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KSS Knit Composite Ltd.

Baherarchala, Mawna, Sreepur, Gazipur
(24.200909, 90.402270)
19th April, 2016

Client Summary Report

Observations & Actions

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ACCORD
on Fire and Building Safety in Bangladesh

Executive Summary

On Tuesday 19th April, 2016 Md. Abdul Momin, Abu Daud Kabir Ahmed & Abdullah Al-Mahmud of Bangladesh ACCORD foundation carried out a visual structural survey of the **KSS Knit Composite Ltd** at the address and coordinates given on the cover page of this report. We were accompanied by Mohammad Rafiqul Islam, General Manager of the company. We also met with Md. Golam Kabir, Manager (Administration), Engr. Md. Shahinuzzaman (Mithun), Manager-Construction of the company & many others and inspected all accessible parts of the buildings.

The factory was comprised of one production building, a medical & baby care Building and boiler room. Also, there are another five buildings named office building, dyeing shed, generator building, boiler building, water treatment plant which are currently under construction. The site was reported by the Manager to have no flooding history.

As part of this structural survey of the **KSS Knit Composite Ltd** complex we inspected the following buildings;

- **Factory Building:** Is currently occupied to 1st Floor Level, with construction works progressing above this level. The Factory Management Team & building permit drawings indicated that this building was being progressed to provide a total of 6 storeys.

Executive Summary (Continued)

A building permit drawing, which appears to be signed by the Local Government in January 2010, was provided during the pre-survey meeting together with Architectural and Structural drawings.

Medical & Baby Care Building: The Engineering drawings dated 10 January, 2008 indicate a single storey steel shed. However, in actual it has been constructed as two storied RC building. No permit drawings were available.

Boiler Room: Single storey non engineered steel roof shed supported with brick masonry wall.

Executive Summary (Continued)

Based on our structural inspection, we have a number of major and non-exhaustive key concerns:

Building 1: Factory building

1. Differences between actual construction and information on design drawings.
2. Damage due to standing water on present roof & column reinforcement above 1st floor left exposed affected by corrosion.
3. Damage in peripheral wall caused by water leakage/improper maintenance of water drainage system & direct exposal of steam from boiler to wall.
4. Improper support to stair case & lift core shed.
5. Columns Stresses and stability for 6 story building

