EH Textiles Ltd
EH Fabrics Ltd

221 – 225 Sataish Rd, Khortoil, Dhaka
(23.9208N, 90.3880E)

31 October, 2013

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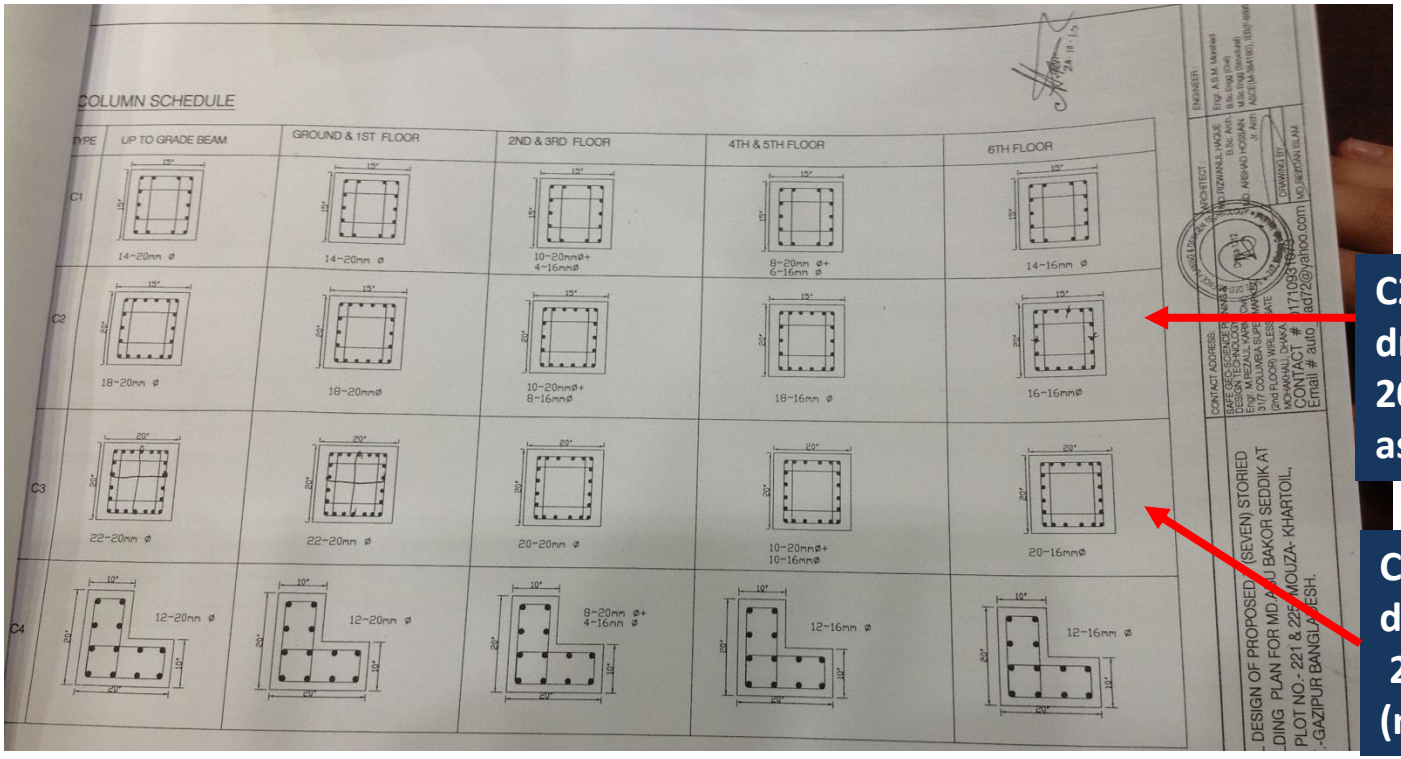
ARUP

Building Observations

Engineering Checks on columns required



C2 – perimeter columns drawings show 20” x 15” at all floors (not as constructed)

C3 – interior columns drawings show 20” x 20” at all floors (not as constructed)

Check on column required: Constructed columns smaller than those shown on Engineering drawings

