

# Tusuka Processing Ltd. (Unit-02)

420/1, Konabari, Neelnagar, Gazipur  
(24.012817, 90.325573)

21<sup>st</sup> November 2021



# Executive Summary

## Building Information

**Building 1** is a 5-storied (G+4) reinforced concrete building over ETP.

**Building 2** is a 5-storied (B+G+4) reinforced concrete building with a basement.

**Building 3** is a single storied prefabricated steel shed with two mezzanine at north & south side.

# Observations

# Inconsistency in the design report

Total Load= 36277  
 Mat Length= 216.48 ft  
 Mat Width= 90.692 ft  
 Area= 19633 ft<sup>2</sup>  
 Load imposed on Soil= 1.84776 ksf  
 Soil Bearing Capacity= 2.5 ksf  
 Mat Area is adequate

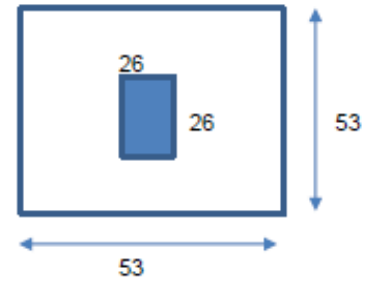
LL Factor= 1.7  
 DL Factor= 1.4  
 f<sub>c</sub> = 4 4000  
 f<sub>y</sub> = 72.5 72500  
 Total Dead Load= 670 kip  
 Total Live Load= 218 kip

Reduction Factor Calculation :  
 Panel Length= 22.25 ft  
 Panel Width= 21.75 ft  
 Contributed Area of a column= 483.938 sft  
 No. Of Floor= 5  
 Total Area, A<sub>t</sub>= 2419.69 sft  
 224.911 m<sup>2</sup>  
 $R = 0.6 + \sqrt{(8/A_t)}$  For Load Group 2  
 = 0.79

Buildig is using as Garments so it is considered for Load Group 2

LL Reduction Factor= 0.8  
 Live Load= 174.4 kip  
 Max Load in Column= 844.4 kip  
 Column Length= 26 in  
 Column Width= 26 in  
 Thickness, T= 30 in  
 Depth, d'= 27 in

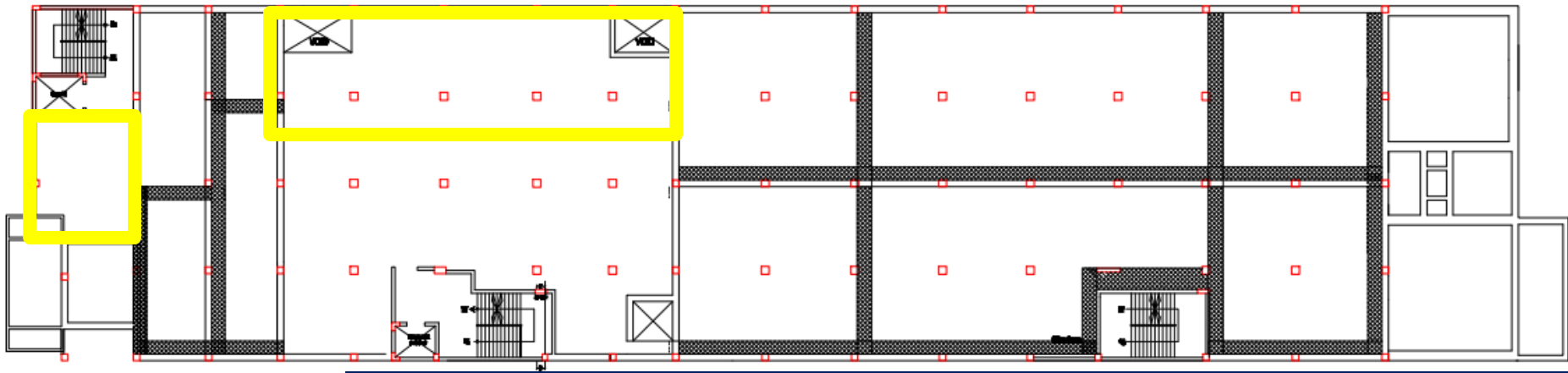
Ratio of Column Length & Width,  $\rho = 1$   
 Length of Critical Perimeter,  $b_o = 212$  in  
 Ultimate Load= 1129.17 kip  
 Nominal=  $4\phi b d \sqrt{f_c'}$   
 = 1230.86 kip  
 Punching Check is Ok



Detailed foundation adequacy check not provided in the design report. Only bearing and punching check of MAT foundation provided. Building engineer is required to check the settlement of the MAT foundation. Also, there is two types of foundation in the building one is MAT with Pile in other part only MAT. So differential settlement also required to address in the design report.

