APPENDIX B – COMMUNITY ROW WASTEWATER PUMPING STATION HOIST DEVICES AND LIFTING CAPACITIES REPORT

STANDARD LIMITATIONS

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1.0 LIFT STATION INFORMATION

Station Name:	Community Row Lift Station
Location of Station:	1525 Roblin Boulevard (at Community Row)
Date of Inspection:	February 17, 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

Community Row Lift Station is a conventional lift station with three (3) floors below ground level. The first floor below ground level contains typical lift station components and controls, the second floor below ground level is a motor room containing wastewater/land drainage pump motors, and the third 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 lifting beam system consisting of an S200x27 beam that spans approximately 5440mm that carries a trolley with a posted 2.0 tons rating. One end of the S200x27 beam is welded to the underside of a W100x19 beam spanning 1520mm supported by HSS 76x76 columns on each side. On the other end, the S200x27 beam is supported by a bolted clip angle connection to steel beam that is a part of the roof framing. Excessive projection of three (3) anchor bolts was observed on one of the HSS column supports, two (2) at the clip angle connection near the column top and one (1) at the base plate. It is assumed that the anchors have not been installed to their design embedment. It appears that sections of pipe were uses as spacers between the washers and nuts. It was also observed that the system was currently condemned; however, it does not appear to be appropriately locked and/or tagged out.

The third floor motor room and fourth floor pump room and the each contain 2 eye-shaped hooks, which are all fabricated of 25.4mm diameter steel rod and are embedded into the underside of the concrete floor above. The pump room additionally contains 2 plate hooks embedded into the underside concrete floor above. Severe corrosion was observed on the plate hooks with significant loss of sectional area.

3.0 ANALYSIS AND LOAD RATING

The beam system on the main floor was analyzed for bending resistance of the S-beam and the supporting W-beam, column shear resistance and weld resistances of the connections. Bending resistance of the S-beam was the governing factor, which was calculated to be 3.0 tons. However, due to the fact that the beam is currently condemned, MMM cannot safely assign a load rating for the system.

The four (4) eye-shaped hooks were analyzed for pullout resistance of the embedment and tension resistance of the hook. The thickness of the cast-in-place concrete was not observed, therefore, the concrete thickness was estimated to be 200mm and an embedment length of 150mm was assumed. The pullout resistance was governing factor, which was calculated to be 3.6 tons. However, due to many assumptions, it is recommended that an additional factor of safety of 3.6 be applied to the hooks, to yield a **load rating of 1.0 ton.**

The two (2) steel plate hooks were analyzed, and a resistance of 3.4 tons was determined. However, due to the observed loss of sectional area cause by the corrosion, no load rating can safely be assigned. They should be deemed unsafe to use and should be replaced.

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
S200x27 Lifting Beam System	1	Main Floor	3.0 tons	N/A	**N/A**
Eye-Shaped Lifting Hooks	4	Underside of Cast-In-Place Concrete Floors	3.6 tons	3.6	**1.0 ton**
Plate Hooks	2	Underside of Third Floor Cast-In-Place Concrete	3.4 tons	N/A	**N/A**

4.0 CONCLUSIONS AND RECOMMENDATIONS

Below is a summary of deficiencies and items requiring further attention.

Table 4.1 Deficiencies

Ref.	Description	Priority
4.1	Repair or Lockout /Tagout W200x27 lifting beam system	**A**
4.2	Replace three (3) anchor bolts with excessive projection.	**A**
4.3	Remove and replace 2 steel plate hooks in the bottom floor pump room.	**B**

Items denoted as Priority A are Must Do Work items and should be addressed immediately.
Items denoted as Priority B are One (1) Year Deferrable items and should be addressed as soon as possible within one (1) year.
Items denoted as Priority C are Three (3) Year Deferrable items and should be addressed within three (3) years.

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 hooks should be rated at 1.0 Ton. The steel plate hooks are not rated as they are deemed unsafe and must be replaced before further use, and the S-Beam system was not given a safe rating because it is currently condemned by the City of Winnipeg.

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

Prepared by:

MMM Group Limited

Damir Muhurdarevic, EIT
Inspector

Reviewed by:

MMM Group Limited

Jim Lukashenko, P.Eng.
Manager, Structures
Associate

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APPENDIX A – Photographs

Photograph No. 1

Typical bottom floor eye-shaped hook

Photograph No. 2

Typical bottom floor plate hook

Photograph No. 3

Main floor lifting beam system over access door

Photograph No. 4

Main floor lifting beam system and trolley