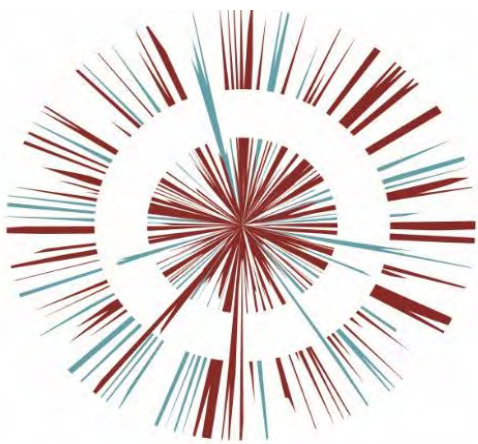


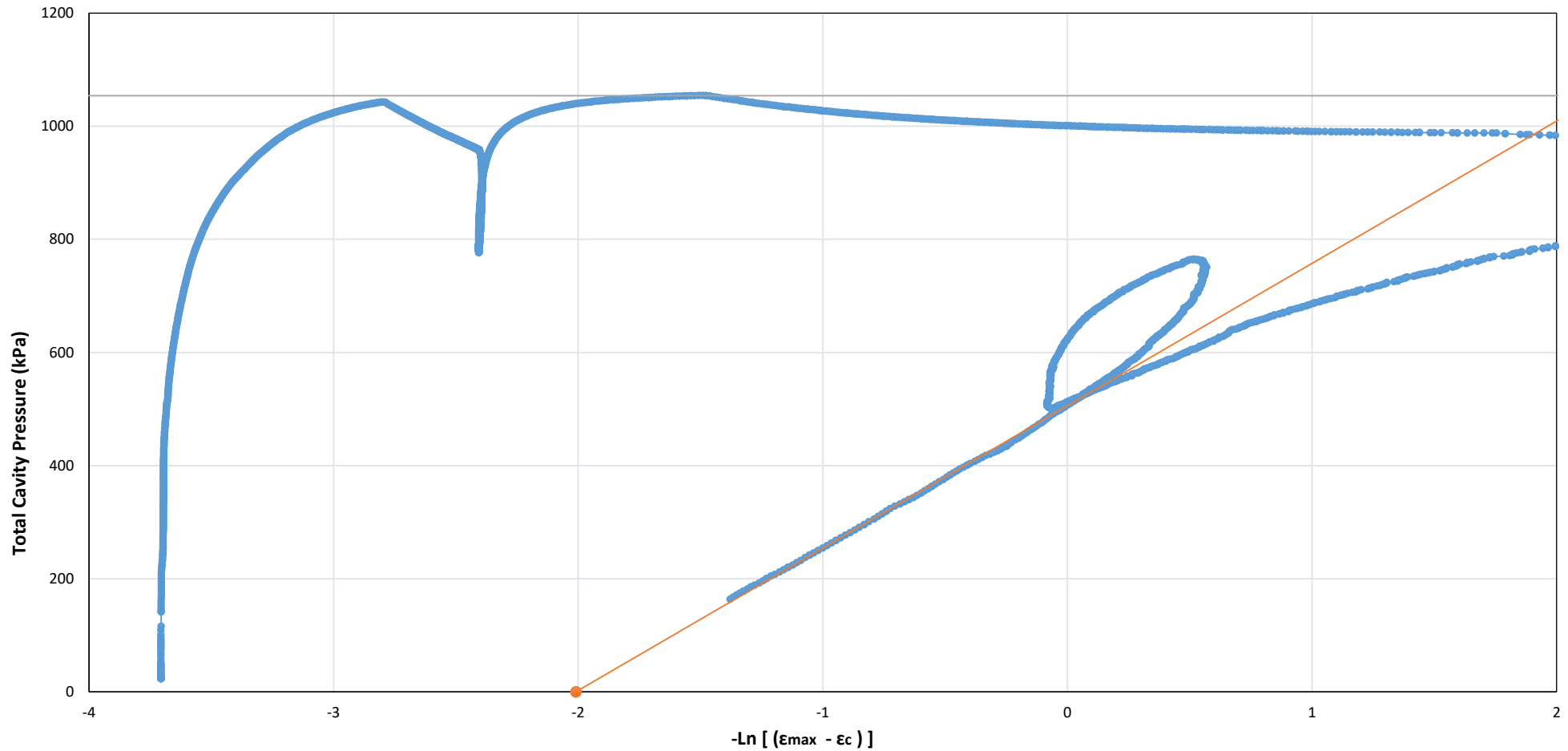


OMEGA ZONE 8, ST HELENS

Omega St Helens Ltd / T. J. Morris Limited



Ground Investigation Report
& Remediation Strategy
Appendix D Part 9
OPP DOC. 2.13

