

Best Wool Sweaters Ltd

Jarun, Konabari, Gazipur, Dhaka, Bangladesh
(+24.000421N, 90.323217E)

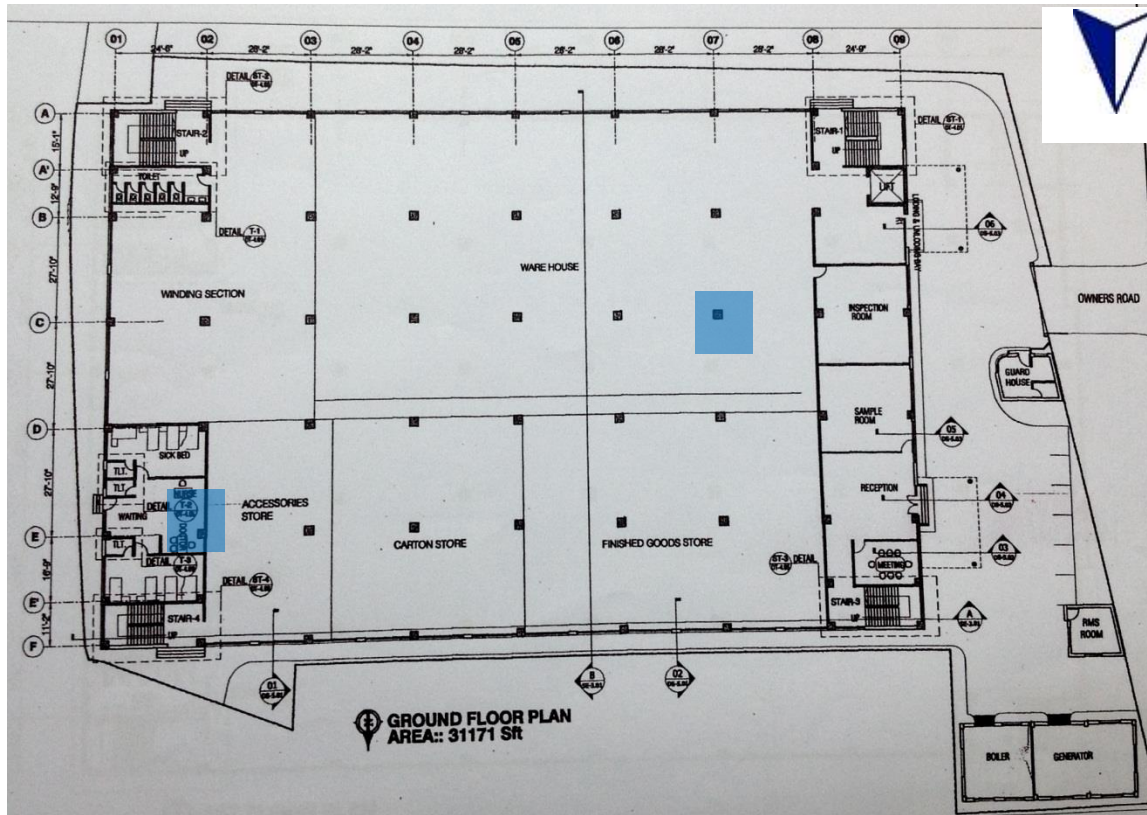
15th June 2014



Observations

Column stresses in the North-East corner of the main building appear to be in excess of normal design limits

Cursory calculations indicate that column stresses in the N-E corner at Ground Floor level are in excess of normal design limits, due to significant water tank and toilet floor build-up loads.