Building 2: Medical & Baby Care Building

6. Differences between actual construction and information on design drawings.
7. Missing edge protection on roof.

Building 3: Boiler Room

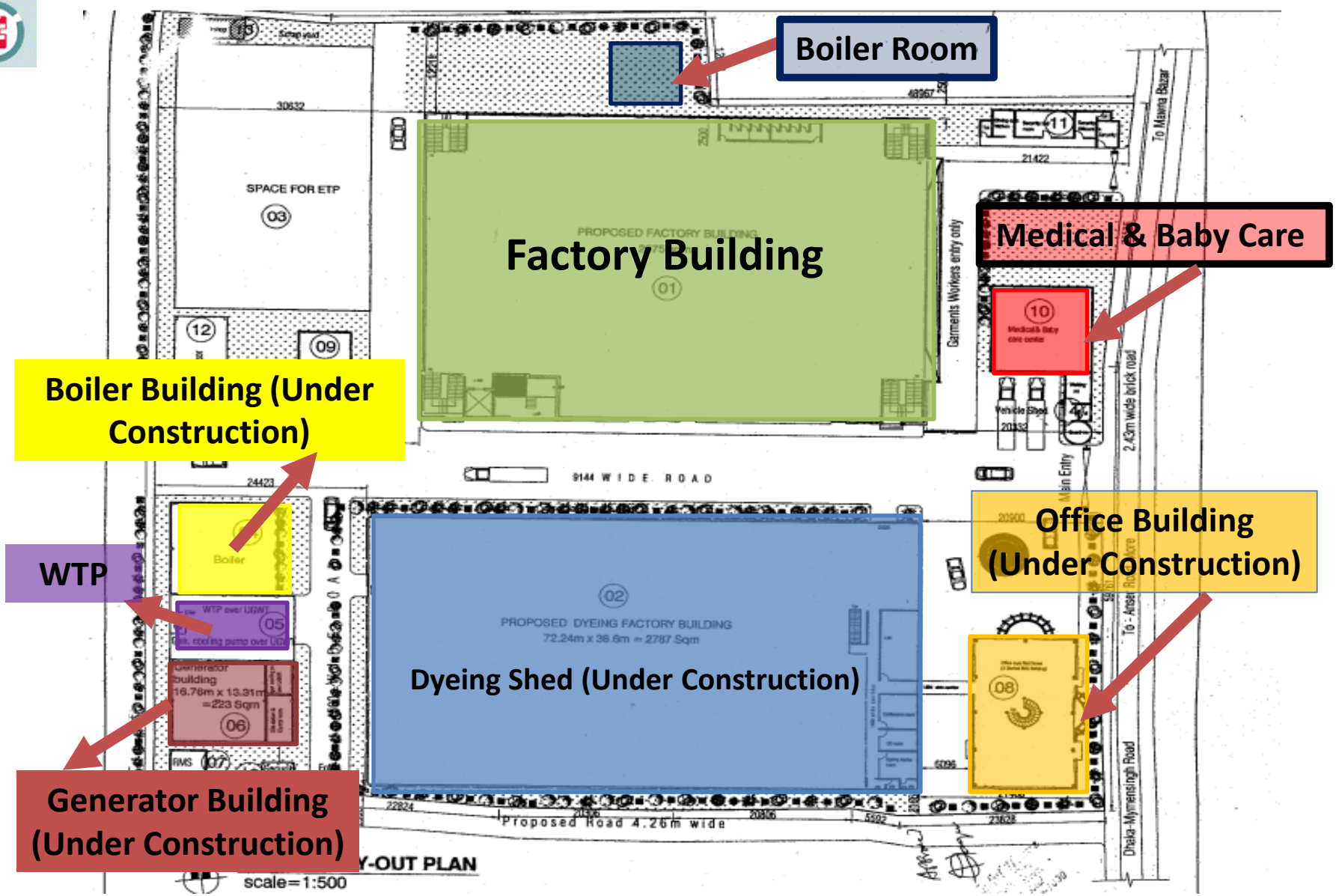
8. Improper support to non-engineered steel roof shed and apparently inadequate steel members on roof shed.

At this point we see no reason to suspend operations in the facility due to these concerns, subject to immediate responses to the required actions noted at the end of this report within the timeframe noted.

Further actions with associated priorities and timeframes are given at the end of this report. Please note that these actions should be completed as soon as practically possible and certainly within the timeframe noted.

Our Limitations and Assumptions are also noted at the end of this report.

