

KC Apparels Ltd

Plot # B 424, 425, 426 & 427. Road # 1, BSCIC Industrial Estate,
Shashongaon, Anayetnagar, Fatullah, Narayanganj -1420
(23.6245865, 90.4807325)

2 June 2024

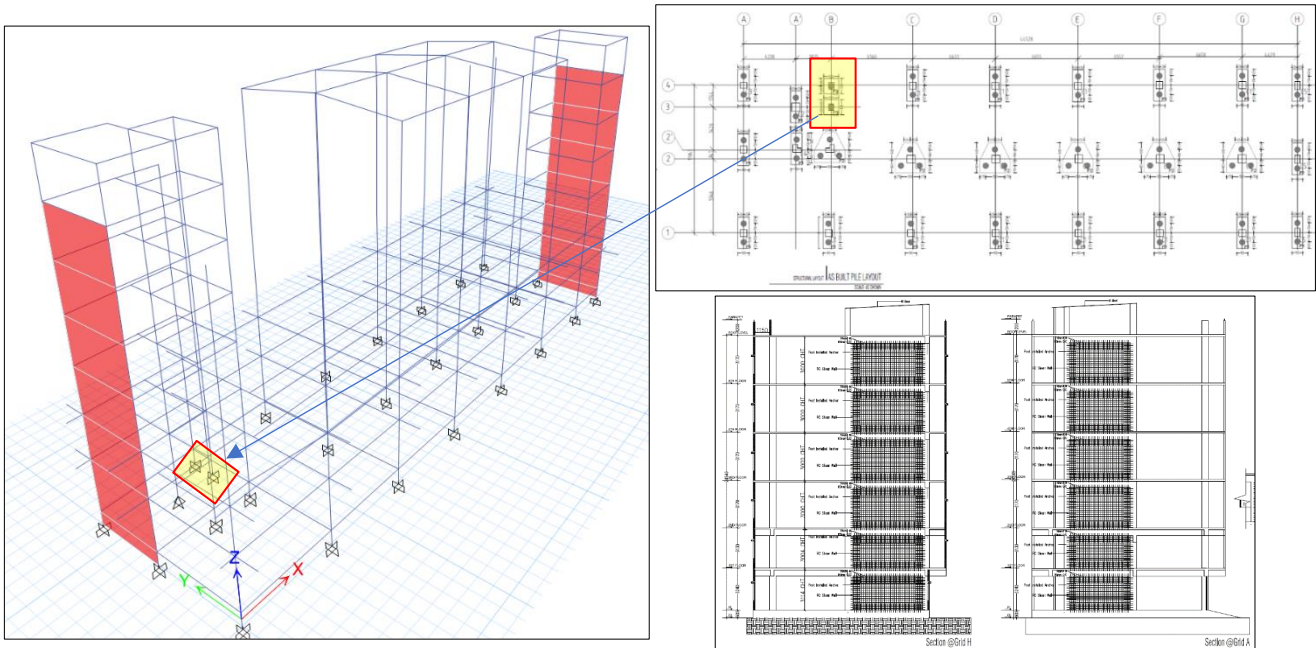


1. Building Information

RCC Building-1 is an existing partial seven-storied (G+5+partial 6) RC building with underground water reservoir and fire pump room.

2. Observations:

Observation 1: Inconsistencies in design documents.



Description: The building engineer assessed the structure and proposed the shear wall to resist lateral loading. As per the proposal, the shear wall was constructed between November 2021 to May 2023.

The foundation details for the shear wall have not been provided in the as-built drawing. In the FEA model, the shear wall has been assigned below the grade beam.

So, the factory is required to provide the foundation details in the drawing and check the adequacy of the foundation considering vertical loading as well as lateral loading.

In the FEA model, two foundations have been considered fixed support which consists of a single pile (marked in figure). The building engineer is required to provide clarification in the report to support the consideration.

The building consists of a beam-column moment frame up to the 2nd floor and a flat plate from the 3rd floor to the roof. The shear wall has been constructed from bottom to top. The structural system and load-bearing mechanism for the lateral load need to be confirmed by the building engineer.

Observation 2: Flat plate to be checked against punching for in situ material strength.

BEAM & SLAB

Equivalent In-Place Compressive Strength for Beam & Slab (psi) as per ACI-562 with ACI-214

Client: KC APPARELS LTD.
 Building: 73FORM GARMENTS BUILDING
 Address: BSCIC INDUSTRIAL AREA, NARAYAN GOIN.
 Ref. No.:

Correction for ACI 318.4 (Eq 9.1)
 $f_{c,eq} = F_{c,1} F_{c,2} F_{c,3} F_{c,4} F_{c,5} F_{c,6}$ (9-1)

