

Silken Sewing Ltd (New) (Extension Building)

Baniar Chala (Member Bari), Vobanipur, Gazipur, Bangladesh

(24.159093,90.427022)

14th March 2022



Buildings Information

1. Woven Building (Partially eight storied) (reinforced concrete structure)

Observations

**Detail Structural Assessment report needs to
be revised**



BUET/CE/01819/390

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

Sent by: Site Incharge
Silken Sweing Ltd. Vobanipur, Gazipur.
Project: Silken Sweing Ltd. Vobanipur, Gazipur.

BRTC No.: 1101-94777/CE/19-20; Date: 2/9/2019

Ref.: Letter, Date: 2/9/2019
Date of Test: 5/9/2019

Contractor/supplier:

Samples were received in unsealed condition.

Sl. No.	Frog Mark / Identification	Bar Desig. / Nominal dia. mm	Actual bar dia. mm	Unit Weight kg/m	Average Unit Weight kg/m	Yield or Proof Load kN	Yield or Proof Strength MPa	Average Yield or Proof Strength (YS) MPa	Tensile Load kN	Tensile Strength MPa	Average Tensile Strength (TS) MPa	TS/YS	Elongation (%)	Average Elongation (%)	Bend Test
1	SAS XBAR 400+	25	24.8	3.786		209	426	416	286	580	575		21		-
2	SAS XBAR 400+	25	24.7	3.763	3.776	204	415	(60500 psi)	282	575	(83500 psi)	1.38	22	22	-
3	SAS XBAR 400+	25	24.8	3.780		200	407		280	570			23		-
1	SAS XBAR 400+	20	19.9	2.434		140	446	452	196	625	625		15		-
2	SAS XBAR 400+	20	20.0	2.461	2.446	152	484	(65500 psi)	199	635	(90500 psi)	1.38	17	16	-
3	SAS XBAR 400+	20	19.9	2.444		134	427		192	610			16		-
1	SAS XBAR 400+	16	16.0	1.581		97	483	483	135	670	675		17		-
2	SAS XBAR 400+	16	16.1	1.590	1.587	98	488	(70000 psi)	137	680	(97500 psi)	1.40	17	17	-
3	SAS XBAR 400+	16	16.1	1.589		96	478		134	665			16		-
1	SAS XBAR 400+	12	11.9	0.876		50.2	444	443	70.1	620	615		18		-
2	SAS XBAR 400+	12	11.9	0.876	0.880	50.2	444	(64000 psi)	69.3	615	(88000 psi)	1.39	18	18	-
3	SAS XBAR 400+	12	12.0	0.865		49.7	440		60.7	615			17		-
1	SAS XBAR 400+	10	9.7	0.578		41.7	530	515	48.8	620	620		16		-
2	SAS XBAR 400+	10	9.7	0.584	0.581	42.2	535	(75000 psi)	49.7	630	(89500 psi)	1.20	17	16	-
3	SAS XBAR 400+	10	9.7	0.581		38.6	489		47.9	605			16		-

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

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

Bar desig./Nominal dia., mm	10	12	16	20	25	28	32	36	40	50	60
Nominal area, sq. mm	79	113	201	314	380	491	674	804	1040	1571	2827
Nominal weight, kg/m	0.617	0.888	1.578	2.466	2.904	3.833	4.834	6.313	7.99	19.855	35.41

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 followed 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.

ASTM A615M-16 Tensile Requirements for Common Steel Grades

Tensile strength, min. psi [MPa]	Grade 60		Grade 75		Grade 80	
	[420]	[520]	[520]	[520]	[520]	[520]
Yield strength, min. psi [MPa]	60 000 [420]	100 000 [520]	100 000 [520]	100 000 [520]	100 000 [520]	100 000 [520]
Elongation in 8 in. [200 mm], min, %	20, 22, 36, 40, 35, 63	9	7	7	7	7

Bar Designation No.
10, 12, 16, 20
25, 28
36, 40, 35, 63

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



Authenticity of this page is verifiable from <http://verify.ce.buet.ac.bd> with the QR Code or ID



Test performed by:
Dr. Syed Ishtiaq Ahmad
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/container/box under the signature of a competent authority. In order to avoid fraudulent 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.

