BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)
DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: http://brtc.ce.buet.ac.bd/#/home, Report verification: http://verify.ce.buet.ac.bd

BRTC
Bureau of Research, Testing & Consultat

STRENGTH OF MATERIALS LABORATORY

TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2016]
Sent by: Eng. Md. Maksudul Karim, General Manager (Plant)
Shahriar Steel Mills Limited, Konapara, Jatrabari, Dhaka.
Project: - - -

BRTC No.: 1102-94137/CE/22-23; Dt. 18/6/2023
Ref.: Letter; Dt. 11/6/2023
Date of Test: 20/6/2023
Contractor/supplier: ---
Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia. (mm)	Actual dia. (mm)	Mass Per Unit Length (kg/m)	Average Mass Per Unit Length (kg/m)	Yield or Proof Load (kN)	Yield or Proof Strength R_{eH} (MPa)	Average Yield Strength, R_{eH} (MPa)	Tensile Load (kN)	Tensile Strength R_m (MPa)	Average Tensile Strength, R_m (MPa)	R_m/R_{eH}	Total Elongation (%) (G.length = 5d)	Average Total Elongation (%)	Bend Test **(Seperate samples)**	Reben Test (Seper sampl
1	SSRM B500 CWR	**10**	9.8	0.595		41.2	**520**		48.3	**610**			**22**		**Satisfactory**	**Satisfac**
2	SSRM B500 CWR	**10**	9.8	0.590	**0.592**	41.2	**520**	**515**	48.3	**610**	**605**	**1.17**	**24**	**23**	**Satisfactory**	**Satisfac**
3	SSRM B500 CWR	**10**	9.8	0.590		40.2	**510**		47.3	**600**			**24**		**Satisfactory**	**Satisfac**
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Conversion factor: 1.0 MPa = 1.0 N/mm^2 = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2016 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm		6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm		28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	Nominal, kg/m	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.98	3.85	4.84	6.31	9.87	15.42
	Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

*22mm dia. bar is not covered in BDS ISO 6935-2:2016. Its properties are derived following the principle used for other bar sizes.
Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2016.
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2 Tensile Requirements for Common Steel Grades

Steel Grade	Yield Strength, R_{eH}, MPa Min.	Max.	Ductility Properties R_m/R_{eH} min.	Elongation, % (min.) Total	At R_m
B400C-R	400	--	1.15	14	7
B400CWR	400	--	1.15	14	7
B500C-R	500	--	1.15	14	7
B500CWR	500	--	1.15	14	7
B600C-R	600	--	1.15	10	7
B450CWR	450	1.25 R_{eH} (min.)	1.15	--	7.5
B400DWR	400	1.3 R_{eH} (min.)	1.25	17	8
B420DWR	420	1.3 R_{eH} (min.)	1.25	16	8
B500DWR	500	1.3 R_{eH} (min.)	1.25	13	8

20
RLN7CA4R8

Countersigned by:
Prof. Dr. Hasib Mohammed Ahsan, Test-in-Charge
Dept. of Civil Engg., BUET, Dhaka-1000, Bangladesh

25 June 2023
Test performed by:
Dr. Md. Ferdous Alam
Assistant Professor, Dept. of Civil Engg., BU

Department of Civil Engineering, BUET, Dhaka-1000, Bangladesh

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Ref.: Letter; Dt. 11/6/2023
Date of Test: 20/6/2023
Contractor/supplier: ---
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Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength R_{eH}	Average Yield Strength, R_{eH}	Tensile Load	Tensile Strength R_m	Average Tensile Strength, R_m	R_m/R_{eH}	Total Elongation (%) (G.length = 5d)	Average Total Elongation (%)	Bend Test **(Seperate samples)**	Reben Test (Seper sampl
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B500 CWR	**12**	12.1	0.898		59.5	**525**		73.7	**650**			**22**		**Satisfactory**	**Satisfac**
2	SSRM B500 CWR	**12**	12.1	0.899	**0.899**	58.5	**515**	**525**	72.7	**645**	**650**	**1.24**	**22**	**21**	**Satisfactory**	**Satisfac**
3	SSRM B500 CWR	**12**	12.1	0.900		60.5	**535**		73.7	**650**			**20**		**Satisfactory**	**Satisfac**
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BDS ISO 6935-2:2016 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm		6	8	10	12	14	16	20	22*	25	28	32	40	50
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BDS ISO 6935-2 Tensile Requirements for Common Steel Grades

Steel Grade	Yield Strength, R_{eH}, MPa		Ductility Properties		
	Min.	Max.	R_m/R_{eH} min.	Elongation, % (min.) Total	At R_m
B400C-R	400	--	1.15	14	7
B400CWR	400	--	1.15	14	7
B500C-R	500	--	1.15	14	7
B500CWR	500	--	1.15	14	7
B600C-R	600	--	1.15	10	7
B450CWR	450	1.25 R_{eH} (min.)	1.15	--	7.5
B400DWR	400	1.3 R_{eH} (min.)	1.25	17	8
B420DWR	420	1.3 R_{eH} (min.)	1.25	16	8
B500DWR	500	1.3 R_{eH} (min.)	1.25	13	8

18
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Countersigned by:
Prof. Dr. Hasib Mohammed Ahsan, Test-in-Charge
Dept. of Civil Engg., BUET, Dhaka-1000, Bangladesh

