

# International Trading Services Ltd (Extension)

Civil Engineers City 4th, 5th & 7th Floors

Jarun Konabari, Gazipur Sadar, Gazipur.

(23.998158, 90.327151)

18 March 2024



## 1. Building Information

Finishing Shed: A two-storied (G+1) prefabricated steel building with roof shed.

Shed-1: This structure is a single storied steel shed.

Shed-2: This is a single-storied steel shed.

Shed-3: This structure is a single storied steel shed.

Shed-4: This is a single-storied steel shed.

Shed 5: This structure is a single storied steel shed.

Shed 6: This structure is a single storied steel shed.

Shed 7: This is a single-storied steel shed.

Shed-8: This is a single-storied steel shed.

Shed-09: This structure is a single storied steel shed.

Shed-10: This structure is a single storied steel shed.

Shed-11: This is a single-storied steel shed.

Utility-1: This is a single-storied steel shed.

Utility-2: This structure is a single storied reinforce concrete (RC) structure.

Medical and Childcare: A single-storied (B+G) reinforced concrete building with an underground water reservoir.

Finished goods store: This is a single-storied steel shed.

ETP building: This is a two-storied reinforced concrete (RC) building with an underground treatment plant.

WTP: This is a two-storied steel shed.

Storied Recycle & Reuse plant: This structure is a single storied lightweight steel roof shed.

Stone station & dry sludge shed: This structure is a single storied steel shed.

Kitchen shed: This is a single-storied steel shed.

Dining & Canteen shed: This is a single-storied steel shed.

Jhute Shed: A single storied prefabricated steel shed building.

Police Camp: A single storied steel roof truss shed.

PP Pump Shed: A single storied (B+G) prefabricated steel shed structure with underground pump room.

Washing Shed: A single storied prefabricated steel shed.

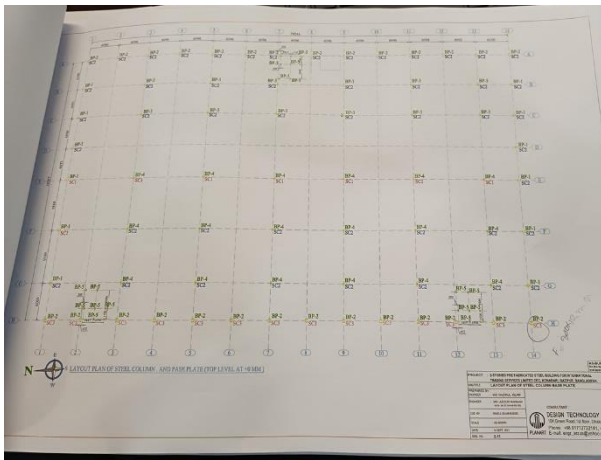
Guard Room-1: A single storied reinforced concrete structure.

Guard Room-2: A single storied reinforced concrete structure.

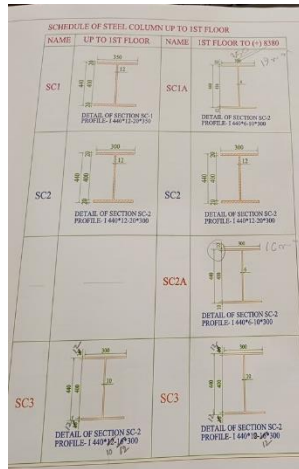
Security Supervisor and Dispatch Room: A single storied reinforced concrete structure.

## 2. Observations:

### Observation-1: Mismatch in as-built drawing. (Finishing Shed)



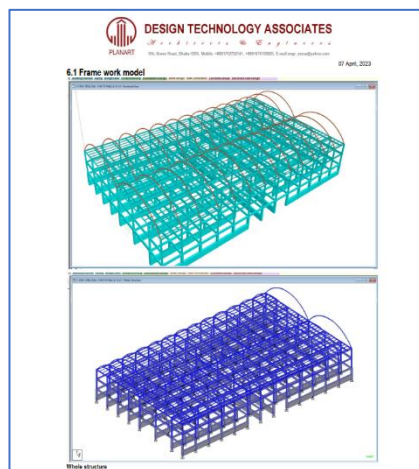
Column layout



Flange thickness 12 mm instead of 16 mm

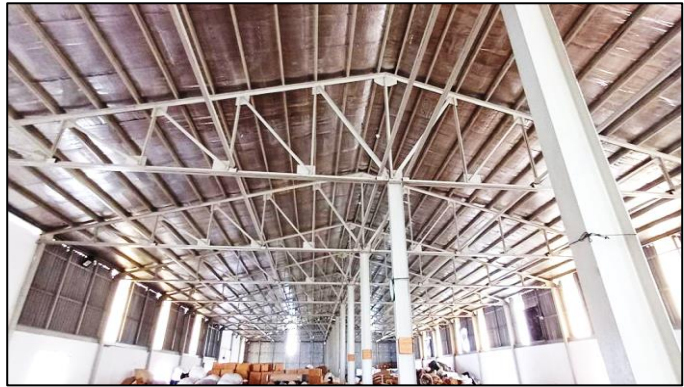
**Description:** Periphery steel column (SC2) sizes did not match with the as-built drawings. As per the drawing, the flange thickness of SC2 column is 16 mm, but on-site we measured 12 mm. The building engineer is required to update the as-built drawing and submit it to RSC.

