

# AKM Knit Wear Ltd

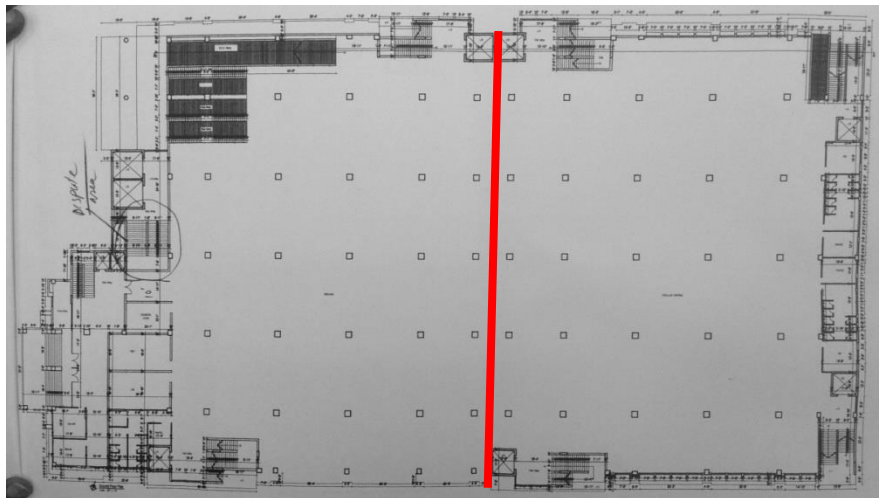
14 Gedda, Karnapara, Ulail, Savar, Dhaka 1340  
(23.82743N, 90.25867E)

23 March 2014, 02 April 2014



# Observations

# **Main Building - Columns appear to be stressed in excess of normal design limits**



Typical column layout

Cursory calculations indicate column working stress is in excess of normal design limits.

Engineer to review structural analysis carried out on building to ensure model represents the as constructed building and concrete strengths inputted to model are based on actual cylinder results.



Tested Basement level Column – Stone Chips

# Main Building - Management of Storage Loads

# Declaration Letter

This is to declare that, I have conducted a load calculation program on the main building AKM Knit Wear Ltd, 14-Goode, Karnapara, Uliail, Savar, Dhaka a 10 storied building having a basement floor and a mezzanine in level-1. To be mentioned that, the construction work of the building for level 9 is in progress. During my calculation I concentrated on dead loading, occupancy loading, impact loading, wind loading & seismic loading. I found the building is having adequate strength to resist and to remain stable under the worst probable load action that may occur during the life time of the building, including the period of construction.

The level-wise load information is given below:

Level	Floor	Type of work	Floor load capacity	Column load capacity
Level-0	Basement floor	Cutting & Stone	300 psf	80 psf
Level-1	Ground floor	Wash	250 psf	80 psf
Level-2	1 <sup>st</sup> Floor	Finishing & Packing	220 psf	80 psf
Level-3	2 <sup>nd</sup> floor	Sewing	220 psf	80 psf
Level-4	3 <sup>rd</sup> floor	Sewing	220 psf	80 psf
Level-5	4 <sup>th</sup> floor	Sewing	220 psf	80 psf
Level-6	5 <sup>th</sup> floor	Sewing	220 psf	80 psf
Level-7	6 <sup>th</sup> floor	Stock lot	220 psf	80 psf
Level-8	7 <sup>th</sup> floor	Sewing (Proposed)	220 psf	80 psf
Level-9	8 <sup>th</sup> floor	Construction work is in progress		

Thus, calculating the overall load I am going to declare that, the building is met the standard level of load management and also the building are totally fit for operating industrial activities.

Engr. Md. Ghulam Kebria  
Project Engineer  
B.Sc. Engrg (Civil)  
MIEB-23098  
Al-Muslim Group



Loading Plan Document

**Our Associate Companies are:**

- ◆ AKM Knit Wear Ltd.
- ◆ Pacific Blue Jeans Wear Ltd.
- ◆ Al-Muslim Washing Ltd.
- ◆ Al-Muslim Garments Accessories Ltd.
- ◆ Al-Muslim Vero Dyeing Ltd.

## LM (LOAD MANAGER) DECLARATION

Date: 18.02.2012

This is to declare that, Mr. Ghulam Kebria (Civil Engineer) is the Project Engineer of AKM Knit Wear Ltd 14, Goida, Karnapara, Uliail, Savar, Dhaka has been assigned as the LM (Load Manager) of the company. As an LM (Load Manager) he is solely responsible for conducting a regular inspection in the entire premises and to keep the load factor is corresponding with the structural design & drawing and as-built design & drawing. During his inspection he follows all the mandatory codes of load inspection. On his visit, if any load factor discrepancy is seen, he is authorized to take instant necessary action to solve the issue.

The key responsibilities of LM (Load Manager) are mentioned below:

- ◆ Conducting inspection in the entire premises on a regular basis.
- ◆ Finding out load factor discrepancy & taking immediate action to resolve the issue.
- ◆ Regular meeting with top management & engineering team.
- ◆ Reporting to the top management about the inspection reports.

