PATERSON GROUP

memorandum

re: **Geotechnical Design Summary Details**
Proposed Residential Development
Riverside South Phase 15-1B – Block 196 – 910 Solarium Avenue, Ottawa

to: Urbandale – **Ms. Christa Jones** – cjones@urbandale.com

date: February 16, 2023

file: PG5131-MEMO.05

Further to your request and authorization, Paterson Group (Paterson) prepared the current memorandum to provide the geotechnical design summary details for the aforementioned project. The following memorandum was prepared based on the design and construction recommendations and precautions provided by Golder in their Geotechnical Investigation Report 1406631-3 Revision 3 dated June 2019 and prepared for the subject site

Relevant design information is presented in Table 1 – Summary of Design Details for the subject blocks and lots. The relevant design and inspection information includes the following:

- ❏ Legal lot/block number
- ❏ Original grade elevations
- ❏ Proposed finished grade elevations
- ❏ Maximum permissible grade raise
- ❏ Proposed USF elevation
- ❏ Bearing resistance values at SLS
- ❏ Seismic site class
- ❏ Estimated engineered fill thickness beneath footings
- ❏ Lightweight fill (LWF) recommendations

Grading Plan Review

Paterson reviewed the following grading plan prepared by IBI Group for Block 196 of Phase 15-1B within the aforementioned development:

- ❏ Grading Plan – 910 Solarium – Project No. 103291 – Drawing No. 204 – Revision 2 dated October 4, 2022.

Based on our review of the aforementioned grading plan, the proposed grades are within the permissible grade raise restriction of **2.1 m** provided throughout the subject phase/block of the proposed development and in the aforementioned geotechnical report. Therefore, the proposed grading is considered acceptable from a geotechnical perspective and no lightweight fill or other considerations to accommodate the proposed grades are required at this time. Table 1 attached to this memorandum provides a grading summary of the subject buildings based on our grading plan review.

Bearing Resistance Values for Foundation Design

Based on our review of the above-noted grading plan, it is expected that the proposed buildings will be founded over an undisturbed, soil bearing surface consisting of one of the following:

Table 1 - Bearing Resistance Values

Bearing Surface	Bearing Resistance Value at SLS (kPa)	Factored Bearing Resistance Value at ULS (kPa)
Stiff Silty Clay, Compact Glacial Till and/or Engineered Fill	75	110

Strip footings, up to 2 m wide, and pad footings, up to 5 m^2 in area, placed over an undisturbed, stiff silty clay bearing surface can be designed using the above noted bearing resistance values. A geotechnical resistance factor of 0.5 was applied to the above noted bearing resistances value at ULS.

Footings designed using the above noted bearing resistance value at SLS given above will be subjected to potential post construction total and differential settlements of 25 and 15 mm, respectively.

An undisturbed soil bearing surface consists of a surface from which all topsoil and deleterious materials, such as loose, frozen or undisturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of concrete for footings.

Tree Planting Restrictions

In accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines), a soils review of the site to determine applicable tree planting setbacks. Atterberg limits testing was completed for recovered silty clay samples at selected locations throughout the subject site by others.

Based on the results of the review by others, the following tree planting setbacks may be considered within the current phase of the proposed development.

Low/Medium Sensitivity Clay Soils

A low to medium sensitivity clay soil was encountered between design underside of footing elevations and 3.5 m below finished grade as per City Guidelines. Based on our Atterberg Limits test results, the modified plasticity limit generally does not exceed 40%. The following tree planting setbacks are recommended for the subject site. Large trees (mature height over 14 m) can be planted within the subject site provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g., in a park or other green space).

Tree planting setback limits may be reduced to 4.5 m for small (mature tree height up to 7.5m) and medium size trees (mature tree height 7.5 m to 14 m) provided that the following conditions are met:

- ❏ The underside of footing (USF) is 2.1 m or greater below the lowest finished grade must be satisfied for footings within 10 m from the tree, as measured from the centre of the tree trunk and verified by means of the Grading Plan as indicated procedural changes below.
- ❏ A small tree must be provided with a minimum of 25 m^3 of available soil volume while a medium tree must be provided with a minimum of 30 m^3 of available soil volume, as determined by the Landscape Architect. The developer is to ensure that the soil is generally un-compacted when backfilling in street tree planting locations.
- ❏ The tree species must be small (mature tree height up to 7.5 m) to medium size (mature tree height 7.5 m to 14 m) as confirmed by the Landscape Architect.
- ❏ The foundation walls are to be reinforced at least nominally (minimum of two upper and two lower 15M bars in the foundation wall).
- ❏ Grading surrounding the tree must promote drainage to the tree root zone (in such a manner as not to be detrimental to the tree), as noted on the subdivision Grading Plan.

