APPENDIX A

(Updates as of January 2024)

City of Timmins Special Provisions

SPECIAL PROVISIONS

INDEX

GENERAL

ASPHALT PAVEMENT

ROAD CONSTRUCTION

**** Specifications shown in bold and italics have been revised or are new for 2024***

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RD-20	60mm PAVING STONE SIDEWALK & DRIVEWAY INCLUDING BEDDING SAND	APR. 2005
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**** Specifications shown in bold and italics have been revised or are new for 2024***

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**** Specifications shown in bold and italics have been revised or are new for 2024***

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**** Specifications shown in bold and italics have been revised or are new for 2024***

General

The amount entered “CASH ALLOWANCES” by the City shall not be altered by the Bidder but will form part of the sub-total for the contract.

The Bidder agrees that they are not entitled to payment of the Cash Allowances, except for additional work carried out in accordance with the Contract and as directed by the contract administrator, and only to the extent of such additional work.

General

The Contractor is responsible for collecting and recording all as-built survey data for the new works including roadwork, underground services, electrical etc. as outlined herein. All survey points shall follow the U.T.M. Zone 17 co-ordinate system with the NAD 83 geodetic system.

Features	Construction Record Data (Red Lines and Digital Survey)
Underground Services	
Maintenance Holes	MH diameter, type, manufacturer, horizontal location, top elevations, inverts, sump bottom
Gravity Sewers	Size, material, class of pipe, bedding type, drop pipe sizes, horizontal length, grade, inverts, fittings, utility crossings
Pressure Pipe and Fittings	Size, material, class of pipe, bedding type, fittings, restraints, thrust blocks, horizontal and vertical alignment, utility crossings
Laterals	Size, material, class of pipe, bedding, fittings, horizontal and vertical alignment, utility crossings, connection location at lot line
Appurtenances (hydrants, valves, curb stops, etc.	Type, material, horizontal and vertical location
Subdrains	Size, material, class of pipe, fittings, horizontal and vertical alignment, connection locations
Roadwork	
Pavement	Material, depth, width; horizontal location and elevation of centerline and E/P
Curb and Gutter	Type, horizontal and vertical alignment, depressions, terminations,
Sidewalk	Material, width, thickness, horizontal and vertical alignment
Granular Materials	Type, width, depth, top and bottom of material
Permanent Signage	Location, size, type, horizontal location
Utilities	
Traffic Signals	Type, horizontal location
Conduit	Location, depth, materials, sizes, horizontal and vertical location, use
Junction Boxes	Location, depth, materials, sizes, horizontal and vertical location, use
Buried Utilities Encountered	Utility ownership, type, dimensions, horizontal and vertical location

Linear Features:

The survey interval for linear features shall be as follows.:

- Underground Services
  - Any change in grade or direction, maximum interval of 15 m.

- Roadwork Features
  - 15m or change in grade

Where the length of feature is less than the stipulated survey interval, a minimum of two survey points will be required.

Minimum survey accuracy shall be as follows:

- Horizontal +/- 50mm
- Vertical +/- 20mm

The following survey codes shall be utilized:

AP	Anchor Pole	IB	Iron Bar 5/8" x 5/8"
AW	Anchor Wire	IB-BENT	Iron Bar Bent and/or Leaning
BC	Buried Conduit	LAT	Lateral
BELLMH	Bell Manhole	LP	Light Pole
BOC	Back of Curb	MH	Manhole
BM	Benchmark	OG	Original Ground
BS	Bottom of Slope	PM	Parking Meter
BLD	Building	PLTR	Planter
CB	Catch Basin	RTW	Retaining Wall (W=Wood/C=Concrete/etc.)
CL	Centerline	RIB	Round Iron Bar
CP	Control point	SAMH	Sanitary Manhole
CSTOP	Curb Stop	SAN	Sanitary Main
DECK	Deck (W=Wood, C=Concrete)	SHED	Shed
DI	Ditch Inlet	SWB	Side Walk Back
DL	Ditch Line	SWF	Side Walk Front
DCB	Double Catch Basin	SN or SIGN	Sign
DS	Drill Steel	SE	Spot Elevation (G=Gravel/C=Concrete/etc.)
DWA	Drive Way Asphalt	SIB	Standard Iron Bar
DWC	Drive Way Concrete	SIB-BENT	Standard Iron Bar Bent
DWG	Drive Way Gravel	STPC	Step Concrete
DWIL	Drive Way Interlock	STPW	Step Wood
DWPS	Drive Way Patio Slab	STMH	Storm Manhole
DWCS	Drive Way Clearstone	STM	Storm Main
EP	Edge of Pavement	SWL	Swale

ER	Edge of Road	TP	Telephone Pole
ES-PC	Edge Strip-Pre-Cast	TOC	Top of Curb
FL	Fence Line	TS	Top of Slope
FP	Flag Pole	TRC	Tree Coniferous
FH	Fire Hydrant	TRD	Tree Deciduous
GAR	Garage	UP	Utility Pole
GAS	Under Ground Gas	WWA	Walkway Asphalt
GR	Guide Rail	WWC	Walkway Concrete
GRDN	Garden	WWG	Walkway Gravel
GT	Gate	WWIL	Walkway Interlock
GV	Gas Valve (Surface)	WWPS	Walkway Patio Slabs
GUT	Gutter Line	WL	Water Level
HDGE	Hedge	WM	Watermain
HH	Hand Hole	WS	Water Service
HP	Hydro Pole	WV	Water Valve
INV	Invert	WVC	Water Valve Chamber

Submission Schedule

The Contractor shall submit all Construction Record Data within thirty (30) calendar days of placing the base asphalt.

Contractor shall maintain up to date red line revision and supporting documentation throughout construction. The Contractor shall provide updates at all progress meetings.

Basis of Payment

Costs for all work completed under this Special Provision shall be deemed to be included in the tender prices for the items requiring the work or any revisions that are required.

Reference

- OPSS.PROV 1001
- OPSS.MUNI 310, 1101, & 1151

General

Compacted Thickness of Asphalt Pavement (unless otherwise specified)

One course	-	50 mm (SP 12.5)
Two courses	-	50 mm base (SP 19), 40 mm top (SP 12.5)
Three courses	-	50 mm base (SP 19), 50 mm second (SP 19), 40 mm top (SP 12.5)

All existing asphalt driveways, boulevard, sidewalks, etc. abutting the roadway shall be paved with 50 mm of SP 12.5 hot mix asphalt as per the contract drawings. Payment shall be made under the “Gutter Bank” Item.

Prior to paving, locate and raise all valve boxes to finished grade.

A tolerance of minus 10 mm and plus 5 mm shall be applied on the thickness of the finished asphalt product. If the asphalt is thinner than 10 mm less than that specified, the Contractor shall be required to remove and replace the asphalt as directed by the Contract Administrator. If the Contractor places the asphalt at a thickness 5 mm more than that specified; the excess quantity of asphalt shall be deducted proportionally from the final payment as directed by the Contract Administrator. The thickness of the finished asphalt product will be determined by coring. If the cores indicate that the thickness of the asphalt is not within the allowable tolerance, the roadway shall be cross-sectioned to determine the extent of reconstruction or asphalt deduction required.

Overlapping of asphalt at the gutter line shall not be allowed.

For those streets indicated in "Schedule C" the Contract Administrator shall issue written notices to the Paving Contractor for each street stating the dates when each is ready to be paved. If asphalt is not placed within three (3) calendar days of this notice, the Contractor shall restore the roadway to the required grade and cross-section at no cost to the Corporation.

OPSS 310 is amended in that automatic screed controls are not required. The first paragraph of Subsection 310.07.07 is deleted and replaced by the following:

"Paving shall not be carried out if, in the opinion of the Contract Administrator, the roadbed is frozen. In case of disagreement, the Contractor has the option of demonstrating, at his own expense and to the satisfaction of the Contract Administrator, that the roadbed is frost-free."

Cancellation of the Surface Course Trial Area

No surface course trial area shall be required.

Asphalt Cement

Asphalt cement shall comply with OPSS MUNI 1101. The Contractor shall supply the asphalt cement for this contract with a performance grade of PG 58-34. Asphalt cement shall also comply with requirements in Table 1 shown below.

Table 1 – Minimum Design Asphalt Cement Content in JFM and Construction Tolerances

SP #	Min. Design AC Content in JMF %	Construction Tolerances		
		Acceptable %	Borderline %	Rejectable %
SP 12.5	5.0	< 0.30	0.30 to 0.50	> 0.50
SP 19.0	4.8	< 0.30	0.30 to 0.50	> 0.30

Mix Design

Mix designs shall be submitted by the Contractor, Ontario Traffic Category should be "C" and "D" unless otherwise specified. Mix design shall be according to the requirements specified in OPSS MUNI 1151.

The following changes have been made to OPSS.MUNI 1101 - NOV. 2016 (**the specifications listed shall take precedent over OPSS.MUNI 1101**):

1. **OPSS.MUNI 1101 - MATERIAL SPECIFICATION FOR PERFORMANCE GRADED ASPHALT CEMENT (PGAC)**

.1 Subsection 1101.02 of OPSS.MUNI 1101 is amended by the addition of the following:

Ontario Ministry of Transportation Publications:

Laboratory Testing Manual:

LS-299 Determining Asphalt Cement's Resistance to Ductile Failure Using Double-Edged-Notched Tension Test (DENT).

LS-308 Determination of Performance Grade of Physically Aged Asphalt Cement Using Extended Bending Beam Rheometer (BBR) Method.

.2 In Subsection 1101.03 of OPSS.MUNI 1101, delete the existing definition of PGAC in its entirety and replace with the following:

Performance Graded Asphalt Cement (PGAC) means an asphalt binder that is an asphalt-based cement produced from petroleum residue, straight or modified using polymers, according to the latest version of AASHTO M 320 (at the time of tendering).

.3 Subsection 1101.03 of OPSS.MUNI 1101 is amended by the addition of the following:

Low Temperature Limiting Grade means the warmest of the Limiting Grades, TL obtained for 1 hour, 24 hours, 72 hours and the two conditioning temperatures according to LS-308, and Form B of LS-308.

Low Temperature Performance Grade (-YY) means the low temperature performance grade specified elsewhere in the Contract Documents and also referred to as the -YY specified for the performance graded asphalt cement where the PGAC Grade specified is PG XX-YY, and the minimum design pavement temperature.

.4 Subsection 1101.04.01.01 of OPSS.MUNI 1101 is amended by the addition of the following:

e) Test results for the product demonstrating compliance to the requirements of the Contract Documents.

f) Average of the critical crack tip opening displacement (□t) as determined according to LS-299 along with a copy of all the LS-299 documentation demonstrating that the product complies with the requirements of the Contract Documents.

g) A two (2) litre sample of the asphalt cement for each grade and the source of asphalt cement used on the Contract for possible owner testing.

h) Confirmation in writing from the asphalt supplier that the asphalt cement does not contain any of the following materials or processes:

The asphalt cement shall not be air blown or catalytically oxidized in any manner and shall not be blended with air blown or catalytically oxidized residues in any manner.

The asphalt cement shall not contain alkaline bases; insoluble particulates or fibres; orthophosphoric acid; salts of iron, copper, manganese and/or cobalt; silicates; synthetic waxes; vegetable oils; waste oils (including but not limited to the following: waste engine oils, waste engine oil residues, re-refined engine oils, cracked residues, tall oils, waste cooking oils, etc.).

No modifiers or additives other than styrene-butadiene (e.g., SB, SBS, SBR) or epoxy-type (e.g., reactive ethylene terpolymers) polymers are used for the modification of neat asphalt cement.

The Contract Administrator shall review the test results submitted. The mix shall not be placed until the Contract Administrator gives a written confirmation of conformance of the PGAC based on the submitted test results and owner testing to the requirements of the Contract Documents. Within 10 Business Days, commencing after the day of delivery of the samples and test documentation, the Contract Administrator shall provide the above confirmation or advise the Contractor of any non-conformance to the contract requirements. Confirmation of conformance to Contract requirements of the submitted PGAC properties does not constitute any guarantee that the mix can be produced or constructed or both to Contract requirements, and does not relieve the Contractor of the responsibility for ensuring the specified quality of Materials and workmanship.

