Jamuna Apparels Ltd. (Extension Buildings)

94/95 (Old), 46 (New), Block - C, Tongi Industrial Area, Tongi
(23.900612, 90.400296)
27th Sept 2021

RSC RMG SUSTAINABILITY COUNCIL

Buildings Information

1. Building-2 (Electrical Substation & Generator) (single storied)
2. Building-3 (Pump House Building) (B+G+1)
3. Building-4 (Toilet for security Employee) (single storied)
4. Shed-1 (single storied)
5. Shed-2 (G+1)
6. Shed-3 (single storied)
7. Shed-4 (G+1)
8. Shed-5 (single storied)
9. Shed-6 (single storied)
10. Shed-7 (single storied)
11. Shed-8 (single storied)
12. Shed-9 (single storied)
13. Shed-10 (single storied)
14. Shed-11 (single storied)
15. Shed-12 (single storied)

Observations

Foundation adequacy to be carried out

Observations: (Building-2, Building-3, Shed-1, Shed-2)

Building-2

Building-3

Shed-1

Shed-2

No geotechnical investigation report was provided for those aforementioned structures. Factory engineer is required to carry out foundation adequacy check for all of these structures by confirming foundation size, thickness and geotechnical investigation report.

Observations: (Building-2, Building-3, Shed-1, Shed-2)

Lack of lateral stability

Observations: (Shed-1, Shed-2, Shed-5, Shed-9)

No compression member/load transfer media provided along long direction

Roof and vertical bracings are provided in some bays but there is no compression member/load transfer media provided along the long direction therefore load path along the long direction is incomplete. Factory engineer is required to check the lateral stability of this shed.

Observations: Shed-1

No compression member/load transfer media provided along long direction

Roof and vertical bracings are provided in some bays but there is no compression member/load transfer media provided along the long direction therefore load path along the long direction is incomplete. Factory engineer is required to check the lateral stability of this shed.

Observations: Shed-2

No framing/bracing system/load transfer media provided along long direction

Lateral stability is provided by truss frame action only along the short direction but there is no framing/bracing system/load transfer media provided along the long direction to transfer the lateral load therefore there is no obvious lateral stability system along long direction. In addition, details of truss connection to brick wall is not provided in the drawing. Factory engineer is required to check the lateral stability of this shed. Also, check the connection adequacy for all steel connections.

Observations: Shed-5 (Child Care part)

No framing/bracing system/load transfer media provided along long direction

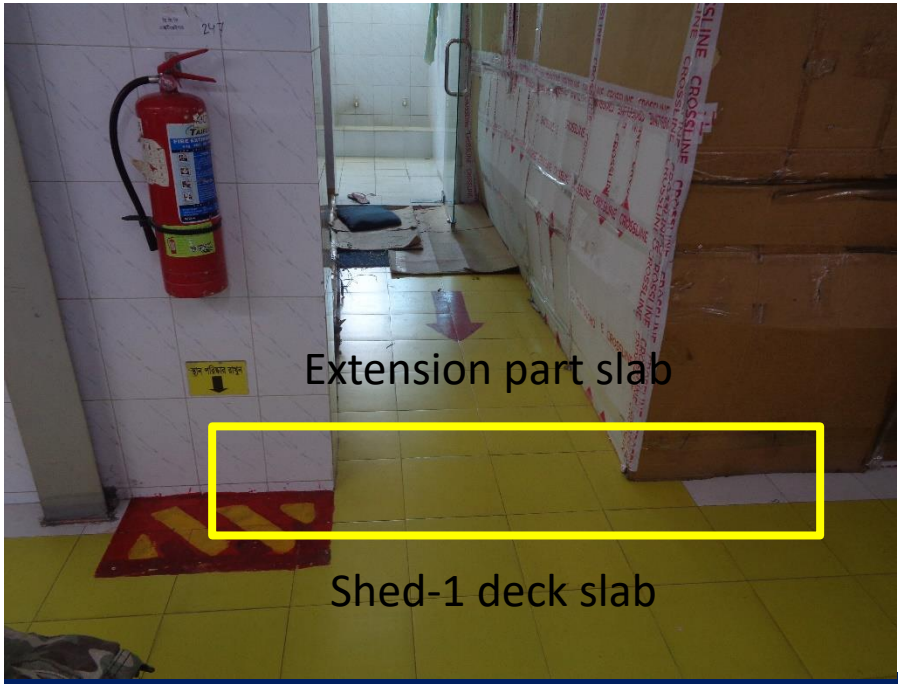
Lateral stability is provided by truss frame action only along the short direction but there is no framing/bracing system/load transfer media provided along the long direction to transfer the lateral load therefore there is no obvious lateral stability system along long direction. In addition, details of truss connection to brick wall is not provided in the drawing. Factory engineer is required to check the lateral stability of this shed. Also, check the connection adequacy for all steel connections.

