

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

TEST OF DEFORMED M.S. BARS IBDS ISO 6935-2:2016

Shahriar Steel Mills Limited, Konapara, Jatrabari, Dhaka.

Project: Sent by: Eng. Md. Maksudul Karim, General Manager (Plant)

BRTC No.: 1102-94137/CE/22-23; Dt. 18/6/2023

Date of Test: 20/6/2023 Ref.: Letter; Dt. 11/6/2023

Contractor/supplier: ---

Samples were received in UNSEALED condition

BDS																			No	SI.
BDS ISO 6935-2:2016 Weight Requirements, Nominal Area etc. (Table 2).									•			1	3	N					, 	<b>*</b>
2:2016 W																				
Veight R													.0	60	co					
Require													SSRM B500 CWR	SSRM B500 CWR	SSRM B500 CWR				Ident	Frog
ments,	1	-	•	ı	•	•	•	•	•				B500 C	B500 C	B500 C				Identification	Frog Mark /
Nomina													)WR	WR.	WR.				3	
Area																				
etc. (Tai																				
Area etc. (Table 2).													10	3	1	mm			dia.	Nominal
				Ė	İ								0	0	10	m			ë	inal
	-		1	+					,		1		9.8	9.8	9.8	mm			dia.	Actual
20 20 20 20 20 20 20 20 20 20 20 20 20 2	1		-	7.	£	-	-	-	(F	-		1	0.590	0.590	0.595	kg/m	Length	Unit	Per	Mass
							- ê	_	You want			Š							K	Þ
							( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )			Yaka Waka				0.592		kg/m	Length	Unit	Mass Per	Average
													191						11111	7777
							11-1111111	**************************************					40.2	41.2	41.2	KN.		Load	Proof	Yield or
		Y																S		
Conve	•												510	520	520	MPa	R <sub>et</sub>	Strength	Proof	Yield or
Conversion factor:			177	977	9		8													Ą
								-						515		MPa	20 皇	Strength,	Yield	Average
OMP:								\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$					4		4					
= 1.0			7	1	+	-		Ê					47.3	48.3	48.3	Ž			Load	ensile
N/mm													6	6	6	<b>₹</b>			Stre	e
$^{2} = 146$	•	•		•		•	ľ	ľ	ľ	•	•		600	610	610	MPa	70		Strength	Tensile
1.0 MPa = 1.0 N/mm <sup>2</sup> = 145 psi. Strengths are based on nominal area.		-				-	l							6		×		Stre	Te	Ave
trength		•					L	_						605		MPa	λο ₃	Strength,	Tensile	Average
ns are														1.17						R <sub>m</sub> /R <sub>eH</sub>
based u								F						7						±
on non									ļ.				24	24	22	= 5d)	(G.length	(%)	Elongation	Total
ninal a																J.	gth		ation	77
rea.														23			(%)	Elongation	Total	Average
						T	L											ation	<u>a</u>	age
													Satis	Satis	Satis		san	(Set	_	ğ
	ľ			1	•		ľ	ľ	ľ	ŀ	ľ	Ė	Satisfactory	Satisfactory	Satisfactory		samples)	(Seperate	Test	Bend
	F						F	F		F										
						l.	l.	Ŀ		l.			Satisfac	Satisfac	Satisfac		sampl	(Seper	Tes	Reben

22mm dia. bar is not covered in BDS ISO 6935-2:2016. Its properties nal mass per Nominal, kg/m nal cross sectional area, sq.mm

Steel	Yield S	Steel Yield Strength, ReH, MPa Ductiliy Properti	Du	<b>Ductiliy Properties</b>	ties
Grade	Min.	Max.	Rm/ReH	Elongation,	n, % (min.)
			min.	Total	A
B400C-R	400	-	1.15	14	7
B400CWR	400		1.15	7.6	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 eн (min.)	1.15		7.5
B400DWR	400	1.3 R eн (min.)	1.25	17	8
B420DWR	420	1.3 R <sub>eн</sub> (min.)	1.25	16	8
B500DWR	500	1.3 R - H (min.)	1 25	3	8

Countersigned by:

Prof. Dr. Hasib Mohammed Ahsan, Test-in-Charge

Dept. of Civil Engg., BUET, Dhaka-1000, Bangladesh

RLN7CA4R8



Test performed by:

Dr. Md. Ferdous Alam

Assistant Professor, Dept. of Civil Engg., BL

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



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## 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.

