

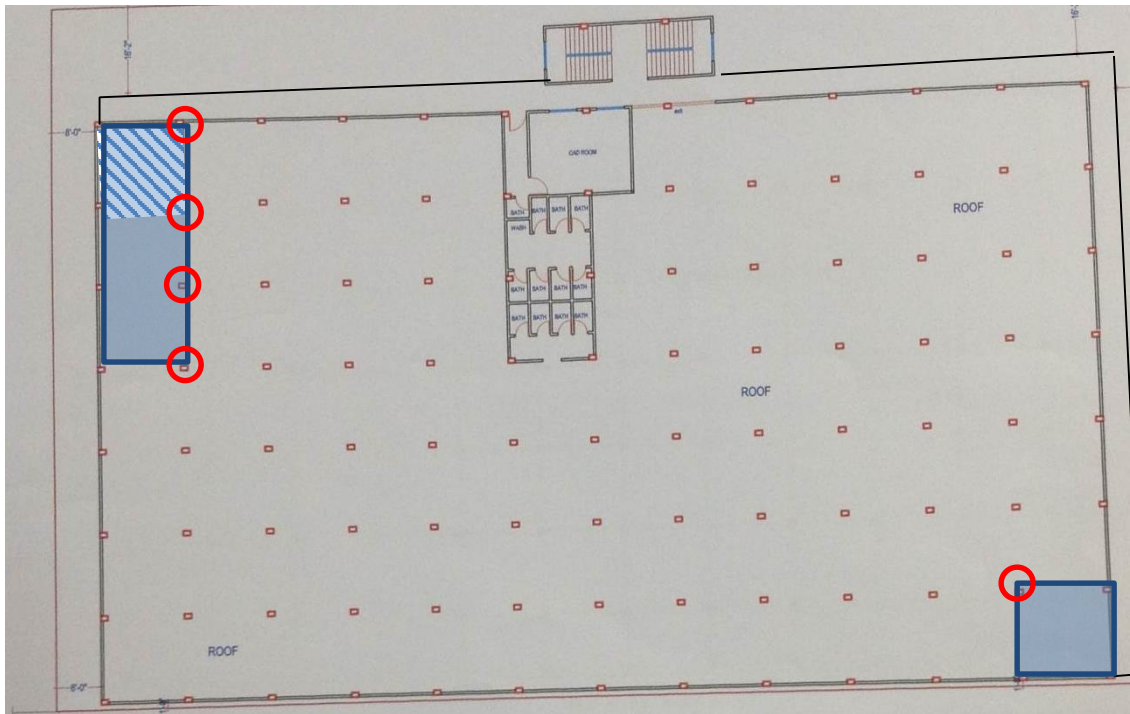
Kims Corporation Ltd.

