

Haesong Corporation Limited

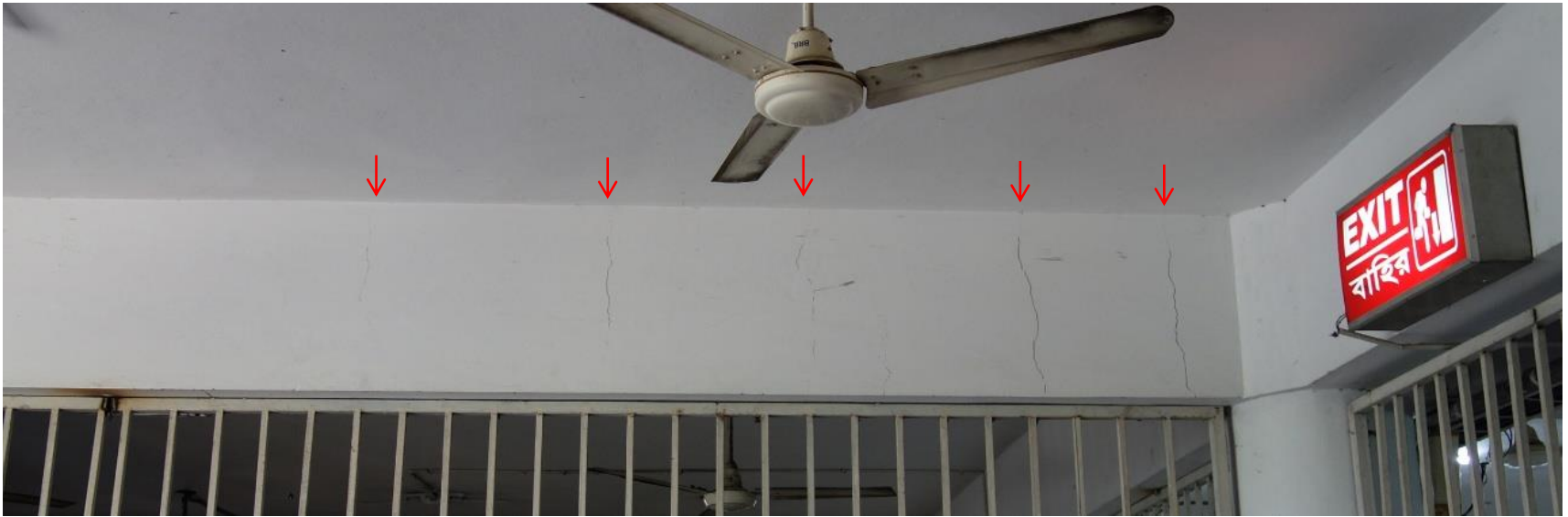
Haesong Sweater Ltd.

Haesong BD Ltd.

Hizalhati (Baroipara), Kaliakair, Gazipur, Bangladesh
(24.027194N, 90.23911123E)

30 October 2013





Cracking on beams:

Numerous beams in the building have shrinkage cracks, Upper floors beams are more cracked. Cause to be investigated.

Appears that lack of side reinforcement bar on deep beams missing(700x280)





Cracks appear be bigger that they are due to paint is lost both sides of crack.

1-After cracking plastic paint swells and produce a bubble.

2-Paint peels off and ends falling down around crack.



Cracking on beams

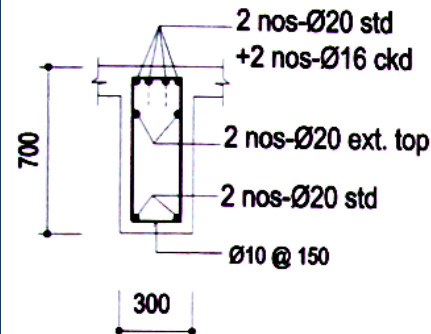
Possible cause:

Lack of side reinforcement
on deep beams
(700x280)

