

Raiyan Knit Composite Ltd. Noor Group Ltd.

Hortokitola, Chandra, Kaliakoir, Gazipur
(24.050241N 90.234168E)

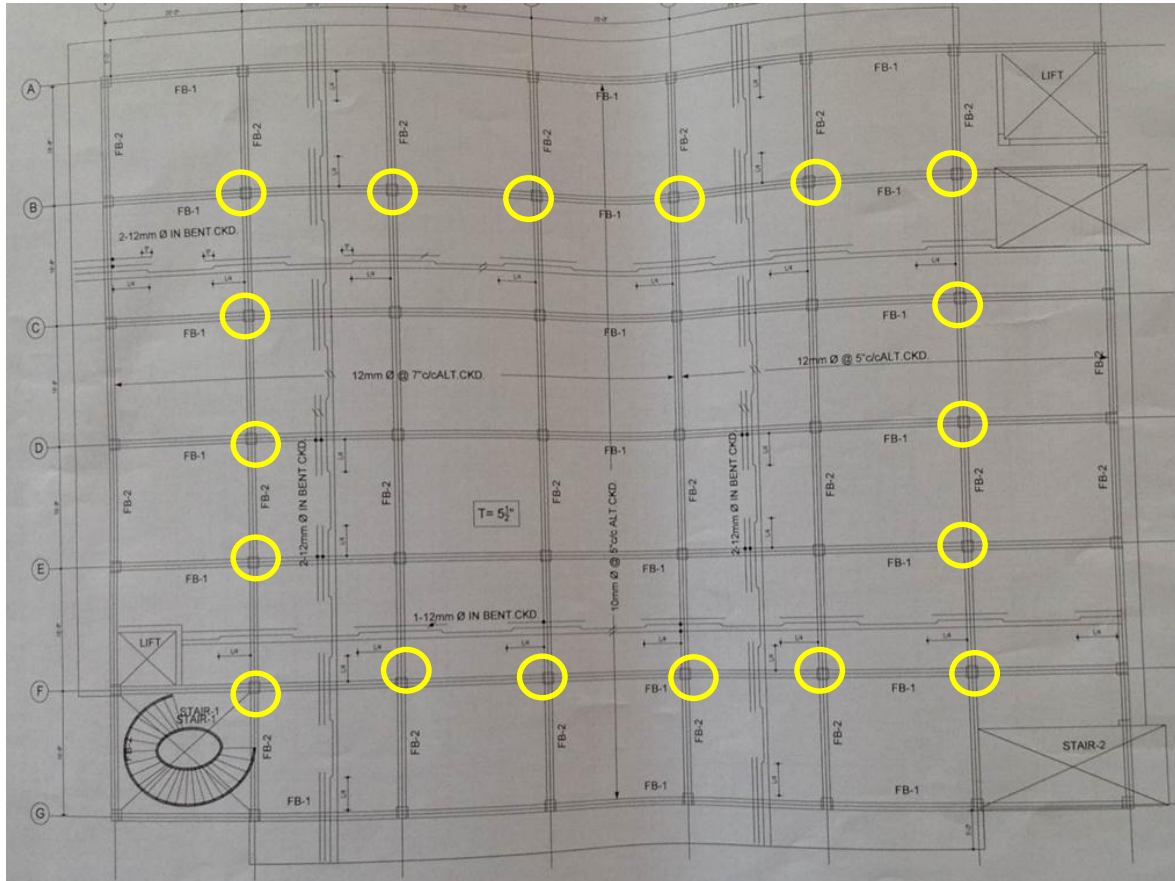
26 APRIL 2014



Observations

Item 1 observation

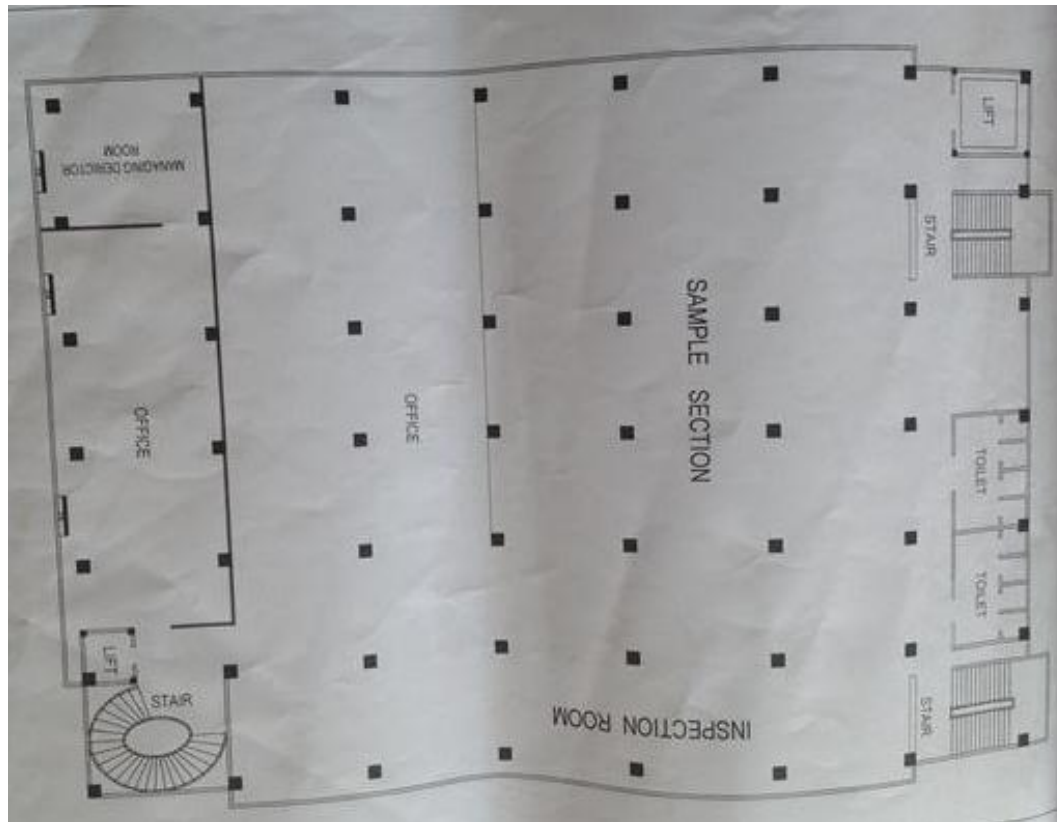
BUILDING 1: Heavy loaded column.



Highlighted columns appear to be stressed to high levels.

Item 2 observation

BUILDING 1: Flat slab thickness.