-		-	-	-		-	-					သ	2	1				No.	SI.	
_	_	1	_	-	-	-	-		ľ	•	1	SSRM B500 CWR	SSRM B500 CWR	SSRM B500 CWR				Identification	Frog Mark /	
	•	1	-	-			•	•		•	1	12	12	12	mm			dia.	Nominal	
-	1	1	-			,		•	-	-		12.1	12.1	12.1	mm			dia.	Actual	
-	-		7.	-				(i		_	1	0.900	0.899	868.0	kg/m	Length	Unit	Per	Mass	
													0.899		kg/m	Length	Unit	Mass Per	Average	
					-							60.5	58.5	59.5	kN		Load	Proof	Yield or	
	•	¥ •	•								<b>)</b>	535	515	525	MPa	ReH	Strength	Proof	Yield or	
													525		MPa	Ren	Strength,	Yield	Average	
						_					•	73.7	72.7	737	ΚN			Load	Tensile	
-						•			•		•	650	645	650	MPa	R <sub>m</sub>		Strength	Tensile	
							•						650		MPa	R <sub>m</sub>	Strength,	Tensile	Average	
													1.24						R <sub>m</sub> /R <sub>eH</sub>	
	ı	,								•	•	20	22	22	= 5d)	(G.length	(%)	Elongation	Total	
							•						21			(%)	Elongation	Total	Average	
		1								•	•	Satisfactory	Satisfactory	Satisfactory		samples)	(Seperate	Test	Bend	
-		1							•			Satisfac	Satisfac	Satisfac		sample	(Seper	Test	Reber	

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

 Nominal bar dla., mm
 6
 8
 10
 12
 14
 16
 20
 22\*
 25
 28

8

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

ominal cross sectional area, sq.mm ominal mass per Nominal, kg/m

22mm dia. bar is not covered in BDS ISO 6935-2:2016. Its properties are derived following the principle used for other bar sizes octual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2016. Octual 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	Yield S	Steel Yield Strength, Red, MPa Ductiliy Properti	Du	Ductiliy Properties	ties
Grade	Min.	Max.	Rm/ReH	Elongation	n, % (min.)
			aj.	Total	
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 <sub>eH</sub> (min.)	1.25	17	8
B420DWR	420	1.3 R eH (min.)	1.25	16	8

Countersigned by:

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

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**A** 25 s.

t performed by:
Md. Ferdous Alam

Dr. Md. Ferdous Alam
Assistant Professor, Dept. of

Assistant Professor, Dept. of Civil Engg., Bl

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



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#### STRENGTH OF MATERIALS LABORATORY

Sent by: Eng. Md. Maksudul Karim, General Manager (Plant) TEST OF DEFORMED M.S. BARS IBDS ISO 6935-2:2016]

Project: Shahriar Steel Mills Limited, Konapara, Jatrabari, Dhaka

> Ref.: Letter; Dt. 11/6/2023 BRTC No.: 1102-94137/CE/22-23; Dt. 18/6/2023

Contractor/supplier: ---Date of Test: 20/6/2023

Samples were received in UNSEALED condition.

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	ত	ĕ				1	, -	K	သ		•			•							1
	Frog Mark /	Identification				SSRM R500 CWR	OCAN DOO ONLY	WWXM BOOK CVVX	SSRM B500 CWR	1	•	1	_	-	-			1	1	1	-
	Nominal	dia.			am m	16		ō	16			•	•				•	•	-	•	
	Actual	dia.			mm	15.8	A . C. C	15.0	15.8	-			-			-		,		-	-
	Mass	Per	Unit	Length	kg/m	1.536	A 1100	1.330	1.542	-	7	-	4	-		-				-	-
	Average	Mass Per	Unit	Length	kg/m		A 1700	1.000						000 000 000 000 000 000 000 000 000 00	** ( ** ( ) * ( )		_				
1	Yield or	Proof	Load		<u>S</u>	110	100	601	110							-					
	Yield or Yield or	Proof	Strength	ReH	MPa	545	540	O.F.O	545	<b>)</b>											•
	Average	Yield	Strength,	Ret	MPa			1													
	lensile	Load			S	130	430	, K	130		-				-		-				X/////////////////////////////////////
+	leusile	Strength		ZQ m	MPa	645	640	0 0	040								-	-	-	-	
4	Avelage	Tensile	Strength,	R <sub>m</sub>	MPa		222														
5	7 m/7 eH										•			•							
T.44.1	1 (0)	Elongation	(%) :	(G.length	= 5d)	16	3	10	•											•	-
1	Tatale	Total	Elongation	(%)			16				•										
	7 C	lest	(Seperate	samples)		Satisfactory	Satisfactory	Satisfactory.	Satisfactory				•						•		•
Pahan	T 054	lest	(Sepera	sample		Satisfac	Satisfac	Catiofac	Odlielac			•									