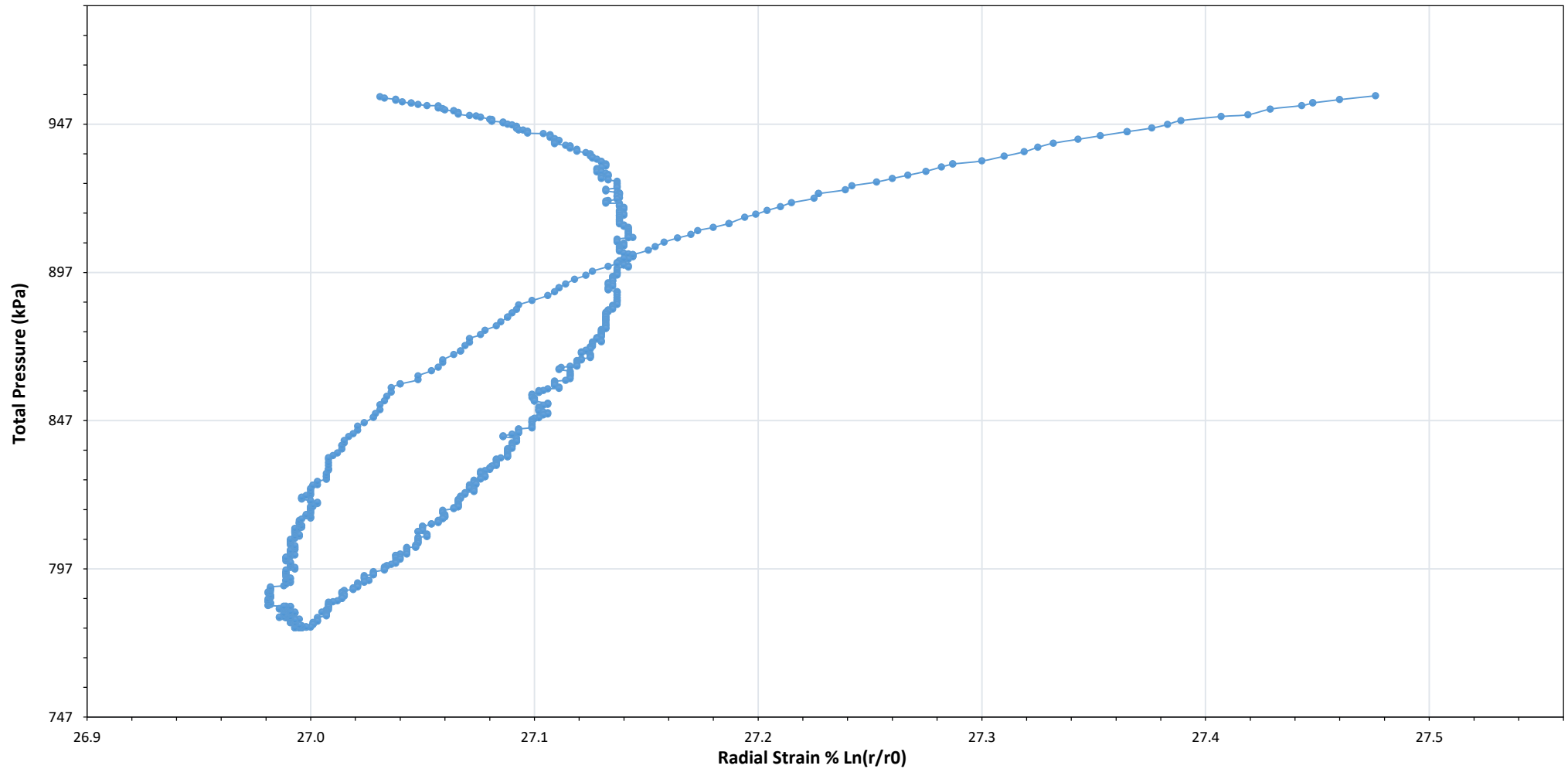


Project Ref: 107284
Client: Geotechnics
Client Ref:
Location: Warrington, UK

Shear strength S_u : 126 kPa
Drainage behaviour: Undrained

Location ID: CPTP8A03
Depth: 3 m
Comments:

Loop 1 Total Pressure with Radial Cavity Strain



Project Ref: 107284

Client: Geotechnics

Client Ref:

Location: Warrington, UK

Drainage behaviour: Undrained

Test type: FDPM

Loop duration: 11.9 mins

Shear modulus G_{ur} : 3967.4 MPa

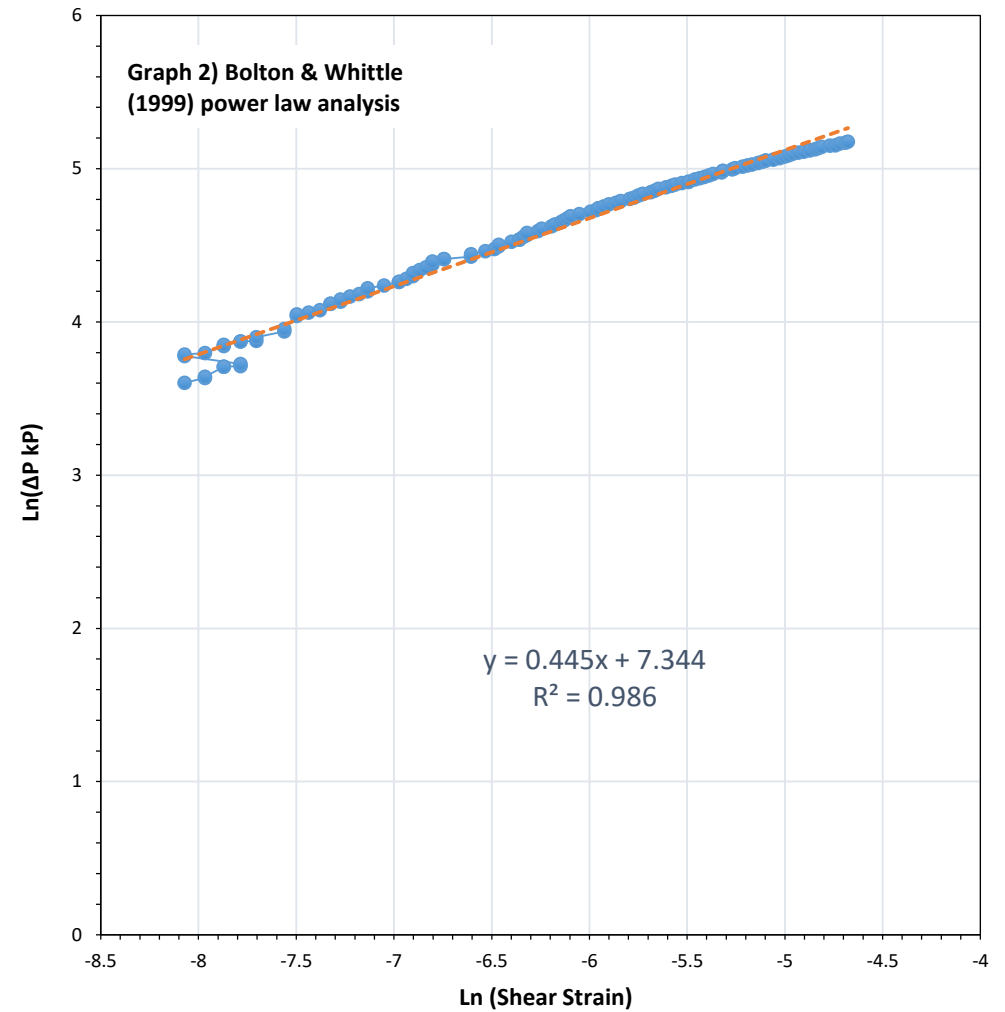
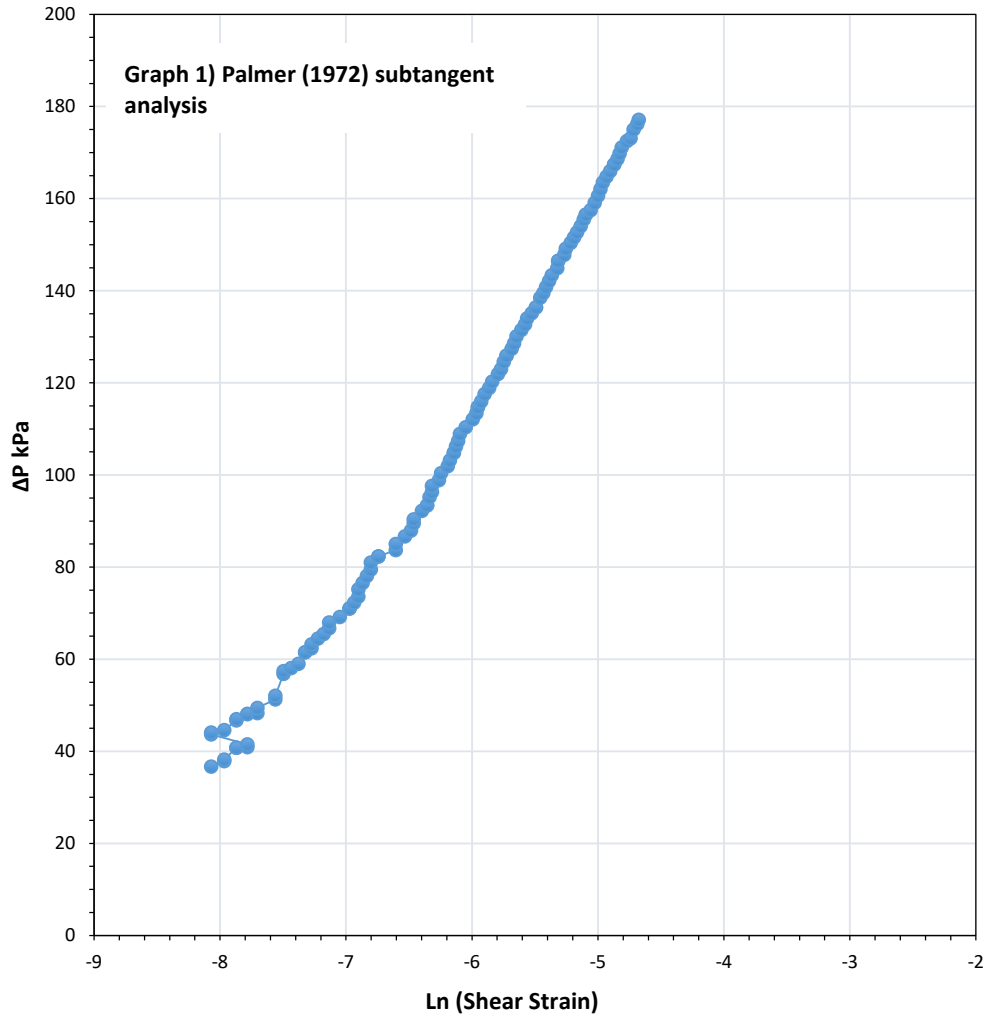
Cavity strain range: 0.08 %

