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Retrieved from the Queensland Geotechnical Database <http://qgd.org.au/>



Easting: 503319 Northing: 6960916 RL: -15.44 m

Logger: DA/DT Operator: DA Machine: Scout 2

Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	FR	Casing									
				0.50	[Symbol]	SAND (SP) Loose to medium dense, fine to medium grained, grey and brown.						
				1.0	[Symbol]	SAND (SP) Loose to medium dense, fine to medium grained, grey and brown, with very soft Silty Clay bands.						
				2.0	[Symbol]							
				3.0	[Symbol]							
				4.0	[Symbol]							
				5.0	[Symbol]							
				6.0	[Symbol]							
				7.0	[Symbol]							
				7.80	[Symbol]							
				8.0	[Symbol]	TUFF (SW) Moderately strong, pink mottled.						
				8.30	[Symbol]							
				8.50	[Symbol]	TUFF, fine grained, pale pink speckled white, cryptocrystalline with some granules, medium bedded, moderately widely spaced fractures. CORE LOSS 0.84m (8.50-9.34)	SW	[Symbol]	[Symbol]	95	95	
				9.0	[Symbol]							
				9.34	[Symbol]							
				10.0	[Symbol]		DW	[Symbol]	[Symbol]	65	53	

SOIL SURVEYS 00:LIBRARY 2012:05:GLB Log SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <<DrawingFiles>> 21/05/2012 14:31 8.30.002 Developed by Dafgei

**Comments:**  
1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NMLC. 3) Borehole grouted on completion.

**Defects - 1.54m : F,60° P,R,O,C**

Depth (m)	Type	Dip (Deg)	Planarity	Roughness	Aperture	Fill
B	Bedding		C - Curvilinear	L - Slickensides	C - Closed	C - Clay
C	Clay seam		D - Discontinuous	P - Polished	F - Filled	F - Iron Oxide
F	Foliation		P - Planar	R - Rough	N - Clean	K - Calcite
H	Schistosity		S - Subplanar	S - Smooth	O - Open	L - Limonite
J	Joint		T - Stepped	V - Very rough	S - Stain	Q - Quartz
L	Dissemination		U - Undulating			S - Secondary mineral
R	Fracture					U - Unidentified mineral
S	Shear zone					W - Weathered rock
T	Contact					X - Carbonaceous
V	Vein					Z - Clean
Z	Decomposed Zone					
DI	Drilling induced break					

**Weathering Grades**

RS - Residual Soil  
XW - Extremely weathered  
DW - Distinctly weathered  
SW - Slightly weathered  
FR - Fresh

**Rock Strength**

VW - Very weak  
W - Weak  
MS - Medium strong  
S - Strong  
VS - Very strong  
ES - Extremely strong

**Samples**

U50 [Symbol]  
SPT [Symbol]  
Disturbed Sample [Symbol]

Approved: [Signature]  
Date: [Date]



Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	FR	NMLC									
				11.0	[Symbol]	CONGLOMERATE, coarse grained, pale grey stained orange brown, granular, very thickly bedded, fragmented to moderately widely spaced fractures. Clasts are medium gravel sized, sub-rounded, siltstone, sandstone and quartz. Clast supported, feriginisation evident. (continued)	DW DW - SW	[Symbol]	[Symbol]	65	53	9.95 m; DI, 5°, U, R, O, Z 10.04 m; DI, 5°, U, R, O, C 10.47 m; J, 10°, U, R, O, L 10.58 m; J, 10°, U, R, O, L 10.85 m; DI, 8°, U, R, O, L 11.12m, Is50 = 1.45 MPa 11.02 m; DI, 7°, P, R, O, Z
				11.30	[Symbol]	CORE LOSS 0.20m (11.30-11.50)						11.53m, Is50 = 0.84 MPa
				12.0	[Symbol]	CONGLOMERATE, coarse grained, pale grey stained orange brown, granular, very thickly bedded, moderately widely to widely spaced fractures. Clasts are medium gravel sized, sub-rounded, siltstone and quartz. Coarse sandstone lenses from 11.50m to 11.57 and 12.38m to 12.48m. Clast supported.	SW - FR FR	[Symbol]	[Symbol]	102	87	11.80 m; J, 30°, T, R, O, Z 11.93 m; DI, 20°, U, R, O, Z 12.28 m; J, 50°, C, R, O, O 12.66 m; DI, 5°, S, R, O, Z
				13.0	[Symbol]							
				14.0	[Symbol]	CONGLOMERATE, coarse grained, pale grey stained orange brown, granular, very thickly bedded, fragmented to closely spaced fractures. Clasts are medium to coarse gravel sized, sub-rounded, siltstone, sandstone and quartz. Clast supported.		[Symbol]	[Symbol]			13.82 m; DI, 10°, U, R, O, Z 14.20 m; J, 10°, S, V, O, Z 14.28 m; J, 10°, P, R, O, Z 14.56 m; J, 5°, S, R, O, Z
				15.0	[Symbol]	SANDSTONE, medium grained, pale greenish grey, granular, thinly bedded, fragmented to closely spaced fractures. Some fine gravel clasts at 15.0m.		[Symbol]	[Symbol]			15.54 m; B, 5°, P, S, O, C
				15.82	[Symbol]	Interbedded SANDSTONE & CONGLOMERATE, medium to coarse grained, pale grey, granular, thinly bedded, very closely to moderately spaced fractures, gravel is medium sized.		[Symbol]	[Symbol]	100	68	15.96 m; DI, 15°, U, R, O, Z 16.10 m; DI, 5°, S, R, O, Z 16.45 m; J, 30°, P, R, O, Z 16.66 m; J, 10°, P, R, O, C 16.85 m; J, 10°, P, R, O, Z 17.27 m; DI, 6°, U, R, O, Z 17.54m, Is50 = 2.19 MPa 17.59 m; DI, 5°, U, R, O, Z
				16.0	[Symbol]							
				17.0	[Symbol]	SILTSTONE, fine grained, dark grey, granular, thinly laminated, very close to moderately widely spaced fractures, some Mudstone laminae present.		[Symbol]	[Symbol]	100	67	18.05 m; B, 2°, P, S, O, Z 18.08 m; B, 2°, P, S, O, Z 18.35 m; B, 2°, P, S, O, Z 18.53 m; B, 2°, P, S, O, Z 18.60 m; B, 2°, P, S, O, Z 18.71m, Is50 = 0.99 MPa 18.61 m; B, 3°, P, S, O, Z 18.90 m; J, 10°, P, S, O, Z
				17.60	[Symbol]							
				18.0	[Symbol]	SANDSTONE, coarse grained, pale grey banded black, granular, thinly bedded, moderately spaced fractures, fine sand bands present. With trace coal stringers.		[Symbol]	[Symbol]	100	100	19.15 m; B, 40°, P, R, O, X 19.46m, Is50 = 0.71 MPa 19.45 m; B, 35°, P, R, O, X 19.70 m; B, 35°, P, R, O, X 19.85m, Is50 = 1.26 MPa
				18.75	[Symbol]							
				19.0	[Symbol]							
				19.60	[Symbol]							
				20.0	[Symbol]							

**Comments:**  
1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NMLC. 3) Borehole grouted on completion.

**Defects - 1.54m : F, 60°, P, R, O, C**

Depth (m)	Type	Dip (deg)	Planarity	Roughness	Aperture	Width
	B - Bedding		C - Curvilinear	L - Slickensides	C - Closed	C - Clay
	C - Clay seam		D - Discontinuous	P - Polished	F - Filled	P - Iron Oxide
	F - Foliation		P - Planar	R - Rough	N - Clean	K - Calcite
	H - Schistosity		S - Subplanar	S - Smooth	O - Open	L - Limonite
	J - Joint		T - Stepped	V - Very rough	S - Stain	Q - Quartz
	L - Cleavage					S - Secondary mineral
	R - Fracture					U - Unidentified mineral
	S - Shear zone					W - Weathered rock
	T - Contact					X - Carbonaceous
	V - Vein					Z - Clean
	Z - Decomposed Zone					
	DI - Drilling induced break					

