

Square Fashions Ltd

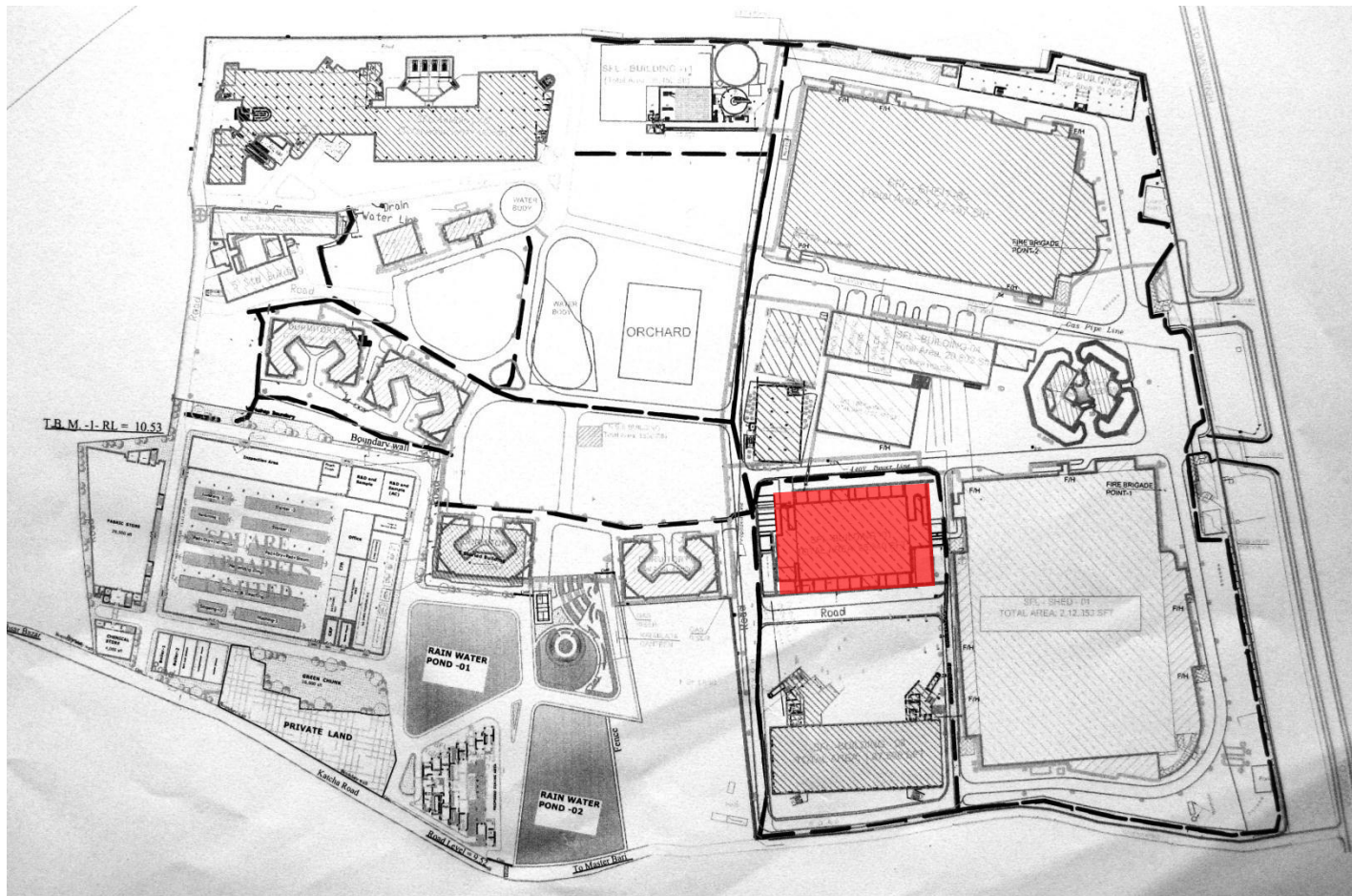
Rokeyapur, Jamirdia, Habir Bari, Valuka, Mymensingh, Bangladesh
(+24.29540N,90.38831E)
29th June 2014



Observations

Building 1 - Cracking to load-bearing masonry wall

Cracking was observed to a load bearing masonry wall supporting a lintel. The masonry wall is located along the East elevation of Building 1 where the RC stair core meets the steel frame structure. The connection detail between the structures is not clear.



Location of
Building 1

Site Layout





Elevation of Lintel



Cracking to masonry wall

Building 2 - Heavy loading to suspended floors and lack of adequate loading plan

Heavy and apparently unmanaged floor loading was observed in Building 2. While a loading plan was provided, it appears to be based on loadings observed at the factory at one particular moment in time; it is not clear whether the loads represent maximum allowable floor loading.



