



STRUCTURAL ENGINEERING DIVISION
Test Floor Laboratory
Department of Civil Engineering
University of Engineering and Technology Lahore, 54890
Pakistan. Ph: 92-42-99029202

Ref: CED/TFL/10/33951

Dated: 03-10-19

Dated of Test: 21-10-2019

To
Resident Engineer
NESPAK - Zeeruk (Jv)
China Pakistan Economic Corridor (CPEC) Western Route Hakla (on M1) to D.I. Khan Motorway - Rehmani Khel to Kot Balian - Package IIA

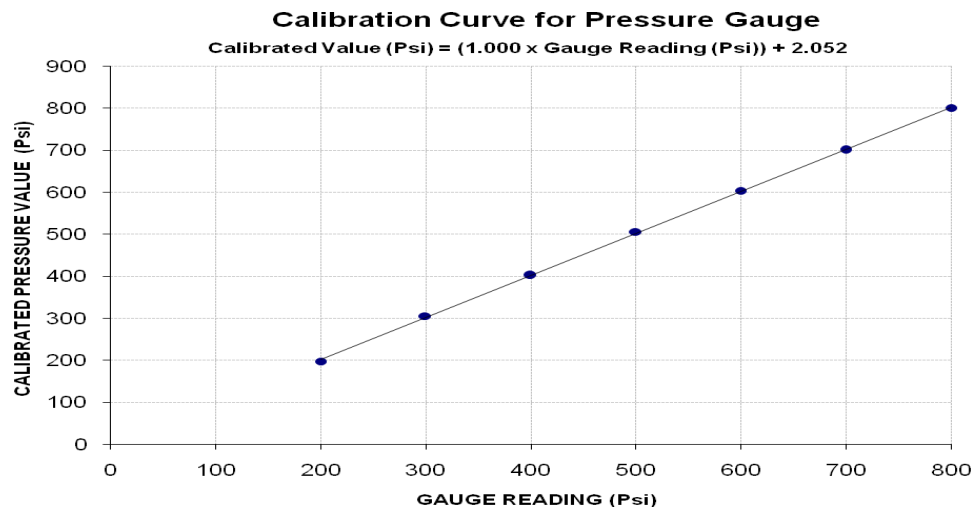
Subject: - CALIBRATION OF PRESSURE GAUGE (MARK: TFL/10/33951)

Reference to your Letter No. RE/NESPAK/P-2A/CPEC-WR/961, dated: 30/09/2019 on the subject cited above. One Pressure Gauge (SS 316 Tube) as received by us has been calibrated. The results are tabulated as under:

Total Range : Zero - 1000 (Psi)
Calibrated Range : Zero - 800 (Psi)

Pressure Gauge Reading (Psi)	200	300	400	500	600	700	800
Calibrated Load (kg)	2750	4250	5600	7050	8400	9750	11150
Calibrated Pressure (Psi)	197.54	305.29	402.27	506.43	603.40	700.38	800.94

The Ram Area of Calibration = 198 cm²



I/C Testing Laboratoires
UET Lahore, Pakistan.

Note:

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STRUCTURAL ENGINEERING DIVISION
Test Floor Laboratory
Department of Civil Engineering
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Pakistan. Ph: 92-42-99029202

To,
 Chief Resident Engineer
 NESPAK
 Development of Kartarpur Corridor

Reference # CED/TFL **34012** (Dr. M Rizwan Riaz)

Dated: 14-10-2019

Reference of the request letter #SA-394/DKC/SG. Test/SM/122

Dated: 14-10-2019

Tension Test Report (Page – 1/1)

Date of Test 21-10-2019

Gauge length 2 inches

Description Steel Structure Steel Strip Tensile and Bend Test as per ASTM A36

Sr. No.	Designation		Size of Strip	X Section Area	Yield load	Breaking Load	Yield Stress	Ultimate Stress	Elongation	% Elongation	Remarks
	(inch)										
1	M.S Column	8x8	24.00x6.00	144.00	5100	7400	347.44	504.13	0.50	25.00	
2	M.S Square Box	2.1/2x2.1/2	21.00x2.50	52.50	1900	2400	355.03	448.46	0.60	30.00	
3	M.S Square Bar	3/4x3/4	19.95x19.95	398.00	15200	23000	374.65	566.91	0.60	30.00	
4	M.S Square Bar	1/2x1/2	11.70x11.80	138.06	4500	6500	319.75	461.86	0.70	35.00	
5	M.S Flat	1.1/2	24.00x5.80	139.20	4900	7000	345.32	493.32	0.60	30.00	
-	-	-	-	-	-	-	-	-	-	-	
Only Five Samples for Tensile and Five Samples for Bend Test											
Bend Test											
Strip Taken from M.S Column (8"x8")Bend Test Through 180° is Satisfactory											
Strip Taken from M.S Square Box (2.1/2"x2.1/2")Bend Test Through 180° is Satisfactory											
Strip Taken from M.S Square Bar (3/4"x3/4")Bend Test Through 180° is Satisfactory											
Strip Taken from M.S Square Bar (1/2"x1/2")Bend Test Through 180° is Satisfactory											
Strip Taken from M.S Flate (1.1/2")Bend Test Through 180° is Satisfactory											

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To,
 Chief Resident Engineer
 NESPAK
 Development of Kartarpur Corridor

Reference # CED/TFL **34013** (Dr. M Rizwan Riaz) Dated: 14-10-2019
 Reference of the request letter # SA-394/DKC/EP/Test/SM/116 Dated: 04-10-2019

