

re: Grading Plan Review
Proposed Residential Development
3288 Greenbank Road - Ottawa

to: Caivan - **Mr. Zeyad Hassan** - zeyad.hassan@caivan.com

date: July 17, 2020

file: PG2743-MEMO.06

Further to your request and authorization, Paterson Group (Paterson) prepared the following memorandum to provide geotechnical responses to city comments regarding the proposed residential development at the aforementioned site. This memorandum should be read in conjunction with Paterson Report PG2743-2 dated March 6, 2019.

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:

- Street Name
- Legal lot/block number
- Original ground surface elevation
- Existing ground surface elevation
- Proposed finished grade elevation
- Maximum allowable grade raise
- Bearing resistance values
- Proposed USF elevation
- Lightweight fill (LWF) recommendations
- Seismic site class

Grading Plan Review

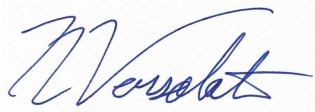
Paterson reviewed the following grading plans prepared by Stantec for the aforementioned residential development:

- Stantec, Grading Plan, Project No. 160401085, Drawing No. GP-1 Revision 2 dated July 10, 2020.
- Stantec, Grading Plan, Project No. 160401085, Drawing No. GP-2 Revision 2 dated July 10, 2020.
- Stantec, Grading Plan, Project No. 160401085, Drawing No. GP-3 Revision 2 dated July 10, 2020.
- Stantec, Grading Plan and Details, Project No. 160401085, Drawing No. GP-1 Revision 0 dated May 1, 2020.

Based on our review of the grading plans provided, the proposed grading for the aforementioned development has areas that exceed the permissible grade raise. Therefore, lightweight fill will be required to account for the permissible grade raise exceedances. The specified lightweight fill requirements and specifications are presented in Table 1 - Summary of Design Details and Figure 1 attached, respectively.

We trust that the current submission meets your immediate requirements.

Paterson Group Inc.



Nicholas F. R. Versolato



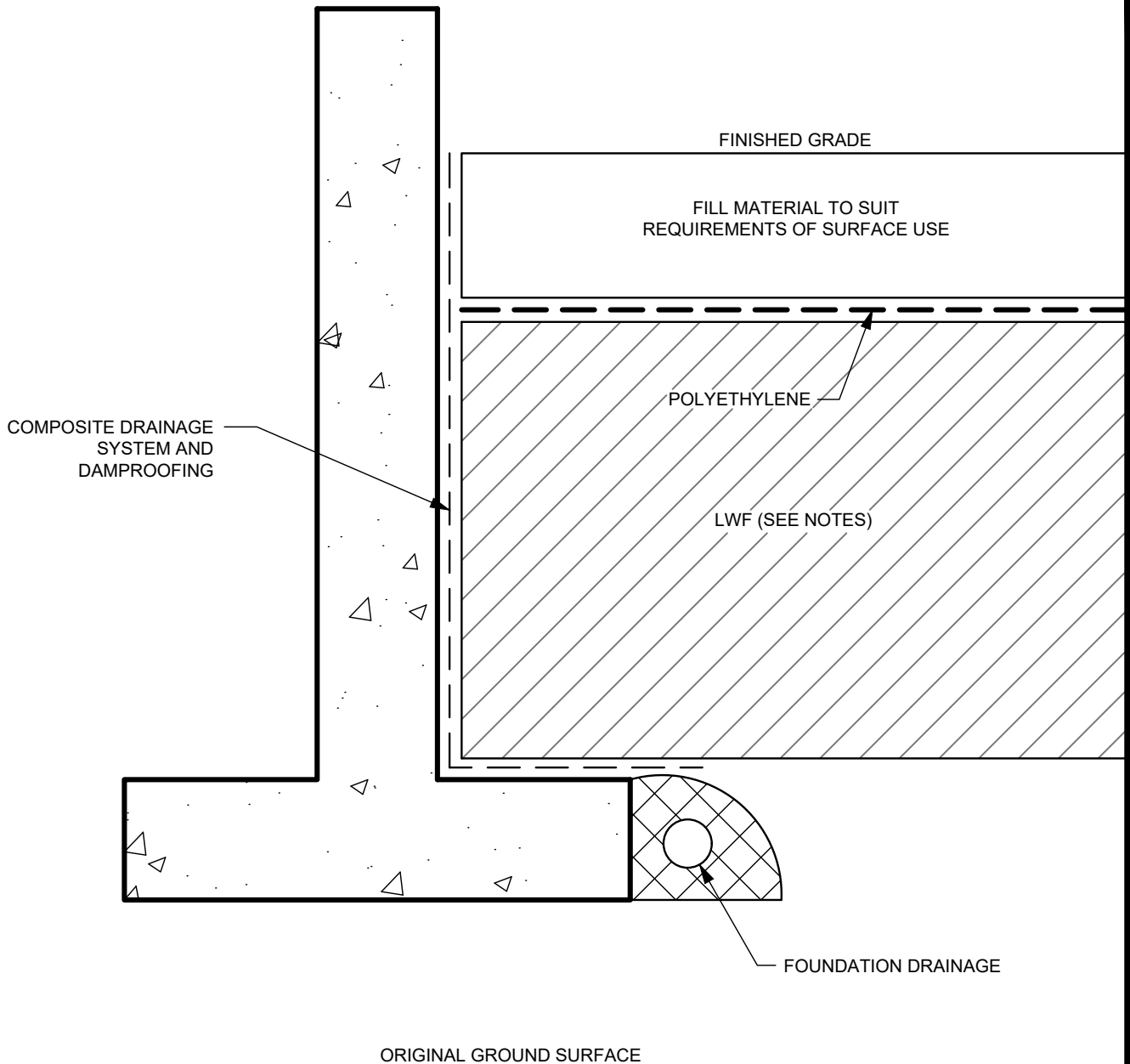
David J. Gilbert, P.Eng.

