

Tusuka Trousers & Jeans Ltd

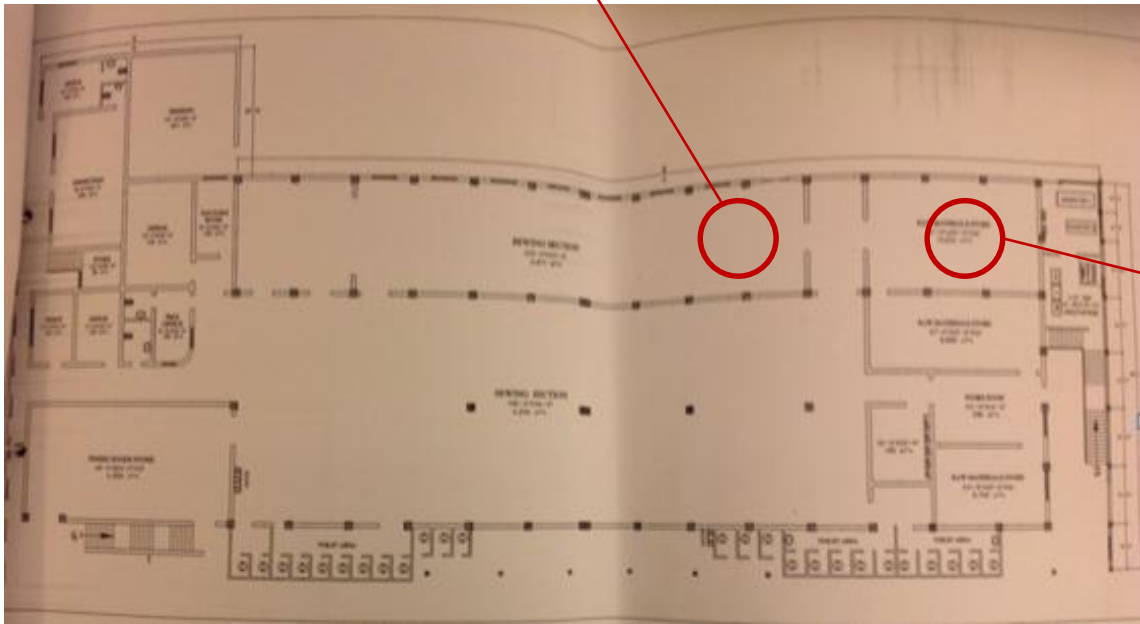
Konabari, Neelnagar, Gazipur, Dhaka
(+ 24.01084N,90.32477E)

