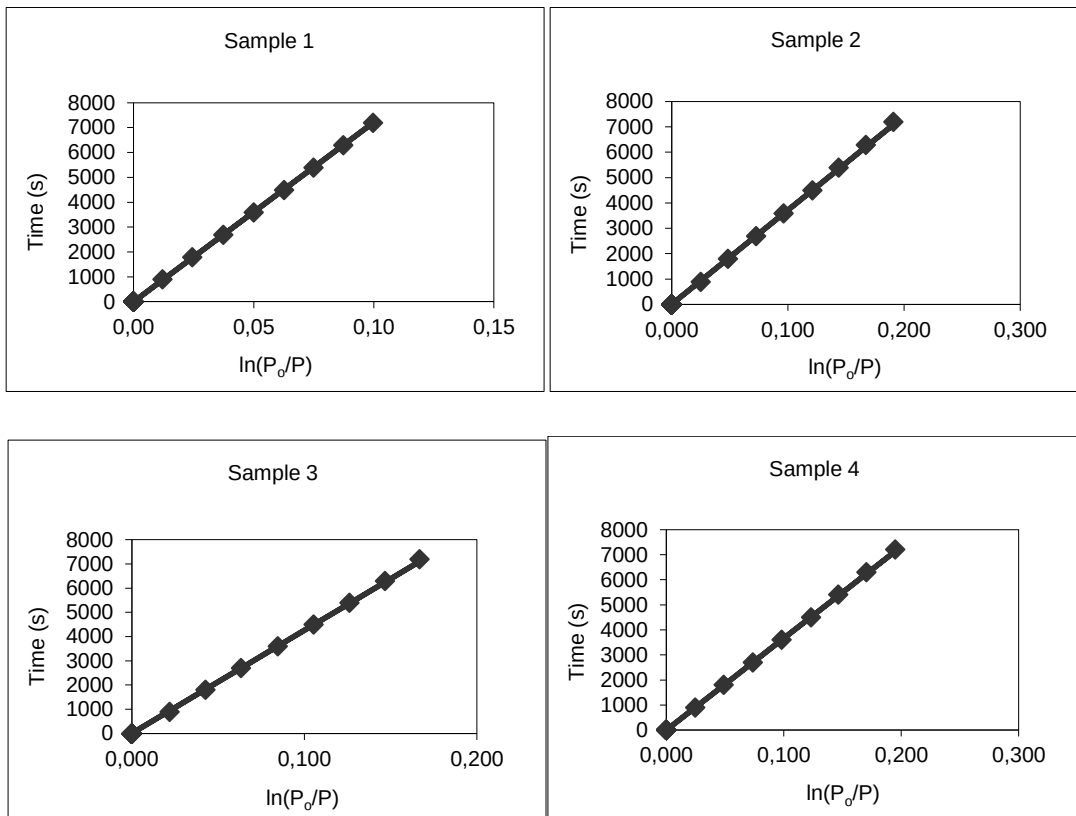


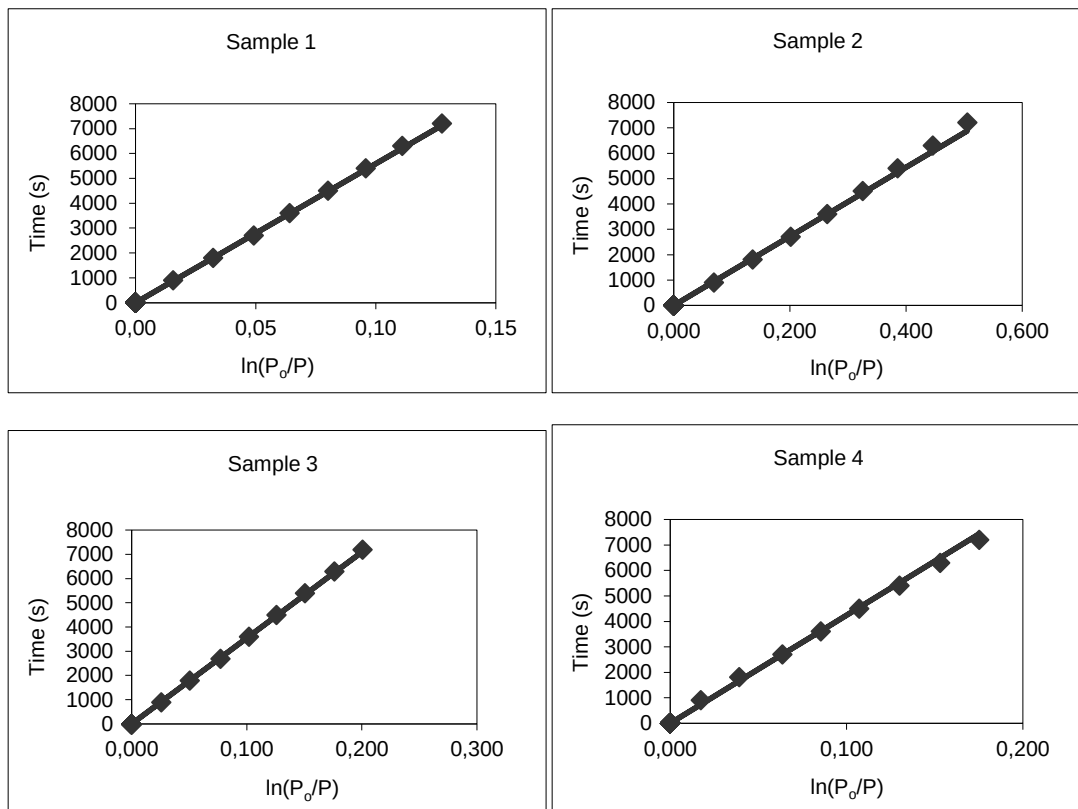
Oxygen permeability index results of the concrete mixtures

28-32 days oxygen permeability results after 3-days initial moist curing period

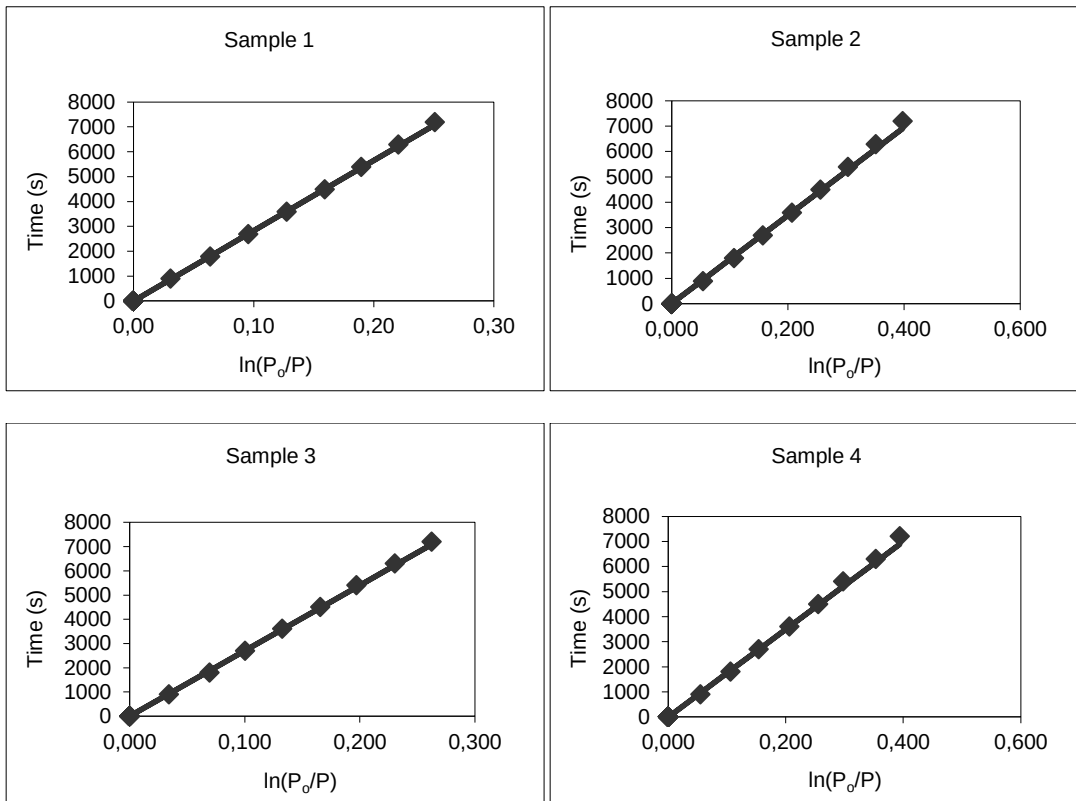
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-40-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	1.2E-10	COV:	25.9	%			
OPI:	9.9						
1		2		3		4	
Diameter (mm)	68.63	Diameter (mm)	68.28	Diameter (mm)	68.42	Diameter (mm)	68.15
Thickness (mm)	30.62	Thickness (mm)	29.99	Thickness (mm)	30.76	Thickness (mm)	28.47
k (m/s)	7.17019E-11	k (m/s)	1.36461E-10	k (m/s)	1.21897E-10	k (m/s)	1.32275E-10
r ²	0.9999	r ²	0.9995	r ²	0.9996	r ²	0.9998
Time (hh.min)	Pressure (kPa)	Time (hh.min)	Pressure (kPa)	Time (hh.min)	Pressure (kPa)	Time (hh.min)	Pressure (kPa)
16.07	102.8	16.07	104.8	16.07	105.9	16.07	102.8
16.22	101.6	16.22	102.3	16.22	103.6	16.22	100.3
16.37	100.4	16.37	99.9	16.37	101.4	16.37	97.9
16.52	99.1	16.52	97.5	16.52	99.4	16.52	95.5
17.07	97.8	17.07	95.2	17.07	97.3	17.07	93.2
17.22	96.6	17.22	92.9	17.22	95.3	17.22	90.9
17.37	95.4	17.37	90.8	17.37	93.3	17.37	88.8
17.52	94.2	17.52	88.7	17.52	91.4	17.52	86.7
18.07	93.1	18.07	86.6	18.07	89.6	18.07	84.6



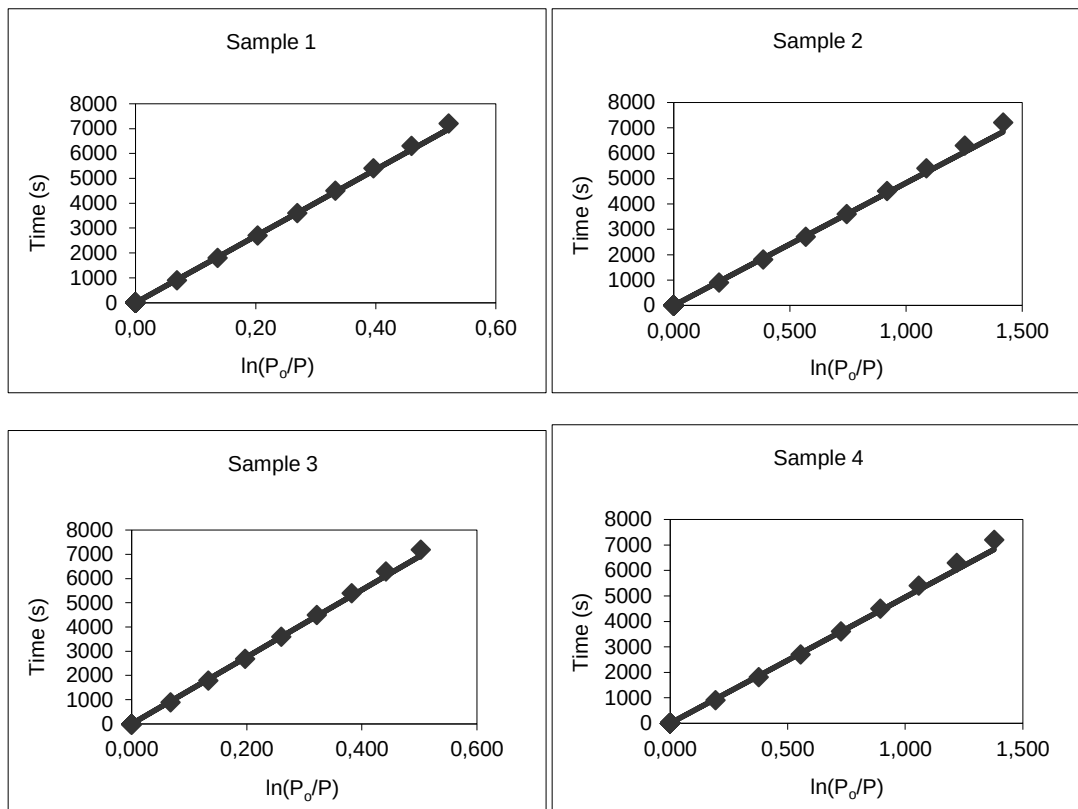
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-50-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	1.9E-10	COV:	71.4%				
OPI:	9.7						
1		2		3		4	
Diameter (mm)	68.33	Diameter (mm)	68.15	Diameter (mm)	68.24	Diameter (mm)	68.12
Thickness (mm)	29.23	Thickness (mm)	31.61	Thickness (mm)	30.01	Thickness (mm)	32.67
k (m/s)	8.83862E-11	k (m/s)	3.87178E-10	k (m/s)	1.43507E-10	k (m/s)	1.34995E-10
r ²	0.9996	r ²	0.9962	r ²	0.9997	r ²	0.9966
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
14.5	101.6	14.5	103.4	14.5	101.4	14.5	105.1
15.05	100.0	15.05	96.4	15.05	98.8	15.05	103.3
15.2	98.3	15.2	90.3	15.2	96.4	15.2	101.1
15.35	96.7	15.35	84.5	15.35	93.8	15.35	98.7
15.5	95.2	15.5	79.4	15.5	91.6	15.5	96.5
16.05	93.7	16.05	74.7	16.05	89.4	16.05	94.4
16.2	92.3	16.2	70.3	16.2	87.2	16.2	92.3
16.35	90.9	16.35	66.2	16.35	85.0	16.35	90.2
16.5	89.4	16.5	62.4	16.5	82.9	16.5	88.2



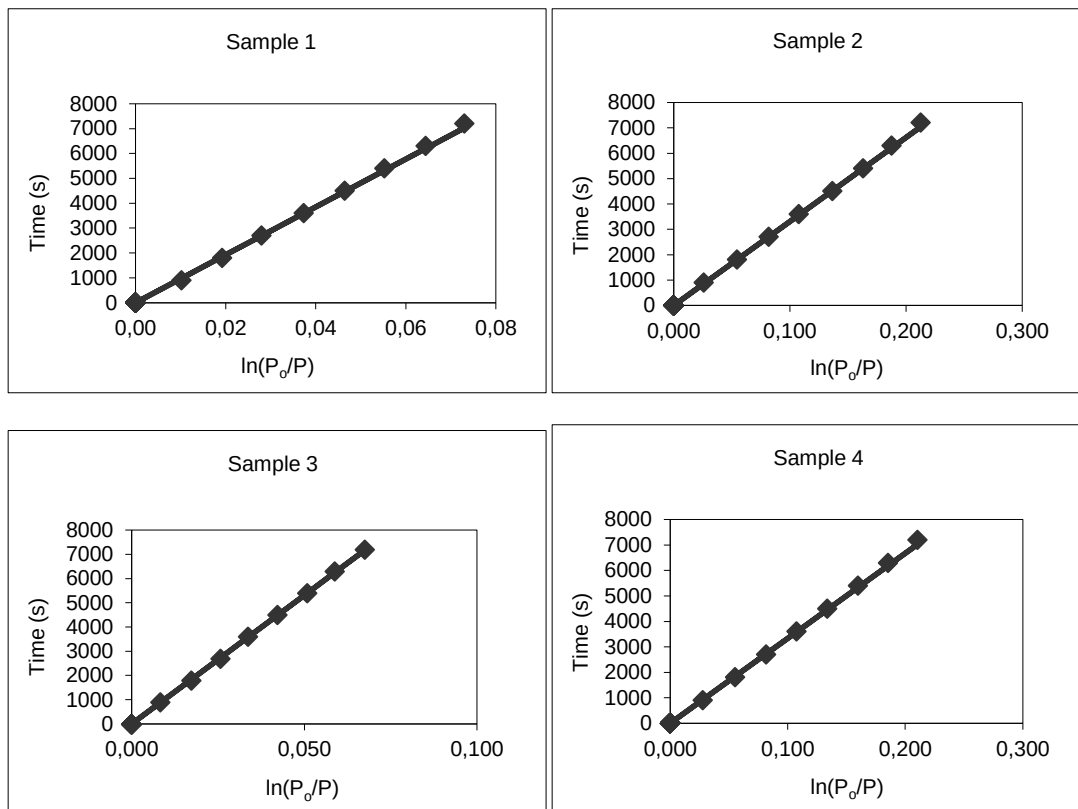
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-60-3			Operator:	AY		
Date:	7/30/2012						
Average k (m/s):	2.5E-10	COV:	28.0%				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	68.51	Diameter (mm)	68.2	Diameter (mm)	68.5	Diameter (mm)	68.09
Thickness (mm)	31.91	Thickness (mm)	31.11	Thickness (mm)	30.15	Thickness (mm)	33.12
k (m/s)	1.89707E-10	k (m/s)	2.9911E-10	k (m/s)	1.87291E-10	k (m/s)	3.1739E-10
r ²	0.9996	r ²	0.9969	r ²	0.9994	r ²	0.9967
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.29	101.1	11.16	103.9	17.29	103.7	17.29	103.8
17.44	98.0	11.31	98.4	17.44	100.3	17.44	98.3
17.59	94.8	11.46	93.3	17.59	96.8	17.59	93.4
18.14	91.9	12.01	88.8	18.14	93.8	18.14	89.0
18.29	89.0	12.16	84.5	18.29	90.9	18.29	84.5
18.44	86.2	12.31	80.4	18.44	87.9	18.44	80.4
18.59	83.6	12.46	76.7	18.59	85.2	18.59	77.1
19.14	81.1	13.01	73.1	19.14	82.4	19.14	72.9
19.29	78.7	13.16	69.8	19.29	79.8	19.29	70.0



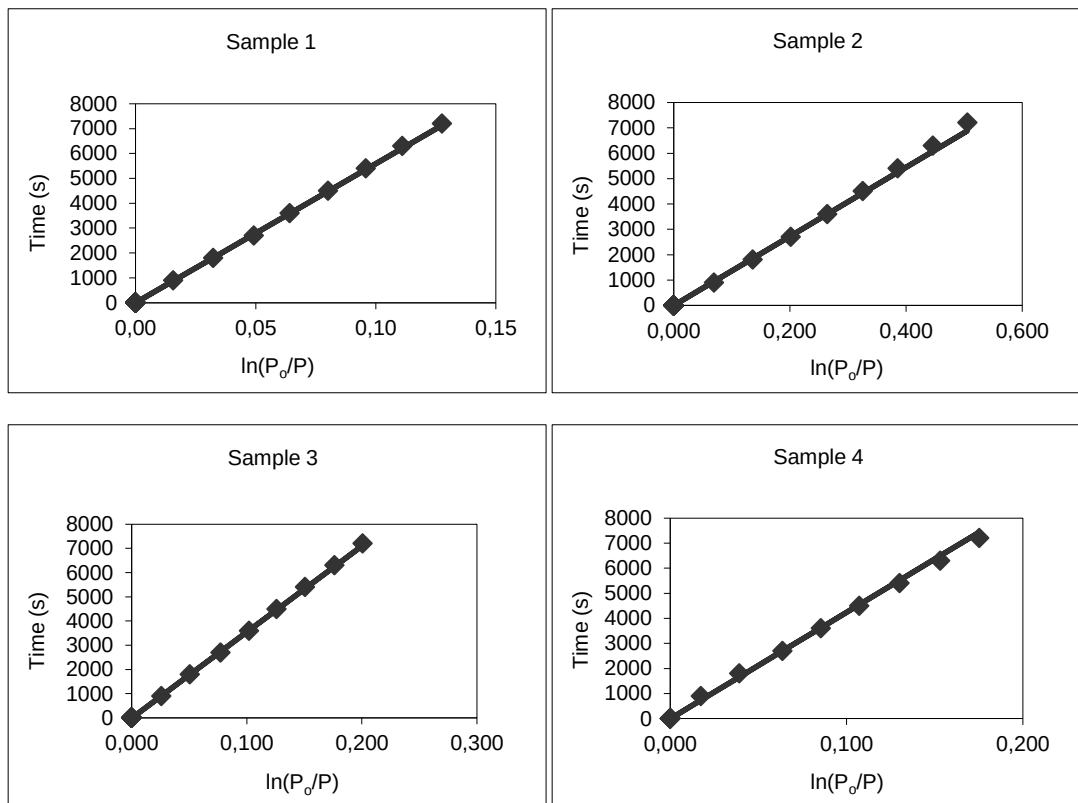
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-75-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	6.5E-10	COV:	52.6%				
OPI:	9.2						
1		2		3		4	
Diameter (mm)	70.54	Diameter (mm)	70.34	Diameter (mm)	70.56	Diameter (mm)	70.68
Thickness (mm)	30.14	Thickness (mm)	30.04	Thickness (mm)	31.66	Thickness (mm)	29.81
k (m/s)	3.53424E-10	k (m/s)	9.71268E-10	k (m/s)	3.5791E-10	k (m/s)	9.29113E-10
r^2	0.9984	r^2	0.9955	r^2	0.9978	r^2	0.9949
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
8.44	103.4	8.44	105.4	8.44	100.5	8.44	104.2
8.59	96.5	8.59	86.7	8.59	94.0	8.59	85.9
9.14	90.2	9.14	71.6	9.14	88.0	9.14	71.5
9.29	84.3	9.29	59.7	9.29	82.5	9.29	59.8
9.44	79.0	9.44	50.0	9.44	77.5	9.44	50.4
9.59	74.1	9.59	42.0	9.59	72.9	9.59	42.6
10.14	69.5	10.14	35.5	10.14	68.6	10.14	36.2
10.29	65.3	10.29	30.1	10.29	64.6	10.29	30.8
10.44	61.4	10.44	25.5	10.44	60.8	10.44	26.2



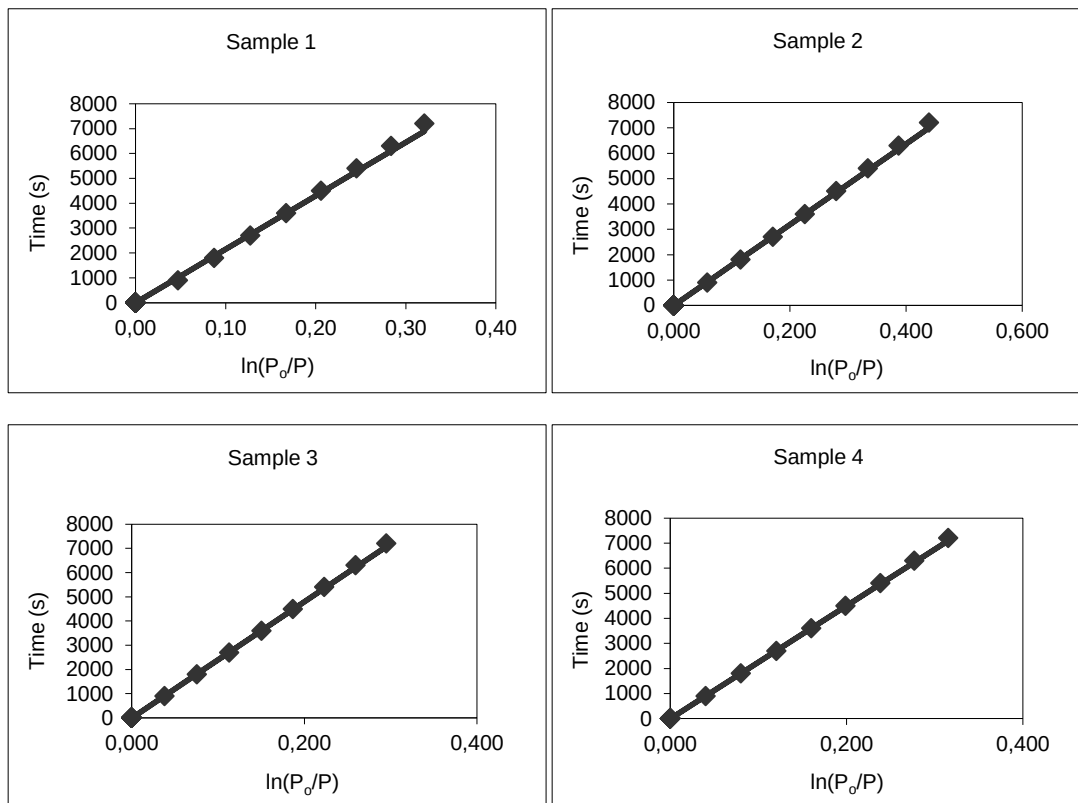
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-40-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	1.0E-10	COV:	60.7 %				
OPI:	10.0						
1		2		3		4	
Diameter (mm)	70.36	Diameter (mm)	70.13	Diameter (mm)	70.55	Diameter (mm)	70.27
Thickness (mm)	30.48	Thickness (mm)	31.5	Thickness (mm)	30.26	Thickness (mm)	32.5
k (m/s)	5.01711E-11	k (m/s)	1.52396E-10	k (m/s)	4.54009E-11	k (m/s)	1.54692E-10
r ²	0.9989	r ²	0.9992	r ²	0.9999	r ²	0.9989
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
13.12	104.0	13.12	101.7	13.12	100.1	13.12	103.8
13.27	102.9	13.27	99.1	13.27	99.2	13.27	101.0
13.42	102.0	13.42	96.3	13.42	98.3	13.42	98.3
13.57	101.1	13.57	93.7	13.57	97.5	13.57	95.7
14.12	100.2	14.12	91.3	14.12	96.7	14.12	93.3
14.27	99.3	14.27	88.7	14.27	95.9	14.27	90.8
14.42	98.4	14.42	86.4	14.42	95.1	14.42	88.5
14.57	97.5	14.57	84.3	14.57	94.3	14.57	86.3
15.12	96.7	15.12	82.2	15.12	93.5	15.12	84.1



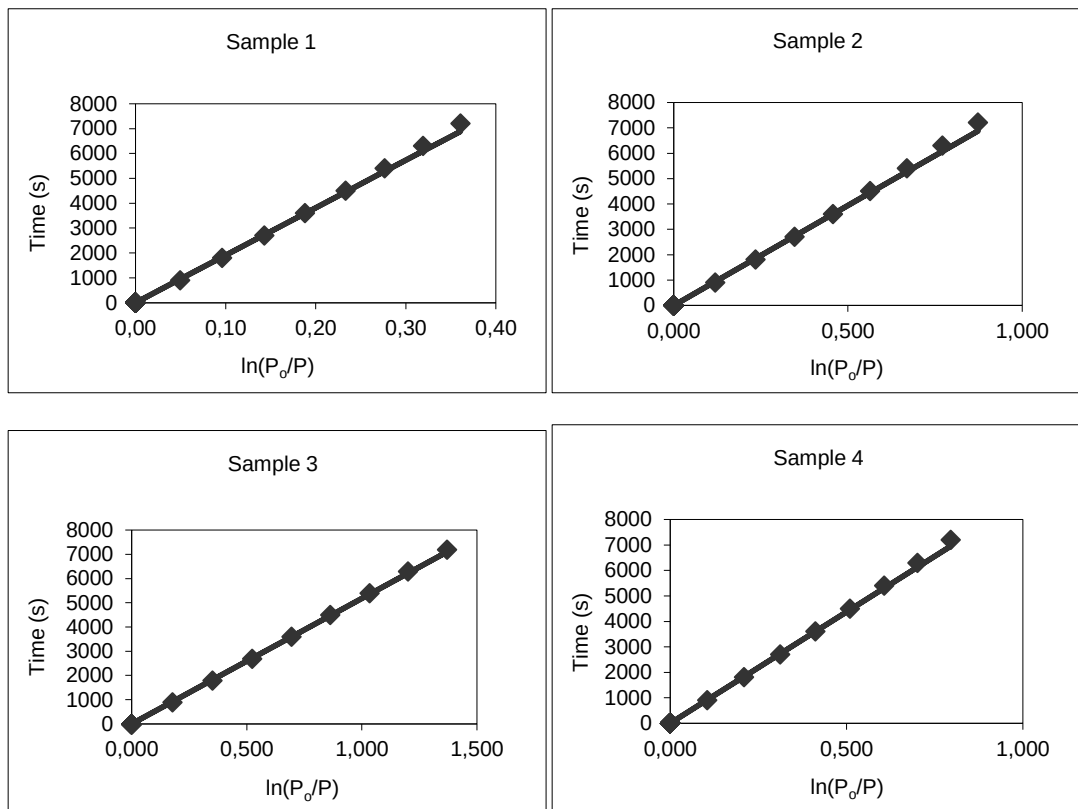
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-50-3			Operator:	AY		
Date:	8/13/2012						
Average k (m/s):	1.7E-10	COV:	65.0 %				
OPI:	9.8						
1		2		3		4	
Diameter (mm)	70.23	Diameter (mm)	69.93	Diameter (mm)	69.88	Diameter (mm)	70.01
Thickness (mm)	29.9	Thickness (mm)	28.62	Thickness (mm)	29.37	Thickness (mm)	32.85
k (m/s)	8.55863E-11	k (m/s)	3.32936E-10	k (m/s)	1.33931E-10	k (m/s)	1.28509E-10
r^2	0.9996	r^2	0.9962	r^2	0.9997	r^2	0.9966
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
14.5	101.6	14.5	103.4	14.5	101.4	14.5	105.1
15.05	100.0	15.05	96.4	15.05	98.8	15.05	103.3
15.2	98.3	15.2	90.3	15.2	96.4	15.2	101.1
15.35	96.7	15.35	84.5	15.35	93.8	15.35	98.7
15.5	95.2	15.5	79.4	15.5	91.6	15.5	96.5
16.05	93.7	16.05	74.7	16.05	89.4	16.05	94.4
16.2	92.3	16.2	70.3	16.2	87.2	16.2	92.3
16.35	90.9	16.35	66.2	16.35	85.0	16.35	90.2
16.5	89.4	16.5	62.4	16.5	82.9	16.5	88.2



