TECHNICAL MEMORANDUM

DATE April 7, 2026 **Project No.** CA0068177.6023

TO Mrs. Tanya Chowieri, Partner
KTS Properties, 69 rue Jean-Proulx unite 301, Gatineau, QC J8Z 1W2

FROM Nickie Unonius **EMAIL** **nickie.unonius@wsp.com**

PRELIMINARY GROUNDWATER INFLOW ESTIMATE – PROPOSED RESIDENTIAL MIXED-USED BUILDING – 770-774 BRONSON AVENUE, OTTAWA, ON

This memorandum contains preliminary estimates of groundwater inflow to the proposed residential mixed-used building located at 770-774 Bronson Avenue, Ottawa, Ontario. These estimates are based on information contained in the following:

- WSP Geotechnical Investigation report titled “Geotechnical Investigation - Proposed Residential Mixed-Used Building – 770-774 Bronson Avenue – Ottawa, Ontario” indicating that the proposed mixed-use residential development is planned to be constructed in two phases: Phase 1 and Phase 2.
- Groundwater elevation measurements and hydraulic conductivity estimates, as described in the September 2015 Golder report titled “Category 3 Permit to Take Water Application – Proposed Development – 770 Bronson Avenue – Ottawa, Ontario”.
- Groundwater elevation measurements described in the June 2024 EXP Services Inc. (EXP) report titled “Phase Two Environmental Site assessment – 770 and 774 Bronson Avenues and 557 Cambridge Street, Ottawa – Ontario”.
- Groundwater elevation measurements and hydraulic conductivity estimates, completed by WSP during a site visit on March 25, 2026.

Proposed Development

The proposed mixed-use residential development is planned to be constructed in two phases: Phase 1 and Phase 2, as follows:

- Phase 1 of the development will be located on the eastern half of the site and will include between 9 and 26 storeys above grade and 3 underground parking levels. The final floor slab level for the proposed third parking level will be approximately 9.6 metres (m) below ground surface (mbgs) (i.e., 65.8 m elevation). The excavation is expected to extend for 1.0 to 1.5 m below the final floor slab level to accommodate foundation and elevator pits. The final depth of excavation is expected to be 10.6 to 11.1 mbgs (elevation 64.8 to 64.3 m).
- Phase 2 of the development will be located on the western half of the site and will consist of a 9-storey residential building with two underground parking levels. The finished floor of the lowest basement level is at approximately elevation 68.4 m, which is approximately 5.5 to 7.5 mbgs. Considering that the excavation will likely extend a further 1.0 to 1.5 m below the lowest basement floor level to accommodate the foundations

and possible elevator pits, it is expected that the excavation will extend to about 7.0 to 9.0 mbgs (elevation 66.9 to 67.4 m).

Based on the above, the excavation for basement and foundation construction will extend through the existing fill, native sandy and gravelly soils, and into the underlying limestone bedrock.

Groundwater Level Measurements and Hydraulic Conductivity Testing

Groundwater level measurements were collected at monitoring wells as part of the historical investigations at the site, and hydraulic conductivity estimates were conducted as part of the 2015 Golder investigation. A site visit was conducted by WSP on March 25, 2026, in an attempt to locate existing monitoring wells and conduct hydraulic conductivity testing. On March 25, 2026, hydraulic conductivity testing was carried out on monitoring wells 1525987 15-5 and MW8. Hydraulic conductivity analysis sheets are included in Attachment A, and the historical and current groundwater conditions are summarized in Table 1.

Table 1: Groundwater Depth and Elevations from Previous and Recent Investigations

Borehole ID	Geological Unit	Ground Surface Elevation (masl)	Groundwater Depth (mbgs)	Groundwater Elevation (masl)	Date of Measurement	Hydraulic Conductivity (m/s)
FG-1-2011	Bedrock	75.10	2.10	73.00	12-Dec-11	-
FG-2-2011	Fill/Bedrock	75.40	2.30	73.10	12-Dec-11	-
FG-3-2011	Fill/Bedrock	74.60	1.90	72.70	12-Dec-11	-
1525987 15-1	Bedrock	75.86	2.50	73.40	27-Mar-15	-
			2.70	73.16	19-Aug-15	3×10^{-6}
			-	-	05-Feb-24	-
1525987 15-2	Bedrock	75.70	2.90	72.80	27-Mar-15	-
			2.60	73.10	19-Aug-15	-
			2.41	73.25	05-Feb-24	-
			2.15	73.55	25-Mar-26	-
1525987 15-3	Bedrock	75.75	3.30	72.50	27-Mar-15	-
			2.70	73.05	19-Aug-15	4×10^{-6}
			2.63	73.09	05-Feb-24	-
1525987 15-4	Bedrock	75.62	2.70	72.90	27-Mar-15	-
			2.60	73.02	19-Aug-15	-
1525987 15-5	Bedrock	75.49	5.28	69.14	05-Feb-24	-
			3.70	71.79	19-Aug-15	7×10^{-9}
			4.83	70.66	25-Mar-26	1×10^{-8}
BH15-2	Bedrock	75.60	1.50[(1)]	74.10[(1)]	19-Jan-16	-
			2.00[(2)]	73.60[(2)]		-
BH15-3A	Fill/Bedrock	75.50	1.30	74.20	19-Jan-16	-
BH15-3B	Bedrock	75.50	5.10	70.40	19-Jan-16	-
BH15-4	Bedrock	74.50	2.40 [(1)]	72.10 [(1)]	19-Jan-16	-
			5.80 [(2)]	68.70 [(2)]		-
BH15-6	Bedrock	73.70	2.00 [(1)]	71.70 [(1)]	19-Jan-16	-
			6.60 [(2)]	67.10 [(2)]		-
MW4	Bedrock	74.56	2.08	72.48	05-Feb-24	9.9×10^{-10}
MW5	Bedrock	73.84	2.83	70.93	05-Feb-24	-
MW6	Bedrock	74.05	2.36	71.59	05-Feb-24	-
MW7	Bedrock	74.38	2.61	71.65	05-Feb-24	1.3×10^{-8}
MW8	Bedrock	74.36	1.54	72.74	05-Feb-24	-
			1.42	72.94	25-Mar-26	5×10^{-8}

