

53B Fairlawn Street Nathan
QLD 4111 Australia
PO Box 108 Salisbury
QLD 4107 Australia
Telephone +61 7 3274 4411
Facsimile +61 7 3275 3619
Email brisbane@coffey.com.au



Atterberg Limits Report

Client: Martin Findlater & Associates	Report Number: E02-129 12/18
Job Number: B17439/1	Report Date: 04/03/2002
Project: Fraser Drive	Order Number:
Location: Tweed Heads South,	
Lab No: CB020213 Sample ID: CB020213	Sample Location
Date Sampled: 11/02/2002	TPC21
Date Tested: 20/02/2002	0.8-1.2m
Sampled By: COFFEY Air Dried	
Sample Method: AS1726 No Cracking or Crumbling Occurred	
Material Source: On Site	
For Use As: -	
Remarks:	

Atterberg Tests	Test Method		Result	
Liquid Limit (%)	AS 1289.3.1.1		59	
Plastic Limit (%)	AS1289.3.2.1		34	
Plastic Index	AS1289.3.3.1		25	
Linear Shrinkage (%)	AS1289.3.4.1		14.0	



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

APPROVED SIGNATORY

BRAD ROSSINGTON
Nata Accred. No 596

Form Number:

REP ATT-1

53B Fairlawn Street Nathan
QLD 4111 Australia
PO Box 108 Salisbury
QLD 4107 Australia
Telephone +61 7 3274 4411
Facsimile +61 7 327 5 3619
Email brisbane@coffey.com.au



Atterberg Limits Report

Client: Martin Findlater & Associates	Report Number: E02-129 13/18
Job Number: B17439/1	Report Date: 04/03/2002
Project: Fraser Drive	Order Number:
Location: Tweed Heads South,	
Lab No: CB020216 Sample ID: CB020216	Sample Location
Date Sampled: 11/02/2002	TPC28
Date Tested: 19/02/2002	0.2-0.6m
Sampled By: COFFEY Air Dried	
Sample Method: AS1726 No Cracking or Crumbling Occurred	
Material Source: On Site	
For Use As: -	
Remarks:	

Atterberg Tests	Test Method		Result	
Liquid Limit (%)	AS 1289.3.1.1		51	
Plastic Limit (%)	AS1289.3.2.1		36	
Plastic Index	AS1289.3.3.1		15	
Linear Shrinkage (%)	AS1289.3.4.1		11.5	



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

APPROVED SIGNATORY

BRAD ROSSINGTON
BRAD ROSSINGTON
Nata Accred. No: 596

Form Number:

REP ATT-1

53B Fairview Street Nathan
QLD 4111 Australia
PO Box 108 Sallsbury
QLD 4107 Australia
Telephone +61 7 3274 4411
Facsimile +61 7 3275 3619
Email brisbane@coffey.com.au



Atterberg Limits Report

Client: Martin Findlater & Associates	Report Number: E02-129 14/18
Job Number: B17439/1	Report Date: 04/03/2002
Project: Fraser Drive	Order Number:
Location: Tweed Heads South,	
Lab No: CB020217 Sample ID: CB020217	Sample Location
Date Sampled: 11/02/2002	TPC30
Date Tested: 22/02/2002	1.0-1.2m
Sampled By: COFFEY Air Dried	
Sample Method: AS1726 No Cracking or Crumbling Occurred	
Material Source: On Site	
For Use As: -	
Remarks:	

Atterberg Tests	Test Method		Result	
Liquid Limit (%)	AS 1289.3.1.1		66	
Plastic Limit (%)	AS1289.3.2.1		33	
Plastic Index	AS1289.3.3.1		33	
Linear Shrinkage (%)	AS1289.3.4.1		15.5	



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

APPROVED SIGNATORY

Brad Rossington
BRAD ROSSINGTON
Nata Accred. No: 596

Form Number:

REP ATT-1

53B Fairlawn Street Nathan
QLD 4111 Australia
PO Box 108 Salisbury
QLD 4107 Australia
Telephone +61 7 3274 4411
Facsimile +61 7 327 5 3619
Email brisbane@coffey.com.au



Atterberg Limits Report

Client: Martin Findlater & Associates	Report Number: E02-129 15/18
Job Number: B17439/1	Report Date: 04/03/2002
Project: Fraser Drive	Order Number:
Location: Tweed Heads South,	
Lab No: CB020219 Sample ID: CB020219	Sample Location
Date Sampled: 11/02/2002	TPC35
Date Tested: 19/02/2002	2.0-2.2m
Sampled By: COFFEY Air Dried	
Sample Method: AS1726 No Cracking or Crumbling Occurred	
Material Source: On Site	
For Use As: -	
Remarks:	