Tension Test Report (Page – 1/1)

Date of Test 21-10-2019
 Gauge length 2 inches
 Description Steel Structure Steel Strip Tensile Test as per ASTM A36

Sr. No.	Designation	Size of Strip	X Section Area	Yield load	Breaking Load	Yield Stress	Ultimate Stress	Elongation	% Elongation	Remarks
1	Electrical Pole Strip	25.50x4.50	114.75	4000	5500	341.96	470.20	0.70	35.00	
2	Arm Lower	27.70x4.50	124.65	4200	6100	330.54	480.07	0.80	40.00	
3	Arm Upper	27.00x3.70	99.90	3500	4600	343.69	451.71	0.70	35.00	
4	Base Plate	25.40x20.00	508.00	19800	26800	382.36	517.54	0.80	40.00	
-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	
Only Four Samples for Tensile Test										
Bend Test										

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STRUCTURAL ENGINEERING DIVISION
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Ref: CED/TFL/10/34020

Dated: 15-10-19

Dated of Test: 19-10-19

To

Chief Executive Officer

Pak Matiari-Lahore Transmission Company (Pvt) Ltd

+660kV Matiari-Lahore HVDC Transmission (CPEC) Lot-8 Baloki Camp for HVDC TL

Subject:- CALIBRATION OF COMPRESSION TESTING MACHINE

(MARK: CED/TFL/10/34020) (Page -1/2)

Reference to your letter No. MLTC-UET-19-2862, dated: 15/10/2019 on the subject cited above. One Compression Testing Machine has been calibrated by using standard calibration device. The results are tabulated as under:

Total Range : Zero - 2000 (kN)
Calibrated Range : Zero - 1800 (kN)

Sr. No.	Machine Reading (kN)	Corrected Load Value (kN)
1	100	96
2	200	192
3	300	293
4	400	392
5	500	493
6	600	591
7	700	690
8	800	790
9	900	890

Sr. No.	Machine Reading (kN)	Corrected Load Value (kN)
10	1000	990
11	1100	1091
12	1200	1189
13	1300	1290
14	1400	1393
15	1500	1488
16	1600	1586
17	1700	1690
18	1800	1787

Note: The calibration of machine is carried out according to the approved ASTM C39/C39M-18 loading rate of 0.25 + 0.05 MPa/sec (3.5kN/sec to 5.0 kN/sec).

I/C Testing Laboratories
UET Lahore, Pakistan.