Unit Weight	Average Unit Weight	Yield or Proof Load	Yield or Proof Strength	Average Yield or Proof Strength (YS)	Tensile Load	Tensile Strength
kg/m	kg/m	kN	MPa	MPa	kN	MPa
3.786		209	426	416	286	580
3.763	3.776	204	415	(60500 psi)	282	575
3.780		200	407		280	570
2.434		140	446	452	196	625
2.461	2.446	152	484	(65500 psi)	199	635
2.444		134	427		192	610
1.581		97	483	483	135	670
1.590	1.587	98	488	(70000 psi)	137	680
1.589		96	478		134	665
0.876		50.2	444	443	70.1	620
0.878	0.880	50.2	444	(64000 psi)	69.3	615
0.885		49.7	440		69.7	615
0.578		41.7	530	515	48.8	620
0.584	0.581	42.2	535	(75000 psi)	49.7	630
0.581		38.6	489		47.9	605

A1.1) Conversion factor: 1.0 MPa = 1.0 N/mm² = 145 psi

Strength of rebar below 500 MPa in test report

Strength of rebar considered in Detail Structural Assessment report as 500 MPa. However, in test report strength of rebar has been found below the design value. Factory engineer is required to revised the Detail Structural Assessment report considering the test results.

4.3.3 Steel Reinforcement:

Yield strength of steel, fy = 72,500 psi

4.3.4 Soil condition:

According to Soil test report the foundation Capacity= 4 ksf [from Soil test]

4.3.4 Cover to Concrete:

Design strength of rebar considered as 500 MPa in Detail Structural Assessment report

4.3.2 Concrete:

For existing part of building

Concrete compressive strength, $f_c = 5000$ psi (For column) [from Cylinder test report]

Concrete compressive strength, $f_c = 4500$ psi (For Footing) [from Cylinder test report]

Concrete compressive strength, $f_c = 4000$ psi (For beam) [from Cylinder test report]

Concrete compressive strength, $f_c = 4000$ psi (For Slab) [from Cylinder test report]

Coarse aggregate: Stone chips

4.3.3 Steel Reinforcement:

Yield strength of steel, $f_y = 72,500$ psi

4.3.4 Soil condition:

According to Soil test report the foundation Capacity= 4 ksf [from Soil test]

4.3.4 Cover to Concrete:

Strength of concrete considered in design report was 5000 psi (34.48 MPa)

Strength of concrete considered in test report was 34.48 MPa. However, in some test reports strength of concrete is below the design value. Factory engineer is required to revised the Detail Structural Assessment report based on equivalent strength of all the test results.

DEPARTMENT OF CIVIL ENGINEERING
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CONCRETE LABORATORY


BRTC
Bureau of Research, Testing & Consultancy


BRTC No. : 1101-96230 /19-20/CE; Dt: 24/9/2019
Sent by : Md. Kamal Uddin, Site In charge
Ref. No. : Letter, Dt: 24/9/2019
Project : Silken Sewing Ltd. (Woven Building)
Sample : Cylinder [Mix proportion(as quoted): 1:1.25:2.50, Aggregate Type: Stone chips]
Location : Padestal
Test : Compressive Strength [ASTM C39]
Date of Test : 29/9/2019

TEST REPORT

Sl. No.	Date of Casting as per the letter	Specimen Designation/ Frog Mark	Specimen Area (sq. in)	Maximum Load (lb)	Crushing Strength (psi)	Average Crushing Strength	Mode of Failure
1	29/8/2019	---	12.67	45,224	3,569	3600 psi	Combined *
2	(31 days test)	---	12.67	44,774	3,534	(24.8 MPa)	Combined *
3		---	12.42	45,900	3,696	(253 kg/cm ²)	Combined *

Note: Samples were received in unsealed condition. * Combined =

Countersigned by: 
Dr. Md. Abdul Jalil
Professor
Department of Civil Engineering

47

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Authenticity of this page is verifiable from



Test: **3600 psi**
(24.8 MPa)
Mas: (253 kg/cm²)
Le:
Con:

Strength of concrete in the test report was 3600 psi (24.82 MPa)

Prepared load plan to be revised



LEGEND:

- 
ZONE-1: STAIR
 ALLOWABLE LIVE LOAD 80PSF.
- 
ZONE-2: WORKING AREA
 ALLOWABLE LIVE LOAD 100PSF.

