

- ✓ ENVIRONMENTAL SERVICES
- ✓ GEOTECHNICAL SERVICES
- ✓ CONSTRUCTION MATERIALS TESTING
- ✓ CONCRETE & ASPHALT MIX DESIGNS
- ✓ APPROVED SPECIAL INSPECTION AGENCY

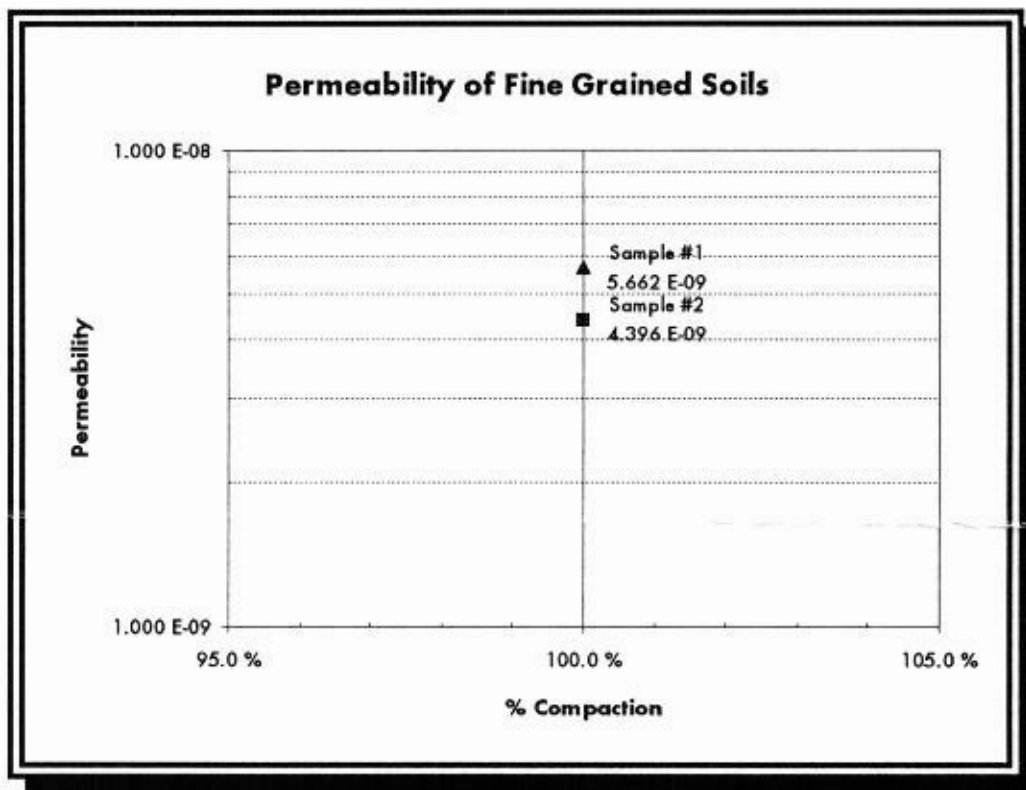
THE MOXIE INTERNATIONAL
840 N. 10th St., #G
Sacramento, CA 95814

Attn: Dennis Lee

Re: Permeability
Project: Misc. Testing Svc., 1994

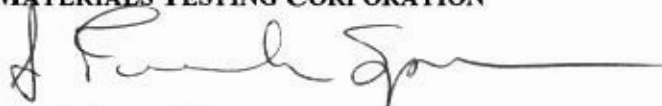
Gentlemen;

As per your request, MTC has performed a Permeability of Concrete Cores obtained from the test slabs at the Corliss Batchplant in Sumner WA.. The testing was performed in accordance with ASTM D 5084 specifications and test procedures. The summary of the results obtained is on the following attached page. A graphically representation of the results is shown below.



If you have any questions concerning the test results, the procedures used, or if MTC can be of any further assistance please call on us at (206) 850-7797.

Respectfully Submitted,
MATERIALS TESTING CORPORATION



J. Frank Spears, P.E.
V.P./General Manager

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PERMEABILITY OF FINE GRAINED SOILS

ASTM D 5084, "Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter" Method A

PROJECT:	MISC TESTING	CONTRACTOR:	
CLIENT:	MOXIE INTERNATIONAL	SUPPLIER:	CORLISS CONCRETE
Permit #:		Sample ID:	Concrete core w/ Moxie 1800
Inspector:	Gary Byrne	Source:	Corliss, Sumner Test Slab

