

Debonair Limited Unit-2 (Extension)

Plot # 356, Shorifpur, Ozarpara, National University, Joydebpur, Gazipur.

Geographic Coordinates: (23.963065, 90.366580)

9 April-2023



Building information:

Template & Office Shed: Single storey structure.

Fabric Warehouse: Single storey structure.

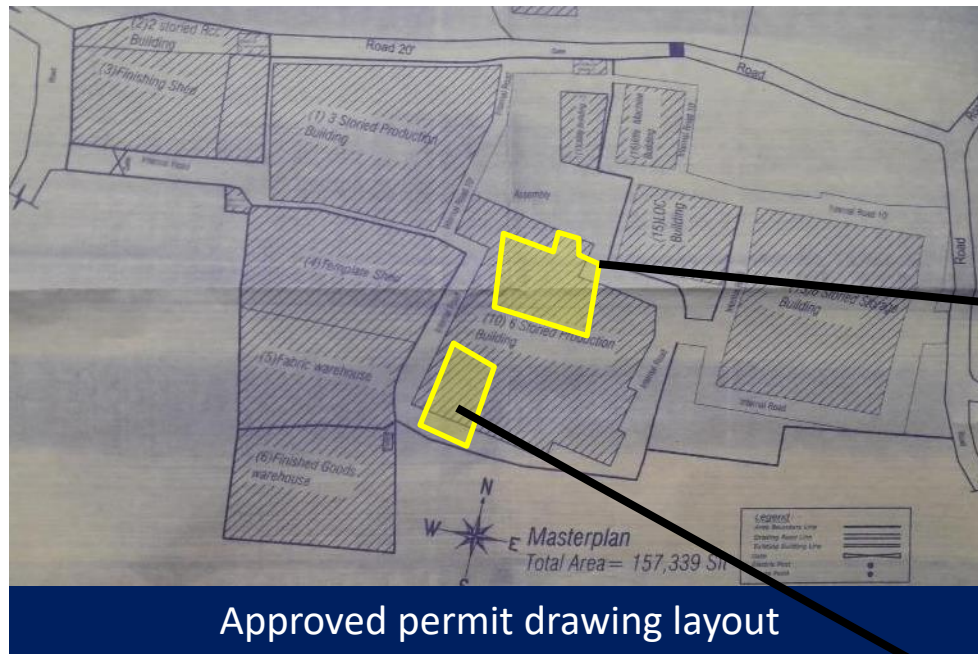
Finished Goods Warehouse: Single storey structure.

Sewing Shed: Single storey structure.

Dining & Canteen Shed: Single storey structure.

Observations

Missing approval drawing from local authority.



Factory had a building permit drawing for 6 storied production building. But the factory built two single storied sheds (Sewing Shed and Dining & Canteen Shed) at the location of proposed 6 storied building. However, approval drawing for the Sewing Shed and Canteen & Dining Shed was not available. Building engineer is required to seek approval from the local authority for the structures.



Lack of credible in-situ material strength in the EA report

Table 2.1: Materials used:

SL No	Item	Locations
1.	Concrete mixed by brick chips (Brick chipped aggregate concrete), coarse sand and cement	Foundation, Column, Grade Beams and Floor slab
2	MS rebar (deformed)	In all RC members
3	MS Steel (angle)	Canopy
4.	MS Steel Plate	Steel Structure
5	5" brick wall	Periphery wall (9'-6" height)

Table 2.2: Materials strength:

Materials Strength		
SL No	Item	Observations
1	Concrete design strength achieved during construction	2,000 psi.
2	Steel strength test from laboratory	60,000 psi
3	MS plate test (Steel members)	50,000 psi

11 | Page

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EA report- Sewing Shed

2.4 Wind Load

As per BNBC 2020, 2.4.6.3 exposure category for this building is Exposure A.

As per table 6.2.8, Basic wind speed, $V_b = 66.5 \text{ m/sec}$ (239.4 km/hr).

Table 2.1: Materials used:

SL No	Item	Locations
1.	Concrete mixed by brick chips (Brick chipped aggregate concrete), coarse sand and cement	Foundation, Column, Grade Beams and Floor slab
2	MS rebar (deformed)	In all RC members
3	MS Steel (angle)	Canopy
4.	MS Steel Plate	Steel Structure
5	5" brick wall	Periphery wall (9'-6" height)

Table 2.2: Materials strength:

Materials Strength		
SL No	Item	Observations
1	Concrete design strength achieved during construction	2,500 psi.
2	Steel strength test from laboratory	60,000 psi
3	MS plate test (Steel members)	50,000 psi

10 | Page

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EA report- Dining & Canteen Shed

Engineering Assessment (EA) report was available on site. The building engineer did not incorporate any material test report in the EA. Building engineer is required to revise the EA report based on in-situ material strength. Also, credible soil test report was not found on site.

