ENG-TECH
CONSULTING LIMITED

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December 02, 2016

File No. 16-035-01

WSP Canada Inc.
1600 Buffalo Place,
Winnipeg, MB
R3T 6B8

ATTENTION: Jason Bunn

RE: Hydraulic Conductivity Test Results, Brightstone Colony

ENG-TECH Consulting Limited (ENG-TECH) received the three (3) Shelby tube samples from the above site, and two (2) samples were extracted on November 18, 2016 and selected for hydraulic conductivity testing by MB Sustainable Development.

ENG-TECH prepared the samples labelled ST1 and ST3 for testing in accordance with ASTM D5084-03, *Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter*. The final hydraulic conductivity values (k_{20}) of 2.5×10^{-8} cm/sec and 5.8×10^{-9} cm/sec were obtained for the samples identified as ST1 and ST3, respectively. The hydraulic conductivity test data is outlined in Table 1, while the graphical representations of the hydraulic conductivity versus elapsed time are shown in Figures 1 and 2.

ENG-TECH trusts the above is all the information you require. If you have any questions, please contact the undersigned.

Sincerely,
ENG-TECH Consulting Limited

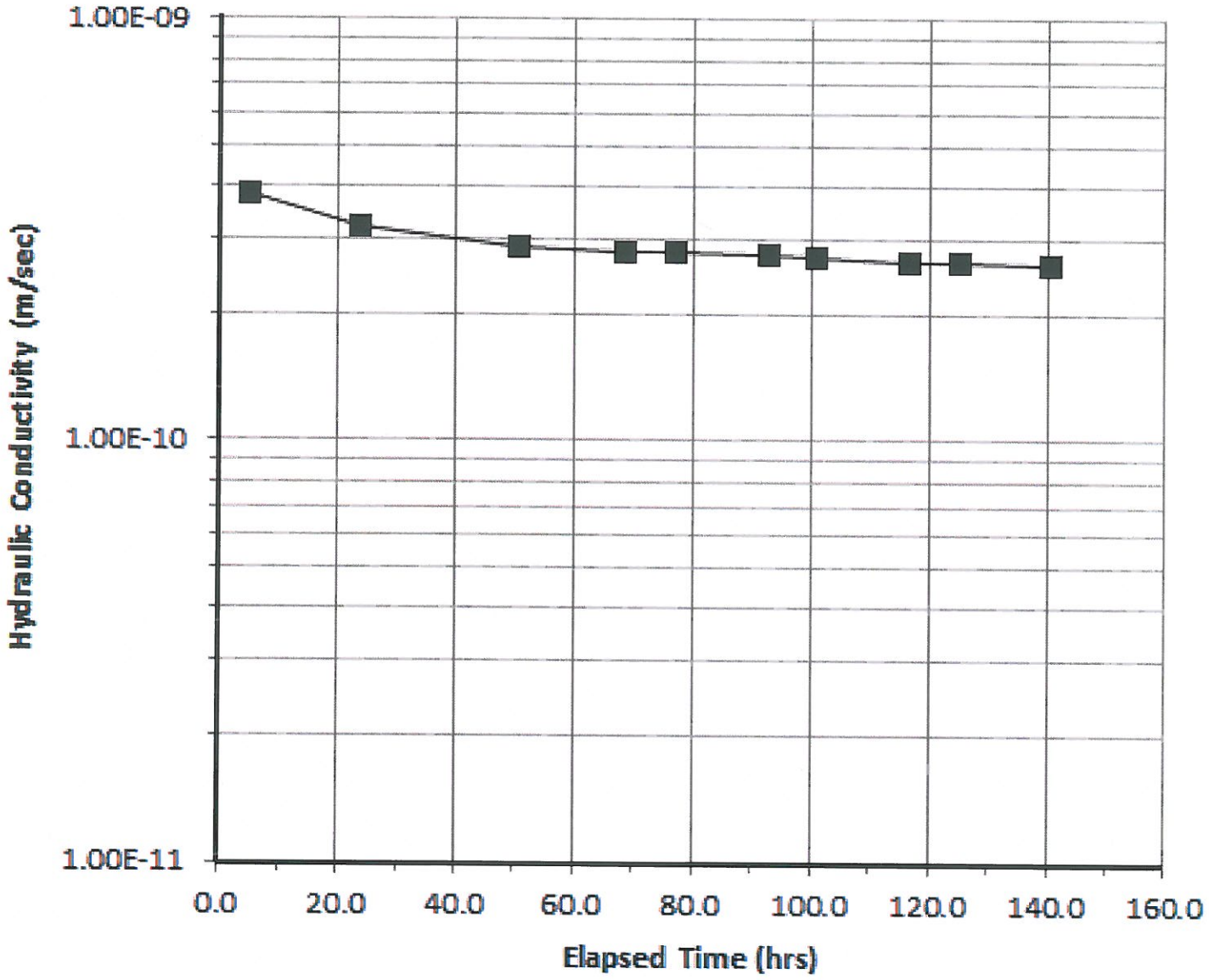
Clark Hryhoruk, M.Sc., P.Eng.
President, Geotechnical Engineer

