

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 [ASTM A 615M-16]

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

Project:

Date of Test: 22/4/2024 Ref.: Letter; Dt. 20/4/2024 BRTC No.: 1103-19935/CE/23-24; Dt. 21/4/2024

Samples were received in UNSEALED condition

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Satisfac		18		610	610	48.1	446	441	34.9		0.607	9.9	10	æ	SSRM B420 DWR		_
		200 mm)		MPa	MPa	ΚN	MPa	MPa	kN	kg/m	kg/m	mm	mm				
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on On	Elongation	(%)		Tensile	Strength	Load	Yield or Proof	Proof	Proof	Unit	Weight	bar	Desig./	3	Identification		ĕ ĕ
e Bence	Average	Elongation	TS/YS	Average	Tensile	Tensile	Average	Average Yield or Yield or	Yield or	Average	Unit	Actual	Bar		Frog Mark /		SI.

ar desig/Normal dia, min	0	Š	1.		20	22	20	40	26	0	1	90
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ominal weight ko/m	0 305 U	0647	0000	1 578	2.466	2.98	3.853	4.834	6.313	0.617 0.888 1.578 2.466 2.98 3.853 4.834 6.313 7.99 9.865 15.41	9.865	15.41 22.2

Actual dia, and TSIYS ratio are provided for informative purpose only. These are not requirements of ASTM A615M-16. Area and weight of 8mm and 22m dia. bars are derived based on principle follwed for other sizes in Table A1.1

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

	Grade 60 [420]	Grade 75 [520]	Grade 80 [550]
Tensile strength min psi IMPai	90 000 [620]	90 000 [620] 100 000 [690] 105 000 [725]	105 000 [725]
Yield strength, min, psi [MPa]	60 000 [420]	60 000 [420] 75 000 [520]	80 000 [550]
Elongation in 8 in. [200 mm], min, %			

10, 12, 16, 20 Bar Designation No.

28, 32, 36, 40, 50, 60

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

> mynkara 24 April 2024

Dr. Shohel Rana Test performed by:

Professor, Dept. of Civil Engg., BUET

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

BRTC No.: 1103-19935/CE/23-24; Dt. 21/4/2024

Date of Test: 22/4/2024 Ref.: Letter; Dt. 20/4/2024

Samples were received in UNSEALED condition

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<u>z</u> (, <u>a</u>	Actual	JUNIT	Average		Yield or Yield or	Average	Tensile	Tensile	Average	SWST	///	S Elongation
ž	Identification	Desig./	bar	Weight	Unit	Proof	Proof		Load	Strength	Tensile		///	///
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		mm	mm	kg/m	kg/m	ΚN	MPa	MPa	Š	MPa	MPa		//	2000 mm)
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ACTM AS	STM ASIAM IS MOISH Daniel													

ASI M A615M-16 Weight Requirements and Nominal Area of bars (Table A1.1)

measured unit weight sha	Nominal weight, kg/m	Nominal area, sq.mm	9	
ll not l			H	1.
nall not be less than 94% of the nomin	0.395	50.3	8	
than 94	0.617	79	10	
1% of th	0.888	113	12	
ie nomi	1.578	113 201	16	
inal we	2.466	314	20	2010
nal weight. 8mm bar size is not covered in	1.578 2.466 2.98 3.853 4.83	314 380	22	27.0
nm bar	3.853	491	25	
size is	4.834	616	28	
not co	6.313	804	22	
/ered ir	7.99	1018	36	
S	9.865	1257	40	
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Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length. Actual dia. and TS/YS ratio are provided for informative purpose only. These are not requirements of ASTM A615M-16. Area and weight of 8mm and 22m dia. bars are derived based on principle follwed for other sizes in Table A1.1

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ASTM A615M-16 Tensile Re

Solum Solum-10 remaile vedantentents for Continion Steel Grades	ILE FOL COLLING	See Prage	
	Grade 60	Grade 75	Grade 80
	[420]	[520]	[550 <u>]</u>
Tensile strength, min. psi [MPa]	90 000 [620]	90 000 [620] 100 000 [690] 105 000 [725]	105 000 [725]
Yield strength, min, psi [MPa]	60 000 [420]	60 000 [420] 75 000 [520] 80 000 [550]	80 000 [550]
Elongation in 8 in. [200 mm], min, % Bar Designation No.			