All the serviceability issue as per BNBC not addressed in the design report. Building engineer is required to address all the serviceability issue as BNBC.

# Significant Vibration on ground floor



Ground floor layout plan



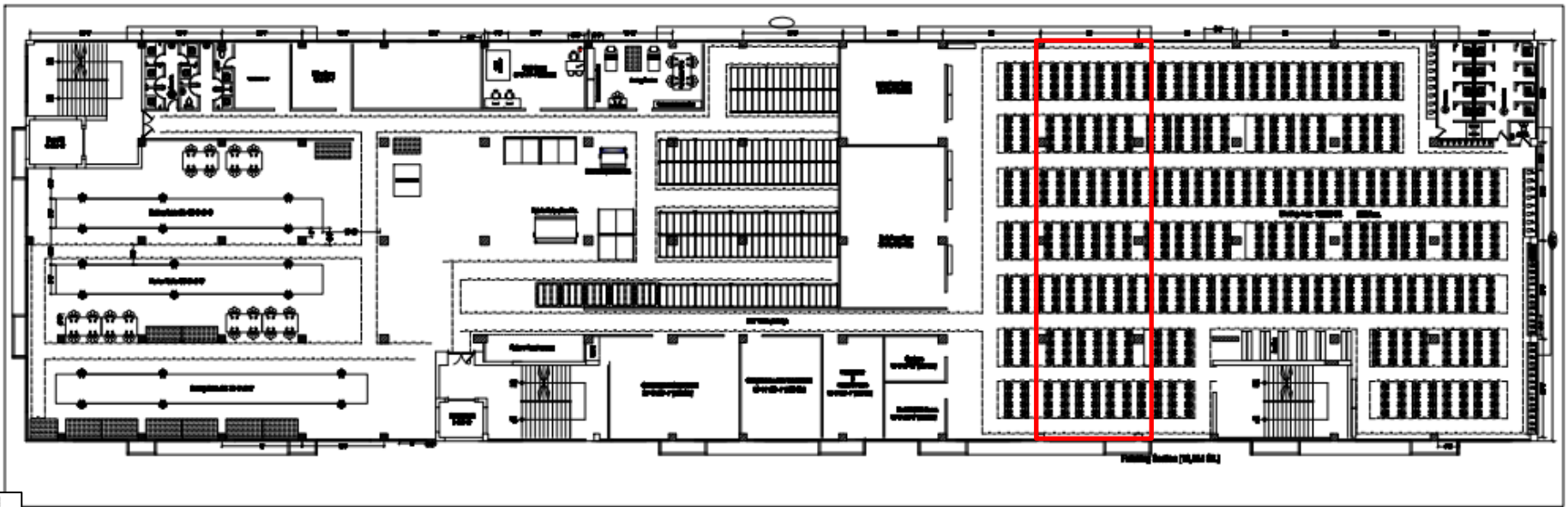
**GROUND FLOOR PLAN**

Significant vibration was felt on the ground floor due to operation of machineries. Building engineer is required to investigate the long-term effect of the vibration and suggest proper remediation.



