

G.A.B. Limited (Extension)

Palashbari, Ashulia, Savar, Dhaka

(23.934823, 90.268478)

10 February 2025

Structural Inspection Report

Authors: Koushik Biswas & Md. Arifuzzaman

Reviewed By: Md. Kamruzzaman Mahfuz

Approved By: Mohammad Ahsan Ullah



1. Executive Summary

On 10 February 2025, **Koushik Biswas & Md. Arifuzzaman** of the RMG Sustainability Council (RSC) carried out a visual structural survey of **G.A.B. Limited (Extension)** at the address and coordinates given on the cover page of this report.

We met with Alquimedes George (Vice president, Country Manager), Md Zahidul Islam (Manager, EHS), and many more.

There are 19 structures in the factory premises. The following structures covered in this inspection

1. Building -5 (Textile Utility Building),
2. Building-6 (Powerhouse Building),
3. Building-7 (Shipping Building),
4. Shed-7 (Yarn Warehouse Shed),
5. Shed-8 (Knitting Extension Shed),
6. Shed-9 (Dyeing Finishing Extension),
7. Shed-10 (Nabin Bazar Warehouse (Extension) &
8. Shed-11 (Fire Pump room).

Building-1, Building-2, Building-3, Building-4, Shed-1, Shed-2, Shed-3, Shed-4, Shed-5, Shed-6 & ETP building were previously covered under G.A.B. Limited (ID-11479).

The factory owned all the structures except the rented Shed-10 (Nabin Bazar Warehouse (Extension)). We were allowed access to all the areas of the structures.

During the inspection, we were provided with the following document for review:

Building permit layout drawing was available for these structures given below.

Building Name	Authority	Approval Date
Building -5	Savar Cantonment Board	26-1-2017
Building -6	Savar Cantonment Board	21-8-2022
Building -7	Savar Cantonment Board	30-7-2023
Shed-7	Savar Cantonment Board	20-4-2023
Shed-8	Savar Cantonment Board	12-2-2020
Shed-9	Savar Cantonment Board	19-2-2020
Shed-10	Savar Cantonment Board	23-01-2016

Building-5

- Construction drawing dated Jan 2017.
- As-built Architectural drawing prepared by Inspace Developments.
- As-built Structural drawing prepared by Inspace Developments.
- Load plan prepared by Inspace Developments considering the live load of 7 kPa for compressor room and 1.5 kPa for the roof.
- DEA Report with software-based FEA model prepared by Inspace Developments.
- 8 nos concrete core test report (4 nos from Column and 4 nos from beam). Equivalent strength for columns 3235 psi and for beam slab 4432 psi.
- Geotechnical investigation report prepared by M. Samiul Islam & Consultants, dated Dec 2016, recommended both shallow and deep foundation based on 3 bore holes data.

Building-6

- Construction drawing prepared by Structural Design Associates dated September 2021.
- As-built Architectural drawing prepared by Inspace Developments.
- As-built Structural drawing prepared by Inspace Developments.
- Load plan prepared by “Inspace Developments” considering the live load of 7 kPa for EGB room and 1.5 kPa for the roof.
- Design Report with software-based FEA model prepared by Inspace Developments.
- 4 nos concrete core test report from Column. Equivalent strength for columns 5066 psi.
- Geotechnical investigation report prepared by M. Samiul Islam & Consultants, dated Sep 2018, for recommended both shallow and deep foundation based on 4 bore holes data.

Building-7

- Construction drawing dated May 2023.
- As-built Architectural drawing prepared by Inspace Developments.
- As-built Structural drawing prepared by Inspace Developments.
- Load plan prepared by “Inspace Developments” considering the live load of 6 kPa for proposed typical floors and 1.5 kPa for the roof.
- Design Report with software-based FEA model prepared by Inspace Developments.
- 142 sets of concrete cylinder test report (Column = 12 sets; Foundation=120 sets, Beam-Slab=10 sets).
- 7 sets of re-bar test reports (500 MPa).
- Geotechnical investigation report prepared by Geoscape Consultants dated Feb 2023 for recommended both shallow and deep foundation based on 3 bore holes data.

Shed-7

- Construction drawing prepared by Structural Design Associates dated April 2022.
- As-built Architectural drawing prepared by Inspace Developments.
- As-built Structural drawing prepared by Inspace Developments.
- Load plan prepared by Inspace Developments considering the live load of 3 kPa for the mezzanine floor.
- Design Report with software-based FEA model prepared by Inspace Developments.
- 5 sets concrete cylinder test report from foundation.
- 7 sets of steel plate test reports achieving (345 MPa).
- Geotechnical investigation report prepared by M. Samiul Islam & Consultants, dated Sep 2018, for recommended both shallow and deep foundation based on 4 bore holes data.

Shed-8

- Construction drawing dated June 2020.
- As-built Architectural drawing prepared by Inspace Developments.
- As-built Structural drawing prepared by Inspace Developments.
- Design Report with software-based FEA model prepared by Inspace Developments.
- 4 nos concrete core test report from Column. Equivalent strength for columns 4943 psi.
- 1 set of re-bar test reports (500 MPa).
- Geotechnical investigation report prepared by M. Samiul Islam & Consultants, dated Dec 2019, for recommended both shallow and deep foundation based on 5 bore holes data.

Shed-9

- Construction drawing prepared by Structural Design Associates dated April 2020.
- As-built Architectural drawing prepared by Inspace Developments.
- As-built Structural drawing prepared by Inspace Developments.
- Design Report with software-based FEA model prepared by Inspace Developments.
- Load plan prepared by Inspace Developments considering the live load of 3 kPa for the mezzanine floor.
- 17 sets concrete cylinder test report from foundation.
- 3 sets of steel plate test reports achieving (345 MPa).
- Geotechnical investigation report prepared by M. Samiul Islam & Consultants, dated Nov 2019, for recommended both shallow and deep foundation based on 5 bore holes data.

Shed-10

- Construction drawing dated Dec 2015.
- As-built Architectural drawing prepared by Inspace Developments.
- As-built Structural drawing prepared by Inspace Developments.
- Retrofitting drawing prepared by Inspace Developments.
- Design Report with software-based FEA model prepared by Inspace Developments.
- Load plan prepared by Inspace Developments considering the live load of 3 kPa for the mezzanine floor.
- 8 nos concrete core test report (4 nos from Column and 4 nos from grade beam). Equivalent strength for columns 5061 psi and for grade beam 3246 psi.
- 1 sets of steel plate test reports achieving (290 MPa).
- Geotechnical investigation report prepared by M. Samiul Islam & Consultants, dated Nov 2015, for recommended both shallow and deep foundation based on 3 bore holes data.

Shed-11

- As-built Architectural drawing prepared by Inspace Developments.
- As-built Structural drawing prepared by Inspace Developments.

We have checked the column capacity

Building 5: considering the provided load plan, the equivalent concrete strength (22.3 MPa) from the available core test report, and rebar strength (415 MPa).

Building 6: considering the provided load plan, the equivalent concrete strength (34.92 MPa) from the available core test report, and rebar strength (415 MPa).

Building 7: considering the provided load plan, the design concrete strength (34.48 MPa) from the available cylinder test report, and design rebar strength from available rebar test report (500 MPa).

Based on the visual inspection a list of non-exhaustive key concerns with associated action plan and timeframes are given at the end of this report. We see no reason to suspend operations in the buildings due to structural concerns (subject to the required immediate actions noted in this report). Please note that these actions should be completed as soon as practically possible and certainly within the time frame noted.

We have reviewed the property from an outline seismic perspective and would consider that the building, along with many others in the Dhaka region, to be at significant risk of damage in a major Seismic event.

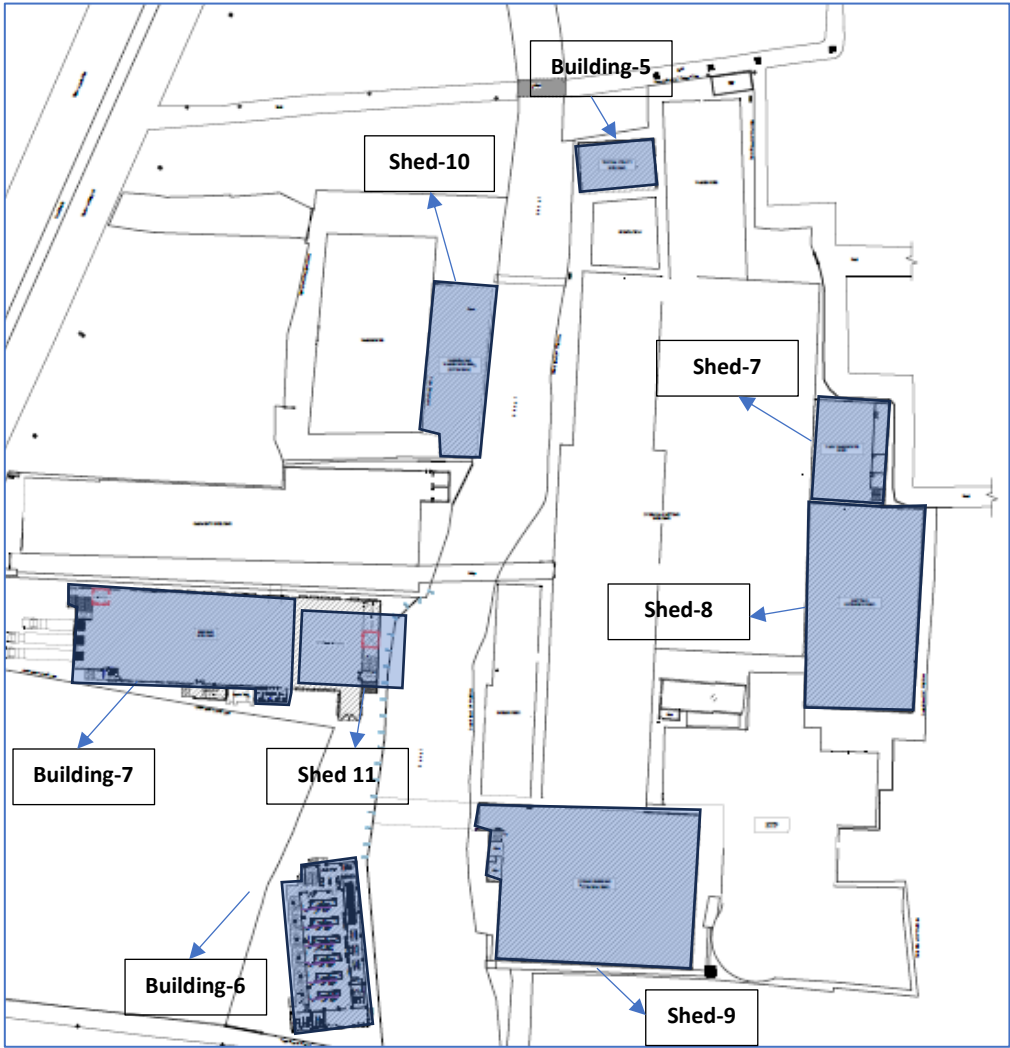
Our Limitations and Assumptions are also noted at the end of this report.