Details of LM (Load Manager):

Engr. Md. Ghulam Kebria  
Project Engineer  
B.Sc Engineer (Civil)  
MIEB-23098

18/02/2012

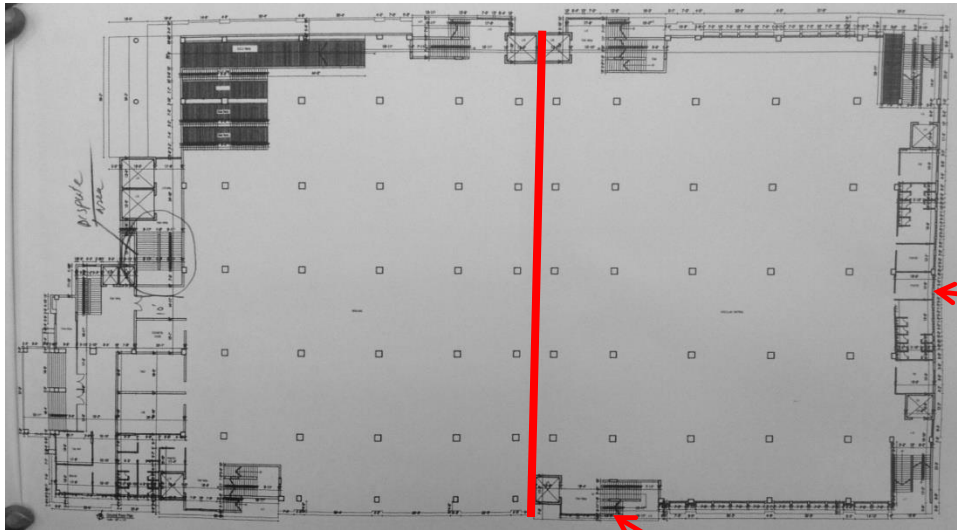
Thanking You.

Authority

We note that loading plans have been produced and a loading manager has been appointed. We do feel, however, that the allowable loads contained in this document are too high. Engineer to review this paying attention to stresses in columns at basement floor.

## Management of Storage Loads

# Main Building - Cracking To Facade Brick-Work



Typical Floor Plan



East Side Cantilever Area

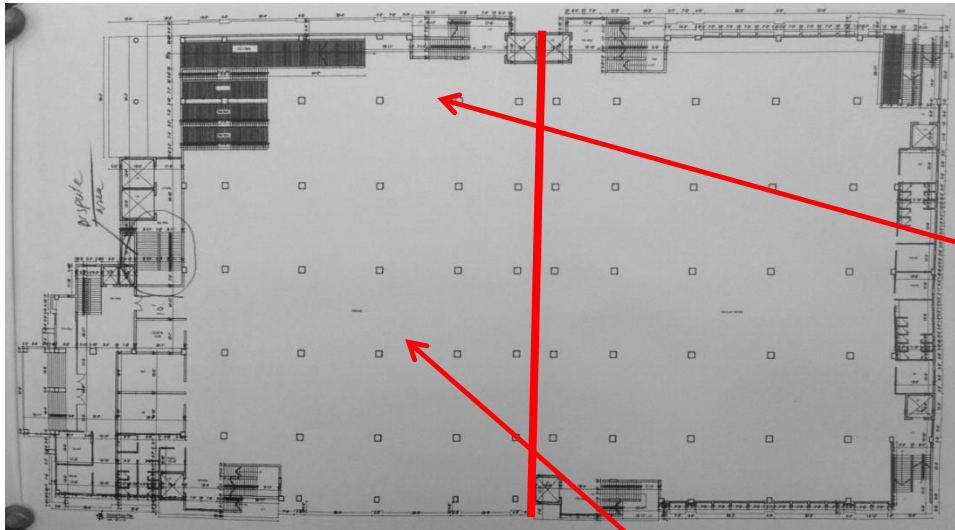
Cracking was observed in the façade brick-work over the cantilevers. Building Engineer to monitor.



South Side Cantilever Area

# Facade Cracking

# Main Building - Hairline Cracking



Typical Floor Plan



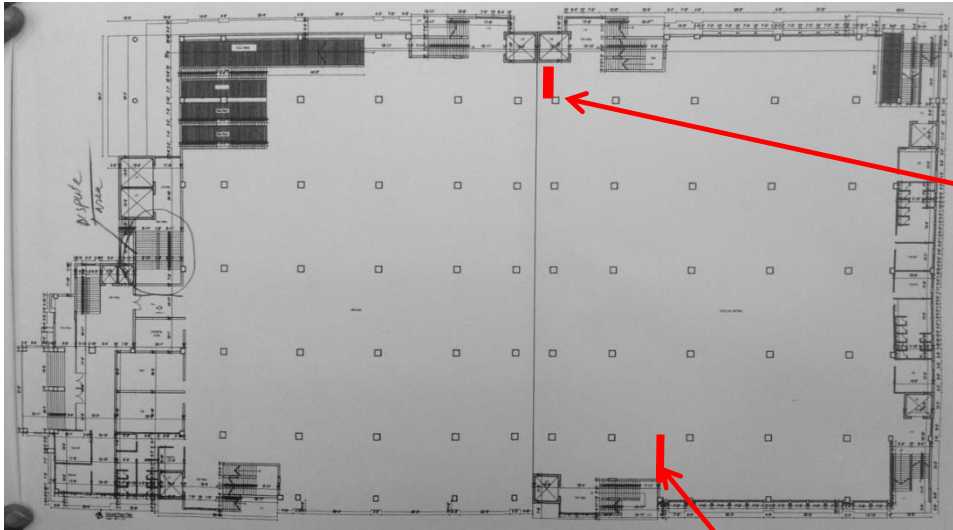
2<sup>nd</sup> Floor At the front of stair case

