

Union Label & Accessories Ltd.

Baniarchala, Bhabanipur, Gazipur Sadar, Gazipur.

(24.153059, 90.420532)

10 April 2023, 14 May 2023 & 06 June 2023



Building information

Main Shed (B-1): The structure is two storied (G+1) prefabricated steel shed building.

Auto Carton Shed (B-2): The structure is single storied (G+Mz) steel shed with a mezzanine floor divided into three parts (main Shed, boiler shed and extension).

Bonded Warehouse Shed-1 (B-3): The structure is single storied prefabricated steel shed.

Manual Cartoon Shed-1 (B-4): The structure is single storied prefabricated steel shed.

Utility Building (B-5): The structure is partially two storied RC building.

Bonded Warehouse Shed-2 (B-6): The structure is single storied prefabricated steel shed.

Bonded Warehouse Shed-3 (B-7): The structure is single storied prefabricated steel shed.

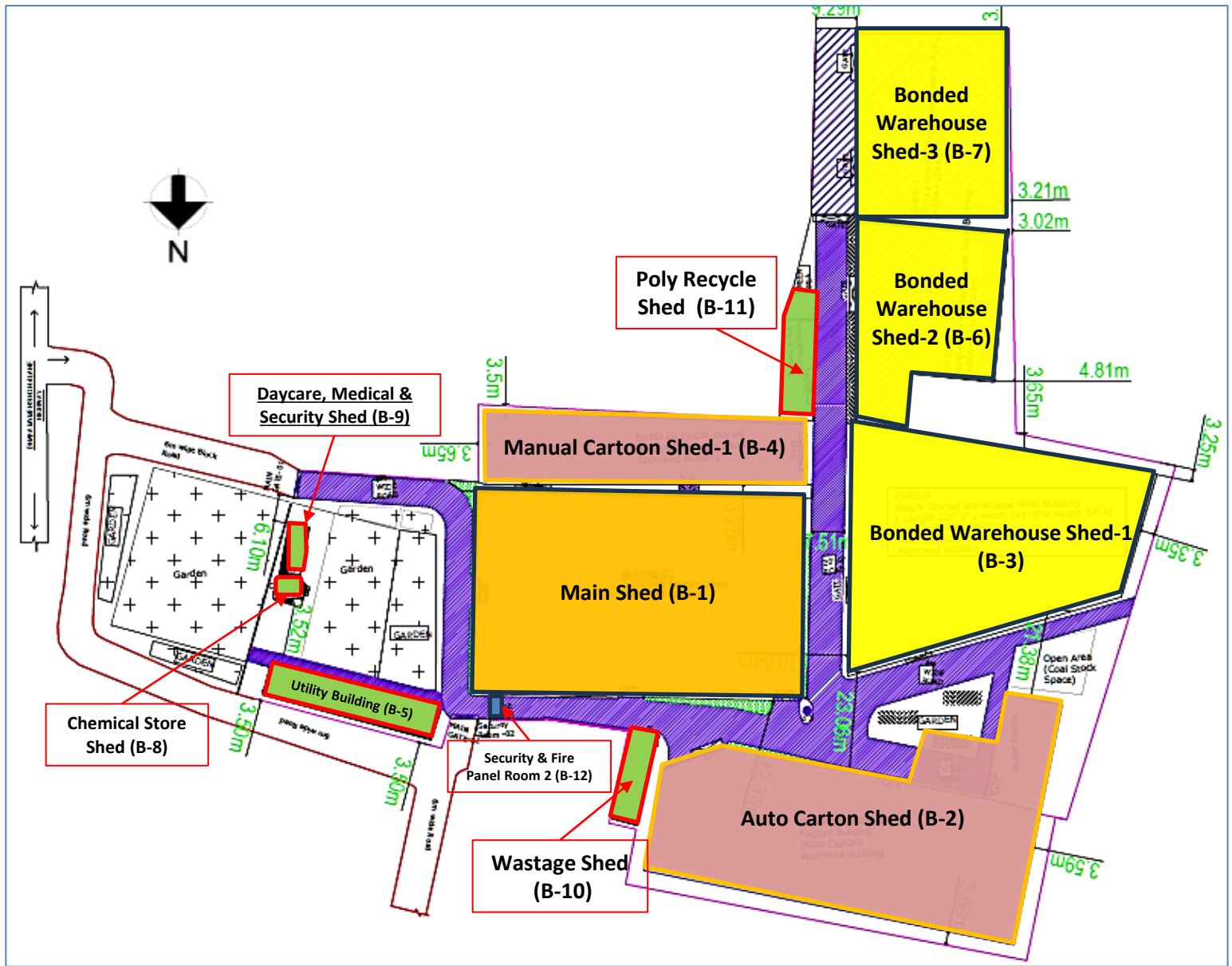
Chemical Store Shed (B-8): The structure is one storied prefabricated steel shed.

Daycare, Medical & Security Shed (B-9): The structure is single storied steel shed.

Wastage Shed (B-10): The structure is single storied steel truss shed.

