

**GROUND ANCHOR STRESSING RECORD** (FORM GATR)Rev.3

Type of Test: **ON-SITE ACCEPTANCE TEST (√) OR ON-SITE SUITABILITY TEST ( )**

**PROJECT :Pembaikan Cerun Jalan Penampang-Tambunan-Keningau-Tenom, Pakej 2C**

**SLOPE NO. : KM56.97 ANCHOR NO. : BP-12 LEVEL NO. : L-1 DATE : 15/8/2011**

Design Working Load (Tw) : <b>700</b> KN	Dia. Of Strand (Ds) : <b>15.24</b> mm	Tendon Length (Lt) : <b>25.00</b> m
Specified Preload (Tp) : <b>250</b> KN	Area Of Strand (As) : <b>140</b> mm <sup>2</sup>	Bond Length (Lb) : <b>6.30</b> m
Proof Load (150% of Tw) : <b>1050</b> KN	Nos. Of Strands (Ns) : <b>6</b> nos.	Free Length (Lf) : <b>17.50</b> m
Angle Of Inclination : <b>20</b> deg.	Elastic Modulus (Es) : <b>200</b> KN/mm <sup>2</sup>	Design Free Length : <b>18</b> m

Displacement Measurement System : By Steel Ruler.	Jack Type / Capacity : <b>RHR 2508/150 tons</b>
Load Measurement System : By <b>*Pressure Gauge (P.G.) [Yes]</b> AND <b>**Load Cell (L.C.) [ ]</b>	
*Effective Ram Area : <b>346.5</b> (cm <sup>2</sup> ) <b>53.71</b> (in <sup>2</sup> ) *Correlated Factor : <b>4.18</b> (psi per KN)	
**Load Cell Ref. No. : <b>                    </b> **Gauge Factor : <b>                    </b> KN/digit **Zero Reading : <b>                    </b>	

**(1) APPARENT FREE LENGTH COMPLIANCE :-**

**MONITORING OF "LOAD - DISPLACEMENT DATA"**

Extrusion (from bearing plate) : **1.20** m

(a) Unused "Stressing" Length (*Lu) : <b>0.54</b> m	(b) Cal. Free Tendon Length (Lfs) = (Lt - Lb - Lu) : <b>18.16</b> m
(c) Min. App. Free Tendon Length (90% Lf) : <b>15.75</b> m	(d) Max. App. Free Tendon Length (Lf + 50% of Lb) : <b>20.65</b> m
(e) OR Max. App. Free Tendon Length (110% of Lfs) : <b>19.98</b> m	

% of Tw	Load (Ta) (KN)	* P.G. (psi)	** L.C. (Reading)	Ram Displacement, E (mm)				Remark
				0 min.	1 min.	5 min.	15 min.	
<b>1st Cycle</b>								
				38 (Ram displacement at zero initial reading)				
20%	144	21%	600	44	-	-	-	
50%	359	51%	1500	65	-	-	-	Plastic
100%	718	103%	3000	105	-	-	-	Disp. (ΔEp)
150%	1053	150%	4400	145	-	-	-	25 mm
100%	718	103%	3000	135	-	-	-	
50%	359	51%	1500	95	-	-	-	
20%	144	21%	600	63	-	-	-	
<b>2nd Cycle</b>								
20%	144	21%	600	63	63	-	-	Plastic
50%	359	51%	1500	75	75	-	-	Disp. (ΔEp)
100%	718	103%	3000	113	113	-	-	2 mm
150%	1053	150%	4400	150	150	150	150	
100%	718	103%	3000	136	136	-	-	Elastic
50%	359	51%	1500	97	97	-	-	Disp. (ΔEe)
20%	144	21%	600	65	65	-	-	85 mm

APPARENT FREE LENGTH =  $\frac{(\Delta E_e \times E_s \times N_s \times A_s)}{(\Delta T_a) \times 1000}$  = **16.45** m

**(2) COMPLIANCE OF EITHER "RESIDUAL LOAD - TIME DATA" OR "DISPLACEMENT - TIME DATA" (Note: Test method depends on the accuracy of the test equipments that can measured within 0.5% change in load or displacement)**

**MONITORING OF "DISPLACEMENT - TIME DATA" AT DESIGN WORKING LOAD. - (Remark : The Applied Load is taken as 110% of Tw, OR otherwise as directed by Engineer.)**

