deeproot®

SILVA CELL & UTILITIES

Integrating Silva Cells into the Built Environment

HOW UTILITIES INTEGRATE WITH SILVA CELL

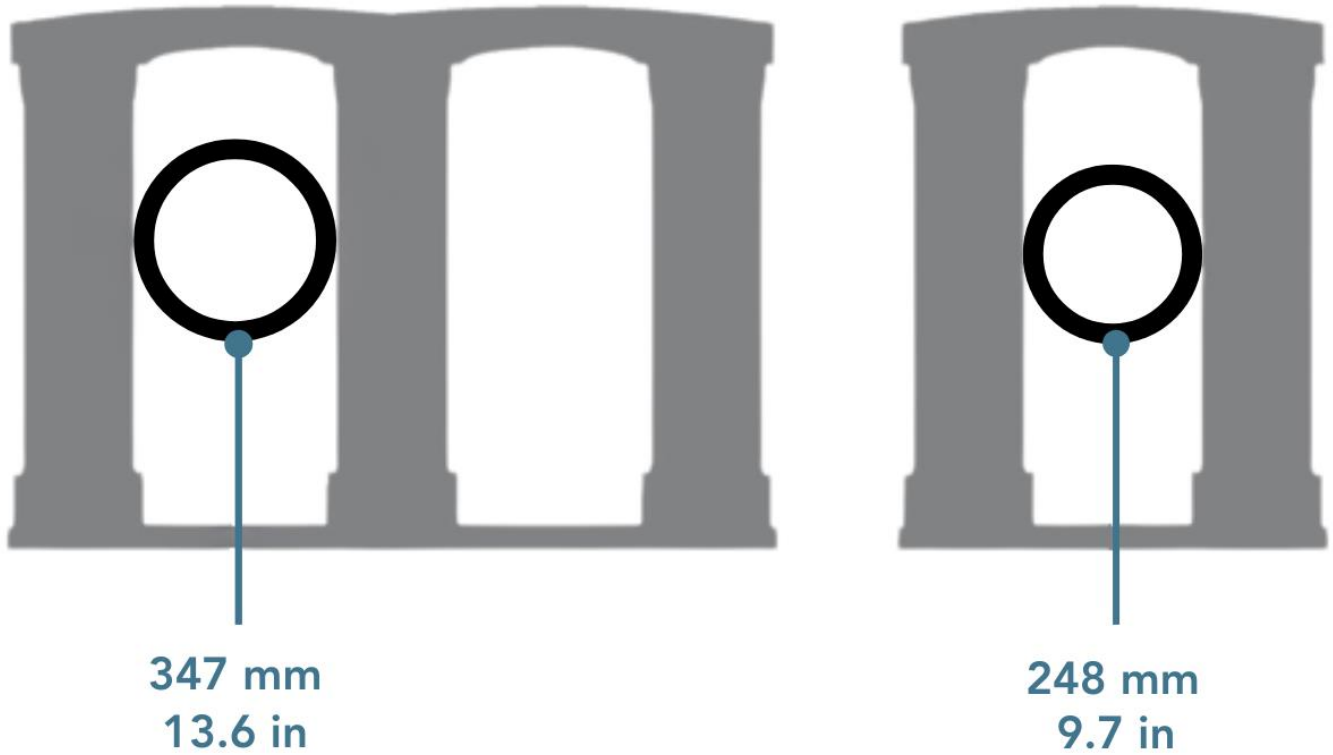
deeproot®


PC
138US
LC
KOMATSU
226
SONOTUBE

HOW UTILITIES INTEGRATE WITH SILVA CELL

MAXIMUM PIPE MEASUREMENTS

deeproot®



deeproot®

HOW UTILITIES INTEGRATE WITH SILVA CELL

UTILITIES AREN'T ALWAYS STRAIGHT LINES

deeproot®


Bobcat
Trailer Source


Trailer Source

HOW UTILITIES INTEGRATE WITH SILVA CELL

STAGGERED CONFIGURATION

deeproot®

deeproot

HOW UTILITIES INTEGRATE WITH SILVA CELL

BETWEEN SILVA CELLS

deeproot®