2. Building Extents



Geographical location of the factory

ID 26011



Master Layout plan of the premises

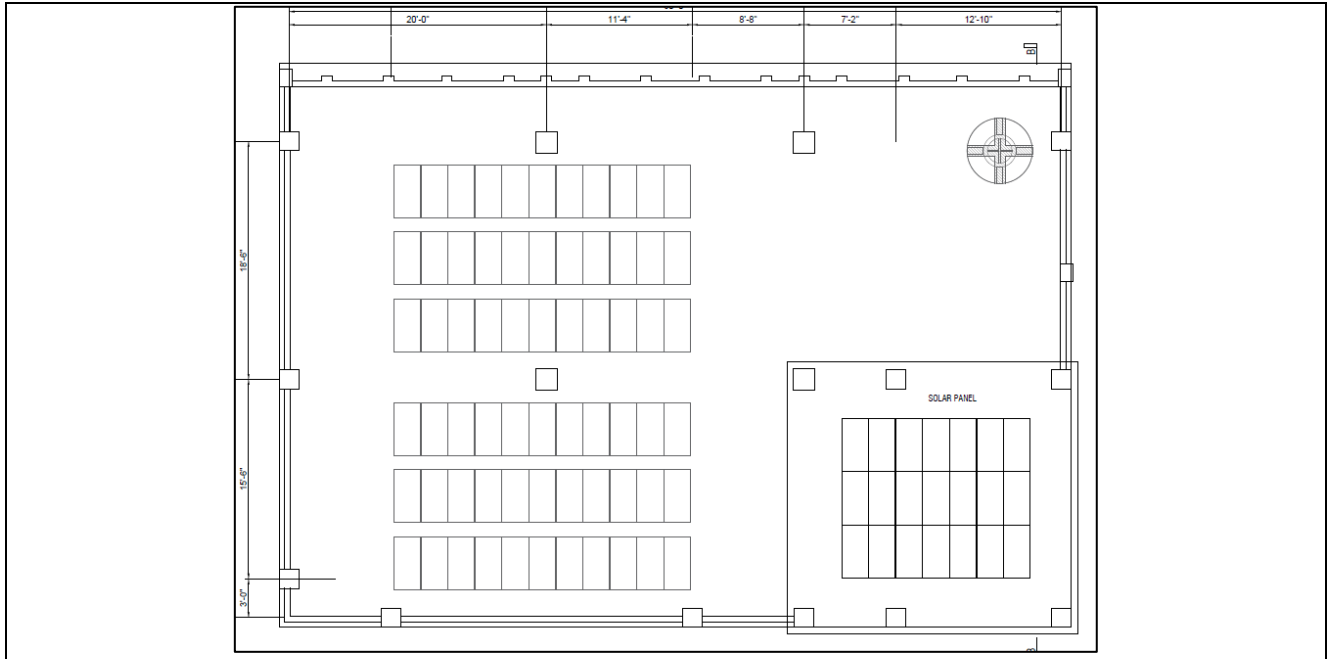
Building -5:

The structure is a two-storied (G+1) reinforced concrete (RC) building. The construction of the building was started in February 2011 and completed in December 2017. The structure has been occupied since Feb 2018.



Floor Level	Floor Area in square meters (m2)	Purpose of floor use
GF	242	Transformer, Chemical Dispensing & Store
1	242	Compressor
Roof		500 liter PVC water tank

Floor usesNorth Elevation



Roof Layout Plan

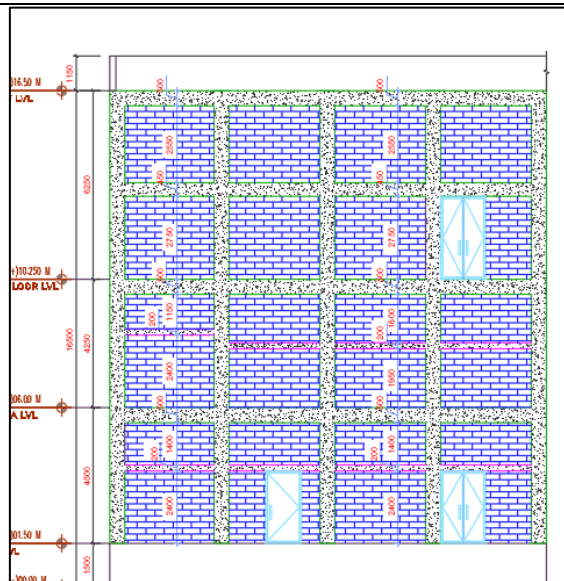


Roof top staircase



PVC water tank on roof and Open to sky

The structure is a two-storied (G+M+1) reinforced concrete (RC) building with a mezzanine floor between the ground and 1st floor. The construction of the building was started in January 2022 and completed in Jun 2023. The structure has been occupied since Jun 2024.



Floor Level	Floor Area in square meters (m2)	Purpose of floor use
GF	697	Generator, Panel Room
Mezzanine	125	Air filter unit
1	600	EGB
Roof		Cooling tower





Building-7:

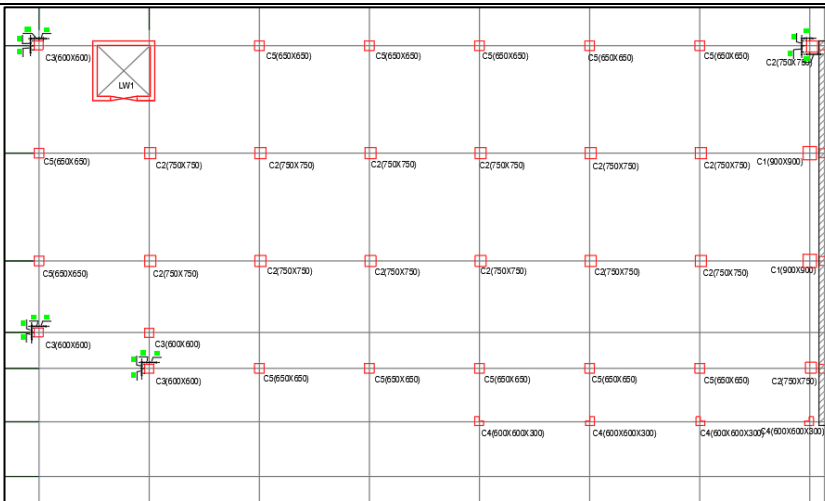
The building is a single-storied RC building. The construction of the building was started in Jul 2023 and completed in Jul 2024. The factory has occupied the building since Jul 2024. The building is used for the Shipping Warehouse, Office. The floor area is 1580 sqm per floor.



West Elevation



Typical framing system



Column Layout Plan

Stability System:

Moment Resisting Frame.

Grid Spacing:

As shown in Figure (max).

RC Column Sizes (mm):

750X750, 900X900

RC Beam Sizes (mm):

375X600(d/s), 300X450(d/s),

Slab Thickness:

140 mm, excluding finishes

Floor-to-Ceiling Height:

Ground Floor: 5.25 m

Foundation Type:

Pile foundation (as per drawing).

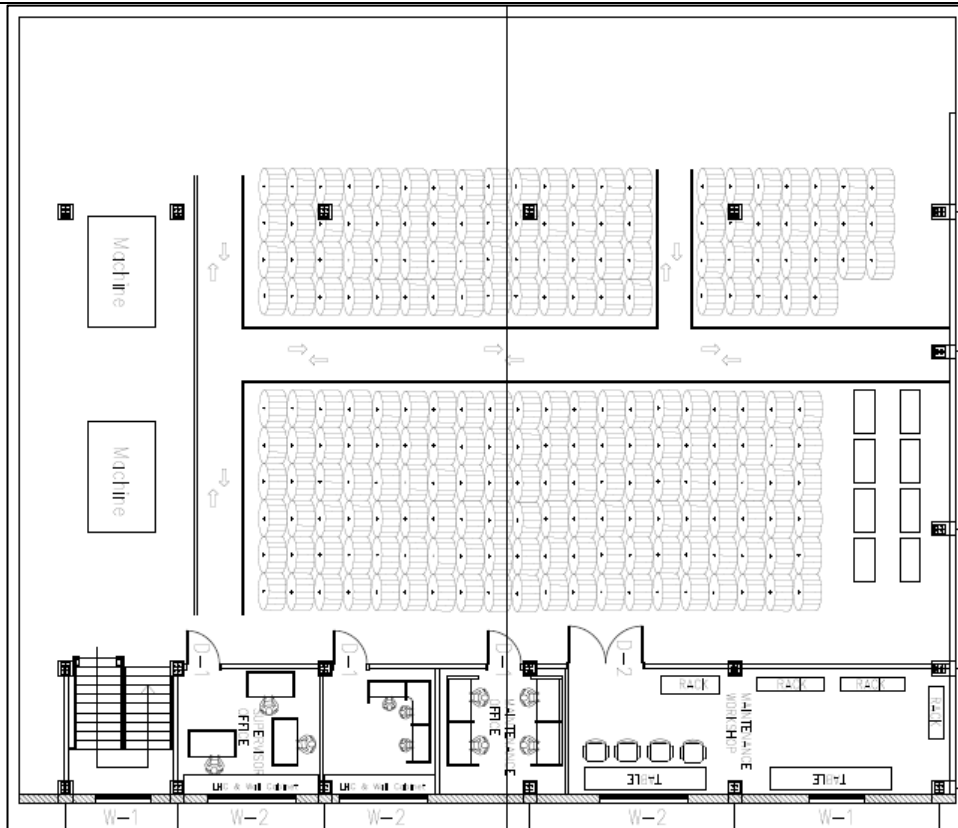
Building information

Shed 7:

A single-storied steel shed with a mezzanine floor. The construction of the shed started in Dec 2022 and was completed in Dec 2023. This building has been occupied since Jan 2024. General floor operation of this shed is Warehouse, Workshop & offices. The floor area is approximately 475 sqm and mezzanine floor area is 86 sqm.



North Elevation



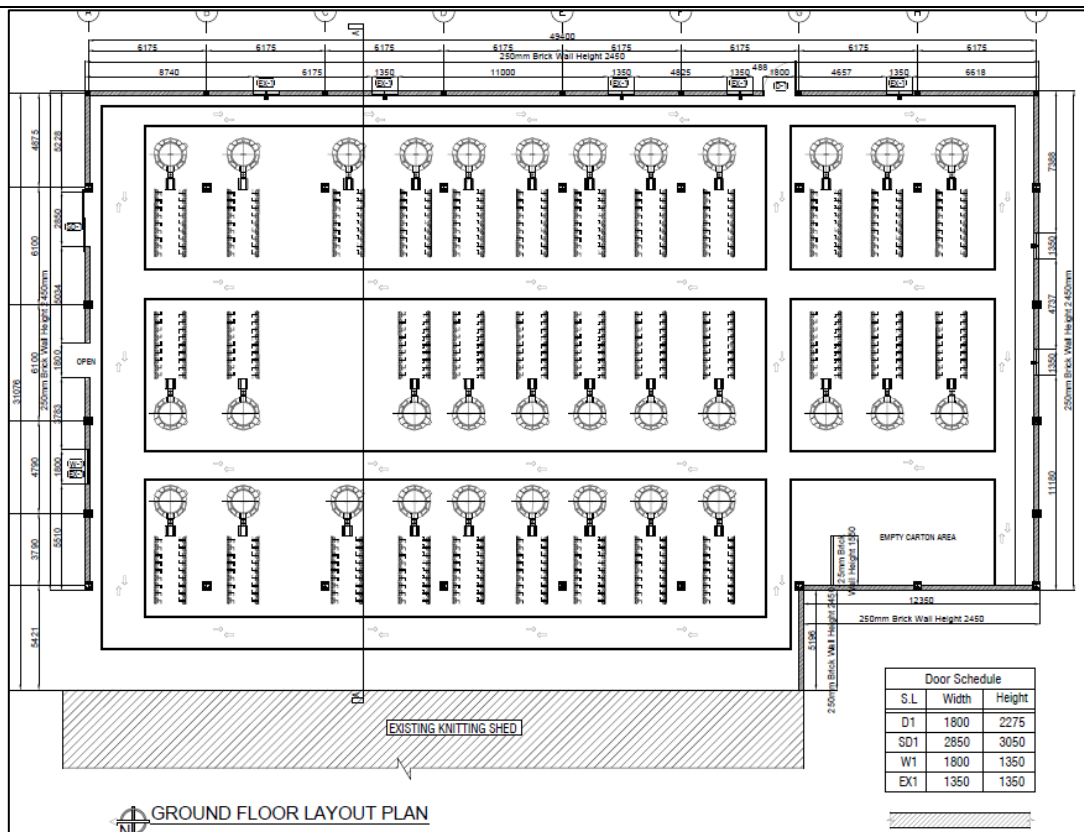
Ground Floor Layout

Shed-8:

A single-storied steel shed. The construction of the shed started in Oct 2020 and was completed in May 2021. This building has been occupied since Aug 2021. General floor operation of this shed is Knitting and production. The floor area is approximately 1500 sqm.



