

SAFETY SUMMIT 2022



Thomas Foley, PE, CCM
Commissioner

Presenters: Carlos Ortiz, Director – Office of Construction Safety
Andrew Melnyk, Deputy Director – Office of Construction Safety

February 15, 2022

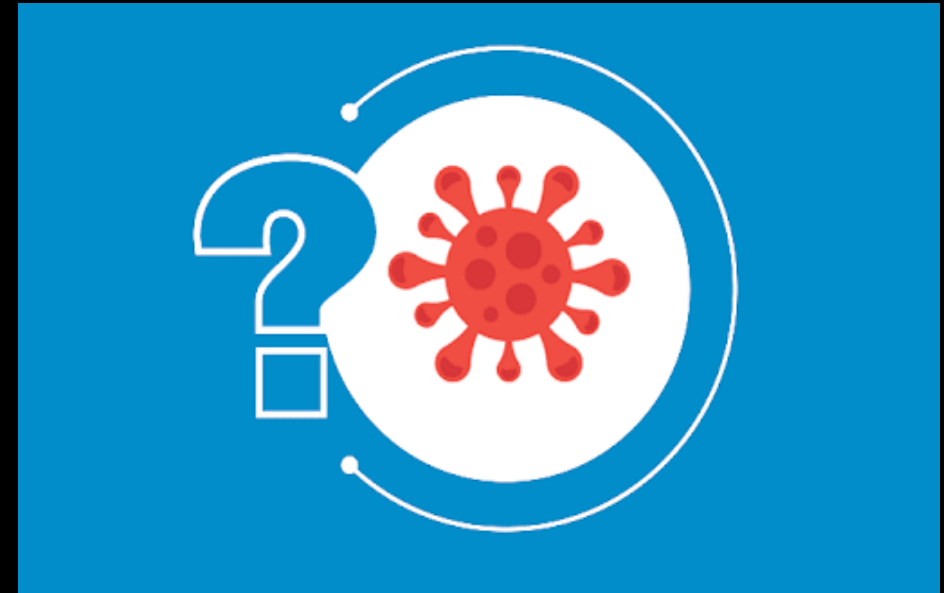
SAFETY SUMMIT AGENDA

- OPENING STATEMENT
- COVID -19 AWARENESS
- STATISTICS AND CHALLENGES
- ACHIEVEMENTS
- OFFICE OF GEOTECHNICAL INVESTIGATIONS
- ON THE HORIZON
- CLOSING REMARKS
- Q&A



COVID-19 AWARENESS

- COVID-19 virus remains prevalent along with new variants
- Contractor is required to have a COVID-19 Safety Plan in place and made available upon request
- Contractor is responsible to ensure compliance with NYC COVID-19 requirements and that employees are protected
- Face covering is required when interacting with members of the public, regardless of vaccination status
- DDC employees must comply with Agency COVID-19 requirements



EXPERIENCING COVID-19 SYMPTOMS

- Coughing
- Sneezing
- Fever
- Body aches
- Loss sense of smell or taste

If yes, get tested!

**If you're sick,
please stay HOME**



DDC COVID-19 HOTLINE

(718) 391-1100

The DDC hotline is still in effect and monitored by the Office of Construction Safety for :

- Questions regarding compliance
- Clarifications
- Anonymous complaints or concerns



STATISTICS: BY THE NUMBERS

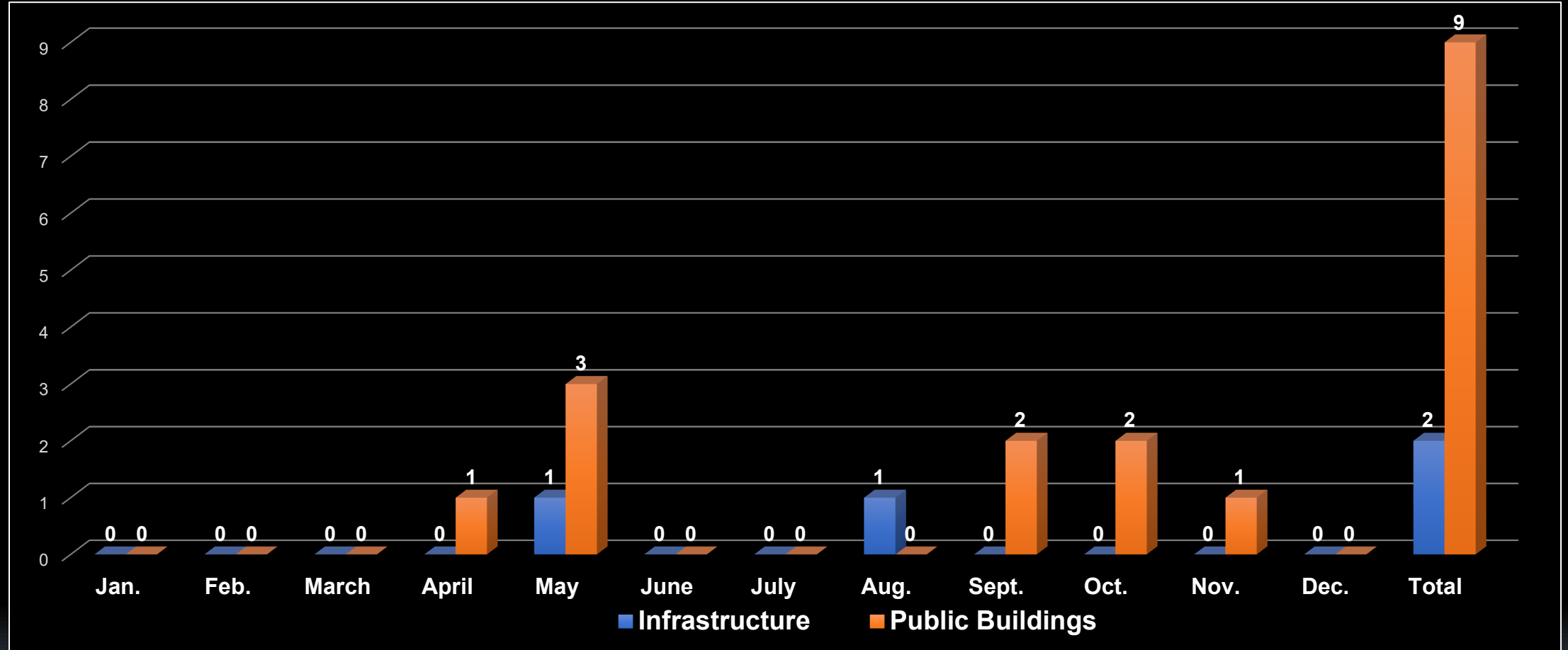


INDUSTRY & DDC: FALL PROTECTION

- 805 fatalities in 2020 attributed to falls, slips and trips
- 645 occurred to a lower level
- Most cited OSHA violation 1926.501 – Duty to have fall protection
- 4,251 serious violations issued by OSHA in 2021
- 245 fall protection related deviations issued in 2021 at DDC projects



DDC FALL PROTECTION SWOs 2021



OSHA 1926 Subpart M – FALL PROTECTION



**If you're working at
6 feet or higher, you
need fall protection.**

osha.gov/stopfalls

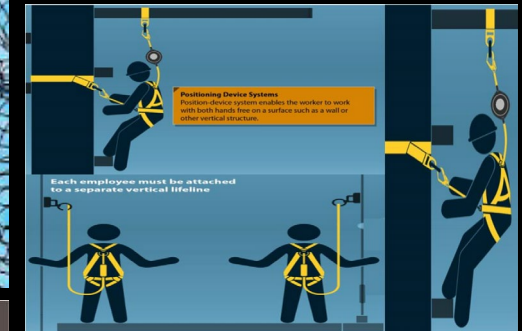
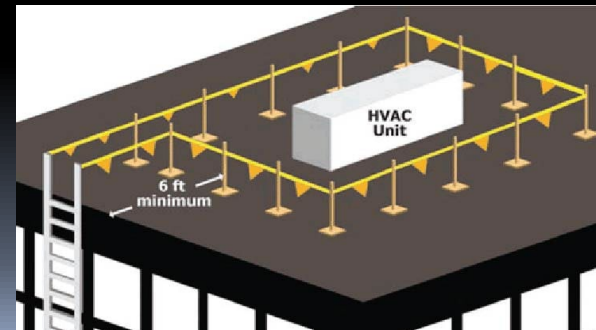
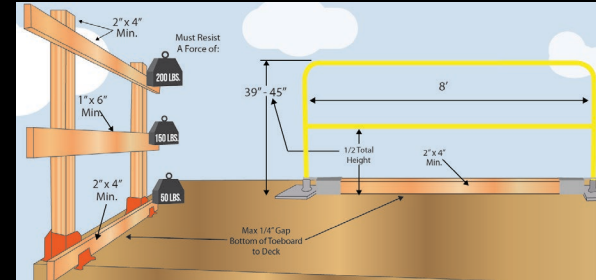


Department of
Design and
Construction

Office of Construction Safety
Safety & Site Support Division

FALL PROTECTION SYSTEMS

- Guardrail
- Personal Fall Arrest
- Safety Net
- Positioning Device
- Warning Line
- Controlled Access Zone (CAZ)
- Safety Monitor



FALL PROTECTION AWARENESS

- Will worker be working at a height six feet or greater?
- Is fall protection part of the SSP?
- Does the JHA identify the fall hazards and control methods?
- Has the competent person determined if the appropriate fall protection system is in place?
- Does it comply with OSHA requirements under subpart M – Fall Protection
- Has the fall protection system been inspected?
- Are the workers trained in the use of fall protection?

PLAN

ahead to get the job done safely.

PROVIDE

the right equipment.

TRAIN

everyone to use the equipment safely.

