

Appendix D2

Geotechnical investigations:

RMS Factual Geotechnical Investigation Report

Consolidation Test

Client: ROADS AND MARITIME SERVICES, SOUTHERN REGION	Office: SYDNEY
Principal: ROADS AND MARITIME SERVICES, SOUTHERN REGION	Date: 21/5/2012
Project: BERRY BYPASS	By: GKC
Location: PRINCES HIGHWAY	Checked: GKC

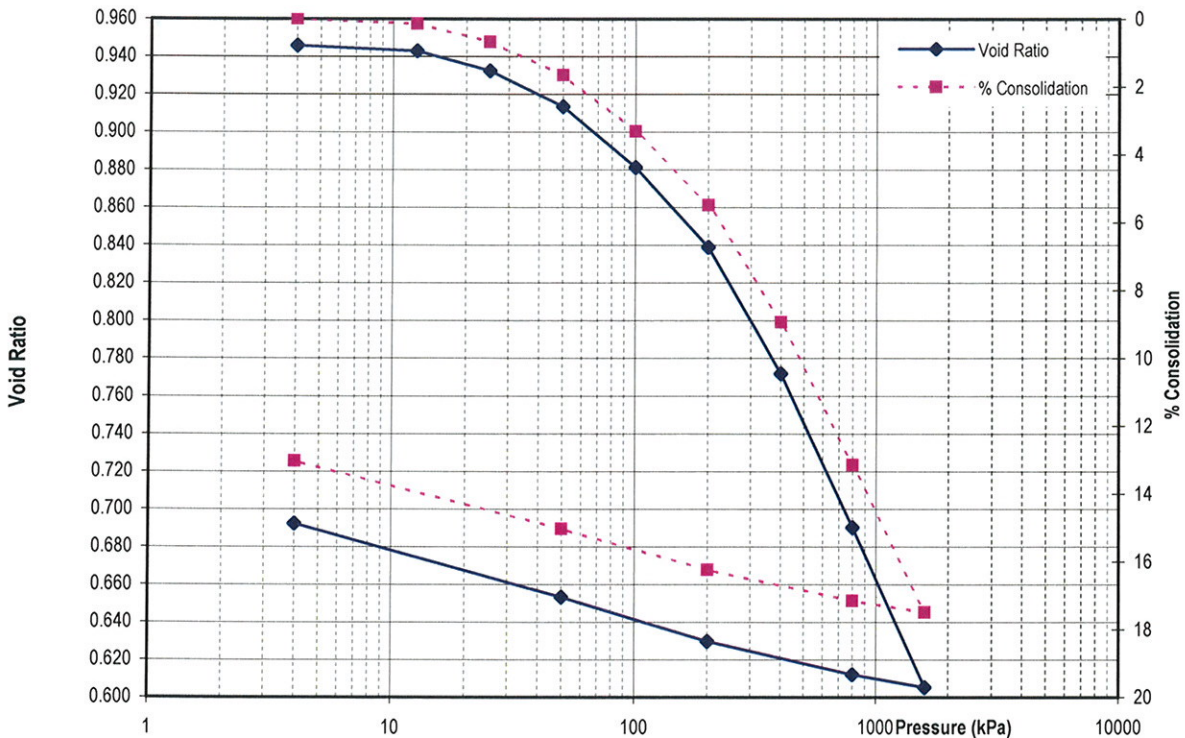
Test Procedure: **AS1289 6.6.1**

Borehole: B5	Depth: 1.05 to 1.55 m	Report No: IOLT 5559
Sample No. B5	Laboratory No's LCOV12S-00422	Sample Type: Undisturbed

Material Description: (SC) CLAYEY SAND - fine to coarse, mottled brown, fines of high plasticity.

Initial Dry Density (t/m^3): 1.36	Initial Moisture Content (%): 35.1	Initial Degree of Saturation (%): 97.6
Soil Particle Density (t/m^3): 2.65	Final Moisture Content (%): 28.0	Initial Specimen Height (mm): 20.023

Pressure Range (kPa)		Void Ratio		Consolidation (%)	C_v $m^2/year$	m_v m^2/kN	C_c	C_α
From	To	at start of load increment	at end of load increment					
4	12.5	0.946	0.943	0.150	1.26538	0.00018	0.00589	
12.5	25	0.943	0.932	0.689	1.82883	0.00043	0.03486	
25	50	0.932	0.913	1.663	5.08850	0.00039	0.06295	
50	100	0.913	0.881	3.321	8.00377	0.00034	0.10718	
100	200	0.881	0.839	5.494	5.23385	0.00022	0.14043	
200	400	0.839	0.772	8.945	7.52972	0.00018	0.22307	
400	800	0.772	0.690	13.145	5.37089	0.00012	0.27149	
800	1600	0.690	0.605	17.500	5.28685	0.00006	0.28150	
1600	800	0.605	0.612	17.155				
800	200	0.612	0.630	16.246				
200	50	0.630	0.653	15.043				
50	4	0.653	0.692	13.035				



GLEN-CONS RPT-001-2010



Lane Cove West Laboratory - Accreditation No. 431

This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025
The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/national standards

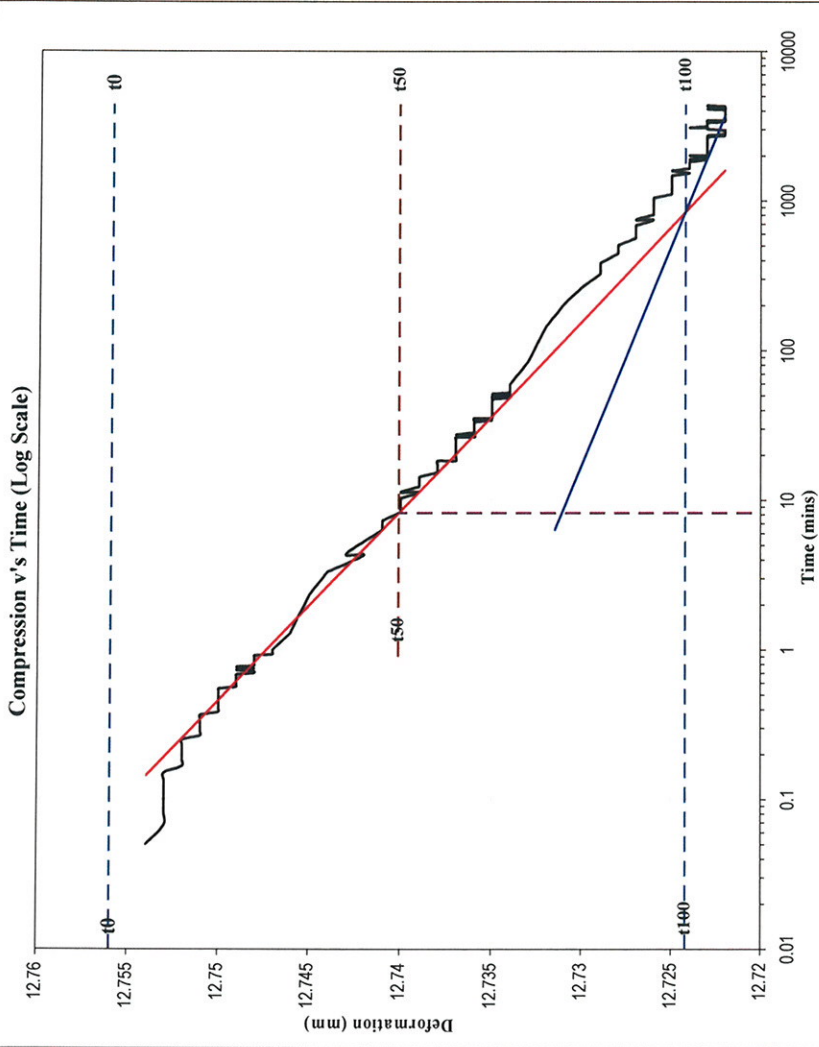
Garry K Collins

Approved Signatory

SAMPLE NO : LCOV12S-00422

Stage 1

Stage Load : 13 kPa
 Rig Number : 11
 Stage : 4.0 to 12.5



Adjust max value of x axis

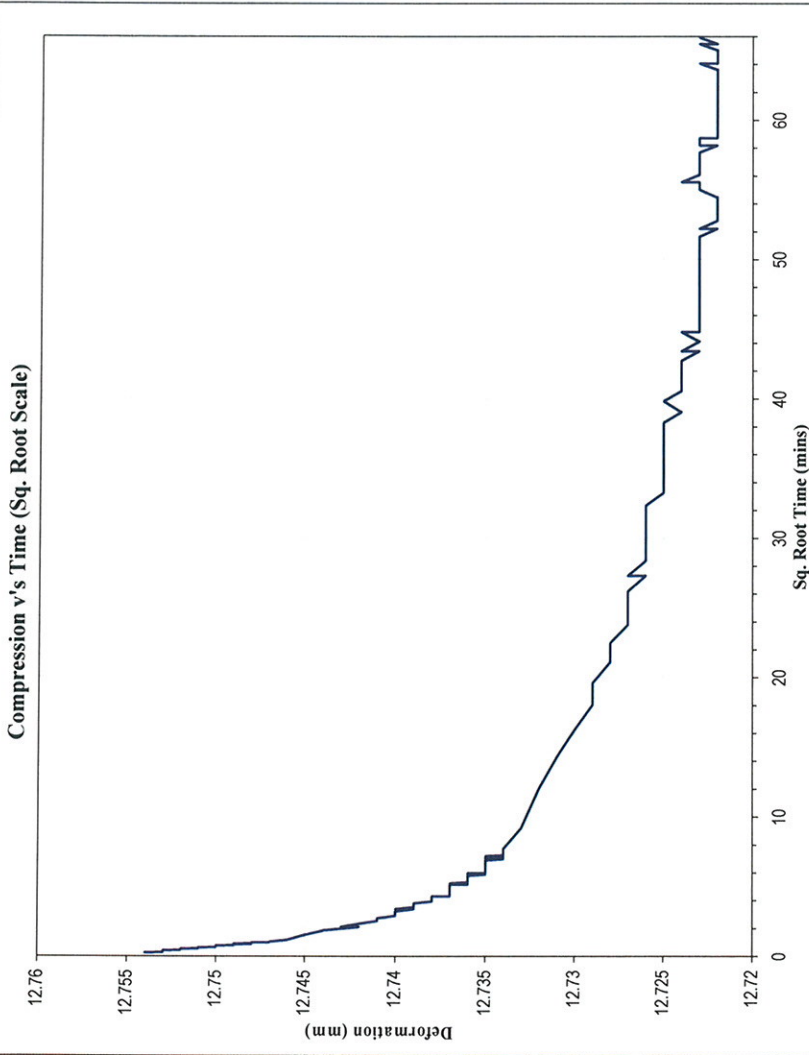
Primary	Time (mins)
6.3	Time (mins)
48.3	Time (mins)