Sl. No	Aggregate Type	Location	Sample Id	Length (l)	Diameter (d)	(l/d)	Core Strength, f _{cc} (psi)	Correction for (l/d)	Correction for (d)	Correction for (l/d)	Correction for (d)	Corrected core strength	Average Core Compressive Strength (psi)	Variation	V ²	Standard Deviation (psi)
1	Stone Ch ips	Beam	Core-1	132	69	1.91	4690	0.949	1.04	1.30	1.06	4266.26	929	86.2549.23		
2	Stone Ch ips	Beam	Core-2	139	69	1.88	4980	0.946	1.04	1.30	1.06	4763.47	436	39367.31		
3	Stone Ch ips	Beam	Core-3	126	69	1.86	3980	0.943	1.04	1.30	1.04	3752.40	1465	209949.69		
4	Stone Ch ips	Beam	Core-4	132	69	1.91	6190	0.949	1.04	1.30	1.06	6646.46	1472	216534.75		
5	Stone Ch ips	Beam	Core-5	134	69	1.94	6130	0.953	1.04	1.30	1.06	6423.42	2224	249923.53		
6	Stone Ch ips	Beam	Core-6	136	69	1.97	4990	0.956	1.04	1.30	1.06	5242.57	99	2490.79	5196.96	1395.26
7	Stone Ch ips	Beam	Core-7	137	69	1.99	3090	0.959	1.04	1.30	1.06	3379.33	2624	320495.66		
8	Stone Ch ips	Beam	Core-8	109	69	1.49	6760	0.899	1.04	1.30	1.06	6660.03	1463	239442.42		
9	Stone Ch ips	Beam	Core-9	130	69	1.88	6360	0.946	1.04	1.30	1.04	6543.96	345	33024.52		
10	Stone Ch ips	Beam	Core-10	132	69	1.62	6130	0.960	1.04	1.30	1.06	6449.34	3279	2620438.13		
11	Stone Ch ips	Beam	Core-11	152	69	1.62	5650	0.950	1.04	1.30	1.04	6130.39	936	674639.53		
12	Stone Ch ips	Beam	Core-12	64	69	1.22	3000	0.930	1.04	1.30	1.06	3067.42	2330	4636999.96		

Correction for ACI-562

$$f_{c,eq} = 0.9 \cdot f_c \cdot \left[1 - 1.20 \cdot \sqrt{\frac{16 \cdot V^2}{21} + 0.0015} \right]$$

$K_{cc} = \frac{1.06}{(l/d)^{1.2} - 0.07432566}$

$f_{c,eq} = 4353$ (psi)

Figure 2-4: equivalent concrete strength.

Centre for Advisory and Testing Services [CATS-MIST (CE)]
 Military Institute of Science and Technology

Compressive Strength of Concrete Drilled Cores

CATS Reference: 2376/Con/2826-268/02/2022 Date: 09.02.2022

Client: RMI Consumers Ltd.
 Project Name & Address: RMI Consumers Ltd. (Factory Building) at Plot: B-4/4, 425, 426, 427, BSCIC, Haryana Industrial Estate, Faridkot, Haryana (Project) - Sangrhadhik, BSCIC, Haryana Industrial Estate, Faridkot, Haryana (Project) - Sangrhadhik.

Sample Brought By: M&H Consultants Date of Receiving: 31.01.2022

Test Method: ASTM C 42 / 42-M Date of Test: 07.02.2022

Type of Sample: Drilled Core Sample Condition: Unsealed

Location of Sample: Slab, Grid: A/B/1-2, F/G/1-2, A/B/1-2 & A/1-2

Construction Year: July 2017 Quantity of Sample: 04 nos

No. of Story: (07 stories) Type of Aggregate: Stone Chips

Sl. No.	Sample Identification Mark	Original Length (mm)	Sawed Length (mm)	Diameter (mm)	Crushing Load (kN)	Crushing Strength (MPa)	Failure Type	Fracture Type
1	Core-1, 1st Floor	144.0	130.0	68.0	186.1	36.6	Crushed	Shear
2	Core-2, 1st Floor	131.0	122.0	69.0	158.2	43.9	Crushed	Crushing
3	Core-3, 3rd Floor	155.0	122.0	69.0	180.1	40.1	Crushed	Crush and Shear
4	Core-4, 5th Floor	85.0	84.0	69.0	17.8	26.0	Crushed	Shear

Remarks:

- All information stipulated hereby other than the test results are provided by the client.
- Please correlate the results with your corresponding design return and consult with your design engineer.

Test Supervised By: [Signature]

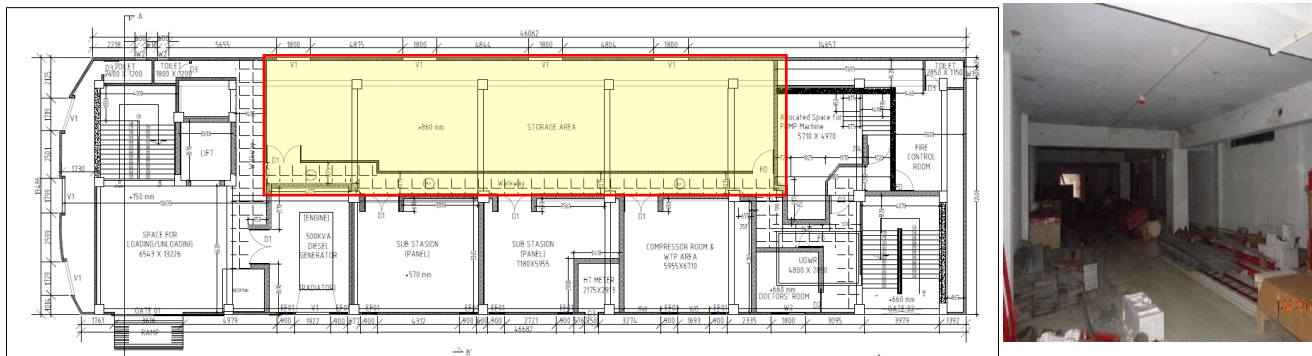
Counter signed by: Dr. G. M. Jafri Hassan, Professor, Date of 07.02.2022, MIST, Haryana, Sangrhadhik, India.