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

28, 32, 36, 40, 50, 60

10, 12, 16, 20

MYNZara

Dr. Shohel Rana Test performed by

24 April 2024

Professor, Dept. of Civil Engg., BUET

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Testing & Consultation Bureau of Research

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Ref.: Letter; Dt. 20/4/2024 Date of Test: 22/4/2024

Samples were received in UNSEALED condition

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1	1	1	-	ı	•	-	•	1	-	I	1	15.9	16.0	0.91	mm		dia.	bar	Actual
1	1	1	-	-	-	-	-	1	-	-	1	1.568	1.575	1.577	kg/m			Weight	Unit
	1			-						Á			1.573		kg/m		Weight	Unit	Average
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													(66500 psi)	459	MPa	(YS)	Strength	Yield or Proof	Average Yield or Average
		-	_	+	-			-	-	•		126	127	126	ΚN			Load	Tensile
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	1	_		1	•		,	•		ı	•		(91000 psi)	630	MPa	(TS)	Strength	Tensile	Average
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	-									ı			17				(%)	Elongation	Average
-	-	-	•		•	•	•	•	•	•	•	Satisfactory	Satisfactory	Satisfactory		samples)	(Seperate	Test	Bend

ASTM A615M-16 Weight Requirements and Nominal Area of bars (Table A1.1)

Measur	Nom	Nom	Bar	ASTM A
sured unit weigh	iinal weight, kg/m	Nominal area, sq.mm	desig./Nominal d	M A615M-16 Wei
t shall not			minal dia., mm	ght Requi
shall not be less than 94% of the	0.395	50.3	8	ht Requirements and Nominal Area of bars (Table A1.1)
han 94%	0.395 0.617 0.888 1.578 2.466 2.98 3.853 4.834 6.313 7.99 1	79	10	nd Nom
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n bar s	3.853	491	25	3
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eight. 8mm bar size is not covered in ASTM A615I	.313	491 616 804 1018 1257 1	32	
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ASTM	.865	1257	40	
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				5 psi. Strengths are based on nominal area
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Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length. Actual dia. and TS/YS ratio are provided for informative purpose only. These are not requirements of ASTM A615M-16. Area and weight of 8mm and 22m dia. bars are derived based on principle follwed for other sizes in Table A1.1

ASTM A615M-16 Tensile Require

Grade 60 Grade 75	Grade 60	Grade 75	Grade 80
••	[420]	[520]	[550]
Tensile strength, min. psi [MPa]	90 000 [620]	90 000 [620] 100 000 [690] 105 000 [725]	105 000 [725]
Yield strength, min, psi [MPa]	60 000 [420]	60 000 [420] 75 000 [520] 80 000 [550]	80 000 [550]
Elongation in 8 in. [200 mm], min, %	///		
Bar Designation No.			

28, 32, 36, 40, 50, 60

10, 12, 16, 20

Countersigned by:

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

24 April 2024

Test performed by:

Professor, Dept. of Civil Engg., BUET Dr. Shohel Rana

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> Ref.: Letter; Dt. 20/4/2024 BRTC No.: 1103-19935/CE/23-24; Dt. 21/4/2024

Date of Test: 22/4/2024

Samples were received in UNSEALED condition.