CDH/pfpc

Attachments: Table 1 – Hydraulic Conductivity Test Data
Figure 1 – Hydraulic Conductivity Versus Elapsed Time (ST1)
Figure 2 – Hydraulic Conductivity Versus Elapsed Time (ST3)

TABLE 1
HYDRAULIC CONDUCTIVITY TEST DATA
BRIGHTSTONE COLONY

SAMPLE IDENTIFICATION	ST1	ST3
INITIAL VALUES		
ENG-TECH Reference No.	16-035-01-4	16-035-01-5
Length of Sample in Tube (cm)	Approx. 23.0	Approx. 33.0
Length (cm)	6.39	6.71
Diameter (cm)	6.31	6.89
Area (cm^2)	31.3	37.3
Volume (cm^3)	199.7	250.1
Water Content (%)	38.3	37.2
Bulk Dry Density (kg/m^3)	1829	1842
Specific Gravity (G_s) (assumed)	2.68	2.68
Void Ratio	1.03	1.00
Degree of Saturation (%)	Approx.100	Approx.100
FINAL VALUES		
Length (cm)	6.52	6.89
Diameter (cm)	6.46	7.00
Area (cm^2)	32.8	38.5
Volume (cm^3)	213.6	265.0
Water Content (%)	46.1	48.2
Bulk Dry Density (kg/m^3)	1753	1785
Specific Gravity (G_s) (assumed)	2.68	2.68
Void Ratio	1.23	1.23
Degree of Saturation (%)	100	100
CONSOLIDATION PHASE		
Confining Pressure (kPa)	103.4	103.4
Pore Water Pressure (kPa)	82.7	82.7
Effective Stress (kPa)	20.7	20.7
PERMEATION PHASE		
Confining Pressure (kPa)	103.4	103.4
Pore Water Pressure (kPa)	82.7	82.7
Effective Stress (kPa)	20.7	20.7
Hydraulic Gradient	17.2	16.3
Permeant Fluid	Distilled Water	Distilled Water
HYDRAULIC CONDUCTIVITY at TEST TEMPERATURE OF 21 °C (cm/sec)	2.6×10^{-8}	5.9×10^{-9}
HYDRAULIC CONDUCTIVITY at TEMPERATURE OF 20 °C (K_{20}) (cm/sec)	2.5×10^{-8}	5.8×10^{-9}