HOW UTILITIES INTEGRATE WITH SILVA CELL

ABOVE SILVA CELLS

deeproot®

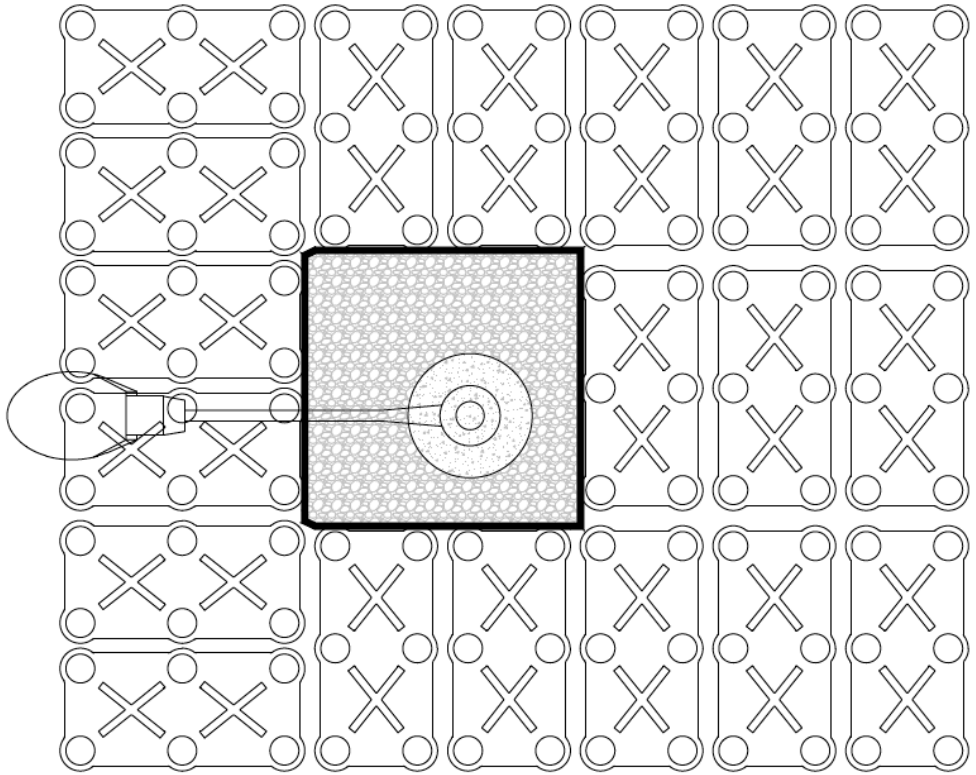

PREMIUM
PREMIUM
PREMIUM

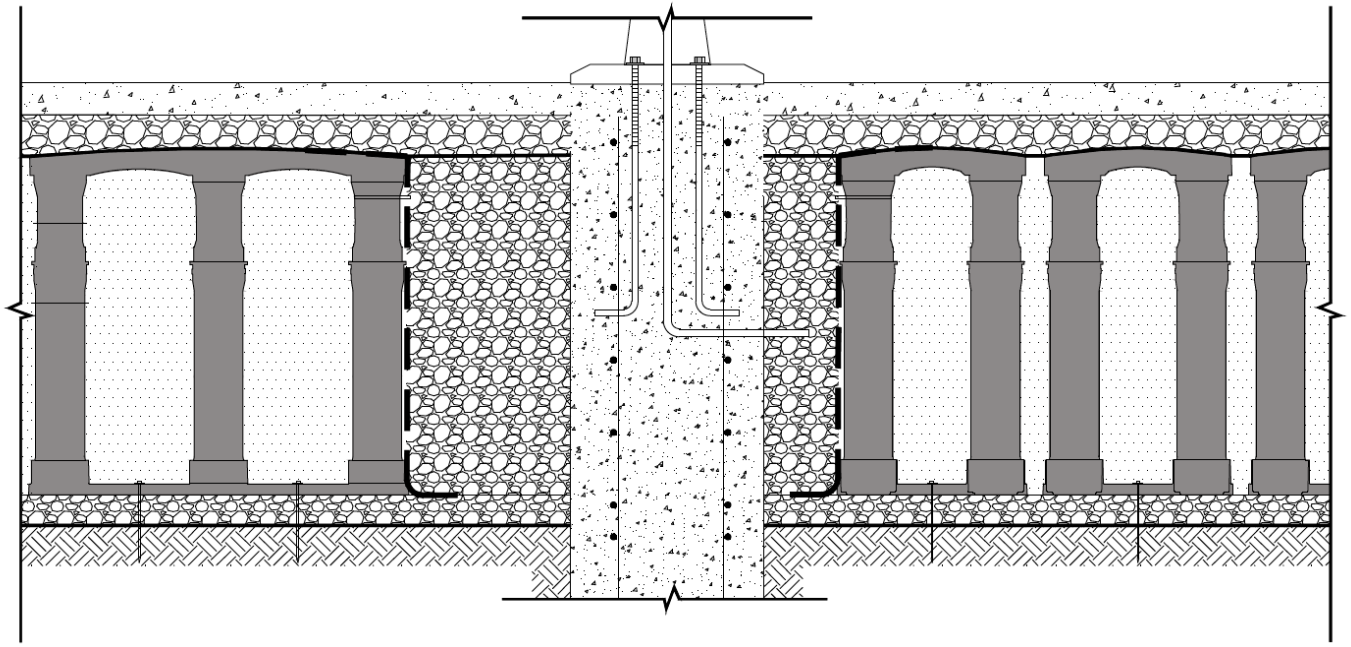
HOW UTILITIES INTEGRATE WITH SILVA CELL

LIGHT POLES AND SILVA CELLS

deeproot®


Unicon
EASY POUR
Concrete Specialties
unicon.ca





deeproot®


CAT

ALTERNATIVE UTILITY INTEGRATION OPTIONS

Alternative Utility Integration Options

-Aggregate Gap Detail

-Bridging Utility with Silva Cells

-Bridging Utilities with Small Concrete Slabs

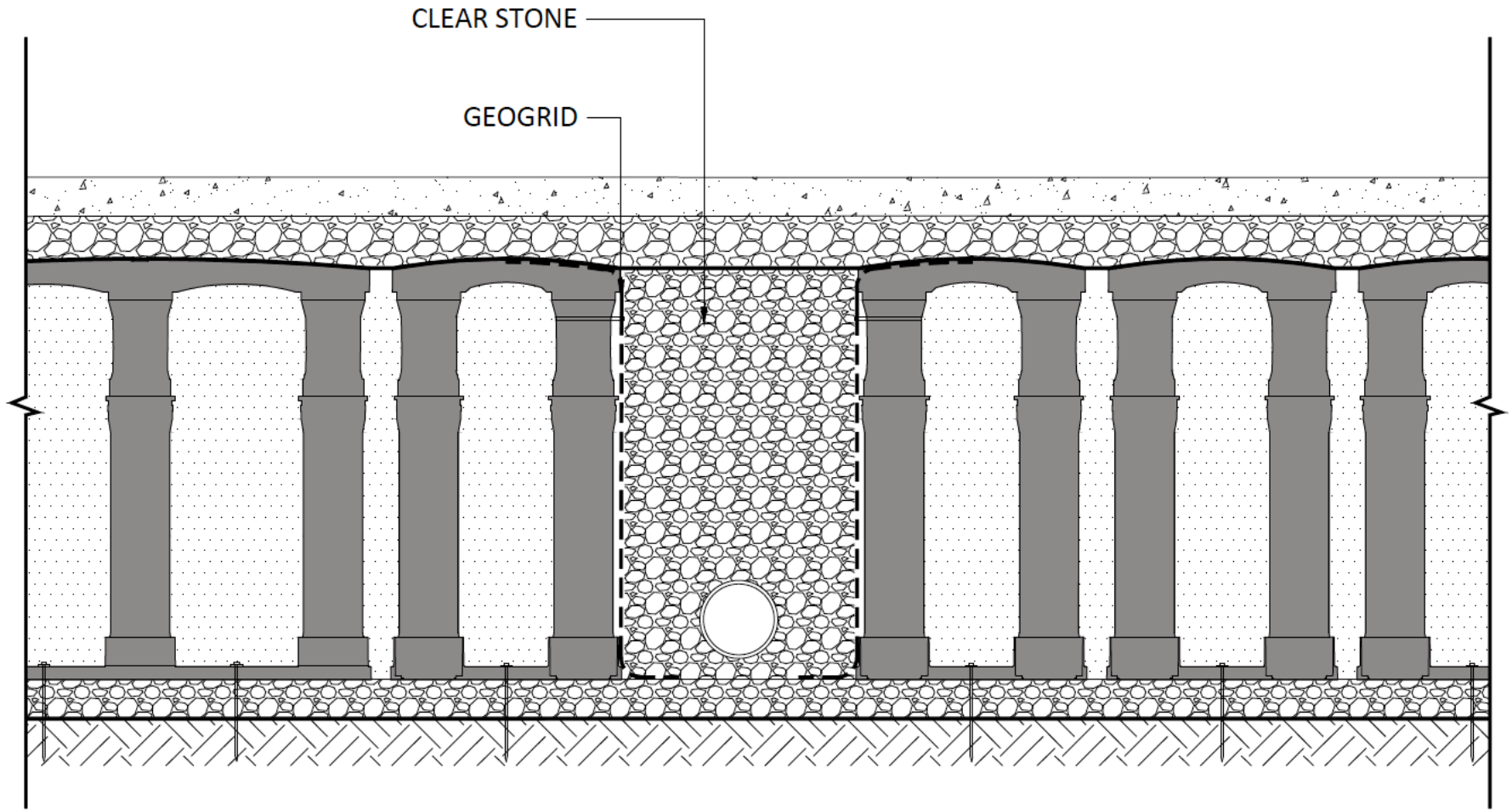
-Bridging Utilities with Customer Concrete Slabs