North Elevation



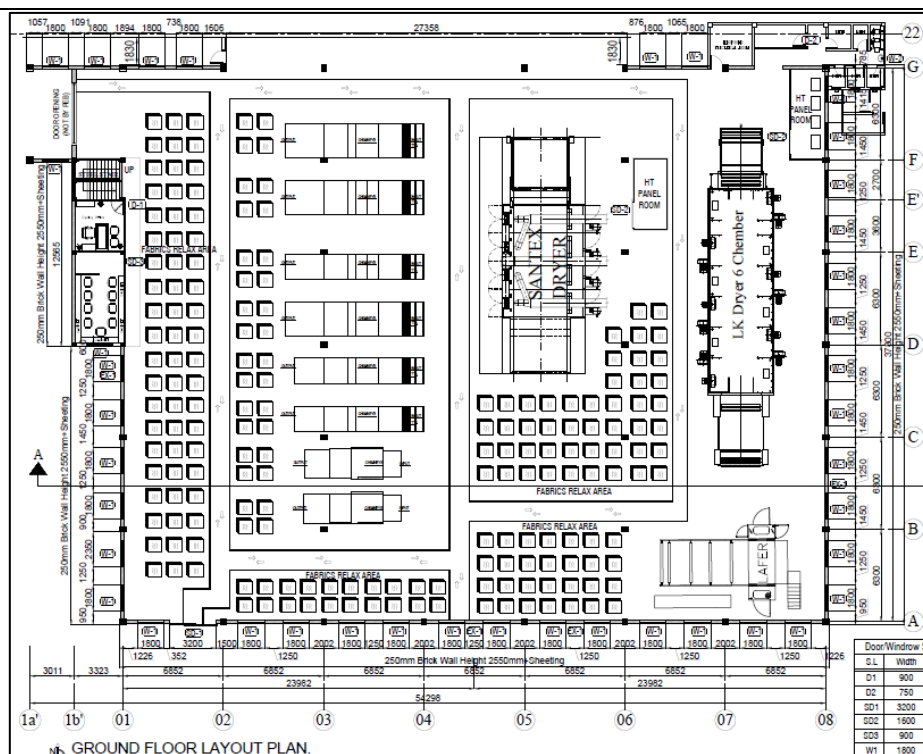
Ground Floor Layout

Shed-9:

A single-storied steel shed with a mezzanine floor. The construction of the shed started in Jun 2020 and was completed in Dec 2020. This building has been occupied since Jan 2021. General floor operation of this shed is Office and production. The floor area is approximately 2000 sqm and the mezzanine floor area is 46 sqm.



Arial view



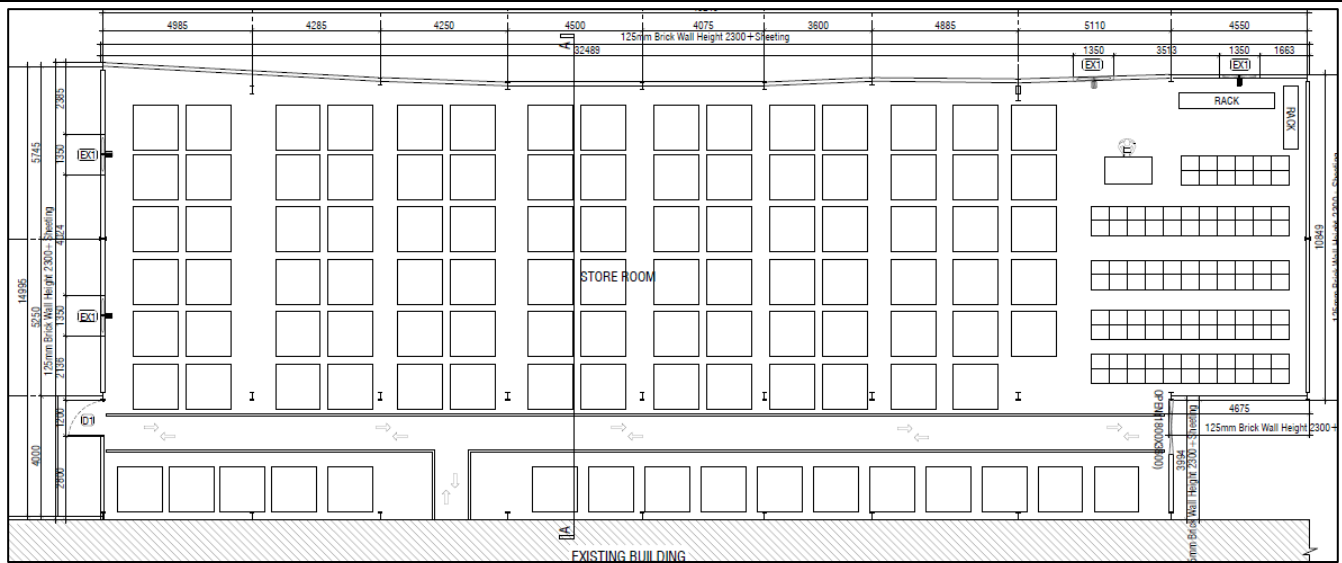
Ground Floor Layout

Shed 10:

A single-storied steel shed. The construction of the shed started in May 2016 and was completed in Dec 2016. This building has been occupied since Jun 2017. The general floor operation of this shed is Accessories Warehouse. The floor area is approximately 688 sqm.



North Elevation



Ground Floor Layout

Shed 11:

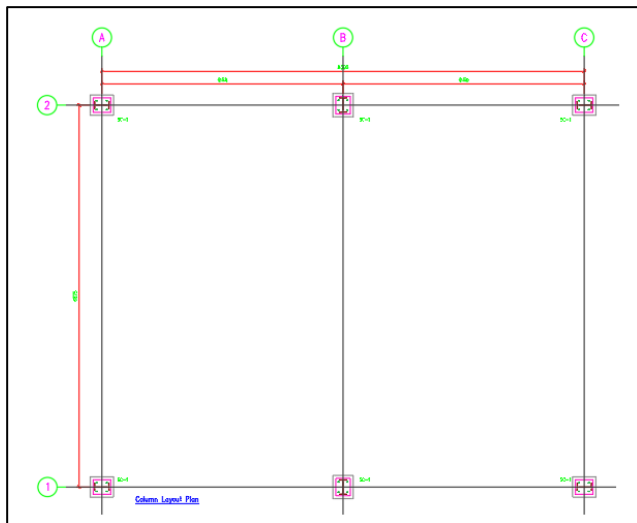
A single-storied steel shed over an underground water reservoir. The construction of the shed started in October 2017 and was completed in December 2017. This building has been occupied since January 2018. The general floor operation of this shed is the Fire pump room. The floor area is approximately 60 sqm.



North Elevation



Portal framing system



Ground Floor Layout

Stability System:

Portal frames in short direction.

Steel column Sizes (mm):

W: 250X5; F: 125X6;

Typical Rafter Sizes (mm):

W: 195X5; F: 100X5;

Connection type: welded.

Floor-to-Ceiling Height:

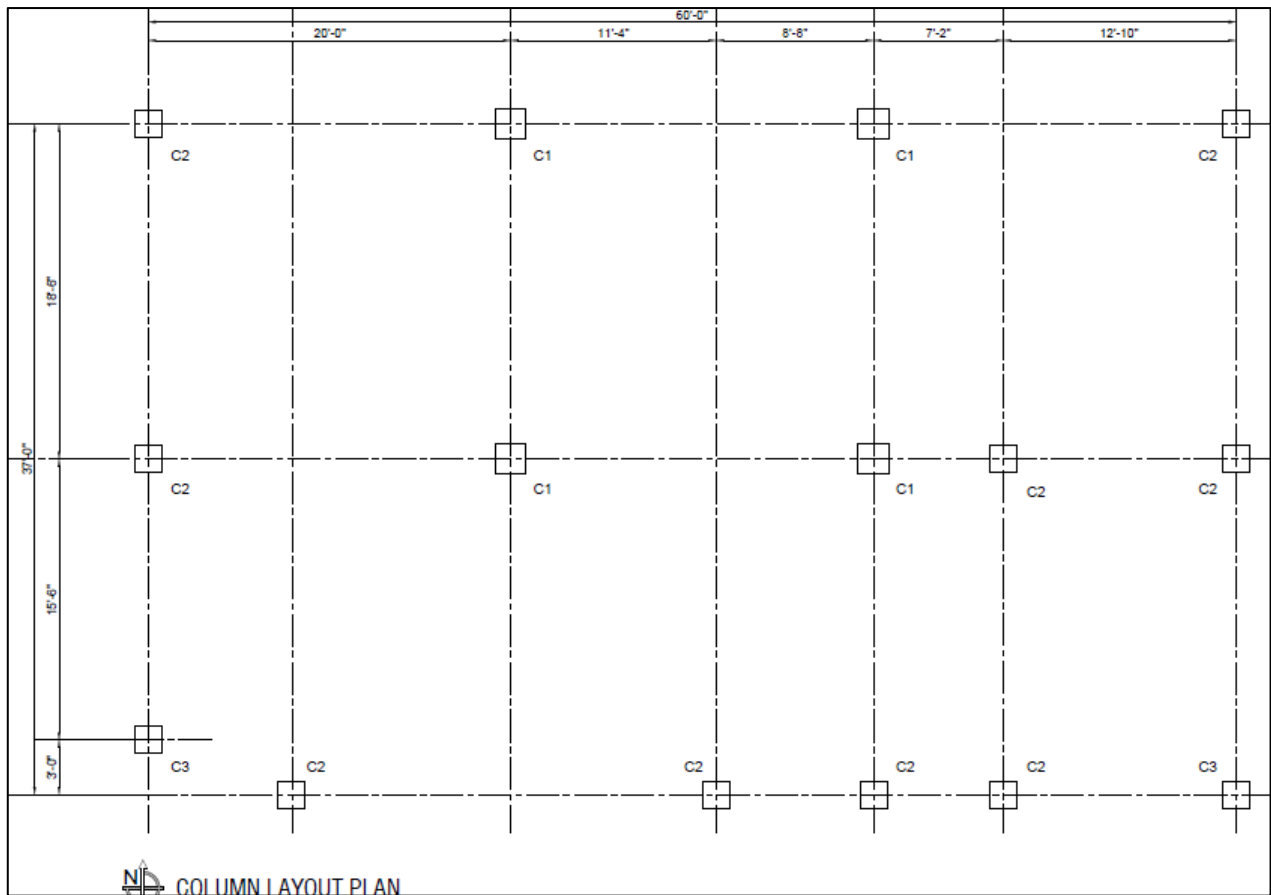
4.9 m (Ridge) & 4.6 m (Edge).

