



**re: Settlement Monitoring Program – Existing Trunk Sewer
Proposed Residential Development
1125 - 1149 Cryville Road - Ottawa**
to: Westrich Pacific Corp. - Mr. David Sanche – dsanche@westrichpacific.com
to: HP Urban – Mr. Peter Hume – peter.hume@hpurban.ca
date: August 29, 2023
file: PG6072-MEMO.02

Further to your request and authorization, Paterson Group (Paterson) prepared a settlement monitoring program for the existing Trunk Sewer during construction of the proposed development at the aforementioned site. This trunk sewer bisects the central portion of this site in an approximate west-east direction.

This memo should be read in conjunction with the Geotechnical Investigation Report Paterson Group Report PG6072-1 Revision 1 dated August 29, 2023.

1.0 Background

Based on review of available design drawings, it is understood that an existing storm trunk sewer bisects the subject site between proposed Buildings A and B in an east-west direction. It is further understood that minimal room is available between the excavations for the proposed buildings and the sewer pipe. It is recommended that a settlement monitoring program is completed on the storm trunk sewer pipe throughout the duration of construction, until the excavation is backfilled.

Subsurface Profile

Based on the geotechnical investigation completed by Paterson, the subsurface profile at the subject site generally consists of pavement structure, topsoil or crushed stone fill at ground surface underlain by brown silty clay with gravel. A weathered shale bedrock was encountered below the above noted layers at all borehole locations. Given the depth of the existing trunk sewer, it is expected that the sewer is founded on the bedrock surface.

2.0 Proposed Monitoring Configuration and Locations

During the excavation for the proposed development, the existing sewer pipe will require settlement monitoring during construction of the proposed underground parking levels. Three (3) settlement monitoring points are recommended to be installed directly on top of the 1,900 mm diameter trunk sewer pipe for monitoring settlement. The approximate monitoring point locations are presented on the drawing attached to the current memorandum.





The settlement monitoring points shall consist of a length of 35 mm x 35 mm standard steel bar within a 200 mm diameter corrugated plastic sleeve. An approximately 50 mm thick concrete levelling pad shall be poured directly over the sewer pipe, followed by the placement of a 100 mm x 100 mm x 12 mm steel plate which shall be cast into the top of the concrete levelling pad. The annular spaces between the hydro-vac hole and sleeve pipe will be filled with bentonite.

The settlement monitoring points shall be used to monitor vertical displacement (settlement) only. Refer to Figure 1, attached to the current memorandum, for a detailed illustration of the monitoring point construction. It is recommended the excavation for the monitoring points to be completed using the hydro-vacuum/hydro-excavation methodology to avoid any disturbance to the existing sewer pipe and the backfill surrounding it.

The settlement monitoring points will be removed at the completion of construction. Rods, survey targets, and sleeve pipes shall be removed, and the remaining hole backfilled with bentonite pellets and sand.

The inclinometer casing will consist of 70 mm diameter, PVC or ABS resin pipe, and will be installed to the bedrock surface.

Proposed Monitoring Frequency and Methodology

Three (3) monitoring points will be installed directly on the top of the 1,900 mm storm trunk sewer pipe prior to any site works. A baseline survey will be completed daily for 3 days prior to the start of construction. The monthly monitoring results shall be provided to the city inspector/site superintendent at the time of pre-construction.

The settlement monitoring points will then be surveyed daily for the first week of excavation in the vicinity of the existing trunk sewer, and then weekly until the foundation excavations in the vicinity of the existing trunk sewer have been backfilled.

All survey measurements will be referenced to 2 benchmarks with established geodetic elevations, such as a sewer manhole cover and/or a fire hydrant arrowhead, located in the vicinity of the site but outside the zone of influence of potential settlement. The monitoring points will be surveyed using a traditional manual survey.



3.0 Settlement Criteria

Following the establishment of the baseline elevation (average of the pre-construction readings) at each settlement monitoring point, the following thresholds and exceedance protocol provided in Table 1, on the next page, are recommended during construction activities:

Settlement Value	Description of Event	Contractor Required Action
Up to 10 mm	<i>Allowable Level</i>	- Work may continue, no action required.
10 to 14 mm	<i>Review Limit</i>	<ul style="list-style-type: none">- Immediately notify all relevant emergency contact parties within 24 hours of the survey.- Complete an additional survey of all monitoring points for confirmation of the readings. Give verbal notification of the results to the Contract Administrator within 1 hour of the additional survey and a written report within 24 hours.- Review the potential cause of the settlement and adjust the monitoring program as required.- Work may continue, however the contractor should give consideration to adjusting construction activities accordingly to minimize potential further movement.
Over 15 mm	<i>Alert Limit</i>	<ul style="list-style-type: none">- Stop excavation work immediately.- Immediately notify all relevant emergency contact parties within 2 hours of the survey.- Complete an additional survey of all monitoring points for confirmation of the readings. Give verbal notification of the results to the Contract Administrator within 1 hour of the additional survey and a written report within 24 hours.- Complete a geotechnical review of the site within 12 hours to identify any obvious visual indications of ground subsidence, movement, sink holes, etc.- Complete a structural review of the affected structure(s) within 12 hours.- Notify all relevant emergency contact parties of the additional survey, geotechnical, and structural reviews within 24 hours.- Coordinate a meeting with the owner, construction manager, and all relevant emergency contact parties to discuss the results, mitigative actions, and plan for moving forward.- Construction work shall not begin until the meeting group has reached a conclusion and appropriate actions are implemented.



