CONSTRUCTION SPECIFICATION FOR THE CLEANING AND FLUSHING OF CULVERTS, PIPE SEWERS, CATCHBASINS, MAINTENANCE HOLES, DITCH INLETS, AND OIL-GRIT SEPARATORS

TABLE OF CONTENTS

411.01 SCOPE

This specification covers the requirements for the cleaning and flushing of pipe and concrete culverts, pipe sewers, catchbasins, maintenance holes, ditch inlets, and oil-grit separators, including cleaning of concrete culverts and wall drains by means of pressure washing for the removal of corrosion deposits buildup and management of cleanout material.

411.02 REFERENCES

This specification refers to the following standards, specifications or publications:

Ontario Provincial Standard Specifications, Construction

OPSS 409 Closed-Circuit Television Inspection of Sewers
OPSS 410 Pipe Sewer Installation in Open Cut
OPSS 421 Pipe Culvert Installation in Open Cut
OPSS 517 Dewatering of Pipeline, Utility, and Associated Structure Excavation

Ontario Ministry of Transportation Publications

MTO Environmental Guide for Fisheries – Best Management Practices Manual 2020

411.03 DEFINITIONS

For the purpose of this specification the following definitions apply:

Air Gap Method means a clear vertical separation between the pressurized potable water supply and a non-pressurized, non-potable water receiving vessel.

Backflow Prevention means a device used to protect potable water supplies from contamination or pollution due to backflow.

Cleaning means suction and vacuuming removal of debris within pipe sewers, catchbasins, maintenance holes, ditch inlets, and oil-grit separators.

Combination Hydro-Jet Cleaner means a service vehicle or equipment capable of pressure washing, suction vacuum cleaning of debris.

Contaminant means contaminant as defined in the E.P.A R.S.O 1990.c E.19

Debris means, dirt, sand, gravel, rocks, bricks, other solid and semi-solid materials, and roots, grease, and encrustations and other materials that may cause restriction to flow in culverts, pipe sewers, catchbasins, maintenance holes, ditch inlets, and oil-grit separators.

Drainage System Components means the components required to collect and convey the stormwater and include pipe and concrete culverts, pipe sewers, catchbasins, maintenance holes, ditch inlets, wall drains and oil-grit separators.

Flushing means hydraulic pressure washing using various nozzles, pressure and flow rates to flush debris within pipe sewer systems downstream.

Oil-grit Separator means an underground storage device designed to separate oil and suspended solids from stormwater.

Pipe Culvert means as defined in OPSS 421.

Pipe Sewer means as defined in OPSS 410.

Receiving Site means a municipal sanitary sewer or sewage treatment plant, certified waste treatment facility, or certified waste disposal site.

Wall Drain means perforated pipe system used to transmit water from the backfill through the wall structure into the drainage system to alleviate hydrostatic pressure on the wall and prevent erosion underneath and around the road due to unattended water overflow.

411.04 DESIGN AND SUBMISSION REQUIREMENTS

When equipment requiring an environmental compliance approval for a waste management system, issued by the Ontario Ministry of the Environment, Conservation and Parks, will be used for the work, a copy of the environmental compliance approval shall be submitted to the Contract Administrator a minimum of two weeks prior to commencement of the work.

Any approvals, releases, and agreements that are required to implement the strategy for the management of cleanout material shall be obtained.

The conditions of the site and the pipe sewer system shall be thoroughly assessed, including the degree of pipe blockage and types of debris. The equipment, nozzles, flow rates, and pressures necessary to complete the work shall be determined. Any supplemental information regarding the sewer network and the assessment method shall be as specified in the Contract Documents.

The proposed cleaning method and procedures, including method to manage effluent and cleanout material shall be submitted to the Contract Administrator at least 14 Days prior to commencing work.

The Contract Administrator shall be notified of the location where cleaning will be performed a minimum of 24 hours in advance of commencing the work.

411.04.01 Permission and Release of Operators of Receiving Sites

Written permission shall be obtained from the operator of a receiving site, prior to its use for disposal of the cleanout material. A copy of this permission shall be provided to the Contract Administrator a minimum of 14 Days prior to the commencement of such work.

411.05 MATERIALS

411.05.01 Water Source

Water source shall be as specified in the Contract Documents. When the source is not specified, water shall be clean and free from oil, acid, alkali, organic matter, or other deleterious substances.

Backflow prevention and air gap methods shall be used when water is taken from potable water systems.

411.06 EQUIPMENT

411.06.01 Combination Hydro-Jet Cleaner

A combination hydro-jet cleaner specifically designed for the purpose of cleaning pipe sewers, catch basins, maintenance holes, ditch inlets, oil-grit separators, and similar facilities, using a selection of nozzles and attachments to permit reaming and root cutting as required, shall be used for the work. The equipment shall be able to clear blockages and remove debris from pipe sewer systems with varied sizes and downstream constraints.