Location ID: CTP8A03

Depth: 3 m

Comments:

Loop 1 Non-Linear Stress-Strain Analysis



Project Ref: 107284

Client: Geotechnics

Client Ref:

Location: Warrington, UK

Obtained Power Law Parameters (right hand side graph)

Non-linearity exponent (β) (gradient): 0.445

Intercept (η): 1.548 MPa

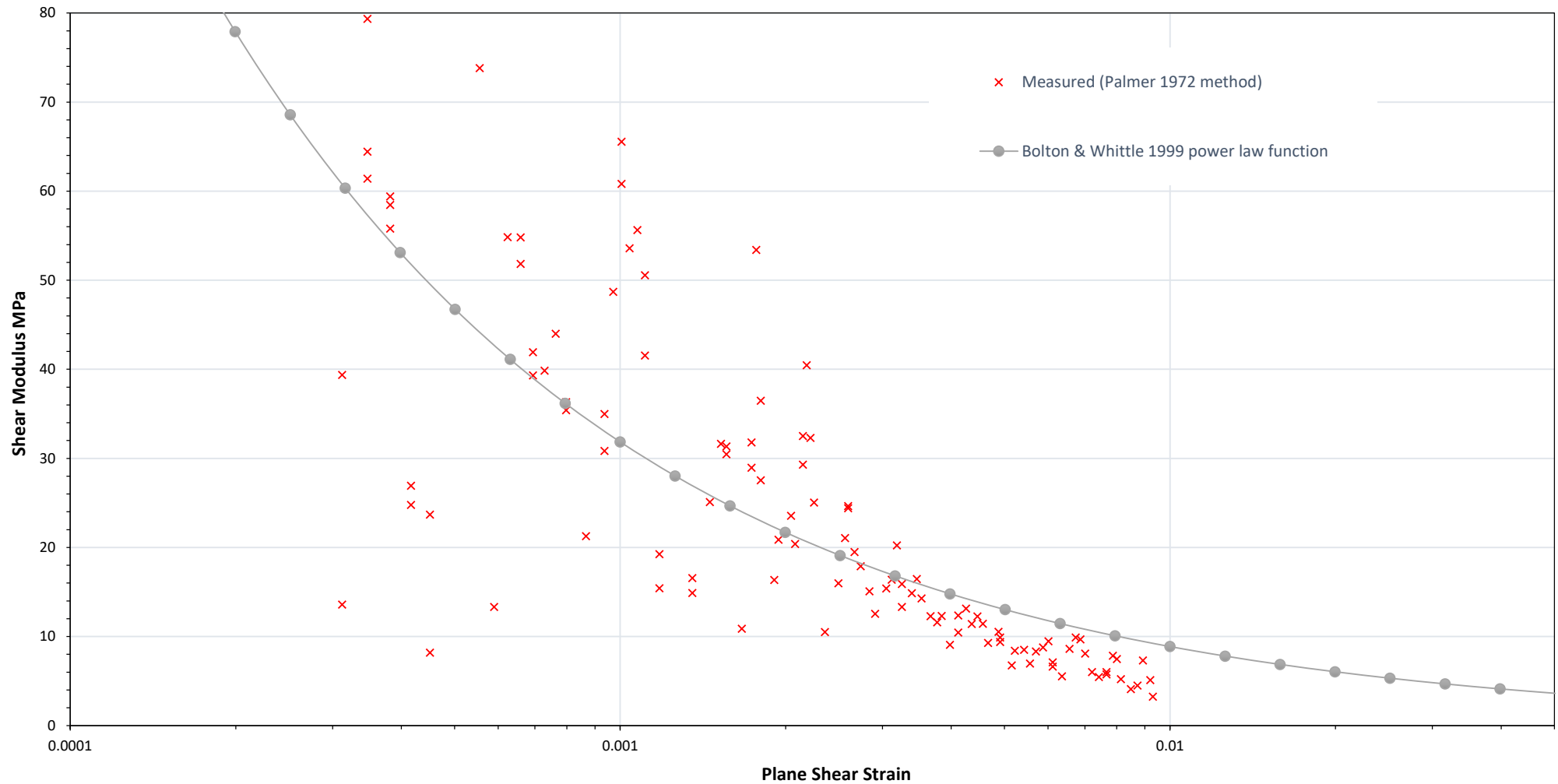
Shear stress constant α ($\beta \cdot \eta$): 0.689 MPa

Location ID: CPTP8A03

Depth: 3 m

Comments:

Loop 1 Non-Linear Analysis - Secant Shear Modulus with Plane Shear Strain



Project Ref: 107284

Client: Geotechnics

Client Ref:

Location: Warrington, UK

Bolton & Whittle 1999 power law parameters applied

Non-linearity exponent (β): 0.445

Intercept (η): 1.548 MPa

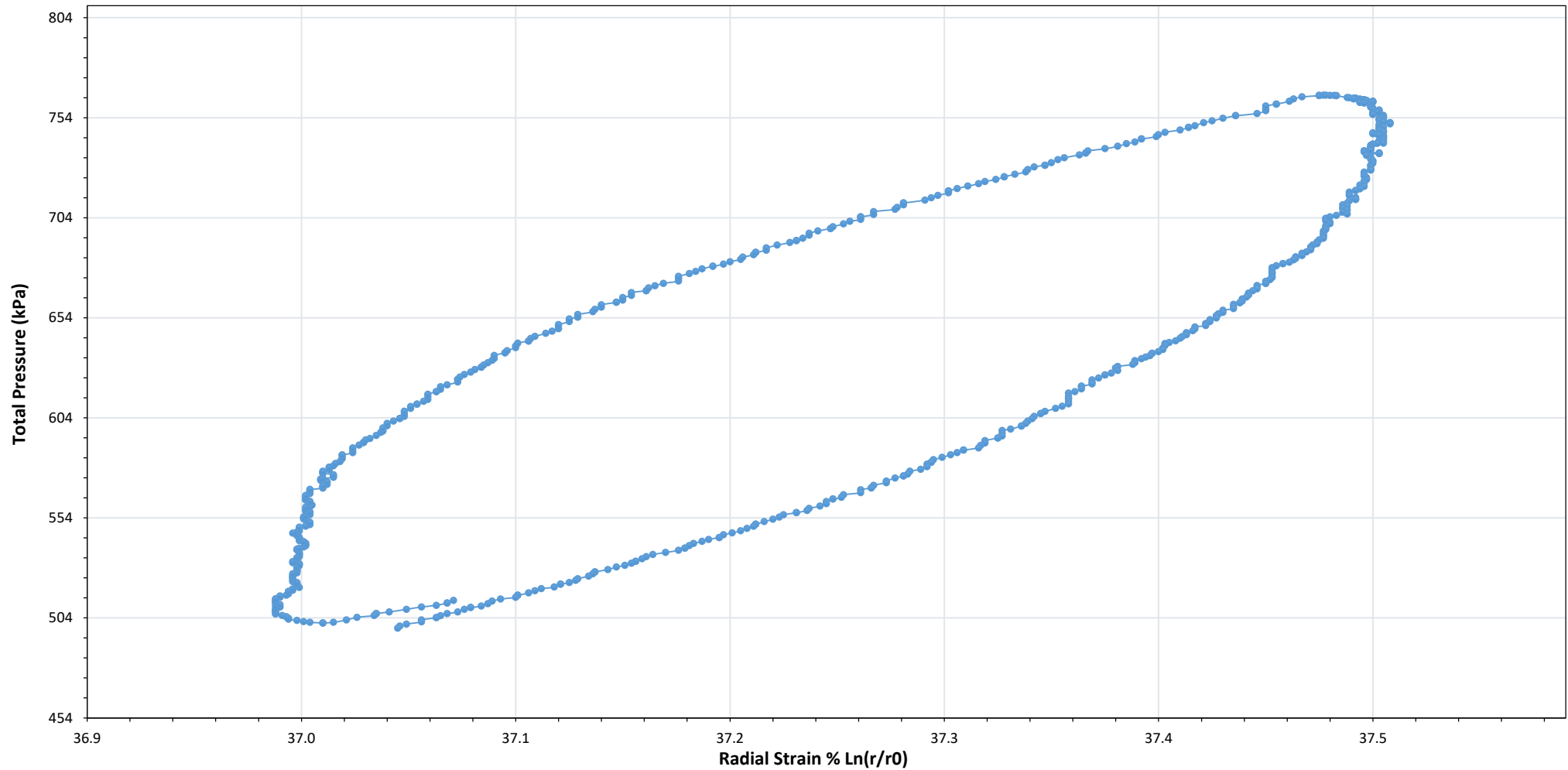
Shear stress constant $\alpha = (\beta * \eta)$: 0.689 MPa

Location ID: **CPTP8A03**

Depth: **3 m**

Comments:

Loop 2 Total Pressure with Radial Cavity Strain



Project Ref: 107284

Client: Geotechnics

Client Ref:

Location: Warrington, UK

Drainage behaviour: Undrained

Test type: FDPM

Loop duration: 11.9 mins

Shear modulus G_{ur} : 2372.5 MPa

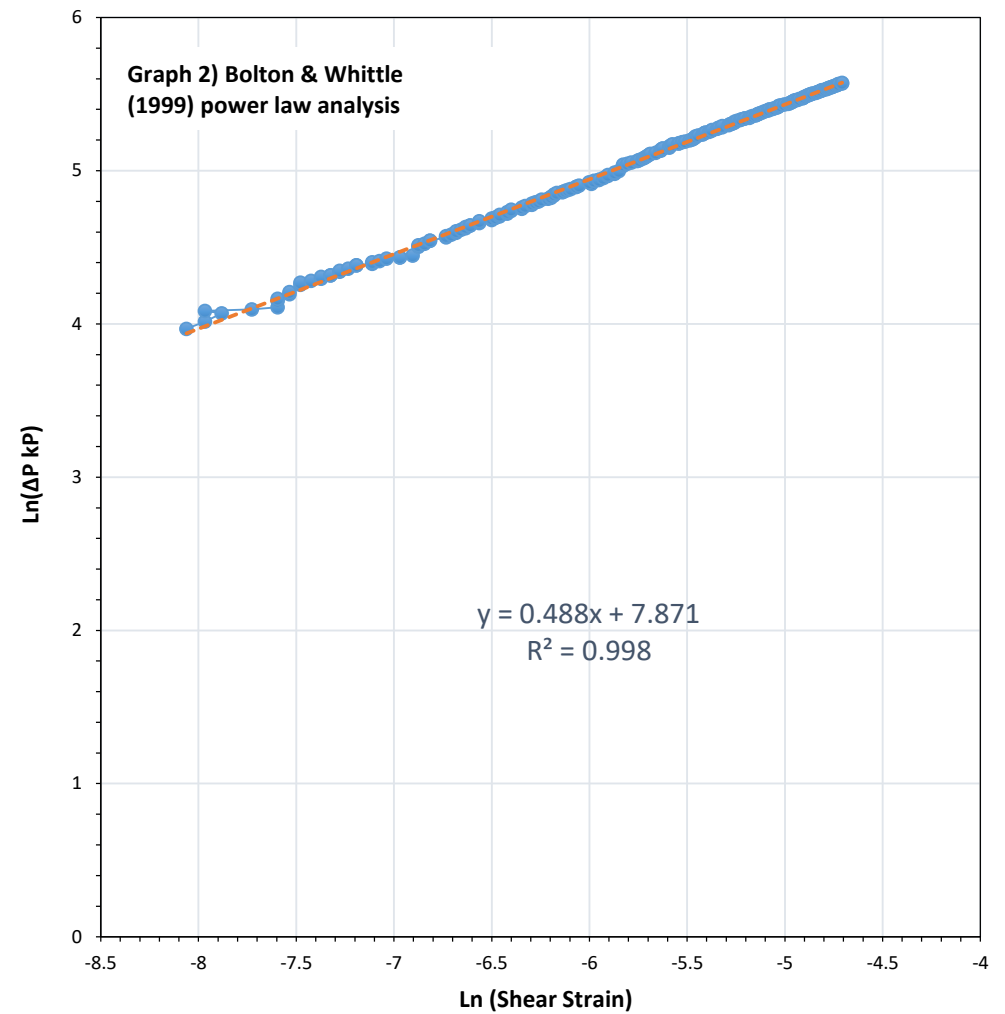
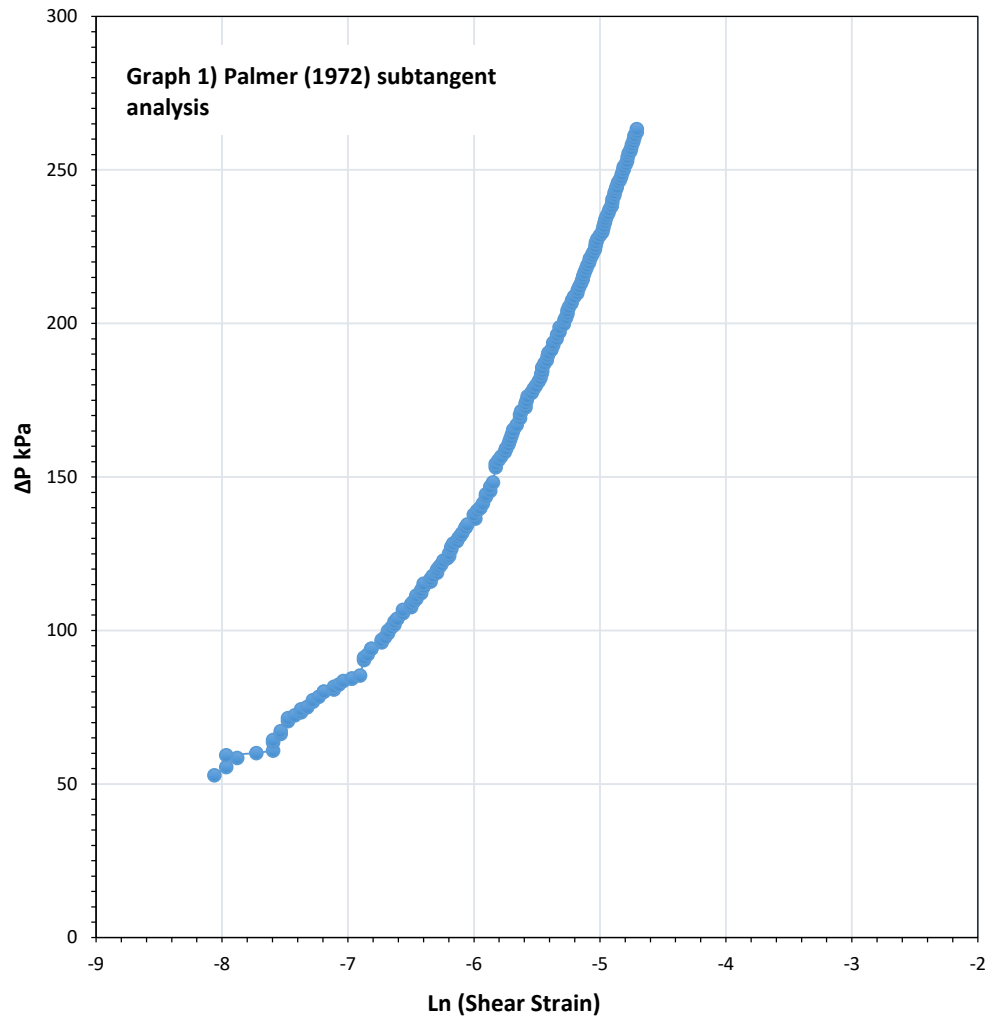
Cavity strain range: 0.32 %

