



Stantec

**MUNICIPALITY OF LEAMINGTON
DRAINAGE FACILITY STUDY
B & C PUMPING STATION**

Prepared for:

Municipality of Leamington
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MUNICIPALITY OF LEAMINGTON DRAINAGE FACILITY STUDY – B & C PUMPING STATION

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CHAPTER 1.0 - INTRODUCTION

Stantec Consulting Ltd. has been retained by the Municipality of Leamington to provide professional engineering services to conduct compliance reviews for five (5) drainage pumping stations with diesel driven and/or electrically operated pumps located in the southern and eastern regions of Leamington. This report documents our observation, findings and recommendations with respect to deficiencies as outlined in various applicable codes pertaining to the B & C Pumping Station.

The B & C Pumping Station consists of two (2) buildings. The primary electric driven pump is housed in a corrugated steel pipe below grade with a small enclosure over top constructed from a timber frame with metal siding and plywood roof. This pumping station is fairly new, constructed in the late 1980's, in comparison to the other drainage pumping stations located in the Leamington area.

The backup pump appears to be in the original structure which is a concrete wet well with timber framed building with metal siding and roof. The backup pump is belt driven, powered by a diesel engine.

CHAPTER 2.0 - SCOPE

The purpose of this report is to document the compliance review of the B & C Pumping Station based on our site assessment with respect to the following codes and standards:

- Ontario Building Code, 1997 Edition
- Ontario Electrical Safety Code, 23rd Edition
- Revised Statutes of Ontario, R.S.O. 1990, Occupational Health and Safety Act
- Revised Regulations of Ontario, R.R.O. 1990, Reg. 851 for Industrial Establishments
- Ontario Regulation 419/05, Air Pollution – Local Air Quality
- Canadian Standards Association, CSA B139-06, Installation Code for Oil Burning Equipment
- National Fire Protection Act, NFPA 10, Standard for Portable Fire Extinguishers
- Ontario Fire Code, O. Reg. 388/97, as amended by O. Reg. 398/98 and 428/98

With respect to Regulation 851 for Industrial Establishment, our compliance review only allowed for the following:

- Machine guarding
- Guardrail / handrail
- Slip / Trip & Fall
- Fall protection

CHAPTER 3.0 - DEFINITIONS

The following definitions will form the basis of our health and safety compliance review:

a) From R.S.O. 1990, Occupational Health and Safety Act (OHSA):

- “*employer*” means a person who employs one or more workers or contracts for the services of one or more workers and includes a contractor or subcontractor who performs work or supplies services and a contractor or subcontractor who undertakes with an owner, constructor, contractor or subcontractor to perform work or supply services;
- “*industrial establishment*” means an office building, factory, arena, shop or office, and any land, buildings and structures appertaining thereto;
- “*worker*” means a person who performs work or supplies services for monetary compensation but does not include an inmate of a correctional institution or like institution or facility who participates inside the institution or facility in a work project or rehabilitation program;
- “*workplace*” means any land, premises, location or thing at, upon, in or near which a worker works.

b) Duties of Employers – Section 25 , OHSA

An employer shall ensure that,

- (1)(c) the measures and procedures prescribed are carried out in the workplace;
- (1)(d) the equipment, materials, and protective devices provided by the employer are used as prescribed;
- (2)(a) provide information, instruction and supervision to a worker to protect the health or safety of the worker;
- (2)(d) acquaint a worker or a person in authority over a worker with any hazards in the work and in the handling, storage, use, disposal and transport of any article, device, equipment, or a biological, chemical or physical agent;
- (2)(h) take every precaution reasonable in the circumstances for the protection of a worker;

For the purposes of this report and based on the definitions in this Chapter, the Municipality of Leamington is the *employer* of the *workers* that will be working in the various pump stations in and about the southern and eastern regions of Leamington.

Pursuant to 25 (2)(h) from the OHSA, taking every precaution reasonable in the circumstances for the protection of a worker would include ensuring compliance to applicable standards that would impact and affect the work environment and health and safety of a *worker*.

CHAPTER 4.0 - OBSERVATIONS & RECOMMENDATIONS

4.1 STRUCTURAL COMPLIANCE REVIEW

The structural review of B & C Pumping Station was conducted to evaluate the structural condition of the facility in order to continue functioning for its intended purpose and compliance with Ontario Building Code.

4.1.1 Structural Deficiency No. 1

Observation

The primary pump enclosure is in fair condition. However, the access stairs to the inlet screen are corroded and are not secured. The stairs also do not meet building code requirements as can be seen in Figure 4-1.



Figure 4-1

Recommendation

It is recommended to replace the access stairs to the inlet screen. The new construction shall include handrails and guarding around the inlet to comply with the building code.

4.1.2 Structural Deficiency No. 2

Observation

The secondary pump building is in need of considerable repair or replacement (see figure 4-2).



Figure 4-2

Recommendation

Since this building is no longer in use and deemed unsafe due to its dilapidated condition and proximity to residential homes, it is recommended to demolish this building.

