

Boring Number: B-1

Client: City of New Bedford
Project Location: New Bedford, MA

Project Name: Kings Highway Survey
Project Number: 0309-100430

Drilling Contractor/Driller: NEBC /

Surface Elevation (ft.):

Drilling Method/Casing/Core Barrel Size: Vacuum Excavation

Total Depth (ft.): 5

Hammer Weight/Drop Height/ Spoon Size:

Depth to Initial Water Level (ft):

Bore Hole Location: See Boring Location Plan

Depth Date Time

Drilling Date: Start: 4/20/2018 **End:** 4/20/2018

4.5 4/20/2018 8:20

Abandonment Method: Backfilled with cuttings.

Logged By: J. Todd / D. Melcher

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
0									6" Asphalt	
	AS	S-1						Fill	Moist, grey-brown, fine to coarse SAND, little fine to coarse gravel, little silt	Occasional cobbles, less than 6" in diameter. Treated wood fragments in top 12".
▼	AS	S-2							Wet, grey, fine to medium SAND, little silt, little ceramic debris	
5									End of utility clearance. Exploration offset approximately 5 ft west to B-1B for permeability test and split spoon sampling.	
10										
15										

Sample Types

Consistency vs Blowcount/Foot

Burmister Classification

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core

HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Granular (Sand):
V. Loose: 0-4 Dense: 30-50
Loose: 4-10 V. Dense: >50
M. Dense: 10-30

Fine Grained (Clay):
V. Soft: <2 Stiff: 8-15
Soft: 2-4 V. Stiff: 15-30
M. Stiff: 4-8 Hard: >30

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: V. Chan

Date: 5/4/2018

Boring Number: B-1



Boring Number: B-1B

Client: City of New Bedford
Project Location: New Bedford, MA

Project Name: Kings Highway Survey
Project Number: 0309-100430

Drilling Contractor/Driller: NEBC / M. Ferreira

Surface Elevation (ft.):

Drilling Method/Casing/Core Barrel Size: Drive and Wash / 4 in / Not Applicable

Total Depth (ft.): 7

Hammer Weight/Drop Height/ Spoon Size: 140 lb / 30 in / 2 in O.D.

Depth to Initial Water Level (ft):

Bore Hole Location: See Boring Location Plan

Depth Date Time

Drilling Date: Start: 4/26/2018 **End:** 4/26/2018

NR -- --

Abandonment Method: Backfilled with cuttings.

Logged By: J. Todd / D. Melcher

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
0								Fill	Casing driven and rollerbit advance directly to 3 ft bgs. Permeability test conducted at 3 ft bgs.	
	SS	S-1	24	5 2 8 9	12	10			A: (Top 6") Wet, medium dense, brown, fine to coarse SAND, little fine gravel, trace ceramic debris, trace shells, trace silt B: (Bottom 6") Moist, medium dense, grey, fine SAND, trace silt	
5	SS	S-2	24	22 17 21 14	14	38		Silty Sand	Moist, dense, grey, fine to medium SAND, little fine gravel, little silt	FeO staining in bottom 7" of S-2.
									End of exploration at 7 ft bgs.	
10										
15										

Sample Types**Consistency vs Blowcount/Foot****Burmister Classification**

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core

HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Granular (Sand):

V. Loose: 0-4 Dense: 30-50
Loose: 4-10 V. Dense: >50
M. Dense: 10-30

Fine Grained (Clay):

V. Soft: <2 Stiff: 8-15
Soft: 2-4 V. Stiff: 15-30
M. Stiff: 4-8 Hard: >30

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: V. Chan

Date: 5/4/2018

Boring Number: B-1B



Boring Number: B-2

Client: City of New Bedford
Project Location: New Bedford, MA

Project Name: Kings Highway Survey
Project Number: 0309-100430

Drilling Contractor/Driller: NEBC /

Surface Elevation (ft.):

Drilling Method/Casing/Core Barrel Size: Vacuum Excavation

Total Depth (ft.): 3

Hammer Weight/Drop Height/ Spoon Size:

Depth to Initial Water Level (ft):

Bore Hole Location: See Boring Location Plan

Depth Date Time

Drilling Date: Start: 4/20/2018 **End:** 4/20/2018

2.8 4/20/2018 9:30

Abandonment Method: Backfilled with cuttings.