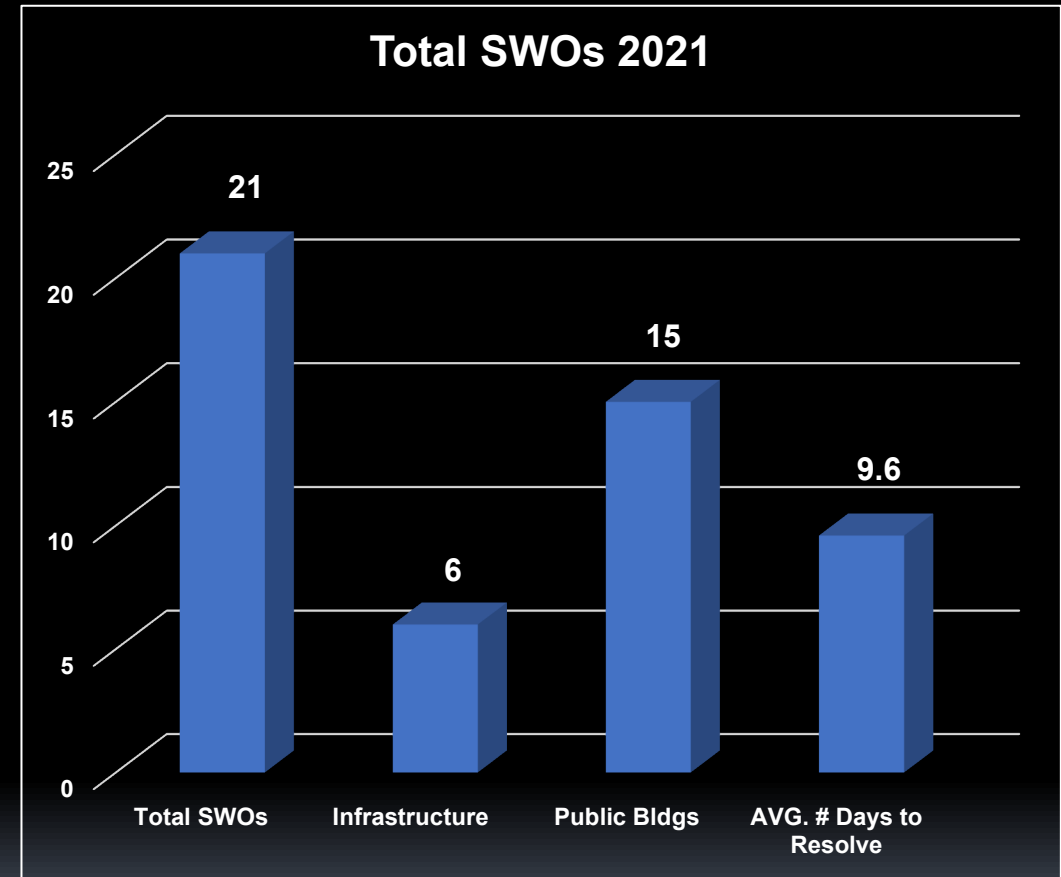
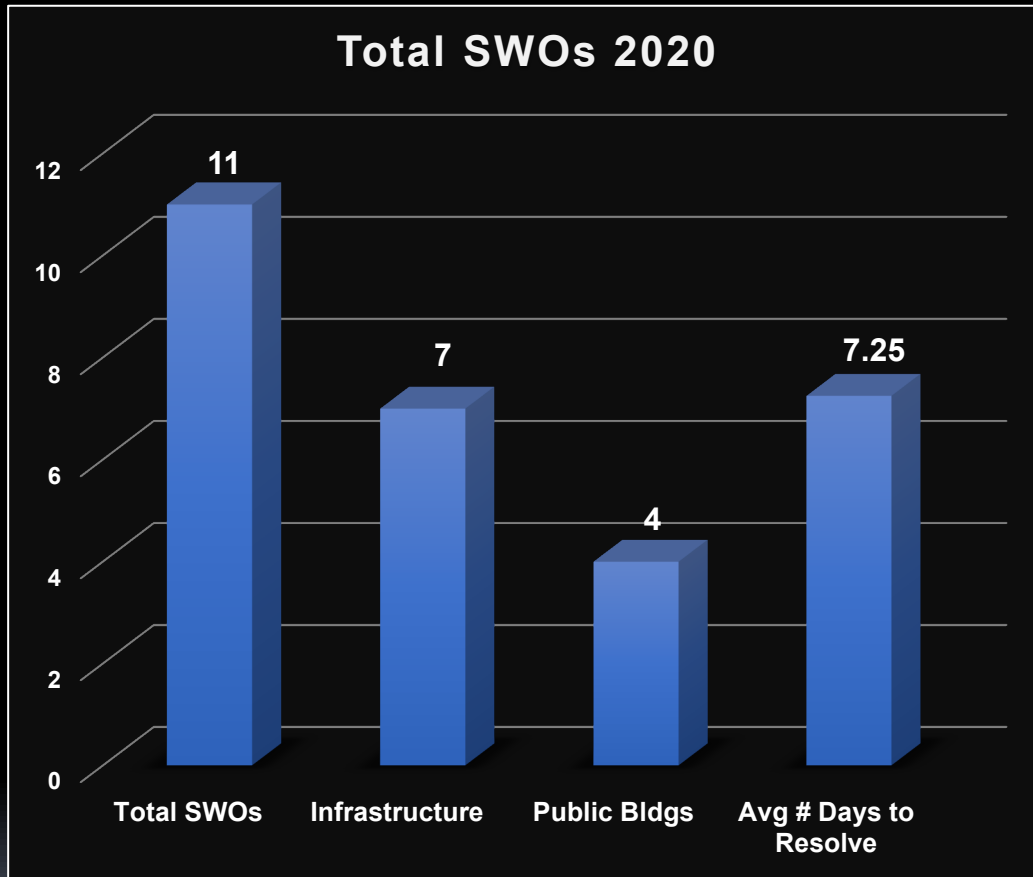


SITE SAFETY PLANS (SSP) ACCEPTANCE

- Includes all involved parties – contractor, Program Units (PU) and OCS
- Target of 60 calendar days
- SSP refresher training provided to PU on January 26, 2022
- PU involvement is critical
- Thorough and timely screening of SSP by PU's is essential
- Communication between contractor, PU and OSC



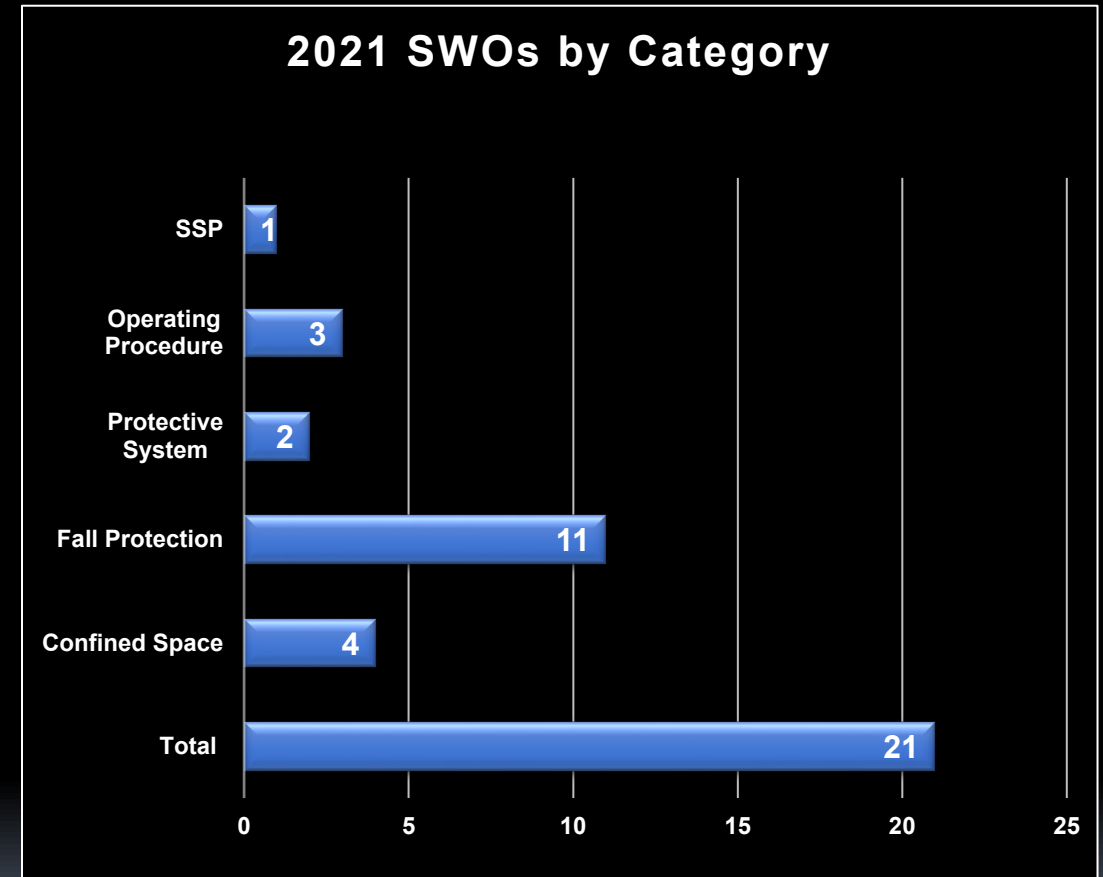
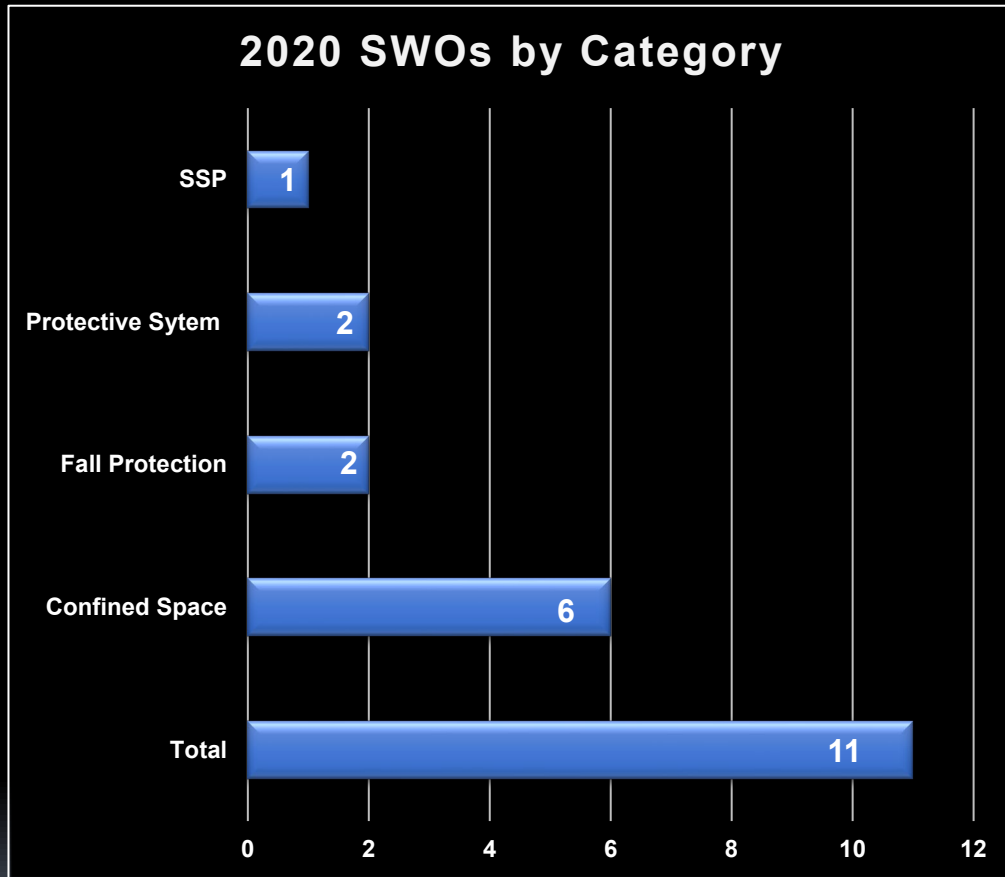
DDC ISSUED SWOs - 2020 vs 2021



