



**GLOBAL ALLIANCE FOR VACCINES AND IMMUNIZATION (GAVI)
HEALTH SYSTEM STRENGTHENING II (HSS-2) PROGRAMME**

***PRILIMINARY ASSESSMENT REPORT
EPI BUILDING, RANGAMATI***



May 12, 2018

Submitted By



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1. INTRODUCTION

GAVI (Global Alliance for Vaccines and Immunization) Health System Strengthening II (HSS 2) Programme is to facilitate the vaccine availability in 44 districts of Bangladesh. The objectives of this programme are (1) strengthening VPD surveillance and its integration into HMIS and (2) improving cold chain and supply chain management system performance. Under this programme, UNICEF is going to preserve various vaccines in the selected buildings of Civil Surgeon's office in those 44 districts. For this purpose, UNICEF is looking for a consultant engineering company to provide architectural and building design services by assessing the structural integrity & safety of the selected buildings, verifying the accessibility & availability of the space for Walk-in-Cold Rooms (WICs), water pack freezer & Ice Lined Refrigerators (ILRs) in those buildings and providing design services for new buildings if necessary. As a part of this programme, technical division of Environment & Infrastructure Management Solution (EIMS) Limited completed total 32 districts assessment, design, drawing, preparation of Bill of Quantity and finally successful implementation of civil work by forming a team of consultants, design expertise, and skilled team of Civil work implementation by assessing the structural integrity of selected buildings by UNICEF, providing logical & accurate design consultancy service and finally by supporting UNICEF to supervise the successful implementation of civil work to complete the project within schedule time. As a chronological part of the programme UNICEF GAVI HSS-2, EIMS again completed total 12 districts assessment out of 44 districts. Among these 12 districts, in order to observe the present physical conditions of the selected building visually and perform the assessment, three members of the team comprising Khandaker Mahedi Hasan, Md. Zahidul Islam and Md. Sharif Uddin were assigned for the visit to Civil Surgeon Office at **Rangamati** district on April 24, 2018 to April 25, 2018. Although Civil Surgeon, Patuakhali was not present, Cold Chain Technician (CCT) was present during the assessment work. Civil Surgeon of **Rangamati**, EPI Superintendent and CCT were present during the assessment work.

2. OBJECTIVE

The main objectives of the structural integrity assessment by EIMS team are written below:

- i. To assess the structural integrity of existing building.
- ii. To verify architectural plan of the building.
- iii. Performing non-destructive tests and measuring physical dimensions for some major structural elements.
- iv. Performing some quick calculations based on the present occupancy and considering existing gravity loads as per NTPA Standard.
- v. Identifying the accessibility and availability of the space as per UNICEF recommendation.

- vi. Preparing relevant drawings for renovation purpose where space is available.
- vii. Coordinating with the District Civil Surgeon over phone to prepare a plan of allocation in case of space constraint.
- viii. Preparing the detail architectural and structural design with relevant drawings for the renovation, extension and new generator building.

3. GUIDELINE CODE

The works mentioned above are performed as per the guideline of National Tripartite Plan of Action (NTPA). It was prepared on July 25, 2013 jointly by the Ministry of Labour and Empowerment (MoLE) and International Labour Organization (ILO) for the fire safety and structural integrity of Readymade Garments Factory buildings.

4. BUILDING INFORMATION

At present there is one office building which is two storied RCC building. Credible documents were not found during the assessment work on site. Based on the verbal information the building was constructed in one phases. This building is used for both Office & Storage purpose.

On the basis of preliminary observation of the building and discussion with the personnel and studying the collected information presented during site visit the following information are written below.

- | | | |
|-------------------------------|---|--|
| a) Building Occupancy | : | Office, Storage and EPI Cold chain |
| b) Structural System | : | Beam-column moment resisting frame with RC slab |
| c) Structural Configuration | : | Regular in terms of framing pattern |
| d) Horizontal Plan Geometry | : | Regular pattern |
| e) Adjacent Building Distance | : | Adequate and no possibility to pounding |
| f) No. of Storey at Present | : | 2 (Two) |
| g) Building Plan Dimension | : | 13.18 m along East-West Direction and 17.90 m along North-South direction. Total area of the ground floor is 235.22 m ² (approx.) |
| h) Construction Year | : | 2012 ~ 2014 |
| i) Constructed by | : | Health Engineering Department (HED) |
| j) Floor Occupancy | : | Ground floor- for office and storage, 1 st floor- for conference, and Dry Store along with office. |
| k) Roof System | : | RC Beam supported slab system |
| l) Floor Live Load | : | Maximum allowed floor live load 2.5 KN/m ² (BNBC 2006) |

m) Architectural Drawing	:	Available
n) Structural Drawing	:	Unavailable
o) Soil Investigation Report	:	Unavailable
p) Foundation Type	:	Unknown
q) Materials Properties	:	Steel deformed bar (40 Grade or higher), Concrete with Brick aggregate.

