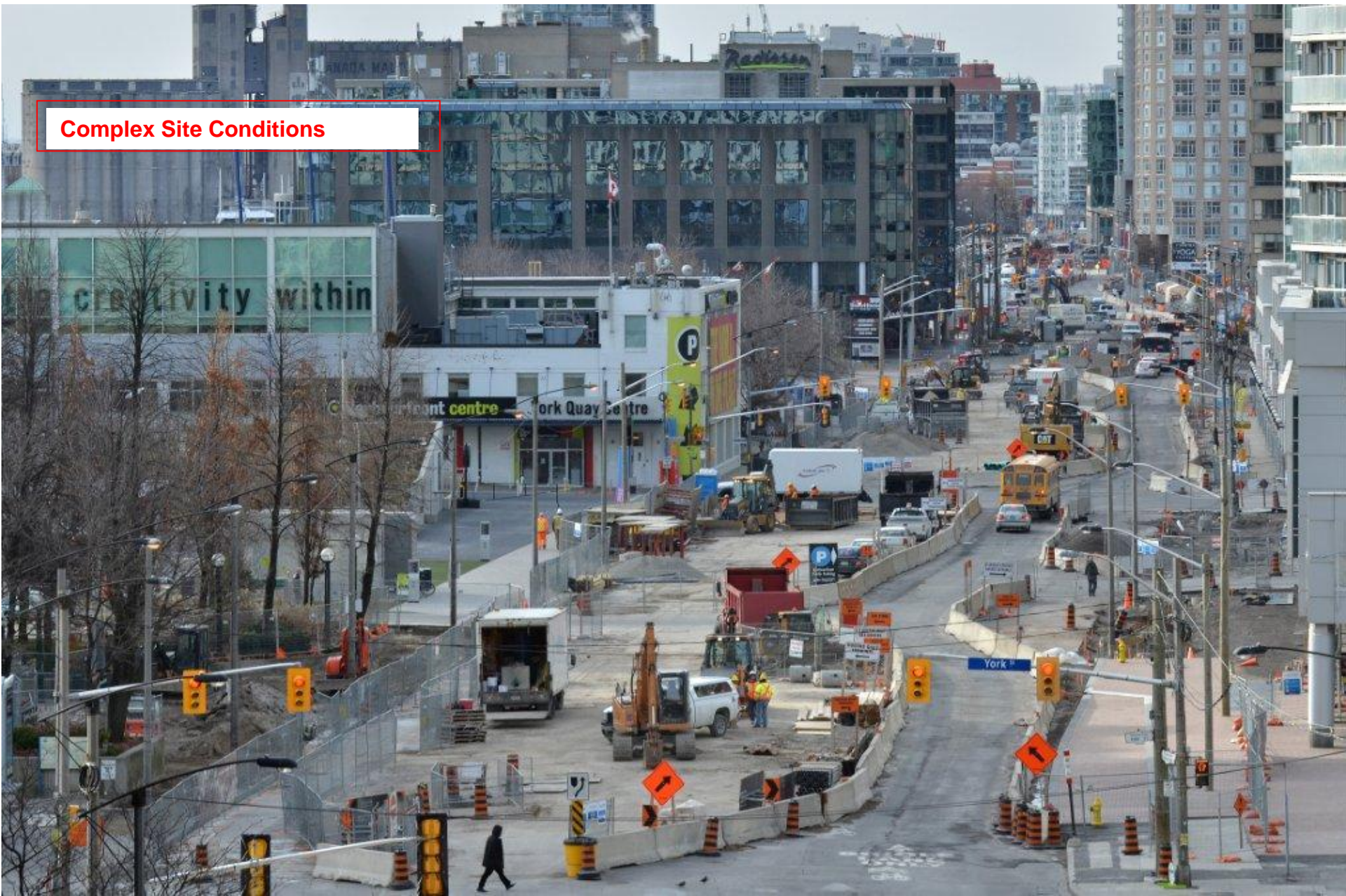
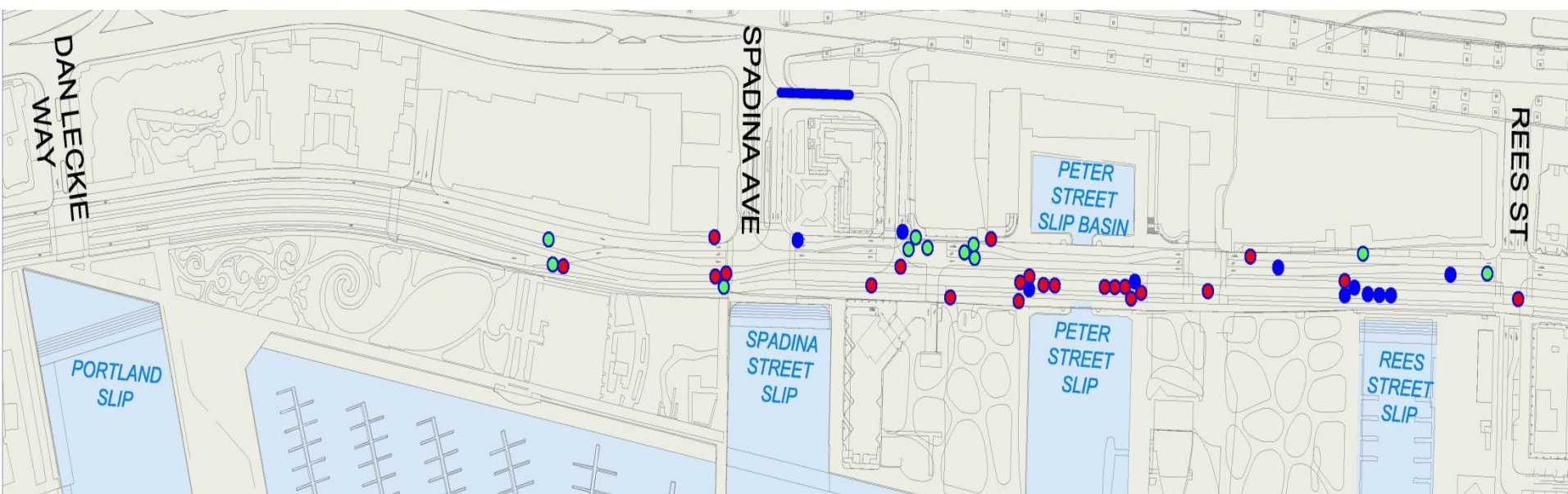


