

# THE KING'S HIGHWAY No.7

NOT SUITABLE FOR TENDER

## NOTES:

### A. SCOPE

- This set of drawings depicts a Temporary excavation shoring design consisting of a soldier pile and lagging system with tiebacks for the excavation of the project at 3201 Highway 7 to a maximum depth of 20m and maximum duration of 24 months.

### B. REFERENCES

- Architectural drawings "P Levels November 2017 - under ROK", by IBI Group, received November 24, 2017.
- Geotechnical Report by McLymont and Rak, dated November 2017.
- Topographical Survey 16-12-2011 by KRSCHNER Surveyors Ltd. plotted June 27, 2017.
- Utility drawings 4443-EX-BP.DWG sent by Schaeffer 4 Associates Ltd., on July 18, 2017.
- Structural drawings 5-101, 103, 202, 204 and 301 of pre-existing Hilton Garden structure.
- Grading Plan drawing SG-2 by Schaeffer Consulting Engineers received on 17.12.01.

### C. DESIGN

- Design complies with the Ontario Building Code 2012.
- Shoring designs are intended to be temporary and have a limited design life. Design assumes construction of the permanent structure to replace the temporary shoring within 24 months of commencement of excavation.
- Pressure:  $P = K \cdot (YH) + \text{plus building surcharge(s)}$

Where:

$$K = 0.28$$

$$Y = 21.7 \text{ kN/m}^3$$

$$H = 12 \text{ kPa}$$

$$H = \text{depth of cut}$$

- Post grouted tieback anchorages = 10 kN/m - to be confirmed by testing. Test program to be designed by Shoring Engineer.
- Existing adjacent buildings are assumed to be in sound condition and to satisfy the requirements of the Ontario Building Code 2012.
- Any proposed Supernormal loads, such as crane outriggers or surcharges near top of shoring, in excess of uniform design surcharge assumed above must be provided for review and acceptance by Shoring Engineer prior to placement.

### D. MATERIALS

- Structural steel to be new or sound used material conforming to CSA G40.21, grade 50C4.
- Alternative grades or sections of equivalent strength may be substituted, subject to Shoring Engineer's approval.
- Concrete:
  - Pile toes 20 MPa
  - Fill above pile toes C-4 MPa
  - Tieback anchorages 30 MPa
- Lagging to be hardwood or full thickness shown.
- Helding to comply with CSA H54 and be performed by certified helters.

### E. GENERAL CONTRACTOR (G.C.) OR EQUIVALENT

- The G.C. has complete control over the sequencing of the Work and the means, methods, and procedures for execution of the Work, except as indicated under Procedures Section.
- Reduce grade to top of shoring and provide a level working surface suitable for shoring equipment. Build up working platforms where required.
- Excavate in advance to remove any underground obstructions that will interfere with pile installation. Backfill with clay or weak-mix.
- Utilities shown on the drawings are schematic only and are based on the utility drawings listed under References Section above. Locate and identify all underground and overhead services within the influence of the shoring project or relocate as necessary.
- Confirm elevation of utilities, including all sewer inverts, by lifting all maintenance hole covers. Report all locate confirmations and information to Shoring Engineer prior to drilling.
- Alter locating underground services, advise Shoring Engineer if there is any interference with the proposed pile locations and/or tieback locations that requires re-design.
- Excavation must be kept dry at all times. Dewater/in-water as needed.
- Groundwater table to be lowered a minimum of 1 m below base of excavation at all stages.
- Lay out pile locations and check all dimensions. Report any discrepancies immediately to Shoring Engineer.