(Dial) t0 = 12.756 mm
 (Dial) t100 = 12.724 mm
 t100 = 831.5 mins

Secondary	Time (mins)
1884.3	Time (mins)
3684.3	Time (mins)

(Dial) t50 = 12.740 mm
 t50 = 8.2 mins

Initial dial gauge height = 12.754 mm
 Final dial gauge height = 12.722 mm



Adjust max value of x axis

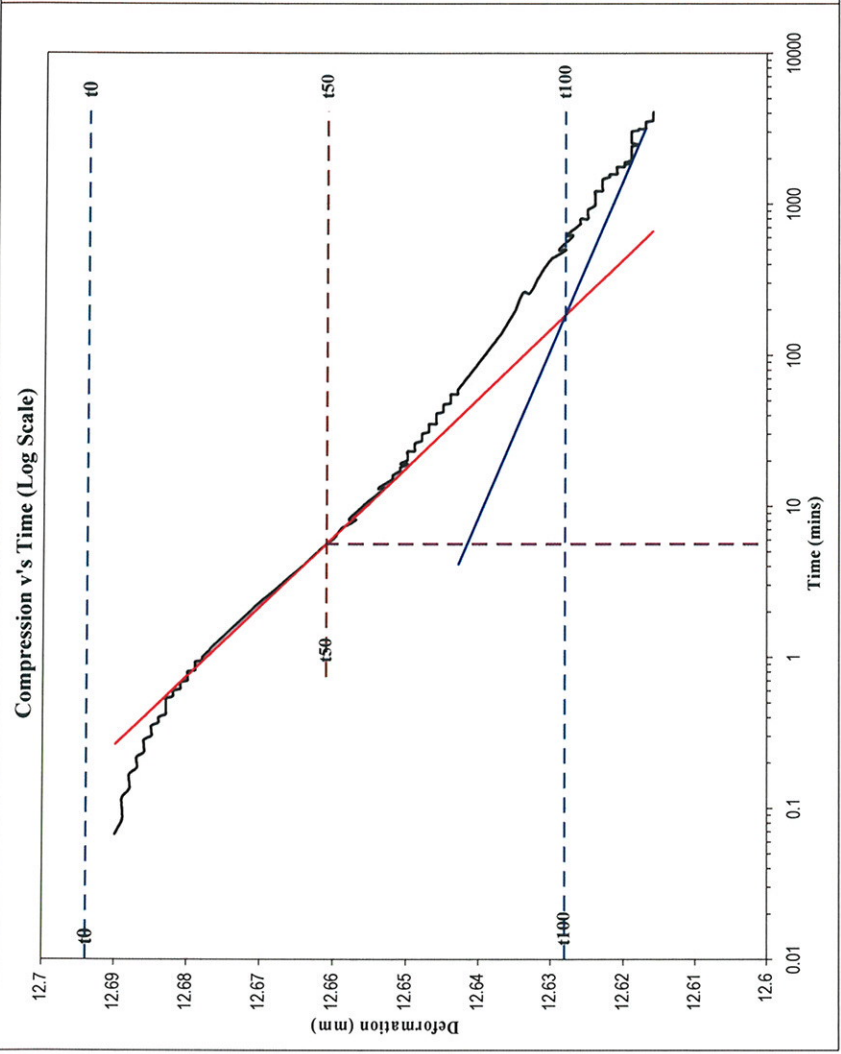
Primary	Root Time
	Root Time
	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 2

Stage Load : 25 kPa
 Rig Number : 11
 Stage : 12.5 - 25



Adjust max value of x axis

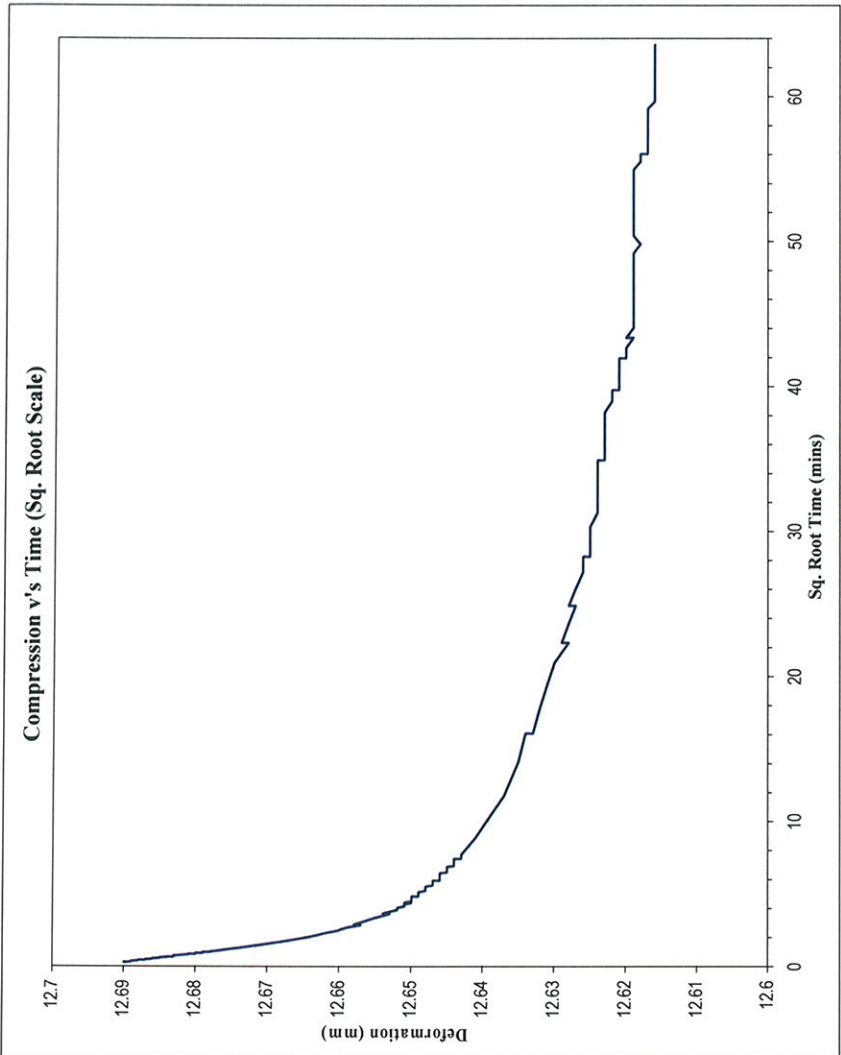
Primary	Time (mins)
4.1	Time (mins)
13.117	Time (mins)

(Dial) t0 = 12.694 mm
 (Dial) t100 = 12.628 mm
 t100 = 182.9 mins

Secondary	Time (mins)
1878.117	Time (mins)
3138.134	Time (mins)

(Dial) t50 = 12.661 mm
 t50 = 5.6 mins

ΔH_c 0.009 mm/log cycle
 Initial dial gauge height = 12.690 mm
 Final dial gauge height = 12.616 mm