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Ref: CED/TFL/10/34020

Dated: 15-10-19

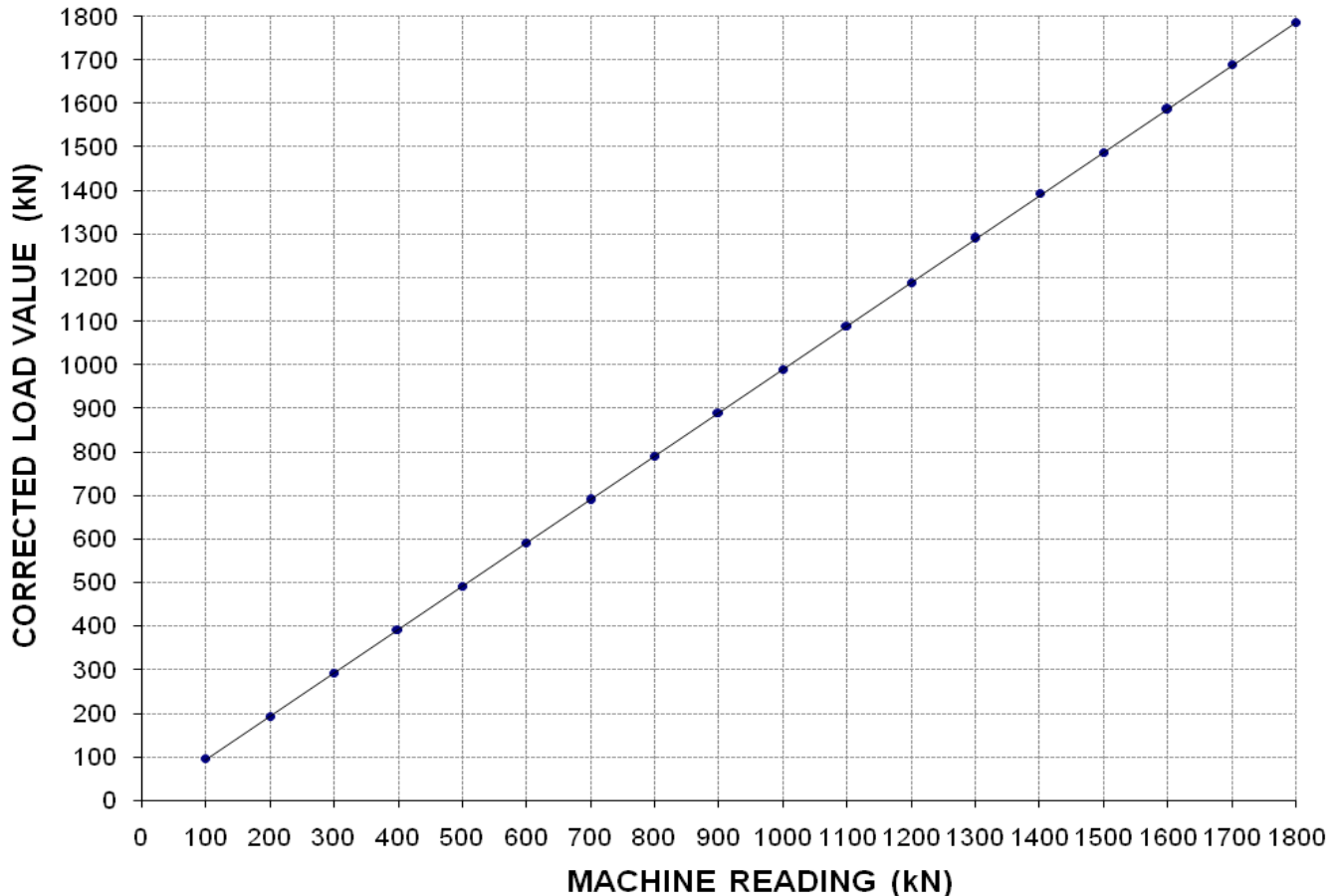
Dated of Test: 19-10-19

To
Chief Executive Officer
Pak Matiari-Lahore Transmission Company (Pvt) Ltd
+660kV Matiari-Lahore HVDC Transmission (CPEC) Lot-8 Baloki Camp for HVDC TL

Subject:- CALIBRATION OF COMPRESSION TESTING MACHINE
(MARK: CED/TFL/10/34020) (Page -2/2)

CYLINDER TESTING MACHINE (2000 kN)

$$\text{Calibrated Value (kN)} = (0.996 \times \text{Machine Reading (kN)}) - 6.437$$



I/C Testing Laboratories
UET Lahore, Pakistan.

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STRUCTURAL ENGINEERING DIVISION
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Department of Civil Engineering
University of Engineering and Technology Lahore, 54890
Pakistan. Ph: 92-42-99029202

Ref: CED/TFL/10/34024

Dated: 15-10-19

Dated of Test: 21-10-19

To
Assistant Director (QCD)
WASA, LDA, Lahore
(M/s Ali Rehman RCC Pipe Factory)

Subject: - CALIBRATION OF HYDRAULIC JACK (MARK: TFL/10/34024)

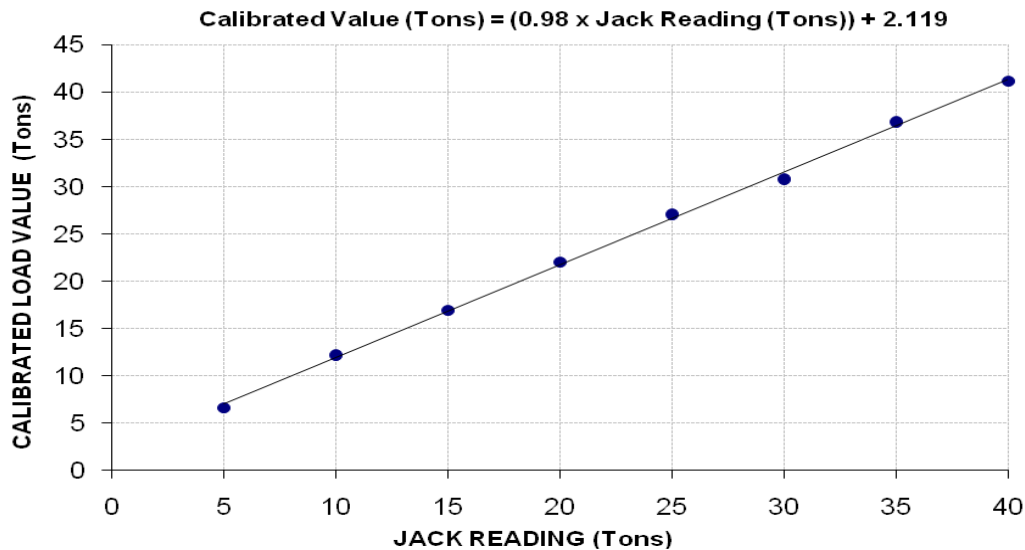
Reference to your Letter No. QCD/1012-13, dated: 10/10/2019 on the subject cited above. One Hydraulic Jack as received by us has been calibrated. The results are tabulated as under:

Total Range : Zero - 45 (Ton)
Calibrated Range : Zero - 40 (Ton)

Hydraulic Jack Reading (Ton)	5	10	15	20	25	30	35	40	
Calibrated Load	(Kg)	6000	11000	15400	20000	24500	27900	33400	37400
	(Ton)	6.61	12.11	16.96	22.02	26.98	30.72	36.78	41.18

1000 Kg = 1.1011 Ton

Calibration Curve For Jack



I/C Testing Laboratories
UET Lahore, Pakistan.

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To,
 Resident Engineer
 NESPAK
 Construction of Under Passes at Kashmir Bridge along Canal Faisalabad

Reference # CED/TFL **34033** (Dr. M Rizwan Riaz)
 Reference of the request letter # 3994/103/AS/02/142

Dated: 17-10-2019
 Dated: 11-10-2019

Tension Test Report (Page -1/1)

Date of Test 21-10-2019
 Gauge length 8 inches
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

Sr. No.	Weight (lbs/ft)	Diameter/ Size (inch)		Area (in ²)		Yield load (kg)	Breaking Load (kg)	Yield Stress (psi)		Ultimate Stress (psi)		Elongation (inch)	% Elongation	Remarks
		Nominal	Actual	Nominal	Actual			Nominal	Actual	Nominal	Actual			
1	0.355	3	0.364	0.11	0.104	3500	4700	70200	73940	94200	99300	0.75	9.4	
2	0.359	3	0.366	0.11	0.105	3500	4600	70200	73190	92200	96200	0.75	9.4	
3	4.244	10	1.260	1.27	1.248	36500	59600	63400	64490	103500	105300	1.40	17.5	
4	4.346	10	1.275	1.27	1.278	34600	56400	60100	59700	97900	97400	1.40	17.5	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Note: only four samples for tensile and four samples for bend test

Bend Test

#3 Bar Bend Test Through 180° is Satisfactory

#3 Bar Bend Test Through 180° is Satisfactory

#10 Bar Bend Test Through 180° is Satisfactory

#10 Bar Bend Test Through 180° is Satisfactory

I/C Testing Laboratoires
UET Lahore, Pakistan.