5 February 2014



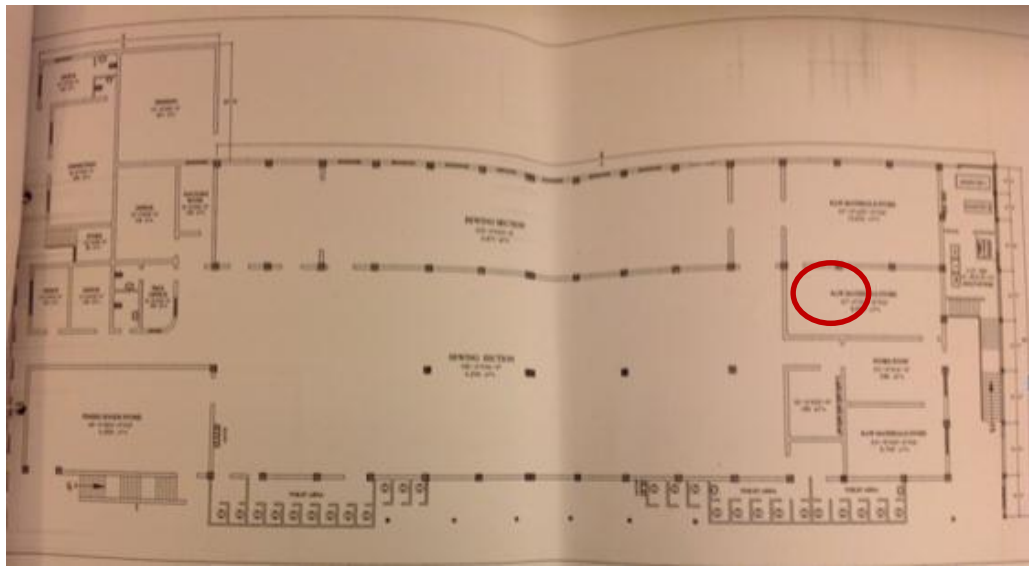
Building Observations Jeans Building

Structural cracking of concrete beams and evidence of temporary remedial measures



Significant cracks are present on the underside of the First Floor tertiary beams. Some of these beams are propped (and the props are not anchored into the base slab).

Structural Cracks



Cracking can be observed on the underside of the slab in one area.