Adjust max value of x axis

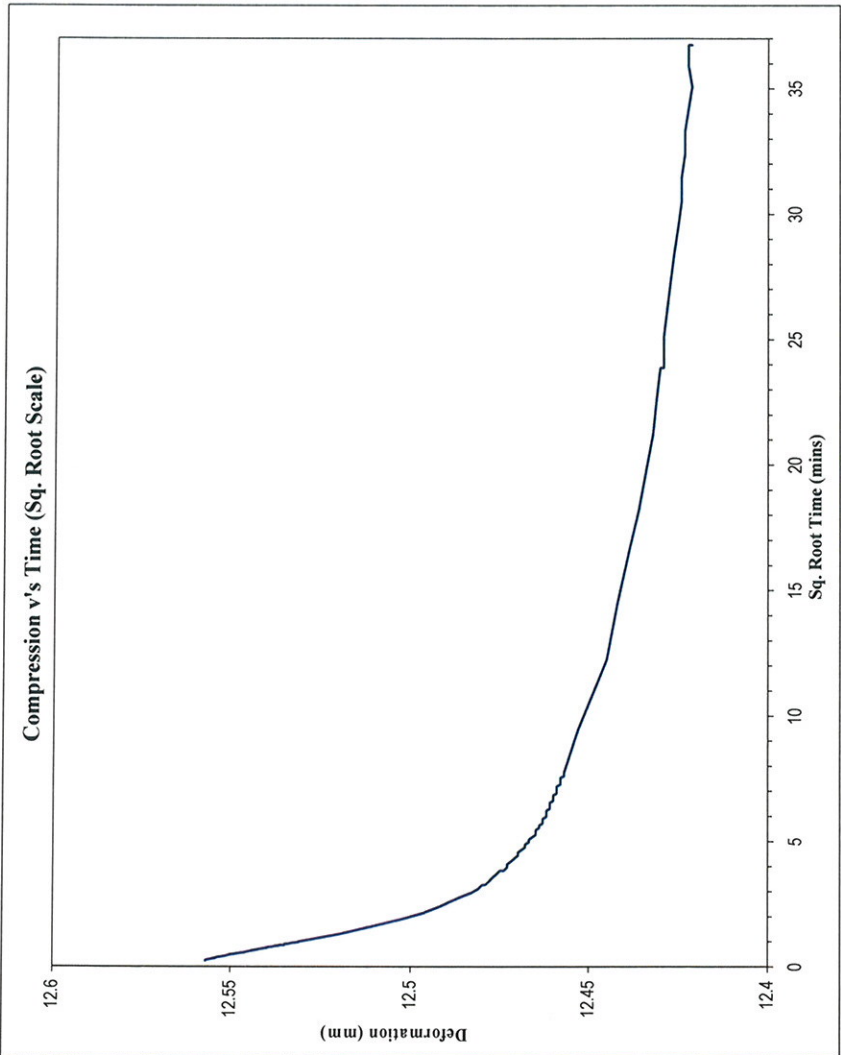
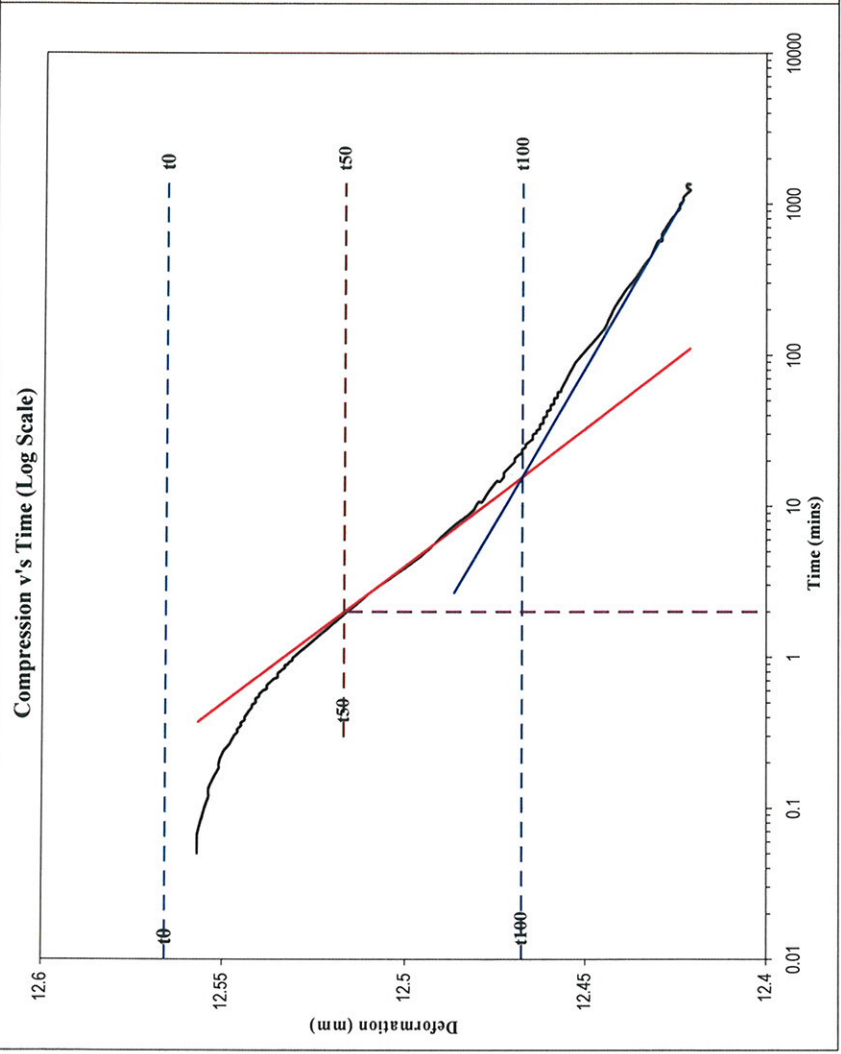
Primary	Root Time
	Root Time
	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 3

Stage Load : 50 kPa
 Rig Number : 11
 Stage : 25 - 50



Adjust max value of x axis

Primary	Time (mins)
2.65	Time (mins)
5.633	Time (mins)

Secondary	Time (mins)
869.633	Time (mins)
1049.65	Time (mins)

(Dial) t0 = 12.566 mm
 (Dial) t100 = 12.468 mm
 t100 = 15.5 mins

(Dial) t50 = 12.517 mm
 t50 = 2.0 mins

$\Delta H\alpha$ 0.0245 mm/log cycle
 Initial dial gauge height = 12.557 mm
 Final dial gauge height = 12.421 mm

Adjust max value of x axis

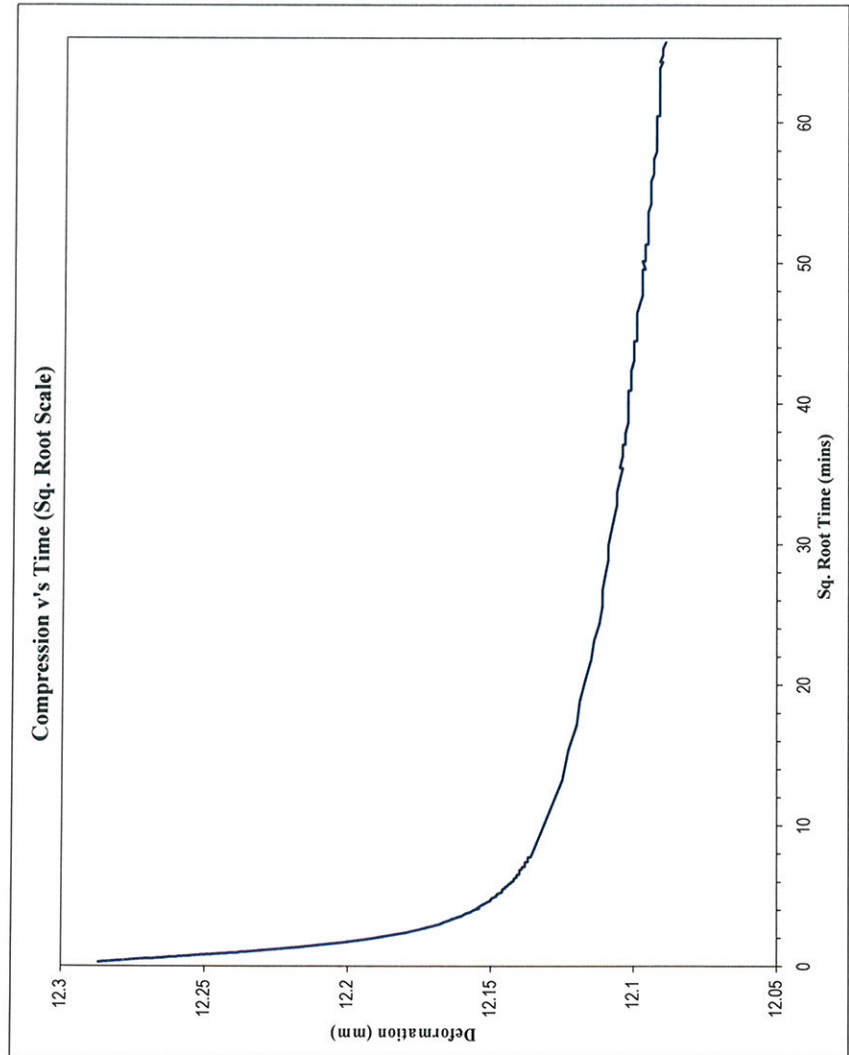
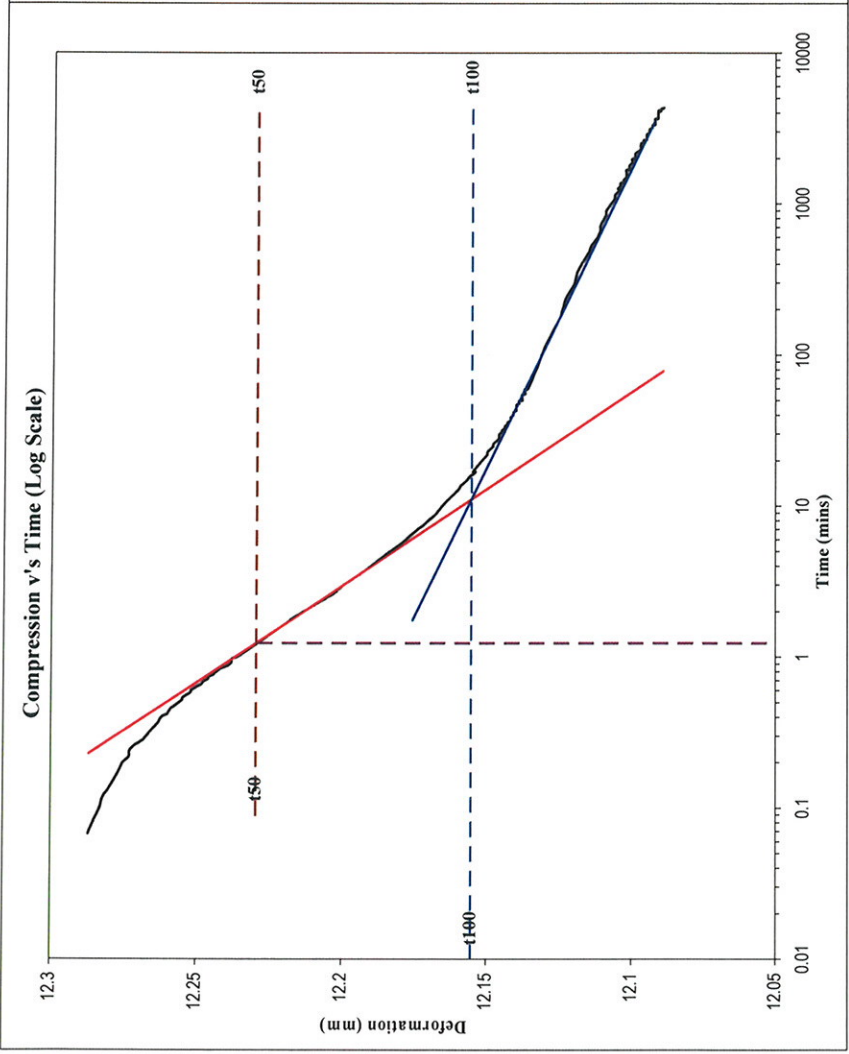
Primary	Root Time
	Root Time
	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 4

Stage Load : 100 kPa
 Rig Number : 11
 Stage : 50 - 100



Adjust max value of x axis

Primary	Time (mins)
1.733	Time (mins)
3.733	Time (mins)

Secondary	Time (mins)
2454.75	Time (mins)
3534.717	Time (mins)