4.0 Monitoring Reports

Monthly settlement monitoring reports will be prepared and submitted to the construction manager/City inspector presenting the following information:

- Settlement data
- Summary of non-compliance, where applicable
- Mitigation measures, where applicable (when review and action levels are exceeded)

We trust that this information satisfies your immediate requirements.

Best Regards,

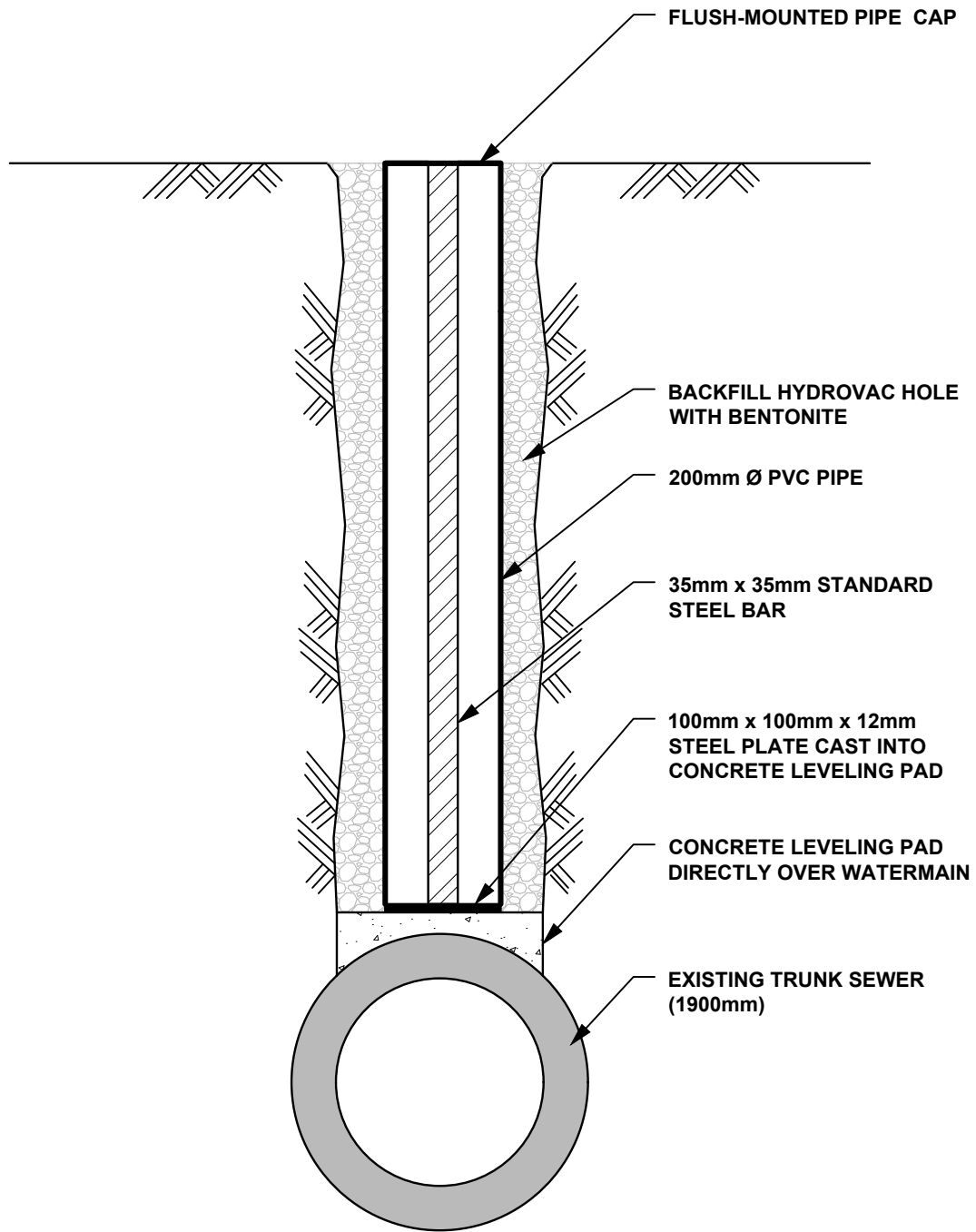
Paterson Group Inc.

Puneet Bandi, M.Eng.

Aug.29 2023

Maha K. Saleh, M.A.Sc., P.Eng.





