

Nadeem Akhtar  
 CEO, N. A. Associates Lahore (Client: Pepsi Co International)

**Test Performed By:** Dr. /Engr. Qasim Khan

**Client Reference:** NA-240-Con-test-01

**Dated:** 05-12-2019

**SOM Lab Ref:** CED/SOM/1851(Page-1/1)

**Dated:** 06-12-2019

**Test:** Tension & Bend Test

**Test Specification:** ASTM-A 615

**Sample Type:** Deformed Steel Bar

**Gauge Length:** 200 mm

S.No.	Weight	Dia.		Area		Yield Load	Ultimate Load	Yield Stress		Ult. Stress		Elongation	Gauge Length	%age Elongation	Remarks
		Nominal	Calculated	Nominal	Calculated			(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	kg/m	mm	mm	mm <sup>2</sup>	mm <sup>2</sup>	kN	kN	MPa	MPa	MPa	MPa	mm	mm	%	
1	0.988	12	12.67	113	126	69.70	87.70	616	554	775	697	27.5	200	13.8	
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**BEND TEST:**

12mm	Sample bend through 180 degrees Satisfactorily without any crack	<b>Note:-</b>  Only Two Samples Received and Tested

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)

Awais Anjum

Test Performed By:

Dr. /Engr. S. Asad Ali Gillani

Assistant Engineer (Civil) Office of The Chief Engineer University of Okara

Client Reference: Nil

SOM Lab

Ref: 1846(Page-1/1)

Dated: Nil

Dated: 06-12-2019

Test: Tension Test & Bend Test

Test Specification: ASTM-A-615

Gauge Length: 8 inch

Sample Type: Deformed Bar

S.No.	Weight	Dia.		Area		Yield Load	Ultimate Load	Yield Stress		Ult. Stress		Elongation	Gauge Length	%age Elongation	Remarks
		Nominal	Calculated	Nominal	Calculated			(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	lb/ft	#	in	in <sup>2</sup>	in <sup>2</sup>	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	1.460	6	0.739	0.44	0.429	14.32	18.22	71790	73630	91310	93650	1.40	8.0	17.5	
2	0.672	4	0.501	0.20	0.197	6.60	8.26	72730	73840	91050	92440	1.00	8.0	12.5	
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**BEND TEST:**

# 6	Sample bend through 180 degrees Satisfactorily without any crack	<b>Note:-</b>  Only Four Samples Received and Tested
# 4	Sample bend through 180 degrees Satisfactorily without any crack	

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)

Awais Anjum

Assistant Engineer (Civil) Office of The Chief Engineer University of Okara

**Test Performed By:**

Dr. /Engr. S. Asad Ali Gillani

**Client Reference:** Nil

**Dated:** Nil

**Test:** Tension Test & Bend Test

**Gauge Length:** 8 inch

**Test Specification:**

**Sample Type:**

**SOM Lab**

**Ref:** 1847(Page-1/1)

**Dated:** 06-12-2019

ASTM-A-615

Deformed Bar

S.No.	Weight	Dia.		Area		Yield Load	Ultimate Load	Yield Stress		Ult. Stress		Elongation	Gauge Length	%age Elongation	Remarks
		Nominal	Calculated	Nominal	Calculated			(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	lb/ft	#	in	in <sup>2</sup>	in <sup>2</sup>	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	0.679	4	0.505	0.20	0.200	7.34	9.12	80940	80940	100610	100610	1.00	8.0	12.5	
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**BEND TEST:**

# 4	Sample bend through 180 degrees Satisfactorily without any crack	<b>Note:-</b>  Only Two Samples Received and Tested

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)

Awais Anjum

Assistant Engineer (Civil) Office of The Chief Engineer University of Okara

**Test Performed By:**

Dr. /Engr. S. Asad Ali Gillani

**Client Reference:** Nil

**Dated:** Nil

**Test:** Tension Test & Bend Test

**Gauge Length:** 8 inch

**Test Specification:**

**Sample Type:**

**SOM Lab**

**Ref:** 1848(Page-1/2)

**Dated:** 06-12-2019

ASTM-A-615

Deformed Bar

S.No.	Weight	Dia.		Area		Yield Load	Ultimate Load	Yield Stress		Ult. Stress		Elongation	Gauge Length	%age Elongation	Remarks
		Nominal	Calculated	Nominal	Calculated			(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	lb/ft	#	in	in <sup>2</sup>	in <sup>2</sup>	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	0.673	4	0.502	0.20	0.198	7.65	9.43	84310	85160	103980	105030	1.10	8.0	13.8	
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**BEND TEST:**

# 4	Sample bend through 180 degrees Satisfactorily without any crack	<b>Note:-</b>  Only Two Samples Received and Tested

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)