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Swimming Pools, Above Ground Hot Tubs, Decks and Additions

The in-situ soils are considered to be acceptable for swimming pools. Above ground swimming pools must be placed at least 5 m away from the residence foundation and neighboring foundations. Otherwise, pool construction is considered routine, and can be constructed in accordance with the manufacturer`s requirements.

Additional grading around the hot tub should not exceed permissible grade raises. Otherwise, hot tub construction is considered routine, and can be constructed in accordance with the manufacturer's specifications.

Additional grading around proposed deck or addition should not exceed permissible grade raises. Otherwise, standard construction practices are considered acceptable.

We trust that the current submission meets your immediate requirements.

Best Regards,

Paterson Group Inc.

Drew Petahtegoose, B.Eng.

David J. Gilbert, P.Eng.

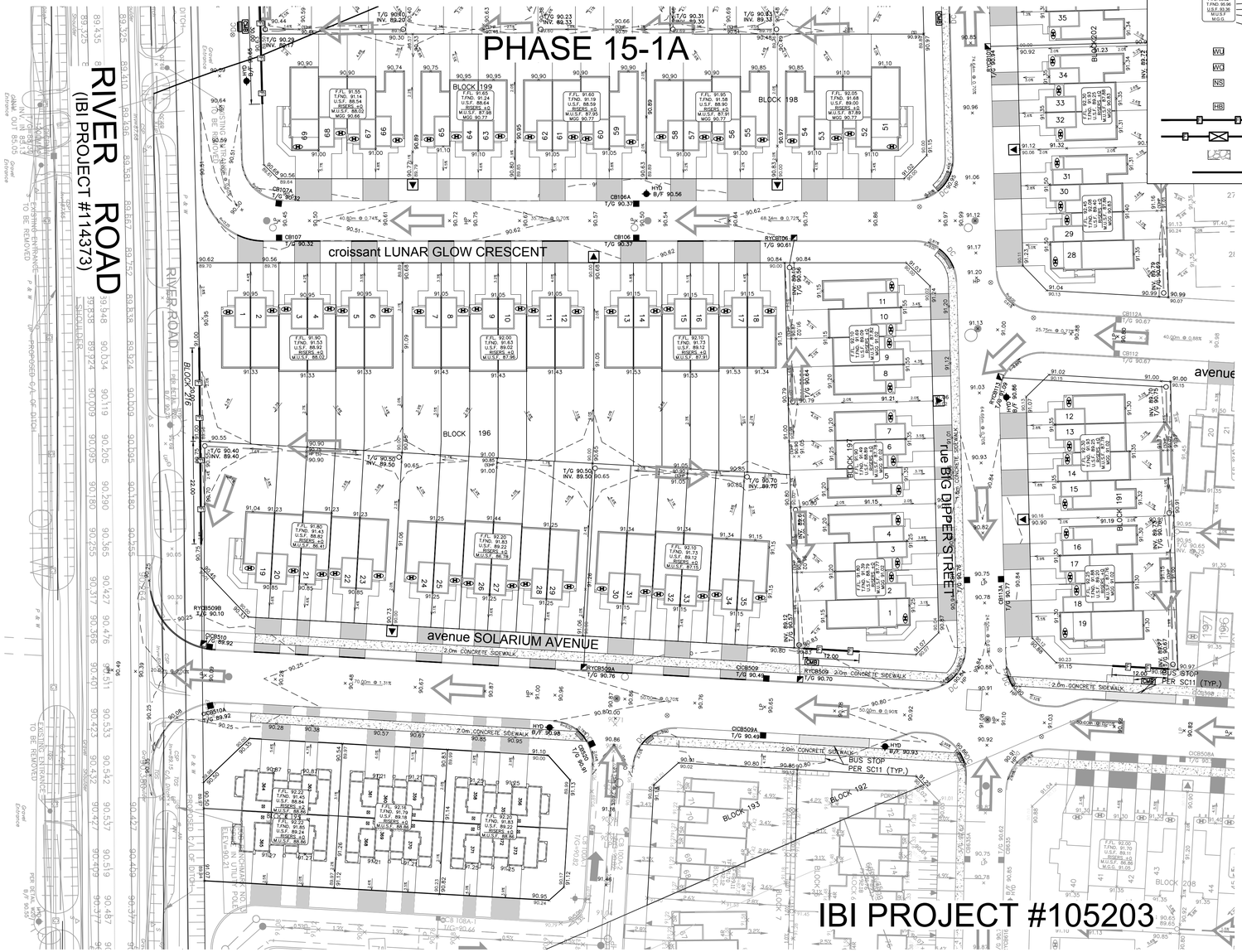
Attachments

- Table 1 – Summary of Design Details

Table 1 - Summary of Design Details - Riverside South - Phase 15-1B - Block 196 (910 Solarium Avenue)

Block / Lot Number	Unit	Civic Address/Street Name	Underside of Footing Elevation	Bearing Resistance Value at SLS	Original Ground Surface - Front	Existing Ground Surface - Front	Proposed Ground Surface - Front	Original Ground Surface - Rear	Existing Ground Surface - Rear	Proposed Ground Surface Rear	Engineered Fill Below USF Thickness Front (Ex. GS)	Engineered Fill Below USF Thickness Rear (Ex. GS)	Permissible Grade Raise	Above Permissible Grade Raise Front	Above Permissible Grade Raise Rear	Minimum Thickness LWF in Garage and Front Porch	Minimum Thickness LWF Extent from Building Face (m) (1.2 m or 2.4 m Along Front and Rear*, and Property Line Along Sides or a Max. of 1.2 m)	Seismic Site Class
			(m)	(kPa)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)		
1	1	1041 Lunar Glow Crescent	88.92	75	89.6	89.70	90.95	89.6	89.96	91.33	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	2	1039 Lunar Glow Crescent	88.92	75	89.6	89.70	90.95	89.6	89.96	91.33	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	3	1037 Lunar Glow Crescent	88.92	75	89.6	89.76	90.95	89.6	89.96	91.33	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	4	1035 Lunar Glow Crescent	88.92	75	89.6	89.76	90.95	89.6	90.00	91.33	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	5	1033 Lunar Glow Crescent	88.92	75	89.6	89.89	90.95	89.6	90.00	91.33	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	6	1031 Lunar Glow Crescent	88.92	75	89.6	89.89	90.95	89.6	90.00	91.33	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
2	7	1029 Lunar Glow Crescent	89.02	75	89.6	89.89	91.05	89.6	90.00	91.43	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	8	1027 Lunar Glow Crescent	89.02	75	89.6	89.89	91.05	89.6	90.00	91.43	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	9	1025 Lunar Glow Crescent	89.02	75	89.6	89.89	91.05	89.6	90.00	91.43	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	10	1023 Lunar Glow Crescent	89.02	75	89.7	90.00	91.05	89.6	90.00	91.43	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	11	1021 Lunar Glow Crescent	89.02	75	89.7	90.00	91.05	89.6	90.00	91.43	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	12	1019 Lunar Glow Crescent	89.02	75	89.7	90.00	91.05	89.6	90.00	91.43	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