.5 Subsection 1101.05 of OPSS.MUNI 1101 is amended by deleting the fourth paragraph and replacing with:

The asphalt cement shall not contain more than 0.3% polyphosphoric acid (PPA) and it shall only be used as a catalyst for the purpose of modification with epoxy-type polymers. All grades of PGAC shall not contain any orthophosphoric acid.

.6 Subsection 1101.05 of OPSS.MUNI 1101 is amended by the addition of the following:

The asphalt cement shall not be air blown or catalytically oxidized in any manner and shall not be blended with air blown or catalytically oxidized residues in any manner.

The asphalt cement shall not contain any of the following additives: alkaline bases; insoluble particulates or fibres; orthophosphoric acid; salts of iron, copper, manganese and/or cobalt; silicates; synthetic waxes; vegetable oils; waste oils (including but not limited to the following: waste engine oils, waste engine oil residues, re-refined engine oils, cracked residues, tall oils, waste cooking oils, etc.).

If modifiers or additives other than styrene-butadiene (e.g., SB, SBS, SBR) or epoxy-type (e.g., reactive ethylene terpolymers) polymers are used for the modification of neat asphalt cement, preapproval from the City of Timmins is required.

PGAC used on the Contract shall meet the following additional requirements:

i) Low temperature limiting grade as measured by LS-308 shall be less than or equal to the low performance temperature grade specified for the PGAC in the Contract Documents;

ii) The maximum grade loss as measured by LS-308 and Form B of LS-308 shall be less than or equal to 6oC at T + 10 with reference to the 1 hour results at T + 10 and less than or equal to 6oC at T + 20 with reference to the 1 hour results at T + 20. (Note: T is the low temperature grade of the asphalt cement specified in the contract); and

iii) The average critical crack tip opening displacement (□t) (CTOD) shall be equal to or greater than 14 mm.

.7 Subsection 1101.08.03 of OPSS.MUNI 1101 is deleted in its entirety and replaced with the following:

The Contract Administrator shall determine the frequency of sampling and testing based on the HMA tender quantity for each grade of PGAC.

All test samples shall be obtained during the production of the asphalt mix at the asphalt mix plant from the storage tank which is directly feeding the production of the asphalt mix. All test samples shall be obtained by the contractor in the presence of the Contract Administrator according to AASHTO T 40, ASTM D 3665, and the asphalt plant's health and safety plan. The asphalt plant's health and safety plan and procedure for sampling shall be reviewed at the pre-pave meeting.

The QA and referee samples for possible Owner testing shall be taken at the same time.

PGAC shall be sampled when notified by the Contract Administrator.

Sample containers shall be supplied by the contractor.

Sample quantities, labelling, and delivery requirements shall be as shown on Table 2. Samples shall be delivered in a condition suitable for testing.

.8 Subsection 1101.08.04 of OPSS.MUNI 1101 is deleted in its entirety and replaced with the following:

QA testing may be carried out by the Owner for purposes of ensuring that the materials used in the Work are according to the quality requirements specified in the Contract Documents. If a test result for any sample indicates non-compliance to the specification, the Contract Administrator shall advise the Contractor of the test results and may arrange for additional testing.

QA testing will be evaluated against the requirements as specified herein.

Test results for performance grade asphalt cement that do not comply with the requirements of this document shall be categorized as minor borderline, major borderline or rejectable based on the following:

1) LS-308 and Form B of LS-308

Minor Borderline: The maximum grade loss is between 6.5°C and 7.5ºC with reference to the 1 hour results at T + 10; or the maximum grade loss is between 6.5°C and 7.5°C at T + 20 with reference to the 1 hour results at T + 10; or the LS-308 grade after three days of conditioning is between -34°C and -32°C.

Major Borderline: The maximum grade loss is between 7.5°C and 9°C with reference to the 1 hour results at T + 10; or the maximum grade loss is between 7.5°C and 9°C at T + 20 with reference to the 1 hour results at T + 10; or the LS-308 grade after three days of conditioning is between -30°C and -32°C.

Rejectable: The low temperature limiting grade is less than -30°C, or the maximum grade loss is greater than 9°C at T + 20 with reference to the 1 hour results at T + 10.

2) LS-299

Minor Borderline: The CTOD value is less than 14.00 mm but greater than or equal to 12.00 mm.

Major Borderline: The CTOD value is less than 12.00 mm but greater than or equal to 10.00 mm.

Rejectable: The CTOD value is less than 10.00 mm.

3) AASHTO M320 Compliance

Minor Borderline: High temperature performance grade is up to 1 °C less than the specified high temperature performance grade.

Major Borderline: High temperature performance grade is between 1°C and 2°C less than the specified high temperature performance grade.

Rejectable: High temperature performance grade loss is greater than 2°.

.9 Subsection 1101.08.05 of OPSS.MUNI 1101 is amended by the addition of the following:

The Owner's review of the test results to determine disposition of the HMA produced shall include all additional testing requirements for which acceptance requirements have been specified.

.10 Subsection 1101.06 of OPSS.MUNI 1101 is amended by deleting the third paragraph and replacing with:

The results obtained from AASHTO M320, LS-299, and LS-308 will be defined as a single category which will be governed by the worst of the results obtained. For example: If AASHTO M320 high temperature grade yields compliance, LS-299 yields a Minor Borderline result and LS-308 yields a Major Borderline result, the PGAC and ultimately, the Hot Mix Asphalt for this contract will be classified as Major Borderline.

.11 Table 1 of OPSS.MUNI 1101 is deleted in its entirety and replaced with the following:

Table 2 - Additional testing requirements and acceptance criteria for PGAC grades (with new acceptance/rejectable limits - revised April 21, 2015)

Property and Attributes (Unit)	Test Method	Results Reported Rounded to the Nearest	Acceptance Criteria	Minor Borderline	Major Borderline	Rejectable
Ash Content, % by mass of residue (%)	LS-227	0.1	≤ 0.6	N/A	N/A	>0.6
Average critical crack tip opening displacement (□t) (mm)	LS-299	0.1	≥ 14	14 to 12	12 to 10	<10
Low temperature limiting grade (LTLG) (°C)	LS-308	0.5	≤ -34°C	-34 to -32°C	-32 to -30°C	> -30°C
Grade Loss (°C)	LS-308	0.5	≤ 6	6.5 to 7.5	7.5 to 9.0	>9
High Temperature Performance Grade (°C)	AASHTO R29	0.5	≤ 1	1	1 to 2	>2

Measurement for Payment

Measurement shall be made in tonnes conforming to OPSS 102.

Basis of Payment

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment, and material required to do the work.

General

Coring of Bituminous Pavement

The Contractor shall obtain and deliver core samples of pavement to the Contract Administrator. The samples shall be delivered to a designated point within the contract limits or to a laboratory at the hot mix plant site.

Warrant

All mix types where the tender quantity is 2,500 tonnes or more are covered by this Special Provision except as follows:

- No pavement samples required from gutter bank

Sampling Frequency

Sampling frequency is based on the amount of pavement of each type of hot mix placed in one day, henceforth, referred to as a Lot.

LOT SIZE	NO. OF CORES
Less than 100 tonnes	3
101 - 300 tonnes	4
301 - 700 tonnes	5
Greater than 700 tonnes	6

Sample Size

Each core shall have a nominal diameter of 150mm and shall consist of the full layer being sampled and at least one underlying layer if one is present.

Sampling Procedure and Delivery of Samples

1. Upon completion of each lot, the Contract Administrator shall give the Contractor the random location of each core to be taken from that lot. The location of the cores shall be determined as follows:

    a) a random number shall be selected from a random number chart

    b) the station of the random core shall be found by multiplying the length of construction by the random number and adding to the station at the start of construction

c) the offset of the core shall be found by multiplying the width of construction by the random number and is measured from the left edge of construction

2. The Contractor shall extract the cores the next regular work day following the completion of the lot, label them as shown in paragraph 5 and deliver them the same day to the City of Timmins Laboratory. These cores shall be sent by the City to an **Approved Laboratory** for testing.

3. Care shall be taken to ensure that cores are not damaged during coring or in transit. If a core is damaged a replacement core shall be extracted at a location selected by the Contract Administrator.

4. All core holes shall be refilled the same day with hot mix and compacted to conform to the adjoining undisturbed pavement.

5. The sample shall be accompanied with identification indicating:

    a) contract no.
    b) date
    c) mix type
    d) street name
    e) lot no.
    f) station location
    g) offset from centreline of roadway

Compliance with Specifications

The cores shall be used to determine compliance for compaction, lift thickness, and any and all other tests required by the Contract Administrator to determine material acceptance. Any cores set aside for testing at a later date shall not be used in the acceptance of the mix.

Basis of Payment

Payment at the contract price for the appropriate hot mix item shall include full compensation for all labour, equipment, and material to do the above work.

General

Scope

This Special Provision requires the Contractor obtain pavement cores to determine quantity and quality of rejectable mixture.

Sampling Frequency

Ten cores, at locations selected by the Contract Administrator, shall be taken whenever a hot mix acceptance test falls in the rejectable zones shown in the table below. Where small quantities of hot mix are involved, the Contract Administrator may elect to have fewer cores taken.

Material	Characteristics	Acceptable Zones %	Borderline Zones %	Rejectable Zones %
Surface Course Mixes	+4.75mm	± 5.0	± 5.1 to +7.5 - 5.1 to - 7.5	+7.5 - 7.5
	- 75 μm	± 2.0	+ 2.1 to + 3.0 - 2.1 to - 3.0	+ 3.0 - 3.0
Binder and Levelling Course Mixes	+ 4.75mm	± 7.0	+ 7.1 to + 10.0 - 7.1 to - 10.0	+ 10.0 - 10.0
	- 75 μm	± 2.0	+ 2.1 to + 3.0 - 2.1 to - 3.0	+ 3.0 - 3.0
Cat C & Cat D SP 12.5	Asphalt Cement	< 0.3	0.00 to + 0.30 - 0.20 to 0.00	> 0.30 < 0.20
Cat C & Cat D SP 19	Asphalt Cement	< 0.3	0.00 to + 0.20 - 0.40 to 0.00	> 0.20 < 0.40

Sample Size

Each core shall have a nominal diameter of 150mm and shall consist of the full layer being sampled.

Sampling Procedure

1. The Contractor shall extract the cores at the locations selected by the Contract Administrator, label them as shown in Paragraph 3 below, and deliver the cores the same day to the City of Timmins Engineering Office. These cores shall be sent by the City of Timmins to an Approved Laboratory for testing.

2. All core holes shall immediately be refilled with hot mix and then compacted to the same density as the adjoining undisturbed pavement.

3. The cores shall be accompanied with identification indicating:

    - contract number
    - mix type
    - core number (or lot number)
    - station location
    - offset from center line of highway
    - date

Payment

Payment at the contract price for the appropriate hot mix item shall include full compensation for all the labour, equipment and material to do the above work; except, if the testing fails to identify any material that falls in the rejectable zones, City shall pay the Contractor $40.00 for each core cut as directed.

Reference

- OPSS.PROV 314

General

The finished Granular "A" surface shall not deviate more than 10mm from the specified grade and cross-section. The granular base shall be maintained to this tolerance until the surface is paved.

If an asphalt lift or surface treatment is not placed within five (5) working days after final grading of the granular base (to be approved by the Contract Administrator) and the roadway then loses its shape from wear and weather, the Paving Contractor shall restore the roadway to the contract grades and tolerances at no extra cost to the City. The Paving Contractor shall be responsible for all maintenance until such time it is paved or surface treated.

Water used to achieve the compaction required shall be included in the price of the granular material.

Payment for Granular "A" shall not be made until the final road grades and cross-sections have been approved by the Contract Administrator and meet contract tolerances as per Section D Supplemental General Conditions, Item 10 Layout Requirements, Table #2..

Payment for Granular "B" shall not be made until Granular "A" base has been constructed and approved by the Contract Administrator.

Measurement for Payment

Measurement shall be made in tonnes conforming to OPSS.MUNI 102.

Basis of Payment

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment and material required to do the work.

Reference

- OPSS.MUNI 301

General

The Contractor shall be required to loosen the existing roadway to a depth of 100mm and shape to the specified grade and cross-section prior to the placement (when required) of Granular "A" material. If the existing roadway material is unacceptable to the Contract Administrator or is in excess, it shall then be removed by the Contractor.