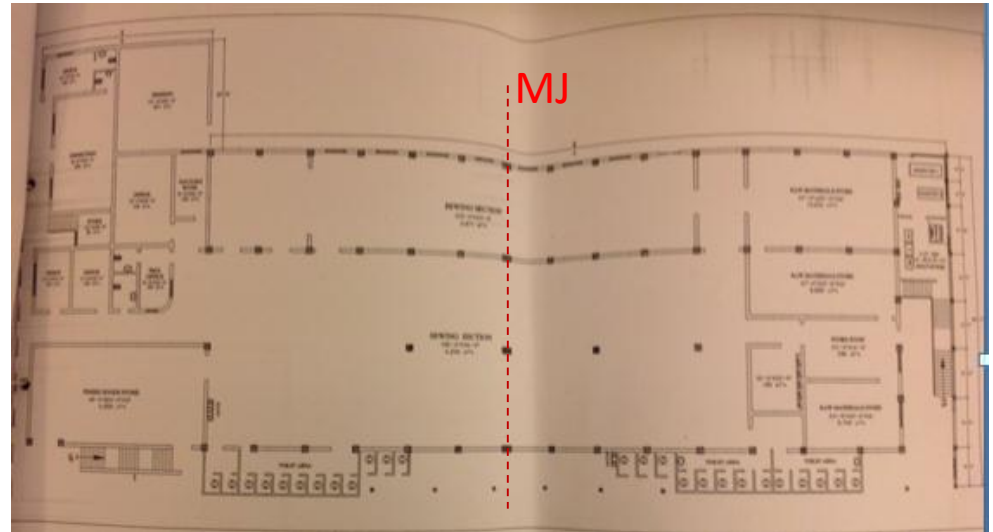


Structural Cracks

Detailed structural drawings were not available



Movement Joint



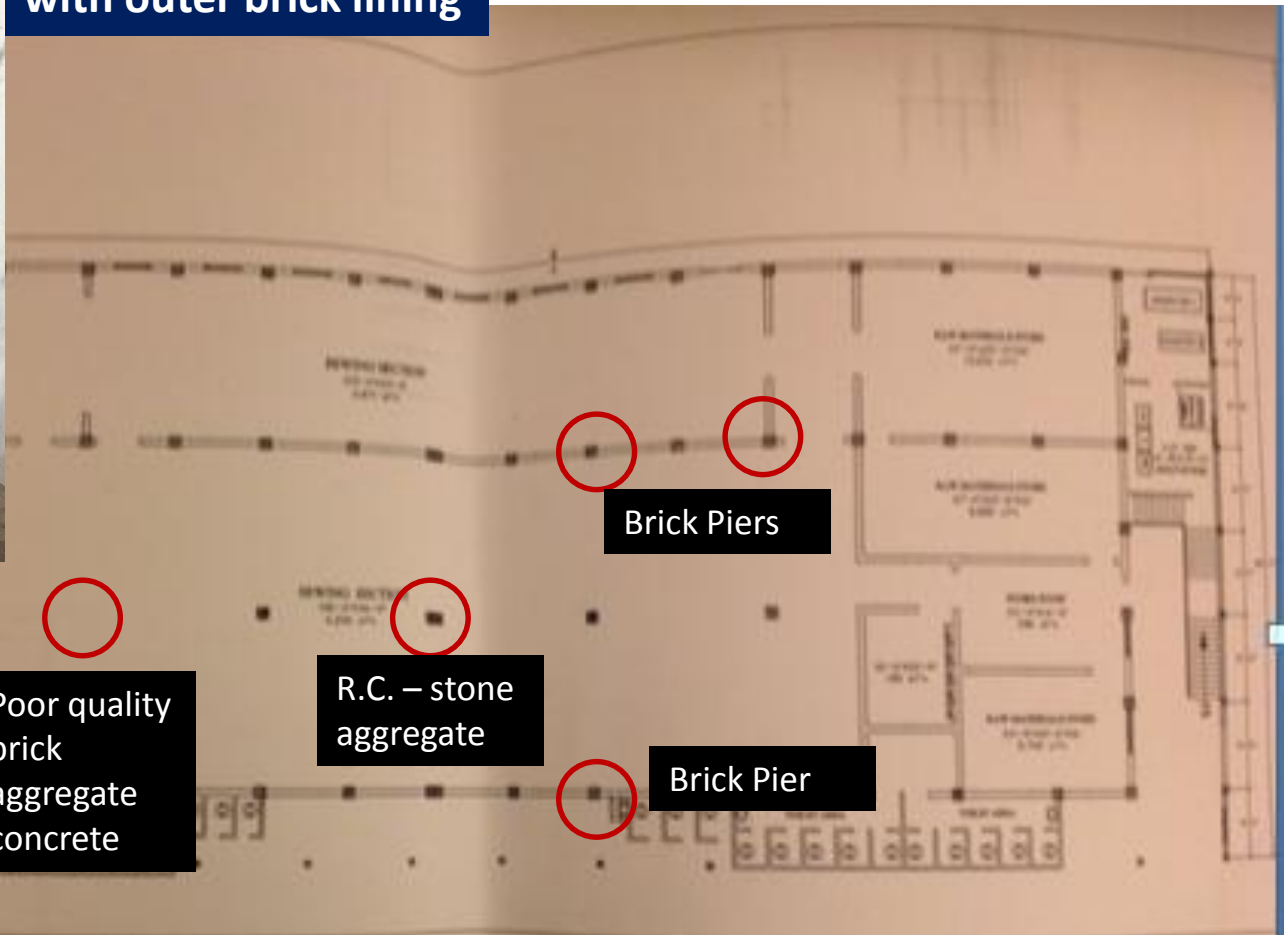
The structural information available did not provide details of the member sizes, foundations or reinforcement content. The movement joint observed on-site was not noted.

Structural Drawings

**A number of columns at ground floor level
appear to be constructed of weak brick
aggregate concrete or brickwork**



**Brick Pier or column
with outer brick lining**



**Poor quality
brick
aggregate
concrete**

**R.C. — stone
aggregate**

Brick Piers

Brick Pier

The structural information provided did not contain details of column construction. Plaster finish to columns was removed and poor quality brick aggregate with high voids content and apparent brick columns were evident.

Variable Column Material

Steelwork connection to Washing Plant



For much of the length of the Washing Plant, it is connected to the Jeans Building only by the light steelwork roof of the washing plant. Typically, there are indications that this connection is under stress and showing signs of movement. Building Engineer to review .

