

# Appendix D2

## Geotechnical investigations:

### RMS Factual Geotechnical Investigation Report

**Consolidation Test**

Client:	<b>ROADS AND MARITIME SERVICES, SOUTHERN REGION</b>	Office:	<b>SYDNEY</b>
Principal:	<b>ROADS AND MARITIME SERVICES, SOUTHERN REGION</b>	Date:	<b>17/5/2012</b>
Project:	<b>BERRY BYPASS</b>	By:	<b>GKC</b>
Location:	<b>PRINCES HIGHWAY</b>	Checked:	<b>GKC</b>

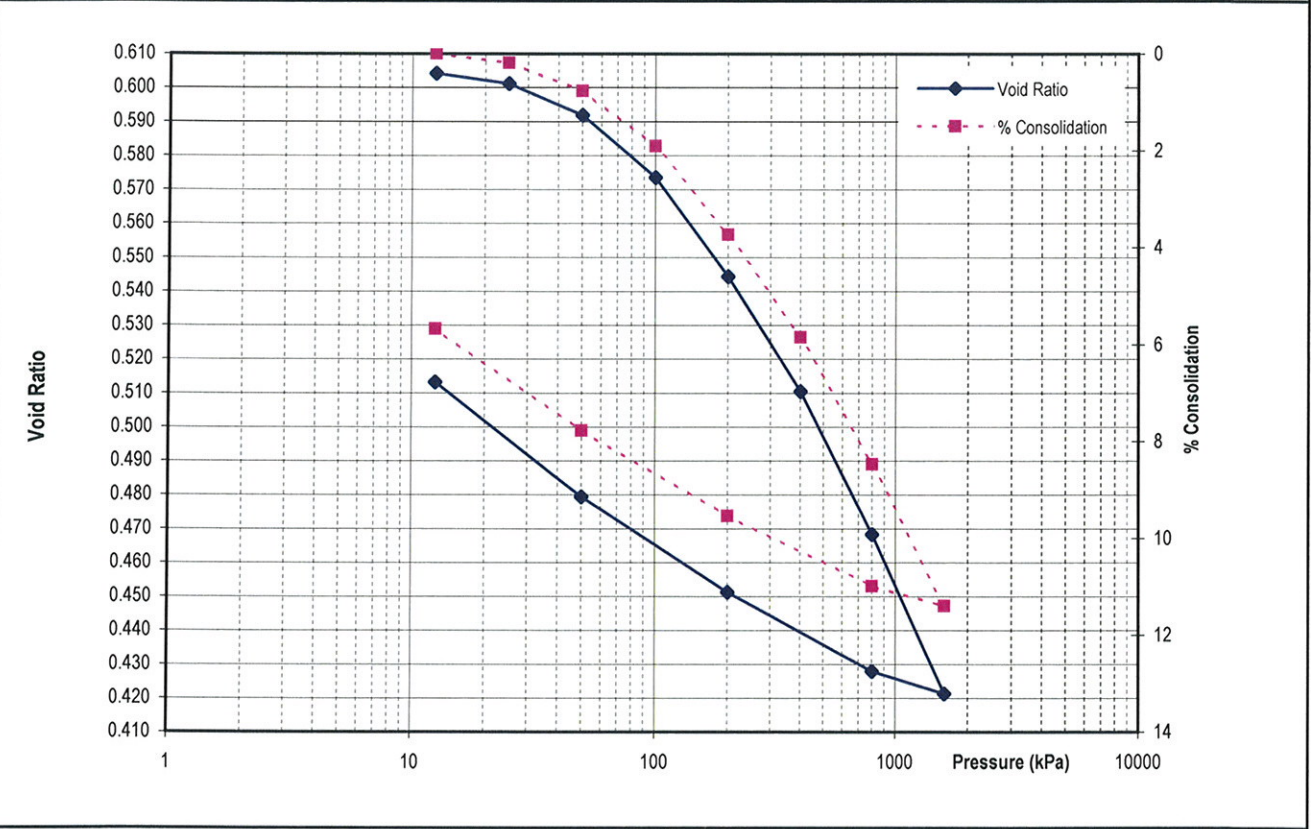
Test Procedure: **AS1289 6.6.1**

Borehole:	<b>B9</b>	Depth:	<b>2.00 to 2.35 m</b>	Report No:	<b>IOLT 5560</b>
Sample No.	<b>B9</b>	Laboratory No's	<b>LCOV12S-00423</b>	Sample Type:	<b>Undisturbed</b>

Material Description: **(CH) SILTY CLAY - high plasticity, light grey, trace of fine to medium sand.**

Initial Dry Density ( $t/m^3$ ):	<b>1.65</b>	Initial Moisture Content (%):	<b>21.3</b>	Initial Degree of Saturation (%):	<b>92.2</b>
Soil Particle Density ( $t/m^3$ ):	<b>2.65</b>	Final Moisture Content (%):	<b>21.0</b>	Initial Specimen Height (mm):	<b>20.027</b>

Pressure Range (kPa)		Void Ratio		Consolidation (%)	$C_v$ $m^2/year$	$m_v$ $m^2/kN$	$C_c$	$C_\alpha$
From	To	at start of load increment	at end of load increment					
12.5	25	0.604	0.601	0.190	1.49883	0.00015	0.01011	
25	50	0.601	0.592	0.769	1.16193	0.00023	0.03087	
50	100	0.592	0.574	1.912	1.06527	0.00023	0.06094	
100	200	0.574	0.544	3.735	1.19279	0.00019	0.09712	
200	400	0.544	0.510	5.847	1.62472	0.00011	0.11256	
400	800	0.510	0.468	8.474	1.82993	0.00007	0.13997	
800	1600	0.468	0.421	11.400	2.36153	0.00004	0.15593	
1600	800	0.421	0.428	10.990				
800	200	0.428	0.451	9.537				
200	50	0.451	0.479	7.779				
50	12.5	0.479	0.513	5.677				



GLEN-CONS RPT-001-2010



Lane Cove West Laboratory - Accreditation No. 431

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The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/national standards

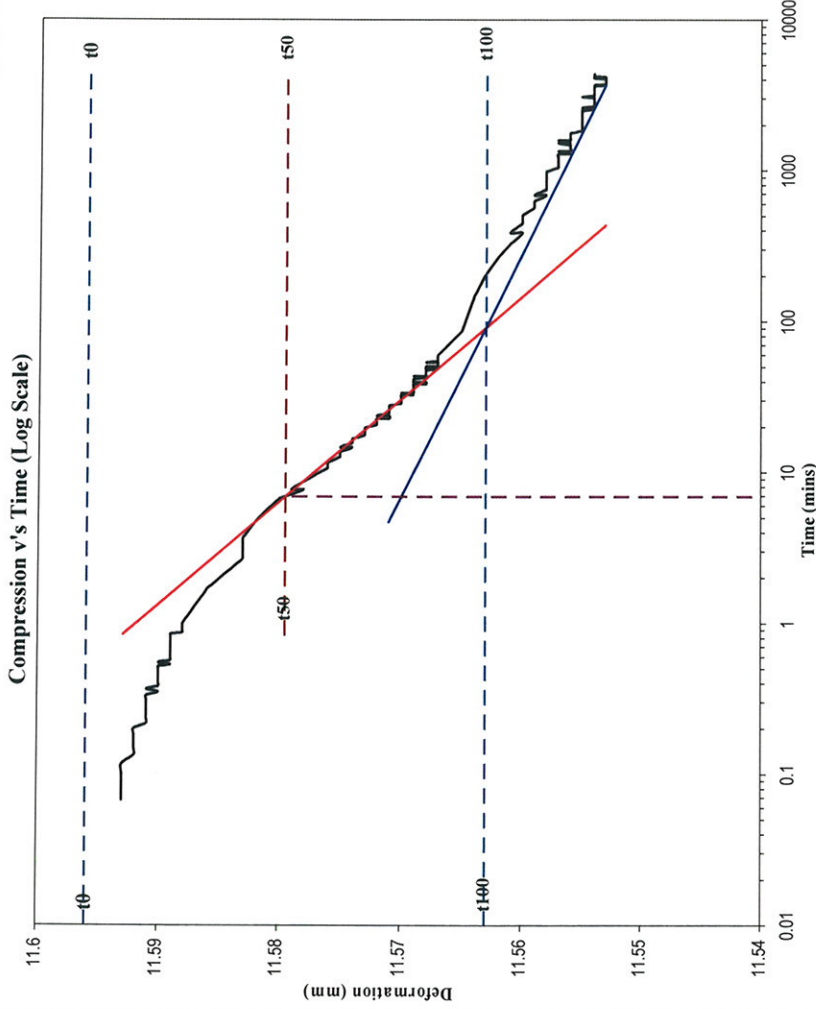
Garry K Collins

Approved Signatory

SAMPLE NO : LCOV12S-00423

**Stage 1**

Stage Load : 25 kPa  
 Rig Number : 10  
 Stage : 12.5 to 25.0



Adjust max value of x axis

Primary	Time (mins)
4.667	Time (mins)
48.667	Time (mins)