Location ID: CPTP8A03

Depth: 3 m

Comments:

Loop 2 Non-Linear Stress-Strain Analysis



Project Ref: 107284

Client: Geotechnics

Client Ref:

Location: Warrington, UK

Obtained Power Law Parameters (right hand side graph)

Non-linearity exponent (β) (gradient): 0.488

Intercept (η): 2.62 MPa

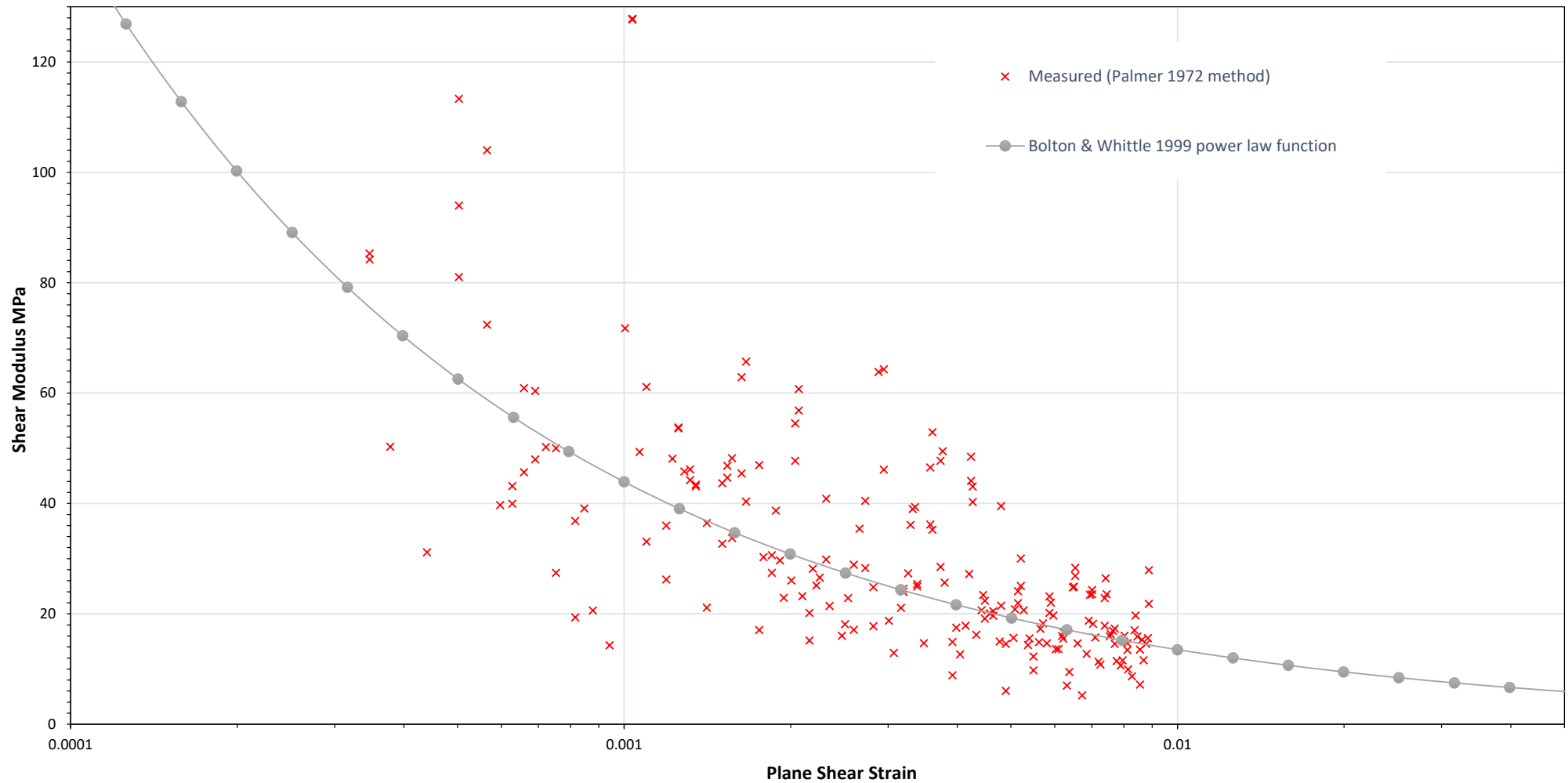
Shear stress constant α ($\beta \cdot \eta$): 1.279 MPa