**There was evidence that the render to drop pad & slab was cracked in a number of locations. Render to be removed to ensure cracks do not extend in to the structure. Building Engineer to monitor.**



Basement below GF Washing Plant Area

## Drop Pad & Slab cracks



Typical Floor Plan



Beam Cracking – 2<sup>nd</sup> Floor

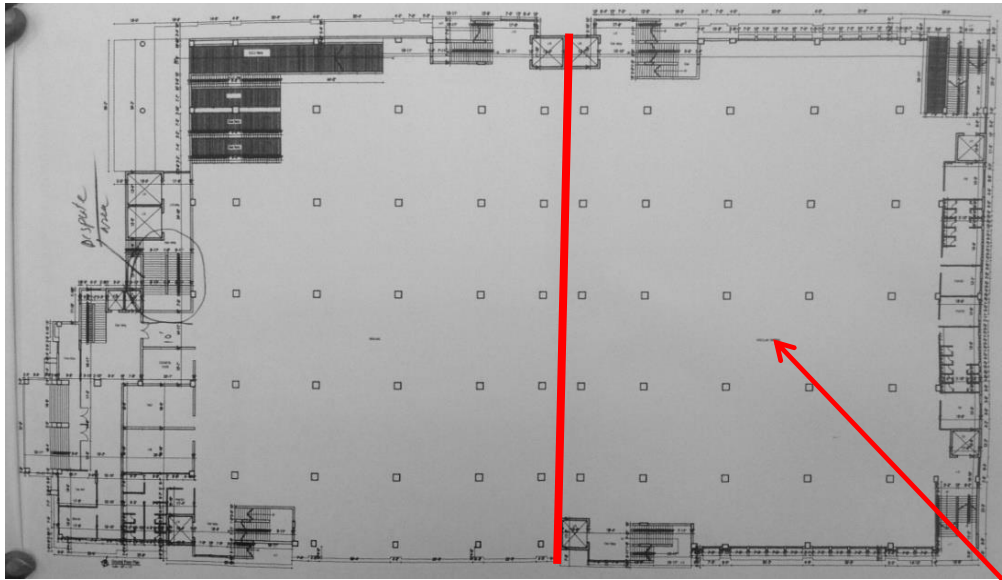


Beam Cracking – 1<sup>st</sup> Floor Accessories Backup Store

Cracking was observed in a number of beams. Render to be removed to ensure cracks do not extend in to the structure. Building Engineer to monitor.

## Beam cracks

# Main Building- Water Ingress Into Structure



Typical Plan

There was evidence of water ingress into structural elements. Building Engineer to monitor.