Source of vibration

# Inconsistency in the as-built drawing

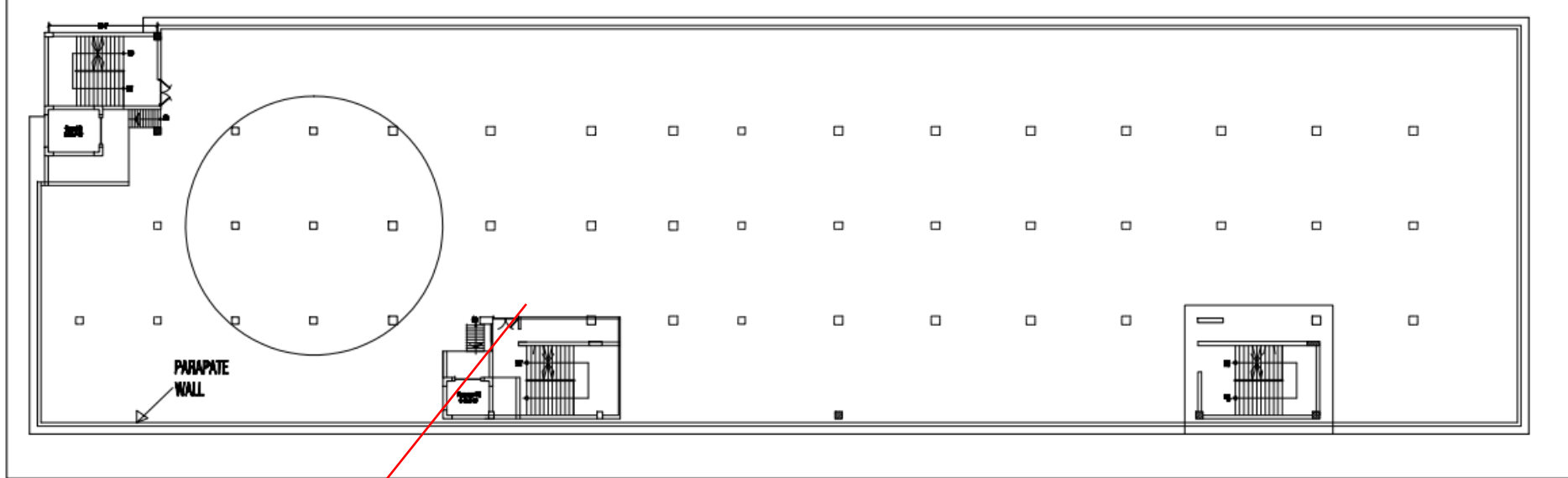


**4TH FLOOR PLAN**

Floor layout plan (4<sup>th</sup> floor)

There are some changes in the floor layout plan. The marked bay is not using for the dining purpose.





**ROOF FLOOR PLAN**

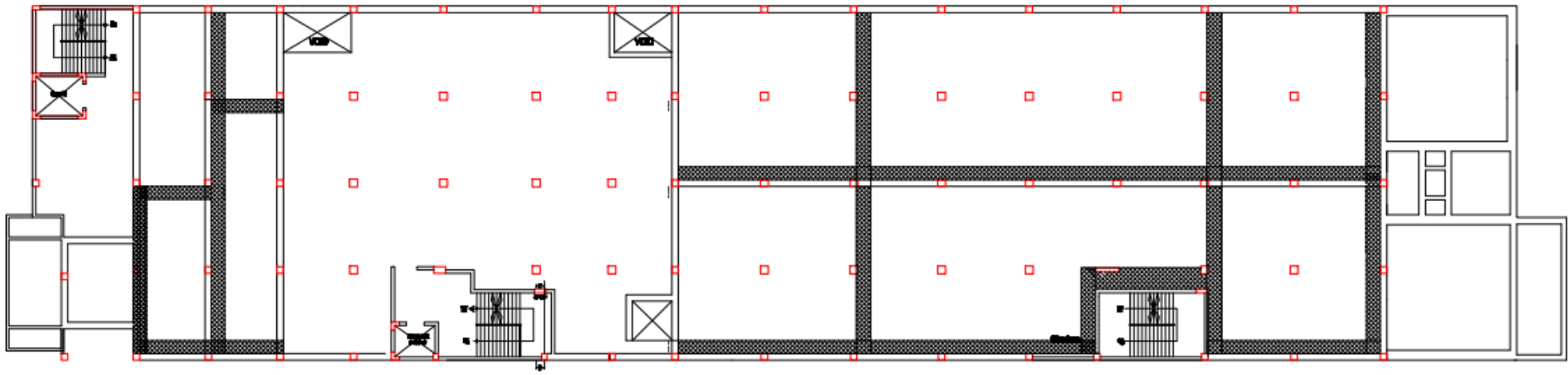
Roof layout plan



Undocumented steel stair



Roof and helipad load plan not produced. Gardening also not include in the roof layout plan.