Structural information

3. Structural systems

Building-5:

RC beam column frame structure with the two-way spanning slab.



Column Layout

Stability System:

Moment resisting frame.

RC column Sizes (mm):

500 x 500; 450 x 450;

Beam Sizes (mm):

Longitudinal direction: 300(b) x 435 (d/s)

Trandverse direction: 300(b) x 435 (d/s)

Slab thickness (mm):

165 mm (excluding finishes)

Material:

Stone Chips Concrete (Column).

Floor to Ceiling Height:

Ground floor 5.3 m,

1st Floor: 4.6 m

Foundation type:

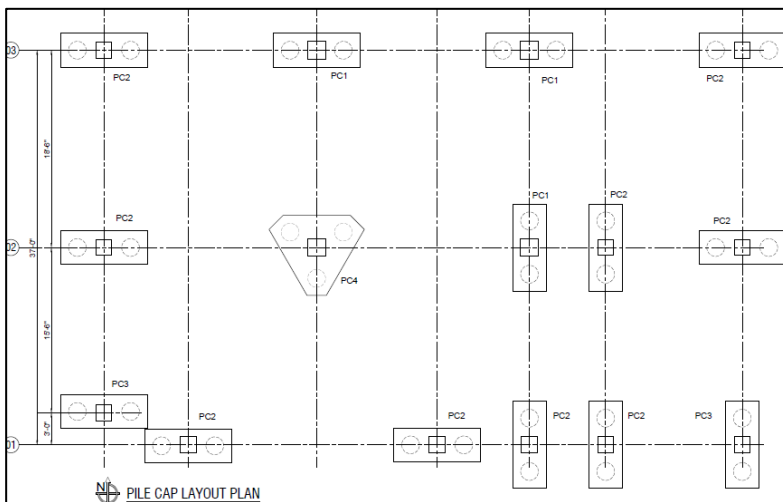
Pile foundation (as per drawing)



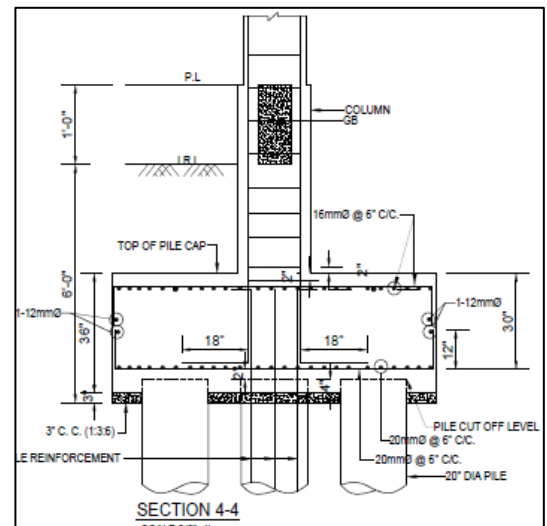
Typical beam column frame



Typical beam column connection

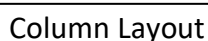


Pile cap layout



Cross-Sectional details

RC beam column frame structure with the two-way spanning slab.



Moment resisting frame.

500 x 500; 600 x 500; 750 x 500

Longitudinal direction: 425(b) x 600 (d/s)
Transverse direction: 375(b) x 675 (d/s)

175 mm (excluding finishes)

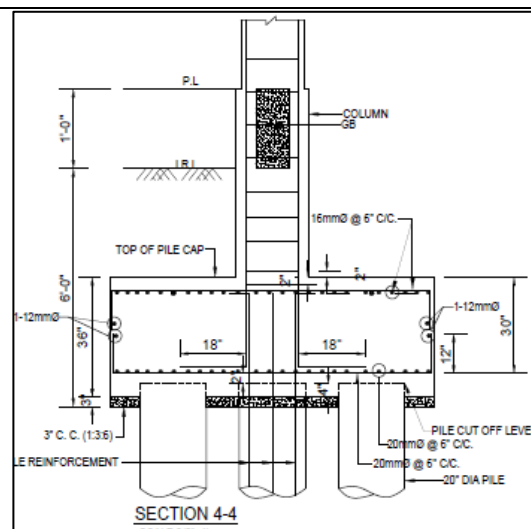
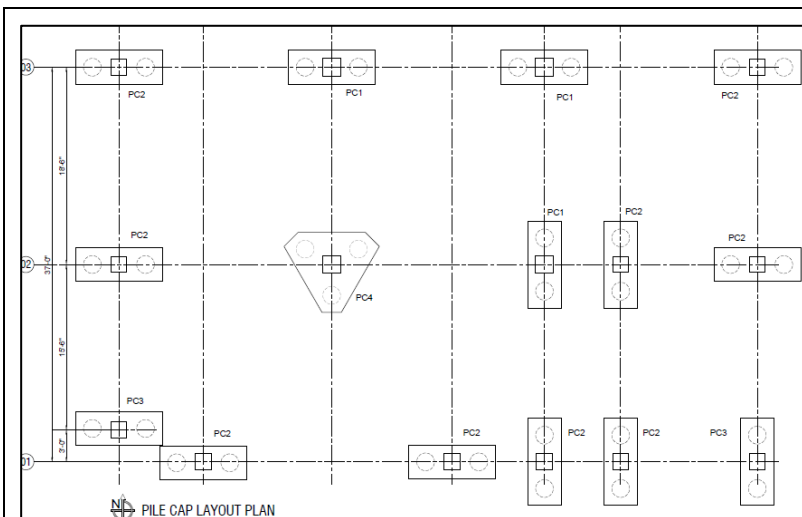
Stone Chips Concrete (Column).

Ground floor 4.5 m, 1st Floor: 4.25 m
2nd Floor: 6.25 m

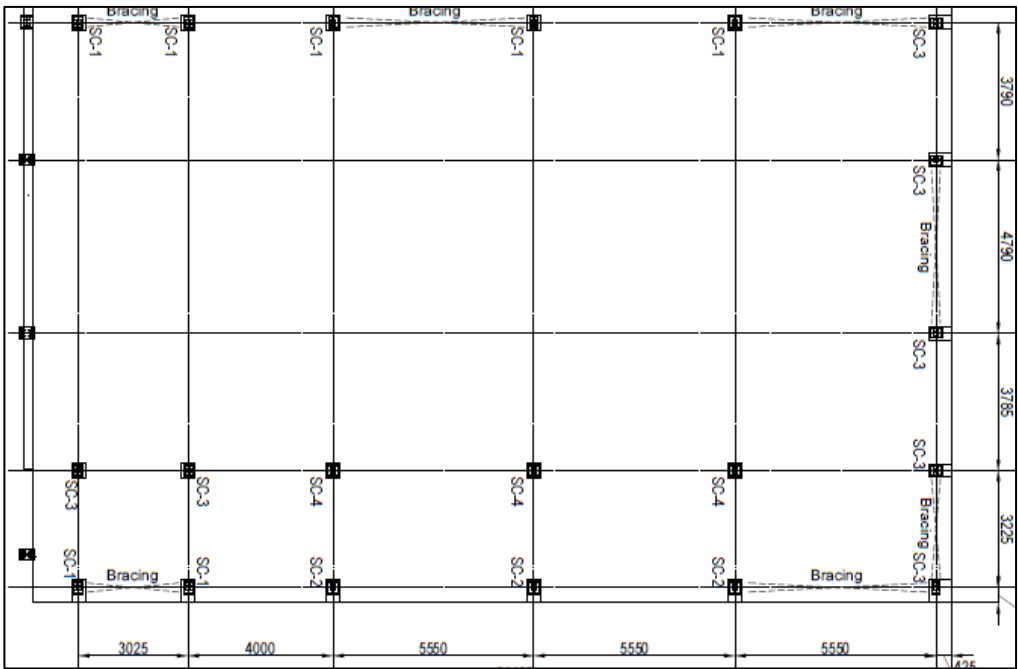
Pile foundation (as per drawing)



Typical beam column frame



Shed-7 The shed is a prefabricated steel portal frame system. The foundation type of the building is pile foundation (as per drawing).



Column Layout

Stability System:

Portal frames in short direction.
Roof & wall bracing system along short direction.

Steel column Sizes (mm):

W: 300~500X6; F: 200X8;
W: 300X6; F: 200X8.

Typical Rafter Sizes (mm):

W: 300~500X6; F: 200X8;
W: 300X6; F: 150X8.

Typical MB, SB Sizes (mm):

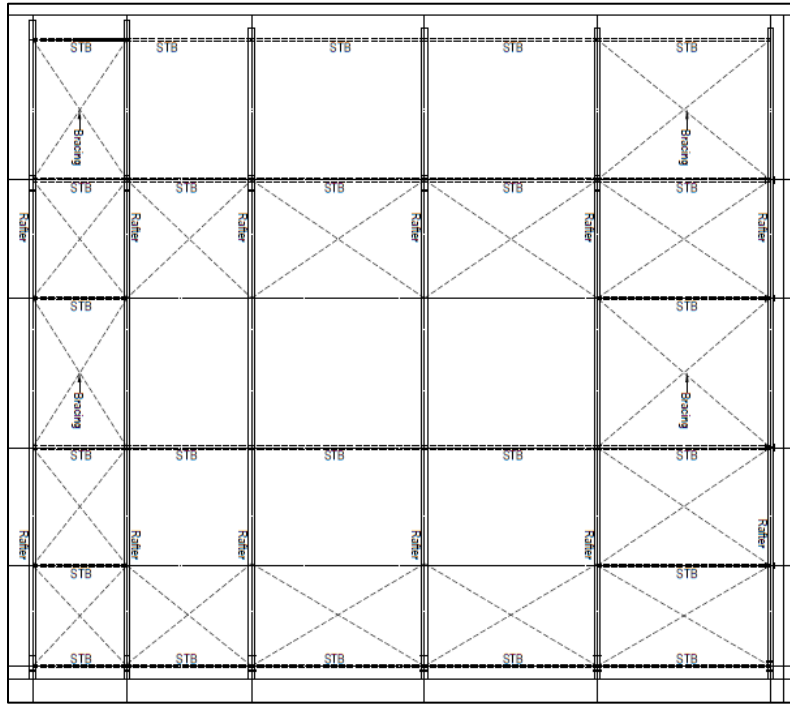
MB- 450X6; F: 200X8.
SB- W: 300X6; F: 150X8.

Bracing type: ms box :100x100x5 mm

Connection type: Bolted.

Floor to Ceiling Height:

8.4 m (Ridge) & 7.4 m (Edge).