Building Extents



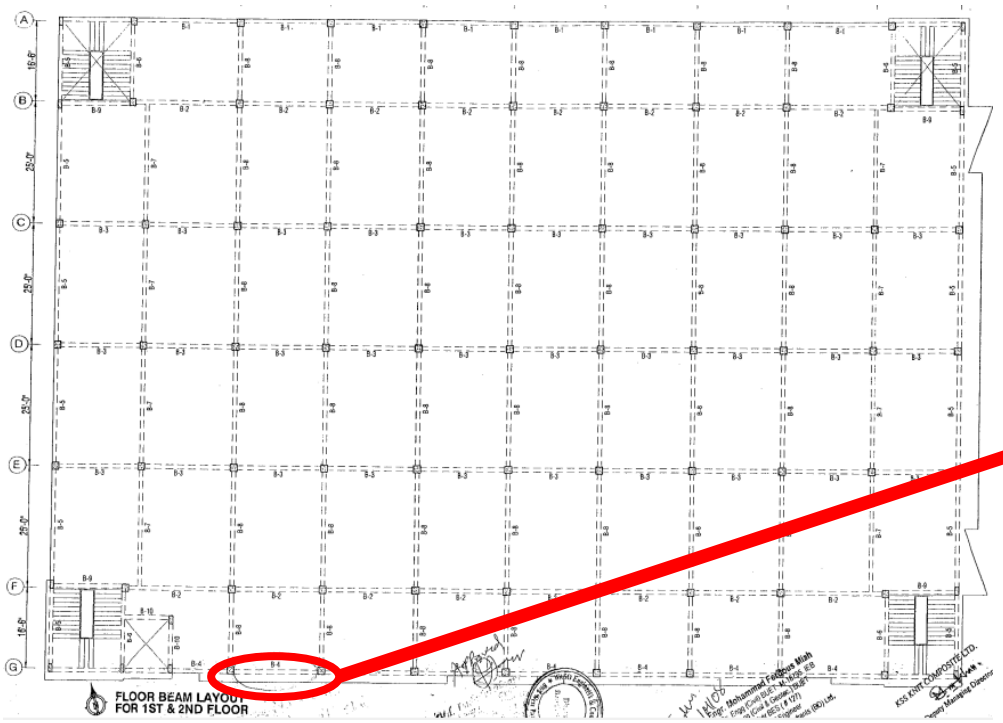
Building Extents

ACCORD on Fire and Building Safety in Bangladesh

Observations

Building 1

Differences between actual construction and information on design drawings.



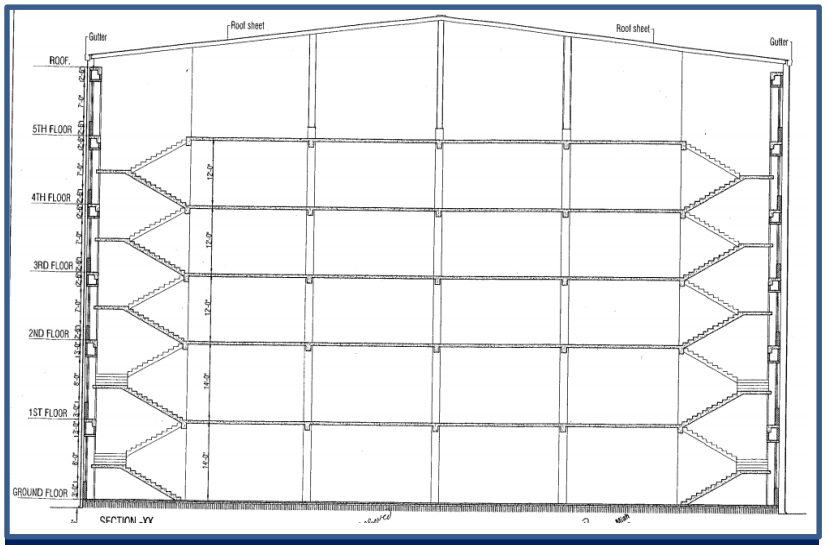
Beam shown in drawing but not found on site

