

Magpie Composite Textile Ltd. (9804)

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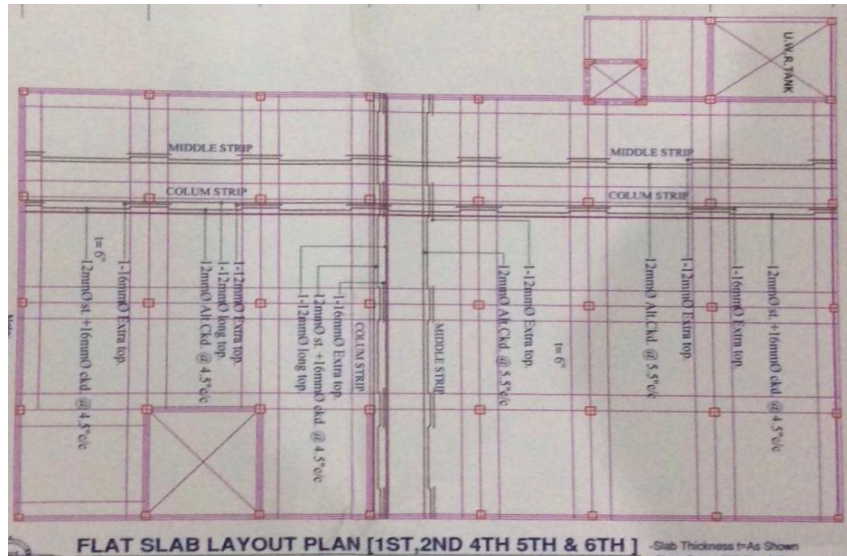
02.JUN.2014



Identified Priority 1 Concerns

1st Priority 1 Concern

Main building



As per our calculation with the live load 3.5kPa for punching shear at the typical column, the shear stress at the first perimeter is higher than the design concrete shear stress. Based on the BNBC codes, the slab thickness should be increased, or shear links provided for slab. However, the drawings provided don't show shear links.

Furthermore, due to the lack of lateral stability system, the increase of un-balanced moments due to lateral loads need to be considered.

Nevertheless, it is assumed that the live load does not reach 3.5kPa under normal loading conditions, and so immediate danger is not imminent.

1st Priority 1 Concern (Continued)

 Main building

The span/depth ratio for flat slab which controls the limit of deflection for an RC element is defined apparently as $L/30$. The ratio for 6.1m span and 152.4mm thickness slab is 40 which was higher than ratio requirement.

Thinner flat slabs will lead to increased deflection in short-term and long-term and reduce the punching shear resistance as well.

The thin flat slab without a drop panels or shear reinforcement may not be able to resist punching shear loads in a seismic event which may cause the slab to collapse suddenly and potentially cause a subsequent total building collapse.

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2nd Priority 1 Concern

Main building

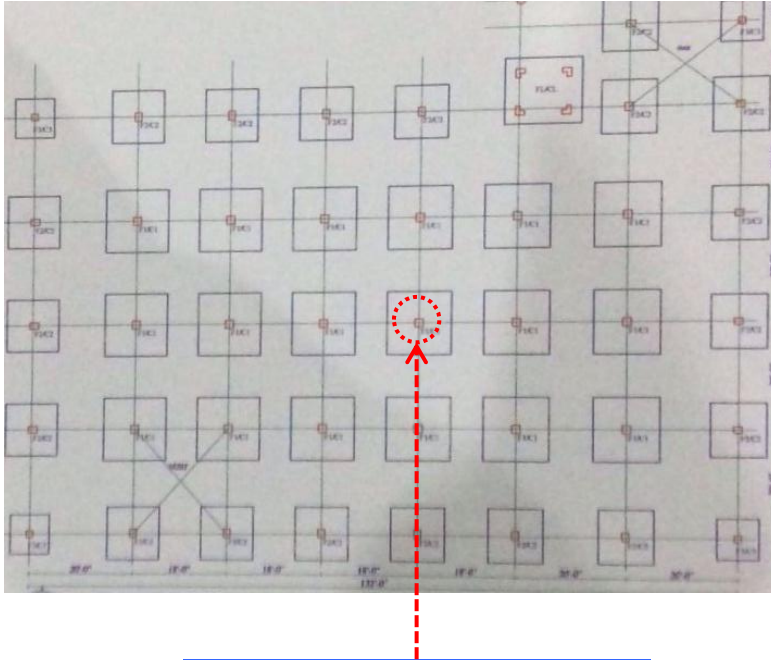


The load due to the storage of carton boxes on level 4 is higher than the design loading of 3.5 kPa (70psf). Each carton box package is estimated to be approximately 22kg with the dimension 0.6x0.4m and 4 layers, so the live load for this area is 3.7kPa (74psf) which is higher than the design loading 3.5kPa (70psf).