Observations: Shed-9

Undocumented extension

Observation: Shed-1

Undocumented extension



Connected slab

An undocumented extension found at south side of Shed-1 which is a multistoried masonry structure, and slab is structurally connected with the deck slab of shed-1 (Mezzanine floor). Factory is required to review the design considering the extension.

Observation: Shed-1

Design report not fully comply with BNBC

Observation: Shed-3

Loadings of the buildings for the analysis.

1. Seismic Load: As per BNBC 2.5.6 Base Shear V= ZIC/R where Seismic Zone co-efficient Z = 0.15 for zone 2 for Gazipur, Importance factor I=1.0, C=1.25S/T^(2/3). S=1.5 T=Ct(hn)^(3/4) where Ct.=0. 073 in SI unit for structural moment resisting frame. R=6 for intermediate moment resisting frame.

2. Wind Load: As per BNBC 2.44.1 exposure category for this building is Exposure A. Sustain wind pressure,(Kn/m2) qz= CcCiCzVb2 where qz= Ci= importance factor=1.0. Cc= velocity to pressure conversion =47.2x10^(-6). Cz= height and exposure co-efficient. Vb= Basic wind speed=215 km/hr for Gazipur. Design wind pressure Pz= CgCpqz where Cg= Gust co-efficient taken from table 6.2.11 ,

4. Dead load:

Self weight and additional 5 psf gravity load on roof for CI sheet. Other framing load as per self weight.

3. Live load:

15 psf gravity load on the sheet roof

Loading parameters

For one no RC column

LOAD COMB 13 1.2DL+1.6LL
9 1.2 10 1.6

LOAD COMB 22 1.05DL+1.25LL+WX

LOAD COMB 23 1.05DL+1.25LL -WX

LOAD COMB 24 1.05DL+1.25LL +WZ

LOAD COMB 25 1.05DL+1.25LL -WZ

Load Combination consideration:

For steel structure at top floor AISC LRFD method has been considered for steel members

For all steel members

LOAD COMB 12 DL+LL
9 1.0 10 1.0

LOAD COMB 13 1.2DL+1.6LL
9 1.2 10 1.6

LOAD COMB 14 1.2DL+0.5LL+0.5LR+1.3WX
9 1.2 10 0.5 5 1.3

LOAD COMB 15 1.2DL+0.5LL+0.5LR+1.3-WX
9 1.2 10 0.5 6 1.3

LOAD COMB 16 1.2DL+0.5LL+0.5LR+1.3WZ
9 1.2 10 0.5 7 1.3

LOAD COMB 17 1.2DL+0.5LL+0.5LR+1.3-WZ
9 1.2 10 0.5 8 1.3

LOAD COMB 18 1.2DL+0.5LL+0.5LR+1.5EC
9 1.2 10 0.5 1 1.5

LOAD COMB 19 1.2DL+0.5LL+0.5LR+1.5-EC
9 1.2 10 0.5 2 1.5

LOAD COMB 20 1.2DL+0.5LL+0.5LR+1.5EZ
9 1.2 10 0.5 3 1.5

LOAD COMB 21 1.2DL+0.5LL+0.5LR+1.5-EZ
9 1.2 10 0.5 4 1.5

Load combinations

Details of wind and seismic loads calculation & consideration not provided in the design report. All the load combinations from BNBC part-6 are not considered in the Design Report. Also, stability check, and foundation adequacy check are not included in the design report. Factory engineer is required to include all load combinations, stability check for all structural members and update the design Report in compliance with the BNBC (section 1.9.1 of part-6).