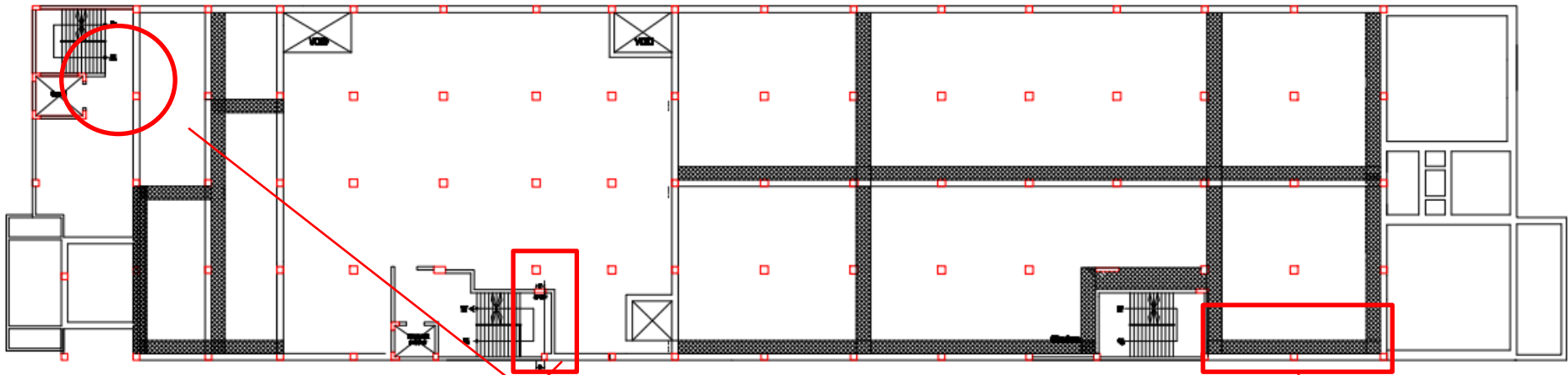
**GROUND FLOOR PLAN**

Ground floor layout plan



Undocumented loading unloading porch

# Dampness throughout the building



Typical floor layout plan



Dampness on 4<sup>th</sup> floor staircase



Dampness on 1<sup>st</sup> floor roof



Dampness on ground floor

# Stagnant of water on roof



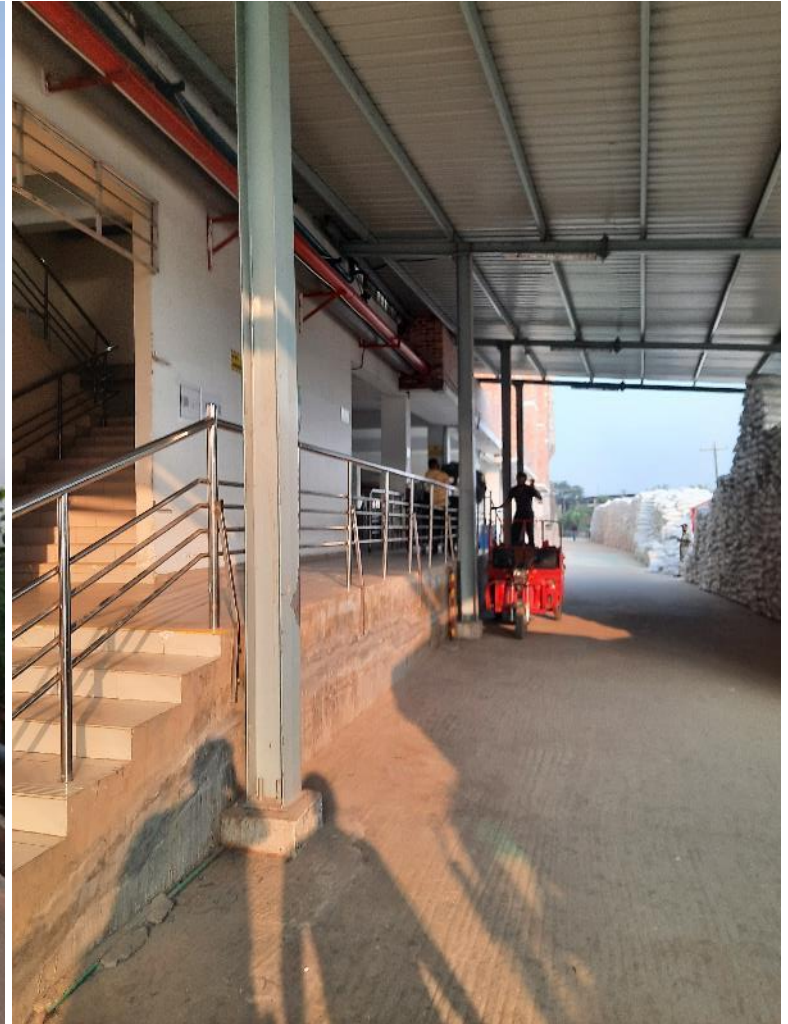
Stagnant of water observed on roof. Building engineer is required to improve the roof drainage system.

