BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819 557 964; PABX: 966 5650-80 Ext. 7226; www.buet.ac.bd/ce/

STRENGTH OF MATERIALS LABORATORY

BRTC
Bureau of Research, Testing & Consultation

TEST OF DEFORMED M.S. BARS [ASTM A 615M-16]

BRTC No.: 1102-05701/CE/19-20; Date: 21/1/2020

Sent by: জনাব মো: বাবুল আখতার,
নির্বাহী প্রকৌশলী, স্থানীয় সরকার প্রকৌশল অধিদপ্তর (এলজিইডি), মাদারীপুর।

স্মারক নং - এলজিইডি/নিপ্র:/মাদারী/২০২০/ ১৬৬, তারিখ: ১৩/০১/২০২০

Contractor: M/S. Atahar Enterprise, Shipchar, Madaripur.

Scheme: ইউজেডআর-০৮, ঢালীকান্দি মহিলা মাদ্রাসা বড় দোয়ালী খলিফাকান্দি জিপিএস ভায়া শহীদ হোসেন হাই স্কুল সড়কে ৭০০ মিটার চেইনেজে ৩০.০০ মিটার পিসি গার্ডার ব্রীজ নির্মাণ কাজ।
Project: MSRDP, Upazilla: Shipchar, District: Madaripur.

Date of Test: 22/1/2020

Samples were received in sealed condition.

Serial No.	Frog Mark / Identification	Bar Designation/ Nominal diameter	Actual bar diameter	Unit Weight	Average Unit Weight	Yield or Proof Load	Yield or Proof Strength	Average Yield or Proof Strength (YS)	Tensile Load	Tensile Strength	Average Tensile Strength (TS)	TS/YS	Elongation (%) (Gauge Length = 200 mm)	Average Elongation (%)	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa				
1	RRM RANI B400 CWR	25	25.2	3.905		239	487	489	302	615	615		20		-
2	RRM RANI B400 CWR	25	25.1	3.869	3.887	239	487	(71000 psi)	302	615	(89500 psi)	1.26	21	20	-
3	RRM RANI B400 CWR	25	25.1	3.886		242	493		304	620			20		-
1	RRM RANI B400 CWR	20	20.5	2.595		147	468	465	189	600	600		18		-
2	RRM RANI B400 CWR	20	20.4	2.571	2.597	141	449	(67500 psi)	186	590	(87500 psi)	1.29	17	18	-
3	RRM RANI B400 CWR	20	20.6	2.624		150	478		192	610			18		-
1	RRM RANI B400 CWR	16	16.2	1.613		90	448	441	134	665	660		18		-
2	RRM RANI B400 CWR	16	16.3	1.628	1.619	88	438	(64000 psi)	133	660	(95500 psi)	1.50	17	17	-
3	RRM RANI B400 CWR	16	16.2	1.616		88	438		131	650			17		-
1	RRM RANI B400 CWR	12	12.1	0.899		51	451	445	62	550	545		17		-
2	RRM RANI B400 CWR	12	12.0	0.890	0.898	51	451	(64500 psi)	62	550	(79000 psi)	1.22	17	17	-
3	RRM RANI B400 CWR	12	12.1	0.906		49	434		61	540			18		-
1	RRM RANI B400 CWR	10	10.1	0.625		34	430	422	41	520	505		18		-
2	RRM RANI B400 CWR	10	9.9	0.609	0.618	32	405	(61000 psi)	39	494	(73500 psi)	1.20	19	18	-
3	RRM RANI B400 CWR	10	10.0	0.620		34	430		40	505			18		-

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

Bar desig./Nominal dia., mm	10	12	16	20	*22*	25	28	32	36	40	50	60
Nominal area, sq.mm	79	113	201	314	*380*	491	616	804	1018	1257	1963	2827
Nominal weight, kg/m	0.617	0.888	1.578	2.466	*2.984*	3.853	4.834	6.313	7.99	9.865	15.41	22.2

Measured unit weight shall not be less than 94% of the nominal weight.
Area and weight of 22m dia. bar is derived based on principle follwed for other sizes in Table A1.1
Actual dia. and TS/YS ratio are provided for informative purpose only. These are not requirements of ASTM A615M-16.

Conversion factor: 1.0 MPa = 1.0 N/mm2 = 145 psi

Note: -

ASTM A615M-16 Tensile Requirements for Common Steel Grades

	Grade 60 [420]	Grade 75 [520]	Grade 80 [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

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Countersigned by:
Prof. Dr. Md. Abdul Jalil, Test-in-Charge
Dept. of Civil Engg., BUET

30/01/2020

Test performed by:
Md. Ruhul Amin
Assistant Professor, Dept. of Civil Engg.

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 reccommended that the test results be collectde by a duly authorized person.*

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Bureau of Research, Testing & Consultation

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

Sent by: BM. Anowar Hossain, In Charge - Quality Control,
The Rani Re-Rolling Mills Ltd., Shyampur, Dhaka-1204, Bangladesh.
Project: -
-

BRTC No.: 1102-05500/CE/19-20; Date: 19/1/2020
Reference: RRM/2020/Test-01; Date: 19/1/2020
Date of Test: 22/1/2020
Contractor/Supplier: -
Samples were received in unsealed condition.

Serial No.	Frog Mark / Identification	Nominal diameter	Actual diameter	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 (%) (gauge length = 5d)	Average Total Elongation (%)	Bend Test (Seperate samples)	Rebend Test (Seperate samples)
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	RRM RANI TMT 500W	25	25.1	3.896	3.896	270	550	545	329	670	670	1.23	18	18	-	-
2	RRM RANI TMT 500W	25	25.2	3.901		270	550		331	675			17		-	-
3	RRM RANI TMT 500W	25	25.1	3.892		265	540		324	660			18		-	-
1	RRM RANI TMT 500W	20	20.1	2.497	2.474	190	605	610	228	725	730	1.20	27	-	-	-
2	RRM RANI TMT 500W	20	20.0	2.460		195	620		233	740			22		-	-
3	RRM RANI TMT 500W	20	20.0	2.464		192	610		228	725			25		-	-
1	RRM RANI TMT 500W	16	16.0	1.583	1.586	112	555	550	140	695	685	1.25	19	20	-	-
2	RRM RANI TMT 500W	16	16.0	1.585		112	555		139	690			19		-	-
3	RRM RANI TMT 500W	16	16.1	1.590		108	535		136	675			21		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-		-	-		-	-			-		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-		-	-		-	-			-		-	-

Conversion factor: 1.0 MPa = 1.0 N/mm² = 145 psi

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	±5	±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 dia. of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2016.

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}	Elongation, % (min.)	
			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

Countersigned by:
Prof. Dr. Md. Abdul Jalil, Test-in-Charge
Dept. of Civil Engg., BUET

25/01/2020
Test performed by:
Md. Ruhul Amin
Assistant Professor, Dept. of Civil Engg.

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2	RRM RANI TMT 500W	12	12.1	0.901		64	565		78.1	690			25		-	-
3	RRM RANI TMT 500W	12	12.1	0.900		63.2	560		77.2	685			23		-	-
1	RRM RANI TMT 500W	10	10.1	0.630	0.631	44.7	570	560	54	685	680	1.21	26	-	-	-
2	RRM RANI TMT 500W	10	10.1	0.633		43.4	555		52.2	665			22		-	-
3	RRM RANI TMT 500W	10	10.1	0.629		44.3	565		53.5	680			26		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-		-	-		-	-			-		-	-
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-	-	-	-	-		-	-		-	-			-		-	-

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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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