Surface restoration shall be performed by a grader of tandem drive with a minimum operating power of 100 H.P.

The surface of a roadway having been restored once and to the satisfaction of the Contract Administrator, shall be deemed ready for placement of the asphalt lift(s). The finished surface shall not deviate more than 10mm from the specified grade and cross-section. If an asphalt lift is not placed after this operation and the roadway then loses its shape from wear and/or weather, the Contractor shall restore the roadway to the desired shape at no extra cost to the City. The cost of re-sectioning the roadway by the City's survey crews shall be paid for by the Contractor as extra work performed by the City's survey section.

Measurement for Payment

The area of roadway surface actually restored shall be measured in square metres.

Basis of Payment

Payment at the contract price per square metre and shall be full compensation for all labour, equipment, and material required.

Reference

- OPSS.MUNI 330

General

Asphalt pulverizing shall consist of processing existing bituminous pavement and underlying granular in place.

Surface restoration shall follow asphalt pulverizing and shall be paid separately as outlined elsewhere.

While processing the existing pavement, the Contractor shall ensure that the existing pavement and granular base course are thoroughly mixed to the specified depth of 150mm.

The processing shall be carried out such that all mixed materials pass the 25.6mm sieve and not more than 75% passes the 4.75mm sieve.

The pulverizing shall be completed to the same station for the full pavement width prior to closing down operations each day.

Measurement for Payment

Measurement for pulverizing is the horizontal area in square metres calculated using the length and width specified.

Basis of Payment

Payment at the contract price shall be full compensation for all labour, equipment and material required to do the work.

The asphalt pavement shall be removed to an average depth of 50mm. The maximum depth of removal in any specific location shall be determined at the time of construction.

For two lane highways, grinding shall be done to essentially the same station for the full pavement width prior to shutdown at the end of the day.

For multi-lane highways, grinding shall be done to essentially the same station for the full pavement width for a specific direction prior to shut down at the end of the day.

The surface remaining after grinding shall have a constant and continuous cross fall matching the intended surface course cross fall. The surface remaining after grinding shall have an even texture, free of grooves and/or ridges, in all directions.

Ramping the edges and manholes are required when paving does not take place on the same day.

The reclaimed asphalt pavement material shall not remain on the roadway after completion of the day's operation. Reclaimed material to be hauled, graded, and compacted at a site to be determined by the Contract Administrator.

Measurement for Payment

The area of roadway grinded shall be measured in square metres. Payment shall be to the nearest 0.1 square meter.

Basis of Payment

Payment at the contract price to the nearest 0.1 square metre shall be full compensation for all labour, equipment, and material required to complete the work.

Reference

- OPSS.MUNI 506

General

Water shall be applied when and as directed by the Contract Administrator. If the Contractor is unable to place water within four (4) hours of the Contract Administrator's instructions, the water will be provided by other agencies and back charged to the Contractor.

Measurement for Payment

The water tank shall be measured and its volume computed in cubic meters. Payment shall be to the nearest 0.1 cubic meter.

Basis of Payment

Payment for the above item shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- OPSS.PROV 307 & 1153
- OPSS.MUNI 309

General

Pot holes shall be filled with cold mix.

Measurement for Payment

All holes to be patched. Average size for a pot hole is estimated at 0.1 square meters. Each patch, no matter how small, shall be paid as 1 each.

Basis of Payment

Payment at the contract price, for the above item, shall be full compensation for all labour, equipment, and material required to do the work.

General

Grindings shall be 100% passing the 37.5 mm sieve and 95 to 100% passing the 26.5 mm sieve after processing.

Grindings shall be placed at a thickness of between 150mm to 200mm. Grindings shall be placed with an asphalt paver capable of laying a consistent satisfactory mat of 4% cross fall and alignment specified on the Contract Drawings.

A single smooth drum vibratory roller of minimum weight of 9,200kg shall be supplied only once all of the grindings have been placed and properly graded to allow for compaction of the grindings. During compaction water shall be applied to the grindings to ensure they properly bind together.

Placement of grindings shall not be carried out when ambient temperature is less than 10 degree Celsius.

The placement of grindings shall be considered one project in its entirety.

Basis of Payment

Payment shall be in square meters. This item shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work.

Reference

- OPSS.PROV 1001
- OPSS.MUN 102, 310, 1101, & 1151

Edge ramping shall be required whenever basecoat is placed on a roadway having concrete curbs and topcoat is not to be placed that same year.

Edge ramping is to be placed to the top of the concrete curb, approximately, 40mm in height and 300mm in width.

Where sections of concrete curb (typically 2.0 meters in length), have not been placed due to structures (catch basins or manholes), an asphalt curb shall be constructed to the general dimensions of a concrete curb, allowing for sloping on the face and back of the asphalt curb.

Asphalt Cement

Asphalt cement shall comply with Appendix Table A-1, *Grade Selection for Ontario*, OPSS MUNI 1101. The Contractor shall supply the asphalt cement for this contract with a penetration grade of PG 52-34.

Mix Design

Job mix formula shall be made by the Contractor having a stability for Ontario Traffic Category “C”. Mix design shall be according to the requirements specified in the Tables in OPSS MUNI 1151

Measurement for Payment

Measurement shall be made in tonnes conforming to OPSS.MUNI 102.

Basis of Payment

Payment at the contract price for the above item shall be full compensation for all labour, equipment, and material required to do the work.

General

Contractor shall provide temporary roadway lane markings after grinding and paving operations in which existing lane markings are no longer visible. This provision should be considered when the scope of work encompasses more than one lane of roadway.

Basis of Payment

Payment at the contract price for the above item shall be included in the price of asphalt and grinding.

Reference

- OPSS.PROV 304, 1006, 1102, & 1103

General

The contractor shall provide the contractor administrator confirmation in writing from the asphalt supplier that the asphalt cement used in the emulsified asphalt for surface treatment does not contain any of the following materials or processes:

- **The asphalt cement shall not be air blown or catalytically oxidized in any manner and shall not be blended with air blown or catalytically oxidized residues in any manner**

- **The asphalt cement shall not contain alkaline bases; insoluble particulates or fibers; orthophosphoric acid; salts of iron, copper, manganese and/or cobalt; silicates; synthetic waxes; vegetable oils; waste oils (including but not limited to the following: waste engine oils, waste engine oil residues, re-refined engine oils, cracked residues, tall oils, waste cooking oils, etc.)**

- **No modifiers or additives other than styrene-butadiene (e.g., SB, SBS, SBR) or epoxy-type (e.g., reactive ethylene terpolymers) polymers are used for the modification of neat asphalt cement**

The contractor shall also provide the contractor administrator in writing a list disclosing all of the major ingredients of the emulsified asphalt prior to commencement of work.

SEALANT MATERIAL

Sealing material shall be a low modulus material such as McAsphalt Beram LM 3060 or Crafco Ultraseal 3407 LM that is specified by MTO for use in all districts.

STREET SWEEPING

Sweeping of roadway that has been routed shall be completed daily. If sweeping not completed, the following days' work shall not be allowed to start.

Basis of Payment

Street sweeping shall be included in the price per linear meter of rout and seal.

TRAFFIC CONTROL

The Contractor is responsible for all traffic control. Traffic control shall be included in the price per linear meter of rout and seal. Traffic control plans to be submitted prior to the start of work. Plans must meet requirements of Ontario Traffic Manual Book 7 for each class of roadway.

Basis of Payment

Traffic control shall be included in the price per linear meter of rout and seal.

Reference

- OPSS.MUNI 102

General

Intersection paving item shall only be used when the paving operation has to stop and start at the intersection due to paving radiuses and oncoming traffic. When the paving operation is passing straight through the intersection and all perpendicular roads have been blocked, paving item shall be considered roadway paving.
The asphalt intersection limits shall be considered the area within the right of way in the longitudinal direction and the right of way in the transverse direction.

Measurement for Payment

Measurement shall be made in tonnes conforming to OPSS.MUN 102.

Basis of Payment

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment, and material required to do the work.

OPSS.MUNI 310 is amended as follows:

310.07.03 – Tack Coat

Add in the following:

A tack coat shall be applied between each asphalt surface including paved shoulders.

A tack coat shall be applied to any Grind and Pave patch over 400m^2.

Basis of Payment

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- OPSS.PROV 206
- OPSS MUNI 180 & 351
- O.Reg. 153/04

General

All driveways abutting the roadway excavation shall be fitted as per the contract drawings, and the earth excavation involved shall be paid under this item.

Total excavation shall not exceed 60m at any time (includes pipe trenches and earth excavation).

Granular “B” and all driveways shall be graded and capped with minimum of 100mm of Granular “A” within 60m of the furthest excavation point prior to 4:00 p.m. each Friday or a penalty of $1,000.00 shall apply for each calendar day of non-compliance.

Clean uncontaminated roadbed granulars shall be salvaged and re-used as pipe bedding, cover, or Granular “B”, providing it meets specifications and with written authorization from the Contract Administrator.

The contractor shall propose the private dump site/s to haul the excavated material at the time of the preconstruction meeting and adhere to the following instruction:

Excavated soils shall conform to O.Reg 153/04 Records of Site Condition; Table 3, Table 8 & TCLP (for hauling to Deloro). All laboratory results shall be provided to Environmental Services Department prior to the material being removed from the site.

If the material is deemed to not be suitable for the proposed dump site, another suitable site will be determined by the contractor at no extra cost to the City.

Payment for earth excavation will not be made until the Granular "B" subbase has been constructed and approved by the Contract Administrator.

Measurement for Payment

Measurement for payment shall be in cubic metres and deductions shall be made for overbuilding.

Basis of Payment

Payment at the contract price, per cubic metre, for this item shall be full compensation for all labour, equipment, and material required to complete the work.

General

Minor excavation up to 300mm deep shall be required in areas as determined by the Contract Administrator.

Driveways shall be paid under the Earth Excavation item.

Measurement for Payment

Measurement shall be made in square metres.

Basis of Payment

Payment at the contract price, per square metres, for minor excavation shall be full compensation for all labour and equipment to complete the work. The work is to include shaping to proposed granular elevations. If Granular “B” is required, it shall be paid under the Granular “B” item.

Reference

- OPSS.MUNI 314 & 1010 (Except for payment purposes)

General

The General Contractor shall be responsible for maintaining of the roadway to contract grades and tolerances for five (5) working days. The five-day period commences once the road release has been signed by the Contract Administrator. If the roadway loses its shape from wear and weather during this five (5) day period, the General Contractor shall restore the roadway to the contract grades and tolerances at no extra cost to the City.

Final payment for Granular "A" shall not be made until the final road grades and cross-sections have been approved on the entire project by the Contract Administrator and meet contract tolerances as per Section D Supplemental General Conditions, Item 10 Layout Requirements, Table #2..

Plan quantity shall be the entire Granular "A" contained within the roadway cross-section i.e. top of gutter bank or back of sidewalk. All driveway fit points shall be included.

Measurement for Payment

Measurement for payment is by plan quantity. Adjustments to the plan quantity shall be by measurement in square metres.

Reference

- OPSS.MUNI 314 & 1010

General

Granular B Type I shall be from non-quarried source only.

The Contractor shall advise the Contract Administrator when Granular “B” is to proposed grade and fully compacted. The Contractor shall sign the Road Release form attached to communicate with the Contract Administrator that the Granular “B” is to proposed grade and compacted.

If Granular “B” is lower than the specified grade then the Contractor has an option of placing additional Granular “B” and having the road re-sectioned, or placing Granular “A” for which he will not be paid under the “Granular B” or “Granular A” Items.

The steel plates for all structures shall be brought to Granular “B” grade prior to notification to the Contract Administrator for checking cross-sections.

Measurement for Payment

Measurement for payment is by the tonne.

Reference

- OPSS.PROV 506

General

Water shall be applied when and as directed by the Contract Administrator. If the Contractor is unable to place water within four (4) hours of the Contract Administrator's instructions, the water will be provided by other agencies and back charged to the Contractor.

Measurement for Payment

The water tank shall be measured and its volume computed in cubic meters. Payment shall be to the nearest 0.1 cubic meter.

Basis of Payment

Payment for the above item shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- OPSS.MUNI 1004.05.02

General

19mm clearstone used to replace unsuitable material must be approved by the Contract Administrator prior to use.