LEGEND:

- 
ZONE-1: STAIR
 ALLOWABLE LIVE LOAD 80PSF.
- 
ZONE-2: WORKING AREA
 ALLOWABLE LIVE LOAD 100PSF.
- 
ZONE-3: TOILET
 ALLOWABLE LIVE LOAD 60PSF.
- 
ZONE-4: LOBBY AREA
 ALLOWABLE LIVE LOAD 100PSF.

Live load plan- 3rd to 6th floor 4.8 kPa (100 psf)

Live load on typical floor (3rd to top floor) is considered as 4.8 kPa in prepared load plan. As per BNBC-2020, live load for light storage areas is required to be considered minimum 6 kPa. However, the factory engineer is required to revise the load plan as per BNBC requirement and check the design accordingly.

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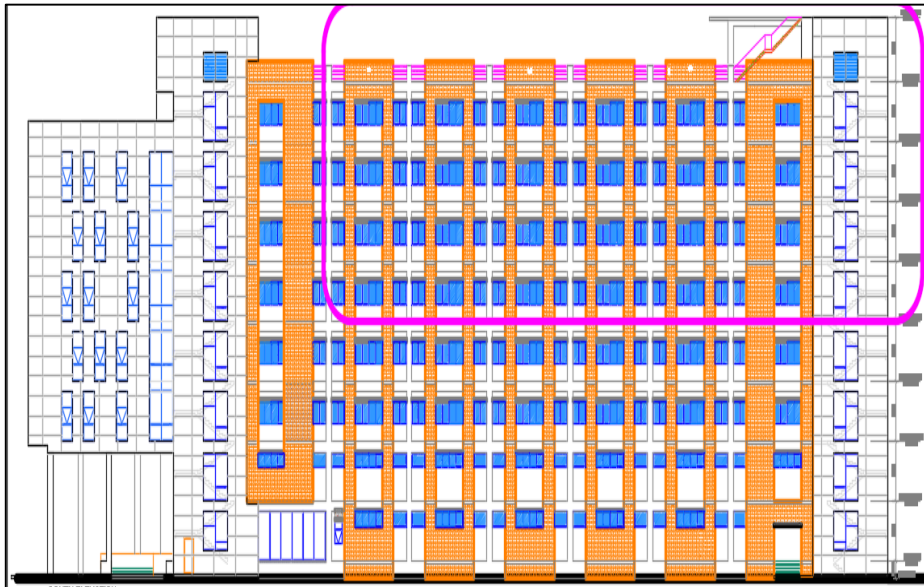
Occupancy or Use	Uniform kN/m ²	Concentrated kN
Storage areas above ceilings	1.00	--
Storage warehouses (shall be designed for heavier loads if required for anticipated storage)		
Light	6.00	--
Heavy	12.00	--
Stores		
Retail		
First floor	4.80	4.50
Upper floors	3.60	4.50
Wholesale, all floors	6.00	4.50
Vehicle barriers	See Sec 2.3.11	
Walkways and elevated platforms (other than exit ways)	2.90	--
Yards and terraces, pedestrian	4.80	--

Live load table (BNBC 2020)