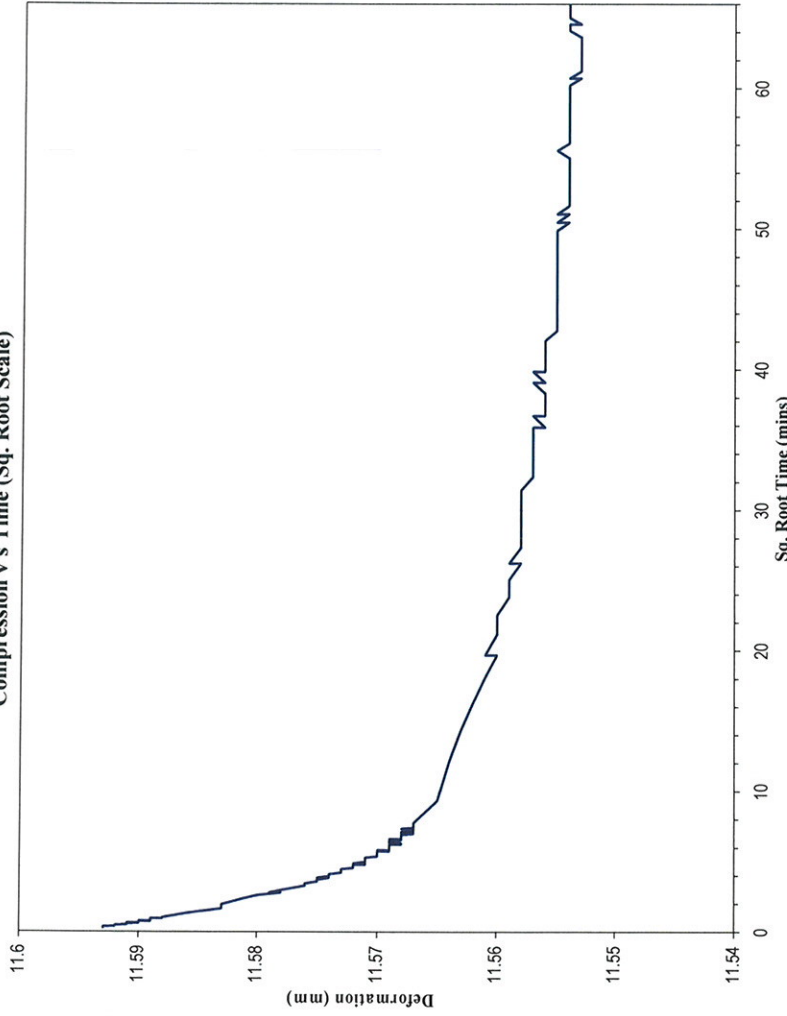
(Dial) t0 = 11.596 mm  
 (Dial) t100 = 11.563 mm  
 t100 = 90.7 mins

Secondary	Time (mins)
2546.667	Time (mins)
3686.667	Time (mins)

(Dial) t50 = 11.580 mm  
 t50 = 6.9 mins

$\Delta Hc$  0.0062 mm/log cycle  
 Initial dial gauge height = 11.593 mm  
 Final dial gauge height = 11.553 mm

Compression v's Time (Sq. Root Scale)



Adjust max value of x axis

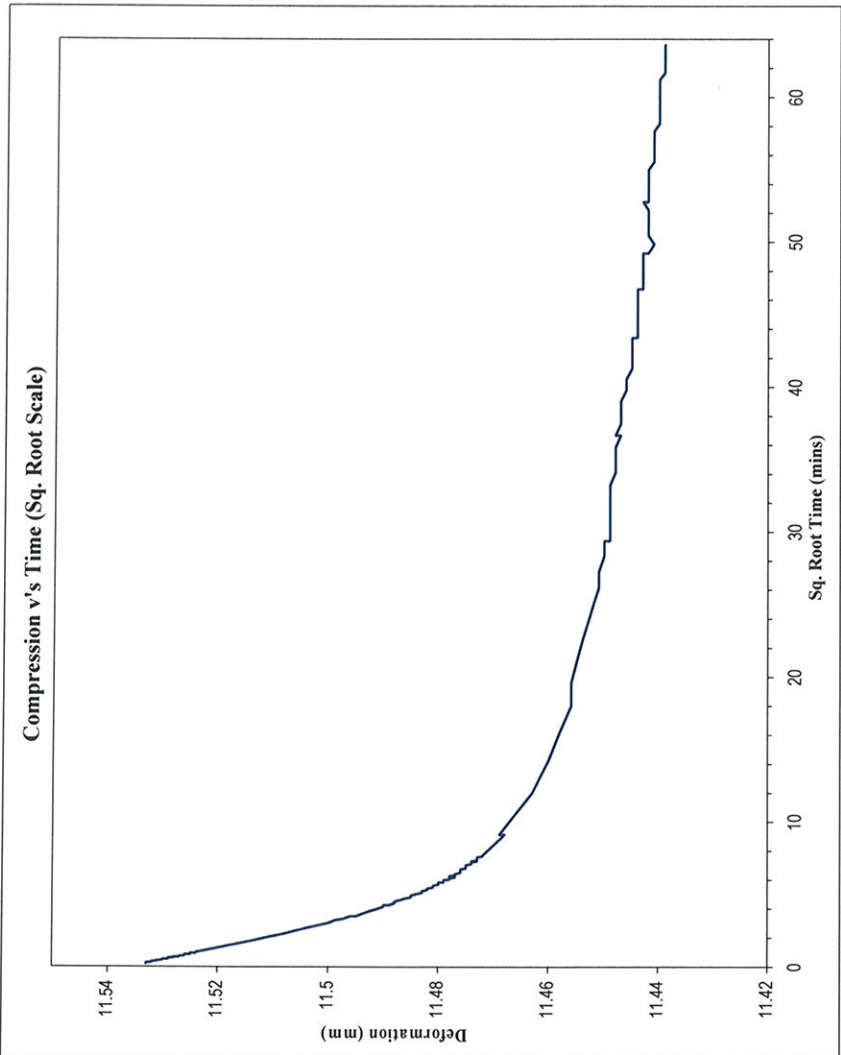
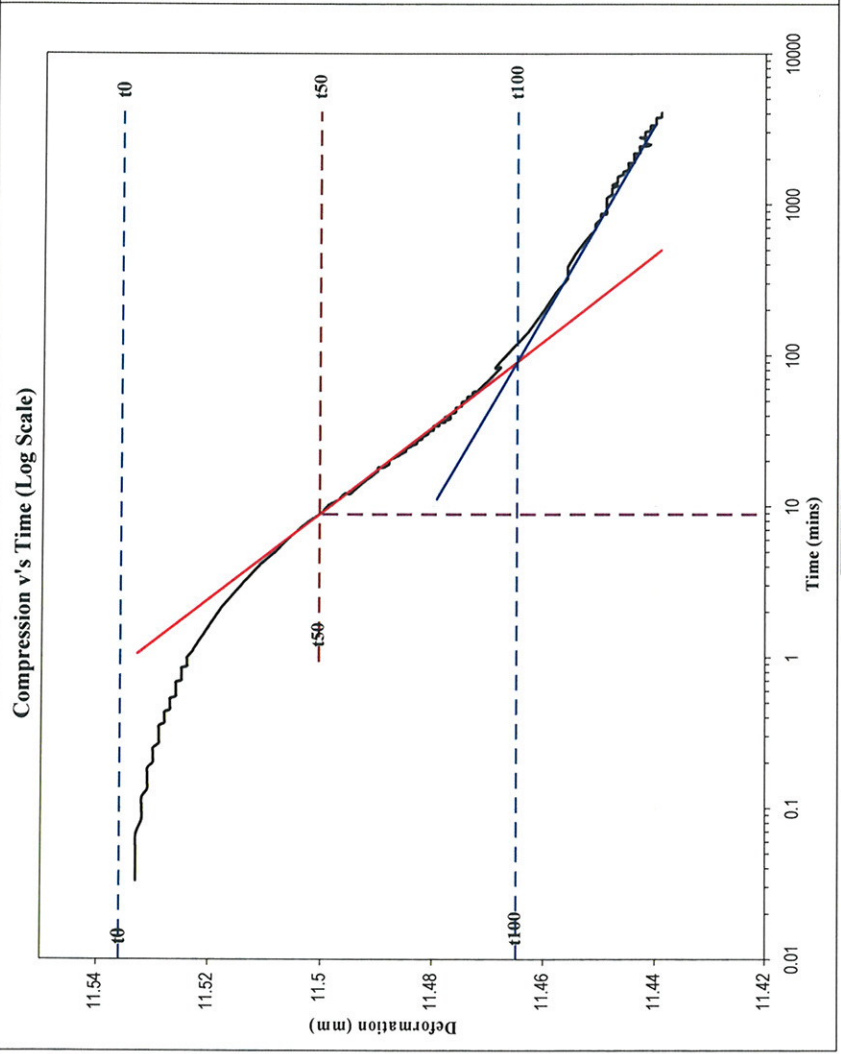
Primary	Root Time
	Root Time
	Root Time

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

SAMPLE NO : LCOV12S-00423

**Stage 2**

Stage Load : 50 kPa  
 Rig Number : 10  
 Stage : 25 - 50



Adjust max value of x axis

Primary	Time (mins)
11.1	Time (mins)
50.1	Time (mins)

Secondary	Time (mins)
803.1	Time (mins)
3443.1	Time (mins)

(Dial) t0 = 11.536 mm  
 (Dial) t100 = 11.465 mm  
 t100 = 90.3 mins

(Dial) t50 = 11.501 mm  
 t50 = 8.8 mins  
 $\Delta H\alpha$  0.0158 mm/log cycle  
 Initial dial gauge height = 11.533 mm  
 Final dial gauge height = 11.439 mm