Water ingress to Slab- 2<sup>nd</sup> floor

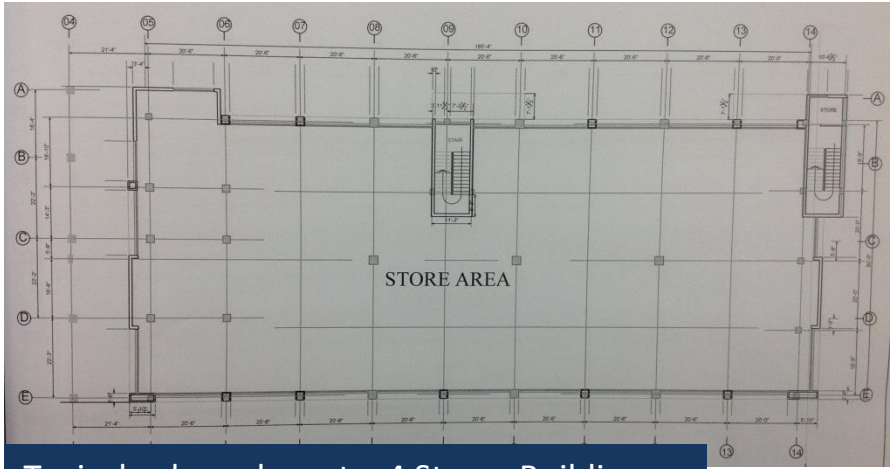
## Water ingress

# Accessories Building - Ongoing Demolition

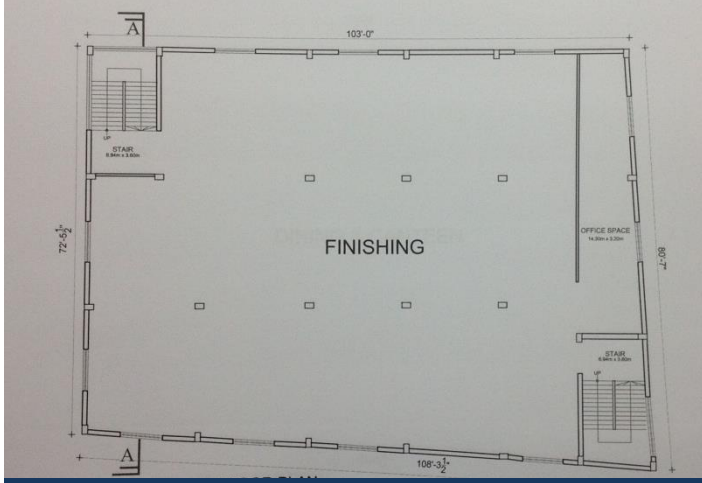


**Note: Roof and façade currently being removed from 6 Storey Accessories building. This is to be replaced with a concrete roof slab.**

# **Accessories & Utility Building - Columns appear to be stressed in excess of normal design limits**



Typical column layout – 4 Storey Building



Typical column layout – 6 Storey Building

Cursory calculations indicate column working stress is in excess of normal design limits.

Building Engineer is to perform detailed calculations and concrete tests to prove column size and (if required):

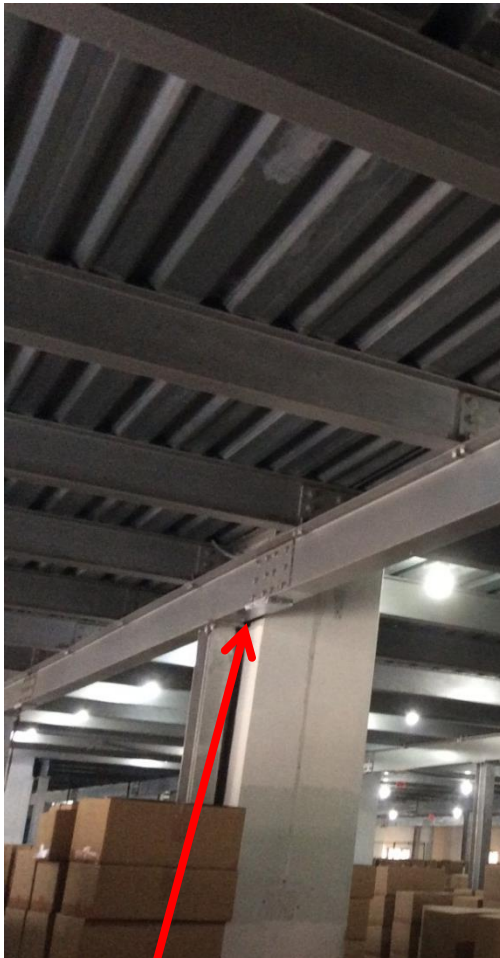
- Reduce loads by vacating floors
- Reinforce columns



Tested Ground Floor Column – Stone Chips

# Utility Building - Steel Infill Slab

**Note: Steel infill not shown on Permit Drawings.**



**Engineer to confirm steel infill floor connections to façade are sound and how steel floor is connected to the main concrete structure.**

**Engineer to confirm all connections are adequate.**

## **Steel Infill Slab**



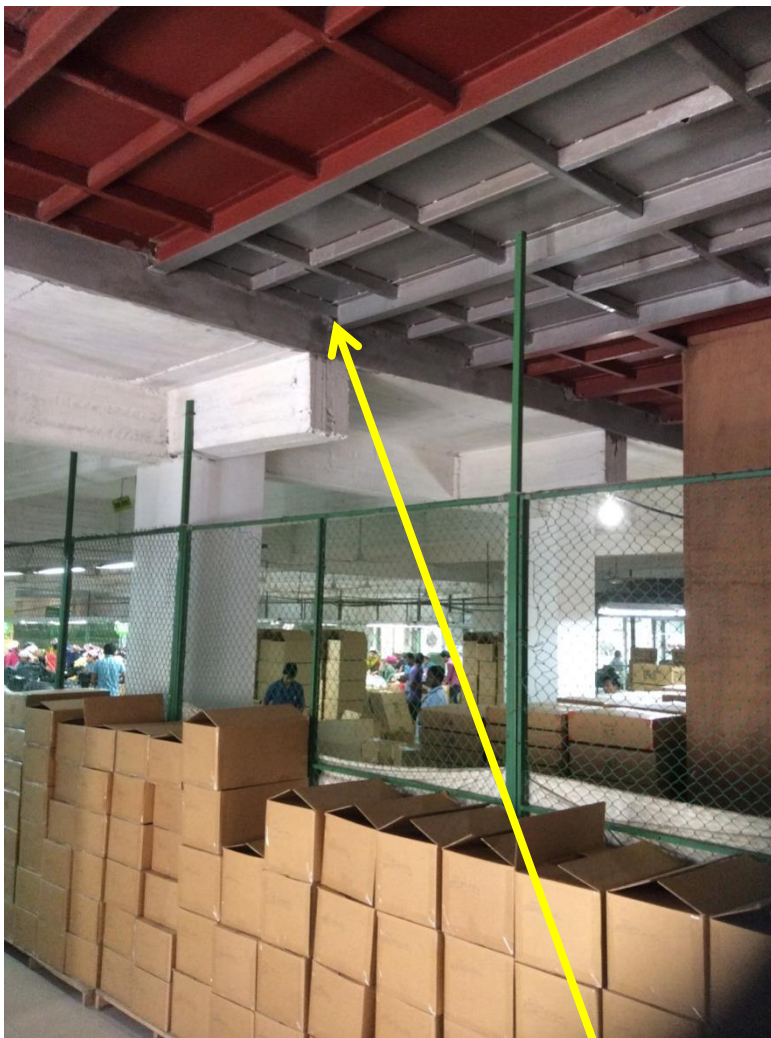
**Steel columns connected to First floor slab. Engineer to confirm capacity of slab to take additional loading.**