During the site visit some physical dimensions were measured for the building. Each concrete moment resisting frame of main building is multiple bay and all columns are prismatic section. All corner columns sections are 300 mm x 500 mm and edge column sections are 300mm x 500mm, 375mm x 500mm; the central column sections are 375 mm x 500 mm, 500mm x 500mm. The main Beam sections are 300 mm x 550 mm, 375mm x 650mm, 300mm x 650mm and Stair beam section is 300mm x 450mm. Thickness of all floor slabs is approximately 150 mm. The thickness of internal partition walls is found 125 mm & outside walls are 250 mm.

5. REPORTED DISTRESS HISTORY

Distress history wasn't issued to us from representative of CS authority, but our visual observation with no distress is found in the existing EPI building.

6. OBSERVATION

The observation of the visiting team members on the general physical condition of the super structure based on visual inspection of the exposed parts are as follows.

- No major structural distress or cracks was observed in the assessed building. But some minor crack was found in the interior and exterior plaster on the wall which can be enlarged the near future.
- No major Dampness was found in the plastering surface and on the roof slab, but water logging was found in a portion of the roof slab due to uneven roof sloping & dust which can be cause of roof dampness.
- Exposed reinforcement found in the roof false column of the building.
- The factor of safety for three columns (selected as per the tributary area of gravity loading) is found satisfactory. Detail calculation of factor of safety are attached in **Annex-I**.
- No Settlement was found in the building by observing interior wall.
- During rainy season ground floor tiles soaked water from soil and sometimes submerged under water.

Major observations are highlighted in the following figures:



Figure 6.1: Cracked Plaster in between beam & wall joint



Figure 6.2: Checking the Column Reinforcement



Figure 6.3: Checking of Beam Reinforcement and spacing



Figure 6.4: Exposed Rebar of Roof False Column



Figure 6.5: Existing Condition of Roof Slab



Figure 6.6: Existing condition of Conference Room at 1st Floor



Figure 6.7: Existing Condition of Dry Store at 1st Floor



Figure 6.8: Existing condition of Cold Room at Ground floor



Figure 6.9: Intake ILR in Logistic Room at Ground floor



Figure 6.10: Sign of past water mark during rainy season at Ground Floor



Figure 6.11: Front side Building Condition



Figure 6.12: Backside Building Condition

7. CONCLUSION

- Based on the above observation, some quick calculation and the present information; it appears that the building in present condition is safe.
- Vertical & horizontal extension is strongly prohibited before doing any detail analysis of the existing structure.
- The existing EPI cold room has sufficient space to fulfill present requirement.
- The EPI building area is not separated by any boundary wall. So the EPI building is not properly secured.
- A new location is required to construct a new generator building.

8. RECOMANDATION

On the basis of preliminary assessment of civil surgeon building, EIMS team is giving the following recommendations.

Recommendation for Existing EPI Building:

- As per provided guideline of UNICEF, in order to accommodate 1 nos. of WIC, 1 nos. of Freezer and dry store room, the EPI cold room must be renovated.
- It is mandatory to accommodate WIC, Precooling room, Freezer room and Monitoring room in ground floor. Dry store may remain at 1st floor.
- Recommended wash basin (sink) can also be installed within the renovated freezer room.
- Appropriate damp proofing measure should be taken in the affected area.
- Resurfacing is highly recommended for water logged area on the roof surface, because some spalling is found on the roof and the roof surface isn't properly sloped.
- Re-plastering is recommended for walls with minor cracks on plaster.
- Repaint of the existing outer side as well as inner part is recommended.
- To avoid corrosion; red oxide and enamel paint must be applied to the exposed reinforcement.
- Existing SDB of 1st floor can be used. But separate electrical SDB are recommended for ground floor (WIC).
- A new boundary wall is recommended to secure and separate the EPI as well as generator building area.

Recommendation for New Generator Building:

- A piece of land is required for the construction of new generator room. In the north-east side of EPI building, land is available to construct a new generator room. We chose this land for generator room and discussed with Civil Surgeon representatives about whether we can use this land or not as a generator

building. And he confirmed us that they have no problem from the CS office about using this land for a new generator building which will supply uninterrupted electricity to the WIC room.

Recommendation for Site Clearance:

- For Physical implementation of new generator building; no problem will be raised because the land is open and no tree or structure is located there, only some vegetation needed to get removed.



Figure 8.1: Proposed land for new generator building

****Disclaimer**

The Above Comments Are Made From Visual Observations And Some Quick Calculation Of The Exposed Parts Of The Superstructure And Best Engineering Judgments Of The Visiting Member, Who Do Not Bear Responsibility For Any Deviation From The Predicted Behavior Of The Structure Caused By Uncertainties Of Construction, Performance Or Calamities Or Inappropriate Design.

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Annex-I