Awais Anjum

Test Performed By:

Dr. /Engr. S. Asad Ali Gillani

Assistant Engineer (Civil) Office of The Chief Engineer University of Okara

Client Reference: Nil

SOM Lab

Ref: 1848(Page-2/2)

Dated: Nil

Dated: 06-12-2019

Test: Tension Test & Bend Test

Test Specification: ASTM-A-615

Gauge Length: 8 inch

Sample Type: Deformed Bar

S.No.	Weight	Dia.		Area		Yield Load	Ultimate Load	Yield Stress		Ult. Stress		Elongation	Gauge Length	%age Elongation	Remarks
		Nominal	Calculated	Nominal	Calculated			(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	lb/ft	#	in	in <sup>2</sup>	in <sup>2</sup>	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	1.482	6	0.745	0.44	0.436	15.49	20.00	77670	78380	100250	101170	1.30	8.0	16.3	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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**BEND TEST:**

# 6	Sample bend through 180 degrees Satisfactorily without any crack	<b>Note:-</b>  Only Two Samples Received and Tested

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)

M. Kamran Siddiqui  
Chief Engineer (HVDC), NTDC, Lahore

Test Performed By: Dr. /Engr.

S. Asad Ali  
Gillani

Client Reference: 8163-66/CE/HVDC/LHR

SOM Lab

Ref: 1856(Page-1/3)

Dated: 06-12-2019

Dated: 06-12-2019

Test: Tension Test & Bend Test

Test Specification: ASTM-A-615

Gauge Length: 8 inch

Sample Type: Deformed Bar

S.No.	Weight	Dia.		Area		Yield Load	Ultimate Load	Yield Stress		Ult. Stress		Elongation	Gauge Length	%age Elongation	Remarks
		Nominal	Calculated	Nominal	Calculated			(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	lb/ft	#	in	in <sup>2</sup>	in <sup>2</sup>	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	1.031	5	0.621	0.31	0.303	9.38	13.32	66720	68260	94790	96980	1.40	8.0	17.5	
2	1.028	5	0.620	0.31	0.302	9.48	13.48	67450	69230	95880	98410	1.40	8.0	17.5	
3	1.028	5	0.620	0.31	0.302	9.38	13.35	66720	68490	95000	97520	1.40	8.0	17.5	
4	1.031	5	0.621	0.31	0.303	9.09	13.12	64690	66190	93340	95490	1.50	8.0	18.8	
5	1.024	5	0.619	0.31	0.301	9.35	13.30	66500	68490	94640	97470	1.40	8.0	17.5	
6	1.025	5	0.619	0.31	0.301	9.81	13.88	69770	71850	98780	101730	1.30	8.0	16.3	
7	0.666	4	0.500	0.20	0.196	9.45	9.23	104200	106330	101730	103810	1.30	8.0	16.3	
8	0.669	4	0.501	0.20	0.197	6.60	9.30	72730	73840	102520	104080	1.20	8.0	15.0	
9	0.678	4	0.503	0.20	0.199	6.47	9.14	71380	71740	100830	101340	1.20	8.0	15.0	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Witnessed By: M Bilal Butt, O. E, Noman Khaliq, AD(HVDC) % PD(HVDC) Lhr, Dr. Ali Adnan (CET Lot 7 & 8)

**BEND TEST:**

# 5(S.1,2)	Sample bend through 180 degrees Satisfactorily without any crack	<b>Note:-</b>  Only Eighteen Samples Received and Tested
# 5(S.3, 4)	Sample bend through 180 degrees Satisfactorily without any crack	
# 5(S.5, 6)	Sample bend through 180 degrees Satisfactorily without any crack	
# 4(S. 7, 8)	Sample bend through 180 degrees Satisfactorily without any crack	
# 4(S. 9,)	Sample bend through 180 degrees Satisfactorily without any crack	

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)

M. Kamran Siddiqui  
Chief Engineer (HVDC), NTDC, Lahore

Test Performed By: Dr. /Engr.

S. Asad Ali  
Gillani

Client Reference: 8163-66/CE/HVDC/LHR

SOM Lab

Ref: 1856(Page-2/3)