Poly Recycle Shed (B-11): The structure is single storied steel truss shed.

Security & Fire Panel Room 2 (B-12): The structure is single storied RC building.



Union Label & Accessories Ltd– Site Layout Plan

Observations

Lack of information in as-built drawings

In the provided as-built drawing no details were found for the jack beam, tie beam and strut member. On the other hand, flange bracing were found missing on grid 11, 12, 13. The building engineer is required to update the drawings providing the details of all structural member.



Rafter without flange bracing



Strut and bracing



Jack Beam

Observation: Main Shed (B-1)

Incomplete Retrofitting work

As per the recommendation of prepared EA the factory carried out the retrofitting work except the grid 11, 12 and 13. Additional flanges were not fully added to the rafter of grid 11, 12 and 13.

11. Conclusion:

- Several steel members are found inadequate against imposed loading.
- The structure is not stable against lateral loading.
- Foundations are found adequate against imposed loading.
- RC beam columns have been found adequate against imposed loading.

12. Recommendation

1. New bracings should be added as per retrofit drawing to provide lateral stability.
2. New flange brace to be added as per drawing.
3. New tie beams are to be installed as per retrofit drawing
4. Several steel members will be retrofit as per provided retrofit drawing.

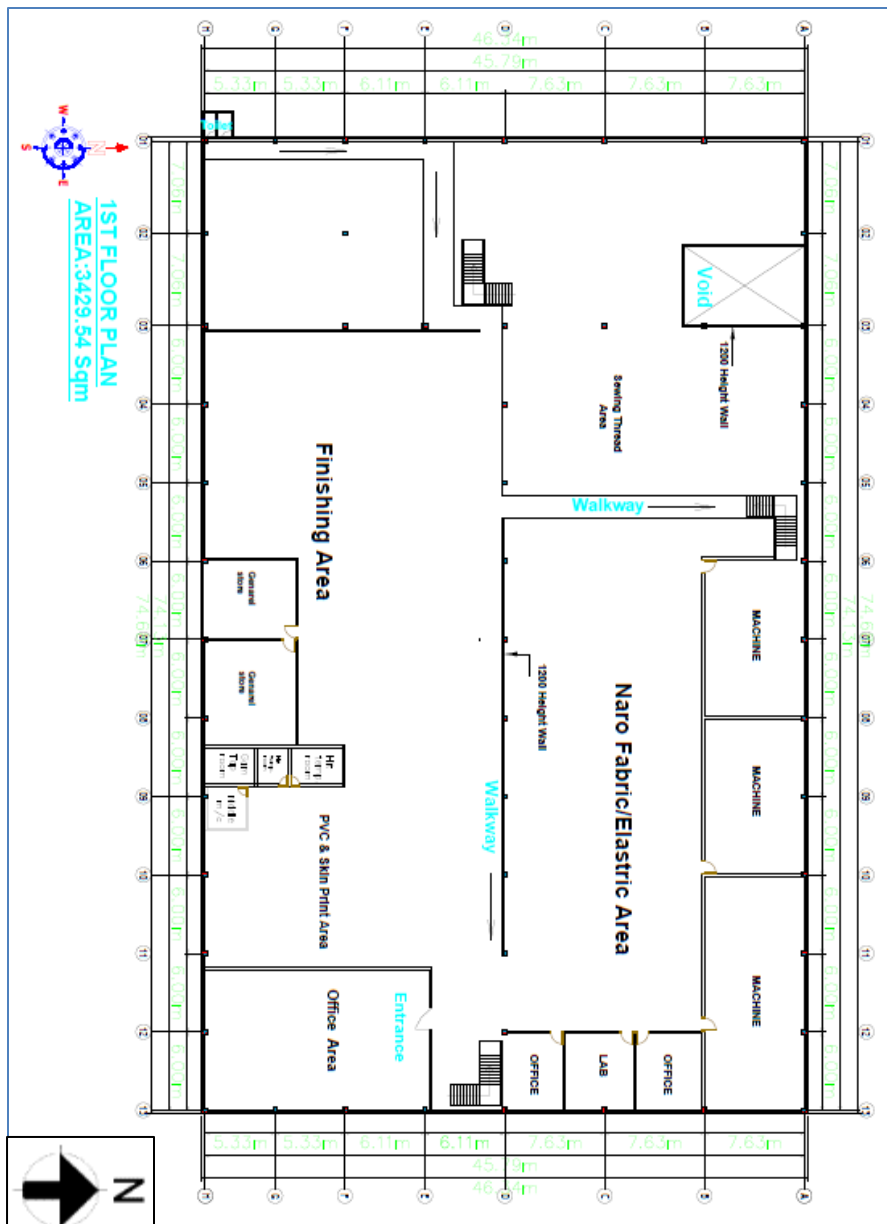
DEA Report



Rafter of grid 13

Prepared EA required to revise as per updated drawings and submit along with retrofitting drawings to RSC. Remedial works must be carried after getting acceptance of EA from RSC.