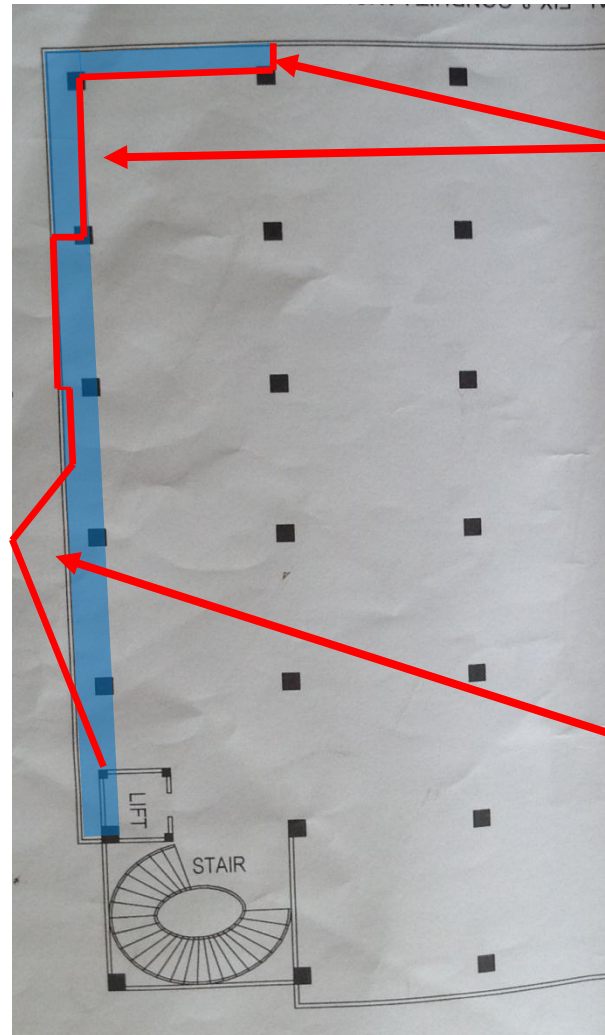


The thickness for the flat slab is given as 165mm (6.5inch) on the structural drawing. On site we measured about 180mm but this considers a thin slab for the 6.1 x 5.1m grid. Concern with punching shear and bending. Partitions is to be considered in the design. Load limits resulting from the calculations are to be recorded and loading plans produced.

Item 3 observation

BUILDING 1: Structural drawings for cantilever façade on building 1 do not match current arrangement of the structure.

Building façade outline differs to what is shown in drawings for several floors. Since only one typical reinforcement drawing was provided for all flat slabs and one typical drawing for both beam-slabs the slab reinforcement needs to be justified by calculation. The different cantilever lengths do have an influence on the required reinforcement



Building façade on 3rd floor



Façade cantilever extends to maximum 2.575m

Item 4 observation

BUILDING 1: RC cover plate under external façade to cover up electrical cables

Cracking in slab to facade connection holding and covering cables for power supply on ground floor level