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Safety & Site Support Division

DDC SWOs by CATEGORY - 2020 vs 2021

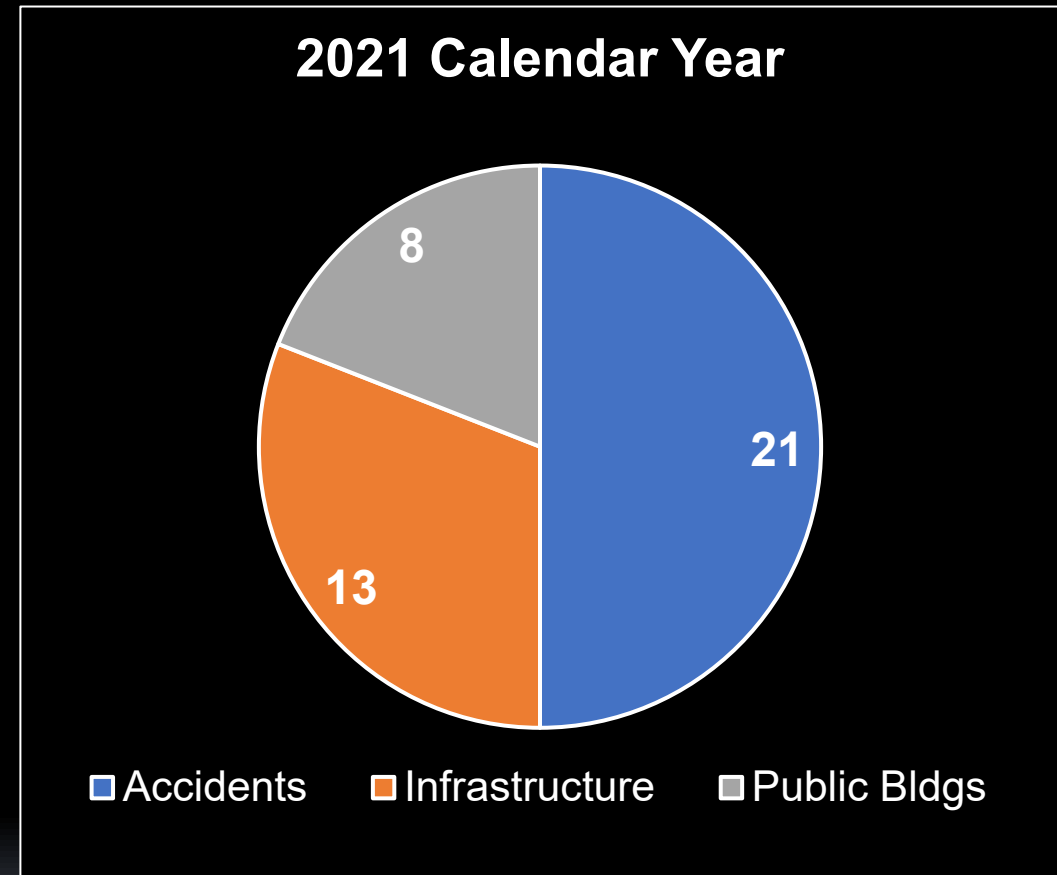
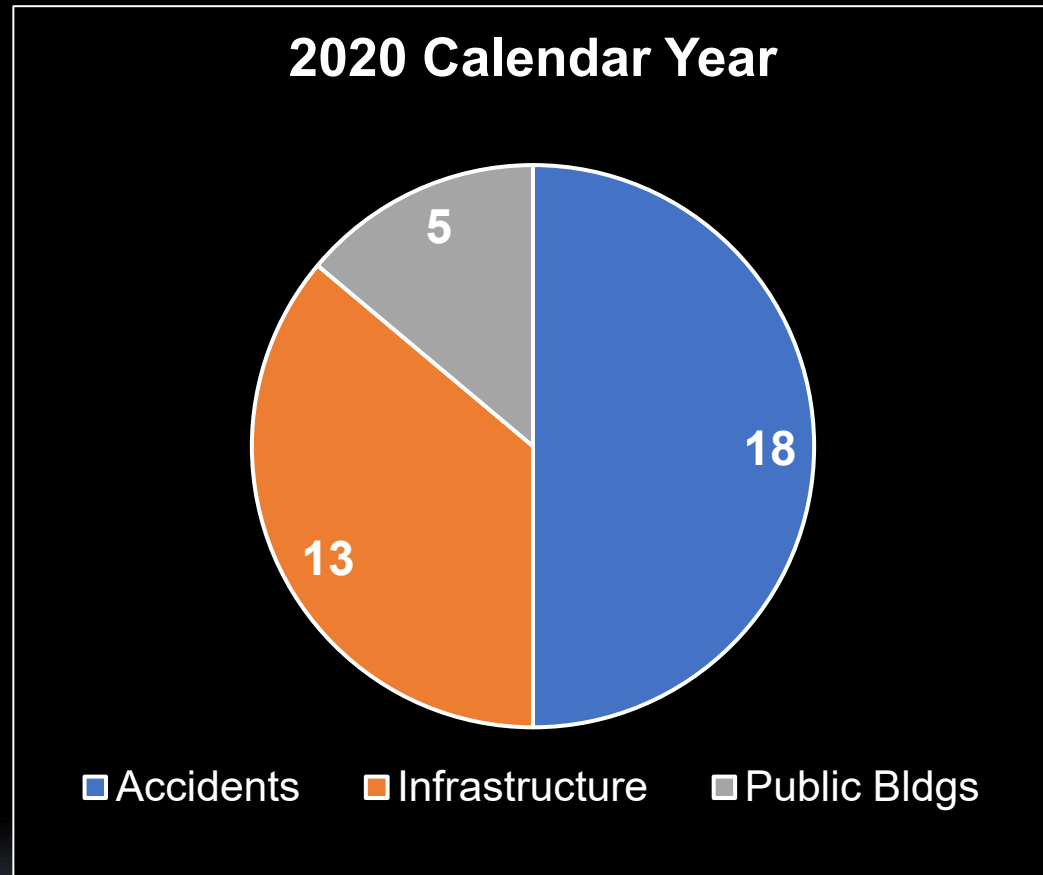


PREVENTING SWOs

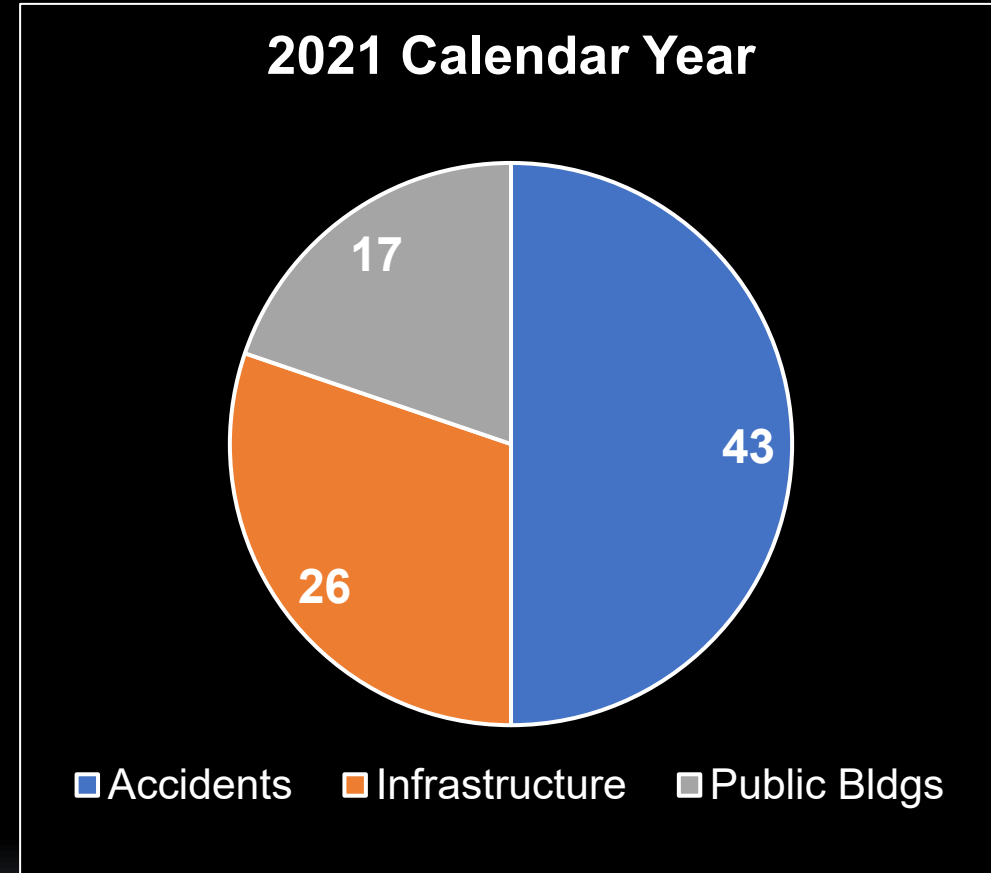
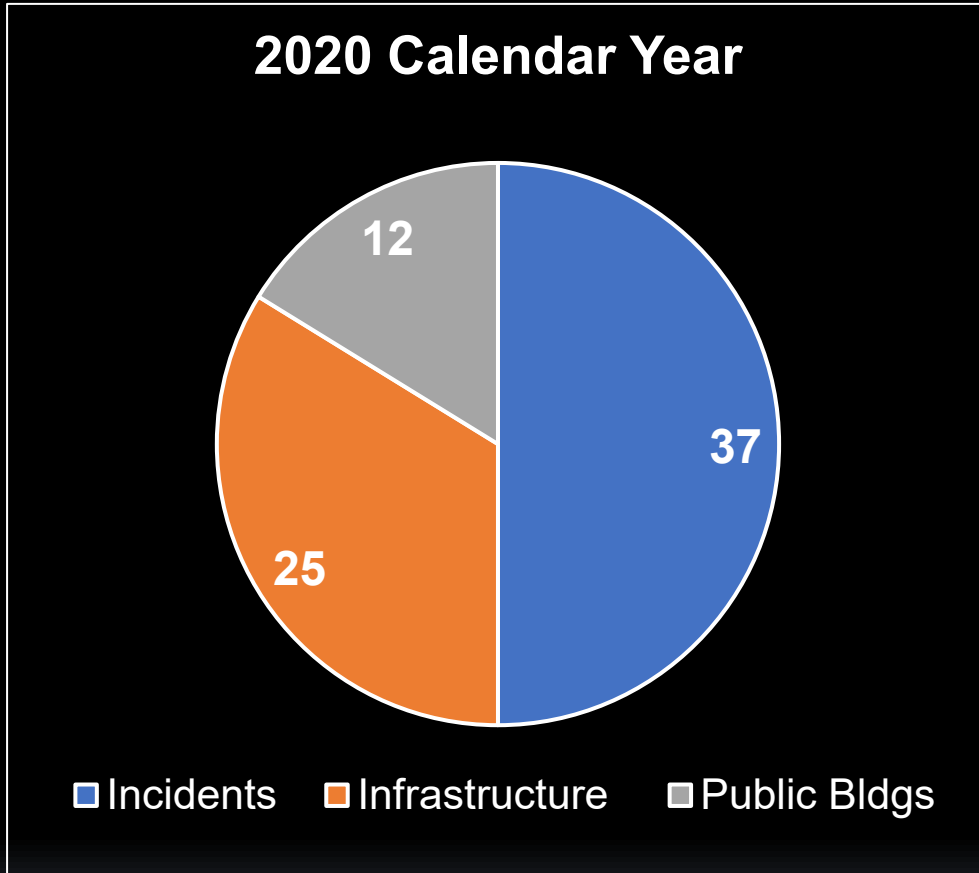
- Daily job briefings
- Competent Person capable of recognizing hazardous conditions and authority to take prompt corrective measures to eliminate
- DDC project staff must play an active role in recognizing potential imminent danger and instructing contractor to correct immediately
- Ensure procedures are in place before activity commences
- “Practice what you preach”
- If you see something, say something - call a “time out” and reassess