3	13	1017 Lunar Glow Crescent	89.12	75	89.7	90.00	91.15	89.6	90.00	91.53	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	14	1015 Lunar Glow Crescent	89.12	75	89.7	90.00	91.15	89.6	90.00	91.53	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	15	1013 Lunar Glow Crescent	89.12	75	89.7	90.00	91.15	89.6	90.00	91.53	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	16	1011 Lunar Glow Crescent	89.12	75	89.7	90.00	91.15	89.6	90.00	91.53	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	17	1009 Lunar Glow Crescent	89.12	75	89.7	90.00	91.15	89.6	90.00	91.53	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	18	1007 Lunar Glow Crescent	89.12	75	89.7	90.00	91.15	89.6	90.00	91.53	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
4	19	932 Solarium Avenue	88.82	75	89.9	90.01	90.85	89.6	89.96	91.04	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	20	930 Solarium Avenue	88.82	75	89.9	90.00	90.85	89.6	89.96	91.23	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	21	928 Solarium Avenue	88.82	75	89.9	90.00	90.85	89.6	89.96	91.23	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	22	9226 Solarium Avenue	88.82	75	89.9	90.00	90.85	89.6	90.00	91.23	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	23	924 Solarium Avenue	88.82	75	89.9	90.00	90.85	89.6	90.00	91.23	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
5	24	922 Solarium Avenue	89.22	75	89.9	90.00	91.25	89.6	90.00	91.25	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	25	920 Solarium Avenue	89.22	75	89.9	90.00	91.25	89.6	90.00	91.25	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	26	918 Solarium Avenue	89.22	75	89.9	90.00	91.25	89.6	90.00	91.44	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	27	916 Solarium Avenue	89.22	75	89.9	90.00	91.25	89.6	90.00	91.44	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	28	914 Solarium Avenue	89.22	75	89.9	90.00	91.25	89.6	90.00	91.25	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	29	912 Solarium Avenue	89.22	75	89.9	90.00	91.25	89.6	90.00	91.25	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
6	30	910 Solarium Avenue	89.12	75	89.9	90.00	91.15	89.6	90.00	91.34	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	31	908 Solarium Avenue	89.12	75	89.9	90.00	91.15	89.6	90.00	91.34	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	32	906 Solarium Avenue	89.12	75	89.9	90.00	91.15	89.6	90.00	91.34	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	33	904 Solarium Avenue	89.12	75	89.9	90.00	91.15	89.6	90.00	91.34	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	34	902 Solarium Avenue	89.12	75	89.9	90.00	91.15	89.6	90.00	91.34	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E
	35	900 Solarium Avenue	89.12	75	89.9	90.00	91.15	89.6	90.00	91.15	n/a	n/a	2.10	0.00	0.00	n/a	n/a	E