### Observation-2: Design report required to be reviewed by RSC for lateral loading. (Finishing Shed)



**Description:** The design report has been prepared for the 2-storied shed building. On the other hand, some mismatches were found. The building engineer is required to revise the DEA report considering the onsite condition and lateral forces.

**Observation-3:** Design report required to be reviewed by RSC for lateral loading (Shed-1).



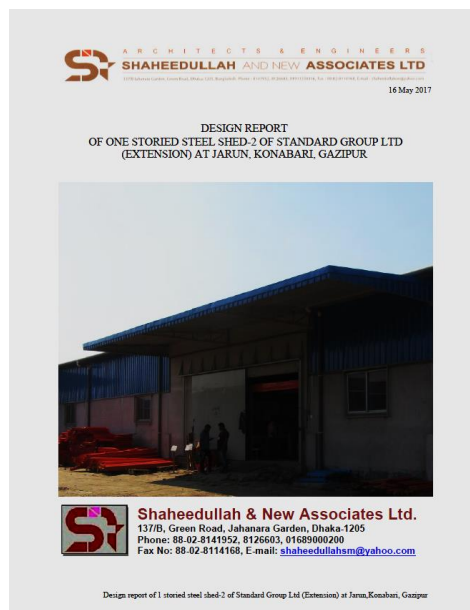
**Description:** Design reports for all structures were available. Factory is required to submit design reports along with other documents (as-built drawing, test reports etc.) to RSC for review.

**Observation-4:** Distorted column observed (Shed-1)



**Description:** A column was found as distorted condition. Factory is required to repair the distorted column and provide protection barrier to the column to protect from further vehicle impact.

**Observation-5:** Lack of information in design documents. (Shed-2, 3, 5, 6, 9, 10)



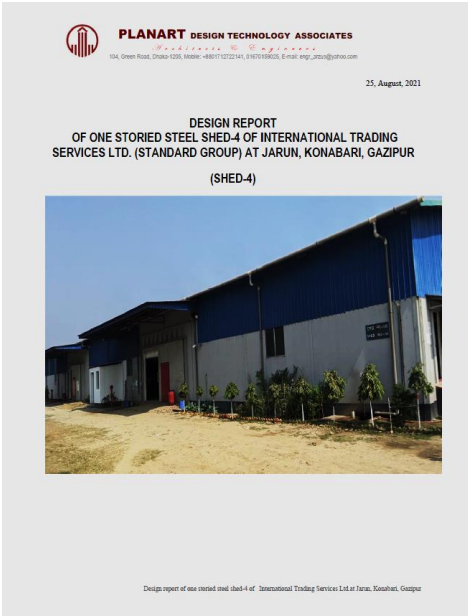
### 3. MATERIALS USED AND THEIR PROPERTIES

| SL No | Item                                                                                              | Locations                                                      |
|-------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| 1     | Steel rebar (60 grade deformed) as per site investigation                                         | All R.C. members                                               |
| 2     | Concrete made by cement, brick chips ¾" down size as coarse aggregate and sand as fine aggregate. | Footings, Columns, Grade beam and slab                         |
| 3     | Mild Steel                                                                                        | Gate and Doors                                                 |
| 4     | Structural steel, Fy=50 ksi as per BUET Test report.                                              | Roof framework, Steel column                                   |
| 5     | Anchor bolts                                                                                      | Under steel columns                                            |
| 6     | Glass & Aluminum                                                                                  | Window, Louvers                                                |
| 7     | Brick wall, Plaster, Paint                                                                        | Exterior and interior wall with adequate plaster and painting. |

**Description:** Design reports were available for the sheds. In the design report, 34.5 kN/cm<sup>2</sup> (50 ksi) steel plate strength was mentioned, but material test reports were not available to verify the strength. Also, the serviceability check was not provided.

The building engineer is required to confirm the material's strength and incorporate the serviceability check in the design report and submit it to the RSC for review.

**Observation-6:** Lack of information in design documents. (Shed-4)



**3. MATERIALS USED AND THEIR PROPERTIES**

| SL No | Item                                                                                                | Locations                                                      |
|-------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| 1     | Steel rebar (60 grade deformed) as per site investigation                                           | All R.C. members                                               |
| 2     | Concrete made by cement, brick chips 3/4" down size as coarse aggregate and sand as fine aggregate. | Footings, Columns, Grade beam and slab                         |
| 3     | Mild Steel                                                                                          | Gate and Doors                                                 |
| 4     | Structural steel $F_y=40$ ksi as per BUET test report.                                              | Roof framework, Steel column                                   |
| 5     | Anchor bolts                                                                                        | Under steel columns                                            |
| 6     | Glass & Aluminum                                                                                    | Window, Louvers                                                |
| 7     | Brick wall, Plaster, Paint                                                                          | Exterior and interior wall with adequate plaster and painting. |

2.2 Plate test report:

STRENGTH OF MATERIALS LABORATORY

TENSION TEST OF MS PLATE (ASTM A36/A36M-14)

Test by: Mr. Nazimuddin  
International Trading Services Ltd.  
Project: Shed-4, Jarun, Konabari, Gazipur

Report No: INTS-MS-001/2021  
Date of Test: 18/08/2021

| Sr. | Sample Identification             | Actual Thickness | Tensile Strength | Yield Strength | Elongation % | Average Elongation |
|-----|-----------------------------------|------------------|------------------|----------------|--------------|--------------------|
| 1   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 2   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 3   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 4   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 5   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 6   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 7   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 8   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 9   | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 10  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 11  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 12  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 13  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 14  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 15  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 16  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 17  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 18  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 19  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |
| 20  | Steel Column Flange, Ground Floor | 12.5             | 255              | 225            | 25           | 25                 |

Important Note: Samples as supplied to us have been tested. BUET does not have any responsibility for the representative character of the samples required to be tested. It is recommended that the samples are sent to a secure and tested under the supervision of a competent authority, in order to avoid further liability of our results. This report has been printed on a security paper. It is also recommended that the test results be verified by a duly authorized person.

