Four H Lingerie Ltd.

BRTC Bus Depot, Baluchara, Hathazari Road, Chittagong, Bangladesh
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2nd July 2014

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Observations

Bracing System Issues

There are significant eccentricities of bracing connections causing minor axis bending to portal frame members. Compression flange braces required for rafters at braced bays also not provided.

Missing compression flange braces

Significant eccentricity to plan bracings

Plan bracing substantially away from vertical supports

Bracing System Issues

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Apparent Deficiency in Steel Connection Design

Moment transfer between portal frames compromised due to connection recess for gutter.

Column-rafter connection at valley

- Column with haunch
- Rafter sitting on top of haunch
- Gutter drain

Steel Connection Design

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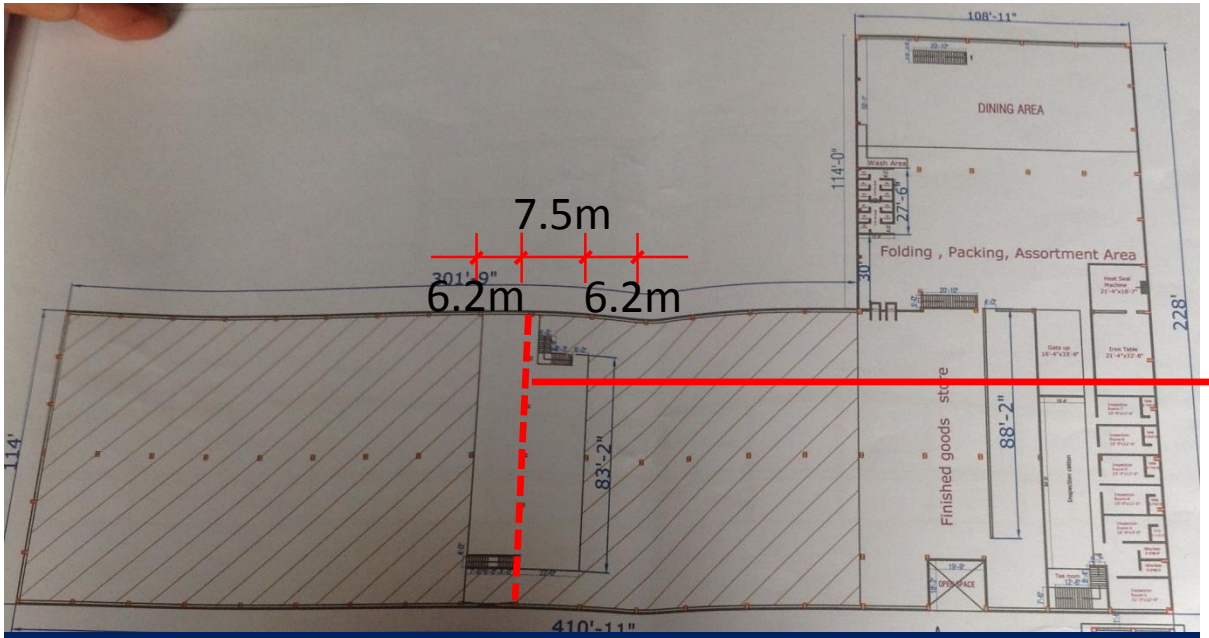
Reduced Portal Frame Member Size Resisting Larger Tributary Wind Area

We have observed that the member sizes in this bay are smaller than the rest of the bays. It also has a slightly larger tributary wind loading area. The columns are also orientated about the weak axis in relation to wind loading.



Column layout

Frame at this bay

Frame with reduced member sizes

Reduced Portal Member Size

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Vertical Support of Portal Frame Unclear

Portal frame apparently supported off corbels from adjacent building.

Capacity of support points of portal frame unclear.

Support points of portal frame unclear.

Portal Support Unclear

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Steel Connection Defects

Untightened vertical braces

Gaps to connections

Gaps to connections

Steel Connection Defects

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Priority Actions

Problems Observed

ITEM 1: Issues with Bracing System

ITEM 2: Apparent Deficiency in Steel Connection Design

ITEM 3: Reduced Portal Frame Member Size Resisting Larger Tributary Wind Area

ITEM 4: Vertical Support of Portal Frame Unclear

ITEM 5: Steel Connection Defects

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Issues with Bracing System	Building Engineer to review bracing system for lateral wind loading as per BNBC with consideration for minor axis bending of rafters due to eccentricity of members at node points. Review design of rafter considering compression flange restraint.	**6-weeks**
2	Issues with Bracing System	Building Engineer to design and detail structural upgrading work where necessary to ensure adequate stiffness of bracing system.	**6-weeks**
3	Issues with Bracing System	Where required, remedial measures to steelwork to be carried out.	**6-months**
4	Apparently Inadequate Steel Connection Design	Building Engineer to assess connection for vertical and lateral loads as per BNBC with particular attention to moment transfer between portal frames.	**6-weeks**
5	Apparently Inadequate Steel Connection Design	Building Engineer to design and detail structural upgrading works, as necessary.	**6-weeks**
6	Apparently Inadequate Steel Connection Design	Where required, remedial measures to steelwork to be carried out.	**6-months**

Item No.	Observation	Recommended Action Plan	Recommended Timeline
7	Reduced Portal Frame Member Size Resisting Larger Tributary Wind Area	Building Engineer to review lateral capacity of portal frame with reduced member size for wind loading as per BNBC.	**6-weeks**
8	Reduced Portal Frame Member Size Resisting Larger Tributary Wind Area	Building Engineer to design and detail structural upgrading works, as necessary.	**6-weeks**
9	Reduced Portal Frame Member Size Resisting Larger Tributary Wind Area	Where required, remedial measures to steelwork to be carried out.	**6-months**
10	Vertical Support of Portal Frame Unclear	Building Engineer to review existing vertical support and confirm by calculations that the structural capacity of the existing support points are adequate. If necessary, remedial works to be carried out.	**6-months**
11	Steel Connection Defects	Building Engineer to review connection gaps at member interfaces and add shim plates where necessary.	**6-months**