Connection to Washing Plant

Structural adequacy of Roof



Cracking at Connection of Lightweight Roof



Bottom chord of truss discontinuous

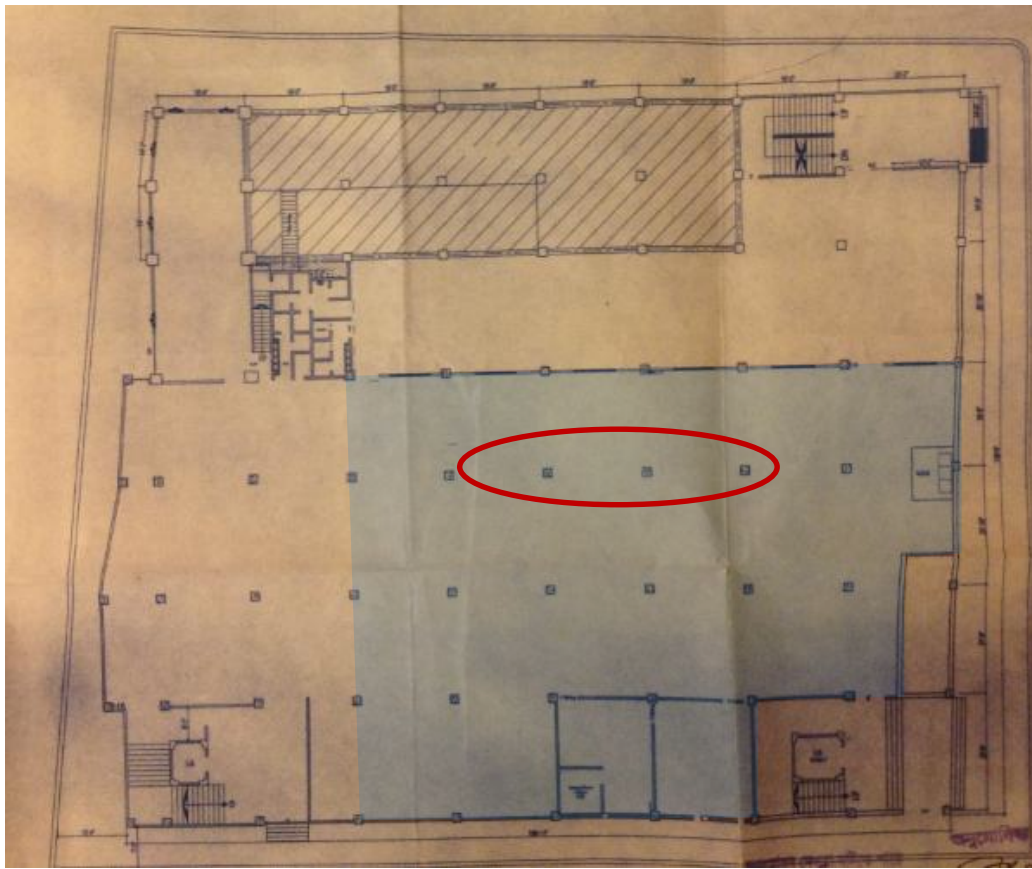
The lightweight roof requires a full structural review.