**Description:** A design report was available for the shed-4. In the design report, 27.5 kN/cm<sup>2</sup> (40 ksi) strength was mentioned for the roof framework (steel angle) and steel column, but material test reports were not available to verify the strength of the roof framework. Also, the serviceability check was not provided.

The building engineer is required to confirm the material's strength and incorporate the serviceability check in the design report and submit it to the RSC for review.

**Observation-7:** Discrepancy in as-built drawing (Shed-5, Shed-10)



Discontinuous bracing (Shed 5)



Additional pipe columns (Shed-10)

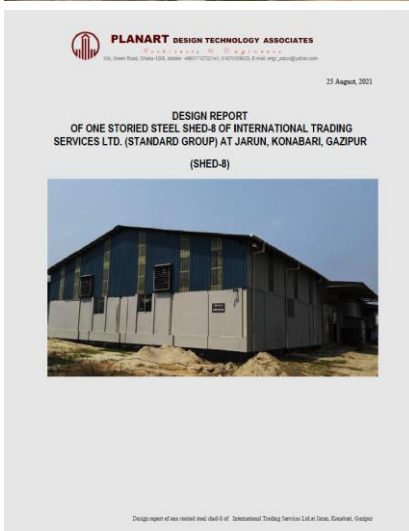
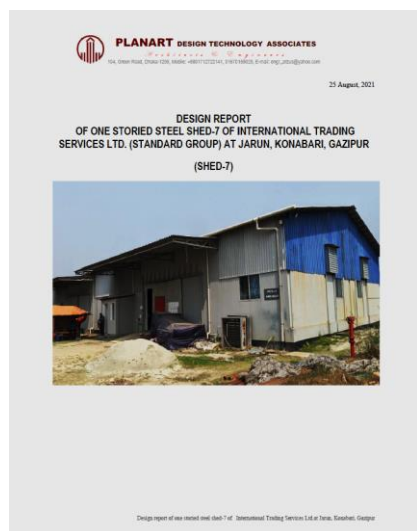
**Description:** Discontinuity of bracing at shed 5 and additional pipe columns at Shed-10 were observed. The building engineer is required to survey the whole structure and update the as-built drawing as per site condition.

**Observation-8:** Crack on brick wall observed (Shed-10)



**Description:** Crack was observed on brick wall. Factory is required to repair the crack with suitable measures.

## Observation-9: Lack of information in design documents. (Shed-7, Shed-8, Shed-11)



| 3. MATERIALS USED AND THEIR PROPERTIES |                                                                                                      |                                                                |
|----------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| SL No                                  | Item                                                                                                 | Locations                                                      |
| 1                                      | Steel rebar (60 grade deformed) as per site investigation                                            | All R.C. members                                               |
| 2                                      | Concrete made by cement, brick chips 1 1/2" down size as coarse aggregate and sand as fine aggregate | Footings, Columns, Grade beam and slab                         |
| 3                                      | Mild Steel                                                                                           | Gate and Doors                                                 |
| 4                                      | Structural steel Fy=40 ksi as per BUET test report.                                                  | Roof framework, Steel column                                   |
| 5                                      | Anchor bolts                                                                                         | Under steel columns                                            |
| 6                                      | Glass & Aluminum                                                                                     | Window, Louvers                                                |
| 7                                      | Brick wall, Plaster, Paint                                                                           | Exterior and interior wall with adequate plaster and painting. |

Shed-7

| 3. MATERIALS USED AND THEIR PROPERTIES |                                                                                                      |                                                                |
|----------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| SL No                                  | Item                                                                                                 | Locations                                                      |
| 1                                      | Steel rebar (60 grade deformed) as per site investigation                                            | All R.C. members                                               |
| 2                                      | Concrete made by cement, brick chips 1 1/2" down size as coarse aggregate and sand as fine aggregate | Footings, Columns, Grade beam and slab                         |
| 3                                      | Mild Steel                                                                                           | Gate and Doors                                                 |
| 4                                      | Structural steel Fy=40 ksi as per BUET test report.                                                  | Roof framework, Steel column                                   |
| 5                                      | Anchor bolts                                                                                         | Under steel columns                                            |
| 6                                      | Glass & Aluminum                                                                                     | Window, Louvers                                                |
| 7                                      | Brick wall, Plaster, Paint                                                                           | Exterior and interior wall with adequate plaster and painting. |