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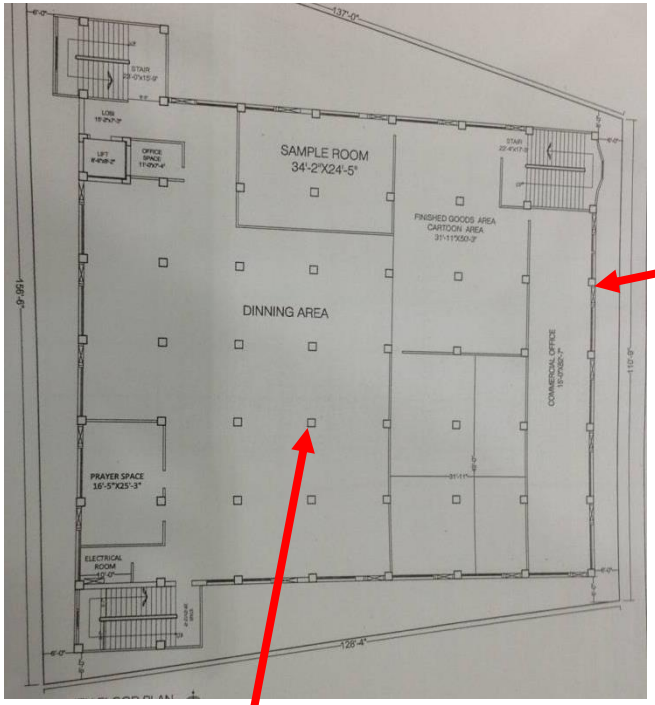
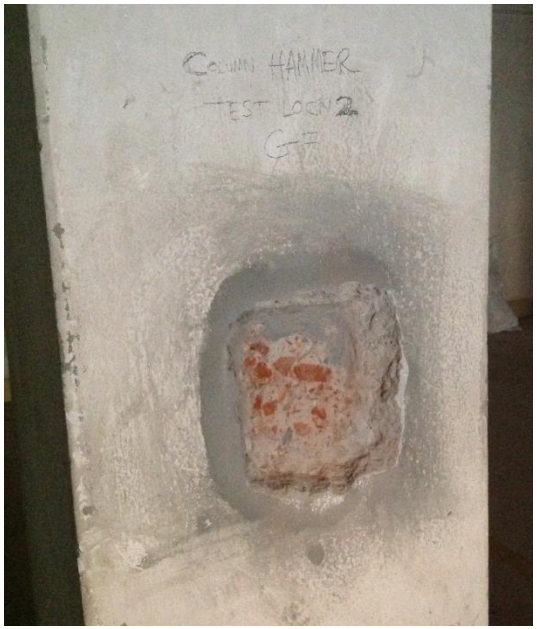


Perimeter columns
Expected size: 15” x 20”

Perimeter columns
Constructed as: 15” x 15” (including render)
Likely actual column size: 14” x 14”



Brick aggregate columns throughout

Interior columns
Expected size: 20” x 20”

Interior columns
Constructed as: 17” x 17” (including render)
Likely actual column size: 16’ x 16’

Column Stresses appear high for all columns, require immediate Engineering assessment.