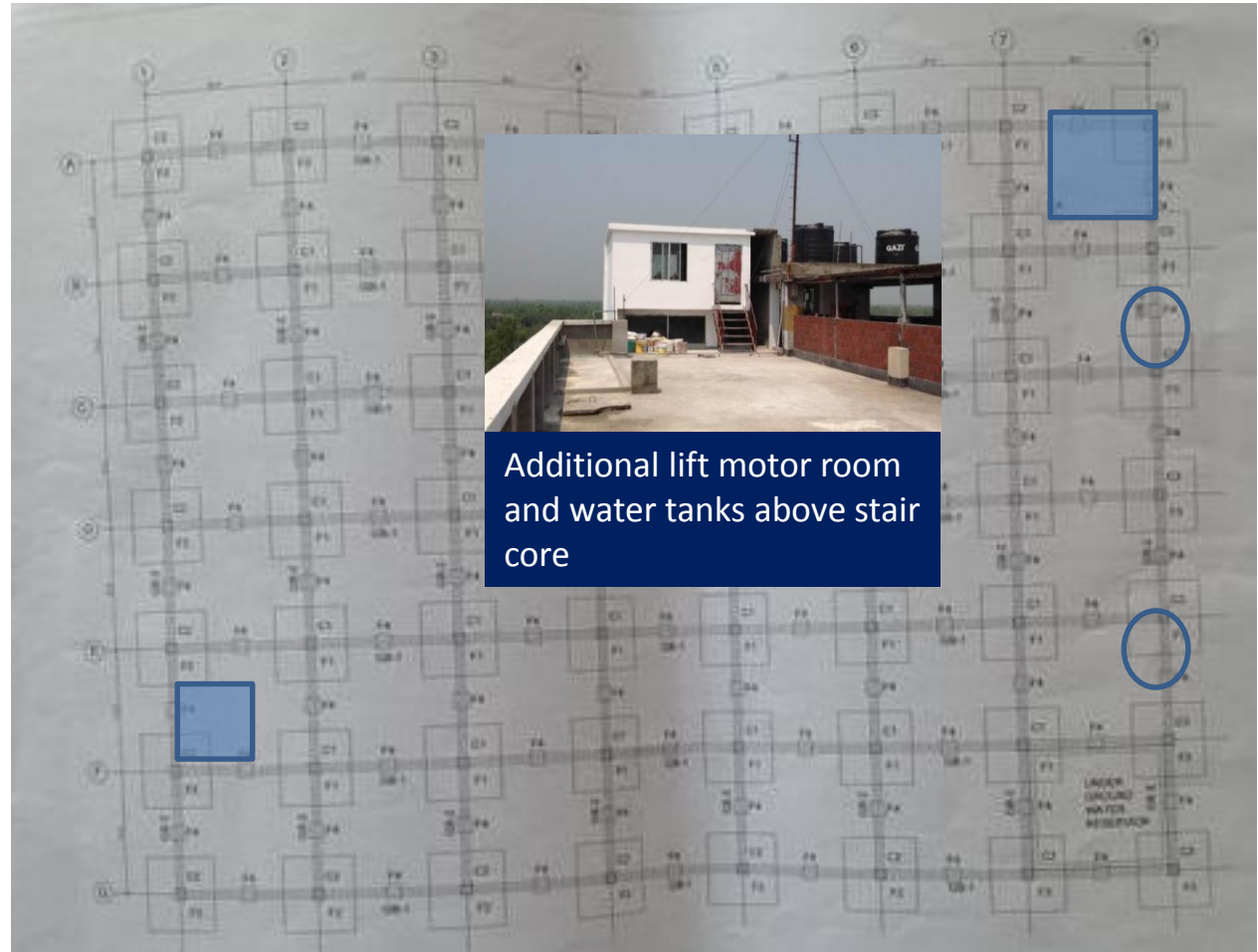
Building 1 – Ground level

Item 5 observation

BUILDING 1: No documentation for two RC columns supporting stair core and the foundations for the lift cores

The foundation drawing does not include any information on the foundation for the lift cores. Reportedly done as a raft foundation.

The stair cores at the back of the building have an additional RC columns (confirmed by taking off plaster), which is not shown on the drawings