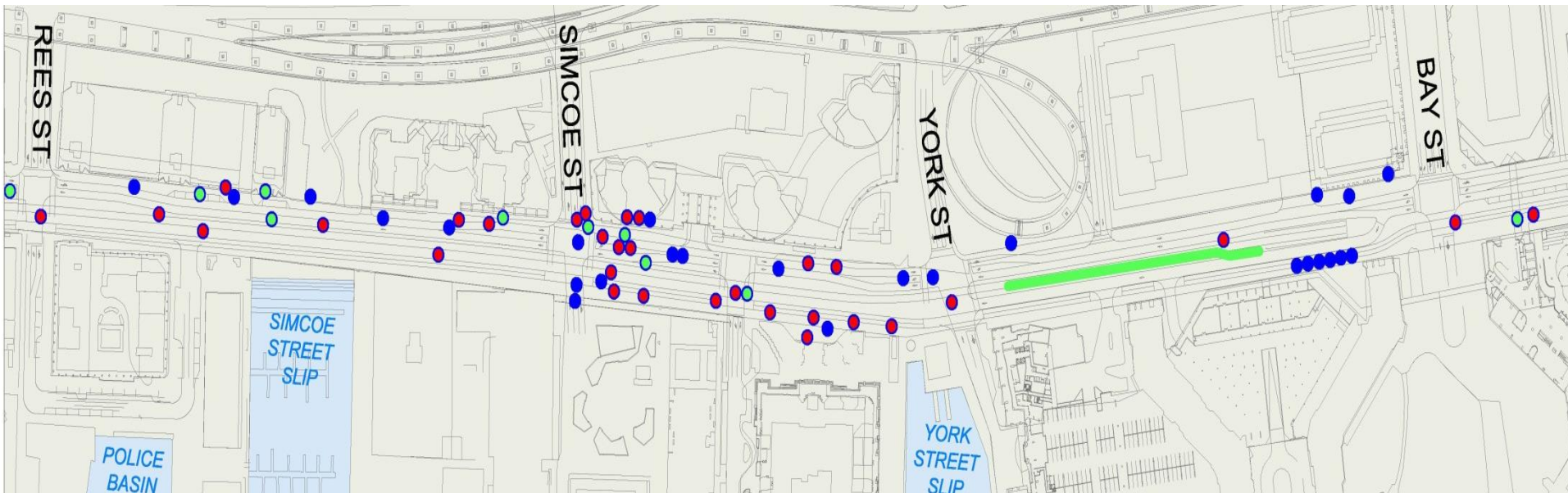
**Complex Site Conditions**



Aerial view showing several different contractors working across the site at the same time and the traffic management required to keep the street open to traffic



Dan Leckie to Rees



Rees to Bay

**110+ Conflicts**

Legend:

Purple-Unknown conditions

Blue-Differing Site Conditions

Green-Utility conflicts

Crews working underground encountered over 100 conflicts with existing utilities, unknown structures, abnormally high water levels and poor soil conditions – far exceeding the typical number of conflicts expected for waterfront construction



Another example of a piece of infrastructure not shown on City as-built drawings. Work had to stop until the unknown pipe could be identified as it was in direct conflict with the new storm line being installed.



An abandoned dockwall was uncovered during construction. This old infrastructure was not shown on City as-built drawings and additional work and time was required to remove the dockwall so that work could proceed.