Water ingress in slab due to standing water

Corrosion in exposed rebar

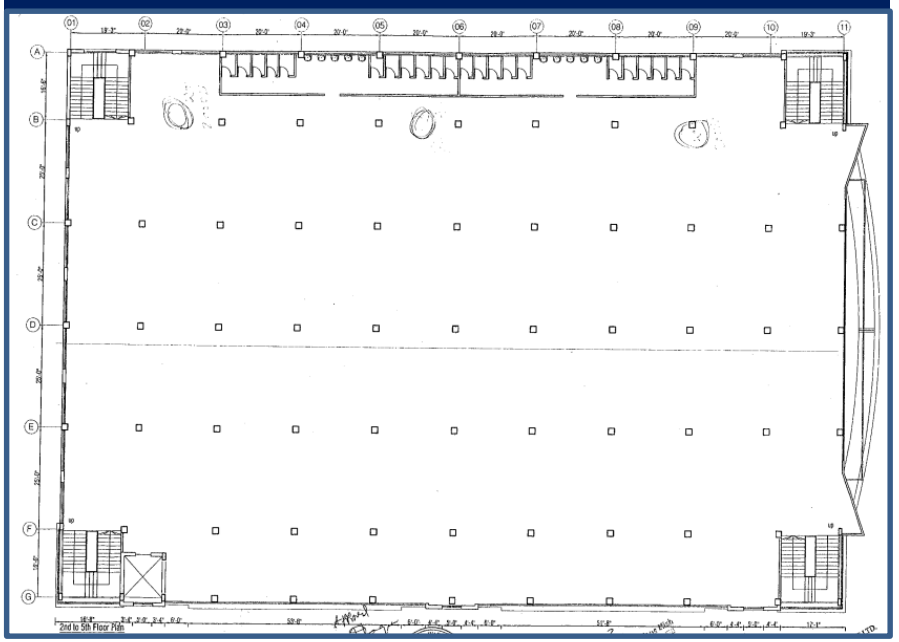
Support to Stair case appears to be improper. It is to be fixed or removed.

Damage in peripheral walls due to water ingress & direct exposal of steam from boiler to walls



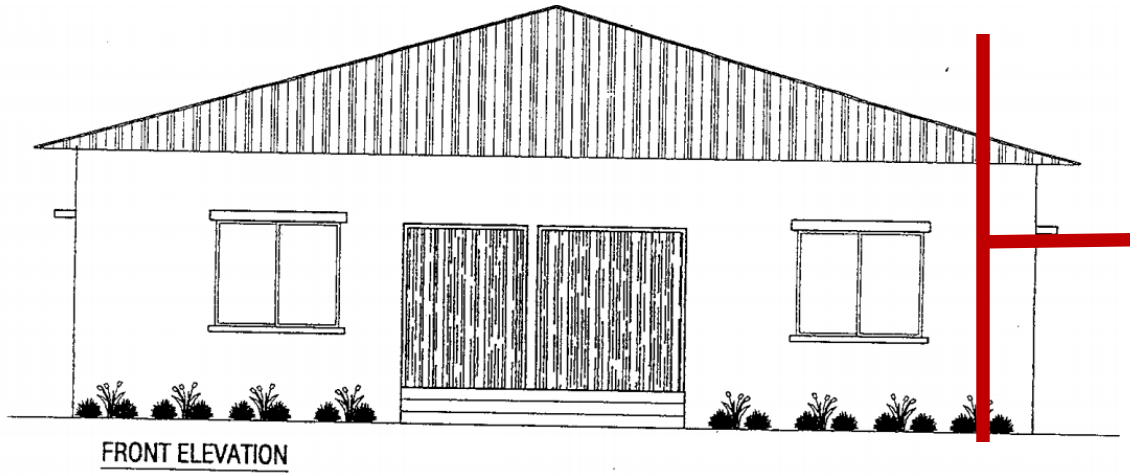
Section of the Building

Typical floor plan



Preliminary calculations indicate that working stress would exceed normal acceptable levels in columns if the building was extended to the permitted 6 storeys. We also have concerns about stability of the roof top steel shed as no structural drawing is available for the proposed roof top steel shed.

Building 2
Medical & Baby Care Building



Single storied steel roof shed shown in drawing

Constructed as 2-storied RCC Building

Discrepancies between drawings provided and the as constructed building

Missing edge protection on roof

Building 3
Boiler Room

Non-engineered steel roof over boiler room. Section sizes appear inadequate

The connections to the walls are inadequate to resist likely uplift forces. and should be checked by a Building Engineer.

Steel supported on brick masonry wall.

Improper support to non-engineered roof shed and apparently inadequate steel members on roof shed.