Rafter and bracing Layout plan



Typical rafter framing System



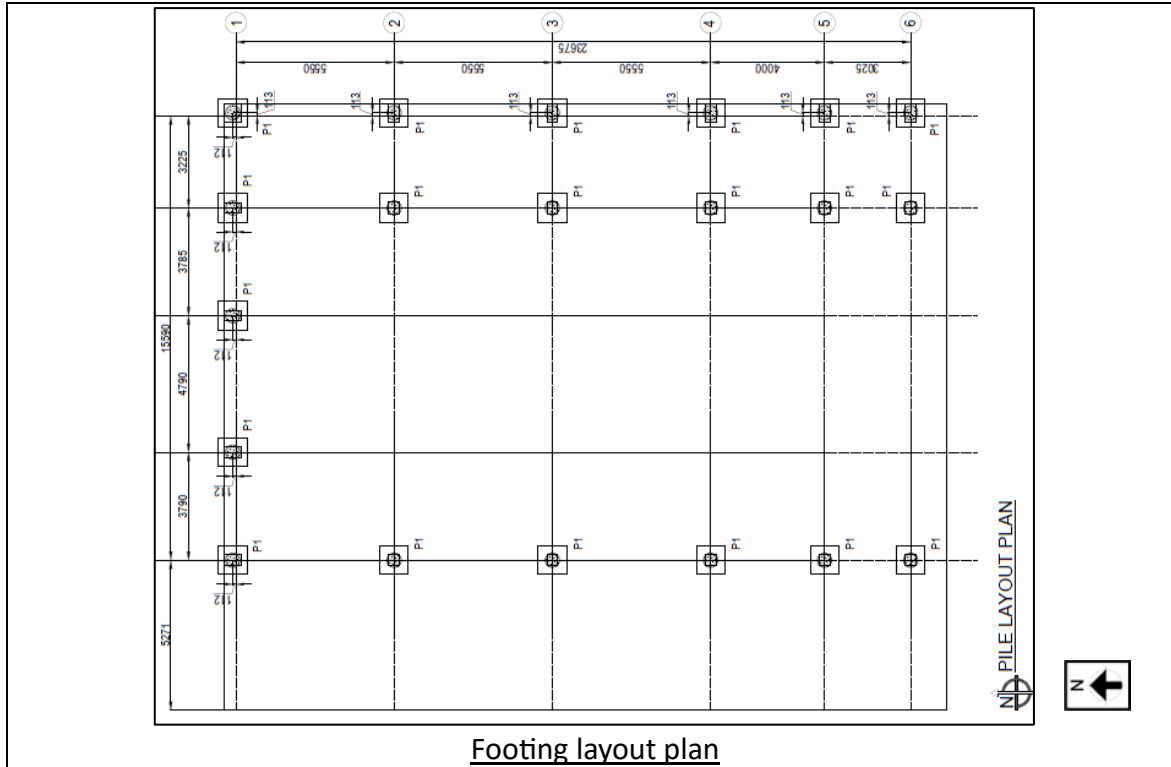
Steel beam column framing



Typical steel connection



Roof and Wall bracing



Shed-8: The shed is a prefabricated steel portal frame system.



Column Layout

Stability System:

Portal frames in short direction.

Roof & wall bracing system along short direction.

Steel column Sizes (mm):

W: 300~650X7; F: 250X10;

W: 250X8; F: 200X10.

Typical Rafter Sizes (mm):

W: 400~800X6; F: 200X10;

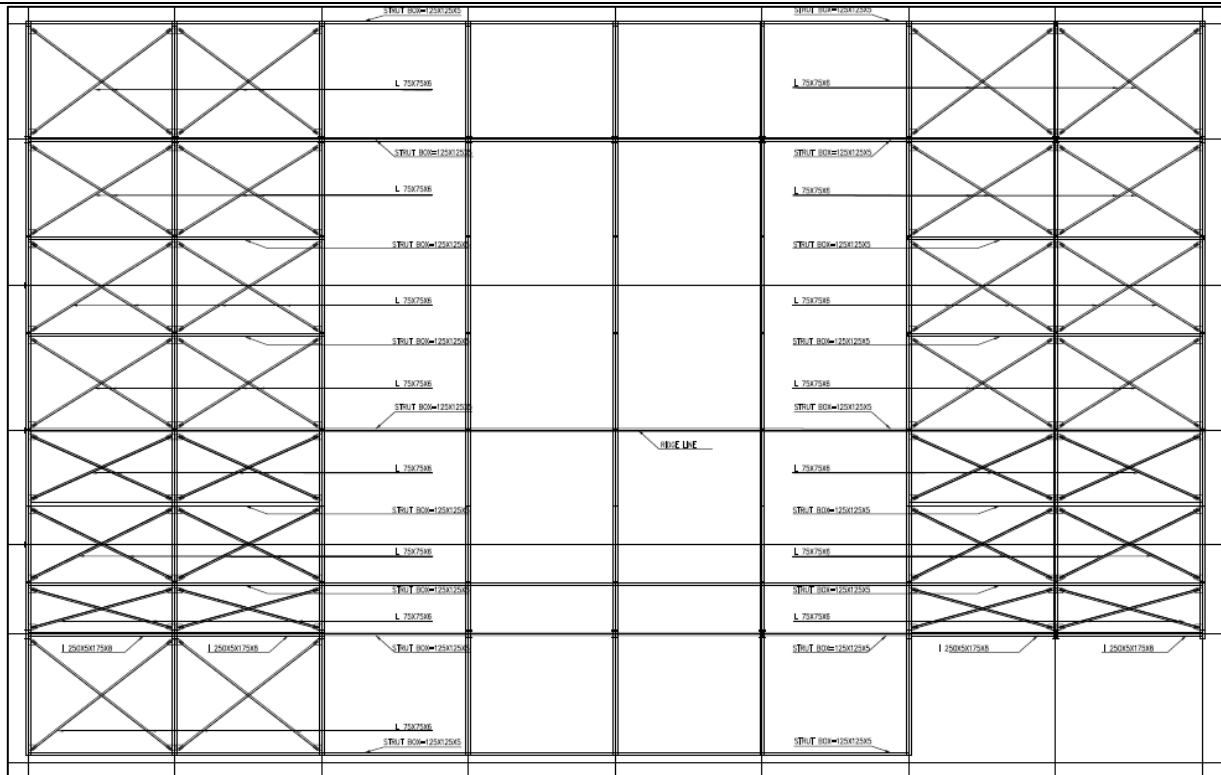
Bracing type: L angle: 75x75x6 mm

Connection type: Bolted.

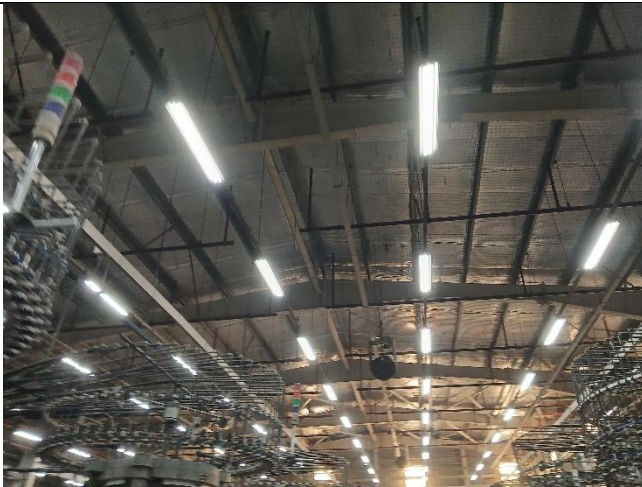
Floor-to-Ceiling Height:

8.6 m (Ridge) & 6.3 m (Edge).

Foundation type: Pile foundation (as per drawing).