Shed-8

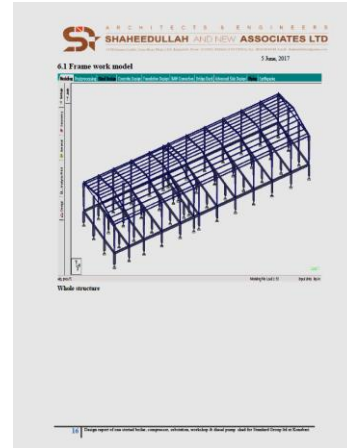
| 3. MATERIALS USED AND THEIR PROPERTIES |                                                                                                      |                                                                |
|----------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| SL No                                  | Item                                                                                                 | Locations                                                      |
| 1                                      | Steel rebar (60 grade deformed) as per site investigation                                            | All R.C. members                                               |
| 2                                      | Concrete made by cement, brick chips 1 1/2" down size as coarse aggregate and sand as fine aggregate | Footings, Columns, Grade beam and slab                         |
| 3                                      | Mild Steel                                                                                           | Gate and Doors                                                 |
| 4                                      | Structural steel Fy=40 ksi as per BUET test report.                                                  | Roof framework, Steel column                                   |
| 5                                      | Anchor bolts                                                                                         | Under steel columns                                            |
| 6                                      | Glass & Aluminum                                                                                     | Window, Louvers                                                |
| 7                                      | Brick wall, Plaster, Paint                                                                           | Exterior and interior wall with adequate plaster and painting. |

Shed-11

**Description:** A design report was available for the shed-7, 8, 11. In the design reports, 27.5 kN/cm<sup>2</sup> (40 ksi) steel strength was mentioned, but material test reports were not available to verify the strength. Also, a serviceability check was not provided.

The building engineer is required to confirm the material's strength and incorporate the serviceability check in the design reports and submit it to the RSC for review.

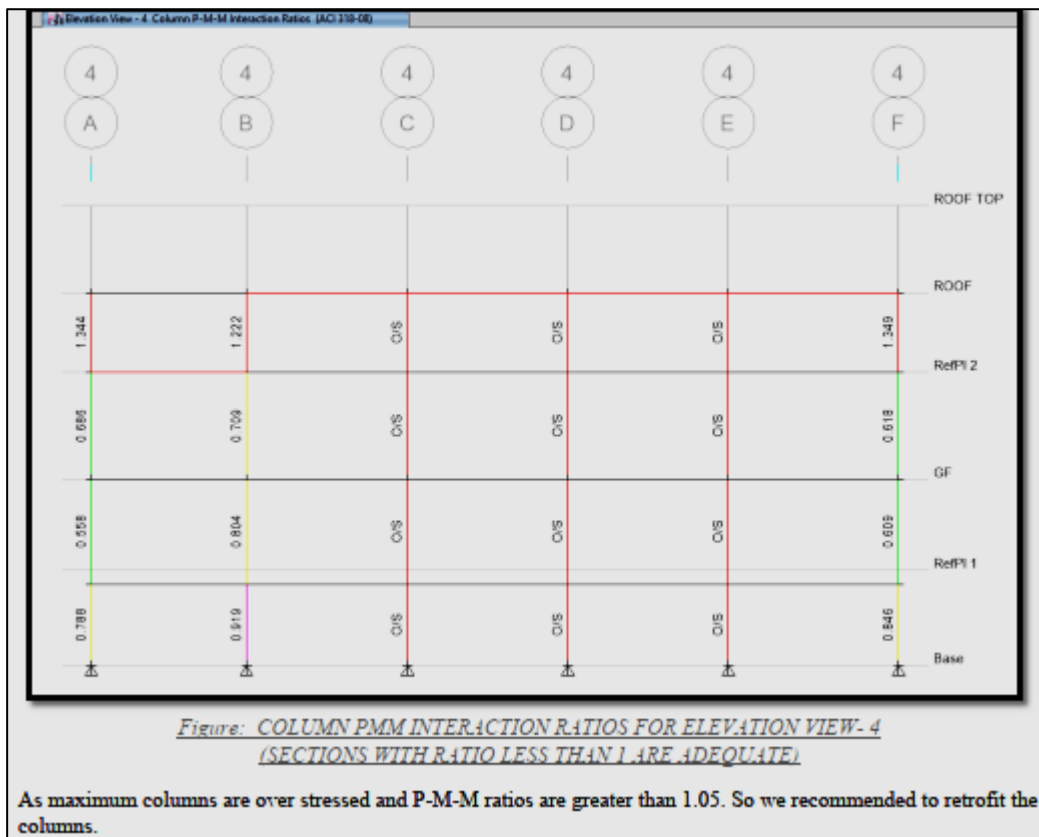
**Observation-10:** Lack of information in design documents. (Utility-1)



**Description:** A Design Report was available for utility-1, which was prepared based on software analysis. Serviceability checks, as per BNBC, were not incorporated in the design report.

The building engineer is required to incorporate a serviceability check in the design report and submit it to the RSC for review.

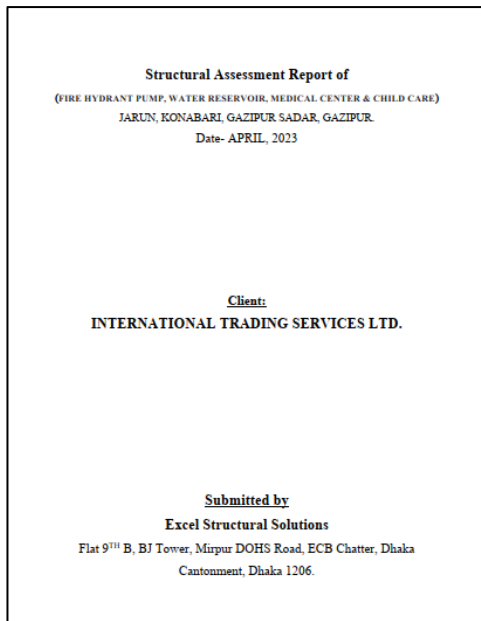
**Observation-11:** Lack of information in design documents. (Utility-2)



**Description:** As per design report, most of the columns are over-stressed, but no remediation plan was available during inspection.