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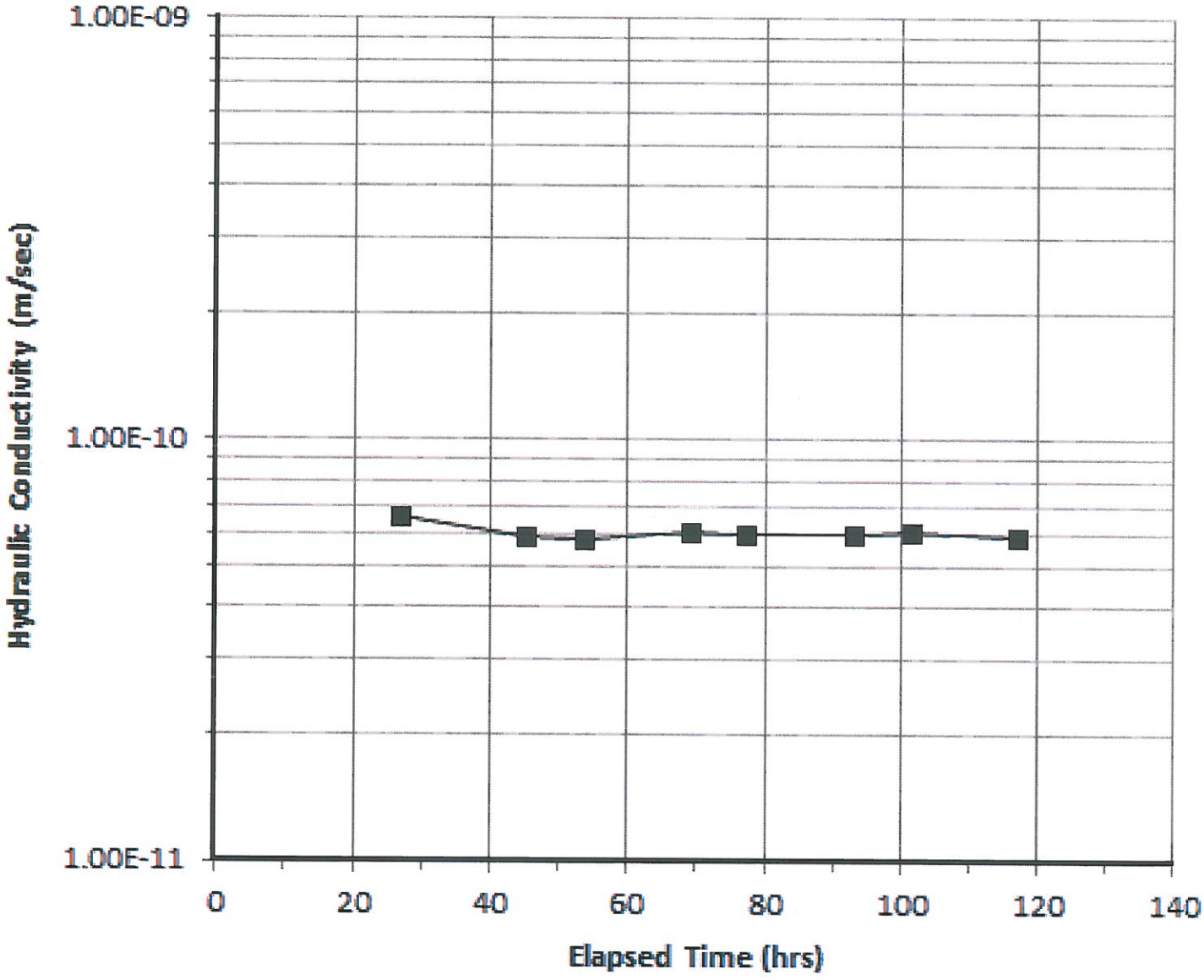
ENG. STAMP:

APEGM Certificate of Authorization
ENG-TECH Consulting Limited
No. 2475 Expiry: April 30, 2017

CLIENT: WSP CANADA INC.			PROJECT: BRIGHTSTONE COLONY	
DATE: DECEMBER 2016			FILE No.: 16-035-01	HYDRAULIC CONDUCTIVITY VERSUS ELAPSED TIME (ST1)
DRAWN BY: PFPC	FIGURE No.: 1	REV.:	SCALE: N/A	



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CLIENT: WSP CANADA INC.			PROJECT: BRIGHTSTONE COLONY	
DATE: DECEMBER 2016			FILE No.: 16-035-01	HYDRAULIC CONDUCTIVITY VERSUS ELAPSED TIME (ST3)
DRAWN BY: PFPC	FIGURE No.: 2	REV.:	SCALE: N/A	