil	Final depth of excavation = 2.32m
Test Pit 3A	Bell/Rogers	Metal	191.98	1.20	1.30	N/A	N/A	95	190.78	190.69	N-S	Soil	Final depth of excavation = 1.41m
Test Pit 3B	Rogers Fiber Optic	Plastic	192.04	0.57	0.66	N/A	N/A	90	191.47	191.38	N-S	Soil	Final depth of excavation = 0.80m
Test Pit 3C	Bell (1)	Plastic	192.11	0.90	0.99	N/A	N/A	90	191.21	191.12	N-S	Soil	Final depth of excavation = 1.00m
	Bell (2)	Plastic	192.11	0.90	0.99	N/A	N/A	90	191.21	191.12	N-S		
Test Pit 4	Gas Service	Metal	192.15	1.21	1.24	N/A	N/A	30	190.94	190.91	N-S	Soil	Targeted Beanfield not found, final depth of excavation = 2.08m
Test Pit 5	Storm Sewer	Concrete	192.16	1.64	N/A	N/A	N/A	N/A	190.52	N/A	N-S	Soil	Final depth of excavation = 1.72m
Test Pit 6	Gas Main	Metal	191.83	1.15	1.26	N/A	N/A	110	190.68	190.57	N-S	Soil	Yellow jacket steel, final depth of excavation = 1.38m
Test Pit 7	Watermain	Metal	191.82	1.80	2.14	N/A	N/A	340	190.02	189.68	N-S	Soil	Final depth of excavation = 2.02m
	Watermain Bell Housing	Metal	191.82	1.73	2.19	N/A	N/A	460	190.09	189.63	N-S		
	Water Service	Metal	191.82	1.84	2.01	N/A	N/A	170	189.98	189.81	E-W		
Test Pit 8	Gas Main	Metal	192.09	1.58	1.69	N/A	N/A	110	190.51	190.40	N-S	Soil	Yellow jacket steel
	Hydro Service Structure	Concrete	192.09	0.79	1.37	970	580	N/A	191.30	190.72	E-W		Final depth of excavation = 1.69m
Test Pit 9	Gas Service	Metal	191.60	1.01	1.07	N/A	N/A	60	190.59	190.53	E-W	Asphalt	Yellow jacket steel
	Unknown Utility	Metal	191.60	0.40	0.42	N/A	N/A	20	191.20	191.18	N-S		Final depth of excavation = 1.20m
Test Pit 10	Gas Service	Metal	191.98	1.62	1.68	N/A	N/A	60	190.36	190.30	E-W	Asphalt	Yellow jacket steel, final depth of excavation = 1.86m
Test Pit 11	Storm Sewer	Concrete	191.61	1.60	N/A	N/A	N/A	N/A	190.01	N/A	N-S	Soil	Final depth of excavation = 1.75m
Test Pit 12	Bell	Plastic	192.19	1.04	1.13	N/A	N/A	95	191.16	191.06	E-W	Soil	Final depth of excavation = 1.36m
	Gas Main	Metal	192.19	1.19	1.30	N/A	N/A	110	191.00	190.89	N-S		Yellow jacket steel
Test Pit 13A	Water Service (1)	Metal	192.36	2.06	2.23	N/A	N/A	170	190.30	190.13	N-S	Soil	
	Water Service (2)	Metal	192.36	2.09	2.16	N/A	N/A	70	190.27	190.20	N-S		Incased in concrete, final depth of excavation = 2.21m
Test Pit 14	Bell	Plastic	192.16	0.92	1.01	N/A	N/A	90	191.24	191.15	N-S	Soil	Final depth of excavation = 1.20m
Test Pit 15	Bell	Plastic	192.28	0.97	1.09	N/A	N/A	120	191.31	191.19	N-S	Soil	Final depth of excavation = 1.22m
	Rogers	Plastic	192.28	0.97	1.09	N/A	N/A	120	191.31	191.19	N-S		

SUBSURFACE UTILITY ENGINEERING (SUE) QUALITY LEVEL A - TEST PIT INVERT TABLE													
Test Pit	Utility / Facility	Material	Ground Elevation (m)	Utility Depth Top (m)	Utility Depth Bottom (m)	Utility Dimensions (mm)			Utility Top Elevation (m)	Utility Bottom Elevation (m)	Direction	Surface Type	Remarks
						Width (mm)	Height (mm)	Diameter (mm)					
Test Pit 16	Watermain	Metal	192.21	1.64	1.96	N/A	N/A	320	190.57	190.25	N-S	Soil	Final depth of excavation = 2.20m
Test Pit 17	Bell Structure	Concrete	191.93	0.82	1.10	380	280	N/A	191.11	190.83	E-W	Soil	Final depth of excavation = 1.58m
Test Pit 19	Hydro Structure	Concrete	191.91	0.71	N/A	630	N/A	N/A	191.20	N/A	E-W	Soil	Final depth of excavation = 0.84m
	Street Light (1)	Plastic	191.91	0.61	0.71	N/A	N/A	100	191.30	191.20	SW-NE		
	Street Light (2)	Plastic	191.91	0.61	0.71	N/A	N/A	100	191.30	191.20	SW-NE		Empty conduit, partially exposed
	Coiled Primary	Direct Buried Cable	191.91	0.84	0.87	N/A	N/A	30	191.07	191.04	N/A		(2) x 30mmØ wrapped Hydro cables, possibly abandoned
Test Pit 20	Hydro Structure	Concrete	190.92	0.86	1.20	600	340	N/A	190.06	189.72	N-S	Concrete	Final depth of excavation = 1.58m
Test Pit 21	Bell	Plastic	191.80	0.96	1.08	N/A	N/A	120	190.84	190.72	N-S	Soil	Final depth of excavation = 1.16m
	Rogers	Plastic	191.80	0.96	1.08	N/A	N/A	120	190.84	190.72	N-S		
Test Pit 22	Watermain	Metal	191.69	1.73	2.06	N/A	N/A	330	189.96	189.63	N-S	Soil	Final depth of excavation = 1.84m
Test Pit 23	Gas Main	Metal	192.36	1.01	1.12	N/A	N/A	110	191.35	191.24	N-S	Soil	Yellow jacket steel
	Unknown Utility	Plastic	192.36	0.08	0.11	N/A	N/A	30	192.28	192.25	N-S		Possibly irrigation pipe, final depth of excavation = 1.20m
Test Pit 24	Hydro Structure	Concrete	192.25	1.00	1.34	600	340	N/A	191.25	190.91	N-S	Concrete	Final depth of excavation = 1.42m
Test Pit 25	Bell	Plastic	192.06	0.78	0.91	N/A	N/A	130	191.28	191.15	E-W	Soil	Final depth of excavation = 1.00m
Test Pit 26	Rogers Fiber Optic	Plastic	192.15	0.70	0.79	N/A	N/A	90	191.45	191.36	E-W	Soil	Final depth of excavation = 1.30m
	Beanfield Fiber Optic	Plastic	192.15	0.91	0.97	N/A	N/A	60	191.24	191.18	E-W		