### F. PROCEDURES

- Drill holes for piles, employing temporary liners, mud-drilling, and other techniques as necessary to prevent ingress of groundwater or loss of soil.
- Provide large enough holes that piles can be set plumb and to line, despite any misalignment of holes.
- Set piles, wedge in place and fill holes with specified concrete. Withdraw liners if used.
- Excavate in stages to suit shoring work.
- Install lagging in 1200 mm maximum lifts. Fill all voids behind lagging with granular on-site or imported material rammed in place.
- Open lagging bays to be lagged before end of work day. No lagging bays are permitted to be left open overnight.
- In wet ground or ground expected to become wet, provide suitable drainage system such as spacers to create 10 mm gap between lagging boards. Provide suitable filter material at gaps to allow seepage of groundwater without washing of fine soil particles.
- Install tiebacks expeditiously to minimize ground movements.
- Do not excavate more than 500 mm below tieback or brace levels until they are installed and/or stressed.
- Shoring Contractor to select tieback drilling methods to prevent ground loss.
- When grouting tiebacks, if grout lakes are observed to be abnormally higher than theoretical volume, cease work and notify appropriate site personnel and Shoring Engineer.
- Install 4 tiebacks in advance with additional strand area to allow testing to twice specified tieback cohesion. Base working tiebacks on results of tests.
- Proof test all other tiebacks to 133 x design load, hold for ten minutes and if no appreciable creep is observed reduce to design load and lock in. Halt stressing if pile moves out of site more than 10 mm, 3 mm at adjacent structures, unless otherwise directed by Shoring Engineer.
- Monitor tieback stressors in good order to allow for re-stressing if necessary to control lateral movements.
- Any tiebacks less than 3m from grade which are within the City's property are to be distressed.

### G. EXCAVATION

- Excavator to dig in lifts per procedures, never over-excavating beyond design or Shoring Contractor's requirements.
- Excavation to be provided accurate excavation wall lines by G.C. At lagged walls, surveyed lagging position to be provided to Excavator by G.C.
- G.C. to supervise Excavator's trim line at shoring face. Do not excavate within 3000 mm of wall trim line unless G.C. is present.
- Exercise additional caution when excavating below the groundwater table.
- Excavation to report any wall breaches or shoring damage immediately. Backfill and berm material at any such location and report to Shoring Contractor, G.C. and Shoring Engineer promptly. Cease further excavation in the area.
- G.C. to flag installed shoring system below grade prior to excavation. Excavator to exercise care when digging near stressed anchors/rakers.

### H. MONITORING BY OWNER

- Make pre-construction survey of nearby buildings, including structural assessment of their condition.
- Make trial holes/test pits to locate underside of existing foundations.
- Monitor movement of shoring throughout construction at least once a week during active excavation. Report results promptly to the Shoring Engineer.
- Provide pile survey monitoring by visual survey per City of Vaughan requirements, including verticals.
- Provide minimum 4 inclinometers as shown.
- All monitoring reports to be distributed promptly to Shoring Engineer and the Shoring Contractor.

### I. FROST PROTECTION BY GENERAL CONTRACTOR

- Protect shoring and/or soil face from the effects of frost.
- Provide protection at existing buildings to prevent effects of frost.
- Affix minimum R4 frost blankets tight to shoring walls between November 1 and March 31. Leave appropriately sized holes to view monitoring targets. Note, additional insulation (R2 to R12) and/or heating and insulation tent may be required to protect shoring supporting existing structures or sensitive services. During prolonged cold weather, heating may be required to combat damaging frost effects.

### J. SAFETY

- All work to be carried out in accordance with the Occupational Health and Safety Act.
- Fall prevention measures (guard rails or equivalent, designed to suitably required safety codes) shall be placed around entire shoring perimeter to allow access to top of shoring for inspection and/or monitoring.

2	RE-ISSUED FOR S.P.A.	17.12.08
1	ISSUED FOR S.P.A.	17.08.15
No.	DESCRIPTION	DATE
	ISSUE / REVISION	
	DESIGN: T.F.	
	DRAWN: C.B./M.B.H.	
	SCALE: 1:2000, 1:20	
	DATE: 17.07.24	
	PRINT: 17.12.08	