Storage on 3th floor

Ongoing vertical extension



Building is designed as 8 storied

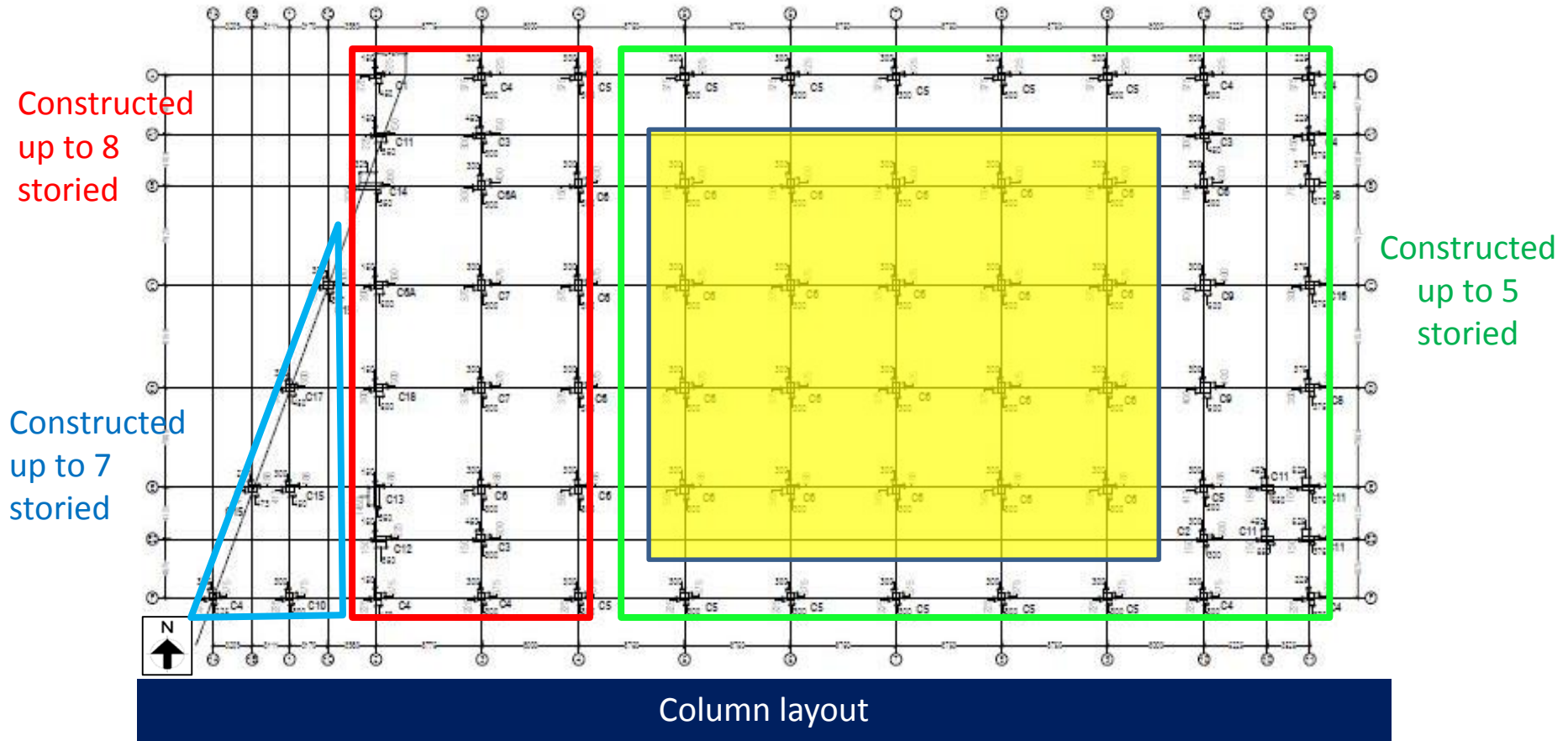
The building has permit drawing for 8 storied and factory is conducting vertical extension on five storied part.



Building is currently partially 8 storied



Ongoing construction on 5th floor



Cursory calculation indicates the stress in highlighted column in layout (yellow marked) will be exceeded normal design limit for above of 7 storied. Factory engineer is required to review, design of column stress and prepare a Detail Engineering Assessment (DEA) report prior conducting any vertical extension.

Falling hazard at existing eight storied part



No edge protection provided at existing 6th, 7th floor and roof

No edge protection provided at existing 6th, 7th floor and roof. Factory is required to provide edge protection at all areas to prevent possible falling hazard.

