Comptex Bangladesh Ltd
Robintex (BD) Ltd

Vulta, Rupganj, Narayangonj, Bangladesh
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17 May 2014

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Observations
Comptex New Factory – Building 3

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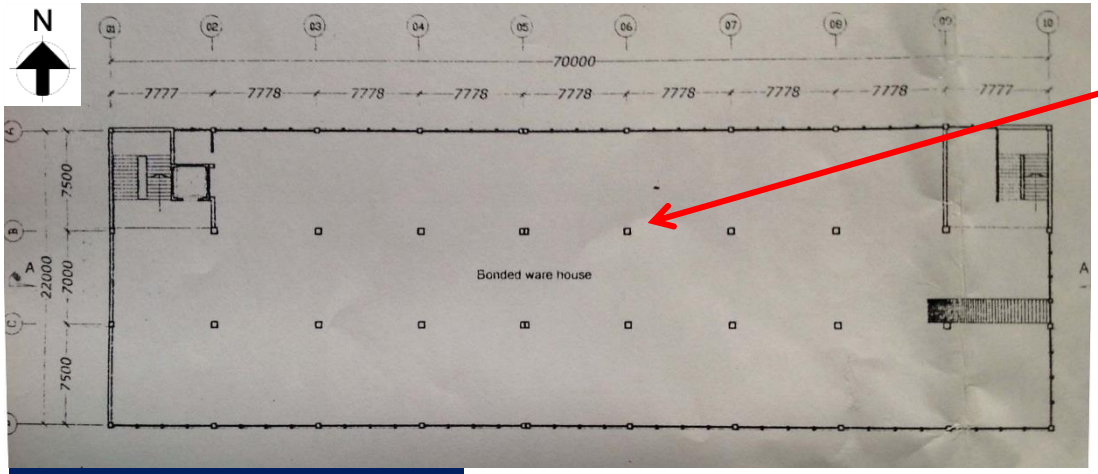
Columns appear to be stressed to a high level and require immediate review



Typical column layout

Design check to be carried out on all columns

Tested Basement Column – Stone Chips

Outline calculations indicate that columns are stressed to a high level and require immediate review.

Building Engineer to perform detailed calculations including a Detail Engineering Assessment (see attached scope) and concrete tests to prove adequacy of column sizes, and (if required):

- Reduce loads by vacating floors
- Reinforce columns

Column Strength – Comptex New Factory

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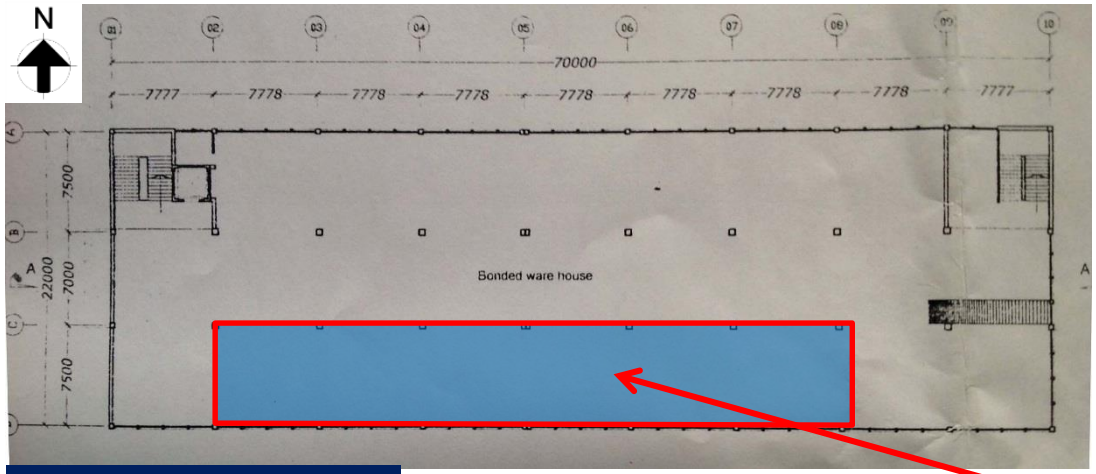
Cracking on soffit of ground floor slab

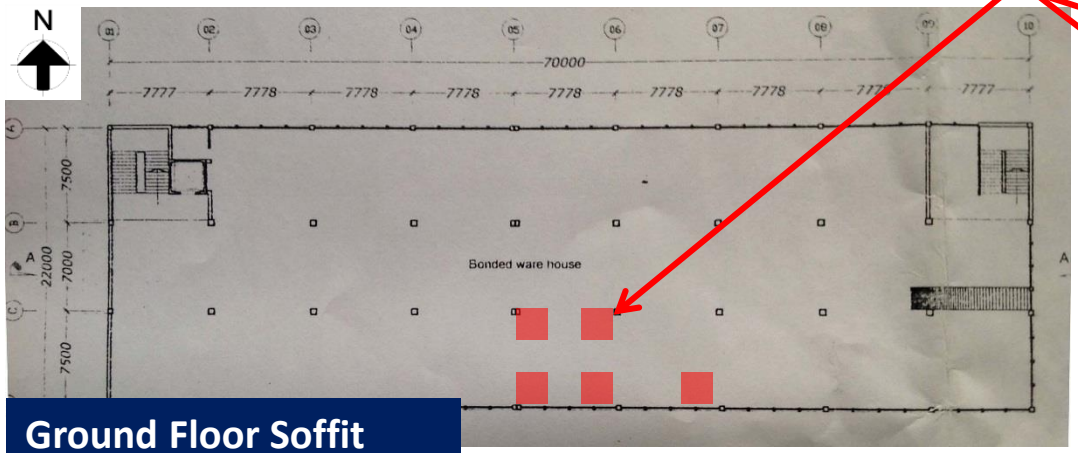


Ground Floor Plan

Stantar machines on ground floor – floor vibration noted

Cracking on ground floor slab soffit (particularly adjacent to building joint) was observed – including beam cracks. Building Engineer to review.