Borehole ID	Geological Unit	Ground Surface Elevation (masl)	Groundwater Depth (mbgs)	Groundwater Elevation (masl)	Date of Measurement	Hydraulic Conductivity (m/s)
MW9	Bedrock	74.75	2.93	71.69	05-Feb-24	-
MW10	Bedrock	75.02	5.08	69.79	05-Feb-24	-
MW11	Bedrock	75.78	4.99	70.72	05-Feb-24	-
			2.44	73.34	25-Mar-26	-
MW12	Bedrock	76.02	3.79	72.14	05-Feb-24	-
MW13	Bedrock	76.11	3.77	72.27	05-Feb-24	-

Notes: (1) shallow monitoring well screen and (2) deeper monitoring well screen

Groundwater Inflow Estimate

Groundwater levels measured over the various investigations ranged between elevation 67.1 m to 74.2 m (see Table 1). Based on our current understanding of the required excavations and the existing sub-surface conditions, it is expected that the excavations for the Phase 1 and Phase 2 will be below the existing groundwater levels in predominantly limestone bedrock. It will be necessary to temporarily lower the water table below the depth of the excavations during construction.

A simplified analytical solution (Equation 6.3 in Powers, 2007) was used to estimate the potential groundwater inflow into the excavations, assuming that the initial groundwater level was 1.0 m higher than the highest groundwater level measured in the study area and that groundwater would need to be lowered to 1.0 m below the final estimated excavation depth. As described above, the proposed development is planned to be constructed in two phases, and each phase area was used to the estimation of groundwater inflow using the simplified analytical solution. For purposes of construction dewatering estimates the following assumptions were made:

- Unconfined aquifer conditions.
- Radial groundwater flow under steady state conditions.
- The initial groundwater elevation within the excavation areas was assumed to be 0.3 mbgs (i.e., 1.0 m higher than the highest groundwater level measured in the study area at 15-4, to account for seasonal groundwater fluctuations).
- The groundwater elevation within the excavated areas will be lowered to 1.0 m lower than the bottom of the proposed final slabs (65.8 masl for Phase 1 and 68.4 masl for Phase 2).
- Groundwater will flow into the excavation areas through the existing fill, native sandy and gravelly soils deposits and weathered and unweathered limestone bedrock. The highest hydraulic conductivity measured at the site (4 x 10-6 m/s, as estimated at 1525987 15-3, refer to Table 1) was used to provide a conservative (i.e., high-end) estimate of groundwater inflow.
- For construction dewatering estimates a proposed excavation area was defined with a length of 74 metres and width of 32 metres for the Phase 1 building with an excavation depth of approximately 11 metres , and for the Phase 2 building, a proposed excavation area was defined with a length of 60 metres and width of 39 metres for the Phase 1 building with an excavation depth of 8.5 metres below grade (refer to Attachment B for dewatering calculations).
- The fluctuation of the groundwater levels measured at the site was not able to be represented within the analytical solution, so a static groundwater elevation one metre higher than the maximum measured value in the area of the building footprint was assumed for the inflow estimates. This assumption results in a potential

overprediction of inflow by the model in areas with less groundwater drawdown. As such, the estimates are likely to be conservative.

- No factor of safety was used.

The assumptions provide a conservative estimate for the groundwater inflow into the proposed excavation areas. The amount of dewatering needed for the excavation is estimated to be about 160,000 litres per day (L/day) for Phase 1 and 131,000 L/day for Phase 2 (steady-state inflow).

The steady-state flow rates represent the water taking rates required to maintain dry conditions within the open-cut area once an excavation area is fully dewatered. Initial rates of groundwater inflow to the excavations are expected to exceed the steady-state rate.

In addition to groundwater inflows into the excavation, the stormwater from direct (or incidental) precipitation needs to be considered. The amount of precipitation that would fall on the abovementioned excavations over 24 hours during a 10-year-return precipitation event (79.2 mm, as observed by Environment Canada at the Ottawa MacDonald-Cartier Int'l A Climate station) was calculated to be approximately 188,000 litres for Phase 1 area and 185,000 liters for Phase 2 area. It is noted that the estimated incidental precipitation assumes potential overland surface water runoff will be directed away from the open excavation using best management practices.

The estimated radius of influence (ROI) of the dewatering was estimated to be approximately 70 m for the excavation of the Phase 1 and approximately 55 m for the excavation of the Phase 2. The estimated ROI does intersect the existing buildings located around the site, noting that the ROI is the distance at which 0 m of drawdown is estimated to occur. The soils and bedrock at the site are not expected to be sensitive to disturbance, however, it is recommended to assess the potential impact caused by the amount of drawdown at the existing buildings around the site prior to construction.

The planned temporary (during construction) and permanent dewatering (long-term due to the foundation drainage system, if one is provided) may directly impact ground settlement. Consequently, adjacent structures founded on sensitive and compressible clay may be affected if within the zone influenced by the lowering of groundwater table. The results of the previous geotechnical investigation (WSP, 2025) as well as the published geologic mapping do not reveal the presence of clay soils, at least within the immediate vicinity of the site. As such, potential impacts to structures are not anticipated due to construction dewatering.

