

**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-49 LEVEL NO. : L-3 DATE : 14/4/2012**

Design Working Load (Tw)	700 KN	Dia. Of Strand (Ds)	15.24 mm	Tendon Length (Lt)	25.00 m
Specified Preload (Tp)	300 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)	17.18 m
Angle Of Inclination	20 deg.	Elastic Modulus (Es)	200 KN/mm <sup>2</sup>	Design Free Length	18.00 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.	1120219	**Gauge Factor	0.735	KN/digit	**Zero Reading	7415

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

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

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

(a) Unused "Stressing" Length (*Lu) :	0.89 m	(b) Cal. Free Tendon Length (Lfs) = ( Lt - Lb - Lu ) :	17.81 m
(c) Min. App. Free Tendon Length (90% Lf):	15.46 m	(d) Max. App. Free Tendon Length ( Lf + 50% of Lb ) :	20.33 m
		(e) OR Max. App. Free Tendon Length (110% of Lfs):	19.59 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>								
20 (Ram displacement at zero initial reading)								
20%	144	21%	600	25	-	-	-	
50%	359	51%	1500	50	-	-	-	Plastic
100%	718	103%	3000	95	-	-	-	Disp. (ΔEp)
150%	1053	150%	4400	145	-	-	-	41 mm
100%	718	103%	3000	130	-	-	-	
50%	359	51%	1500	91	-	-	-	
20%	144	21%	600	61	-	-	-	
<b>2nd Cycle</b>								
20%	144	21%	600	61	61	-	-	Plastic
50%	359	51%	1500	76	76	-	-	Disp. (ΔEp)
100%	718	103%	3000	113	113	-	-	4 mm
150%	1053	150%	4400	151	151	151	151	
100%	718	103%	3000	135	135	-	-	Elastic
50%	359	51%	1500	93	93	-	-	Disp. (ΔEe)
20%	144	21%	600	65	65	-	-	86 mm

APPARENT FREE LENGTH =  $\frac{(\Delta E_e \times E_s \times N_s \times A_s)}{(\Delta T_a) \times 1000}$  = **16.26 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.)

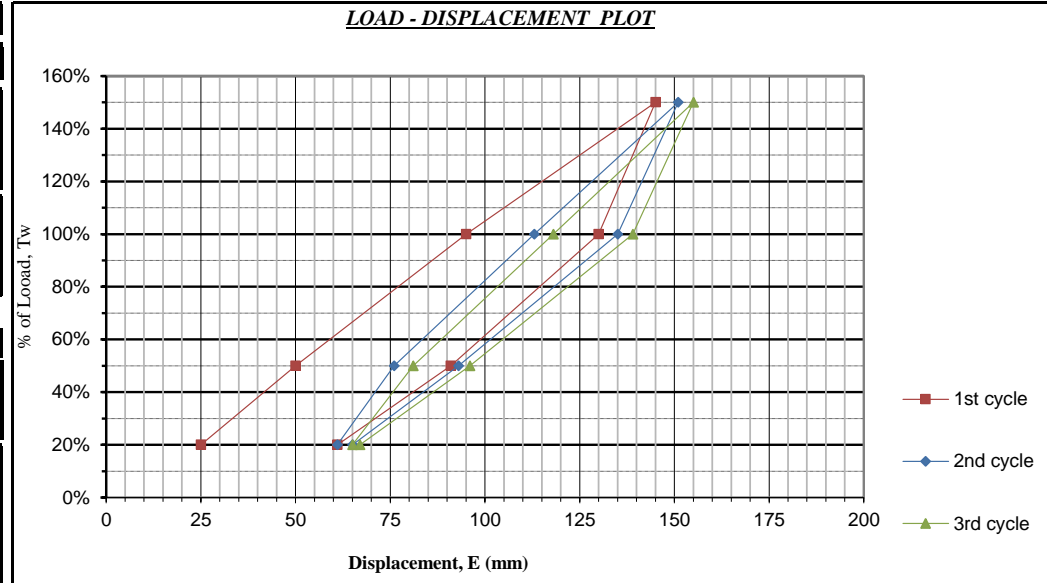
Time	Load (kN)	Ram Disp. (mm)	Net Ram Disp. (mm)	**L.C. Or #D.G. (Reading)		Loss of Load/ change in Disp. (%)		% Permissible (should be <1% per interval)	Remark
				Unit	kN	Total	Interval		
0 min.	722			6433		-	-	-	-
5 min.	720			6435.2	-1.62	-0.22%	-0.22%	1 %	O.K./ Not Acceptable
15 min.	718			6438	-3.68	-0.51%	-0.29%	2 %	O.K./ Not Acceptable
50 min.	717			6440	-5.15	-0.71%	-0.20%	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	7415	18
20% Tw	144	600	7235.2	24
110% Tp	335	1400	6974	324.1

RESIDUAL LOAD (By Immediate Lift-Off)	
* P.G. :	1400 (psi)
** L.C. :	6974 (Reading)
LOAD :	324.1 (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	81	81	-	-	Disp. (ΔEp)
100%	718	103%	3000	118	118	-	-	2 mm
150%	1053	150%	4400	155	155	155	155	
100%	718	103%	3000	139	139	-	-	Elastic
50%	359	51%	1500	96	96	-	-	Disp. (ΔEe)
20%	144	21%	600	67	67	-	-	88 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.	713			6445	-8.82	-1.22%	-0.51%	4 %	O.K./ Not Acceptable
8 hrs.	710			6449.3	-11.98	-1.66%	-0.44%	5 %	O.K./ Not Acceptable
1 day	708			6452.2	-14.11	-1.95%	-0.30%	6 %	O.K./ Not Acceptable
3 days	707			6453	-14.7	-2.04%	-0.08%	7 %	O.K./ Not Acceptable
10 days	704			6456.6	-17.35	-2.40%	-0.37%	8 %	O.K./ Not Acceptable

Remarks :  $\Delta e = 76.5$  mm

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