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To,
M/S Ravi Green Engineering (Pvt) Ltd
Lahore

Reference # CED/TFL **34034** (Dr. M Rizwan Riaz)
Reference of the request letter # RG/MT/UE/2644

Dated: 18-10-2019
Dated: 18-10-2019

Tension Test Report (Page -1/1)

Date of Test 21-10-2019
Gauge length 8 inches
Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

Sr. No.	Weight (lbs/ft)	Diameter/ Size		Area (in ²)		Yield load (kg)	Breaking Load (kg)	Yield Stress (psi)		Ultimate Stress (psi)		Elongation (inch)	% Elongation	Remarks
		Nominal (#)	Actual (inch)	Nominal	Actual			Nominal	Actual	Nominal	Actual			
1	0.373	3	0.374	0.11	0.110	3600	5000	72200	72420	100200	100600	1.70	21.3	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Note: only one sample for tensile and one sample for bend test														
Bend Test														
#3 Bar Bend Test Through 180° is Satisfactory														

I/C Testing Laboratories
UET Lahore, Pakistan.

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STRUCTURAL ENGINEERING DIVISION
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Pakistan. Ph: 92-42-99029202

To,
M/S Reliance Weaving Mills Ltd
Multan

Reference # CED/TFL **34035** (Dr. M Rizwan Riaz)
Reference of the request letter # Nil

Dated: 18-10-2019

Dated: 17-10-2019

Tension Test Report (Page -1/1)

Date of Test 21-10-2019
Gauge length 8 inches
Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

Sr. No.	Weight (lbs/ft)	Diameter/ Size (mm)		Area (in ²)		Yield load (kg)	Breaking Load (kg)	Yield Stress (psi)		Ultimate Stress (psi)		Elongation (inch)	% Elongation	Remarks
		Nominal	Actual	Nominal	Actual			Nominal	Actual	Nominal	Actual			
1	0.417	10	10.04	0.12	0.123	4000	5500	73487	71910	101044	98900	1.10	13.8	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Note: only one sample for tensile and one sample for bend test														
Bend Test														
10mm Dia Bar Bend Test Through 180° is Satisfactory														

I/C Testing Laboratories
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Pakistan. Ph: 92-42-99029202

To,
 Resident Engineer
 CAMEOS Consultant
 ZMAK Road Project

Reference # CED/TFL **34037** (Dr. M Rizwan Riaz)
 Reference of the request letter # ZMAK/CAMEOS/RE/430

Dated: 18-10-2019
 Dated: 11-10-2019

Tension Test Report (Page -1/1)

Date of Test 21-10-2019
 Gauge length 8 inches
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

Sr. No.	Weight (lbs/ft)	Diameter/ Size (mm)		Area (in ²)		Yield load (kg)	Breaking Load (kg)	Yield Stress (psi)		Ultimate Stress (psi)		Elongation (inch)	% Elongation	Remarks
		Nominal	Actual	Nominal	Actual			Nominal	Actual	Nominal	Actual			
1	0.426	10	10.14	0.12	0.125	3900	5700	71650	68670	104719	100400	0.90	11.3	
2	0.422	10	10.10	0.12	0.124	4000	5700	73487	71000	104719	101200	1.00	12.5	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Note: only two samples for tensile and one sample for bend test														
Bend Test														
10mm Dia Bar Bend Test Through 180° is Satisfactory														

I/C Testing Laboratories
UET Lahore, Pakistan.

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To,
Resident Engineer
CAMEOS Consultant
ZMAK Road Project

Reference # CED/TFL **34038** (Dr. M Rizwan Riaz)
Reference of the request letter # ZMAK/CAMEOS/RE/432

Dated: 18-10-2019
Dated: 11-10-2019

Tension Test Report (Page – 1/4)

Date of Test 21-10-2019
Gauge length 640 mm
Description Steel Strand Tensile Test as per ASTM A-416-94a

Sr. No.	Nominal Diameter	Nominal Weight	Measured weight	Yield strength clause (6.3)		Breaking strength clause (6.2)		Young's Modulus of Elasticity "E"	% Elongation	Remarks / Coil No.
	(mm)	(kg/km)	(kg/km)	(kg)	(kN)	(kg)	(kN)	GPa		
1	12.70 (1/2")	775.0	793	18000	176.58	20500	201.11	199	>3.50	xx
2	12.70 (1/2")	775.0	793	18500	181.49	20400	200.12	199	>3.50	xx
3	12.70 (1/2")	775.0	795	18800	184.43	20400	200.12	198	>3.50	xx
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Only three samples for Test

Note:

1. Modulus of Elasticity is based on nominal steel area of the steel strand vide clause 13.3 of ASTM – A416a
2. Load versus percentage strain graphs are attached

