Marma Composite LTD

Tongabari, Ashulia, Savar, Dhaka-1341, Bangladesh

(23.900564N, 90.318957E)

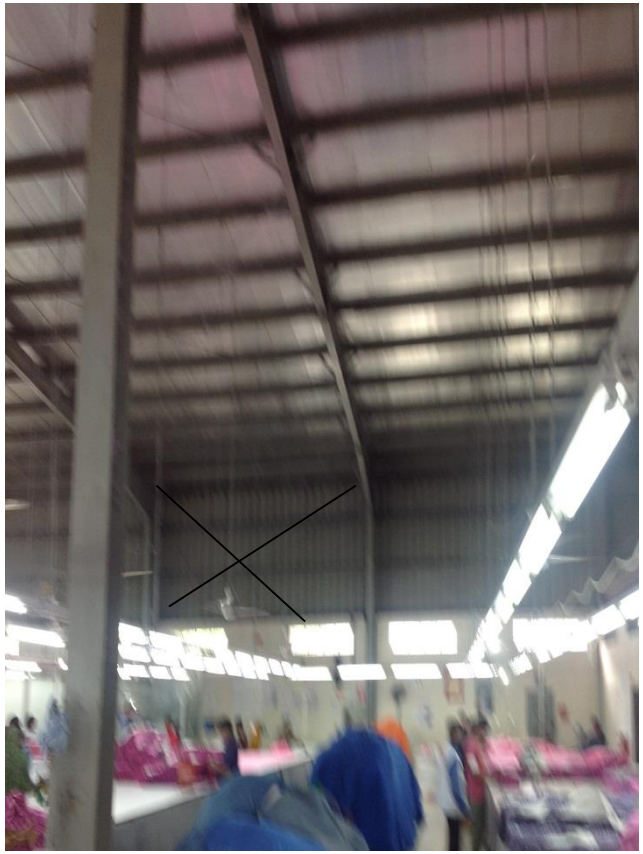
27th May 2014

ACCORD on Fire and Building Safety in Bangladesh ARUP

Observations

Inadequate Bracing Systems

North Face Wall Bracing



South Face Wall Bracing

The Main factory Wall Bracing does not continue to ground level. It is not obvious where the bracing on the south face of the main factory structure terminates.

Inadequate Bracing Systems

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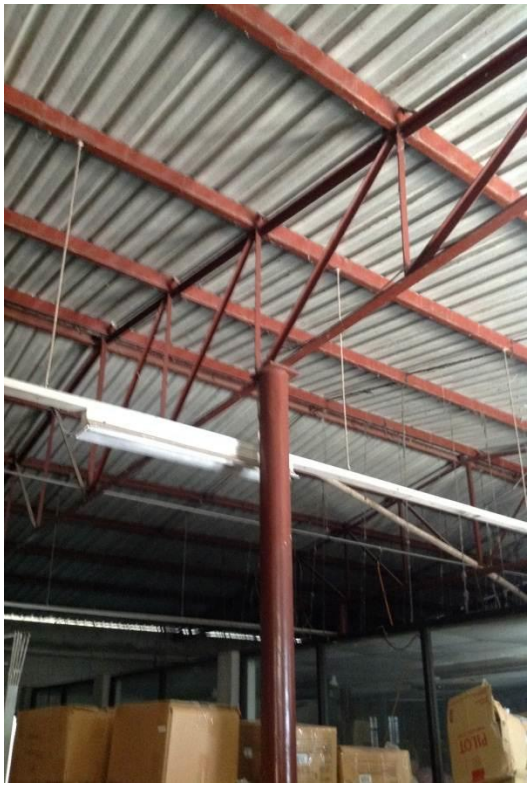
Steel Connections Appear Non Engineered

Typical Mezzanine Welded Connection



Original building truss to CHS Connection

Original building extension portal moment connection

Various steel connections appear non-engineered such as the welded connections for the mezzanine structure in the main factory building, the truss to column connection in the original factory building and the portal frame apex moment connection in the original building extension.

Steel Connections Appear Non Engineered

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Increased Span for the Reinforced Concrete Beam in the Generator Room

Generator room

The original concrete beam span has almost doubled. It is unlikely this beam has been designed to cater for this additional span. This beam should be checked by a suitable qualified structural engineer to ensure the beam can span the additional length.

Increased span to Concrete Beam

Lightweight Roof Structures Appear Non-Engineered

Canteen

Main building office

Various Roof structures in the complex, such as that to the dining shed, generator room, boiler Room and main factory offices appear non-engineered.

Lightweight Roof Structures Appear Non-Engineered

Steel Structure Supporting Water Tanks Appears too Slender

The steel structure supporting 15000 Litres of water appears to be too slender to cater for accidental damage, particularly from possible vehicle impact.

Steel Structure Supporting Water Tanks Appears too Slender

Priority Actions

Problems Observed

Item No 1: Inadequate bracing systems.

Item No 2: Steel connections appear non engineered.

Item No 3: Increased span for the reinforced concrete beam in the generator room.

Item No 4: Lightweight roof structures appear non-engineered.

Item No 5: Steel structure supporting water tanks appears too slender.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Inadequate bracing systems	Structural engineer to check the capacity of the steel frames under horizontal and vertical loading and make any necessary alterations.	**6-months**
2	Steel connections appear non engineered	Structural engineer to check the capacity of all connections and make any necessary alterations.	**6-weeks**
3	Increased span for the reinforced concrete beam in the generator room	Building manager to temporarily prop the beam.	**6-weeks**
4	Increased span for the reinforced concrete beam in the generator room	Structural engineer to check the capacity of the beam to ensure it can span the additional length. Structural engineer to recommend any building alterations if required.	**6-weeks**
5	Lightweight roof structures appear non-engineered	Lightweight roof structure to be reconstructed/upgraded to ensure adequacy for code vertical and wind loads by the Building Engineer.	**6-months**
6	Steel structure supporting water tanks appears too slender	Structural Engineer to check the capacity of the steel structure to take into account any accidental load damage and make any necessary alterations.	**6-months**