Location ID: CPTP8A03

Depth: 3 m

Comments:

Loop 2 Non-Linear Analysis - Secant Shear Modulus with Plane Shear Strain



Project Ref: 107284

Client: Geotechnics

Client Ref:

Location: Warrington, UK

Bolton & Whittle 1999 power law parameters applied

Non-linearity exponent (β): 0.488

Intercept (η): 2.62 MPa

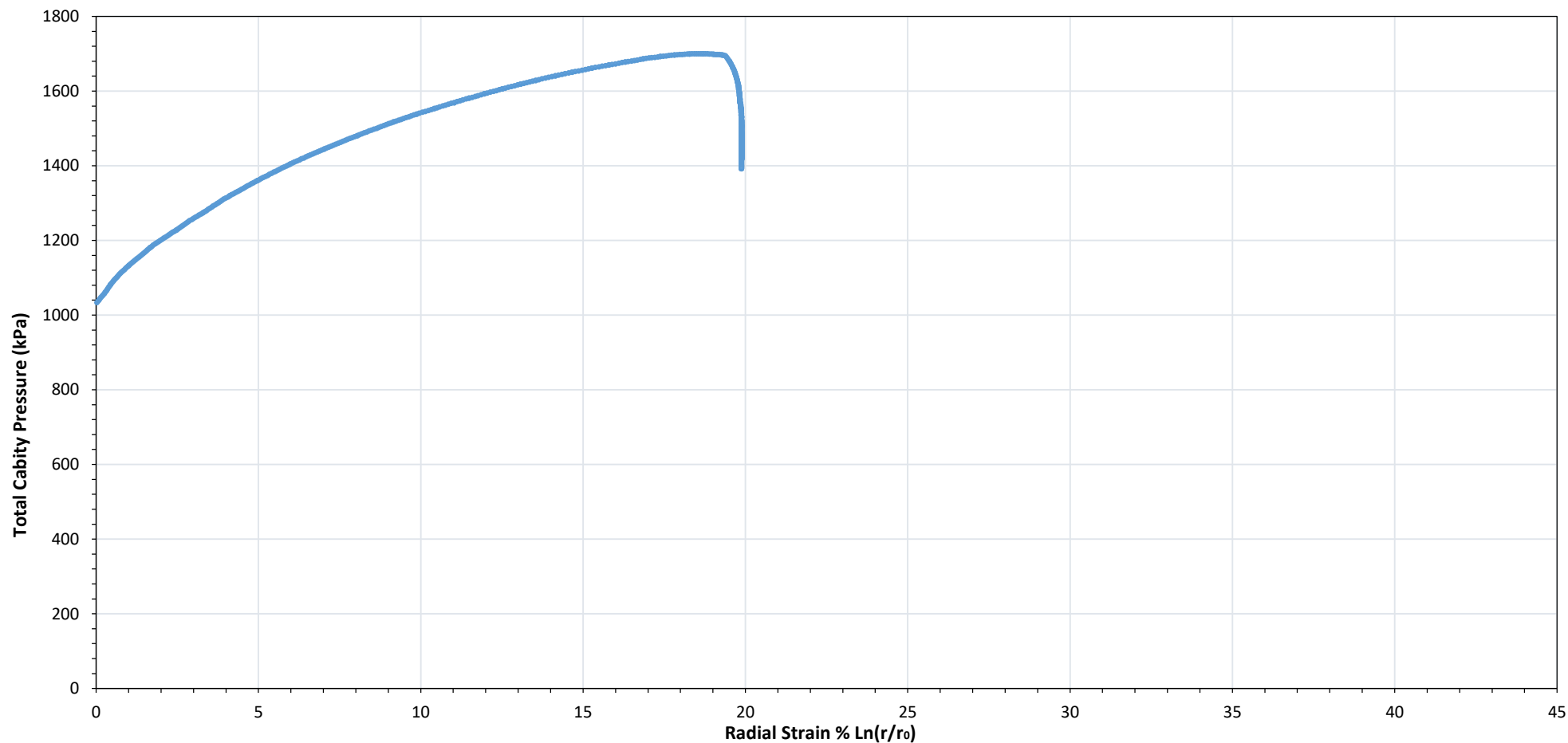
Shear stress constant $\alpha = (\beta \cdot \eta)$: 1.279 MPa

Location ID: **CPTP8A03**

Depth: **3 m**

Comments:

Pressuremeter Test - Total Pressure with Radial Strain



Project Ref: 107284

Client: Geotechnics

Client Ref:

Location: Warrington, UK

Test Engineer: PC

Date: 30/09/2019

Unload-reload Loops: 0

Drainage behaviour: Undrained

Test type: FDPM

Duration: 18 mins

Location ID: CPTP8A03

Depth: 6.42 m

Comments: Membrane damaged, test ended early.