Loading to Ground Floor



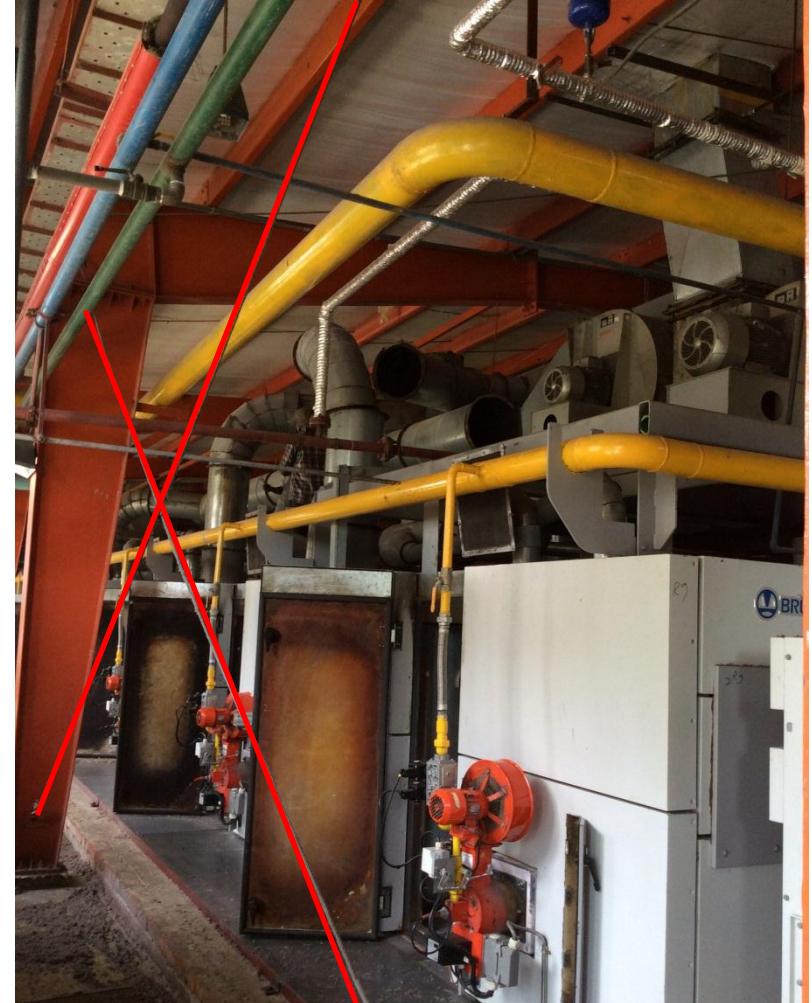
Loading to 1st floor

Building 2 - Lack of stability members to steel roof structures

Vertical bracing is missing to the steel frame structure at Ground Floor level and, where provided, bracing is loose and therefore ineffective to the steel structures at both Ground and 3rd Floor levels. Wind posts are missing to the gable end at 3rd Floor level.



Missing vertical bracing in single storey shed



Loose bracing in single storey shed

B2 - Stability Bracing

Building 2 - Cracking to Basement slab

Cracking and water ingress was observed in a number of locations to the Basement slab. It is understood that repair works are being carried out.



Cracking and water ingress to Basement slab



Cracking and water ingress to Basement slab

Building 2 - Design check required for architectural features

There are concerns about the structural adequacy of the architectural features to the façade and the roof. These features do not appear to be structurally designed. Inadequate supports, cracking and deflections were observed. It is not clear whether the extra load of these features is taken into account in the overall structural design of the building.



Typical architectural features to Building 2



Cracking and deflections to support structure



Inadequate supports

Building 2 - Movement joint not incorporated at roof level

The expansion joint in the RC structure does not appear to be incorporated at roof level.



Front side: Movement joint should be here



Back side: Movement joint in façade

B2 - Movement Joint

Building 2 - Ponding to RC Roof slabs

Ponding was observed to the RC roof slabs in a number of locations.



Ponding to roof slab



Ponding to roof slab



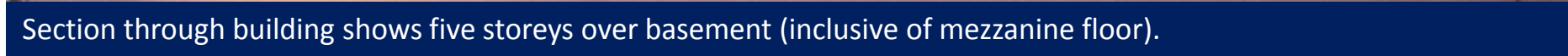
Ponding to roof slab

Building 2 - Missing / inaccurate design documentation requiring clarification

Missing / inaccurate design documentation requiring clarification;

- A building permit drawing was not available.
- The structural drawings, while generally representative of the constructed buildings, do not show how the different floor construction types interface with the structural frame.
- There were no drawings for the steel roof structure above 3rd Floor.
- There are a number of inconsistencies between the documents provided and the constructed buildings, particularly with respect to the architectural drawings.