Building 1-Documentation

Item 6 observation

BUILDING 1: Tin roof to cover dining area

Non engineered dining shed roof structure. Single angle steel section used as rafter beam. Weak fixing provided from column to both rafter and roof slab. Angle section used as purlins. No bracing provided for lateral stability.



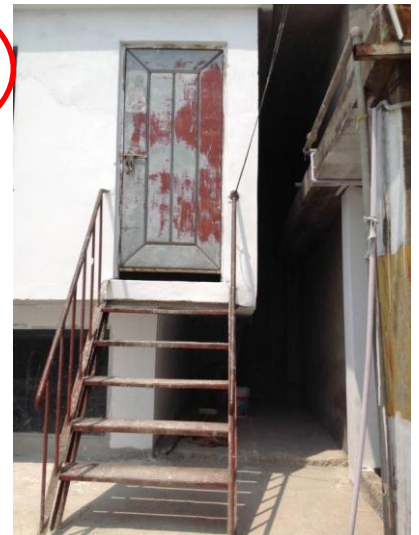
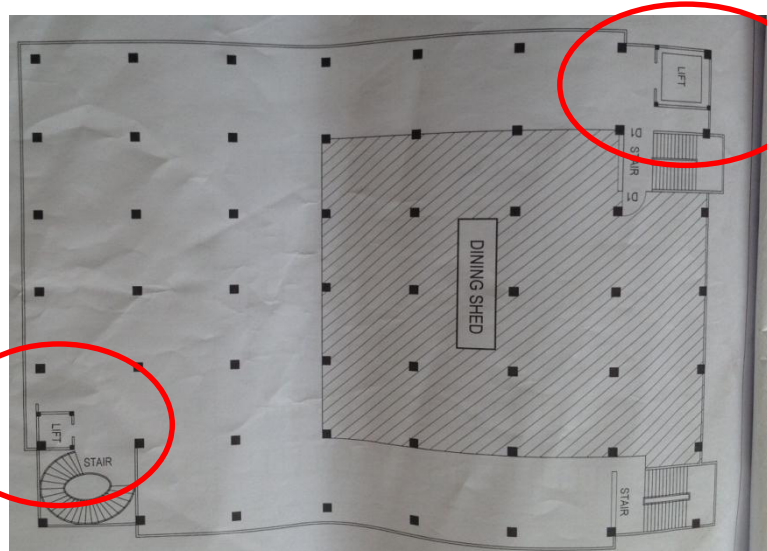
Building 1 - Roof Level