**Steel columns out of plumb. Engineer to confirm Stability of structure.**



**Building Engineer to confirm how steel beams are supported at walls.**



**Building Engineer to confirm adequacy of connection of steel infill slab to concrete structure either side.**

Engineer to confirm connection of steel structure to water tank slab and to check slenderness of column.



**Accessories Building - Stability of steel  
roof to dining area to be reviewed by  
Building Engineer**

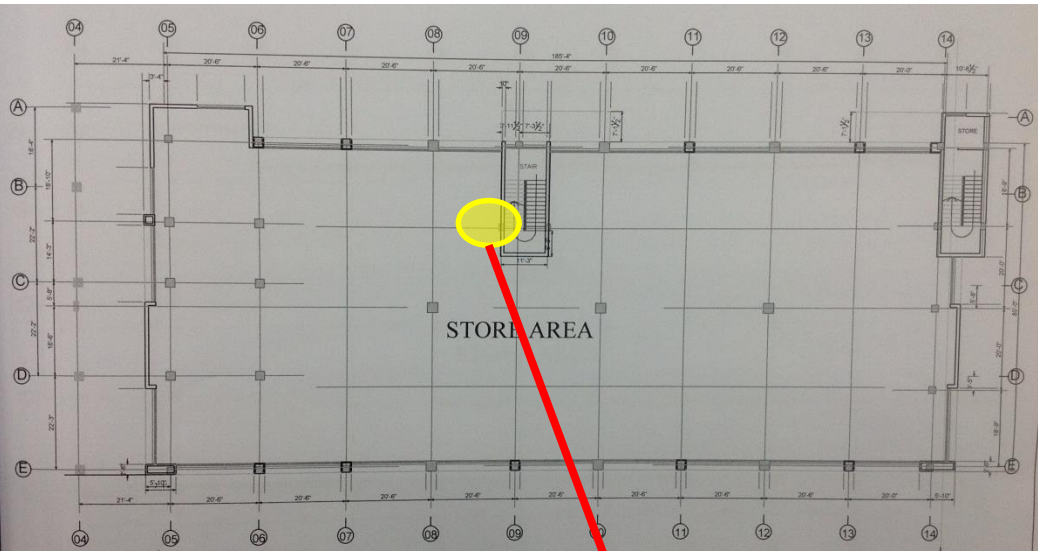


**Roof structure to Dining Area, may be susceptible to wind uplift.  
Building Engineer to review.**



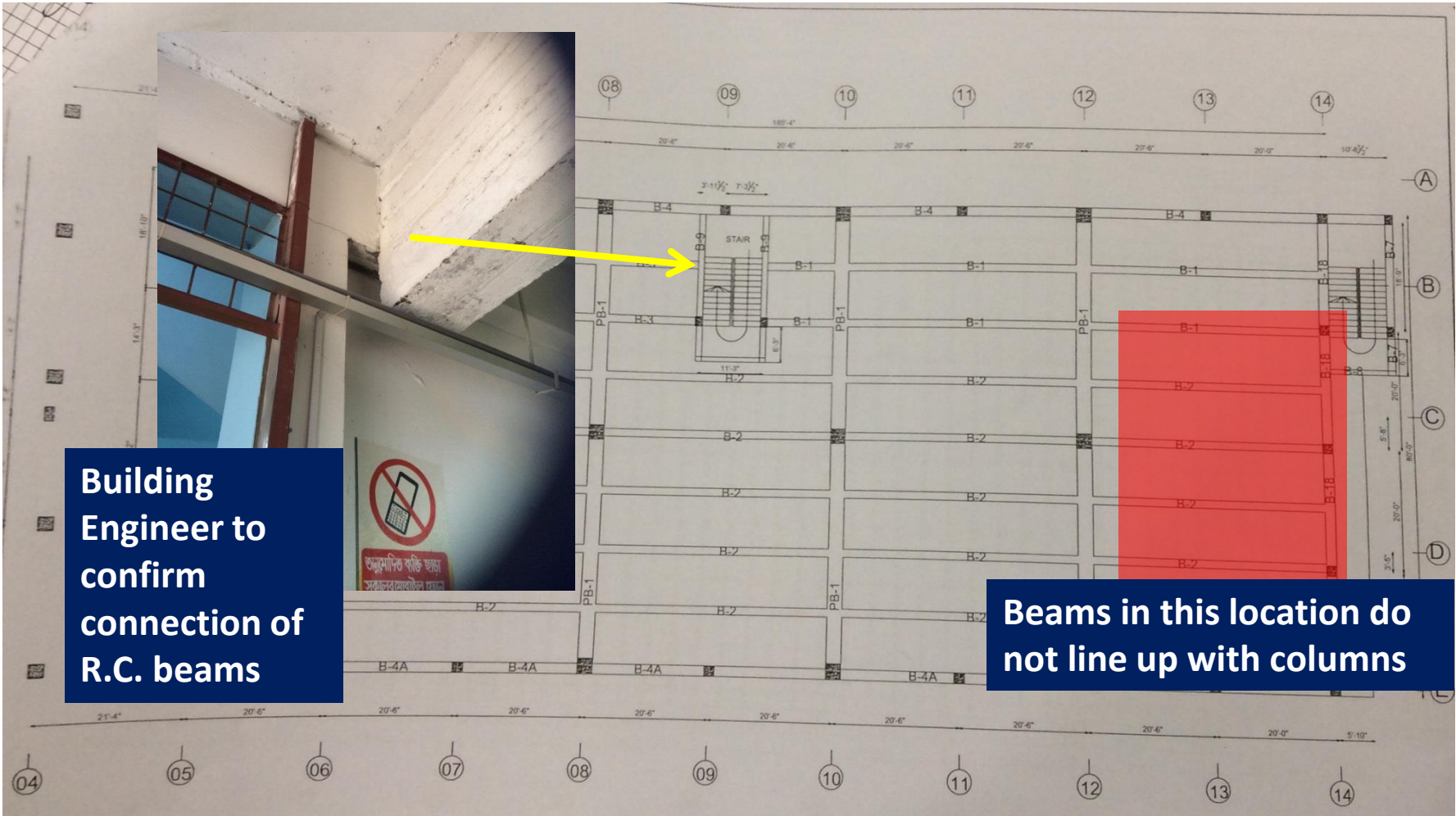
Building Engineer to confirm support/connection detail at these locations.