Adjust max value of x axis

Primary	Root Time
	Root Time
	Root Time

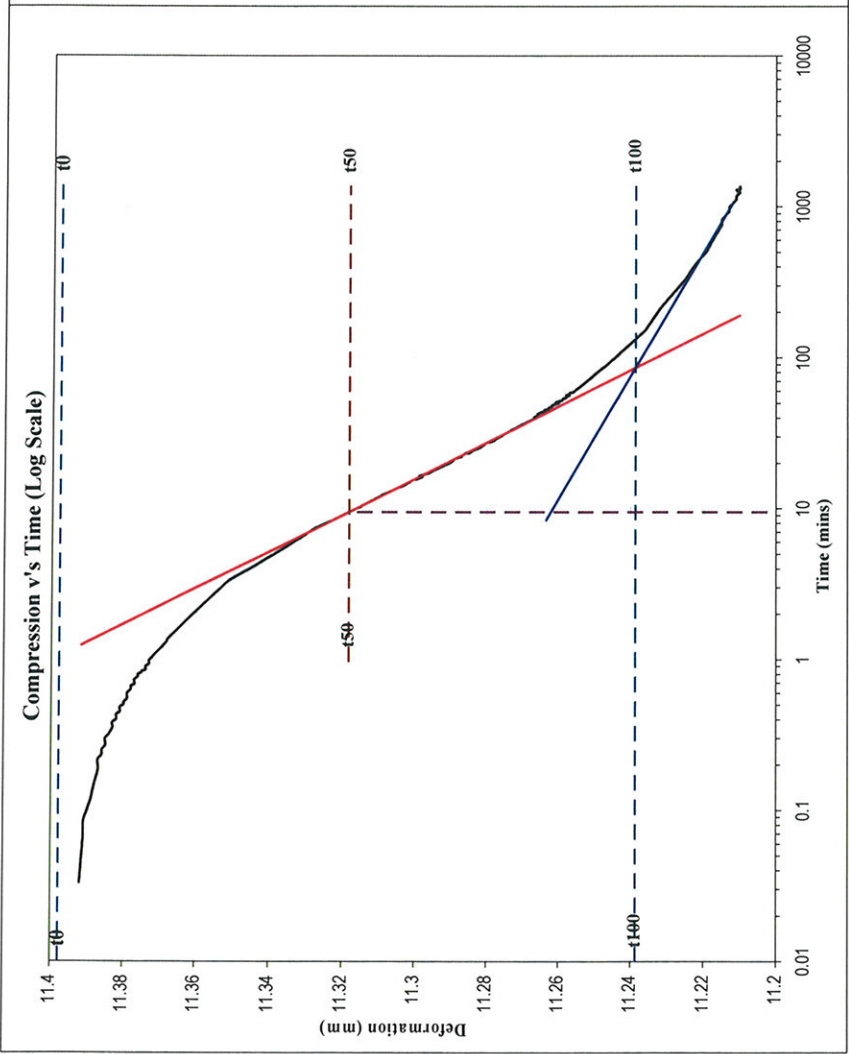
t0 = #N/A mm  
 t90 = #N/A mm  
 t90 = #N/A mins



SAMPLE NO : LCOV12S-00423

**Stage 3**

Stage Load : 100 kPa  
 Rig Number : 10  
 Stage : 50 - 100

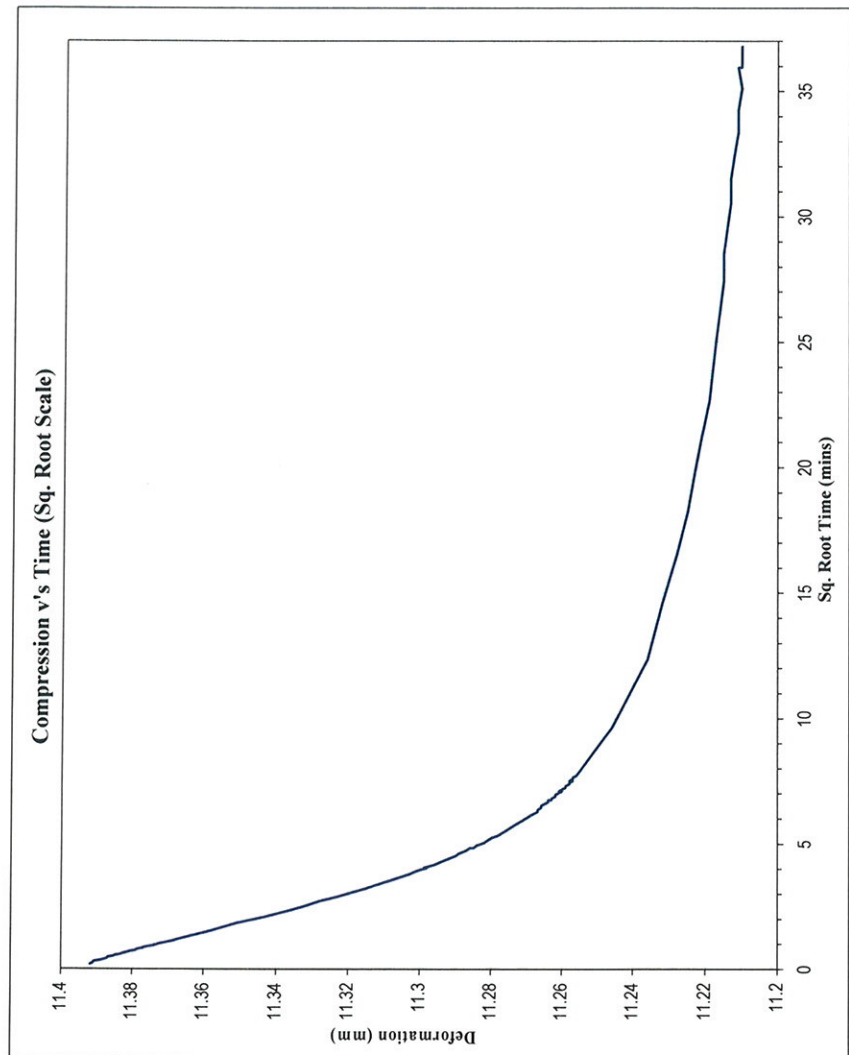


Adjust max value of x axis

Primary	Secondary
Time (mins)	Time (mins)
8.317	872.317
21.317	1052.333

(Dial) t0 = 11.398 mm  
 (Dial) t100 = 11.239 mm  
 t100 = 85.7 mins

(Dial) t50 = 11.318 mm  
 t50 = 9.5 mins  
 $\Delta H\alpha$  0.0245 mm/log cycle  
 Initial dial gauge height = 11.392 mm  
 Final dial gauge height = 11.210 mm