Vibration at first floor



Floor Plan

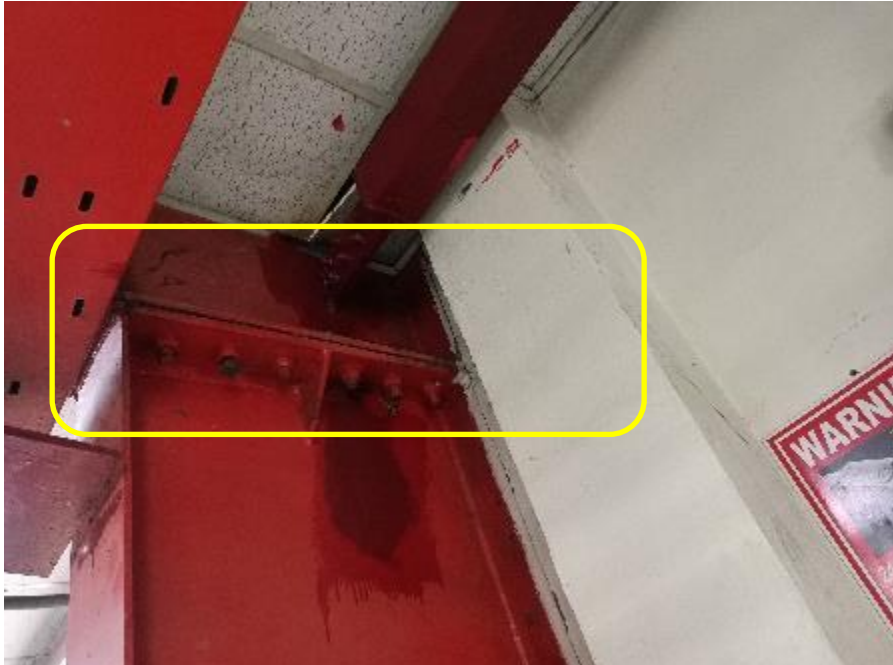


Vibration observed at the first floor

During inspection, significant vibration was observed at the first floor of the Main Shed due to the spinning machine's operation. Building engineer is required to measure the vibration and to investigate whether the vibration is impacting the structure or not and to take proper measure accordingly.

Significant connection gap and loose bracing

Significant gaps were observed in Rafter-column joint at several locations. Also, loose cable bracings were found. Building engineer is required to carry out suitable remedial works for the gap and tighten the loose bracing where necessary.