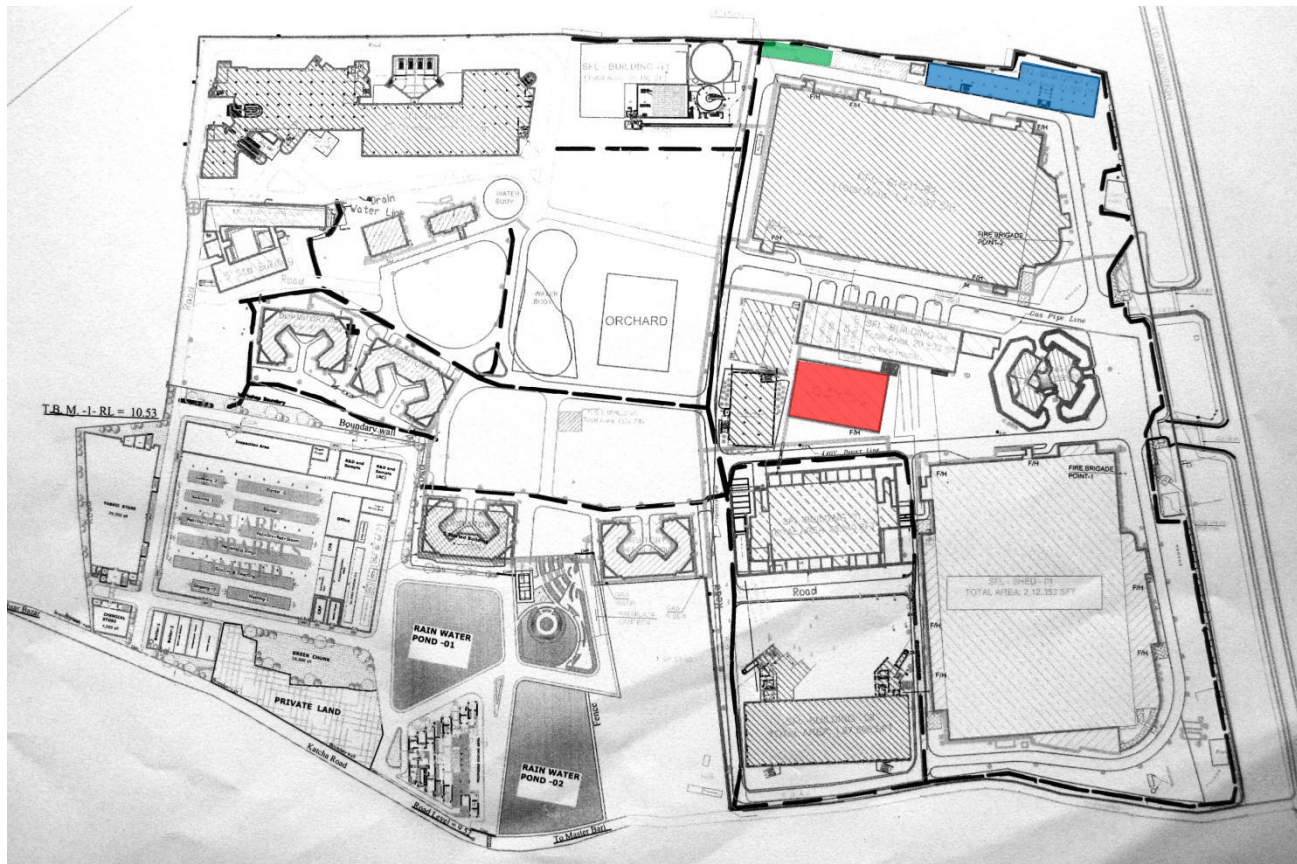
B2 - Drawing Discrepancies



20

Buildings 3, 5 and 7 - Heavy loading to suspended floors and lack of adequate loading plans

Heavy loading was observed to Buildings 3, 5 and 7. While these buildings appear to have been designed as storage buildings, the loading on the floors does not appear to be managed. While some loading plans were provided, these appeared to be based on loadings observed at the factory at a particular time; it is not clear whether the loads represent the maximum allowable floor loading.



