patersongroup **memorandum**

consulting engineers

re:	**Geotechnical Design Parameters - Infiltration Gallery** **Proposed Residential Development** **Wateridge - Block 29 - Wanaki Road - Ottawa**
to:	Novatech Engineering - **Mr. Justin Gauthier** - j.gauthier@novatech-eng.com
cc:	Colonnade BridgePort - **Ms. Bonnie Martell** - bmartell@colonnadebridgeport.ca
date:	November 1, 2019
file:	PG4965-MEMO.03

Further to your request and authorization, Paterson Group (Paterson) prepared the current memorandum to provide a geotechnical design parameters for the proposed infiltration gallery located at the aforementioned site.

The following memorandum should be read in conjunction with Paterson Report PG4965-1 Revision 1 dated September 13, 2019.

Paterson reviewed the following grading plan prepared by Novatech Engineering Inc. regarding the aforementioned development:

- ❑ General Plan of Services, Project No. 119066-00, Drawing No. 119066-GR, Revision 3 dated September 18, 2019.

Geotechnical Design Parameters

Based on the above noted drawings, it is expected that the subsoil conditions expected at the base and sidewalls over the infiltration gallery will consist of a very stiff to stiff brown silty clay. It should be further noted that the long-term groundwater level is located below the bottom of the infiltration gallery based on the dimensions provided in Note #10 presented on the aforementioned drawing. It is anticipated that the long-term groundwater will not effect the performance of the infiltration gallery and sufficient separation between the invert level and the long-term groundwater level is present.

The following hydraulic conductivity values can be used for the design of the system based upon previous experience at similar sites in the immediate area with similar stratigraphy and typical published values for very stiff to stiff brown silty clay. The hydraulic conductivity value was conservatively estimated to be in the order of 1×10^{-6} to 1×10^{-8} m/sec. Based on the above noted hydraulic conductivity values, the approximate infiltration rates will range from 14 to 46 mm/hr. It should be noted that a safety correction factor was not applied to the above noted infiltration rates for calculating the design infiltration rates.

We trust that this information satisfies your immediate requirements.

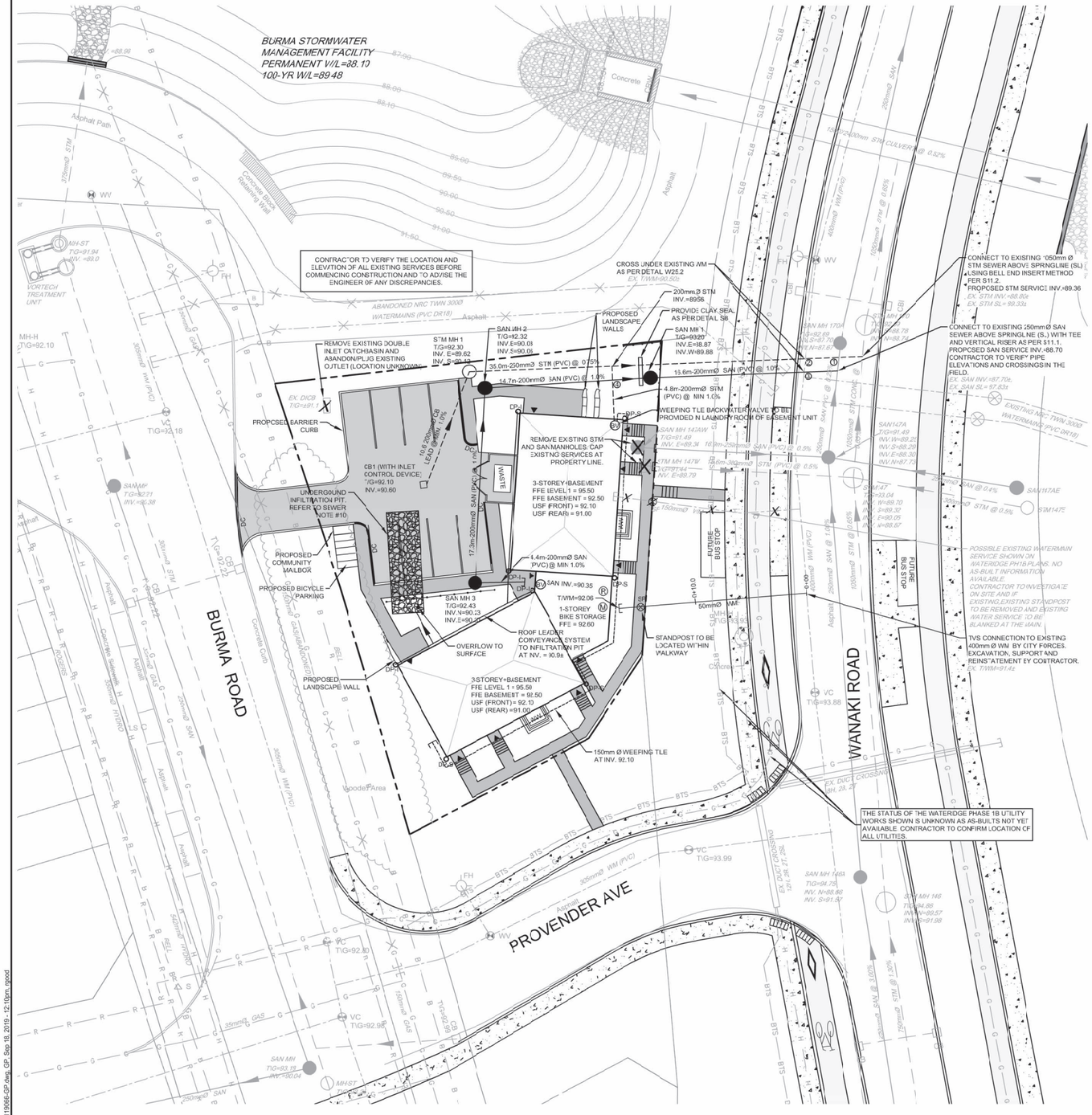
Best Regards,

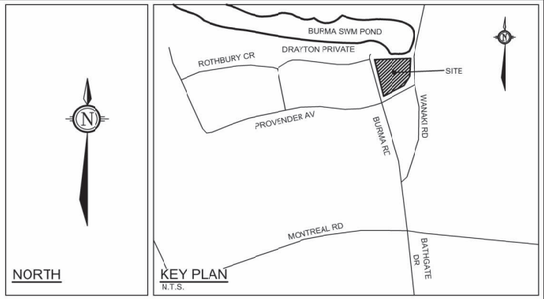
Paterson Group Inc.