Bar desig.Nominal dia, mm 8 10 12 16 20 22 2	ASTM A615M-16 Weight Benuirements and Noming Apparet and Action (T. 1)	,				1		1									SONNE CHARGO	SSRM B420 DWR 20 19.9 19.9	SSRM B420 DWR 20 20.0 SSRM B420 DWR 20 19.9 	SSRM B420 DWR 20 20.0 SSRM B420 DWR 20 19.9 SSRM B420 DWR 20 19.9	SSRM B420 DWR 20 20.0 SSRM B420 DWR 20 20.0 SSRM B420 DWR 20 19.9 SSRM B420 DWR 20 19.9	SSRM B420 DWR 20 20.0 SSRM B420 DWR 20 19.9 SSRM B420 DWR 20 19.9	SSRM B420 DWR 20 20.0 SSRM B420 DWR 20 19.9	SSRM B420 DWR 20 20.0 SSRM B420 DWR 20 19.9 SSRM B420 DWR 20 19.9
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r. 1.0 MPa = 1.0 N/mm² = 145 psi. Strengths are based on nominal area		-	1		-		•			•		1 1	ГТ	1 1	1 1 1	1 1 1 1	1 1 1	(98000 psi)	98000 psi)	675 (98000 psi)	MPa 675 (98000 psi)	(TS) MPa 675 (98000 psi)	Strength (TS) MPa 675 (98000 psi)	Tensile Strength (TS) MPa 675 (98000 psi)
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	•	•	,		•		•		•								Satisfactory	Satisfactory Satisfactory .	Satisfactory Satisfactory Satisfactory	Satisfactory Satisfactory Satisfactory Satisfactory	Satisfactory Satisfactory Satisfactory Satisfactory	Satisfactory Satisfactory Satisfactory Satisfactory	(Seperate samples) Satisfactory Satisfactory Satisfactory	Test (Seperate samples) Satisfactory Satisfactory Satisfactory

Ig/Nominal dia,,mm 8 10 12 16 20 22 25 28 32 36 40 50 60 I area, sq.mm 50.3 79 113 201 314 380 491 616 804 1018 1257 1963 2827 I weight, kg/m 0.395 0.617 0.888 1.578 2.466 2.98 3.853 4.834 6.313 7.99 9.865 15.41 22.2 ed unit weight shall not be less than 94% of the nominal weight. 8mm bar size is not covered in ASTM A615M-16.	medsured unit weight	Monorad we	Nominal die	Naminal are
20 22 25 28 32 36 40 314 380 491 616 804 1018 1257 466 2.98 3.853 4.834 6.313 7.99 9.865 I weight. 8mm bar size is not covered in ASTM	Sma	giit, kg/m	a, sy.IIIII	ominal dia., mm
20 22 25 28 32 36 40 314 380 491 616 804 1018 1257 466 2.98 3.853 4.834 6.313 7.99 9.865 I weight. 8mm bar size is not covered in ASTM	1 Ssel ed 101	0.395	20.3	8
20 22 25 28 32 36 40 314 380 491 616 804 1018 1257 466 2.98 3.853 4.834 6.313 7.99 9.865 I weight. 8mm bar size is not covered in ASTM	nan 94%	1.00	6.9	10
20 22 25 28 32 36 40 314 380 491 616 804 1018 1257 466 2.98 3.853 4.834 6.313 7.99 9.865 I weight. 8mm bar size is not covered in ASTM	of the	0.888	113	12
20 22 25 28 32 36 40 314 380 491 616 804 1018 1257 466 2.98 3.853 4.834 6.313 7.99 9.865 I weight. 8mm bar size is not covered in ASTM	nomin	1.578	201	6
25 28 32 36 40 491 616 804 1018 1257 3.853 4.834 6.313 7.99 9.865 Im bar size is not covered in ASTM	¥	2.466	314	20
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32 36 40 804 1018 1257 .313 7.99 9.865 ot covered in ASTM	m bar :	3.853	491	25
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36 40 50 60 1018 1257 1963 2827 7.99 9.865 15.41 22.2 ered in ASTM A615M-16.	not cov	6.313	804	32
40 50 60 1257 1963 2827 9.865 15.41 22.2 0 ASTM A615M-16.	ered in	7.99	1018	36
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111111111111111111111111111111111111111	1-16.	22.2	2827	60