Upon excavation for new landscaping, crews discovered that an existing storm lead was not connected to the main storm sewer. This storm lead had to be redesigned and redirected north (not part of project scope).



**Toronto Hydro ductbank in conflict with new sanitary sewer proposed for same location**

Toronto Hydro ductbank (not shown on as-built drawings) discovered when crews excavated for the new sanitary sewer proposed in the same location.



Excavating around unidentified pipe not shown on City “as-built” drawings.



Crews work around a conflict with existing hydro infrastructure in order to install required municipal services in the same location.





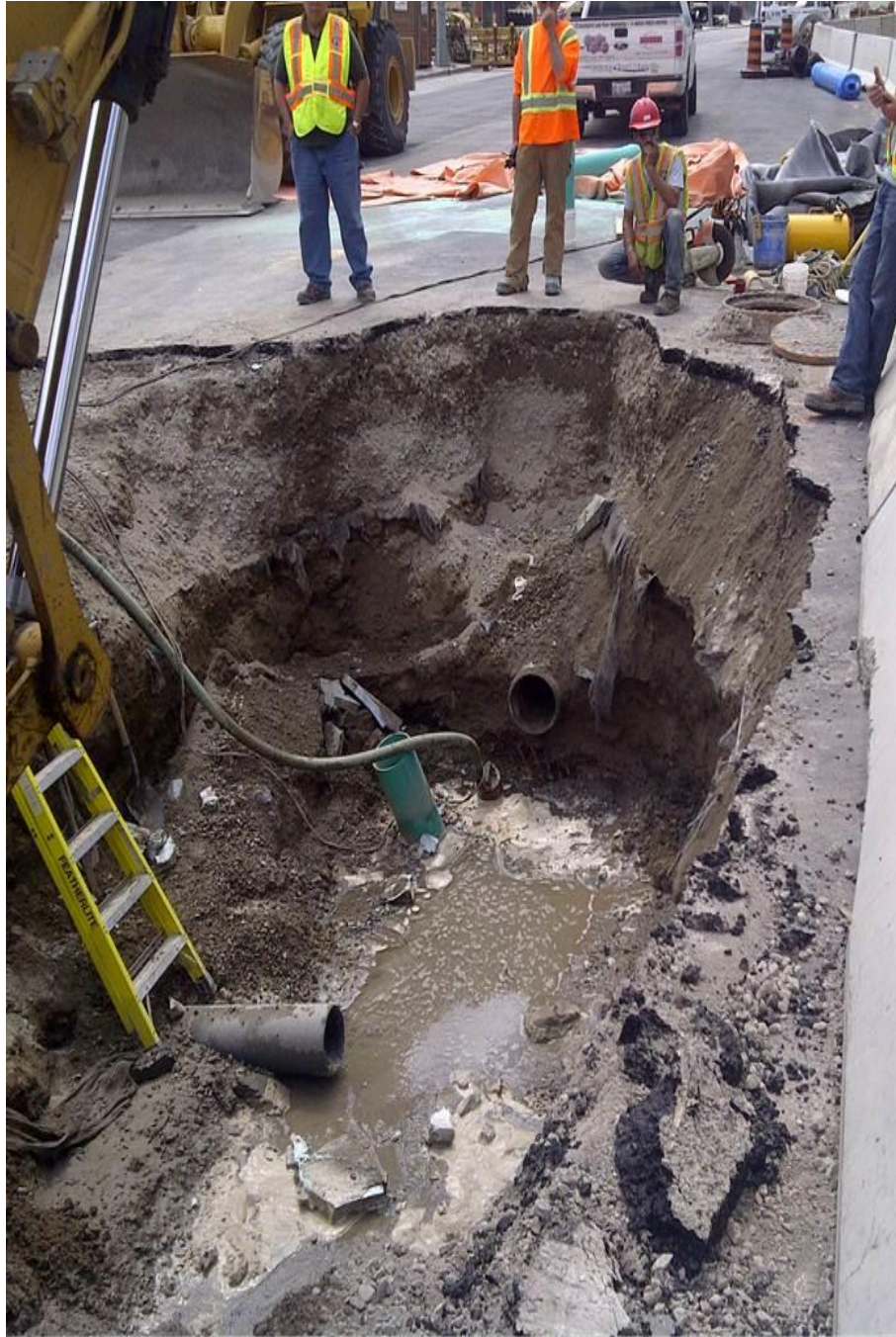
Unknown pipes not indicated on City surveys/as-built drawings. Work has to stop when these are uncovered and time is required to determine the owner/usage, and possible redesign.