1st Floor Roof

Building Observations

Trousers Building

Cracking to top of suspended ground floor slab over basement



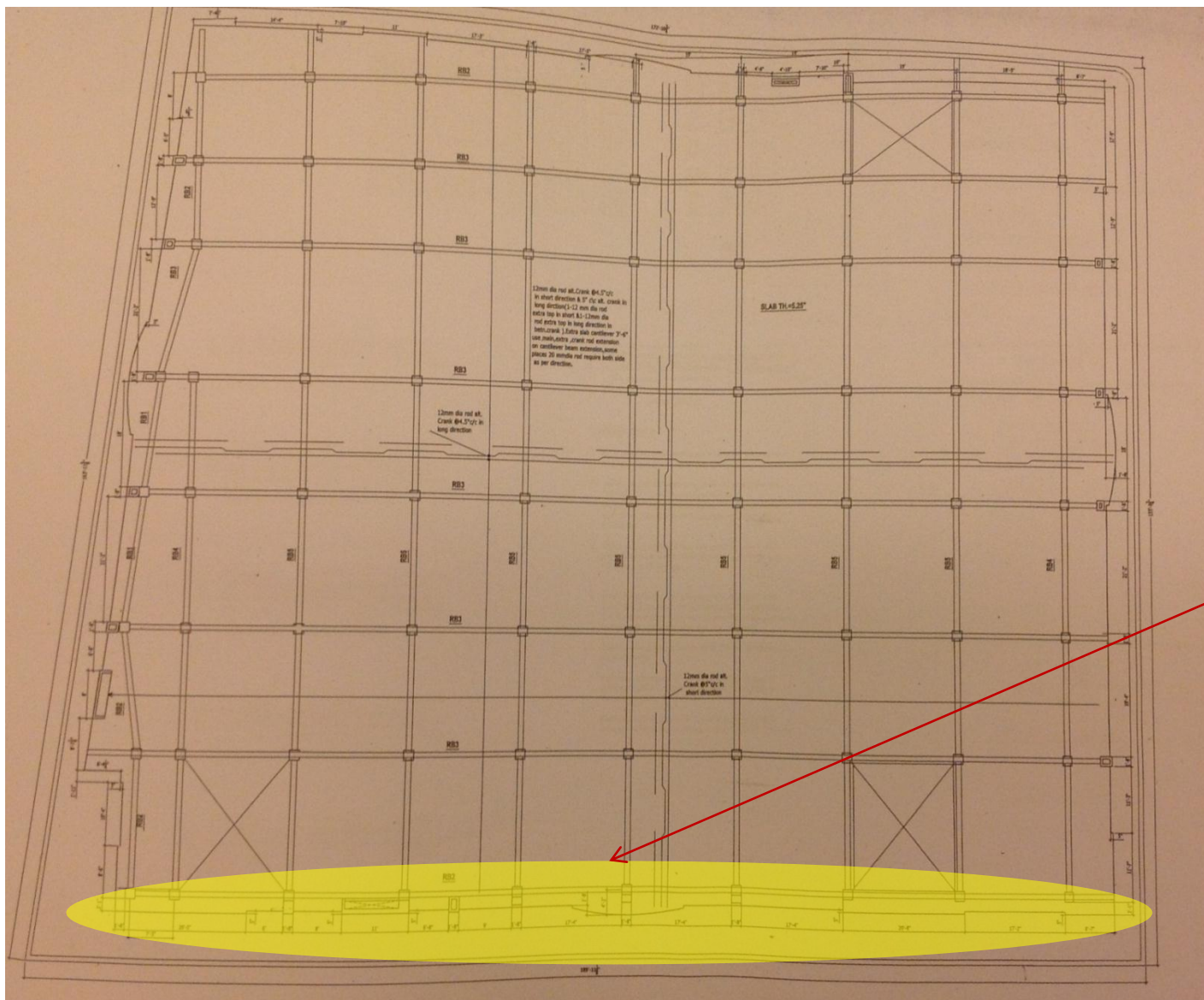
**Basement below
shaded in blue.**



**Building Engineer to review cracks in Ground Floor
finishes for potential structural implications.**

Cracking to Ground Floor Slab

Design check required due to discrepancies between Structural drawings and building structure



Grid dimensions, in the highlighted area, noted during site inspection do not match the structural drawings

Discrepancies with Structural Drawings

Damage to underside of beams and visible reinforcement at locations of cast-in electrical conduits



Soffit of 3rd Floor



Soffit of 2nd Floor

A number of beams throughout the building have significant penetrations/damage close to the beam-column connection. This will impact upon the shear and moment capacity of these joints. The Building Engineer should review these connections.