(Dial) t0 = 12.304 mm
 (Dial) t100 = 12.155 mm
 t100 = 11.0 mins

(Dial) t50 = 12.230 mm
 t50 = 1.2 mins

$\Delta H\alpha$ 0.0253 mm/log cycle
 Initial dial gauge height = 12.287 mm
 Final dial gauge height = 12.089 mm

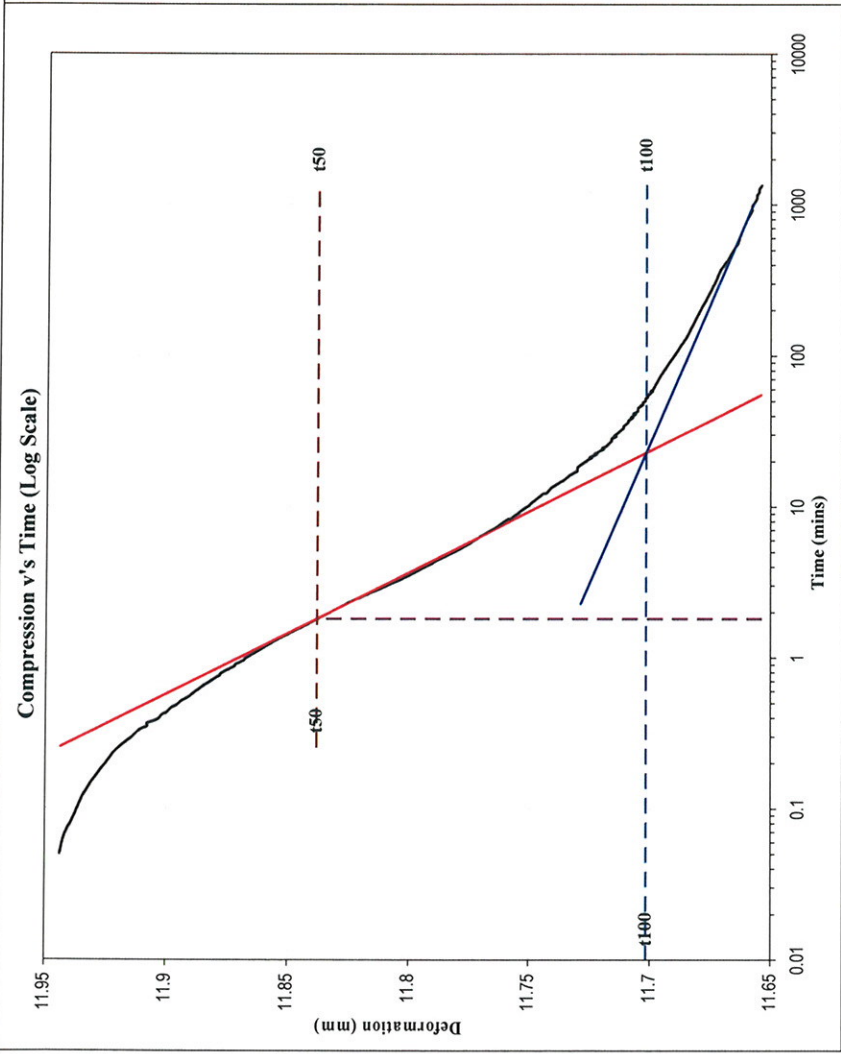
Primary	Root Time
	Root Time
	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 5

Stage Load : 200 kPa
 Rig Number : 11
 Stage : 100 - 200



Adjust max value of x axis

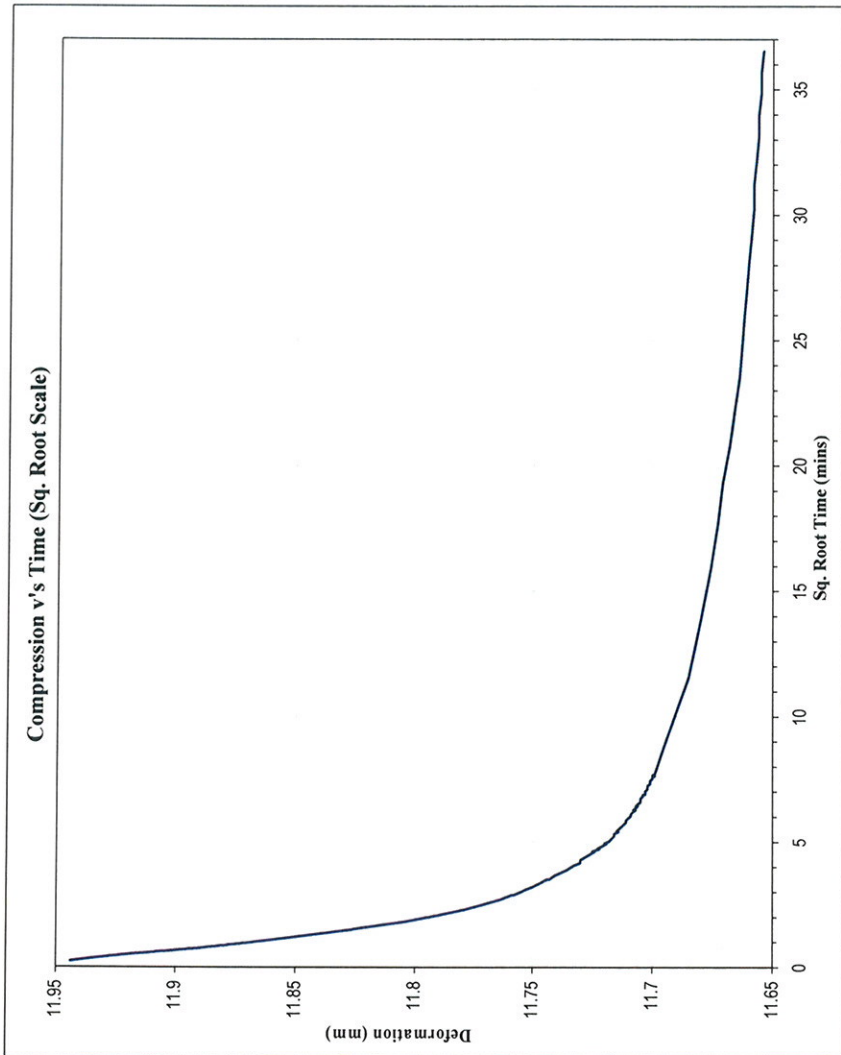
Primary	Secondary
Time (mins)	Time (mins)
2.267	673.283
6.283	1033.283

(Dial) t0 = 11.975 mm
 (Dial) t100 = 11.702 mm
 t100 = 22.8 mins

(Dial) t50 = 11.838 mm
 t50 = 1.8 mins

$\Delta H\alpha$ 0.0269 mm/log cycle

Initial dial gauge height = 11.944 mm
 Final dial gauge height = 11.654 mm



Adjust max value of x axis

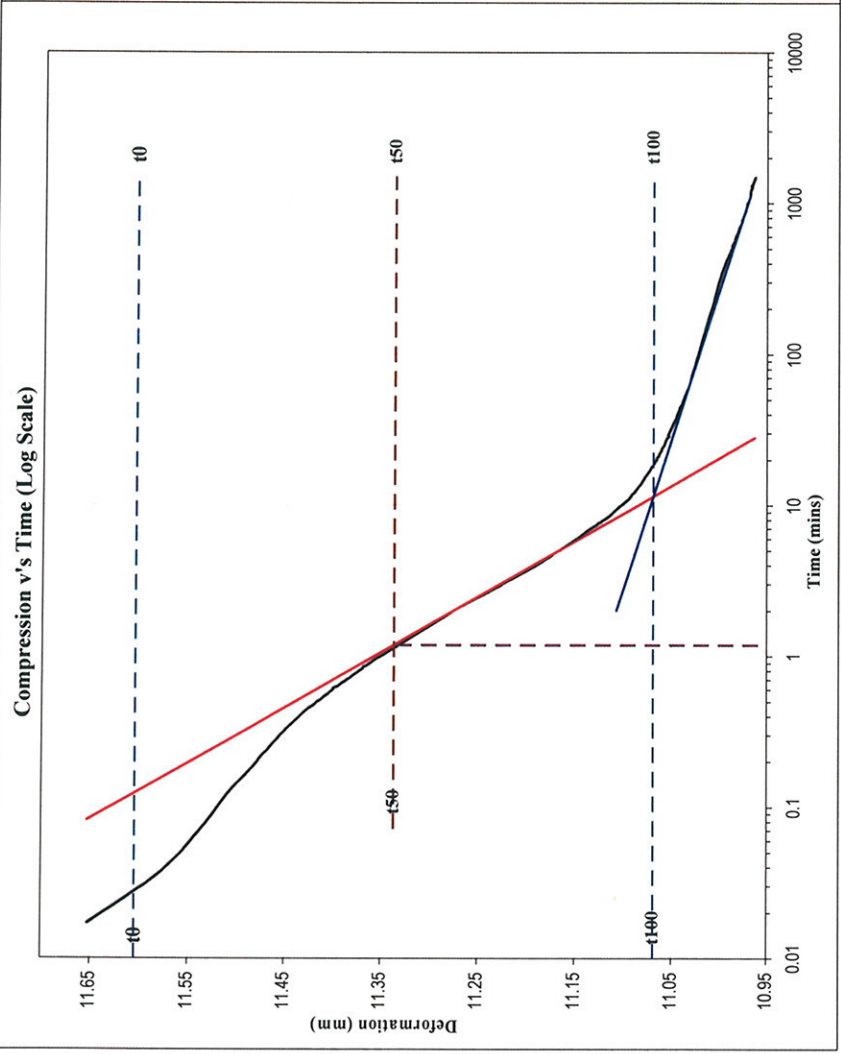
Primary	Root Time
Root Time	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 6