411.07 CONSTRUCTION

411.07.01 General

The conditions of the site and the pipe sewer system shall be thoroughly assessed prior to work commencement, including the degree of pipe blockage and types of debris.

The work shall commence at the upstream end of pipe sewer systems and progress to the downstream end.

Prior to using any mechanical equipment in pipe sewer systems, verification of utility locates shall be obtained.

Water flow volumes and pressures shall not cause damage to the pipe sewer system or flooding of property. Water flow volumes and pressures shall be appropriate for the age and condition of the pipe sewer system.

Debris that cannot be removed by flushing shall be loosened and broken up using reamers and root cutters as required.

No blockage to service connections or laterals shall occur as a result of the cleaning and flushing or cleanout operation.

Protection of waterbodies and waterbody banks shall be as specified in the Contract Documents.

When beaver dam removal is required within culvert cleanout operations, the beaver dam removal shall be performed in accordance with MTO Best Management Practice for Beaver Dam Removal as specified in MTO Environmental Guide for Fisheries – Best Management Practices Manual.

For post installation inspections, pipe culverts and pipe sewers requiring cleaning and flushing shall be as specified in the Contract Documents.

The Owner may request additional documentation of findings after cleaning and flushing operations as specified in the Contract Documents.

During the cleaning operation, any encountered defects of the drainage system components shall immediately be reported to the Contract Administrator.

The road surface immediately above the culvert shall be monitored during cleanout operations. If any visual indications that pavement or embankment sinkholes are developing during cleaning or flushing operation, the work should stop immediately and reported to the Contract Administrator.

Any damage caused to the existing drainage system components surfaces resulting from the cleaning operations shall be reported to the Contract Administrator and repaired at no additional cost to the Owner.

411.07.02 Culvert Cleaning

Pipe culverts shall be cleaned out to the bottom of the pipe, unless otherwise directed by the Contract Administrator or specified in the Contract Documents.

Open footing concrete culvert shall be cleaned out to the level of the top of footing and closed box concrete culvert shall be cleaned out to the bottom slab level, unless otherwise directed by the Contract Administrator or specified in the Contract Documents.

All works within a watercourse shall be conducted in the dry. The surface waters of the watercourse shall be protected from the entry of any disturbed sediment or other debris. Dewatering shall be according to OPSS 517. The work shall include capturing and collecting of all removed sediment. When sediment control measures are found ineffective immediate changes shall be made.

The culvert shall be considered clean when all debris, including vegetation at the inlet and outlet that obstructs the flow, sand or silt has been removed from the top, side and bottom (invert) of the culvert.

411.07.03 Culvert and Wall Drain Cleaning by Pressure Washing

The pressure wash cleaning equipment with less than 3,000 PSI pressure at the nozzle shall be used for removal of the corrosion deposits buildup in concrete culverts, around the existing wall drains and cleaning the clogged wall drains. The pressure washer shall be operated at a distance of 150 mm to 300 mm from the surface.

Pressure washing shall not be allowed when ambient temperatures are less than 4°C.

Chemical cleaning compounds shall not be allowed during pressure washing operations.

During the cleaning operation, any encountered culvert defects shall immediately be reported to the Contract Administrator.

Scraping hand tools may be used to locally remove heavy leachate deposits. Upon the completion of the pressure wash cleaning, any standing water shall be removed by mopping and/or air blasting.

Local waterbody aggregates shall be removed and reinstated at repair locations to the top of floor slab.

411.07.04 Pipe Sewer Cleaning and Flushing

Flushing shall be used to transport debris from each section of pipe sewer to the downstream maintenance hole or catchbasin. Each section of pipe sewer between maintenance holes, catch basins, ditch inlets shall be cleaned and flushed before cleaning and flushing the next downstream section. Debris shall be continuously cleaned from the downstream maintenance hole or catchbasin as flushing occurs.

The passage of debris from one section of pipe sewer to another shall not be permitted, unless specified in the Contract Documents. A weir or sediment trap shall be placed in the maintenance hole to prevent passage of debris from the upstream pipes. When cleaning and flushing is completed for each section, the weir or sediment trap shall be removed.

Cleaning and flushing shall continue for each section of pipe sewer until no further debris is flushed from the pipe, and the pipe sewer section is free of impediments to flow. A minimum of 90% of the pipe sewer circumference shall be free of debris.

If cleanout cannot be completed due to damaged or broken pipe sewer, catchbasin, maintenance hole, or ditch inlet, the Contract Administrator shall be immediately notified.

411.07.05 Catchbasin, Maintenance Hole, and Ditch Inlet Cleanout

A combination hydro-jet cleaner shall remove debris from catchbasins, maintenance holes, and ditch inlets separately.

