ROAD DEVELOPMENT AUTHORITY (RDA)

Concrete Laboratory
Research & Development Division
P.O. Box 14, Borupana Road, Ratmalana, Sri Lanka.
Tel: 0112 634701 Fax: 0112632649

TEST REPORT

Reference No: LR/2021/0060

Issued To	:	Quality Manager, Captain Steel Pvt Ltd, No.249/3, Waikkiyawatta Road, Pahala Bomiriya, Kaduwela.
Project/Road Name	:	Not Mentioned
Test Location/Road Section	:	Not Mentioned
Invoice No.	:	IV/2021/0053
Test Item(s)/Material(s)	:	1 test Items i Steel Physical Test - BS4449:2005
Test Details	:	Following tests were done by R & D Division Laboratory staff of i Steel Physical Test - BS4449:2005 - 07 Nos'
Tested Date(s)	:	12-Feb-2021
Issue Date	:	17-Feb-2021

ROAD DEVELOPMENT AUTHORITY (RDA)
Concrete Laboratory
Research & Development Division
P.O. Box 14, Borupana Road, Ratmalana, Sri Lanka.
Tel: 0112 650684 Fax: 01125656056

Source : Not Mentioned

Lab Ref. No: LR/2021/0060

Brand : CAPTAIN RB 500

Sample No :
S/2021/0216 - 08 mm
S/2021/0217 - 10 mm
S/2021/0218 - 12 mm
S/2021/0219 - 16 mm
S/2021/0220 - 20 mm
S/2021/0221 - 25 mm
S/2021/0222 - 32 mm

Sample Size		Test Result		Specification for Mass per Metre
		Cross Sectional Area (mm^2)	Mass per Metre (kg)	(kg)
- 08 mm S/2021/0216	1	49.3	0.386	0.371– 0.419
	2	49.2	0.386	
	3	49.1	0.385	
- 10 mm S/2021/0217	1	77.5	0.608	0.589 – 0.645
	2	78.3	0.614	
	3	77.7	0.610	
- 12 mm S/2021/0218	1	113.3	0.888	0.848 – 0.928
	2	112.8	0.885	
	3	113.0	0.886	

Conclusion:

Tensile properties and mass per metre of all specimens comply with BS 4449:2005+A2:2009 standards.

1.Samples were handed over to R&D by - Quality Manager, Captain Steel (Pvt) Ltd, No.249/3, Waikkiyawatta Road, Pahala Bomiriya,Kaduwela.

2.Results of the test valid only for the sample sent to the laboratory.

Tested by:		**Checked by:**		**Authorized by:**	
Name:	U.K.M.Viduranga	Name:	J.K.B.P.Jayasooriya	Name:	A.W.C.Chamikara
Designation:	Research Assistant	Designation:	Research Assistant	Designation:	Material Engineer
Date:	12-Feb-2021	Date:	17-Feb-2021	Date:	17-Feb-2021

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Brand : CAPTAIN RB 500

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S/2021/0216 - 08 mm
S/2021/0217 - 10 mm
S/2021/0218 - 12 mm
S/2021/0219 - 16 mm
S/2021/0220 - 20 mm
S/2021/0221 - 25 mm
S/2021/0222 - 32 mm

Sample Size		Test Result: Cross Sectional Area (mm^2)	Test Result: Mass per Metre (kg)	Specification for Mass per Metre (kg)
- 16 mm S/2021/0219	1	202.1	1.585	1.508 - 1.651
	2	203.0	1.592	
	3	203.4	1.595	
- 20 mm S/2021/0220	1	309.0	2.423	2.358 – 2.581
	2	308.8	2.422	
	3	309.4	2.426	
- 25 mm S/2021/0221	1	491.0	3.851	3.676 – 4.023
	2	491.9	3.858	
	3	493.3	3.869	
32 mm S/2021/0222	1	793.6	6.224	6.026 - 6.593
	2	789.5	6.192	
	3	793.8	6.226	

Conclusion:

Tensile properties and mass per metre of all specimens comply with BS 4449:2005+A2:2009 standards.

1.Samples were handed over to R&D by - Quality Manager, Captain Steel (Pvt) Ltd, No.249/3, Waikkiyawatta Road, Pahala Bomiriya,Kaduwela.

2.Results of the test valid only for the sample sent to the laboratory.