Ground Floor Plan

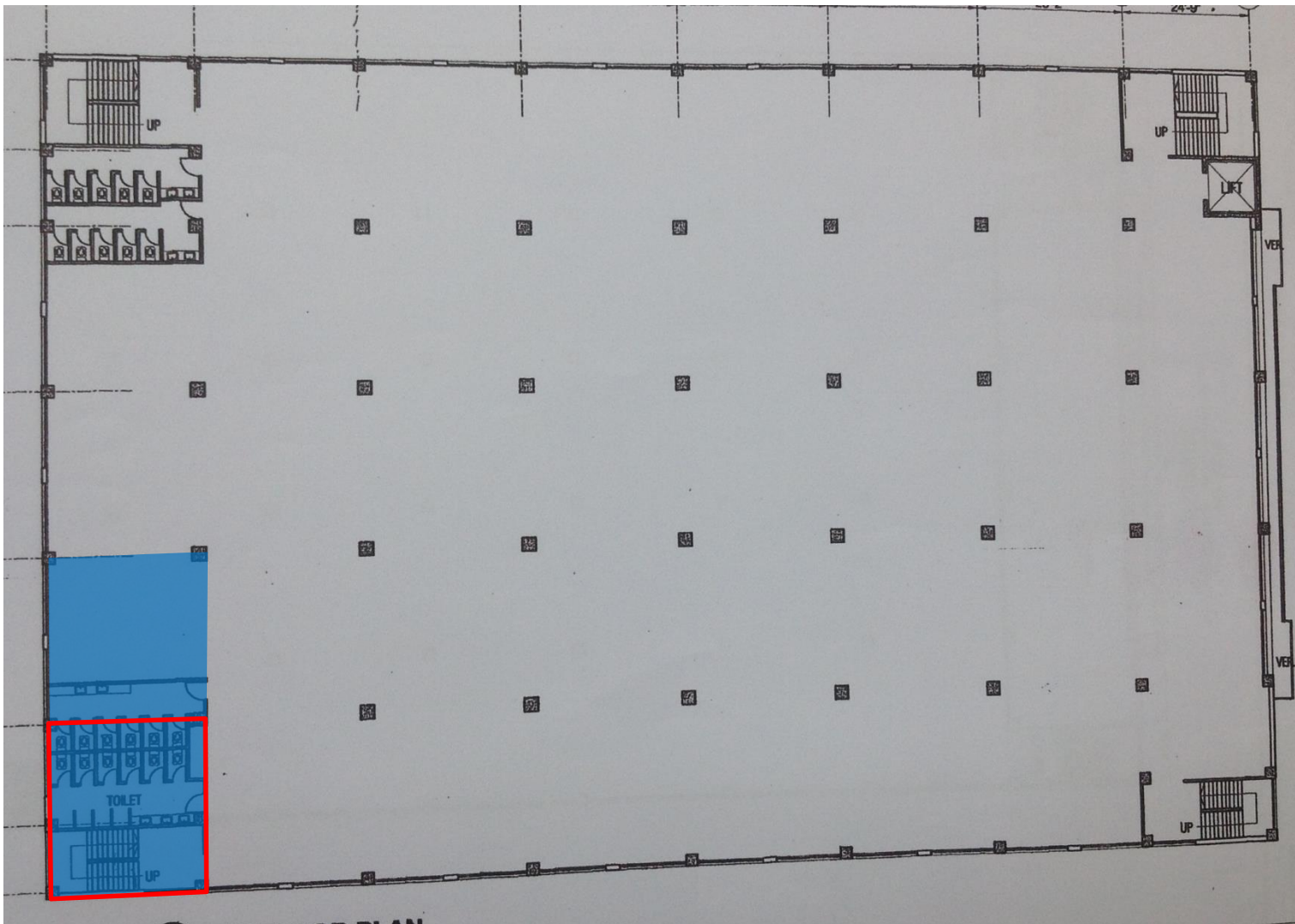
Tested Columns



Tested Column

Stone aggregate was observed in the Ground Floor columns. High yield steel reinforcement is called up on the drawings and was observed in the columns at Roof level. Reinforcement quantities observed at Roof level and determined at Ground Floor level appear to be consistent with the drawings.