# Lack of stability of the steel porch



Absence of load transfer media observed in the long direction. Building engineer is required to check the lateral stability of the porch.

# Possible vehicle impact to the column



Columns are susceptible to have vehicle impact loading. Building engineer is required to provide vehicle impact protection around the column.

# **Service hole through the cantilever slab & loose concrete around the hole**



Service hole through the slab and loose concrete around the hole observed. Building engineer is required to remove the loose concrete to avoid falling hazard and check slab rebar are not compromised due to the hole.

# Apparently lack of load transfer media



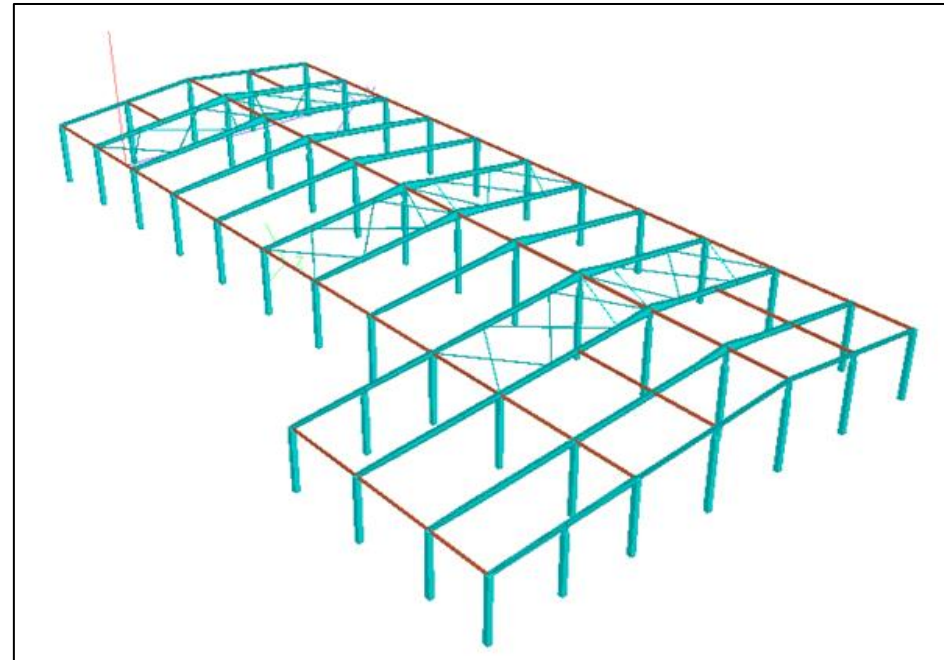
Compression strut/tie beams are not provided in the ridge position along long direction. Building engineer is required to check the lateral stability of the shed.

# Inconsistency in the design report



# REPORT ON STRUCTURAL DESIGN OF TUSUKA WASHING-3 AT GAZIPUR.

Originated by	Reviewed by	Approved by
Engr. Edris Ull	Engr. Edris Ull	Engr. Nazrul Islam