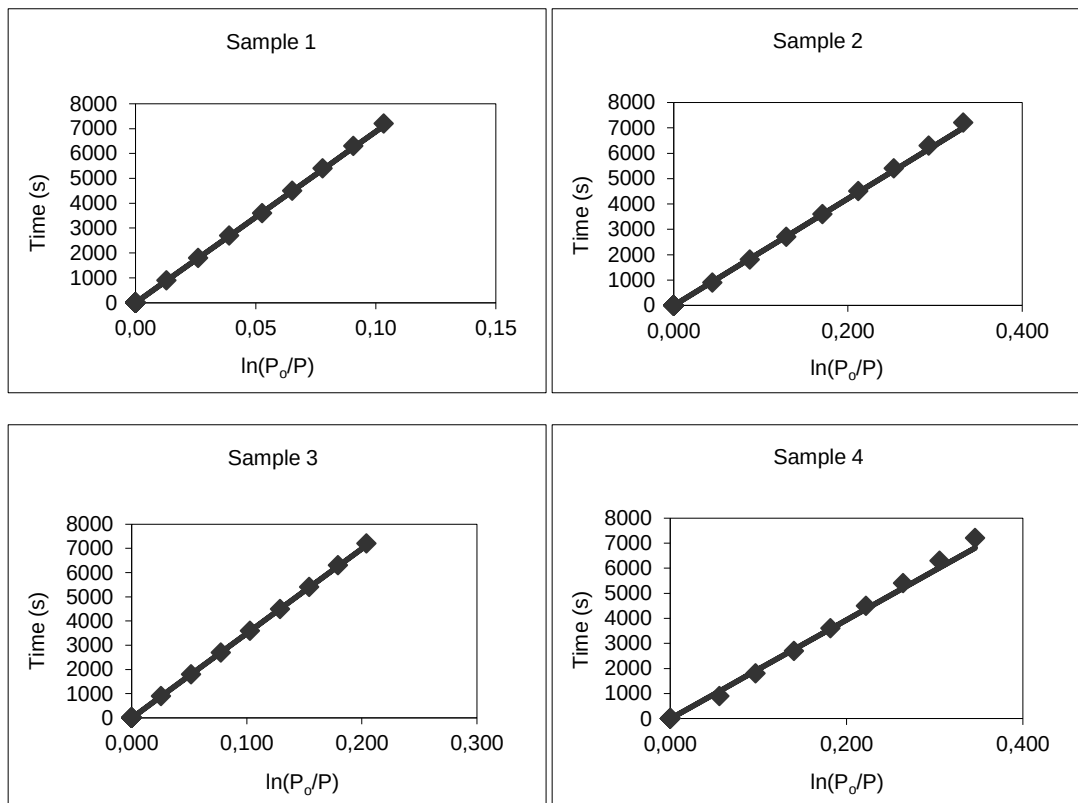
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-60-3			Operator:	AY		
Date:	7/27/2012						
Average k (m/s):	2.4E-10	COV:	23.7%				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	70.25	Diameter (mm)	69.85	Diameter (mm)	70.5	Diameter (mm)	70.1
Thickness (mm)	28.9	Thickness (mm)	32.08	Thickness (mm)	31.1	Thickness (mm)	30.15
k (m/s)	2.11363E-10	k (m/s)	3.23344E-10	k (m/s)	2.05447E-10	k (m/s)	2.15096E-10
r ²	0.9964	r ²	0.9987	r ²	0.9995	r ²	0.9997
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
9.51	103.5	12.14	103.8	7.37	101.6	7.37	102.8
10.06	98.7	12.29	98.0	7.52	97.8	7.52	98.7
10.21	94.9	12.44	92.5	8.07	94.2	8.07	94.9
10.36	91.1	12.59	87.5	8.22	90.7	8.22	91.1
10.51	87.6	13.14	82.8	8.37	87.4	8.37	87.6
11.06	84.2	13.29	78.4	8.52	84.3	8.52	84.2
11.21	81.0	13.44	74.3	9.07	81.3	9.07	81.0
11.36	77.9	13.59	70.4	9.22	78.4	9.22	77.9
11.51	75.1	14.14	66.9	9.37	75.6	9.37	75.0



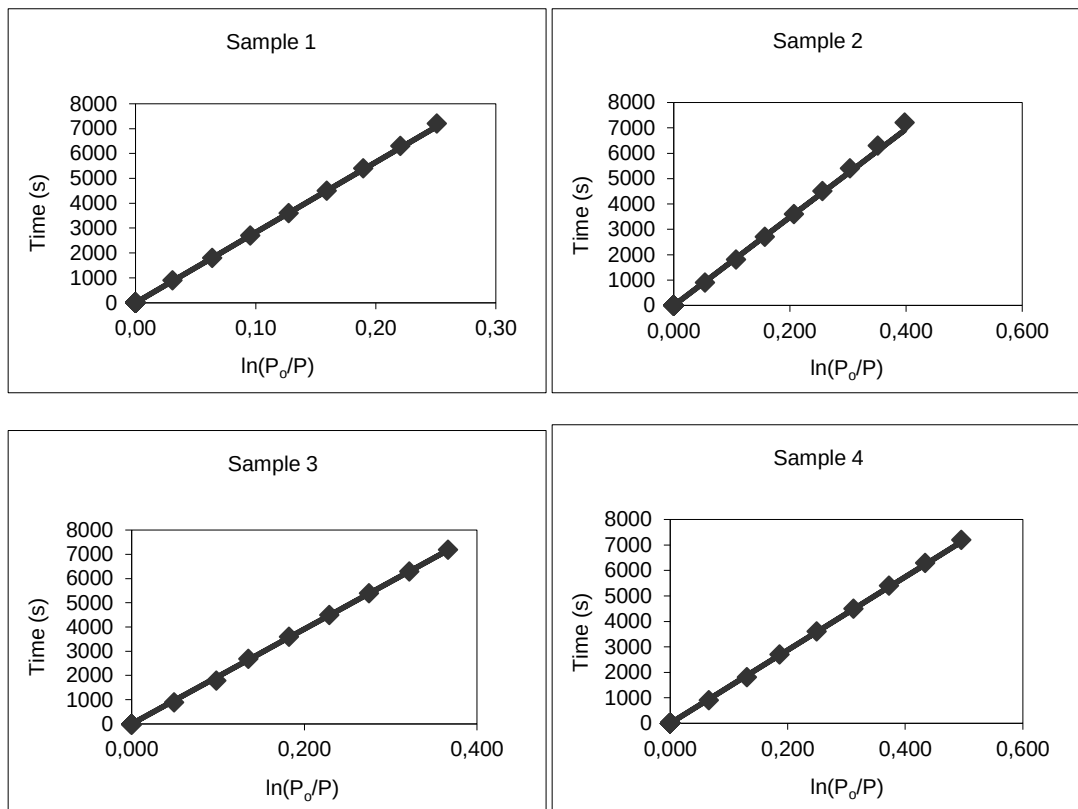
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-75-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	6.1E-10	COV:	46.9%				
OPI:	9.2						
1		2		3		4	
Diameter (mm)	69.09	Diameter (mm)	68.03	Diameter (mm)	68.4	Diameter (mm)	68.65
Thickness (mm)	30.17	Thickness (mm)	30.21	Thickness (mm)	29.5	Thickness (mm)	31.4
k (m/s)	2.56635E-10	k (m/s)	6.42055E-10	k (m/s)	9.5958E-10	k (m/s)	5.94376E-10
r^2	0.9968	r^2	0.9965	r^2	0.9996	r^2	0.9980
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
8.4	101.4	8.4	103.0	8.4	98.4	8.4	103.3
8.55	96.5	8.55	91.4	8.55	82.4	8.55	93.0
9.1	92.1	9.1	81.4	9.1	69.2	9.1	83.8
9.25	87.9	9.25	72.8	9.25	58.3	9.25	75.6
9.4	84.0	9.4	65.2	9.4	49.1	9.4	68.4
9.55	80.3	9.55	58.6	9.55	41.5	9.55	62.0
10.1	76.9	10.1	52.7	10.1	35.0	10.1	56.3
10.25	73.7	10.25	47.6	10.25	29.6	10.25	51.2
10.4	70.7	10.4	43.0	10.4	25.0	10.4	46.6



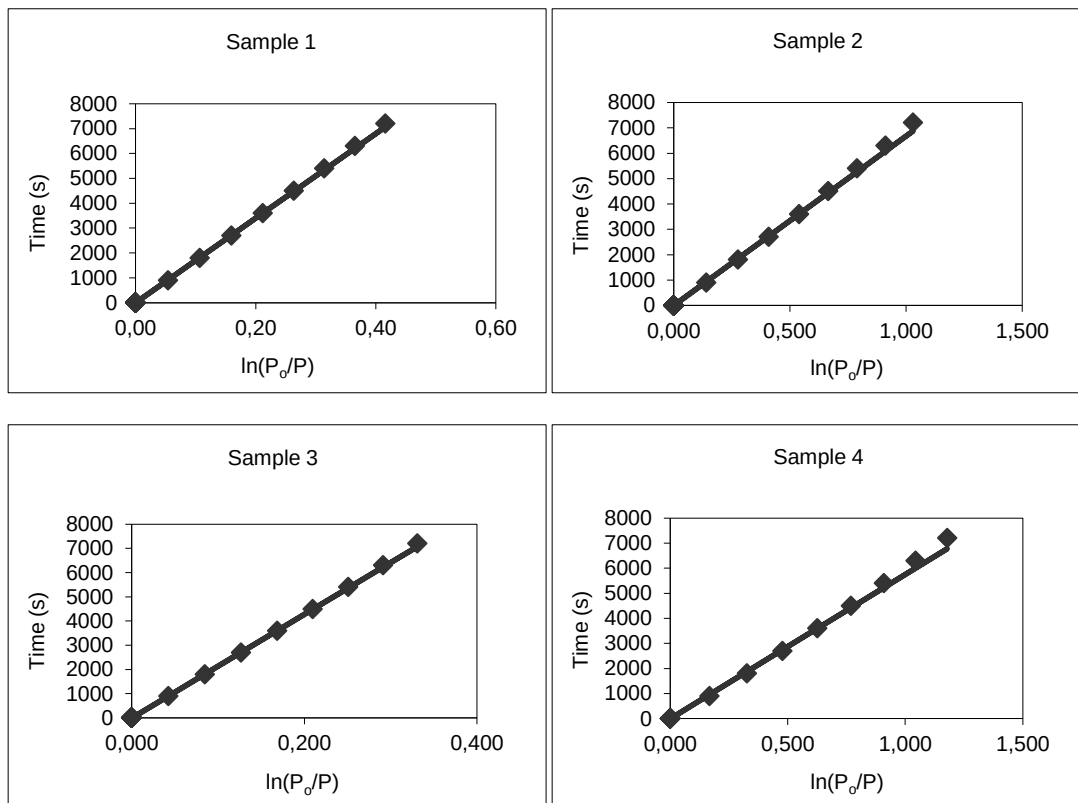
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-40-3			Operator:	AY		
Date:	8/7/2012						
Average k (m/s):	1.7E-10	COV:	49.1%				
OPI:	9.8						
1		2		3		4	
Diameter (mm)	70.41	Diameter (mm)	70.14	Diameter (mm)	70.29	Diameter (mm)	70.11
Thickness (mm)	28.7	Thickness (mm)	30.84	Thickness (mm)	30.25	Thickness (mm)	30.6
k (m/s)	6.64176E-11	k (m/s)	2.33078E-10	k (m/s)	1.38769E-10	k (m/s)	2.43077E-10
r^2	0.9997	r^2	0.9985	r^2	0.9999	r^2	0.9930
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
8.4	101.4	8.4	103.0	8.4	104.0	8.4	102.9
8.55	100.1	8.55	98.5	8.55	101.4	8.55	97.3
9.1	98.8	9.1	94.3	9.1	98.8	9.1	93.4
9.25	97.6	9.25	90.5	9.25	96.2	9.25	89.4
9.4	96.2	9.4	86.8	9.4	93.8	9.4	85.8
9.55	95.0	9.55	83.3	9.55	91.4	9.55	82.4
10.1	93.8	10.1	80.0	10.1	89.1	10.1	79.0
10.25	92.7	10.25	76.8	10.25	86.9	10.25	75.8
10.4	91.5	10.4	73.9	10.4	84.8	10.4	72.8



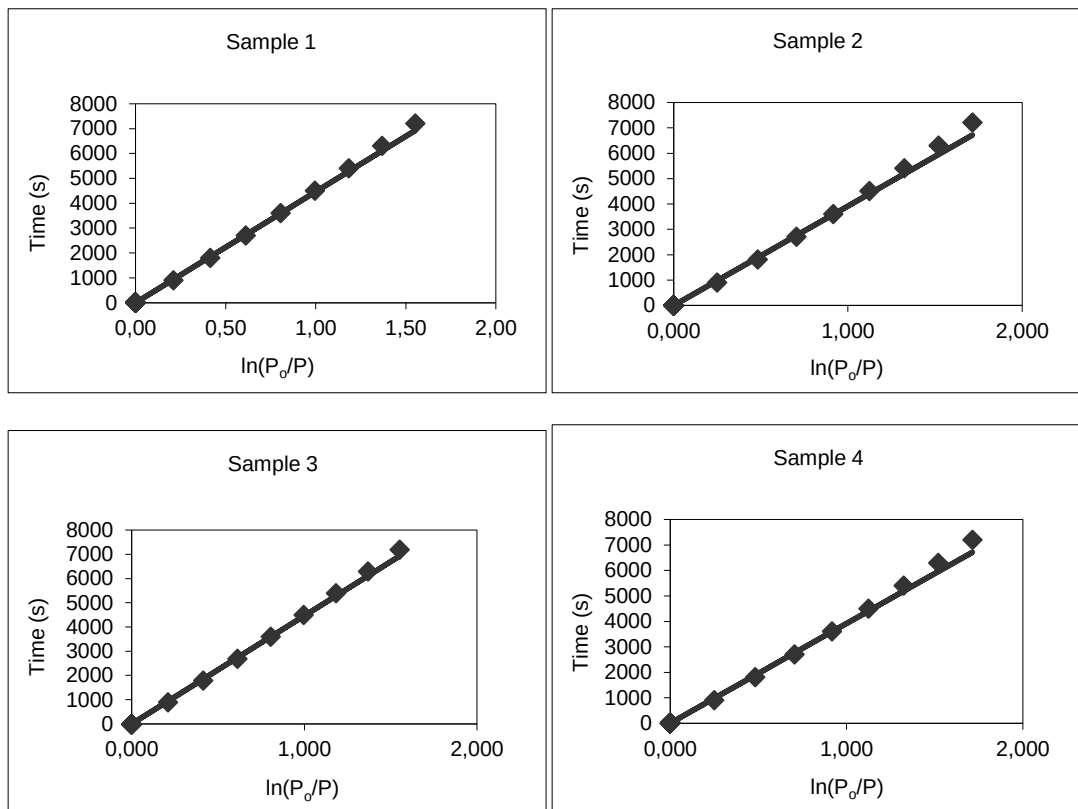
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-50-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	2.7E-10	COV:	29.3%				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	70.4	Diameter (mm)	70.34	Diameter (mm)	70.54	Diameter (mm)	70.41
Thickness (mm)	32.41	Thickness (mm)	30.87	Thickness (mm)	31.28	Thickness (mm)	33.91
k (m/s)	1.82473E-10	k (m/s)	2.79017E-10	k (m/s)	2.55026E-10	k (m/s)	3.76038E-10
r ²	0.9996	r ²	0.9969	r ²	0.9995	r ²	0.9996
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.29	101.1	11.16	103.9	17.04	99.0	17.04	103.1
17.44	98.0	11.31	98.4	17.19	94.2	17.19	96.5
17.59	94.8	11.46	93.3	17.34	89.7	17.34	90.5
18.14	91.9	12.01	88.8	17.49	86.5	17.49	85.6
18.29	89.0	12.16	84.5	18.04	82.5	18.04	80.3
18.44	86.2	12.31	80.4	18.19	78.7	18.19	75.5
18.59	83.6	12.46	76.7	18.34	75.2	18.34	71.0
19.14	81.1	13.01	73.1	18.49	71.8	18.49	66.8
19.29	78.7	13.16	69.8	19.04	68.6	19.04	62.8



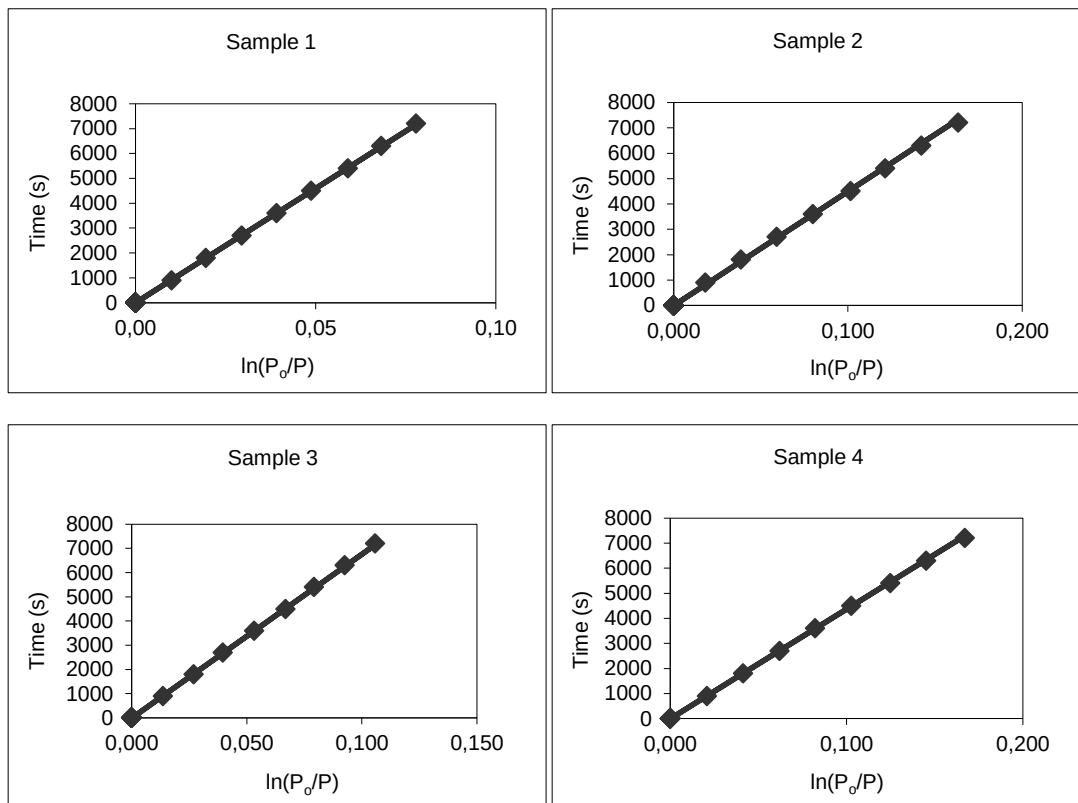
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-60-3			Operator:	AY		
Date:	8/7/2012						
Average k (m/s):	5.0E-10	COV:	55.4%				
OPI:	9.3						
1		2		3		4	
Diameter (mm)	70.43	Diameter (mm)	70.38	Diameter (mm)	70.13	Diameter (mm)	70.43
Thickness (mm)	30.07	Thickness (mm)	29.95	Thickness (mm)	32.66	Thickness (mm)	28.93
k (m/s)	2.80585E-10	k (m/s)	7.02245E-10	k (m/s)	2.44806E-10	k (m/s)	7.7913E-10
r^2	0.9994	r^2	0.9965	r^2	0.9996	r^2	0.9937
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
14.06	100.5	14.06	102.0	14.06	98.7	14.06	102.6
14.21	95.2	14.21	88.6	14.21	94.6	14.21	86.7
14.36	90.3	14.36	77.3	14.36	90.7	14.36	74.0
14.51	85.7	14.51	67.7	14.51	87.0	14.51	63.6
15.06	81.3	15.06	59.4	15.06	83.4	15.06	54.9
15.21	77.2	15.21	52.4	15.21	80.0	15.21	47.6
15.36	73.4	15.36	46.3	15.36	76.8	15.36	41.3
15.51	69.8	15.51	41.0	15.51	73.8	15.51	36.1
16.06	66.3	16.06	36.4	16.06	70.9	16.06	31.6



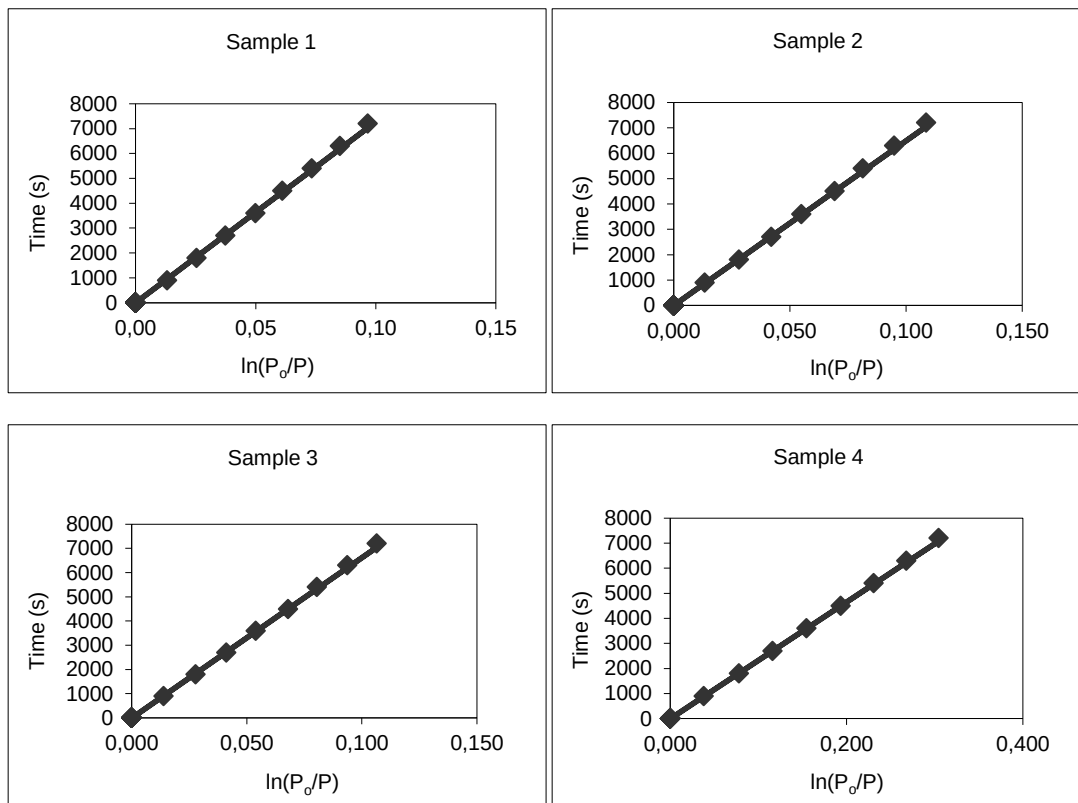
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-75-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	1.2E-09	COV:	12.5%				
OPI:	8.9						
1		2		3		4	
Diameter (mm)	70.78	Diameter (mm)	70.48	Diameter (mm)	70.52	Diameter (mm)	70.37
Thickness (mm)	29.61	Thickness (mm)	31.04	Thickness (mm)	32.67	Thickness (mm)	35.24
k (m/s)	1.02989E-09	k (m/s)	1.21809E-09	k (m/s)	1.14471E-09	k (m/s)	1.38724E-09
r ²	0.9975	r ²	0.9913	r ²	0.9975	r ²	0.9913
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.43	103.4	11.26	103.6	17.43	103.4	11.26	103.6
17.58	83.8	11.41	80.7	17.58	83.8	11.41	80.7
18.13	68.3	11.56	63.9	18.13	68.3	11.56	63.9
18.28	56.1	12.11	51.1	18.28	56.1	12.11	51.1
18.43	46.2	12.26	41.4	18.43	46.2	12.26	41.4
18.58	38.2	12.41	33.6	18.58	38.2	12.41	33.6
19.13	31.6	12.56	27.5	19.13	31.6	12.56	27.5
19.28	26.3	13.11	22.6	19.28	26.3	13.11	22.6
19.43	21.9	13.26	18.6	19.43	21.9	13.26	18.6



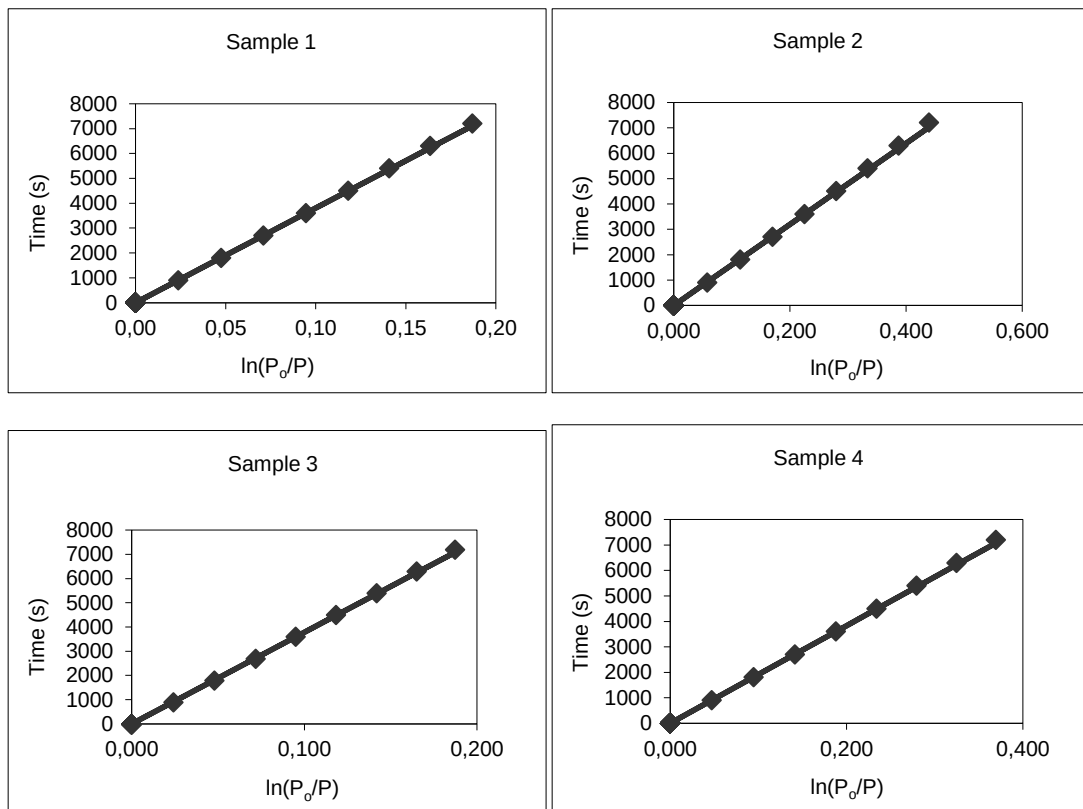
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-40-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	8.7E-11	COV:	34.3%				
OPI:	10.1						
1		2		3		4	
Diameter (mm)	70.18	Diameter (mm)	70.29	Diameter (mm)	70.34	Diameter (mm)	70.05
Thickness (mm)	31.17	Thickness (mm)	29.29	Thickness (mm)	29.29	Thickness (mm)	31.42
k (m/s)	5.46163E-11	k (m/s)	1.06134E-10	k (m/s)	6.93188E-11	k (m/s)	1.17582E-10
r^2	0.9999	r^2	0.9990	r^2	0.9998	r^2	0.9996
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
11.48	101.2	11.48	102.2	11.48	100.5	11.48	101.3
12.03	100.2	12.03	100.3	12.03	99.1	12.03	99.2
12.18	99.3	12.18	98.3	12.18	97.8	12.18	97.2
12.33	98.3	12.33	96.3	12.33	96.6	12.33	95.2
12.48	97.3	12.48	94.3	12.48	95.2	12.48	93.3
13.03	96.4	13.03	92.3	13.03	94.0	13.03	91.4
13.18	95.4	13.18	90.5	13.18	92.8	13.18	89.4
13.33	94.5	13.33	88.6	13.33	91.6	13.33	87.6
13.48	93.6	13.48	86.8	13.48	90.4	13.48	85.7