Location of Building 3



Location of Building 5



Location of Building 7



Site Layout



Loading to all suspended floors of Building 5



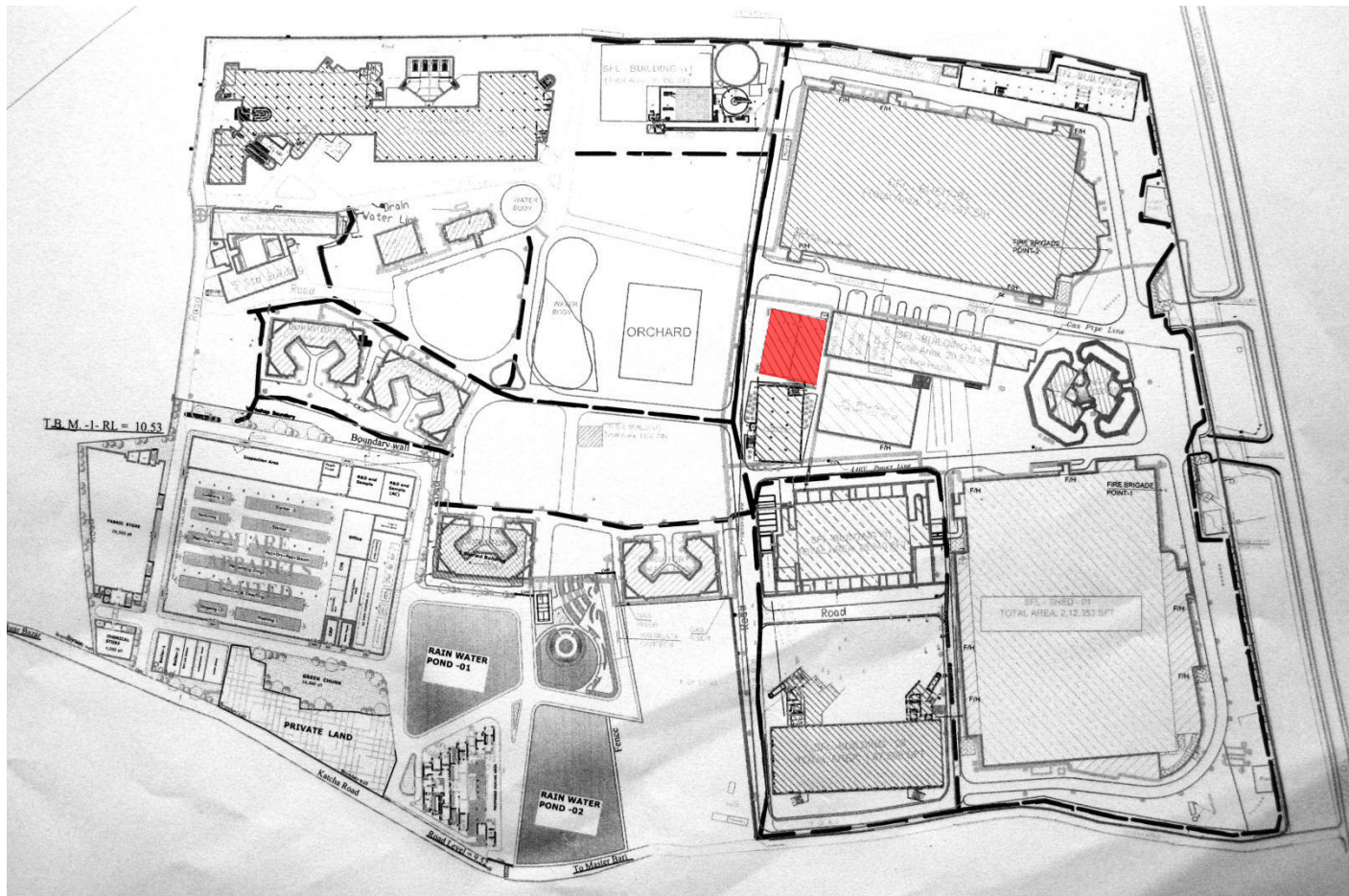
Loading to 1st Floor of Building 3



Loading to all suspended floors of Building 3

Shed 3 - appears to be non-engineered

Shed 3 appears to be non-engineered. The prefabricated roof trusses appear to be supported on a combination of masonry walls and RC-encased steel posts, the connections to which are unclear. The lateral stability system of the building is not clear. The design documents are incomplete.