# Utility Building - Concrete connections



**Building Engineer to confirm connection of R.C. beams**





**Building Engineer to confirm connection of R.C. beams**

**Beams in this location do not line up with columns**

**Beam layout does not match as constructed layout. Some beams do not line up with columns. Engineer to confirm that the as built structure matches the design intent for beams and columns.**



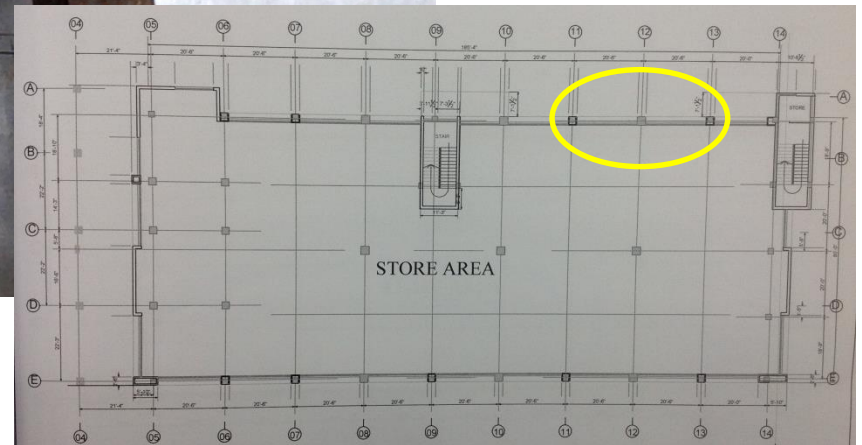
Engineer to confirm that concrete structure matches design intent.



# Concrete connections in Utility Building

# Utility Building - Exposed Reinforcement

# Exposed reinforcement to be protected



# Accessory & Utility Building - Load Management Plan Required.



Building Engineer to prepare controlled loading plans for all floors which will designate where storage can be placed.

# Steel Structures



Engineer to review adequacy of structure to carry water tank



Façade of Chemical Store is tack welded to top of column.