Water Control During Construction

Effective on July 1, 2025, construction dewatering activities greater than 50,000 litres of groundwater, storm water or a combination of both per day on any day are eligible to be registered on the MECP EASR.

Based on the available groundwater information at the site as well as our understanding of the extent and depth of the required excavations, the combination of groundwater and storm water per day will exceed 50,000 L/day. Therefore, under the Ontario Water Resource Act, water taking at the site for either Phase 1 or Phase 2 will require a registration under the MECP EASR system. It is expected that water management will be required.

A small portion of precipitation and runoff water may infiltrate to groundwater, considering the site is within an urbanized area, and measures are to be put in place to prevent runoff water from entering the open excavations, to minimize dewatering requirements.

The contractor is typically responsible for the design of a temporary groundwater control system, including assessing the appropriate type of pump(s) and other equipment as well as their arrangement. The contractor shall ensure that all construction dewatering operations to manage groundwater and direct precipitation seeping into / landing in excavations is carried out in accordance to Part II.2 of the Ontario Water Resources Act, including O. Reg. 63/16 as amended by O. Reg. 66/25. On-site precipitation and runoff water at ground level within work sites is to be managed as per O. Reg. 64/16.

In addition to the temporary construction dewatering, in areas where the grade is being permanently lowered below the groundwater level, permanent drainage systems will be required. Based on the available designs and observed groundwater elevations this will include the areas of the Phase 1 and Phase 2 buildings footprint. The volume of groundwater to be handled in the permanent drainage system is anticipated to be similar to the steady-state inflow amount, depending on the design of the drainage system.

These groundwater estimates are preliminary in nature and include several simplifying assumptions.

WSP Canada Inc.

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NU/CAMC/al

Attachments Attachment A – Hydraulic Conductivity Analysis
Attachment B – Groundwater Inflow Estimate

https://wsponlinecan.sharepoint.com/sites/ca-ca0068177.6023/shared documents/05. technical/3.0 hydrog text - geotech report/technical memo/ca0068177.6023-tm-reva-groundwater inflow-2026apr07.docx

ATTACHMENT A

Hydraulic Conductivity Analysis

HVORSLEV SLUG TEST ANALYSIS
FALLING HEAD TEST 15-1

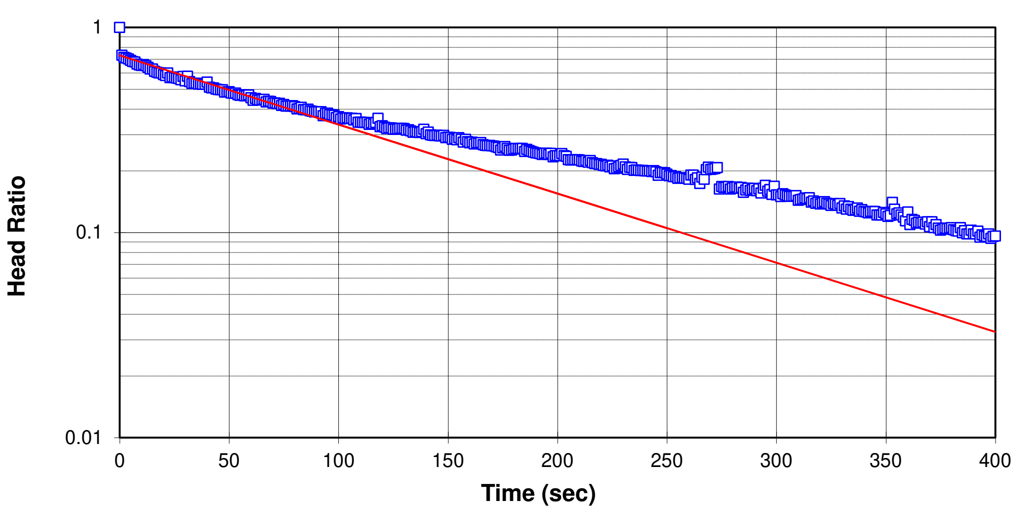
INTERVAL (metres below ground surface)

Top of Interval = 4.12
Bottom of Interval = 5.63

$$K = \frac{r_c^2}{2L_e} ln\left[\frac{L_e}{2R_e} + \sqrt{1 + \left(\frac{L_e}{2R_e}\right)^2}\right]\left[\frac{ln\left(\frac{h_1}{h_2}\right)}{(t_2 - t_1)}\right]$$ where K = (m/sec)

where:
r_c = casing radius (metres)
R_e = filter pack radius (metres)
L_e = length of screened interval (metres)
t = time (seconds)
h_t = head at time t (metres)

INPUT PARAMETERS		RESULTS		
r_c =	0.02			
R_e =	0.04	K=	3E-06	m/sec
L_e =	1.5	K=	3E-04	cm/sec
t_1 =	0			
t_2 =	250			
h_1/h_0 =	0.73			
h_2/h_0 =	0.11			



Project Name: TC United Ph II ESA Ottawa
Project No.: 1525987
Test Date: 8/19/2015

Analysis By: DH
Checked By: BH
Analysis Date: 8/20/2015

Golder Associates Ltd.