-Running Utilities Outside Silva Cell Frames in Same Excavation Area

ALTERNATIVE UTILITY INTEGRATION OPTIONS

AGGREGATE GAP BRIDGING

deeproot

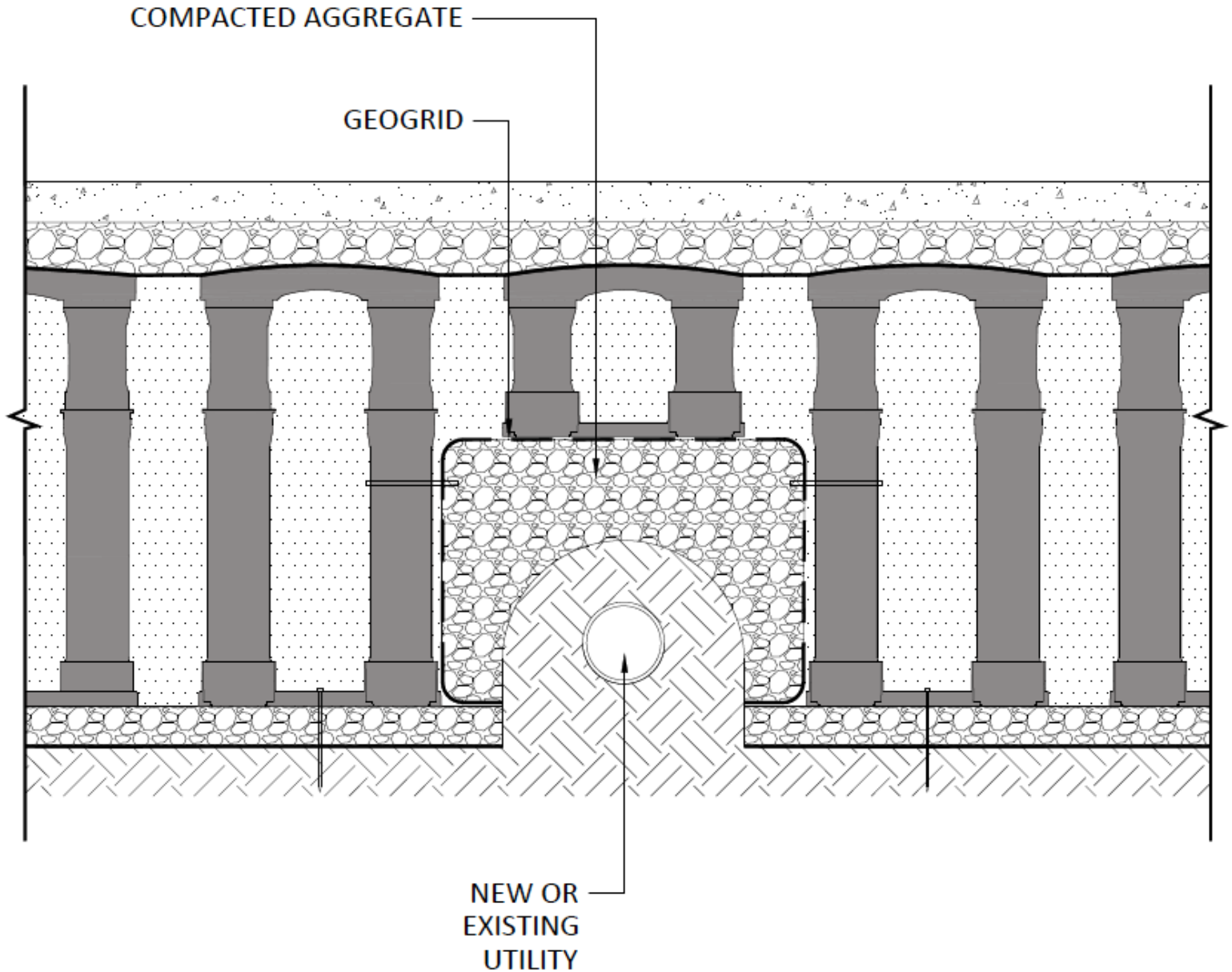


deeproot

ALTERNATIVE UTILITY INTEGRATION OPTIONS

BRIDGING UTILITIES WITH SILVA CELLS

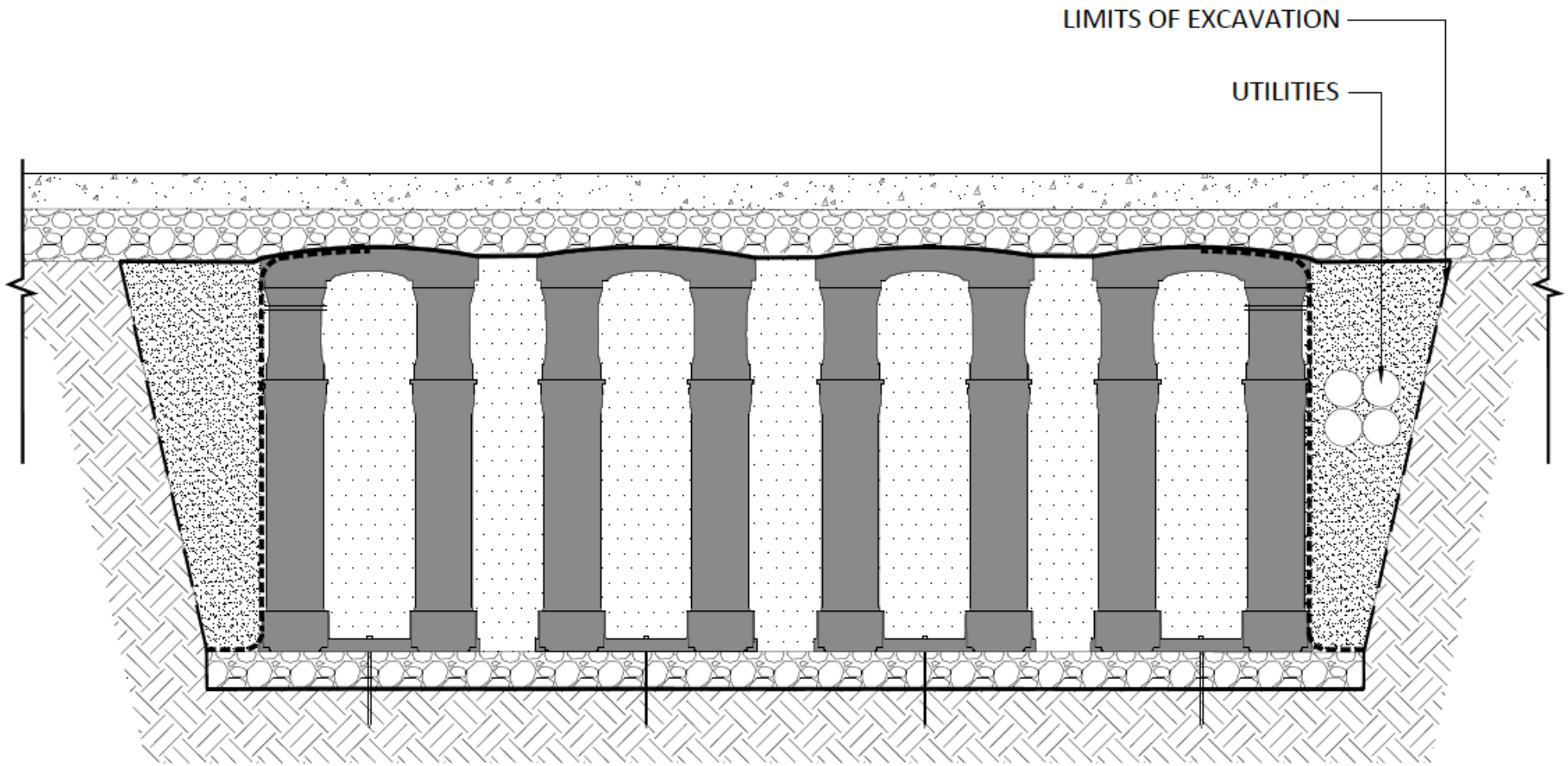
deeproot®



deeproot