Crack Location



Ground Floor Soffit

Cracking on soffit of ground floor slab

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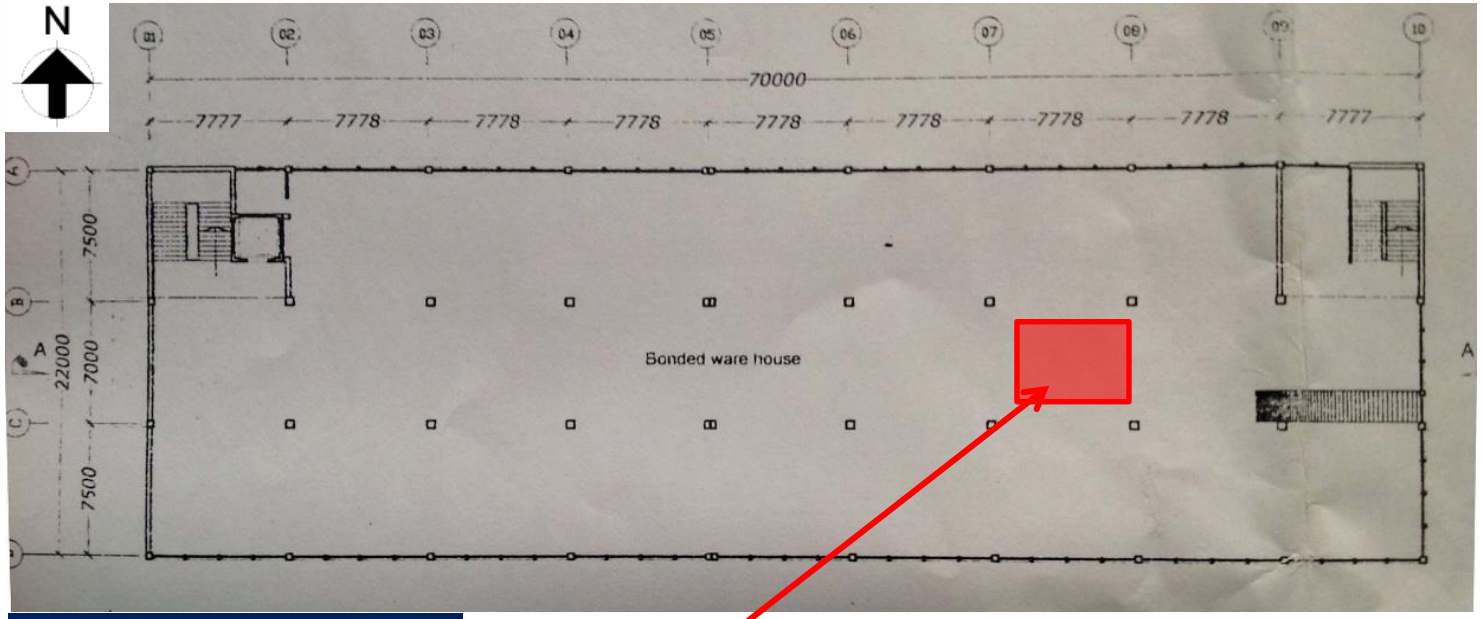
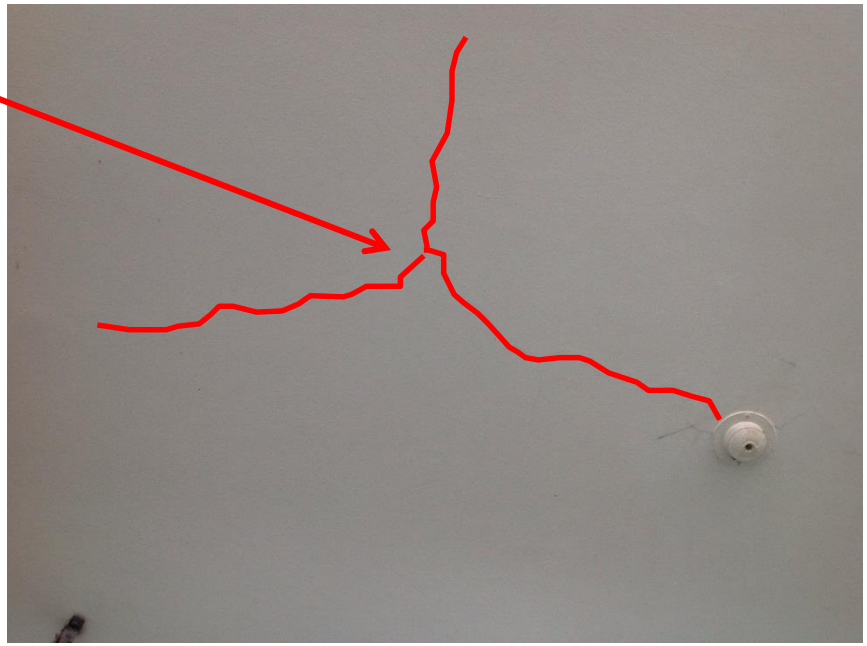
Cracking on soffit of 3rd floor slab