Item 7 observation

BUILDING 1: Additional structures at roof level (above the lifts)

Lift shaft motor room not in original drawings.

Both comprise cantilever slabs / structures.



Item 8 observation

BUILDING 1: Cracking in some floor areas

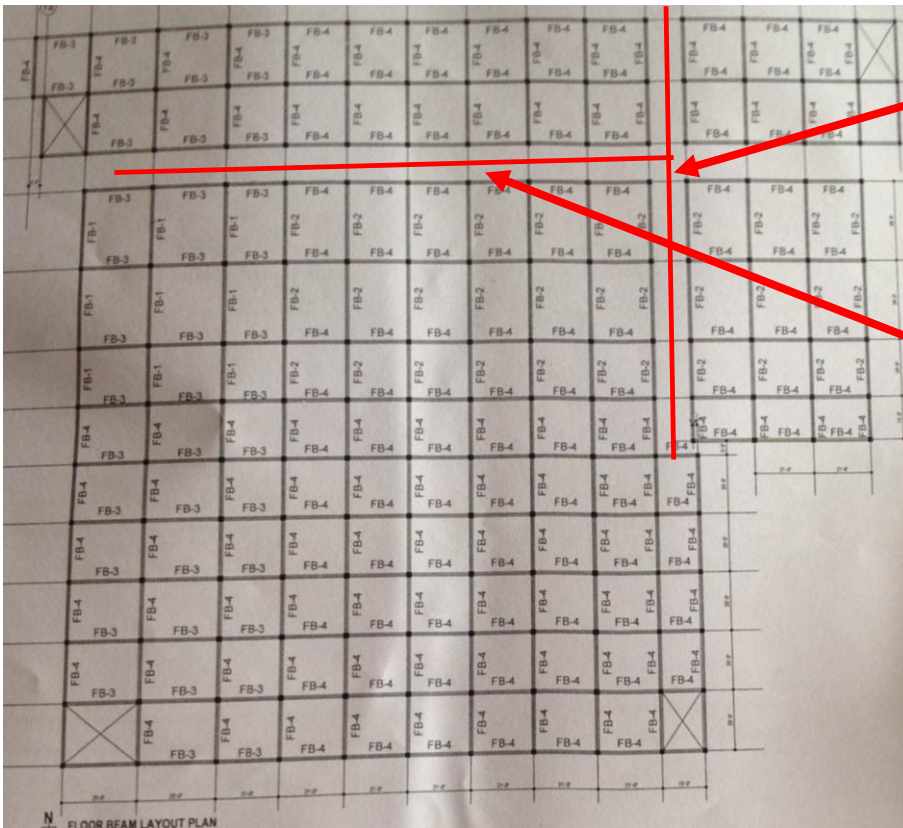
Cracking observed in soffit of flat slabs possibly due to conduit in slab base , to be investigated



Flat Slabs

Item 9 observation

BUILDING 2: Cantilever slab at movement joint locations.