Description: Two concrete cores have been taken from the flat plate 3rd floor and 5th floor. The equivalent concrete strength of flat plate has been calculated considering the cores from the flat plate and cores taken from the beam & slab.

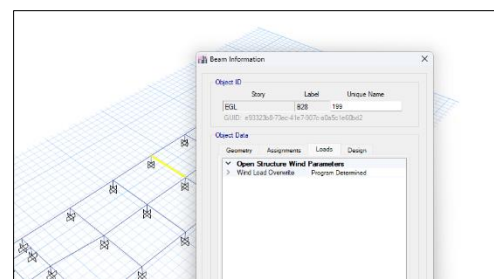
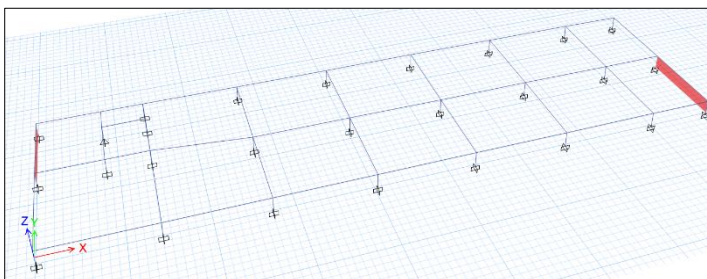
The equivalent concrete strength for the flat plate needs to be calculated separately by taking at least four cores from the flat plate.

Also, some of the cores could not be verified during the inspection as per the core layout plan.

Observation 3: The adequacy of the suspended slab over the ground floor is not provided.



Ground floor layout plan. Suspend slab over the UGWT in the marked location



Description There is an underground water reservoir. The underground water reservoir's roof slab (Ground floor slab) is being used as storage. Loading has not been considered for the FEA model for the beam & slab. Also, load plan has not been prepared for the suspended slab ground floor as well as for the stair top & shed top.

The building is required to prepare a load plan as per BNBC and check the adequacy of the beam and slab.

Observation-6: Exposed column re-bar in lift machine room.



Description: Exposed reinforcement was found in the column in the lift machine room. Building engineer is required to repair the column with non-shrinkable grout to cover the exposed re-bar.

Observation-7: Non-structural elements not anchored or braced.



Description: During the inspection, PVC water tanks at the roof and storage racks on the floors were found without anchoring.

Building engineer is required to adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC.

3. Action Plan:

Serial No	Observation	Action Plan	Timeline
1	Inconsistencies in design documents.	Building engineer is required to update the as-built drawing providing information on the shear wall foundation and check the adequacy of the foundation considering vertical loading as well as lateral loading from the shear wall.	within 6 weeks
2		The structural system and load-bearing mechanism for the lateral load need to be confirmed by the building engineer. Prepare a design report based on the structural system.	within 6 weeks
3		Carry out remedial work if required.	within 6 months
4	Flat plate to be checked against punching for in situ material strength.	Verify the in-situ concrete strength by taking at least four core samples from the flat plates.	within 6 weeks
5		Building engineer is required to check the adequacy (Punching & Flexure) of the flat plate based on in situ concrete strength.	within 6 weeks
6		Building engineer is required to prepare an accurate core test layout plan.	within 6 months
7	Adequacy of the suspended slab on the ground floor is not provided.	The building is required to check the adequacy of the beam and slab.	within 6 weeks
8		Produce and actively manage floor loading plans for all the floors.	within 6 weeks
9		Carry out remedial work if required.	within 6 months
10		Implement the floor live load plan program.	within 6 months
11	Lack of lateral load transfer media in the long direction of the steel roof shed.	The building Engineer is required to confirm the lateral load path & verify the lateral stability of the steel shed.	within 6 weeks
12		The building engineer is required to survey the whole structure and prepare accurate as-built drawings.	within 6 weeks
13		Implement the remediation if required.	within 6 months
14	Connection gap found at steel roof shed.	The building engineer is required to survey and identify the locations and carry out suitable remedial works.	within 6 months
15	Exposed column re-bar in the lift machine room.	Building engineer is required to repair the column with non-shrinkable grout to cover the exposed re-bar.	within 6 months

16	Non-structural elements not anchored or braced.	Building engineer is required to adequately anchor and brace all non-structural elements to resist earthquake forces to comply with the BNBC.	within 6 months
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