					Average		
I	Initial Height of Sample (inches):	4.182	4.184	4.192	4.181	4.185	
I	Initial Diameter of Sample (inches):	2.714	2.721	2.721	2.720	2.719	
C	Area of Sample [$3.1416 \times B^2 / 4$]:	5.806	in ²	I	Maximum Dry Density:	148.6 lbs/ft	
D	Area of Sample [$C \times 6.452$]:	37.460	cm ²	J	Optimum % Moisture:		
E	Cell Pressure:	50	psi	K	Weight of Sample:	947.7 gram	
F	Upper Cap Pressure:	20	psi	L	Sample % Moisture:		
G	Lower Cap Pressure:	40	psi	M	Density [$K / (A \times C) \times 3.8095 \times (1 - L / 100)$]:	148.6 lbs/ft	
H	Loss of Head [$(F - G) / 0.036 \times 2.54$]:	1411.11	cm	N	Sample % Compaction [$M / (x \times 100)$]:	100.0 %	
		#1	#2	#3	#4	#5	#6
O	Initial Inlet Burette Reading:	31.7	33.7	34.2	36.2	36.9	
P	Final Inlet Burette Reading:	33.7	34.2	36.2	36.9		
Q	Initial Outlet Burette Reading:	16.6	14.4	13.8	11.6	10.7	
R	Final Outlet Burette Reading:	14.4	13.8	11.6	10.7		
S	Initial Reading Time:	05/17/94 14:44	07:55:00 AM	01:47:45 PM	08:29:45 AM	03:50:45 PM	
T	Final Reading Time:	05/18/94 07:55	05/18/94 13:47	05/19/94 08:29	05/19/94 15:50		
U	Elapsed Time (T-S) (H:M:S):	17:11:00	05:52:45	18:42:00	07:21:00	Done	Done
V	Elapsed Time (seconds):	61860	21165	67320	26460		
W	Inlet Flow (P-O):	2.0	0.5	2.0	0.7	-36.9	
X	Flow (R-Q) (should be $\pm 5\%$ of W):	2.2	0.6	2.2	0.9	10.7	
Y	Temperature (°C):	20	20	20	20	20	20
Z	Correction Factor [$-0.02452 \times Y + 1.495$]:	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046
	Permeability [$(A \times W \times 2.54) / (D \times H \times V) \times Z$]:	6.531 E-09	4.772 E-09	6.001 E-09	5.344 E-09		
	Average Permeability (cm/s):	5.662 E-09 cm/s					

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 Porous Materials using a Flexible Wall Permeameter" Method A

PROJECT:	MISC TESTING	CONTRACTOR:	
CLIENT:	MOXIE INTERNATIONAL	SUPPLIER:	CORLISS CONCRETE
Permit #:		Sample ID:	Concrete core with Moxie 1800 #2
Inspector:	Gary Byrne	Source:	Test Slab at Corliss, Sumner Plant

					Average		
I	Initial Height of Sample (inches):	3.581	3.591	3.604	3.580	3.589	
I	Initial Diameter of Sample (inches):	2.721	2.721	2.722	2.722	2.722	
C	Area of Sample [$3.1416 \times B^2 / 4$]:	5.817	in ²	I	Maximum Dry Density:	147.0 lbs/ft ³	
D	Area of Sample [$C \times 6.452$]:	37.531	cm ²	J	Optimum % Moisture:		
E	Cell Pressure:	50	psi	K	Weight of Sample:	805.7 gram	
F	Upper Cap Pressure:	20	psi	L	Sample % Moisture:		
G	Lower Cap Pressure:	40	psi	M	Moisture Density [K/(AxC) x 3.8095 x (1-E/100)]:	147.0 lbs/ft ³	
H	Loss of Head [(F - G) / 0.038 x 2.54]:	1411.11	cm	N	Proctor % Compaction [M/T x 100]:	100.0 %	
		#1	#2	#3	#4	#5	#6
O	Initial Inlet Burette Reading:	1	8	8.4	10	12.1	
P	Final Inlet Burette Reading:	8	8.4	10	12.1		
Q	Initial Outlet Burette Reading:	48.8	41.8	41.4	39.9	37.8	
R	Final Outlet Burette Reading:	41.8	41.4	39.9	37.8		
S	Initial Reading Time:	6/10/94 15:51	10:32:00 AM	6/13/94 15:09	9:34:45 AM	9:30:15 AM	
T	Final Reading Time:	6/13/94 10:32	6/13/94 15:09	6/14/94 9:34	6/15/94 9:30		
U	Elapsed Time [T-S] (H:M:S):	18:41:00	4:37:30	18:25:15	23:55:30	Done	Done
V	Elapsed Time (seconds):	240060	16650	66315	86130		
W	Inlet Flow [P-O]:	7.0	0.4	1.6	2.1	-12.1	
X	Flow [R-Q] (should be ± 5 % of W):	7.0	0.4	1.5	2.1	37.8	
Y	Temperature (°C):	20	20	20	20	20	20
Z	Correction Factor [-0.02452 x Y + 1.495]:	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046
	Permeability [(A x W x 2.54) / (D x H x V) x Z]:	5.042 E-09	4.154 E-09	4.172 E-09	4.216 E-09		
	Average Permeability (cm/s):	4.396 E-09 cm/s					