Measurement for Payment

Measurement shall be in cubic metres.

Reference

- OPSS.MUNI 206, 802, & 803

General

Where specified on the contract drawings, roadside boulevards shall be graded to the elevations and widths indicated, unless otherwise approved. If additional material is required to meet the proposed elevations, it shall be free of roots, vegetation or other debris. The Contractor shall grade and compact, to a uniform surface, the areas to be graded in such a way that surface drainage will flow into the storm sewer system as indicated.

Measurement for Payment

The actual area of grading shall be measured in square metres.

Basis of Payment

Payment shall be made at the contract price per square meter and shall be full compensation for supplying, loading, hauling, spreading, and compacting the material required.

Payment shall be made to the nearest square metre.

Reference

- OPSS.MUNI 355

General

The work involved in the item shall include the salvage, regrading, and replacing of private driveways affected by construction. The work shall include but not limited to the following:

1. Remove and stockpile paving stones/patio slabs neatly away from the affected construction area as approved by the Contract Administrator.

2. Remove and stockpile precast concrete or wooden curbs neatly without damage away from the construction area.

3. Regrade the granular subbase either by excavation or by minor surface regrading as required.

4. If granular “A” base is required, it shall be paid under the Granular “A” Item.

5. Place salvaged curbs and paving stones to the new gradient approved by the Contract Administrator.

6. Replace the materials damaged by removal.

7. Saw cut paving stones as required to fit.

The Contractor shall include the placement of bedding sand to the specified thickness, compacting the stones to a uniform gradient and sweeping bedding sand to the stone joints.

Measurement for Payment

Area covered by paving stones shall be measured in square metres.

Basis of Payment

Payment at the contract price for the above tender item shall be full compensation for all labour and equipment to complete the work.

Reference

- OPSS.PROV 351, 1002
- OPSS.MUNI 353, 904

CONCRETE PLACEMENT DEADLINE

Concrete shall not be placed after September 1st of the given year. Any concrete placed after this date will not be accepted.

CONCRETE MIX DESIGN

OPSS 351, 352, 353, OPSS.MUNI 904 is amended to include the following:

The Concrete shall conform to CSA A23.1 (Latest Edition), Table 1, 2, 4 & 20:

- *class of exposure:* ***C2***: non-structurally reinforced (i.e., plain) concrete exposed to chlorides and freezing and thawing (examples: steps, sidewalks, curbs and gutters)
- *maximum water to cementing materials ratio*: **0.45**
- *minimum specified compressive strength and age:* **32 MPa @ 28 days**
- *slump:* **80mm ± 20mm** (except for curb and gutter: **40mm ± 20mm**)
- *air content*: **6.5% ± 1.5** (14-20 mm nominal maximum sizes of coarse aggregate)
- *allowable curing regimes*: **curing type 2, 7 days at ≥ 10^0C for a time necessary to attain 70% of the specified strength**

Aggregates must meet OPSS 1002.

CONCRETE FINISHING

Avoid finishing practices that reduce or eliminate the air entrained voids in the wearing surface layer. Delay finishing until all bleed water has risen to, and disappeared from the surface.

CONCRETE CURING

Curing shall be done as per OPSS MUNI 904 – Clause 904.07.10.01, 904.07.10.03, 904.07.10.05, 904.07.10.06 and OPSS 353 – Clause 353.07.08.03.

Curing with Burlap and Water for first 48 hours

Burlap shall be pre-soaked for 24 hours prior to pouring. Two layers of burlap shall be placed immediately after finishing concrete. The burlap shall be maintained in a continuously wet condition throughout the curing period. The burlap shall be covered with a layer of moisture vapour barrier.

Curing Compound

Curing compound shall be applied to all exposed concrete surfaces after 48 hours burlap and water curing. A second application of curing compound shall be applied within 30 to 60 minutes after the first application.

Cold Weather Curing

Temperature is considered cold weather when the air temperature drops below 5°C or likely to fall below 5°C within 96 hours. Curing with burlap and water shall be maintained for 7 days followed by curing compound. Minimum curing temperature of 10°C shall be maintained for 7 days. Where air temperature drops below the minimum temperature housing and heating may be required to maintain curing temperatures. After 7 days of housing and heating, the enclosure can be removed once the temperature differential is less than 15°C.

Hot Weather Curing

Temperature is considered hot weather when the air temperature exceeds 27°C or exceeds 27°C within 24 hours. Curing with burlap and water shall be maintained for 7 days.

SUBMITTALS

Required Submittals

1. Mix design (for each type of concrete structure) as per most recent OPSS MUNI 1350.
2. Certificate of Ready Mixed Concrete Production Facilities.
3. Certification that aggregates will not, nor have the potential to, react with cement to result in deleterious expansion in the concrete.
4. Certification that deleterious substances in aggregate are within limits specified in CSA A23.1 (Latest Edition), Table 12 – Limits for Deleterious Substances and Physical Properties of Aggregates.
5. Certification that proposed performance mix will produce concrete meeting the requirements of the Specifications.
6. Manufacturer's specifications for curing compound.

POLICY FOR ACCEPTANCE OF WORK

Initial Acceptance

a) sidewalk slabs with cracks larger than 6mm shall be replaced.
b) sidewalk slabs with more than one crack of any size shall be replaced.
c) sidewalks with differential settlement of 20mm or more shall be replaced.
d) sidewalk slabs with spalled surfaces shall be replaced.
e) sidewalk slabs with a crack of any size which has concrete breaking or spalling away at the edges of the crack shall be replaced.
f) sidewalk slabs with a corner broken off may be saw cut and repaired at this stage.

g) curbs and/or gutters which have spalled may be patched at this stage.

Final Acceptance

a) items no. "**a**" to no. "**e**" for "Initial Acceptance" will also apply for "Final Acceptance".
b) sidewalk slabs with a corner broken off shall be replaced.
c) curbs and/or gutters which have spalled shall be replaced.

Any work which was repaired for "Initial Acceptance" and has deteriorated shall be replaced.

CONCRETE SIDEWALK

Refer to OPSS Form 351, OPSS MUNI 904 &1002.

Polypropylene multi filament fibres with a dosage of 0.75kg/m^3 and a size of 20mm shall be added to the concrete as reinforcement.

Material used for sidewalk granular base shall be Granular "A" of 150mm depth. To be paid under the "Granular A" Item.

A typical sidewalk shall have a thickness of 125mm. At a residential entrance it shall have a minimum thickness of 150mm and at a commercial or institutional building shall have a minimum thickness of 200mm and be extended 2 meters beyond curb cut on each side.

Where a service crosses a sidewalk slab, an additional expansion joint shall be placed on both sides of the slab. In the case where it is directly under a sidewalk joint, an additional expansion joint shall be placed.

Tactile Plates shall be installed at each sidewalk intersection ramp. The tactile plates shall be yellow cast in place or approved equivalent by the Contract Administrator.

Measurement for Payment - Sidewalk

Include all labour, equipment and material for concrete sidewalk. The price per square metre, measured in the field shall include preparation, grading, and compaction for new base.

Measurement for Payment – Tactile Plates

Include all labour, equipment and material each intersection ramp. The price per each, measured in the field shall include preparation and installation.

Payment at the Contract price for the above tender item shall be full compensation for all labour, equipment and material to do the work. The price per each sidewalk intersection ramp location.

Warranty
Contractor shall warranty the concrete sidewalk for two (2) years.

CONCRETE STEPS

Refer to OPSS 352.

- Concrete steps shall be required at some walkway entrances.
- Construct concrete steps where directed by the Contract Administrator
- Construct concrete steps in accordance with OPSD 512.010 & 512.011. Handrails if specified in contract drawings to meet Ontario Building Code and be installed as per OPSS 908 and OPSD 980. Handrails if required shall be paid under separate contract item.

Measurement for Payment

Measurement for payment shall be in cubic metres for the concrete placed, based on the neat lines called for in the Contract.

Basis of Payment

Payment shall be made at the contract price, per cubic metre, for concrete steps and such payment shall be compensation in full for all labour, equipment, and material required to complete the work. Excavation for the concrete steps and backfill is included in this Item.

Warranty

Contractor shall warranty the concrete steps for two (2) years. In the event of any spalling, contractor to remove and replace **all** concrete and restore adjacent damaged areas.

CONCRETE RETAINING WALL

Refer to OPSS MUNI 904 & 1002.

The Contractor shall be required to excavate and construct the retaining wall to the grades and location shown.

Measurement for Payment

Measurement for payment shall be in cubic metres for the concrete placed, based on the neat lines called for in the Contract.

Basis of Payment

Payment shall be made at the contract unit price, per cubic metre, for retaining wall and such payment shall be compensation in full for all labour, equipment, and

material required to complete the work. Excavation for the retaining wall structure and backfill is included in this Item.

Warranty

Contractor shall warranty the concrete retaining wall for two (2) years. In the event of any spalling, contractor to remove and replace **all** concrete and restore adjacent damaged areas.

CONCRETE EDGE STRIP

Refer to OPSS 353.

- Provide edge strip to the size indicated on the drawings including reinforcing.
- Include the cost of polyethylene plastic and expansion joints adjacent to buildings and structures in the price for the concrete edge strip.
- Provide expansion joints at 6m intervals in concrete edge strips.
- Extend reinforcing into curb and gutter minimum 600mm.
- Where directed by the Contract Administrator, extend the concrete edge strip to buildings.
- Where the width from the front of the concrete edge strip to the building exceeds 300mm, extend concrete to the building.
- Provide double expansion joints between concrete edge strip and buildings. A polyethylene plastic sheet shall also be installed between the expansion joints and the building

Measurement of Payment

Measurement for payment shall be in metres, horizontally, over the center line of the concrete edge strip.

Basis for Payment

Payment for the above tender item shall be full compensation for all labour, equipment and material to do the work.

Concrete edge strip shall be up to 300mm in width, any concrete poured outside the 300 mm width shall be paid by the square meter (m^2) under the “Concrete Sidewalk” Item.

Warranty

Contractor shall warranty the concrete edge strip for two (2) years. In the event of any spalling, contractor to remove and replace **all** concrete and restore adjacent damaged areas.

CONCRETE CURB AND GUTTER REPLACEMENT AND APPURTENANCES

Refer to specifications OPSS 353, 510, 802, 803, 310, 314 and 1002. This specification shall also be followed for Barrier Curb.

General

1. Remove existing curb where indicated to OPSS 510.
2. Sawcut and remove existing pavement to the limits set out by the Contract Administrator.
3. Cut and remove existing sod to the limits set out by the Contract Administrator.
4. Remove and salvage paving stones to the limits set out by the Contract Administrator.
5. Provide compacted Granular “A” as required to underside of curb grade approved by the Contract Administrator.
6. Construct forms to the grade lines approved by the Contract Administrator.
7. Prior to pouring concrete, forms must be inspected by the Contract Administrator. Allow 24 hours’ notice to the Contract Administrator or his designated representative for this inspection.
8. Place and cure concrete in accordance with OPSS 353.
9. Provide Granular “A” as required and compact prior to placement of hot mix asphalt course where required to OPSS 314.
10. Place 90mm hot mix asphalt restoration where required in two lifts not exceeding 50mm to OPSS 310.
11. Provide topsoil and sod where required to match new curb and existing lawn grade to OPSS 802 and 803.
12. Replace paving stone where required to match new curb and existing pavers.
13. Do not remove curb that will not be replaced within 7 calendar days.
14. Adjust catchbasins to fit new curb elevations.

Measurement for Payment

Measurement of concrete curb and gutter shall be made in metres along the flow lines of the gutter whether straight or circular. Measurement shall include the space occupied by setbacks, gutter outlets, and frames and grates.

Basis of Payment

Payment at the contract price per linear metre shall be full compensation for all labour, equipment, and material to complete the work.

Warranty

Contractor shall warranty the concrete curb and gutter for two (2) years. In the event of any spalling, contractor to remove and replace **all** concrete and restore adjacent damaged areas.

CONCRETE CURING BOX

The Contractor shall make available a secure location with adequate power supply for the concrete curing box to be housed.

Housing for the concrete curing box shall be located on the project site. It shall also be the responsibility of the contractor to ensure the safety of the curing box at all times during the concrete curing period. The contractor shall be responsible for replacement of the concrete curing box should any damage or theft occur while the box is on the project site.