ACCIDENTS - DDC PROJECTS



INCIDENTS - DDC PROJECTS





REDUCING ACCIDENTS AND INCIDENTS

- Plan properly
- Hold daily job briefings
- Ensure employees are properly trained (JHA)
- PPE
- Inspect, maintain and use proper tools and equipment for the task - use as intended
- Safeguards are in place
- Hierarchy of Controls
- No shortcuts in safety

WHY CONDUCT AND INVESTIGATION

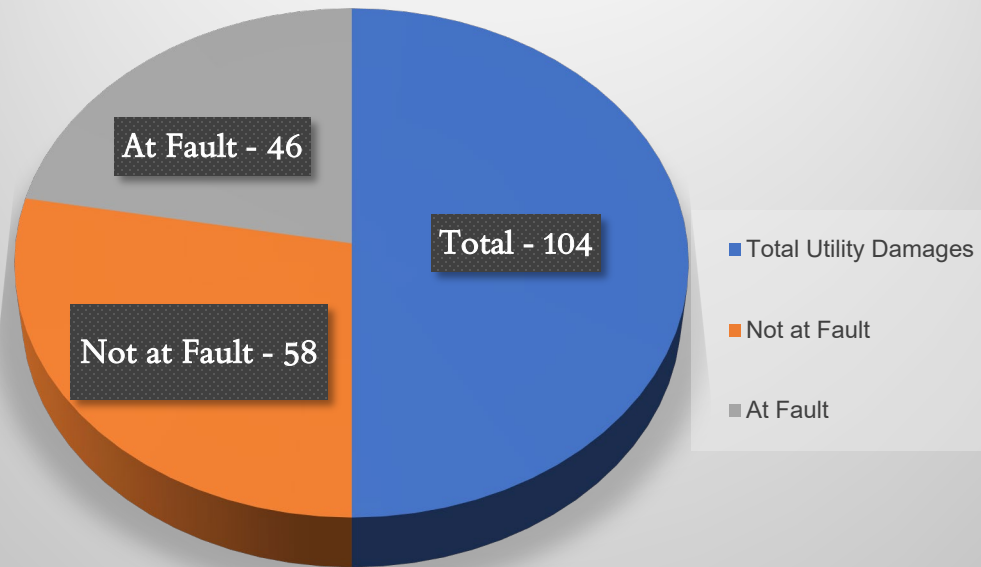
- A robust investigation demonstrates a commitment to employee safety
- An investigation identifies areas of improvement
- A well executed incident investigation provides for the gathering of complete information that results in valuable action items
- Implementation of corrective action to prevent recurrence
- Communicating investigation findings provides opportunity to improve workplace culture



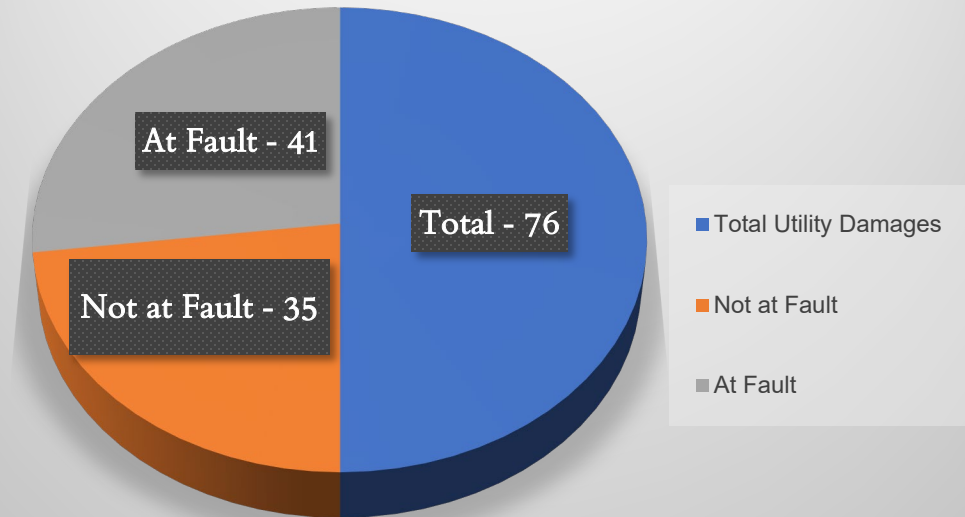


UTILITY DAMAGES DDC PROJECTS - 2020 vs 2021

Utility Damages 2020 Calendar Year

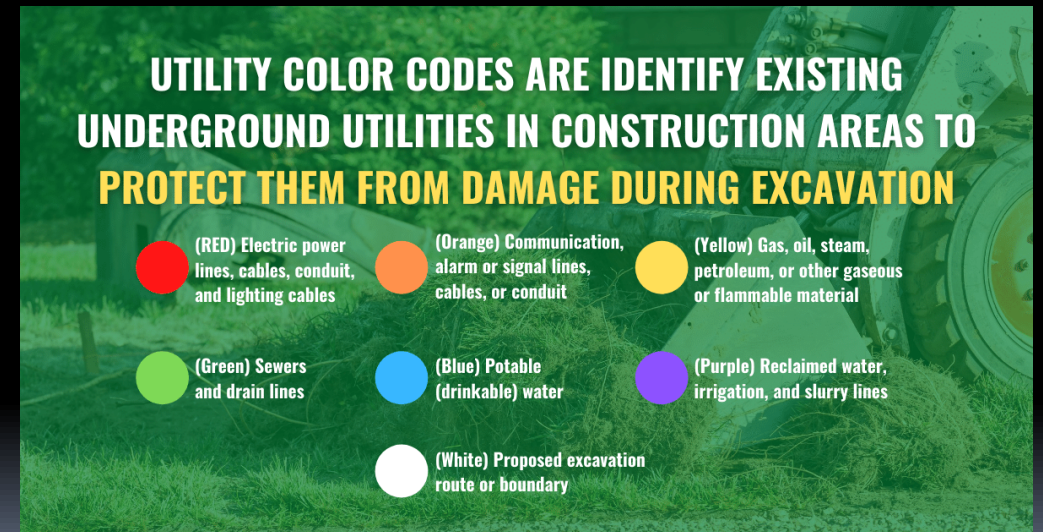


Utility Damages 2021 Calendar Year



REDUCTION IN UTILITY DAMAGES

- Continue to improve “At fault” damages
- Respect and maintain the marks – **NO** powered or mechanized equipment within the Tolerance Zone
- Provide a spotter where overhead utilities are located
- Support and protect exposed utilities within the excavation
- NY 811 Excavator Training & Education Program
- Request assistance from utility representative



WHAT'S ON THE HORIZON

- Revision to the DDC Contract Safety Requirements
- Design Build Safety Requirements

SAFETY SUMMIT 2022



Presented by:

Jeffrey Au, P.E., P.Eng., Director, Office of Geotechnical Investigations

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Eralda Allajbe, Section Chief, Office of Geotechnical Investigations

Date: February 15, 2022

Thomas Foley, PE, CCM
Commissioner

Safety and Site Support Division Office of Geotechnical Investigations (OGI)

OGI is a group of professional engineers and geologists whose commitment is to provide the highest quality of geotechnical data, design and construction recommendations, and technical guidance to aid the design of municipal infrastructure and public building projects.



Our Mission

Provide geotechnical support to DDC Infrastructure and Public Buildings Divisions as well as other mayoral agencies for various capital projects.

- Roadways/Pedestrian Plazas
- Sewers
- Trunk Water Mains
- Public Buildings
- Parks
- Geothermal Systems
- Green Infrastructure



Our Role in Safety

OGI supports DDC by providing technical expertise on soil conditions necessary to plan, design, and build safely.

- One of our main services is the **subsurface investigations**: Critical to construct a sound foundation of any structures for the **safety of the public and the environment**.
- Field work for subsurface investigations resembles a “**mini construction site**.”
- **Work site safety is paramount!**
GOAL: Field crews get home safe daily -
General public is not harmed from the work zone - Environment is protected from utility damages.





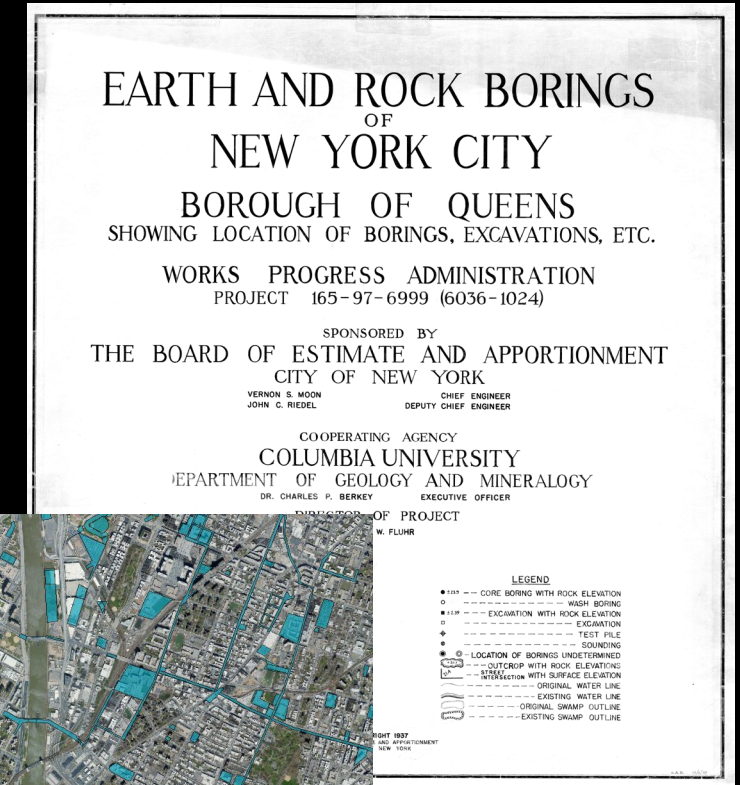
OGI Services

- Historical Data Research
- Subsurface Investigations
- Geotechnical Reporting
- MS4 & Green Infrastructure Studies
- Geothermal Feasibility
- Forensic Engineering

OGI Services

Historical Data Research

- Maintains an archive of over 4,300 completed geotechnical investigations spanning more than 80 years.
- Holds the Works Progress Administration (WPA) Rock Line Maps of the five boroughs, information dating to the mid-1930s.
- Geotechnical investigations are mapped in ArcGIS forming a city-wide index of geological information.
- Historical data are useful when planning new investigations and supplementing existing design information.