16, Sutar Noardda, Arapara, Savar
(23.850058, 90.251219)
03 May 2014



Observations

Observed high loading



**200mm build-up in
toilet area on 1st and
2nd floor toilet areas**

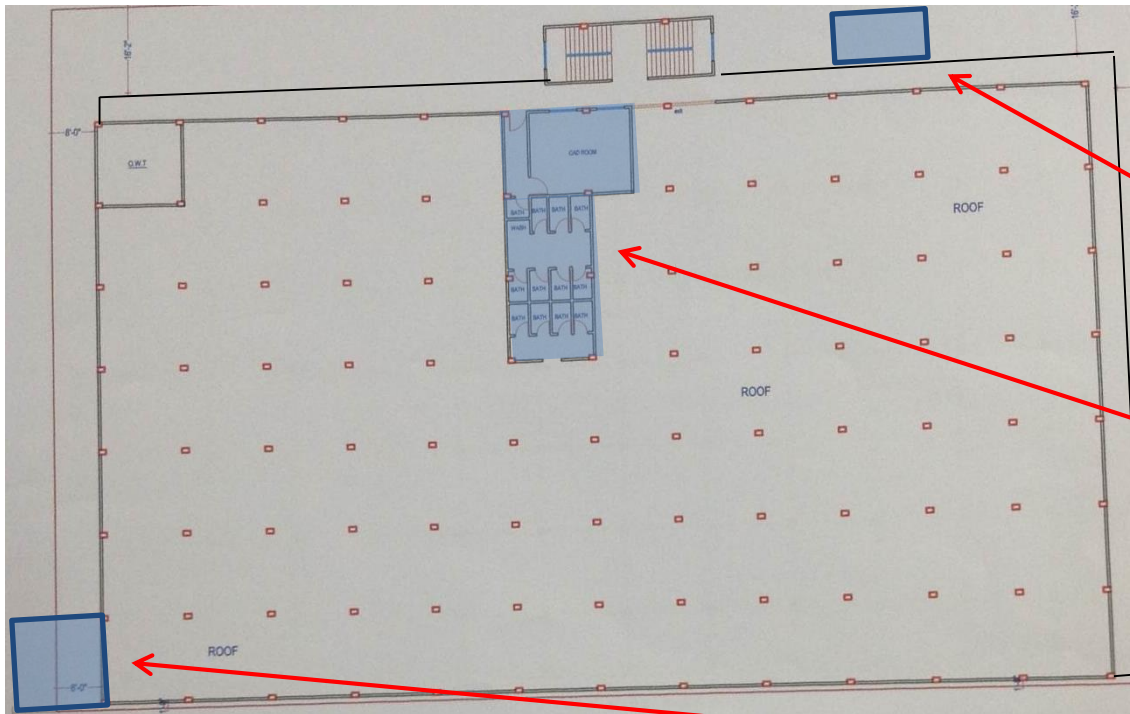


**Concrete water
tank at roof level**



**Heavily loaded
columns**

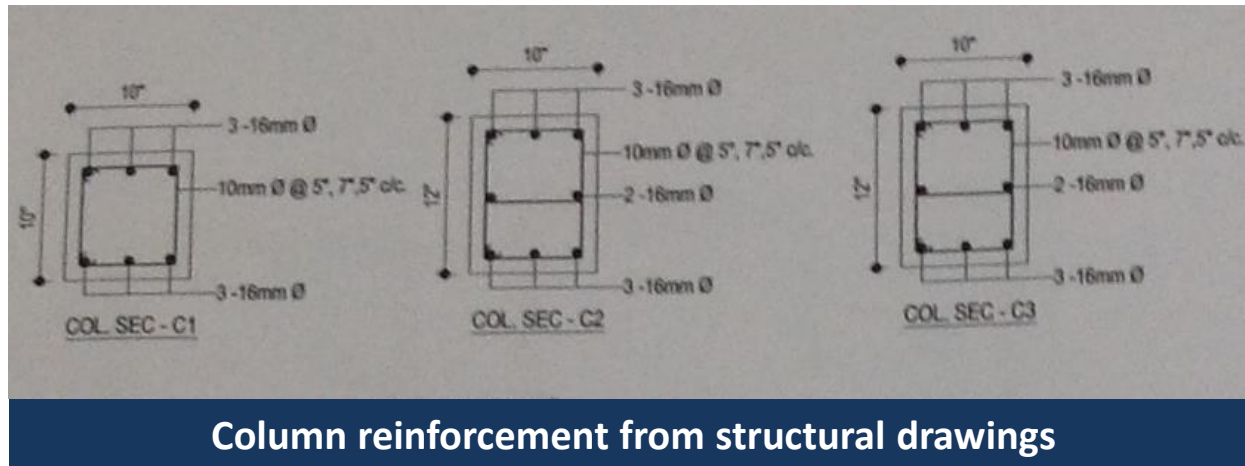
Documentation: highlighted areas not documented on structural drawings



No building permit was given for the building surveyed on site.

- Steel staircase located adjacent to the primary stair well not present on any drawings.
- CAD room and toilet block not on the original structural drawings.
- Stair well leading to the mosque room located on the southern side of the building not present on either the structural or as-built drawings.

Rebar quantities observed differ from structural drawings



- Ferro-scanning of column recorded 4 number bars in the columns.
- 6 bars @ 16mm diameter are called up on the structural drawings.
- 4 bars is in agreement with previous NDT carried out.

It was also noted that the reinforcing steel provided was unribbed mild steel bars.

Flexural cracking in beams and slabs



- Flexural cracks were found in the beams and slabs on all levels.
- Significant cracking was observed in the floor slab screed. These cracks were particularly prevalent over beams, running between columns. This behaviour is consistent with flexural cracking as hairline cracking was also observed in the soffit of the floor slabs.
- Hairline cracks were also observed in the beams.

Loading observed



Storage on first floor

- The floor use for 1st, 2nd and 3rd floors was general sewing which is relatively lightly loaded.
- Some evidence of storage was observed on the 1st and 2nd floors, relating to packaging of products.



Second floor packaging/storage



Typical floor load

Water damage around water tank and supporting columns



Water tank elevation



Soffit of water tank with concrete spalling

- Significant water damage observed to water tank walls, slab and supporting beam.
- Evidence of water ingress also observed in columns below water tank at all levels.

Cracking in the stairwell



- Numerous cracks were observed in the walls of the main stairwell located on the western face of the building.

Non-engineered steel stair



A steel stair providing access to the first and second floors appears to be non-engineered. The main issues observed are:

- No bracing provided to the structure.
- Unequal rise between steps in each flight.
- Section sizes appear to be light.

Stairs to first floor in boiler house



- A steel stair providing access to the first floor of the boiler house appears to be non-engineered and unfit for purpose.
- This stair is a hazard and is in need of replacement.