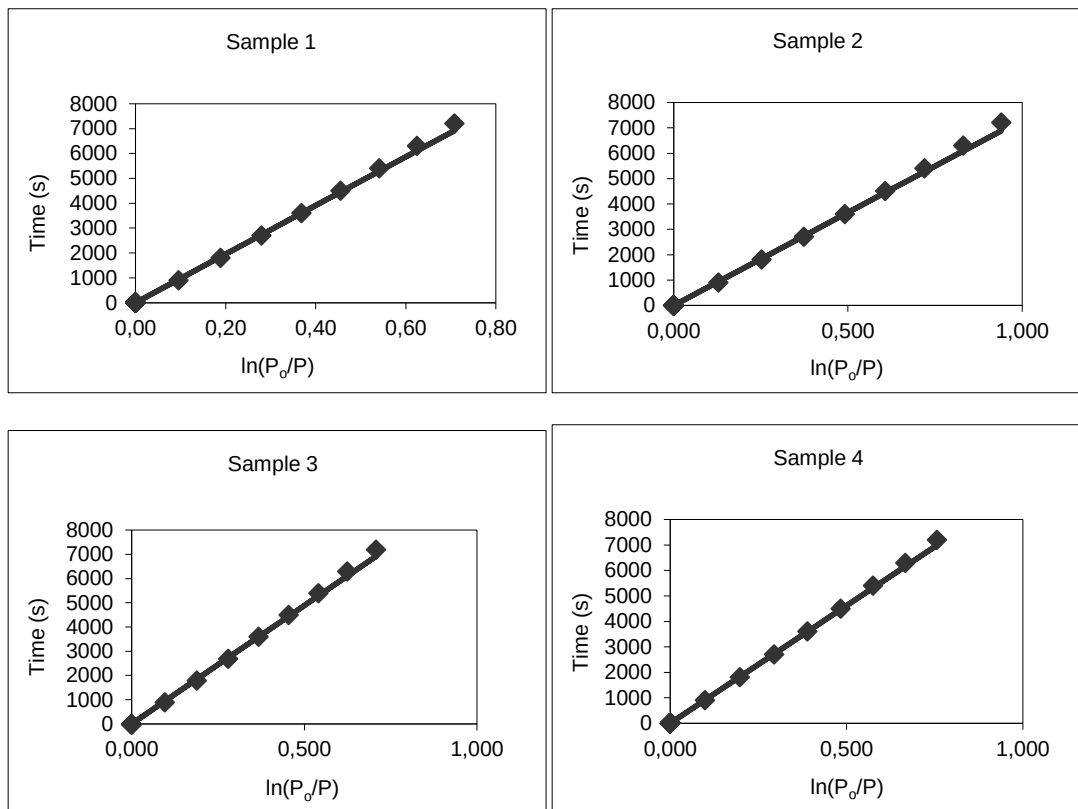
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID: SF-50-3		Operator: AY					
Date: 8/12/2012							
Average k (m/s):	1.1E-10	COV:	65.0 %				
OPI:	10.0						
1		2		3		4	
Diameter (mm)	70.23	Diameter (mm)	70.01	Diameter (mm)	70.2	Diameter (mm)	70.15
Thickness (mm)	32.01	Thickness (mm)	30.83	Thickness (mm)	29.59	Thickness (mm)	30.71
k (m/s)	7.002E-11	k (m/s)	7.59429E-11	k (m/s)	7.1252E-11	k (m/s)	2.11676E-10
r^2	0.9987	r^2	0.9989	r^2	0.9991	r^2	0.9996
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
11.08	102.2	11.08	97.1	11.08	99.1	11.08	104.1
11.23	100.9	11.23	95.8	11.23	97.8	11.23	100.2
11.38	99.7	11.38	94.4	11.38	96.4	11.38	96.3
11.53	98.5	11.53	93.1	11.53	95.1	11.53	92.7
12.08	97.3	12.08	91.9	12.08	93.9	12.08	89.2
12.23	96.2	12.23	90.6	12.23	92.6	12.23	85.8
12.38	95.0	12.38	89.5	12.38	91.5	12.38	82.6
12.53	93.9	12.53	88.3	12.53	90.3	12.53	79.6
13.08	92.8	13.08	87.1	13.08	89.1	13.08	76.8



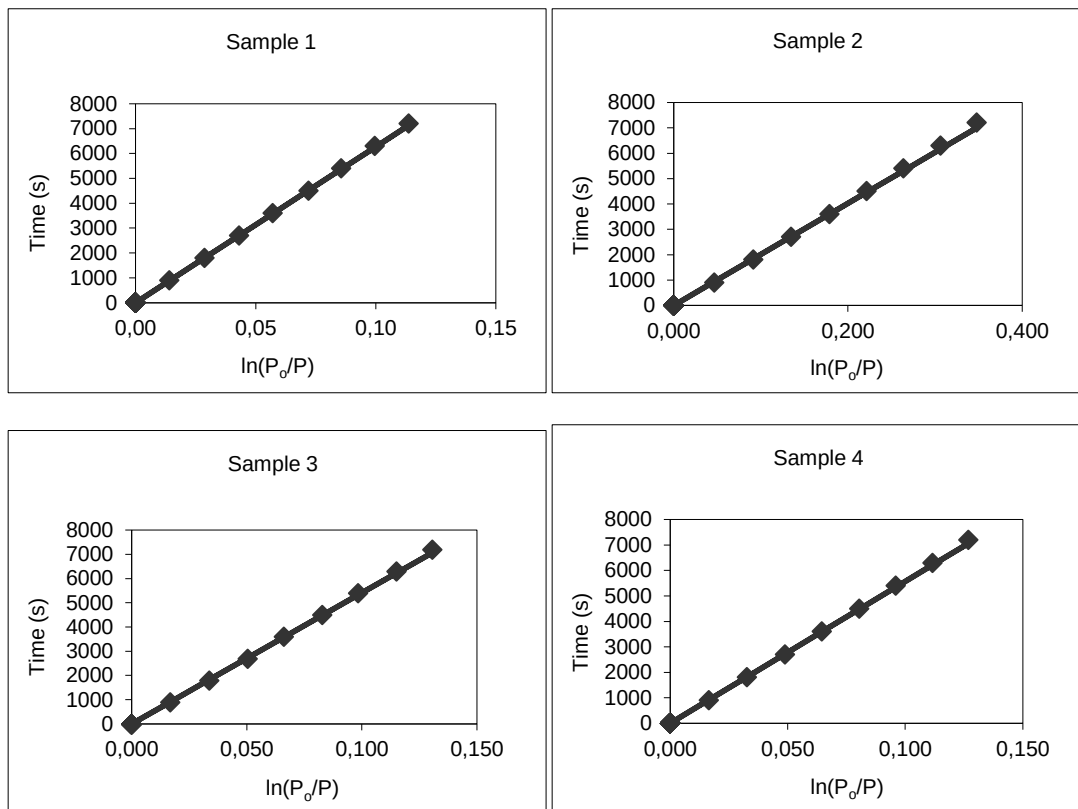
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-60-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	2.0E-10	COV:	46.6 %				
OPI:	9.7						
1		2		3		4	
Diameter (mm)	70.11	Diameter (mm)	70.03	Diameter (mm)	70.31	Diameter (mm)	70.24
Thickness (mm)	29.22	Thickness (mm)	31.44	Thickness (mm)	29.76	Thickness (mm)	29.05
k (m/s)	1.23246E-10	k (m/s)	3.14938E-10	k (m/s)	1.25605E-10	k (m/s)	2.42267E-10
r ²	0.9997	r ²	0.9989	r ²	0.9997	r ²	0.9995
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
14.55	103.1	14.55	104.6	14.55	100.1	14.55	103.4
15.1	100.7	15.1	98.7	15.1	97.7	15.1	98.7
15.25	98.3	15.25	93.3	15.25	95.4	15.25	94.1
15.4	96.0	15.4	88.2	15.4	93.1	15.4	89.8
15.55	93.8	15.55	83.5	15.55	91.0	15.55	85.7
16.1	91.6	16.1	79.0	16.1	88.9	16.1	81.8
16.25	89.5	16.25	74.9	16.25	86.8	16.25	78.2
16.4	87.5	16.4	71.0	16.4	84.9	16.4	74.7
16.55	85.5	16.55	67.4	16.55	83.0	16.55	71.5



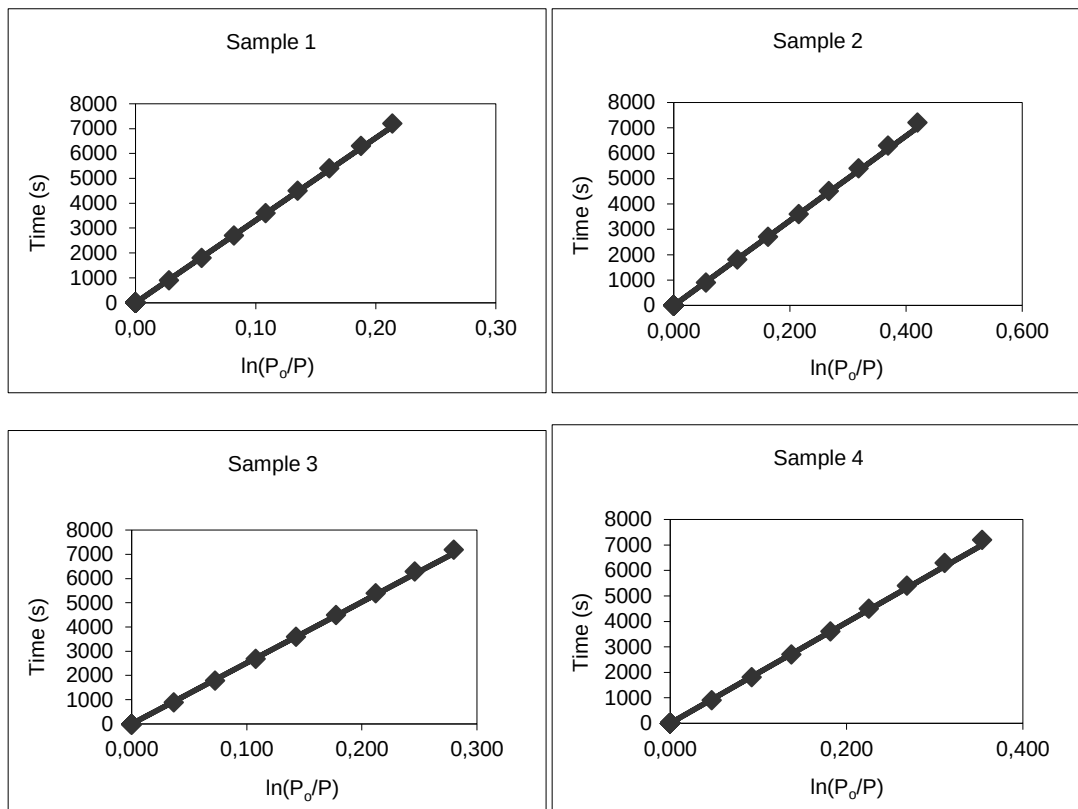
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-75-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	5.3E-10	COV:	12.6	%			
OPI:	9.3						
1		2		3		4	
Diameter (mm)	70.55	Diameter (mm)	70.67	Diameter (mm)	70.5	Diameter (mm)	70.18
Thickness (mm)	30.86	Thickness (mm)	29.44	Thickness (mm)	29.82	Thickness (mm)	29.87
k (m/s)	4.92928E-10	k (m/s)	6.23969E-10	k (m/s)	4.76992E-10	k (m/s)	5.1325E-10
r ²	0.9973	r ²	0.9965	r ²	0.9973	r ²	0.9986
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
6.25	101.0	6.25	102.3	6.25	101.0	6.25	105.4
6.4	91.8	6.4	90.0	6.4	91.8	6.4	95.4
6.55	83.6	6.55	79.4	6.55	83.6	6.55	86.5
7.1	76.4	7.1	70.4	7.1	76.4	7.1	78.5
7.25	69.9	7.25	62.6	7.25	69.9	7.25	71.4
7.4	64.1	7.4	55.7	7.4	64.1	7.4	65.0
7.55	58.8	7.55	49.8	7.55	58.8	7.55	59.3
8.1	54.1	8.1	44.6	8.1	54.1	8.1	54.1
8.25	49.7	8.25	39.9	8.25	49.7	8.25	49.4



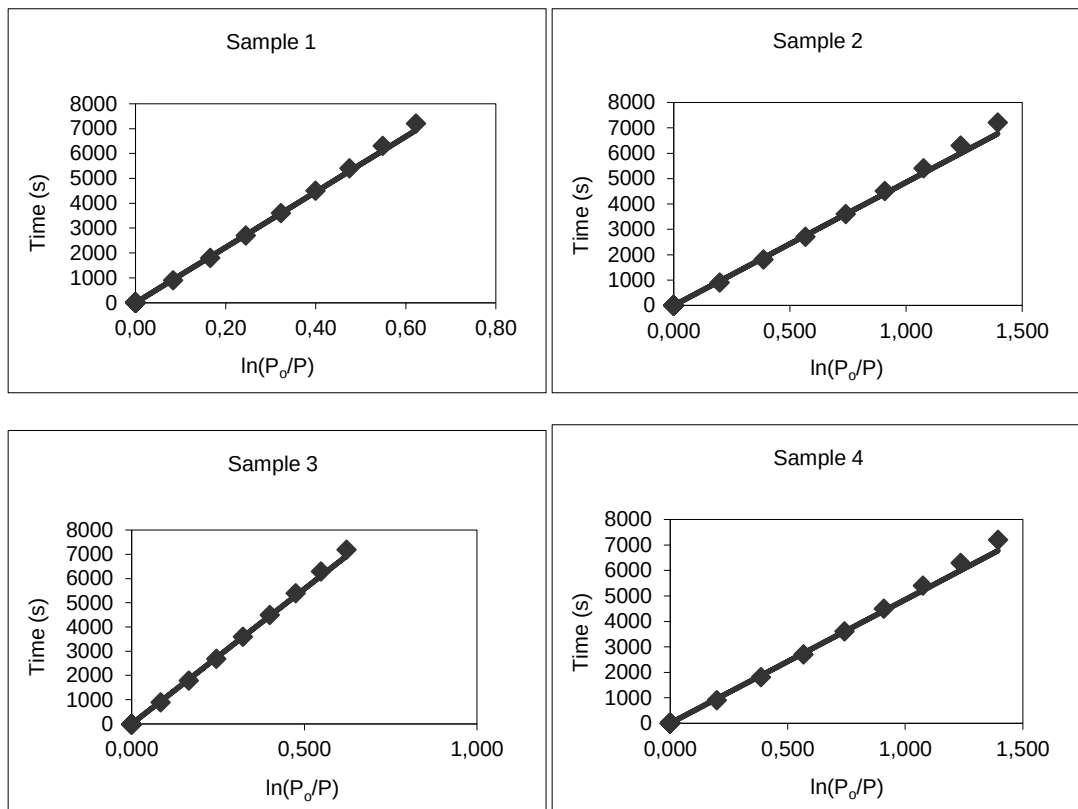
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-40-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	1.2E-10	COV:	59.7 %				
OPI:	9.9						
1		2		3		4	
Diameter (mm)	70.18	Diameter (mm)	70.29	Diameter (mm)	70.34	Diameter (mm)	70.05
Thickness (mm)	31.17	Thickness (mm)	29.29	Thickness (mm)	29.29	Thickness (mm)	31.42
k (m/s)	7.97935E-11	k (m/s)	2.30444E-10	k (m/s)	8.60728E-11	k (m/s)	9.04844E-11
r ²	0.9998	r ²	0.9986	r ²	0.9994	r ²	0.9994
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
13.39	101.5	13.39	103.4	12.32	101.3	12.32	104.0
13.54	100.1	13.54	98.7	12.47	99.6	12.47	102.3
14.09	98.6	14.09	94.3	13.02	97.9	13.02	100.6
14.24	97.2	14.24	90.3	13.17	96.3	13.17	99.0
14.39	95.9	14.39	86.4	13.32	94.8	13.32	97.5
14.54	94.4	14.54	82.8	13.47	93.2	13.47	95.9
15.09	93.2	15.09	79.4	14.02	91.8	14.02	94.5
15.24	91.9	15.24	76.1	14.17	90.3	14.17	93.0
15.39	90.6	15.39	73.0	14.32	88.9	14.32	91.6



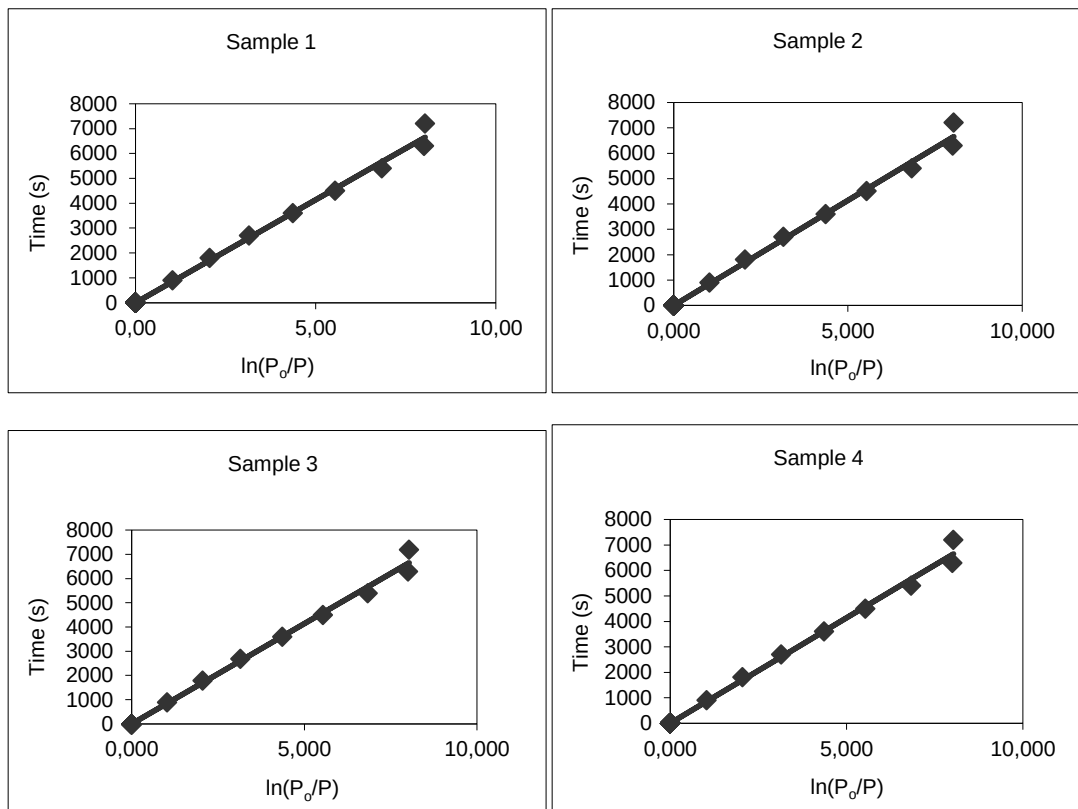
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-50-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	2.2E-10	COV:	27.3	%			
OPI:	9.7						
1		2		3		4	
Diameter (mm)	70.18	Diameter (mm)	70.29	Diameter (mm)	70.34	Diameter (mm)	70.05
Thickness (mm)	31.17	Thickness (mm)	29.29	Thickness (mm)	29.29	Thickness (mm)	31.42
k (m/s)	1.50493E-10	k (m/s)	2.77872E-10	k (m/s)	1.84704E-10	k (m/s)	2.53258E-10
r ²	0.9996	r ²	0.9988	r ²	0.9992	r ²	0.9987
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.32	105.4	12.32	103.6	12.32	102.0	12.32	103.8
12.47	102.5	12.47	98.0	12.47	98.3	12.47	99.1
13.02	99.7	13.02	92.8	13.02	94.9	13.02	94.6
13.17	97.1	13.17	88.0	13.17	91.6	13.17	90.5
13.32	94.6	13.32	83.5	13.32	88.4	13.32	86.6
13.47	92.1	13.47	79.3	13.47	85.4	13.47	82.9
14.02	89.7	14.02	75.3	14.02	82.5	14.02	79.4
14.17	87.3	14.17	71.6	14.17	79.8	14.17	76.0
14.32	85.1	14.32	68.1	14.32	77.1	14.32	72.9



University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-60-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	7.0E-10	COV:	45.3	%			
OPI:	9.2						
1		2		3		4	
Diameter (mm)	70.18	Diameter (mm)	70.29	Diameter (mm)	70.34	Diameter (mm)	70.05
Thickness (mm)	31.17	Thickness (mm)	29.29	Thickness (mm)	29.29	Thickness (mm)	31.42
k (m/s)	4.42051E-10	k (m/s)	9.37333E-10	k (m/s)	4.13502E-10	k (m/s)	1.0124E-09
r^2	0.9976	r^2	0.9934	r^2	0.9976	r^2	0.9934
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
6.36	106.2	6.36	105.5	6.36	106.2	6.36	105.5
6.51	97.6	6.51	86.5	6.51	97.6	6.51	86.5
7.06	90.0	7.06	71.7	7.06	90.0	7.06	71.7
7.21	83.1	7.21	59.8	7.21	83.1	7.21	59.8
7.36	76.9	7.36	50.3	7.36	76.9	7.36	50.3
7.51	71.2	7.51	42.5	7.51	71.2	7.51	42.5
8.06	66.0	8.06	36.0	8.06	66.0	8.06	36.0
8.21	61.3	8.21	30.7	8.21	61.3	8.21	30.7
8.36	57.0	8.36	26.1	8.36	57.0	8.36	26.1

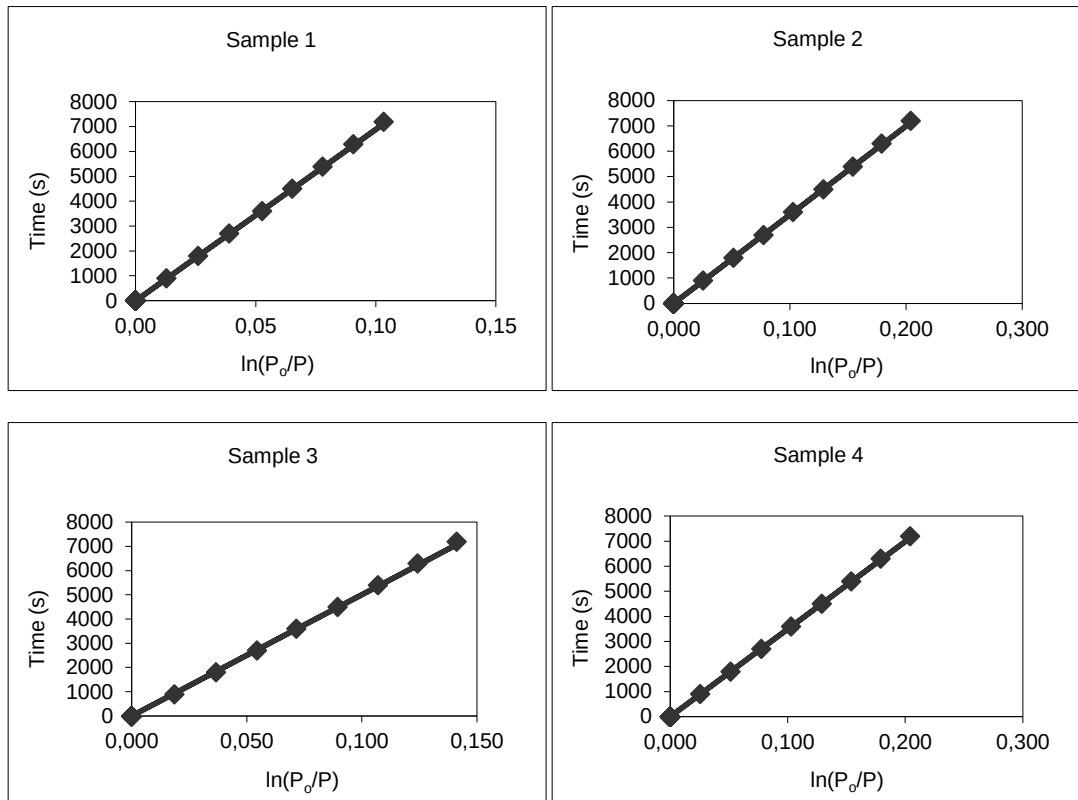


University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-75-3			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	5.9E-09	COV:	4.2 %				
OPI:	8.2						
1		2		3		4	
Diameter (mm)	70.18	Diameter (mm)	70.29	Diameter (mm)	70.34	Diameter (mm)	70.05
Thickness (mm)	31.17	Thickness (mm)	29.29	Thickness (mm)	29.29	Thickness (mm)	31.42
k (m/s)	6.08173E-09	k (m/s)	5.69704E-09	k (m/s)	5.68895E-09	k (m/s)	6.15329E-09
r ²	0.9897	r ²	0.9897	r ²	0.9897	r ²	0.9897
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
11.07	93.6	11.07	93.6	11.07	93.6	11.07	93.6
11.22	33.4	11.22	33.4	11.22	33.4	11.22	33.4
11.37	12.0	11.37	12.0	11.37	12.0	11.37	12.0
11.52	4.0	11.52	4.0	11.52	4.0	11.52	4.0
12.07	1.2	12.07	1.2	12.07	1.2	12.07	1.2
12.22	0.4	12.22	0.4	12.22	0.4	12.22	0.4
12.37	0.1	12.37	0.1	12.37	0.1	12.37	0.1
12.52	0.0	12.52	0.0	12.52	0.0	12.52	0.0
13.07	0.0	13.07	0.0	13.07	0.0	13.07	0.0

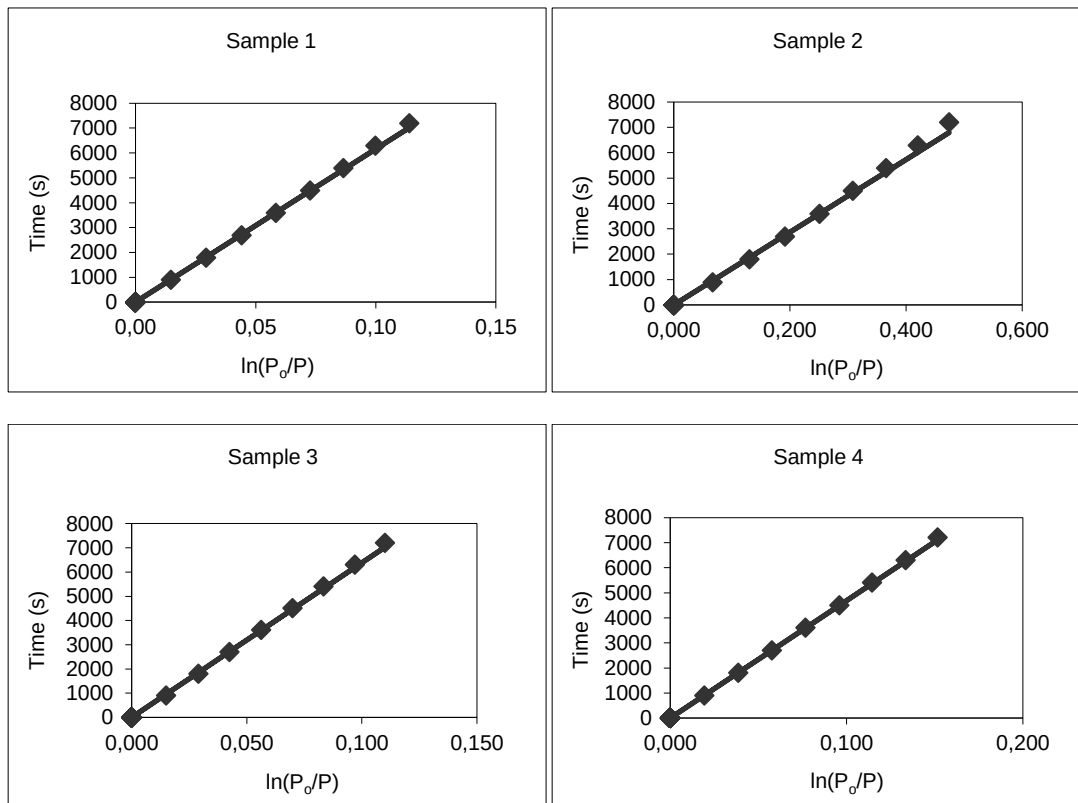


28-32 days oxygen permeability results after 7-days initial moist curing period

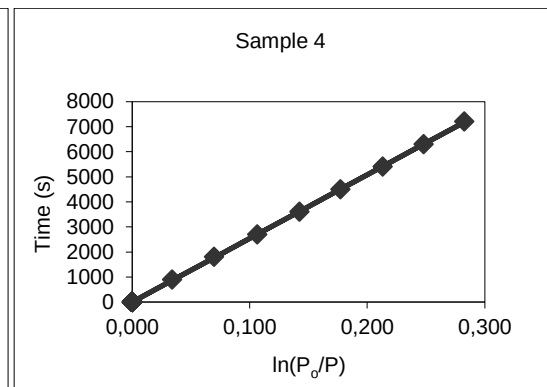
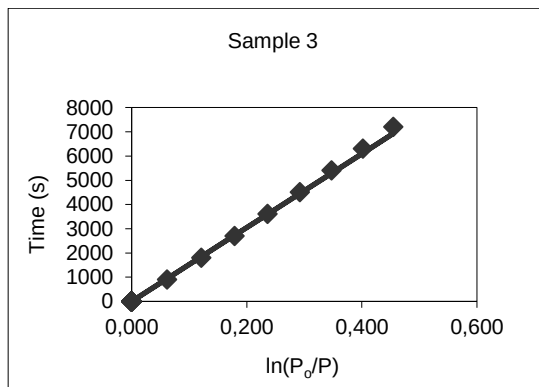
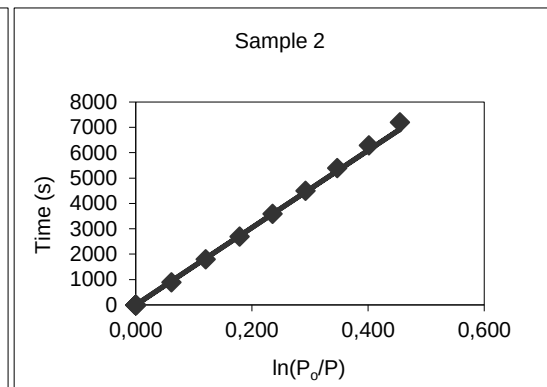
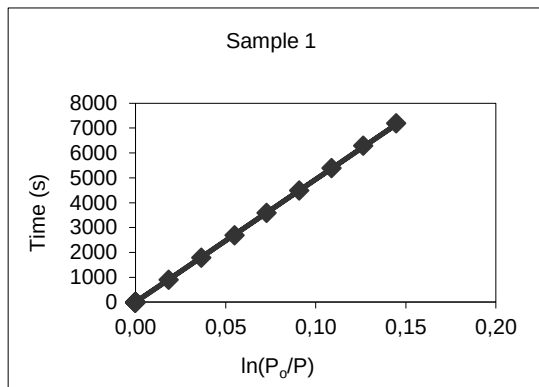
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-40-7			Operator:	AY		
Date:	8/6/2012						
Average k (m/s):	1.2E-10	COV:	32.0	%			
OPI:	9.9						
1		2		3		4	
Diameter (mm)	68.59	Diameter (mm)	68.31	Diameter (mm)	68.37	Diameter (mm)	68.16
Thickness (mm)	31.58	Thickness (mm)	31.48	Thickness (mm)	29.71	Thickness (mm)	31.57
k (m/s)	7.70124E-11	k (m/s)	1.52904E-10	k (m/s)	9.9989E-11	k (m/s)	1.54017E-10
r ²	0.9997	r ²	0.9999	r ²	0.9994	r ²	0.9999
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.3	101.4	12.3	104.0	12.3	99.7	12.3	104.0
12.45	100.1	12.45	101.4	12.45	97.9	12.45	101.4
13	98.8	13	98.8	13	96.1	13	98.8
13.15	97.6	13.15	96.2	13.15	94.5	13.15	96.2
13.3	96.2	13.3	93.8	13.3	92.8	13.3	93.8
13.45	95.0	13.45	91.4	13.45	91.2	13.45	91.4
14	93.8	14	89.1	14	89.6	14	89.1
14.15	92.7	14.15	86.9	14.15	88.1	14.15	86.9
14.3	91.5	14.3	84.8	14.3	86.6	14.3	84.8



