Client Reference No.: ZEG/IRR/RWCS/GEN/UET/251707 **Dated:** 17-07-2025

SOM Lab Ref: CED/SOM/1518 **Dated:** 17-07-2025

Test Type: Flexural Toughness of Steel Fiber Reinforced Shotcrete (RWCS-1)

Test Performed by: Dr. Wasim Abbas

Mr. Ren Pengxun,

Project Manager,

Zhongmei Engineering Group-Almehreen Enterprises Joint Venture

Peshawar

This is with reference to your above-mentioned letter and SOM receipt No. 1518 dated: 17-07-2025. The beam samples of Steel Fiber Reinforced Shotcrete submitted in the Laboratory were tested to determine their Flexural Toughness as per ASTM C 1018. The values of toughness indices exhibited by each sample are provided in the Table below. It is to be noted that each test was stopped once the drop in the load after peak was 90% of ultimate load carrying capacity.

Sample No.	Sample description with respect to Steel Fiber Dosage	Size of Test Specimen (Dimensions in mm)	Flexural Strength (MPa)	Flexural Toughness Index I_5	Flexural Toughness Index, I_{10}
1	60 kg/m^3	100 × 100 × 350	6.62	2.6	3.3
2			4.93	5.3	-
3			4.94	4.4	-

Note**:** Please always confirm the results of above report on web: www.uet-civil.edu.pk

Client Reference No.: Nil **Dated:** 17-07-2025

SOM Lab Ref: CED/SOM/1521 **Dated:** 17-07-2025

Test Type: Load Test of RPC Manhole Cover 24” Diameter

Test Standard: Non-standard test was performed as per requirement of the client [Application of load at the center of the Manhole Cover through circular steel plate of 15 Inches diameter]

Test Performed by: Dr. Asad Ali Gillani

Azam Nafees

Construction Manager

Etihad Town Premier Enclave Raiwind Road Lahore.

This is with reference to your above-mentioned letter and SOM receipt No. 1521 dated: 17-07-2025. The sample of RPC Manhole Cover submitted in the Laboratory has been tested and the result is provided below.

Load Test Result

Diameter of Manhole Cover	Average Thickness of Manhole Cover	Maximum Load	Observations/Remarks
640 mm	69.2 mm	9100 kg	Manhole Cover was cracked at this load

Witnessed by: M. Azhar (Audit Officer Etihad)

Engr. M.Bilawal Mehmood **Test Performed By:** **Dr. /Engr.** Asad Ali Gillani

RE ECSP (Pvt) Ltd. Lahore.(Smart Safe Cities Phase-II Project For 19 Distt Phase-II)

Client Reference: ECSP/PSCS/ARE/18 **SOM Lab Ref:** 1522 (P-1/2)

Dated: 11-05-2025 **Dated:** 17-07-2025

Test: Tension Test & Bend Test **Test Specification:** ASTM-A-615 Deformed Bar (Sheikhoo Steel)

Guage Length: 200 mm **Sample Type:**

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^2	mm^2	kN	kN	MPa	MPa	MPa	MPa	mm	mm	%	
1	1.532	16	15.76	201	195	102.20	131.50	508	525	654	675	30.0	200	15.0	
2	1.525	16	15.73	201	194	102.00	131.50	507	526	654	678	27.5	200	13.8	
3	0.912	12	12.16	113	116	56.20	75.70	497	484	670	652	35.0	200	17.5	
4	1.054	12	13.07	113	134	55.70	75.00	493	415	664	559	37.5	200	18.8	
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BEND TEST:

16mm	Sample bend through 180 degrees Satisfactorily without any crack
12mm	Sample bend through 180 degrees Satisfactorily without any crack

Note:-

Only Six Samples Received and Tested

Note: Please always confirm the results of above report on web www.uet-civil.edu.pk

Engr. M.Bilawal Mehmood **Test Performed By:** **Dr. /Engr.** Asad Ali Gillani

RE ECSP (Pvt) Ltd. Lahore.(Smart Safe Cities Phase-II Project For 19 Distt Phase-II)

Client Reference: ECSP/PSCS/ARE/011 **SOM Lab Ref:** 1522 (P-2/2)

Dated: 02-05-2025 **Dated:** 17-07-2025

Test: Tension Test & Bend Test **Test Specification:** ASTM-A-615 Deformed Bar (Sheikhoo Steel)

Guage Length: 200 mm **Sample Type:**

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^2	mm^2	kN	kN	MPa	MPa	MPa	MPa	mm	mm	%	
1	1.533	16	15.76	201	195	102.70	131.20	511	527	653	673	30.0	200	15.0	
2	1.535	16	15.78	201	196	102.00	131.20	507	522	653	672	35.0	200	17.5	
3	0.908	12	12.13	113	116	56.50	75.20	500	489	665	651	32.5	200	16.3	
4	0.911	12	12.15	113	116	56.70	75.20	502	489	665	649	35.0	200	17.5	
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BEND TEST:

16mm	Sample bend through 180 degrees Satisfactorily without any crack
12mm	Sample bend through 180 degrees Satisfactorily without any crack

Note:-

Only Six Samples Received and Tested

Note: Please always confirm the results of above report on web www.uet-civil.edu.pk