3rd Floor Soffit

Crack on slab soffit



Evidence of slab cracks noted – Building Engineer to review if cracks penetrate to building structure

Cracking on 3rd floor soffit

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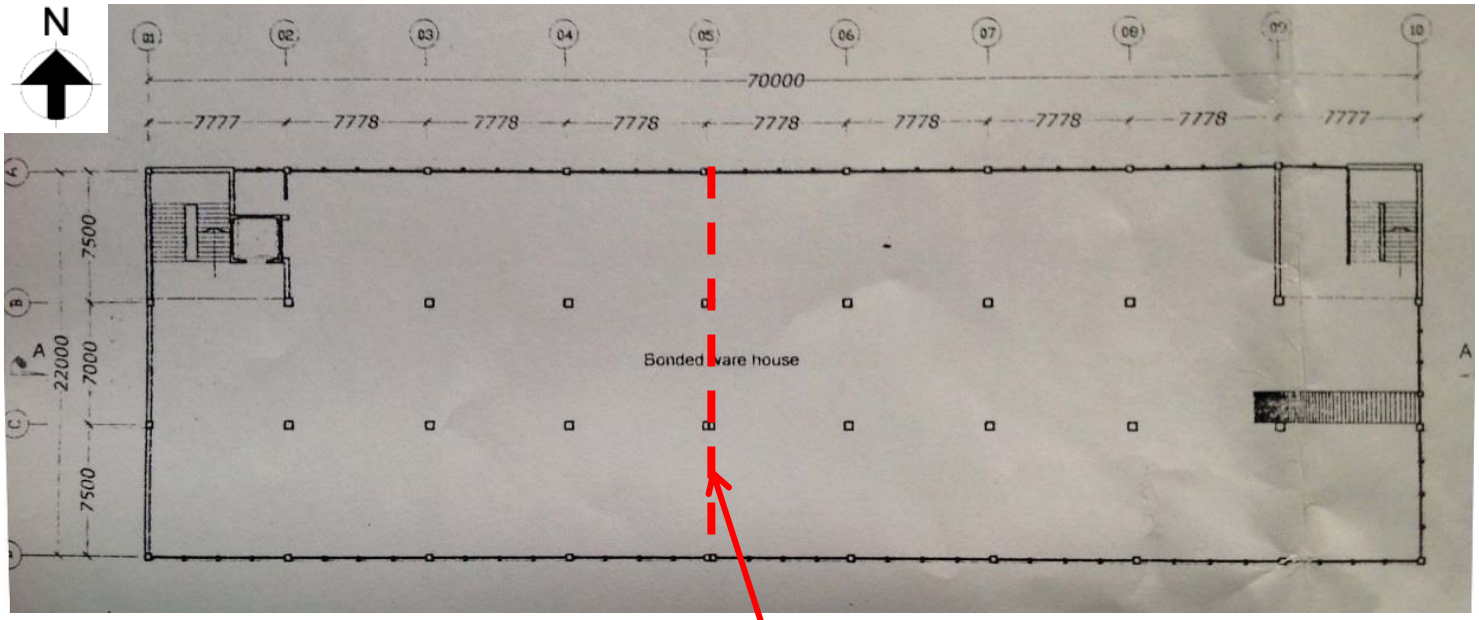
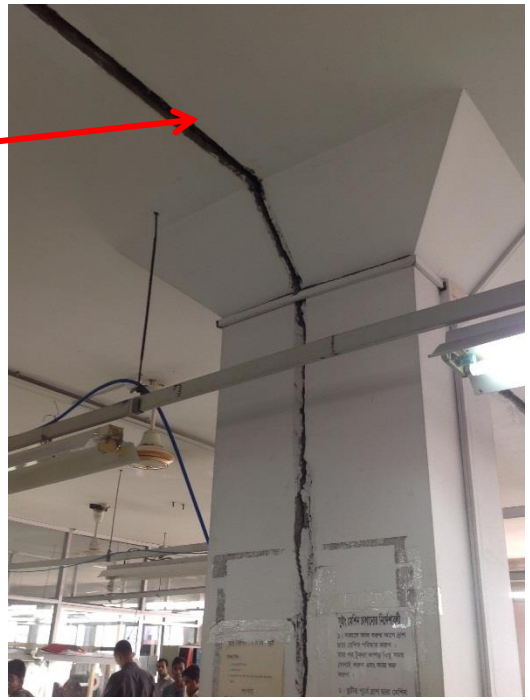
Cracked plasterwork at building movement joint



Some loose plasterwork at the building joint, particularly on the 2nd floor soffit, to be made good to avoid possibility of falling plaster at a future date.

Building Joint



Building Joint

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Observations
Comptex Old Factory - Building 1