**SHERWOOD**  
GEOTECHNICAL ENGINEERS  
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Mississauga, Ontario L5L 5M5  
T: 905.820.3480 F: 905.820.3492  
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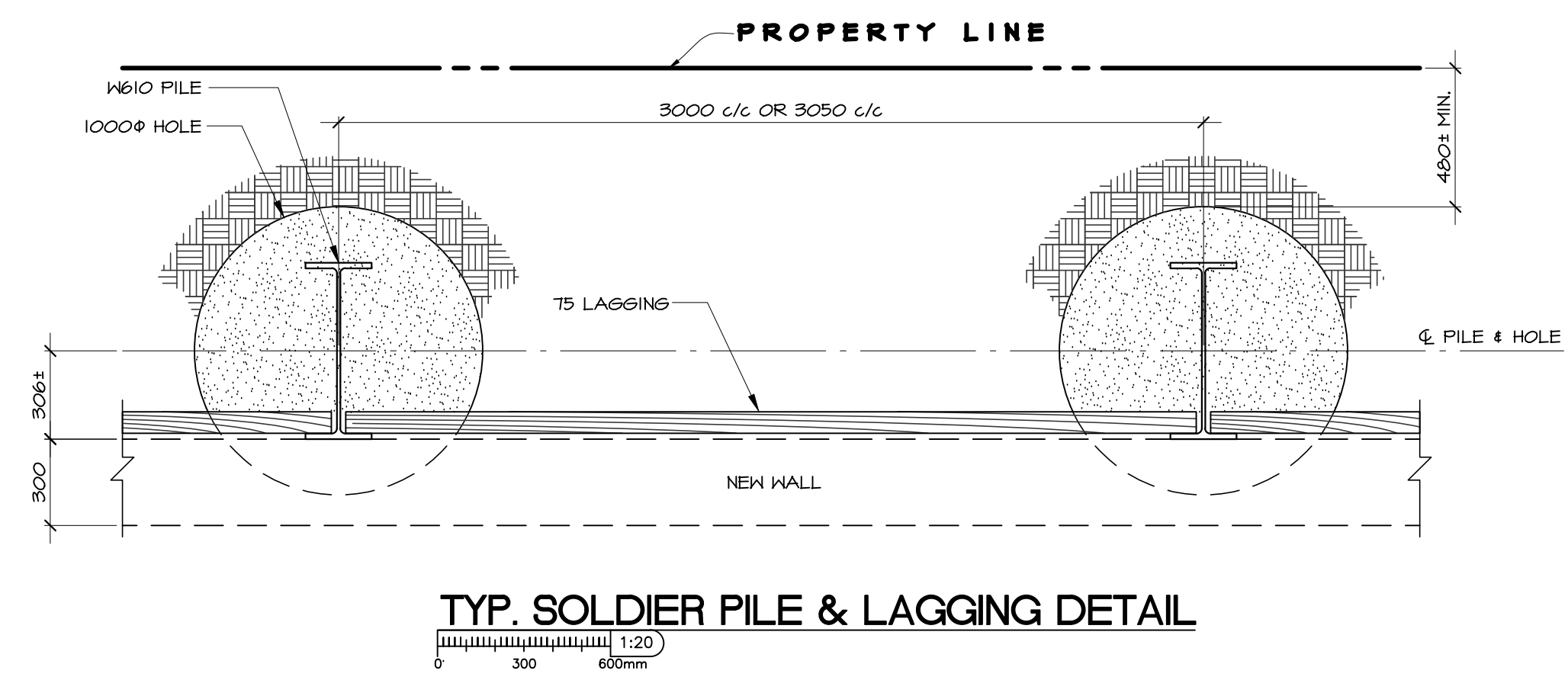
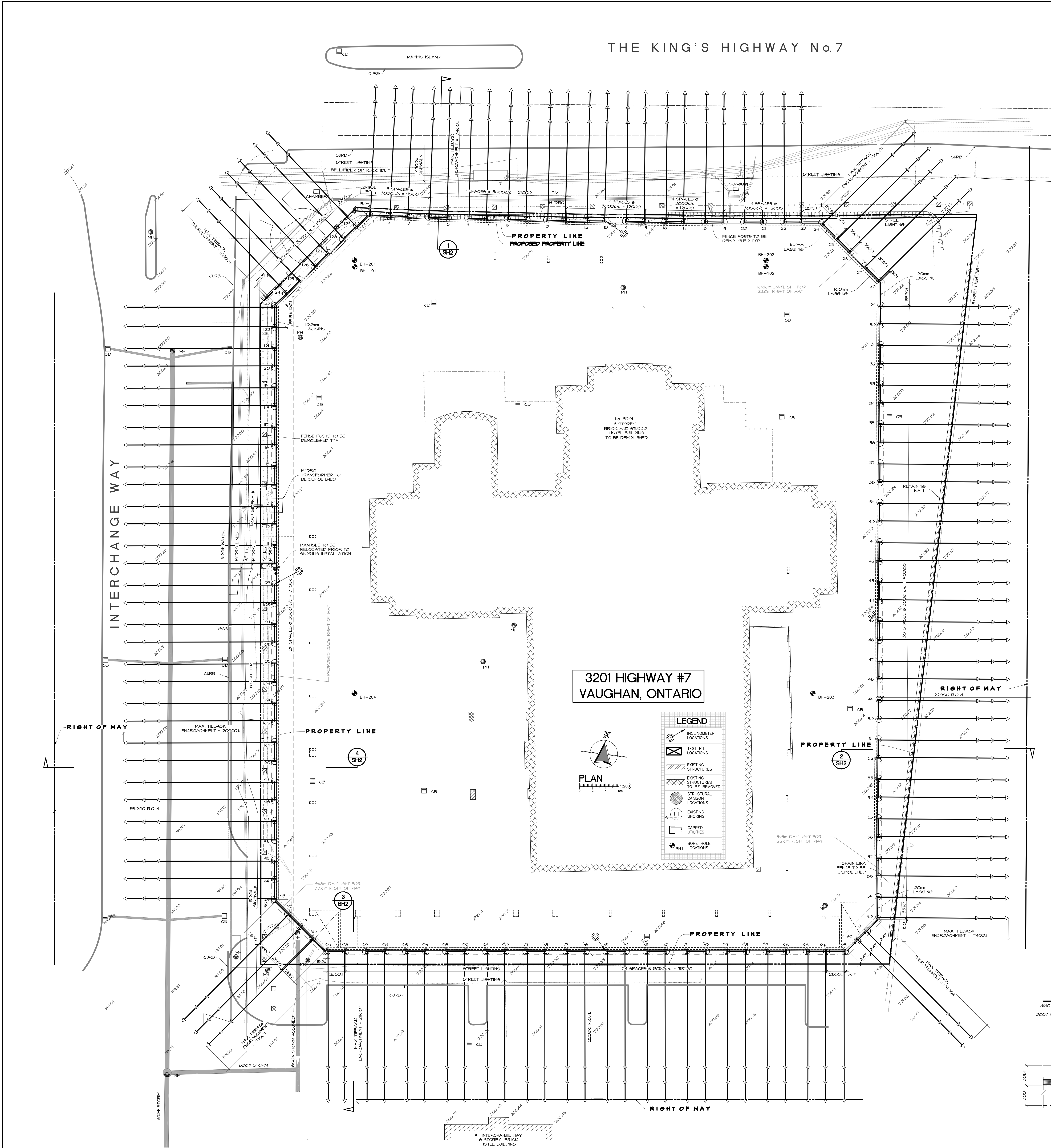
Easton's Group / Gupta, Group  
3100 Steeles Ave., Suite 601  
Markham, Ontario, L3R 8T3