**Weathering Grades**

RS - Residual Soil  
XW - Extremely weathered  
DW - Distinctly weathered  
SW - Slightly weathered  
FR - Fresh  
Rock Strength  
VW - Very weak  
W - Weak  
MS - Medium strong  
S - Strong  
VS - Very strong  
ES - Extremely strong

**Samples**

U50 [Symbol]  
SPT [Symbol]  
Disturbed Sample [Symbol]

**Approved:** [Signature]  
**Date:** [Date]

SOIL SURVEYS 00: LIBRARY 2012:05:G.L.B. Log, SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <<DrawingFiles>> 21/05/2012 14:31 8.30.002 Developed by Datigel



Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NM/LC									
				21.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, very thickly bedded, moderately widely spaced fractures. Clasts are sub-rounded, medium gravel size siltstone, sandstone and quartz, clast supported. (continued)	FR			100	100	20.13 m; J, 25°, P, R, O, Z 20.41 m; DI, 20°, P, R, O, Z 20.56 m; DI, 30°, P, R, O, Z 21.05m, Is50 = 2.19 MPa 20.95 m; DI, 60°, U, R, O, Z
				22.0								
				22.19		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, very thickly bedded, moderately widely spaced fractures. Clasts are sub-rounded, fine gravel size siltstone, sandstone and quartz, with some medium gravel, clast supported.						21.70 m; DI, 30°, S, R, O, Z 22.08 m; DI, 20°, P, R, O, Z 22.46m, Is50 = 2.33 MPa 22.65 m; DI, 40°, S, R, O, Z
				23.0								
				23.10		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, very thickly bedded, moderately widely spaced fractures. Clasts are sub-rounded, medium gravel size siltstone, sandstone and quartz, clast supported.				100	90	23.08 m; DI, 50°, U, R, O, Z 23.52 m; DI, 50°, P, R, O, Z
				24.0								
				23.93		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, very thickly bedded, moderately widely spaced fractures. Clasts are sub-rounded, medium gravel size siltstone, sandstone and quartz, clast supported.						23.88 m; T, 100°, P, R, O, Z 23.94 m; B, 100°, P, R, O, X 24.08 m; B, 150°, P, S, O, Z 24.15 m; B, 80°, P, S, O, X 24.21 m; B, 110°, P, S, O, X
				24.60		SANDSTONE, medium grained, dark grey, banded black, granular, thinly bedded, closely spaced fractures, some coal bands, fine sand from 23.93m to 24.0m.						24.42 m; B, 130°, P, S, O, X 24.51 m; J, 30°, C, S, O, Z 24.66 m; J, 55°, P, R, O, Z
				25.0								
				26.0		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, very thickly bedded, closely spaced to moderately widely spaced fractures. Clasts are sub-rounded, medium gravel size siltstone, sandstone and quartz, fine gravel from 25.14m to 25.27m and 26.14m to 26.37m, clast supported.						24.94m, Is50 = 2.89 MPa 24.85 m; DI, 10°, U, R, O, Z 24.93 m; J, 45°, P, R, O, Z 25.51 m; DI, 20°, P, R, O, Z 25.63 m; J, 30°, S, R, O, Z
				26.43		SILTSTONE, fine grained, dark grey, granular, thinly laminated, some mudstone.				100	94	26.03 m; J, 30°, P, R, O, Z 26.5m, Is50 = 0.81 MPa 26.40 m; DI, 140°, U, R, O, Z 26.59 m; DI, 90°, S, R, O, Z
				27.0								26.89 m; DI, 170°, U, R, O, Z 26.99 m; J, 200°, P, S, O, Z
				27.76								27.43m, Is50 = 3.27 MPa 27.42 m; T, 400°, P, S, O, Z
				28.0		SANDSTONE, medium grained, pale grey, granular, thinly bedded, moderately widely spaced fractures, some siltstone and fine sandstone laminae.						28.19m, Is50 = 1.78 MPa 28.27 m; B, 25°, P, S, O, Z
				28.65								28.52 m; B, 90°, U, S, O, Z 28.62 m; J, 50°, S, R, O, X 28.76 m; DI, 80°, C, S, O, X
				29.0		SANDSTONE, medium grained, dark grey, banded black, granular, thinly bedded, closely spaced fractures, some coal bands present.				100	97	28.90 m; J, 25°, P, S, O, X 29.18 m; J, 160°, S, R, O, X 29.29 m; DI, 7°, S, R, O, Z
				29.40								
				30.0								