Column and facade at end of corridor (gridline 6) is not supported below and hence provides additional dead load to one side of the cantilever

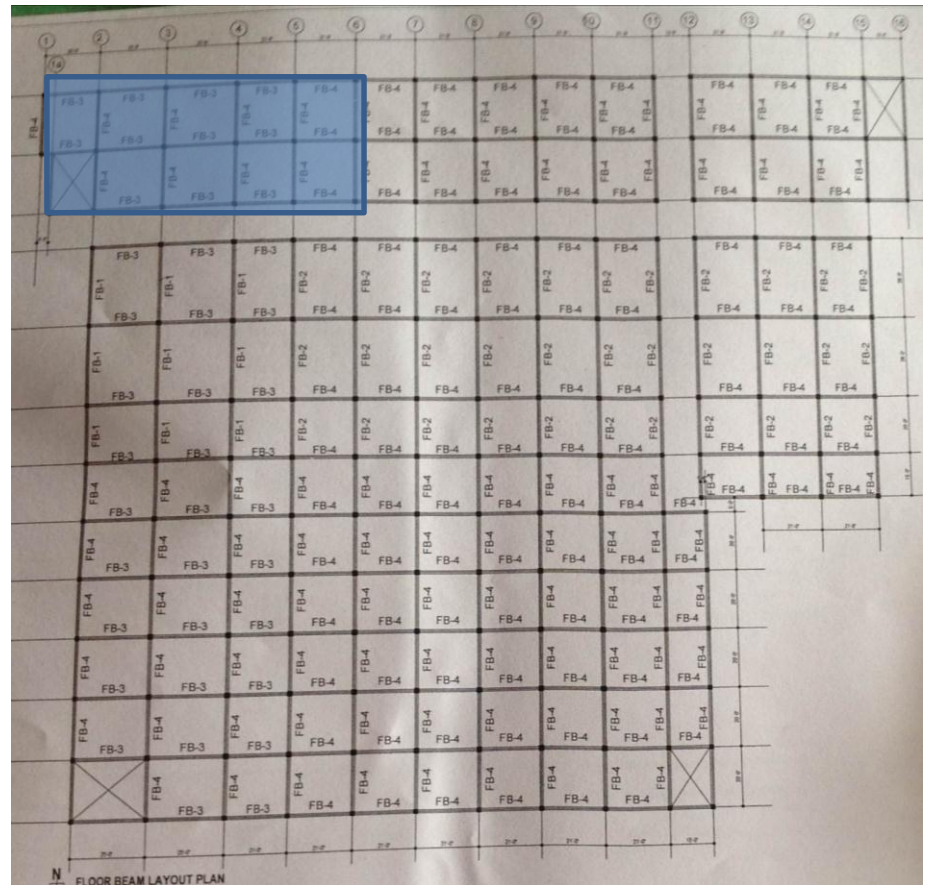


Building 2 – Cantilever slab

Item 10 observation

BUILDING 2: Stability of building part J-M/1-6

Stability for the highlighted building part (gridline J-M / 1-6) is only provided in short direction by a moment frame with 2 spans (3 columns). Moment frame should therefore be checked for adequacy.



Building 2 – Cantilever slab

Item 11 observation

STEEL SHED: Stability of steel shed



Building appears to be non engineered

Weak lateral stability across the frames as Edge/Haunch connections do not appear to be designed to take moments.

Weak longitudinal stability, no bracing is provided either horizontally on wall planes.



Steel shed

Item 12 observation

BAMBOO SHEDs: Stability and vertical props



Two bamboo supported sheds observed on site. One used for waste storage, the second for storage of construction material. These are non engineered and appear unstable. To be reviewed.

Item 13 observation

ADMIN BUILDING: Stair support



Staircase to first floor does not appear to have been engineered.
Poor bearing provide at both ends of flight.
Risk of buckling at base of flight under evacuation loading.