City personnel shall be provided access to the concrete curing box at all times.

Basis of Payment

Payment for the above work shall be included in the concrete items price.

Reference

- Standard Detail Drawing 346.

General

All concrete to be used in this item shall be 20 MPa (minimum).

Measurement for Payment

This item shall be measured for each support system incorporated into the work as directed by the Contract Administrator.

Basis of Payment

Payment for each support system shall be considered to be payment in full for the supply of all labour, equipment, and material required to complete the work to the satisfaction of the Contract Administrator.

Reference

- OPSS. MUNI 1004

General

Section 1004.05.05.01 of OPSS Form 1004 is revised as follows:

- Gabion stones shall be well graded in size from 150mm to 300mm in maximum dimensions.

- Gabion walls installed with geotextile behind it shall use Marafi 350 or a geotextile approved equal.

Measurement for Payment

Measurement shall be in cubic metres based on the nominal dimension of the gabion units used. Where gabion excavation overlaps excavation required for other work, the measurement shall be made as specified with no deductions for overlaps.

Basis of Payment

Payment at the contract price shall be full compensation for all the labour, equipment, and material required to complete the work for installation of gabion wall including cutting the gabions to the profile of the pipe and geotextile behind the wall and around the pipe, as shown on drawings.

Reference

- OPSS.PROV 501 & SP RD-21

General

Where indicated on the contract drawings, a base shall be prepared for the bedding sand. This is to include 150mm of Granular "A" Type 2 compacted to 100% Standard Proctor Density to within ± 10mm of design grade. Payment of Granular "A" - Type 2 shall be made under its respective item in the Form of Tender.

Materials

Bedding sand shall be well graded sand suited to concrete manufacture, passing a 4.75mm sieve.

SIEVE NO.	% PASSING
4.75mm	100
2.36mm	80 - 100
1.18mm	50 - 85
0.60mm	25 - 60
0.30mm	10 - 30
0.15mm	5 - 15
0.075mm	0 - 10

Filling sand shall pass a 1.18mm sieve and have some 10% of silty material.

Interlocking precast concrete pavers shall be of the "cobblestone" type as manufactured by D. Barnett & Co., Lafarge, or Oaks Precast. The colour is to be multi-covered blend of 40% brown and 60% salmon. Pavers 60mm thickness.

Installation

The sand bedding shall be spread loose and screeded in a uniform layer to a depth determined in the field such that following the compaction of the paving stone surface, the bedding sand layer shall not exceed 40mm.

Paving units shall be placed on the uncompacted screeded sand in the prescribed laying pattern. The units shall be placed to achieve gaps nominally 2 to 4mm wide between adjacent units. Where required, all units must be cut using an approved concrete saw to ensure an accurate fit. Paving stones shall not be cut to a size of less than one third full stone size. After laying the paving units, they shall be compacted to achieve consolidation of the sand bedding and brought to design elevations by not less than two (2) passes of suitable plate compactor.

The compactor shall be a high-frequency low-amplitude mechanical flat plate vibrator having a plate sufficient to cover a minimum of 12 paving units. Compaction shall proceed as closely as possible following laying of paving units. Sand for joint filling shall then be spread over the surface. This sand should be broomed to fill joints. At least one pass of the plate vibrator is required to achieve compaction of the joint filling sand.

Should the Contractor wish to propose an alternative installation method, this method shall be in writing. The Contractor assumes full responsibility for any approved alternative installation method. Alternative installation method must be approved in writing by the Contract Administrator.

Measurement of Payment

The area covered by the paving stones shall be measured accurate to the nearest decimeter.

Basis of Payment

Payment at the contract price to the nearest square meter shall be full compensation for supplying and spreading all required materials and placing and compacting the paving units.

All driveways shall be restored with equivalent or better materials. It shall match its existing granular subbase and have a minimum of 150mm granular “A”.

If the driveway is of asphalt construction, the asphalt cement shall comply with Appendix Table A-1, *Grade Selection for Ontario*, OPSS MUNI 1101. The Contractor shall supply the asphalt cement with a penetration grade of PG 52-34. This special provision is intended only to describe payment of the asphalt. Payment for granular materials will be made under its respective item.

If the driveway is of concrete construction, refer to OPSS 350, 360, MUNI 904 and 1002

The Concrete Driveway shall conform to *CSA A23.1-04, Table 1, 2, 4 & 20* and with the City of Timmins Concrete Specification.

In Phase I, the Contractor shall provide to the satisfaction of the Contract Administrator, access and usage of walkways and driveways until the completion on the Phase II work.

Installation and removal of all such ramps shall be included in the granular “A” item.

Driveway area consists of area outside the earth excavation limit i.e. outside back of gutterbank or back of sidewalk.

Basis of Payment

Payment for the restoration of driveways shall be made under each respective item.

Reference

- OPSS Form 206
- O.Reg 406/19
- SP-RD-01

General

Excess soils shall be hauled to a location supplied by the Contractor. The Contractor shall submit an excess soil reuse plan to the Contract Administrator two weeks prior to the pre-construction meeting.

Measurement of Payment

Payment shall be in meters to the nearest 0.1 m.

Basis of Payment

Payment shall be made at the contract unit price per lineal meter for "Ditching" and such payment shall be compensation, in full, for all operations herein described.

General

DOW Chemical Polystyrene H140 extruded sheets (.61m x 2.44m) or equivalent as approved by the contract administrator, shall be placed as shown by Standard Detail Drawing #380 and in areas and thickness as designated on the Contract Drawings.

Measurement for Payment

Measurement shall be made by square metre of insulation placed.

Basis of Payment

Payment shall be made at the unit price bid, per lineal metre, for either the 100mm or 50mm placement as stated in the Form of Tender. For any non-standard width installations, payment shall be based on a percentage increment in accordance with the change in width beyond the standard.

The unit price shall be full compensation for supplying all materials including granular material for placing the expanded polystyrene, as specified and for all other operations which may be required to complete the installation.

Reference

- OPSS.PROV 120

General

The Contractor shall excavate the rock based on the actual lines given on Standard Drawing No. 256.

The Contractor shall place Granular “B” – Type 1 from the top of the specified bedding to the top of the rock trench. Granular “B” to be paid under the Granular “B” Item.

Measurement for Payment

Measurement shall be computed from field measurement of cross-sections taken after earth over burden has been removed and shall be based on the actual lines shown on City Standard Drawing No. 256.

Basis of Payment

Payment at the contract price, per cubic meter, for rock excavation (trench) shall be full compensation for all labour, equipment, and material necessary to complete the work as per Consulting Engineer's recommendations including mobilization and demobilization of the equipment.

Reference

- OPSS.PROV 120

General

Pre-Blasting Survey and Monitoring

The Contractor shall engage a Professional Consulting Engineer, licensed in Ontario, at the Contractor's expense herein referred to as the Consulting Engineer. The Consulting Engineer shall:

a) Conduct pre-blasting survey of all homes on the street within the contract limits and all premises potentially affected by Contractor's blasting operations and submit three (3) copies to the Engineer before commencing construction. The pre-blasting survey report shall include, as a minimum, the following information:

- Type of structure, including type of construction, and the date, if possible, when built.
- Any differential settlements: visible cracks in walls, floors, and ceilings shall be identified and described, including a diagram, if applicable, room-by-room.
- Any other apparent structural or cosmetic damage or defect must also be noted.
- The report shall use positive dimensions whenever practical to do so, instead of general terms, e.g. "sagging 1 to 2 cm" as opposed to "sagging badly".
- Clear quality photographs, as deemed necessary for proper recording of significant concerns.

The standard inspection procedure shall include the provision of an explanatory letter to the building owner with a formal request for permission to carry out an inspection.

b) Make written recommendations on all blasting operations and blasting vibration monitoring and submit three (3) copies to the Manager of Engineering prior to commencing construction. The report shall include the maximum explosive charges that can be used at different locations throughout the area of rock excavation.

Further seismic readings shall be taken by the Consulting Engineer during blasting operations. The monitoring equipment shall be placed to obtain representative readings and a monitoring report shall be provided to the Manager of Engineering. As construction proceeds, the monitoring equipment shall be repositioned on an on-going basis.

In addition to the above, vibrations generated shall not exceed the vibrational peak particle velocity recommended by the Consulting Engineer.

If the monitoring station is not at the nearest structure, then the allowable particle velocity shall be reduced in accordance with the increased distance from the blast and shall be determined by the Consulting Engineer.

Additional monitoring and reading shall be obtained in other sensitive areas where the pre-blast survey indicates the need.

The Contractor and Consulting Engineer shall visit the Owners of properties and buildings where test and/or investigations are required and shall describe blasting and seismic investigations to them and obtain their permission to carry out the necessary investigations and notify them of the blasting schedule. The Consulting Engineer shall determine the geographical limits of the pre-blasting survey and all property owners within that area shall be provided with the blasting schedule. In addition, all property owners shall be provided with a card, stating that a copy of the pre-blast survey, of their property shall be provided upon written request.

The Contractor shall not commence blasting operations until the Manager of Engineering has reviewed the pre-blasting report and is satisfied that the requirements of this special provision have been met.

The Consulting Engineer shall be an advisor to the Contractor and the acceptance of his reports and recommendations by the Owner shall, in no way, relieve the Contractor of any responsibility for damage or injury by blasting.

The Contractor shall follow the recommendation of the Consulting Engineer in all blasting operations and vibration monitoring, etc.

In addition to the liability insurance coverage required under Section 106.2 of the General Conditions, the contractor shall take out and keep in force until the date of acceptance of the entire work by the Engineer, insurance acceptable to the Engineer providing insurance coverage in respect of any one accident resulting from blasting operations to a limit of at least $5,000,000 exclusive of interest and cost and shall name the Corporation as additional insured.

Blasting Mats

Where blasting methods are employed by the Contractor in the vicinity of buildings, structures or other properties subject to damage by flying material, the Contractor shall supply and place blasting mats or use such other methods as may be approved by the Engineer to prevent damage by air borne materials.

Measurement for Payment

The measurement for payment will be lump sum.

Basis of Payment

Payment at the contract lump sum price shall be full compensation for all labour, equipment, and material required including Consulting Engineer's reports, etc. to complete the work to the satisfaction of the Engineer.

Reference

- OPSS.PROV 310
- OPSS.MUNI 1101

General

Asphalt to be removed shall be sawcut straight, the subgrade compacted, and then paved with 50mm asphalt.

Asphalt shall be SP 12.5 in accordance with SP ASP-01. Asphalt cement shall have a penetration grade of 150/200.

Basis of Payment

Include all labour, equipment, and material to complete the above work in the contract price per square metre. Include the cost of removal of asphalt where it is required.

Reference

- OPSS.PROV 310, 1001, & 1003
- OPSS.MUNI 1101

General

- Asphalt shall be laid in single lifts not to exceed 50mm.
- Asphalt cement shall comply with SP ASP-01 and Appendix Table A-1, *Grade Selection for Ontario*, OPSS MUNI. 1101.
- The Contractor shall supply the asphalt cement with a penetration grade of 150/200.
- This item shall include the preparation of the grade.

Measurement for Payment

Measurement for payment shall be in square meters of the finished surface.

Basis of Payment

Include all labour, equipment, and material. The price per square meter (m^2) shall also include preparation of the grade.

Reference

- OPSS.PROV 310
- OPSS.MUNI 1101

General

1. Confirm area for overlay with Contract Administrator.

2. Treat 400mm area at perimeter of overlay with undiluted SS-1 emulsified asphalt at a rate of 0.35 kg/m^2.

3. Adjust all water valves in the overlay area prior to paving.

4. Place and compact overlay and grade to provide a smooth finish correcting geometric deficiencies on the surface of the existing asphalt.

5. Feather down edges of overlay area to provide a smooth transition between the overlay and the existing pavement.

6. Asphalt cement shall have a penetration grade of 150/200.

Measurement for Payment

Measurement for payment shall be in square metres.

Adjustment shall be made for significant areas of the patch exceeding or less than 50mm.

Basis of Payment

Payment at the contract price for the above item shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- STD-DWG #211

General

Parking meter posts shall not be removed until parking meter heads have been removed by the City of Timmins Traffic Department.