Stage Load : **400** kPa
 Rig Number : **11**
 Stage : **200 - 400**



Adjust max value of x axis

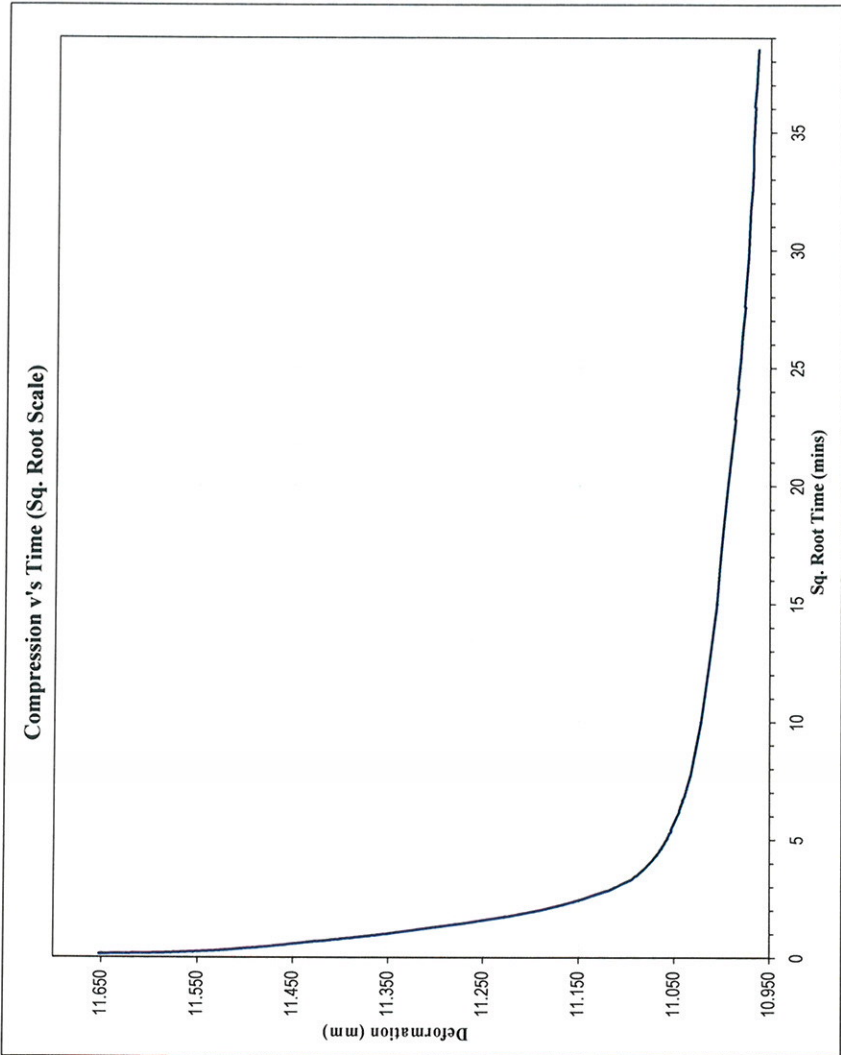
Primary	Time (mins)
2	4.983

Secondary	Time (mins)
100	1121

(Dial) t0 = 11.605 mm
 (Dial) t100 = 11.069 mm
 t100 = 11.4 mins

(Dial) t50 = 11.337 mm
 t50 = 1.2 mins

ΔH_c 0.0508 mm/log cycle
 Initial dial gauge height = 11.653 mm
 Final dial gauge height = 10.963 mm



Adjust max value of x axis

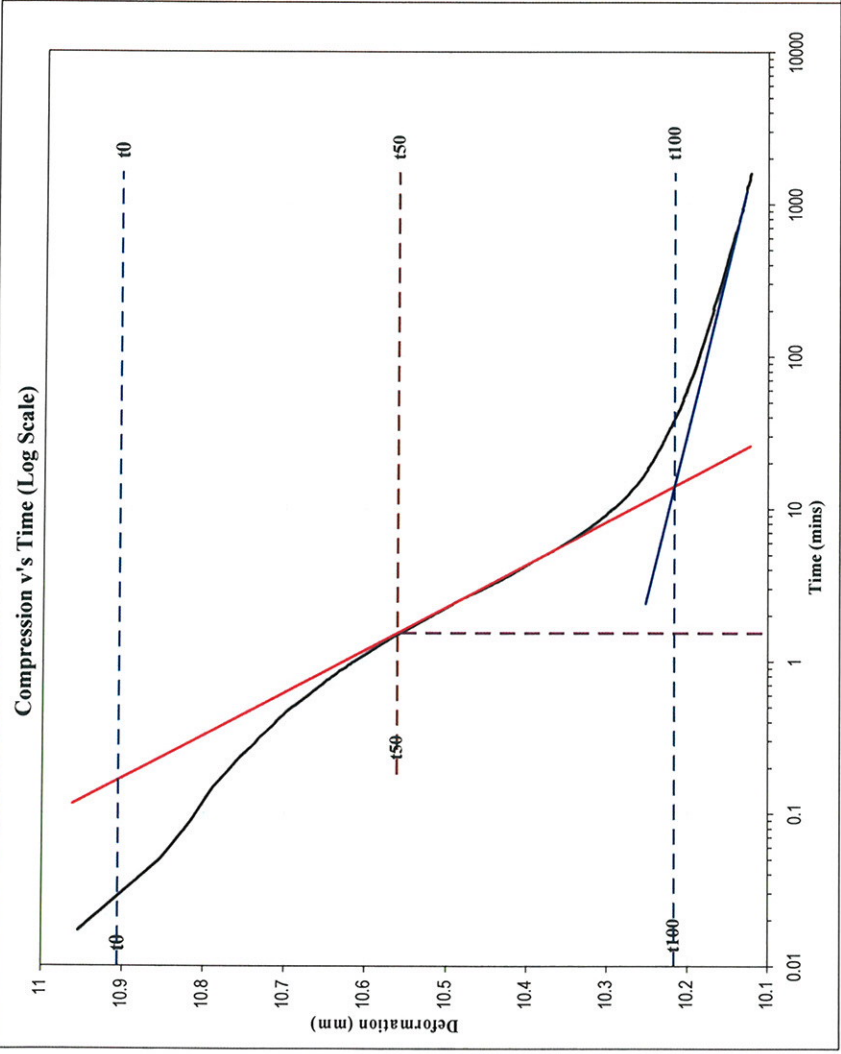
Primary	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 7

Stage Load : 800 kPa
 Rig Number : 11
 Stage : 400 - 800



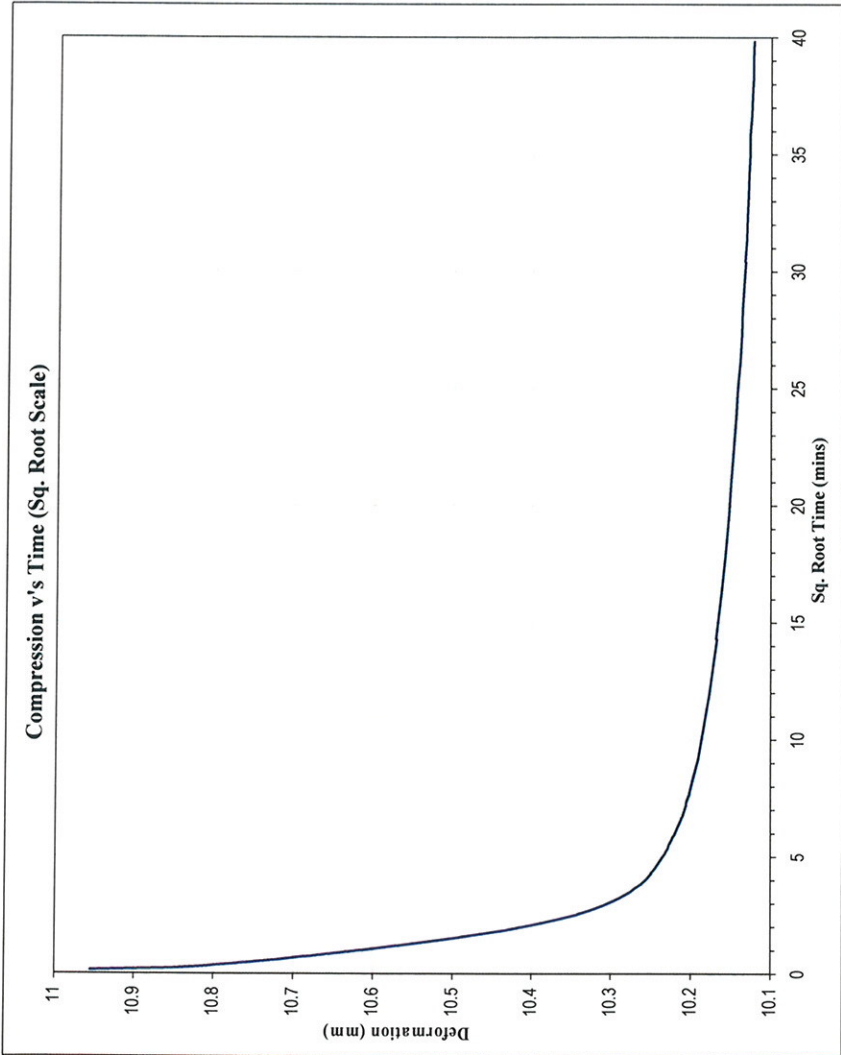
Adjust max value of x axis

Primary	Secondary
Time (mins)	Time (mins)
2.383	744.383
5.4	1224.4

(Dial) t0 = 10.906 mm
 (Dial) t100 = 10.217 mm
 t100 = 14.0 mins

(Dial) t50 = 10.561 mm
 t50 = 1.5 mins

ΔH_c 0.0463 mm/log cycle
 Initial dial gauge height = 10.963 mm
 Final dial gauge height = 10.122 mm



