

Billah Resources Ltd (9284)

17/1, Khataldia, Squid Road, Nishad Nagar, Tongi, Gazipur

(+23.902611N, +90.389351E)

26.APRIL.2014

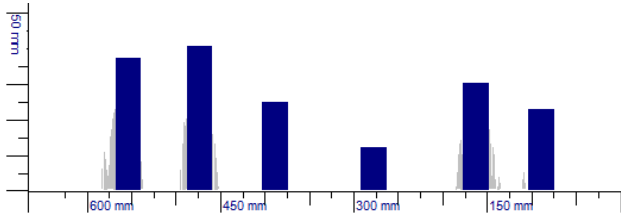



ACC RD
on Fire and Building Safety in Bangladesh



Identified Priority 1 Concerns

Potentially High Column Stresses and Questionable Reinforcing Quantities in Critical Columns.




 Manufacturers of Alloy Steel Casting, Specialized Steel, High Strength Deformed Bars & Wire Rod in Auto Re-Rolling Mill and Ship Breakers.

রহিম স্টীল মিলস কোঃ (প্রাইভেট) লিমিটেড
Rahim Steel Mills Co. (Pvt) Ltd.


MILLS TEST CERTIFICATE

Date: 12-12-2010

Test Certificate to: Billa Resources Ltd.
17/1, Khuthaldia, squab Road,
Arshadnagar, Tonga, Gazipur.

Test Sample : Deformed Bar Of Grade-60

| Sl. No | Sample ID | Rolled Section | Nominal Dia (mm) | Nominal Area Under test (cm ²) | Yield Strength (YS) | | Ultimate Tensile Strength (UTS) | | % Elongation | Bend Test |
|--------|-----------|----------------|------------------|--|---------------------|-----|---------------------------------|-----|--------------|-----------|
| | | | | | PSI | MPa | PSI | MPa | | |
| 1 | RB | 10 | 10 | 0.785 | 63800 | 440 | 94975 | 655 | 19 | OK |
| 2 | RB | 12 | 12 | 1.13 | 63220 | 436 | 95990 | 662 | 18 | OK |
| 3 | RB | 16 | 16 | 2.01 | 64090 | 442 | 97150 | 670 | 17 | OK |
| 4 | RB | 20 | 20 | 3.14 | 63510 | 438 | 97005 | 669 | 17 | OK |
| 5 | RB | 22 | 22 | 3.80 | 63945 | 441 | 96425 | 665 | 16 | OK |
| 6 | RB | 25 | 25 | 4.91 | 63075 | 435 | 97440 | 672 | 17 | OK |
| 7 | RB | 28 | 28 | 6.16 | 63365 | 437 | 96860 | 668 | 16 | OK |
| 8 | RB | 32 | 32 | 8.04 | 62640 | 432 | 97730 | 674 | 16 | OK |


 Harun Or Rashid
 Quality Assurance Department

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)
 DEPARTMENT OF CIVIL ENGINEERING
 Concrete Laboratory

BRIC No: 1100-36276 /12-13/CE; Dt: 21/11/2012
 San by: Asst. Chief Engineer (Lab), Advanced Development Technologies Ltd., Gulshan North, Dhaka-1212.
 Ref. No: 9207-2135/12; Dt: 21/11/2012
 Project: Billa Resource Ltd.
 Sample: Cylinder [Mix proportions quoted], Not mentioned, Aggregate Type: Stone chips
 Location: Not mentioned
 Test: Compressive Strength (ASTM C 15)
 Date of Test: 20/11/2012

TEST REPORT

| Sl. No. | Date of Casting as per the Letter | Specimen Designation/Prog. Mark | Specimen Area (sq. in) | Maximum Load (lb) | Crushing Strength (psi) | Average Crushing Strength (30.8 MPa) | Made of |
|---------|-----------------------------------|---------------------------------|------------------------|-------------------|-------------------------|--------------------------------------|-----------|
| 1 | 24/10/12 | P10201 | 12.41 | 47,104 | 4,558 | 4440 psi | Combined* |
| 2 | 07/09/12 | P10307 | 12.53 | 55,950 | 4,481 | (30.8 MPa) | Combined* |
| 3 | | P10507 | 12.86 | 54,435 | 4,251 | (31.2 kg/cm ²) | Combined* |

*Note: Samples were received in untested condition. * Combined = Mortar and Aggregate failures