All parking meters and posts within the limits of construction shall be removed and salvaged. All parking meters shall be delivered to the City of Timmins Public Work's yard on Pine Street South.

All parking meter parts not required for relocation shall be delivered to the City of Timmins Public Work's yard on Pine Street South.

Install new galvanized or existing steel posts as per Standard Drawing #211.

The Contractor shall arrange with City of Timmins Traffic Department will re-instate parking meter heads prior to the roadway being re-opened for public use.

Work shall be completed as per contract documents and drawings provided.

Basis of Payment

Payment at the contract unit price for the item "Parking Meter Post Removal and Installation" shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Reference

- OPSS.MUNI 180 & 510

General

Include all labour, equipment, and materials to remove all asphalt designated for removal to its full depth.

The Contractor shall salvage all asphalt and dispose of it at City of Timmins MacLean Drive snow dump (1.1km North of JV Bonhomme Blvd.) in the South-West corner of the dump.

The asphalt shall be free of boulders, steel, wood, concrete etc.

The salvaged material shall be reviewed by the Contract Administrator and the Contractor, if any debris, boulders, etc. are found, the Contractor shall, at his own expense, clean the asphalt of all foreign matter at the dump site. No payment shall be made for this item until it has been accepted by the Contract Administrator.

Asphalt included in composite surfaces shall be paid in composite surface removal and shall be deducted from asphalt removal.

Measurement for Payment

Measurement shall be as per plan quantity method, as specified in OPSS 510.09.02.

Reference

- OPSS.-MUNI 180, 510.

General

Include all labour, equipment, and material to remove (up to 450mm of thickness) asphalt and concrete composite surface.

Dispose of concrete and asphalt outside the limits of the contract in a site provided by the Contractor and approved by the Contract Administrator.

The Contractor shall obtain the specified notices and Property Owner's Release provided in OPSS 180 and deliver them to the owner as specified.

Sawcut existing concrete composite surface to its full depth at the limits of construction and at any fit points.

Measurement for Payment

Measurement shall be made in square meters.

Basis of Payment

Payment at the contract price, per square meters, for composite surface removal shall be full compensation for all labour and equipment to complete the work. The work is to include shaping to proposed granular elevations. If Granular is required, it shall be paid under the respective item.

Trees shall be removed, including the roots of the trees and disposed of at the Contractor's dump site approved by the Contract Administrator.

Measurement for Payment

Measurement shall be for each tree removed.

Basis of Payment

Payment at the contract price for each tree removed shall be compensation in full for all labour, material, and equipment required to do the work.

Reference

- OPSS.MUNI 610

General

Salvage and deliver all street light poles, davits, luminaries, and appurtenances to City of Timmins Public Work's yard.

Measurement and Basis of Payment

Payment shall be made at the contract price for each street light removed and shall be compensation in full for all work necessary to remove and salvage the street lights as specified.

Reference

- OPSS.MUNI 314

General

Granular “B” Type II from quarried sources shall only used with prior approval from the Manager of Engineering – City of Timmins

Granular “B” - Type II shall be obtained from a PJV site or equivalent and approved by the Contract Administrator.

Granular "B" surface shall not deviate more than 30mm from the specified grade and cross-section. The granular base shall be maintained to this tolerance until Granular A” is placed.

Granular “B” shall be placed and compacted in lifts not to exceed 350mm. The Contract Administrator shall be advised when the 1st lift is ready for compaction testing.

The Contractor shall advise the Contract Administrator when Granular “B” is to proposed grade and fully compacted. The Contractor shall sign the Road Release form attached to communicate with the Contract Administrator that the Granular “B” is to proposed grade and compacted.

If Granular “B” is lower than the specified grade then the Contractor has an option of placing additional Granular “B” and having the road re-sectioned, or placing Granular “A” for which he will not be paid under the “Granular B” or “Granular A” Items.

The steel plates for all structures shall be brought to Granular “B” grade prior to notification to the Contract Administrator for checking cross-sections.

Water used to achieve the compaction required shall be included in the price of the granular material.

Payment for Granular "B" shall not be made until Granular "A" base has been constructed and approved by the Contract Administrator.

Measurement for Payment

Measurement for Granular “B” – Type II shall be made in tonnes.

Basis of Payment

Payment shall be full compensation for all labour, equipment, and material required to do the work.

The Contractor shall remove unsuitable material from the trench and dispose of to an approved landfill site.

Measurement for Payment

The measurement shall be in cubic metres.

Basis of Payment

Payment at the contract price, per cubic metre, shall be full compensation for all labour, material, and equipment necessary to complete the work to the satisfaction of the Engineer.

Reference

- OPSS.MUNI 802 & 803

General

Screened Topsoil

Prior to delivery to site, all topsoil shall be screened through a 25mm sieve.

Placing of Sod

Sod shall not be placed after September 15th.

The work shall consist of the following:

- provide all material, labour, and equipment to re-instate all granular “A” and final adjustment of asphalt fit points to contract grades and tolerances

Measurement for Payment

Payment for the above work will be a lump sum price.

Basis of Payment

The Contractor must obtain sign off and Road Release approval in Phase I, on the entire project, meet Granular ‘A’ contract tolerances as per Section D Supplemental General Conditions, Item 10 Layout Requirements, Table #2 to be eligible for payment of this item.

Reference

- OPSS.PROV 353 & 1002

General

OPSS 353 is amended to include the following:

The Concrete Curb shall conform to *CSA A23.1-04, Table 1, 2, 4 & 20*

- *class of exposure*: **C2**: non-structurally reinforced (i.e., plain) concrete exposed to chlorides and freezing and thawing. (Examples: steps, sidewalks, curb and gutters)
- *maximum water to cementing materials ratio*: **0.45**
- *minimum specified compressive strength and age*: **32 MPa @ 28 days**
- *air Content*: **6.5% ± 1** (14-20 mm nominal maximum sizes of coarse aggregate)
- *allowable curing regimes*: **curing type 2, 7 days at ≥ 10^0C for a time necessary to necessary to attain 70% of the specified strength.**

Aggregates must meet *OPSS 1002* – April 2004

Curing shall be done as per *OPSS 353* – Clause 353.07.08.03
Burlap and Water for first 48hours and then directly followed by an application of Curing Compound.

Items to Submit:

1. Mix design as per OPSS MUNI Prov. 1350 – April 2007
2. Certificate of Ready Mixed Concrete Production Facilities.
3. Certification that aggregates will not, nor have the potential to, react with cement to result in deleterious expansion in the concrete.
4. Certification that deleterious substances in aggregate are within limits specified in CSA A23.1-04, Table 12 – Limits for Deleterious Substances and Physical Properties of Aggregates.
5. Certification that proposed performance mix will produce concrete meeting the requirements of the Specification

Measurement for Payment

Measurement of concrete curb and gutter shall be made in metres along the flow lines of the gutter whether straight or circular. Measurement shall include the space occupied by setbacks, gutter outlets, and frames and grates.

Basis of Payment

Payment at the contract price per linear metre shall be full compensation for all labour, equipment, and material to complete the work.

Warranty

Contractor shall warranty the concrete curb and gutter for two (2) years. In the event of any spalling, contractor to remove and replace **all** concrete and restore adjacent damaged areas.

Reference

- OPSS.PROV 314

General

50mm Minus Rockfill surface shall not deviate more than 30mm from the specified grade and cross-section. The granular base shall be maintained to this tolerance until geotextile is placed.

50mm Minus Rockfill shall be placed and compacted in lifts not to exceed 350mm. The Contract Administrator shall be advised when the 1st lift is ready for compaction testing.

The Contractor shall advise the Contract Administrator when 50mm Minus is to proposed grade and fully compacted. The Contractor shall sign the Road Release form attached to communicate with the Contract Administrator that the 50mm Minus is to proposed grade and compacted.

If 50mm Minus is lower than the specified grade then the Contractor has an option of placing additional 50mm Minus and having the road re-sectioned, for which he will not be paid.

Water used to achieve the compaction required shall be included in the price of the granular material.

This material shall meet the following gradation requirements:

50mm Minus Rockfill	
Dimension	% Passing by Weight
53mm	100
37.5mm	95-100
26.5mm	80-100
19mm	70-90
9.5mm	50-80
4.75mm	35-65
2mm	20-47
425µm	10-30
150µm	5-15
75µm	0-5

Measurement for Payment

Measurement for 50mm Minus Rockfill shall be made by the tonne.

Basis of Payment

Payment shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- OPSS.PROV 314

General

150mm Minus Rockfill shall be placed and compacted in lifts not to exceed 350mm. The Contract Administrator shall be advised when the 1st lift is ready for compaction testing.

Water used to achieve the compaction required shall be included in the price of the granular material.

This material shall be non-acid generating, comprised of hard, inorganic granular particles and meet the following gradation requirements:

150mm Minus Rockfill	
Dimension	% Passing by Weight
150mm	100
75mm	50-100
25mm	10-100
9.5mm	0-65
4.75mm	0-35
850µm	0-5

Measurement for Payment

Measurement for 150mm Minus Rockfill shall be made by the tonne.

Basis of Payment

Payment shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- OPSS.PROV 517

General

The use of this item will be determined by the Manager of Engineering if conventional dewatering systems such as pumps are not effective.

Measurement for Payment

Payment for this item shall be on a time and materials basis. The Contractor shall provide all documentation to justify costs. The Contractor's costs shall be paid as per the mark up in the General Conditions.

Refer to OPSS 180, 310, MUNI 314, 353, MUNI 510, 802, 803
OPSD 600.040, SP RD-18, SP RD-32, SD 209

The work to be carried out under this item shall include the following:

- sawcut cutting, removal and disposal of any asphalt, concrete and granular materials
- all materials required to complete the installation of the proposed concrete curb and gutter
- adjustment of all grates, frames, lids and valves

Measurement for Payment

Measurement for payment shall be in linear metres.

Basis of Payment

Payment at the contract price, per unit, shall be full compensation for the supply of all labour, equipment, and materials to complete the construction of the concrete curb and gutter as shown on the plan or directed by the Contract Administrator.

Reference

- OPSS.PROV 355

General

The work involved in the item shall include the grading and placing of private driveways affected by construction. The work shall include but is not limited to the following:

1. Supply new paving stones ensuring that the same or the closest match of colour, style and size available is used in the restoration of said driveway/walkway.

2. Remove and stockpile precast concrete or wooden curbs neatly without damage away from the construction area.

3. Grade the granular subbase either by excavation or by minor surface regrading as required.

4. If Granular “A” base is required, it shall be paid under the Granular “A” Item.

5. Place paving stones to the new gradient approved by the Contract Administrator.

6. Replace the materials damaged by removal.

7. Saw cut paving stones as required to fit.

The Contractor shall include the placement of bedding sand to the specified thickness, compacting the stones to a uniform gradient and sweeping bedding sand to the stone joints.

Measurement for Payment

Area covered by paving stones shall be measured in square metres.

Basis of Payment

Payment at the contract price for the above tender item shall be full compensation for all labour and equipment to complete the work.

The Contractor shall monitor the roadway surface after the final application of the surface treatment. Once all of the loose surface rock has been dispersed to the shoulder, the Contractor shall regrade.

Measurement for Payment

The measurement for payment shall be lump sum.

TERRAFIX COMBIGRID

Contractor shall utilize Terrafix Combigrid 40/40 Q1 151 GRK 3, or City of Timmins approved equivalent, for all geotextile repair areas.

Basis of Payment

Payment to be included as part of the “Terrafix Combigrid” item, shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Reference

- OPSS.MUNI 180
- O.Reg. 153/04, 406/19
- SP RD-01

General

Hauling of Excess Soils shall adhere to O.Reg 406/19

Excess soils shall be hauled to a location supplied by the Contractor. The Contractor shall submit an excess soil reuse plan to the Contract Administrator two weeks prior to the pre-construction meeting.

Sections 8 to 16 of the O.Reg 406/19 are required before removing excess soil from a project area. Generally, the requirements include:

1. Preparation of an assessment of past uses
2. Preparation and implementation of a sampling and analysis plan; sampling shall conform to O.Reg 153/04 Record of Site Condition Table, 3, Table 8
3. Preparation of a soil characterization report
4. Preparation of an excess soil destination assessment report
5. Development and implementation of a tracking system

All laboratory results shall be provided to the Environmental Services department prior to the excess soils being removed from the site.