Building 3 – Steel stair

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	BUILDING 1+2: Review of column stresses	Establish if grade 60ksi rebar steel was used in the columns in building one.	6-weeks
2	BUILDING 1+2: Review of column stresses	Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for 100mm diameter cores from 4 internal columns including those shown in observations	6-weeks
3	BUILDING 1+2: Review of column stresses	No further construction to proceed until rebar grades have been established.	6-months
4	BUILDING 1: Flat slab thickness	Carry out verification of adequacy of flat slab	6-weeks
5	BUILDING 1: Flat slab thickness	Load restrictions resulting from the calculations to be obeyed.	6-weeks
6	BUILDING 1: Flat slab thickness	Strengthening of slab should this be required	6-months
7	BUILDING 1: Structural drawings for cantilever façade on building 1 do not match current arrangement of the structure	Building engineer to check, collect information and produce accurate and complete as-built documentation soonest.	6-months
8	BUILDING 1: RC cover plate under external façade to cover up electrical cables	Replace slab with new lightweight metal cable tray. Ensure proper fixing to façade and external building wall.	Immediate - Now
9	BUILDING 1: Foundation drawings do not show footings below columns located around lift shafts and stair core. Undocumented columns in wall of stairwell	Building engineer to check, collect information and produce accurate and complete as-built documentation soonest. Note: the loads should also include the water tanks and the additional lift motor building recently built	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
10	BUILDING 1: Tin roof to cover dining area non-engineered steel roof structure is unlikely to be able to withstand strong winds	Steel roof structure to be reviewed, designed and documented.	6-weeks
11	BUILDING 1: Tin roof to cover dining area non-engineered steel roof structure is unlikely to be able to withstand strong winds	Steel structure to be upgraded to support code vertical and wind loads.	6-months
12	BUILDING 1: Additional structures at roof level (above the lifts)	Additional structures should be designed and upgraded to support code vertical and wind loads by the building Engineer. Loads to be followed through to foundation (note: cantilever effects to be taken into account when calculating foundation loads)	6-months
13	BUILDING 1: Cracking in soffit of flat slabs	Monitor the development of all cracks	6-weeks
14	BUILDING 1: Cracking in soffit of flat slabs	Remove the cast- in pipe and replace with external piping. Repair the concrete along the removed pipe together with any required remedial works for the flat slab established in the design checks	6-months
15	BUILDING 2: Cantilever slab at movement joint locations.	Assess the design floor load (imposed live load) on the 2m long cantilever and clearly mark the areas accordingly.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
16	BUILDING 2: Stability of building part J-M/1-6	Structural checks for adequacy of stability frame.	Immediate - Now
17	BUILDING 2: Stability of building part J-M/1-6	Design of strengthening elements if required (we currently do not see any reason why the buildings have to be separated by movement joints in 3 parts. Strengthening could just mean to connect the slabs)	6-weeks
18	BUILDING 2: Stability of building part J-M/1-6	Implementation of strengthening elements if required.	6-months
19	STEEL SHED: Stability of steel shed	DO NOT USE IN STRONG WIND CONDITIONS.	Immediate - Now
20	STEEL SHED: Stability of steel shed	Building engineer to design temporary measures to stabilise the building (e.g. diagonals)	Immediate - Now
21	STEEL SHED: Stability of steel shed	Implement the temporary measures to stabilise the building	6-weeks
22	STEEL SHED: Stability of steel shed	Replace temporary measures with a permanent design or remove the shed.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
23	BAMBOO SHEDS: Stability and vertical props	DO NOT USE IN STRONG WIND CONDITIONS.	Immediate - Now
24	BAMBOO SHEDS: Stability and vertical props	Building engineer to instruct additional timber props to be installed. Some of them diagonally to provide lateral restraint	Immediate - Now
25	BAMBOO SHEDS: Stability and vertical props	Make the building safer with additional props and diagonals	6-weeks
26	BAMBOO SHEDS: Stability and vertical props	Replace temporary shed with a permanent design or remove the shed.	6-months
27	ADMIN BUILDING: Stair support	Building engineer to design proper support for the upper level / review and justify the fixing for the lower level	Immediate - Now
28	ADMIN BUILDING: Stair support	Implement a proper support bracket for the stair on the upper level	Immediate - Now