HVORSLEV SLUG TEST ANALYSIS
FALLING HEAD TEST 15-3

INTERVAL (metres below ground surface)

Top of Interval = 4.43
Bottom of Interval = 5.93

$$K = \frac{r_c^2}{2L_e} \ln\left[\frac{L_e}{2R_e} + \sqrt{1 + \left(\frac{L_e}{2R_e}\right)^2}\right]\left[\frac{\ln\left(\frac{h_1}{h_2}\right)}{(t_2 - t_1)}\right]$$

where K = (m/sec)

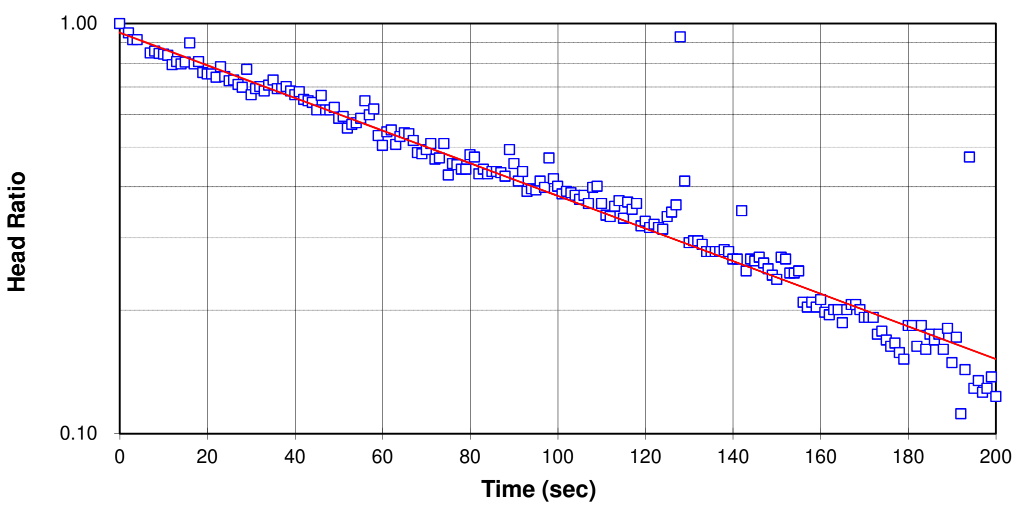
where:
- r_c = casing radius (metres)
- R_e = filter pack radius (metres)
- L_e = length of screened interval (metres)
- t = time (seconds)
- h_t = head at time t (metres)

INPUT PARAMETERS

r_c =	1.9E-02
R_e =	3.8E-02
L_e =	1.5
t_1 =	0
t_2 =	100
h_1/h_0 =	0.95
h_2/h_0 =	0.38

RESULTS

K=	4E-06	m/sec
K=	4E-04	cm/sec



Project Name: TC United Ph II ESA Ottawa
Project No.: 1525987
Test Date: 8/19/2015

Analysis By: DH
Checked By: BH
Analysis Date: 8/24/2015

Golder Associates Ltd.

HVORSLEV SLUG TEST ANALYSIS
FALLING HEAD TEST 15-5

INTERVAL (metres below ground surface)

Top of Interval = 13.82
Bottom of Interval = 15.34

$$K = \frac{r_c^2}{2L_e} ln\left[\frac{L_e}{2R_e} + \sqrt{1 + \left(\frac{L_e}{2R_e}\right)^2}\right]\left[\frac{ln\left(\frac{h_1}{h_2}\right)}{(t_2 - t_1)}\right]$$ where K = (m/sec)

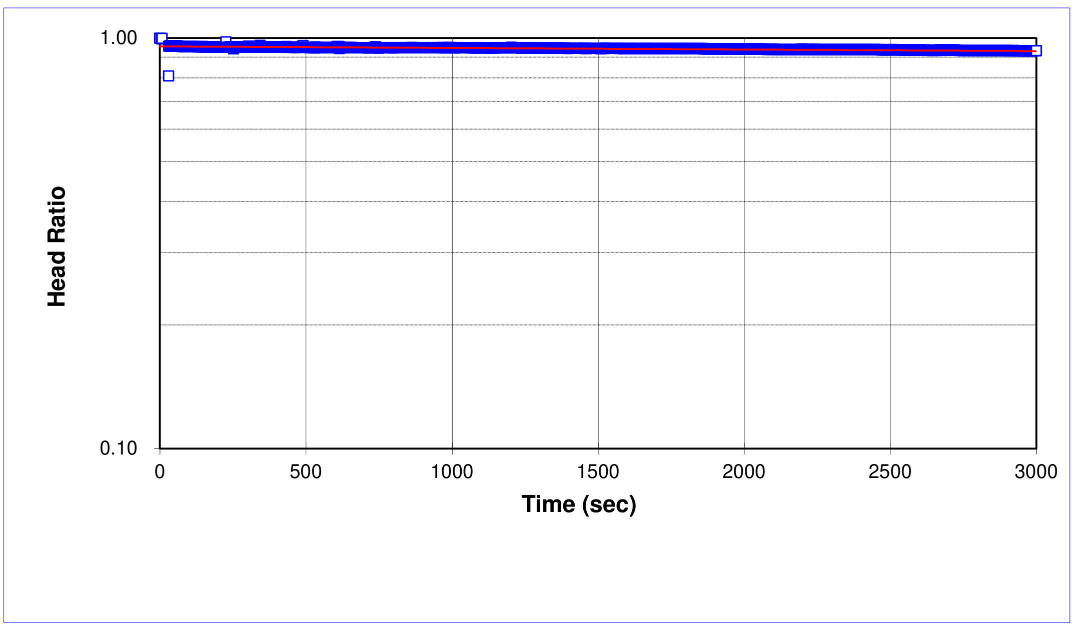
where:
- r_c = casing radius (metres)
- R_e = filter pack radius (metres)
- L_e = length of screened interval (metres)
- t = time (seconds)
- h_t = head at time t (metres)

INPUT PARAMETERS

r_c =	2.5E-02
R_e =	3.8E-02
L_e =	1.5
t_1 =	0
t_2 =	3000
h_1/h_0 =	0.96
h_2/h_0 =	0.93

RESULTS

K=	7E-09	m/sec
K=	7E-07	cm/sec



Project Name: TC United Ph II ESA Ottawa
Project No.: 1525987
Test Date: 8/19/2015
Analysis By: DH
Checked By: BH
Analysis Date: 8/20/2015

Golder Associates Ltd.