The localised live load is higher than the imposed load, the stacking of the boxes should be carefully monitored to ensure that there is no possibility of overloading should loading conditions change in future.

Identified Priority 2 Concerns

Priority 2 Concern



Column to be checked

Main building

Based on the load rundown analysis of the building with 7 floors as per Building permission drawing and existing building, it turns out to be YELLOW status for all checked columns that have similar loading condition and design. Which requires that all floor loadings must be carefully monitored and a provided loading plan must be strictly maintained.

SCHEDULE OF COLUMN					
COLUMN	UP TO GRADE BEAM		G. FLOOR ROOF TO 1ST. FLOOR ROOF	2ND FLOOR ROOF TO 3RD FLOOR ROOF	4TH FLOOR ROOF TO 6TH FLOOR ROOF
C1	SIZE	20"x20"	18"x18"	18"x18"	18"x18"
	ROD	12-20mmØ	12-20mmØ	12-20mmØ	12-16mmØ
	SECTION				

Identified Priority 3 Concerns

1st Priority 3 Concern

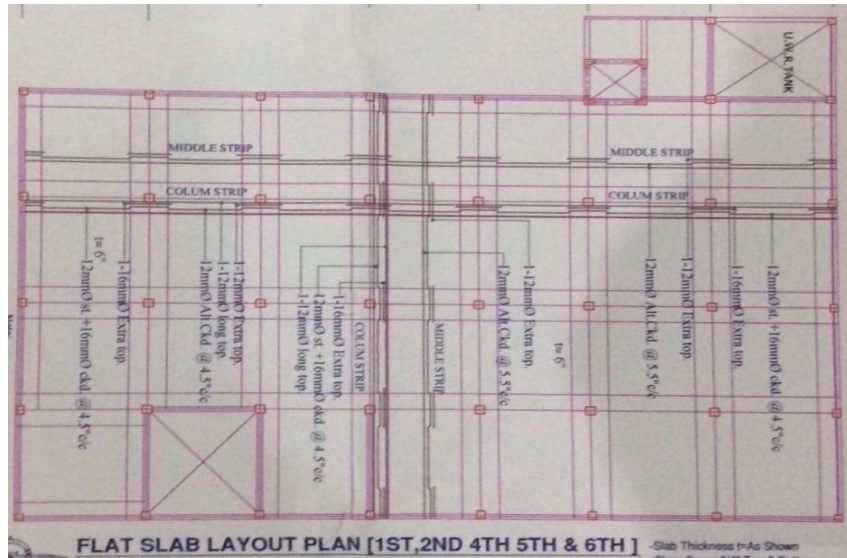
Main building



The rafter at this level are missing longitudinal bracing in the roof plane, across one or both end bays of the structure.

Tie rods should be provided in the middle of each purlin span to prevent buckling of the purlin.

Dining room on roof floor



The overall structural arrangement does not appear to have any rational form of lateral stability system to resist wind or earthquake loads. A lateral load analysis is required to be carried out. Together with the very low factor of safety to resist punching shear, the building is at a very high risk of failure if a significant event occurs.

The design engineer needs to check the deflection and storey drift under lateral wind and seismic load.

We require that these items be investigated in a Detailed Engineering Assessment

3rd Priority 3 Concern

Dyeing section



The building is a portal frame with moment connections to provide stability in-plan. The span is 24m with a 5.8m frame spacing in longitudinal direction.

The rafters are missing longitudinal bracing in the roof plane, across one or both end bays.

The steel columns are also missing vertical bracing in the elevations.

The roof purlins should also be provided with tie-rods at mid-span to help prevent buckling.



4th Priority 3 Concern



Dyeing
finished
section

Finished
section

The steel trusses and beams are not longitudinally braced and the steel connections need to be reviewed and repaired properly according to the proper design detailing.

We require that these items be investigated in a Detailed Engineering Assessment

5th Priority 3 Concern

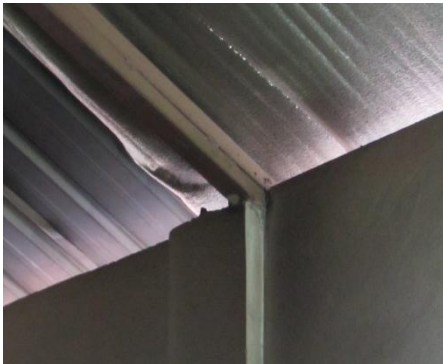
Generator room



This type of structural building appears to be a temporary structure.