**Comments:**

1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NM/LC. 3) Borehole grouted on completion.

Water First Noted    Water Steady Level

**Defects - 1.54m : F,60°, P,R,O,C**

Depth (m)	Type	Dip (Deg)	Planarity	Roughness	Aperture	Width
	B - Bedding		C - Curvilinear	L - Slickensides	C - Closed	C - Clay
	C - Clay seam		D - Discontinuous	P - Polished	F - Filled	F - Iron Oxide
	F - Foliation		P - Planar	R - Rough	N - Clean	K - Calcite
	H - Schistosity		S - Subplanar	S - Smooth	O - Open	L - Limonite
	J - Joint		T - Stepped	V - Very rough	S - Stain	Q - Quartz
	L - Cleavage		R - Fracture			S - Secondary mineral
	R - Fracture		S - Shear zone			U - Unidentified mineral
	T - Contact		Z - Decomposed Zone			W - Weathered rock
	V - Vein		DI - Drilling induced break			X - Carbonaceous
	Z - Decomposed Zone					Y - Clean

**Weathering Grades**

RS - Residual Soil  
XW - Extremely weathered  
DW - Distinctly weathered  
SW - Slightly weathered  
FR - Fresh  
**Rock Strength**  
VW - Very weak  
W - Weak  
MS - Medium strong  
S - Strong  
VS - Very strong  
ES - Extremely strong

**Samples**

U50  
SPT  
Disturbed Sample

Approved: \_\_\_\_\_  
Date: \_\_\_\_\_



Drilling Method				Depth	Graphic	Description	Weathering	Strength Estimated	Defect Spacing	Rec (%)	RQD	Samples and Remarks
TC	WB	RR	NM/LC									
				30.05		CONGLOMERATE, coarse grained, pale grey speckled dark grey, granular, very thickly bedded, moderately widely to widely spaced fractures. Clasts are sub-rounded, fine gravel size siltstone, sandstone and quartz, clast supported. (continued)	FR			100	97	30.03 m; T, 10°, P, S, O, Z 30.15 m; B, 110°, P, S, O, Z 30.41 m; B, 100°, P, S, O, K
				31.0		Interlaminated SILTSTONE & SANDSTONE, fine grained, alternating pale grey and dark grey, granular, thinly laminated, very closely spaced to widely spaced fractures. Some mudstone laminae, calcite veins.				96	85	30.83 m; B, 10°, P, S, O, K 31.13 m; B, 30°, P, S, O, Z 31.42 m; Is50 = 1.18 MPa 31.70 m; B, 50°, P, S, O, Z 31.90 m; B, 50°, P, S, O, Z 32.51 m; Is50 = 1.22 MPa 32.63 m; B, 50°, P, S, O, Z 33.13 m; B, 50°, P, S, O, Z
				32.0								
				33.0								
				34.0								33.80 m; B, 50°, P, S, O, Z 33.96 m; J, 45°, P, S, O, Z 34.11 m; J, 40°, S, S, O, Z 34.20 m; DI, 0°, P, S, O, Z 34.45 m; B, 20°, P, S, O, Z 34.66 m; J, 10°, S, S, O, Z 34.79 m; B, 40°, P, S, O, Z
				35.0						100	88	35.21 m; B, 40°, P, S, O, Z 35.62 m; B, 40°, P, S, O, Z
				36.0								36.38 m; B, 40°, P, S, O, Z 36.57 m; DI, 70°, S, R, O, Z
				36.60		BOREHOLE BH 306 TERMINATED AT 36.60 m						
				37.0								
				38.0								
				39.0								
				40.0								