Paterson Group Inc.

Head Office and Laboratory
154 Colonnade Road South
Ottawa - Ontario - K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

Northern Office and Laboratory
63 Gibson Street
North Bay - Ontario - P1B 8Z4
Tel: (705) 472-5331 Fax: (705) 472-2334

St. Lawrence Office
993 Princess Street - Suite 100
Kingston - Ontario - K7L 1H3
Tel: (613) 542-7381



NOTES:

1. USE EPS12 BELOW FRONT PORCH
2. USE EPS15 BELOW GARAGE AND DRIVEWAY
USE EPS12 BELOW LANDSCAPED AREAS
3. MINIMUM GRANULAR THICKNESS OVER LWF SHOULD BE AS FOLLOWS:

FRONT PORCH	150mm OF OPSS GRANULAR A
GARAGE	300mm OF OPSS GRANULAR A
DRIVEWAY	300mm OF OPSS GRANULAR A
LANDSCAPED	500mm OF APPROVED BACKFILL SOIL
4. PLACEMENT OF LWF SHOULD BE ON A LEVELED SURFACE (SAND CAN BE USED TO PROVIDE AN ADEQUATE LEVELLING SURFACE).

PG2743 - Table 1 - Summary of Grading Design Details - Proposed Residential Development - 3288 Greenbank Road, Ottawa