*22mm dia haris n	unit length	Nominal mass per	Nominal cross sect	Nominal bar dia., mm	BDS ISO 6935-2:2016
*22mm dia har is not covered in RDS ISO 6935-2:20	Permissible deviation, %	Nominal, kg/m	l cross sectional area, sq.mm	<b>H</b>	Weight Requirements,
102-2-58	±8	0.222	28.3	6	omin
116. Its properties are derived following the principle used for	±8	0.395	50.3	8	al Area etc. (
roperti	±6	0.616	78.5	10	1
es are	±6 ±5	0.887	113	12	able 2).
derive	1/1	1.21	154 201 314 380	14	
d follo	±5	1.58	201	16	
wing t	<b>±</b> 5	2.46	314	20	
he pri	±5	2.46 2.98	380	22*	
nciple	#4	3.85 4.84 6.31	491	25	
used	#4	4.84	616 804	28	
for ot	#4	6.31	804	32	
ner ba	±5   ±5   ±4   ±4   ±4   ±4	9.87	1257	40	
other bar sizes.	#	15.42	1964	50	

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	Yield S	Steel Yield Strength, ReH, MPa Ductiliy Properti	Du	<b>Ductiliy Properties</b>	ties
Grade	Min.	Max.	Rm/ReH	Elongation	n, % (min.)
			3,	Total	At R <sub>m</sub>
B400C-R	400	•	1.15	7.1	
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	
B450CWR	450	1.25 R <sub>eH</sub> (min.)	1.15		7.5
B400DWR	400	1.3 R eн (min.)	1.25	17	8
B420DWR	420	1.3 R <sub>ен</sub> (min.)	1.25	16	8
RWD0058	500	1.3 R eH (min.)	1.25	3	6

Countersigned by:

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

rJWMn35r6

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

25 June 2023

Dr. Md. Ferdous Alam Test performed by:

Assistant Professor, Dept. of Civil Engg., Bl

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



Project:

Sent by: Eng. Md. Maksudul Karim, General Manager (Plant)
Shahriar Steel Mills Limited, Konapara, Jatrabari, Dhaka.

TEST OF DEFORMED M.S. BARS IBDS ISO 6935-2:20161

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

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# STRENGTH OF MATERIALS LABORATORY

Ref.: Letter; Dt. 11/6/2023 BRTC No.: 1102-94137/CE/22-23; Dt. 18/6/2023

Date of Test: 20/6/2023

Contractor/supplier: --

•	SI.	Zo.	į	3.		1	2	3	•			•	-	•		1
	Frog Mark /	Identification				SSRM B500 CWR	SSRM B500 CWR	SSRM B500 CWR		•	-			-	•	1
	Nominal	di.			3	20	20	20				•	•	•	•	
	Actual	dia.			mm	19.9	19.9	19.9		-	-	-		1	-	-
	Mass	Per	Unit	Length	kg/m	2.441	2,441	2.444		-400						-
	Average	Mass Per	Unit	Length	kg/m		2,442									
			Load		K	181	171	179					Control books			
	Yield or Yield or	Proof	Strength	R₩	BdW	575	545	570	\\ <u>\</u>							1
	Average	m	Strength,	70 8	MPa		565								\ \ \ \	
	Tensile	Load			×2	211	204	209						-	+	
Samples w	Tensile	Strength		Rm	MPa	675	650	665	•			-				
ere receivo	Average	Tensile	Strength,	ZO ≡	MPa		665									
ed in UNS	R <sub>m</sub> /R <sub>eH</sub>						1.18			•						
Samples were received in UNSEALED condition.	Total	Elongation	(%)	(G.length	= 5d)	81	18	18	•							
ndition.	Average	Total	Elongation	(%)			28						•			
	Bend	Test	(Seperate	samples)		Satisfactory	Satisfactory	Satisfactory				•				
	Reber	Tes	(Seper	sampl		Satisfac	Satisfac	Satistac		•				ļ.		

******	unit length	Nominal mass per	Nominal cross sect	Nominal bar dia., mm	DUS 130 0533-2.20
CO3 CO1 CO -: L-1-1	unit length Permissible deviation,% ±8   ±8   ±6   ±5   ±5   ±5   ±5   ±4   ±4   ±4   ±4	Nominal, kg/m	cross sectional area, sq.mm	m	DDS 130 0333-2.2010 Weight Negulientelle, IN
3.304	±8	0.222	28.3	6	Morning Alea etc. (1 abic 4).
	8∓	0.395	50.3	8	VI ca
	±6	0.616	50.3   78.5   113	10	
2	±6 ±5	0.887	113	12	010 4).
2	±5	1.21	54	14	
2	#5	1.58 2.46 2.98 3.85 4.84 6.31	201 314 380 491 616 804	6	
2	#5	2.46	314	20	
ho nr	±5	2.98	380	22*	
	#4	3.85	491	25	
Hepr	#	4.84	616	28	
5	#4	6.31	804	32	
apr ha	±5   ±5   ±5   ±4   ±4   ±4   ±4	9.87 15.42	1257	8	
20712	#	15.42	1964	50	