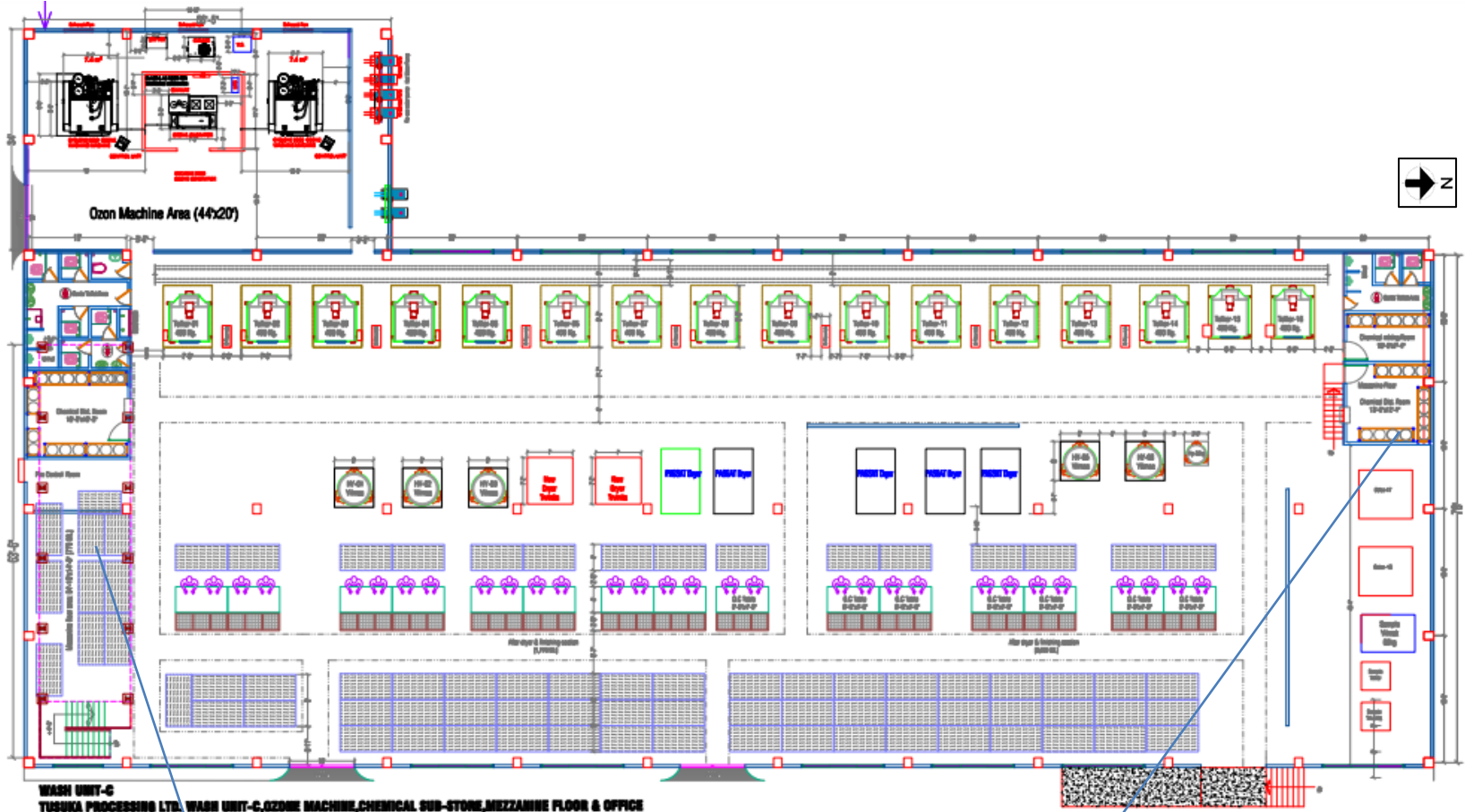


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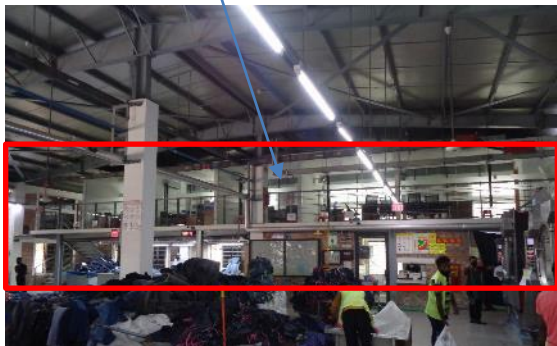
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In design report, adequacy check for RC member not addressed, serviceability checks not addressed as per BNBC, detail calculation of assigned loads & connection not addressed. Building engineer is required to prepare the design report addressing all highlighted issue and compliance with BNBC 1.9.1