Tested by: for e.e. Lanka
Name: U.K.M.Viduranga
Designation: Research Assistant
Date: 12-Feb-2021

Checked by:
Name: J.K.B.P.Jayasooriya
Designation: Research Assistant
Date: 17-Feb-2021

Authorized by:
Name: A.W.C.Chamikara
Designation: Material Engineer
Date: 17-Feb-2021

ROAD DEVELOPMENT AUTHORITY (RDA)
Concrete Laboratory
Research & Development Division
P.O. Box 14, Borupana Road, Ratmalana, Sri Lanka.
Tel: 0112 650684 Fax: 01125656056

Road Development Authority Concrete Laboratory Research & Development Division

Source : Not Mentioned

Lab Ref. No: LR/2021/0060

Brand : CAPTAIN RB 500

Sample No :
S/2021/0216 - 08 mm
S/2021/0217 - 10 mm
S/2021/0218 - 12 mm
S/2021/0219 - 16 mm
S/2021/0220 - 20 mm
S/2021/0221 - 25 mm
S/2021/0222 - 32 mm

Sample Size		Tensile Strength (MPa)	Yield Strength (MPa)	Strength Ratio (Tensile Strength/Yield Strength)	Elongation After Fracture (%)	Elongation at Maximum Force (%)
- 08 mm S/2021/0216	1	619.2	532.3	1.16	15.0	13.3
	2	615.9	528.9	1.16	16.0	14.0
	3	619.3	540.4	1.15	16.0	13.9
- 10 mm S/2021/0217	1	678.5	602.9	1.13	17.0	13.5
	2	674.3	592.1	1.14	16.0	13.3
	3	668.9	577.2	1.16	15.0	12.2
- 12 mm S/2021/0218	1	647.1	551.9	1.17	17.0	14.0
	2	658.8	567.0	1.16	20.0	15.8
	3	650.6	560.6	1.16	19.0	16.1
Specified Absolute Values		-	485 - 650	>1.06	-	>4.0

Conclusion:

Tensile properties and mass per metre of all specimens comply with BS 4449:2005+A2:2009 standards.

1.Samples were handed over to R&D by - Quality Manager, Captain Steel (Pvt) Ltd, No.249/3, Waikkiyawatta Road, Pahala Bomiriya,Kaduwela.

2.Results of the test valid only for the sample sent to the laboratory.

tested by:
Name: U.K.M.Viduranga
Designation: Research Assistant
Date: 12-Feb-2021

Checked by:
Name: J.K.B.P.Jayasooriya
Designation: Research Assistant
Date: 17-Feb-2021

Authorized by:
Name: A.W.C.Chamikara
Designation: Material Engineer
Date: 17-Feb-2021

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Research & Development Division
P.O. Box 14, Borupana Road, Ratmalana, Sri Lanka.
Tel: 0112 650684 Fax: 01125656056

Source : Not Mentioned

Lab Ref. No: LR/2021/0060

Brand : CAPTAIN RB 500

Sample No :
S/2021/0216 - 08 mm
S/2021/0217 - 10 mm
S/2021/0218 - 12 mm
S/2021/0219 - 16 mm
S/2021/0220 - 20 mm
S/2021/0221 - 25 mm
S/2021/0222 - 32 mm

Sample Size		Tensile Strength (MPa)	Yield Strength (MPa)	Strength Ratio (Tensile Strength/Yield Strength)	Elongation After Fracture (%)	Elongation at Maximum Force (%)
- 16 mm S/2021/0219	1	730.4	636.0	1.15	18.0	14.2
	2	724.7	630.1	1.15	18.0	14.4
	3	722.8	632.0	1.14	17.0	13.1
- 20 mm S/2021/0220	1	704.2	599.1	1.18	17.0	13.2
	2	712.8	609.4	1.17	19.0	14.7
	3	703.1	599.5	1.17	18.0	13.5
- 25 mm S/2021/0221	1	662.9	559.6	1.18	25.0	18.7
	2	661.9	559.0	1.18	26.0	19.7
	3	658.4	554.7	1.19	25.0	18.6
- 32 mm S/2021/0222	1	704.2	523.3	1.35	33.0	24.5
	2	667.6	510.3	1.31	30.0	23.0
	3	701.5	503.5	1.39	31.0	24.3
Specified Absolute Values		-	485 - 650	>1.06	-	>4.0

Conclusion:

Tensile properties and mass per metre of all specimens comply with BS 4449:2005+A2:2009 standards.

1.Samples were handed over to R&D by - Quality Manager, Captain Steel (Pvt) Ltd, No.249/3, Waikkiyawatta Road, Pahala Bomiriya,Kaduwela.