Gap observed in connections



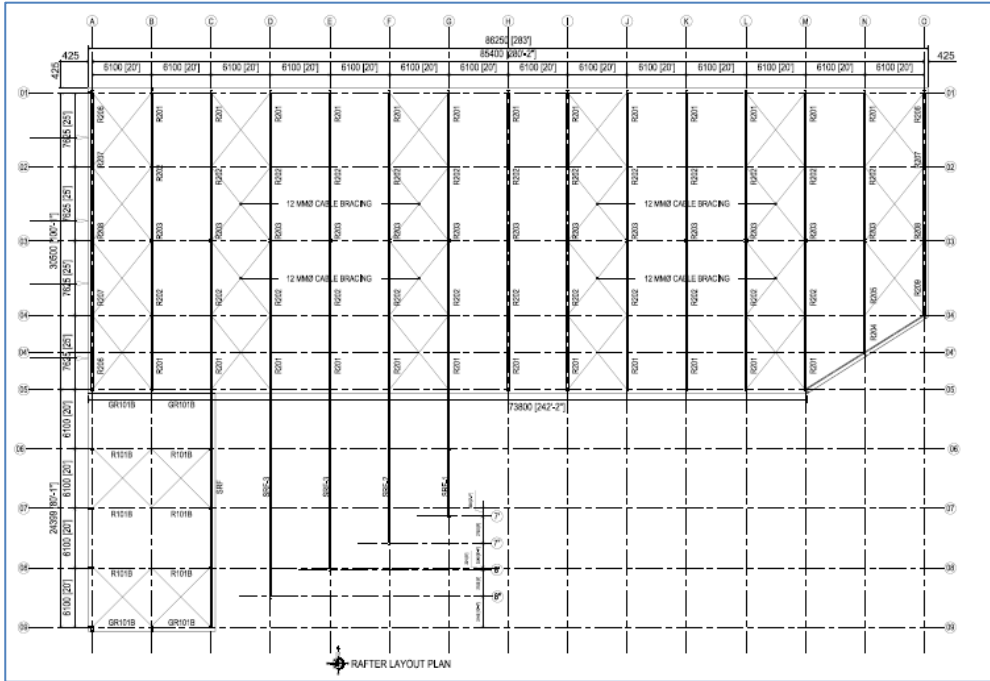
Loose cable bracing

Lack of information & mismatch in as-built drawings

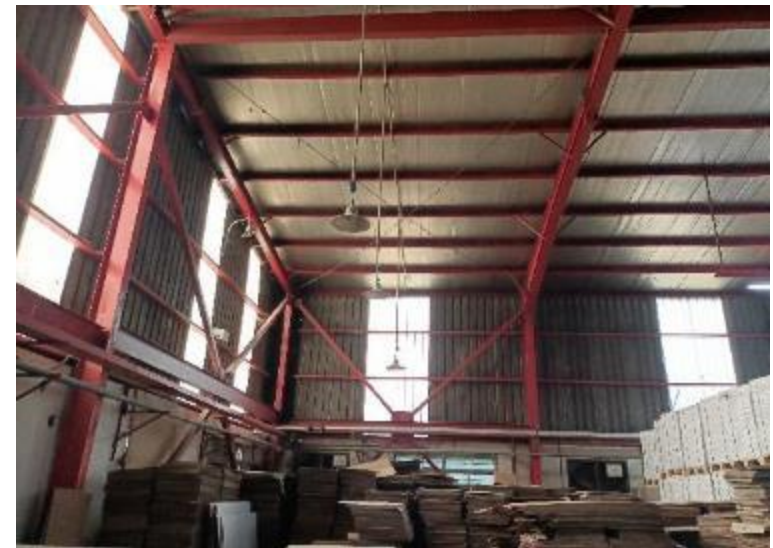
Sectional details of Grid D, E, F & G and corbel beam details were found missing in the provided as-built drawings. On the other hand, bracing layout were not matched with the as-built condition. The building engineer is required to update the drawings providing the details of all structural member.



Corbel beam



Rafter without flange bracing

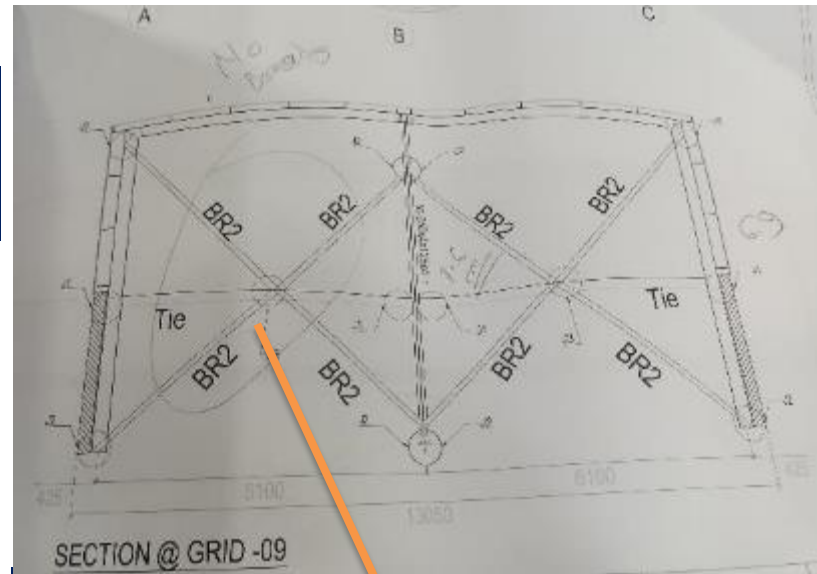


Bracings

Observation: Auto Carton Shed (B-2)

Incomplete stability system

Vertical bracings were found missing at southside of the shed. On the other hand, compression strut were not observed at south part of the shed.



Bracing details



No-compression strut

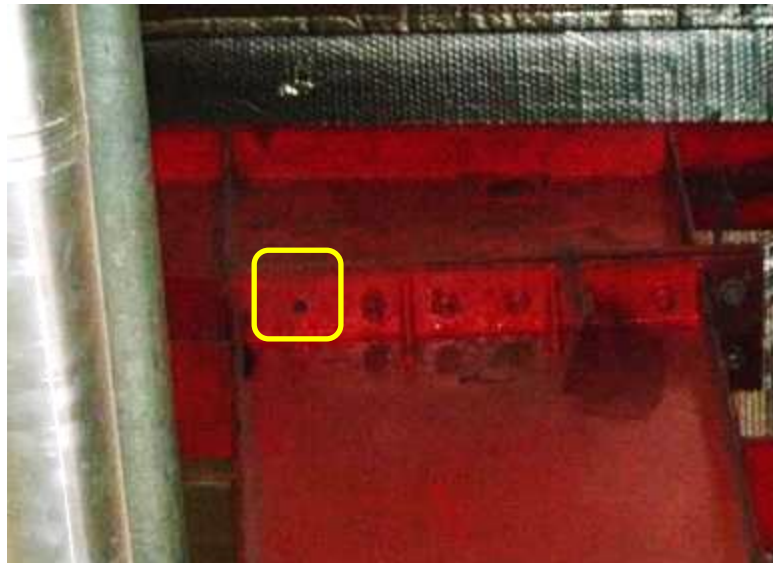


Missing bracings

Observation: Auto Carton Shed (B-2)

Connection gap and bolt missing

Significant gaps observed in column-bracing joint at several locations. Also, bolt missing found in rafter-column joint. Building engineer is required to carry out suitable remedial works for the connection gap and install the missing bolt.