ALTERNATIVE UTILITY INTEGRATION OPTIONS

RUNNING UTILITIES OUTSIDE SYSTEM



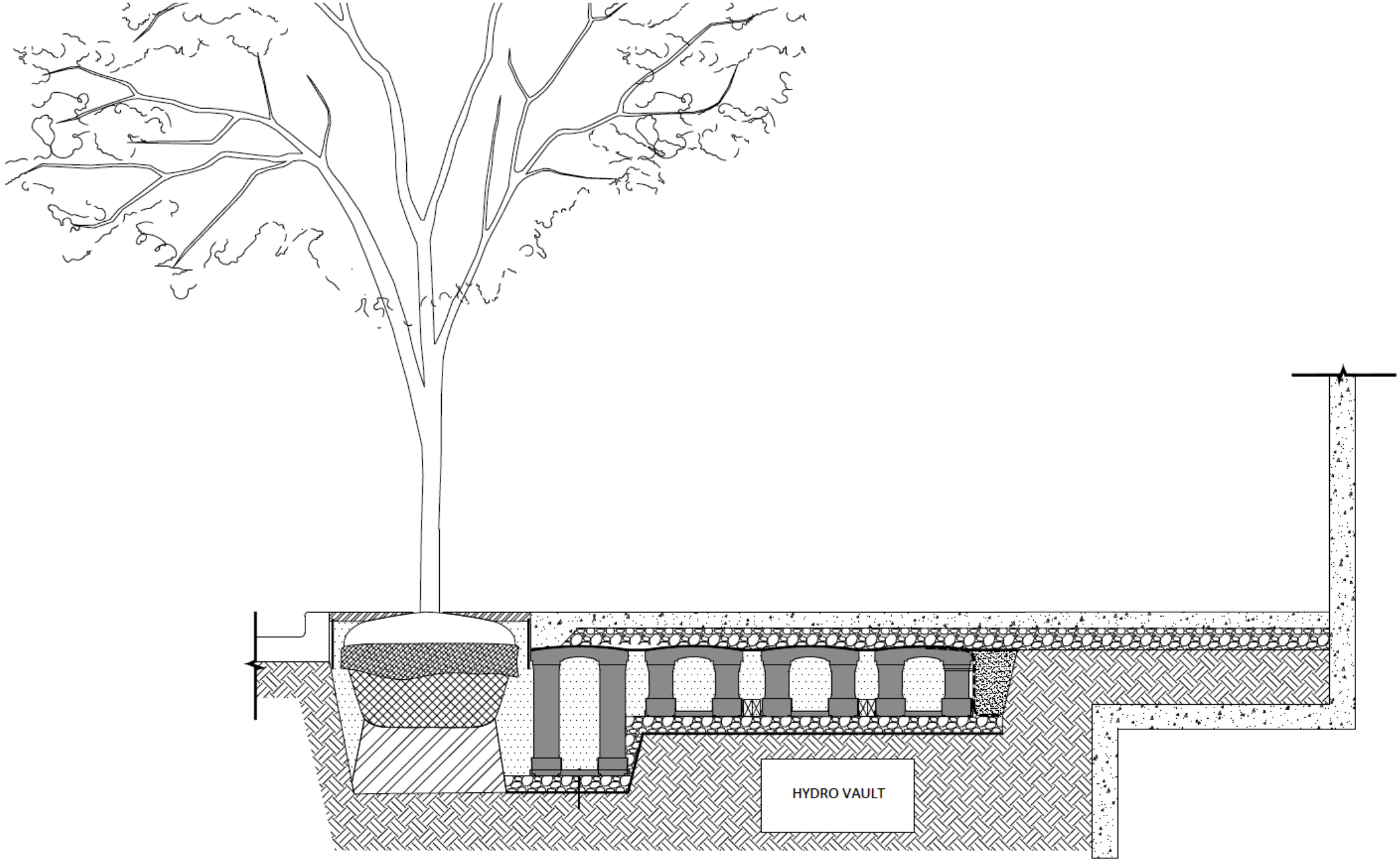
deeproot


CAT

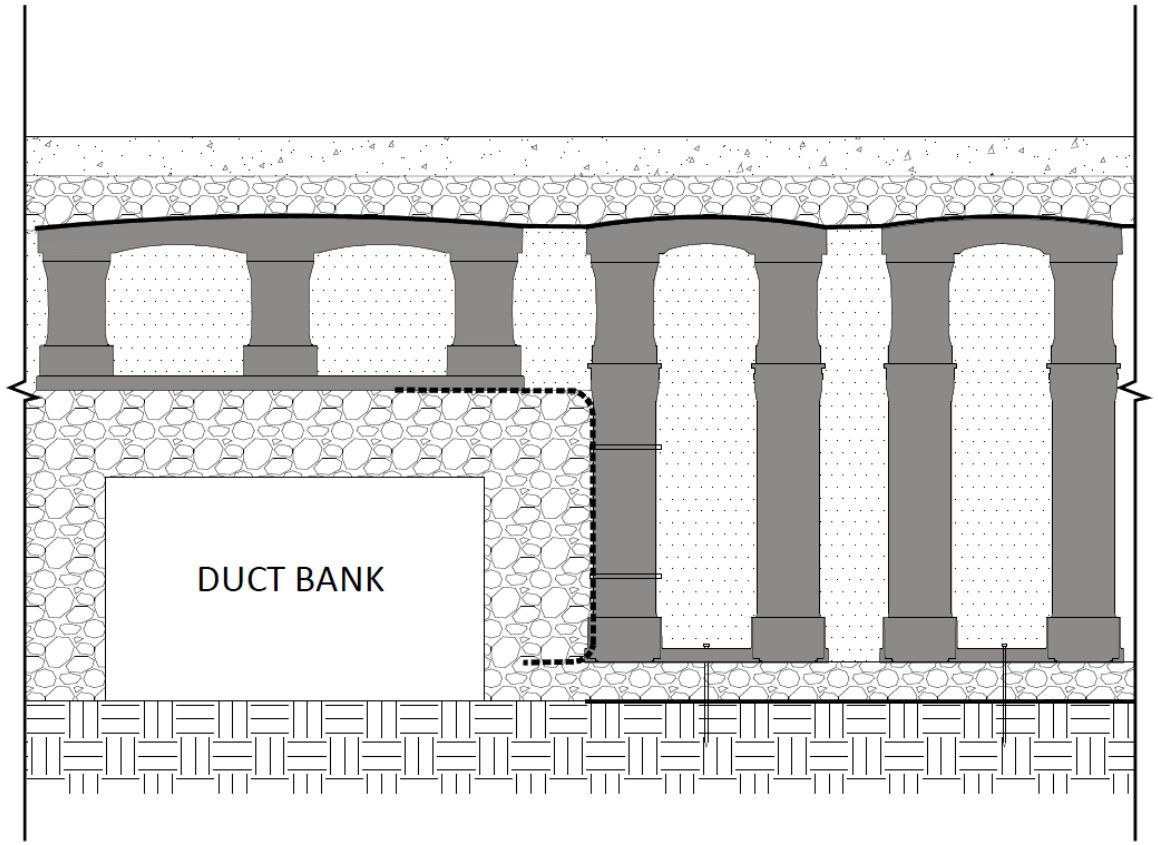
ALTERNATIVE UTILITY INTEGRATION OPTIONS

DUCT BANKS AND SILVA CELLS

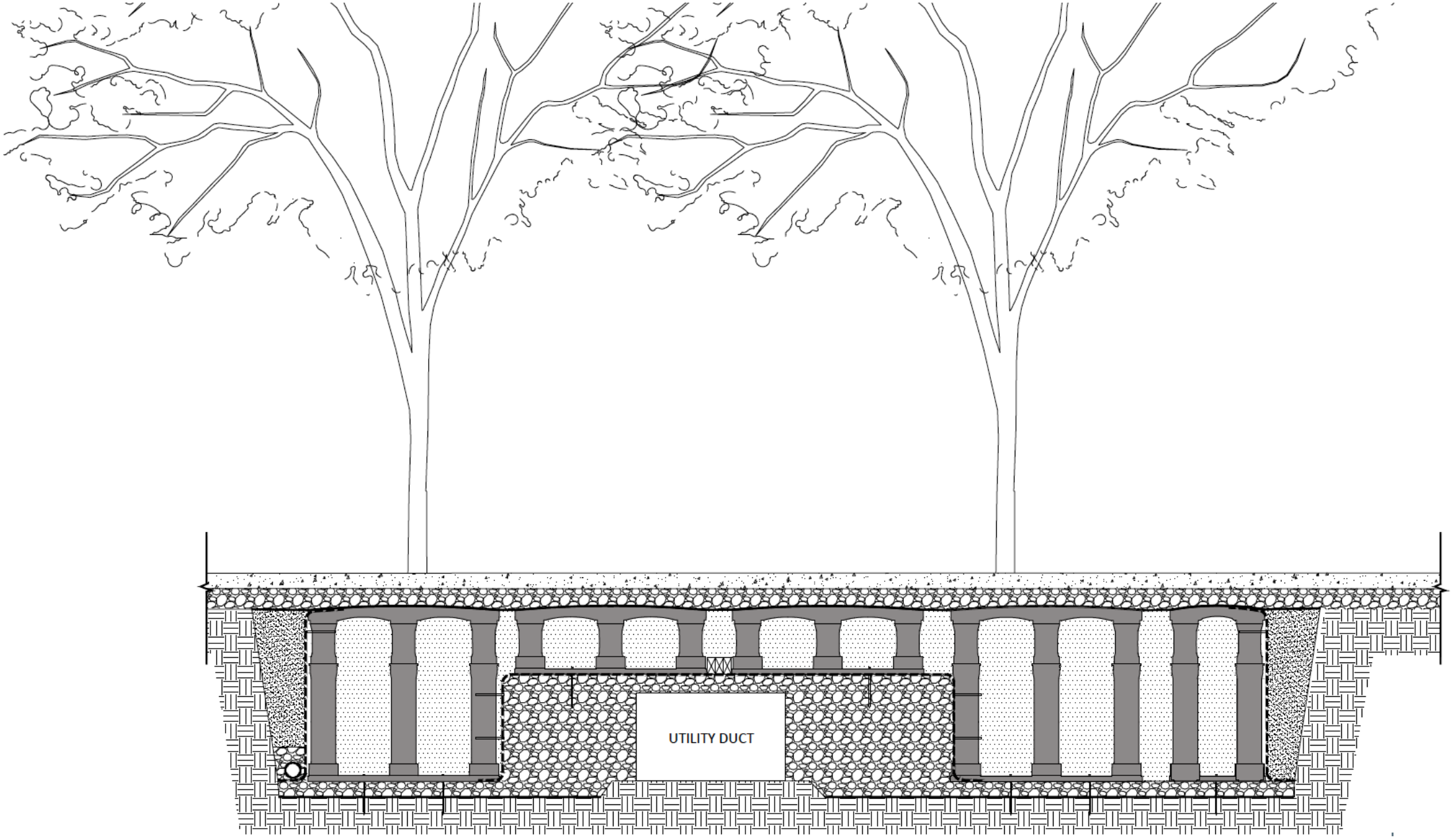
deeproot®



deeproot



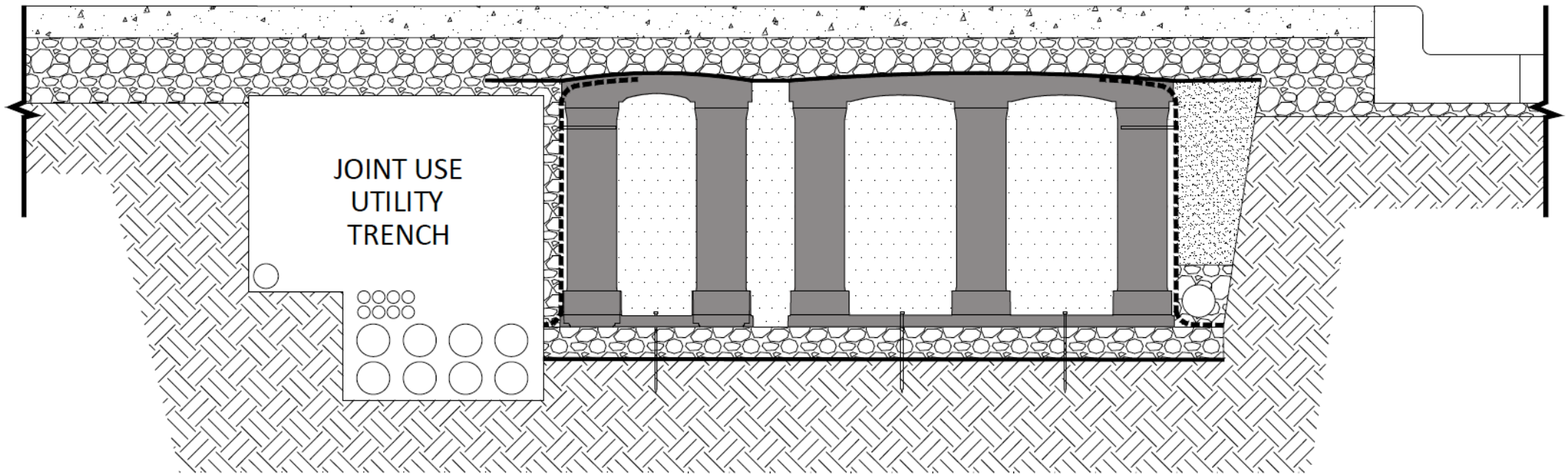