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

\*22mm dia, bar is not covered in BDS ISO 9935-2:2016, its properties are derived rollowing the principle used to outer 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 Requireme

Steel	Yield S	Yield Strength, Ren, MPa	uG	<b>Ductiliy Properties</b>	ties
Grade	Min.	Max.	Rm/ReH	Elongation,	n, % (min.)
			min.	Total	At R <sub>m</sub>
B400C-R	400		1.15	71	
B400CWR	400	-	1.15	7.1	7
B500C-R	500		1.15	1,4	
B500CWR	500		1.15	14	7
B600C-R	600		1.15	10	7
B450CWR	450	1.25 R <sub>эн</sub> (min.)	1.15		7.5
B400DWR	400	1.3 R <sub>eH</sub> (min.)	1.25	77	8
B420DWR	420	1.3 R <sub>eH</sub> (min.)	1.25	16	8
B500DWR	500	1.3 R eн (min.)	1.25	3	8

Countersigned by:

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

25 June 2023

mAS2JLE6D

Dr. Md. Ferdous Alam Test performed by:

Assistant Professor, Dept. of Civil Engg., Bl

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#### STRENGTH OF MATERIALS LABORATORY

TEST OF DEFORMED M.S. BARS IBDS ISO 6935-2:20161

Sent by: Eng. Md. Maksudul Karim, General Manager (Plant) Shahriar Steel Mills Ltd., Konapara, Jatrabari, Dhaka.

Contractor/supplier: --Date of Test: 20/6/2023

Ref.: Letter; Dt. 11/6/2023

BRTC No.: 1102-94137/CE/22-23; Dt. 18/6/2023

Samples were received in UNSEALED condition.

		area.	Conversion factor: 1.0 MPa = 1.0 N/mm <sup>2</sup> = 145 psi. Strengths are based on nominal area.	hs are base	psi. Strengt.	$N/mm^2 = 145$	0 MPa = 1.0	sion factor: 1.	Convers	50	Area etc. (Table 2).	) ) × 1 ) E	30	ble 2).	BDS ISO 6935-2:2016 Weight Requirements, Nominal Area etc. (Table 2).	BDS ISO 6935-2
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Satisfac	Satisfactory		2			675	333		565	777		2 854	35.0	ر م	DOD DEOD OWD	) [
Sausiac	Satisfactory	N	22	1.20	670	675	333	560	560	275	3.832	3.905	25.2	25	SSRM B500 CWR	o
Satisfac	Satisfactory		22			660	325		560	275		3.736	24.6	25	SSRM B500 CWR	
			= 5d)		MPa	MPa	Ž	MPa	MPa	KN.	kg/m	kg/m	mm	am M		
sample	samples)	(%)	(G.length		<b>2</b> 0	<b>2</b> 0		R <sub>et</sub>	ReH		Length	Length				
(Sepera	(Seperate	Elongation	(%)		Strength,			Strength,	Strength	Load	Unit	Unit				
	) lest	i otal	Elongation		Tensile	Strength	Load	Yield	Proof	Proof	Mass Per	Per	dia.	dia.	Identification	Z <sub>o</sub>
	Bend	Average	otal	ス型ス。野	Average	Tensile	Tensile	Average	Yield or	Yield or	Average	Mass	Actual	Nominal	Frog Mark /	SI.
Dokon			1						-				MANAGER	11111111111111111111111111111111111111		

Nominal bar dia., mm BDS ISO 6935-2:2016 Weight Requirements, Nominal Area etc. (Table 2). Nominal mass per Nominal, kg/m lominal cross sectional area, sq.mm 22mm dia, bar is not covered in BDS ISO 6935-2:2016. Its properties are derived following the principle used for other bar sizes 20

Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length

Steel	Yield S	Steel Yield Strength, Red, MPa Ductiliy Properti	Du	<b>Ductiliy Properties</b>	ties
Grade	Min.	Max.	Rm/ReH	Elongation,	n, % (min.)
			Min.	Total	At R <sub>m</sub>
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 <sub>вн</sub> (min.)	1.15		7.5
B400DWR	400	1.3 R ен (min.)	1.25	17	8
B420DWR	420	1.3 R <sub>ен</sub> (min.)	1.25	16	8
BENNOWB	400	1 3 P (min )	26		

Countersigned by:

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

E2rMNg2rb



25 June 2023

Test performed by:

Dr. Md. Ferdous Alam

Assistant Professor, Dept. of Civil Engg., Bl

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 par 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 It is also recommended that the test results be collected by a duly authorized person