Column Extends



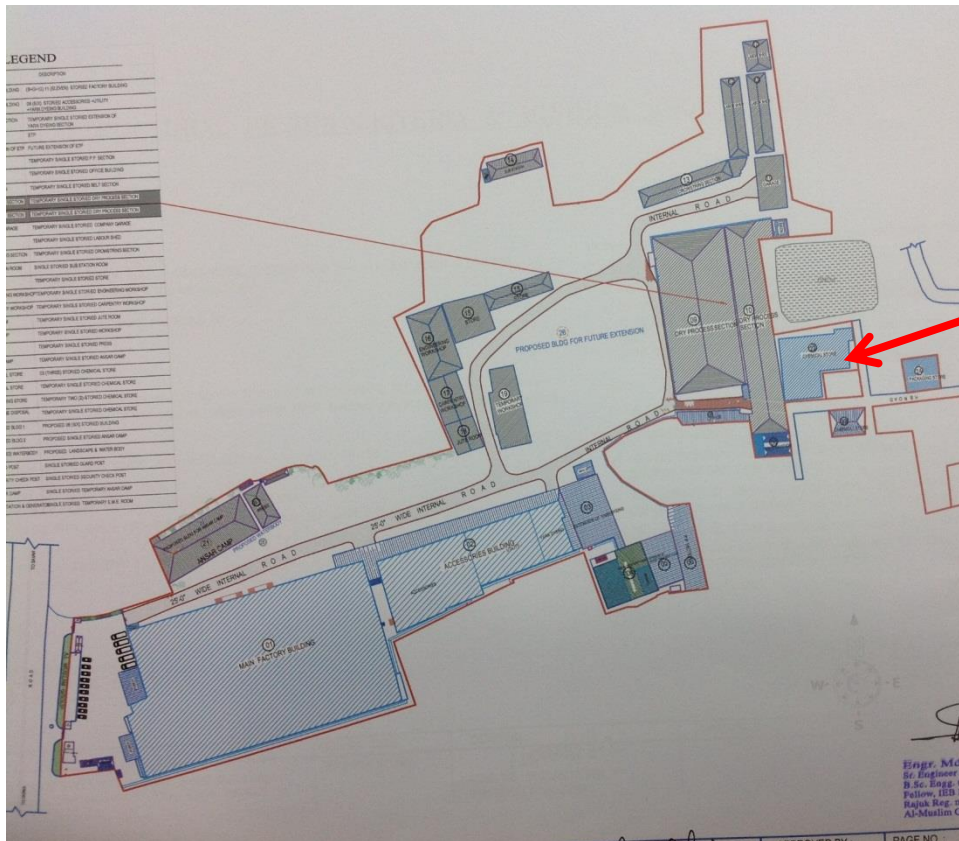
Bracing details not evident in several locations – Engineer to review



Connection Detail unknown

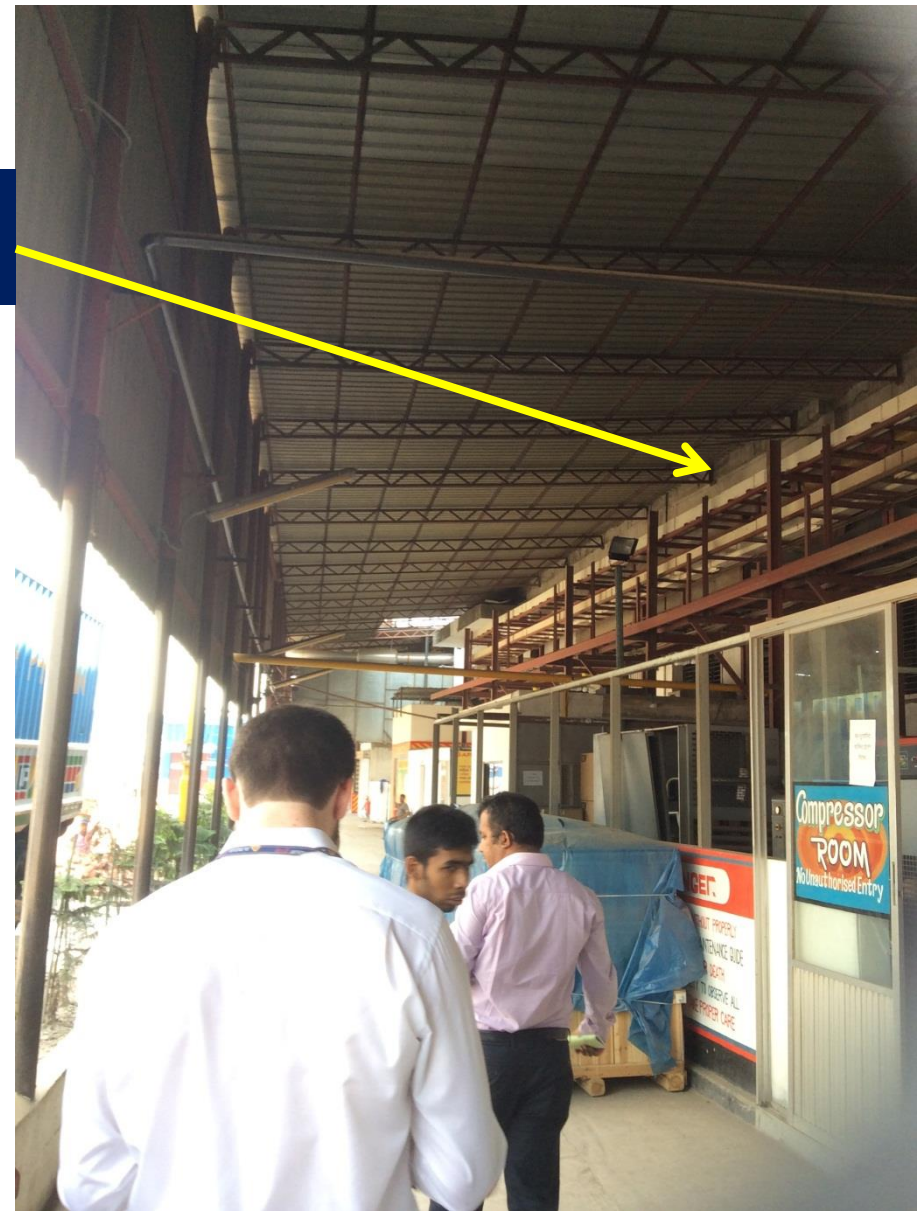
Engineer to review stability and connection details on all steel structures.