2.Results of the test valid only for the sample sent to the laboratory.

tested by:
Name: U.K.M.Viduranga
Designation: Research Assistant
Date: 12-Feb-2021

Checked by:
Name: J.K.B.P.Jayasooriya
Designation: Research Assistant
Date: 17-Feb-2021

Authorized by:
Name: A.W.C.Chamikara
Designation: Material Engineer
Date: 17-Feb-2021

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING
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TESTING OF "Captain" BRAND REINFORCEMENT STEEL BARS
Report No: UM/MT/132/01/21

Date : 08th February 2021

Client : Director,
Research & Development,
Research & Development Division,
Road Development Authority,
Borupana Road,
Rathmalana.

TESTING OF "Captain" BRAND REINFORCEMENT STEEL BARS

Report No : UM/MT/132/01/21

ORIGINAL SEEN. CERTIFIED AS A TRUE COPY

Client : Director,
Research & Development,
Research & Development Division,
Road Development Authority,
Borupana Road,
Rathmalana.

Client's reference : Letters Dated 27th January and 02nd February 2021

Particulars of Samples : Samples of 8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm and 32mm "Captain" Brand Reinforcement Steel Bars.

Type of Test	Diameter	Lab Sample No's
Chemical Composition	8 mm	S/2021/0216
	10mm	S/2021/0217
	12mm	S/2021/0218
	16mm	S/2021/0219
	20mm	S/2021/0220
	25mm	S/2021/0221
	32mm	S/2021/0222

Tests Performed : Chemical composition as per BS 4449: 2005+A2:2009 Standards

Results :

Chemical Composition :

Sample Size	Element (%) by Mass				
	C	S	P	Cu	Carbon Equivalent
8 mm	0.197	0.030	0.032	0.276	0.34
10 mm	0.196	0.014	0.018	0.007	0.33
12 mm	0.194	0.025	0.015	0.006	0.33
16 mm	0.209	0.041	0.021	0.006	0.35
20 mm	0.206	0.043	0.020	0.007	0.35
25 mm	0.218	0.028	0.014	0.007	0.35
32 mm	0.217	0.033	0.020	0.006	0.35
Specification (Maximum)	0.240	0.055	0.055	0.850	0.52

Conclusion :

Chemical compositions of all specimens comply with BS 4449: 2005+A2:2009 standards.

Report prepared by:

Mr. V.S.C. Weragoda
Senior Lecturer,
Department of Materials Science and Engineering

Mr. V.Sivahar,
Head, Department of Materials Science and Engineering,
University of Moratuwa.

This report refers specifically to the samples submitted for testing to the Department of Materials Science and Engineering at University of Moratuwa.

Department of Materials Science and Engineering
University of Moratuwa, Moratuwa,
Sri Lanka.

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TESTING OF "Captain" BRAND REINFORCEMENT STEEL BARS
Report No: UM/MT/127/01/21

ORIGINAL SEEN. CERTIFIED AS A TRUE COPY

Date : 08th February 2021

Client : Director,
Research & Development,
Research & Development Division,
Road Development Authority,
Borupana Road,
Rathmalana.

Department of Materials Science and Engineering
University of Moratuwa, Moratuwa,
Sri Lanka.

TESTING OF "Captain" BRAND REINFORCEMENT STEEL BARS

Report No : UM/MT/127/01/21

Client : Director,
Research & Development,
Research & Development Division,
Road Development Authority,
Borupana Road,
Rathmalana.

Client's reference : Letters Dated 27th January and 02nd February 2021

Particulars of Samples : Samples of 8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 25 mm and 32mm "Captain" Brand Reinforcement Steel Bars.
(Grade RB500 as per SLS 375)

Type of Test	Diameter	Quantity	Lab Sample No's
Bend Test	8 mm	35 Nos.	S/2021/0216
	10mm		S/2021/0217
	12mm		S/2021/0218
Re – bend Test	16mm		S/2021/0219
	20mm		S/2021/0220
	25mm		S/2021/0221
	32mm		S/2021/0222

Tests Performed : Bend and re–bend tests as per SLS: 375: 2009 Standards

Results :

Sample Size	Test Result	
	Bend Test	Re – bend Test
8 mm	Pass*	Pass*
10 mm	Pass*	Pass*
12 mm	Pass*	Pass*
16 mm	Pass*	Pass*
20 mm	Pass*	Pass*
25 mm	Pass*	Pass*
32 mm	Pass*	Pass*

* All 05 specimens

ORIGINAL SEEN. CERTIFIED AS A TRUE COPY

Conclusion :
Bend and re-bend properties of all specimens comply with SLS 375:2009 standards.

Report prepared by:

Mr. V.S.C. Weragoda
Senior Lecturer,
Department of Materials Science and Engineering

Mr. V.Sivahar,
Head, Department of Materials Science and Engineering,
University of Moratuwa.

This report refers specifically to the samples submitted for testing to the Department of Materials Science and Engineering at University of Moratuwa.