Observation: Shed-3

Lack of as-built drawing

Observation: (Building-2, Shed-2 (RC part, steel stair), Shed-8)

Building-2

Shed-2 (RC part)

Shed-2 (Steel stair)

(Shed-8)

No as-built drawing was provided for those aforementioned structures. Factory engineer is required to prepare full set of as-built drawing for all of these structures.

Observation: (Building-2, Shed-2 (RC part, steel stair), Shed-8)

Apparently non engineered sheds

Observations: Shed-5 (Canteen part), Shed-6, Shed-7, Shed-10, Shed-11, Shed-12

Inadequate structural members (Shed-5)

Poor connection details (Shed-6)

Inadequate structural members (Shed-7)

Poor connection details (Shed-10)

Lack of lateral stability system, poor connection details and apparently inadequate members observed.

Observations: Shed-5 (Canteen part), Shed-6, Shed-7, Shed-10)

Inadequate structural members (Shed-11)

Inadequate structural members (Shed-12)

Lack of lateral stability system, poor connection details and apparently inadequate members observed.

Observations: Shed-11, Shed-12

Priority Actions

Problems Observed

Building-2, Building-3, Shed-1, Shed-2

Item 01: Foundation adequacy to be carried out.

Shed-1:

Item 02: Lack of lateral stability.

Item-03: Undocumented extension.

Shed-2, Shed-5 (Child Care part), Shed-9

Item 04: Lack of lateral stability.

Shed-3

Item-05: Design report not fully comply with BNBC

Building-2, Shed-2 (RC part, steel stair), Shed-8

Item-06: Lack of as-built drawing.

Shed-5 (Canteen part), Shed-6, Shed-7, Shed-10, Shed-11, Shed-12

Item-07: Apparently non engineered sheds.

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Foundation adequacy to be carried out (Building-2, Building-3, Shed-1, Shed-2)	Carryout geotechnical investigation and verify the foundation type, sizes, thickness.	6-weeks
02	Foundation adequacy to be carried out (Building-2, Building-3, Shed-1, Shed-2)	Factory engineer is required to review the foundation adequacy.	6-weeks
03	Foundation adequacy to be carried out (Building-2, Building-3, Shed-1, Shed-2)	Implement remediation works where required.	6-months
04	Lack of lateral stability (Shed-1)	Factory engineer is required to check the lateral stability of the sheds.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
05	Lack of lateral stability (Shed-1)	Check the connection adequacy for all steel connections.	6-weeks
06	Lack of lateral stability (Shed-1)	Implement remediation works where required.	6-months
07	Undocumented extension (Shed-1)	Factory is required to review the design considering the extension.	6-weeks
08	Undocumented extension (Shed-1)	Implement remediation as outcome of Design Report (if required).	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
09	Lack of lateral stability (Shed-2, Shed-5 (Child Care part), Shed-9)	Factory engineer is required to check the lateral stability of the sheds.	6-weeks
10	Lack of lateral stability (Shed-2, Shed-5 (Child Care part), Shed-9)	Check the connection adequacy for all steel connections.	6-weeks
11	Lack of lateral stability (Shed-2, Shed-5 (Child Care part), Shed-9)	Implement remediation works where required.	6-months
12	Design report not fully comply with BNBC (Shed-3)	Factory engineer is required to prepare the design Report in compliance with the section 1.9.1 of BNBC part-6.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Design report not fully comply with BNBC (Shed-3)	Implement remediation as outcome of design Report (where required).	6-months
14	Lack of as-built drawing (Building-2, Shed-2 (RC part, steel stair), Shed-8))	Factory engineer is required to prepare full set of as-built drawing for all these structures.	6-weeks
15	Apparently non engineered sheds (Shed-5 (Canteen part), Shed-6, Shed-7, Shed-10, Shed-11, Shed-12))	Factory is required to replace all the sheds with engineered or check the lateral stability of the sheds.	6-weeks
16	Apparently non engineered sheds (Shed-5 (Canteen part), Shed-6, Shed-7, Shed-10, Shed-11, Shed-12))	Carryout remedial works where required.	6-month