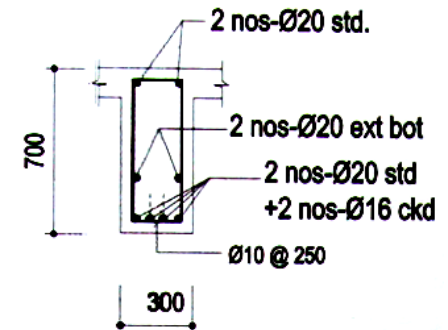
To be investigated

CROSS SECTION

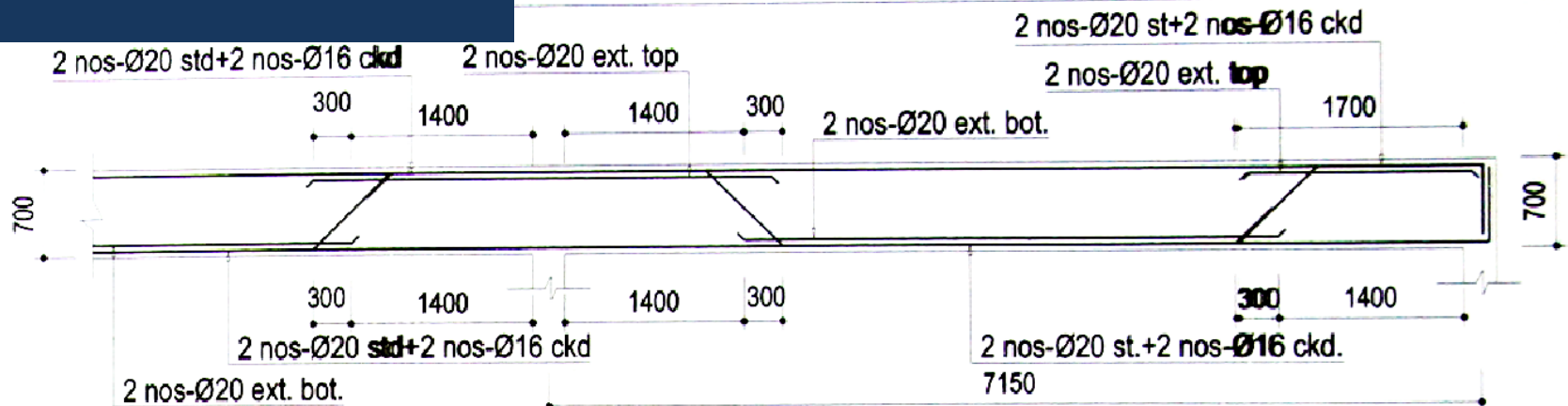
SUPPORT



MIDDLE



LONG SECTION



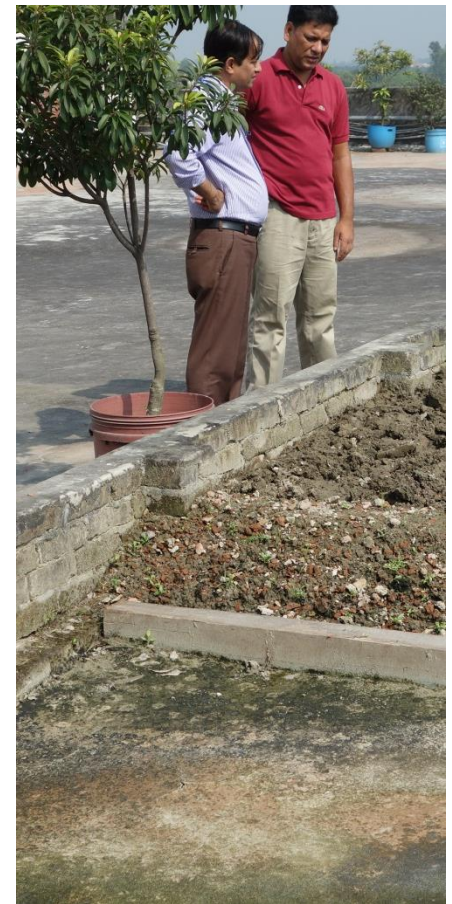
Shrinkage cracks



Broken parapet

Masonry parapet laying on a cantilever slab. Crack produced by slab deflection.

Currently the cantilever slab is overloaded by a mound of earth. It must be removed



Soil overloading roof slab

Currently there are 22 cm of non compact soil . possible overload of 3.5 kPa
Limit the soil layer to 18 cm. Better if it is removed.



No drainage flat roof
Rain water accumulation on deflected slabs between beams may produce damage and corrosion.

Inadequate sloped layer on top of the structural slab or non sloped slab.

