

## **APPENDIX B – OLIVE PUMPING STATION EXISTING HOIST DEVICES AND LIFTING CAPACITIES REPORT**

### **STANDARD LIMITATIONS**

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## 1.0 LIFT STATION INFORMATION

<b>Station Name:</b>	<u>Olive Lift Station</u>
<b>Location of Station:</b>	<u>Assiniboine Crescent east of Olive Street</u>
<b>Date of Inspection:</b>	<u>February 10, 2010</u>
<b>Inspected By:</b>	<u>Damir Muhurdarevic, EIT</u>
<b>Inspecting Firm:</b>	<u>MMM Group Limited (MMM)</u>
<b>Client:</b>	<u>City of Winnipeg – Water and Waste Department</u>

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## **2.0 OBSERVATIONS**

### **2.1 General**

Olive Lift Station is a conventional lift station with a main floor at ground level and three (3) 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 floor below grade is a combination chamber, the second floor below ground level is a motor room containing the 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 combination chamber on the first floor below ground and the motor room on the second floor below ground each have four (4) U-shaped lifting hooks that are fabricated of 19.4mm diameter steel rod and are embedded into the underside of the main and first floor cast-in-place concrete slabs. During the inspection it was observed that one of the hooks in the motor room on the second floor below ground is bent.

The pump room located on the third floor below ground has two (2) U-shaped lifting hooks that are fabricated of 19.4mm diameter steel rod and are embedded into the underside of the second floor cast-in-place concrete slab.



### 3.0 ANALYSIS AND LOAD RATING

All U-hooks were analyzed for pullout resistance of and the tension resistance of the hooks. The thickness of the roof and floor slabs was not observed and therefore the embedment length of the hooks was only estimated. The slabs were estimated to be 200mm thick and an embedment length of 150mm was used. The governing factor in the hooks was the pullout resistance, which was calculated to be 6.8 tons. A factor of safety of 4.5 was applied to the hooks to yield a load rating of 1.5 tons. The one (1) bent hook located in the motor room was not rated for safe use and was recommended to 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
U-Shaped Lifting Hooks	9	Underside of Main, First and Second Cast-In-Place Concrete Floors	6.8 tons	4.5	<b>1.5 tons</b>
U-Shaped Lifting Hook	1	Underside of First and Cast-In-Place Concrete Floor	n/a	n/a	<b>n/a</b>

## 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	Replace bent U-shaped lifting hook located in the motor room	A

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 our analysis it was found that the U-shaped lifting hooks are to be rated at 1.5 tons, except the bent U-shaped hook in the pump room that was not given a rating and needs to be replaced.

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**

U-shaped lifting hook welded to a steel plate, located on the bottom floor



**Photograph No. 2**

Various lifting hooks embedded in the ceiling, located in the motor room (U-shaped hook bent)