STANDARD LIMITATIONS

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1.0 LIFT STATION INFORMATION

Station Name:	Conway Lift Station
Location of Station:	2206 Portage Avenue (at Conway Street)
Date of Inspection:	February 19, 2010
Inspected By:	Damir Muhurdarevic, EIT
Inspecting Firm:	MMM Group Limited (MMM)
Client:	City of Winnipeg – Water and Waste Department

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2.0 OBSERVATIONS

2.1 General

Conway 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 a combined chamber room, 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 steel wide flange lifting beam (175mm high by 93mm wide) that spans the entire length of the room and has an attached sliding hook. There is no posted rating on the beam and wall connections were unable to be observed due to Styrofoam wall insulation.

The motor room has one (1) U-shaped hook, fabricated of 19.4mm diameter steel rod and embedded into the cast-in-place concrete floor above.

The pump room has three (3) eye-shaped hooks, fabricated of 19.4mm diameter steel rod embedded into the cast-in-place concrete floor above.

ANALYSIS AND LOAD RATING

The W-beam on the main floor was analyzed for bending resistance of the beam and the shear resistance of an assumed bolted connection. The assumed shear resistance was found to be the governing factor which was calculated to be 3.0 tons. This resistance was reduced by a safety factor of 3.0, due to the wall connection assumptions, to yield a **load rating of 1.0 ton.**

The analysis of the U-shaped hook determined a resistance 6.8 tons. However, due to many assumptions, it is recommended that an additional factor of safety of 4.5 be applied to the hooks, to yield a **load rating of 1.5 tons.**

The three (3) eye-shaped hooks were analyzed for pullout resistance of the concrete embedment and the tension resistance of the hook. A concrete thickness of 200mm and an embedment length of 150mm were used. The governing factor was the pullout resistance, which was calculated to be 3.4 tons. However, it is recommended that an additional factor of safety of 3.4 be applied to the hooks, to yield a **load rating of 1.0 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
Main Floor Lifting Beam	1	Main Floor	3.0 tons	3.0	**1.0 ton**
U-Shaped Hook	1	Underside of Second Cast-In-Place Concrete Floor	6.8 tons	4.5	**1.5 ton**
Eye-Shaped Lifting Hooks	3	Underside of Cast-In-Place Concrete Floors	3.4 tons	3.4	**1.0 ton**

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 eye-shaped hooks should be rated at 1.0 tons, and the U-shaped hook at 1.5 tons. The main floor W-Beam is rated at 1.0 tons.

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

Prepared by:

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Inspector

Reviewed by:

MMM Group Limited

Jim Lukashenko, P.Eng.
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APPENDIX A – Photographs

Photograph No. 1

Typical pump room eye-shaped hooks

Photograph No. 2

Motor room U-shaped hook

Photograph No. 3

Main floor lifting beam with sliding hook

Photograph No. 4

Main floor lifting beam