Gap between connection plates



Connection gap found between steel connection plates of rafter. Building engineer is required to fill all the steel connection gap with suitable method.

Observation: Dining & Canteen Shed

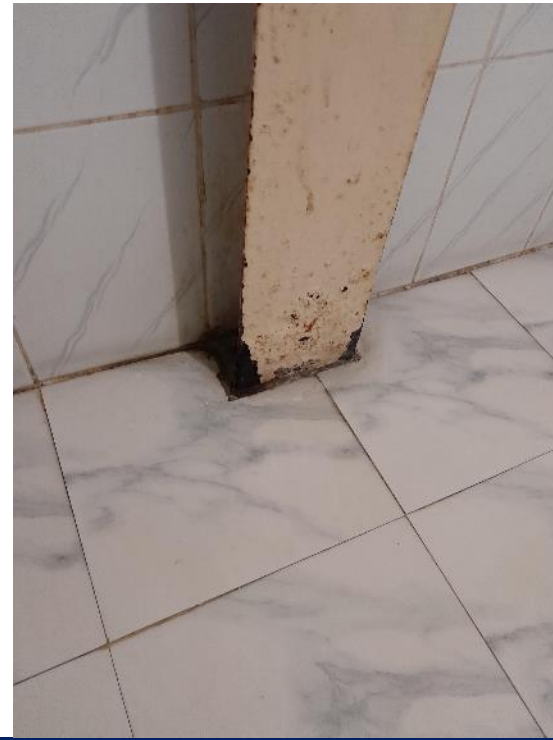
Design report need to be updated



Design report- Template & Office Shed

Design report was available on site. Proper connection adequacy check was not incorporated in the design report. However, the building engineer is required to incorporate the proper connection design check in the design report.

Corrosion on steel member



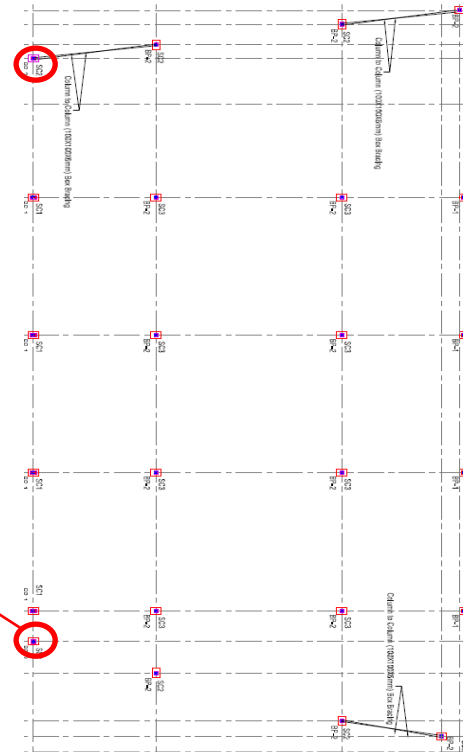
corroded steel member

Building is required to identify all corroded member, remove the corrosion and apply suitable anti-corrosive coating to the affected steel members.

Steel column out of plumb



Steel column out of plumb



Column Layout plan

Indicated column was found vertically inclined which may occur due to poor fabrication work. Building engineer is required to check the column alignment and suggest necessary alternatives.

Irregular framing system and discontinuous welding in the steel column



Rafter Layout: Irregular column layout and beam arrangement



Irregular column and beam



Tack welding- 350 mm spacing

Building engineer is required to revise the design report considering non-compact section due to discontinuous welding and actual framing arrangement.

Loose cable bracing



Loose cable bracing at wall and roof

Building engineer is required to identify the loose bracing and tighten the bracing accordingly.

Lack of anchorage of nonstructural elements



Steel racks without anchored/braced.

Building engineer is required to be provide adequate anchor/braced all non-structural elements to avoid falling hazard due to any kind of lateral force.

Design report need to be updated

02. Building Description & Structural System

The substructure consists of concrete shallow footings.