Dated: 06-12-2019

Dated: 06-12-2019

Test: Tension Test & Bend Test

Test Specification: ASTM-A-615

Gauge Length: 8 inch

Sample Type: Deformed Bar

S.No.	Weight	Dia.		Area		Yield Load	Ultimate Load	Yield Stress		Ult. Stress		Elongation	Gauge Length	%age Elongation	Remarks
		Nominal	Calculated	Nominal	Calculated			(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	lb/ft	#	in	in <sup>2</sup>	in <sup>2</sup>	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	2.655	8	0.997	0.79	0.780	25.08	35.60	70010	70910	99380	100650	1.40	8.0	17.5	
2	2.671	8	1.000	0.79	0.785	24.77	35.04	69160	69600	97810	98430	1.30	8.0	16.3	
3	2.612	8	0.989	0.79	0.768	26.35	35.63	73570	75670	99460	102310	1.40	8.0	17.5	
4	2.643	8	0.995	0.79	0.777	26.81	36.00	74850	76100	100510	102200	1.30	8.0	16.3	
5	2.626	8	0.991	0.79	0.772	25.48	35.95	71150	72810	100370	102710	1.20	8.0	15.0	
6	2.628	8	0.991	0.79	0.772	25.15	35.58	70210	71840	99320	101630	1.30	8.0	16.3	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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Witnessed By: M Bilal Butt, O. E, Noman Khaliq, AD(HVDC) % PD(HVDC) Lhr, Dr. Ali Adnan (CET Lot 7 & 8)

**BEND TEST:**

# 8(S.1,2)	Sample bend through 180 degrees Satisfactorily without any crack
# 8(S.3, 4)	Sample bend through 180 degrees Satisfactorily without any crack
# 8(S.5, 6)	Sample bend through 180 degrees Satisfactorily without any crack

**Note:-**  
Only Twelve Samples Received and Tested

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)

M. Kamran Siddiqui  
Chief Engineer (HVDC), NTDC, Lahore

Test Performed By: Dr. /Engr.

S. Asad Ali  
Gillani

Client Reference: 8163-66/CE/HVDC/LHR

SOM Lab

Ref: 1856(Page-3/3)

Dated: 06-12-2019

Dated: 06-12-2019

Test: Tension Test & Bend Test

Test Specification: ASTM-A-615

Gauge Length: 8 inch

Sample Type: Deformed Bar

S.No.	Weight	Dia.		Area		Yield Load	Ultimate Load	Yield Stress		Ult. Stress		Elongation	Gauge Length	%age Elongation	Remarks
		Nominal	Calculated	Nominal	Calculated			(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	lb/ft	#	in	in <sup>2</sup>	in <sup>2</sup>	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	3.334	9	1.117	1.00	0.980	34.25	46.50	75540	77080	102560	104660	1.50	8.0	18.8	
2	3.331	9	1.116	1.00	0.979	33.84	46.13	74640	76240	101730	103910	1.60	8.0	20.0	
3	3.328	9	1.116	1.00	0.978	33.84	45.59	74640	76320	100540	102800	1.20	8.0	15.0	
4	3.372	9	1.123	1.00	0.991	36.54	47.93	80600	81330	105710	106670	1.10	8.0	13.8	
5	3.377	9	1.124	1.00	0.992	36.09	47.68	79590	80230	105150	106000	1.00	8.0	12.5	
6	3.342	9	1.118	1.00	0.982	35.07	46.74	77340	78760	103080	104970	1.30	8.0	16.3	
7	3.349	9	1.119	1.00	0.984	34.96	46.74	77110	78370	103080	104760	1.60	8.0	20.0	
8	3.324	9	1.115	1.00	0.977	35.27	46.61	77790	79620	102790	105210	1.30	8.0	16.3	
9	3.336	9	1.117	1.00	0.980	34.05	45.57	75090	76620	100490	102550	1.20	8.0	15.0	
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Witnessed By: M Bilal Butt, O. E, Noman Khaliq, AD(HVDC) % PD(HVDC) Lhr, Dr. Ali Adnan (CET Lot 7 & 8)

**BEND TEST:**

# 9(S.1,2)	Sample bend through 180 degrees Satisfactorily without any crack	<b>Note:-</b>  Only Eighteen Samples Received and Tested
# 9(S.3, 4)	Sample bend through 180 degrees Satisfactorily without any crack	
# 9(S.5, 6)	Sample bend through 180 degrees Satisfactorily without any crack	
# 9(S. 7, 8)	Sample bend through 180 degrees Satisfactorily without any crack	
# 9(S. 9,)	Sample bend through 180 degrees Satisfactorily without any crack	

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)



**Test Performed By: Dr. S. Asad Ali Gillani**

Maj Adnan Khalid ( R)

Dy Sir MTL DHA, Extnl Elec. cSystem – Sector –A & B, DHA Ph-V - (M/S MCC Ruba)