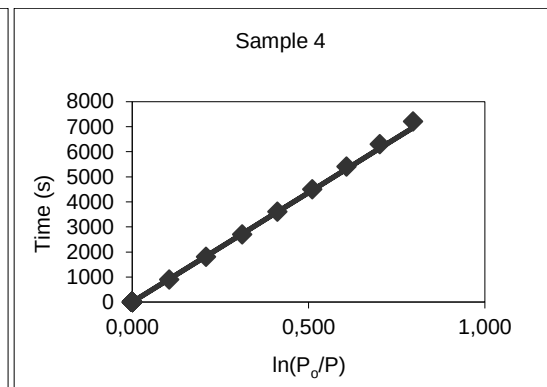
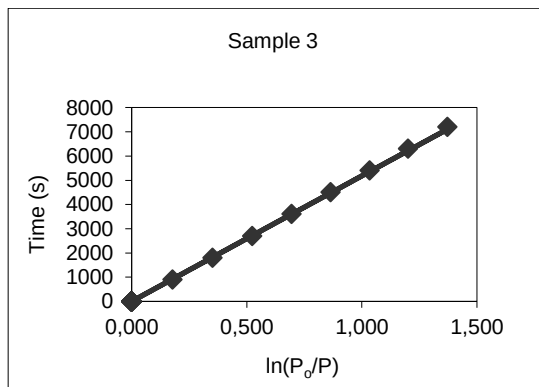
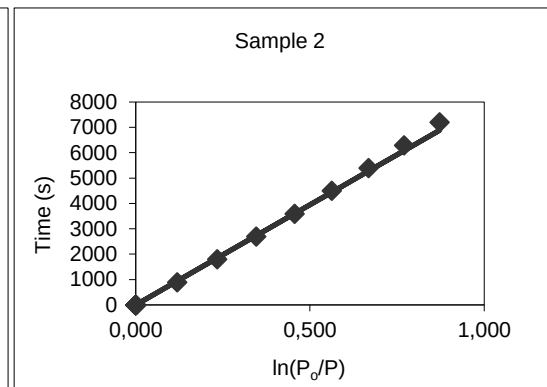
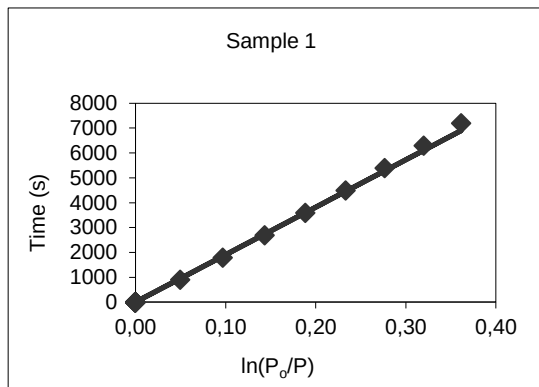
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-50-7			Operator:	AY		
Date:	8/6/2012						
Average k (m/s):	1.5E-10	COV:	83.5%				
OPI:	9.8						
1		2		3		4	
Diameter (mm)	68.11	Diameter (mm)	68.2	Diameter (mm)	68.53	Diameter (mm)	68.21
Thickness (mm)	29.58	Thickness (mm)	29.88	Thickness (mm)	29.11	Thickness (mm)	31.21
k (m/s)	8.10623E-11	k (m/s)	3.4511E-10	k (m/s)	7.61555E-11	k (m/s)	1.13226E-10
r^2	0.9988	r^2	0.9943	r^2	0.9989	r^2	0.9998
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.56	105.9	12.56	102.9	12.56	99.6	12.56	103.6
13.11	104.4	13.11	96.2	13.11	98.1	13.11	101.6
13.26	102.9	13.26	90.3	13.26	96.7	13.26	99.7
13.41	101.4	13.41	85.0	13.41	95.4	13.41	97.8
13.56	99.9	13.56	80.1	13.56	94.1	13.56	96.0
14.11	98.5	14.11	75.6	14.11	92.9	14.11	94.1
14.26	97.2	14.26	71.4	14.26	91.6	14.26	92.4
14.41	95.9	14.41	67.6	14.41	90.4	14.41	90.6
14.56	94.5	14.56	64.0	14.56	89.2	14.56	89.0



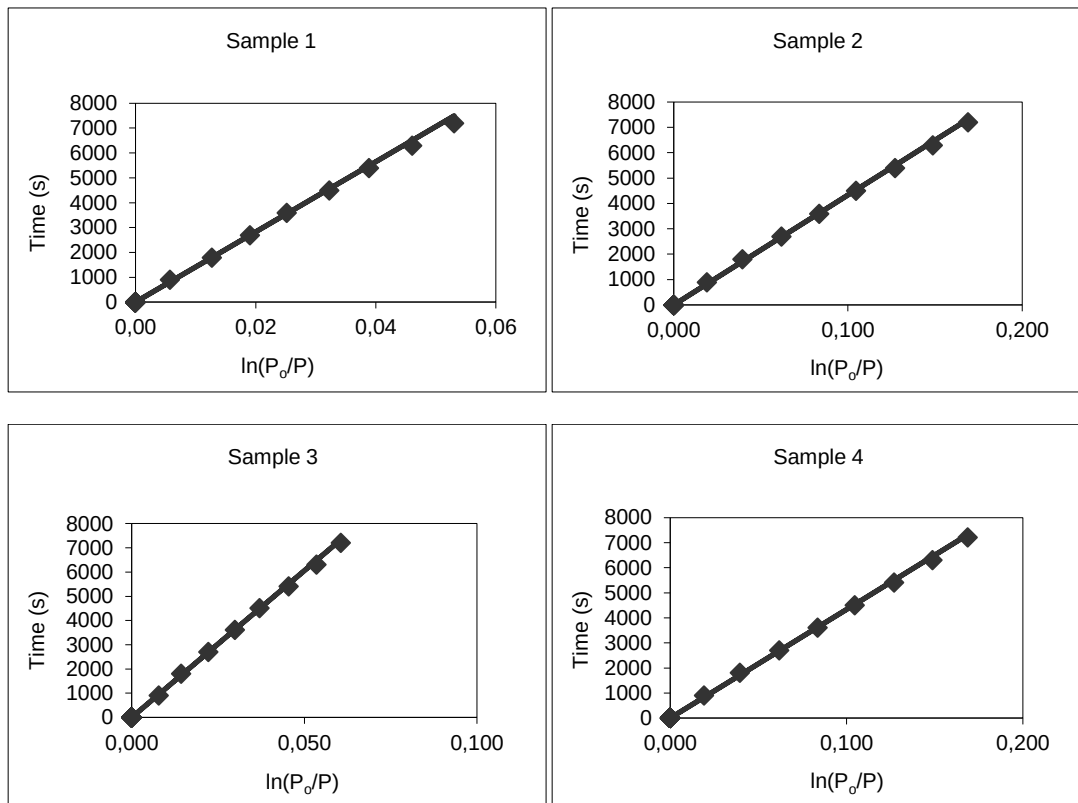
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-60-7			Operator:	AY		
Date:	8/6/2012						
Average k (m/s):	2.4E-10	COV:	46.7	%			
OPI:	9.6						
1		2		3		4	
Diameter (mm)	68.18	Diameter (mm)	68.12	Diameter (mm)	68.28	Diameter (mm)	68.12
Thickness (mm)	30.12	Thickness (mm)	30.5	Thickness (mm)	30.64	Thickness (mm)	29.17
k (m/s)	1.03829E-10	k (m/s)	3.35695E-10	k (m/s)	3.35657E-10	k (m/s)	1.96861E-10
r^2	0.9999	r^2	0.9975	r^2	0.9975	r^2	0.9999
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.56	102.4	12.56	102.4	12.56	102.4	12.56	104.0
13.11	100.5	13.11	96.3	13.11	96.3	13.11	100.5
13.26	98.7	13.26	90.8	13.26	90.8	13.26	97.0
13.41	96.9	13.41	85.6	13.41	85.6	13.41	93.5
13.56	95.2	13.56	80.9	13.56	80.9	13.56	90.2
14.11	93.5	14.11	76.5	14.11	76.5	14.11	87.1
14.26	91.8	14.26	72.4	14.26	72.4	14.26	84.0
14.41	90.2	14.41	68.5	14.41	68.5	14.41	81.1
14.56	88.6	14.56	65.0	14.56	65.0	14.56	78.4



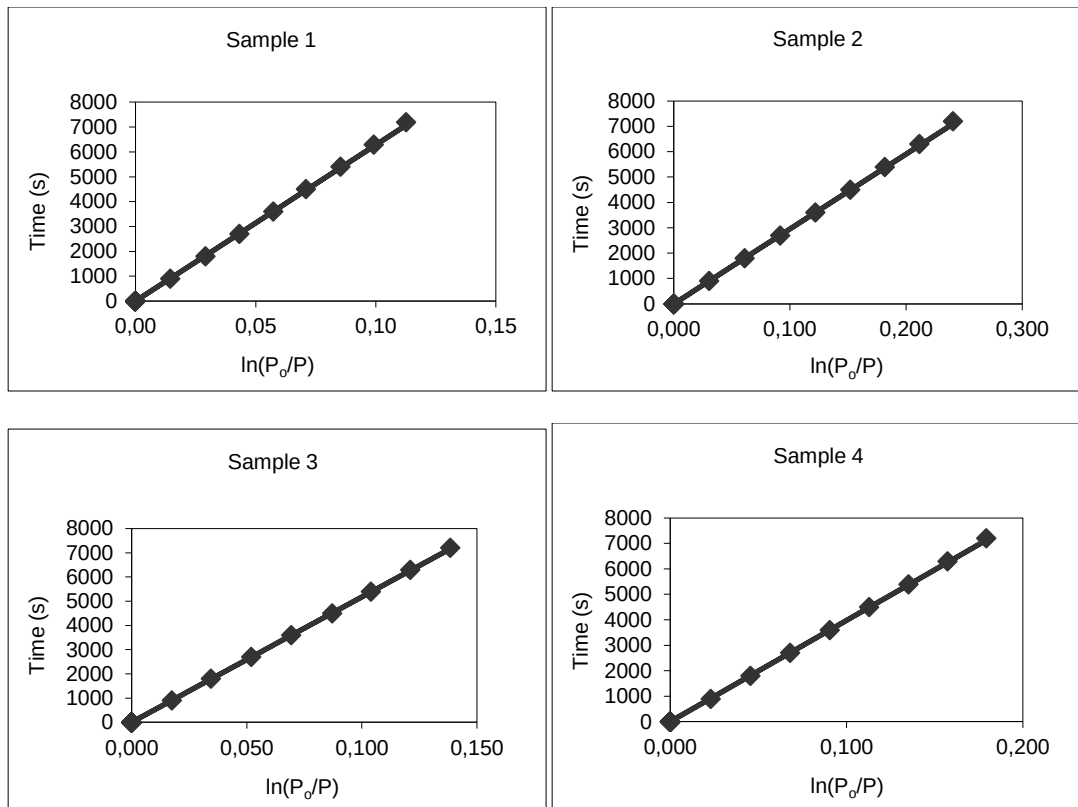
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-75-7			Operator:	AY		
Date:	8/6/2012						
Average k (m/s):	5.8E-10	COV:	47.3%				
OPI:	9.2						
1		2		3		4	
Diameter (mm)	70.58	Diameter (mm)	70.43	Diameter (mm)	70.61	Diameter (mm)	70.35
Thickness (mm)	29.85	Thickness (mm)	32.05	Thickness (mm)	29.85	Thickness (mm)	29.93
k (m/s)	2.43789E-10	k (m/s)	6.34607E-10	k (m/s)	9.11697E-10	k (m/s)	5.4016E-10
r^2	0.9969	r^2	0.9965	r^2	0.9997	r^2	0.9981
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
8.4	101.4	8.4	103.0	8.4	98.4	8.4	103.3
8.55	96.5	8.55	91.4	8.55	82.4	8.55	93.0
9.1	92.1	9.1	81.4	9.1	69.2	9.1	83.8
9.25	87.9	9.25	72.8	9.25	58.3	9.25	75.6
9.4	84.0	9.4	65.2	9.4	49.1	9.4	68.4
9.55	80.3	9.55	58.6	9.55	41.5	9.55	62.0
10.1	76.9	10.1	52.7	10.1	35.0	10.1	56.3
10.25	73.7	10.25	47.6	10.25	29.6	10.25	51.2
10.4	70.7	10.4	43.0	10.4	25.0	10.4	46.6



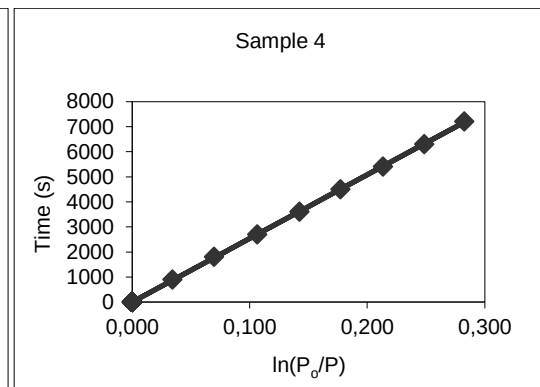
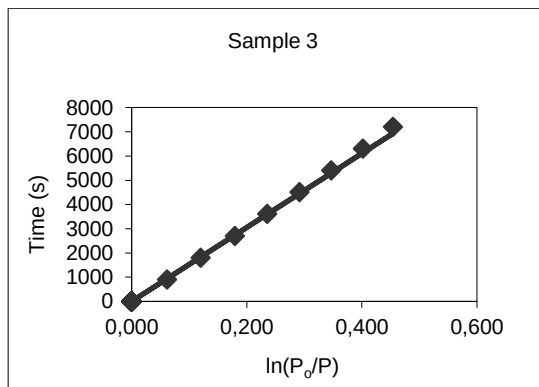
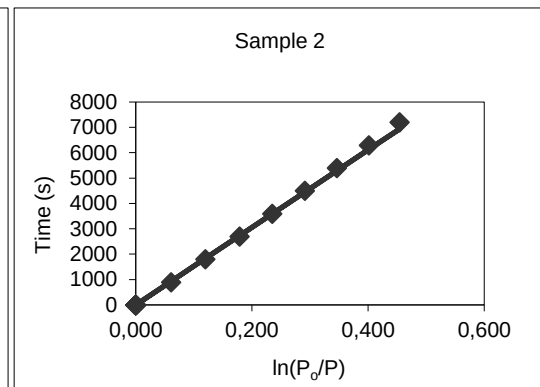
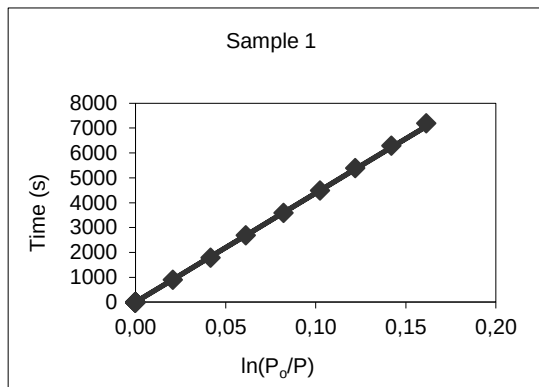
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-40-7			Operator:	AY		
Date:	8/13/2012						
Average k (m/s):	7.8E-11	COV:	60.3%				
OPI:	10.1						
1		2		3		4	
Diameter (mm)	70.4	Diameter (mm)	70.01	Diameter (mm)	70.5	Diameter (mm)	70.36
Thickness (mm)	28.37	Thickness (mm)	31.72	Thickness (mm)	30.93	Thickness (mm)	30.75
k (m/s)	3.30121E-11	k (m/s)	1.20533E-10	k (m/s)	4.15638E-11	k (m/s)	1.15687E-10
r^2	0.9968	r^2	0.9988	r^2	0.9985	r^2	0.9988
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
14.5	102.1	14.5	103.2	14.5	99.1	14.5	103.2
15.05	101.5	15.05	101.2	15.05	98.4	15.05	101.2
15.2	100.8	15.2	99.2	15.2	97.7	15.2	99.2
15.35	100.1	15.35	97.0	15.35	97.0	15.35	97.0
15.5	99.5	15.5	94.9	15.5	96.2	15.5	94.9
16.05	98.8	16.05	92.9	16.05	95.5	16.05	92.9
16.2	98.2	16.2	90.9	16.2	94.7	16.2	90.9
16.35	97.5	16.35	88.9	16.35	94.0	16.35	88.9
16.5	96.8	16.5	87.1	16.5	93.3	16.5	87.1



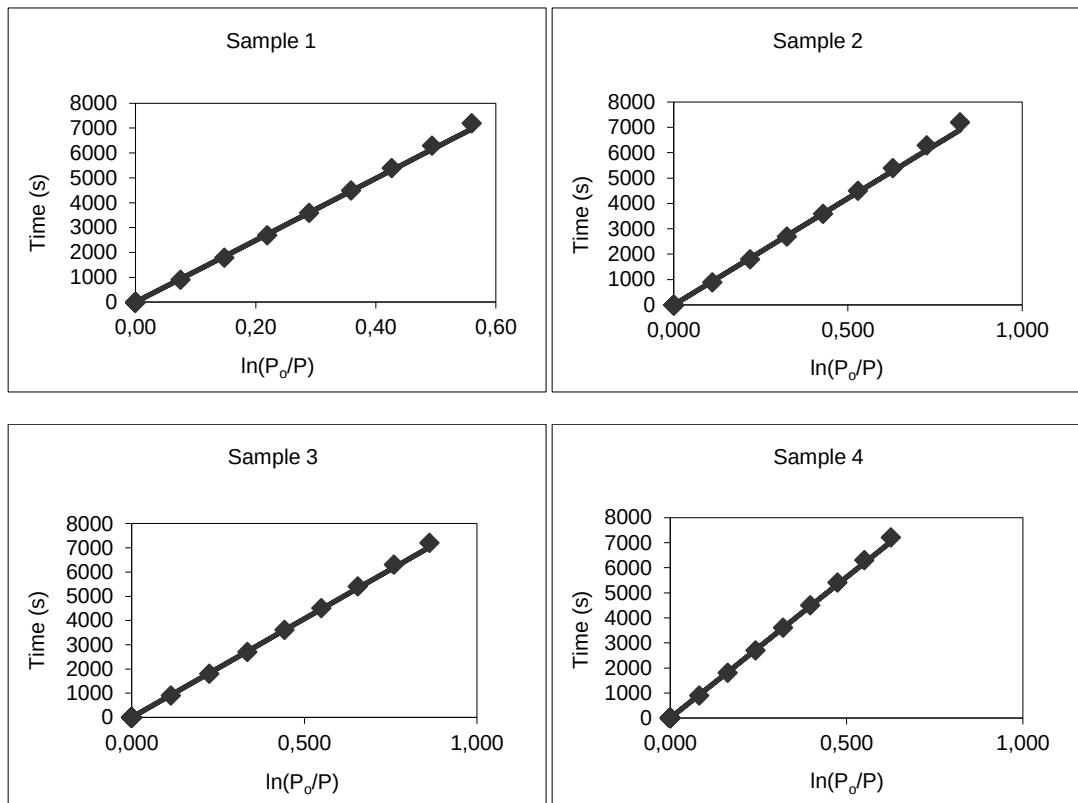
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-50-7			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	1.2E-10	COV:	35.7 %				
OPI:	9.9						
1		2		3		4	
Diameter (mm)	70.24	Diameter (mm)	70.11	Diameter (mm)	70.28	Diameter (mm)	69.6
Thickness (mm)	29.87	Thickness (mm)	31.24	Thickness (mm)	30.08	Thickness (mm)	32.97
k (m/s)	7.59273E-11	k (m/s)	1.70061E-10	k (m/s)	9.32448E-11	k (m/s)	1.35472E-10
r ²	0.9996	r ²	0.9997	r ²	0.9999	r ²	0.9998
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
13.12	105.7	13.12	103.5	13.12	101.2	13.12	104.2
13.27	104.1	13.27	100.4	13.27	99.4	13.27	101.8
13.42	102.6	13.42	97.4	13.42	97.7	13.42	99.6
13.57	101.2	13.57	94.5	13.57	96.1	13.57	97.4
14.12	99.8	14.12	91.6	14.12	94.4	14.12	95.2
14.27	98.4	14.27	88.9	14.27	92.7	14.27	93.1
14.42	97.0	14.42	86.3	14.42	91.2	14.42	91.0
14.57	95.7	14.57	83.8	14.57	89.6	14.57	89.0
15.12	94.4	15.12	81.4	15.12	88.1	15.12	87.1



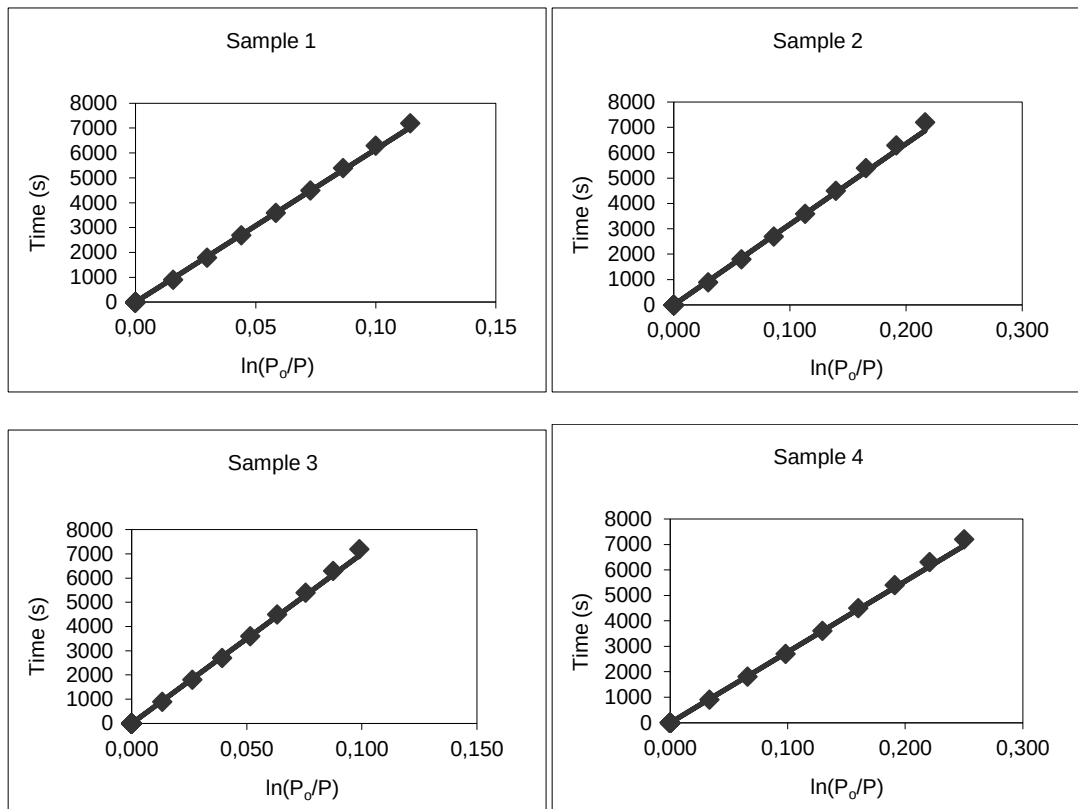
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-60-7			Operator:	AY		
Date:	8/14/2012						
Average k (m/s):	2.4E-10	COV:	45.9%				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	70.25	Diameter (mm)	69.85	Diameter (mm)	70.5	Diameter (mm)	70.1
Thickness (mm)	28.9	Thickness (mm)	32.08	Thickness (mm)	31.1	Thickness (mm)	30.15
k (m/s)	1.05203E-10	k (m/s)	3.35415E-10	k (m/s)	3.192E-10	k (m/s)	1.92262E-10
r^2	0.9995	r^2	0.9978	r^2	0.9978	r^2	0.9999
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.16	102.7	17.16	102.4	12.56	102.4	12.56	104.0
17.31	100.6	17.31	96.3	13.11	96.3	13.11	100.5
17.46	98.5	17.46	90.8	13.26	90.8	13.26	97.0
18.01	96.6	18.01	85.6	13.41	85.6	13.41	93.5
18.16	94.6	18.16	80.9	13.56	80.9	13.56	90.2
18.31	92.7	18.31	76.5	14.11	76.5	14.11	87.1
18.46	90.9	18.46	72.4	14.26	72.4	14.26	84.0
19.01	89.1	19.01	68.5	14.41	68.5	14.41	81.1
19.16	87.4	19.16	65.0	14.56	65.0	14.56	78.4



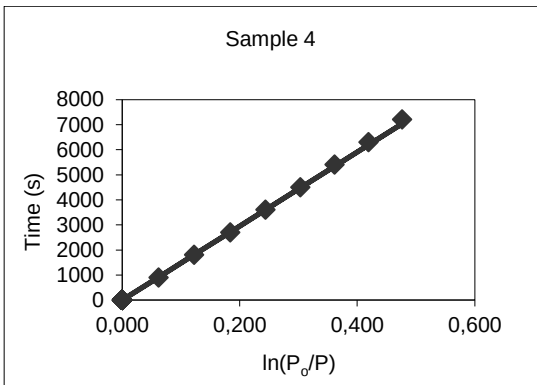
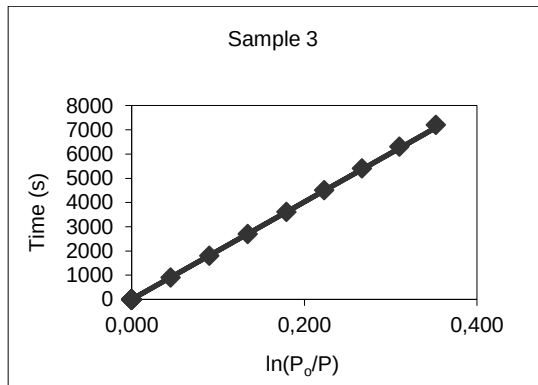
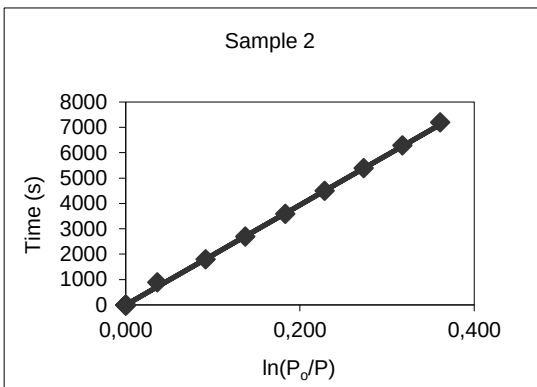
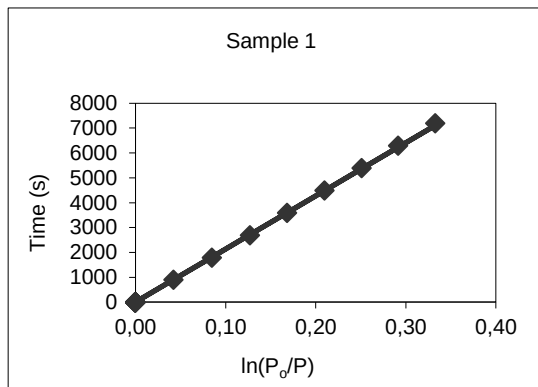
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-75-7			Operator:	AY		
Date:	8/14/2012						
Average k (m/s):	5.2E-10	COV:	20.1%				
OPI:	9.3						
1		2		3		4	
Diameter (mm)	68.19	Diameter (mm)	68.22	Diameter (mm)	68.54	Diameter (mm)	68.26
Thickness (mm)	30.18	Thickness (mm)	31.66	Thickness (mm)	28.65	Thickness (mm)	30.57
k (m/s)	4.07148E-10	k (m/s)	6.28869E-10	k (m/s)	5.87662E-10	k (m/s)	4.58467E-10
r^2	0.9980	r^2	0.9970	r^2	0.9989	r^2	0.9990
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
14.5	104.3	14.5	99.5	14.5	100.3	14.5	105.4
15.05	96.8	15.05	88.9	15.05	89.5	15.05	97.0
15.2	90.0	15.2	79.8	15.2	80.1	15.2	89.6
15.35	83.8	15.35	71.8	15.35	71.7	15.35	82.7
15.5	78.1	15.5	64.8	15.5	64.4	15.5	76.5
16.05	72.8	16.05	58.6	16.05	57.9	16.05	70.8
16.2	68.1	16.2	53.0	16.2	52.1	16.2	65.6
16.35	63.6	16.35	48.1	16.35	46.9	16.35	60.7
16.5	59.6	16.5	43.7	16.5	42.3	16.5	56.3



