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**TENSILE PROPERTIES AND CHEMICAL COMPOSITION OF 08MM,
10MM, 12MM, 16MM, 20MM, 25MM & 32MM DIAMETER
REINFORCEMENT STEEL BARS**
UM/MT/22/09/23

Date : 11th September 2023

Client : Mr. Nuwan Munasinghe
Quality Assurance Manager
Captain Steel (Pvt.) Ltd.
249/3, Waikkiyawatta Road,
Pahala Bomiriya,
Kaduwela.

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Report No : UM/MT/22/09/23

Client : Mr. Nuwan Munasinghe
Quality Assurance Manager
Captain Steel (Pvt.) Ltd.
249/3, Waikkiyawatta Road,
Pahala Bomiriya,
Kaduwela.

Client's reference : Letter dated 07th September 2023

Project : Anuradhapura Integrated Urban Development Project (AIUDP)
Contractor – M/S Malwatta Construction

Item : RB 500 Grade Reinforcement Steel Bars. The details are given in the following table.

Diameter	No. of Samples	Manufacturer
08mm	05	Captain
10mm	05	
12mm	05	
16mm	05	
20mm	05	
25mm	05	
32mm	05	

Tests Performed : Tensile Test and Chemical composition as per BS 4449:2005 standard

Results :

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TENSILE PROPERTIES AND CHEMICAL COMPOSITION OF 08MM, 10MM, 12MM, 16MM, 20MM, 25MM & 32MM DIAMETER REINFORCEMENT STEEL BARS

Table 1. Characteristic Tensile Properties

Sample	Yield Strength (MPa)	Tensile Strength (MPa)	Tensile/ yield strength ratio	Total Elongation at maximum force, A_{gt} (%)	Total Elongation at fracture, A_t (%)	Cross Sectional Area (mm^2)	Mass per meter (Kg)	
							Actual	Specified values as per the standard
08mm (S1)	645	796	1.23	8.40	20	53.38	0.419	0.371 ~ 0.419
08mm (S2)	641	767	1.20	7.88	19	51.92	0.408	
08mm (S3)	639	761	1.19	8.38	20	50.01	0.393	
10mm (S1)	637	724	1.14	8.86	21	75.96	0.596	0.589 ~ 0.645
10mm (S2)	631	717	1.14	8.36	20	77.85	0.611	
10mm (S3)	638	716	1.12	8.86	21	77.67	0.610	
12mm (S1)	559	662	1.18	11.33	26	108.47	0.852	0.848 ~ 0.928
12mm (S2)	588	698	1.19	11.35	26	113.14	0.888	
12mm (S3)	568	685	1.21	11.34	26	113.08	0.888	
16mm (S1)	552	655	1.19	11.33	26	197.76	1.552	1.509 ~ 1.651
16mm (S2)	582	658	1.13	10.33	24	193.41	1.518	
16mm (S3)	558	656	1.18	11.33	26	193.65	1.520	
20mm (S1)	568	670	1.18	11.84	27	315.83	2.479	2.359 ~ 2.581
20mm (S2)	554	649	1.17	11.82	27	315.65	2.478	
20mm (S3)	558	654	1.17	11.83	27	316.05	2.481	
25mm (S1)	528	634	1.20	11.32	26	468.76	3.680	3.677 ~ 4.023
25mm (S2)	532	639	1.20	11.32	26	469.14	3.683	
25mm (S3)	533	643	1.21	11.82	27	471.76	3.703	
32mm (S1)	566	688	1.22	11.84	27	792.96	6.225	6.026 ~ 6.594
32mm (S2)	570	691	1.21	11.35	26	790.93	6.209	
32mm (S3)	574	693	1.21	11.35	26	791.96	6.217	
Specified values as per the standard	≥ 500 , < 650	-	≥ 1.08	≥ 5.0	-	-	-	-

Note: S1, S2 and S3 refer to Sample 1, Sample 2 and Sample 3 respectively.

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Table 2. Chemical Composition (% by mass)

Sample	Carbon	Sulphur	Phosphorus	Copper	Carbon Equivalent
08mm bar	0.18	0.049	0.040	0.360	0.38
10mm bar	0.17	0.043	0.030	0.320	0.32
12mm bar	0.18	0.045	0.030	0.310	0.35
16mm bar	0.20	0.039	0.024	0.390	0.37
20mm bar	0.20	0.036	0.030	0.154	0.37
25mm bar	0.21	0.042	0.033	0.166	0.38
32mm bar	0.22	0.039	0.034	0.139	0.40
Maximum specified values (product analysis) as per the standard	0.24	0.055	0.055	0.85	0.52

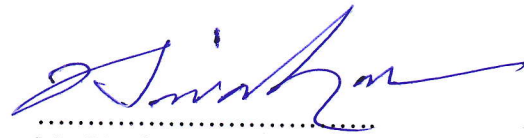
Conclusion :

The results of tensile test and chemical composition of all the above mentioned 08mm, 10mm, 12mm, 16mm, 20mm, 25mm & 32mm diameter steel bar samples comply with the requirements of RB 500 Grade in **BS 4449:2005** Standard.

Report prepared by :



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Department of Materials Science & Engineering



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Mr. V. Sivahar
Head
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This report refers specifically to the sample submitted for testing by the client to the Department of Materials Science and Engineering at University of Moratuwa.