Logged By: J. Todd / D. Melcher

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
0									6" Asphalt	
	AS	S-1						Fill	Moist, brown, fine to medium SAND, little fine to coarse gravel, little silt	
▼									A large boulder was encountered at approximately 3 ft bgs. Offset approximately 8 ft bgs southwest to B-2A.	
5										
10										
15										

Sample Types**Consistency vs Blowcount/Foot****Burmister Classification**

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core

HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Granular (Sand):
V. Loose: 0-4 Dense: 30-50
Loose: 4-10 V. Dense: >50
M. Dense: 10-30

Fine Grained (Clay):
V. Soft: <2 Stiff: 8-15
Soft: 2-4 V. Stiff: 15-30
M. Stiff: 4-8 Hard: >30

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: V. Chan

Date: 5/4/2018

Boring Number: B-2



Boring Number: B-2A

Client: City of New Bedford
Project Location: New Bedford, MA

Project Name: Kings Highway Survey
Project Number: 0309-100430

Drilling Contractor/Driller: NEBC /

Surface Elevation (ft.):

Drilling Method/Casing/Core Barrel Size: Vacuum Excavation

Total Depth (ft.): 5

Hammer Weight/Drop Height/ Spoon Size:

Depth to Initial Water Level (ft):

Bore Hole Location: See Boring Location Plan

Depth Date Time

Drilling Date: Start: 4/20/2018 **End:** 4/20/2018

4.5 4/20/2018 11:00

Abandonment Method: Backfilled with cuttings.

Logged By: J. Todd / D. Melcher

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
0									6" Asphalt	
	AS	S-1						Fill	Moist, brown, fine to coarse SAND, some fine to coarse gravel, trace silt	Occasional cobbles, less than 6" in diameter.
▼	AS	S-2						Silty Sand	Wet, brown, fine to medium SAND, little silt	
5									End of vacuum excavation.	
10										
15										

Sample Types**Consistency vs Blowcount/Foot****Burmister Classification**

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core

HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Granular (Sand):

V. Loose: 0-4 Dense: 30-50
Loose: 4-10 V. Dense: >50
M. Dense: 10-30

Fine Grained (Clay):

V. Soft: <2 Stiff: 8-15
Soft: 2-4 V. Stiff: 15-30
M. Stiff: 4-8 Hard: >30

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: V. Chan

Date: 5/4/2018

Boring Number: B-2A



Boring Number: B-3

Client: City of New Bedford
Project Location: New Bedford, MA

Project Name: Kings Highway Survey
Project Number: 0309-100430

Drilling Contractor/Driller: NEBC / M. Ferreira

Surface Elevation (ft.):

Drilling Method/Casing/Core Barrel Size: Drive and Wash / 4 in / Not Applicable

Total Depth (ft.): 9

Hammer Weight/Drop Height/ Spoon Size: 140 lb / 30 in / 2 in O.D.

Depth to Initial Water Level (ft):

Bore Hole Location: See Boring Location Plan

Depth Date Time

Drilling Date: Start: 4/20/2018 **End:** 4/26/2018

NE 4/20/2018 12:50

Abandonment Method: Backfilled with cuttings.