Column Strength – Factory Building



Typical Floor Plan



Extent of Toilets at all floor levels



Extent of Water Tank at Roof level

Column Strength – Factory Building



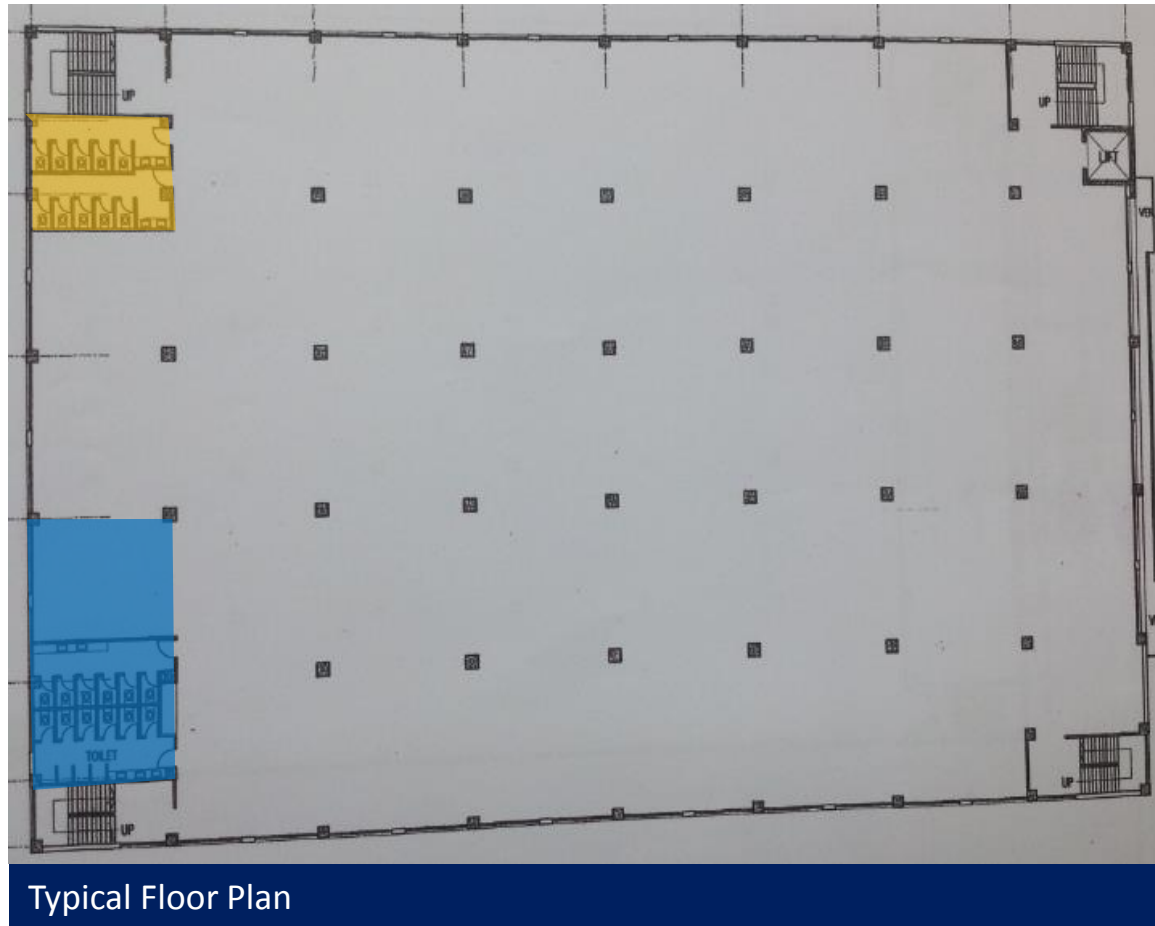
430mm average toilet floor build-up at all floor levels



Water Tank at Roof level

Column Strength – Factory Building

The Toilet block to the South-East corner, adjacent to Stair 3, is not in the location shown on the drawings other than at 1st Floor level. At all other floors, the majority of the Toilets are located to the North-East corner, adjacent to Stair 4, and, while these vary in size, occupy a larger area than is shown on the drawings.



Toilets typically not located in this area, other than at 1st Floor level



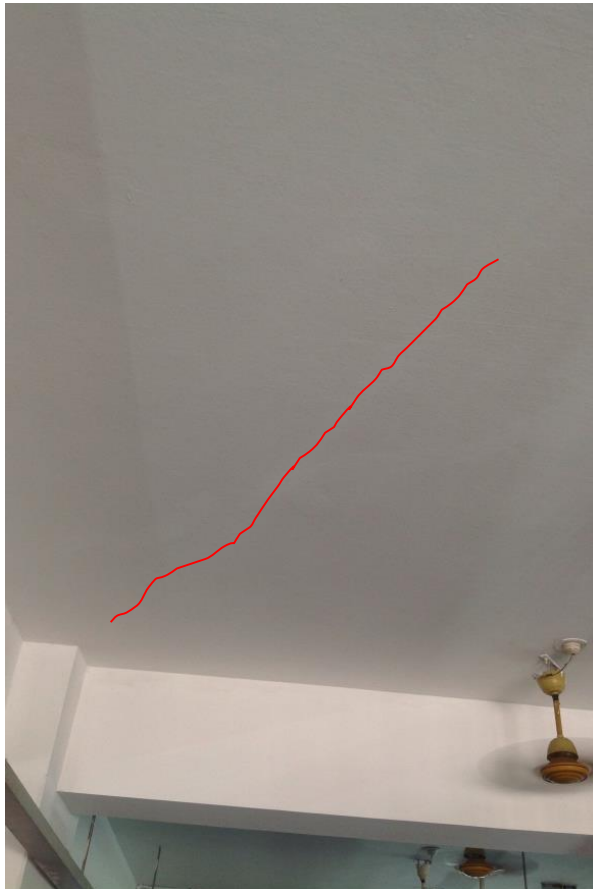
Toilet block in this area is typically larger than shown