Damage at Beam/Column Connection

Design check required for plinth loading in toilet areas to confirm floor slab/beams load capacity



**Building Engineer to
review plinth loadings in
toilet areas.**

First Floor

Floor Slab Load Capacity

Load management of storage loads



1st Floor

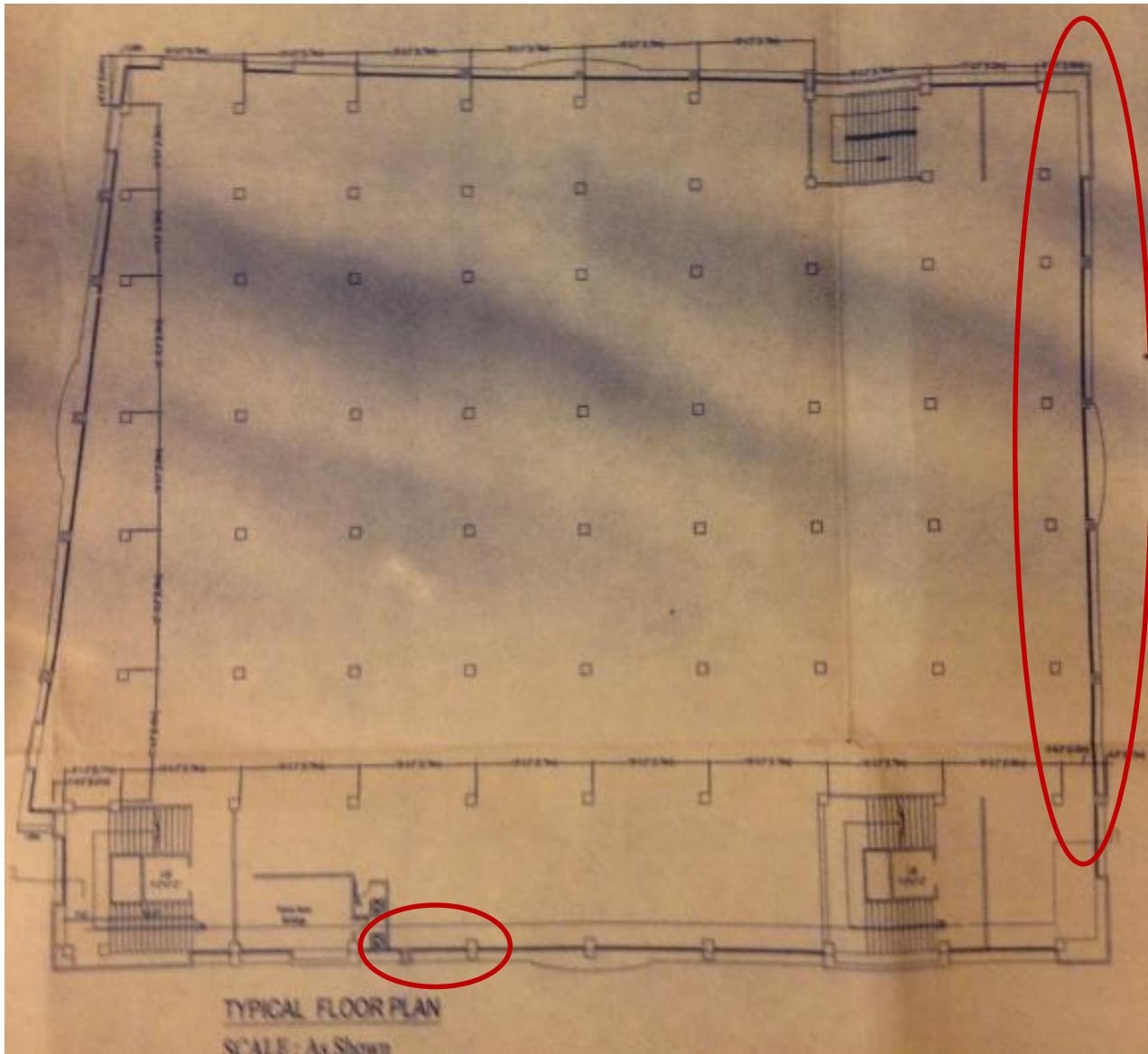


1st Floor

**Storage loads were observed on the 1st, 3rd, 6th and 7th floors.
Load management plan to be prepared by the Building Engineer and height restrictions to be introduced to prevent future overloading.**

Load Management

Cracks in brick piers



On North face (and one example on East face), there are brick piers along the building perimeter. It is possible these are not intended to be structural.