Ground floor front façade not connected to building



Soffit of 1st floor beam



Separation of wall from building

- Front façade of the building on eastern side is not tied into the main structure of the building.
- Wall is constructed from unreinforced brick and is unable to resist any horizontal loads.
- Evidence of separation from cracking developed on northern corner, see photograph

Concrete spalling, exposed rebar



Soffit of cantilever slab



Soffit of boiler house roof slab



Water tank supporting beam

- Rebar has been exposed in several locations due to concrete spalling.
- Significant deterioration of the water tank supporting beams and roof of boiler house was observed, with some localised deterioration of the cantilever slabs.

Brick aggregate used in construction



- After removing plaster from a ground floor column, brick aggregate was observed.

Problems Observed

1. Heavily-loaded columns under the water tank and toilet area
2. As-built documentation does not reflect the built structure.
3. Rebar quantities differ between drawings and built structure
4. Flexural cracks noted in the beams and slabs
5. Stacking of finished goods on the suspended floors
6. Poor condition of the water tanks concrete.
7. Non-engineered external steel stairs in the main building and to the roof of the boiler house.
8. Façade wall on south side at ground floor is not tied into the building.
9. Poor structural condition of first floor structure over boiler house

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Heavily loaded columns under the water tank and toilet area	Maintain existing activities on the floor plate avoiding any storage of materials in the areas mentioned in full report.	Immediate - Now
2	Heavily loaded columns under the water tank and toilet area	Building Engineer to verify concrete strength by 100mm dia cores or the existing cylinder strength data for the columns noted under the toilets.	6-weeks
3	Heavily loaded columns under the water tank and toilet area	If required reduce the loading on the columns by removing the existing tank and relocate tank from over the toilet area.	6-weeks
4	Heavily loaded columns under the water tank and toilet area	Reduce the build-up in the toilets area or strengthen columns should the review of the concrete strength require it.	6-months
5	As-built documentation does not reflect the built structure	Building Engineer to survey existing structure and update the existing "As-Built" drawings	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
6	Rebar quantities differ between drawings and built structure	Building Engineer to update As-built drawings with the corrected rebar quantities as outlined in the engineering investigation already carried out by TUV.	6-weeks
7	Rebar quantities differ between drawings and built structure	Building Engineer to carry out spot checks to verify findings of the TUV report.	6-weeks
8	Flexural cracks noted in the beams and slabs	Building Engineer to carry out study to verify the load capacity of the members as-built.	6-weeks
9	Flexural cracks noted in the beams and slabs	Building Engineer to remove plaster/finishes in area of cracking in slabs and beams.	6-weeks
10	Flexural cracks noted in the beams and slabs	Review cracking and make recommendations for repair as necessary	6-weeks
11	Flexural cracks noted in the beams and slabs	Carry out repairs as necessary.	6-months
12	Stacking of finished goods on the suspended floors	Building Engineer to produce loading plans to be displayed at each floor level.	6-weeks
13	Stacking of finished goods on the suspended floors	Factory Manager to actively manage floor usage in accordance with the loading plan.	6-weeks
14	Stacking of finished goods on the suspended floors	Continue to implement load plan.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
15	Poor condition of the concrete water tanks	Engineer to investigate the condition of the concrete and rebar of the water tank on the roof.	6-weeks
16	Poor condition of the concrete water tanks	Engineer to make recommendations on the repair to the tank.	6-weeks
17	Poor condition of the concrete water tanks	Carry out repairs to the water tank as per Engineer's details, or demolish and replace with new tank (same size).	6-months
18	Non-engineered external steel stairs in the main building and to the roof of the boiler house	Building Engineer to review the two steel stairs.	6-weeks
19	Non-engineered external steel stairs in the main building and to the roof of the boiler house	Building Engineer to design any additional structure deemed necessary or replacement engineered stairs	6-weeks
20	Non-engineered external steel stairs in the main building and to the roof of the boiler house	Build additional structure as per Building Engineer's recommendations.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
21	Façade wall on south side at ground floor is not tied into the building	Building Engineer to review lateral stability of the ground floor façade on the east side of the building, facing the existing road.	6-weeks
22	Façade wall on south side at ground floor is not tied into the building	Building Engineer to design ties between façade and building as required.	6-weeks
23	Façade wall on south side at ground floor is not tied into the building	Build additional structure as per Building Engineer's recommendations.	6-months
24	Poor structural condition of 1st floor structure over boiler house	Building Engineer to review the structural condition of the 1st floor structure over the boiler house.	6-weeks
25	Poor structural condition of 1st floor structure over boiler house	Building Engineer to design any additional structure deemed necessary.	6-weeks
26	Poor structural condition of 1st floor structure over boiler house	Build additional structure as per Building Engineer's recommendations, or remove this first floor structure.	6-months