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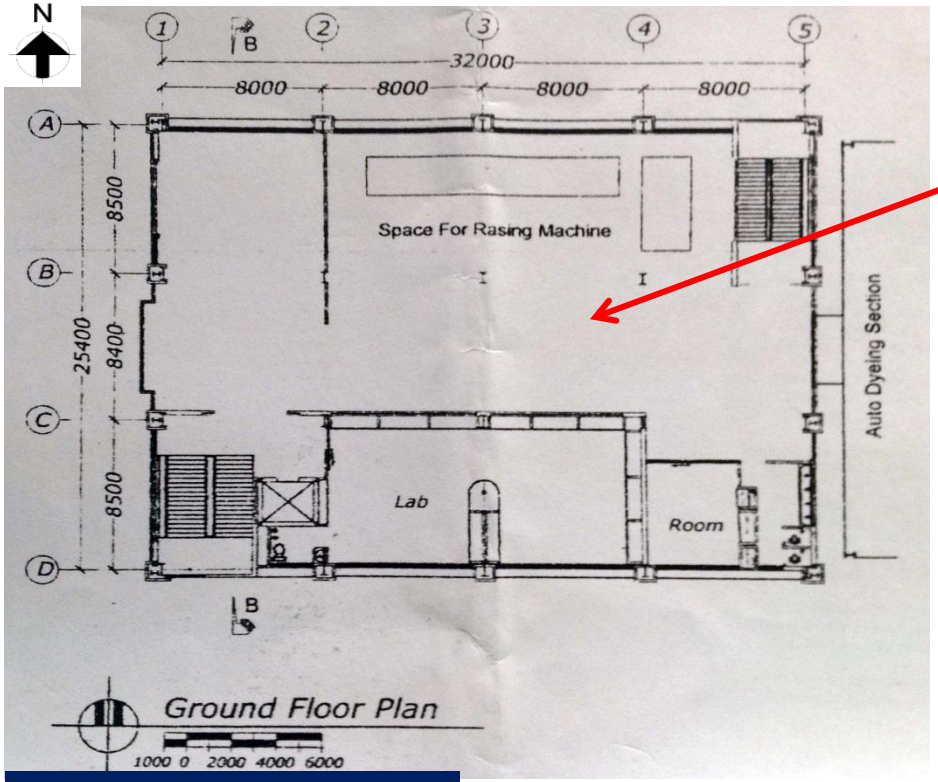
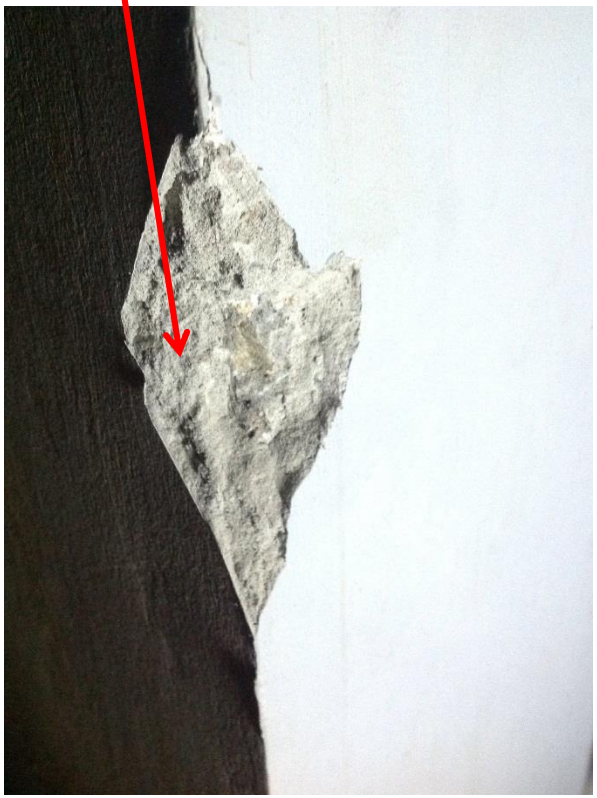
Columns, within the basement, appear to be stressed in excess of normal design limits



Typical column layout

Design check to be carried out on all concrete columns within the basement

Tested Basement Column – Stone Chips



Cursory calculations indicate that column working stress, within the basement concrete columns, is in excess of normal design limits

Building Engineer is to perform detailed calculations and concrete tests to prove column size and (if required):

- Reduce loads by vacating floors
- Reinforce columns

Column Strength – Comptex Old Building

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Management of floor loads

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Storage load on 1st floor

Loading on Ground floor

Storage load on Ground floor

Storage load on 1st floor

Building Engineer to prepare controlled loading plans, based on floor slab and column capacity, for all floors which will designate allowable storage density and where storage may be placed.

Management of Floor Loads

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Observations
Comptex `Textiles Dyeing Unit
Building 2