4.1.3 Structural Deficiency No. 3

Observation

Water leaking from the roof onto electrical equipment, which can potentially lead to an electrical hazard as seen in Figure 4.3.



Figure 4-3

Recommendation

Replace roof material with new to prevent any further moisture entering the building.

4.2 MECHANICAL COMPLIANCE REVIEW

The mechanical review of B & C Pumping Station was conducted to evaluate the mechanical condition of the facility in order to continue functioning for its intended purpose and compliance with the following codes and standards:

- Ontario Building Code
- Canadian Standards Association, CSA B139-06 for diesel fuel handling
- Ontario Regulation 419/05 for diesel emissions and noise pollution

4.2.1 Mechanical Deficiency No. 1

Observation

The entrance door of the building has an opening at the bottom of the door used for ventilation which allows for the entrance unwanted animals and debris as seen in Figure 4-4.



Figure 4-4

Recommendation

It is recommended that this opening be covered by a metal grille and a bird screen to prevent any animals or unwanted debris from entering into the building.

4.2.2 Mechanical Deficiency No. 2

Observation

It is our understanding that the back-up pump and diesel engine has not been operational for an extended period of time and requires refurbishing to get them back into working order, if required.

Recommendation

Since it was brought to our attention that this diesel driven pump is no longer in use, no further consideration was given.

4.3 ELECTRICAL COMPLIANCE REVIEW

The electrical review of B & C Pumping Station was conducted to evaluate the electrical condition of the facility in order to continue functioning for its intended purpose and compliance with Ontario Electrical safety code and applicable sections within the Ontario Building Code with respect to lighting.

The electrical service for the building housing the diesel driven pump was permanently disconnected. Since this building is no longer in service, no further consideration was given to the electrical condition of this building.

4.3.1 Electrical Deficiency No. 1

Observation

The electrical distribution equipment housed in the building for the electric driven pump does not have the proper 1 meter un-obstructive clearance as required by the Electrical code as can be seen in Figure 4-5. Upon review of the documents received by the Municipality with respect to this pump station, there was no indication of an electrical certificate of final inspection to indicate that it has passed the electrical safety inspection conducted by Electrical Safety Authority (ESA). If there was an electrical certificate of final inspection, this might indicate any variances that could have been given to supercede this code requirement.



Figure 4-5

Recommendation

Since there is no indication of any variances to the 1 meter clearance in front of electrical equipment, it is recommended that the electrical distribution equipment be housed in a corrosion resistance weatherproof enclosure and mounted outdoors on the exterior wall of the building.

4.3.2 Electrical Deficiency No. 2

Observation

The electrical wiring within the electric pump building does not have adequate mechanical protection to prevent the wire insulation from being compromised, which may lead to the potential of being exposed to live conductors. Refer to Figure 4-6 as one of many examples.



Figure 4-6

Recommendation

Replace existing NMS (non metallic sheathed) type wiring with T90 conductors in conduit or armoured cable, such as BX or TECK construction.

4.3.3 Electrical Deficiency No. 3

Observation

Existing four (4) circuit load centre is rusted due to the water leaks. The rusted out load centre can be seen in Figure 4-7.



Figure 4-7

Recommendation

It is recommended to replace existing four (4) circuit load centre with new since it may not be reliable due to water damage.

4.4 HEALTH AND SAFETY COMPLIANCE REVIEW

The health and safety review of B & C Pumping Station was based on general compliance with Ontario Health and Safety Act, however, the following have been excluded from the scope of this review:

- Exposure of a worker in excess of occupational exposure limits (ie: mould, diesel engine exhaust, etc.)
- Racking / Shelf like structures
- Ergonomics
- Personal Protective Equipment (PPE) requirements
- Storage of Flammable Liquids

4.4.1 Health and Safety Deficiency No. 1

Observation

Trip / Slip & Fall hazard exist from holes in floor around electric motor. See Figures 4-8 and 4.9 below.



Figure 4-8



Figure 4-9

Recommendation

Fabricate a metal guard around the pump base opening to eliminate the trip hazard.

4.4.2 Health and Safety Deficiency No. 2

Observation

Hatch in floor not suitably secured as can be seen in Figure 4-10.



Figure 4-10

Recommendation

Provide removable fasteners to secure the pump well access hatch to the floor.

4.4.3 Health and Safety Deficiency No. 3

Observation

Burn hazard on diesel engine exhaust as can be seen in Figure 4-11.

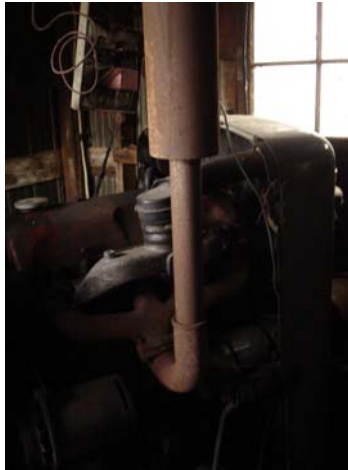


Figure 4-11

Recommendation

Suitably insulate diesel exhaust stack and muffler to prevent burn hazard. However, we recommend giving this deficiency no further consideration since the diesel driven pump is no longer in use.