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WESTRICH PACIFIC CORP

**PROPOSED MULTI-STOREY BUILDINGS
1125 - 1149 CRYVILLE ROAD
OTTAWA, ONTARIO**

Title:

**SEWER TRUNK SETTLEMENT
MONITORING POINT INSTALLATION**

Date:

09/2023

Report No.:

PG6072-MEMO.02

Scale:

N.T.S.

Drawing No.:

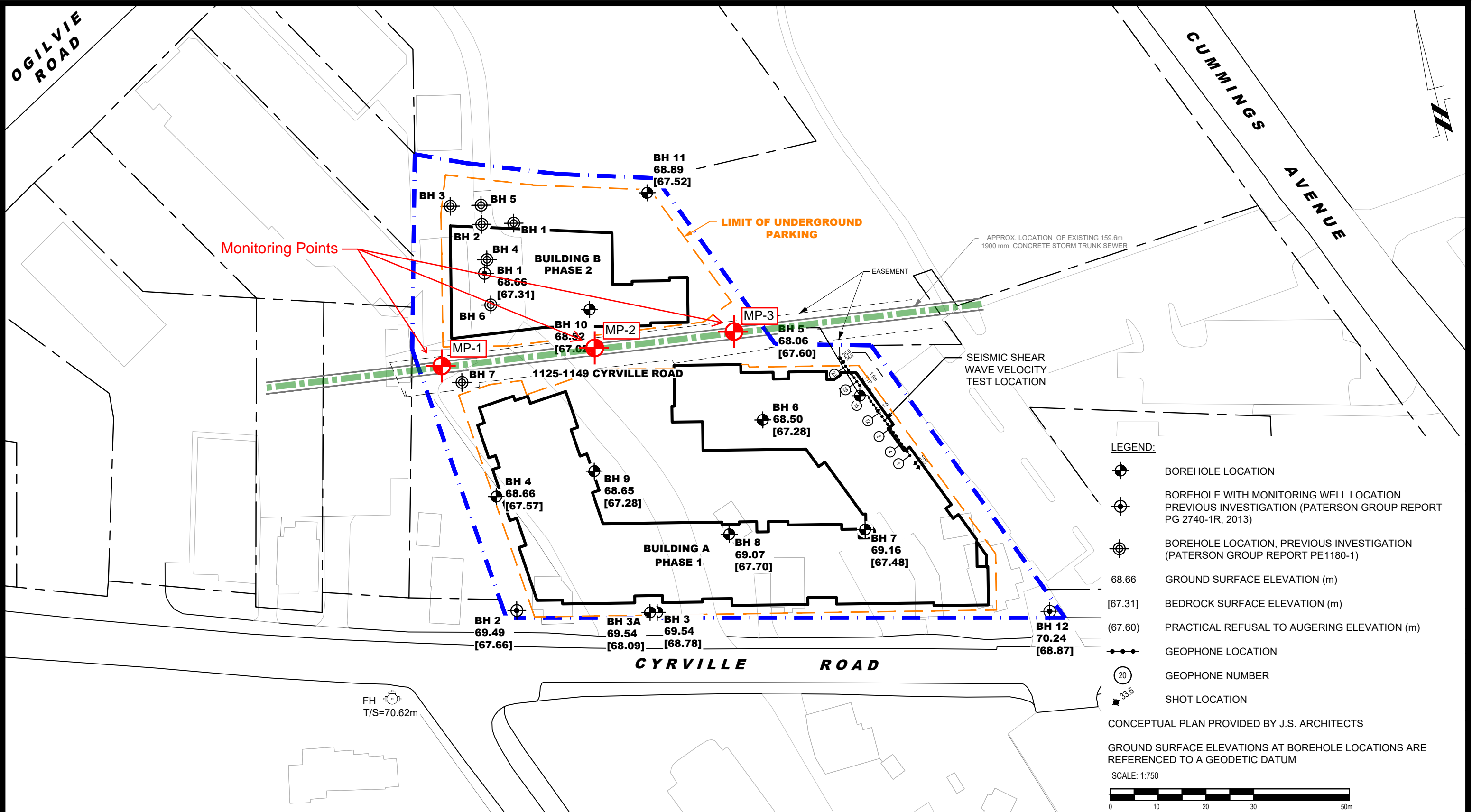
FIGURE 1

Drawn by:

NFRV

Checked by:

MS



NO.	REVISIONS	DATE	INITIAL
1	REVISED WITH UPDATED BUILDING B AND UNDERGROUND PARKING LAYOUTS.	08/08/2023	OC

WESTRICH PACIFIC CORPORATION
GEOTECHNICAL INVESTIGATION
PROPOSED MULTI-STOREY BUILDINGS
1125-1149 CYRVILLE ROAD

OTTAWA, ONTARIO

Title: **MONITORING POINT LOCATION PLAN**

Scale:	1:750	Date:	11/2021
Drawn by:	YA	Report No.:	PG6072-MEMO.02
Checked by:	OC	Dwg. No.:	PG6072-1
Approved by:	MS	Revision No.:	1

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