Strut and bracing Layout plan



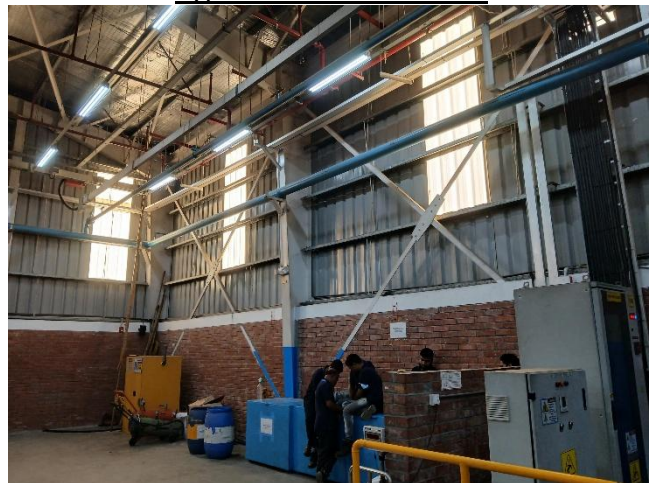
Typical rafter framing System



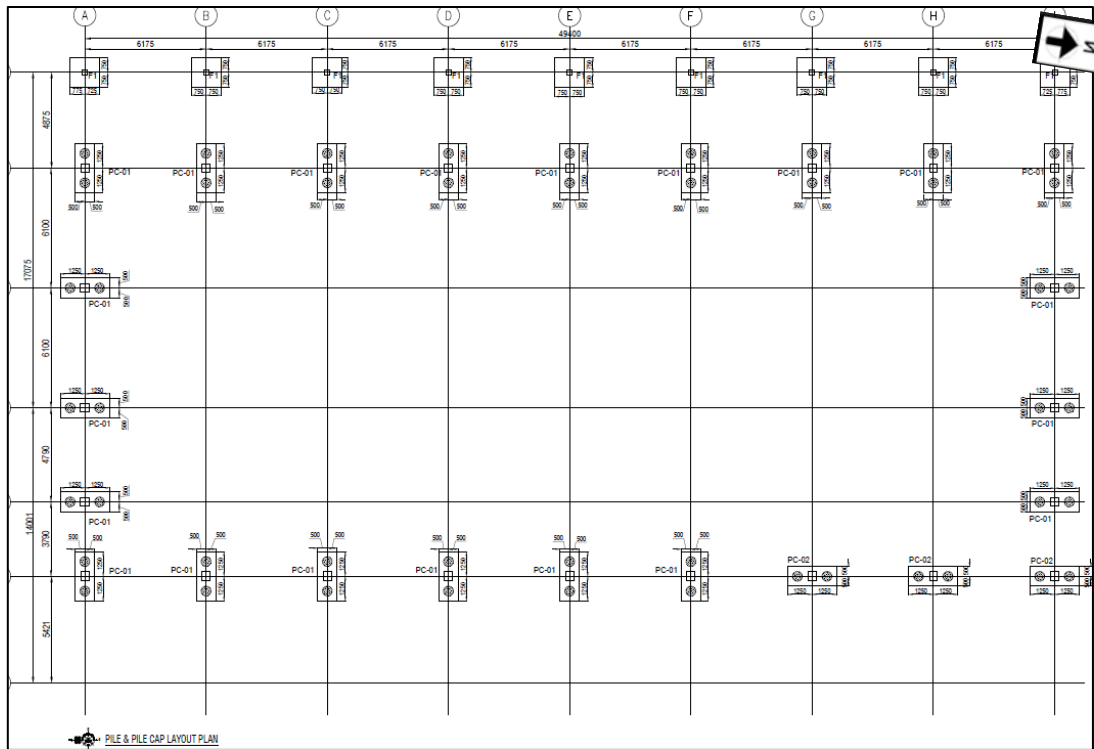
Typical steel connection



Roof bracing



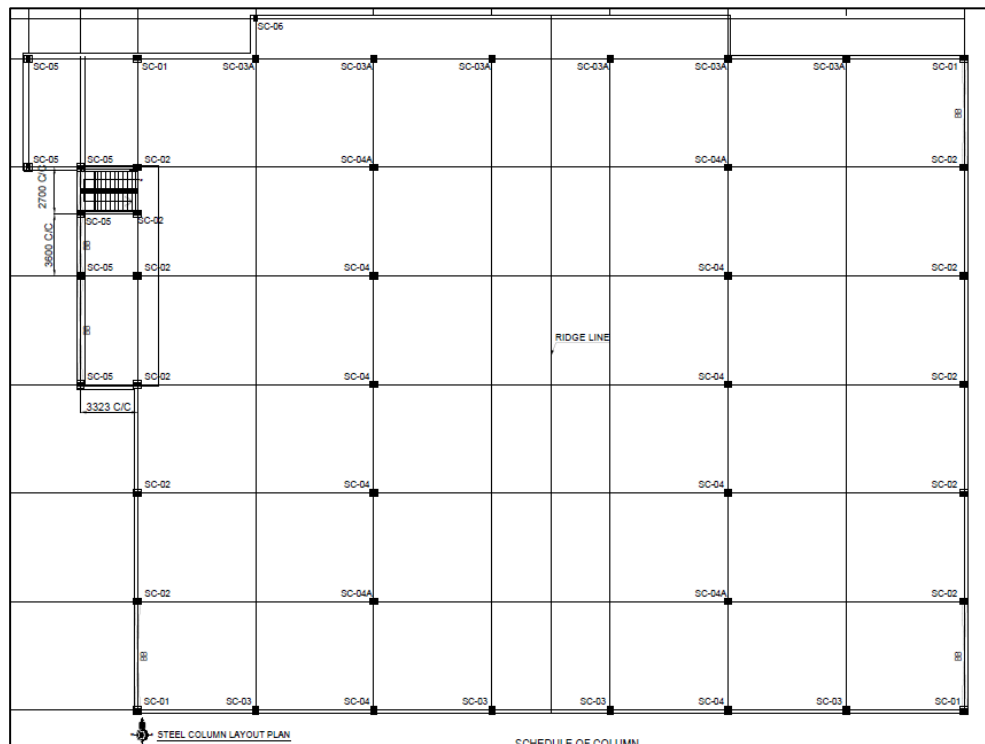
Wall bracing



Pile and pile cap layout plan

Shed-9

The shed is a prefabricated steel portal frame system. The foundation type of the building is pile foundation (as per drawing).



Column Layout

Stability System:

Portal frames in short direction.

Roof & wall bracing system along short direction.

Steel column Sizes (mm):

W: 300~550X6; F: 200X10;

W: 300X6; F: 175X8.

Typical Rafter Sizes (mm):

W: 450~600~500X6; F: 200X8;

W: 450X5; F: 150X6.

Typical MB, SB Sizes (mm):

MB- 500X6; F: 150X8.

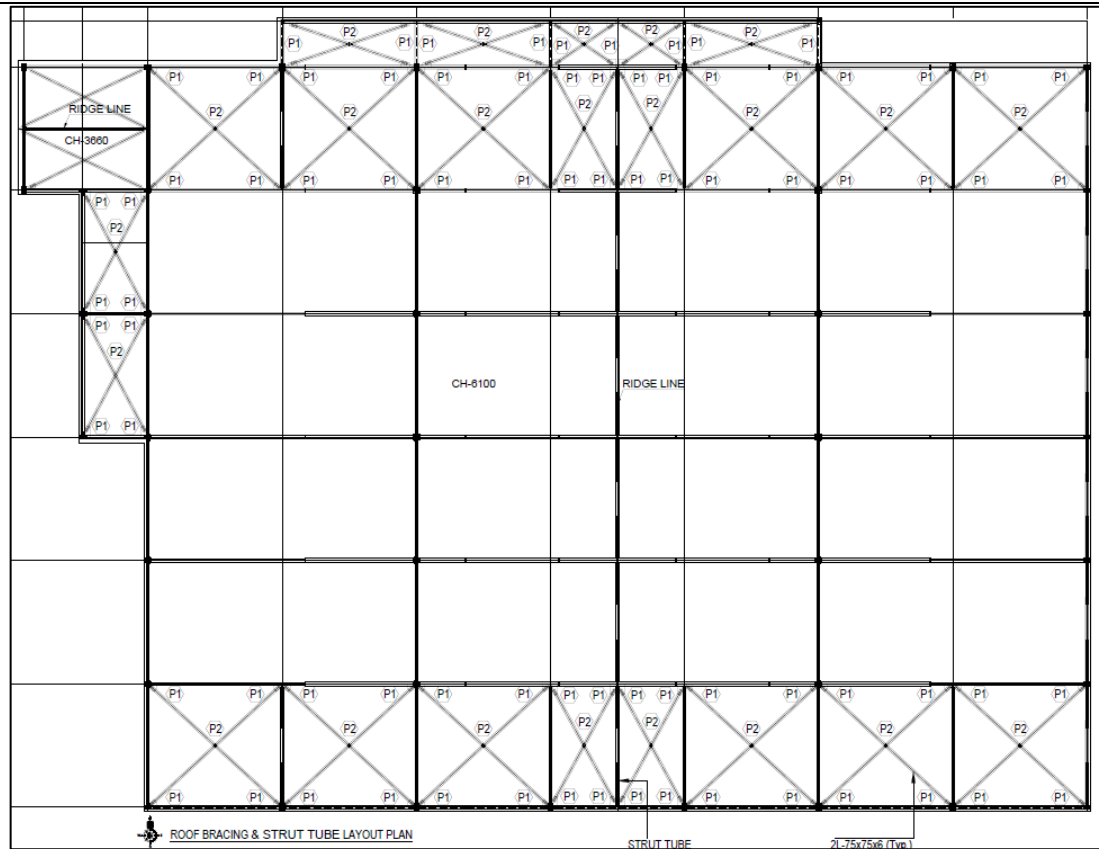
SB- W: 300X5; F: 150X6.

Bracing type: MS box :100x100x5 mm

Connection type: Bolted.

Floor to Ceiling Height:

8.4 m (Ridge) & 7.4 m (Edge).



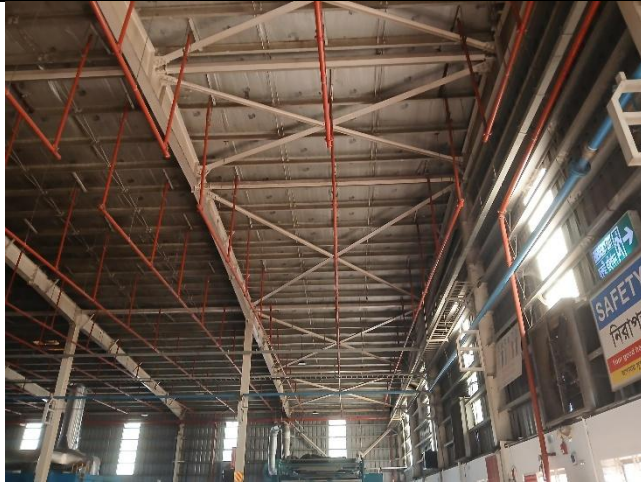
Rafter and bracing Layout plan



Typical rafter framing System



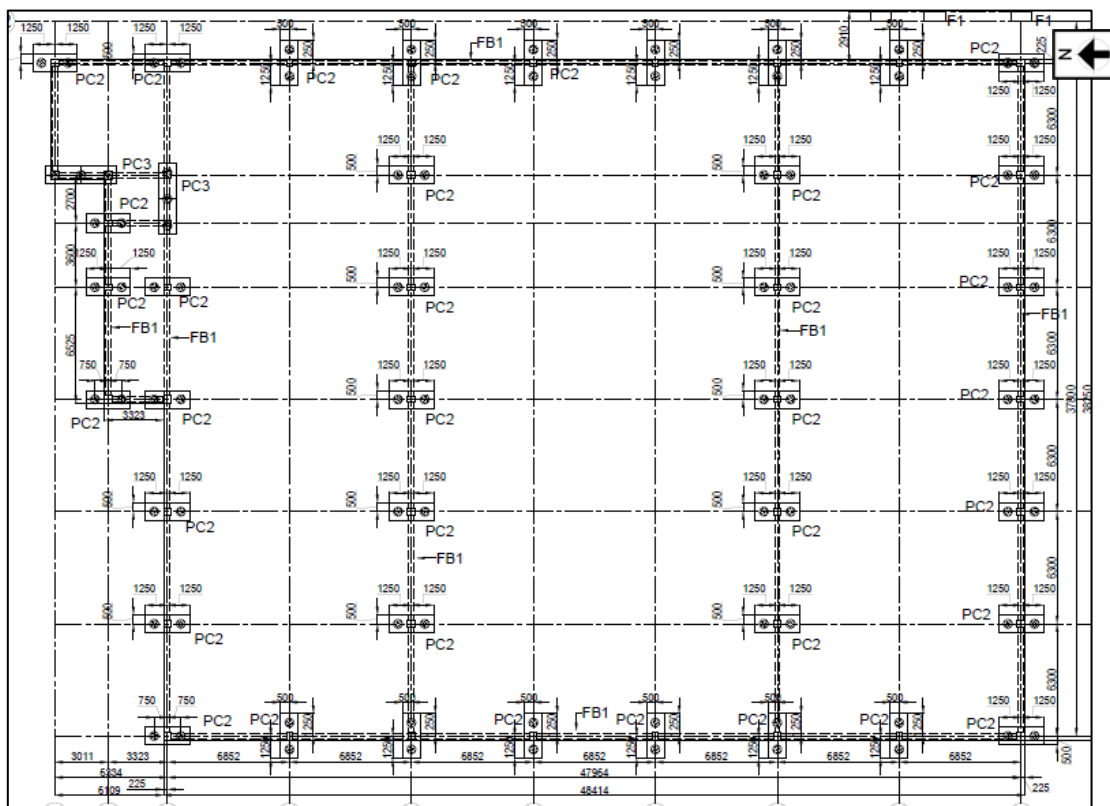
Typical Steel rafter to column connection



Roof bracing

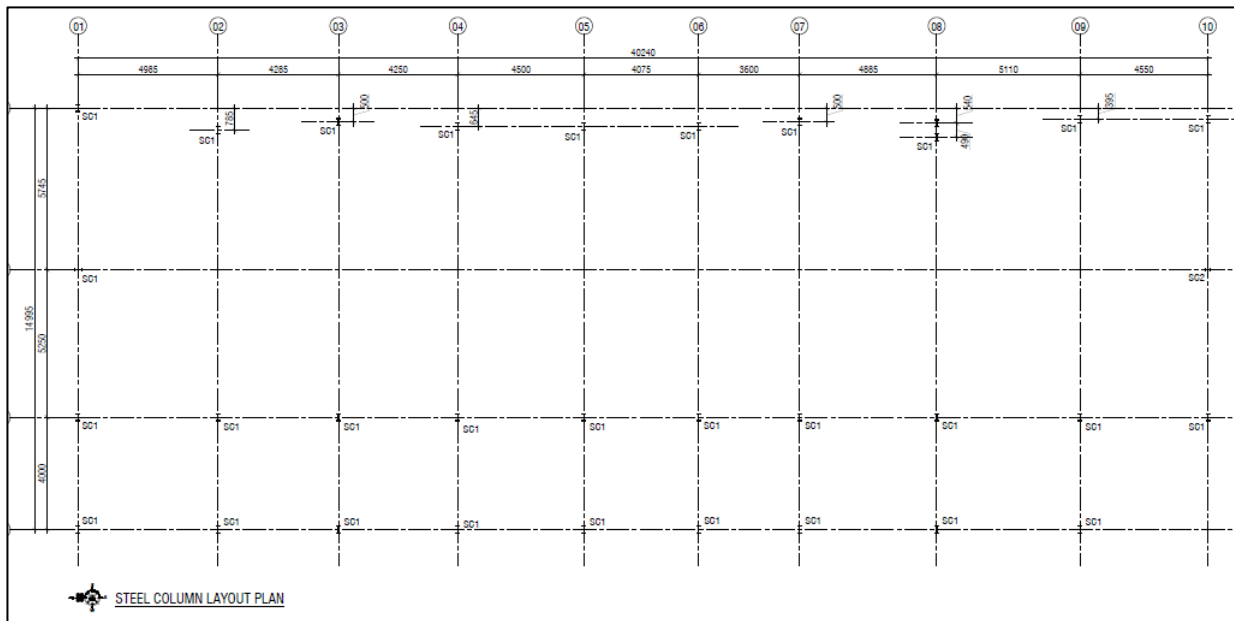


Wall bracing



Pile and pile cap layout plan

Shed-10 The shed is a prefabricated steel portal frame system. The foundation type of the building is pile foundation (as per drawing).