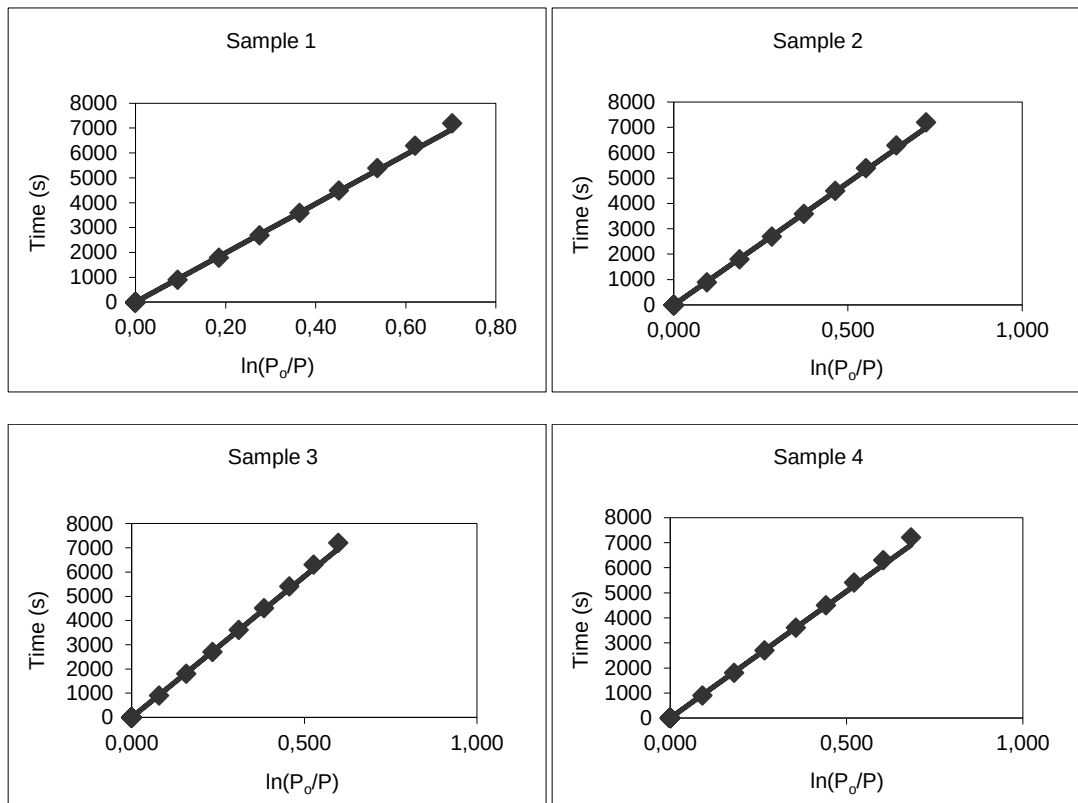
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-40-7			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	1.2E-10	COV:	47.1 %				
OPI:	9.9						
1		2		3		4	
Diameter (mm)	70.81	Diameter (mm)	70.48	Diameter (mm)	70.04	Diameter (mm)	70.32
Thickness (mm)	29.81	Thickness (mm)	30.05	Thickness (mm)	30.56	Thickness (mm)	32.55
k (m/s)	7.57105E-11	k (m/s)	1.47514E-10	k (m/s)	6.92456E-11	k (m/s)	1.84722E-10
r^2	0.9987	r^2	0.9963	r^2	0.9975	r^2	0.9980
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
10.34	102.4	10.34	104.0	10.34	100.0	10.34	105.4
10.49	100.8	10.49	100.9	10.49	98.7	10.49	101.9
11.04	99.4	11.04	98.1	11.04	97.4	11.04	98.7
11.19	98.0	11.19	95.4	11.19	96.2	11.19	95.5
11.34	96.6	11.34	92.8	11.34	95.0	11.34	92.6
11.49	95.2	11.49	90.4	11.49	93.9	11.49	89.8
12.04	93.9	12.04	88.1	12.04	92.7	12.04	87.0
12.19	92.7	12.19	85.8	12.19	91.6	12.19	84.5
12.34	91.3	12.34	83.7	12.34	90.6	12.34	82.0



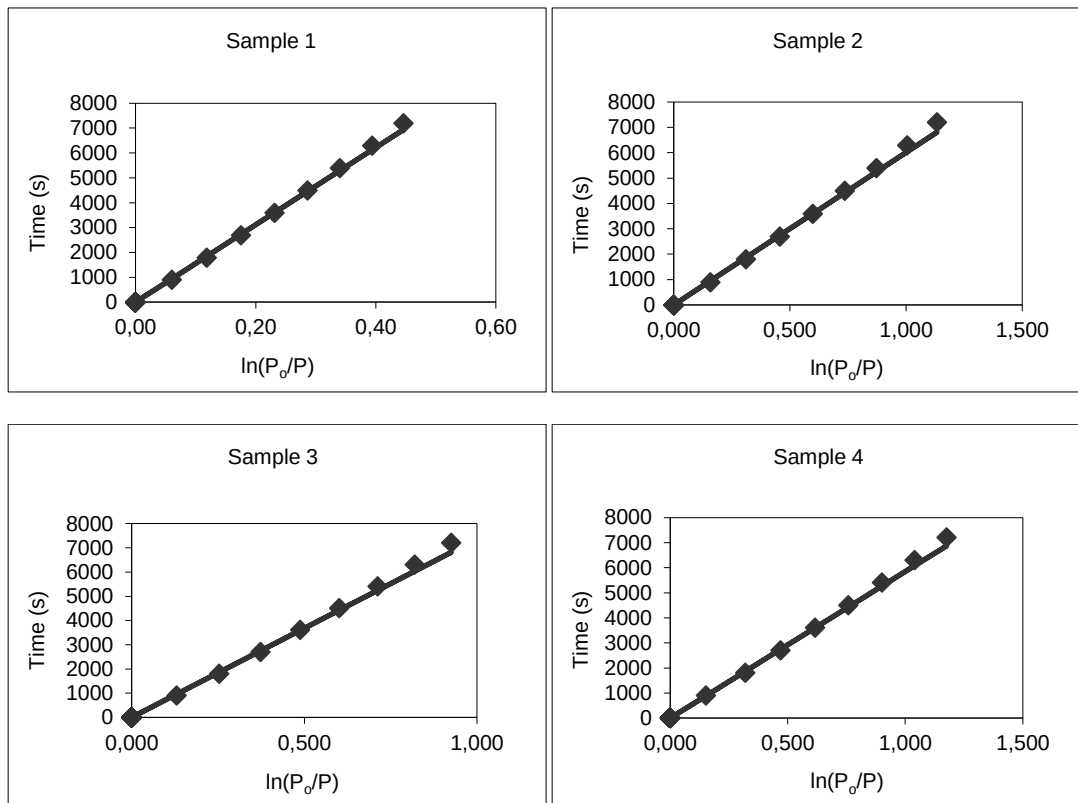
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-50-7			Operator:	AY		
Date:	8/7/2012						
Average k (m/s):	2.7E-10	COV:	14.2 %				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	70.37	Diameter (mm)	70.32	Diameter (mm)	70.19	Diameter (mm)	70.59
Thickness (mm)	31.56	Thickness (mm)	32.62	Thickness (mm)	31.04	Thickness (mm)	30.08
k (m/s)	2.35344E-10	k (m/s)	2.64832E-10	k (m/s)	2.47265E-10	k (m/s)	3.20913E-10
r^2	0.9997	r^2	0.9992	r^2	0.9996	r^2	0.9991
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
14.06	103.6	14.06	100.3	14.06	102.3	14.06	105.7
14.21	99.3	14.21	96.7	14.21	97.7	14.21	99.4
14.36	95.2	14.36	91.5	14.36	93.5	14.36	93.5
14.51	91.3	14.51	87.4	14.51	89.4	14.51	88.0
15.06	87.5	15.06	83.5	15.06	85.5	15.06	82.8
15.21	84.0	15.21	79.8	15.21	81.8	15.21	78.1
15.36	80.6	15.36	76.3	15.36	78.3	15.36	73.6
15.51	77.4	15.51	73.0	15.51	75.0	15.51	69.5
16.06	74.3	16.06	69.9	16.06	71.9	16.06	65.7



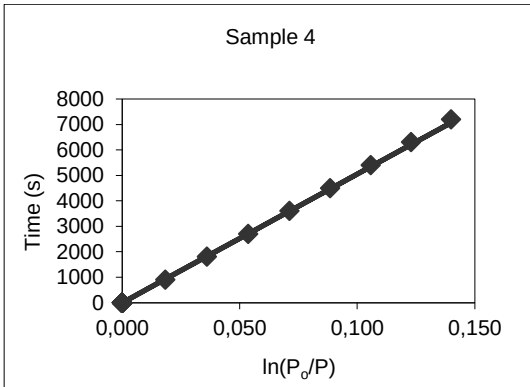
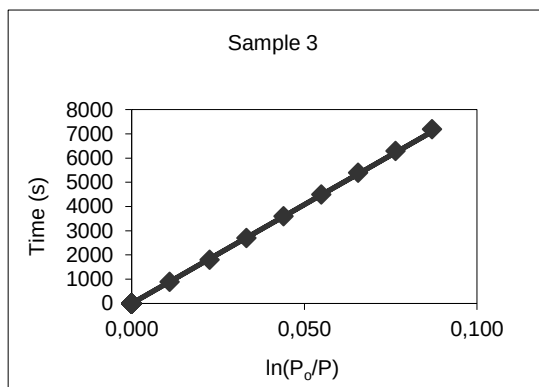
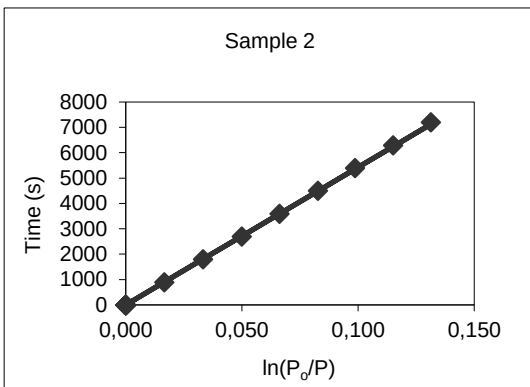
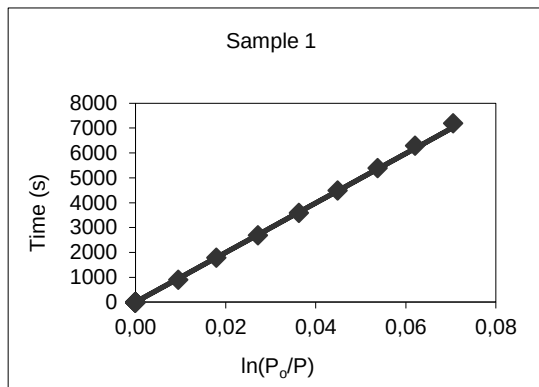
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-60-7			Operator:	AY		
Date:	7/31/2012						
Average k (m/s):	4.7E-10	COV:	10.1%				
OPI:	9.3						
1		2		3		4	
Diameter (mm)	70.53	Diameter (mm)	70.28	Diameter (mm)	70.48	Diameter (mm)	70.25
Thickness (mm)	31.29	Thickness (mm)	29.96	Thickness (mm)	29.56	Thickness (mm)	31.67
k (m/s)	4.95916E-10	k (m/s)	4.92119E-10	k (m/s)	3.9898E-10	k (m/s)	4.92933E-10
r^2	0.9979	r^2	0.9985	r^2	0.9980	r^2	0.9972
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.13	101.7	12.13	99.7	12.13	99.6	12.13	103.6
12.28	92.6	12.28	90.6	12.28	92.0	12.28	94.5
12.43	84.5	12.43	82.5	12.43	85.1	12.43	86.4
12.58	77.2	12.58	75.2	12.58	78.8	12.58	79.3
13.13	70.6	13.13	68.6	13.13	73.1	13.13	72.5
13.28	64.7	13.28	62.7	13.28	67.9	13.28	66.6
13.43	59.4	13.43	57.4	13.43	63.1	13.43	61.5
13.58	54.6	13.58	52.6	13.58	58.8	13.58	56.6
14.13	50.3	14.13	48.3	14.13	54.8	14.13	52.3



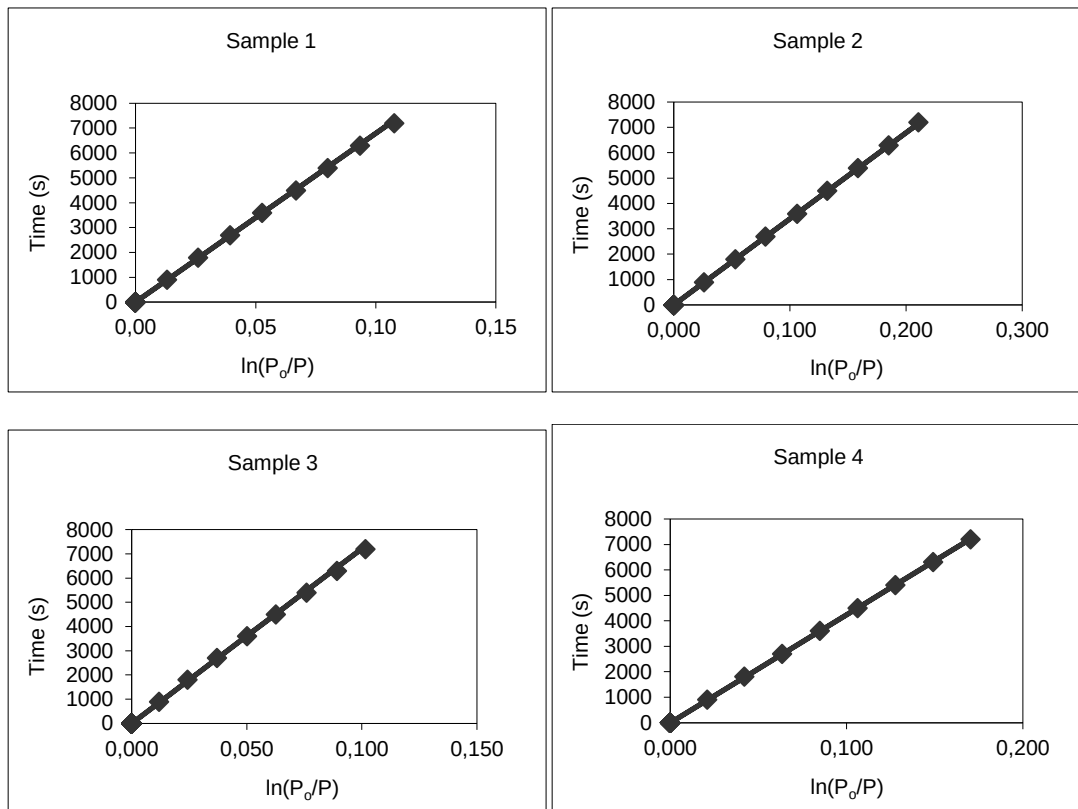
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-75-7			Operator:	AY		
Date:	8/7/2012						
Average k (m/s):	6.5E-10	COV:	37.3%				
OPI:	9.2						
1		2		3		4	
Diameter (mm)	70.46	Diameter (mm)	70.54	Diameter (mm)	70.52	Diameter (mm)	70.69
Thickness (mm)	30.83	Thickness (mm)	30.69	Thickness (mm)	30.86	Thickness (mm)	32.25
k (m/s)	3.10973E-10	k (m/s)	7.91284E-10	k (m/s)	6.49442E-10	k (m/s)	8.55118E-10
r^2	0.9976	r^2	0.9946	r^2	0.9948	r^2	0.9963
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
11.48	103.0	11.48	102.8	11.48	99.2	11.48	100.8
12.03	96.9	12.03	87.6	12.03	87.0	12.03	86.6
12.18	91.4	12.18	75.2	12.18	76.9	12.18	73.2
12.33	86.4	12.33	65.0	12.33	68.3	12.33	63.0
12.48	81.7	12.48	56.4	12.48	60.8	12.48	54.4
13.03	77.3	13.03	49.2	13.03	54.4	13.03	47.2
13.18	73.3	13.18	42.9	13.18	48.6	13.18	40.9
13.33	69.4	13.33	37.6	13.33	43.7	13.33	35.6
13.48	65.9	13.48	33.1	13.48	39.3	13.48	31.1



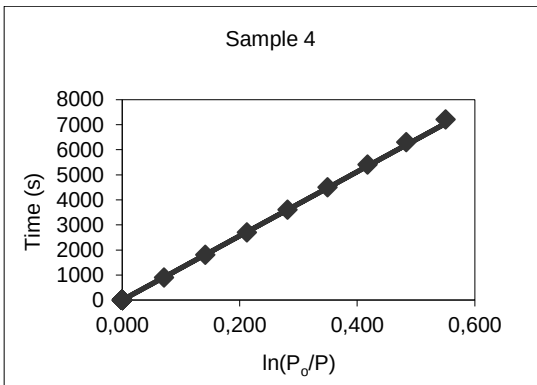
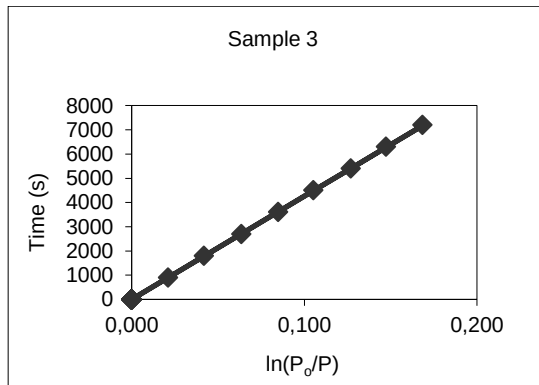
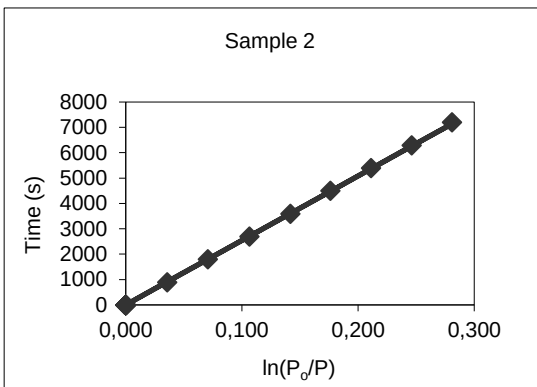
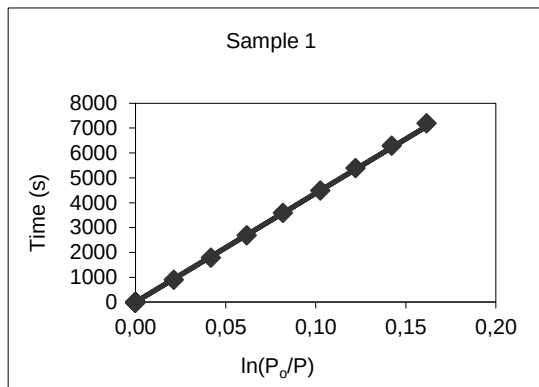
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID: SF-40-7		Operator: AY					
Date: 8/12/2012							
Average k (m/s): 7.2E-11		COV: 32.3%					
OPI: 10.1							
1		2		3		4	
Diameter (mm)	70.4	Diameter (mm)	70.17	Diameter (mm)	70.09	Diameter (mm)	70.09
Thickness (mm)	28.95	Thickness (mm)	30.72	Thickness (mm)	30.2	Thickness (mm)	29.42
k (m/s)	4.59995E-11	k (m/s)	9.09433E-11	k (m/s)	5.94366E-11	k (m/s)	9.32615E-11
r^2	0.9991	r^2	0.9998	r^2	0.9996	r^2	0.9994
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
11.48	102.8	11.48	103.2	11.48	103.5	11.48	104.8
12.03	101.9	12.03	101.5	12.03	102.4	12.03	102.9
12.18	101.0	12.18	99.8	12.18	101.2	12.18	101.1
12.33	100.1	12.33	98.2	12.33	100.1	12.33	99.4
12.48	99.2	12.48	96.6	12.48	99.0	12.48	97.6
13.03	98.3	13.03	95.0	13.03	98.0	13.03	96.0
13.18	97.5	13.18	93.5	13.18	96.9	13.18	94.3
13.33	96.6	13.33	92.0	13.33	95.9	13.33	92.7
13.48	95.8	13.48	90.5	13.48	94.9	13.48	91.1



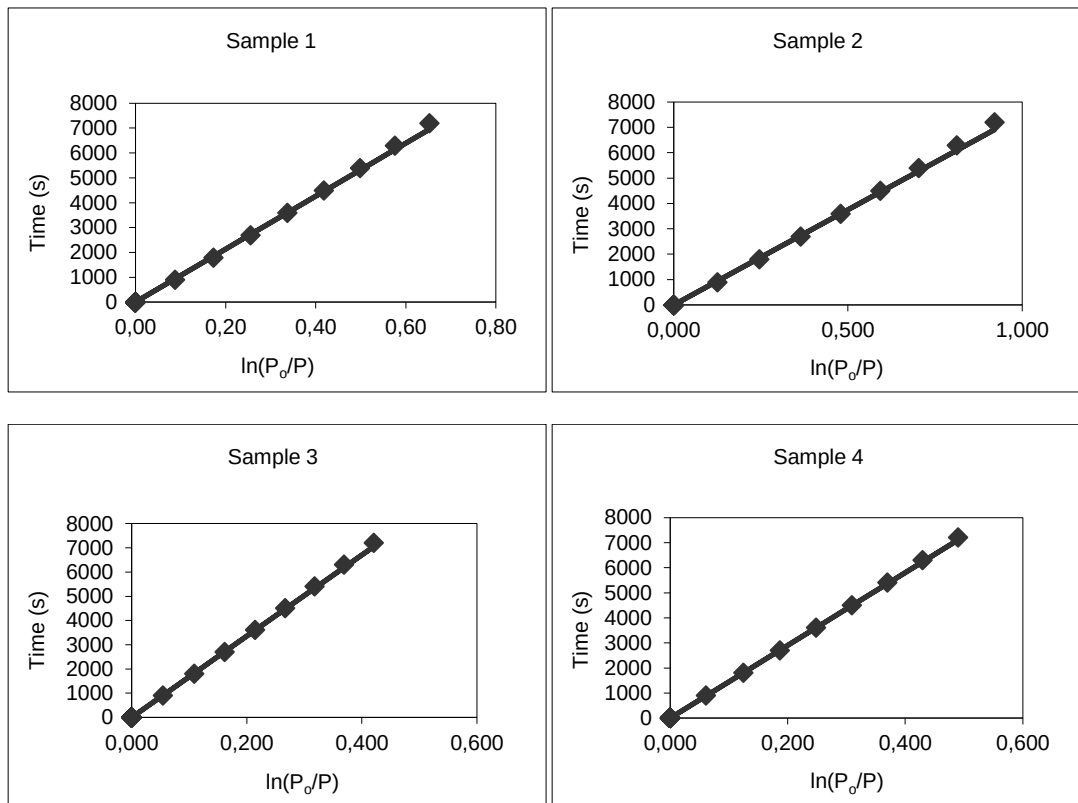
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-50-7			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	1.0E-10	COV:	36.4	%			
OPI:	10.0						
1		2		3		4	
Diameter (mm)	70.38	Diameter (mm)	70.15	Diameter (mm)	70.56	Diameter (mm)	70.06
Thickness (mm)	31.04	Thickness (mm)	30.07	Thickness (mm)	29.69	Thickness (mm)	31.65
k (m/s)	7.39636E-11	k (m/s)	1.42743E-10	k (m/s)	6.66768E-11	k (m/s)	1.21326E-10
r ²	0.9995	r ²	0.9999	r ²	0.9989	r ²	1.0000
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
14.55	102.6	14.55	104.0	14.55	100.5	14.55	103.7
15.1	101.3	15.1	101.3	15.1	99.3	15.1	101.5
15.25	100.0	15.25	98.6	15.25	98.1	15.25	99.4
15.4	98.6	15.4	96.1	15.4	96.8	15.4	97.3
15.55	97.3	15.55	93.5	15.55	95.6	15.55	95.2
16.1	96.0	16.1	91.1	16.1	94.4	16.1	93.2
16.25	94.7	16.25	88.8	16.25	93.1	16.25	91.2
16.4	93.4	16.4	86.4	16.4	91.9	16.4	89.3
16.55	92.1	16.55	84.3	16.55	90.8	16.55	87.4



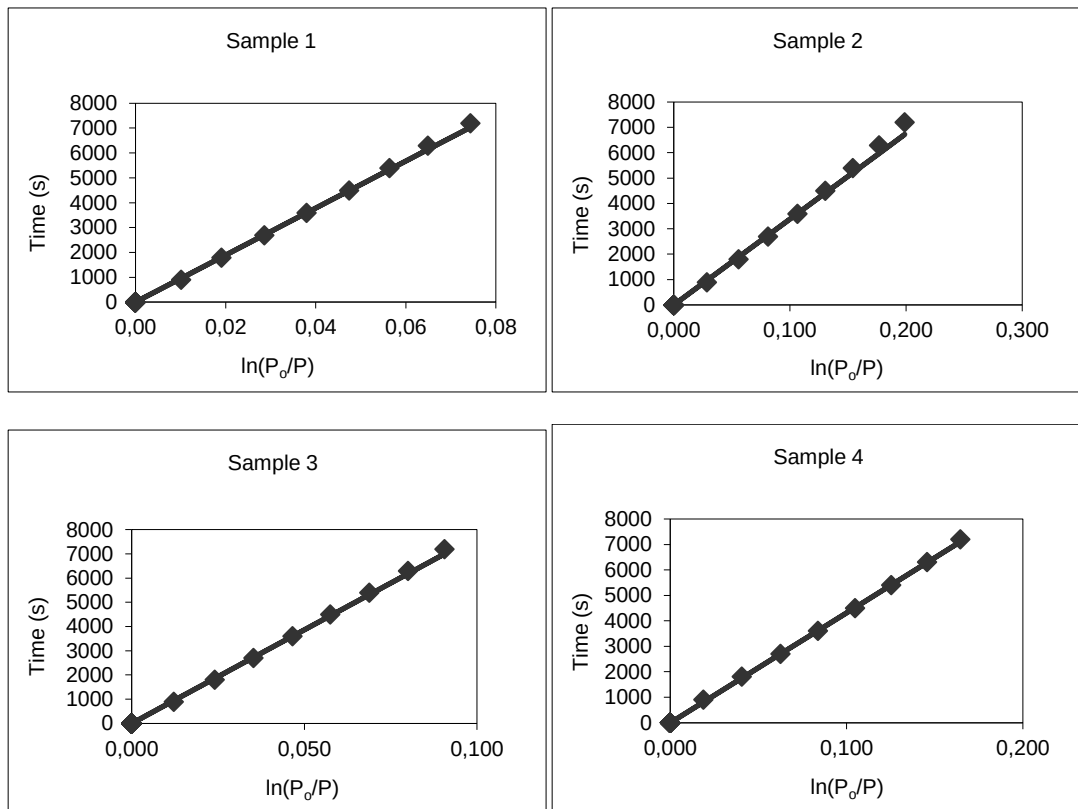
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-60-7			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	2.0E-10	COV:	63.4%				
OPI:	9.7						
1		2		3		4	
Diameter (mm)	70.28	Diameter (mm)	70.33	Diameter (mm)	70.19	Diameter (mm)	70.19
Thickness (mm)	28.38	Thickness (mm)	31.62	Thickness (mm)	28.94	Thickness (mm)	29.62
k (m/s)	1.0336E-10	k (m/s)	1.99089E-10	k (m/s)	1.09536E-10	k (m/s)	3.69074E-10
r ²	0.9994	r ²	0.9999	r ²	1.0000	r ²	0.9993
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.16	102.7	17.16	103.2	17.16	99.5	17.16	102.0
17.31	100.6	17.31	99.6	17.31	97.4	17.31	95.0
17.46	98.5	17.46	96.1	17.46	95.4	17.46	88.5
18.01	96.6	18.01	92.8	18.01	93.4	18.01	82.5
18.16	94.6	18.16	89.6	18.16	91.4	18.16	77.0
18.31	92.7	18.31	86.5	18.31	89.6	18.31	71.9
18.46	90.9	18.46	83.5	18.46	87.7	18.46	67.2
19.01	89.1	19.01	80.7	19.01	85.9	19.01	62.9
19.16	87.4	19.16	77.9	19.16	84.1	19.16	58.8



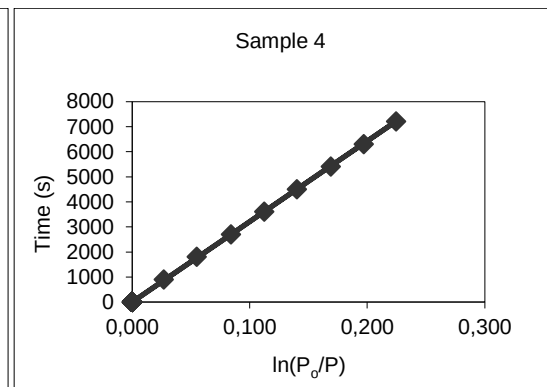
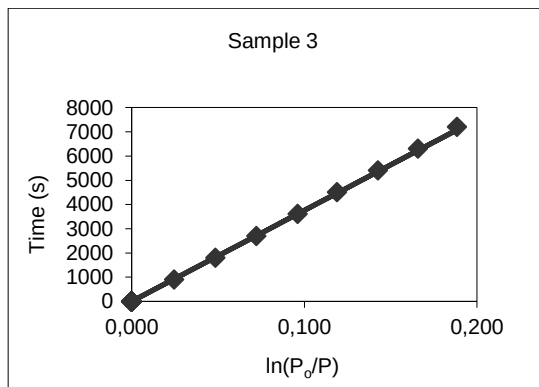
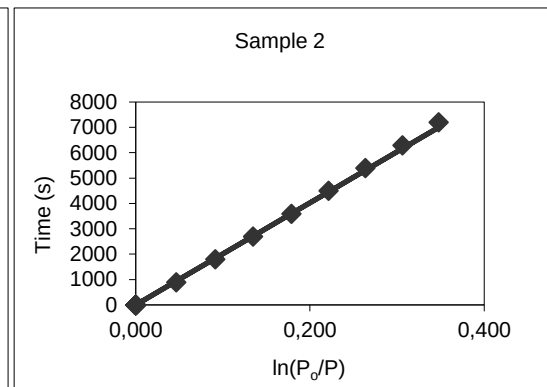
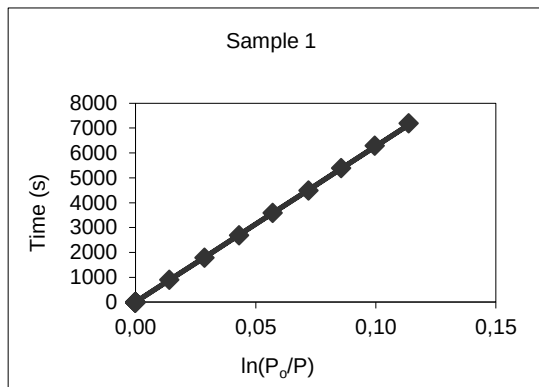
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-75-7			Operator:	AY		
Date:	8/13/2012						
Average k (m/s):	4.3E-10	COV:	37.6%				
OPI:	9.4						
1		2		3		4	
Diameter (mm)	70.28	Diameter (mm)	70.56	Diameter (mm)	70.58	Diameter (mm)	70.33
Thickness (mm)	30.67	Thickness (mm)	31.36	Thickness (mm)	30.79	Thickness (mm)	30.25
k (m/s)	4.54394E-10	k (m/s)	6.52221E-10	k (m/s)	2.894E-10	k (m/s)	3.32692E-10
r^2	0.9980	r^2	0.9969	r^2	0.9992	r^2	0.9997
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.16	102.8	17.16	101.0	17.16	97.9	17.16	103.0
17.31	94.1	17.31	89.1	17.31	92.7	17.31	96.9
17.46	86.4	17.46	78.9	17.46	87.8	17.46	91.0
18.01	79.6	18.01	70.1	18.01	83.3	18.01	85.5
18.16	73.3	18.16	62.5	18.16	79.0	18.16	80.4
18.31	67.6	18.31	55.8	18.31	75.0	18.31	75.6
18.46	62.4	18.46	50.0	18.46	71.2	18.46	71.2
19.01	57.8	19.01	44.8	19.01	67.7	19.01	67.1
19.16	53.5	19.16	40.2	19.16	64.3	19.16	63.1