Atterberg Tests	Test Method		Result	
Liquid Limit (%)	AS 1289.3.1.1		54	
Plastic Limit (%)	AS1289.3.2.1		36	
Plastic Index	AS1289.3.3.1		18	
Linear Shrinkage (%)	AS1289.3.4.1		12.0	



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

APPROVED SIGNATORY

Brad Rossington
BRAD ROSSINGTON
Nata Accred. No. 596

Form Number:

REP ATT-1

53B Fairlawn Street Nathan
QLD 4111 Australia
PO Box 108 Salisbury
QLD 4107 Australia
Telephone +61 7 3274 4411
Facsimile +61 7 327 5 3619
Email brisbane@coffey.com.au



Atterberg Limits Report

Client: Martin Findlater & Associates	Report Number: E02-129 16/18
Job Number: B17439/1	Report Date: 04/03/2002
Project: Fraser Drive	Order Number:
Location: Tweed Heads South,	
Lab No: CB020220 Sample ID: CB020220	Sample Location
Date Sampled: 11/02/2002	TPC36
Date Tested: 19/02/2002	1.2-1.6m
Sampled By: COFFEY Air Dried	
Sample Method: AS1726 No Cracking or Crumbling Occurred	
Material Source: On Site	
For Use As: -	
Remarks:	

Atterberg Tests	Test Method	Result
Liquid Limit (%)	AS 1289.3.1.1	45
Plastic Limit (%)	AS1289.3.2.1	23
Plastic Index	AS1289.3.3.1	22
Linear Shrinkage (%)	AS1289.3.4.1	14.0



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

APPROVED SIGNATORY

Brad Rossington
BRAD ROSSINGTON
Nata Accred. No: 596

Form Number:

REP ATT-1

test resultsclient : *Martin Findlater & Associates*job no : *B17439/1*

principal :

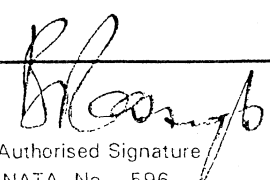
laboratory : *BRISBANE*project : *Fraser Drive*report date : *04 March 2002*location : *Tweed Heads South*test report : *E02-129 17/18*test procedure : *AS1289 3.8.1*test date : *20/02/2002*

Sample Number	DETERMINATION OF EMERSON CLASS NUMBER			
	CB020205	CB020211	CB020214	CB020215
<i>Sample Identification</i>	<i>TPC3</i>	<i>TPC16</i>	<i>TPC22</i>	<i>TPC27</i>
<i>Depth</i>	<i>1.8-2.0m</i>	<i>0.9-1.1m</i>	<i>1.1-1.5m</i>	<i>0.5-0.8m</i>
<i>EMERSON CLASS NUMBER</i>	<i>6</i>	<i>3</i>	<i>6</i>	<i>5</i>
<i>Soil Description</i>	<i>(CI) Silty CLAY medium plasticity pale grey & yellow brown, trace of fine sand</i>	<i>(CH) Silty CLAY high plasticity pale yellow brown, of fine sand.</i>	<i>(CI) Silty CLAY medium plasticity red brown, trace of fine sand & Gravel.</i>	<i>(CH) Silty CLAY high plasticity red brown, trace of fine sand.</i>
<i>Type of Water</i>	<i>Distilled</i>			
<i>Temperature of Water</i>	<i>25</i>			

remarks :



This laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full without the prior approval of the laboratory.


Authorised Signature
NATA No 596

test resultsclient : *Martin Findlater & Associates*job no : *17439/1*

principal :

laboratory : *BRISBANE*project : *Fraser Drive*report date : *04 March 2002*location : *Tweed Heads South*test report : *E02-129 18/18*test procedure : *AS1289 3.8.1*test date : *20/02/2002*

Sample Number	DETERMINATION OF EMERSON CLASS NUMBER	
	CB020219	
Sample Identification	<i>TPC35</i>	
Depth	<i>0.5-0.7m</i>	
EMERSON CLASS NUMBER	<i>5</i>	
Soil Description	<i>(CH) Silty CLAY</i> <i>high plasticity</i> <i>orange brown,</i> <i>some fine sand.</i>	
Type of Water	<i>Distilled</i>	
Temperature of Water	<i>C°</i>	<i>25</i>
remarks :		



