

MZM (CEPZ) Ltd. (11782)

Plot # 8-9, Sector # 2/A, CEPZ, Chittagong-4223

(+22.286953N, 91.779617E)

30.August.2014



Identified Priority 1 Concerns

1st Priority 1 Concern

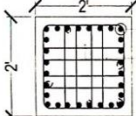
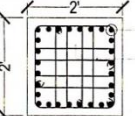
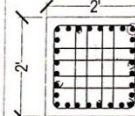
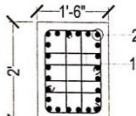
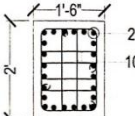
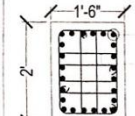
High column stresses to all internal column. The factor of safety was found to be between 1.25 & 1.5 for C2 columns and between 1.86 & 1.5 for C1 columns by calculation based on existing loadings.



2nd Priority 1 Concern

COLUMN SCHEDULE

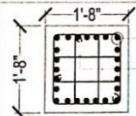
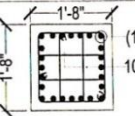
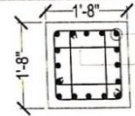
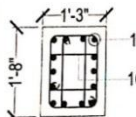
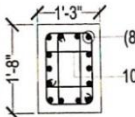
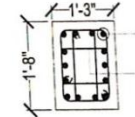
Design Drawing

TYPE	BELOW GL	REINFORCEMENT		
		Grd. & 1st. FLOOR	2nd. & 3rd. FLOOR	4th. & 5th. FLOOR
C1	27"X27"	 28-25mm Ø 10mm@5"/7"/5" c/c	 28-20mm Ø 10mm@5"/7"/5" c/c	 (20-20+8-16)mm Ø 10mm@5"/7"/5" c/c
C2	21"X27"	 24-25mm Ø 10mm@5"/7"/5" c/c	 24-20mm Ø 10mm@5"/7"/5" c/c	 (20-20+4-16)mm Ø 10mm@5"/7"/5" c/c

Structural design drawings do not match the Structural as built drawings and neither match the "As Built" condition of the building

COLUMN SCHEDULE

"As Built" Drawing

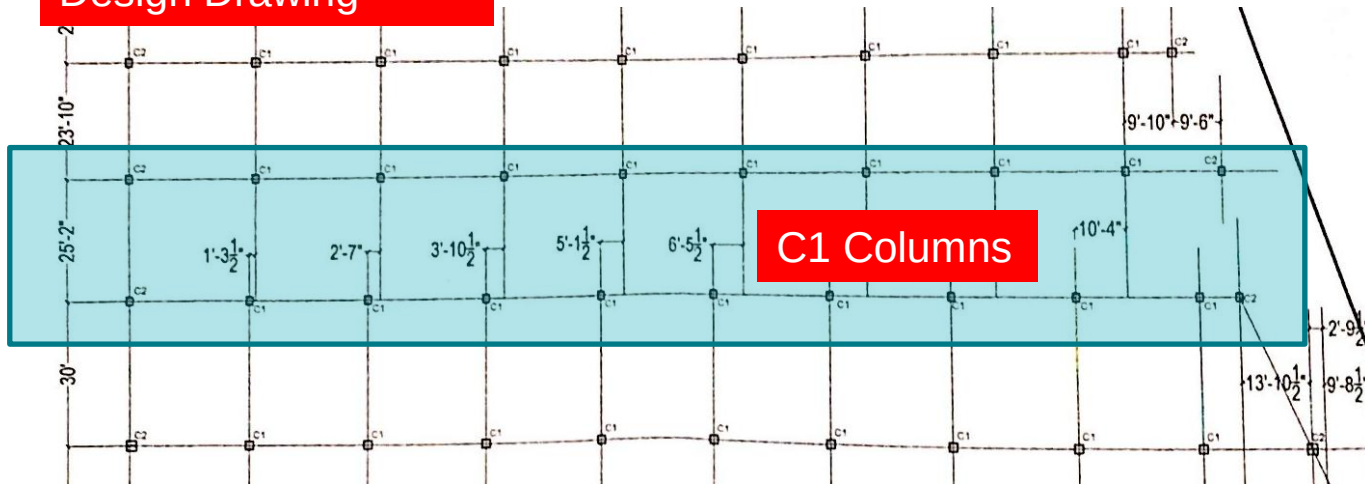
TYPE	BELOW GL	REINFORCEMENT		
		Grd. & 1st. FLOOR	2nd. & 3rd. FLOOR	4th. & 5th. FLOOR
C1	23"X23"	 24-25mm Ø 10mm@5"/7"/5" c/c	 (16-25+8-20)mm Ø 10mm@5"/7"/5" c/c	 16-20mm Ø 10mm@5"/7"/5" c/c
C2	18"X23"	 14-25mm Ø 10mm@5"/7"/5" c/c	 (8-25+6-20)mm Ø 10mm@5"/7"/5" c/c	 14-20mm Ø 10mm@5"/7"/5" c/c

The column size for both columns reduce from the design drawings to the as built drawings.