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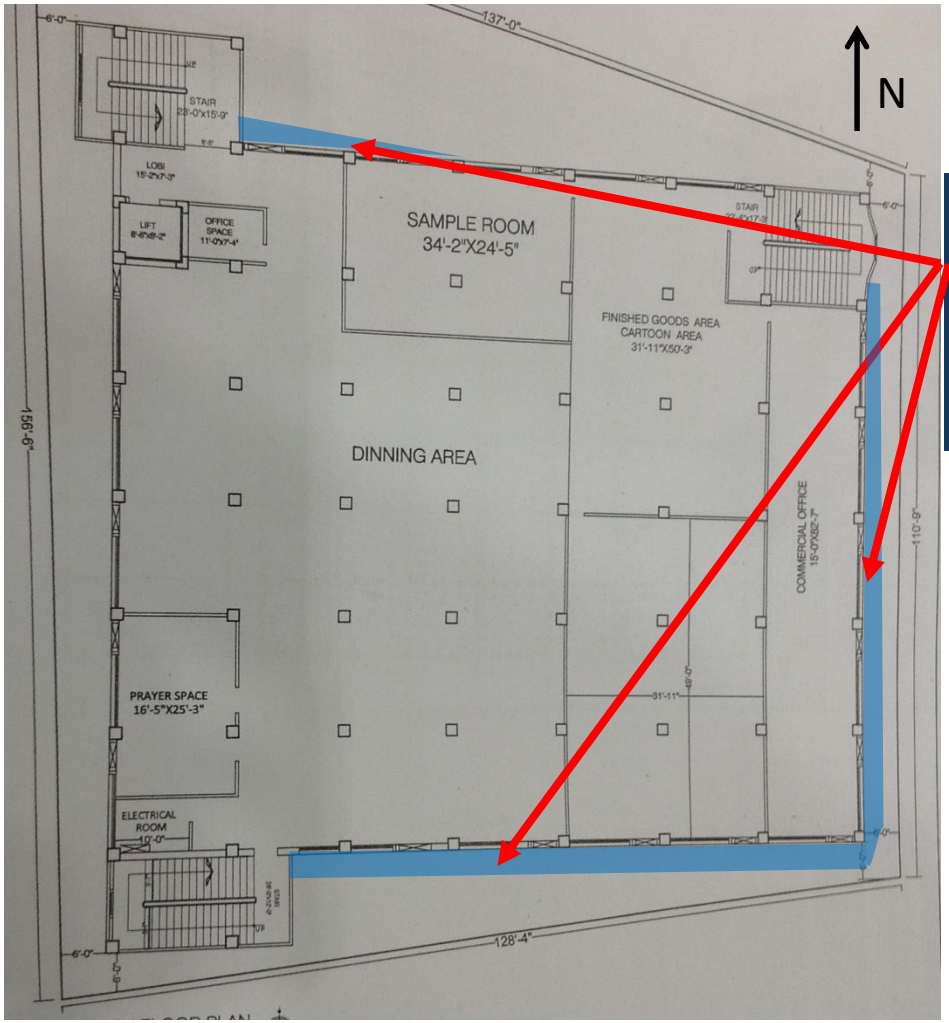
Additional cantilevers have been constructed on 3 sides of the building.



Additional cantilevering slab on 3 sides not shown on engineering or permit drawings. Constructed from 1st to 6th Floor.