Many of these brick piers from 1st floor upwards are cracked at the line of the interface between concrete beams and the pier.

The Building Engineer should review and ensure that these piers are stable without support from the concrete structure above.

Cracks in Brick Piers



R.C. Beam

Brick
Pier

R.C. Column

Horizontal Crack around
brick pier. This example
was taken on the 6th floor.



The Building Engineer
should review and ensure
that these piers are stable
without support from the
concrete structure above.

Cracks in Brick Piers

Priority Actions

Problems Observed – Jeans Building

ITEM 1;

- Structural cracking of concrete beams and evidence of temporary remedial measures
- Detailed structural drawings were not available
- A number of columns at ground floor level appear to be constructed of weak brick aggregate concrete or brickwork piers

ITEM 2; Steelwork connection to Washing Plant

ITEM 3; Structural adequacy of 1st Floor Roof

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Verify the structural adequacy of the Jeans Building structure – review structural cracking, remedial measures currently in place and load capacity of columns	Detail Engineering Assessment of as built structure of Jeans Building to be commenced as per attached scope.	Immediate - Now
2	Verify the structural adequacy of the Jeans Building structure – review structural cracking, remedial measures currently in place and load capacity of columns	Building Engineer to carry out survey of as-built structure and note details of any structural cracking.	Immediate - Now
3	Verify the structural adequacy of the Jeans Building structure – review structural cracking, remedial measures currently in place and load capacity of columns	Verify insitu concrete strengths by cores and existing reinforcement for all columns	Immediate - Now

Item No.	Observation	Recommended Action Plan	Recommended Timeline
4	Verify the structural adequacy of the Jeans Building structure – review structural cracking, remedial measures currently in place and load capacity of columns	Detail Engineering Assessment to be completed	6-weeks
5	Verify the structural adequacy of the Jeans Building structure – review structural cracking, remedial measures currently in place and load capacity of columns	Building Engineer to prepare and building owner to implement a schedule of strengthening and remedial structural works where required.	6-weeks
6	Verify the structural adequacy of the Jeans Building structure – review structural cracking, remedial measures currently in place and load capacity of columns	Produce and actively manage a loading plan for all floors within the building giving consideration to floor capacity and column capacity.	6-weeks
7	Verify the structural adequacy of the Jeans Building structure – review structural cracking, remedial measures currently in place and load capacity of columns	Continue to implement load plan	6-months

Detail Engineering Assessment

This Schedule develops a minimum level of information, Analysis and testing expected as part of a Detail Engineering Assessment.

The Building(s) have been visually assessed and it is deemed necessary that a detailed engineering assessment be carried out by a competent Engineering Team employed by the factory Owner.

This Request should be read in conjunction with the BUET developed Tripartite Guideline document for Assessment of Structural Integrity of Existing RMG Factory Buildings in Bangladesh (Tripartite Document), the latest version of this document should be referenced. This document also gives guidance on required competency of Engineering Team.