Location of Shed 3

Site Layout

Non-engineered Shed 3



Lateral stability system unclear – no apparent bracing system



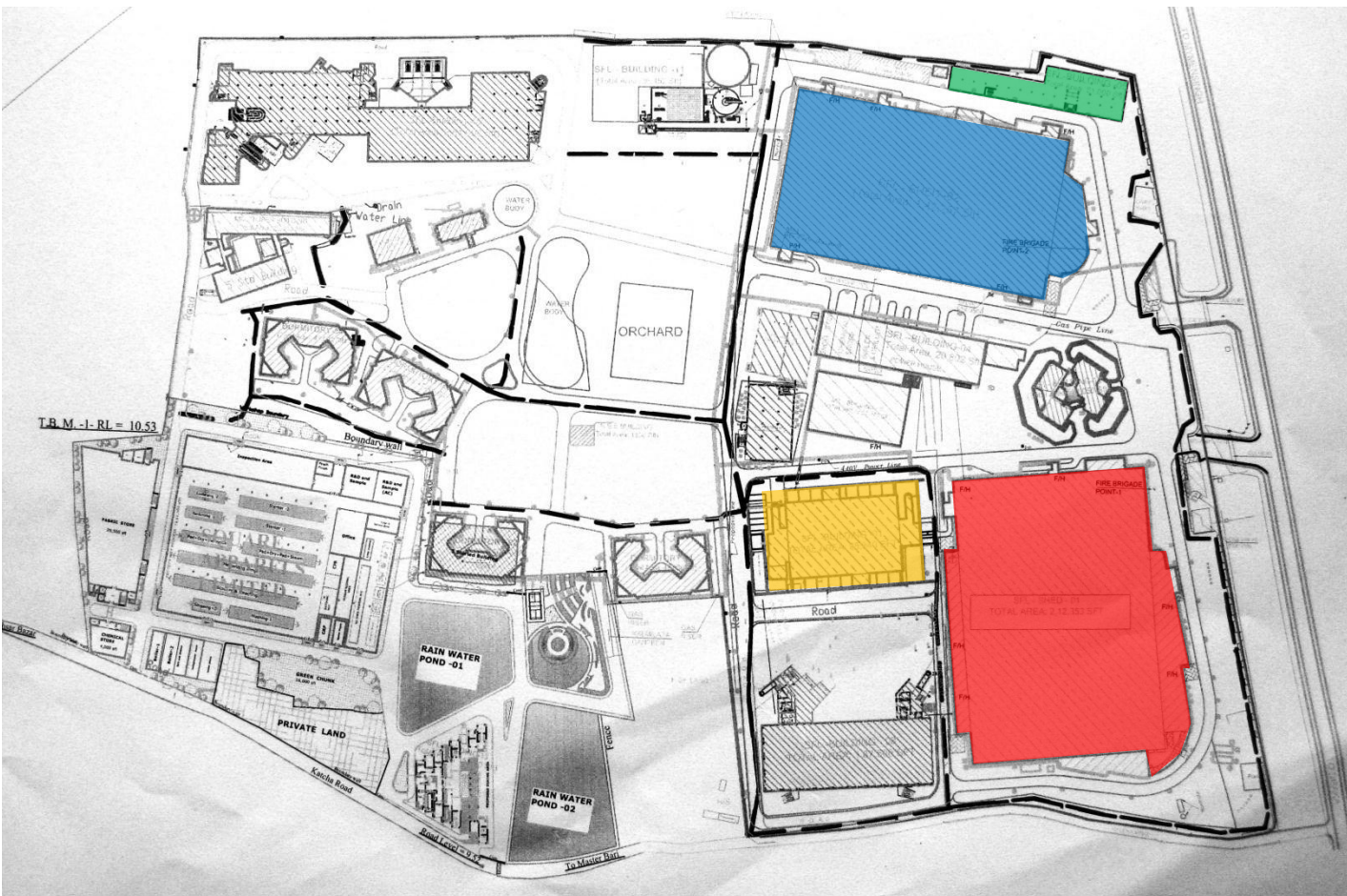
Connection details between trusses and support structure are not clear



Wind posts missing to gable end

Sheds 1 & 2 and Buildings 1 & 5 - Missing / loose bracing

There is missing bracings to Shed 2 and Building 1 and, where provided, bracing to Sheds 1 and 2 and to Building 5 is loose and therefore ineffective.



Location of Building 5



Site Layout

Missing / Loose Bracing



Shed 2 – Vertical bracing not complete. Horizontal bracing provided as indicated in red.



Shed 2 – Bracing not over full height – Building Engineer to review.



Building 1 – Missing vertical bracing



Shed 5 – Loose Bracing

Shed 1 and Buildings 1 & 5 - substandard connection details

Steel connection details in a number of buildings were observed to be substandard, including inadequate bearing / opening up of end / splice plates, missing or inadequately installed bolts, over-sized bolt-holes, etc.