deeproot



deeproot


2 St SW

PLANNING FOR THE FUTURE



FUTURE UTILITY INSTALLATIONS AND REPAIRS

deeproot®

deeproot®

MAINTENANCE AND REPAIR MANUAL

Utility Repairs and New Installations

1. Locate

2. Excavate

3. Repair or Add Service (Lateral)

4. Replace Silva Cells

5. Replace Permanent Surfacing

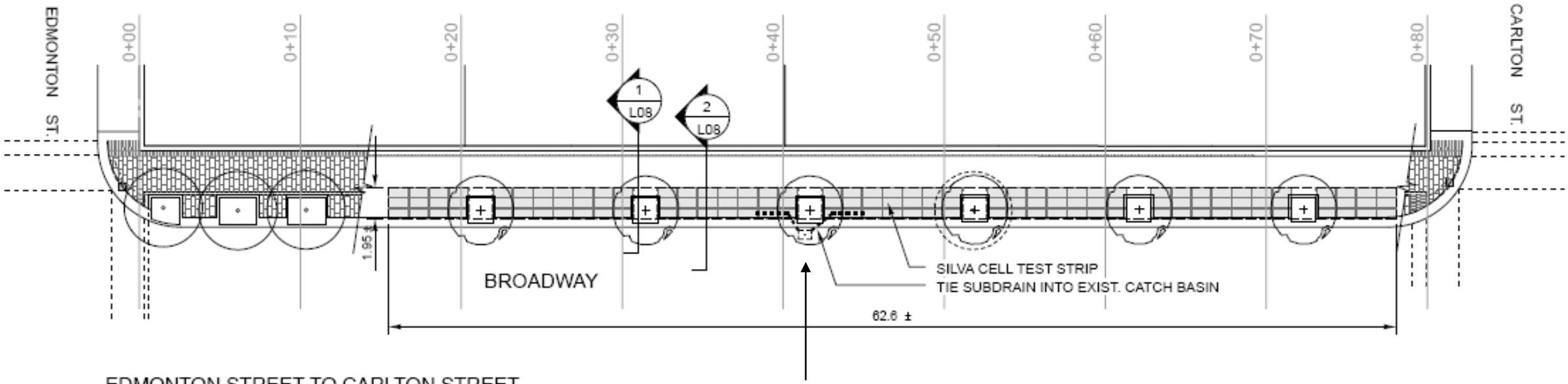
deeproot®

FUTURE UTILITY INSTALLATIONS AND REPAIRS

PROJECT: WATER SERVICE REPAIR, WINNIPEG

deeproot


373
TRAFFIC TICKET EXPERTS
Area of excavation



EDMONTON STREET TO CARLTON STREET

Site of installation

deeproot

The existing pavement is removed. In this case the existing pavers were salvaged for re -installment