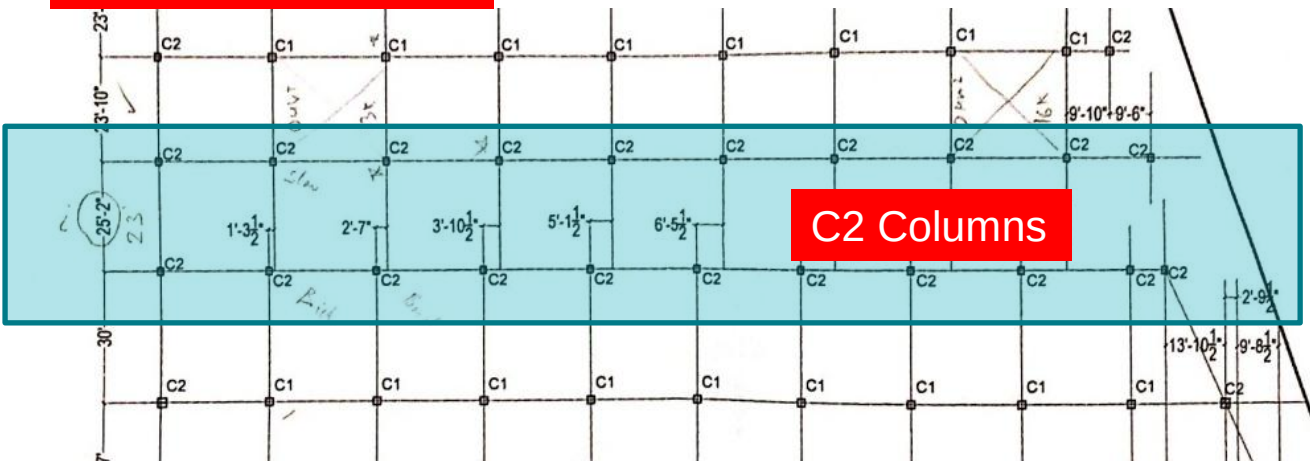
Column	Size - Design	Size – As Built
C1	24" x 24"	20" x 20"
C2	24" x 18"	20" x 15"

2nd Priority 1 Concern (Continued)

Design Drawing



“As Built” Drawing



The column types changes between the Design Drawings and the “As Built” drawings along the central section of the building.

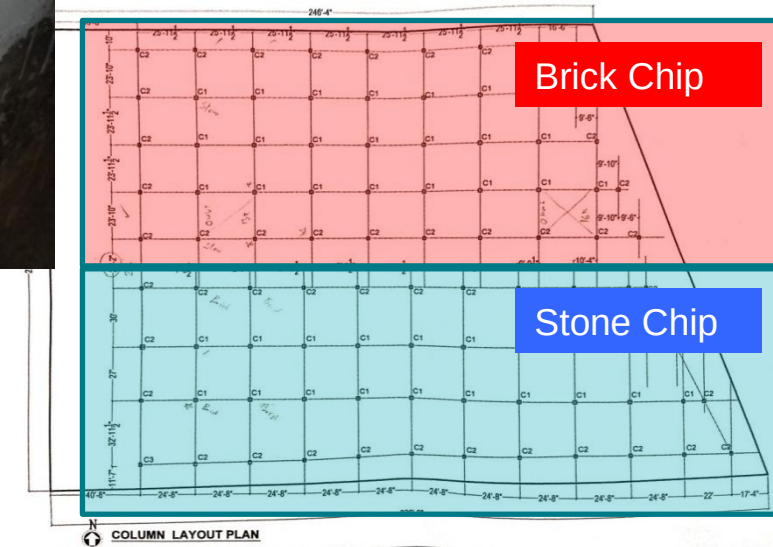
2nd Priority 1 Concern (Continued)



The coarse aggregate in the columns differs from brick to stone throughout the building.

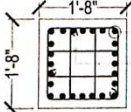
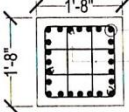
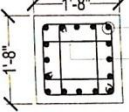
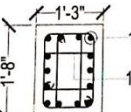
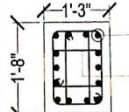
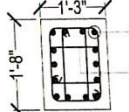
The drawings detail stone chip to all columns.

It would appear that the North part of the building uses brick chips and the South part uses stone chips based on our limited intrusive survey. It would be necessary to check more columns at all levels to determine which columns use brick aggregate.