Adjust max value of x axis

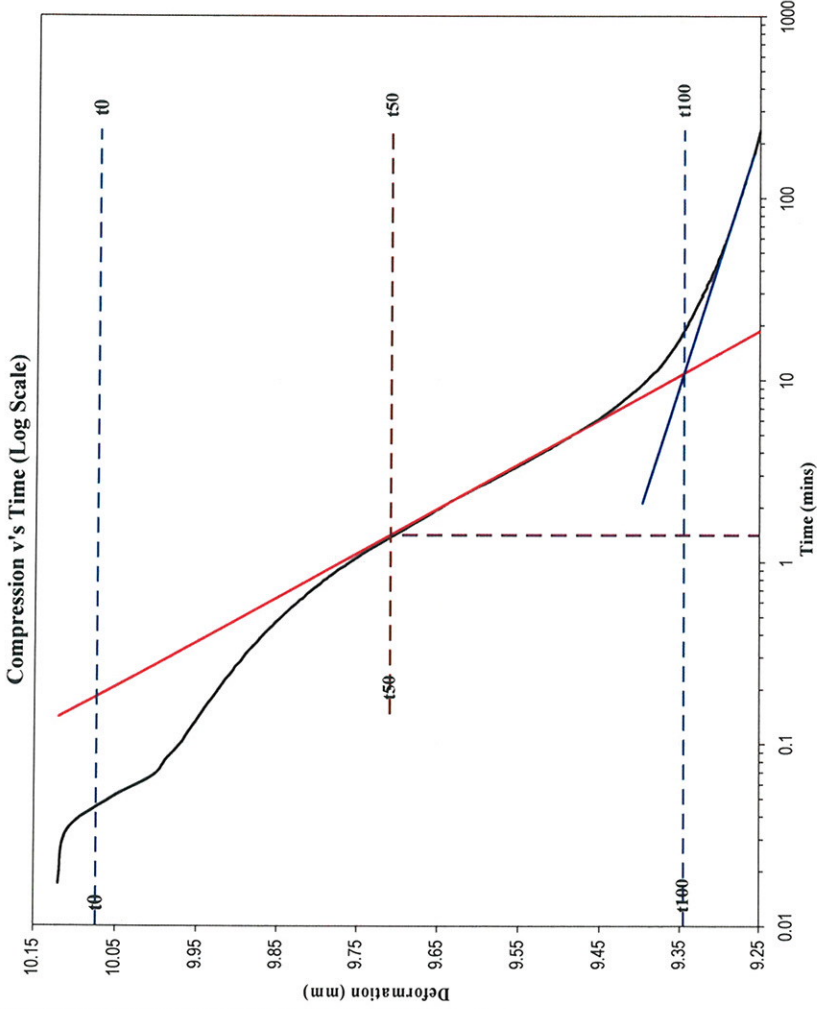
Primary	Root Time
Root Time	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 8

Stage Load : 1600 kPa
 Rig Number : 11
 Stage : 800 - 1600



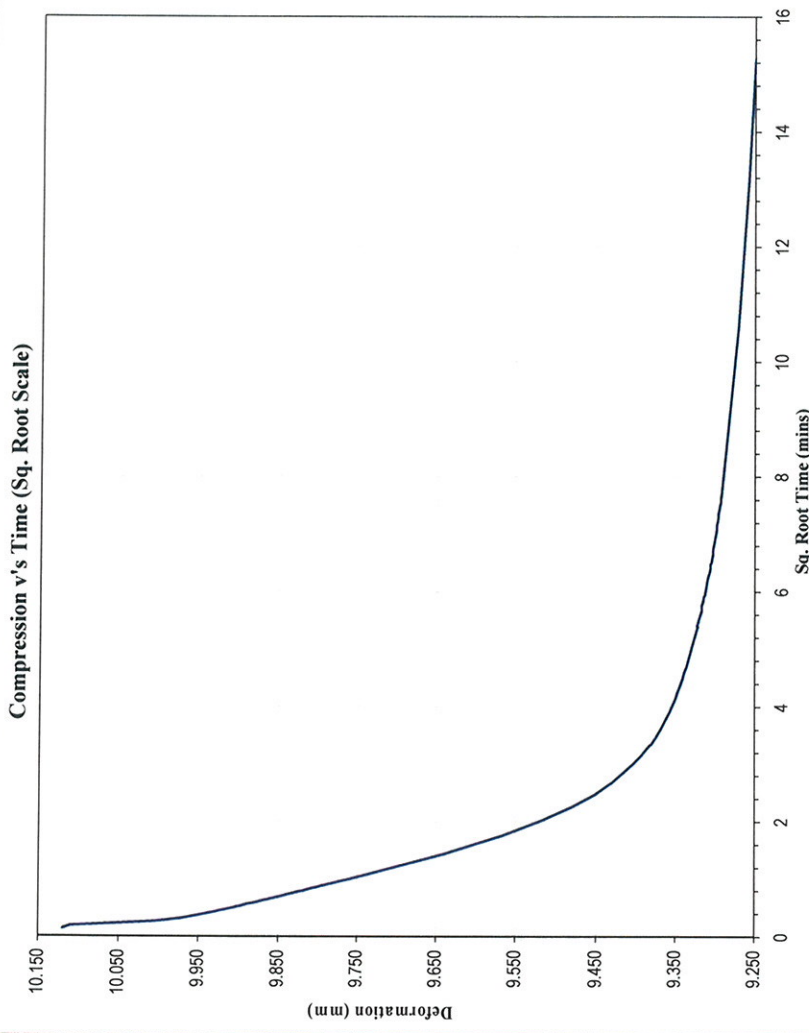
Adjust max value of x axis

Primary	Time (mins)	Secondary	Time (mins)
2.1	100	100	100
5.1	200	200	200

(Dial) t0 = 10.074 mm
 (Dial) t100 = 9.346 mm
 t100 = 10.8 mins

(Dial) t50 = 9.710 mm
 t50 = 1.4 mins

$\Delta H\alpha$ 0.0729 mm/log cycle
 Initial dial gauge height = 10.120 mm
 Final dial gauge height = 9.250 mm



Adjust max value of x axis

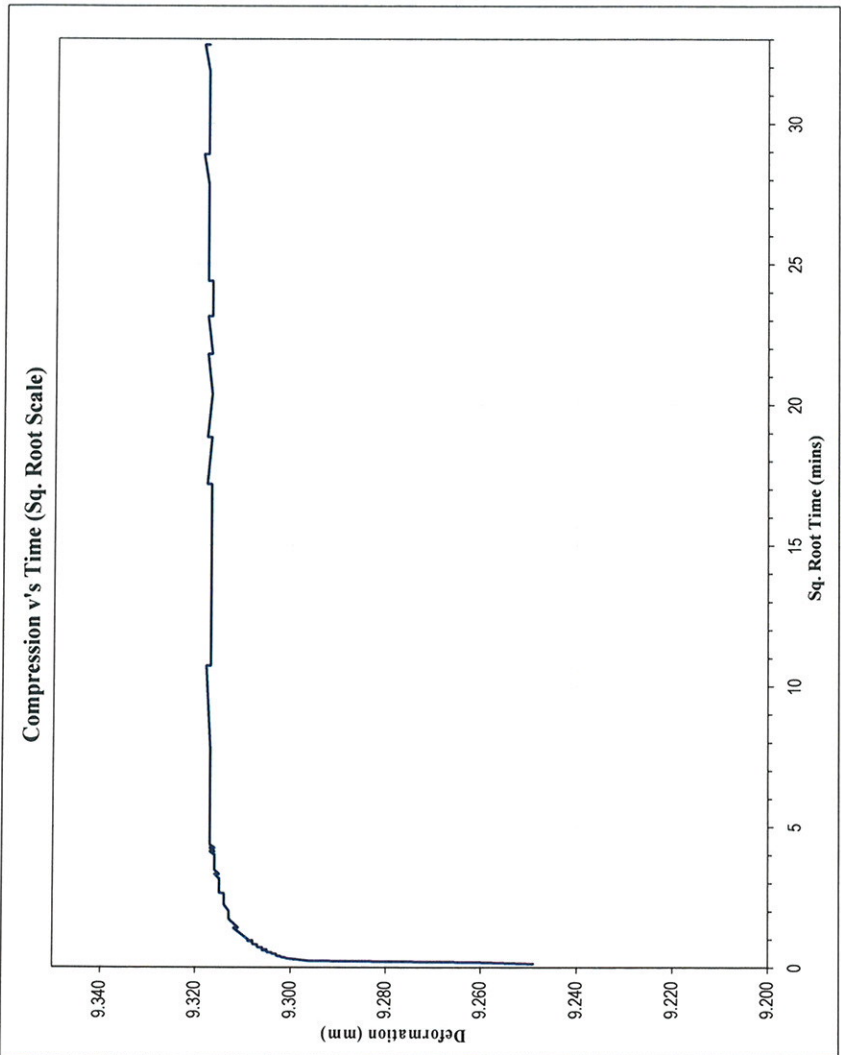
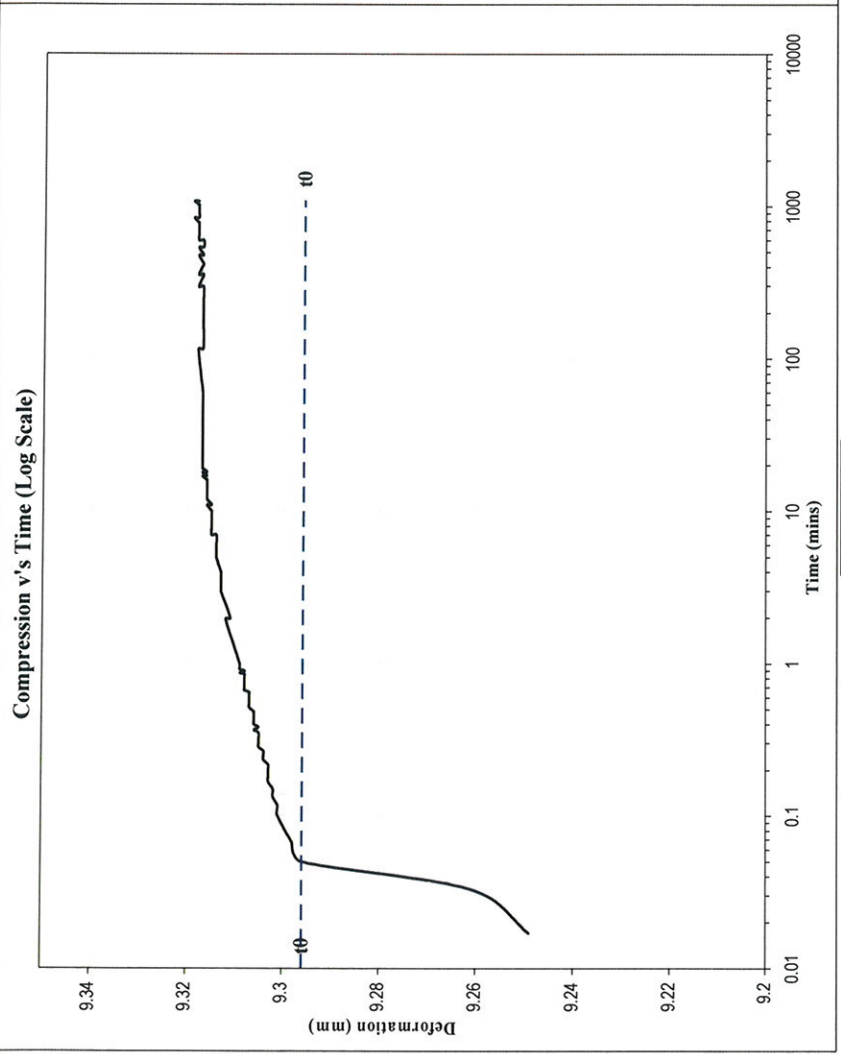
Primary	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 9 (Rebound)