SOIL SURVEYS 00: LIBRARY 2012:05:G.LB Log SOIL SURVEY BOREHOLE LOG 111-12936 NEW.GPJ <DrawingFiles> 21/05/2012 14:31 8.30.002 Developed by Dargei

**Comments:**  
1) Drilled from floating barge - all depths measured from river bed level. 2) Note: the coring method used was NQ3 not NMLC. 3) Borehole grouted on completion.

**Defects - 1.54m : F,60°,P,R,O,C**

Type	Dip (Deg)	Planarity	Roughness	Aperture	Fill
B - Bedding	C - Curvilinear	L - Slickensides	C - Closed	C - Clay	
F - Foliation	D - Discontinuous	P - Polished	F - Filled	F - Iron Oxide	
H - Schistosity	P - Planar	R - Rough	N - Clean	K - Calcite	
J - Joint	S - Subplanar	S - Smooth	O - Open	L - Limonite	
L - Cleavage	T - Stepped	V - Very rough	S - Stain	Q - Quartz	
R - Fracture	U - Undulating			S - Secondary mineral	
S - Shear zone				U - Unidentified mineral	
T - Contact				W - Weathered rock	
V - Vein				X - Carbonaceous	
Z - Decomposed zone				Z - Clean	
DI - Drilling induced break					

**Weathering Grades**

RS - Residual Soil  
XW - Extremely weathered  
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SW - Slightly weathered  
FR - Fresh

**Rock Strength**

VW - Very weak  
W - Weak  
MS - Medium strong  
S - Strong  
VS - Very strong  
ES - Extremely strong

**Samples**

U50  
SPT  
Disturbed Sample

Approved: \_\_\_\_\_  
Date: \_\_\_\_\_

Water First Noted    Water Steady Level

SOIL\_SURVEYS\_00.LIBRARY.GLB.Grctbl.DG PHOTO CORE PHOTO 4 PER PAGE 111-12936 NEW.GPJ <<DrawingFile>> 26/04/2012 14:47 8.2.856 Developed by Datgel



TITLE

AECOM  
Brisbane  
Cross River Rail  
Core Photo - BH 306

DRAWN	DT	DATE	26/04/2012
CHECKED	CB	DATE	26/04/2012
SCALE	Not To Scale		A4
PROJECT No	110-12936	FIGURE No	1/2

SOIL\_SURVEYS\_00.LIBRARY.GLB Grictbl DG PHOTO CORE PHOTO 4 PER PAGE 111-12936 NEW.GPJ <<DrawingFile>> 26/04/2012 14:47 8.2.856 Developed by Datgel



TITLE

AECOM  
Brisbane  
Cross River Rail  
Core Photo - BH 306

DRAWN	DT	DATE	26/04/2012
CHECKED	CB	DATE	26/04/2012
SCALE	Not To Scale		A4
PROJECT No	110-12936	FIGURE No	2/2

## IN-SITU PACKER PERMEABILITY TEST RESULT

**PROJECT:** **CRR**  
**PROJECT No.:** **110-12936**

**BH No.:** **306**  
**Test No.:** **1**  
**Date:** **7/12/2011**

Packer type: Double  
Packer pressure: 2000kPa  
Gauge pressures measured in: kPa  
Tested by: CS

Vertical depth to:  
(below river bed)

Top of test section (m):	26.00
Base of test section (m):	28.50
Centre of test section(m):	27.25
Base of casing (m):	25.00
Ground water (m)	TIDAL