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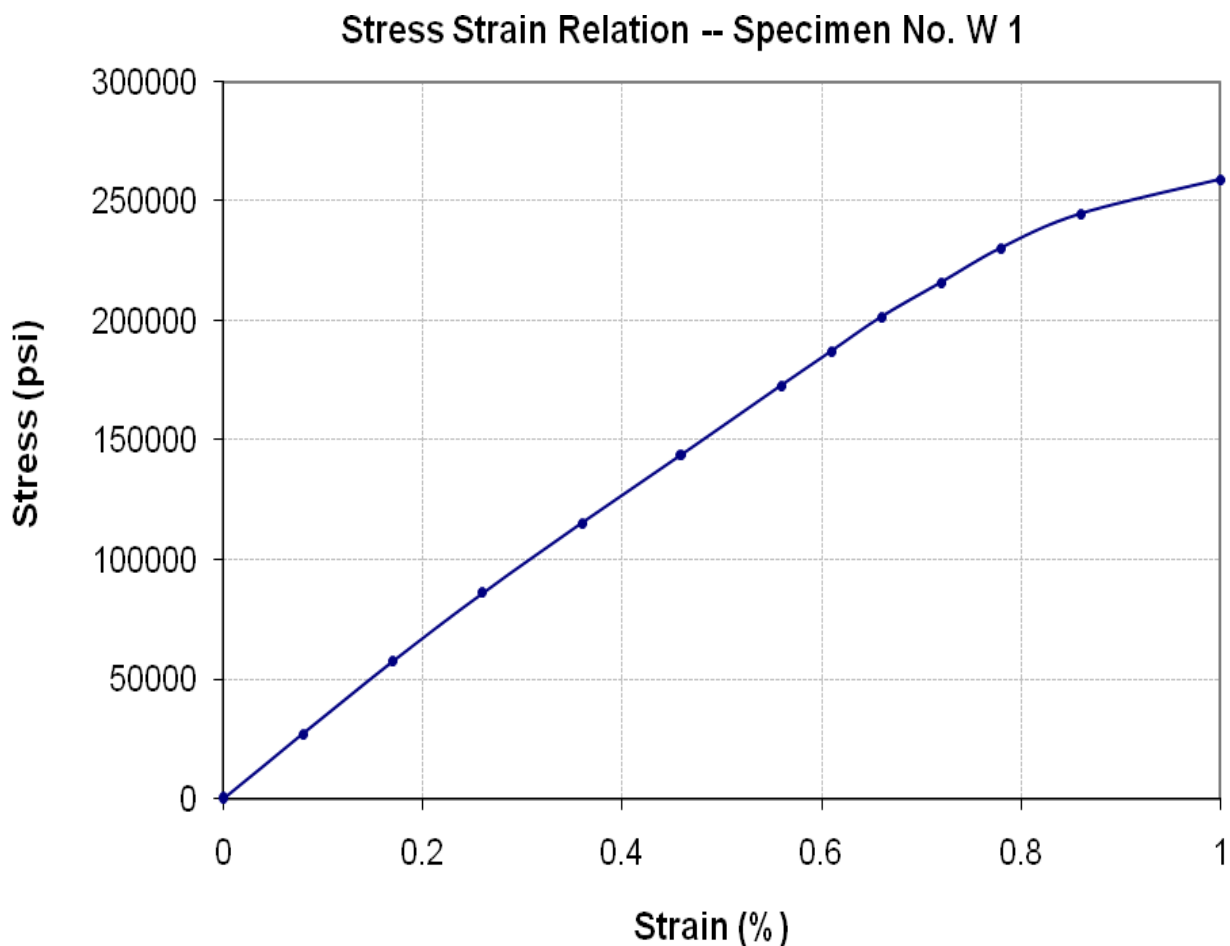
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To,
Resident Engineer
CAMEOS Consultant
ZMAK Road Project

Reference # CED/TFL **34038** (Dr. M Rizwan Riaz)
Reference of the request letter # ZMAK/CAMEOS/RE/432

Dated: 18-10-2019
Dated: 11-10-2019

Graph (Page – 2/4)