The aggregate base is removed and the fabric covering the decks is cut and removed

deeproot

The Silva Cells are removed and the existing watermain exposed where the new connection will be

deeproot

Once the new service is installed, the excavation is backfilled to the bottom of the Silva frames

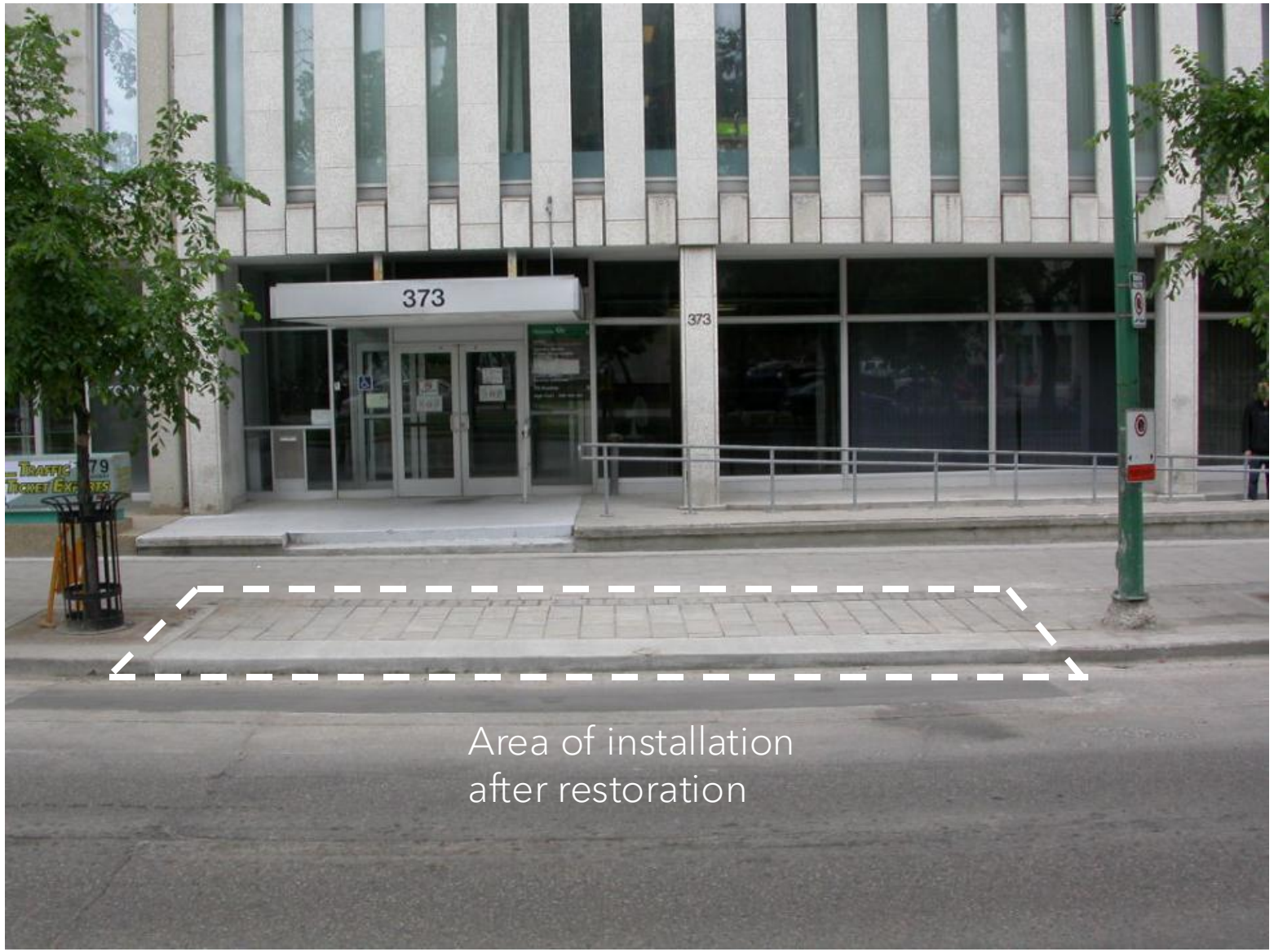
deeproot

The Silva Cells frames are re-installed and the existing irrigation and drain lines are run back through the cells

deeproot

The Silva Cell frames are filled with soil , the decks are attached and the geotextile fabric is patched

deeproot



The aggregate base is replaced, a new curb is installed, and the salvaged pavers are reinstalled to complete the restoration