HVORSLEV SLUG TEST ANALYSIS
FALLING HEAD TEST 1525987 15-5

INTERVAL (metres below ground surface)

Top of Interval = 13.94
Bottom of Interval = 15.39

$$K = \frac{r_c^2}{2L_e} ln\left[\frac{L_e}{2R_e} + \sqrt{1 + \left(\frac{L_e}{2R_e}\right)^2}\right]\left[\frac{ln\left(\frac{h_1}{h_2}\right)}{(t_2 - t_1)}\right]$$

where K = (m/sec)

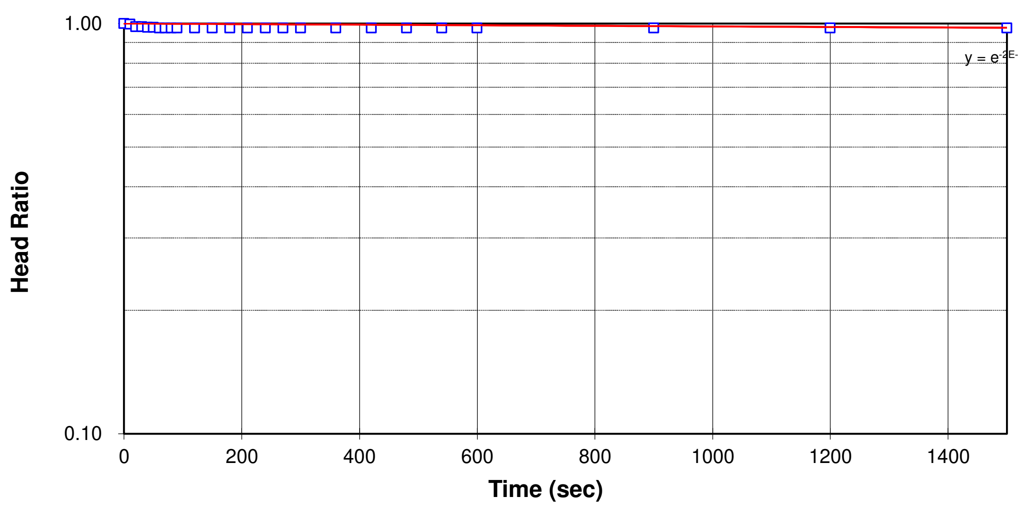
where:
- r_c = casing radius (metres)
- R_e = filter pack radius (metres)
- L_e = length of screened interval (metres)
- t = time (seconds)
- h_t = head at time t (metres)

INPUT PARAMETERS

r_c =	2.5E-02
R_e =	3.8E-02
L_e =	1.5
t_1 =	0
t_2 =	1500
h_1/h_0 =	1.00
h_2/h_0 =	0.98

RESULTS

K=	1E-08	m/sec
K=	1E-06	cm/sec



Project Name: KTS Properties - Bronson Ave, Ottawa
Project No.: CA0068177.6023
Test Date: 25-Mar-25

Analysis By: NU
Checked By: CAMC
Analysis Date: 25-Mar-25

WSP Canada Inc.

BOUWER AND RICE SLUG TEST ANALYSIS
FALLING HEAD TEST BH/MW-8

INTERVAL (metres below ground surface)

Top of Interval =	**3.05**
Bottom of Interval =	**6.07**

$$K = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right)}{2L_e}\frac{1}{t}\ln\frac{y_0}{y_t}$$ where K=m/sec

where:

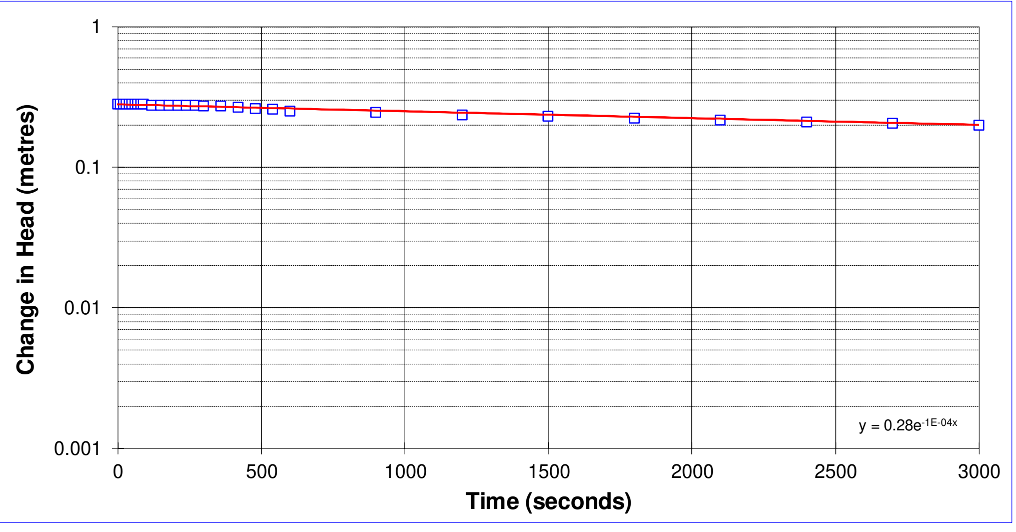
r_c = casing radius (metres);
R_e = effective radius (metres);
L_e = length of screened interval (metres);
r_w = radial distance to undisturbed aquifer (metres)
y_0 = initial drawdown (metres)
y_t = drawdown (metres) at time t (seconds)