Building 1 – Missing bolts

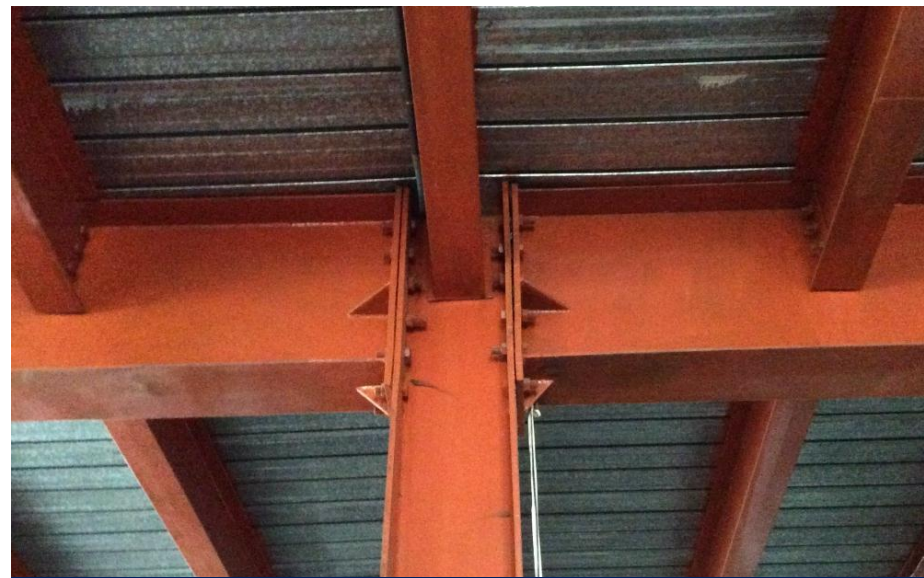


Building 1 – Oversized bolt holes

Substandard connection details



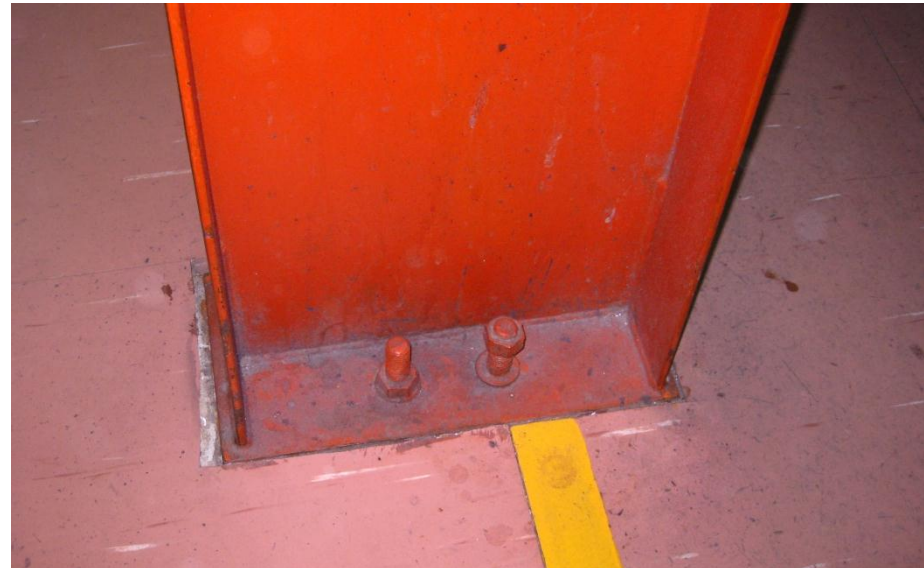
Building 1 – RC column to steel beam connection