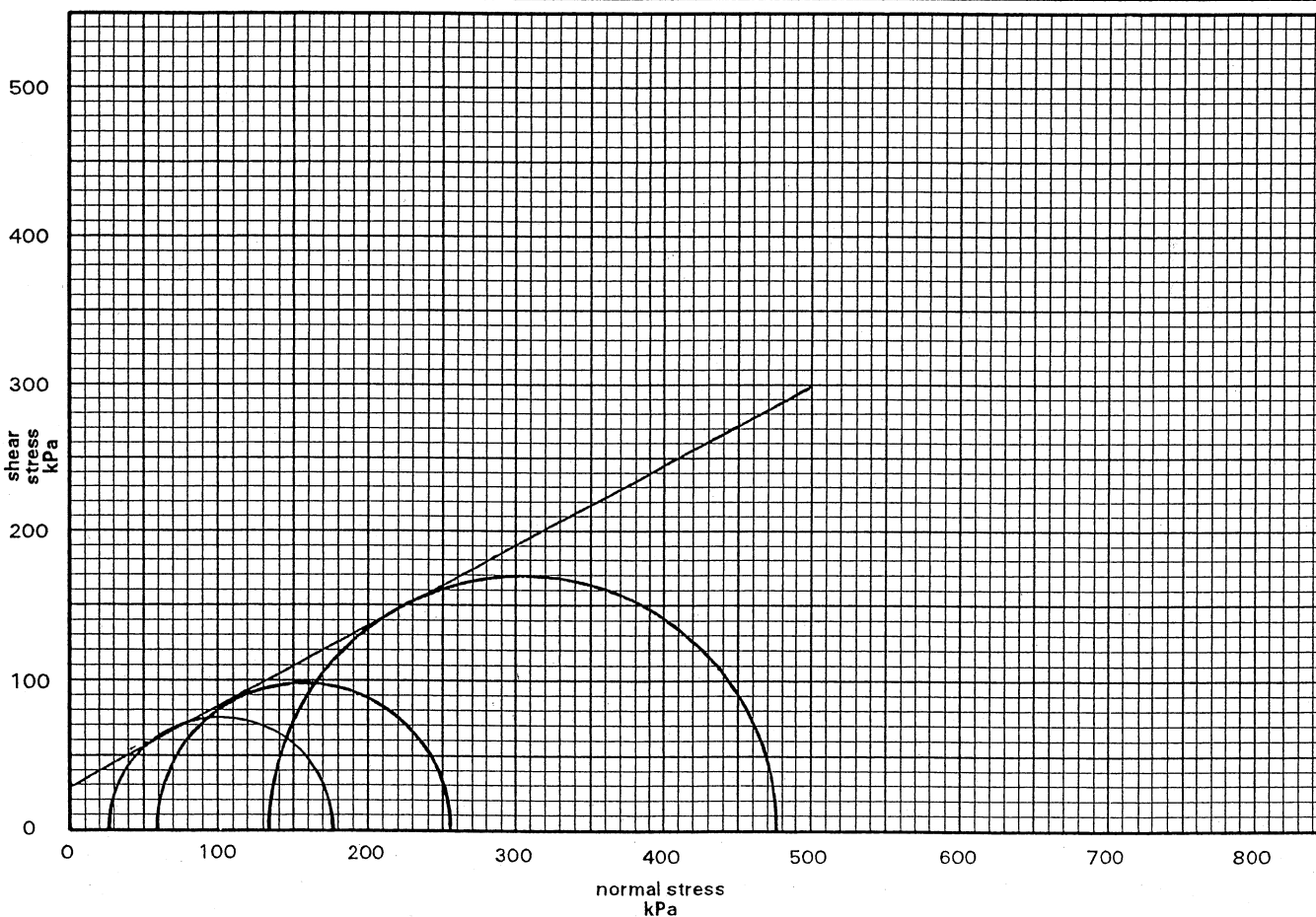
This laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full without the prior approval of the laboratory.