Logged By: J. Todd

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
0	AS	S-1							3" Topsoil	
	AS	S-2						Fill	Moist, brown, fine to coarse SAND, some silt, little fine to coarse gravel	Occasional cobbles, less than 6" in diameter.
5	SS	S-3	24	29 53 56 59	15	109		Silty Sand	Moist, very dense, grey, fine to coarse SAND, some silt, trace fine gravel	Vacuum excavation to 5 ft bgs. Permeability test conducted at 5 ft bgs.
	SS	S-4	24	53 65 33 30	18	98			Moist, very dense, grey, fine to coarse SAND, little silt, little fine to coarse gravel	
10									End of exploration at 9 ft bgs.	
15										

Sample Types**Consistency vs Blowcount/Foot****Burmister Classification**

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core

HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Granular (Sand):
V. Loose: 0-4 Dense: 30-50
Loose: 4-10 V. Dense: >50
M. Dense: 10-30

Fine Grained (Clay):
V. Soft: <2 Stiff: 8-15
Soft: 2-4 V. Stiff: 15-30
M. Stiff: 4-8 Hard: >30

and 35-50%
some 20-35%
little 10-20%
trace <10%
moisture, density, color

Reviewed by: V. Chan

Date: 5/4/2018

Boring Number: B-3

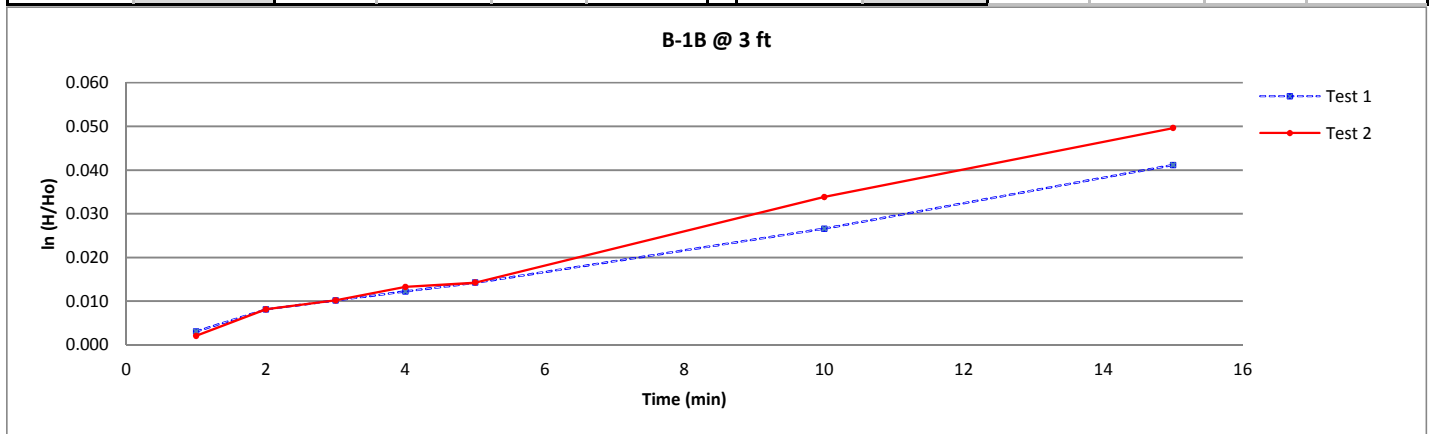


PT ID No. B- 1B
Sheet 1 of 1

Prepared for: City of New Bedford			PROJECT: LOCATION: Kings Highway Survey New Bedford, MA		
INSPECTOR:	J. Todd	DRILLER:	M. Ferreira	Start Date:	4/26/2018
CONTRACTOR:	NEBC	HELPER:	N. Crowley	Start Time:	10:20
Weather:	Overcast, Breezy, 18.1 °C				
Depth of PT:	3 ft	Drill Bit Type:	Roller	Weight of Hammer for casing:	140 lbs
Rig Type:	CME 55 (ATV)	Casing Internal Diameter:	4 in	Type of Hammer:	Safety
		Casing Length:	62 in		