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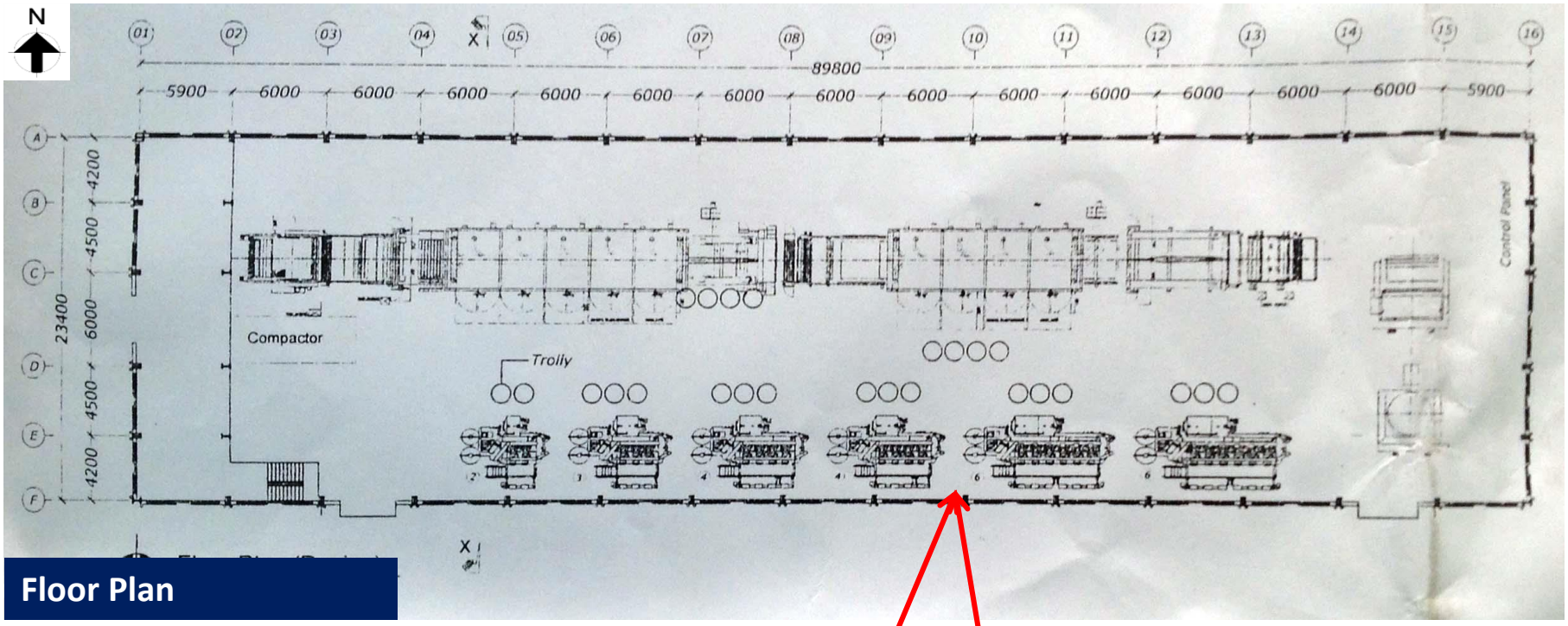
Damaged bracing and corrosion of structural steel sections



Floor Plan

Corrosion of steel section

Damaged bracing to be reinstated

Steelwork Defects

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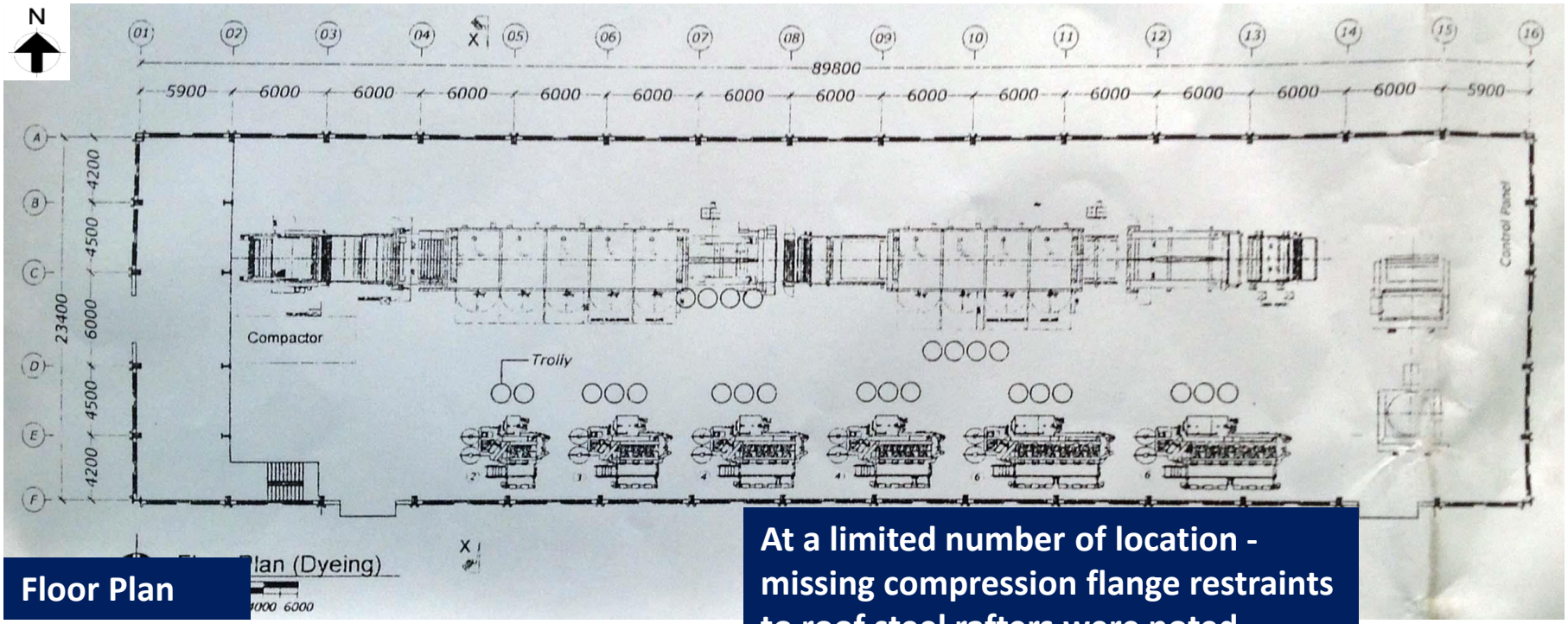
Missing flange restraints to roof steel rafters



Roof Steelwork

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Observations
Comptex Utility Building – Building 4

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Defective Handrail to stairs