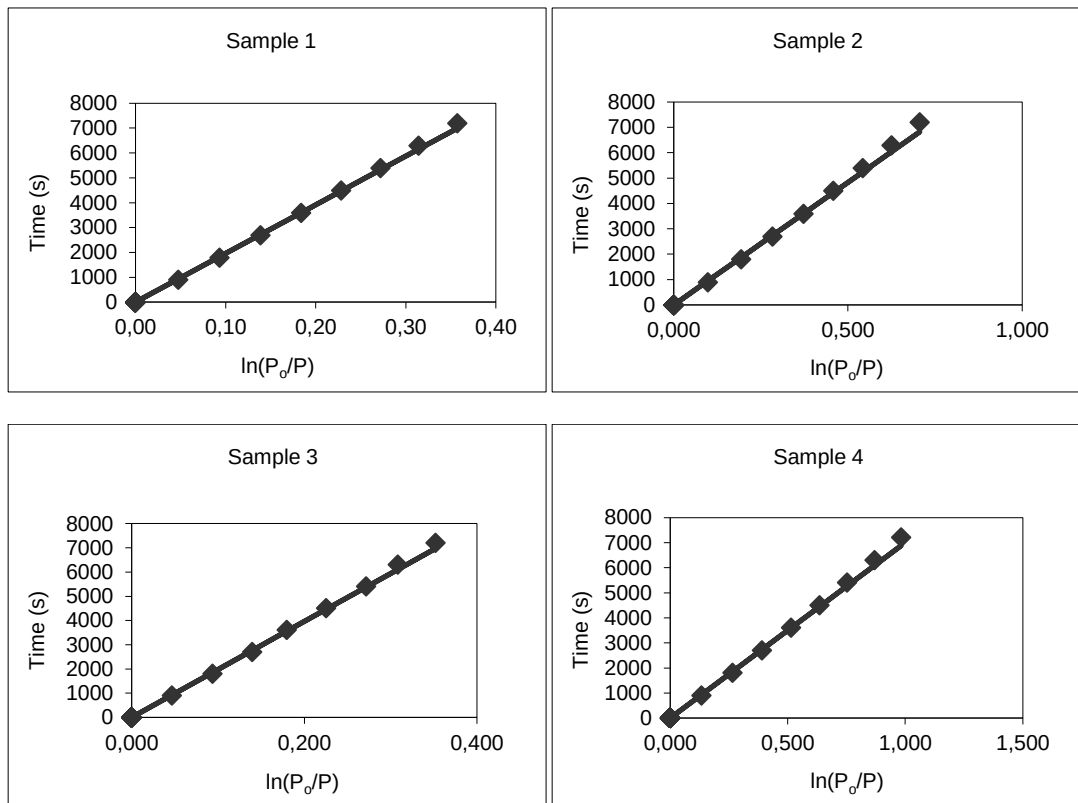
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-40-7			Operator:	AY		
Date:	8/14/2012						
Average k (m/s):	1.0E-10	COV:	48.5%				
OPI:	10.0						
1		2		3		4	
Diameter (mm)	68.02	Diameter (mm)	68.29	Diameter (mm)	68.57	Diameter (mm)	68.18
Thickness (mm)	30.17	Thickness (mm)	31.94	Thickness (mm)	30.26	Thickness (mm)	32.18
k (m/s)	5.39984E-11	k (m/s)	1.55116E-10	k (m/s)	6.52282E-11	k (m/s)	1.27159E-10
r^2	0.9987	r^2	0.9918	r^2	0.9986	r^2	0.9996
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
13.39	102.8	13.39	105.8	13.39	101.0	13.39	102.7
13.54	101.8	13.54	102.8	13.54	99.8	13.54	100.8
14.09	100.9	14.09	100.0	14.09	98.6	14.09	98.6
14.24	99.9	14.24	97.5	14.24	97.5	14.24	96.4
14.39	99.0	14.39	95.1	14.39	96.4	14.39	94.4
14.54	98.1	14.54	92.8	14.54	95.4	14.54	92.5
15.09	97.2	15.09	90.7	15.09	94.3	15.09	90.6
15.24	96.4	15.24	88.6	15.24	93.3	15.24	88.7
15.39	95.5	15.39	86.7	15.39	92.3	15.39	87.1



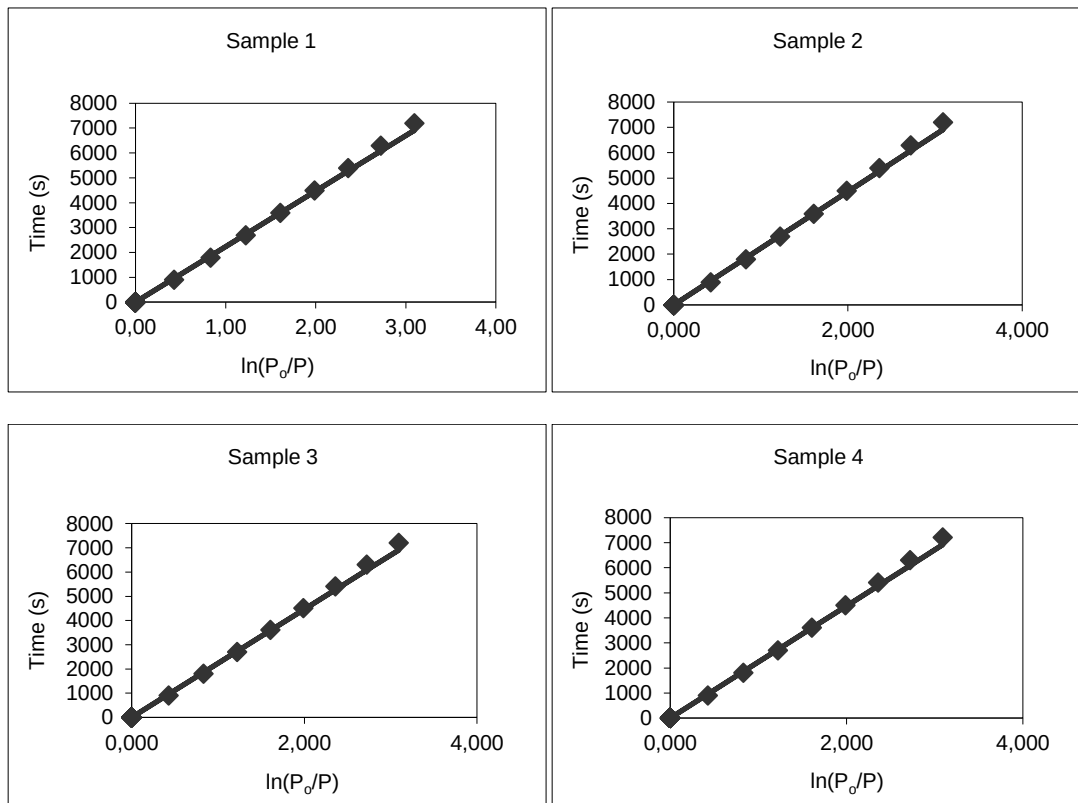
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-50-7			Operator:	AY		
Date:	8/14/2012						
Average k (m/s):	1.7E-10	COV:	48.1%				
OPI:	9.8						
1		2		3		4	
Diameter (mm)	68.83	Diameter (mm)	68.13	Diameter (mm)	68.17	Diameter (mm)	68.32
Thickness (mm)	29.2	Thickness (mm)	32.03	Thickness (mm)	31.23	Thickness (mm)	32.79
k (m/s)	7.77114E-11	k (m/s)	2.68233E-10	k (m/s)	1.41008E-10	k (m/s)	1.74483E-10
r ²	0.9998	r ²	0.9986	r ²	0.9995	r ²	0.9999
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
13.39	101.5	13.39	103.4	13.39	99.9	13.39	102.4
13.54	100.1	13.54	98.7	13.54	97.5	13.54	99.7
14.09	98.6	14.09	94.3	14.09	95.2	14.09	97.0
14.24	97.2	14.24	90.3	14.24	92.9	14.24	94.2
14.39	95.9	14.39	86.4	14.39	90.7	14.39	91.5
14.54	94.4	14.54	82.8	14.54	88.7	14.54	89.0
15.09	93.2	15.09	79.4	15.09	86.6	15.09	86.5
15.24	91.9	15.24	76.1	15.24	84.6	15.24	84.1
15.39	90.6	15.39	73.0	15.39	82.7	15.39	81.8



University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-60-7			Operator:	AY		
Date:	8/14/2012						
Average k (m/s):	4.6E-10	COV:	50.8%				
OPI:	9.3						
1		2		3		4	
Diameter (mm)	68.15	Diameter (mm)	68.25	Diameter (mm)	68.07	Diameter (mm)	68.08
Thickness (mm)	32.12	Thickness (mm)	32.64	Thickness (mm)	31.26	Thickness (mm)	31.44
k (m/s)	2.76224E-10	k (m/s)	5.59286E-10	k (m/s)	2.66261E-10	k (m/s)	7.51029E-10
r^2	0.9985	r^2	0.9949	r^2	0.9980	r^2	0.9965
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
10.31	104.0	10.31	98.9	10.31	105.1	10.31	101.9
10.46	99.2	10.46	89.6	10.46	100.3	10.46	89.2
11.01	94.7	11.01	81.5	11.01	95.7	11.01	78.2
11.16	90.5	11.16	74.4	11.16	91.4	11.16	68.9
11.31	86.6	11.31	68.2	11.31	87.8	11.31	60.9
11.46	82.8	11.46	62.5	11.46	83.9	11.46	54.0
12.01	79.2	12.01	57.5	12.01	80.1	12.01	48.0
12.16	76.0	12.16	52.9	12.16	77.2	12.16	42.7
12.31	72.8	12.31	48.8	12.31	73.9	12.31	38.1

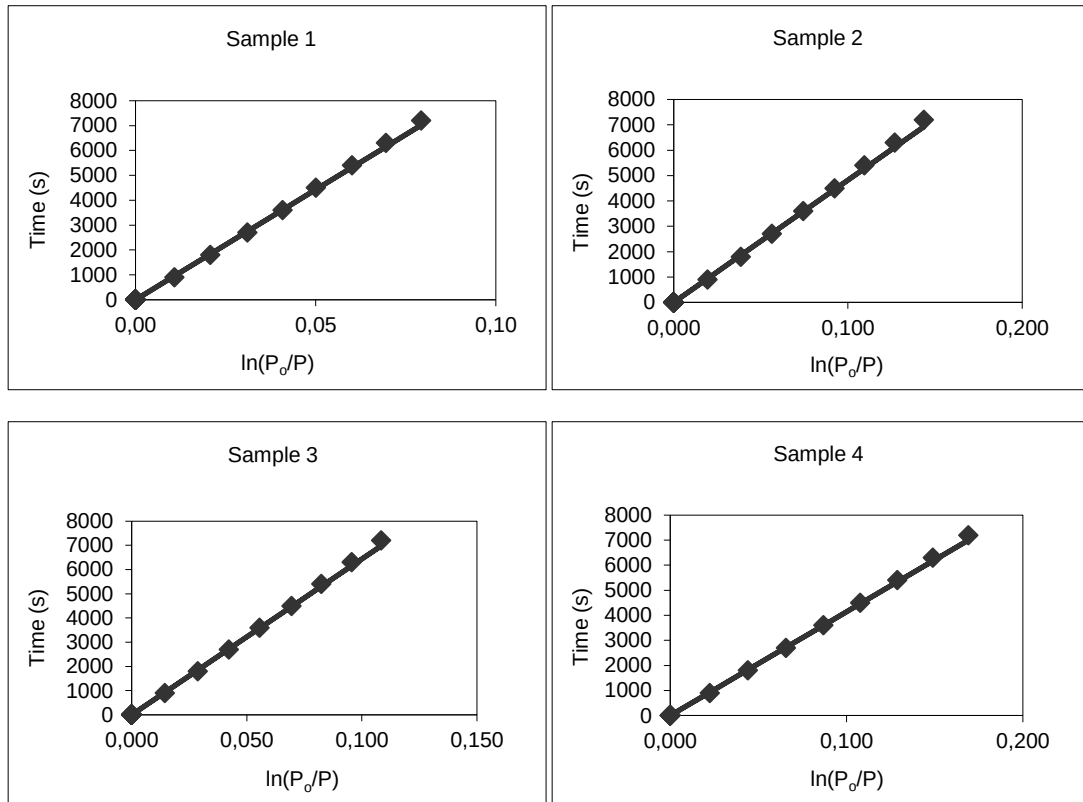


University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-75-7			Operator:	AY		
Date:	8/4/2012						
Average k (m/s):	2.4E-09	COV:	4.6	%			
OPI:	8.6						
1		2		3		4	
Diameter (mm)	68.18	Diameter (mm)	68.13	Diameter (mm)	68.45	Diameter (mm)	68.19
Thickness (mm)	30.94	Thickness (mm)	30.7	Thickness (mm)	33.68	Thickness (mm)	33.39
k (m/s)	2.31171E-09	k (m/s)	2.29715E-09	k (m/s)	2.49662E-09	k (m/s)	2.49404E-09
r^2	0.9968	r^2	0.9968	r^2	0.9968	r^2	0.9968
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
9.46	96.9	9.46	96.9	9.46	96.9	9.46	96.9
10.01	63.1	10.01	63.1	10.01	63.1	10.01	63.1
10.16	42.1	10.16	42.1	10.16	42.1	10.16	42.1
10.31	28.5	10.31	28.5	10.31	28.5	10.31	28.5
10.46	19.4	10.46	19.4	10.46	19.4	10.46	19.4
11.01	13.3	11.01	13.3	11.01	13.3	11.01	13.3
11.16	9.1	11.16	9.1	11.16	9.1	11.16	9.1
11.31	6.4	11.31	6.4	11.31	6.4	11.31	6.4
11.46	4.4	11.46	4.4	11.46	4.4	11.46	4.4

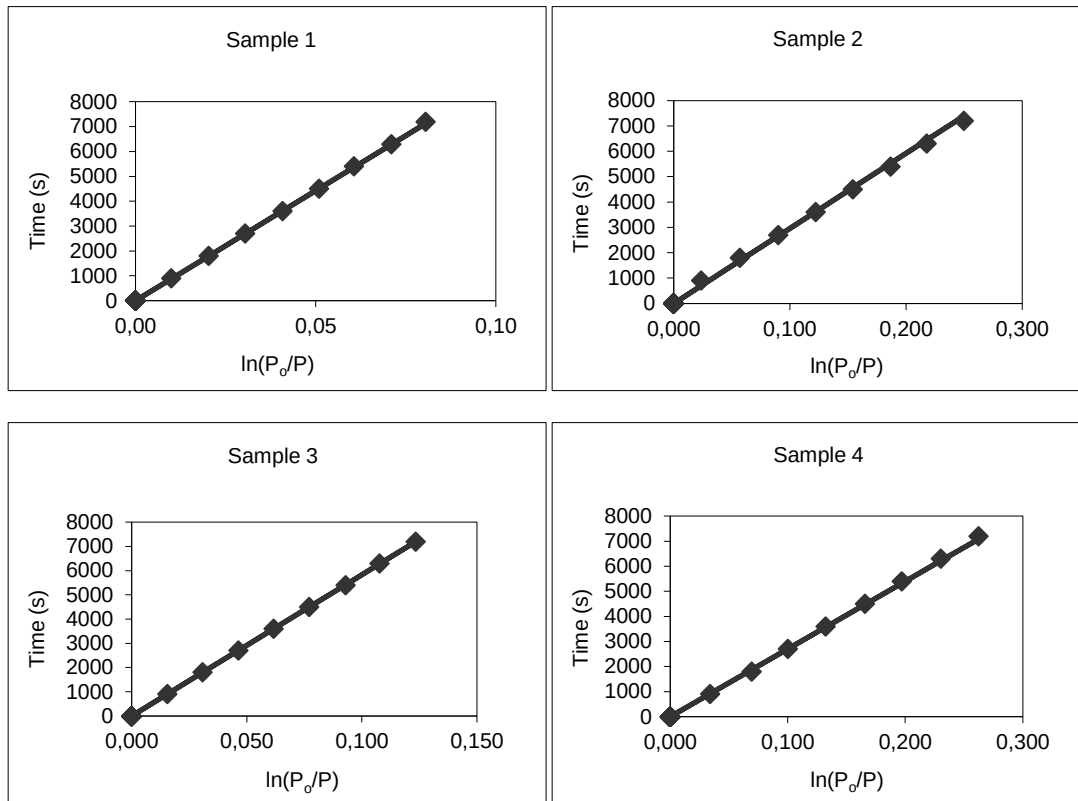


28-32 days oxygen permeability results after 28-days initial moist curing period

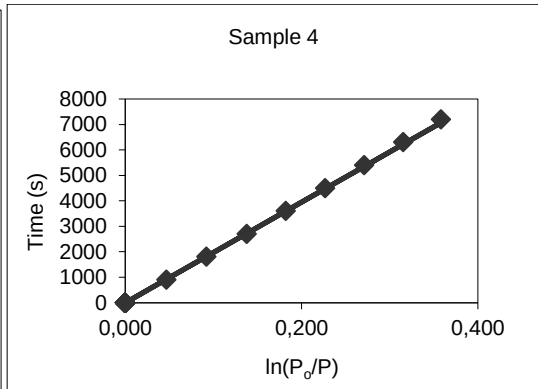
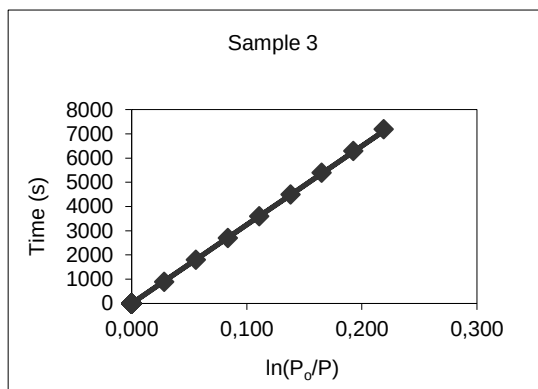
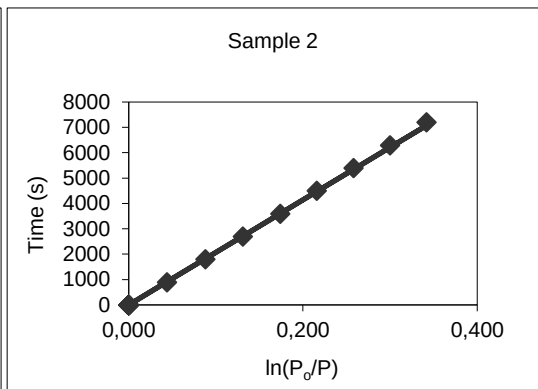
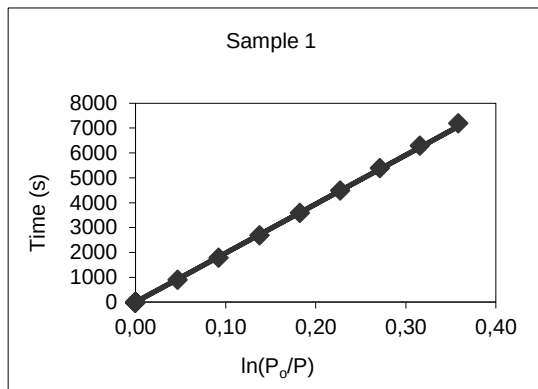
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-40-28			Operator:	AY		
Date:	7/29/2012						
Average k (m/s):	9.4E-11	COV:	33.0 %				
OPI:	10.0						
1		2		3		4	
Diameter (mm)	68.76	Diameter (mm)	68.09	Diameter (mm)	68.24	Diameter (mm)	68.12
Thickness (mm)	31.58	Thickness (mm)	32.57	Thickness (mm)	30.06	Thickness (mm)	31.09
k (m/s)	5.90456E-11	k (m/s)	1.13345E-10	k (m/s)	7.83202E-11	k (m/s)	1.26731E-10
r ²	0.9985	r ²	0.9973	r ²	0.9983	r ²	0.9987
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
11.16	101.9	11.16	105.7	11.16	99.8	11.16	103.8
11.31	100.8	11.31	103.6	11.31	98.4	11.31	101.5
11.46	99.8	11.46	101.6	11.46	97.0	11.46	99.3
12.01	98.8	12.01	99.8	12.01	95.7	12.01	97.2
12.16	97.9	12.16	98.1	12.16	94.4	12.16	95.2
12.31	97.0	12.31	96.3	12.31	93.1	12.31	93.2
12.46	96.0	12.46	94.7	12.46	91.9	12.46	91.2
13.01	95.1	13.01	93.0	13.01	90.7	13.01	89.4
13.16	94.2	13.16	91.5	13.16	89.5	13.16	87.6



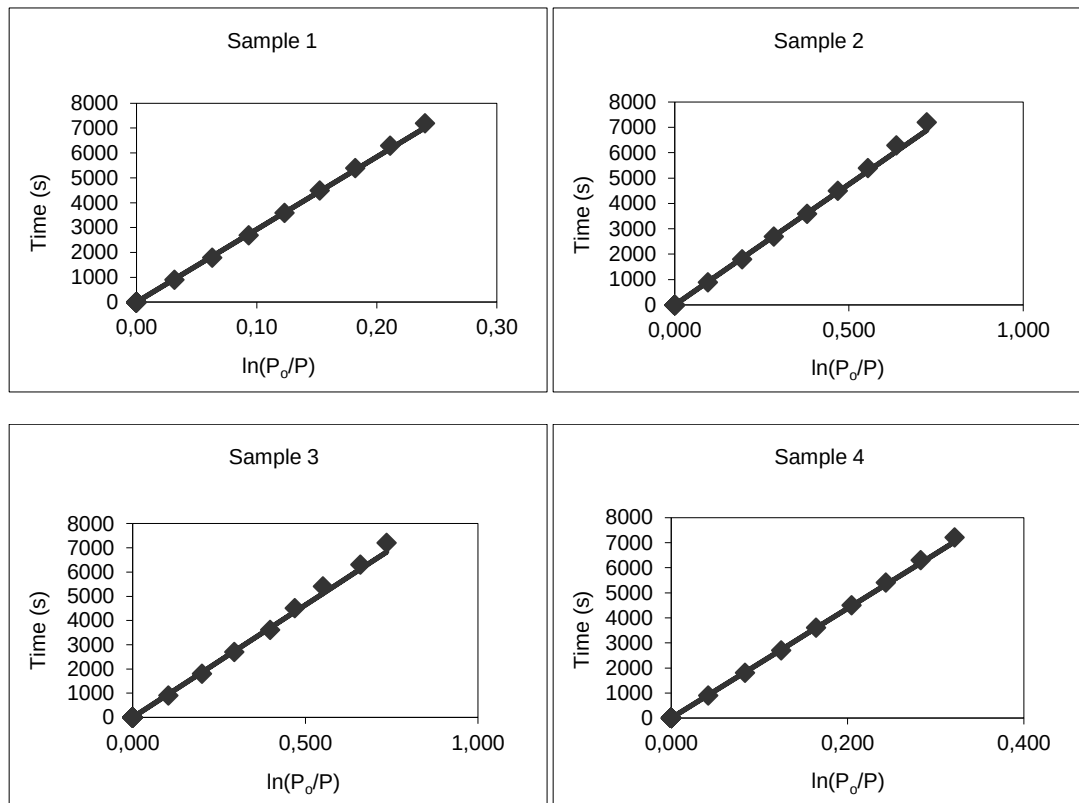
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-50-28			Operator:	AY		
Date:	7/29/2012						
Average k (m/s):	1.3E-10	COV:	51.7 %				
OPI:	9.9						
1		2		3		4	
Diameter (mm)	68.38	Diameter (mm)	68	Diameter (mm)	69.51	Diameter (mm)	68.16
Thickness (mm)	32.11	Thickness (mm)	31.01	Thickness (mm)	31.88	Thickness (mm)	32.56
k (m/s)	6.14407E-11	k (m/s)	1.83641E-10	k (m/s)	8.99878E-11	k (m/s)	2.04285E-10
r ²	0.9998	r ²	0.9972	r ²	1.0000	r ²	0.9994
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.29	102.0	17.29	102.7	17.29	100.6	17.29	103.7
17.44	101.0	17.44	100.3	17.44	99.1	17.44	100.3
17.59	99.9	17.59	97.0	17.59	97.5	17.59	96.8
18.14	98.9	18.14	93.8	18.14	96.0	18.14	93.8
18.29	97.9	18.29	90.9	18.29	94.6	18.29	90.9
18.44	96.9	18.44	88.0	18.44	93.1	18.44	87.9
18.59	96.0	18.59	85.2	18.59	91.7	18.59	85.2
19.14	95.0	19.14	82.6	19.14	90.3	19.14	82.4
19.29	94.1	19.29	80.0	19.29	88.9	19.29	79.8



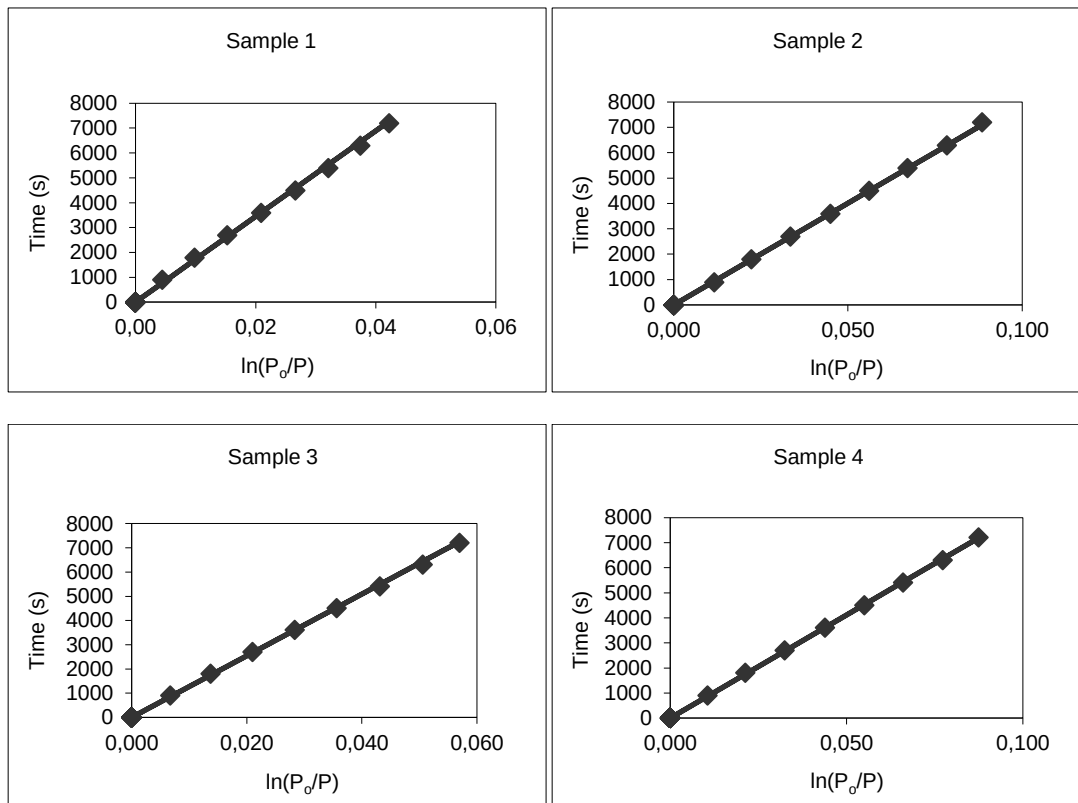
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-60--28			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	2.3E-10	COV:	17.8	%			
OPI:	9.6						
1		2		3		4	
Diameter (mm)	68.67	Diameter (mm)	70.29	Diameter (mm)	68.21	Diameter (mm)	68.09
Thickness (mm)	30.67	Thickness (mm)	29.29	Thickness (mm)	33.17	Thickness (mm)	30.23
k (m/s)	2.596E-10	k (m/s)	2.25493E-10	k (m/s)	1.73567E-10	k (m/s)	2.60254E-10
r^2	0.9994	r^2	0.9994	r^2	0.9998	r^2	0.9994
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
16.07	106.1	16.07	103.2	16.07	101.4	16.07	106.1
16.22	101.3	16.22	98.8	16.22	98.6	16.22	101.3
16.37	96.8	16.37	94.5	16.37	95.9	16.37	96.8
16.52	92.4	16.52	90.5	16.52	93.3	16.52	92.4
17.07	88.4	17.07	86.7	17.07	90.8	17.07	88.4
17.22	84.6	17.22	83.2	17.22	88.3	17.22	84.6
17.37	80.9	17.37	79.7	17.37	86.0	17.37	80.9
17.52	77.4	17.52	76.5	17.52	83.6	17.52	77.4
18.07	74.2	18.07	73.3	18.07	81.4	18.07	74.2