INPUT PARAMETERS

r_c =	0.03
r_w =	0.10
L_e =	1.52
$ln(R_e/r_w)$	2.00
y_0 =	0.28
y_t =	0.20
t =	3000

RESULTS

K=	5E-08	m/sec
K=	5E-06	cm/sec



Project Name: KTS Properties - Bronson Ave, Ottawa
Project No.: CA0068177.6023
Test Date: 03-25-25

Analysis By: NU
Checked By: CAMC
Analysis Date: 2025-03-25

770 Bronson Avenue, Ottawa **MW4**
Rising Head Test Analysis
Hvorslev Method (1951)

H_0 2.08 m
(static water level in metres)

Time (sec)	**Water Level (m)**	**Drawdown (m)**	**H-h/H-h0**	**Recovery to Original Water Level (%)**
0	4.88	2.80	1.00	0
30	4.88	2.80	1.00	0
60	4.87	2.79	1.00	0
90	4.87	2.79	1.00	0
120	4.86	2.78	0.99	1
150	4.86	2.78	0.99	1
210	4.86	2.78	0.99	1
270	4.85	2.77	0.99	1
330	4.85	2.77	0.99	1
390	4.84	2.76	0.99	1
450	4.84	2.76	0.99	1
510	4.83	2.75	0.98	2
630	4.82	2.74	0.98	2
750	4.82	2.74	0.98	2
870	4.81	2.73	0.98	3
990	4.79	2.71	0.97	3
1110	4.77	2.69	0.96	4
1410	4.76	2.68	0.96	4
1710	4.75	2.67	0.95	5
2010	4.74	2.66	0.95	5
2310	4.67	2.59	0.93	8
2610	4.62	2.54	0.91	9
2910	4.51	2.43	0.87	13

To constant= 0.37

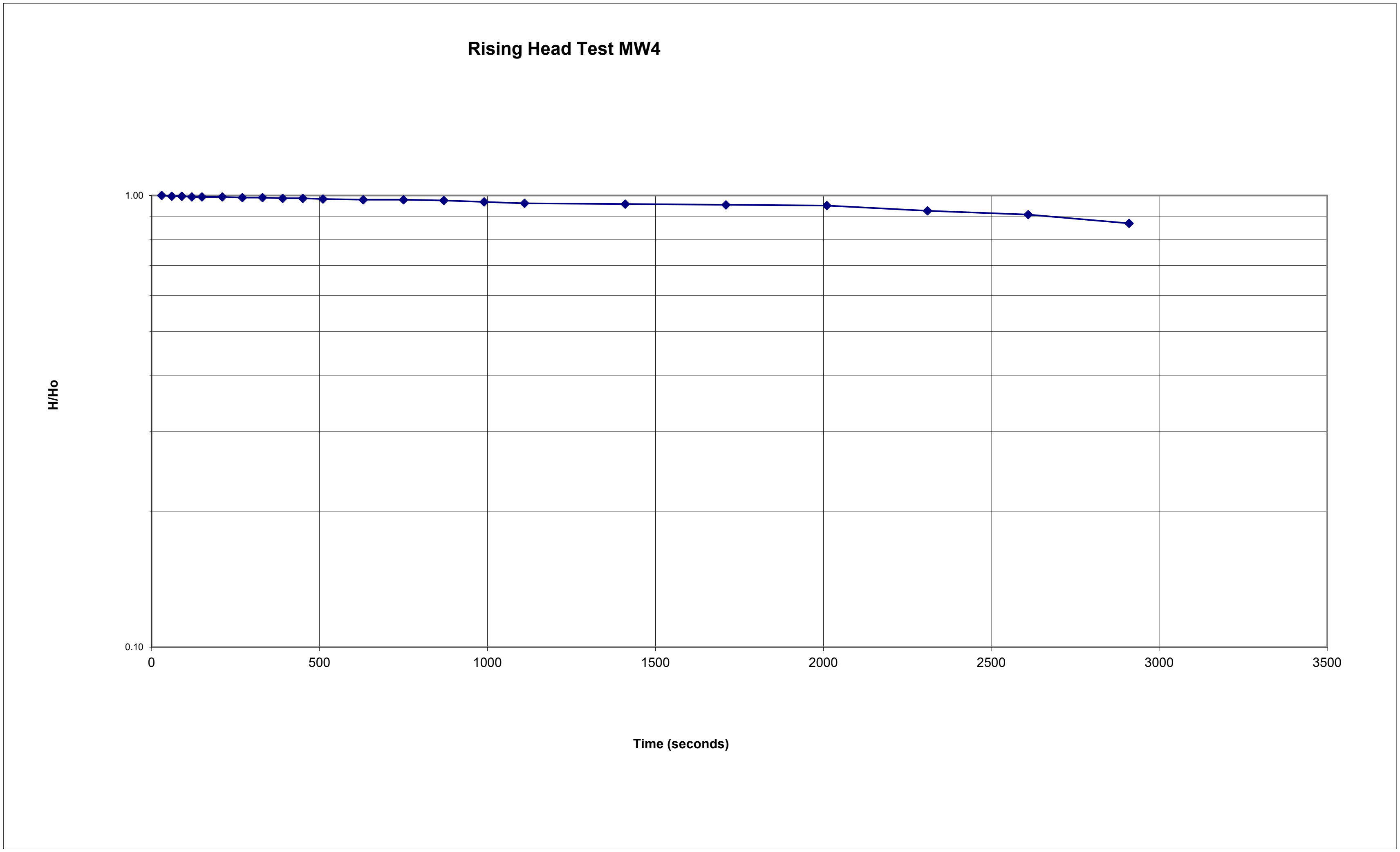
L/R	ln(L/R)
122.0	4.804021

input

r=	0.0032	(pipe radius)
L=	3.05	(effective screen length, if straddles water)
R=	0.03	(hole radius)
To=	8180	

$$K = \frac{r2(\ln(L/R))}{2(To)(L)}$$

K= 9.86E-10 m/sec or **9.86E-08 cm/sec**


Rising Head Test MW4
1.00
0.10
H/Ho
0
500
1000
1500
2000
2500
3000
3500
Time (seconds)