Gap observed in connections

Bolt missing

Incomplete lateral stability system

Observation: Bonded Warehouse Shed 1 & 2 (B-3 & 6)

Roof and wall bracing are provided but load transfer media is not provided along long direction for this shed. Therefore, lateral stability system of the shed is apparently incomplete. Building engineer is required to check the lateral stability of the structure.



Bonded Warehouse-2



Bonded Warehouse-1

No load transfer media is provided along long direction
Bonded Warehouse 1 & 2

Observation: Bonded Warehouse-1 & 2 (B-3 & 6)

Columns susceptible to vehicle impact



Effected Column

Sign of damage due to vehicle impact on steel column. Impact protection not provided to columns at floor area of Bonded Warehouse-1. Columns are susceptible to impact loading from vehicles.



Effected Column

Connection gap at joint

Significant gaps observed in Rafter-column joint at several locations. Building engineer is required to carry out suitable remedial works.



Gap observed in connections
Bonded Warehouse -1



Gap observed in connections
Bonded Warehouse -2

Retrofitting design requires detail review

The factory conducted retrofitting with some irregular sections which are modeled with equivalent sections in the analysis software. During inspection Engineering Assessment (EA) report was available onsite. The factory is required to submit the EA report to the RSC for detail review.

Zone co-efficient, $Z = 0.2$

Seismic force resisting system-

Ordinary Steel Moment frames

Response modification co-efficient, $R = 6$ (OMRF Steel, Table 6.2.24, BNBC)

Ordinary RCC Moment frames

Response modification co-efficient, $R = 5$ (OMRF RCC, Table 6.2.24, BNBC)

Site coefficient, $S = 1.5$

3. Material Strength:

3.1 Concrete strength:

2370 psi is used as concrete strength for all RCC members as no core was taken.

3.2. Steel rebar strength:

60,000 psi is considered in analysis of steel reinforcement for all buildings.

3.3 Steel member material strength:

50,000 psi is considered in analysis of steel strength for all buildings. Steel material strength is confirmed by test. Test report attached in appendix.

DEA Report



Manual Carton Shed

Moreover, in the provided design report material specification (no test report steel plate), details calculation of wind and other input values are not mentioned. Before submitting the EA, the factory is required to incorporate the all the issues in revised EA.

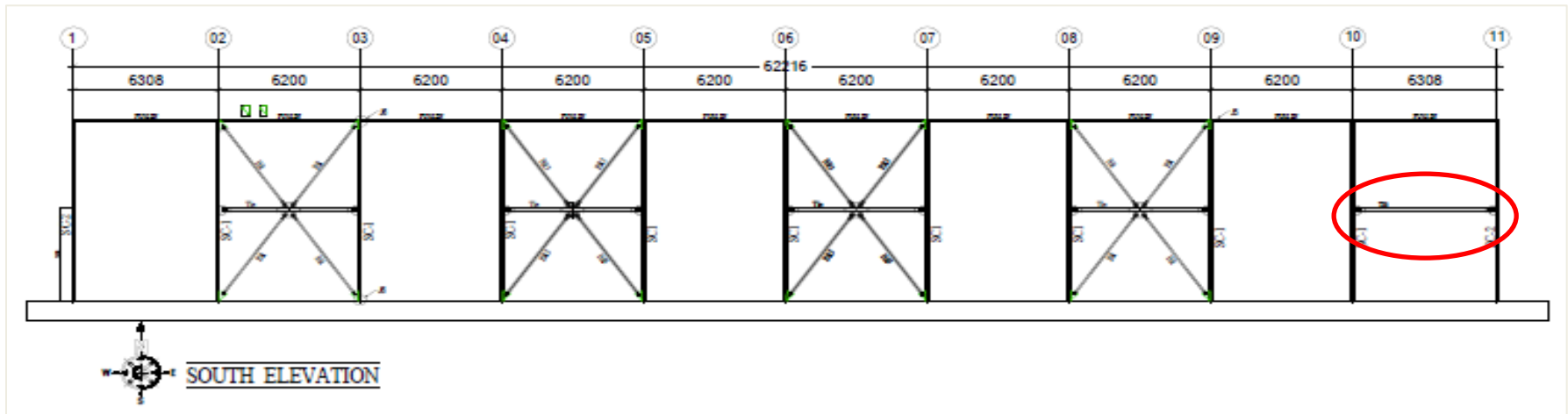
Observation: Manual Carton Shed (B-4)

Tie Beam missing

Steel tie beams were found missing at east side of Shed as per the retrofitting drawing. Building engineer is required to install the missing bracing as per the accepted drawings.