Lot/Block Number	Unit *	Street Name	Underside of Footing Elevation	Bearing Resistance Value at SLS	Original GS Front	Proposed GS Front	Original GS Rear	Proposed GS Rear	Estimated Engineered Fill Below Underside of Footing Elevation	Permissible Grade Raise	Above Permissible Grade Raise - Front	Above Permissible Grade Raise - Rear	LWF within Garage and Front Porch	Minimum Requirements for Lightweight Fill along Building Exterior	Seismic Site Class
			(m)	(kPa)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
BLOCK 5															
Block 8	A	Lane D	92.48	100	92.60	93.98	92.80	93.98	0.30	2.00	n/a	n/a	No	n/a	D
	B	Lane D	92.48	100	92.50	93.98	92.70	93.98	0.30	2.00	n/a	n/a	No	n/a	D
	C	Lane D	92.48	100	92.50	93.98	92.57	93.98	0.30	2.00	n/a	n/a	No	n/a	D
	D	Lane D	92.48	100	92.50	93.98	92.56	93.98	0.30	2.00	n/a	n/a	No	n/a	D
	E	Lane D	92.48	100	92.50	93.98	92.55	93.98	0.30	2.00	n/a	n/a	No	n/a	D
	F	Lane D	92.48	100	92.50	93.98	92.55	93.98	0.30	2.00	n/a	n/a	No	n/a	D
Block 9	A	Lane D	92.65	100	92.40	94.15	92.56	94.15	0.55	2.30	n/a	n/a	No	n/a	D
	B	Lane D	92.65	100	92.30	94.15	92.40	94.15	0.65	2.30	n/a	n/a	No	n/a	D
	C	Lane D	92.65	100	92.11	94.15	92.30	94.15	0.84	2.30	n/a	n/a	No	n/a	D
	D	Lane D	92.65	100	92.54	94.15	92.11	94.15	0.84	2.30	n/a	n/a	No	n/a	D
	E	Lane D	92.65	100	92.50	94.15	92.52	94.15	0.45	2.30	n/a	n/a	No	n/a	D
Block 10	A	Lane D	92.66	100	92.40	94.31	92.52	94.16	0.56	2.30	n/a	n/a	No	n/a	D
	B	Lane D	92.66	100	92.45	94.31	92.50	94.16	0.51	2.30	n/a	n/a	No	n/a	D
	C	Lane D	92.66	100	92.50	94.31	92.50	94.16	0.46	2.30	n/a	n/a	No	n/a	D
	D	Lane D	92.66	100	92.50	94.31	92.53	94.16	0.46	2.30	n/a	n/a	No	n/a	D
	E	Lane D	92.66	100	92.56	94.31	92.58	94.31	0.40	2.30	n/a	n/a	No	n/a	D
Block 11	A	Lane D	92.61	100	92.56	94.26	92.59	94.26	0.35	2.00	n/a	n/a	No	n/a	D
	B	Lane D	92.61	100	92.60	94.26	92.60	94.11	0.31	2.00	n/a	n/a	No	n/a	D
	C	Lane D	92.61	100	92.63	94.26	92.63	94.11	0.30	2.00	n/a	n/a	No	n/a	D
	D	Lane D	92.61	100	92.67	94.26	92.67	94.11	0.30	2.00	n/a	n/a	No	n/a	D
	E	Lane D	92.61	100	92.70	94.26	92.70	94.26	0.30	2.00	n/a	n/a	No	n/a	D
Block 12	A	Lane D	92.80	100	92.70	94.30	92.66	94.30	0.44	2.00	n/a	n/a	No	n/a	D
	B	Lane D	92.80	100	92.65	94.30	92.60	94.30	0.50	2.00	n/a	n/a	No	n/a	D
	C	Lane D	92.80	100	92.61	94.30	92.58	94.30	0.52	2.00	n/a	n/a	No	n/a	D
	D	Lane D	92.80	100	92.58	94.30	92.56	94.30	0.54	2.00	n/a	n/a	No	n/a	D
	E	Lane D	92.80	100	92.56	94.30	92.54	94.30	0.56	2.00	n/a	n/a	No	n/a	D