General Formula:			Formula for 4" internal diameter casing (in/hr):		
ASTM D-6391 – 11 PERMEABILITY COEFFICIENT (Km) FORMULA:			$K_m = \pi R_t \times \frac{\left[D \left\{ \ln \left(\frac{h_1}{h_2} \right) \right\} \right]}{11 \times (t_2 - t_1)}$		
where:			$R_t = 2.2902(0.9842^T) / T^{0.1702}$		

B-1B @ 3 ft											
TEST 1						TEST 2					
Water temperature (°C), T:		11.5		Rt= 1.26		Water temperature (°C), T:		11.5		Rt= 1.26	
FIELD DATA		CALCULATED DATA				FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t ₂ -t ₁)	*Km (in/hr)	Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t ₂ -t ₁)	*Km (in/hr)
1	0.188	61.813	0.003	0.017	0.2612	1	0.125	61.875	0.002	0.017	0.1741
2	0.500	61.500	0.008	0.017	0.4372	2	0.500	61.500	0.008	0.017	0.5243
3	0.625	61.375	0.010	0.017	0.1755	3	0.625	61.375	0.010	0.017	0.1755
4	0.750	61.250	0.012	0.017	0.1758	4	0.813	61.188	0.013	0.017	0.2639
5	0.875	61.125	0.014	0.017	0.1762	5	0.875	61.125	0.014	0.017	0.0881
10	1.625	60.375	0.027	0.083	0.2130	10	2.063	59.938	0.034	0.083	0.3384
15	2.500	59.500	0.041	0.083	0.2518	15	3.000	59.000	0.050	0.083	0.2720



TEST 1 FINAL RESULTS			TEST 2 FINAL RESULTS		
Time Weighted Average Permeability Coefficient	Km=	0.2367 in/hr	Time Weighted Average Permeability Coefficient	Km=	0.2852 in/hr

AVERAGE B-1B @ 3 ft		
Time Weighted Average Permeability Coefficient	Km=	0.2609 in/hr

Inspectors Remarks:
Cuttings and tailings consist of brown fine to coarse SAND, some silt, trace fine gravel.

DEFINITION OF VARIABLES

*Km= Mean permeability
T = Temperature of permeant (water), in °C
Ln = Natural Logarithmic
t1 = Time at the start of the test in the same units selected for Km

t2= Time at the end of the test in the units selected for Km
h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km
h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km



PT ID No. B- 3
Sheet 1 of 1

Prepared for: City of New Bedford		PROJECT: LOCATION: Kings Highway Survey New Bedford, MA	
INSPECTOR: CONTRACTOR:	J. Todd NEBC	DRILLER: HELPER:	M. Ferreira N. Crowley
Start Date: Start Time:		4/26/2018 13:05	
Weather:		Partly Cloudy, Breezy, 33.8 °C	
Depth of PT:	5 ft	Drill Bit Type:	Roller
Rig Type:	CME 55 (ATV)	Casing Internal Diameter:	4 in
Weight of Hammer for casing:		140 lbs	
Type of Hammer:		Safety	
Casing Length:		76 in	

General Formula: Formula for 4" internal diameter casing (in/hr):