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ASTM A615M-16 Tensile Requir

Grade 60 Grade 75	Grade 60	Grade 75	S Grada 80
	[420]	[520]	[550]
Tensile strength, min. psi [MPa]	90 000 [620]	100 000 [690]	105 000 [725]
Yield strength, min, psi [MPa]	60 000 [420]	75 000 [520]	80 000 [550]
Elongation in 8 in. [200 mm], min, %			
Bar Designation No.			
10, 12, 16, 20	9	7	7
25, 22	8	7	7
28, 32, 36, 40, 50, 60	7	6	6

Countersigned by:

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

TORKANA

24 April 2024

Dr. Shohel Rana Test performed by:

Professor, Dept. of Civil Engg., BUET

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	<u>a</u> c a.	מבת טוו ווטווווומו	שווים מוכים	1.3 mm a 1.3 mm - 1.43 psr. Onengins are pased of Hollina alea				ш	5 40	32 3	25 2	20 22	12 16	al dia,, mm 8 10 12 16 20 22 25 28 32 36 40 50 60	Bar desig./Nominal dia., mm	Bard
			the are ha	= 115 psi Stropo	= 10 N/mm ²	T 10 MP2	Conversion factor				A1.1)	bars (Table	nal Area of L	ASTM A615M-16 Weight Requirements and Nominal Area of bars (Table A1.1)	A615M-16 W	ASTN
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Satisfactory		18			650	320		484	237		3.799	24.8	22	OOTHO D440		\[\(\)
Satisfactory	18	48	1.36	(93000 psi)	640	314	(68500 psi)	470	231	3.794	3.789	24.0) N	SSBW B420 DWD		ו נג
Satisfactory		18		645	640	314 4	474	468	230		3.795	24.0	2 6	OWN DCVB WGSS		.
		200 mm)		MPa	MPa	ź	MPa	MPa	κN	kg/m	кg/m	n m		CODM DASO DIVID		Ţ
samples)		(G. length =		(TS)			(YS)						Į a.			
(Seperate	(%)			Strength			Strength	Strength	Load	Weight		ola.	Nominai			
Test	Elongation	(%)		Tensile	Strength	Load	Yield or Proof	Proof	Proot	Unit	vveignt		Desig./	To all call call call		
Bend	Average	Elongation	TS/YS	Average	Tensile	ensile	Average		Yield or	Average Yield or Yield or	CERT	Comai	7 2	Idontification		Z (
			13									NAME OF THE PARTY	Dar.	Fron Mark /		S

/4V/	9.865 15.41 22.2	7.99	3 2.466 2.98 3.853 4.834 6.313 7.99 9.	4.834	3.853	2.98	2.466	1.578	0.888	0.61	0.395	ninal weight, kg/m
4	113 201 314 380 491 616 804 1018 1257 1963 2827	1018	804	616	491	380	314	201	<u>1</u>	79	50.3	minal area, sq.mm
50	40	36	32	28	25	22	20	16	12	10	00	Bar desig/Nominal dia., mm

ASTM A615M-16 Tel Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

Actual dia, and TSYS ratio are provided for informative purpose only. These are not requirements of ASTM A615M-16. Area and weight of 8mm and 22m dia. bars are derived based on principle follwed for other sizes in Table A1.1

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AST W ACTOM- TO Tensile Requirements for Common Steel Grades	its for Commo	on Steel Grade	5
	Grade 60	Grade 75	Grade 80
	[420]	[520]	[550]
Tensile strength, min. psi [MPa]	90 000 [620]	90 000 [620] 100 000 [690] 105 000 [725]	105 000 [725]
Yield strength, min, psi [MPa]		60 000 [420] 75 000 [520] 80 000 [550]	80 000 [550]
Elongation in 8 in. [200 mm], min, % Bar Designation No.			

Countersigned by:

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

28, 32, 36, 40, 50, 60

24 April 2024

Dr. Shohel Rana

Test performed by

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