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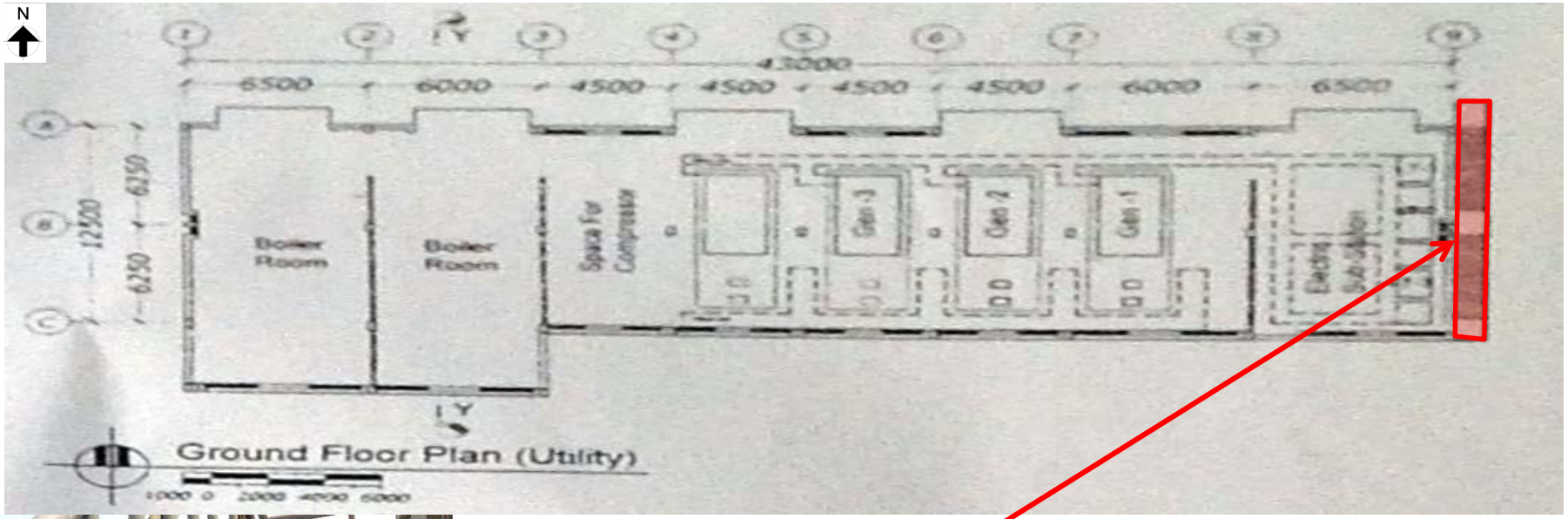
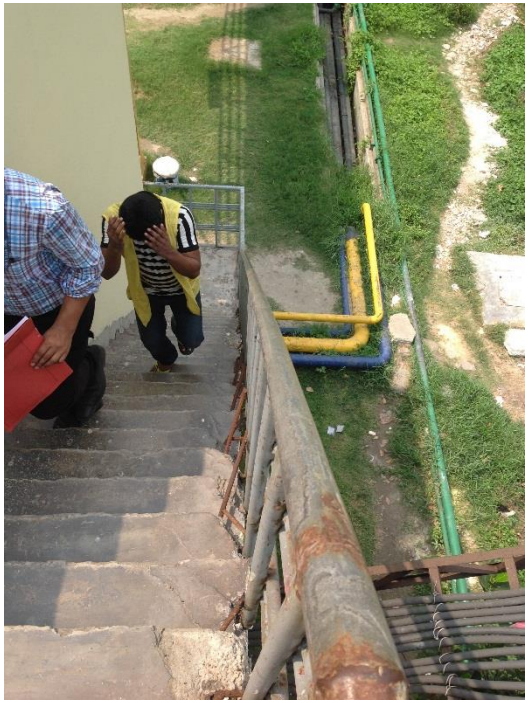


Defective handrail to a steep stairs, danger to people using it. Handrail and fixing to concrete to be reviewed by Building Engineer.



Defective Handrail

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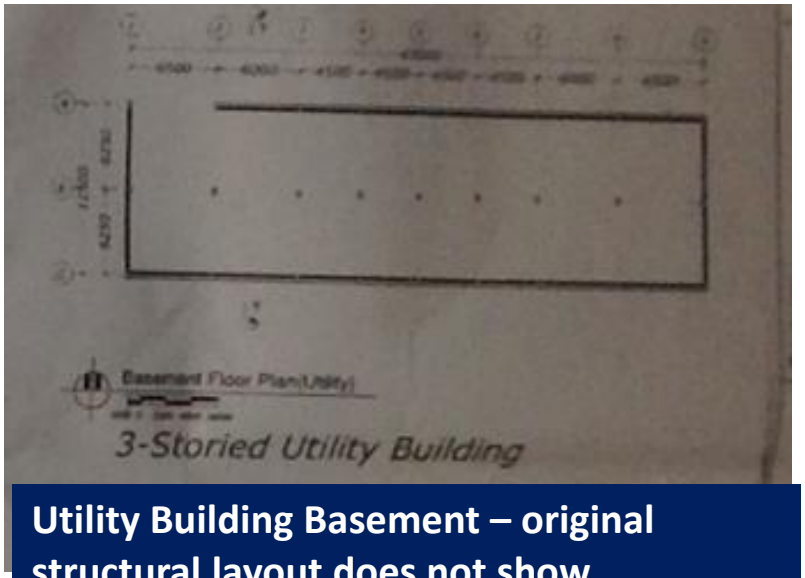
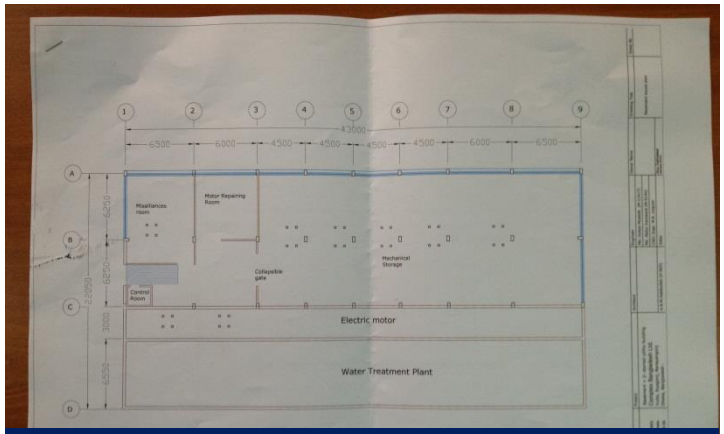
Basement columns do not correspond with structural drawings