The building engineer is required to prepare remediation plan and submit design report along with other documents (as-built drawing, test report, retrofitting drawing etc.) to RSC for review.

**Observation-12:** Structural Assessment report required to be reviewed against lateral loading. (Medical and Childcare)



**Description:** The Structural Assessment report has been prepared for the single-storied (B+G) Medical and Childcare building with a basement. The structural Assessment report needs to be reviewed against lateral loading.

**Observation-13:** Core cutting location not filled up. (Medical and Childcare)



**Description:** Core cutting locations were found exposed. The building engineer is required to fill up all exposed locations with micro concrete.

**Observation-14:** Lack of design documents. (Finished goods store and Single storied stone station & dry sludge shed).



Finished goods store

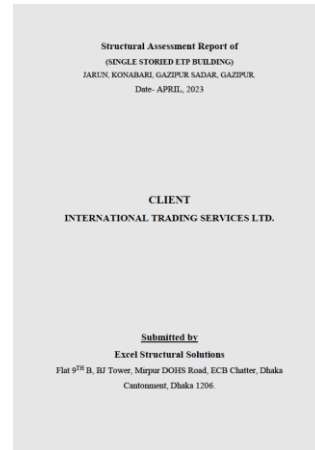


Single storied stone station & dry sludge shed

**Description:** 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 as per BNBC.

At the time of inspection, design documents (design report and material test reports) were not available which are required to be prepared in compliance with section 1.9.1 (part-6, BNBC).

**Observation-15:** Lack of information in design documents. (ETP building)



**A. MATERIAL PROPERTY**

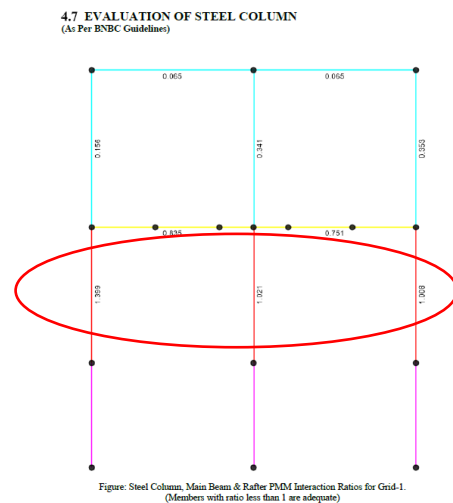
The principal material of construction is reinforced concrete. As per investigation and design drawings, the following material properties have been used:

- |                                                                |                       |
|----------------------------------------------------------------|-----------------------|
| A. Yield strength of steel (Rebar), $f_y$                      | = 72500 Psi           |
| B. Compressive strength of Column, Beam, Slab concrete, $f_c'$ | = 4000 Psi            |
| C. Young's modulus of concrete, $E_c$                          | = $57,000\sqrt{f_c'}$ |

**Description:** A design report was available for the ETP building. In the design report, the steel yield strength and the concrete compressive strength were considered to be 72.5 ksi and 4.0 ksi, respectively. However, material test reports were not available on-site to verify the strength.

The building engineer is required to confirm the material's strength, update the design report, and submit it to the RSC for review.

**Observation-16:** Overstressed steel members in the structural assessment report. (WTP)



**Description:** A structural assessment report was prepared based on software analysis and was available on-site for WTP. In the FEA model, some overstressed columns were observed.

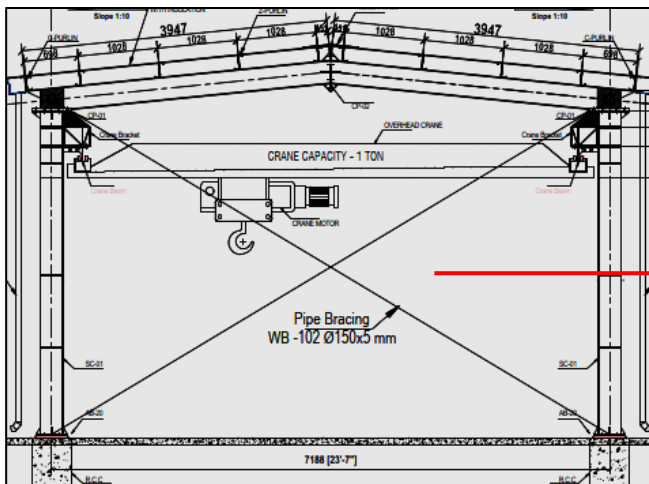
The building engineer is required to update the FEA model, assessment report and other requirements as per BNBC.