Stage Load : 800 kPa
 Rig Number : 11
 Stage : 1600 - 800



Adjust max value of x axis

Primary	Root Time
	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

Adjust max value of x axis

Secondary	Time (mins)
	Time (mins)

(Dial) t50 = #N/A mm
 t50 = #N/A mins
 ΔHc = #N/A mm/log cycle
 Initial dial gauge height = 9.249 mm
 Final dial gauge height = 9.319 mm

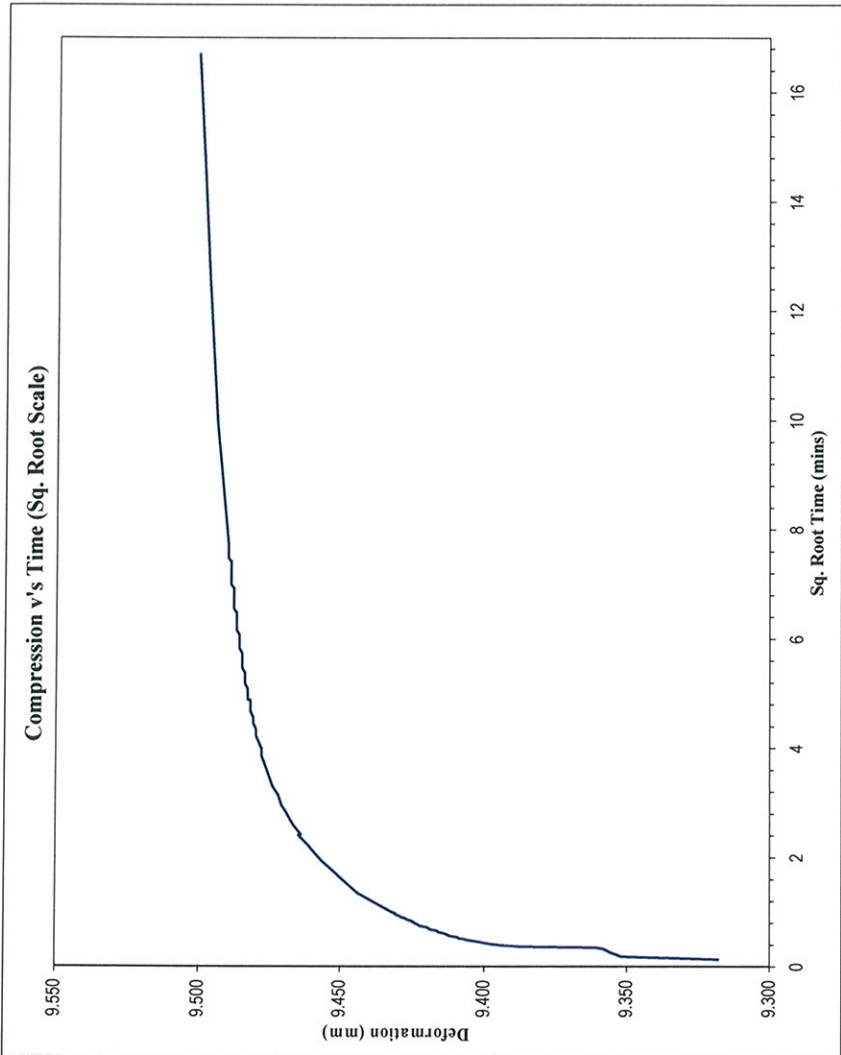
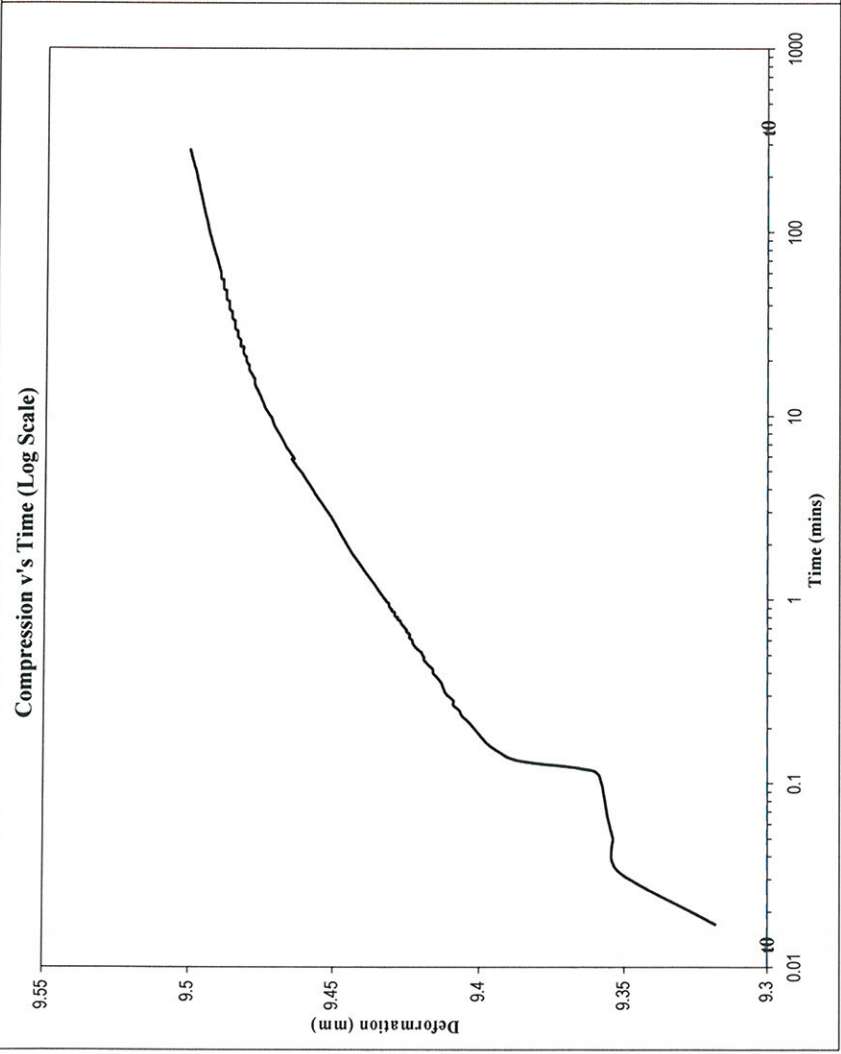
Primary	Time (mins)
	Time (mins)

(Dial) t0 = 9.296 mm
 (Dial) t100 = #N/A mm
 t100 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 10 (Rebound)

Stage Load : 200 kPa
 Rig Number : 11
 Stage : 800 - 200



Adjust max value of x axis

Primary	Root Time
	Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t90 = #N/A mins

Adjust max value of x axis

Secondary	Time (mins)
	Time (mins)

t50 = #N/A mm
 t50 = #N/A mins

t0 = 9.3 mm
 t100 = #N/A mm
 t100 = #N/A mins

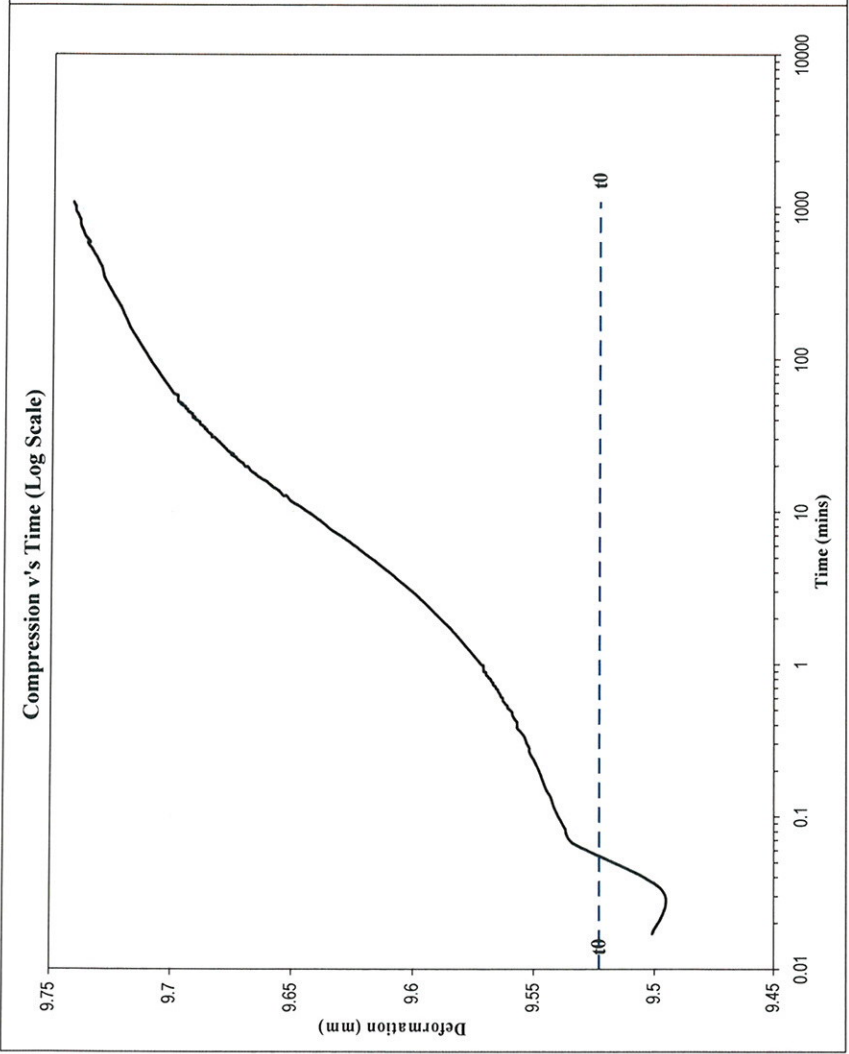
Initial stage height = 9.319 mm
 Final stage height = 9.501 mm