# Steel Structures



# Lightweight Steel Canopy – Adjacent to Utility Building

Engineer to assess stability and connections of lightweight steel canopy.



# Priority Actions

# Problems Observed

## Main Building

**ITEM 1:** Internal Columns appear to be stressed in excess of normal design limits

**ITEM 2:** Cracking to façade

**ITEM 3:** Hairline cracking to structural elements

**ITEM 3:** Water ingress through structure

**ITEM 4:** Management of storage loads

# Problems Observed

## Accessories and Utility Buildings

**Item 1;** Columns appear to be stressed in excess of normal design limits in both building.

**Item 2;** Steel infill floor in the utility building

**Item 3;** Stability of steel roof to dining area

**Item 4;** Beam layout of 4 Storey Utility building

**Item 5;** Exposed reinforcement

**Item 6;** Management of storage loads

## Steel Structures

**Item 7;** Columns at ground floor level of chemical store are susceptible to vehicle impact.

**Item 8;** All steel structures appear to have little or no lateral stability.

**Item 9;** Lightweight Steel Canopy adjacent to Utility Building

Item No.	Observation	Recommended Action Plan	Priority
1	Concrete column capacity	Engineer to review structural analysis carried out on building to ensure model represents the as constructed building and concrete strengths inputted to model are based on cylinder results.	6-weeks
2	Concrete column capacity	See Item 2	6-months
3	Management of storage loads	Review load plans based on outcome of analysis review and actively manage this for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-weeks
4	Management of storage loads	Continually inspect floor plates based on load plans and reduce loading if necessary.	6-months
5	Cracking to Façade and structural elements	Record details of all cracking and start to monitor for any changes.	6-weeks
6	Cracking to Façade and structural elements	Continue to monitor cracking on the façade.	6-months
7	Cracking to Façade and structural elements	Continue to monitor cracking.	6-months
8	Water Ingress	Building Engineer to investigate source of water ingress and remedy if necessary with appropriate sealant.	6-weeks
9	Water Ingress	Continue to monitor for water ingress throughout building and implement corrective procedures if necessary.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
10	Verify concrete strengths in columns in GF	Factory Engineer to review design, loads and columns stresses in both buildings.	6-months
11	Verify concrete strengths in columns in GF	Verify insitu concrete strengths either by 100mm diameter cores or existing cylinder strength data for cores from 4 columns.	6-months
12	Steel infill floor in 4 Storey structure is constructed independent of the main concrete structure	Provide calculations showing the structural adequacy of all supports for steel infill floor including wall and slab supports. Stability of the steel structure to be confirmed by calculation by Engineer.	6-weeks
13	Stability of steel roof to dining area	The steel roof over the Dining Area should be reviewed by the Building Engineer and, if required, upgraded to support code vertical and wind loads or the area should be vacated and removed.	6-weeks
14	Beam layout of 4 Storey Utility building	The concrete structure should be reviewed by the Building Engineer to show that the built structure matches the design intent. Particularly a check should be carried out on the beams that are shown on the drawings to be in line with the columns but are not in reality.	6-weeks
15	Beam layout of 4 Storey Utility building	All drawings to be revised to match built structure.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
16	Exposed Reinforcement	Exposed reinforcement should be protected with suitable resin	6-months
17	Management of storage loads	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-weeks
18	Management of storage loads	Continue to implement load management plan	6-months
19	Columns at ground floor level of chemical store are susceptible to vehicle impact	Column to be protected from vehicle impact.	6-weeks
20	Stability and connections in steel structures	Building Engineer to provide calculations to prove adequacy of as-built structures. Stability of all steel structures to be reviewed and upgraded where required. All connections in steel structures to be checked and upgraded where required.	6-weeks
21	Stability of lightweight steel canopy adjacent to Utility Building	Lightweight steel canopy should be reviewed by the Building Engineer and, if required, upgraded to support code vertical and wind loads or the area should be vacated and removed.	6-weeks