Additional Cantilever
1st to 6th Floor

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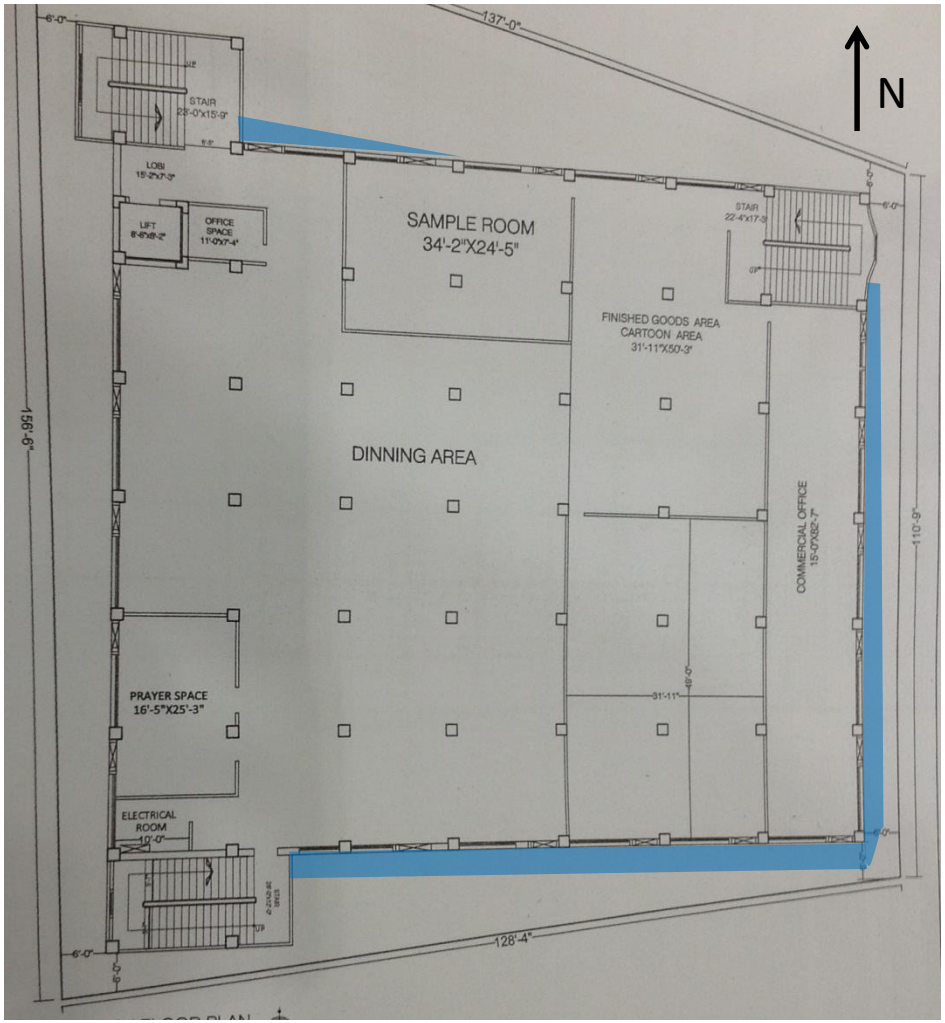

Additional Cantilever
1st to 6th Floor

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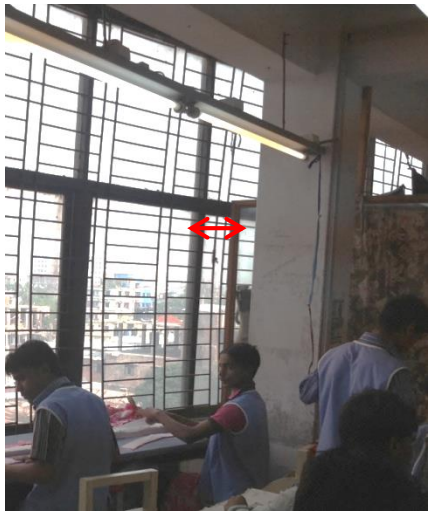
Flat slab cantilever



Cantilever – South Façade
Approx. 1.6m

Cantilever – North Façade
Approx. 0.8m

Cantilever – East Façade
Approx. 1.0m

Additional Cantilever
1st to 6th Floor

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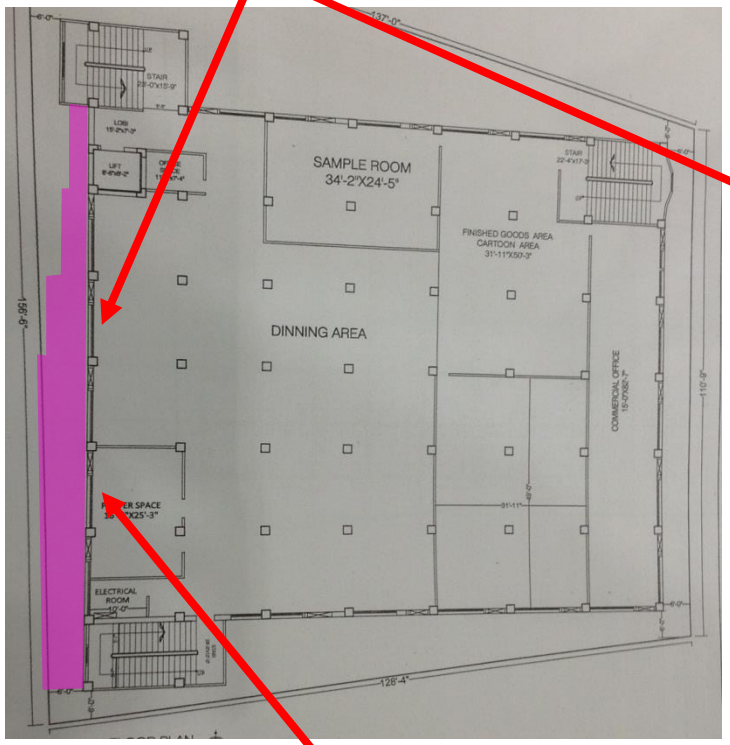
Irregular Western façade