**Observation-17:** Lack of lateral stability system (Single storied recycle & reuse plant).

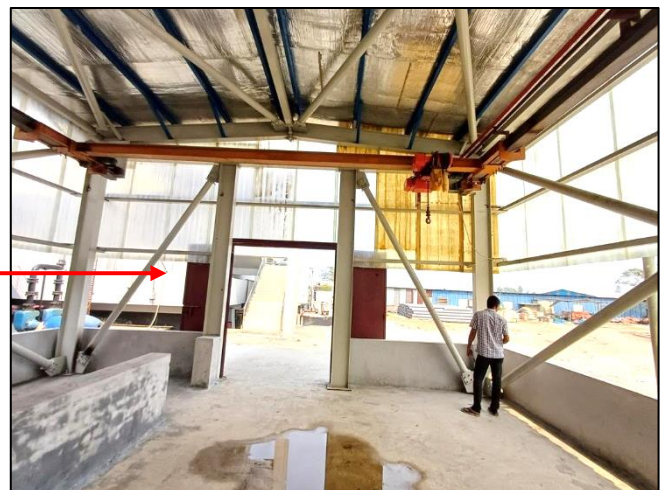


**Description:** Lack of lateral stability system, apparent inadequate members and non-engineered connection were observed. The building engineer is required to check the member, connection & stability system of the structure and suggest proper remediation accordingly.

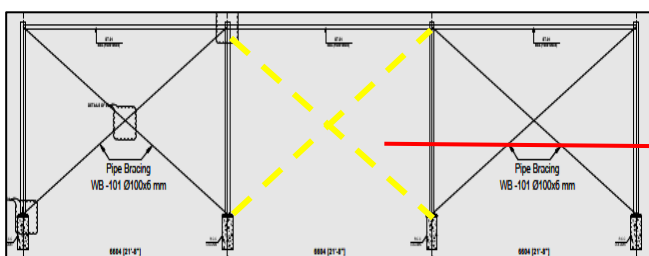
**Observation-18:** Discrepancy in as-built drawing (Single storied stone station & dry sludge shed).



Discontinuous bracing (Shed 5)



Additional pipe columns (Shed-10)



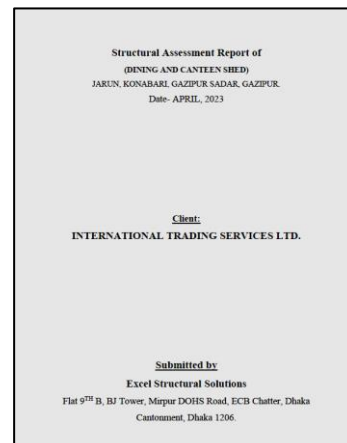
**Description:** Mismatches in bracing arrangement was observed between as-built drawing and onsite condition. The building engineer is required to survey the whole structure and update the as-built drawing as per site condition.

**Observation-19:** Apparently non-engineered roof. (Kitchen shed)



**Description:** The roof of the kitchen shed is apparently non-engineered. Building engineer to check the stability of the lightweight roof structure against uplift forces.

**Observation-20:** Overstressed steel members in the structural assessment report. (Dining & canteen shed)



## 2.5 EVALUATION OF STEEL COLUMN (As Per BNBC Guidelines)

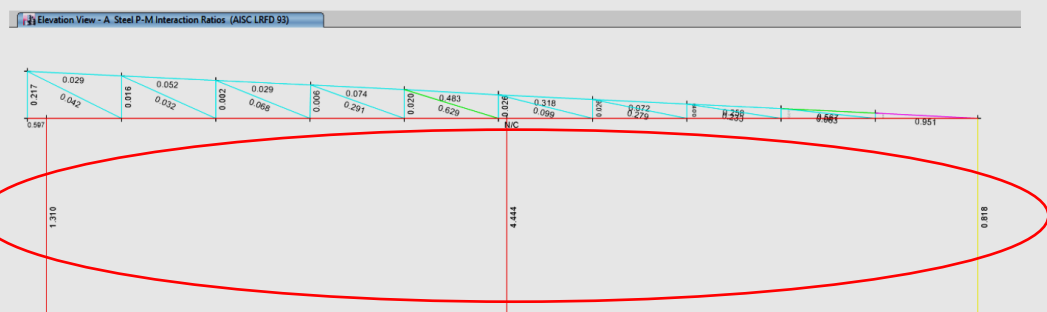


Figure: Steel Column, Main Beam & Rafter PMM Interaction Ratios for Grid-A.  
(Members with ratio less than 1 are adequate)

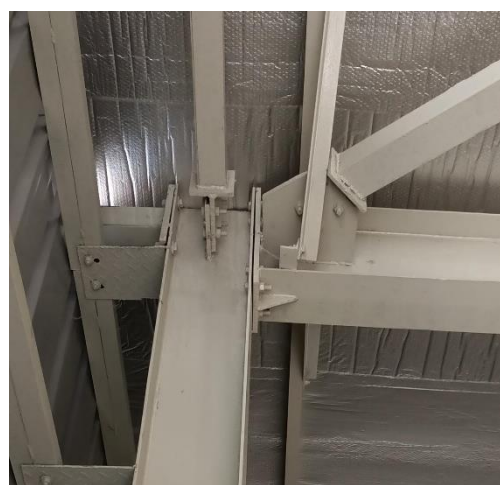
**Description:** A structural assessment report was prepared based on software analysis and was available on-site for the dining & canteen shed. In the FEA model, some overstressed columns were observed. The building engineer is required to update the FEA model, assessment report and other requirements as per BNBC.