OGI Services

Subsurface Investigations - Purpose

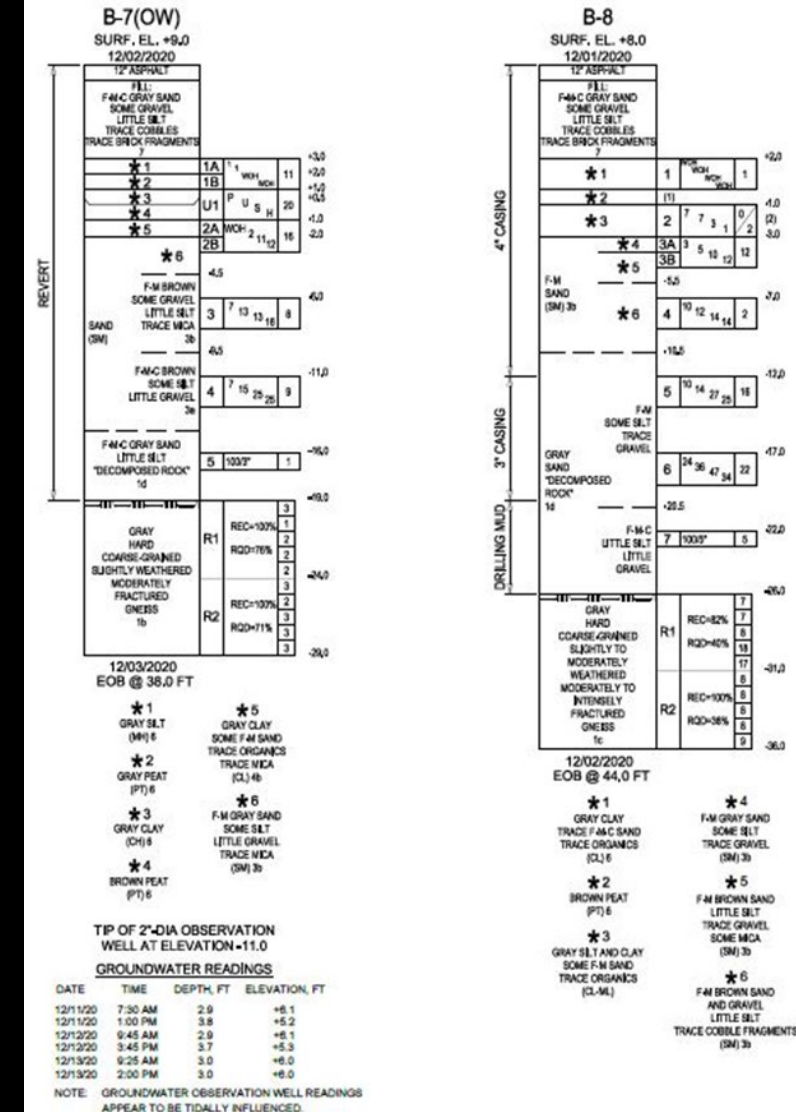
OGI's work provides engineers the critical information to design buildings and infrastructures safely. Subsurface conditions must be considered in order to plan for and construct a sound foundation for the safety of the public and environment.

➤ How deep is acceptable end-bearing material?

- Foundation systems must be designed to bear the load of a structure. Depth and composition of bearing materials may indicate which foundation system is best suited.

➤ Are there compressible or unsuitable bearing soils?

- Engineers may design a deep foundation to bypass poor load-bearing soils or remove them to improve ground stability for shallow foundations. Settlement analysis is important to the design.



OGI Services

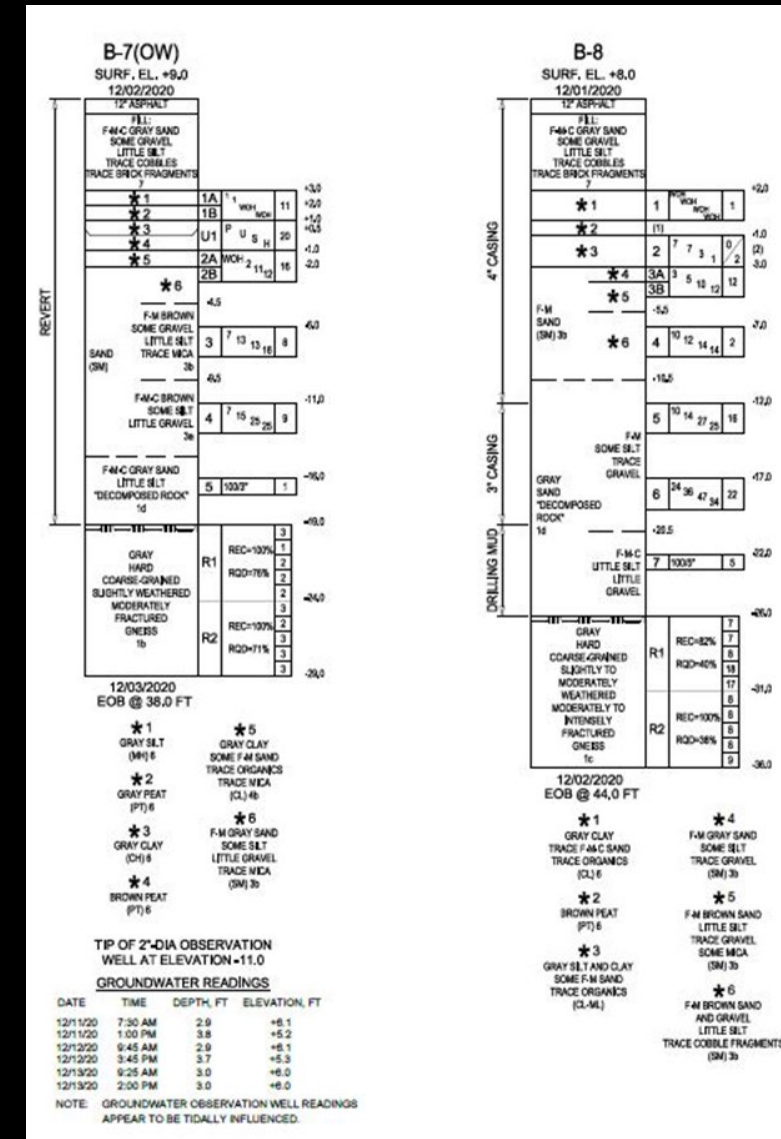
Subsurface Investigations - Purpose (cont'd.)

➤ Where is groundwater?

- Engineers are faced with design challenges when a shallow groundwater table is present. The design of structural features such as basements and its drainage system must be taken into account with respect to groundwater level.
- Is construction dewatering needed?

➤ Are the subsurface materials permeable (enough)?

- Soil permeability data are critical to determine a site's potential for stormwater capture.
- Groundwater flow with bedrock must be evaluated for the design of a geothermal system and tunneling system within bedrock.



OGI Services

Subsurface Investigations - Types

➤ Test Borings

- In-situ testing such as SPT, CPT, and borehole geophysics provide detailed information about the physical, chemical, and engineering properties of soils.

➤ Test Pits

- Shallow excavations to determine soil conditions, roadway pavement composition, and to examine underground structural elements.

➤ Bedrock Coring

- Core samples of bedrock allow engineers to determine the depth of competent rock surface, its relative integrity, and its mineral composition.



OGI Services

Subsurface Investigations – Types (cont'd)

➤ Groundwater Determination

- In-situ observations to determine the depth and flow direction of groundwater as well as a soil/rock formation's potential to absorb or transmit water.

➤ Laboratory Analysis

- Analytical methods to determine the composition, physical properties, and mechanical properties of a soil, rock, or concrete.



OGI Services

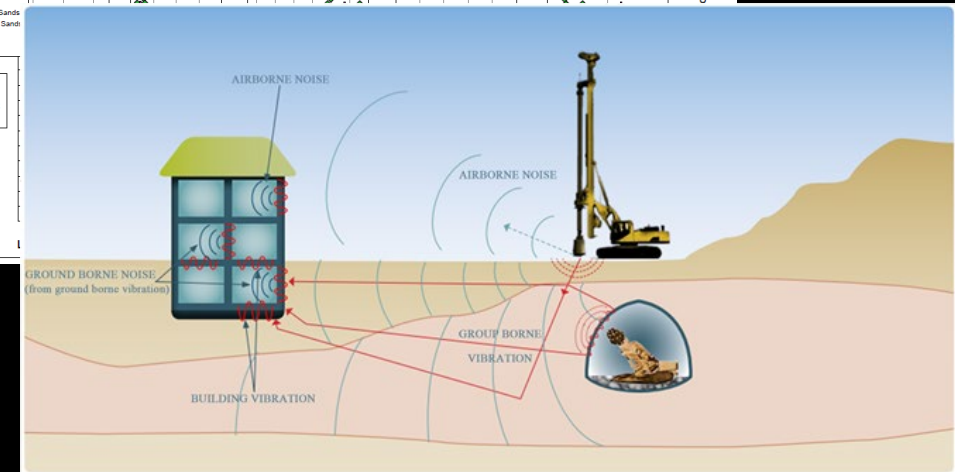
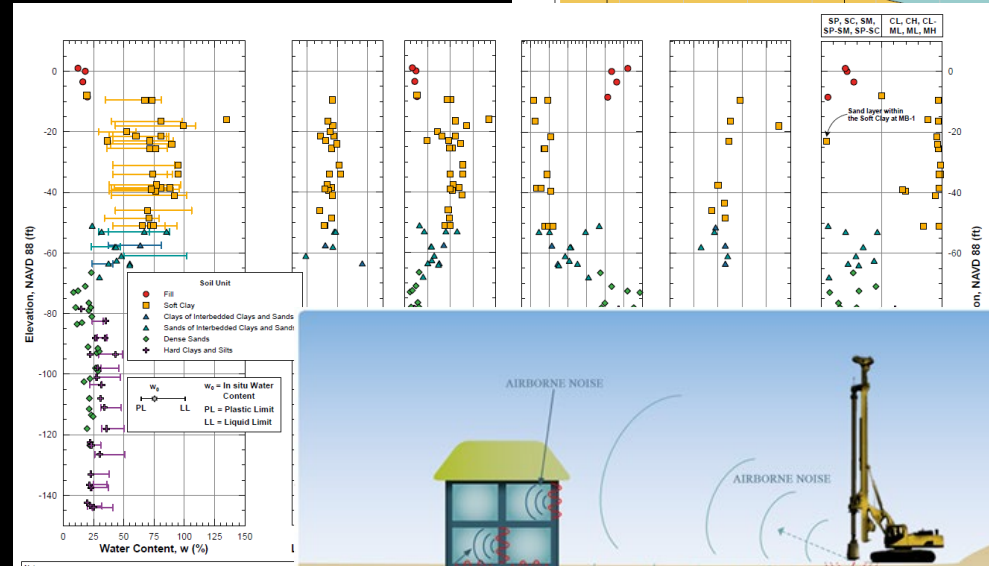
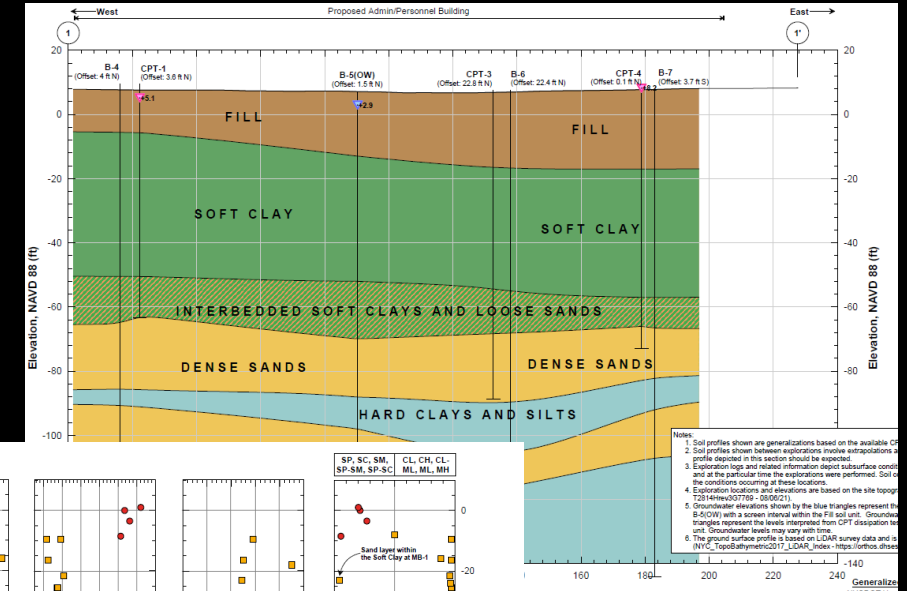
Geotechnical Reporting