Authorised Signature
NATA No 596

B. Rossington

triaxial shear testclient : **MARTIN FINDLATER & ASSOCIATES PTY LTD**job no : **B17439/1**

principal :

laboratory : **MELBOURNE**project : **FRASER DRIVE**report date : **March 18, 2002**location : **TWEED HEADS SOUTH**test report : **AB**test procedure : **AS1289 6.2.2**borehole no : **TPC 36**sample number : **-**material description : **SILTY CLAY, high plasticity, mottled grey, red brown, gravel**depth : **1.2 - 1.6m**sampled date : **N.A**sample type : **U50**test date : **13/03/02**sample size : **50mm x 101mm**test type : **CUPP**

angle of friction ϕ' (degrees):	29
cohesion c' (kPa):	27
initial dry density (t/m^3):	1.67
initial B response (%):	95
strain rate (%/min):	0.009mm/min
initial C_v (mm ² /sec):	-
failure criteria/mode:	PPSR
initial cell/back pressure (kPa):	550/500

moisture contents:	
initial (%):	23.1
final - top (%):	27.0
- middle (%):	20.5
- bottom (%):	21.9

remarks :



This laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full without the prior approval of the laboratory.

Authorised Signature
NATA No 1040

Ernie Gorchling



job no: B 17439/1

page 4 of 4

Stress vs Strain %

office: MELBOURNE

date: 13.3.02

borehole: TPC.36

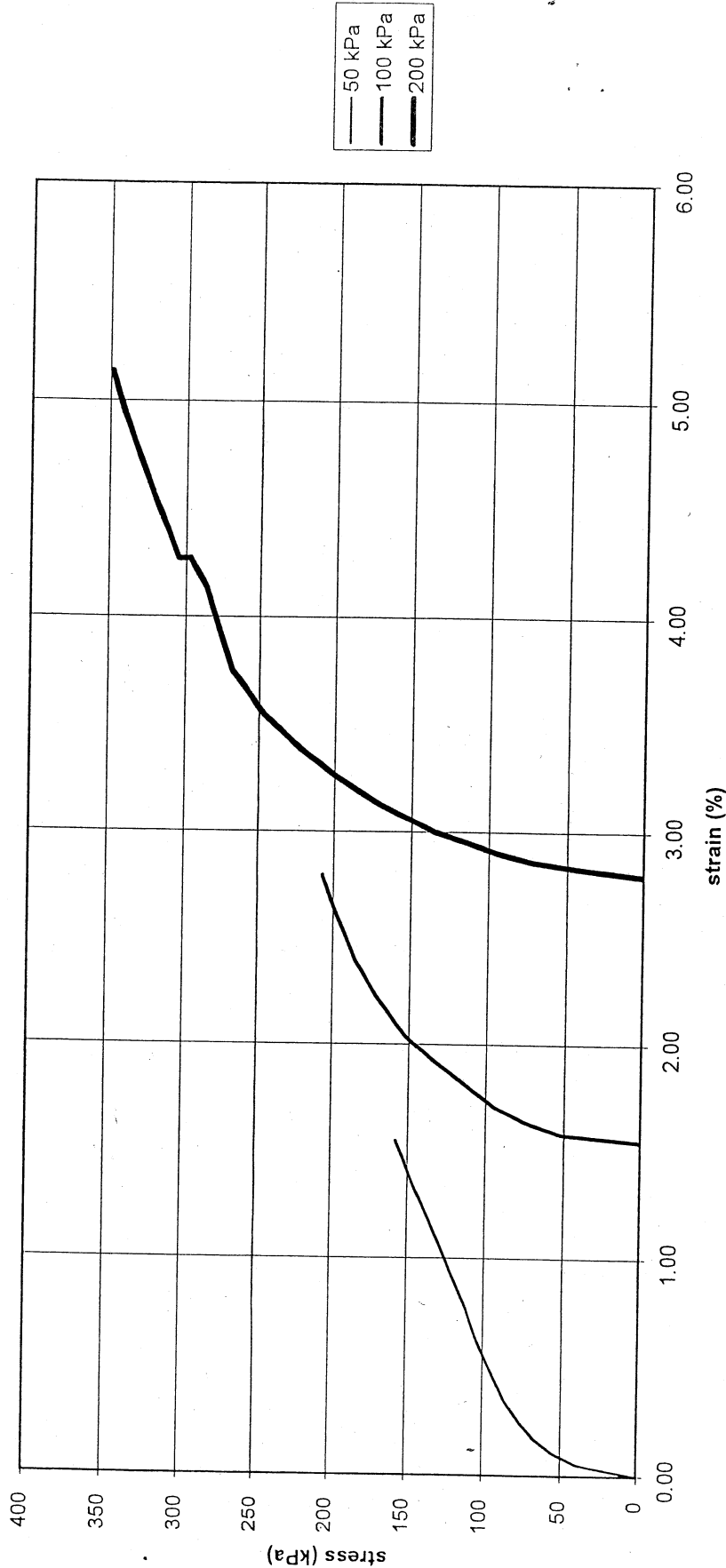
depth: 1.2 - 1.6

client: MARTIN FIDLATER & ASSOCIATES PTY LTD

principal:

project: FRASER DRIVE

location: TWEED HEADS SOUTH





Pore Water Pressure vs Strain %

job no: B 17439/1

page 3 of 4

office: MELBOURNE

date: 13.3.02

borehole: TPC.36

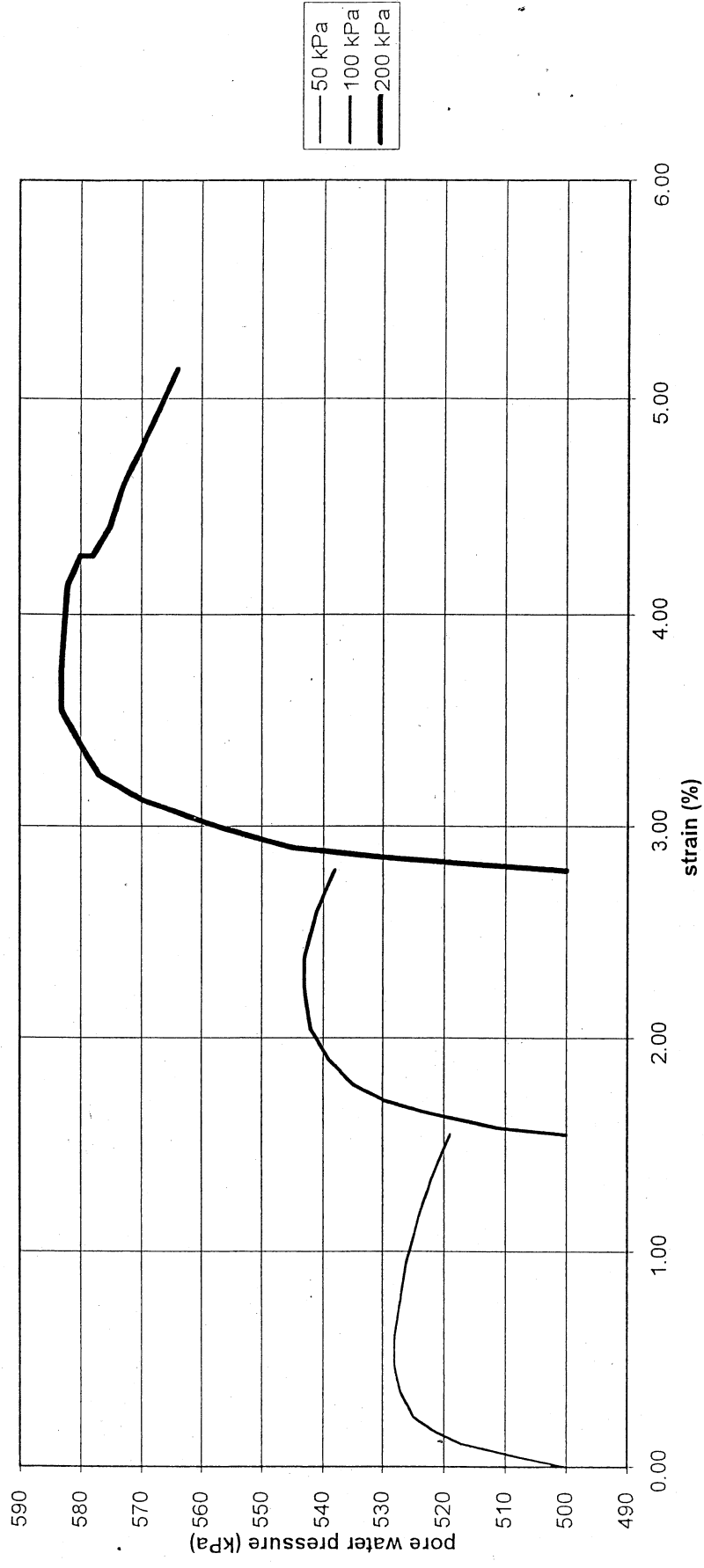
depth: 1.2 .1.6

client: MARTIN FIDLATER & ASSOCIATES PTY LTD

principal:

project: FRASER DRIVE

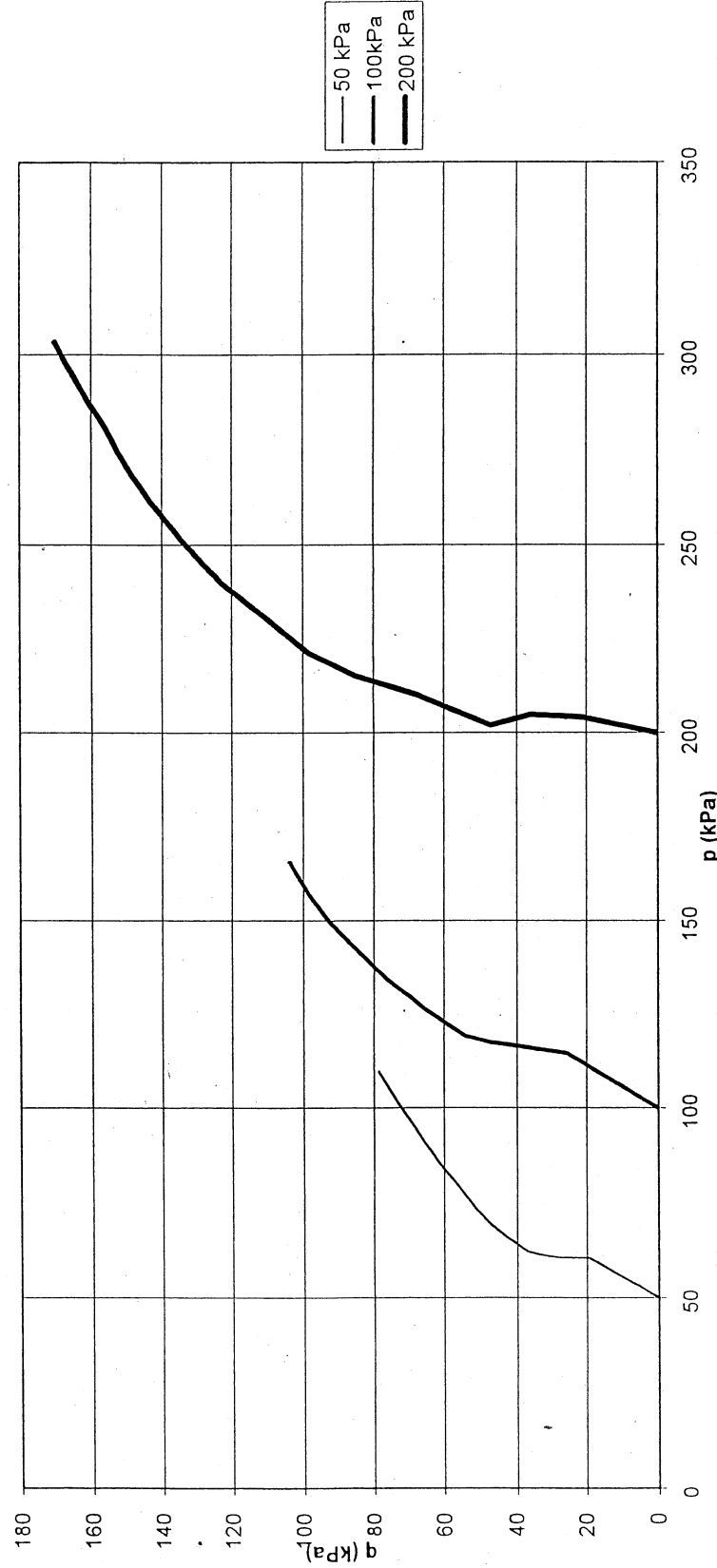
location: TWEED HEADS SOUTH



P vs Q Plot

office: **MELBOURNE**date: **13.3.02**borehole: **TPC.36**depth: **1.2 .1.6**client: **MARTIN FIDLATER & ASSOCIATES PTY LTD**

principal:

project: **FRASER DRIVE**location: **TWEED HEADS SOUTH**

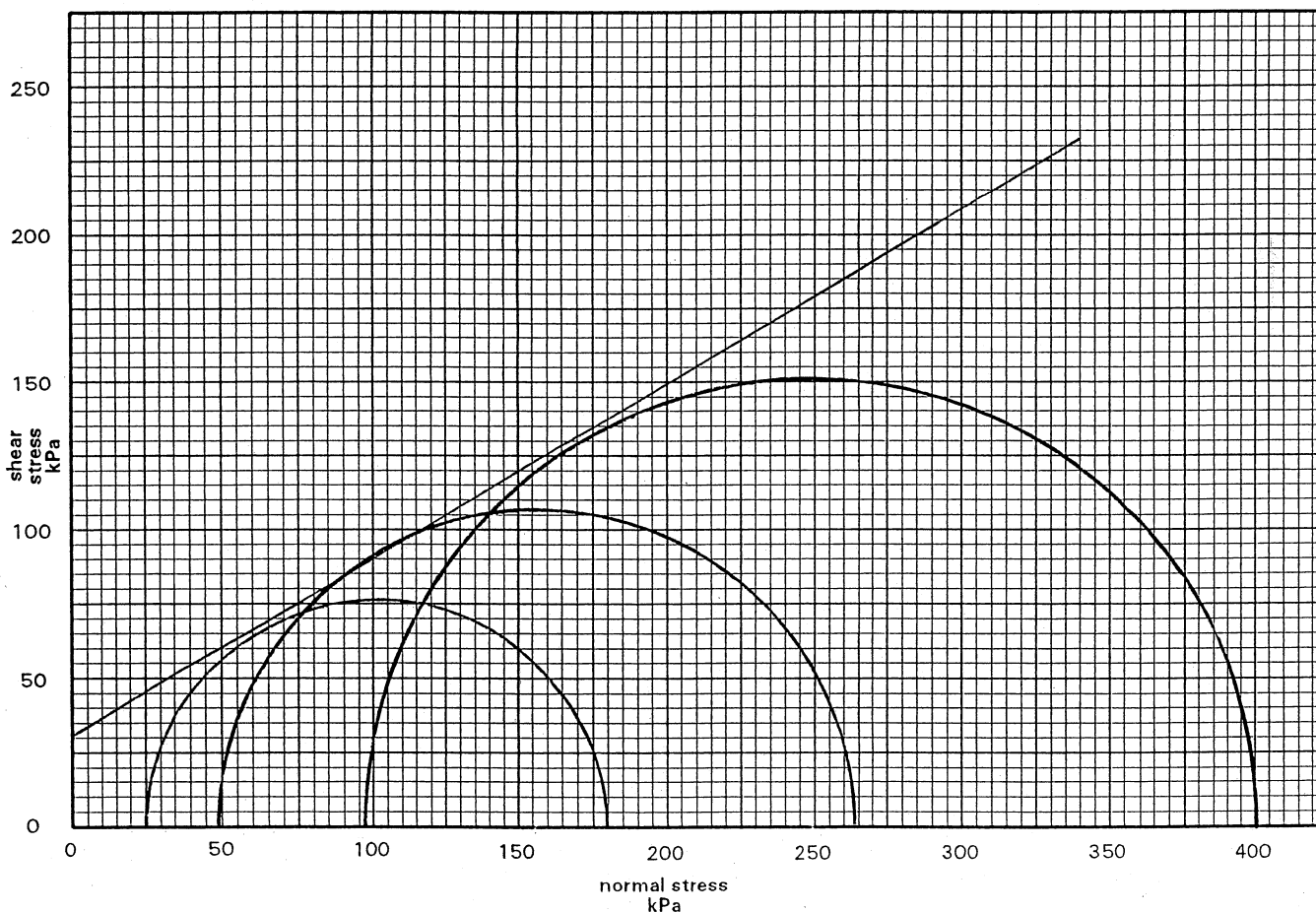
triaxial shear test

client : **MARTIN FINDLATER & ASSOCIATES PTY LTD**job no : **B17439/1**

principal :

laboratory : **MELBOURNE**project : **FRASER DRIVE**report date : **March 26, 2002**location : **TWEED HEADS SOUTH**test report : **AC**test procedure : **AS1289 6.2.2**borehole no : **TPC36**

sample number : -

material description : **SILTY CLAY, high plasticity, mottled grey, red brown, gravel**depth : **1.2 - 1.6m**sampled date : **N.A**sample type : *** remoulded**test date : **15/03/02**sample size : **63mm x 127mm**test type : **CUPP**

angle of friction ϕ' (degrees):	30
cohesion c' (kPa):	32
initial dry density (t/m^3):	1.64
initial B response (%):	95
strain rate (%/min):	0.009mm/min
initial C_v (mm ² /sec):	-
failure criteria/mode:	PPSR
initial cell/back pressure (kPa):	500

moisture contents:	
initial (%):	19.6
final - top (%):	21.7
- middle (%):	21.3
- bottom (%):	21.9

remarks : * Sample was remoulded to 95% Maximum Dry Density @ Optimum Moisture Content in five equal layers. Hand tamping tools were used to achieve compaction.



This laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full without the prior approval of the laboratory.

Authorised Signature
NATA No 1040

Engle Gnehl



P vs Q Plot

office: MELBOURNE

date: 21/03/02

client: MARTIN FINDLATER & ASSOCIATES PTY LTD

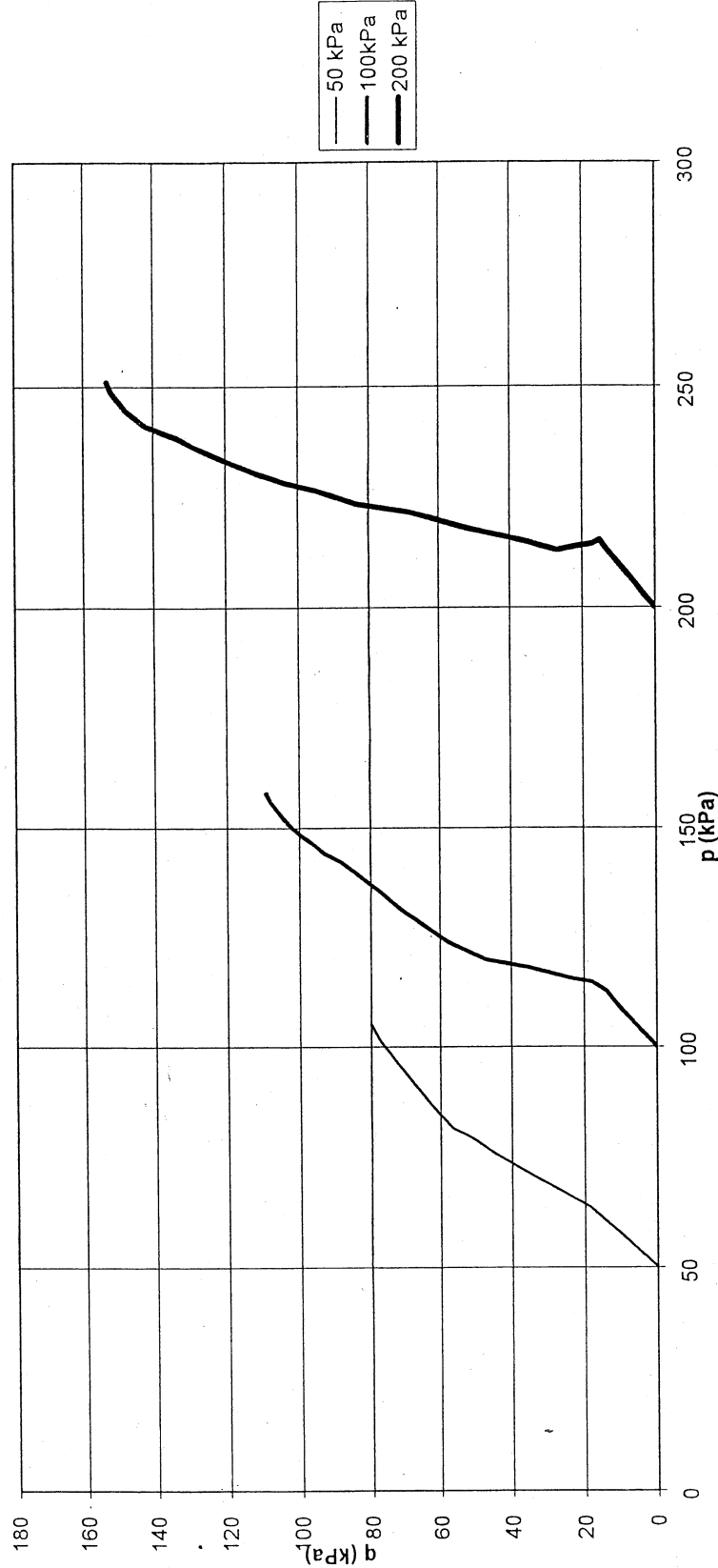
principal:

project: FRASER DRIVE

borehole: TPC36

location: TWEED HEADS SOUTH

depth: 1.2-1.6m





Pore Water Pressure vs Strain %

office: MELBOURNE

date: 21/03/02

borehole: TPC36

depth: 1.2-1.6m

client: MARTIN FINDLATER & ASSOCIATES PTY LTD

principal:

project: FRASER DRIVE

location: TWEED HEADS SOUTH