**Observation-21:** Absence of design documents. (Jhute Shed)



**Description:** 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 reports were available, which are required to be prepared in compliance with section 1.9.1.1 (part-6, BNBC).

**Observation 22:** Connection Gap. (Jhute Shed)



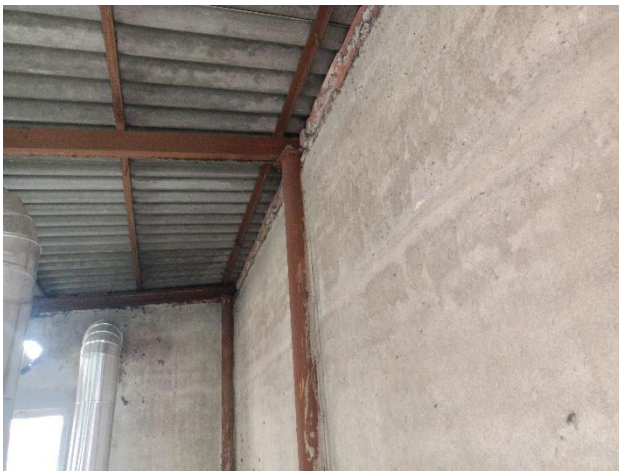
**Description** Connection gaps observed in strut joint. Building engineer is required to carry out suitable remedial works.

**Observation-23:** Non-engineered connection. (PP Pump Shed)



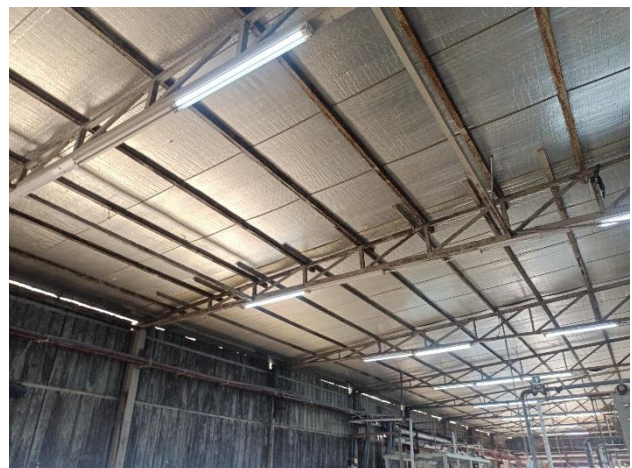
**Description:** Inadequate connections were observed at the lightweight roof of the single-storied Sheds. The building engineer is required to check the connection adequacy of the lightweight roof against the uplift forces.

**Observation-24:** Corrosion in steel member (PP Pump Shed, Washing Shed)



**Description:** Corrosion in steel member observed in several locations. The building engineer is required to suggest proper remedial measures accordingly

**Observation-25: Lack of lateral stability. (Washing Shed)**



**Description:** 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.

**Observation-26: Hanging Beam. (Guard Room-1)**



**Description:** The floor beam was found discontinued and hanging inside the RMS room. Building engineer is required to provide adequate support for the hanging beam.

### 3. Action Plan:

| Observation                                                                         | Action Plan                                                                                                                                                             | Timeline        |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Mismatch in as-built drawing. (Finishing Shed)                                      | The building engineer is required to update the as-built drawing as per the existing condition of the building.                                                         | within 6 weeks  |
| Design report required to be reviewed by RSC for lateral loading. (Finishing Shed). | The building engineer is required to revise the DEA report as per on-site conditions and for lateral loading. Submit the revised DEA to RSC for review.                 | within 6 weeks  |
|                                                                                     | Implement remediation work if required.                                                                                                                                 | within 6 months |
|                                                                                     | Implement floor loading plan.                                                                                                                                           | within 6 months |
| Design report required to be reviewed by RSC for lateral loading (Shed-1).          | Factory is required to submit design reports along with other documents (as-built drawing, test reports etc.) to RSC for review.                                        | within 6 weeks  |
|                                                                                     | Carry out the suggested remedial work if required.                                                                                                                      | within 6 months |
| Distorted column observed (Shed-1)                                                  | Factory is required to repair the distorted column and provide protection barrier to the column to protect from further vehicle impact.                                 | within 6 weeks  |
| Lack of information in design documents. (Shed-2, 3, 5, 6, 9, 10)                   | Verify in situ material strength (MS plate tensile strength)                                                                                                            | within 6 weeks  |
|                                                                                     | The building engineer is required to confirm the material's strength and incorporate the serviceability check in the design report and submit it to the RSC for review. | within 6 weeks  |
|                                                                                     | Carry out the suggested remedial works.                                                                                                                                 | within 6 months |
| Lack of information in design documents. (Shed-4)                                   | Verify in situ material strength (MS plate tensile strength)                                                                                                            | within 6 weeks  |
|                                                                                     | The building engineer is required to confirm the material's strength and incorporate the serviceability check in the design report and submit it to the RSC for review. | within 6 weeks  |
|                                                                                     | Carry out the suggested remedial works.                                                                                                                                 | within 6 months |
| Discrepancy in as-built drawing (Shed-5, Shed-10)                                   | The building engineer is required to survey the whole structure and update the as-built drawing as per site condition.                                                  | within 6 weeks  |

