

STANDARD LIMITATIONS

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1.0 LIFT STATION INFORMATION

Station Name:	<u>Hawthorne Lift Station</u>
Location of Station:	<u>1178 Kildonan Drive</u>
Date of Inspection:	<u>January 20, 2010</u>
Inspected By:	<u>Damir Muhurdarevic, EIT</u>
Inspecting Firm:	<u>MMM Group Limited (MMM)</u>
Client:	<u>City of Winnipeg – Water and Waste Department</u>

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2.0 OBSERVATIONS

2.1 General

Hawthorne Lift Station is a conventional lift station with a main floor at ground level and four (4) floors below ground level. The lift station is constructed of cast-in-place concrete below ground level and masonry and wood framing above ground level. The main floor contains typical lift station components and controls, the first and second floors below grade are chamber rooms, the third floor below ground level is a motor room containing the pump motors, and the fourth floor below ground level is a pump room containing wastewater/land drainage pumps. The condition and operation of the pumps and motors was not observed.

2.2 Lifting Devices

The main floor has a wide flange lifting beam (175mm high by 93mm wide) that spans the length of the room with an attached sliding hook. No posted rating was observed on the lifting beam. The wall supports connections were unable to be observed due to Styrofoam wall insulation.

The third floor motor room and the fourth floor pump room each have three (3) U-shaped hooks, fabricated of 19.4mm diameter steel rod embedded into the underside of the cast-in-place concrete floor above. The second floor chamber has four (4) similar hooks, which are embedded into the underside of the concrete floor beams above.

3.0 ANALYSIS AND LOAD RATING

The beam on the main floor was analyzed for bending resistance of the beam and shear resistance of the assumed bolted clip angle wall connections. The resistance of the assumed wall connection was the governing factor, which was calculated to be 3.0 tons. However, due to assumptions of the wall connections, it is recommended a safety factor of 2.0 be applied to yield a **load rating of 1.5 tons**.

The ten (10) U-shaped hooks were analyzed for pullout resistance of the embedment and the tension resistance of the hook. The thickness of the ceiling was unable to be observed therefore; a concrete thickness of 200mm and an embedment length of 150mm were assumed. The governing factor in the hooks was the pullout resistance, which was calculated to be 6.8 tons. However, due to assumptions in the calculations, it is recommended that a safety factor of 4.5 be applied to yield a **load rating of 1.5 tons**.

Table 3.1 below is a summary table of lifting device load ratings:

Table 3.1 Load Rating Summary

Type	Quantity	Location	Calculated Resistance	Safety Factor	Load Rating
Wide Flange Lifting Beam	1	Main Floor	3.0 tons	2.0	1.5 ton
U-Shaped Hook	10	Underside of Cast-In-Place Concrete Floors	6.8 tons	4.5	1.5 ton

4.0 CONCLUSIONS AND RECOMMENDATIONS

MMM, through this inspection, does not warrant the lifting devices installation or warrant that the design complies with current codes or standards. As per MMM's analysis it was found that the hooks should be rated at **1.5 tons**, and the main floor wide flange lifting beam is to be rated at 1.5 tons as well.

This lift station inspection is limited to a visual inspection lifting members and connections. The inspection pertains to surface material condition only.

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Photograph No. 1

Pump and motor room U-shaped lifting hooks



Photograph No. 2

Lifting beam located on the main floor