➤ Geotechnical Data Report (GDR)

- A summary of subsurface investigation findings and laboratory test results.
- Part of the construction document to inform the contractor about subsurface conditions.

➤ Geotechnical Engineering Report (GER)

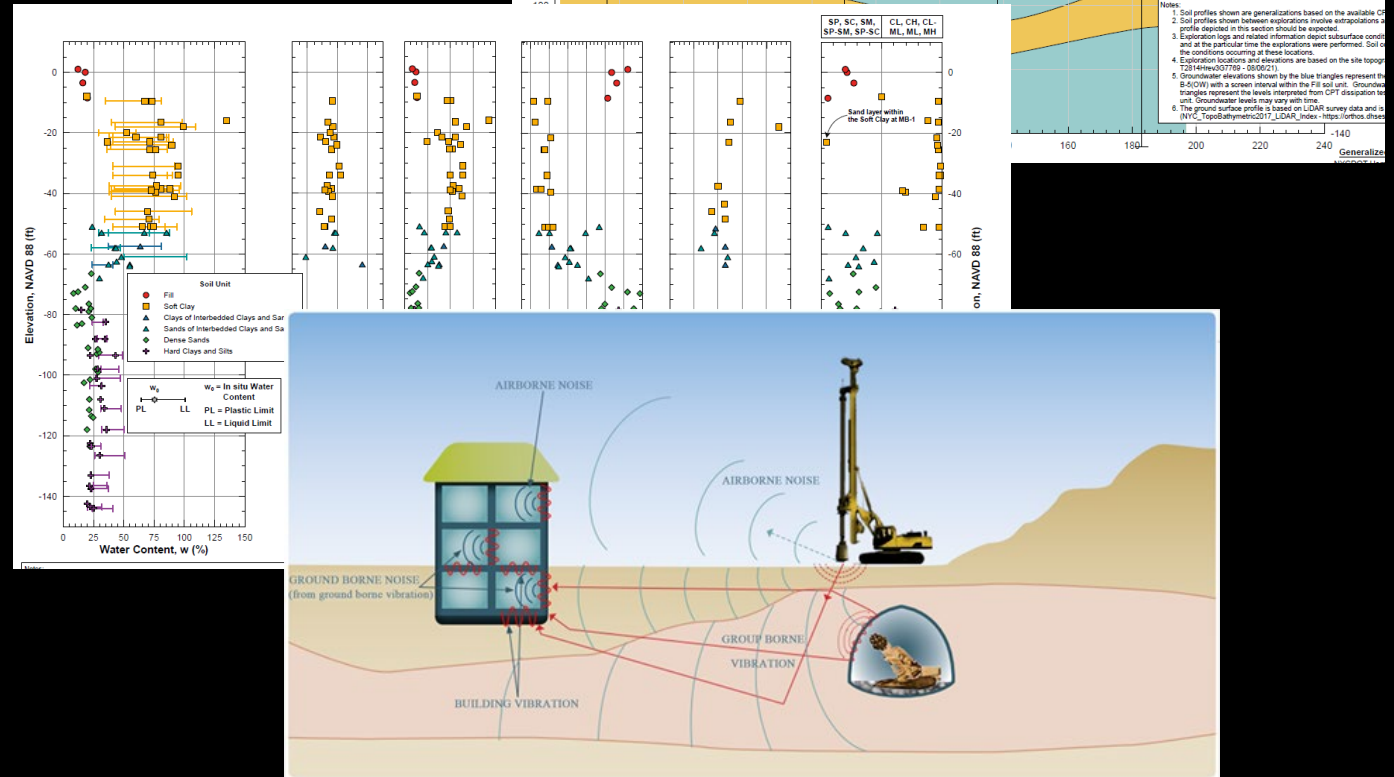
- Foundation recommendations
- Design soil parameters
- Design groundwater level
- Settlement/liquefaction evaluations
- Construction recommendations (e.g.: *support of excavation system*)



OGI Services Geotechnical Reporting (cont'd.)

➤ Pre-Construction Survey (PCS)

- A visual survey of properties adjacent to proposed construction activity focusing on existing exterior and interior damage and signs of settlement prior to construction.
- Ambient vibration monitoring and information from a GDR/GER used to inform future construction of structural susceptibilities and recommend limits to construction methods.



OGI Services

MS4 & Green Infrastructure Studies

Municipal Separate Storm Sewer System (MS4) and Green Infrastructure are methods of collecting and discharging storm water apart from a municipality's sanitary sewer system. These methods are intended to reduce the combined sewer overflow to treatment plants and water bodies.

➤ Field Studies

- Test boring programs designed to study the shallow subsurface soil composition and depths.
- Observations and sampling focus on grain size distribution.
- Permeability/percolation testing performed in tandem quantify the soil formation's ability to absorb and disperse stormwater.

Depth of PT: 5 ft	Drill Bit Type: Tricone	Weight of Hammer for casing: 140 lbs
Rig Type: Geoprobe	Casing Internal Diameter: 4 in	Type of Hammer: Auto
	Casing Length: 78 in	

General Formula: $K_{pm} = \pi R_t \times \left[\frac{D \left(\frac{h_1}{h_2} \right)}{11 \times (t_2 - t_1)} \right]$

Formula for 4" internal diameter casing (in/hr): $K_{pm} = 1.142 R_t \times \left[\frac{L_n \left(\frac{h_1}{h_2} \right)}{(t_2 - t_1)} \right]$

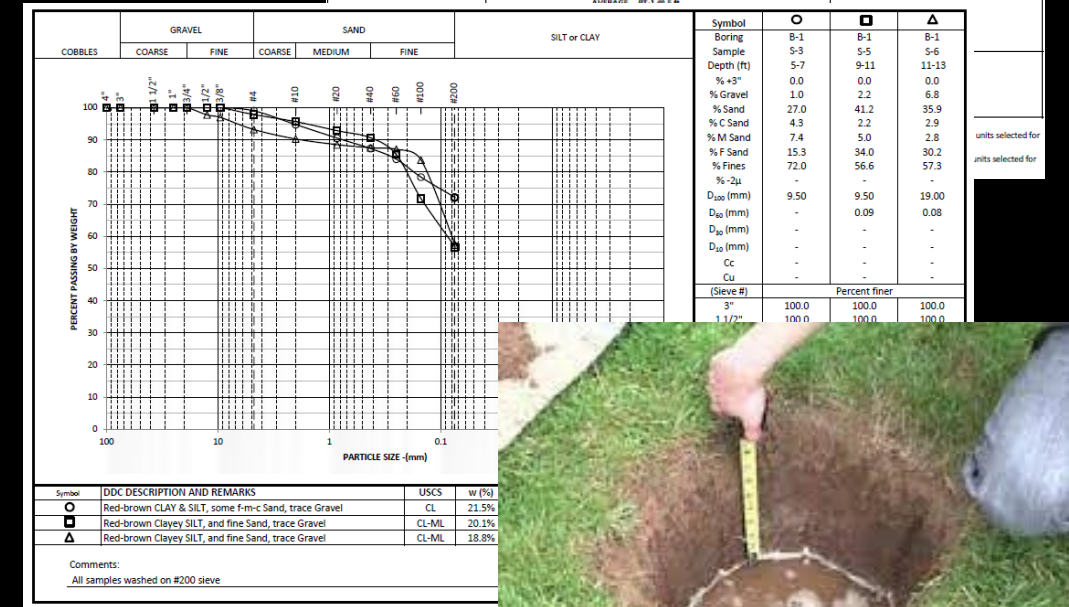
ASTM D-6991 - 11 PERMEABILITY COEFFICIENT (in/hr) FORMULA:

where: $R_t = 2.2902(0.9842)^{t/70.158}$

TEST 1							TEST 2						
Water temperature (°C), T: 10 Re= 1.32							Water temperature (°C), T: 10 Re= 1.32						
FIELD DATA							FIELD DATA						
Time (min)	Depth (in)	Height (in)	Ln (h ₀ /h)	(t ₂ -t ₁)	*Km (in/hr)		Time (min)	Depth (in)	Height (in)	Ln (h ₀ /h)	(t ₂ -t ₁)	*Km (in/hr)	
1	0.000	78.000	0.000	0.017	0.0000		1	0.000	78.000	0.000	0.017	0.0000	
2	0.000	78.000	0.000	0.017	0.0000		2	0.000	78.000	0.000	0.017	0.0000	
3	0.125	77.875	0.002	0.017	0.1451		3	0.000	78.000	0.000	0.017	0.0000	
4	0.125	77.875	0.002	0.017	0.0000		4	0.125	77.875	0.002	0.017	0.1451	
5	0.250	77.750	0.003	0.017	0.1453		5	0.125	77.875	0.002	0.017	0.0000	
10	0.500	77.500	0.006	0.083	0.0583		10	0.250	77.750	0.003	0.083	0.0291	
15	0.750	77.250	0.010	0.083	0.0585		15	0.500	77.500	0.006	0.083	0.0583	

PT-1 @ 5 ft

TEST 1 FINAL RESULTS		TEST 2 FINAL RESULTS	
Time Weighted Average Permeability Coefficient	Km= 0.0583 in/hr	Time Weighted Average Permeability Coefficient	Km= 0.0388 in/hr



OGI Services

MS4 & Green Infrastructure (cont'd.)