Column Strength – Factory Building

Hairline cracking to soffit of beams and slabs in main building

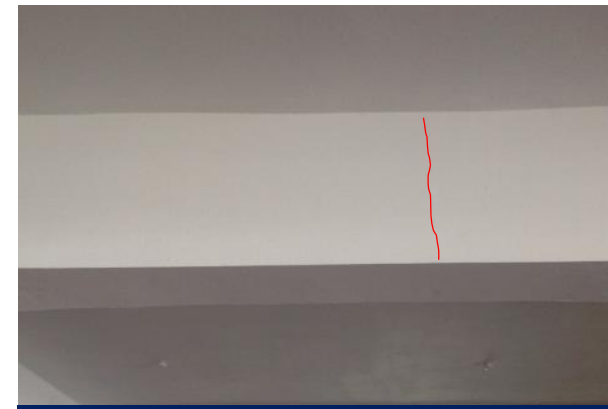
Hairline cracking was observed in the render to a number of beam and slab soffits at most floor levels. Cracking was also observed to the top of the slab. Note that a large number of cracks appear to have been filled and / or painted over. It is not clear whether the cracking extends into the concrete.



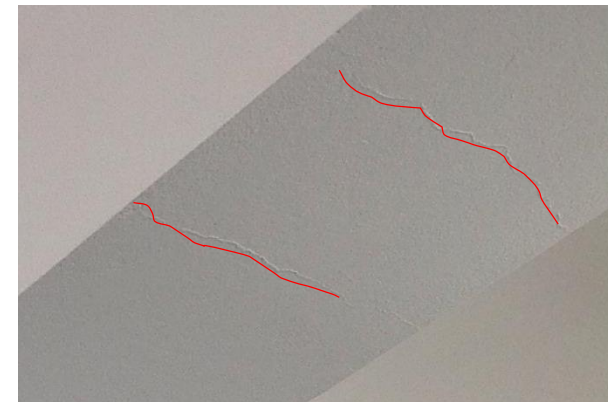
Cracking to slab soffit



Cracking to top of slab



Cracking to Beam Soffit



Filled Cracks to Beam Soffit

Lightweight, apparently non-engineered roof structures to utility buildings

A number of utility buildings and the elevated water tank have lightweight roof structures that appear to be non-engineered and may be unsuitable to resist uplift forces and lateral loads.



Lightweight roof to Compressor Room



Lightweight roof to Compressor Room



Roofs to Substation and Diesel Generator Room



Non-engineered roof to water tank



Lightweight roof to Wastage Shed

Lightweight Roof Structures

Priority Actions

Problems Observed

ITEM 1: Column stresses in the North-East corner of the main building appear to be in excess of normal design limits - due to loading from the elevated Water Tank and significant Toilet floor build-up

ITEM 2: Hairline cracking to soffit of beams and slabs in main building

ITEM 3: Lightweight, apparently non-engineered roof structures to utility buildings

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Column stresses in the North-East corner of the main building appear to be in excess of normal design limits - due to loading from the elevated Water Tank and significant Toilet floor build-up	Factory Engineer to review design, loads and column stresses in area of the building highlighted above.	6-weeks
2	Column stresses in the North-East corner of the main building appear to be in excess of normal design limits - due to loading from the elevated Water Tank and significant Toilet floor build-up	Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for cores from 4 columns.	6-weeks
3	Column stresses in the North-East corner of the main building appear to be in excess of normal design limits - due to loading from the elevated Water Tank and significant Toilet floor build-up	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
4	Hairline cracking to soffit of beams and slabs in main building	Monitor cracks to beams and slab soffit. Engage an engineer to investigate if cracks are only in the plastering.	6-months
5	Hairline cracking to soffit of beams and slabs in main building	Engage a Building Engineer to advise on load reduction and repair and strengthening of the slab if required.	6-months
6	Lightweight, apparently non-engineered roof structures to utility buildings	Engage a Building Engineer to review the design of all lightweight roof structures within the compound, and confirm their ability to withstand wind loading pressure, suctions and uplift forces, with special emphasis on connections and bracing.	6-months
7	Lightweight, apparently non-engineered roof structures to utility buildings	Building Engineer to implement any actions / supervise any remedial works as identified following the review.	6-months