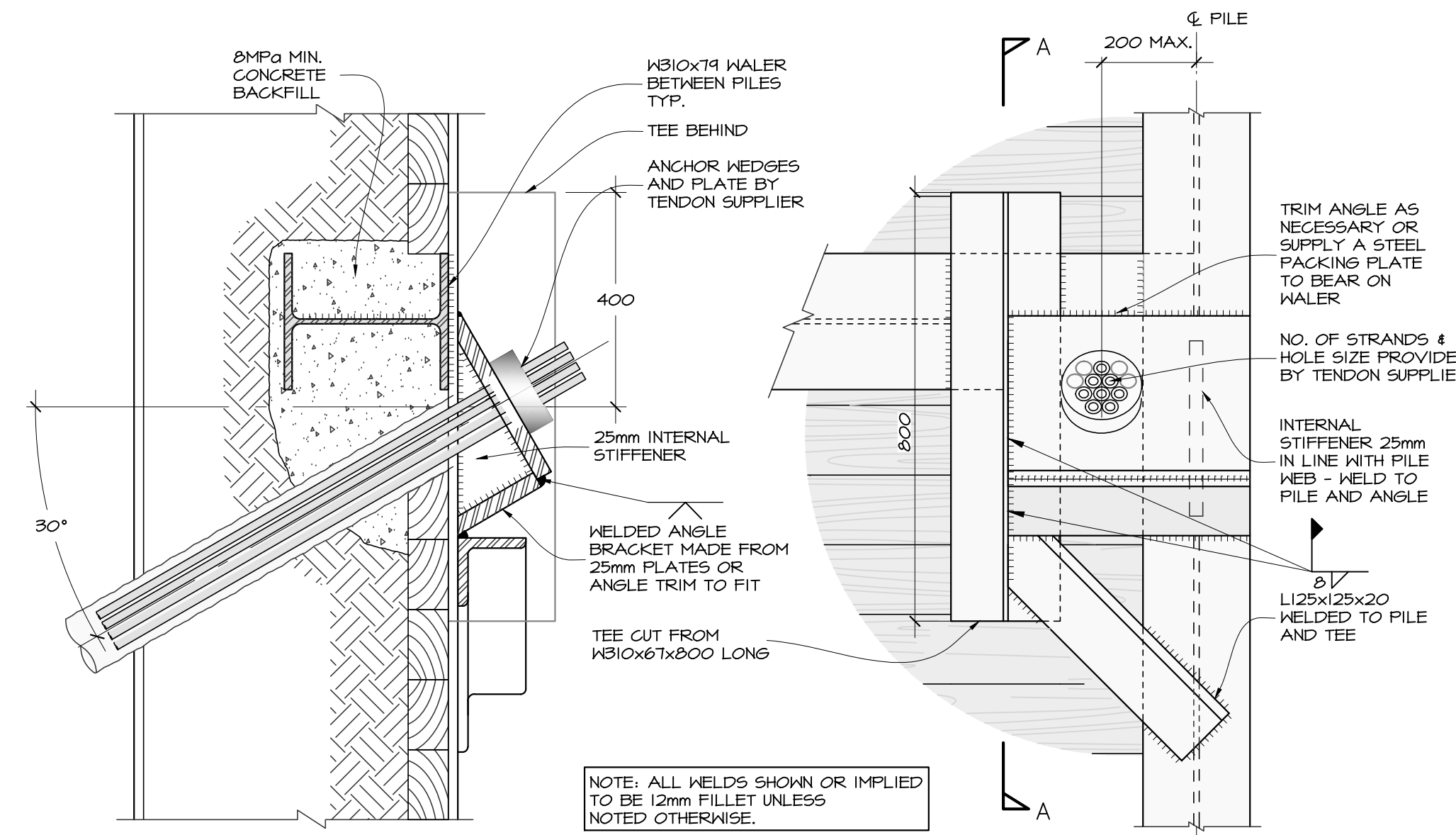
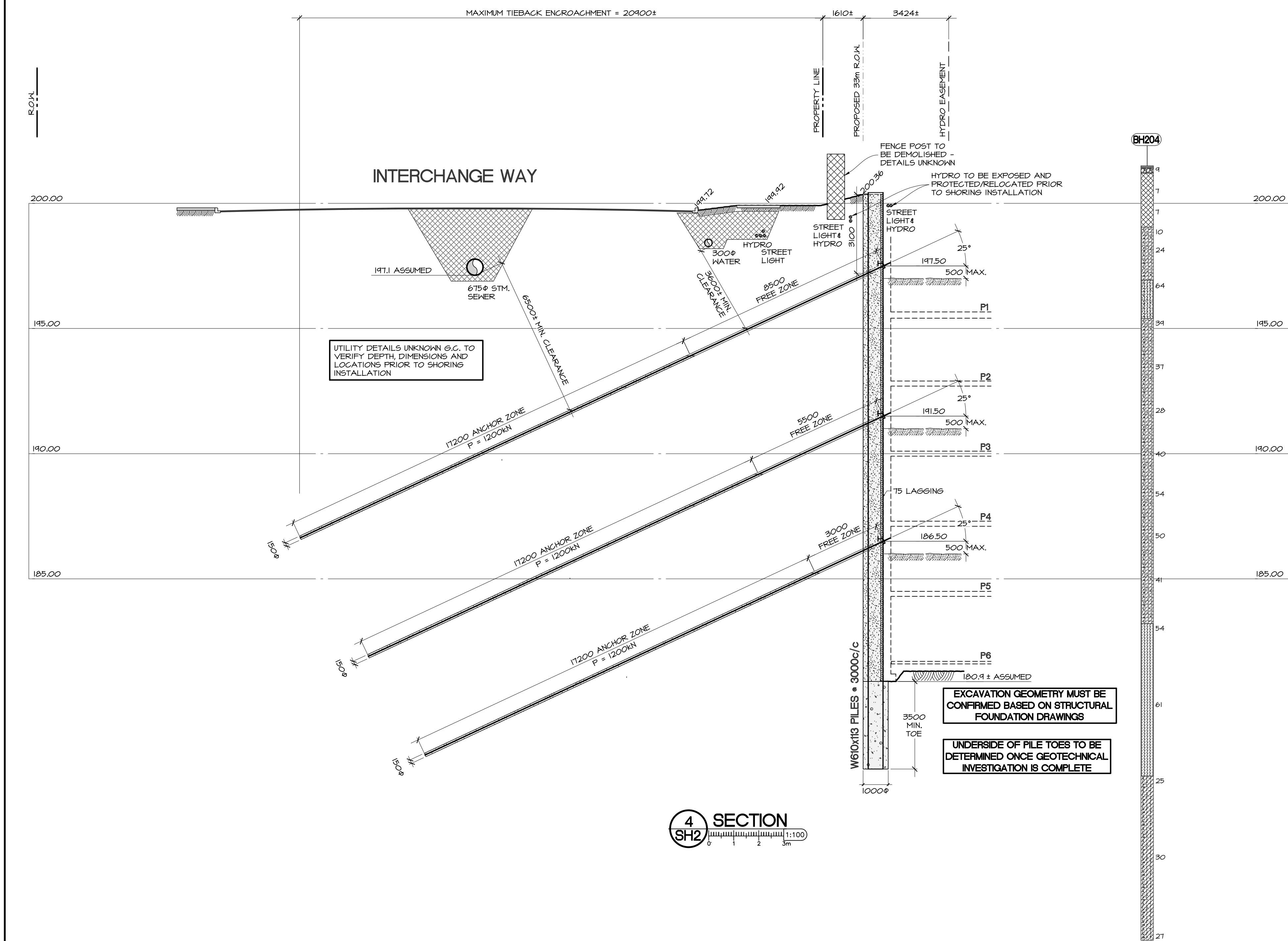