25 June 2023
Test performed by:
Dr. Md. Ferdous Alam
Assistant Professor, Dept. of Civil Engg., BU

Department of Civil Engineering, BUET, Dhaka-1000, Bangladesh

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Project: - - -

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		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B500 CWR	**16**	15.8	1.536		110	**545**		130	**645**			**16**		**Satisfactory**	Satisfac
2	SSRM B500 CWR	**16**	15.8	1.536	**1.538**	109	**540**	**545**	129	**640**	**645**	**1.18**	**16**	**16**	**Satisfactory**	Satisfac
3	SSRM B500 CWR	**16**	15.8	1.542		110	**545**		130	**645**			**16**		**Satisfactory**	Satisfac
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BDS ISO 6935-2:2016 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm		6	8	10	12	14	16	20	*22**	25	28	32	40	50
Nominal cross sectional area, sq.mm		28.3	50.3	78.5	113	154	201	314	*380*	491	616	804	1257	1964
Nominal mass per unit length	Nominal, kg/m	0.222	0.395	0.616	0.887	1.21	1.58	2.46	*2.98*	3.85	4.84	6.31	9.87	15.42
	Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	*±5*	±4	±4	±4	±4	±4

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Conversion factor: 1.0 MPa = 1.0 N/mm^2 = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2 Tensile Requirements for Common Steel Grades

Steel Grade	Yield Strength, R_{eH}, MPa		Ductiliy Properties		
	Min.	Max.	R_m/R_{eH} min.	Elongation, % (min.) Total	At R_m
B400C-R	400	--	1.15	14	7
B400CWR	400	--	1.15	14	7
B500C-R	500	--	1.15	14	7
B500CWR	500	--	1.15	14	7
B600C-R	600	--	1.15	10	7
B450CWR	450	1.25 R_{eH} (min.)	1.15	--	7.5
B400DWR	400	1.3 R_{eH} (min.)	1.25	17	8
B420DWR	420	1.3 R_{eH} (min.)	1.25	16	8
B500DWR	500	1.3 R_{eH} (min.)	1.25	13	8

16

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Department of Civil Engineering ★ BUET, Dhaka-1000, Bangladesh ★

25 June 2023

Countersigned by:
Prof. Dr. Hasib Mohammed Ahsan, Test-in-Charge
Dept. of Civil Engg., BUET, Dhaka-1000, Bangladesh

Test performed by:
Dr. Md. Ferdous Alam
Assistant Professor, Dept. of Civil Engg., BU

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		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B500 CWR	**20**	19.9	2.441		181	**575**		211	**675**			**18**		**Satisfactory**	**Satisfac**
2	SSRM B500 CWR	**20**	19.9	2.441	**2.442**	171	**545**	**565**	204	**650**	**665**	**1.18**	**18**	**18**	**Satisfactory**	**Satisfac**
3	SSRM B500 CWR	**20**	19.9	2.444		179	**570**		209	**665**			**18**		**Satisfactory**	**Satisfac**
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B450CWR	450	1.25 R_{eH} (min.)	1.15	--	7.5
B400DWR	400	1.3 R_{eH} (min.)	1.25	17	8
B420DWR	420	1.3 R_{eH} (min.)	1.25	16	8
B500DWR	500	1.3 R_{eH} (min.)	1.25	13	8

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Countersigned by:
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Dept. of Civil Engg., BUET, Dhaka-1000, Bangladesh

25 June 2023
Test performed by:
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Assistant Professor, Dept. of Civil Engg., BU

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		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B500 CWR	**25**	24.6	3.736	**3.832**	275	**560**	**560**	325	**660**	**670**	**1.20**	**22**	22	**Satisfactory**	**Satisfac**
2	SSRM B500 CWR	**25**	25.2	3.905		275	**560**		333	**675**			**22**		**Satisfactory**	**Satisfac**
3	SSRM B500 CWR	**25**	25.0	3.854		277	**565**		333	**675**			**21**		**Satisfactory**	**Satisfac**
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Conversion factor: 1.0 MPa = 1.0 N/mm^2 = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2016 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm		6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm		28.3	50.3	78.5	113	154	201	314	*380*	491	616	804	1257	1964
Nominal mass per unit length	Nominal, kg/m	0.222	0.395	0.616	0.887	1.21	1.58	2.46	*2.98*	3.85	4.84	6.31	9.87	15.42
	Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	*±5*	±4	±4	±4	±4	±4

*22mm dia. bar is not covered in BDS ISO 6935-2:2016. Its properties are derived following the principle used for other bar sizes.
Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2016.
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2 Tensile Requirements for Common Steel Grades

Steel Grade	Yield Strength, R_{eH}, MPa		Ductiliy Properties		
	Min.	Max.	R_m/R_{eH} min.	Elongation, % (min.) Total	At R_m
B400C-R	400	--	1.15	14	7
B400CWR	400	--	1.15	14	7
B500C-R	500	--	1.15	14	7
B500CWR	500	--	1.15	14	7
B600C-R	600	--	1.15	10	7
B450CWR	450	1.25 R_{eH} (min.)	1.15	--	7.5
B400DWR	400	1.3 R_{eH} (min.)	1.25	17	8
B420DWR	420	1.3 R_{eH} (min.)	1.25	16	8
B500DWR	500	1.3 R_{eH} (min.)	1.25	13	8

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25 June 2023

Countersigned by:
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Important Note: *Samples as supplied to us have been tested. BRTC does not have any responsibility as to the representative character of the samples required to be tested. It is recommended that the samples are sent in a secure and sealed cover/packet/container under the signature of a competent authority. In order to avoid fradulent fabrication of test results, this report has been printed on a security pap It is also recommended that the test results be collected by a duly authorized person.*