➤ Reporting

- Percolation test data calculated in conformance to DEP standard and combined w/ soil test data are used to inform whether or not a site meets installation criteria.
- Sites meeting these criteria are selected to receive a “green” design, such as permeable pavements or rain gardens.

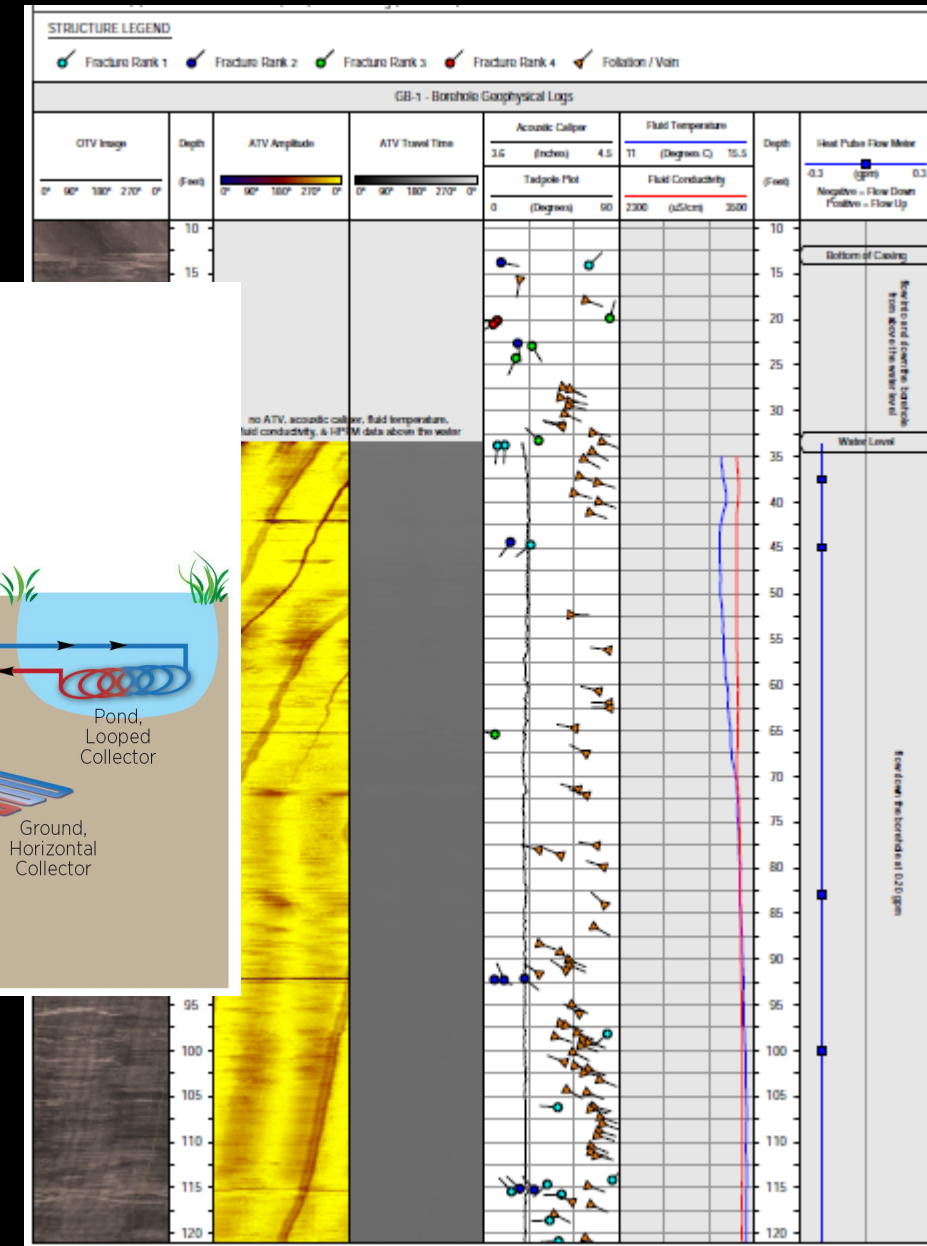
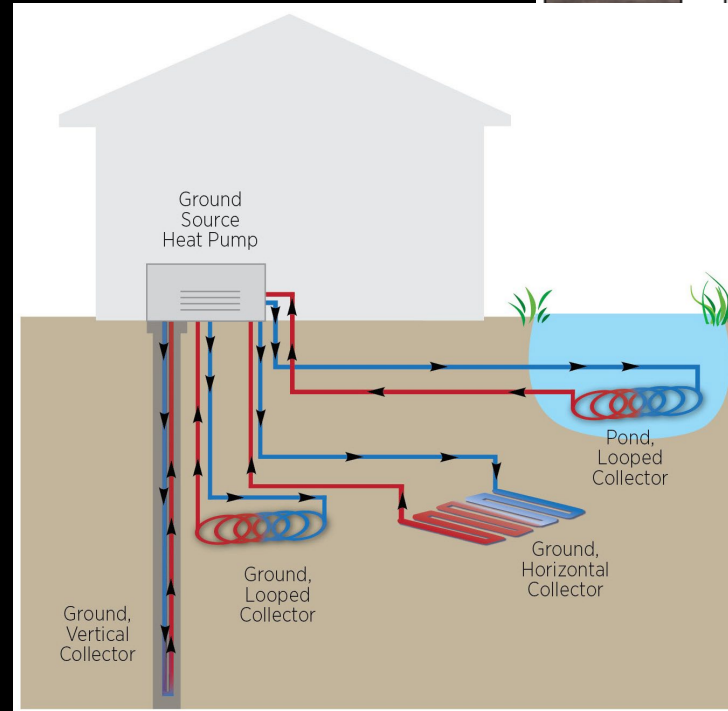


OGI Services

Geothermal Feasibility

Ground Source Heat Pumps (*geothermal wells*) function by supplementing a building's HVAC heating, cooling and ventilation needs with the constant temperature of ground and groundwater via a heat exchanger.

- **Thermo-conductivity Field Studies**
 - Conduct test borings to classify soil, bedrock and perform laboratory testing.
 - Perform in-situ testing: borehole geophysics and pump testing (Packer testing).

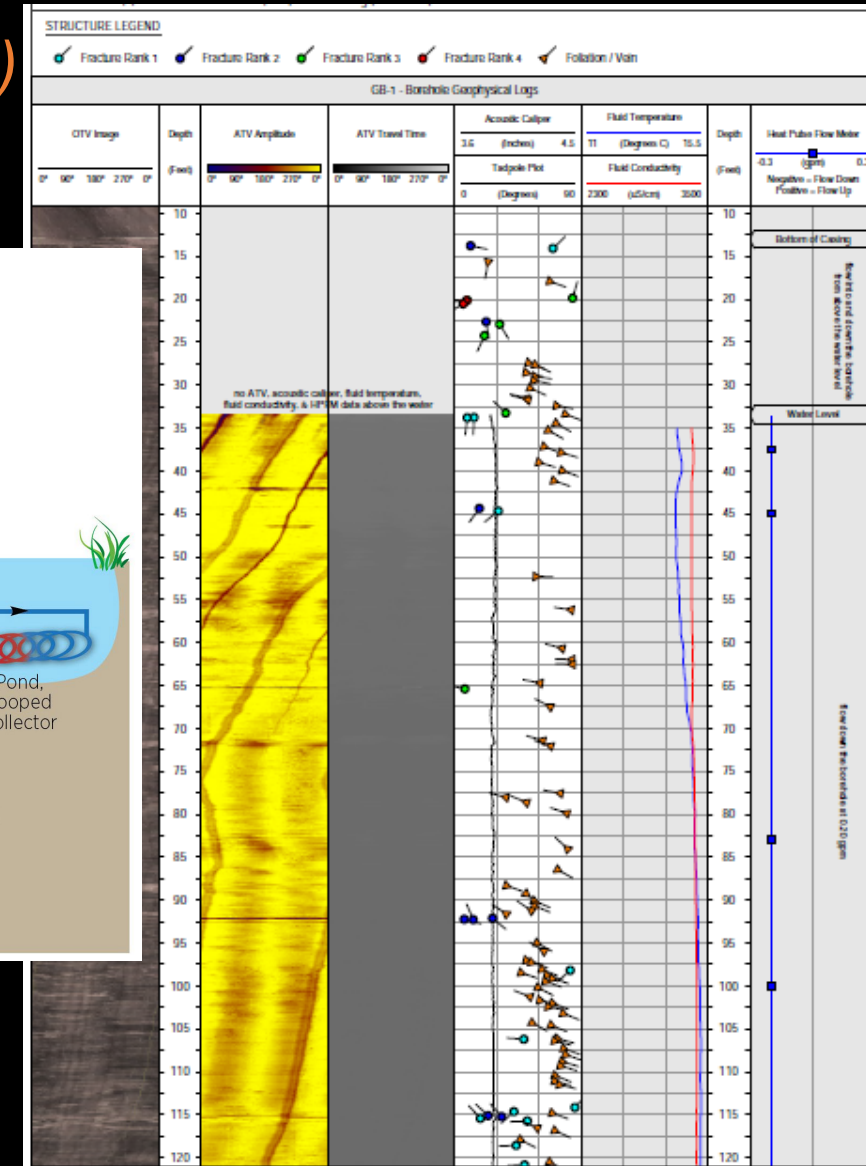
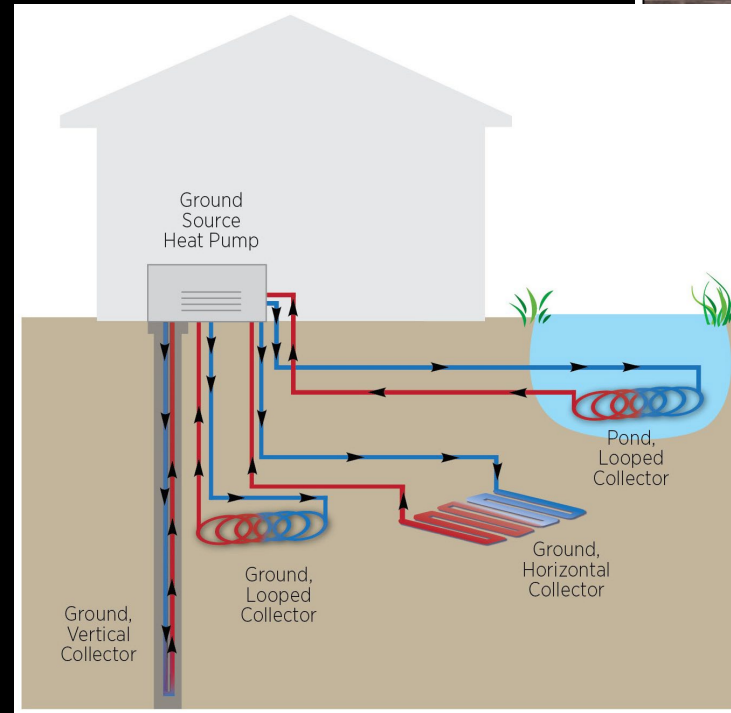


OGI Services

Geothermal Feasibility (cont'd.)