Priority Actions

Problems Observed

Building 1: Factory building

1. Differences between actual construction and information on design drawings.
2. Damage due to standing water on present roof & column reinforcement above 1st floor left exposed affected by corrosion.
3. Damage in peripheral wall caused by water leakage/improper maintenance of water drainage system & direct exposal of steam from boiler to wall.
4. Improper support to stair case & lift core shed.
5. Capacity of columns to support the 6 story building indicated on structural drawings.

Building 2: Medical & Baby Care Building

6. Differences between actual construction and information on design drawings.
7. Missing edge protection on roof.

Building 3: Boiler Room

8. Improper support to non-engineered roof shed and apparently inadequate steel members on roof shed.

Item 1 and actions

Building 1: Factory Building

Differences between actual construction and information on design drawings

Priority 1 (Immediate - Now)	• None required.
Priority 2 (within 6-weeks)	• Commence survey of as constructed building.
Priority 3 (within 6-months)	• Building Engineer to complete survey as constructed building. Updated drawings to be prepared showing the correct as constructed layout. • Prepare/update calculations showing the structural adequacy of the building structure taking into account the omission of the beam. • Prepare controlled loading plans for all floors and continue to implement.

Item 2 and actions

Building 1: Factory Building

Damage due to standing water on present roof & column reinforcement above 1st floor left exposed affected by corrosion.

Priority 1 (Immediate - Now)	• None required.
Priority 2 (within 6-weeks)	• None required.
Priority 3 (within 6-months)	• Factory engineer to investigate the extent of damage and take steps to repair the damage. • Remove corrosion & provide protective cover to exposed reinforcement.

Item 3 and actions

Building 1: Factory building.

Damage in peripheral wall caused by water leakage/improper maintenance of water drainage system & direct exposal of steam from boiler to wall.

Priority 1 (Immediate - Now)	• None Required
Priority 2 (within 6-weeks)	• Provide proper drainage. • Divert steam outlet away from main factory building wall.
Priority 3 (within 6-months)	• Repair damaged walls.

Item 4 and actions

Building 1: Factory building
Improper support to stair case & lift core shed.

Priority 1 (Immediate - Now)	• None required
Priority 2 (within 6-weeks)	• Building engineer to check the support stability of the stair shed.
Priority 3 (within 6-months)	• Carry out necessary strengthening works.

Item 5 and actions

Building 1: Factory building

Capacity of columns to support the 6 story building indicated on structural drawings.

Priority 1 (Immediate - Now)	• None required
Priority 2 (within 6-weeks)	• None required
Priority 3 (within 6-months)	• Capacity calculations were completed on the columns for the vertical expansion of the building and showed that the column stresses are in excess of the calculated capacity should the building be extended above 4th floor. • Detailed engineering calculations and confirmatory testing of the concrete strength is to be completed to verify future expansion above 4th floor. • Detailed engineering calculation along with detailed drawings also needs to be completed to prove the stability of proposed roof top steel shed.

Item 6 and actions

Building 2: Medical & Baby Care Building
Differences between actual construction and information on design drawings.

Priority 1 (Immediate - Now)	• None required
Priority 2 (within 6-weeks)	• Engage a Building Engineer to survey the structure and prepare a full set of “as-constructed” drawings. • Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.
Priority 3 (within 6-months)	• None required

Item 7 and actions

Building 2: Medical & Baby Care Building
Missing edge protection on roof.

Priority 1 (Immediate - Now)	• None required
Priority 2 (within 6-weeks)	• None required
Priority 3 (within 6-months)	• Provide necessary edge protection.

Item 8 and actions

Building 3: Boiler Room

Improper support to non-engineered roof shed and apparently inadequate steel members on roof shed

Priority 1 (Immediate - Now)	• None required
Priority 2 (within 6-weeks)	• Engage a Building Engineer to check the capacity of the lightweight steel roof structure/connection details and wall/connection details.
Priority 3 (within 6-months)	• Make any necessary alterations as required.

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 ACCORD.

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 insitu 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.