View of specific equipment support columns within the basement of the Utility Building



Utility Building Basement – original structural layout does not show equipment support columns



Utility Building Basement – updated Architectural layout showing equipment support columns.

Building Engineer to update basement column layout and prepare design verification calculations for equipment support columns.

Utility Building – Basement Columns

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Observations
Comptex Offices – Building 5

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Management of floor loads

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Storage load on 2nd floor

Storage load on 2nd floor

Storage load on 1st floor

Building Engineer to prepare controlled loading plans, based on floor slab and column capacity, for all floors which will designate allowable storage density and where storage may be placed.

Management of Floor Loads

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Any proposed additions to the existing building structure, including addition of a 5th storey, should be reviewed by the Building Engineer

Permit for a total of 5 storeys

Existing structure – 3 storeys
4th storey currently being constructed

Permit allows a total of 5 storeys. Building Engineer to review structural design and concrete strength within existing columns prior to commencing construction of any further building extension above the 4 storeys currently being constructed.

Additional Building Storeys

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General Observations

Structural steel drawings should be collated and verified by the Building Engineer for the following areas;

Comptex New Factory – roof steelwork

Comptex Old Factory – Superstructure building frame

Comptex Textiles Dyeing Unit – Steel Building frame including extension

Priority Actions

Problems Observed

Comptex New Factory – Building 3

ITEM 1: Columns appear to be stressed to a high level and require immediate review

ITEM 2: Cracking on soffit of ground floor slab

ITEM 3: Cracking on soffit of 3rd floor slab

ITEM 4: Cracked plasterwork at building movement joint

Comptex Old Factory - Building 1

ITEM 5: Columns, within the basement, appear to be stressed in excess of normal design limits

ITEM 6: Management of floor loads

Comptex Textiles Dyeing Unit – Building 2

ITEM 7: Damaged bracing and corrosion of structural steel sections

ITEM 8: Missing flange restraints to roof steel rafters

Comptex Utility Building – Building 4

ITEM 9: Defective Handrail to stairs

ITEM 10: Basement columns do not correspond with structural drawings

Comptex Offices – Building 5

ITEM 11: Management of floor loads

ITEM 12: Any proposed additions to the existing building structure, including addition of a 5th storey, should be reviewed by the Building Engineer

General

ITEM 13: Structural drawings for roof steelwork (New Factory), superstructure building frame (Old Factory) and Dyeing Unit to be collated and verified.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Comptex New Factory – Building 3 Columns appear to be stressed to a high level and require immediate review	Building Engineer to review design, loads and column stresses in all columns in Building 3.	**Immediate - Now**
2	Comptex New Factory – Building 3 Columns appear to be stressed to a high level and require immediate review	Verify insitu concrete strength either by 100mm diameter cores or existing cylinder strength data for cores from 4 columns . Verify grade of steel reinforcement used.	**Immediate - Now**
3	Comptex New Factory – Building 3 Columns appear to be stressed to a high level and require immediate review	A Detail Engineering Assessment of Building 3 to be commenced, see attached Scope.	**Immediate - Now**
4	Comptex New Factory – Building 3 Columns appear to be stressed to a high level and require immediate review	Detail Engineering Assessment for Building 3 to be completed.	**6-weeks**
5	Comptex New Factory – Building 3 Columns appear to be stressed to a high level and require immediate review	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	**6-weeks**
6	Comptex New Factory – Building 3 Columns appear to be stressed to a high level and require immediate review	Continue to implement load plan	**6-months**

Detail Engineering Assessment

This Schedule develops a minimum level of information, Analysis and testing expected as part of a Detail Engineering Assessment.
The Building(s) have been visually assessed and it is deemed necessary that a detailed engineering assessment be carried out by a competent Engineering Team employed by the factory Owner.
This Request should be read in conjunction with the BUET developed Tripartite Guideline document for Assessment of Structural Integrity of Existing RMG Factory Buildings in Bangladesh (Tripartite Document), the latest version of this document should be referenced. T his document also gives guidance on required competency of Engineering Team.