Abandoned manhole not on as-built drawings.



Several watermains (which were not scheduled to be replaced) failed while work was underway in adjacent areas and had to be rebuilt. Work was not part of project scope.

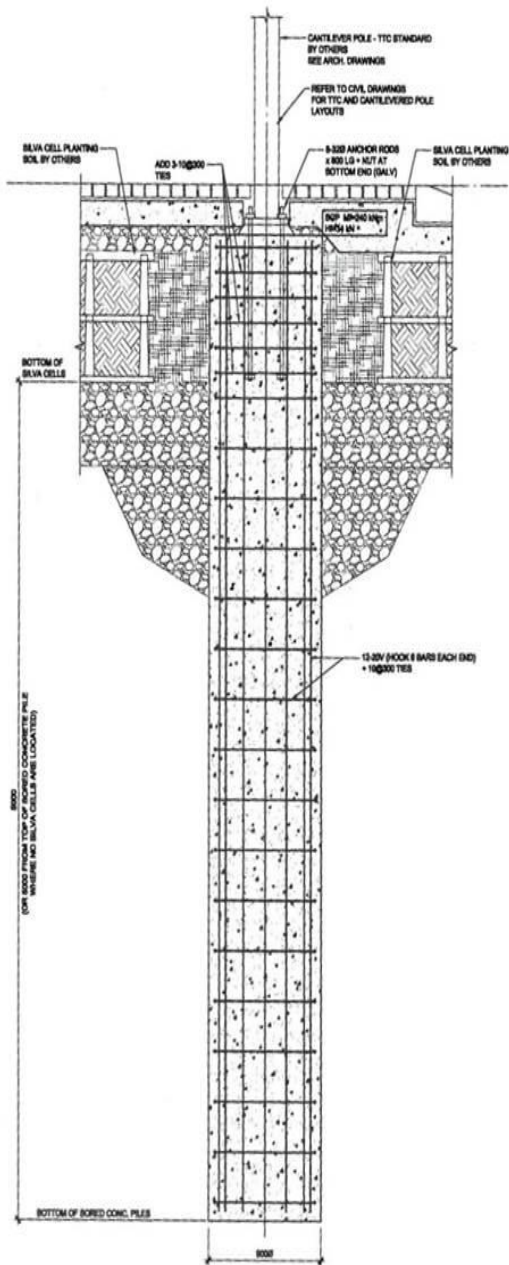


This watermain failure also resulted in a sinkhole due to the poor soil conditions. The watermain was rebuilt (not part of project scope) and sinkhole filled.