➤ Reporting

- Summarize test data, laboratory testing and geophysical measurements.
- Test results will determine if site's geology and groundwater can supply heating and cooling needs of the proposed system.
- Quantify what is the thermo exchange capability of material in order to design the heat exchange system.
- Include recommendations about geothermal system types and configurations best suited for the site.



OGI Services

Forensic Engineering

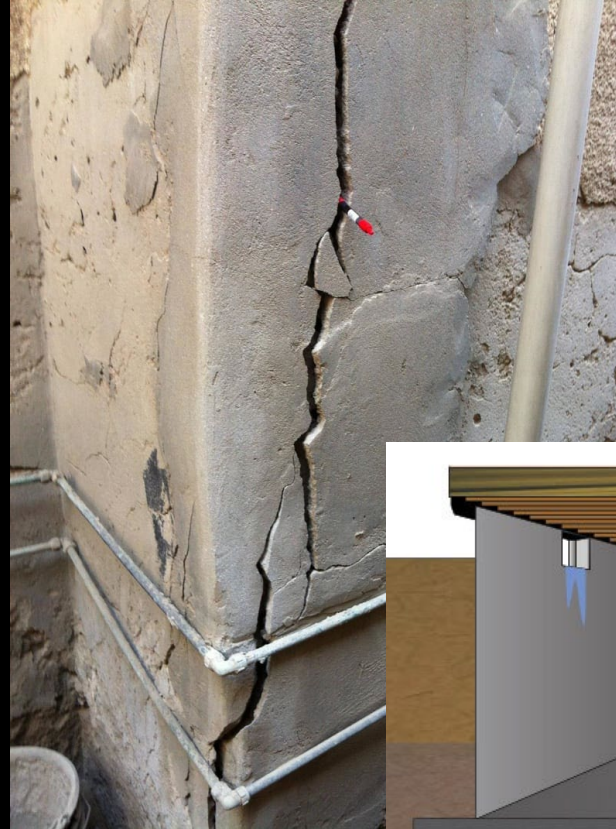
Forensic engineering is the practice of applying engineering knowledge to determine the reason for structural, mechanical, or material failure.

➤ Structural assessment of existing building elements

- Columns
- Beams
- Slabs
- Façades

➤ Water Infiltration Investigations

- Drain damage
- Structural damage
- Groundwater movement
- Flooding





Safety Measures

- Safety measures before geotechnical investigations
- Safety measures during geotechnical investigations

Safety Measures Before Geotechnical Investigations

- **Record information** – Utility survey & as-built plans may identify buried utilities and structures (e.g.: *subways*). Historical drawings may identify locations of past buildings and details about their foundations.
- **“OneCall”** – 811, Call before you dig. Notification to the OneCall system will allow utility stakeholders to visually mark their investments along the project site.
- **Work Zone Traffic Control (WZTC) plan** – The work site must be properly established with signage and devices to protect workers and ensure safe passage for pedestrians and motorists.
- **Boring Location Plan (BLP)** – Borings must be planned in areas that minimize impediments to traffic, protect the public, the properties, and avoid contact with utilities.
- **Permits** – Required by agencies such as State DOT, City DOT, NYSDEC/ACOE, MTA/NYCT/LIRR, DPR, and USCG.
- **Health & Safety project book** – Includes Job Hazard Analysis (JHA), Dust & Noise mitigation plans, printed copies of permits & One Call tickets, and routes to hospitals.

New York 811

Ticket No: 220100246
ROUTINE
Original Call Date: 01/10/22 07:34 am
Op: webus4
Start Date: 01/13/22 07:00 am
Lead Time: 20
Viewing Date: 01/14/22 07:27 am

NYC Department of Transportation
Office of Permit Management
STREET OPENING PERMIT
PERMIT#: S01-2022006-A05

NEW YORK CITY

ISSUED DATE: 1/6/2022 PERMIT VALID FROM: 1/6/2022 TO: 4/4/2022
BOROUGH: [REDACTED] PERMIT TYPE: 0126 - TEST PITS, CORES OR BORING
FEES (NON-REFUNDABLE): ROADWAY TYPE: [REDACTED]
ADMINISTRATION FEE \$405.00 SIDEWALK TYPE: CONCRETE
TOTAL: \$405.00 FEE WAIVED/CONTRACT

PERMISSION HEREBY GRANTED TO:

NAME: [REDACTED] LICENSE #: None
CONTACT NAME: [REDACTED] CONTRACT #: [REDACTED]
PHONE: [REDACTED] SPONSORING AGENCY: NYC DEPT OF DESIGN & CONST
ADDRESS: [REDACTED]

TO OPEN THE SIDEWALK AT:

HOUSE#: [REDACTED]
ON STREET: AMBOY ROAD
FROM STREET: ARMSTRONG AVENUE
TO STREET: OLD AMBOY ROAD

LOCATION DETAILS:
FOR PURPOSE OF: geotechnical f
RELATED AGENCY #: [REDACTED]
FOR MAX. LENGTH OF: 5 FT
INSPECT DIST: 44
RECORDED: None
TRACKING #: 20220105004
Note: If House Number is not provided Per block (for all non-Contract work, i.e. Contr:

NOTES:
1. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES LOCATED IN THE WORK AREA.
2. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES LOCATED IN THE WORK AREA.
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PERMITTEE SHALL COMPLY WITH ALL DEPARTMENT OF TRANSPORTATION MAY RESULT IN REVOCATION OF THE

Safety Measures During Geotechnical Investigations

- **Prior to commencing work, additional steps must be taken to ensure a safe working environment.**
 - Situational awareness – Located near overhead lines? Obvious physical hazards? Weather conditions?
 - Will the environment present a confined space or a hazardous atmosphere?
 - Verify OneCall markings.
 - Install Maintenance and Protection of Traffic (MPT) per WZTC plan.
 - Machinery & tools are in proper working order & good condition.
 - Conduct daily “Toolbox Talk” and ensure that fire safety, electrical safety, spill prevention and first aid are in place.
 - All workers must have OSHA 10-Hour Construction training and wear proper PPE



Safety Measures During Geotechnical Investigations

➤ During the investigation...

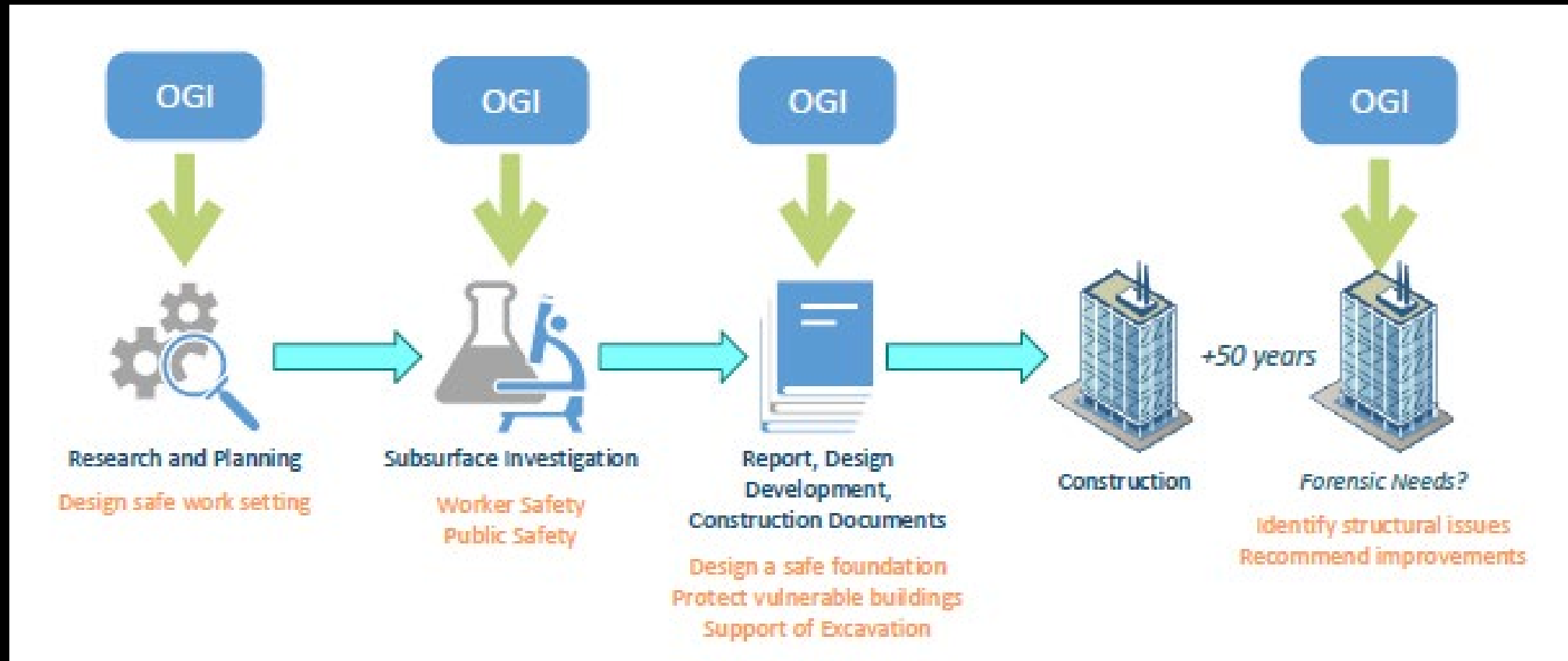
- Pre-clearing the proposed boring locations to 6 feet below ground surface by utilizing soft digging and/or vacuum excavation.
- Workers shall properly operate machinery and equipment.
- Housekeeping – Keep the site neat/clear and the work area delineated with proper devices in order to protect the workers and the public.
- Impacted soil – PID screening to detect volatile contaminants in soil.
- Drill cuttings shall be properly contained. Identify if environmental testing, drumming & disposal is required.



➤ Upon completion ...

- Restoration – Backfill or grout boreholes and restore the surface to its original conditions.
- Cleanup – Upon drilling completion and restoration must clean up remaining debris and remove them from the site.





OGI in Standard Construction Project Phasing



THANK YOU!

**Department of
Design and
Construction**