Adjust max value of x axis

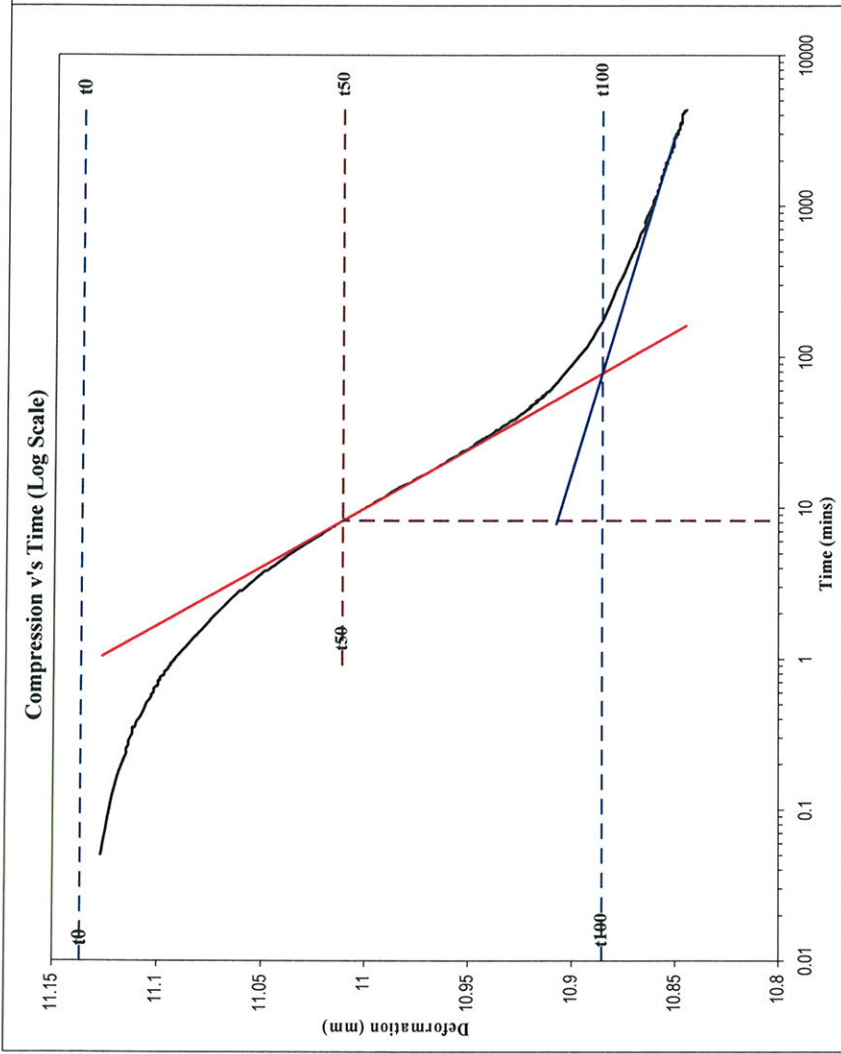
Primary	Root Time
Root Time	Root Time

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

SAMPLE NO : LCOV12S-00423

**Stage 4**

Stage Load : 200 kPa  
 Rig Number : 10  
 Stage : 100 - 200



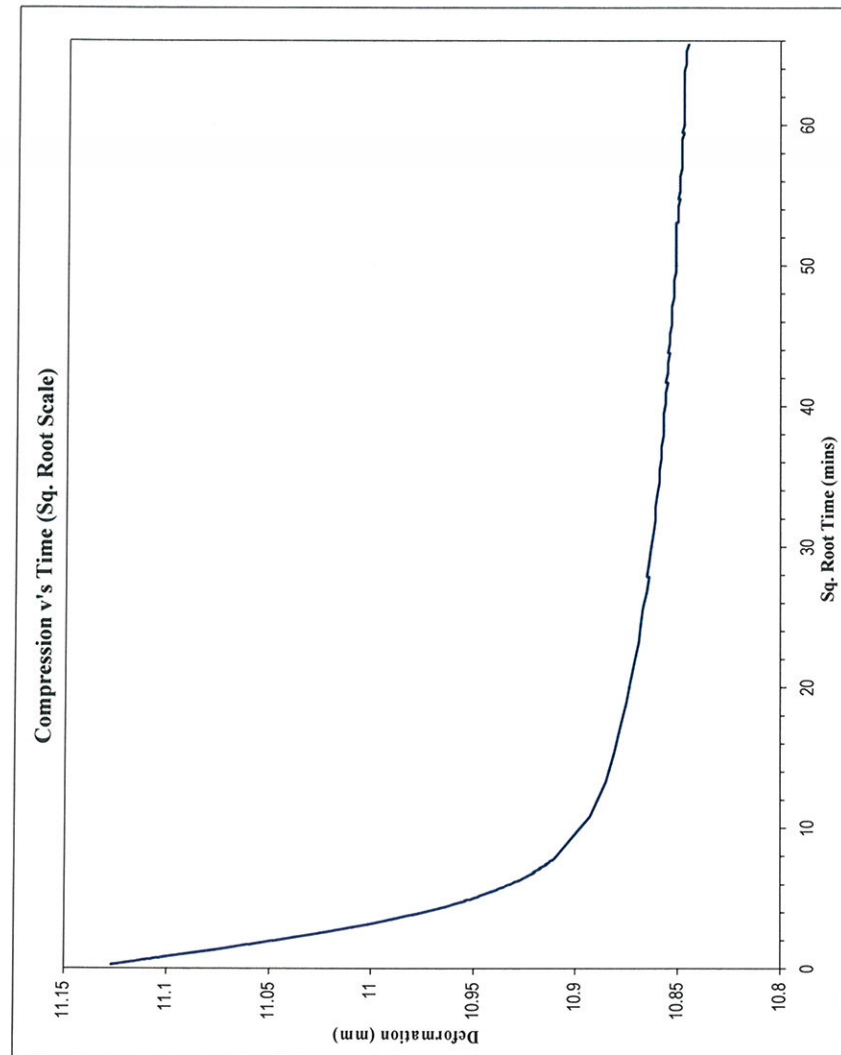
Adjust max value of x axis

Primary	Secondary
Time (mins)	Time (mins)
7.8	1616.8
22.817	2996.833

(Dial) t0 = 11.137 mm  
 (Dial) t100 = 10.886 mm  
 t100 = 77.7 mins

(Dial) t50 = 11.011 mm  
 t50 = 8.2 mins

$\Delta H\alpha$  0.0224 mm/log cycle  
 Initial dial gauge height = 11.127 mm  
 Final dial gauge height = 10.845 mm



Adjust max value of x axis

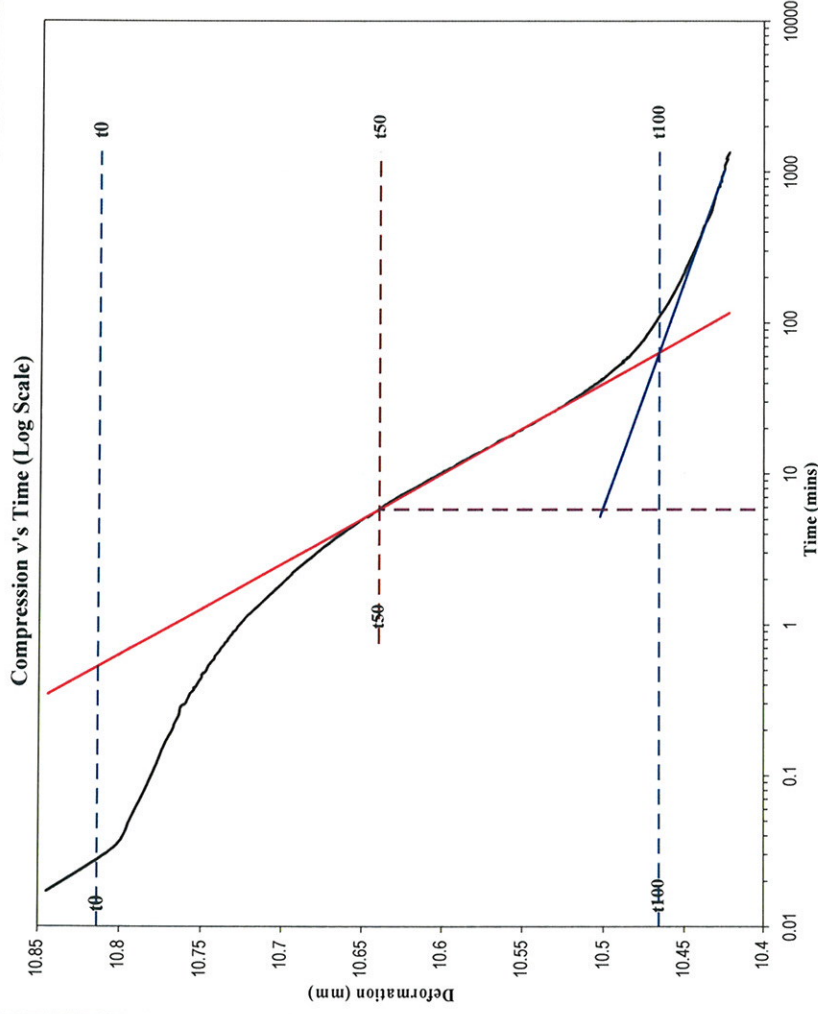
Primary	Root Time
Root Time	Root Time

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

**Stage 5**

Stage Load : 400 kPa  
 Rig Number : 10  
 Stage : 200 - 400

SAMPLE NO : LCOV12S-00423



Adjust max value of x axis

Primary	Time (mins)
5.167	Time (mins)
20.183	Time (mins)

Secondary	Time (mins)
736.183	Time (mins)
1036.183	Time (mins)

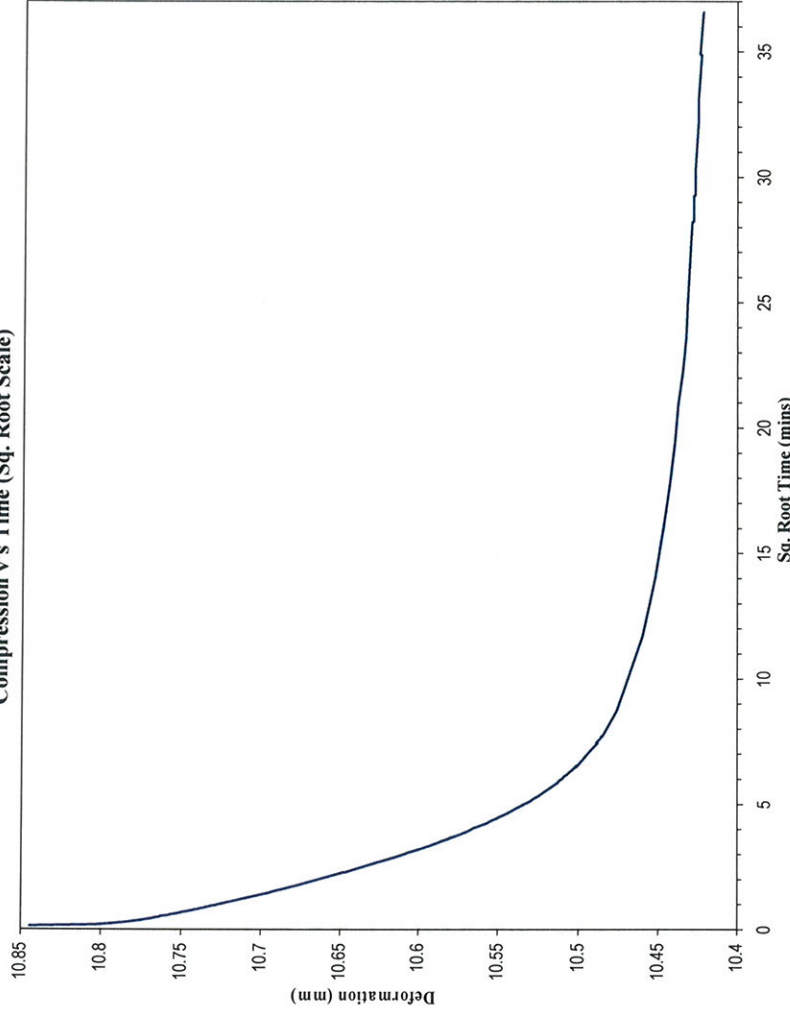
(Dial) t0 = 10.814 mm  
 (Dial) t100 = 10.466 mm  
 t100 = 63.4 mins

(Dial) t50 = 10.640 mm  
 t50 = 5.8 mins

$\Delta H\alpha$  0.0337 mm/log cycle

Initial dial gauge height = 10.845 mm  
 Final dial gauge height = 10.422 mm

Compression v's Time (Sq. Root Scale)