Irregular façade on Western Elevation – all levels

Appeared to be supported by additional columns at façade line



Additional columns and slab outline not shown on engineering or permit drawings

Irregular Western Facade

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Water leakage from roof slab

Water leakage from roof slab

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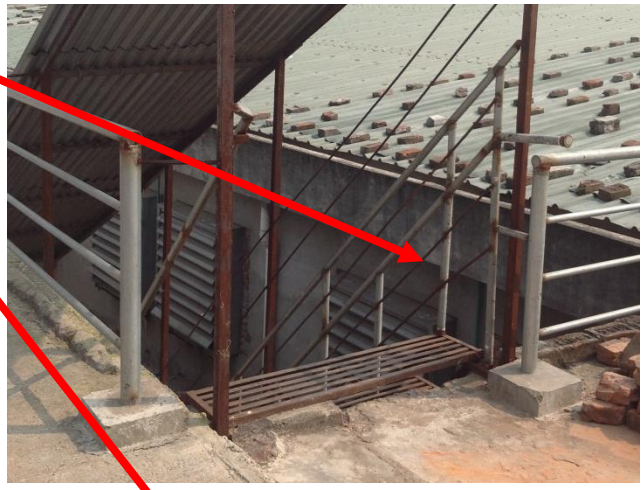
Roof Level Stairs

Flimsy corroding handrail

Very lightweight structure with significant corrosion apparent

Very slender support columns



Stair 2

Stair 1

Steel stairs is badly corroded and may not support required access/escape loadings. The Concrete supports appear very slender and their design should be checked.

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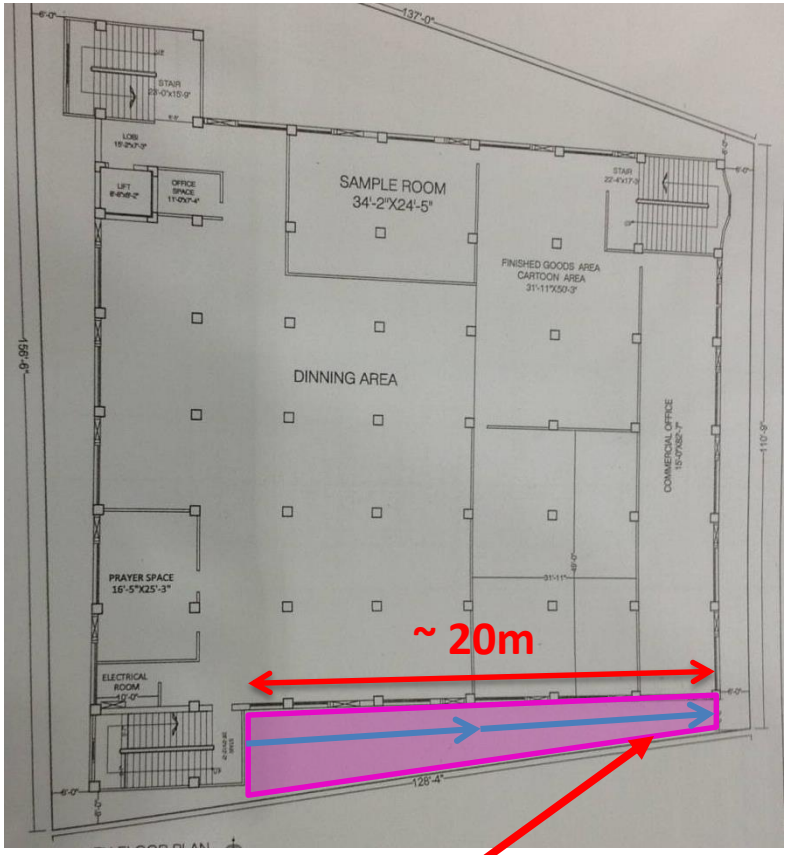
Non-Structural Observations