770 Bronson Avenue, Ottawa **MW7**
Rising Head Test Analysis
Hvorslev Method (1951)

H_0 2.58 m
(static water level in metres)

Time (sec)	**Water Level (m)**	**Drawdown (m)**	**H-h/H-h0**	**Recovery to Original Water Level (%)**
0	2.66	0.08	1.00	0
30	2.66	0.08	1.00	0
60	2.66	0.08	1.00	0
90	2.66	0.08	1.00	0
120	2.66	0.08	1.00	0
150	2.65	0.07	0.87	13
210	2.65	0.07	0.87	13
270	2.65	0.07	0.87	13
330	2.64	0.06	0.75	25
390	2.64	0.06	0.75	25
450	2.64	0.06	0.75	25
510	2.64	0.06	0.75	25
630	2.63	0.05	0.62	38
750	2.63	0.05	0.62	38
870	2.62	0.04	0.50	50
990	2.62	0.04	0.50	50
1110	2.61	0.03	0.37	63
1410	2.61	0.03	0.37	63
1710	2.6	0.02	0.25	75
2010	2.6	0.02	0.25	75
2310	2.59	0.01	0.12	88

To constant= 0.37

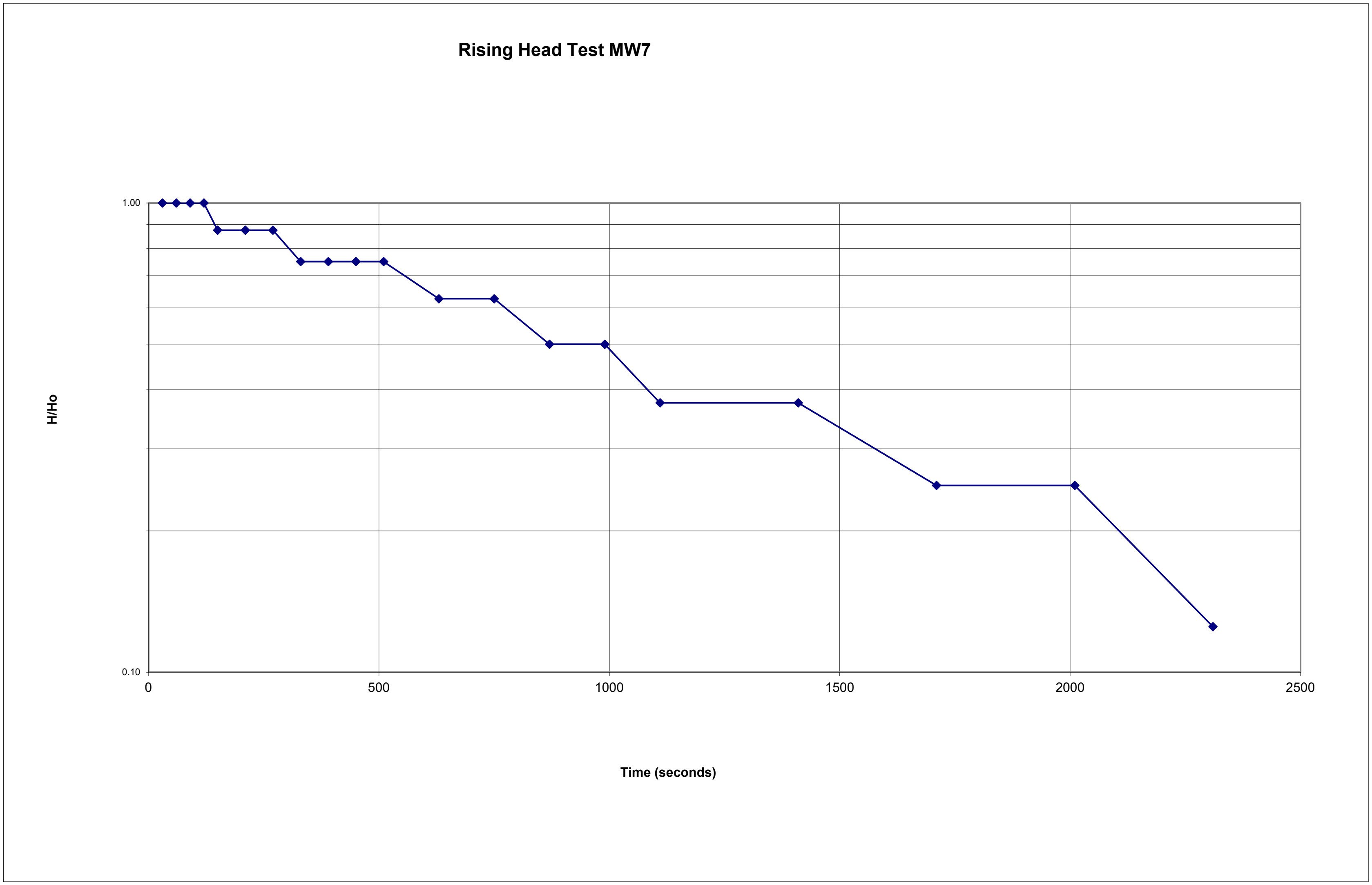
L/R	ln(L/R)
122.0	4.804021

input

r=	0.0032	(pipe radius)
L=	3.05	(effective screen length, if straddles water)
R=	0.03	(hole radius)
To=	620	

$$K = \frac{r2(\ln(L/R))}{2(To)(L)}$$

K= 1.30E-08 m/sec or **1.30E-06 cm/sec**


Rising Head Test MW7
H/Ho
1.00
0.10
0
500
1000
1500
2000
2500
Time (seconds)