Countersigned by: 
 Dr. Md. Abnur Rouf
 Professor
 Department of Civil Engineering
 BUET, Dhaka-1000, Bangladesh

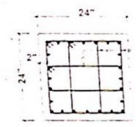
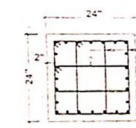
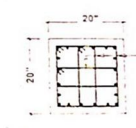
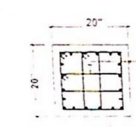
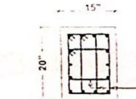
Test Performed by: 
 Dr. Mohammed Al Amin Siddique
 Assistant Professor
 Department of Civil Engineering
 BUET, Dhaka-1000, Bangladesh

Important Notes: This report is only valid for the purpose mentioned. BRIC does not take any responsibility as to the reliability or accuracy of the data required for the design of the structure. BRIC is not responsible for any design and safety code violations or other by-laws of the competent authority. It is the user's responsibility to ensure that the test results are used only for the intended purpose.

Priority 1 Concern

COLUMN SCHEDULE:

Column Identification Size and rebar detail

- C1**
 (3 NOS)  1 of 24-Ø28
Ø10@8" c/c
- C1A**
 (3 NOS)  1 of 24-Ø25
Ø10@8" c/c
- C2**
 (6 NOS)  1 of 20-Ø28
Ø10@8" c/c
- C2A**
 (2 NOS)  1 of 20-Ø25
Ø10@8" c/c
- C3**
 (1 NOS)  1 of 14-Ø25
Ø10@8" c/c

Although Ferroskan results were not definitively conclusive, scans indicate a deficiency in the critical column reinforcing (scans show 20 bars, drawings show 24). In addition the column load run-downs indicate higher than desirable stress in the columns in question (G.L. C/7). However, we were provided with Compressive Strength Test results and Mill Test Certificates which indicate favourable material strengths.

High Column Stresses & Deficient Reinforcing

Identified Priority 2 Concerns

No loading plan



Although slab loading was in general very light, there was some sporadic storage throughout the factory. There was no loading plan provided nor was there any evidence that load monitoring was taking place.

No Loading Plan or Storage Monitoring

Identified Priority 3 Concerns

(None)

Overall Stability System



For all floor levels above the Ground Floor, the majority of the slab was constructed as a flat slab configuration. A proper lateral restraint system was not observed.

We require that the lateral stability of the structure be further investigated through a Detailed Engineering Assessment.



Lateral Restraint System

Water Ingress at Roof Level



The exposed portion of roof slab contained no waterproofing. However, no evidence of water infiltration was observed at the underside of the roof slab.

Roof Waterproofing System

Priority Actions

Problems Observed Summary

ITEM 1: (Priority 1) Although not definitive, Ferro-scanning indicates reinforcement in the verified column is less than shown on the structural drawings. Additionally, column load run-downs indicate high levels of stress in the critical columns.

ITEM 2: (Priority 2) No loading plan was provided, nor did load monitoring measures appear to be in effect.

ITEM 3: (Priority 2) There was no significant lateral restraint system present and the majority of the floor area above the ground floor was constructed as flat slab.

Item 1 and actions

High Column Stress and Possible Reinforcing Deficiency in Critical Columns.

Priority 1 (Immediate – Now)

- A Detailed Engineering Assessment including verification of column reinforcing to be commenced.
- The Factory Engineer to verify design, loads and column stresses.

Priority 2 (within 6 weeks)

- The Detailed Engineering Assessment to be completed.

Priority 3 (within 6 months)

- Complete implementation of any works deemed necessary by the DEA.

Item 2 and Actions

No Loading Plan in Effect

Priority 1 (Immediate – Now)

- Limit storage loads throughout the factory

Priority 2 (within 6 weeks)

- The Factory Engineer is to produce and actively manage a loading plan for all floor plates giving consideration to slab, beam and column capacities.

Priority 3 (within 6 months)

- Maintain and actively monitor loading plan.

Item 3 and Actions

No Lateral Restraint System Present

Priority 1 (Immediate – Now)

- As part of the Detailed Engineering Assessment, evaluate the structure's lateral stability under wind and seismic loads.

Priority 2 (within 6 weeks)

- Detailed Engineering Assessment to be completed

Priority 3 (within 6 months)

- Complete implementation of any works deemed necessary by the DEA.