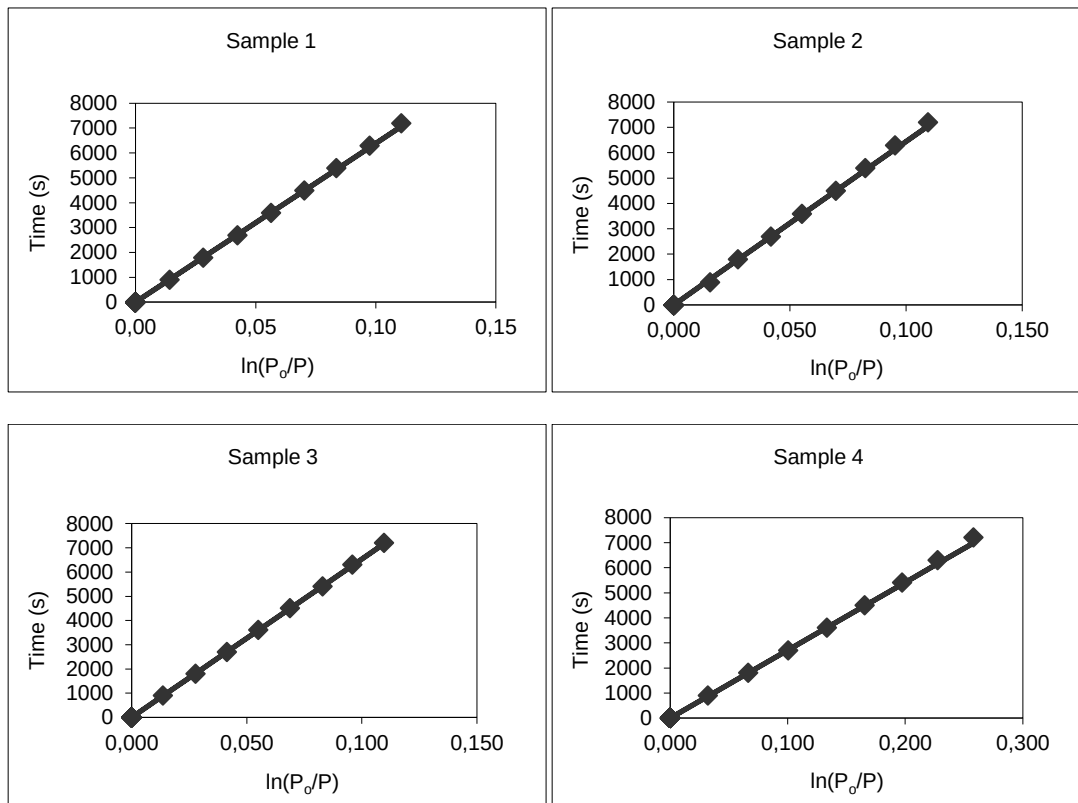
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	PC-75-28			Operator:	AY		
Date:	7/30/2012						
Average k (m/s):	3.4E-10	COV:	52.5%				
OPT:	9.5						
1		2		3		4	
Diameter (mm)	70.58	Diameter (mm)	70.58	Diameter (mm)	70.58	Diameter (mm)	70.47
Thickness (mm)	29.85	Thickness (mm)	28.15	Thickness (mm)	31.18	Thickness (mm)	29.5
k (m/s)	1.60687E-10	k (m/s)	4.60108E-10	k (m/s)	5.19424E-10	k (m/s)	2.13251E-10
r ²	0.9987	r ²	0.9963	r ²	0.9940	r ²	0.9990
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
11.25	103.9	11.25	103.6	11.25	103.4	11.25	104.1
11.4	100.7	11.4	94.1	11.4	99.1	11.4	93.9
11.55	97.6	11.55	85.3	11.55	95.1	11.55	85.2
12.1	94.7	12.1	77.9	12.1	91.2	12.1	77.5
12.25	91.9	12.25	70.8	12.25	87.7	12.25	69.9
12.4	89.2	12.4	64.8	12.4	84.2	12.4	65.1
12.55	86.6	12.55	59.5	12.55	81.0	12.55	60.0
13.1	84.2	13.1	54.8	13.1	77.9	13.1	53.8
13.25	81.7	13.25	50.2	13.25	74.9	13.25	49.9



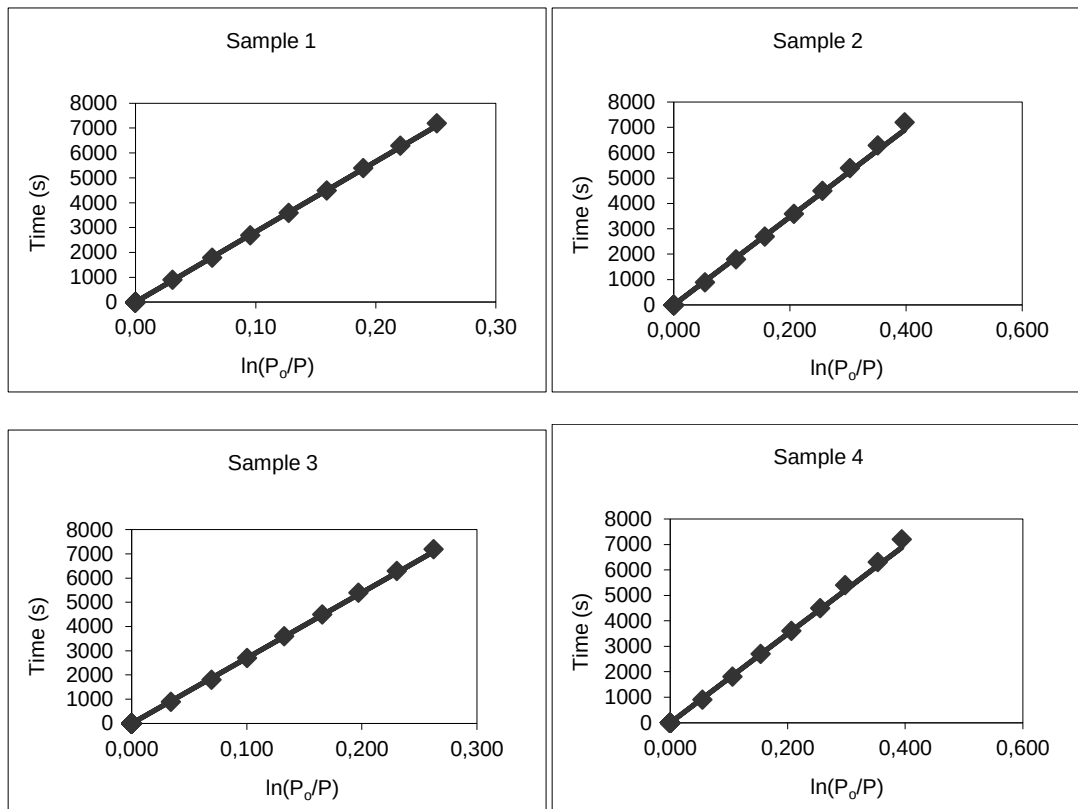
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-40-28			Operator:	AY		
Date:	7/26/2012						
Average k (m/s):	4.9E-11	COV:	36.1 %				
OPI:	10.3						
1		2		3		4	
Diameter (mm)	70.53	Diameter (mm)	70.24	Diameter (mm)	70.42	Diameter (mm)	70.29
Thickness (mm)	29.89	Thickness (mm)	32.56	Thickness (mm)	31.32	Thickness (mm)	31.03
k (m/s)	2.81131E-11	k (m/s)	6.51496E-11	k (m/s)	3.99006E-11	k (m/s)	6.09622E-11
r^2	0.9982	r^2	0.9997	r^2	0.9992	r^2	0.9998
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.3	109.7	9.51	110.6	12.3	107.2	12.3	110.5
12.45	109.2	10.06	109.3	12.45	106.4	12.45	109.3
13	108.6	10.21	108.2	13	105.7	13	108.2
13.15	108.0	10.36	107.0	13.15	104.9	13.15	107.0
13.3	107.4	10.51	105.7	13.3	104.2	13.3	105.7
13.45	106.8	11.06	104.6	13.45	103.4	13.45	104.6
14	106.2	11.21	103.4	14	102.6	14	103.4
14.15	105.6	11.36	102.3	14.15	101.9	14.15	102.3
14.3	105.1	11.51	101.2	14.3	101.2	14.3	101.2



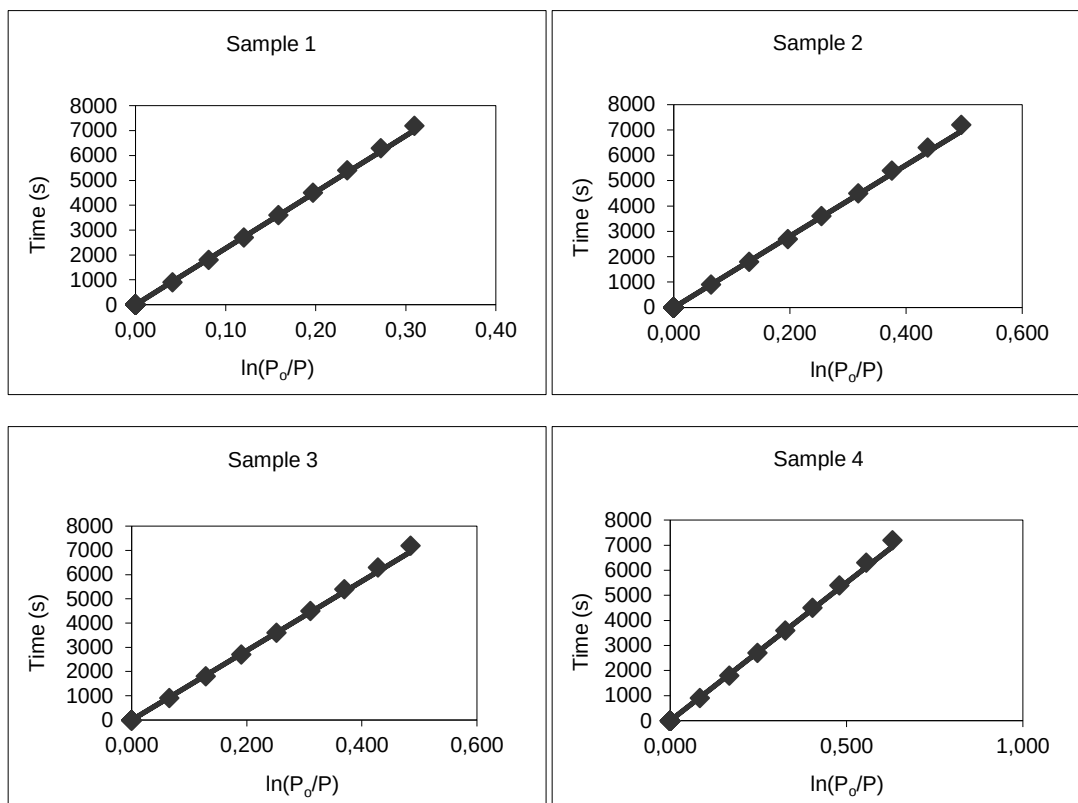
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-50-28			Operator:	AY		
Date:	7/26/2012						
Average k (m/s):	1.0E-10	COV:	57.8%				
OPI:	10.0						
1		2		3		4	
Diameter (mm)	70.32	Diameter (mm)	70.23	Diameter (mm)	70.11	Diameter (mm)	69.95
Thickness (mm)	28.02	Thickness (mm)	33.41	Thickness (mm)	27.15	Thickness (mm)	32.32
k (m/s)	6.98476E-11	k (m/s)	8.24101E-11	k (m/s)	6.7112E-11	k (m/s)	1.9098E-10
r^2	0.9994	r^2	0.9986	r^2	0.9999	r^2	0.9986
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.3	106.4	9.51	102.2	12.3	103.1	12.3	104.4
12.45	104.9	10.06	100.6	12.45	101.7	12.45	101.1
13	103.4	10.21	99.4	13	100.3	13	97.7
13.15	102.0	10.36	98.0	13.15	98.9	13.15	94.4
13.3	100.6	10.51	96.7	13.3	97.6	13.3	91.4
13.45	99.2	11.06	95.3	13.45	96.2	13.45	88.5
14	97.9	11.21	94.1	14	94.9	14	85.7
14.15	96.5	11.36	92.9	14.15	93.7	14.15	83.1
14.3	95.3	11.51	91.6	14.3	92.4	14.3	80.6



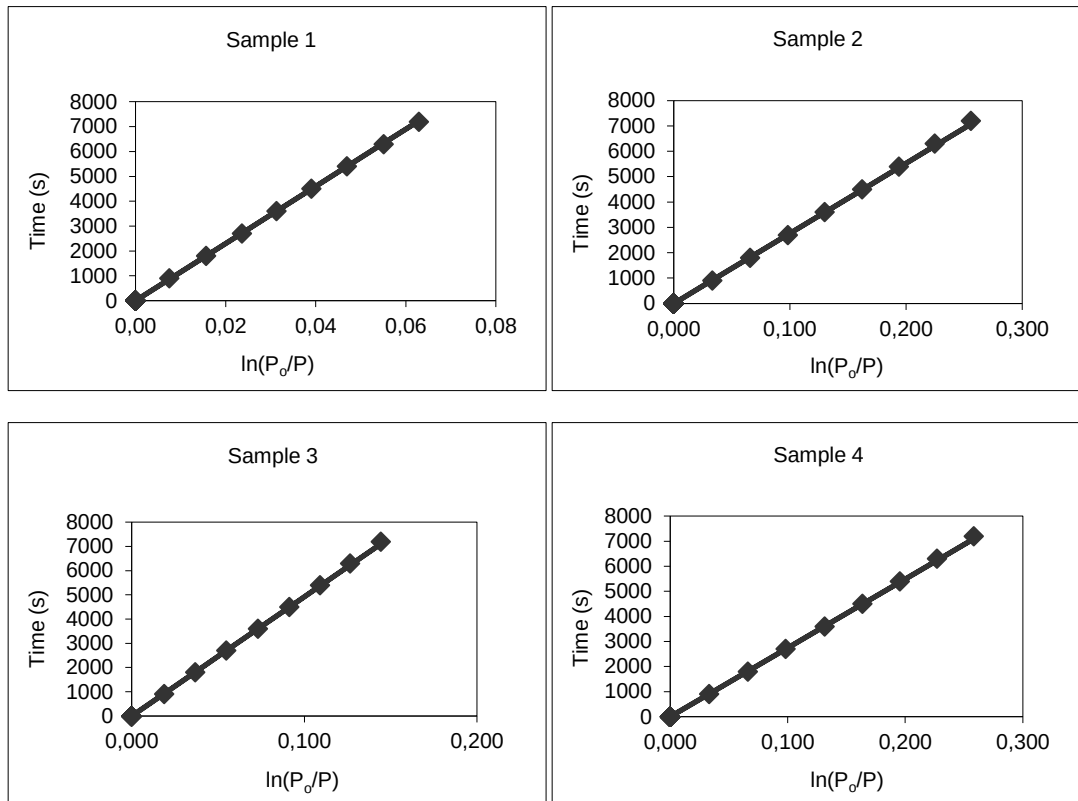
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-60-28			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	2.3E-10	COV:	27.3%				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	70.18	Diameter (mm)	70.22	Diameter (mm)	69.98	Diameter (mm)	70.05
Thickness (mm)	31.17	Thickness (mm)	32.08	Thickness (mm)	30.11	Thickness (mm)	31.42
k (m/s)	1.76593E-10	k (m/s)	2.90946E-10	k (m/s)	1.79215E-10	k (m/s)	2.84485E-10
r^2	0.9996	r^2	0.9969	r^2	0.9994	r^2	0.9967
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.29	101.1	11.16	103.9	17.29	103.7	17.29	103.8
17.44	98.0	11.31	98.4	17.44	100.3	17.44	98.3
17.59	94.8	11.46	93.3	17.59	96.8	17.59	93.4
18.14	91.9	12.01	88.8	18.14	93.8	18.14	89.0
18.29	89.0	12.16	84.5	18.29	90.9	18.29	84.5
18.44	86.2	12.31	80.4	18.44	87.9	18.44	80.4
18.59	83.6	12.46	76.7	18.59	85.2	18.59	77.1
19.14	81.1	13.01	73.1	19.14	82.4	19.14	72.9
19.29	78.7	13.16	69.8	19.29	79.8	19.29	70.0



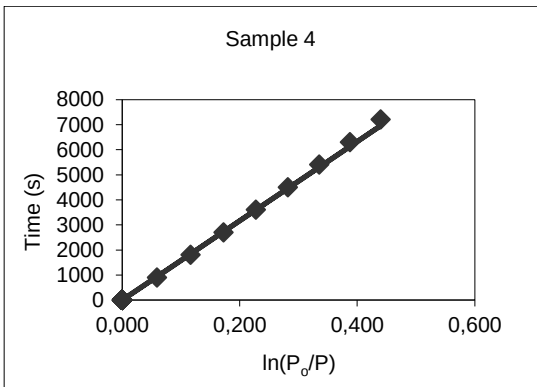
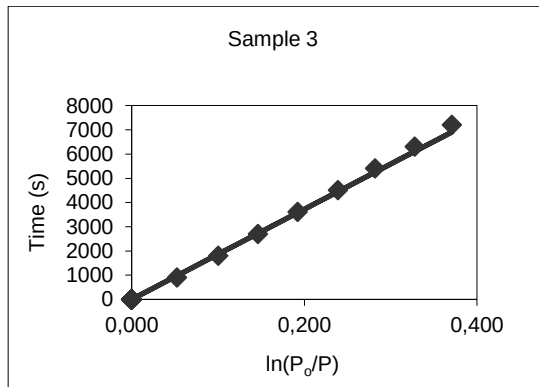
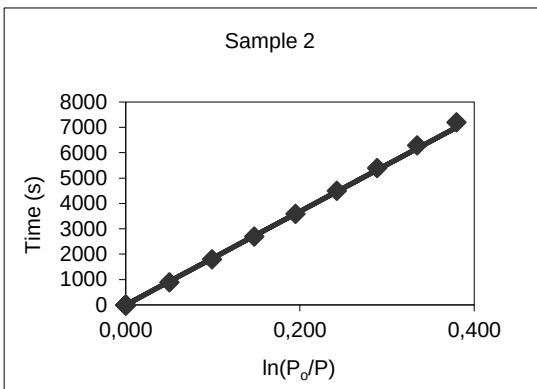
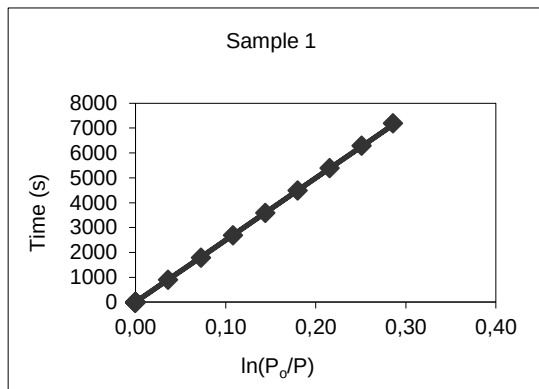
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	FA-75-28			Operator:	AY		
Date:	7/27/2012						
Average k (m/s):	3.5E-10	COV:	30.7 %				
OPI:	9.5						
1		2		3		4	
Diameter (mm)	68.43	Diameter (mm)	68.16	Diameter (mm)	68.5	Diameter (mm)	68.04
Thickness (mm)	29.23	Thickness (mm)	31.22	Thickness (mm)	29.85	Thickness (mm)	31.44
k (m/s)	2.15886E-10	k (m/s)	3.73062E-10	k (m/s)	3.46013E-10	k (m/s)	4.80291E-10
r ²	0.9987	r ²	0.9978	r ²	0.9977	r ²	0.9978
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
13.48	102.4	13.48	97.3	13.48	99.4	13.48	104.2
14.03	98.3	14.03	91.2	14.03	93.1	14.03	95.7
14.18	94.4	14.18	85.4	14.18	87.4	14.18	88.1
14.33	90.8	14.33	79.9	14.33	82.1	14.33	81.3
14.48	87.4	14.48	75.4	14.48	77.3	14.48	75.1
15.03	84.1	15.03	70.8	15.03	72.8	15.03	69.6
15.18	80.9	15.18	66.8	15.18	68.7	15.18	64.4
15.33	78.0	15.33	62.8	15.33	64.8	15.33	59.7
15.48	75.1	15.48	59.3	15.48	61.2	15.48	55.5



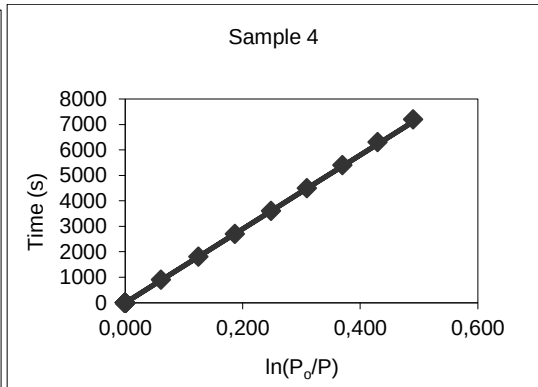
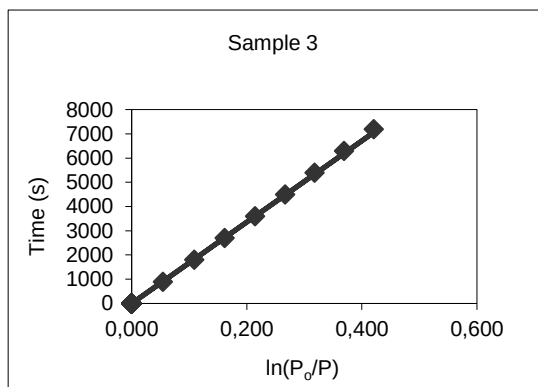
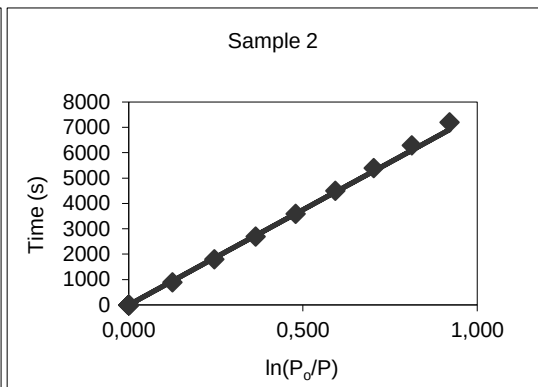
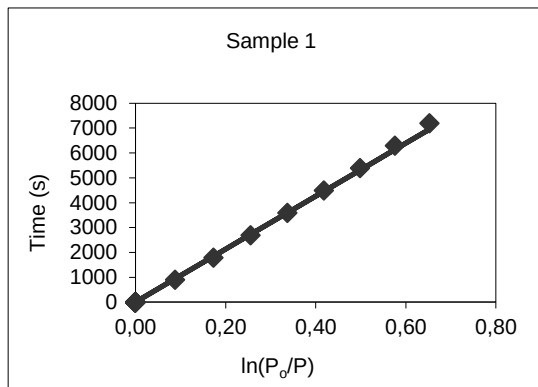
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-40-28			Operator:	AY		
Date:	7/31/2012						
Average k (m/s):	1.2E-10	COV:	53.0 %				
OPI:	9.9						
1		2		3		4	
Diameter (mm)	70.46	Diameter (mm)	70.13	Diameter (mm)	70.17	Diameter (mm)	70.09
Thickness (mm)	29.79	Thickness (mm)	30.61	Thickness (mm)	30.24	Thickness (mm)	29.54
k (m/s)	4.16231E-11	k (m/s)	1.77481E-10	k (m/s)	9.84862E-11	k (m/s)	1.72881E-10
r^2	0.9999	r^2	0.9994	r^2	0.9997	r^2	0.9996
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
11.25	103.2	11.25	103.5	11.25	100.8	11.25	101.4
11.4	102.5	11.4	100.0	11.4	98.9	11.4	98.1
11.55	101.6	11.55	96.9	11.55	97.1	11.55	94.9
12.1	100.8	12.1	93.8	12.1	95.4	12.1	91.9
12.25	100.0	12.25	90.8	12.25	93.7	12.25	88.9
12.4	99.3	12.4	88.0	12.4	92.0	12.4	86.1
12.55	98.5	12.55	85.2	12.55	90.4	12.55	83.4
13.1	97.7	13.1	82.6	13.1	88.8	13.1	80.8
13.25	96.9	13.25	80.1	13.25	87.2	13.25	78.3



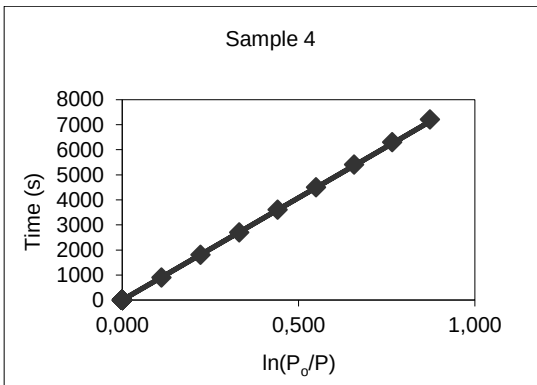
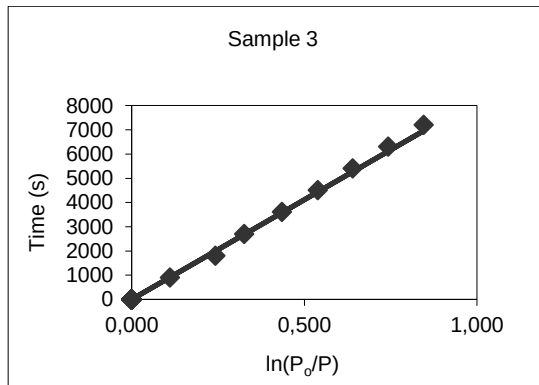
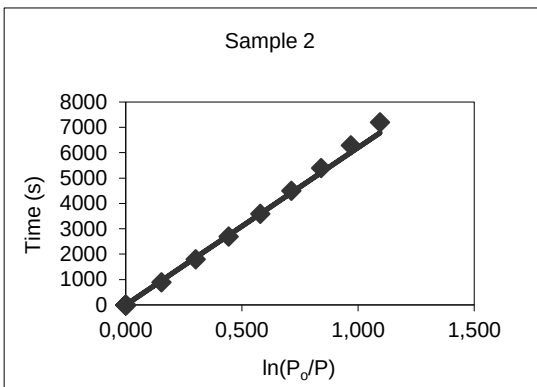
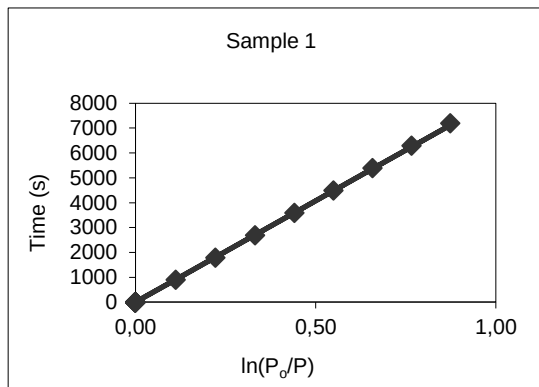
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-50-28			Operator:	AY		
Date:	7/31/2012						
Average k (m/s):	2.6E-10	COV:	17.9%				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	70.39	Diameter (mm)	70.31	Diameter (mm)	70.48	Diameter (mm)	70.29
Thickness (mm)	30.94	Thickness (mm)	31.8	Thickness (mm)	30.62	Thickness (mm)	31.03
k (m/s)	1.98048E-10	k (m/s)	2.73222E-10	k (m/s)	2.56877E-10	k (m/s)	3.09767E-10
r^2	0.9999	r^2	0.9986	r^2	0.9969	r^2	0.9979
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.13	101.8	12.13	103.6	12.13	105.8	12.13	99.7
12.28	98.2	12.28	98.5	12.28	100.4	12.28	93.9
12.43	94.7	12.43	93.8	12.43	95.7	12.43	88.7
12.58	91.4	12.58	89.4	12.58	91.4	12.58	83.9
13.13	88.1	13.13	85.2	13.13	87.3	13.13	79.4
13.28	85.0	13.28	81.3	13.28	83.3	13.28	75.2
13.43	82.1	13.43	77.6	13.43	79.8	13.43	71.3
13.58	79.2	13.58	74.1	13.58	76.2	13.58	67.6
14.13	76.5	14.13	70.9	14.13	73.0	14.13	64.2



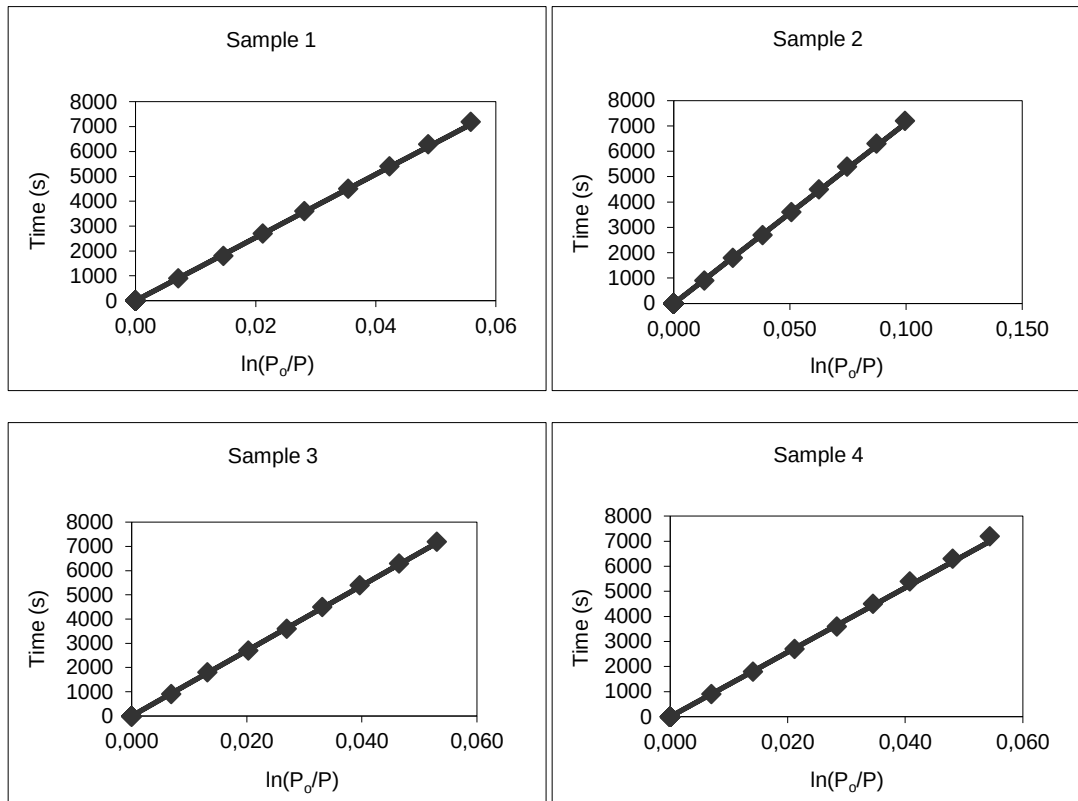
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-60-28			Operator:	AY		
Date:	8/12/2012						
Average k (m/s):	4.3E-10	COV:	40.1 %				
OPI:	9.4						
1		2		3		4	
Diameter (mm)	70.28	Diameter (mm)	70.33	Diameter (mm)	70.47	Diameter (mm)	70.34
Thickness (mm)	28.62	Thickness (mm)	31.91	Thickness (mm)	29.83	Thickness (mm)	30.39
k (m/s)	4.24022E-10	k (m/s)	6.68008E-10	k (m/s)	2.81253E-10	k (m/s)	3.34137E-10
r^2	0.9980	r^2	0.9969	r^2	0.9992	r^2	0.9997
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.16	102.8	17.16	101.0	17.16	97.9	17.16	103.0
17.31	94.1	17.31	89.1	17.31	92.7	17.31	96.9
17.46	86.4	17.46	78.9	17.46	87.8	17.46	91.0
18.01	79.6	18.01	70.1	18.01	83.3	18.01	85.5
18.16	73.3	18.16	62.5	18.16	79.0	18.16	80.4
18.31	67.6	18.31	55.8	18.31	75.0	18.31	75.6
18.46	62.4	18.46	50.0	18.46	71.2	18.46	71.2
19.01	57.8	19.01	44.8	19.01	67.7	19.01	67.1
19.16	53.5	19.16	40.2	19.16	64.3	19.16	63.1