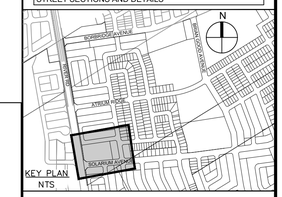
The following grading plan prepraed by IBI Group was reviewed as part of our submission:
Grading Plan - Drawing No. 204, Project No. 103291, Revision 2 dated October 4, 2022
The original ground surface provided herein is based on our review of ground surface elevation information obtained at the time of the investigaiton undertaken by others.
Bearing resistance values provided assume that the bearing surface is an undisturbed compact glacial till or stiff silty clay bearing medium. If another bearing surface is encountered during construction, the bearing surface should be inspected by Paterson to provide suitable bearing resistance values.



GRADING LEGEND

- PROPOSED DITCH C/W FLOW DIRECTION AND SLOPE
- SLOPE C/W FLOW DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED SPOT GRADE
- PROPOSED SWALE GRADE
- PROPOSED SWALE HIGH POINT GRADE
- LOT CORNER GRADE C/W EXISTING GRADE
- FULL STATIC PONDING GRADE
- RETAINING WALL C/W TOP OF WALL AND GRASS GRADE
- TERRACING 3:1 MAXIMUM UNLESS NOTED OTHERWISE
- PRESSURE REDUCING VALVE
- FINISHED FLOOR ELEVATION
- TOP OF FOUNDATION ELEVATION
- UNDERSIDE OF FOOTING ELEVATION
- MINIMUM UNDERSIDE OF FOOTING (Based on the higher of the sewer obverts, or hydraulic grade line)
- MINIMUM GARAGE GRADE
- WU — WALKUP UNIT
- WO — WALKOUT UNIT
- NS — NON-STANDARD FOUNDATION (Frost cover not provided for standard unit)
- HB — HIGHBACK UNIT (1.5m frost cover on footings)
- NOISE BARRIER LOCATION
- NOISE BARRIER GATE
- RIP-RAP
- TOWN HOUSE SPLITS

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



No.	REVISIONS	By	Date
14			
13			
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3			
2	REVISED PER CITY COMMENTS	L.M.E	2022:10:04
1	SUBMISSION 1 FOR CITY REVIEW	L.M.E	2022:07:21

Riverside South

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Project Title

910 SOLARIUM

LICENSED PROFESSIONAL ENGINEER
L. M. ERION
13379508
2022/10/04
PROVINCE OF ONTARIO

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Drawing Title

GRADING PLAN

Scale

5 0 5 10
1:500

Design	Date
L.E.	2022-07-20
Drawn	Checked
C.C.	L.E.
Project No.	Drawing No.
103291	204

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