411.07.06 Oil-Grit Separator Cleanout

Oil-grit separators shall be cleaned out by closing or blocking off the inlet and outlet pipes, dewatering the system, removal of debris by vacuum or other mechanical means, and cleaning and flushing to remove sediment. The inlet and outlet pipes shall not be reopened or unblocked until after the separator has been inspected by the Contract Administrator.

411.07.07 Closed-Circuit Television Inspection

Unless otherwise specified in the Contract Documents, pipe culverts and pipe sewers shall be inspected after cleaning by closed-circuit television (CCTV) according to OPSS 409. The Contract Administrator shall be notified a minimum 24 hours prior to the inspection.

When specified in the Contract Documents, water shall be added immediately prior to CCTV inspection to the upstream end of the pipe culvert and pipe sewer system for minimum flow to the system low point by gravity.

411.07.08 Management of Cleanout Material

Cleanout material shall be inspected to identify the presence of any visual, olfactory or other evidence of the spill of a contaminant. Material that is found during cleanout to be impacted by a spill of a contaminant shall be managed as specified in the Contract Documents.

Debris removed from culverts, pipe sewers, catchbasins, maintenance holes, ditch inlets, and oil-grit separators shall be managed as excess material according to the Contract Documents.

The cleanout material shall be managed by one, or a combination of, the following:

a) as a composite material without dewatering; or

b) by dewatering and subsequent management of sludge component.

A copy of the weigh tickets or receipts provided by the site operator shall be submitted to the Contract Administrator. Where such documentation is not available, written confirmation that the waste has been received shall be obtained from the owner of the disposal site, and provided to the Contract Administrator, a maximum of 14 Days after disposal activities are complete.

411.07.08.01 Management as a Composite Material Without Dewatering

When cleanout is done without dewatering, the composite material shall be managed as non-hazardous solid industrial or commercial waste and shall be transported from the area designated for cleanout directly to one of the following:

a) a landfill site with an environmental compliance approval/certificate of approval for a disposal site valid for commercial and municipal waste;

b) a waste treatment facility with an environmental compliance approval/certificate of approval for a waste disposal site (processing), or a certificate of approval for waste disposal site (mobile processing) valid for commercial or municipal waste.

411.07.08.02 Dewatering and Subsequent Management of Sludge Component

Cleanout material shall be dewatered as necessary. Dewatering shall be by discharge of the liquid component of cleanout material directly to one or a combination of the following:

a) a waste treatment facility with an environmental compliance approval/certificate of approval for a waste disposal site (processing), or a certificate of approval for a waste disposal site (mobile processing), valid for commercial or municipal waste;

b) the culvert, pipe sewer or ditch from which the material was removed.

The sludge or solid component of the cleanout material shall be managed as non-hazardous solid industrial waste or commercial waste and shall be transported directly, with the exception of dewatering en route, from the area designated for cleanout to a certified receiving site.

Transportation of the cleanout material shall be done by a hauler with a certificate of approval for a waste management system that is valid for the following:

a) the entire work period;

b) the entire area within the limits of the work and the entire haul route;

c) the equipment to be utilized, and

d) non-hazardous solid industrial waste, or commercial waste.

411.09 MEASUREMENT FOR PAYMENT

411.09.01 Actual Measurement

411.09.01.01 Clean out of Pipe Sewer

Measurement shall be in metres and along the centreline of the pipe sewer from the centre of the maintenance hole, catch basin, or ditch inlet at each end of the pipe sewer system to be cleaned out.

When cleaning and flushing is incomplete due to a collapsed pipe or immovable blockage, the length of collapsed pipe or blockage shall be deducted from the length measured for payment.

411.09.01.02 Clean Out of Pipe Culvert, Concrete Culvert, Catchbasin, Maintenance Hole, Ditch Inlet, and Oil-Grit Separator

For measurement purposes, a count shall be made of the number of structures cleaned.

411.09.02 Plan Quantity Measurement

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clause under Actual Measurement.

411.10 BASIS OF PAYMENT

411.10.01

Clean Out of Pipe Culvert – Item
Clean Out of Concrete Culvert – Item
Clean Out of Pipe Sewer – Item
Clean Out of Catchbasin – Item
Clean Out of Maintenance Hole – Item
Clean Out of Ditch Inlet – Item
Clean Out of Oil-Grit Separator – Item

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment, and Material to do the work.

Payment for the management of material found, during the cleanout operation, to be contaminated by the spill of a contaminant shall be treated as a Change in the Work.

Any costs incurred due to delays in obtaining the approvals, releases, agreements or verifications required to complete the work as specified in the Contract, shall be borne by the Contractor at no additional cost to the Owner.