Adjust max value of x axis

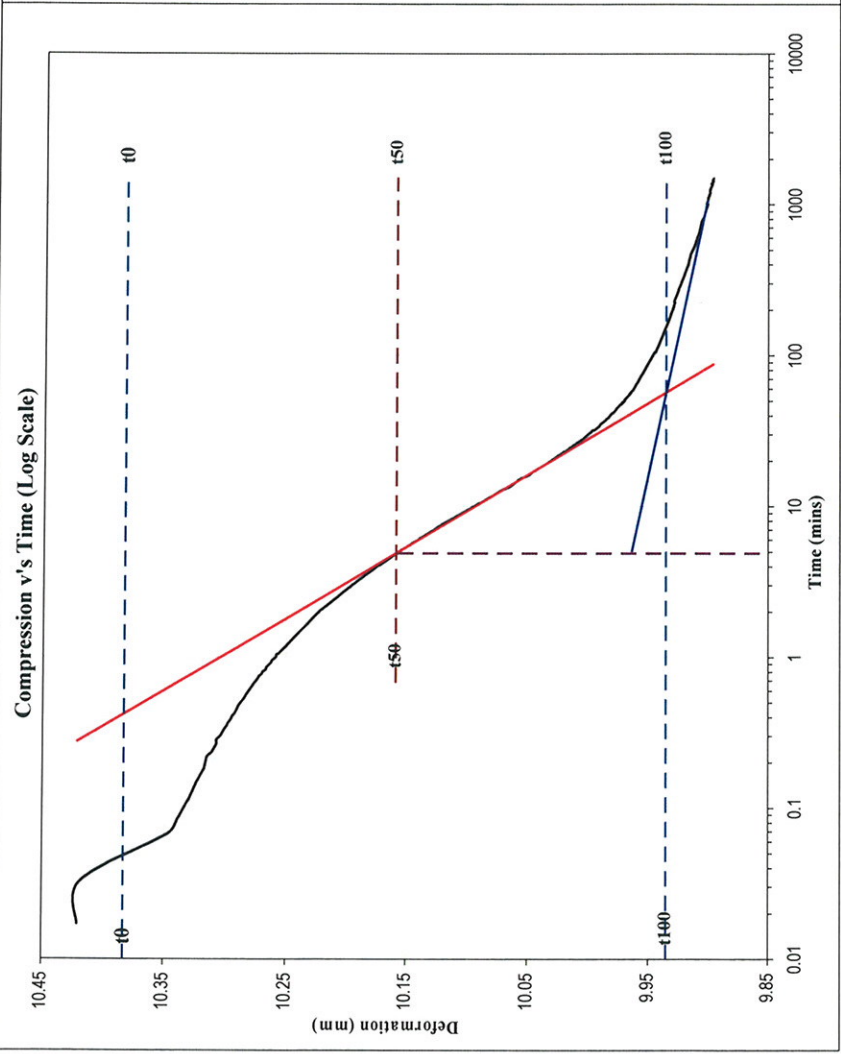
Primary	Root Time
	Root Time
	Root Time

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

SAMPLE NO : LCOV12S-00423

**Stage 6**

Stage Load : 800 kPa  
 Rig Number : 10  
 Stage : 400 - 800



Adjust max value of x axis

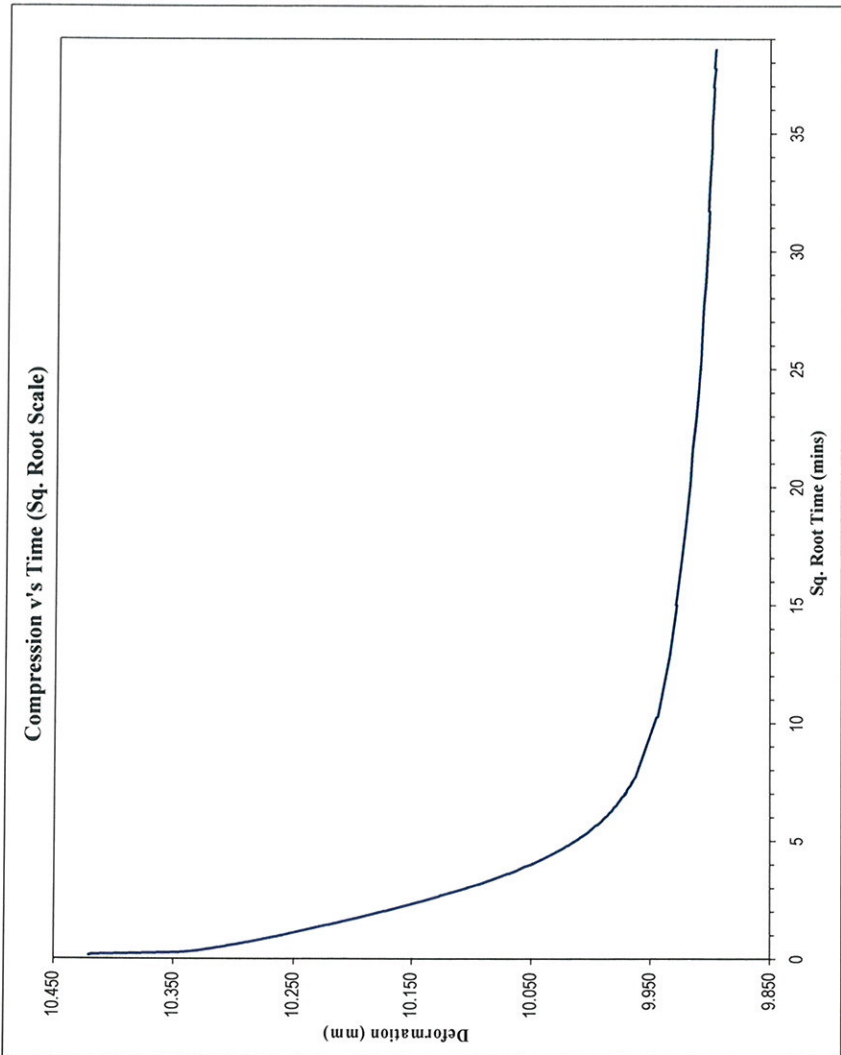
Primary	Time (mins)
5.05	Time (mins)
17.05	Time (mins)

Secondary	Time (mins)
825.05	Time (mins)
1065.05	Time (mins)

(Dial) t0 = 10.383 mm  
 (Dial) t100 = 9.935 mm  
 t100 = 56.6 mins

(Dial) t50 = 10.159 mm  
 t50 = 4.9 mins

$\Delta H_c$  0.0271 mm/log cycle  
 Initial dial gauge height = 10.422 mm  
 Final dial gauge height = 9.896 mm



Adjust max value of x axis

Primary	Root Time
	Root Time
	Root Time

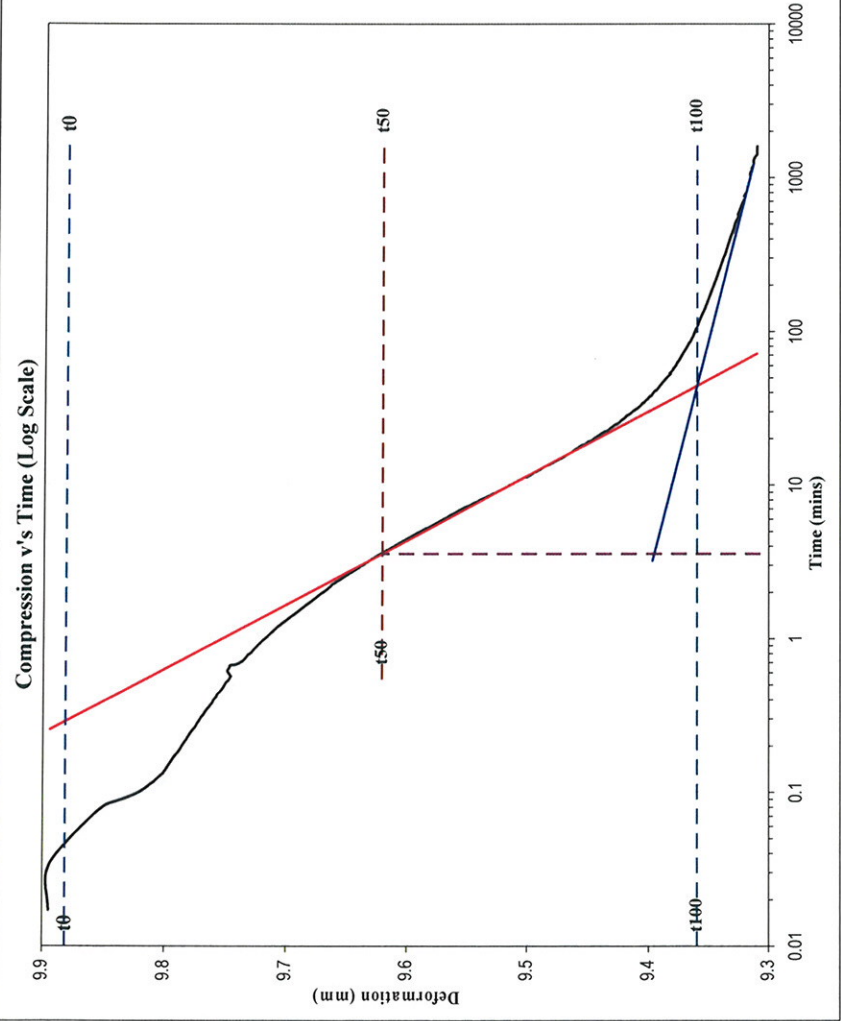
t0 = #N/A mm  
 t90 = #N/A mm  
 t90 = #N/A mins