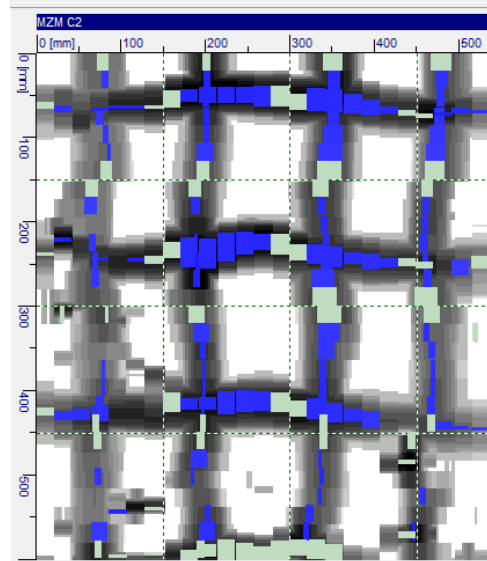
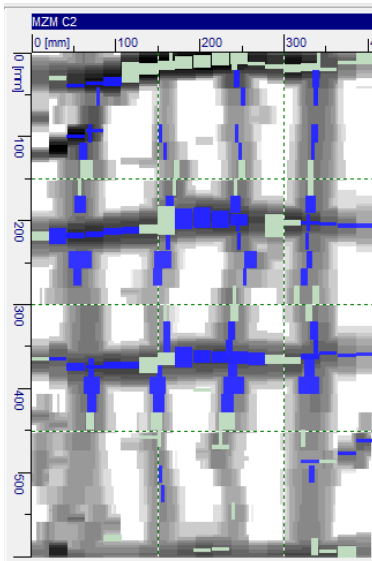
2nd Priority 1 Concern (Continued)

COLUMN SCHEDULE

TYPE	BELOW GL	REINFORCEMENT		
		Grd. & 1st. FLOOR	2nd.& 3rd. FLOOR	4th.& 5th. FLOOR
C1	23"X23"	 24-25mm Ø 10mm@5"17"/5"c/c	 (16-25+8-20)mm Ø 10mm@5"17"/5"c/c	 16-20mm Ø 10mm@5"17"/5"c/c
C2	18"X23"	 14-25mm Ø 10mm@5"17"/5"c/c	 (8-25+6-20)mm Ø 10mm@5"17"/5"c/c	 14-20mm Ø 10mm@5"17"/5"c/c

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The reinforcement discovered during the Ferro-scanning did not match the structural “As Built” drawings.



The scans for the C2 column (left) clearly show 12N° 25mmØ bars. While the drawings show 14 N° 25mmØ bars.

The scans for the C2 column shows 16N° 25mmØ bars. While the drawings show 24N° 25mmØ bars.

3rd Priority 1 Concern



The allowable loading for the building is unknown

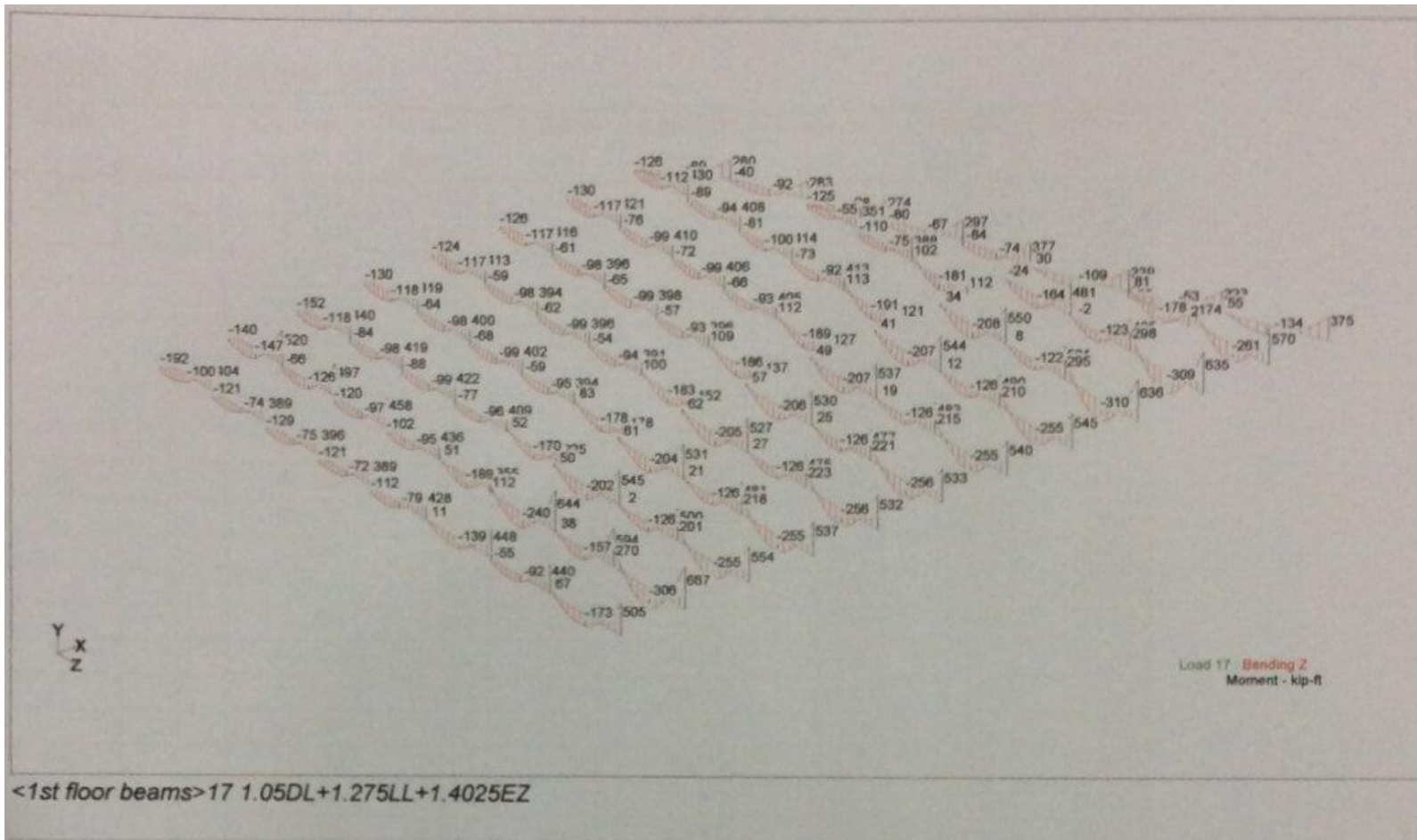
We were advised that the floors were designed for 80psf. Given the columns have been constructed considerably smaller than the original design the allowable loading will be greatly reduced.