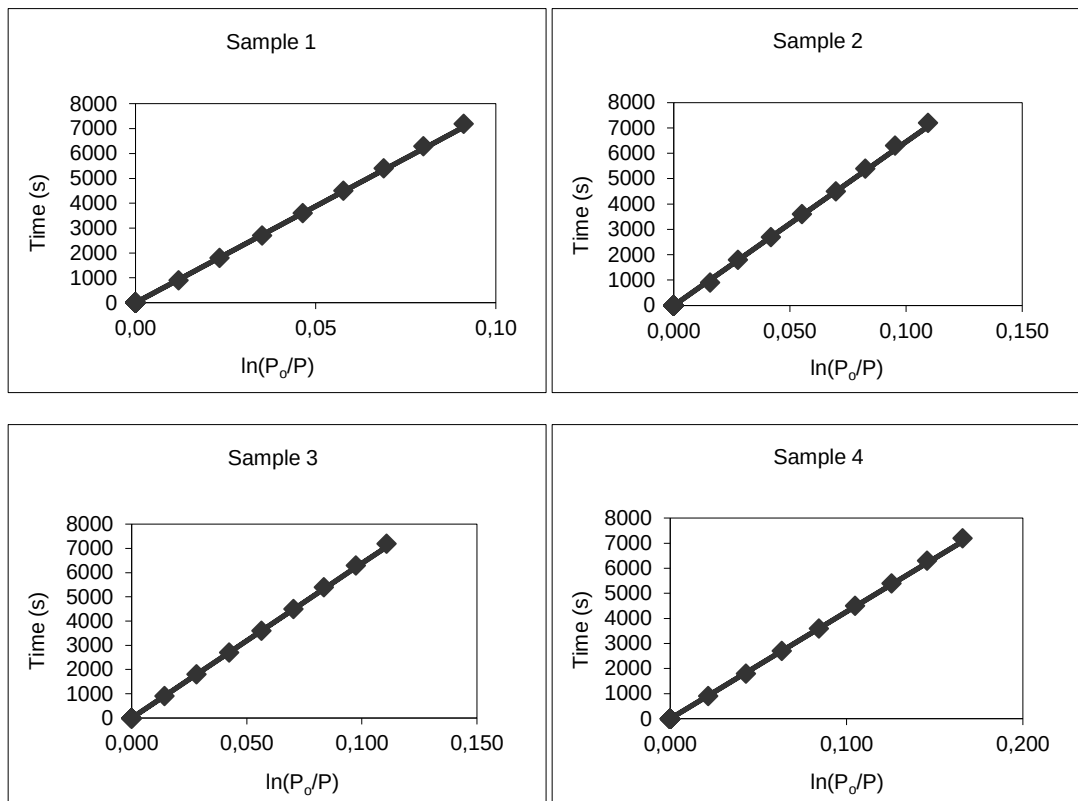
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SL-75-28			Operator:	AY		
Date:	7/31/2012						
Average k (m/s):	6.4E-10	COV:	12.8	%			
OPI:	9.2						
1		2		3		4	
Diameter (mm)	70.48	Diameter (mm)	70.35	Diameter (mm)	70.66	Diameter (mm)	70.25
Thickness (mm)	31.61	Thickness (mm)	30.34	Thickness (mm)	30.69	Thickness (mm)	30.55
k (m/s)	6.1655E-10	k (m/s)	7.59875E-10	k (m/s)	5.81254E-10	k (m/s)	5.99783E-10
r^2	0.9998	r^2	0.9938	r^2	0.9969	r^2	0.9998
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.13	101.0	12.13	103.2	12.13	103.2	12.13	101.0
12.28	90.3	12.28	88.4	12.28	92.4	12.28	90.3
12.43	80.9	12.43	76.3	12.43	81.0	12.43	80.9
12.58	72.4	12.58	66.2	12.58	74.5	12.58	72.4
13.13	64.9	13.13	57.7	13.13	66.8	13.13	64.9
13.28	58.3	13.28	50.5	13.28	60.2	13.28	58.3
13.43	52.3	13.43	44.4	13.43	54.4	13.43	52.3
13.58	47.0	13.58	39.1	13.58	49.1	13.58	47.0
14.13	42.2	14.13	34.5	14.13	44.3	14.13	42.2



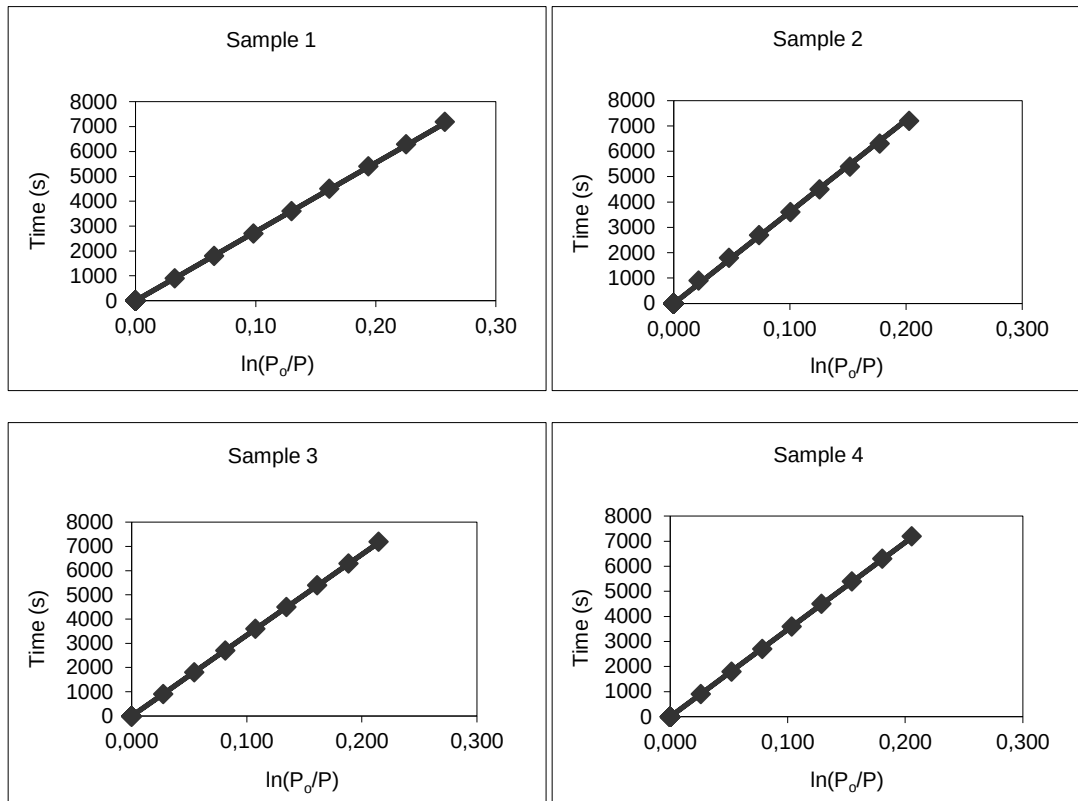
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-40-28			Operator:	AY		
Date:	7/27/2012						
Average k (m/s):	4.4E-11	COV:	33.4 %				
OPI:	10.4						
1		2		3		4	
Diameter (mm)	70.09	Diameter (mm)	70.24	Diameter (mm)	70.13	Diameter (mm)	70.11
Thickness (mm)	29.75	Thickness (mm)	29.4	Thickness (mm)	30.32	Thickness (mm)	29.13
k (m/s)	3.75578E-11	k (m/s)	6.59004E-11	k (m/s)	3.61929E-11	k (m/s)	3.59964E-11
r ²	0.9994	r ²	0.9993	r ²	0.9997	r ²	0.9982
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
13.48	103.3	13.48	106.3	13.48	102.1	13.48	100.1
14.03	102.5	14.03	104.9	14.03	101.4	14.03	99.4
14.18	101.8	14.18	103.6	14.18	100.7	14.18	98.7
14.33	101.1	14.33	102.3	14.33	100.0	14.33	98.0
14.48	100.4	14.48	101.0	14.48	99.3	14.48	97.3
15.03	99.7	15.03	99.8	15.03	98.7	15.03	96.7
15.18	99.0	15.18	98.6	15.18	98.1	15.18	96.1
15.33	98.3	15.33	97.4	15.33	97.4	15.33	95.4
15.48	97.6	15.48	96.2	15.48	96.8	15.48	94.8



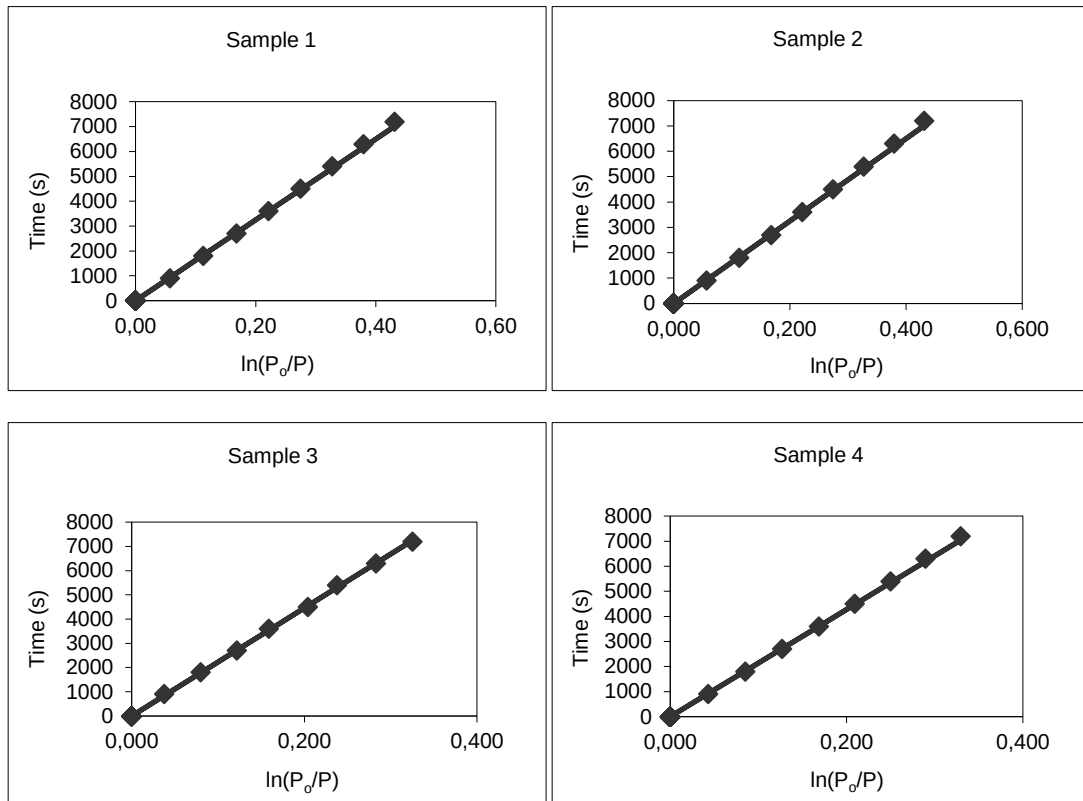
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-50-28			Operator:	AY		
Date:	7/28/2012						
Average k (m/s):	8.1E-11	COV:	28.0 %				
OPI:	10.1						
1		2		3		4	
Diameter (mm)	70.04	Diameter (mm)	70.12	Diameter (mm)	70.51	Diameter (mm)	70.05
Thickness (mm)	29.47	Thickness (mm)	30.21	Thickness (mm)	29.67	Thickness (mm)	30.05
k (m/s)	6.0916E-11	k (m/s)	7.47508E-11	k (m/s)	7.35627E-11	k (m/s)	1.13074E-10
r^2	0.9992	r^2	0.9986	r^2	0.9994	r^2	0.9995
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
10.52	103.5	10.52	102.2	10.52	106.4	10.52	103.6
11.07	102.2	11.07	100.6	11.07	104.9	11.07	101.4
11.22	101.1	11.22	99.4	11.22	103.4	11.22	99.3
11.37	99.9	11.37	98.0	11.37	102.0	11.37	97.3
11.52	98.8	11.52	96.7	11.52	100.6	11.52	95.2
12.07	97.7	12.07	95.3	12.07	99.2	12.07	93.3
12.22	96.6	12.22	94.1	12.22	97.9	12.22	91.4
12.37	95.5	12.37	92.9	12.37	96.5	12.37	89.6
12.52	94.5	12.52	91.6	12.52	95.3	12.52	87.8



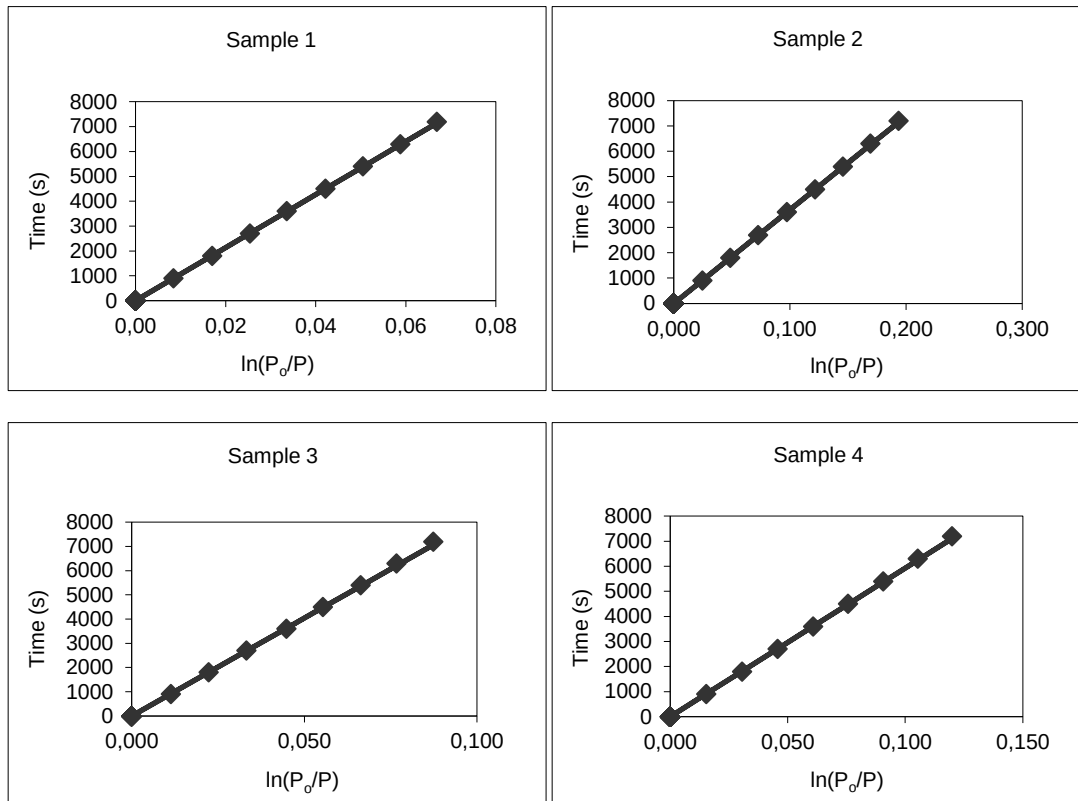
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-60-28			Operator:	AY		
Date:	7/29/2012						
Average k (m/s):	1.5E-10	COV:	8.7	%			
OPI:	9.8						
1		2		3		4	
Diameter (mm)	70.35	Diameter (mm)	70.44	Diameter (mm)	70.36	Diameter (mm)	70.15
Thickness (mm)	28.8	Thickness (mm)	30.76	Thickness (mm)	29.71	Thickness (mm)	30.55
k (m/s)	1.66041E-10	k (m/s)	1.38217E-10	k (m/s)	1.4269E-10	k (m/s)	1.41537E-10
r^2	0.9998	r^2	0.9987	r^2	0.9999	r^2	0.9999
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.09	103.9	17.09	102.9	17.09	99.9	17.09	103.2
17.24	100.5	17.24	100.7	17.24	97.2	17.24	100.6
17.39	97.3	17.39	98.1	17.39	94.6	17.39	97.9
17.54	94.1	17.54	95.6	17.54	92.1	17.54	95.4
18.09	91.2	18.09	93.1	18.09	89.7	18.09	93.1
18.24	88.4	18.24	90.7	18.24	87.4	18.24	90.7
18.39	85.6	18.39	88.4	18.39	85.1	18.39	88.4
18.54	82.9	18.54	86.2	18.54	82.8	18.54	86.2
19.09	80.3	19.09	84.0	19.09	80.6	19.09	84.0



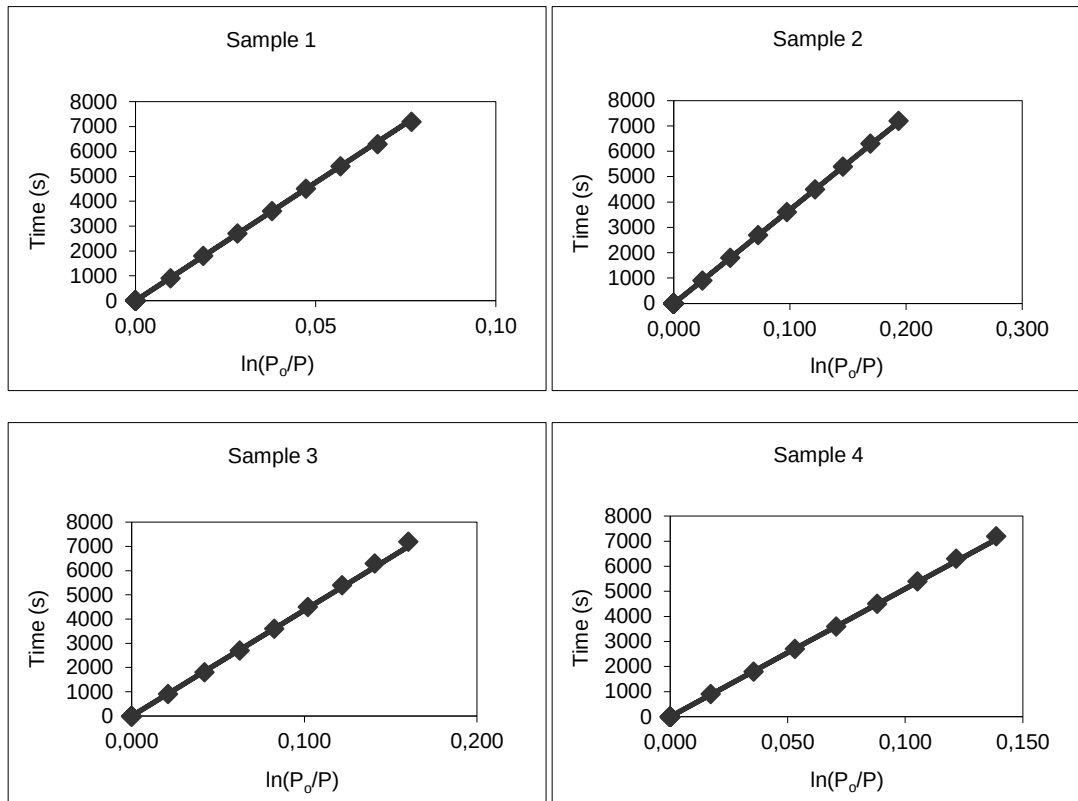
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	SF-75-28			Operator:	AY		
Date:	7/29/2012						
Average k (m/s):	2.6E-10	COV:	15.9 %				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	70.6	Diameter (mm)	70.79	Diameter (mm)	70.64	Diameter (mm)	70.44
Thickness (mm)	30	Thickness (mm)	30.6	Thickness (mm)	29.8	Thickness (mm)	31.31
k (m/s)	2.90062E-10	k (m/s)	2.94277E-10	k (m/s)	2.13119E-10	k (m/s)	2.32111E-10
r ²	0.9987	r ²	0.9987	r ²	0.9995	r ²	0.9991
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.3	103.8	12.3	103.8	12.3	100.1	12.3	99.6
12.45	98.1	12.45	98.1	12.45	96.4	12.45	95.4
13	92.7	13	92.7	13	92.4	13	91.5
13.15	87.8	13.15	87.8	13.15	88.6	13.15	87.8
13.3	83.2	13.3	83.2	13.3	85.4	13.3	84.2
13.45	78.9	13.45	78.9	13.45	81.6	13.45	80.8
14	74.9	14	74.9	14	78.9	14	77.6
14.15	71.0	14.15	71.0	14.15	75.4	14.15	74.6
14.3	67.5	14.3	67.5	14.3	72.3	14.3	71.6



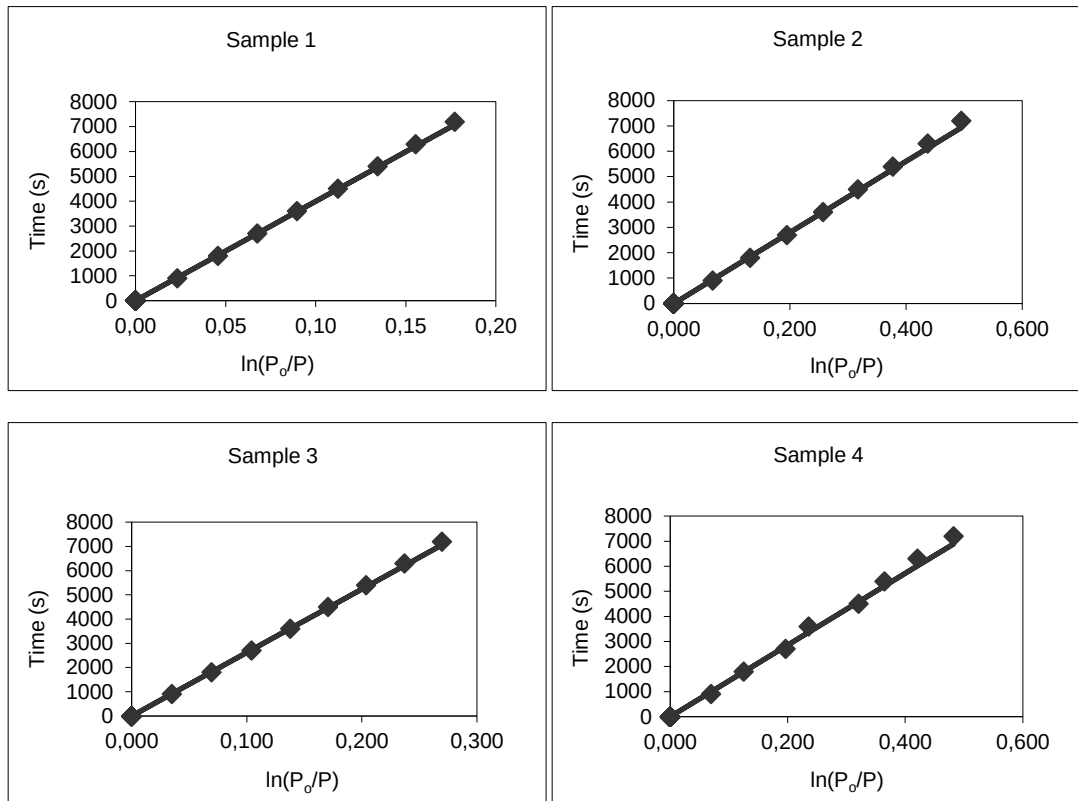
University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-40-28			Operator:	AY		
Date:	8/3/2012						
Average k (m/s):	8.9E-11	COV:	49.3%				
OPI:	10.1						
1		2		3		4	
Diameter (mm)	67.91	Diameter (mm)	68.51	Diameter (mm)	69.04	Diameter (mm)	68.17
Thickness (mm)	31.31	Thickness (mm)	32.73	Thickness (mm)	32.24	Thickness (mm)	30.71
k (m/s)	5.04195E-11	k (m/s)	1.49622E-10	k (m/s)	6.58407E-11	k (m/s)	8.8122E-11
r^2	0.9999	r^2	0.9999	r^2	0.9994	r^2	0.9997
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.42	101.4	17.42	102.4	17.42	100.8	17.42	103.9
17.57	100.5	17.57	99.9	17.57	99.6	17.57	102.3
18.12	99.7	18.12	97.5	18.12	98.6	18.12	100.8
18.27	98.9	18.27	95.2	18.27	97.5	18.27	99.3
18.42	98.1	18.42	92.9	18.42	96.4	18.42	97.8
18.57	97.2	18.57	90.7	18.57	95.3	18.57	96.4
19.12	96.4	19.12	88.5	19.12	94.3	19.12	94.9
19.27	95.6	19.27	86.4	19.27	93.3	19.27	93.5
19.42	94.8	19.42	84.4	19.42	92.3	19.42	92.2



University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-50-28			Operator:	AY		
Date:	8/2/2012						
Average k (m/s):	1.1E-10	COV:	33.1 %				
OPI:	10.0						
1		2		3		4	
Diameter (mm)	68.15	Diameter (mm)	68.18	Diameter (mm)	68.3	Diameter (mm)	68.22
Thickness (mm)	32.61	Thickness (mm)	31	Thickness (mm)	30.17	Thickness (mm)	31.62
k (m/s)	5.91514E-11	k (m/s)	1.43089E-10	k (m/s)	1.1589E-10	k (m/s)	1.04919E-10
r ²	0.9996	r ²	0.9999	r ²	0.9983	r ²	0.9995
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.14	103.4	12.14	102.4	12.14	100.2	12.14	106.6
12.29	102.4	12.29	99.9	12.29	98.1	12.29	104.8
12.44	101.5	12.44	97.5	12.44	96.1	12.44	102.9
12.59	100.5	12.59	95.2	12.59	94.1	12.59	101.1
13.14	99.5	13.14	92.9	13.14	92.3	13.14	99.3
13.29	98.6	13.29	90.7	13.29	90.5	13.29	97.6
13.44	97.7	13.44	88.5	13.44	88.7	13.44	95.9
13.59	96.7	13.59	86.4	13.59	87.0	13.59	94.4
14.14	95.8	14.14	84.4	14.14	85.4	14.14	92.8



University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-60-28			Operator:	AY		
Date:	8/2/2012						
Average k (m/s):	2.6E-10	COV:	44.3 %				
OPI:	9.6						
1		2		3		4	
Diameter (mm)	68.38	Diameter (mm)	68.07	Diameter (mm)	68.07	Diameter (mm)	68.04
Thickness (mm)	32.05	Thickness (mm)	31.23	Thickness (mm)	30.35	Thickness (mm)	30.27
k (m/s)	1.35131E-10	k (m/s)	3.74685E-10	k (m/s)	1.96729E-10	k (m/s)	3.53168E-10
r^2	0.9995	r^2	0.9975	r^2	0.9993	r^2	0.9941
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
12.14	104.4	12.14	106.4	12.14	101.3	12.14	105.3
12.29	102.0	12.29	99.5	12.29	97.8	12.29	98.2
12.44	99.7	12.44	93.2	12.44	94.5	12.44	92.9
12.59	97.5	12.59	87.5	12.59	91.3	12.59	86.5
13.14	95.4	13.14	82.2	13.14	88.2	13.14	83.2
13.29	93.3	13.29	77.4	13.29	85.4	13.29	76.4
13.44	91.2	13.44	72.9	13.44	82.6	13.44	73.1
13.59	89.3	13.59	68.7	13.59	79.9	13.59	69.1
14.14	87.4	14.14	64.8	14.14	77.3	14.14	65.0



University of Cape Town and University of Witswatersrand							
Departments of Civil Engineering							
Oxygen Permeability Test Analysis							
Sample ID:	CC-75-28			Operator:	AY		
Date:	8/14/2012						
Average k (m/s):	1.2E-09	COV:	0.5%				
OPI:	8.9						
1		2		3		4	
Diameter (mm)	68.29	Diameter (mm)	68.16	Diameter (mm)	68.35	Diameter (mm)	68.13
Thickness (mm)	33.29	Thickness (mm)	32.81	Thickness (mm)	33.35	Thickness (mm)	32.97
k (m/s)	1.24386E-09	k (m/s)	1.23061E-09	k (m/s)	1.24392E-09	k (m/s)	1.2377E-09
r^2	0.9975	r^2	0.9975	r^2	0.9975	r^2	0.9975
Time	Pressure	Time	Pressure	Time	Pressure	Time	Pressure
(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)	(hh.min)	(kPa)
17.43	103.4	17.43	103.4	17.43	103.4	17.43	103.4
17.58	83.8	17.58	83.8	17.58	83.8	17.58	83.8
18.13	68.3	18.13	68.3	18.13	68.3	18.13	68.3
18.28	56.1	18.28	56.1	18.28	56.1	18.28	56.1
18.43	46.2	18.43	46.2	18.43	46.2	18.43	46.2
18.58	38.2	18.58	38.2	18.58	38.2	18.58	38.2
19.13	31.6	19.13	31.6	19.13	31.6	19.13	31.6
19.28	26.3	19.28	26.3	19.28	26.3	19.28	26.3
19.43	21.9	19.43	21.9	19.43	21.9	19.43	21.9