I/C Testing Laboratories
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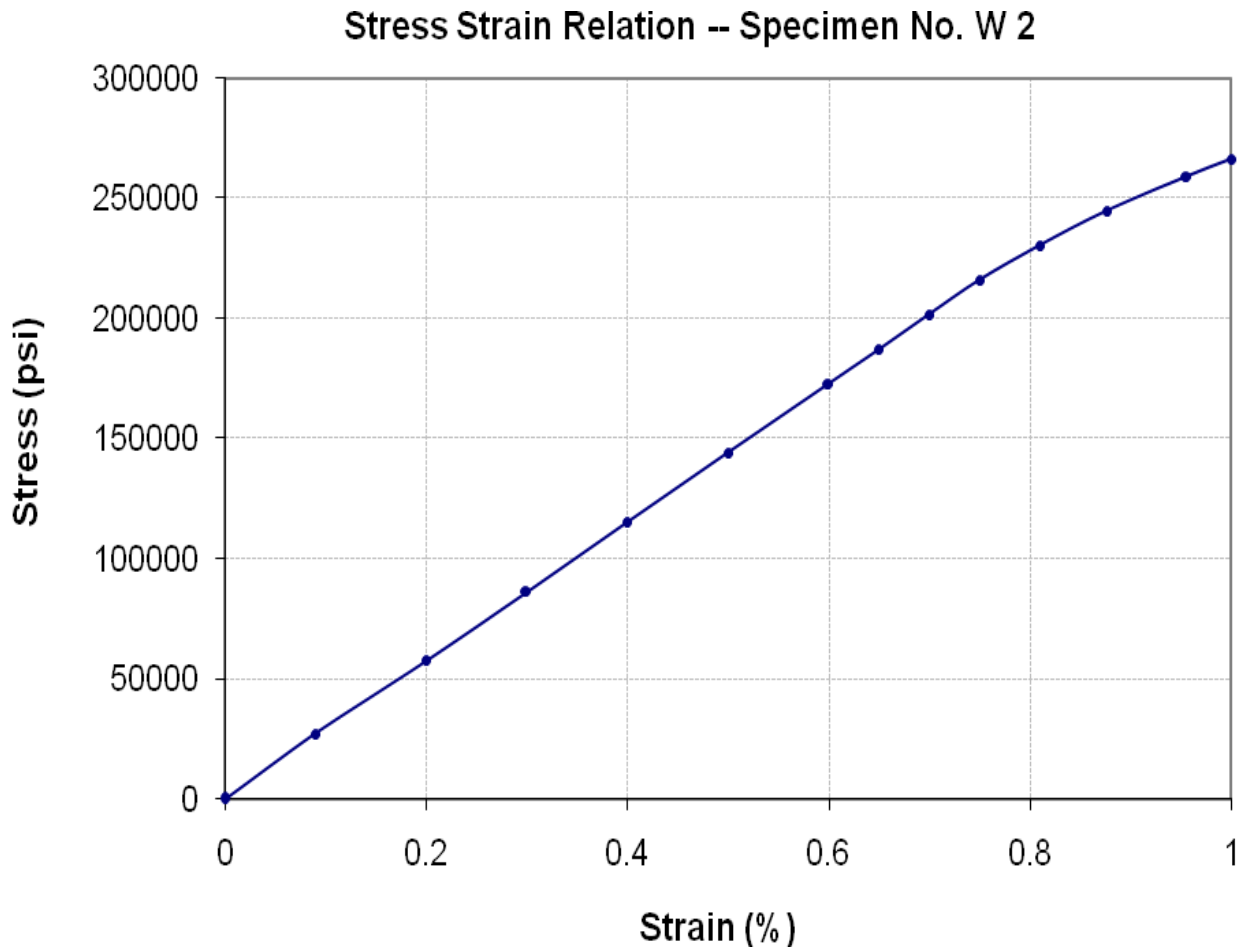
To,
Resident Engineer
CAMEOS Consultant
ZMAK Road Project

Reference # CED/TFL **34038** (Dr. M Rizwan Riaz)
Reference of the request letter # ZMAK/CAMEOS/RE/432

Dated: 18-10-2019

Dated: 11-10-2019

Graph (Page – 2/4)



I/C Testing Laboratoires
UET Lahore, Pakistan.

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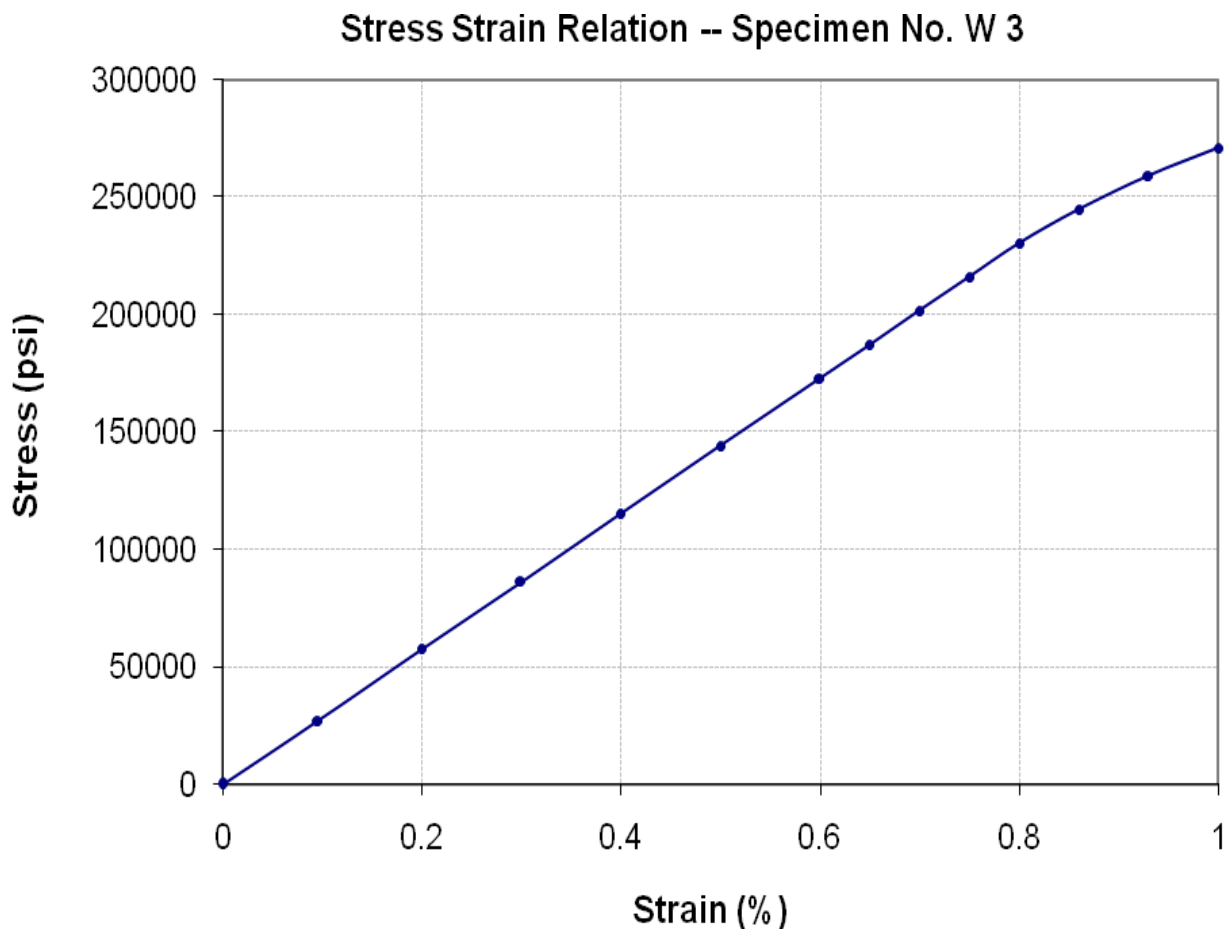
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To,
Resident Engineer
CAMEOS Consultant
ZMAK Road Project