4.4.4 Health and Safety Deficiency No. 4

Observation

Nip point with diesel engine drive belt and associate pulley as can be seen in Figure 4-12.



Figure 4-12

Recommendation

Proper guarding around drive belt and associated pulley in compliance with OHSA regulations is required. However, we recommend giving this deficiency no further consideration since the diesel driven pump is no longer in use.

4.4.5 Health and Safety Deficiency No. 5

Observation

Guardrail was lacking for the fall hazard into water. Refer to Figures 4-13 & 4-14 for examples.

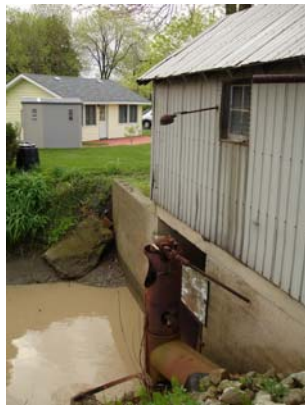


Figure 4-13



Figure 4-14

Recommendation

Install suitable guardrail and where a worker is exposed to the hazard of falling into liquid that is of sufficient depth for a life jacket to be effective as protection from the risk of drowning, there shall be an alarm system and rescue equipment, appropriate in the circumstances, to ensure the worker's rescue from the liquid and,

- (a) the worker shall wear a life jacket; or

- (b) the employer shall develop written measures and procedures to prevent the worker from drowning and shall implement them.

4.4.6 Health and Safety Deficiency No. 6

Observation

Although the review of the storage of flammable liquids was excluded from the scope of the health and safety review, Stantec observed many different types of containers containing flammable liquids (ie: motor oil, lubricating grease, gasoline, etc.) of various sizes that were either simply laying on the floor or located in no particular proper location.

Recommendation

Stantec recommends that all flammable liquids be properly stored away in a non-combustible constructed cabinet located away from any oxidizers or sources of ignition.

CHAPTER 5.0 - OPINION OF PROBABLE CONSTRUCTION COST

5.1 GENERAL

A cost estimate can be described as an attempt to project what someone else will be willing to contract for in the future to do construction work which has not yet been defined and which is subject to changes in scope, design, and market conditions.

Our opinion of the probable cost for construction to repair deficiencies as described in this report is summarized in this section. The cost summary has been prepared taking into consideration the following factors:

- Labour costs are based on union labour rates for the Essex County area.
- Material costs are based on vendor supplied price quotations and historical pricing of similar equipment.
- PST is included in the pricing at 8% for each line item, where applicable. No GST included.
- An overhead and profit allowance for the contractor is included in each line item.
- A contingency allowance is included in the estimate and is intended to allow for changes that may occur during construction. It is not intended to cover price increases due to escalation or scope changes.
- An allowance for engineering is **not** included since most of this work can be done as a direct assignment to the Contractor.

The level of accuracy in projecting costs at this stage of development of a project is typically plus or minus 20% or greater and can be refined if the project proceeds into the design stage to a level of plus or minus 10% just prior to tendering. However, the level of accuracy cannot be guaranteed, and the actual final cost of the project will only be determined through the tendering and construction process.

5.2 COST ESTIMATE

Item No.	Deficiency Remediation Description	Cost Estimate
4.1	Structural Repairs:	
4.1.1	Deficiency No. 1 – New access stairs to inlet screen	\$ 4,000.00
4.1.2	Deficiency No. 2 – Demolition of building housing diesel driven pump	\$ 6,000.00
4.1.3	Deficiency No. 3 – Repair roof	\$ 800.00
4.2	Mechanical Repairs:	
4.2.1	Deficiency No. 1 – Cover door opening with metal grille and bird screen	\$ 200.00
4.2.2	Deficiency No. 2 – No action required (diesel pump not in use)	\$ 0.00
4.3	Electrical Repairs:	
4.3.1	Deficiency No. 1 – Relocate existing power distribution equipment outdoors	\$ 5,000.00
4.3.2	Deficiency No. 2 – Replace existing NMS type wiring with TECK cables	\$ 500.00
4.3.3	Deficiency No. 3 – Replace existing load centre with new	\$ 500.00
4.4	Health & Safety Repairs:	
4.4.1	Deficiency No. 1 – Guarding around electric motor base	\$ 500.00
4.4.2	Deficiency No. 2 – Secure well hatch	\$ 200.00
4.4.3	Deficiency No. 3 – No action required (diesel pump not in use)	\$ 0.00
4.4.4	Deficiency No. 4 – No action required (diesel pump not in use)	\$ 0.00
4.4.5	Deficiency No. 5 – Guardrail, Rescue Equipment and Procedures for Rescue	\$ 1,000.00
4.4.6	Deficiency No. 6 – Flammable Liquids Cabinet	\$ 1,000.00
5.1	Contingency Allowance:	\$ 2,000.00
	Total (Opinion of Probable Construction Cost):	<u>\$21,700.00</u>