Depth of centre of test section (m):	27.25
Length of test section (m):	2.50

Gauge Height above ground level (m):	
Hole Diameter in test section (mm)	75

1st period	Time (mins)	0	5	10	15	Average
Gauge Pressure 100	Flow reading	514.6	514.8	514.9	514.9	Flow (l/min)
	Water Take	0.00	0.20	0.10	0.00	0.020
2nd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	518.0	518.2	518.2	518.5
	Water Take	0.00	0.20	0.00	0.30	0.033
3rd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 300	Flow reading	519.6	519.8	519.8	519.9
	Water Take	0.00	0.20	0.00	0.10	0.020
4th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	518.5	518.5	518.5	518.5
	Water Take	0.00	0.00	0.00	0.00	0.000
5th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 100	Flow reading	515.9	515.9	515.9	515.9
	Water Take	0.00	0.00	0.00	0.00	0.000

Period	Flow (q) (l/min)	Gauge Press (kPa)	Gauge Press (m of water)	Friction Loss (m)*		Total Head (m)	Lugeon Value	Perm. (m/s)
				Basic	In extra rods			
1st	0.020	100.00	10.220	0.000	0.000	37.470	0.022	2.38E-09
2nd	0.033	200.00	20.440	0.000	0.000	47.690	0.029	3.11E-09
3rd	0.020	300.00	30.660	0.000	0.000	57.910	0.014	1.54E-09
4th	0.000	200.00	20.440	0.000	0.000	47.690	0.000	0.00E+00
5th	0.000	100.00	10.220	0.000	0.000	37.470	0.000	0.00E+00

\*Where friction loss is assumed to be negligible.

N.B. Pressure Conversion: 1 bar = 100 kPa = 14.503 psi



## IN-SITU PACKER PERMEABILITY TEST RESULT

**PROJECT:** CRR  
**PROJECT No.:** 110-12936

**BH No.:** 306  
**Test No.:** 2  
**Date:** 7/12/2011

Packer type: Double  
Packer pressure: 2000kPa  
Gauge pressures measured in: kPa  
Tested by: CS

Vertical depth to:  
(below river bed)

Top of test section (m):	20.00
Base of test section (m):	22.50
Centre of test section(m):	21.25
Base of casing (m):	19.00
Ground water (m)	TIDAL

Depth of centre of test section (m):	21.25
Length of test section (m):	2.50

Gauge Height above ground level (m):	
Hole Diameter in test section (mm)	75

1st period	Time (mins)	0	5	10	15	Average
Gauge Pressure 100	Flow reading	519.1	521.0	523.5	525.5	Flow (l/min)
	Water Take	0.00	1.90	2.50	2.00	0.427
2nd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	526.0	526.5	526.5	526.9
Water Take		0.00	0.50	0.00	0.40	0.060
3rd period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 300	Flow reading	526.8	527.2	527.5	527.6
Water Take		0.00	0.40	0.30	0.10	0.053
4th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure 200	Flow reading	527.0	527.0	527.0	527.0
Water Take		0.00	0.00	0.00	0.00	0.000
5th period	Time (mins)	0	5	10	15	Average
	Gauge Pressure	Flow reading				
Water Take		0.00	0.00	0.00	0.00	0.000

Period	Flow (q) (l/min)	Gauge Press (kPa)	Gauge Press (m of water)	Friction Loss (m)*		Total Head (m)	Lugeon Value	Perm. (m/s)
				Basic	In extra rods			
1st	0.427	100.00	10.220	0.000	0.000	31.470	0.554	6.03E-08
2nd	0.060	200.00	20.440	0.000	0.000	41.690	0.059	6.40E-09
3rd	0.053	300.00	30.660	0.000	0.000	51.910	0.042	4.57E-09
4th	0.000	200.00	20.440	0.000	0.000	41.690	0.000	0.00E+00
5th	0.000	0.00	0.000	0.000	0.000	21.250	0.000	0.00E+00

\*Where friction loss is assumed to be negligible.

N.B. Pressure Conversion: 1 bar = 100 kPa = 14.503 psi

Note - zero flow at period 4 - test ended