Factory Building:

The superstructure consists of Gable moment resisting steel frame. The wall elevation consists of 125 mm brick wall and profile sheet. Lateral resistance in the long direction is provided by cross steel bracings. Transverse direction stability by Gable frames itself.

Sl. No.	Item	Field data
01.	Types of Structure	Steel Structure.
02.	Types of Frame	Moment Resisting Braced Frame.
03.	No. of Story	01.
04.	B/W Thickness	5" Thick.
05.	Types of Diaphragm	Rigid.
06.	Roof System	Pitch Roof by Profile Sheet.
07.	Construction Period	Around 2018

3

Design report

The metal profile sheet roof of the steel shed is assumed as rigid in the design report which to be flexible. Building engineer is required to revise the design report and software-based analysis considering flexible roof and actual framing system.

Loose cable bracing



Loose cable bracing at wall and roof

Building engineer is required to identify the loose bracing and tighten the bracing accordingly.

Gap between connection plates



Onsite connection gap (Finished goods Warehouse)

Connection gap found between steel connection plates of rafter. Building engineer is required to fill all the steel connection gap with suitable method.

Problems Observed

Sewing Shed and Dining & Canteen Shed:

Item 01: Missing approval drawing from local authority.

Item 02: Lack of credible in-situ material strength in the EA report.

Item 03: Gap between connection plates.

Template & Office Shed:

Item 04: Design report need to be updated.

Item 05: Corrosion on steel member.

Item 06: Steel column out of plumb.

Fabric Warehouse Shed:

Item 07: Irregular framing system and discontinuous welding in the steel column.

Item 08: Loose cable bracing.

Item 09: Lack of anchorage of nonstructural elements.

Finished Goods Warehouse Shed:

Item 11: Design report need to be updated.

Item 12: Loose cable bracing.

Item 13: Gap between connection plates.

Priority Actions

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Missing approval drawing from local authority. (Sewing Shed and Dining & Canteen Shed).	Building engineer is required to collect building permit drawings from government authorized local institutions.	6-months
02	Lack of credible in-situ material strength in the EA report. (Sewing Shed and Dining & Canteen Shed)	Building engineer is required to revise the Engineering Assessment (EA) based on in-situ material strength (soil, concrete & steel).	6-weeks
03	Lack of credible in-situ material strength in the EA report. (Sewing Shed and Dining & Canteen Shed)	Carry out suggested remedial works if required.	6-months
04	Gap between connection plates. (Sewing Shed and Dining & Canteen Shed)	Building engineer is required to fill all the steel connection gap with suitable method.	6-weeks
05	Design report need to be updated. (Template & Office Shed)	Building engineer is required to incorporate the proper connection adequacy check in the design report.	6-weeks
06	Design report need to be updated. (Template & Office Shed)	Carry out suggested remedial works if required.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
07	Corrosion on steel member. (Template & Office Shed)	Building engineer is required to identify all corroded member, remove the corrosion and apply suitable anti-corrosive coating to the affected steel members.	6-months
08	Steel column out of plumb. (Template & Office Shed)	Building engineer is required to check the column alignment and suggest necessary alternatives.	6-months
09	Irregular framing system and discontinuous welding in the steel column. (Fabric Warehouse Shed)	Building engineer is required to revise the design report considering non-compact section due to discontinuous welding and actual framing arrangement.	6-weeks
10	Irregular framing system and discontinuous welding in the steel column. (Fabric Warehouse Shed)	Carry out suggested remedial works where required.	6-months
11	Loose cable bracing. (Fabric Warehouse Shed)	Building engineer is required to identify the loose bracing and tighten the bracing accordingly.	6-months
12	Lack of anchorage of nonstructural elements. (Fabric Warehouse Shed)	Building engineer is required to be provide adequate anchor/braced all non-structural elements to avoid falling hazard due to any kind of lateral force.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Design report need to be updated. (Finished Goods Warehouse Shed)	Building engineer is required to revise the design report and software-based analysis considering flexible roof and actual framing system.	6-weeks
14	Design report need to be updated. (Finished Goods Warehouse Shed)	Carry out suggested remedial works if required.	6-months
15	Loose cable bracing. (Finished Goods Warehouse Shed)	Building engineer is required to identify the loose bracing and tighten the bracing accordingly.	6-months
16	Gap between connection plates. (Finished Goods Warehouse Shed)	Building engineer is required to fill all the steel connection gap with suitable method.	6-weeks