ATTACHMENT B

Groundwater Inflow Analysis

CONSTRUCTION DEWATERING ASSUMPTIONS - Unconfined Aquifer

Project: Proposed Residential Mixed-Use Building - 770-774 Bronson Ave, Ottawa - PHASE 1

Radial Flow Water Table Aquifer (Powers, 2007)

$$Q = \frac{\pi K (H^2 - h^2)}{\ln {R_0}/{r_s}} \text{ (m}^3\text{/day)}$$

Sichardt and Kryieleis (Powers, 2007)

$$R_{sich} = C(H-h)\sqrt{K} \text{ (m)}$$

Appendix A-1: Construction Dewatering Flow Rate - No Cut-Off Structure

Description	Symbol	Value	Unit	Explanation
Input Data				
Ground elevation		75.40	m asl	Based on WSP 2025 Geotechnical Report
Groundwater elevation		75.09	m asl	Highest interpreted groundwater level
P3 Underground Parking Level - Final Slab		65.80	m asl	Based on WSP 2025 Geotechnical Report
Estimated base of excavation - P3 Underground Parking Level		64.30	m asl	Based on WSP 2025 Geotechnical Report
Base of water bearing zone		63.30	m asl	Estimated as 1 m below the bottom of the excavation
Hydraulic conductivity - Limestone bedrock	K	4E-06	m/s	BH15-3 - shallow monitoring well (Golder 2015)
	K	3.5E-01	m/day	Converted to m/day
Dimensions of Excavation	a	74.0	m	Estimated from design plan
	b	32.0	m	Estimated from design plan
Output				
Target water level		63.30	masl	1.0 m below the bottom of excavation
Water level above bottom of water bearing zone before dewatering	H	11.8	m	
Water level at excavation wall	h	0.0	m	
Equivalent radius	r_s	27.5	m	Equivalent radius based on excavation geometry
Sichardt and Kyrieleis estimate for radius of influence	R_{sich}	70.7	m	where c = 3000 for well approximation
Radius of influence	R_0	70.7	m	Estimated = rs+Rsich
Construction dewatering flow rate	Q	159.5	m^3/day	Construction dewatering flow rate
Safety factor	S.F.	1.0	-	Enter desired safety factor
Construction dewatering flow rate (with S.F.)	Q	159.5	m^3/day	
		159,456	L/day	

Precipitation Estimate

Location	Assumed Precip Event (mm)	Area (m^2)	Total (Liters)
Excavation Area	79.2	2,368	187,546

CONSTRUCTION DEWATERING ASSUMPTIONS - Unconfined Aquifer

Project: Proposed Residential Mixed-Use Building - 770-774 Bronson Ave, Ottawa - PHASE 2

Radial Flow Water Table Aquifer (Powers, 2007)

$$Q = \frac{\pi K(H^2 - h^2)}{\ln R_0 / r_s} \text{ (m}^3\text{/day)}$$

Sichardt and Kryieleis (Powers, 2007)

$$R_{sich} = C(H-h)\sqrt{K} \text{ (m)}$$

Appendix A-2: Construction Dewatering Flow Rate - No Cut-Off Structure

Description	Symbol	Value	Unit	Explanation
Input Data				
Ground elevation		75.40	m asl	Based on WSP 2025 Geotechnical Report
Groundwater elevation		75.09	m asl	Highest groundwater level in a bedrock monitoring well plus one meter
P2 Underground Parking Level - Final Slab		68.40	m asl	Based on WSP 2025 Geotechnical Report
Estimated base of excavation - P2 Underground Parking Level		66.90	m asl	Based on WSP 2025 Geotechnical Report
Base of water bearing zone		65.90	m asl	Estimated as 1 m below the bottom of the excavation
Hydraulic conductivity - Limestone bedrock	K	4E-06	m/s	BH15-3 - shallow monitoring well (Golder 2015)
	K	3.5E-01	m/day	Converted to m/day
Dimensions of Excavation	a	60.0	m	Estimated from design plan
	b	39.0	m	Estimated from design plan
Output				
Target water level		65.90	masl	1.0 m below the bottom of excavation
Water level above bottom of water bearing zone before dewatering	H	9.2	m	
Water level at excavation wall	h	0.0	m	
Equivalent radius	r_s	27.3	m	Equivalent radius based on excavation geometry
Sichardt and Kyrieleis estimate for radius of influence	R_{sich}	55.1	m	where c = 3000 for well approximation
Radius of influence	R_0	55.1	m	Estimated = rs+Rsich
Construction dewatering flow rate	Q	130.4	m^3/day	Construction dewatering flow rate
Safety factor	S.F.	1.0	-	Enter desired safety factor
Construction dewatering flow rate (with S.F.)	Q	130.4	m^3/day	
		130,383	L/day	

Precipitation Estimate

Location	Assumed Precip Event (mm)	Area (m^2)	Total (Liters)
Excavation Area	79.2	2,340	185,328

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