Reference # CED/TFL **34038** (Dr. M Rizwan Riaz)
Reference of the request letter # ZMAK/CAMEOS/RE/432

Dated: 18-10-2019
Dated: 11-10-2019

Graph (Page – 4/4)



I/C Testing Laboratories
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To,
 Senior Site Engineer
 Pachem Global (Pvt) Limited
 Construction of PA Chem Processing Plant, Sahianwala Industrial Estate
 (Kisan Steel)

Reference # CED/TFL **34039** (Dr. M Rizwan Riaz)
 Reference of the request letter # 300/PGL/14102019/01

Dated: 18-10-2019
 Dated: 14-10-2019

Tension Test Report (Page -1/1)

Date of Test 21-10-2019
 Gauge length 8 inches
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

Sr. No.	Weight (lbs/ft)	Diameter/ Size		Area (in ²)		Yield load (kg)	Breaking Load (kg)	Yield Stress (psi)		Ultimate Stress (psi)		Elongation (inch)	% Elongation	Remarks
		Nominal (#)	Actual (inch)	Nominal	Actual			Nominal	Actual	Nominal	Actual			
1	0.359	3	0.366	0.11	0.105	3400	4500	68200	71060	90200	94100	0.75	9.4	
2	0.359	3	0.366	0.11	0.105	4200	5100	84200	87780	102200	106600	0.80	10.0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Note: only two samples for tensile and one sample for bend test

Bend Test

#3 Bar Bend Test Through 180° is Satisfactory

I/C Testing Laboratoires
UET Lahore, Pakistan.

Note:

- 1- You can See your reports On Internet in the following web site
http://www.uet.edu.pk/faculties/facultiesinfo/civil/index.html?RID=testing_reports
- 2- The above results pertain to sample /samples supplied to this laboratory.
- 3- Sealed sample / Unsealed sample / Marked sample/Signed Samples



STRUCTURAL ENGINEERING DIVISION
Test Floor Laboratory
Department of Civil Engineering
University of Engineering and Technology Lahore, 54890
Pakistan. Ph: 92-42-99029202

Ref: CED/TFL/10/34040

Dated: 18-10-19

Dated of Test: 21-10-19

To
Material Engineer
NESPAK
Up-Gradation/Dualization of Motorway Link from Kohat via Jand Pindigheb to Khushal Garh (Pkg-1)

Subject: - **CALIBRATION OF HYDRAULIC JACK (MARK: TFL/10/34040)** (Page -1/2)

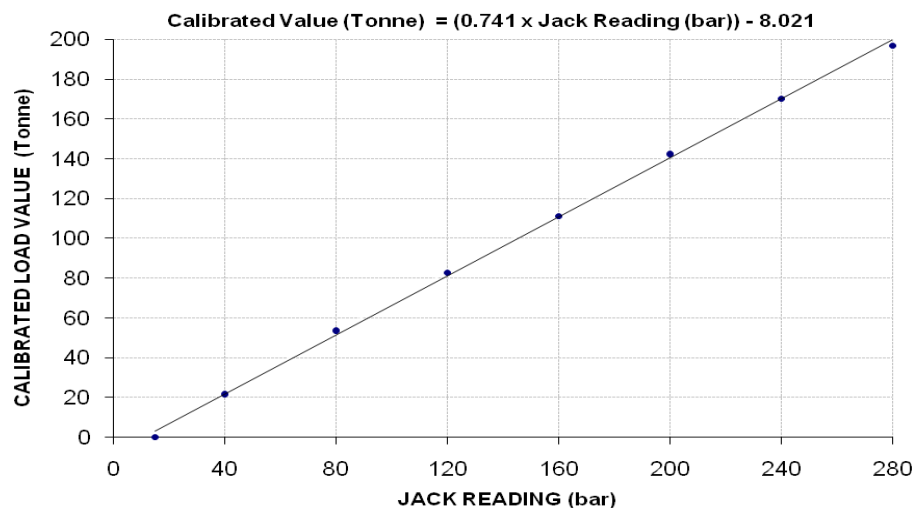
Reference to your Letter No. 36264/103/JH/030, dated: 19/10/2019 on the subject cited above. One Hydraulic Jack (Jack No 407, Gauge No. SF 407) as received by us has been calibrated. The results are tabulated as under:

Total Range : Zero - 1000 (bar)
Calibrated Range : Zero - 280 (bar)

Hydraulic Jack Reading (bar)	15	40	80	120	160	200	240	280	
Calibrated Load	(kg)	0	21400	53200	82800	111200	142000	170200	196800
	(Tonne)	0	21.40	53.20	82.80	111.20	142.00	170.20	196.80
Calibrated Pressure (bar)	0	28.58	71.05	110.58	148.50	189.64	227.30	262.82	

The Ram Area of Jack = 734.35 cm²

Calibration Curve For Jack No. 407



I/C Testing Laboratories
UET Lahore, Pakistan.