November 1, 2019

Richard Groniger, C. Tech.

David J. Gilbert, P.Eng





GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO THE GEOTECHNICAL INVESTIGATION REPORT (REPORT NO. PG4965-1, DATED JUNE 21, 2019, PREPARED BY PATERSON GROUP INC.) FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECTS AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO SITE SERVICING AND STORMWATER MANAGEMENT REPORT (R-2019-094) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
14. REFER TO TOPOGRAPHICAL PLAN OF SURVEY (BLOCK 29-REGISTERED PLAN 4M-1581) BY ANNIS, O'SULLIVAN VOLLEBEKK FOR DETAILS OF THE EXISTING SITE.

CRITICAL SEWER PIPE CROSSING TABLE

CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE
①	EX. 251mm Ø SAN OBV.=87.85±	250mm Ø STM INV.=89.37	1.52m±
②	250mm Ø STM OBV.=89.65	EX. 400mm Ø WM B/W=90.10±	0.45m±
③	200mm Ø SAN OBV.=88.90	EX. 400mm Ø WM B/W=90.10±	1.17m±
④	200mm Ø STM OBV.=89.77	200mm Ø SAN INV.=89.92	0.15m

50mmØ WATER SERVICE TABLE

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+00	93.8±	91.4±	TVS CONNECTION TO EXSTING 400mmØ WM
0+14.9	94.3±	91.98	STANDPOST AT PROPERTY LINE
0+16.6	94.4±	92.06	CAP 1m FROM BUILDING FACE

INLET CONTROL DEVICE DATA - CB1

ICD TYPE: TEMPEST LMF ICD VORTEX 98 (AS PER S4.1)
DIAMETER OF OUTLET PIPE: 200mm

DESIGN EVENT	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)
1:5 YR	10.1	1.4±	92.16	1.4
1:100 YR	10.3	1.5±	92.22	6.4

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200Ø)	701.010	OPSD
CB, FRAME & COVER	400.020	OPSD
STORM / SANITARY MH FRAME & COVER	401.010	OPSD
SEWER TRENCH - BEDDING (GRANULAR A) COVER (GRANULAR A OR GRANULAR B TYPE I, WITH MAXIMUM PARTICLE SIZE=25mm)		
STORM SEWER	PVC DR 35	
SANITARY SEWER	PVC DR 35	
CATCHBASIN LEAD	PVC DR 35	

2. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.5m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
3. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 0.5%.
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX, POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
6. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 437.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
7. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm AND 600mm SUMPS RESPECTIVELY UNLESS OTHERWISE INDICATED.
8. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.
9. ALL STORM AND SANITARY SERVICES SHALL BE EQUIPPED WITH BACKFLOW PREVENTERS AS PER THE CITY OF OTTAWA STANDARD DETAILS S14 AND S14.1 OR S14.2.
10. INFILTRATION PIT IS TO BE 2.6m(W) x9.0m(L) x 1.6m(D) OF 40-50mm Ø CLEARSTONE WRAPPED WITH NON WOVEN FILTER CLOTH (TERRAFIX 360R OR APPROVED EQUAL) WITH 1.2m COVER. BACKFILL TO BE SITE EXCAVATED MATERIAL, FREE OF DELETERIOUS AND ORGANICS CAN BE PLACED IN 300mm LOOSE LIFTS AND COMPACTED TO 98% SPMDD, UNDER DRY AND ABOVE FREEZING CONDITIONS. ALTERNATIVELY, AN ENGINEERED FILL SUCH AS GIB TYPE II CAN BE PLACED IN 300mm LOOSE LIFTS AND COMPACTED TO 98% SPMDD.

WATERMAIN NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFEERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN	COPPER "TYPE K"	

2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
4. PROVIDE MINIMUM 0.50m VERTICAL CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS WHEN WATERMAIN IS BELOW AND A MINIMUM OF 0.25m VERTICAL CLEARANCE WHEN WATERMAIN IS ABOVE.
5. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER INFORMATION

HABITAT FOR HUMANITY GREATER OTTAWA
768 BELFAST ROAD
OTTAWA, ON K1G 0Z7

PHONE: 613-749-9950

No.	REVISION	DATE	BY
3.	REVISED PER CITY COMMENTS	18 SEPT 2019	JJM
2.	ISSUED FOR COORDINATION	13 SEPT 2019	JJM
1.	ISSUED FOR SITE PLAN APPROVAL	22 JUN 2019	JJM

SCALE 1:200 (1:200, 0 2 4 6 8)

DESIGN LGB
CHECKED GJM
DRAWN RG
CHECKED LGB
APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER G.J. MacDONALD PROVINCE OF ONTARIO

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Facsimile (613) 254-5867
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LOCATION
CITY OF OTTAWA
455 WANAKI ROAD (BLOCK 29)

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 11906600
REV REV # 3
DRAWING No. 19066-GP

DO7-12-19-0117

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