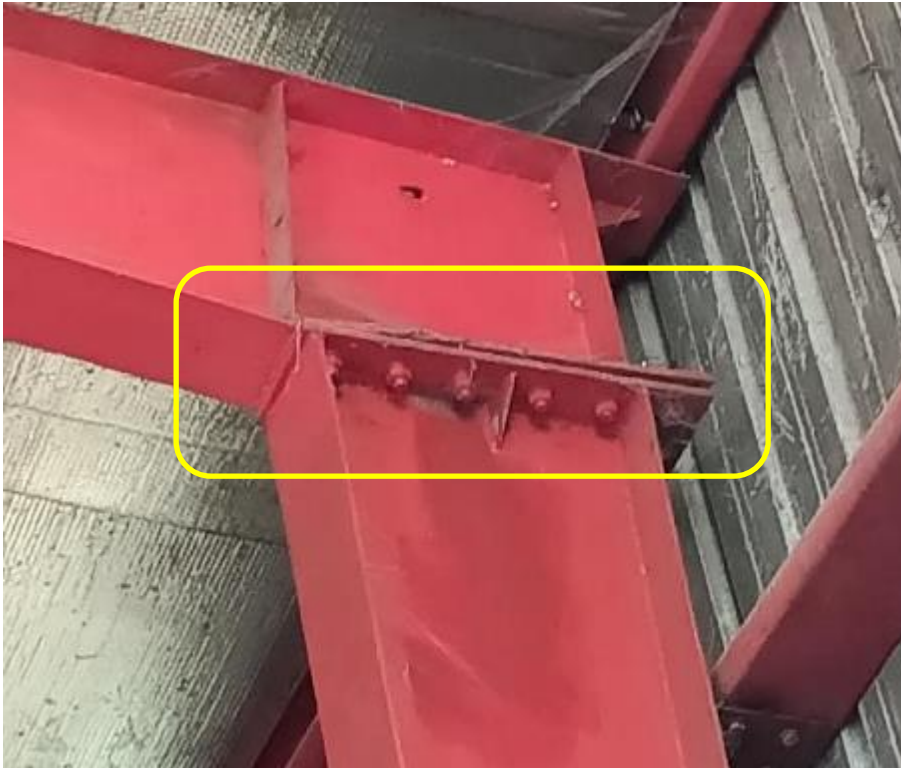


Missing tie beam



Significant connection gap

Significant gaps observed in Rafter-column joint at several locations. Building engineer is required to carry out suitable remedial works.



Gap observed in connections



Gap observed in connections

Absence of design documents



As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2, part-6 of BNBC. At the time of inspection, only as-built drawings were available, but no design report was available which are required to be prepared in compliance with section 1.9.1.1 (part-6, BNBC).

No design report was available for Utility Building

Observation: Utility Building (B-5)

Lack of design documents



As per BNBC, every building or structure designed shall have its design documents prepared in accordance with the provision of Section 1.9.1. The design document shall include a design report, and a set of structural drawings, which shall be prepared in compliance with section 1.9.1.1 and section 1.9.1.2, part-6 of BNBC. At the time of inspection, only as-built drawings were available, but no design report was available which are required to be prepared in compliance with section 1.9.1.1 (part-6, BNBC).

No design report was available for Bonded Warehouse 3

Observation: Bonded Warehouse 3 (B7)

Lack of lateral stability system



No load transfer media is provided along long direction

Only roof bracings are provided but load transfer media is not provided along long direction for this shed. Therefore, lateral stability system of the shed is apparently incomplete. Building engineer is required to check the lateral stability of the structure.

Apparently inadequate connection

Apparently Inadequate structural member, poor connection details were found. Building engineer is required to check the adequacy of the steel members & connection for uplift and lateral forces otherwise replace with engineered structure.



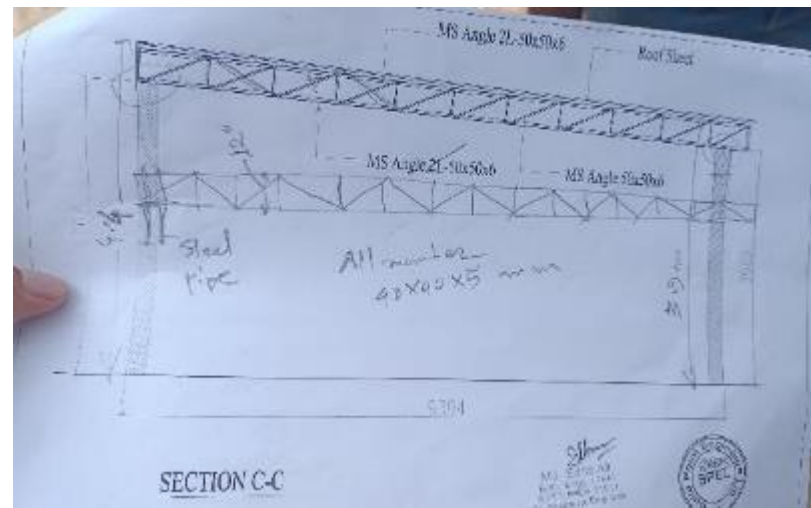
Apparently inadequate connection

Mismatch in as-built drawings

Type of truss, member details and support conditions were not matched with as-built condition. The factory engineer is required to survey the whole structure and prepare full set of as-built drawing in compliance in compliance with section 1.9.1.2, part-6 of BNBC.