Note:

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STRUCTURAL ENGINEERING DIVISION
Test Floor Laboratory
Department of Civil Engineering
University of Engineering and Technology Lahore, 54890
Pakistan. Ph: 92-42-99029202

Ref: CED/TFL/10/34040

Dated: 18-10-19

Dated of Test: 21-10-19

To
Material Engineer
NESPAK
Up-Gradation/Dualization of Motorway Link from Kohat via Jand Pindigheb to Khushal Garh (Pkg-1)

Subject: - **CALIBRATION OF HYDRAULIC JACK (MARK: TFL/10/34040)** (Page -2/2)

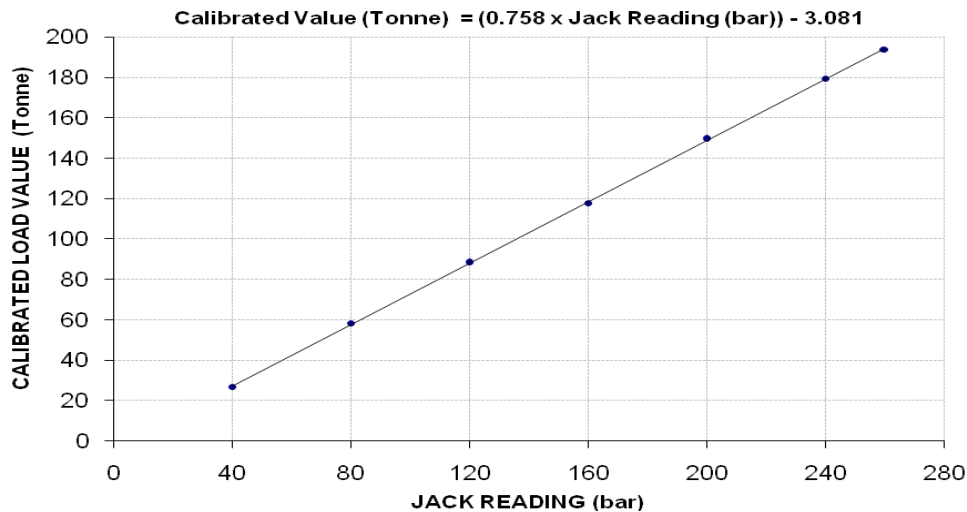
Reference to your Letter No. 36264/103/JH/030, dated: 19/10/2019 on the subject cited above. One Hydraulic Jack (Jack No 408, Gauge No. SF 408) as received by us has been calibrated. The results are tabulated as under:

Total Range : Zero - 1000 (bar)
Calibrated Range : Zero - 260 (bar)

Hydraulic Jack Reading (bar)	0	40	80	120	160	200	240	260	
Calibrated Load	(kg)	0	26800	58200	88200	117600	149400	179200	193800
	(Tonne)	0	26.80	58.20	88.20	117.60	149.40	179.20	193.80
Calibrated Pressure (bar)	0	35.81	77.76	117.85	157.13	199.62	239.44	258.95	

The Ram Area of Jack = 733.975 cm²

Calibration Curve For Jack No. 408



I/C Testing Laboratories
UET Lahore, Pakistan.

Note:

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- 2- The above results pertain to sample /samples supplied to this laboratory.
- 3- Sealed sample / Unsealed sample / Marked sample/Signed Samples



STRUCTURAL ENGINEERING DIVISION
Test Floor Laboratory
Department of Civil Engineering
University of Engineering and Technology Lahore, 54890
Pakistan. Ph: 92-42-99029202

To,
 Additional Director Development
 DHA Phase-XI (Rahbar)
 Construction of DHA Girls School at Block- 'B', Sector-I, DHA Phase-XI (Rahbar)

Reference # CED/TFL **34041** (Dr. M Rizwan Riaz) Dated: 21-10-2019
 Reference of the request letter # 700/3/Girls School/PH-XI/Projects/3028 Dated: 17-10-2019

Tension Test Report (Page -1/1)

Date of Test 21-10-2019
 Gauge length 8 inches
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

Sr. No.	Weight (lbs/ft)	Diameter/ Size (inch)		Area (in ²)		Yield load (kg)	Breaking Load (kg)	Yield Stress (psi)		Ultimate Stress (psi)		Elongation (inch)	% Elongation	Remarks
		Nominal	Actual	Nominal	Actual			Nominal	Actual	Nominal	Actual			
1	0.444	3/8	0.408	0.11	0.131	3500	5100	70200	59110	102200	86200	1.40	17.5	Ittefaq Steel
2	0.442	3/8	0.407	0.11	0.130	3300	5000	66200	55990	100200	84900	1.20	15.0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Note: only two samples for tensile and one sample for bend test														
Bend Test														
3/8" Dia Bar Bend Test Through 180° is Satisfactory														

I/C Testing Laboratoires
UET Lahore, Pakistan.

Note:

- 1- You can See your reports On Internet in the following web site
http://www.uet.edu.pk/faculties/facultiesinfo/civil/index.html?RID=testing_reports
- 2- The above results pertain to sample /samples supplied to this laboratory.
- 3- Sealed sample / Unsealed sample / Marked sample/Signed Samples