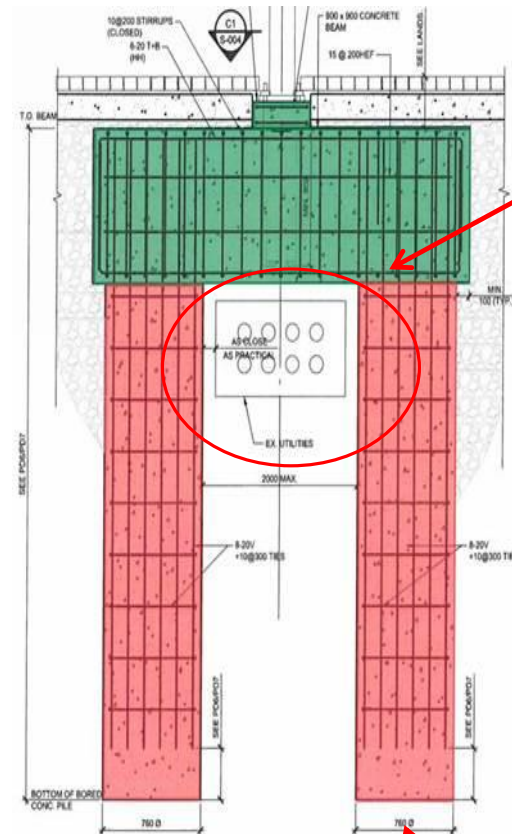


An existing storm pipe failed while work was underway in a nearby location and had to be repaired (not part of project scope).

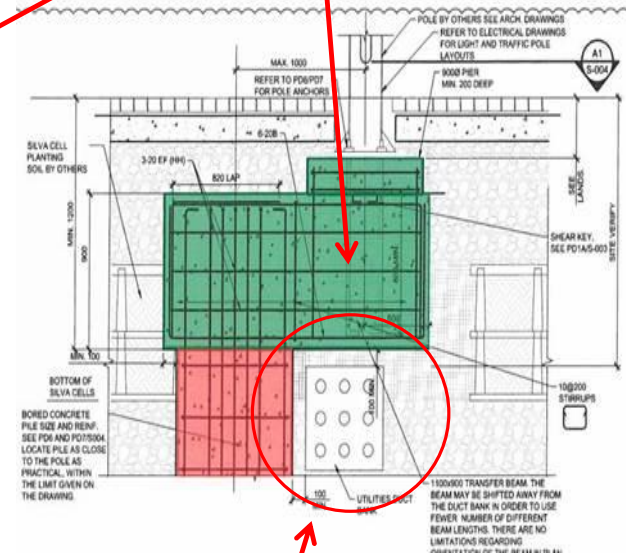
## Typical street pole footing



## Redesigned footings to address underground conflicts



Ductbanks in conflict



Footings designed to manage conflicts

A typical street pole footing (above left) is drilled straight into the ground. To work around conflicting underground infrastructure new footings were designed that could bridge across the conflicts (above centre/right).



This is an example of the rebar required for one of the revised street pole footings needed to work around existing underground Hydro infrastructure that was not yet decommissioned as planned.



Waterfront construction requires extensive dewatering.





Due to difficulties with dewatering, water fills up the shoring used to keep the site safe and secure for underground infrastructure to be installed.



Another example of dewatering difficulties. Crews work in water in an underground chamber.



The significant flood which hit Toronto in July 2013 led the City of Toronto to cap the volume of water that could be discharged into the sanitary sewer. As a result, dewatering costs increased further.



Due to required changes in construction staging, extensive winter work was required to work around conflicts and Toronto Hydro crews in order keep to the 2015 project schedule.



In order to keep to the 2015 schedule, granite work proceeded throughout the winter using tents and heaters which allow proper curing in frigid temperatures.



One example of ground heaters and tarps employed for winter work.