Truss section



Provided sectional details

Observation: Wastage Shed (B-10)

Apparently inadequate connection on truss



Truss connection with Steel column



Truss connection with steel column

Apparently inadequate connection between truss and Steel pipe column was observed. On other hand connection details or proper drawings were not found on site. The building engineer is required to check the connection adequacy of the truss against uplift force of wind.

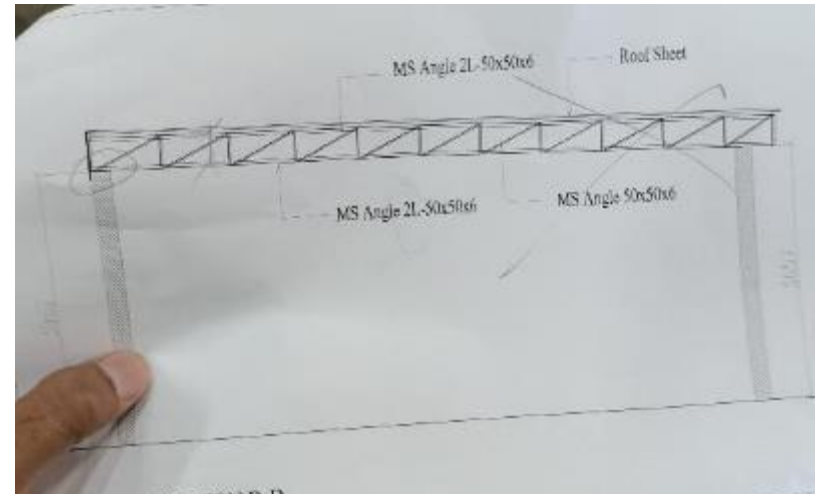
Observation: Wastage Shed (B-10)

Lack of drawing for steel part



Inside of Poly Recycle Room

Proper as-built drawing was not available for the Poly Recycle Room. Only a section and elevation was provided for the shed but not matched with the onsite condition.



Provided sectional details

The building engineer is required to survey the whole structure and prepare full set of as-built drawing in compliance in compliance with section 1.9.1.2, part-6 of BNBC.

Observation: Poly Recycle Room (B-11)

Apparently inadequate connection



Truss connection with RC column



Truss connection with RC column

Apparently inadequate connection between truss and RC column was observed. On other hand connection details or proper drawings were not found on site. The building engineer is required to check the connection adequacy of the truss against uplift force of wind.

Observation: Poly Recycle Room (11)

Lack of drawing

No drawings were found for the Security & Fire Pannel Room 2. The factory engineer is required to survey the whole structure and prepare full set of as-built drawing in compliance in compliance with section 1.9.1.2, part-6 of BNBC.



Inside of Security and Fire Pannel Room 2



Security and Fire Pannel Room 2

Observation: Security & Fire Pannel Room 2 (B-12)

Priority Actions

Problems Observed

Building-01: Manual Shed

Item 01: Lack of information in as-built drawings.

Item 02: Incomplete Retrofitting work.

Item 03: Vibration at first floor.

Item 04: Significant connection gap and loose bracing.

Building-02: Auto Carton Shed

Item 05: Lack of information & mismatch in as-built drawings.

Item 06: Incomplete stability system.

Item 07: Connection gap and bolt missing.

Building-03 & 06: Bonded Warehouse Shed 01 & 02

Item 08: Incomplete lateral stability system.

Item 09: Columns susceptible to vehicle impact. (B-3)

Item 10: Connection gap at joint.

Problems Observed (Continue)

Building-04: Manual Shed

Item 11: Retrofitting design requires detail review.

Item 12: Tie Beam missing.

Item 13: Significant connection gap.

Building-05: Utility Building

Item 14: Absence of design documents.

Building-07: Bonded Warehouse Shed 03

Item 15: Lack of design documents.

Shed-08: Chemical Store Shed

Item 16: Lack of lateral stability system.

Shed-09: Daycare, Medical & Security Shed

Item 17: Apparently inadequate connection.

Problems Observed (Continue)

Building-10: Wastage Shed

Item 18: Mismatch in as-built drawings

Item 19: Apparently inadequate connection on truss.

Building-11: Poly Recycle Room

Item 20: Lack of drawing for steel part.

Item 21: Apparently inadequate connection.

