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

STRENGTH OF MATERIALS LABORATORY

B R T
Bureau of Rese
Testing & Consu

TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2016]

Sent by: Engr. Md. Masudul Karim, General Manager (GM Plant)
Shahriar Steel Mills Ltd., Konapara, Jatrabari, Dhaka.

BRTC No.: 1102-80237/CE/22-23; Dt. 8/1/2023
Ref.: Letter; Dt. 8/1/2023
Date of Test: 9/1/2023

Samples were received in UNSEALED condition.

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)	Reb T (Sep sam
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B500 CWR	10	9.8	0.587		42.2	535		49.3	625			24		Satisfactory	Satis
2	SSRM B500 CWR	10	9.8	0.590	0.588	43.2	545	540	49.3	625	625	1.16	24	24	Satisfactory	Satis
3	SSRM B500 CWR	10	9.8	0.586		42.2	535		49.3	625			24		Satisfactory	Satis
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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

*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.

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

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Countersigned by:
Prof. Dr. A. B. M. Badruzzaman, Test-in-Charge
Dept. of Civil Engg., BUET

16 January 2023

Test performed by:
Dr. Munaz Ahmed Noor
Professor, Dept. of Civil Engg., BUET

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 p It is also recommended that the test results be collected by a duly authorized person.*

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Ref.: Letter; Dt. 8/1/2023
Date of Test: 9/1/2023

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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)	Reb… T… (Sep… sam…
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B500 CWR	12	11.7	0.843		61.5	545		72.7	645			22		Satisfactory	Satisf…
2	SSRM B500 CWR	12	11.8	0.857	0.853	62.5	555	555	73.7	650	650	1.17	22	22	Satisfactory	Satisf…
3	SSRM B500 CWR	12	11.8	0.858		63.5	560		73.7	650			22		Satisfactory	Satisf…
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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
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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.	Yield Strength, R_{eH}, MPa Max.	Ductiliy Properties R_m/R_{eH} min.	Elongation, % (min.) Total	Elongation, % (min.) 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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16 January 2023

Countersigned by:
Prof. Dr. A. B. M. Badruzzaman, Test-in-Charge
Dept. of Civil Engg., BUET

Test performed by:
Dr. Munaz Ahmed Noor
Professor, Dept. of Civil Engg., BUET

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

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Shahriar Steel Mills Ltd., Konapara, Jatrabari, Dhaka.

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Ref.: Letter; Dt. 8/1/2023
Date of Test: 9/1/2023

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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)	Re T (Sep sam
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B500 CWR	**16**	15.8	1.536	**1.537**	112	**555**	**555**	134	**665**	**665**	**1.20**	**20**	**20**	**Satisfactory**	**Satisf**
2	SSRM B500 CWR	**16**	15.8	1.539		113	**560**		134	**665**			**21**		**Satisfactory**	**Satisf**
3	SSRM B500 CWR	**16**	15.8	1.536		112	**555**		133	**660**			**20**		**Satisfactory**	**Satisf**
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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
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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

3
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Countersigned by:
Prof. Dr. A. B. M. Badruzzaman, Test-in-Charge
Dept. of Civil Engg., BUET

16 January 2023
Test performed by:
Dr. Munaz Ahmed Noor
Professor, Dept. of Civil Engg., BUET

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		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B500 CWR	**20**	19.9	2.443		184	**585**		213	**680**			**20**		**Satisfactory**	**Satisf**
2	SSRM B500 CWR	**20**	19.9	2.444	**2.443**	185	**590**	**580**	215	**685**	**680**	**1.17**	**20**	**20**	**Satisfactory**	**Satisf**
3	SSRM B500 CWR	**20**	19.9	2.442		180	**575**		209	**665**			**20**		**Satisfactory**	**Satisf**
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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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Countersigned by:
Prof. Dr. A. B. M. Badruzzaman, Test-in-Charge
Dept. of Civil Engg., BUET

16 January 2023
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Department of Civil Engineering, BUET, Dhaka-1000, Banglades

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1	SSRM B500 CWR	25	25.0	3.863		285	580		343	700			20		Satisfactory	Satisf
2	SSRM B500 CWR	25	25.0	3.846	3.852	285	580	580	340	695	695	1.20	20	20	Satisfactory	Satisf
3	SSRM B500 CWR	25	25.0	3.846		281	575		339	690			21		Satisfactory	Satisf
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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

5
MTdZDJbr7

16 January 2023

Countersigned by:
Prof. Dr. A. B. M. Badruzzaman, Test-in-Charge
Dept. of Civil Engg., BUET

Test performed by:
Dr. Munaz Ahmed Noor
Professor, Dept. of Civil Engg., BUET

Department of Civil Eng... BUET, Dhaka-1000, Bangl...

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 pa... It is also recommended that the test results be collected by a duly authorized person.*

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
STRENGTH OF MATERIALS LABORATORY

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B R T
Bureau of Rese
Testing & Consu

TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2016]

Sent by: Engr. Md. Masudul Karim, General Manager (GM Plant)
Shahriar Steel Mills Ltd., Konapara, Jatrabari, Dhaka.

BRTC No.: 1102-80237/CE/22-23; Dt. 8/1/2023
Ref.: Letter; Dt. 8/1/2023
Date of Test: 9/1/2023

Samples were received in UNSEALED condition.

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)	Re T
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	SSRM B420 DWR	**25**	24.7	3.767		225	**459**		313	**635**			**19**		**Satisfactory**	
2	SSRM B420 DWR	**25**	24.7	3.772	**3.771**	226	**461**	**462**	315	**640**	**640**	**1.39**	**19**	**19**	**Satisfactory**	
3	SSRM B420 DWR	**25**	24.7	3.773		229	**467**		318	**645**			**20**		**Satisfactory**	
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B500DWR	500	1.3 R_{eH} (min.)	1.25	13	8

6
h39PXPbRG

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Dept. of Civil Engg., BUET

16 January 2023
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