SAMPLE NO : LCOV12S-00423

**Stage 7**

Stage Load : 1600 kPa  
 Rig Number : 10  
 Stage : 800 - 1600



Adjust max value of x axis

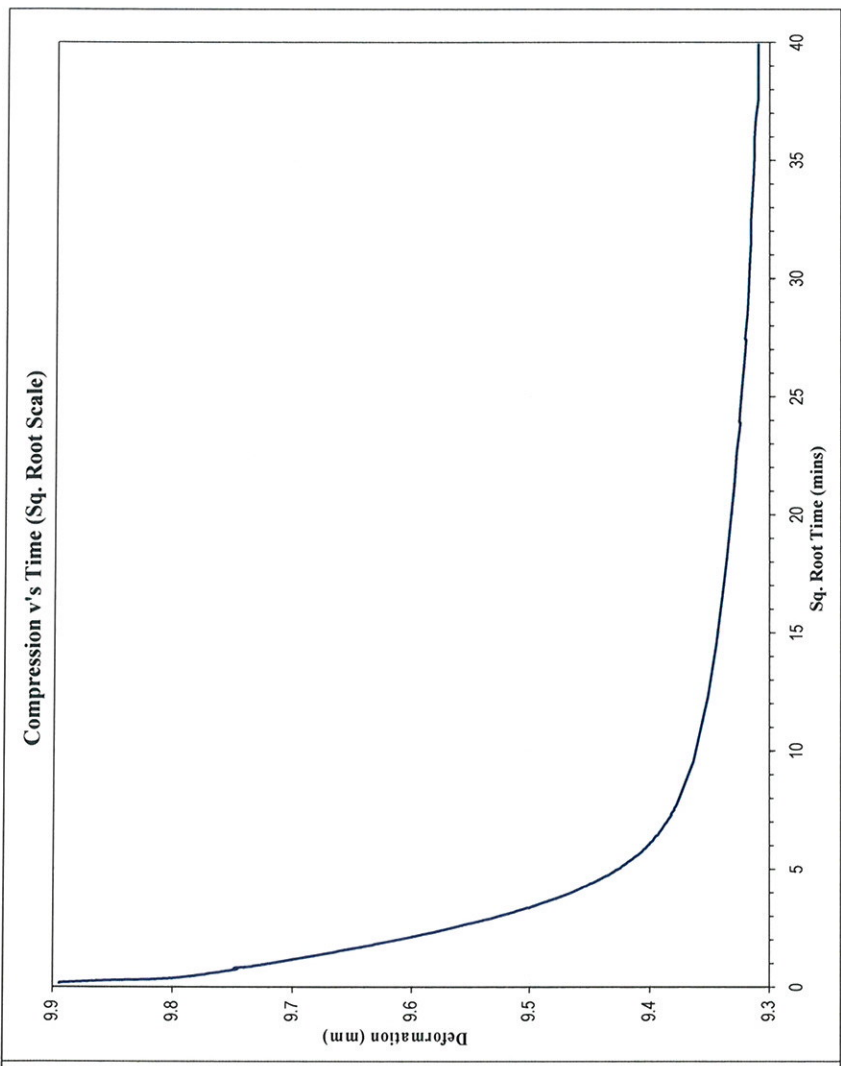
Primary	Time (mins)
	3.2
	13.2

Secondary	Time (mins)
	751.2
	1231.717

(Dial) t0 = 9.882 mm  
 (Dial) t100 = 9.360 mm  
 t100 = 44.0 mins

(Dial) t50 = 9.621 mm  
 t50 = 3.6 mins

$\Delta H\alpha$  0.0326 mm/log cycle  
 Initial dial gauge height = 9.895 mm  
 Final dial gauge height = 9.310 mm



Adjust max value of x axis

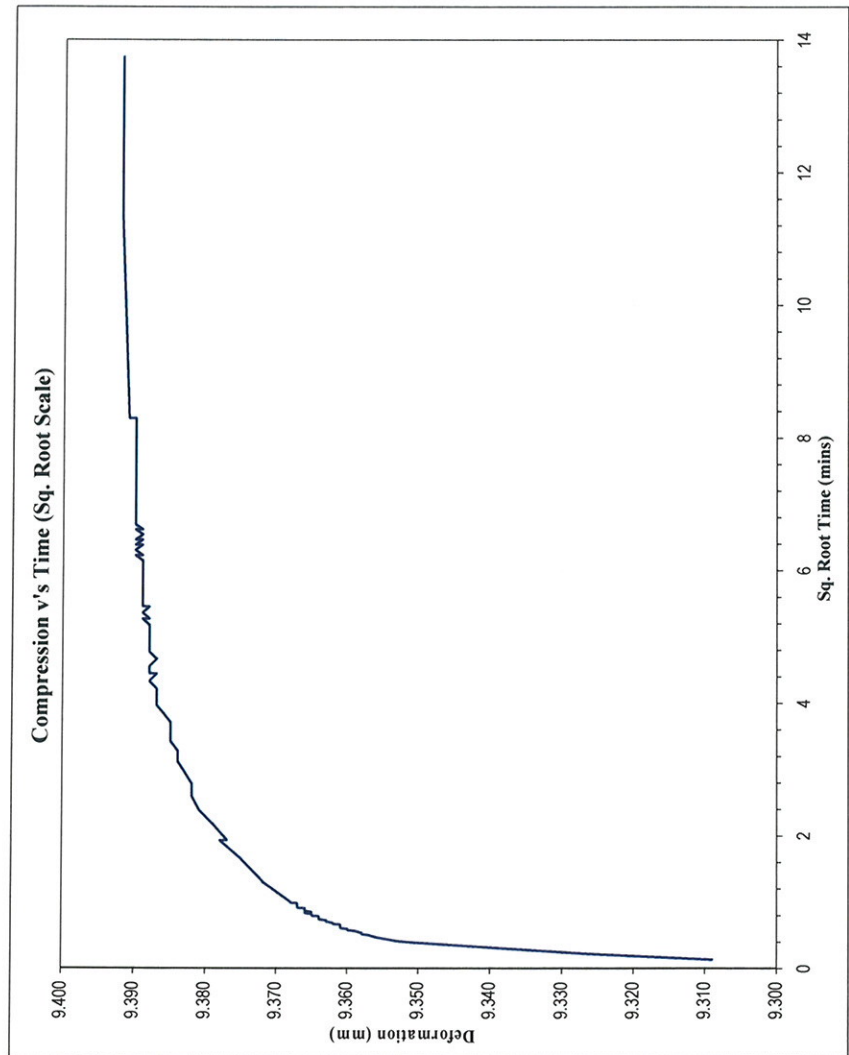
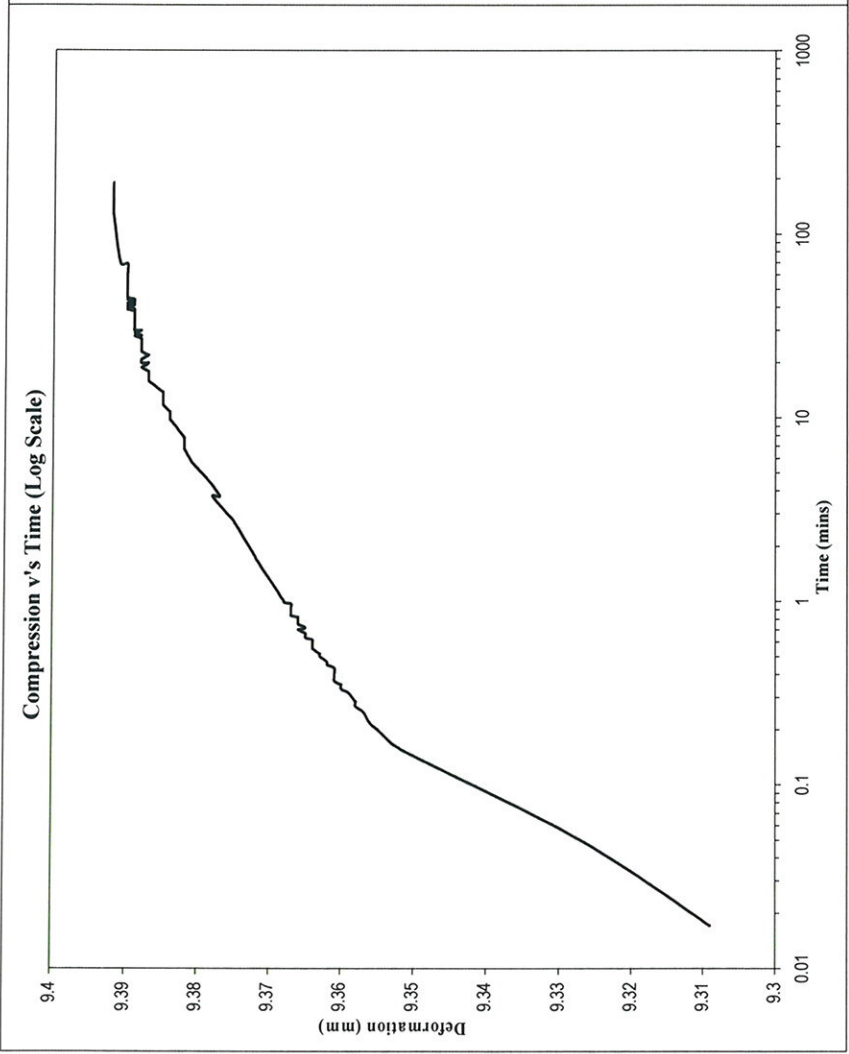
Primary	Root Time