ΔHcα #N/A mm/log cycle

SAMPLE NO : LCOV12S-00422

Stage 11 (Rebound)

Stage Load : 50 kPa
 Rig Number : 11
 Stage : 200 - 50

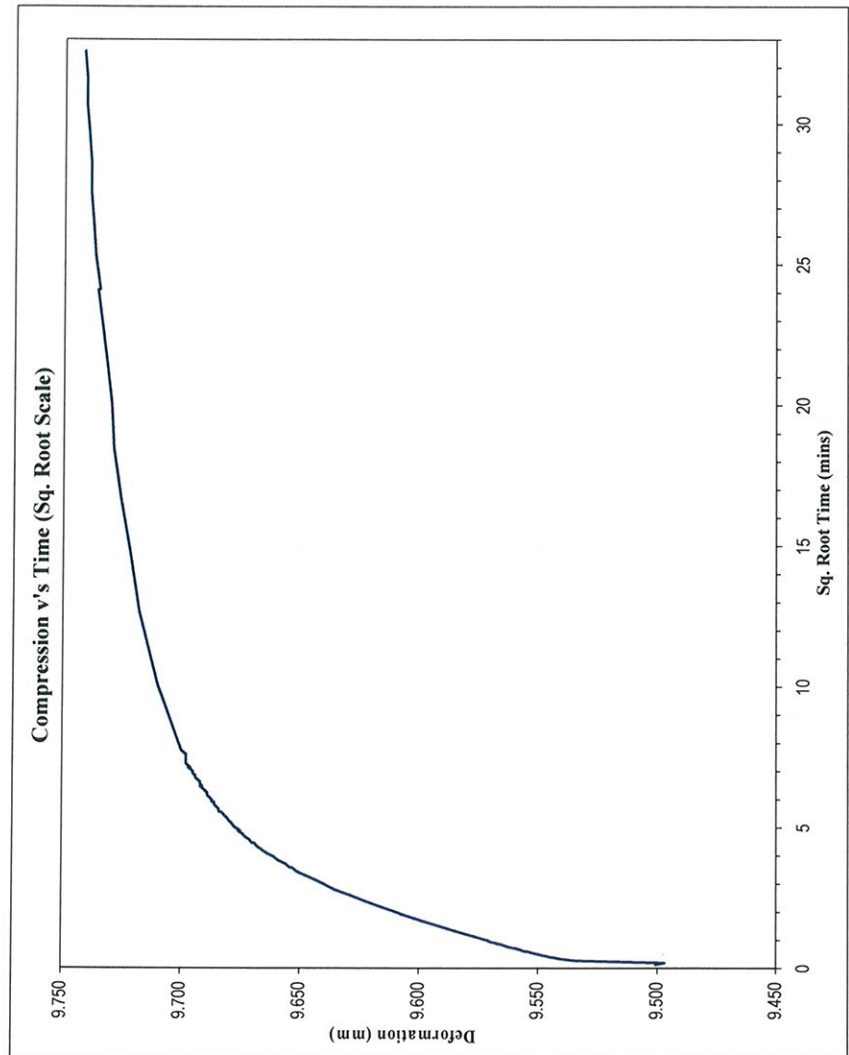


Adjust max value of x axis

Primary	Time (mins)	t0 = 9.523 mm
	Time (mins)	t100 = #N/A mm
	Time (mins)	t100 = #N/A mins

Secondary	Time (mins)	t50 = #N/A mm
	Time (mins)	t50 = #N/A mins

ΔHc = #N/A mm/log cycle
 Initial stage height = 9.501 mm
 Final stage height = 9.742 mm



Adjust max value of x axis

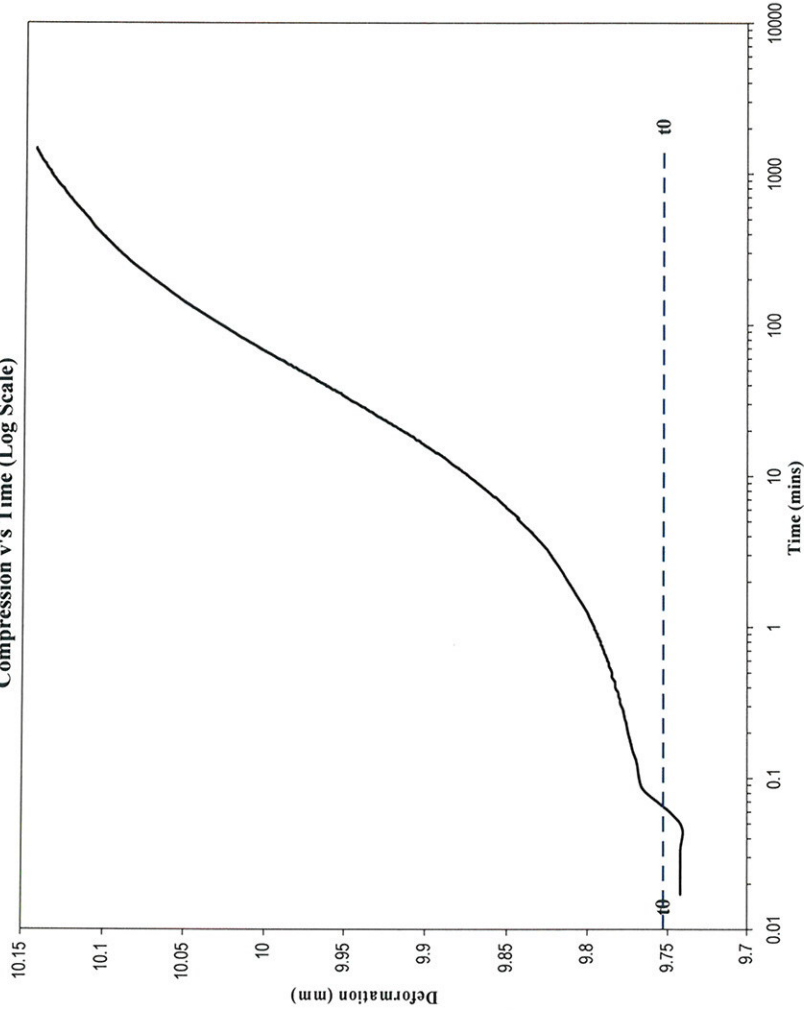
Primary	Root Time	t0 = #N/A mm
	Root Time	t90 = #N/A mm
	Root Time	t90 = #N/A mins

SAMPLE NO : LCOV12S-00422

Stage 12 (Rebound)

Stage Load : 4 kPa
 Rig Number : 11
 Stage : 50 - 4

Compression v's Time (Log Scale)



Adjust max value of x axis

Primary
Time (mins)
Time (mins)

Secondary
Time (mins)
Time (mins)

t0 = 9.753 mm
 t100 = #N/A mm
 t1000 = #N/A mins

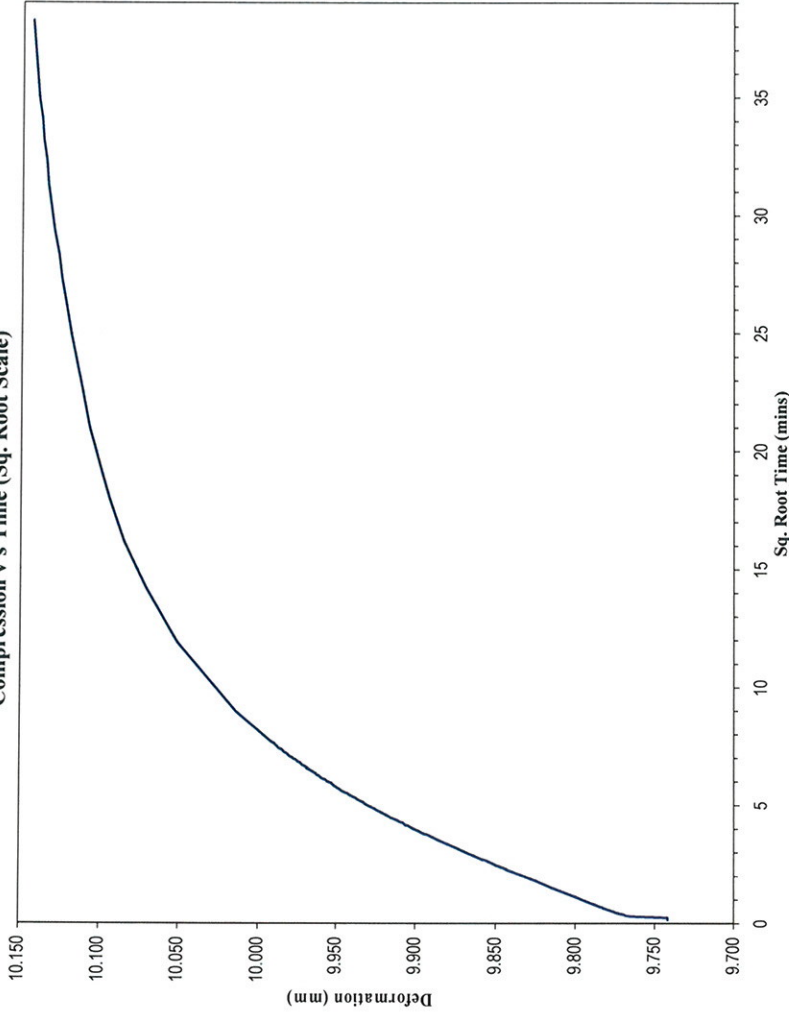
t50 = #N/A mm
 t500 = #N/A mins

Initial height = 9.742 mm
 Final height = 10.144 mm

$\Delta H\alpha$ #N/A mm/log cycle

t0 = #N/A mm
 t90 = #N/A mm
 t900 = #N/A mins

Compression v's Time (Sq. Root Scale)



Adjust max value of x axis

Primary
Root Time
Root Time

t0 = #N/A mm
 t90 = #N/A mm
 t900 = #N/A mins