Building-12: Security & Fire Pannel Room 2

Item 22: Lack of drawing.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Lack of information in as-built drawings. (Main Shed)	Building engineer is required to prepare a full set of structural drawings in compliance with section 1.9.1.2, part-6 of BNBC and submit to RSC for review.	6-weeks
02	Lack of lateral stability. (Main Shed)	Review the requirement of retrofitting suggest on Engineering Assessment (EA) by RSC.	6-weeks
03	Lack of lateral stability. (Main Shed)	Complete the remedial works where necessary after getting acceptance from RSC.	6-months
04	Vibration at ground floor. (Main Shed)	Building engineer is required to measure the vibration and to investigate whether the vibration is impacting the structure or not.	6-weeks
05	Vibration at ground floor. (Main Shed)	Complete implementation of any remedial works.	6-months
06	Significant connection gap and loose bracing. (Main Shed)	Building engineer is required to repair the gap in connections with a suitable method.	6-weeks
07	Significant connection gap and loose bracing. (Main Shed)	Tighten the loose bracing where necessary.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
08	Lack of information in as-built drawings. (Auto Cartoon Shed)	Building engineer is required to prepare a full set of structural drawings in compliance with section 1.9.1.2, part-6 of BNBC and submit it to RSC for review.	6-weeks
09	Incomplete stability system. (Auto Cartoon Shed)	Building engineer is required to check the lateral stability of the structure.	6-weeks
10	Incomplete stability system. (Auto Cartoon Shed)	Implement remediation work if required.	6-months
11	Connection gap and bolt missing. (Auto Cartoon Shed)	Building engineer is required to repair the gap in connections with a suitable method.	6-weeks
12	Connection gap and bolt missing. (Auto Cartoon Shed)	Install the missing bolt where necessary.	6-weeks
13	Incomplete lateral stability system. (Bonded Warehouse Shed 1 & 2)	Building engineer is required to check the lateral stability of the structure.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
14	Incomplete lateral stability system. (Bonded Warehouse Shed 1 & 2)	Implement remediation work if required.	6-months
15	Columns susceptible to vehicle impact. (Bonded Warehouse Shed 1)	Install a barrier to prevent vehicle impact in column.	6-weeks
16	Columns susceptible to vehicle impact. (Bonded Warehouse Shed 1)	Repair the damaged column as per recommendation by factory engineer.	6-weeks
17	Connection gap at joint. (Bonded Warehouse Shed 1 & 2)	Building engineer is required to repair the gap in connections with a suitable method.	6-weeks
18	Retrofitting design requires detail review. (Manual Carton Shed)	The factory is required to submit the Engineering Assessment (EA) to the RSC for detail review.	6-weeks
19	Retrofitting design requires detail review. (Manual Carton Shed)	Carry out remedial action if required.	6-months
20	Tie beam missing. (Manual Carton Shed)	Install the missing tie beam as per drawing after getting acceptance from RSC.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
21	Significant connection gap. (Manual Carton Shed)	Building engineer is required to repair the gap in connections with a suitable method.	6-weeks
22	Absence of design documents. (Utility Building)	Building engineer is required to prepare the design documents including a design report, and a set of structural drawings in compliance with section 1.9.1.1 and section 1.9.1.2, part-6 of BNBC and submit it to RSC for review.	6-weeks
23	Absence of design documents. (Utility Building)	Carry out remedial works (if any) after reviewed by the RSC.	6-months
24	Lack of design documents. (Bonded Warehouse Shed-3)	Building engineer is required to prepare the design documents including a design report, and a set of structural drawings in compliance with section 1.9.1.1 and section 1.9.1.2, part-6 of BNBC and submit it to RSC for review.	6-weeks
25	Lack of design documents. (Bonded Warehouse Shed-3)	Carry out remedial works (if any) after reviewed by the RSC.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
26	Lack of lateral stability system. (Chemical Store Shed)	Building engineer is required to check the lateral stability of the structure.	6-weeks
27	Lack of lateral stability system. (Chemical Store Shed)	Implement remediation work if required.	6-months
28	Apparently inadequate connection. (Daycare, Medical & Security Shed)	Building engineer is required to check the adequacy of the structural members against the gravity & lateral forces or replace with the engineered one.	6-weeks
29	Apparently inadequate connection. (Daycare, Medical & Security Shed)	Building engineer is required to check the connection adequacy for uplift forces.	6-weeks
30	Apparently inadequate connection. (Daycare, Medical & Security Shed)	Carry out necessary remedial works where necessary.	6-months
31	Mismatch in as-built drawings. (Wastage Shed)	Building engineer is required to prepare a full set of structural drawings in compliance with section 1.9.1.2, part-6 of BNBC and submit it to RSC for review.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
32	Apparently inadequate connection on truss. (Wastage Shed)	Building engineer is required to check the connection adequacy for uplift forces as part of EA otherwise replace with well designed structure.	6-weeks
33	Apparently inadequate connection on truss. (Wastage Shed)	Implement remediation work where required.	6-months
34	Lack of drawing for steel part. (Poly Recycle Shed)	Building engineer is required to prepare a full set of structural drawings in compliance with section 1.9.1.2, part-6 of BNBC and submit it to RSC for review.	6-weeks
35	Apparently inadequate connection. (Poly Recycle Shed)	Factory is required to carry out the Engineering Assessment (EA) to check connection adequacy against the uplift force.	6-weeks
36	Apparently inadequate connection. (Poly Recycle Shed)	Carryout remedial work if required.	6-months
37	Lack of drawing. (Security & Fire Pannel Room 2)	Building engineer is required to prepare a full set of structural drawings in compliance with section 1.9.1.2, part-6 of BNBC and submit it to RSC for review.	6-weeks