	F	Lane D	92.80	100	92.53	94.30	92.52	94.30	0.58	2.00	n/a	n/a	No	n/a	D
Block 13	A	Lane D	92.79	100	92.52	94.29	92.50	94.29	0.59	2.30	n/a	n/a	No	n/a	D
	B	Lane D	92.79	100	92.46	94.29	92.46	94.29	0.63	2.30	n/a	n/a	No	n/a	D
	C	Lane D	92.79	100	92.42	94.29	92.42	94.29	0.67	2.30	n/a	n/a	No	n/a	D
	D	Lane D	92.79	100	92.39	94.29	92.38	94.29	0.71	2.30	n/a	n/a	No	n/a	D
	E	Lane D	92.79	100	92.33	94.29	92.33	94.29	0.76	2.30	n/a	n/a	No	n/a	D
Block 14	A	Lane D	92.62	100	92.38	94.12	92.33	94.12	0.59	2.30	n/a	n/a	No	n/a	D
	B	Lane D	92.62	100	92.54	94.12	92.33	94.12	0.59	2.30	n/a	n/a	No	n/a	D
	C	Lane D	92.62	100	92.11	94.12	92.30	94.12	0.81	2.30	n/a	n/a	No	n/a	D
	D	Lane D	92.62	100	92.40	94.12	92.40	94.12	0.52	2.30	n/a	n/a	No	n/a	D
	E	Lane D	92.62	100	92.30	94.12	92.42	94.12	0.62	2.30	n/a	n/a	No	n/a	D
Block 15	A	Lane D	92.45	100	92.44	93.95	92.42	93.95	0.33	2.30	n/a	n/a	No	n/a	D
	B	Lane D	92.45	100	92.45	93.95	92.44	93.95	0.31	2.30	n/a	n/a	No	n/a	D
	C	Lane D	92.45	100	92.47	93.95	92.46	93.95	0.30	2.30	n/a	n/a	No	n/a	D
	D	Lane D	92.45	100	92.49	93.95	92.48	93.95	0.30	2.30	n/a	n/a	No	n/a	D
	E	Lane D	92.45	100	92.50	93.95	92.50	93.95	0.30	2.30	n/a	n/a	No	n/a	D
BLOCK 4															
Block 1	A	STREET B	92.12	100	92.44	94.09	-	-	-	2.00	n/a	n/a	No	n/a	D
	B	STREET B	92.12	100	92.43	94.09	-	-	-	2.00	n/a	n/a	No	n/a	D
	C	STREET B	92.12	100	92.43	94.09	-	-	-	2.00	n/a	n/a	No	n/a	D
	D	STREET B	92.12	100	92.42	94.09	-	-	-	2.00	n/a	n/a	No	n/a	D
	E	STREET B	92.12	100	92.56	94.09	-	-	-	2.00	n/a	n/a	No	n/a	D
	F	STREET B	92.12	100	92.55	93.97	-	-	-	2.00	n/a	n/a	No	n/a	D
	G	STREET B	92.12	100	92.54	93.97	-	-	-	2.00	n/a	n/a	No	n/a	D
	H	STREET B	92.12	100	92.52	93.91	-	-	-	2.00	n/a	n/a	No	n/a	D
Block 2	A	STREET B	92.12	100	92.42	94.27	-	-	-	2.00	n/a	n/a	No	n/a	D
	B	STREET B	92.12	100	92.46	94.27	-	-	-	2.00	n/a	n/a	No	n/a	D
	C	STREET B	92.12	100	92.49	94.27	-	-	-	2.00	n/a	n/a	No	n/a	D
	D	STREET B	92.12	100	92.54	94.27	-	-	-	2.00	n/a	n/a	No	n/a	D
	E	STREET B	92.12	100	92.63	94.27	-	-	-	2.00	n/a	n/a	No	n/a	D
	F	STREET B	92.12	100	92.61	94.19	-	-	-	2.00	n/a	n/a	No	n/a	D
	G	STREET B	92.12	100	92.59	94.14	-	-	-	2.00	n/a	n/a	No	n/a	D
	H	STREET B	92.12	100	92.57	94.14	-	-	-	2.00	n/a	n/a	No	n/a	D
	A	STREET B	92.43	100	92.40	-	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	B	STREET B	92.43	100	92.56	94.40	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	C	STREET B	92.43	100	92.58	94.40	-	-	0.30	2.00	n/a	n/a	No	n/a	D