Column Layout

Stability System:

Portal frames in short direction.

Roof & wall bracing system along short direction.

Steel column Sizes (mm):

W: 150X14; F: 250X5.

W: 150X14; F: 200X5.

Typical Rafter Sizes (mm):

W: 125X6; F: 250X5,

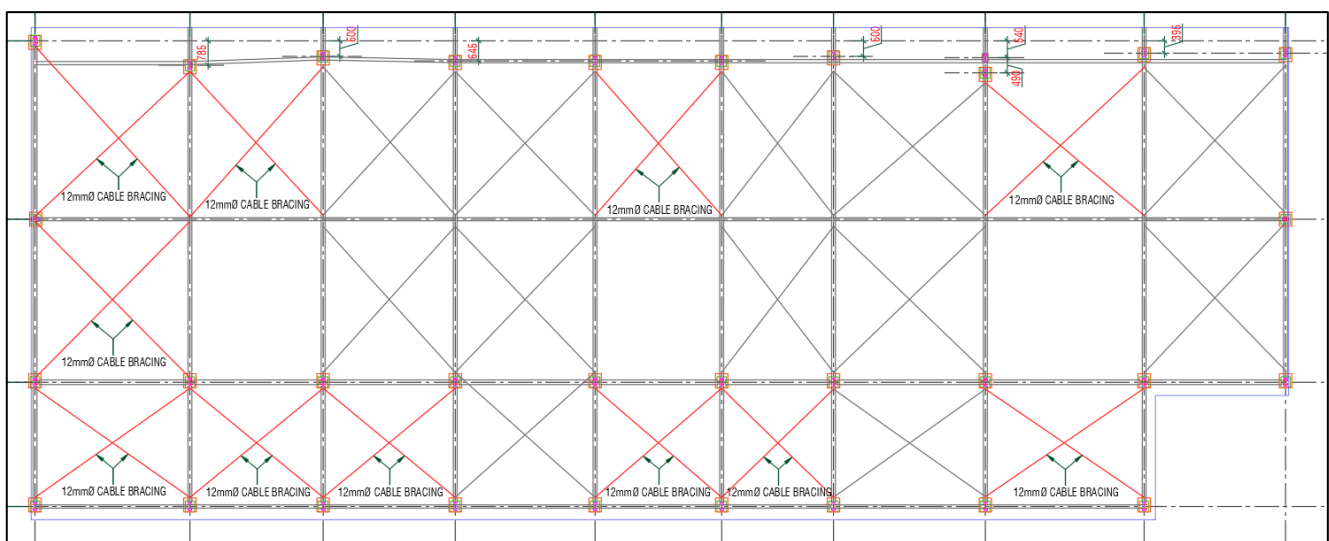
W: 125X8; F: 250X6.

Bracing type: 12 mm dia cable, 20 mm dia rod, 75x75x6 double angle.

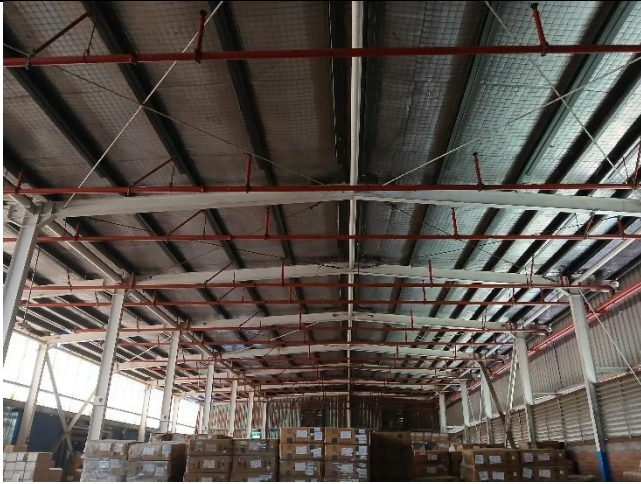
Connection type: Bolted.

Floor-to-Ceiling Height:

5.9 m (Ridge) & 4.9 m (Edge).



Strut and bracing Layout plan



Typical rafter framing System



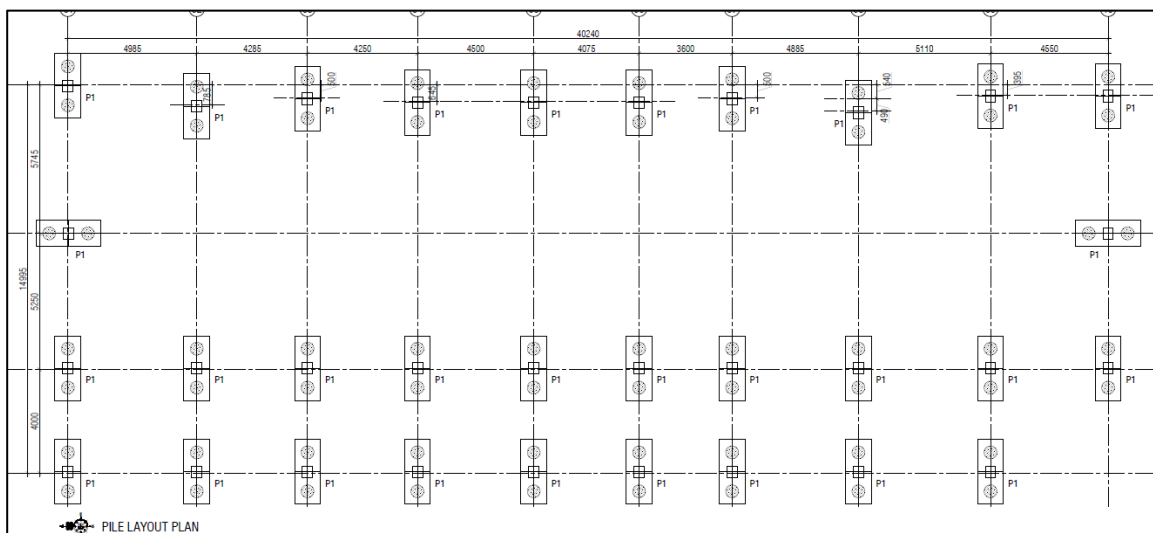
Typical steel connection



Roof bracing



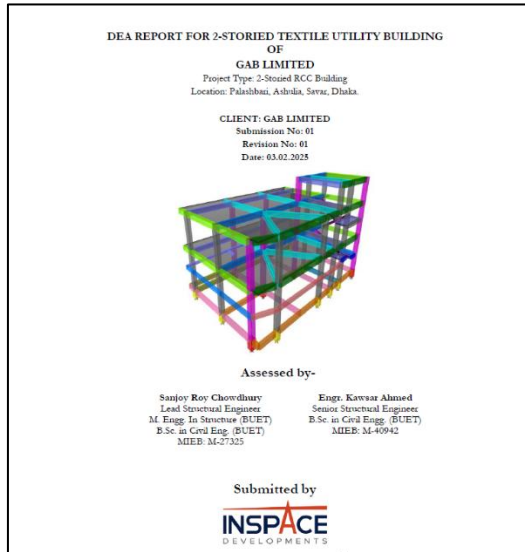
Wall bracing



Pile and pile cap layout plan

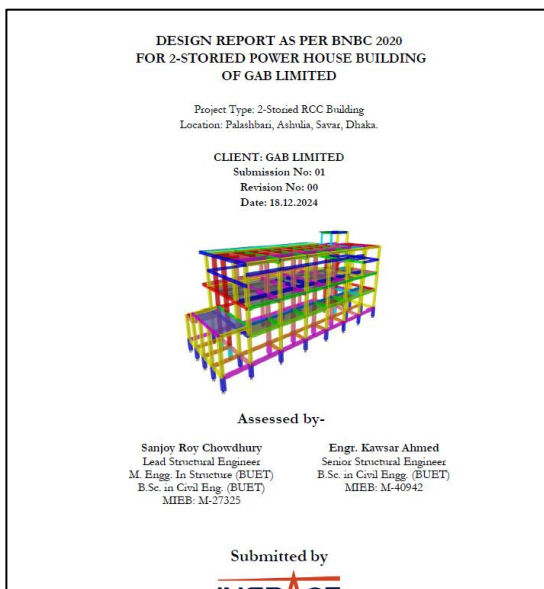
4. Observations

Observation-1: Prepared DEA report needs to be reviewed against lateral forces (Building -5).



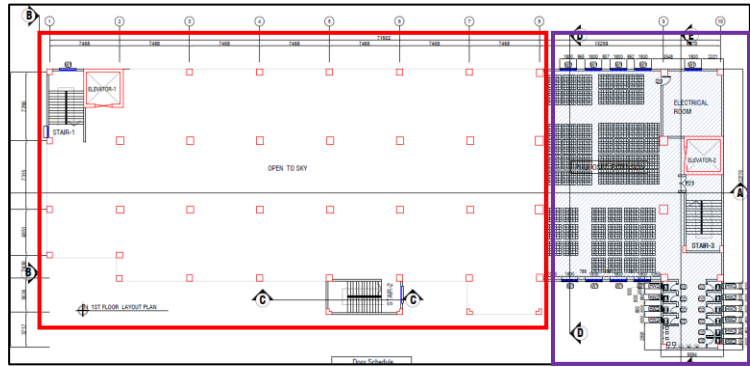
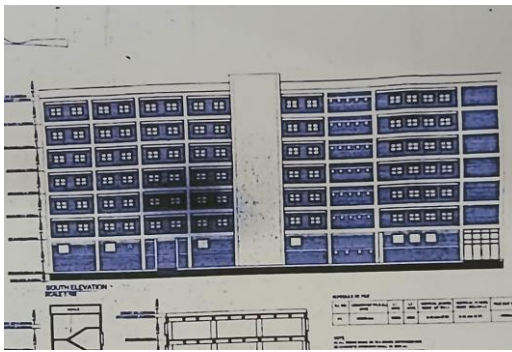
Description: A DEA report has been prepared for the two-storied Building 5. The prepared DEA report needs to be reviewed against lateral forces. Building engineer is required to submit the DEA report to the RSC for detailed review.

Observation-2: Prepared design report needs to be reviewed against lateral forces (Building -6).



Description: A design report has been prepared for the three-storied Building 6. The prepared design report needs to be reviewed against lateral forces. Building engineer is required to submit the design report to the RSC for detailed review.