Engr. Farrukh Alvi **Test Performed By:** **Dr. /Engr.** Asad Ali Gillani

Dy. General Manager Works.Habib Rafiq Engineering (Pvt.) Ltd.(101 Tower,Lahore)

Client Reference: HRLE/SKG/2025/Hunza/12-42.33/28-10.43/212 **SOM Lab Ref:** 1523 (P-1/1)

Dated: 17-07-2025 **Dated:** 17-07-2025

Test: Tension Test **Test Specification:** ASTM-A-615

Guage Length: 200 mm **Sample Type:** Deformed Bar (Hunza Steel)

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^2	mm^2	kN	kN	MPa	MPa	MPa	MPa	mm	mm	%	
1	4.828	28	27.98	616	615	255.20	377.00	414	415	612	614	42.5	200	21.3	
2	4.804	28	27.91	616	612	269.00	387.00	437	440	628	633	40.0	200	20.0	
3	0.882	12	11.96	113	112	54.20	72.50	480	483	642	646	32.5	200	16.3	
4	0.885	12	11.98	113	113	58.50	73.70	518	520	652	655	35.0	200	17.5	
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BEND TEST:

28mm	Sample bend through 180 degrees Satisfactorily without any crack
12mm	Sample bend through 180 degrees Satisfactorily without any crack

Note:-

Only Six Samples Received and Tested

Note: Please always confirm the results of above report on web www.uet-civil.edu.pk

Umer Farooq
ASM Steel Buildings Lahore.

Test Performed By: **Dr. /Engr.** Asad Ali Gillani

Client Reference: Nil
SOM Lab Ref: CED/SOM/1520(Page-1/1)
Test: Tension Test & Bend Test
Sample Type: Deformed Bar

Dated: 16-07-2025
Dated: 17-07-2025
Test Specification: ASTM-A 615
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^2	mm^2	kN	kN	MPa	MPa	MPa	MPa	mm	mm	%	
1	3.016	22	22.11	380	384	255.70	333.50	673	666	877	869	30.0	200	15.0	
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BEND TEST:

--	No Bend test performed

Note:-

Only One Sample Received and Tested

Note: Please always confirm the results of above report on web www.uet-civil.edu.pk

Muhammad Afnan Talha **Test Performed By:** **Dr. /Engr.** Nauman Khurram

PC Fortis Tower LLP.(Const Supervision of Infrastructure Dev Works of FORTIS Tower Bahria Town Ph-8 Rwp)

Client Reference: Nil **SOM Lab Ref:** 1517 (Page-1/1)

Dated: 17-07-2025 **Dated:** 17-07-2025

Test: Tension Test & Bend Test **Test Specification:** ASTM-A-706

Gauge Length: 8 inch **Sample Type:** Deformed Bar (Islamabad Supreme)

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^2	in^2	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	1.248	6	0.684	0.44	0.367	10.62	15.85	53240	63830	79450	95260	1.20	8.0	15.0	
2	1.248	6	0.684	0.44	0.367	10.14	15.46	50840	60950	77510	92930	1.20	8.0	15.0	
3	0.586	4	0.468	0.20	0.172	5.10	7.49	56210	65360	82620	96070	1.20	8.0	15.0	
4	0.663	4	0.498	0.20	0.195	5.12	8.02	56430	57880	88470	90740	0.70	8.0	8.8	
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BEND TEST:

# 6	Sample bend through 180 degrees Satisfactorily without any crack
# 4	Sample bend through 180 degrees Satisfactorily without any crack

Note:-

Only Six Samples Received and Tested

Note: Please always confirm the results of above report on web www.uet-civil.edu.pk

Nadeem Ahmad,RE **Test Performed By:** **Dr. /Engr.** Asad Ali Gillani

NESPAK Lhr.(Strom Water Drainage System From Sham Nagar to River Ravi,Pkg-II)

Client Reference: 3882/11/NA/01/480 **SOM Lab Ref:** 1519 (Page-1/1)

Dated: 28-06-2025 **Dated:** 17-07-2025

Test: Tension Test **Test Specification:** ASTM-A-615

Gauge Length: 8 inch **Sample Type:** Deformed Bar (Aziz Steel)

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^2	in^2	Tons	Tons	psi	psi	psi	psi	in	in	%	
1	1.043	5	0.625	0.31	0.307	9.17	14.12	65270	65910	100440	101430	1.20	8.0	15.0	
2	1.049	5	0.626	0.31	0.308	9.19	14.27	65420	65840	101530	102190	1.20	8.0	15.0	
3	1.066	5	0.631	0.31	0.313	9.30	14.55	66140	65510	103490	102500	1.40	8.0	17.5	
4	0.666	4	0.500	0.20	0.196	6.42	9.30	70820	72270	102520	104610	1.30	8.0	16.3	
5	0.665	4	0.498	0.20	0.195	6.24	9.28	68800	70560	102290	104920	1.30	8.0	16.3	
6	0.665	4	0.498	0.20	0.195	6.27	9.33	69130	70910	102860	105490	1.20	8.0	15.0	
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BEND TEST:

# 5	Sample bend through 180 degrees Satisfactorily without any crack
# 4	Sample bend through 180 degrees Satisfactorily without any crack

Note:-

Only Eight Samples Received and Tested

Note: Please always confirm the results of above report on web www.uet-civil.edu.pk