Excess soils must be reported to the RPRA registry in accordance with the regulation which includes but is not limited to properly recording for tracking purposes at the source site, during transportation and at the disposal site. A confirmation receipt of the excess soil at the destination site must be obtained by the hauler and provided to the City of Timmins. The City of Timmins Excess Soils tracking document may be made available upon request.

Measurement for Payment

Measurement for payment shall be included in the Earth Excavation and/or Minor Excavation item.

Basis of Payment

Payment at the contract price for this item shall be full compensation for all labour, equipment, and material required to complete the work.

General

All salvageable culverts removed shall be hauled away by the Contractor and stockpiled at either the Tisdale Public Work's Shop or the Timmins Public Work's Shop, whichever is the closest.

Where culverts are deemed unsalvageable by the Contractor, he shall contact the Contract Administrator to verify the condition prior to any material being disturbed. If any material is disturbed, the Contractor shall not be paid for the removal of the culvert. Culverts which are deemed salvageable and damaged by the Contractor shall be replaced at no charge to the Owner.

Measurement for Payment

The removal of culverts shall be measured, horizontally, in linear metres.

Basis of Payment

Payment at the contract price, per linear metre, shall be full compensation for the disposal of debris for salvage as directed by the Contract Administrator, for the removal and disposal of any appurtenances (i.e. concrete or wood end walls), for all earth excavation incidental, for the subsequent disposition of the excavation material, and for the backfilling of the resulting trenches, holes, and pits. Imported granular backfill shall be paid for in accordance with the specification for that particular material.

Reference

- OPSS.PROV 408

General

Excavate/Salvage

- Remove and place catchbasins, manhole structures, frames, and grates as shown on the Drawings or as instructed by the Contract Administrator
- Adjust structures to final grades with a minimum of one (1) adjustment unit
- Connect proposed piping to relocated structures

Measurement for Payment

Measurement shall be for each structure relocated.

Basis of Payment

Payment at the contract price shall be compensation in full for all labour, equipment, and material required to do the work.

Reference

- OPSS.MUNI 904

General

- Excavate for structure to the lines and grades shown

- Provide 150mm Granular "A" below base of structure

- Connect poured in place manhole around existing pipes and proposed pipes as indicated

- Backfill structure with compacted Granular "B" to a minimum of 300mm on vertical sides

- Supply and install frame and grate specified

- Supply and install manhole steps to OPSD 405.01 - solid rectangular aluminium

- Backfill all other areas with acceptable native materials compacted

- Concrete strength shall be 30 MPa

- Reinforcing bar steel strength shall be 300 MPa

Basis of Payment

Payment at the contract lump sum price for cast-in-place structure shall be compensation for all labour, equipment and materials required to do the work.

Reference

- OPSS.PROV 407 & 408

General

Frames and Covers

Manhole Frame and Covers

Manhole frame and grates shall be the “adjustable” by Mueller Canada, Model AJ633-SR or approved equivalent. The cover shall be as per OPSD 401.010 or latest version.

Minimum of 1 and maximum of 3 adjustment units shall be used.

Installation

Phase 1

Cover shall be set to 40mm below Granular “A” grade or to asphalt base course elevation where two (2) lifts of asphalt are prescribed.

Phase 2

Cover shall be set to finish asphalt grade.

Underside of frame shall be set to 350mm below finished asphalt grade (does not include allowance for adjustment units).

Catchbasin Frame and Covers

Catchbasin frame and covers shall be as per OPSD 400.020 or latest version.

Installation

Phase 1

Cover shall be set to 10mm below Granular “A” grade or to asphalt base course elevation where two (2) lifts of asphalt are prescribed.

Phase 2

Cover shall be set to finish asphalt grade.

Catch Basin /Manhole Frame and Covers

Where a catchbasin manhole is specified, the top shall be:

1. A herringbone open cover manhole frame and grate where placed with no curb and gutter

2. A catchbasin frame and grate when placed with curb and gutter

3. All covers shall indicate year of construction and sanitary or storm whichever is applicable

General

Payment for manholes shall not be made until each manhole has been parged.

All manholes including storm sewer and sanitary sewer manholes shall be benched.

All manholes, catchbasins, and ditch inlets shall be provided with frost straps except monolithic catchbasins.

All manholes, catchbasins and ditch inlets shall have *"Denso LT Petrolatum Tape", "Blueskin PreSeal"* or equivalent as approved by the contract administrator applied externally around the riser sections and grade adjustment units.

Frame and grate shall not be placed on any structure until Granular "A" is approved for final grade. A steel plate cover, with a minimum 13mm thickness, shall be placed to Granular "B" grade in place of the frame and grate.

All new catchbasins not connected to sub-drains shall have a 1.0m sub-drain on each side along the gutterline.

Measurement for Payment

Measurement shall be by the number of manholes, catchbasins or ditch inlets installed.

Refer to Section 407.09 of OPSS.PROV 407.

Basis of Payment

Payment at the contract unit prices per manhole, catchbasin or ditch inlet shall be full compensation for the supply of all labour, equipment and materials including frost straps; for all excavation; for all timbering and shoring; for the disposal of unacceptable and surplus material; for the supply, placing and compacting of granular backfill; for the supply and placement of the manhole, catchbasin and ditch inlet frames and covers; for any connections to the existing sewer system; for benching and/or constructing inverts and for all other items of work and material incidental to the satisfactory completion of the work.

Refer to Section 407.10 of OPSS.PROV 407.

Reference

- OPSS.MUNI 410

General

Materials

Storm Sewer Pipe up to 600mm Diameter

Ultra-Rib PVC pipe or equivalent PVC pipe to be approved by the Engineer.

The pipe shall be smooth wall and have a minimum stiffness of 320 kPa @ 5% deflection in accordance with ASTMD 2412 and conform to CSA B182.4

Single service laterals shall be 100mm diameter and have a maximum dimension ratio of 28 unless otherwise shown on the contract drawings. Pipe stiffness (F/AY) shall not be less than 690KPa at 5% deflection when tested in accordance with A.S.T.M. D2412. The pipe shall have a locked-in gasket and integral bell. The pipe is to be made available in 4 metre laying lengths and is to be painted green.

Storm Sewer Pipe Larger than 600mm up to 1050mm Diameter

PVC SDR 35 Ringtite or equivalent PVC pipe to be approved by the Engineer.

The pipe shall be smooth wall and shall conform to CSA B182.2 and have a minimum stiffness of 320 kPa @ 5% deflection.

Storm Sewer Pipe Larger than 1050 Diameter

Concrete pipe design and specifications shall conform to CSA A257 and to be approved by the Engineer or an equivalent PVC pipe approved by the Engineer.

Measurement for Payment

Payment for the 6m of 150mm diameter polyethylene Subdrain and geotextile wrap shall be included in the storm pipe item.

Salvage all materials for which this Special Provision is specified including catchbasin and manhole frames and grates for all structures removed.

Deliver all salvaged material to the Tisdale Public Works shop or the Timmins Public Work's Shop, whichever is closest.

Remove from site and dispose of all material which is deemed to be not salvageable by the Contract Administrator.

Reference

- OPSS.PROV 405

General

Subdrain inlets and outlets shall be taken to and connected to all new and existing storm structures which shall be *"all inclusive"* with the payment for this Item.

Subdrains shall be polyethylene pipe as per OPSS 405.05.03 complete with geotextile sock and clearstone as per Detail "A" – Standard Detail Drawing #261.

Measurement for Payment

The measurement for payment shall be in linear metres.

Basis of Payment

Payment at the contract price, per linear metre, for this item shall be full compensation for all labour, equipment, and material required to complete the work.

Reference

- OPSS.-MUNI 511

General

Broken concrete shall not be used as rip rap.

Geotextile shall be 270R or approved equivalent.

The Contractor shall screen all rip rap materials prior to use to eliminate all materials passing 100mm.

Measurement for Payment

Measurement for payment shall be in square meters of the finished surface of rip rap constructed as specified. No separate measurement shall be made for geotextile.

Basis of Payment

Payment at the contract price for rip rap with geotextile shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- OPSS.PROV 408
- Refer to Section 408.10 of OPSS.PROV 408.

General

The work to be carried out under this item shall include the resetting of any Corporation-owned manhole and/or catchbasin structure as directed by the Contract Administrator. The resetting shall be accomplished by removing and salvaging the existing frame and grate and replacing deficient or broken adjustment units. Use precast grade rings or approved manhole bricks or reinforced concrete suitable to carry AASHTO H20 live loads. Parge on the outside and not on the inside of the structure.

Measurement for Payment

Measurement shall be by the number of structures that have been reset.

Basis of Payment

Payment at the contract price per unit shall be full compensation for the supply of all labour, equipment, and materials to reset the catchbasins and/or manholes as directed by the Contract Administrator including any excavation required, the supply, placing and compaction of granular backfill, the removal and salvaging of the frame and grate, roughening of the upper surface of the existing concrete, removal and disposal of bituminous and concrete pavement, placing of concrete or bricks on structure, resetting and grouting the frame and grate, and for all other items of work and materials incidental to the satisfactory completion of this work.

Reference

- OPSS.PROV 410

General

Service Connections and Reconnections

For each existing service encountered during the construction of the proposed sanitary/storm main, a new service of a size and class specified shall be installed in its place to property line. At property line or the street side of property line, the Contractor shall connect the existing service to the new service by means of an approved City of Timmins adapter or a pipe repair clamp to ensure a proper leak-proof connection.

Sanitary/storm services shall be to a maximum depth based on the existing sanitary service at the property line. Furthermore, the service must be installed perpendicular to the main sanitary/storm sewer.

The Contractor shall not allow the interruption of any service to any building. The Contractor shall take care not to allow sewage to reverse flow or obstruct flow in any manner so as to cause flooding to any residence.

Pipe bedding shall be Granular A and cover material shall be bedding sand. Include payment for Bedding and Cover Material in the “Sanitary Sewer Connection and Reconnection” and “Storm Sewer Connection and Reconnection” Items.

New sanitary/storm services shall be left capped at property line.

Backfill

For the cost of backfilling with the native material, backfill shall be included in the pipe unit price.

Measurement for Payment

Shall be measured per unit connected or reconnected.

Basis of Payment

Payment at the contract unit price(s) for the items of work listed in the schedule of prices shall be full compensation for removing the existing service as well as supply of all material, labour, and equipment necessary to complete the work as shown on the contract drawings and as specified herein.

The Contractor is to reconnect to an existing storm or sanitary system using a proper rubber coupler, i.e. Fernco. The coupler is to be attached to the pipes with stainless steel clamps of the approved size.

Measurement for Payment

Measurement shall be for each connection.

Basis of Payment

Payment at the contract price for each connection shall be full compensation for the supply of all material, labour, and equipment to complete the work.

Reference

- OPSS.PROV 410

General

Materials

Sanitary Sewer up to 600mm Diameter

PVC pipe to be approved by the Engineer. PVC pipe must conform to A.S.T.M. Designation 12454-B (originally 1120). Unless specified, the maximum dimension ratio for pipe diameters 200mm to 600mm inclusive shall be 35, and pipe stiffness (F/AY) shall not be less than 320 kPa at 5% deflection when tested in accordance with A.S.T.M. D2412.

At a depth greater than 4 meters the maximum dimension ratio for pipe diameters 200mm to 600mm inclusive shall be 26. The pipe shall have locked-in gasket and integral bell joint features. The pipe is to be made available in 4 metre laying lengths. Sewer main pipe shall be colour coded green.

Single service laterals shall be 125mm diameter and have a maximum dimension ratio of 28 unless otherwise shown on the contract drawings. Pipe stiffness (F/AY) shall not be less than 690 kPa at 5% deflection when tested in accordance with A.S.T.M. D2412. The pipe shall have a locked-in gasket and integral bell. The pipe is to be made available in 4 metre laying lengths and is to be colour coded white.

All associated PVC fittings and accessories shall be as manufactured and furnished by the pipe supplier or approved equal and have bell and/or spigot configurations suitable for the pipe.

Sanitary Sewer Larger than 600mm Diameter

Reinforced concrete pipe or PVC pipe approved by the Engineer shall be used for sewers larger than 600mm diameter.