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

SAMPLE NO : LCOV12S-00423

**Stage 8 (Rebound)**

Stage Load : **800** kPa  
 Rig Number : **10**  
 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 = 9.309 mm  
 Final dial gauge height = 9.392 mm

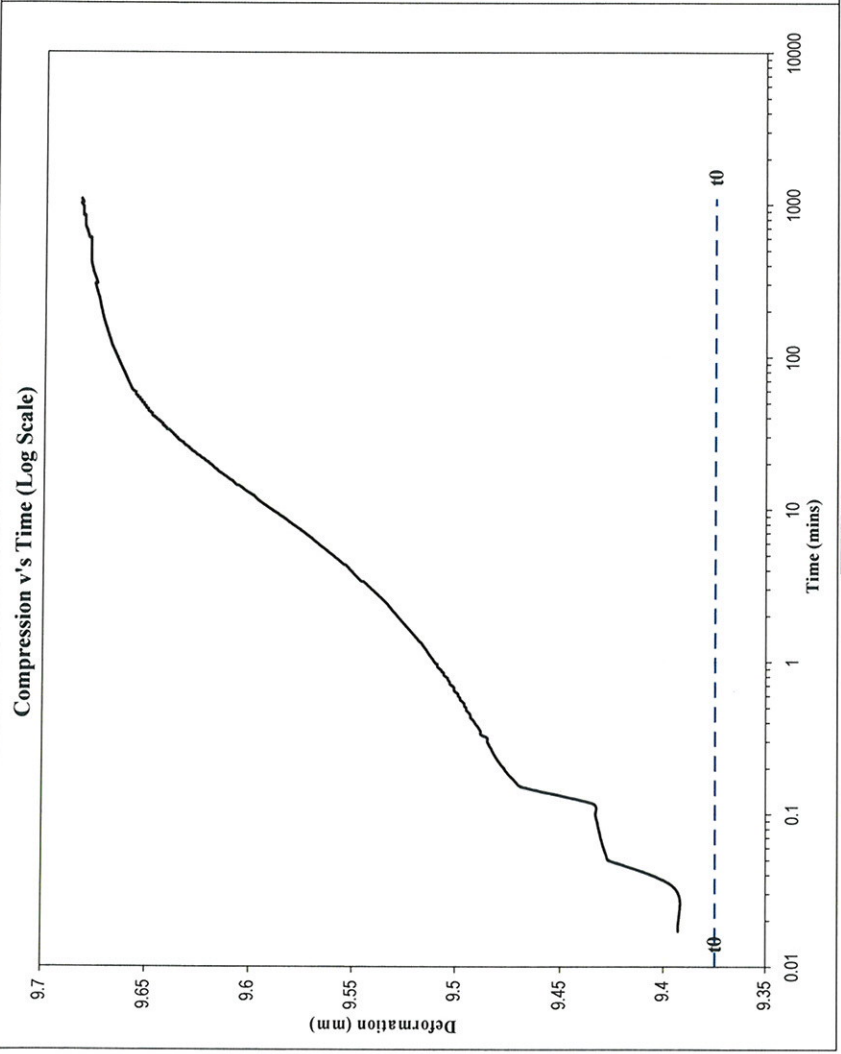
Primary	Time (mins)
	Time (mins)

(Dial) t0 = 9.293 mm  
 (Dial) t100 = #N/A mm  
 t100 = #N/A mins

SAMPLE NO : LCOV12S-00423

**Stage 9 (Rebound)**

Stage Load : 200 kPa  
 Rig Number : 10  
 Stage : 800 - 200



Adjust max value of x axis

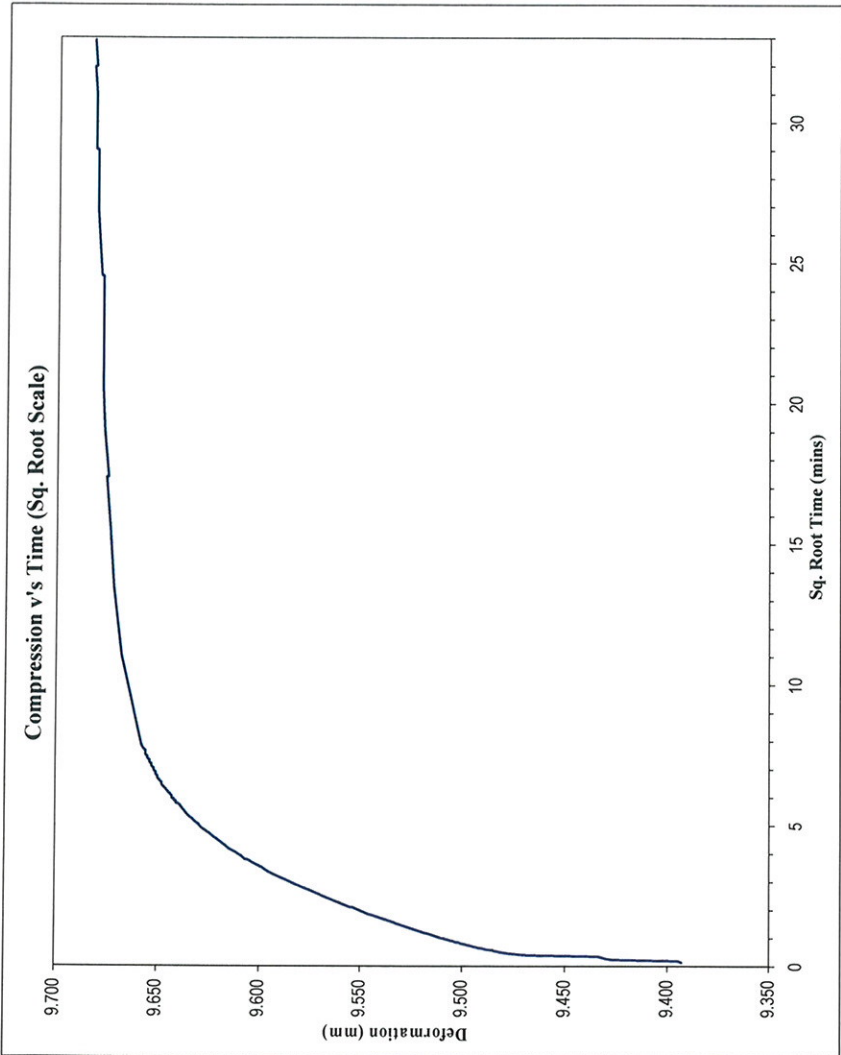
Primary	Time (mins)
	Time (mins)

Secondary	Time (mins)
	Time (mins)

(Dial) t0 = 9.375 mm  
 (Dial) t100 = #N/A mm  
 t100 = #N/A mins

(Dial) t50 = #N/A mm  
 t50 = #N/A mins

$\Delta H_c$  #N/A mm/log cycle  
 Initial dial gauge height = 9.393 mm  
 Final dial gauge height = 9.683 mm



Adjust max value of x axis

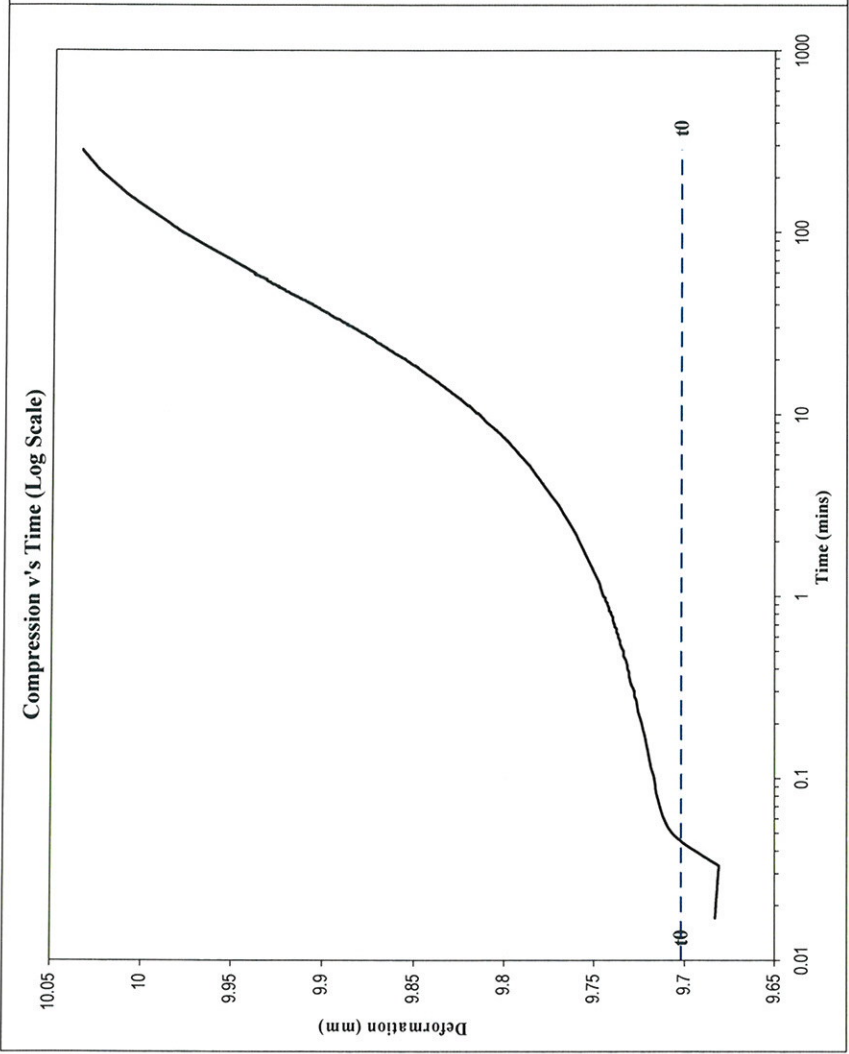
Primary	Root Time
	Root Time

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

SAMPLE NO : LCOV12S-00423

**Stage 10 (Rebound)**

Stage Load : **50** kPa  
 Rig Number : **10**  
 Stage : **200 - 50**



Adjust max value of x axis

Primary	Time (mins)
	Time (mins)