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Lot/Block Number	Unit *	Street Name	Underside of Footing Elevation	Bearing Resistance Value at SLS	Original GS Front	Proposed GS Front	Original GS Rear	Proposed GS Rear	Estimated Engineered Fill Below Underside of Footing Elevation	Permissible Grade Raise	Above Permissible Grade Raise - Front	Above Permissible Grade Raise - Rear	LWF within Garage and Front Porch	Minimum Requirements for Lightweight Fill along Building Exterior	Seismic Site Class
			(m)	(kPa)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
Block 3	D	STREET B	92.43	100	92.60	94.40	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	E	STREET B	92.43	100	92.73	94.28	-	-	-	2.00	n/a	n/a	No	n/a	D
	F	STREET B	92.43	100	92.72	94.28	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	G	STREET B	92.43	100	92.68	94.40	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	H	STREET B	92.43	100	92.66	94.28	-	-	0.30	2.00	n/a	n/a	No	n/a	D
Block 4	A	STREET B	92.44	100	92.62	94.41	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	B	STREET B	92.44	100	92.65	94.41	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	C	STREET B	92.44	100	92.67	94.41	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	D	STREET B	92.44	100	92.69	94.41	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	E	STREET B	92.44	100	92.83	94.05	-	-	-	2.00	n/a	n/a	No	n/a	D
	F	STREET B	92.44	100	92.78	94.05	-	-	-	2.00	n/a	n/a	No	n/a	D
	G	STREET B	92.44	100	92.72	94.12	-	-	0.30	2.00	n/a	n/a	No	n/a	D
	H	STREET B	92.44	100	92.65	94.23	-	-	0.30	2.00	n/a	n/a	No	n/a	D
Block 5	A	STREET B	92.45	100	92.50	94.24	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	B	STREET B	92.45	100	92.48	94.24	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	C	STREET B	92.45	100	92.46	94.24	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	D	STREET B	92.45	100	92.43	94.24	-	-	0.32	2.30	n/a	n/a	No	n/a	D
	E	STREET B	92.45	100	92.43	94.06	-	-	0.32	2.30	n/a	n/a	No	n/a	D
	F	STREET B	92.45	100	92.46	94.06	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	G	STREET B	92.45	100	92.48	94.06	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	H	STREET B	92.45	100	92.50	94.06	-	-	0.30	2.30	n/a	n/a	No	n/a	D
Block 6	A	STREET B	92.43	100	92.43	94.40	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	B	STREET B	92.43	100	92.38	94.40	-	-	0.35	2.30	n/a	n/a	No	n/a	D
	C	STREET B	92.43	100	92.32	94.35	-	-	0.41	2.30	n/a	n/a	No	n/a	D
	D	STREET B	92.43	100	92.25	94.40	-	-	0.48	2.30	n/a	n/a	No	n/a	D
	E	STREET B	92.43	100	92.46	94.04	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	F	STREET B	92.43	100	92.45	94.04	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	G	STREET B	92.43	100	92.44	94.04	-	-	0.30	2.30	n/a	n/a	No	n/a	D
	H	STREET B	92.43	100	92.43	94.04	-	-	0.30	2.30	n/a	n/a	No	n/a	D
Block 7	A	STREET B	93.10	100	92.08	94.35	-	-	1.32	2.30	n/a	n/a	No	n/a	D
	B	STREET B	93.10	100	92.11	94.35	-	-	1.29	2.30	n/a	n/a	No	n/a	D
	C	STREET B	93.10	100	92.13	94.35	-	-	1.27	2.30	n/a	n/a	No	n/a	D
	D	STREET B	93.10	100	92.16	95.35	-	-	1.24	2.30	0.9	n/a	1.50	Min. 0.9 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	E	STREET B	93.10	100	92.29	95.35	-	-	1.11	2.30	0.8	n/a	1.50	Min. 0.8 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	F	STREET B	93.10	100	92.27	95.35	-	-	1.13	2.30	0.8	n/a	1.50	Min. 0.8 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	G	STREET B	93.10	100	92.25	95.35	-	-	1.15	2.30	0.8	n/a	1.50	Min. 0.8 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	H	STREET B	93.10	100	92.22	95.35	-	-	1.18	2.30	0.8	n/a	1.50	Min. 0.8 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall and 0.8 m thick extending 1.2 m horizontally beyond the exterior side wall.	D
Block 8	A	STREET B	93.10	100	92.10	94.35	-	-	1.30	2.00	0.3	n/a	1.50	Min. 0.3 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall and 0.3 m thick extending 1.2 m horizontally beyond the exterior side wall.	D
	B	STREET B	93.10	100	92.09	94.35	-	-	1.31	2.00	0.3	n/a	1.50	Minimum 0.3 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	C	STREET B	93.10	100	92.08	94.35	-	-	1.32	2.00	0.3	n/a	1.50	Minimum 0.3 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	D	STREET B	93.10	100	92.07	94.35	-	-	1.33	2.00	0.3	n/a	1.50	Minimum 0.3 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	E	STREET B	93.10	100	92.22	94.35	-	-	1.18	2.00	0.1	n/a	1.50	Minimum 0.3 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	F	STREET B	93.10	100	92.20	94.35	-	-	1.20	2.00	0.1	n/a	1.50	Minimum 0.3 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D