- Access and egress from fire exits is down a narrow passage beside the building which has several obstacles that may hinder escape – non-structural issue
- Some broken panes of glass – non structural issue



Passage narrows towards end

Overhanging cantilever

Trip hazards

Non-Structural Observations

Access and egress from fire exits is down a narrow passage beside the building

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Non-Structural Observations
Some broken panes of glass

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Priority Actions

Problems Observed

ITEM 1: Verify the structural adequacy of all building columns at all levels based on as built dimensions and material properties and reduce loads as detailed below
ITEM 2: Cantilever alterations to façades (all elevations) to be Reviewed and checked
ITEM 3: Rectify Water issues causing damage and corrosion
ITEM 4: Rectify Fire stairs at roof level
ITEM 5: Address issues at ground level with Access and egress from fire exits

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Verify the structural adequacy of all building columns at all levels based on as built dimensions and material properties and reduce loads as detailed below	The function and loading on Ground Level, First, Second and Third Level to be limited to 4.0kN/m2. The function and loading on Levels 4,5,6 is to be limited to a maximum of 2.0kN/m2. No storage is allowed on the roof.	**Immediate - Now**
2	Verify the structural adequacy of all building columns at all levels based on as built dimensions and material properties and reduce loads as detailed below	Factory Engineer to review design, loads and columns stresses.	**Immediate - Now**
3	Verify the structural adequacy of all building columns at all levels based on as built dimensions and material properties and reduce loads as detailed below	Verify in situ concrete strength for ground level columns either by cores or existing cylinder strength data for ground floor columns.	**Immediate - Now**
4	Verify the structural adequacy of all building columns at all levels based on as built dimensions and material properties and reduce loads as detailed below	A Detail Engineering Assessment of Factory to be commenced, see attached Scope	**Immediate - Now**
5	Verify the structural adequacy of all building columns at all levels based on as built dimensions and material properties and reduce loads as detailed below	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	**6-weeks**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
6	Verify the structural adequacy of all building columns at all levels based on as built dimensions and material properties and reduce loads as detailed below	Detail Engineering Assessment to be completed	**6-weeks**
7	Verify the structural adequacy of all building columns at all levels based on as built dimensions and material properties and reduce loads as detailed below	Continue to implement load plan	**6-months**
8	Cantilever alterations to façades (all elevations) to be Reviewed and checked	Engineer to inspect As-Built structure and ensure adequacy of additional cantilevers and Western façade additions as part of Detail Engineering Assessment.	**Immediate - Now**
9	Cantilever alterations to façades (all elevations) to be Reviewed and checked	Revise Drawings to reflect As-Built structure	**6-weeks**
10	Cantilever alterations to façades (all elevations) to be Reviewed and checked	Detail Engineering Assessment to be completed	**6-weeks**
11	Water causing damage and corrosion	Engineer to inspect water damaged structure including the exterior and implement an appropriate repair solution.	**6-weeks**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
12	Water causing damage and corrosion	Roof drainage system/water proofing to be installed	**6-weeks**
13	Fire stairs at roof level inadequate and in poor condition.	Inspect, repair/replace any badly corroded treads in stair	**6-weeks**
14	Fire stairs at roof level inadequate and in poor condition.	Repair/Replace all handrails where anchorage is damaged	**6-weeks**
15	Fire stairs at roof level inadequate and in poor condition.	Escape stairs/supports should be designed and upgraded to support code loads by the building Engineer.	**6-months**
16	Access and egress from fire exits is down a narrow passage beside the building	Remove/repair trip hazards so that fire escape passage is clear	**6-weeks**
17	Access and egress from fire exits is down a narrow passage beside the building	Review building fire escape routes and if possible do not use stairs leading to narrow passage as primary fire escape	**6-months**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
18	Broken glass on facades facing street	Carry out general maintenance and remove broken glass from windows	**6-months**