

**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-40 LEVEL NO. : L-2 DATE : 14/4/2012**

Design Working Load (Tw)	700 KN	Dia. Of Strand (Ds)	15.24 mm	Tendon Length (Lt)	32.50 m
Specified Preload (Tp)	250 KN	Area Of Strand (As)	140 mm <sup>2</sup>	Bond Length (Lb)	6.30 m
Proof Load (150% of Tw)	1050 KN	Nos. Of Strands (Ns)	6 nos.	Free Length (Lf)	24.68 m
Angle Of Inclination	20 deg.	Elastic Modulus (Es)	200 KN/mm <sup>2</sup>	Design Free Length	25.00 m

Displacement Measurement System	By Steel Ruler.	Jack Type / Capacity	RHR 2508/150 tons
Load Measurement System	By *Pressure Gauge (P.G.) [Yes] AND **Load Cell (L.C.) [Yes]		
*Effective Ram Area	346.5 (cm <sup>2</sup> ) 53.71 (in <sup>2</sup> )	*Correlated Factor	4.18 (psi per KN)
**Load Cell Ref. No.	1113251	**Gauge Factor	0.732 KN/digit
		**Zero Reading	7409.8

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

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

Extrusion (from bearing plate) : **1.52 m**

(a) Unused "Stressing" Length (*Lu) :	0.86 m	(b) Cal. Free Tendon Length (Lfs) = ( Lt - Lb - Lu ) :	25.34 m
(c) Min. App. Free Tendon Length (90% Lf):	22.21 m	(d) Max. App. Free Tendon Length ( Lf + 50% of Lb ) :	27.83 m
		(e) OR Max. App. Free Tendon Length (110% of Lfs):	27.87 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>								
				41 (Ram displacement at zero initial reading)				
20%	144	21%	600	44	-	-	-	
50%	359	51%	1500	65	-	-	-	Plastic
100%	718	103%	3000	124	-	-	-	Disp. (ΔEp)
150%	1053	150%	4400	190	-	-	-	29 mm
100%	718	103%	3000	170	-	-	-	
50%	359	51%	1500	105	-	-	-	
20%	144	21%	600	70	-	-	-	
<b>2nd Cycle</b>								
20%	144	21%	600	70	70	-	-	Plastic
50%	359	51%	1500	89	89	-	-	Disp. (ΔEp)
100%	718	103%	3000	139	139	-	-	2 mm
150%	1053	150%	4400	193	193	193	193	
100%	718	103%	3000	173	173	-	-	Elastic
50%	359	51%	1500	107	107	-	-	Disp. (ΔEe)
20%	144	21%	600	72	72	-	-	121 mm

APPARENT FREE LENGTH =  $\frac{(\Delta E_e \times E_s \times N_s \times A_s)}{(\Delta T_a) \times 1000}$  = **22.92 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.)

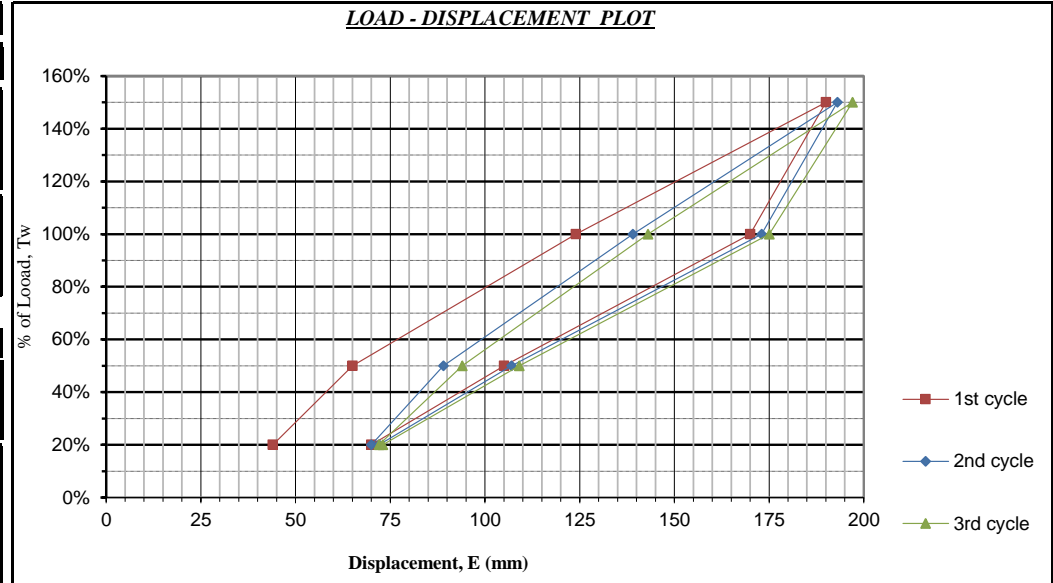
Time	Load (kN)	Ram Disp. (mm)	Net Ram Disp. (mm)	**L.C. Or #D.G. (Reading)		Loss of Load/ change in Disp. (%)		% Permissible (should be <1% per interval)	Remark
				Unit	kN	Total	Interval		
0 min.	730			6412		-	-	-	-
5 min.	728			6415.9	-2.85	-0.39%	-0.39%	1 %	O.K./ Not Acceptable
15 min.	726			6417.6	-4.1	-0.56%	-0.17%	2 %	O.K./ Not Acceptable
50 min.	728			6415.4	-2.49	-0.34%	0.22%	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)	Ram Disp. (mm)
0%	0	0	7409.8	25
20% Tw	144	600	7253.9	39
110% Tp	287	1200	7057	258.2

RESIDUAL LOAD (By Immediate Lift-Off)	
* P.G. :	1200 (psi)
** L.C. :	7057 (Reading)
LOAD :	258.2 (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	72	72	-	-	Plastic
50%	359	51%	1500	94	94	-	-	Disp. (ΔEp)
100%	718	103%	3000	143	143	-	-	1 mm
150%	1053	150%	4400	197	197	197	197	
100%	718	103%	3000	175	175	-	-	Elastic
50%	359	51%	1500	109	109	-	-	Disp. (ΔEe)
20%	144	21%	600	73	73	-	-	124 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 (kN)	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
				Unit	kN	Total	Interval		
2 1/2 hrs.	726			6417.9	-4.319	-0.59%	-0.25%	4 %	O.K./ Not Acceptable
8 hrs.	725			6418.8	-4.978	-0.68%	-0.09%	5 %	O.K./ Not Acceptable
1 day	725			6419.2	-5.27	-0.72%	-0.04%	6 %	O.K./ Not Acceptable
3 days	727			6416.6	-3.367	-0.46%	0.26%	7 %	O.K./ Not Acceptable
10 days	728			6414.6	-1.903	-0.26%	0.20%	8 %	O.K./ Not Acceptable

Remarks :  
 Δe = **110.1 mm**

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 RECORDED BY : **EDWARD F. L. (COW/JWGC)**  
 ENGINEER : **CHESTER CHEE (RE/JWGC)**