We would advise that the suspended floors are not loaded above 40psf (2.0kPa) until a Detailed Engineering Assessment is undertaken.

Plinths have been constructed around the toilets at 1st floor, we recommend that the increase in dead load is also checked as part of the Detailed Engineering Assessment.



Overall Stability System



The building did not feature any core or shear walls. Stability was achieved through sway action between beams and columns and masonry infill walls.

A analysis has been carried out however, we were not shown any concrete design based on this analysis.

We require that these items are investigated in a Detail Engineering Assessment

Water Ingress at Roof Level



No permanent roof currently exists as construction is ongoing, therefore no waterproofing membrane exists on the upper floor of the building. This means that any cracks in the surface finishes on the roof will allow water to seep into the concrete slab beneath the finishes and cause corrosion of the reinforcing steel. We would recommend a waterproof membrane is applied to the roof of the building at the end of construction, or to an upper level, if construction is to stop for more than one year.

Priority Actions

Problems Observed Summary

- | | | |
|---------|--------------|--|
| ITEM 1: | (Priority 1) | High column stresses to all internal columns. |
| ITEM 2: | (Priority 1) | Structural design drawings do not match structural as built drawings and neither match the “As Built” condition of the building. |
| ITEM 3: | (Priority 1) | Unknown stability system. |
| ITEM 4: | (Priority 1) | The allowable loading for the building is unknown. |
| ITEM 5: | (Priority 3) | No waterproof membrane to the roof. |

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Priority 1 - High column stresses to all internal columns.	Remove any stored yarn / cloth from the upper slabs. Ensure that the load on the upper slabs does not exceed 40psf (2.0kPa)	Immediate – Now
2	Priority 1 - High column stresses to all internal columns.	Carry out a Detailed Engineering Assessment on the building, involving all actions described in the slide at the end of the report.	6-weeks
3	Priority 1 - High column stresses to all internal columns.	Carry out the recommendations highlighted in the Detailed Engineering Assessment.	6-months
4	Priority 1 - Structural design drawings do not match structural as built drawings and neither match the “As Built” condition of the building.	Re survey the building as part of a Detailed Engineering Assessment and revise the drawings to match the site conditions.	Immediate – Now
5	Priority 1 - Unknown stability system.	Carry out a Detailed Engineering Assessment on the building to verify that it is stable under lateral loading.	6-weeks
6	Priority 1 - Unknown stability system.	Carry out all recommendations of the Detailed Engineering Assessment.	6-months
7	Priority 1 - The allowable loading for the building is unknown.	Ensure that the load on the upper slabs does not exceed 40psf (2.0kPa) Carry out a Detailed Engineering Assessment on the building to verify the allowable imposed load for each level.	Immediate – Now
8	Priority 1 - The allowable loading for the building is unknown.	Produce loading plans for each level. Ensure these are displayed and actively managed.	6-weeks
9	Priority 3 - No waterproof membrane to the roof.	Apply a suitable waterproofing membrane to the roof once construction has finished.	6-months