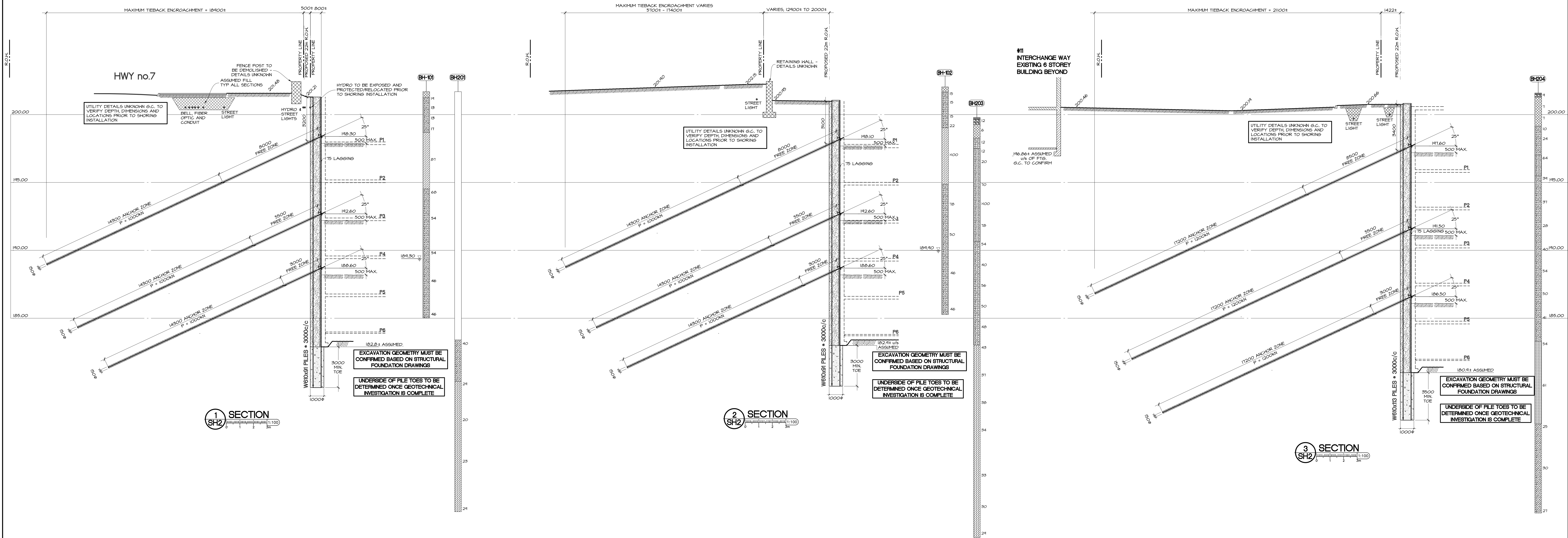
#3201 Highway 7  
Vaughan, Ontario