**Client Reference:** 408/241/E/790/004

**SOM Lab Ref:** 1806 (Page-1/1)

**Dated:** 29-11-2019

**Dated:** 02-12-2019

**Test:** Tension Test

**Test Specification:**ASTM-F-1554

**Guage Length:** 200 mm

**Sample Type:** Anchor-Bolt (19mm)

S.No.	Weight	Dia.		Area		Yield	Ultimate	Yield Stress		Ultimate. Stress		Elongation	Gauge Length	%age Elongation	Reduction of Area(%)
		Nominal	Calculated	Nominal	Calculated	Load	Load	(according to nominal area)	(according to measured area)	(according to nominal area)	(according to measured area)				
	kg/m	mm	mm	mm <sup>2</sup>	mm <sup>2</sup>	kN	kN	MPa	MPa	MPa	Mpa	mm	mm	%	
1	2.195	19	18.88	284	280	112.50	178.50	397	402	630	638	37.5	200	18.8	.48.9
2	2.208	19	18.92	284	281	105.00	154.70	370	374	546	551	42.5	200	21.3	52.7
3	2.004	19	18.03	284	255	104.20	159.20	368	409	561	624	40.0	200	20.0	47.2

**Note:-**

Only Three Samples  
Received and Tested

Note: Please always confirm the results of above report on web [www.uet-civil.edu.pk](http://www.uet-civil.edu.pk)

**Test Performed By:** Dr. Syed Asad Ali Gillani

Engr. Muhammad kaleem Sheikh  
Chief Resident Engineer,  
M-3, IC Industrial City, Faisalabad

**Client Reference:** CRE/M3IC/FIC-030/Lab/147

Dated: 11-09-2019

**SOM Laboratory Reference:** CED/SOM/1824(Page-1/1)

Dated: 03-12-2019

**Test:** Stiffness Test & Tensile Test,

**Sample Type:** GRP Pipe (450mm Diameter)

### Stiffness Test (Parallel Plate Loading Test as per ASTM-D-2412)

(GRP Pipe 450mm)

Total Length = 312 mm, External Diameter = 467 mm, Wall Thickness = 10.5 mm

Percentage Reduction in Diameter of Sample	Compression Load, P (kN)	Stiffness (Corrected)			Remarks
		Pipe Stiffness (kN/m <sup>2</sup> )	Stiffness Factor (N-m)	Specific Tangential initial Stiffness (N/m <sup>2</sup> )	
5%	7.8	1157	2050	23107	No Crack Observed
10%	14.9	1192	2112	23802	No Crack Observed

### Tensile Test

Sample Type	Size of Sample (mm)	Ultimate Load (kN)	Ultimate Stress (MPa)
GRP Pipe (450mm)	30.0 x 10.4	6.65	21.314

**Note:** Please always confirm the results of above report on web: [www.uet-civil.edu](http://www.uet-civil.edu)

**Test Performed By:** Dr Irfan Ul Hassan

DCRE / RE -1,  
Zeeruk International (Pvt) Ltd,  
Lahore Sialkot Motorway Project  
(FWO Camp Jamke Cheema)

**Client Reference:** LSMP/RE-II/St/19/752

Dated 02-12-2019

**SOM Laboratory Reference:** CED/SOM/1825-A(Page-2/2)

Dated 03-12-2019

**Test:** Shear Modulus Test & Adhesion Test

**Sample Type:** Elastomeric Bearing Pad (500mm x 450mm x 77mm )

(Manufacturer: Rainbow-Karachi)

**Shear Strength and Adhesion Test (AS PER ASTM- D-429-08 & -D-4014)**

<b>S. No</b>	<b>PROPERTIES</b>	<b>RESULTS</b>
1	Shear Modulus	12.79 Kg/cm <sup>2</sup>
2	Adhesion Between Elastomeric and Steel	29.23 N/mm

**Test Performed by:** Dr. S. Asad Ali Gillani

DCRE  
Zeeruk International (Pvt) Ltd.  
Lahore Sialkot Motorway Project  
(FWO Camp Jamke Cheema)

**Client Reference No.:** LSM/RE-II/St/19/752

Dated: 02-12-2019

**SOM Lab Ref:** CED/SOM/1825(Page-1/2)

Dated: 03-12-2019

**Test:** Tensile Test, Elongation, Strength, Hardness Test & Comp. Set Test

**Sample Type:** Elastomeric Bearing Pad (Manufacturer: Rainbow –Karachi)

**Size:** 500 x 450 x 77mm

Description	Unit	Before Aging	After aging @100°C.	Standard ASTM
Tensile Strength	Kgs/cm <sup>2</sup>	207.94	163.95	D-412
Elongation at Break	%	530	490	D-412
Hardness (Shore A)	Point	61.5	65.33	D-2240

**-- TEAR STRENGTH (AS PER ASTM-D-624)**

S. No	Sample Size (mm)	Ultimate Load (kN)	Tear Strength (N/mm)
1	12.5 x 3.75	0.265	70.67

**- COMPRESSION SET TEST (AS PER ASTM-D-395)**

S. No.	Thickness of Sample (mm)	Final Thickness (mm)	Compression set (%)
1	3.75	3.70	1.333