Down pipes are on long facades, then drainage slope might be in that direction (transversal slope)



Slabs deflection



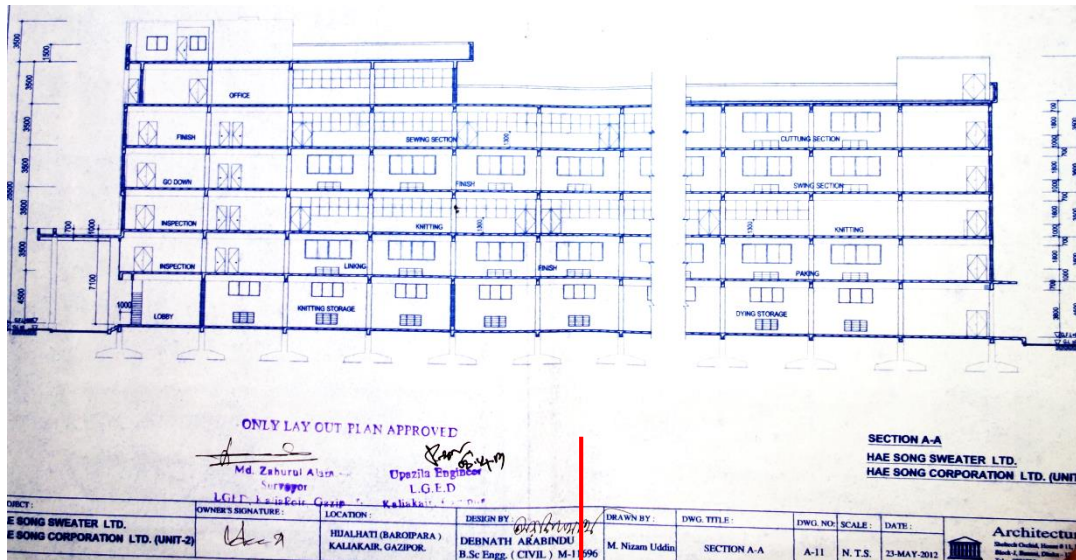
Generator Building

Structure supporting cooling water tank for generator on Generator building roof has an inadequate bracing system.

Lateral bracing system uncompleted It does not get footings.

Vertical bracing in the perpendicular direction is missing.

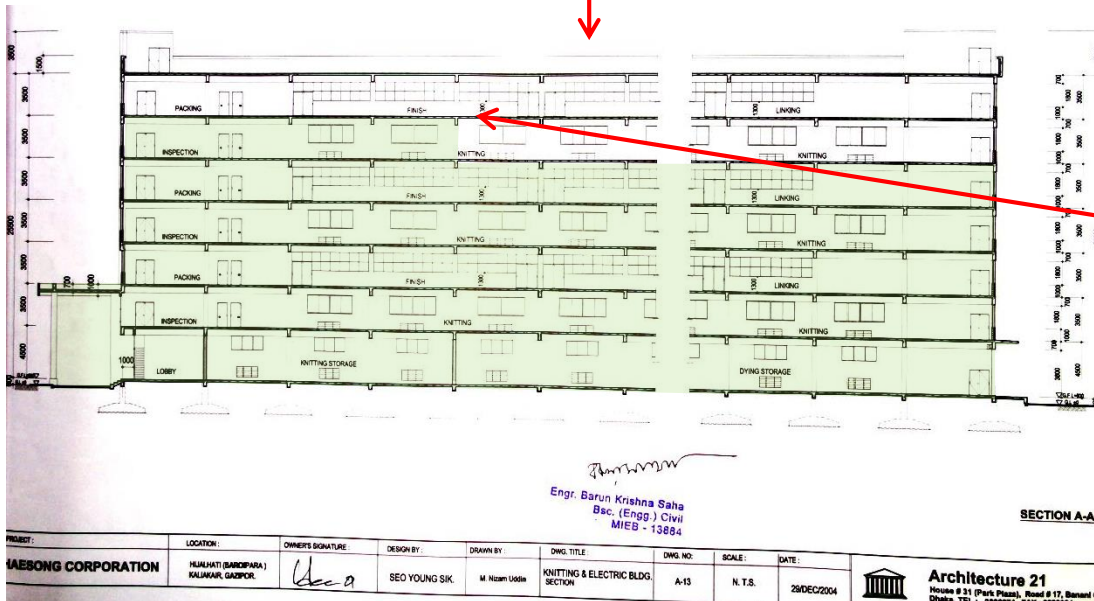
Steel Bracing



Structure drawings do not agree with actual arrangement of the building.