Possible vehicle impact for column



No barrier provided for the exposed columns at ground floor

Columns at ground floor are prone to possible vehicle impact. Factory is required to provide barrier for all exposed column at ground floor to prevent from possible vehicle impact.

Non-structural elements found unbraced/not anchored



Storage rack found within the building without braced/anchored

Factory is required to brace/anchor all non structural elements.

Problems Observed

Woven Building:

Item-1: Detail Structural Assessment report needs to be revised.

Item-2: Prepared load plan to be revised.

Item-3: Ongoing vertical extension.

Item-4: Falling hazard at existing eight storied part.

Item-5: Possible vehicle impact for column.

Item-6: Non-structural elements found unbraced/not anchored.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Detail Structural Assessment report needs to be revised (Woven Building)	Building engineer is required to revise the Detail Structural Assessment report based on actual strength of concrete & rebar test reports.	6-weeks
02	Detail Structural Assessment report needs to be revised (Woven Building)	Implement any remediation work if required.	6-months
03	Prepared load plan to be revised (Woven Building)	Building engineer is required to check the occupancy of the building and revise the load plan following occupancy type & BNBC minimum floor live load requirements.	6-weeks
04	Prepared load plan to be revised (Woven Building)	Check the design of the building accordingly.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
05	Prepared load plan to be revised (Woven Building)	Implement floor live load plan.	6-months
06	Ongoing vertical extension (Woven Building)	Building engineer is required to review, design of column stress and prepare a DEA report with necessary remedial action prior conducting any vertical extension above 5 storied.	6-weeks
07	Ongoing vertical extension (Woven Building)	Verify in-site material strength if required.	6-weeks
08	Ongoing vertical extension (Woven Building)	Implement required remediation works prior any extension.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
09	Falling hazard at existing eight storied part (Woven Building)	Factory is required to provide edge protection to all open areas to prevent possible falling hazards.	6-weeks
10	Possible vehicle impact for column (Woven Building)	Factory is required to provide barrier for all exposed columns at ground floor to prevent possible vehicle impact.	6-months
11	Non-structural elements found unbraced/not anchored (Woven Building)	Factory is required to brace/anchor all non-structural elements.	6-months

Survey Limitations and Assumptions

This report is for the private and confidential use of Accord for whom it was prepared together with their professional advisors as appropriate. It should not be reproduced in whole or in part or relied upon by third parties for any use without the express written permission of RSC.

This report can be used in discussion with the supplier or factory owner as a means to rectify or address any observations made. The report is not comprehensive and is limited to what could be observed during a visual inspection of the building.

This Report is not intended to be treated as a generalised inspection and does not cover the deterioration of structural members through dampness, fungal or insect attack, nor does it deal with problems and defects of a non-structural nature. Other non structural aspects of the building such as fire safety have not been assessed in this survey.

Except as otherwise noted, drains and other services were not viewed or tested during our inspection and are therefore similarly excluded from this Report. We have not inspected any parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.

External inspection of the façade walls has generally been carried out from ground level only by visual sighting. No opening up works were carried out (except as noted) and we rely on the Architects and Engineers drawings provided to us for our views on concealed parts of the structure and in particular foundations. Strengths of materials and components are untested and we recommend that the factory owners Building Engineer carries out in situ testing over and above those suggested to satisfy themselves with the material strengths and component details.

Recommendations, where given, are for the purpose of providing indicative advice only, are not exhaustive, relate solely to identifying key and obvious structural defects as identified in this presentation, and do not take the form of or constitute a specification for works. We take no responsibility for the works as constructed. This report does not interfere with the factory owners Building Engineers responsibility for the structural performance of this building, The Building Engineer remains fully responsible for the structural adequacy of the building.

This report does not comment in detail on the future seismic performance of the building and only highlights the fact that the building may experience significant damage or collapse in a seismic event along with many others in the Dhaka region.

The observations in this report are based on the Engineering Judgement of the lead surveyor/engineer at the time of the survey. We assume in making these observations that no covering up of faults defects, filling or plastering over cracking or significant repair work has been carried out by the building owner. Any future alteration or additional work by the building owner will void this report.