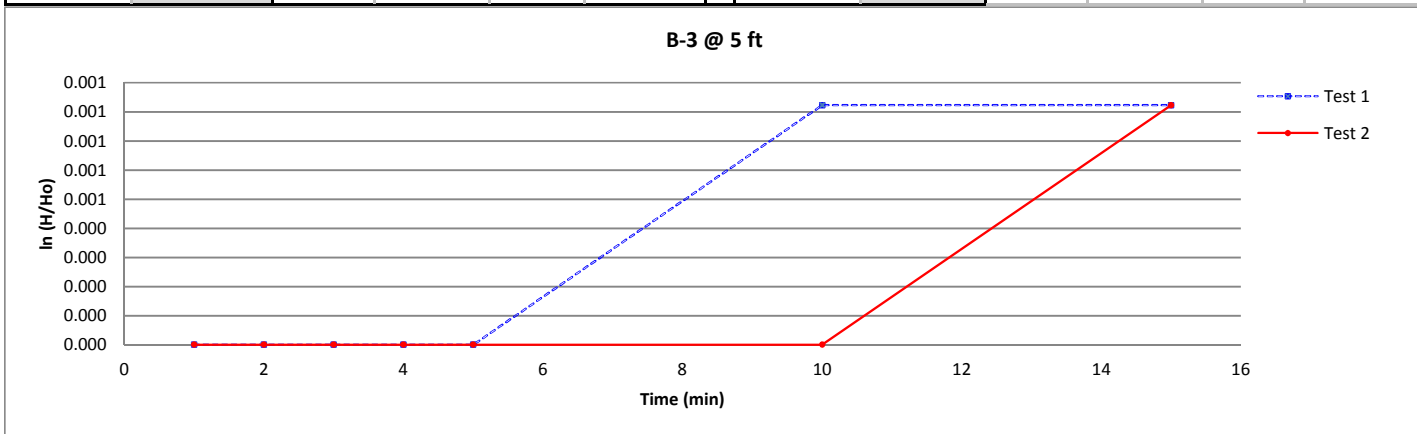
ASTM D-6391 – 11 PERMEABILITY COEFFICIENT (Km) FORMULA:

$$K_m = \pi R_t \times \frac{\left[D \left\{ \ln \left(\frac{h_1}{h_2} \right) \right\} \right]}{11 \times (t_2 - t_1)}$$

$$K_m = 1.142 R_t \times \frac{\left[\ln \left(\frac{h_1}{h_2} \right) \right]}{(t_2 - t_1)}$$

where: $R_t = 2.2902(0.9842^T) / T^{0.1702}$

B-3 @ 5 ft																		
TEST 1							TEST 2											
Water temperature (°C), T:			18.8		Rt=		1.03			Water temperature (°C), T:			18.8		Rt=	1.03		
FIELD DATA		CALCULATED DATA					FIELD DATA		CALCULATED DATA									
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t ₂ -t ₁)	*Km (in/hr)		Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t ₂ -t ₁)	*Km (in/hr)						
1	0.000	76.000	0.000	0.017	0.0000		1	0.000	76.000	0.000	0.017	0.0000						
2	0.000	76.000	0.000	0.017	0.0000		2	0.000	76.000	0.000	0.017	0.0000						
3	0.000	76.000	0.000	0.017	0.0000		3	0.000	76.000	0.000	0.017	0.0000						
4	0.000	76.000	0.000	0.017	0.0000	4	0.000	76.000	0.000	0.017	0.0000							
5	0.000	76.000	0.000	0.017	0.0000	5	0.000	76.000	0.000	0.017	0.0000							
10	0.063	75.938	0.001	0.083	0.0116	10	0.000	76.000	0.000	0.083	0.0000							
15	0.063	75.938	0.001	0.083	0.0000	15	0.063	75.938	0.001	0.083	0.0116							



TEST 1 FINAL RESULTS		TEST 2 FINAL RESULTS	
Time Weighted Average Permeability Coefficient	Km= 0.0039 in/hr	Time Weighted Average Permeability Coefficient	Km= 0.0039 in/hr

AVERAGE B-3 @ 5 ft	
Time Weighted Average Permeability Coefficient	Km= 0.0039 in/hr

Inspectors Remarks:
Cuttings and tailings consist of brown fine to coarse SAND, some silt, little fine to coarse gravel.

DEFINITION OF VARIABLES

*Km= Mean permeability
T = Temperature of permeant (water), in °C
Ln = Natural Logarithmic
t1 = Time at the start of the test in the same units selected for Km

t2= Time at the end of the test in the units selected for Km
h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km
h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

NEW BEDFORD
KINGS HIGHWAY IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	78	137
PROJECT FILE NO.		606709	

DRAINAGE & UTILITY PLANS