Building 5 – Minimal bearing of end plates



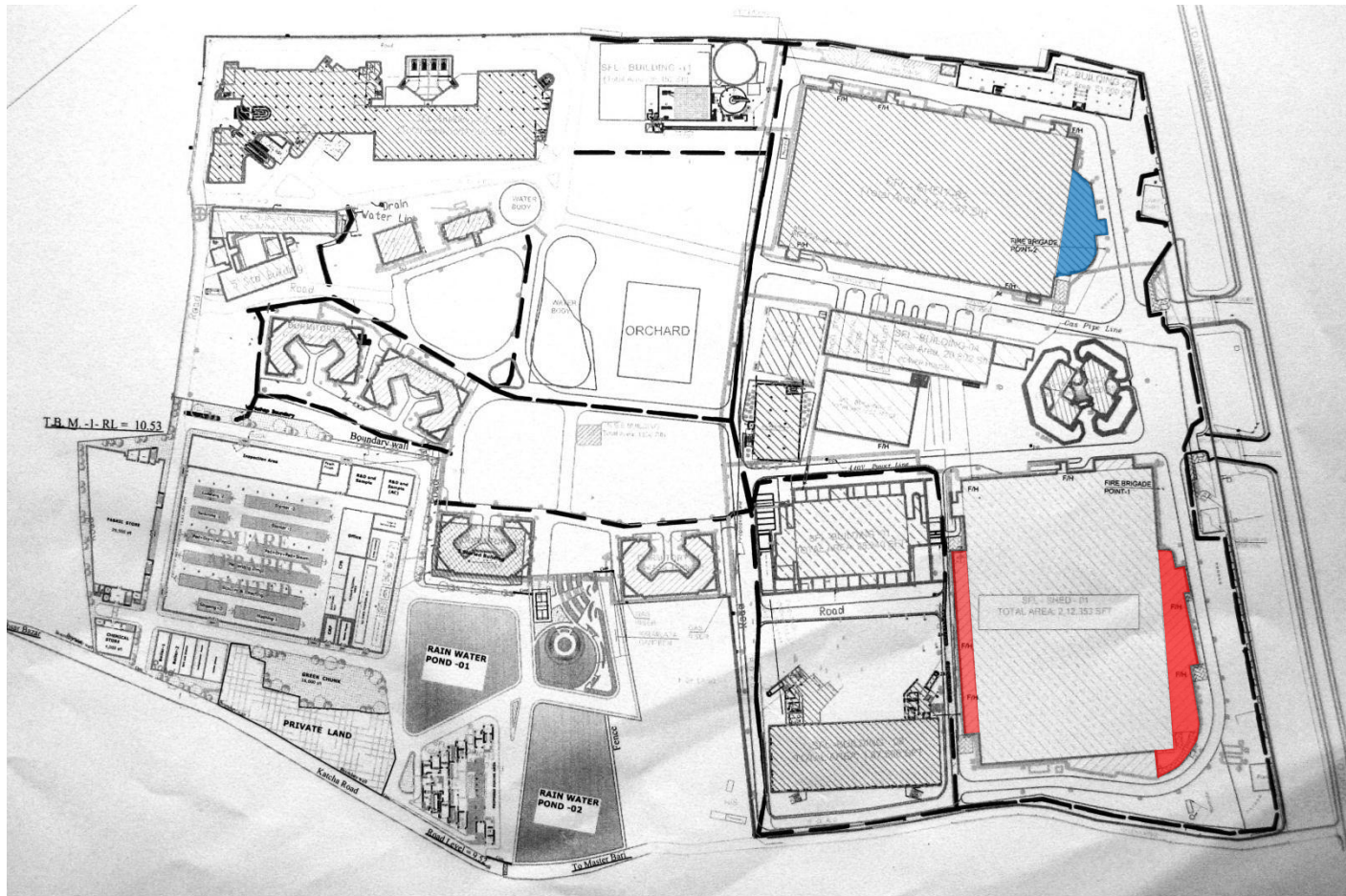
Building 5 – Minimal bearing of end plates



Shed 1 – Loose nuts to bolts

Sheds 1 and 2 - Cracking, ponding and water damage to perimeter RC roof slabs

Cracking, ponding and water damage was observed to the roof slabs of the perimeter single-storey RC structures to Sheds 1 and 2.



Extent of perimeter
RC structures to
Shed 1



Extent of perimeter
RC structures to
Shed 2



Site Layout

Concrete roof slab defects



Shed 1 – Cracking to roof slab



Shed 1 – Water ponding on roof slab

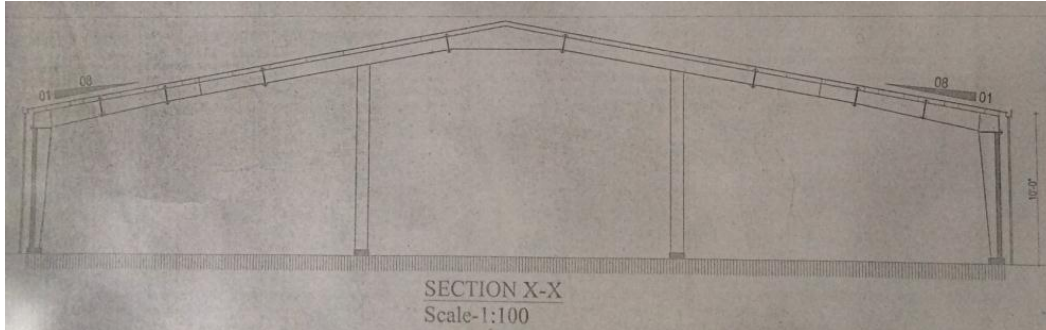


Shed 1 – Water damage to roof slab

Concrete roof slab defects

Missing original documentation and inaccuracies in documentation requiring clarification

Permit drawings were not provided for review. Furthermore, there are a number of inconsistencies between the documents provided and the constructed buildings, particularly with the architectural drawings.