Structure drawings do not agree with the permit drawings. They show a 7 storied building (only 6 have been built).

Roof top has been partially built according approved lay out drawings



Structure drawings

Priority Actions

Problems Observed

ITEM 1: Concrete strength in columns within 6 storeys area

ITEM 2: Concrete strength in columns within 5 storeys area

ITEM 3: Shrinkage cracking on beams

ITEM 4: Broken parapet on roof top corner

ITEM 5: Roof Top Garden overload on roof slab

ITEM 6: Deflections on slabs produce rain water accumulation
on a non well sloped roof

ITEM 7: Inappropriate bracing system on generator cooling
water tank structure.

ITEM 8: Structural drawings do not agree with current
arrangement of the building at roof top

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Concrete strength in columns within 6 storeys area - Verify concrete strengths in internal columns supporting 6 storeys on GF and on 1st floor	Maintain current use of the floors and don't change use or increase occupation, either of which could increase loading	6-weeks
2	Concrete strength in columns within 6 storeys area - Verify concrete strengths in internal columns supporting 6 storeys on GF and on 1st floor	Factory Engineer to review design, loads and columns stresses in area identified above.	6-weeks
3	Concrete strength in columns within 6 storeys area - Verify concrete strengths in internal columns supporting 6 storeys on GF and on 1st floor	Verify in situ concrete stresses either by cores or existing cylinder strength data for cores from 4 columns.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
4	Concrete strength in columns within 6 storeys area - Verify concrete strengths in internal columns supporting 6 storeys on GF and on 1st floor	A Detail Engineering Assessment of Factory to be commenced, see attached Scope	6-weeks
5	Concrete strength in columns within 6 storeys area - Verify concrete strengths in internal columns supporting 6 storeys on GF and on 1st floor	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-months
6	Concrete strength in columns within 6 storeys area - Verify concrete strengths in internal columns supporting 6 storeys on GF and on 1st floor	Detail Engineering Assessment to be completed	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
7	Concrete strength in columns within 6 storeys area - Verify concrete strengths in internal columns supporting 6 storeys on GF and on 1st floor	Continue to implement load plan	6-months
8	Concrete strength in columns within 5 storeys area - Verify concrete strengths on internal columns supporting 5 storeys at GF	Factory Engineer to review design, loads and columns stresses in all columns.	6-weeks
9	Concrete strength in columns within 5 storeys area - Verify concrete strengths on internal columns supporting 5 storeys at GF	Verify in situ concrete stresses either by cores or existing cylinder strength data for cores from 4 columns.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
10	Concrete strength in columns within 5 storeys area - Verify concrete strengths on internal columns supporting 5 storeys at GF	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	6-months
11	Shrinkage cracking on all beams	Shrinkage cracks need to be sealed against water entry and moisture to prevent corrosion. Building's Engineer must specify a sealant system. Common repair methods include chipping out the crack and applying a mortar patching compound to the surface, use of epoxies, or other sealants.	6-months
12	Broken parapet on roof top corner	Remove mound of earth from roof corner which is overloading the cantilever.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Broken parapet on roof top corner	Cracks have been produced by deflection of the cantilever slab . Building's Engineer must specify a masonry repair system to fix parapet pieces currently separated by cracks.	6-months
14	Roof Top Garden overloading of roof slab	Limit earth layer thickness to 18 cm. Building's Engineer to ensure adequate water proofing system has been located under the orchard	6-months
15	Deflections on slabs produce rain water accumulation on a non well sloped roof	Manage drainage from roof level and downpipes to avoid structural corrosion due to continuous moisture. Avoid overloading from casting heavy sloped layer on top of the structural slab. Lightweight system required.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
16	Inappropriate bracing system on generator cooling water tank structure.	Building engineer to carry out a stability analysis of the water tank structure and propose additional stability system.	6-months
17	Structural drawings do not agree with current arrangement of the building at roof top	The structural drawings showed inconsistencies compared to the current structure observed on site at roof. We suggest a professional structural engineer verifies the current design and corrects these drawings.	6-months