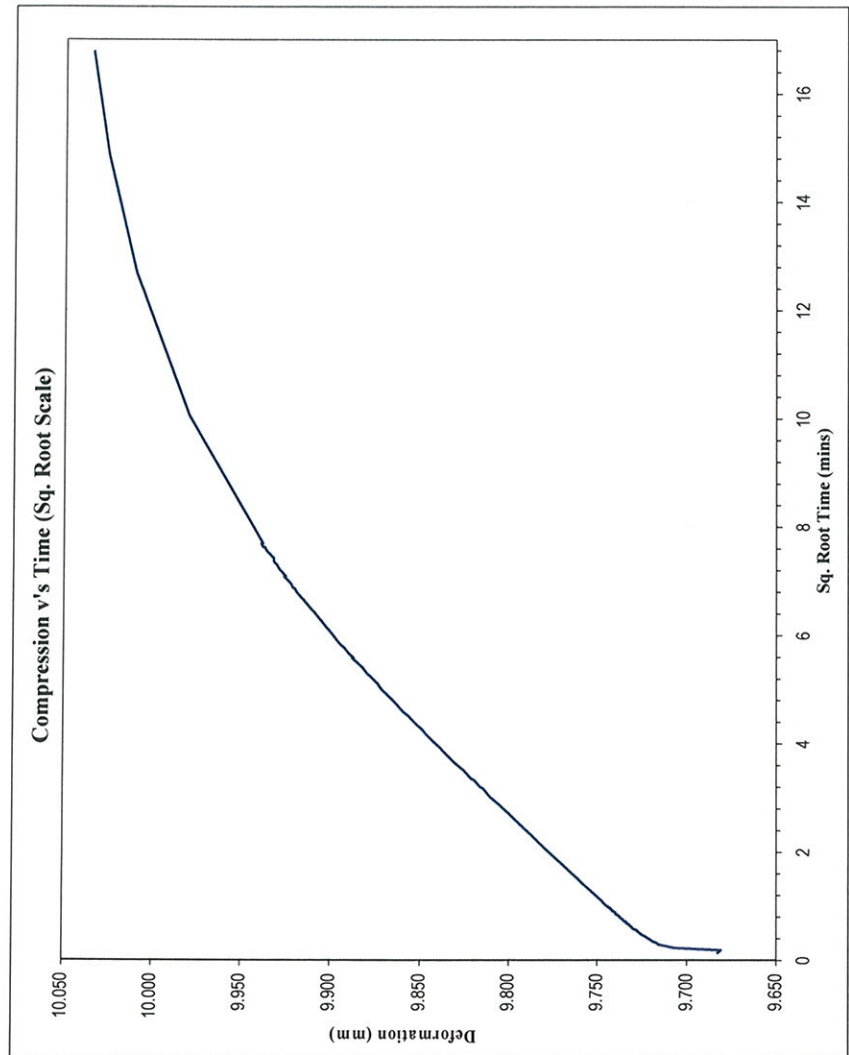
Secondary	Time (mins)
	Time (mins)

t0 = **9.702** mm  
 t100 = #N/A mm  
 t100 = #N/A mins

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

ΔHc #N/A mm/log cycle

Initial stage height = **9.683** mm  
 Final stage height = **10.035** mm



Adjust max value of x axis

Primary	Root Time
	Root Time

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

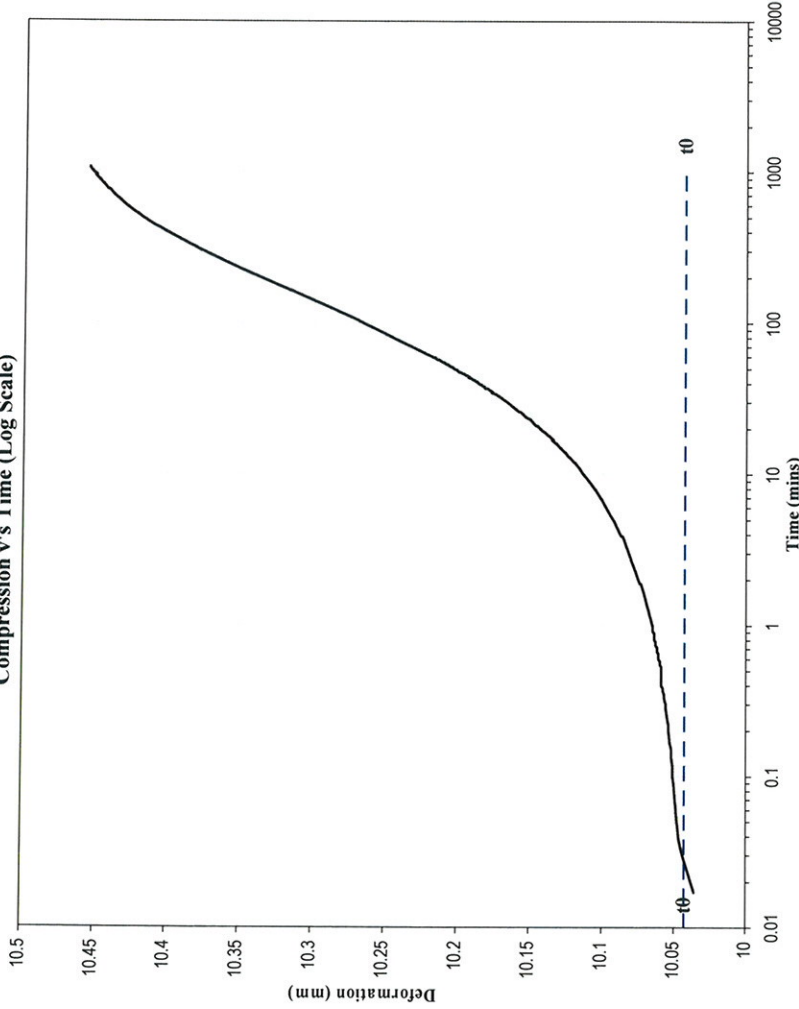


SAMPLE NO : LCOV12S-00423

**Stage 11 (Rebound)**

Stage Load : 13 kPa  
 Rig Number : 10  
 Stage : 50 - 12.5

Compression v's Time (Log Scale)



Adjust max value of x axis

Primary	Time (mins)
	Time (mins)

Secondary	Time (mins)
	Time (mins)

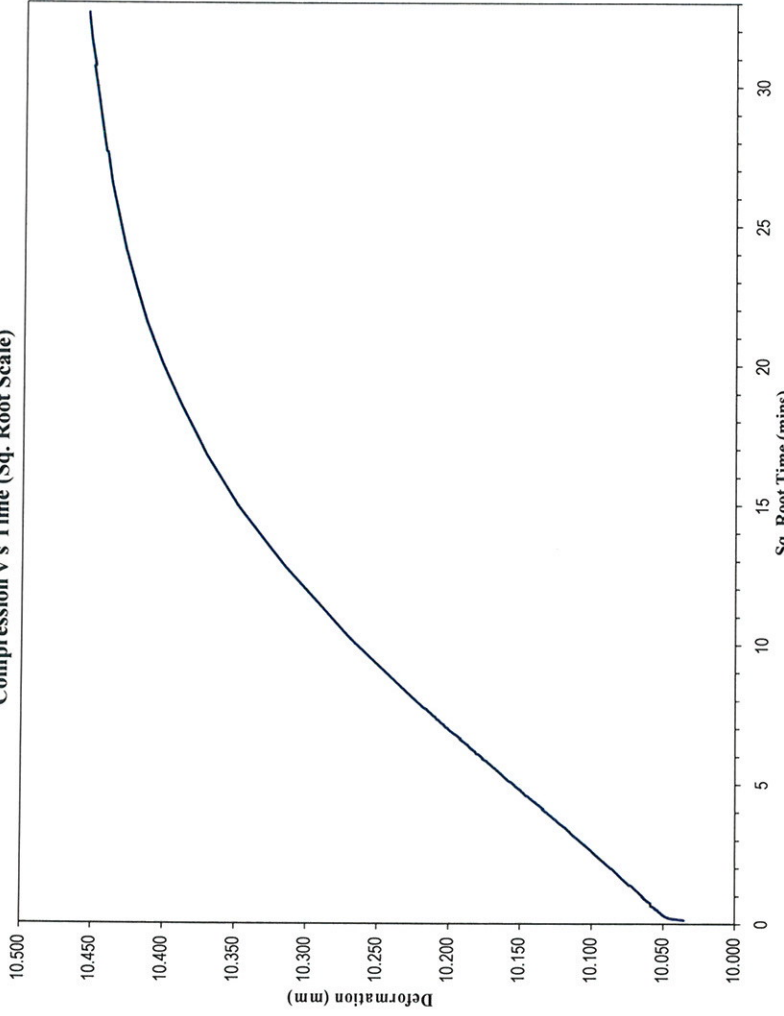
t0 = 10.043 mm  
 t100 = #N/A mm  
 t50 = #N/A mins

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

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

Initial stage height = 10.036 mm  
 Final stage height = 10.456 mm

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  
 t90 = #N/A mins