Observation-03: Possible vertical and horizontal extension. (Building 07).



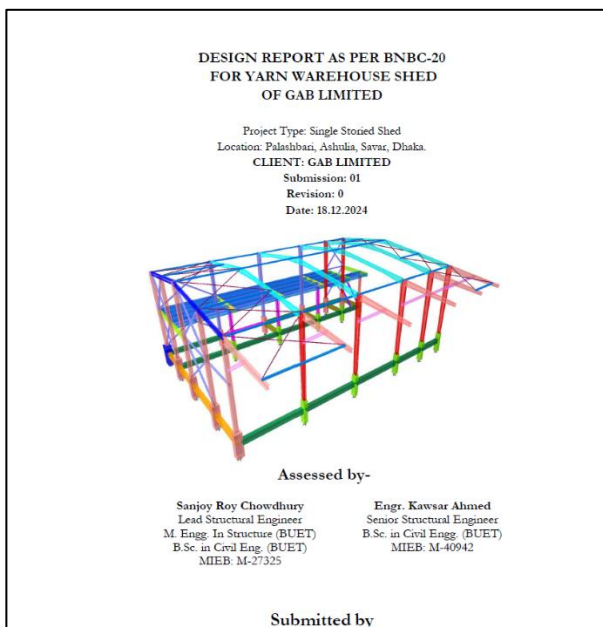
Approval from local authority

Proposed layout showing future extension

Description: The building has permit drawings for 7 storied, and currently, this is a single-storied. During the inspection, the proposed drawing with the design report was available on site, considering future vertical and horizontal extension.

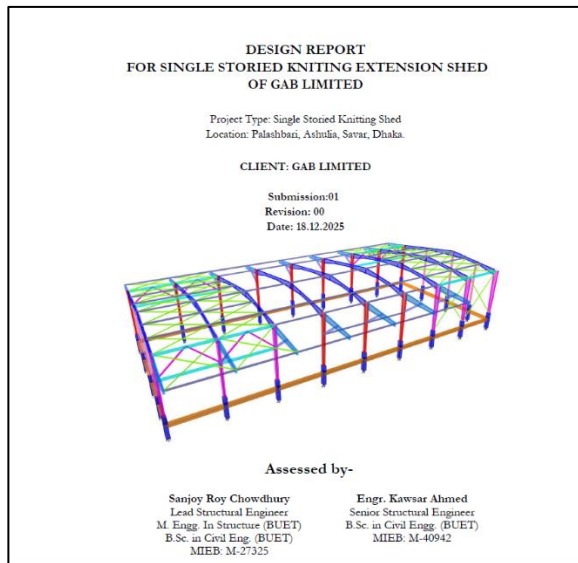
Building engineer is required to submit the prepared Design report to RSC for review prior to conducting any vertical and horizontal extension.

Observation-4: Prepared design report needs to be reviewed against lateral forces (Shed -7).



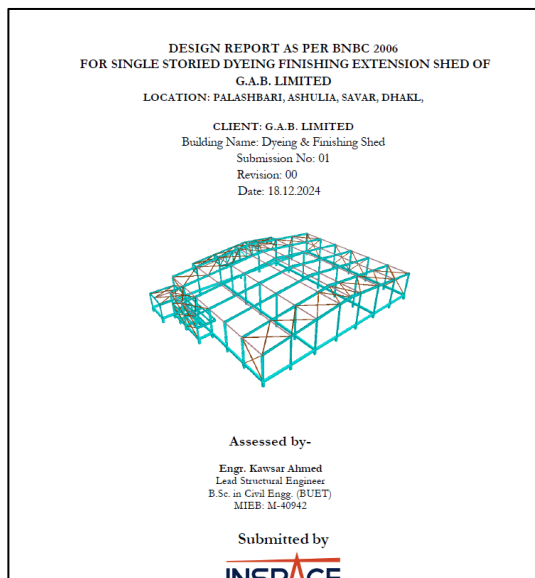
Description: A design report has been prepared for the single-storied Shed 7. The prepared design report needs to be reviewed against lateral forces. Building engineer is required to submit the design report to the RSC for detailed review.

Observation-5: Prepared design report needs to be reviewed against lateral forces (Shed -8).



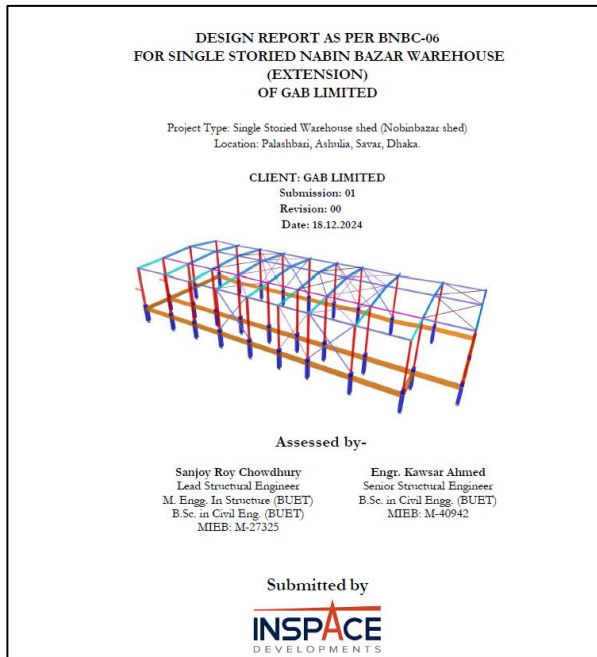
Description: A design report has been prepared for the single-storied Shed 8. The prepared design report needs to be reviewed against lateral forces. Building engineer is required to submit the design report to the RSC for detailed review.

Observation-6: Prepared design report needs to be reviewed against lateral forces (Shed-9).



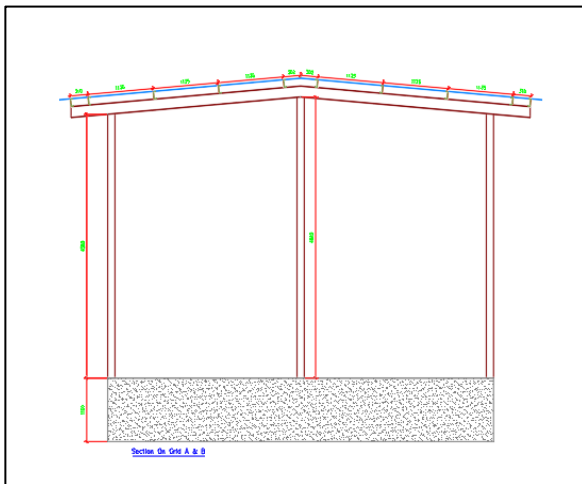
Description: A design report has been prepared for the single storied Shed 8. The prepared design report needs to be reviewed against lateral forces. Building engineer is required to submit the design report to the RSC for detailed review.

Observation-7: Prepared design report needs to be reviewed against lateral forces (Shed -10).



Description: A design report has been prepared for the single-storied Shed 8. The prepared design report needs to be reviewed against lateral forces. Building engineer is required to submit the design report to the RSC for detailed review.

Observation-8: Inadequate as-built drawings (Shed 11)



Description: In the available as-built drawing, only superstructure details were available. However, no structural details of the substructure, including the foundation and underground water reservoir, were available. The building engineer is required to update the drawing based on the as-constructed structure.

Observation-9: Incomplete lateral stability system. (Shed 11)



Description: During the inspection, no load transfer media along the long direction was observed. So, lateral stability in the long direction is incomplete. The building engineer is required to check the stability system as part of the EA for the existing structure.

5. Action Plan

Observation	Action Plan	Timeline
Prepared DEA report needs to be reviewed against lateral forces (Building -5).	The building engineer is required to submit the DEA report to RSC for review against lateral forces.	within 6 weeks
	Carry out remedial work if required.	within 6 months
	Continuing to implement the load plan	within 6 months
Prepared design report needs to be reviewed against lateral forces (Building -6).	The building engineer is required to submit the design report to RSC for review against lateral forces.	within 6 weeks
	Carry out remedial work if required.	within 6 months
	Continuing to implement the load plan	within 6 months
Possible vertical and horizontal extension. (Building 07).	The Building engineer is required to submit the prepared Design report to RSC for review prior to conducting any vertical and horizontal extension.	within 6 weeks
	Carry out remedial work if required.	within 6 months
Prepared design report needs to be reviewed against lateral forces (Shed -7).	The building engineer is required to submit the design report to RSC for review against lateral forces.	within 6 weeks
	Carry out remedial work if required.	within 6 months
	Continuing to implement the load plan	within 6 months
Prepared design report needs to be reviewed against lateral forces (Shed -8).	The building engineer is required to submit the design report to RSC for review against lateral forces.	within 6 weeks
	Carry out remedial work if required.	within 6 months
Prepared design report needs to be reviewed against lateral forces (Shed -9).	The building engineer is required to submit the design report to RSC for review against lateral forces.	within 6 weeks
	Carry out remedial work if required.	within 6 months
Prepared design report needs to be reviewed against lateral forces (Shed -10).	The building engineer is required to submit the design report to RSC for review against lateral forces.	within 6 weeks
	Carry out remedial work if required.	within 6 months
Inadequate as-built drawings. (Shed 11).	The building engineer is required to survey the full structure and produce accurate as-built drawings.	within 6 weeks
Incomplete lateral stability system. (Shed 11)	The building engineer is required to check the stability system of the existing structure.	within 6 weeks
	Implement remediation work if required.	within 6 months

Survey Limitations and Assumptions

This report is for the private and confidential use of RSC for whom it was prepared together with their professional advisors as appropriate. It should not be reproduced in whole or in part or relied upon by third parties for any use without the express written permission of RSC.

This report can be used in discussion with the supplier or factory owner as a means to rectify or address any observations made. The report is not comprehensive and is limited to what could be observed during a visual inspection of the building.

This Report is not intended to be treated as a generalized inspection and does not cover the deterioration of structural members through dampness, fungal or insect attack, nor does it deal with problems and defects of a non-structural nature. Other non-structural aspects of the building such as fire safety have not been assessed in this survey.

Except as otherwise noted, drains and other services were not viewed or tested during our inspection and are therefore similarly excluded from this Report. We have not inspected any parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.

External inspection of the façade walls has generally been carried out from ground level only by visual sighting. No opening up works were carried out (except as noted) and we rely on the Architects and Engineers drawings provided to us for our views on concealed parts of the structure and in particular foundations. Strengths of materials and components are untested and we recommend that the factory owners Building Engineer carries out in situ testing over and above those suggested to satisfy themselves with the material strengths and component details.

Recommendations, where given, are for the purpose of providing indicative advice only, are not exhaustive, relate solely to identifying key and obvious structural defects as identified in this presentation, and do not take the form of or constitute a specification for works. We take no responsibility for the works as constructed. This report does not interfere with the factory owners Building Engineers responsibility for the structural performance of this building, The Building Engineer remains fully responsible for the structural adequacy of the building.

This report does not comment in detail on the future seismic performance of the building and only highlights the fact that the building may experience significant damage or collapse in a seismic event along with many others in the Dhaka region.

The observations in this report are based on the Engineering Judgement of the lead surveyor/engineer at the time of the survey. We assume in making these observations that no covering up of faults defects, filling or plastering over cracking or significant repair work has been carried out by the building owner. Any future alteration or additional work by the building owner will void this report.