Shed 3 – Architectural section does not match constructed building



Building 5 – Staircase not shown on drawings

Documentation

Priority Actions

Problems Observed

ITEM 1: Building 1 - Cracking to load-bearing masonry wall

ITEM 2: Building 2 - Heavy loading to suspended floors and lack of adequate loading plan

ITEM 3: Building 2 - Lack of stability members to steel roof structures

ITEM 4: Building 2 - Cracking to Basement slab

ITEM 5: Building 2 - Design check required for architectural features

ITEM 6: Building 2 - Movement Joint does not appear to be incorporated at Roof level

ITEM 7: Building 2 - Ponding to RC Roof slabs

Problems Observed

ITEM 8: Buildings 3, 5 and 7 - Heavy loading to suspended floors and lack of adequate loading plans

ITEM 9: Shed 3 - appears to be non-engineered

ITEM 10: Sheds 1 & 2 and Buildings 1 & 5 - Missing / loose bracing

ITEM 11: Shed 1 and Buildings 1 & 5 - substandard connection details

ITEM 12: Sheds 1 and 2 - Cracking, ponding and water damage to perimeter RC roof slabs

ITEM 13: All Buildings - Missing original documentation and inaccuracies in documentation requiring clarification

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Building 1 - Cracking to load-bearing masonry wall	Building Engineer to review extent of cracking in masonry wall and carry out a design check on this element for the applied loads.	6-weeks
2	Building 1 - Cracking to load-bearing masonry wall	Building Engineer to implement any actions / supervise remedial works to masonry wall as identified following the review.	6-weeks
3	Building 2 - Heavy floor loading and lack of adequate loading plan	Building Engineer to produce a loading plan for each area of the building, with due consideration to column and floor capacity in each area.	6-weeks
4	Building 2 - Heavy floor loading and lack of adequate loading plan	Factory Management to ensure loading plan is implemented and actively managed.	6-weeks
5	Building 2 - Heavy floor loading and lack of adequate loading plan	Continue to implement loading plan	6-months
6	Building 2 - Lack of stability members to steel roof structures	Building Engineer to review stability design and stability systems provided to each area of Building 2 and prepare a schedule of necessary remedial works.	6-weeks
7	Building 2 - Lack of stability members to steel roof structures	Stability member remedial works to be carried out.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
8	Building 2 - Cracking to Basement slab	Building Engineer to review extent of cracking to slab and carry out design check on this element for the applied loads.	6-weeks
9	Building 2 - Cracking to Basement slab	Building Engineer to implement any actions / supervise any remedial works as identified following the review.	6-months
10	Building 2 - Design check required for architectural features	Building Engineer to review extent of deflection and cracking to architectural features and to assess the impact of these on the primary structure.	6-weeks
11	Building 2 - Design check required for architectural features	Building Engineer to implement any actions / supervise any remedial works as identified following the review.	6-months
12	Building 2 - Movement Joint does not appear to be incorporated at Roof level	Building Engineer to review beam-column detail across movement joint and prepare a schedule of remedial works as required.	6-weeks
13	Building 2 - Movement Joint does not appear to be incorporated at Roof level	Building Engineer to implement any actions / supervise any remedial works as identified following the review.	6-months
14	Building 2 - Ponding to RC Roof slabs	Building Engineer to review the roof drainage and implement an appropriate drainage system that will prevent water ponding on the roof areas.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
15	Buildings 3, 5 and 7 - Heavy loading to suspended floors and lack of adequate loading plans	Building Engineer to produce a loading plan for each of the buildings, with due consideration to column and floor capacity.	6-weeks
16	Buildings 3, 5 and 7 - Heavy loading to suspended floors and lack of adequate loading plans	Factory Management to ensure loading plan is implemented and actively managed.	6-weeks
17	Buildings 3, 5 and 7 - Heavy loading to suspended floors and lack of adequate loading plans	Continue to implement loading plan	6-months
18	Shed 3 appears to be non-engineered	Building Engineer to review the design of Shed 3, and to confirm, by calculations, its ability to withstand wind loading pressure, suction and uplift forces, with special emphasis on connections and bracing.	6-weeks
19	Shed 3 appears to be non-engineered	Building Engineer to implement any actions / supervise any remedial works as identified following the review.	6-months
20	Sheds 1 & 2 and Buildings 1 & 5 - Missing / loose bracing	Building Engineer to provide adequate bracing to Shed 2, and to tighten bracing to Sheds 1 and 2 and Buildings 1 and 5.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
21	Shed 1 and Buildings 1 & 5 - substandard connection details	Building Engineer to review all connection details to Sheds 1 and Buildings 1 and 5, and to prepare a schedule of actions / remedial works, as required.	6-weeks
22	Shed 1 and Buildings 1 & 5 - substandard connection details	Building Engineer to implement any actions / supervise any remedial works as identified following the review.	6-months
23	Sheds 1 and 2 - Cracking, ponding and water damage to perimeter RC roof slabs	Building Engineer to review extent of cracking, ponding and water damage to roofs and to prepare a schedule of remedial works, as required.	6-weeks
24	Sheds 1 and 2 - Cracking, ponding and water damage to perimeter RC roof slabs	Building Engineer to implement actions / supervise any remedial works as identified following the review.	6-months
25	Missing original documentation and inaccuracies in documentation provided	Building Engineer to check, collect information and produce accurate and fully complete as-built documentation.	6-months