| Observation                                                                                           | Action Plan                                                                                                                                                                                     | Timeline        |
|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Crack on brick wall observed (Shed-10)                                                                | Factory is required to repair the crack with suitable measures.                                                                                                                                 | within 6 weeks  |
| Lack of information in design documents. (Shed-7, Shed-8, Shed-11)                                    | Verify in situ material strength (MS plate tensile strength)                                                                                                                                    | within 6 weeks  |
|                                                                                                       | The building engineer is required to confirm the material's strength and incorporate the serviceability check in the design reports and submit it to the RSC for review.                        | within 6 weeks  |
|                                                                                                       | Carry out the suggested remedial works.                                                                                                                                                         | within 6 months |
| Lack of information in design documents. (Utility-1)                                                  | The building engineer is required to incorporate a serviceability check in the design report and submit it to the RSC for review.                                                               | within 6 weeks  |
|                                                                                                       | Carry out the suggested remedial works.                                                                                                                                                         | within 6 months |
| Lack of information in design documents. (Utility-2)                                                  | The building engineer is required to prepare remediation plan and submit design report along with other documents (as-built drawing, test report, retrofitting drawing etc.) to RSC for review. | within 6 weeks  |
|                                                                                                       | Carry out the suggested remedial works.                                                                                                                                                         | within 6 months |
| Structural Assessment report required to be reviewed against lateral loading. (Medical and Childcare) | Prepared design report to be checked against lateral loads following BNBC 2006 by RSC.                                                                                                          | within 6 weeks  |
|                                                                                                       | Carry out remedial works if required.                                                                                                                                                           | within 6 months |
| Core cutting location not filled up. (Medical and Childcare)                                          | The building engineer is required to fill up all exposed locations with micro concrete.                                                                                                         | within 6 weeks  |
| Lack of design documents. (Finished goods store and Single storied stone station & dry sludge shed)   | The building engineer is required to prepare design documents (including design reports and material test reports) in compliance with section 1.9.1 (part 6, BNBC).                             | within 6 weeks  |
|                                                                                                       | Carry out the suggested remedial works.                                                                                                                                                         | within 6 months |
| Lack of information in design documents. (ETP building)                                               | Verify in situ material strength (steel yield strength and the concrete compressive strength)                                                                                                   | within 6 weeks  |
|                                                                                                       | The building engineer is required to revise the assessment report and submit the documents to RSC to complete the review.                                                                       | within 6 weeks  |
|                                                                                                       | Carry out the suggested remedial works.                                                                                                                                                         | within 6 months |

| Observation                                                                             | Action Plan                                                                                                                                                                                                                       | Timeline        |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Overstressed steel members in the structural assessment report. (WTP)                   | The building engineer is required to review the design of the overstressed columns.                                                                                                                                               | within 6 weeks  |
|                                                                                         | The building engineer is required to update the FEA model, assessment report and other requirements as per BNBC.                                                                                                                  | within 6 weeks  |
|                                                                                         | Carry out the suggested remedial works.                                                                                                                                                                                           | within 6 months |
| Lack of lateral stability system (Single storied recycle & reuse plant).                | The building engineer is required to check the member, connection & stability system of the structure and suggest proper remediation accordingly.                                                                                 | within 6 weeks  |
|                                                                                         | Carry out remedial works if required.                                                                                                                                                                                             | within 6 months |
| Discrepancy in as-built drawing (Single storied stone station & dry sludge shed).       | The building engineer is required to survey the whole structure and update the as-built drawing as per site condition.                                                                                                            | within 6 weeks  |
| Apparently non-engineered roof. (Kitchen shed)                                          | Building engineer to check the stability of the lightweight roof structure against uplift forces.                                                                                                                                 | within 6 weeks  |
|                                                                                         | Carry out the suggested remedial works.                                                                                                                                                                                           | within 6 months |
| Overstressed steel members in the structural assessment report. (Dining & canteen shed) | The building engineer is required to review the design of the overstressed columns.                                                                                                                                               | within 6 weeks  |
|                                                                                         | The building engineer is required to update the FEA model, assessment report and other requirements as per BNBC.                                                                                                                  | within 6 weeks  |
|                                                                                         | Carry out the suggested remedial works.                                                                                                                                                                                           | within 6 months |
| Absence of design documents. (Jhute Shed)                                               | 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. | within 6 weeks  |
|                                                                                         | Implement remediation work if required.                                                                                                                                                                                           | within 6 months |
| Connection Gap. (Jhute Shed)                                                            | Building engineer is required to carry out suitable remedial works.                                                                                                                                                               | within 6 weeks  |
| Non-engineered connection. (PP Pump Shed)                                               | The building engineer is required to check the connection adequacy of the lightweight roof against the uplift forces.                                                                                                             | within 6 weeks  |
|                                                                                         | Implement remediation work if required.                                                                                                                                                                                           | within 6 months |

| Observation                                            | Action Plan                                                                                | Timeline        |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------|
| Corrosion in steel member (PP Pump Shed, Washing Shed) | Building engineer to remove the corrosion and apply suitable corrosion resistance coating. | within 6 weeks  |
| Lack of lateral stability. (Washing Shed)              | Building engineer is required to check the lateral stability of the structure.             | within 6 weeks  |
|                                                        | Carry out remedial works if required.                                                      | within 6 months |
| Hanging Beam. (Guard Room-1)                           | Building engineer is required to provide adequate support for the hanging beam.            | within 6 months |