The steel beams of the roof are very small with very simple connections and appear to be corroded and have excessive deflections.

We require that these items be investigated in a Detailed Engineering Assessment.



Priority Actions

Problems Observed Summary

- ITEM 1: (1st Priority 1) The flat slab in the main building appears not to be sufficient to resist the punching shear forces.**
- ITEM 2: (2nd Priority 1) Loading intensity in the main building appears to be greater than what was the allowable load in some locations.**
- ITEM 3: (1st Priority 2) The typical columns in the main building have a low factor of safety with respect to their loading capacity with 7 floors.**
- ITEM 4: (1st Priority 3) The rafter beams in the roof of main building are missing their longitudinal bracing in the roof. No tie rods have been provided for the purlins at the mid-span between trusses.**
- ITEM 5: (2nd Priority 3) No lateral load resistance system in the main building.**

Problems Observed Summary

- ITEM 6: (3rd Priority 3) Dyeing section - The rafters are missing their longitudinal bracing in the roof. The steel columns are also missing the vertical bracing in the elevations. No tie rods have been provided for the purlins at their mid-span.**
- ITEM 7: (4th Priority 3) The structure for the shed buildings needs to be reviewed for its lack of longitudinal bracing and the connections of steel structure needs to reviewed with proper design detailing.**
- ITEM 8: (5th Priority 3) There is no waterproofing provided on the existing RC roof of the main building**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	1st Priority 1 - The flat slab in the main building appears not to be sufficient to resist the punching shear forces.	Limit the average imposed load on the floor to a maximum of 1.5kPa (30 psf)	Immediate - Now
2	1st Priority 1 - The flat slab in the main building appears not to be sufficient to resist the punching shear forces.	Carry out intrusive testing of the structure to determine the actual concrete strength, rebar strength and rebar layout	6-weeks
3	1st Priority 1 - The flat slab in the main building appears not to be sufficient to resist the punching shear forces.	Carry out full structural modelling of the building with respect to both gravity and lateral loads to assess the extent of modifications required to attain acceptable structural stability. Carry out structural strengthening works as required	6-months
4	2nd Priority 1 - Loading intensity in the main building appears to be greater than what was the allowable load in some locations.	Immediately reduce stacking height of fabric bag to ensure total load does not exceed 1.5kPa (30 psf)	Immediate - Now
5	2nd Priority 1 - Loading intensity in the main building appears to be greater than what was the allowable load in some locations.	Mark the maximum allowable height of fabric stacking to ensure full compliance Develop floor loading plans and use them.	6-weeks
6	2nd Priority 1 - Loading intensity in the main building appears to be greater than what was the allowable load in some locations.	Ensure continued compliance to the loading intensity limitations on a long-term basis. Maintain and enforce the loading plans.	6-months
7	1st Priority 2 - The typical columns in the main building have a low factor of safety with respect to their loading capacity with 7 floors.	Factory Engineer needs to review design, loads and columns stresses in areas identified above. Verify in-situ concrete stresses either by 100mm dia. cores or existing cylinder strength data for the columns concerned.	6-weeks
8	1st Priority 2 - The typical columns in the main building have a low factor of safety with respect to their loading capacity with 7 floors.	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor and column capacities.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
9	1st Priority 3 - The rafter beams in the roof of main building are missing their longitudinal bracing in the roof. No tie rods have been provided for the purlins at the mid-span between trusses.	The bracing system needs to be provided in the longitudinal direction and a tie rod needs to be provided to the purlins at mid-span.	6-months
10	2nd Priority 3 - No lateral load resistance system in the main building.	Building engineer to check and provide the solution for lateral resisting requirements of the structure.	6-weeks
11	2nd Priority 3 - No lateral load resistance system in the main building.	As per the results of structural analysis, the building needs to be revised to accord with BNBC building codes with regard to lateral stability.	6-months
12	3rd Priority 3 - Dyeing section - The rafters are missing their longitudinal bracing in the roof. The steel columns are also missing the vertical bracing in the elevations. No tie rods have been provided for the purlins at their mid-span.	The bracing system need to be provided in the longitudinal direction in the roof and for the columns. The purlins need to provided with tie rods in their mid-span.	6-months
13	4th Priority 3 - The structure for the shed buildings needs to be reviewed for its lack of longitudinal bracing and the connections of steel structure needs to reviewed with proper design detailing.	The detailed design for the shed buildings needs be carry out to justify its structural stability under wind load. A bracing system needs to be provided in longitudinal direction.	6-months
14	5th Priority 3 - There is no waterproofing provided on the existing RC roof of the main building	Provide a proper waterproof layer on the roof level.	6-months