We expect that the following will be carried out:

1. Development of Full Engineering As-Built Drawings showing Structure, loading, elements, dimensions , levels, foundations and framing on Plan, Section and Elevational drawings .
2. The Engineering team are to carry out supporting calculations with a model based design check to assess the safety and serviceability of the building against loading as set out in BNBC-2006, Lower rate provisions can be applied in accordance with the Tripartite Guidelines following international engineering practice, justification for these lower rate provisions must be made.
3. A geotechnical Report describing ground conditions and commenting on foundation systems used/proposed.
4. A report on Engineering tests carried out to justify material strengths and reinforcement content in all key elements studied.
5. Detailed load plans shall be prepared for each level showing current and potential future loading with all key equipment items shown with associated loads.
6. The Engineering team will prepare an assessment report that covers the following:
 - As-Built drawings including
 - Plans at each level calling up and dimensioning all structural components
 - Cross sectional drawings showing structural beams, slabs, floor to floor heights, roof build-ups and Basic design information of the structure
 - Highlight any variation between As-built compared to the designed structure
 - Results of testing for strength and materials
 - Results of geotechnical assessment and testing/investigation
 - Details of loading, inputs and results of computer modelling
 - Commentary on adequacy/inadequacy of elements of the structure
 - Schedule of any required retrofitting required for safety or performance of Structure

Any proposals for Retrofitting to follow guidance developed in the Tripartite Document

Item No.	Observation	Recommended Action Plan	Recommended Timeline
8	Building Engineer to review steelwork connection to Washing Plant	Steelwork connection to Washing Plant to be reviewed by the Building Engineer . This structure is to be designed by the Building Engineer and, if required, upgraded to support code vertical and wind loads or the area should be vacated.	6-weeks
9	Building Engineer to review structural adequacy of Roof	Structural adequacy of 1st floor roof to be reviewed by the Building Engineer . This structure is to be designed by the Building Engineer and, if required, upgraded to support code vertical and wind loads or the area should be vacated.	6-weeks
10	Cracking to top of suspended ground floor slab over basement	Sections of floor finish to slab to be removed to investigate if cracks penetrate the building structure.	6-weeks
11	Cracking to top of suspended ground floor slab over basement	Building Engineer to carry out design check on slab to confirm that the structure is adequate to carry the design loads	6-weeks
12	Cracking to top of suspended ground floor slab over basement	Produce and actively manage a loading plan for all floors within the building giving consideration to floor capacity and column capacity	6-weeks
13	Cracking to top of suspended ground floor slab over basement	Continue to implement load plan	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
14	Design check required due to discrepancies between structural drawings and building structure	Complete as-built survey and complete calculations to verify the structural adequacy of the building structure taking account of the survey dimensions.	6-weeks
15	Design check required due to discrepancies between structural drawings and building structure	Produce and actively manage a loading plan for all floors within the Trousers Building.	6-weeks
16	Design check required due to discrepancies between structural drawings and building structure	Continue to implement load plan	6-months
17	Damage to underside of beams and visible reinforcement at locations of cast-in electrical conduits	Building Engineer to carry out survey to identify locations where structural capacity of reinforced concrete beams has been reduced by penetrations or electrical conduit installation	6-weeks
18	Damage to underside of beams and visible reinforcement at locations of cast-in electrical conduits	Building Engineer to carry out design calculations to verify the adequacy of the structure and to prepare a schedule of remedial works to reinstate the areas affected by the electrical installation	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
19	Design check required for plinth loading in toilet areas to confirm floor slab load capacity	Extent of plinth loading within toilet areas to be surveyed and capacity of floor slab to be assessed by Building Engineer to confirm the adequacy of the floor slab and beams	6-weeks
20	Load management of storage loads	Produce and actively manage a loading plan for all floor plates within the Trousers Building giving consideration to floor capacity and column capacity. (Refer to Item 5)	6-weeks
21	Load management of storage loads	Continue to implement load management plan	6-months
22	Cracks in brick piers	Sections of plaster finish to wall to be removed and extent of crack to be reviewed by Building Engineer	6-weeks
23	Cracks in brick piers	Cracks to be monitored by Building Engineer	6-weeks
24	Cracks in brick piers	Building Engineer to confirm that adequate lateral restraint is provided to the walls. If required remedial works to be carried out.	6-months