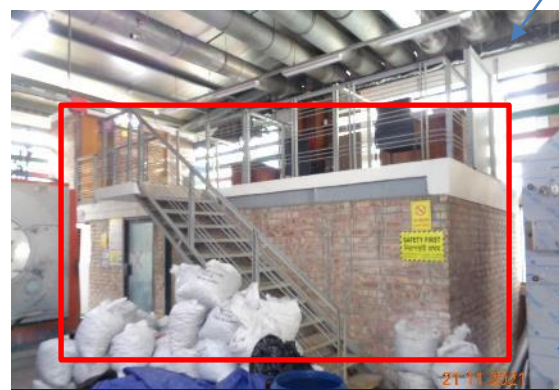
# Inconsistency in the as-built drawings



**WASH UNIT-C  
TUSOKA PROCESSING LTD. WASH UNIT-C, OZONE MACHINE, CHEMICAL SUB-STONE, MEZZANINE FLOOR & OFFICE**



South Mezzanine



North Mezzanine

Structurally connected Mezzanine floor at north and south not shown in the as-built architectural and structural drawing.

# Observations: Building 3

# Corrosion on steel member



Corrosion observed on the steel member. The factory is required remove the rust and provide corrosion proofing coating on the steel member.

# Problems Observed

## Building 1

- 01: Inconsistency in the design report.
- 02: Significant vibration on ground floor.
- 03: Inconsistency in the as-built drawing.
- 04: Dampness throughout the building.
- 05: Stagnant of water on roof.
- 06: Lack of stability of the steel porch.
- 07: Possible vehicle impact to the column.

## Building 2:

- 08: Service hole through the cantilever slab & loose concrete around the hole.

## Building 3:

- 09: Apparently lack of load transfer media.
- 10: Inconsistency in the design report.
- 11: Inconsistency in the as-built drawing.
- 12. Corrosion on steel member.

# Priority Action

Item No.	Observation	Recommended Action Plan	Recommended Timeline
01	Inconsistency in the design report. (Building 1)	Building engineer is required to address all the issue highlighted in the observation and prepare design report in compliance with BNBC 1.9.1	6-weeks
02	Inconsistency in the design report. (Building 1)	Carryout remedial works where required.	6-months
03	Significant vibration on ground floor. (Building 1)	Building engineer is required to investigate the long-term effect of the vibration and suggest proper remedial actions.	6-weeks
04	Significant vibration on ground floor. (Building 1)	Carry out any remedial works where necessary	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
05	Inconsistency in the as-built drawing. (Building 1)	Building engineer is required to survey the structure and prepare accurate as-built drawings.	6-weeks
06	Dampness throughout the building. (Building 1)	Dampness throughout the building. (Building 1)	6-weeks
07	Stagnant of water on roof. (Building 1)	Building engineer is required to improve the roof drainage system with adequate slope.	6-weeks
08	Lack of stability of the steel porch. (Building 1)	Building engineer is required to check the lateral stability of the steel porch.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
09	Lack of stability of the steel porch. (Building 1)	Carryout remedial works where necessary.	6-months
10	Possible vehicle impact to the column. (Building 1)	Building engineer is required to provide safety guards around the susceptible column.	6-weeks
11	Service hole through the cantilever slab & loose concrete around the hole. (Building 2)	Building engineer is required to remove the loose concrete to avoid falling hazard.	6-weeks
12	Service hole through the cantilever slab & loose concrete around the hole. (Building 2)	Building engineer is required to check slab rebar are not compromised due to the hole and suggest remedial works.	6-weeks

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Apparently lack of load transfer media. (Building 3)	Building engineer is required to survey the structure and prepare accurate as-built drawings.	6-weeks
14	Apparently lack of load transfer media. (Building 3)	Carryout remedial works where necessary.	6-months
15	Inconsistency in the design report. (Building 3)	Building engineer is required to prepare the design report addressing all highlighted issue and comply with BNBC 1.9.1.	6-weeks
16	Inconsistency in the design report. (Building 3)	Carryout remedial works where necessary.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
17	Inconsistency in the as-built drawing. (Building 3)	Building engineer is required to survey the structure and prepare accurate as-built drawings.	6-weeks
18	Corrosion on steel member. (Building 3)	The factory is required remove the rust and provide corrosion proofing coating on the steel member.	6-weeks