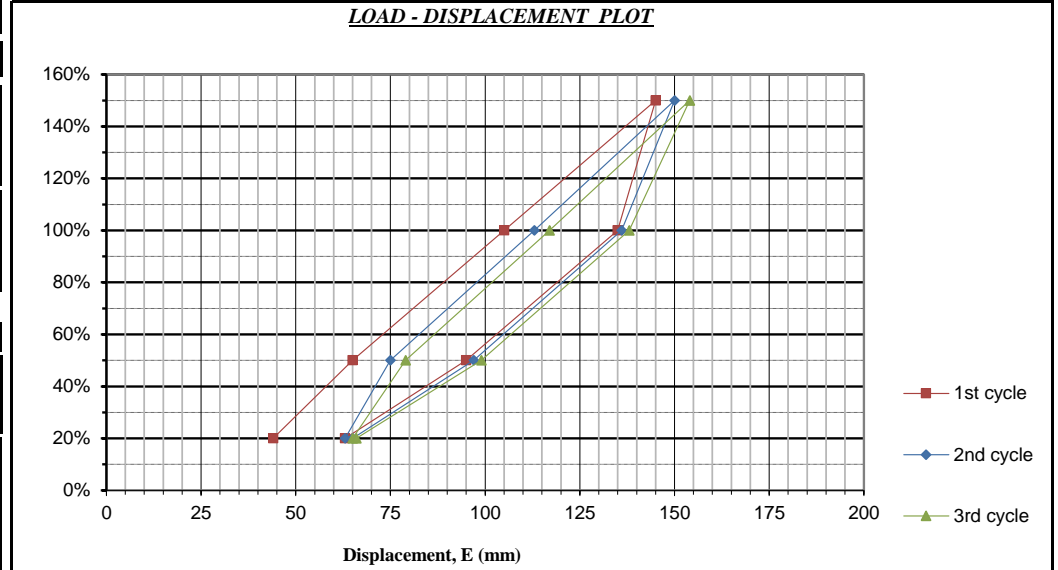
Time	Load		Ram Disp. (mm)	Net Ram Disp. (mm)	**L.C. Or #D.G. (Reading)		Loss of Load/change in Disp. (%)		% Permissible (should be <1% per interval)	Remark
	psi	kN			mm	mm	Total	Interval		
0 min.	3200	766	123	58	12		-	-	-	-
5 min.	3200	766	123	58	12.89	0.89	1.07%	1.07%	1 %	O.K./ Not Acceptable
15 min.	3200	766	123	58	13	1	1.21%	0.13%	2 %	O.K./ Not Acceptable
50 min.	3200	766	123	58	13.02	1.02	1.23%	0.02%	3 %	O.K./ Not Acceptable

\* Note : The rate of displacement (% of Change) should reduce to 1% or less per time interval of observation period.

**(3) ANCHOR LOCKED-OFF TEST & MEASUREMENT OF RESIDUAL LOAD. - (Remark : The Locked-Off Load is taken as 110% of Tp OR otherwise as directed by the Engineer if the load loss at lock-off is higher than 10%)**

% of Load	Load (KN)	* P.G. (psi)	** L.C. (Reading)	Displacement (mm)
0%	0	0		68
20% Tw	144	600		76
110% Tp	287	1200		98

RESIDUAL LOAD (By Immediate Lift-Off)	
* P.G. :	1200 (psi)
** L.C. :	(Reading)
LOAD :	287.1 (KN)



(\*Lu : Extruded length as measured from end plate of jack with strands straightened by the application of a minimum tension load.)

% of Tw	Load (Ta) (KN)	* P.G. (psi)	** L.C. (Reading)	Ram Displacement, E (mm)				Remark
				0 min.	1 min.	5 min.	15 min.	
<b>3rd Cycle</b>								
20%	144	21%	600	65	65	-	-	Plastic
50%	359	51%	1500	79	79	-	-	Disp. (ΔEp)
100%	718	103%	3000	117	117	-	-	1 mm
150%	1053	150%	4400	154	154	155	155	
100%	718	103%	3000	138	138	-	-	Elastic
50%	359	51%	1500	99	99	-	-	Disp. (ΔEe)
20%	144	21%	600	66	66	-	-	89 mm

REMARK : **COMPLIED [ √ ] / NOT COMPLIED [ ] / FAILED [ ]**

**(4) EXTENDED RESIDUAL LOAD - TIME MONITORING (Further monitoring to be carried out on the anchor using load cell if the permissible loss of load or displacement exceed the 1% per interval as directed by the Engineer)**

Time	Load		Ram Disp. (mm)	Net Ram Disp. (mm)	**L.C. Or #D.G. (Reading)		Loss of Load/change in Disp. (%)		% Permissible (should be <1% per interval)	Remark
	psi	kN			mm	mm	Total	Interval		
2 1/2 hrs.									4 %	O.K./ Not Acceptable
8 hrs.									5 %	O.K./ Not Acceptable
1 day									6 %	O.K./ Not Acceptable
3 days									7 %	O.K./ Not Acceptable
10 days									8 %	O.K./ Not Acceptable

Remarks : Δe = **82.8** mm

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