EXCAVATION SHORING

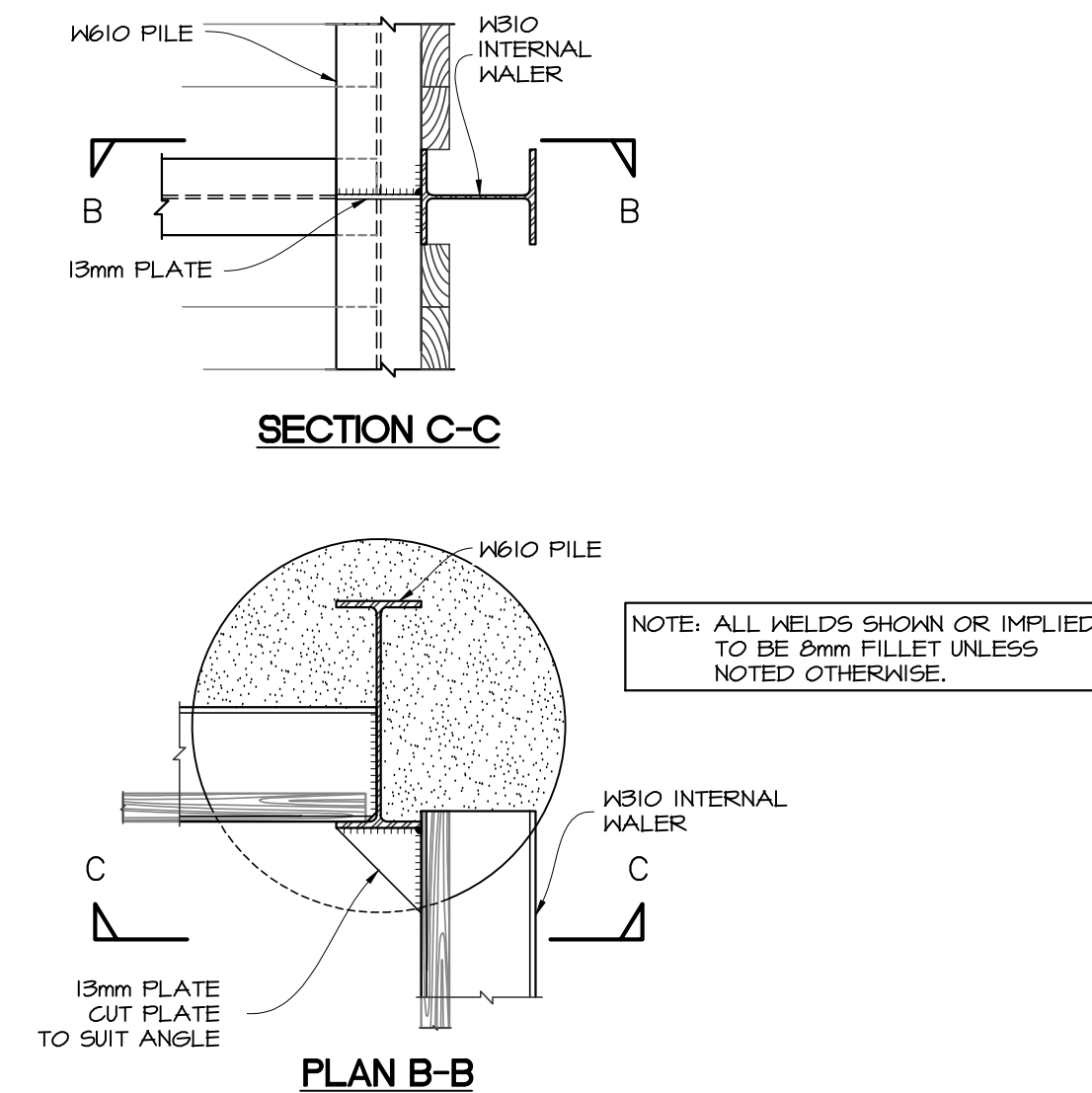
PLAN, NOTES & DETAIL

JOB NO.	16.055	DWG. NO.	SH1
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TYPICAL SOLDIER PILE AND LAGGING  
TIEBACK CONNECTION DETAIL  
LOADS 900KN-1200KN



SOLDIER PILE AND LAGGING CORNER DETAIL

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