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Lot/Block Number	Unit *	Street Name	Underside of Footing Elevation	Bearing Resistance Value at SLS	Original GS Front	Proposed GS Front	Original GS Rear	Proposed GS Rear	Estimated Engineered Fill Below Underside of Footing Elevation	Permissible Grade Raise	Above Permissible Grade Raise - Front	Above Permissible Grade Raise - Rear	LWF within Garage and Front Porch	Minimum Requirements for Lightweight Fill along Building Exterior	Seismic Site Class
			(m)	(kPa)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
	G	STREET B	93.10	100	92.18	94.35	-		1.22	2.00	0.2	n/a	1.50	Minimum 0.3 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall.	D
	H	STREET B	93.10	100	92.16	94.35	-		1.24	2.00	0.2	n/a	1.50	Min. 0.3 m thick layer of LWF extending 2.4 m horizontally beyond the front foundation wall and 0.3 m thick extending 1.2 m horizontally beyond the exterior side wall.	D
Block 9	A	STREET B	92.85	100	92.08	94.10	-		1.07	2.00	0.02	n/a	No	n/a	D
	B	STREET B	92.85	100	92.09	94.10	-		1.06	2.00	0.01	n/a	No	n/a	D
	C	STREET B	92.85	100	92.11	94.10	-		1.04	2.00	n/a	n/a	No	n/a	D
	D	STREET B	92.85	100	92.13	94.10	-		1.02	2.00	n/a	n/a	No	n/a	D
	E	STREET B	92.85	100	92.15	94.10	-		1.00	2.00	n/a	n/a	No	n/a	D
	F	STREET B	92.85	100	92.13	94.10	-		1.02	2.00	n/a	n/a	No	n/a	D
	G	STREET B	92.85	100	92.11	94.10	-		1.04	2.00	n/a	n/a	No	n/a	D
	H	STREET B	92.85	100	92.09	94.10	-		1.06	2.00	0.01	n/a	n/a	No	n/a
Block 10	A	STREET B	92.85	100	92.15	94.10	-		1.00	2.00	n/a	n/a	No	n/a	D
	B	STREET B	92.85	100	92.17	94.10	-		0.98	2.00	n/a	n/a	No	n/a	D
	C	STREET B	92.85	100	92.19	94.10	-		0.96	2.00	n/a	n/a	No	n/a	D
	D	STREET B	92.85	100	92.22	94.10	-		0.93	2.00	n/a	n/a	No	n/a	D
	E	STREET B	92.85	100	92.25	94.10	-		0.90	2.00	n/a	n/a	No	n/a	D
	F	STREET B	92.85	100	92.29	94.32	-		0.86	2.00	0.03	n/a	No	n/a	D
	G	STREET B	92.85	100	92.26	94.10	-		0.89	2.00	n/a	n/a	No	n/a	D
	H	STREET B	92.85	100	92.23	94.10	-		0.92	2.00	n/a	n/a	No	n/a	D
	I	STREET B	92.85	100	92.19	94.10	-		0.96	2.00	n/a	n/a	No	n/a	D
	J	STREET B	92.85	100	92.15	94.10	-		1.00	2.00	n/a	n/a	No	n/a	D
Block 11	A	STREET B	92.96	100	92.32	94.21	-		0.94	2.00	n/a	n/a	No	n/a	D
	B	STREET B	92.96	100	92.33	94.21	-		0.93	2.00	n/a	n/a	No	n/a	D
	C	STREET B	92.96	100	92.34	94.21	-		0.92	2.00	n/a	n/a	No	n/a	D
	D	STREET B	92.96	100	92.35	94.21	-		0.91	2.00	n/a	n/a	No	n/a	D
	E	STREET B	92.96	100	92.36	94.21	-		0.90	2.00	n/a	n/a	No	n/a	D
	F	STREET B	92.96	100	92.36	94.21	-		0.90	2.00	n/a	n/a	No	n/a	D
	G	STREET B	92.96	100	92.35	94.21	-		0.91	2.00	n/a	n/a	No	n/a	D
	H	STREET B	92.96	100	92.34	94.21	-		0.92	2.00	n/a	n/a	No	n/a	D
	I	STREET B	92.96	100	92.33	94.21	-		0.93	2.00	n/a	n/a	No	n/a	D
	J	STREET B	92.96	100	92.32	94.21	-		0.94	2.00	n/a	n/a	No	n/a	D

The following grading plans were reviewed as part of this summary:
 - Stantec, SNTC Lands, Grading Plan, Project No. 160401085, Drawing No. GP-1 Revision 2 Dated July 10, 2020.
 - Stantec, SNTC Lands, Grading Plan, Project No. 160401085, Drawing No. GP-2 Revision 2 Dated July 10, 2020.
 - Stantec, SNTC Lands, Grading Plan, Project No. 160401085, Drawing No. GP-3 Revision 2 Dated July 10, 2020.

Legend

*Townhouse block units are listed from the front view, left to right