We expect that the following will be carried out:

1. Development of Full Engineering As-Built Drawings showing Structure, loading, elements, dimensions , levels, foundations and framing on Plan, Section and Elevational drawings .
2. The Engineering team are to carry out supporting calculations with a model based design check to assess the safety and serviceability of the building against loading as set out in BNBC-2006, Lower rate provisions can be applied in accordance with the Tripartite Guidelines following international engineering practice, justification for these lower rate provisions must be made.
3. A geotechnical Report describing ground conditions and commenting on foundation systems used/proposed.
4. A report on Engineering tests carried out to justify material strengths and reinforcement content in all key elements studied.
5. Detailed load plans shall be prepared for each level showing current and potential future loading with all key equipment items shown with associated loads.
6. The Engineering team will prepare an assessment report that covers the following:
    - As-Built drawings including
        - Plans at each level calling up and dimensioning all structural components
        - Cross sectional drawings showing structural beams, slabs, floor to floor heights, roof build-ups and Basic design information of the structure
    - Highlight any variation between As-built compared to the designed structure
    - Results of testing for strength and materials
    - Results of geotechnical assessment and testing/investigation
    - Details of loading, inputs and results of computer modelling
    - Commentary on adequacy/inadequacy of elements of the structure
    - Schedule of any required retrofitting required for safety or performance of Structure

Any proposals for Retrofitting to follow guidance developed in the Tripartite Document

Item No.	Observation	Recommended Action Plan	Recommended Timeline
7	Comptex New Factory – Building 3 Cracking on soffit of ground floor slab	Sections of plaster finish to slab soffit to be removed to investigate if cracks penetrate the building structure.	**Immediate - Now**
8	Comptex New Factory – Building 3 Cracking on soffit of ground floor slab	Building Engineer to obtain loading from equipment on ground floor and verify the adequacy of the floor slab structure.	**6-weeks**
9	Comptex New Factory – Building 3 Cracking on soffit of ground floor slab	If required, relocate equipment and carry out remedial works to repair cracks on slab soffit.	**6-weeks**
10	Comptex New Factory – Building 3 Cracking on soffit of 3rd floor slab	Sections of plaster finish to soffit of 3rd floor slab to be removed to investigate if cracks penetrate the building structure.	**6-weeks**
11	Comptex New Factory – Building 3 Cracking on soffit of 3rd floor slab	Building Engineer to carry out design check on slab to confirm that these cracks are non-structural.	**6-months**
12	Comptex New Factory – Building 3 Cracked plasterwork at building movement joint	Building Engineer to inspect internal line of building movement joint and prepare a schedule of areas where making good works are required to ensure that there is no risk of falling plasterwork.	**6-months**
13	Comptex New Factory – Building 3 Cracked plasterwork at building movement joint	Carry out making good works per Building Engineers schedule.	**6-months**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
14	Comptex Old Factory - Building 1 Columns, within the basement, appear to be stressed in excess of normal design limits	Building Engineer to review design, loads and column stresses in area identified above.	**6-weeks**
15	Comptex Old Factory - Building 1 Columns, within the basement, appear to be stressed in excess of normal design limits	Verify insitu concrete strengths (using min. 4 no. 100mm dia. Cores) and existing reinforcement for all columns.	**6-weeks**
16	Comptex Old Factory - Building 1 Columns, within the basement, appear to be stressed in excess of normal design limits	Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor capacity and column capacity.	**6-weeks**
17	Comptex Old Factory - Building 1 Columns, within the basement, appear to be stressed in excess of normal design limits	Continue to implement load management plan	**6-months**
18	Comptex Old Factory - Building 1 and Comptex Offices – Building 5 Management of floor loads	Produce and actively manage a loading plan for all floor plates of the factory giving consideration to floor capacity and column capacity.	**6-weeks**
19	Comptex Old Factory - Building 1 and Comptex Offices – Building 5 Management of floor loads	Continue to implement load plan	**6-months**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
20	Comptex Textiles Dyeing Unit – Building 2 Damaged bracing and corrosion of structural steel sections	Building Engineer to survey building bracing for completeness and to identify areas of corrosion on the steel frame.	**6-weeks**
21	Comptex Textiles Dyeing Unit – Building 2 Damaged bracing and corrosion of structural steel sections	Building Engineer to issue a schedule of remedial works for bracing reinstatement and corrosion protection.	**6-weeks**
22	Comptex Textiles Dyeing Unit – Building 2 Damaged bracing and corrosion of structural steel sections	Remedial works to be carried out.	**6-months**
23	Comptex Textiles Dyeing Unit – Building 2 Missing flange restraints to roof steel rafters	The design of the steel roof should be checked by the Building Engineer - specifically the provision of compression flange restraints should be reviewed as they are not all provided in matching locations on each rafter as would be expected.	**6-months**
24	Comptex Textiles Dyeing Unit – Building 2 Missing flange restraints to roof steel rafters	Missing flange restraints to be reinstated.	**6-months**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
25	Comptex Utility Building – Building 4 Defective Handrail to stairs	Building Engineer to inspect stairs handrail and issue schedule of works required.	**6-weeks**
26	Comptex Utility Building – Building 4 Defective Handrail to stairs	Remedial works to be carried out.	**6-weeks**
27	Comptex Utility Building – Building 4 Basement columns do not correspond with structural drawings	Building Engineer to survey as constructed building – in particular columns within the basement. Updated drawings to be prepared showing the as constructed layout.	**6-weeks**
28	Comptex Utility Building – Building 4 Basement columns do not correspond with structural drawings	Prepare calculations showing the structural adequacy of the building columns and equipment support columns taking into account the factory design imposed loading and the as built structure.	**6-months**
29	Comptex Offices – Building 5 Any proposed additions to the existing building structure, including addition of a 5th storey, should be reviewed by the Building Engineer	If any additions to the building structure are proposed, the Building Engineer shall provide calculations showing the structural adequacy of all columns taking into account any additions to the existing structure, the loading plans and as built structure, including insitu concrete strength testing.	**6-months**
30	Buildings 1, 2 and 3 Structural drawings for roof steelwork (New Factory), superstructure building frame (Old Factory) and Dyeing Unit to be collated and verified.	Building Engineer to verify completeness of structural design drawings for the areas highlighted above. Full set of design drawings to be collated for each of these areas.	**6-months**