deeproot

FUTURE UTILITY INSTALLATIONS AND REPAIRS

PROJECT: NASHDENE YARD, TORONTO

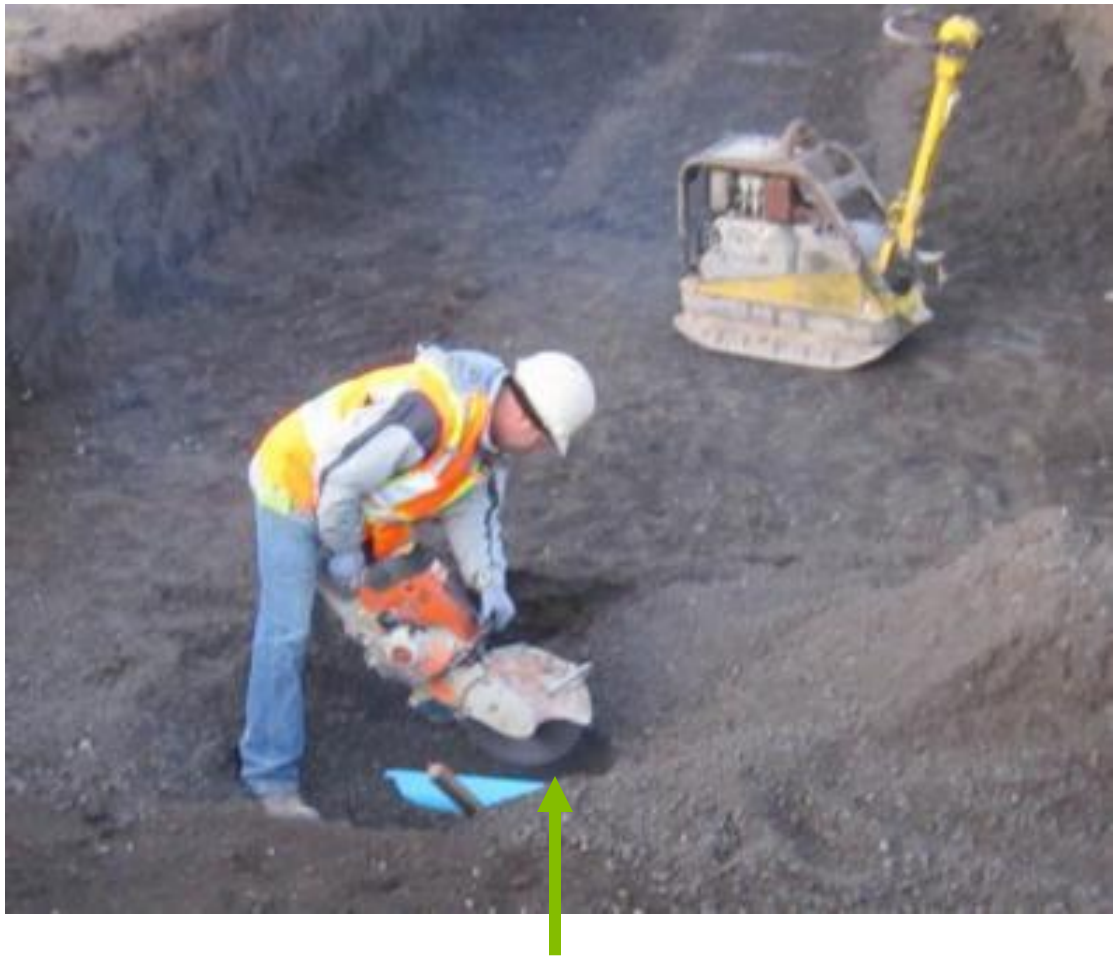
deeproot®


Silva Cells

Boring head or Pneumatic –gopher going in on one side

Boring head or Pneumatic–gopher coming out the other side

deeproot



Prior to constructing the Silva Cells, a PVC pipe was buried below the level of the Silva Cells to act as a watermain

A saw cut was made into the pipe to act like a break in the pipe

deeproot

A typical Silva Cell system is constructed over the buried pipe

deeproot

Silva Cell system with concrete pavement now over the top

Riser pipe and hose connection to the pipe buried under the Silva Cells

deeproot

A fire hose from a nearby hydrant was connected to the buried pipe via the riser pipe. When the hydrant was turned on, it flooded the area with water

**Due to the soil in the Silva Cells being loosely compacted, the water came to the surface very near to the location of the break rather than traveling underground*

deeproot


JCB

Click here to watch a video of the Silva Cell removal demo at the Nashdene Yard project in Toronto.

deeproot®

FUTURE UTILITY INSTALLATIONS AND REPAIRS

RESTORATION OPTIONS

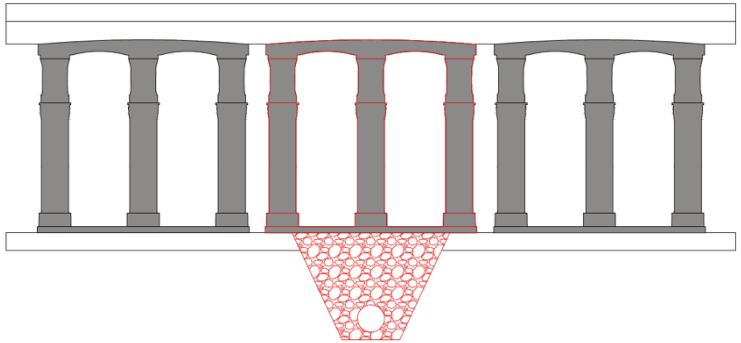
deeproot®

Restoration Options

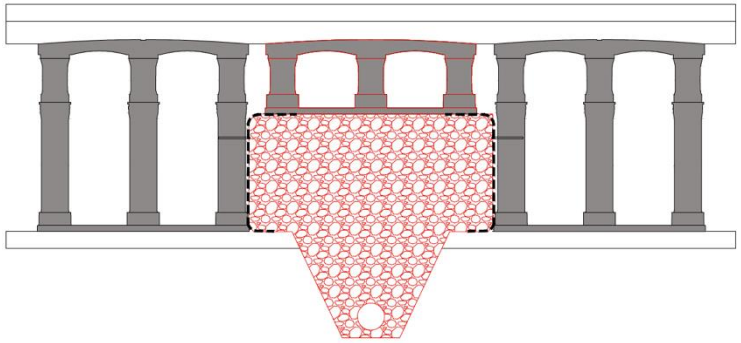
1. Restore the area temporarily at the time of the repair and do the permanent restoration at a later date.

2. Restore the area permanently at the time of the repair using one of three permanent restoration options.

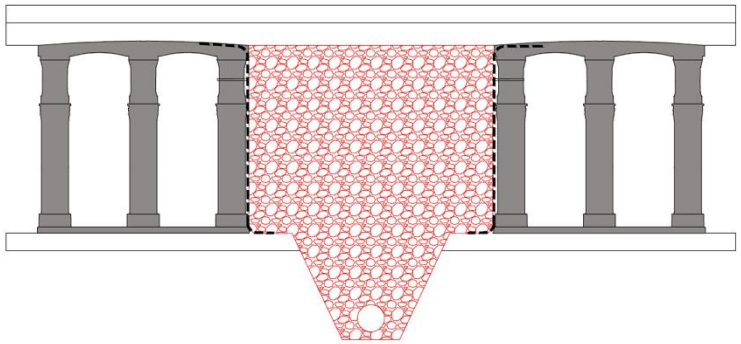
Option 1 – fill/compact the excavation to the bottom of the Silva Cells and re install new or salvaged frames and decks



Option 2 – fill/compact the excavation up to the bottom of the uppermost layer of Silva Cells and re install a single layer of frames and decks



Option 3 – fill/compact the excavation to the bottom of the Silva Cells, install geogrid around the perimeter of the remaining opening and fill with compacted soil, clear stone or flowable fill/U-fill (in the case of flowable fill, try to establish some link between adjacent soil volumes)



deeproot®

CONCLUDING THOUGHTS

Concluding Thoughts

-Many Options for Utility Integration with Silva Cells

-Plan for the Future Whenever Possible

-Planned/Emergency Repairs are Simple with Silva Cells, with Various Restoration Options Available

THANK YOU!

DeepRoot Green Infrastructure, LLC
www.deeproot.com
info@deeproot.com
Toll Free: 800 561 3883