Concrete shall be manufactured in accordance with A.S.T.M. Designation C-76 for Classes III, IV and V. The pipe must be supplied only by manufacturers who have been pre-qualified by the Ministry of the Environment. The pipe must be jointed by flexible, watertight rubber gaskets as per A.S.T.M. Designation C-443. Suppliers shall submit evidence of Ministry of the Environment pipe-qualification before supplying any pipe to the job site. Quality control of the pipe material must be subject to the conditions as given in Section A-iii).

Measurement for Payment

The measurement for payment shall be in linear metres (per OPSS 410.09.01.01).

Basis of Payment

Payment at the unit price tendered shall be considered to be payment in full for the supply of all labour, equipment, and material required to install the sewer pipes to the grades.

Reference

- OPSS.MUNI 409 & 411

General

Requirements

The Contractor shall carry out two separate (2) camera inspections of entire sanitary sewer and storm sewer installation including catchbasin leads and provide a digital video copy and inspection report to the City for approval. One camera inspection shall be completed after the pipe has been installed and the second camera inspection shall be carried out 1 month prior to the end of warranty period. The first camera inspection shall be conducted one week, (7) days after full flow has been returned to the line. For each camera inspection the pipe shall be first videoed showing the actual flow conditions in the sewer main and then videoed again after the sewer main has been flushed and is running clean. The Contractor shall video 10m both upstream and downstream of the new sewers. If sand and other debris is found then the Contractor shall flush and re-video the line up to the end of the next manhole both upstream and downstream and verify the corrected deficiencies.

All detailed reports and videos shall be coded in accordance with Pipeline Assessment Certification Program (latest edition). ***All data shall conform to NASSCO data model and be submitted in a Microsoft Access Database and be compatible with CT Spec software.***

Basis of Payment

The second camera inspection shall be carried out 1 month prior to the end of warranty period. The amount of $1,000.00 will be held on the Letter of Credit until all camera work inspections are carried out and any deficiencies corrected by the Contractor.

The cost of camera inspections shall be included in the “Sanitary Sewer” and “Storm Sewer” items.

Reference

- OPSD.701.021

General

Break into Structure

The Contractor shall break into the existing structure, and break no greater than 50mm into the benching of this manhole if necessary. The Contractor shall break the minimum amount needed to accommodate the new pipes. ***The new pipes shall have "Denso LT Petrolatum Tape", "Blueskin PreSeal" or equivalent as approved by the Contract Administrator applied externally around the break into structure. Installation shall follow manufacturer's recommendations.*** High strength concrete (min. 35 MPa or greater than the concrete structure) shall be used to parge and re-bench where necessary to the satisfaction of the Contract Administrator.

Measurement for Payment

The cost of connecting the pipe to the structure shall be included in the "Break into Structure" item.

A break into structure shall be measured per break in.

The unit of measurement for a break into structure shall be each**.**

Basis of Payment

Payment at the contract price for each break into structure, including benching and connecting the pipe to the structure shall be full compensation for all labour, equipment, and material required to complete the work to the satisfaction of the Contract Administrator.

Reference

- OPSD 701.021

General

Break into Benching

The Contractor shall break into the existing structure greater than 50mm into the surface of the benching. The Contractor shall break the minimum amount needed to accommodate the new pipe. High strength concrete (min. 35 MPa or greater than the concrete structure) shall be used to parge and re-bench where necessary to the satisfaction of the Contract Administrator.

Measurement for Payment

The cost of connecting the pipe to the structure shall be included in the “Break into Benching” item.

A break into benching shall be measured per break in.

The unit of measurement for a break into benching shall be each**.**

Basis of Payment

Payment at the contract price for each break into benching, including benching and connecting the pipe to the structure, shall be full compensation for all labour, equipment, and material required to complete the work to the satisfaction of the Contract Administrator.

General

Where water services are in the same trench as sanitary services, the water service valves may have to be relocated to the property line. The service connected pipes shall be insulated with foam rap up to the property line.

Measurement for Payment

Service connections shall be measured per connection. The unit of measurement shall be each.

Basis of Payment

Payment at the contract unit price for each connection shall be full compensation for the supply of all labour, equipment, and material necessary to complete the work.

Reference

- OPSS.PROV 410

General

Service Reconnections

For each existing Storm service encountered during the construction of the proposed Storm main, the service of a same size and class specified, shall be reconnected in the trench to the new Storm system. The Contractor shall connect the existing service to the new service by means of an approved adapter or a pipe repair clamp to ensure a proper leak-proof connection. The connection to the Storm sewer main shall be with a Kor-N-Tee Assembly or approved equivalent (by the Engineer).

Storm services shall be to a maximum depth based on the existing storm service in the trench. Furthermore, the service must be installed perpendicular to the main storm sewer.

The cost of removing the existing storm in the trench is to be included in the Reconnection Item.

The Contractor shall not allow the interruption of any service to any building. The Contractor shall take care not to allow sewage to reverse flow or obstruct flow in any manner so as to cause flooding to any residence.

Include payment for Bedding and Cover Material in the “Sanitary Sewer Connection and Reconnection” Items.

Measurement for Payment

Shall be measured per unit reconnected.

Basis of Payment

Payment at the contract unit price(s) for the items of work listed in the schedule of prices shall be full compensation for the supply of all material, labour, and equipment necessary to complete the work as shown on the contract drawings and as specified herein.

Reference

- O.Reg 278/05 or latest version

General

Safety Precautions

No cutting or use of power tools shall be permitted.

All handling of Asbestos Cement Pipe must conform to O.REG 278/05 or latest version.

Preconditions

- All workers must be notified of the presence of asbestos pipe on site
- Contractor to make every attempt to leave main line in place and grout it
- ***NOTIFY DELORO LANDFILL OF ASBESTOS DELIVERY, CONTRACTOR SHALL PAY ALL TIPPING FEES***

Measurement for Payment

Measurement for payment shall be paid per linear metre of pipe disposed off site (includes services and main).

Basis of Payment

Payment at the contract price shall be full compensation for all labour, equipment, disposal and handling of materials required to complete the work.

Reference

- OPSS.PROV 180, 206, & 314
- OPSS.MUNI 102, 351
- SP RD-01, RD-37

General

The work under this item shall include the following, but not necessarily limited to:

- All excavation, dewatering, bracing, supply and placement of indicated bedding material

- Supply and placement of storm sewer pipe of the size and type indicated

- Supply and installation of all necessary fittings required

- Supply placement and compaction of required cover material

- Backfilling of trench with compacted Granular "B" – Type I material as indicated on drawings

Trench widths shall be maintained as narrow a possible without compromising safety. Wider excavations cannot be made without prior approval of the Engineer. Pavement removal must be saw-cut in neat straight lines. Pavement must be saw-cut in long straight lines (min. 30 metres) to the approval of the Engineer. A "saw-toothed" edge of pavement will not be acceptable.

Gravel areas affected by construction shall be restored to match existing.

Measurement of Payment

The measurement for payment shall be in lineal metres measured along the profile of storm sewer installed.

Basis of Payment

Payment at the unit price tendered shall be considered to be payment in full for the supply of all labour, equipment, and material required to install the storm sewer as indicated.

General

The determination for the requirement of temporary pumping or by-pass pumping shall be the responsibility of the contractor.

The temporary pumping which occurs unsupervised or overnight shall be considered “By-Pass Pumping”.

The Contractor shall allow for a pumping capacity equivalent to the maximum capacity of the pipe being by-passed; c/w a stand-by pump with the equivalent capacity or more and shall be automated to activate in the event of failure of the main pump.

The Contractor shall submit a detailed by-pass pumping plan for approval by the Manager of Engineering, two (2) weeks prior to start of any pumping. If by-pass pumping is required, the Contractor shall engage the services of a qualified professional engineer and provide a detailed by-pass pumping procedure.

Basis of Payment

Payment for this item shall be included in the unit price of the sanitary sewer pipe.

Reference

- OPSS.MUNI 407

General

The Contractor shall fill and parge holes in structures as directed by the Contract Administrator. A layer of Mortar as per OPSS 407.05.06 shall be placed between the structure wall and all bricks used to fill the hole. After the hole is completely filled, a layer of Mortar shall be used to parge the interior and the exterior flush to the walls of the structure to the satisfaction of the Contract Administrator.

Measurement for Payment

Payment for this item shall be by the number of holes parged.

Basis of Payment

All holes smaller than 150mm shall be deemed the responsibility of the Contractor. All holes bigger than 450mm shall be paid on a Time and Material basis. Payment at the contract price for each hole parged shall be compensation in full for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Reference

- OPSS.PROV 408

General

STRUCTURE ADJUSTMENT

Structure adjustment shall be considered any scope of work that ranges from finished grade to 300 mm below. For all structural work, materials must be City of Timmins approved and follow manufacturer's recommendations. **Also included in the unit price bid shall be the installation of *"Denso LT Petrolatum Tape", "Blueskin PreSeal"* or equivalent as approved by the contract administrator on the exterior of the grade adjustment units.**

Measurement for Payment

Measurement shall be by the number of structures that have been adjusted.

Basis of Payment

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment and material required to do the work. Payment price shall also include installation cost of new or existing frame and grate or manhole frame and lid.

Cost for the supply of new catchbasin frame and grate/manhole frame and lid, curb removal, curb installation, asphalt removal, asphalt paving to be under separate contract items.

STRUCTURE REPAIR

Refer to specifications OPSS.PROV 408

Structure repair shall be considered any scope of work that is below 300mm from finished grade. When rebuilding brick structures, contractor is to verify in the field along with the City Field Inspector the depth of the rebuild. For all structural work, materials must be City of Timmins approved and follow manufacturer's recommendations. Also included in the unit price bid will be any parging required.

Measurement for Payment

Measurement for payment shall be in vertical meters and taken from the bottom of rebuild portion to 300 mm below finish grade. The top 300 mm portion will be paid under "Structure Adjustment" item.

Basis of Payment

Payment at the Contract price for this item shall be full compensation for all labour, equipment, and material to do the work.

STRUCTURE PARGING

Refer to specifications OPSS.PROV 408

The structure parging item shall be used when the only work to the structure involves parging. Parging shall be considered the concrete parging of the entire internal manhole and/or catchbasin structure using materials approved by the City of Timmins and following manufacturer's recommendations.

Measurement for Payment

Measurement shall be by the number of structures that have been parged.

Basis of Payment

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment and material required to do the work.

SUPPLY OF CATCHBASIN FRAME AND GRATES, MANHOLE LIDS AND FRAME, AND MANHOLE ADJUSTABLE LIDS

Refer to specifications OPSS.PROV 408

Contractor shall provide material costs for catchbasin frame and grate, manhole frame and lid, and adjustable manhole riser with lid. Installation costs to be paid under "Structure Adjustment" item. Materials provided to meet OPSS.PROV 408.

Measurement for Payment

Measurement shall be by the number of structures that have been supplied.

Basis of Payment

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment and material required to do the work.

Reference

- OPSS.MUNI 517 & 1840

General

The work under this item shall include the following, but not necessarily limited to:

- All inspection, excavation, dewatering, cleaning and reparation of the host pipe prior to insertion
- Supply and insertion of pipe liners of the size and type indicated into the existing length of existing culverts of various diameters
- Supply and placement of grout in the annulus between the liner pipe and the host culvert
- Clean-up and restoration of the project area to like or better conditions

Measurement of Payment

The measurement for payment shall be in lineal metres by Plan Quantity and may be revised by Adjusted Plan Quantity of the horizontal length in metres from the ends of the pipe or pipe section.

Basis of Payment

Payment at the unit price tendered shall be considered to be payment in full for the supply of all labour, equipment, and material required to install the pipe liner as indicated.

Reference

- OPSS.PROV 407 & 410

General

Two weeks prior to the start of construction, the Contractor shall submit a detailed test procedure to the Contract Administrator.

All infiltration/exfiltration shall be conducted in the presence of the Contract Administrator.

City of Timmins Sanitary Sewer Infiltration Test Form shall be completed to document testing.

All sanitary sewer maintenance holes and storm sewer maintenance holes shall be tested for leakage. Leakage shall not exceed a rate of 3 litres per hour per metre of head above the lowest pipe invert in the maintenance hole.

Measurement of Payment

The measurement for payment shall be included in the cost of sewer main or sewer appurtenance.

Basis of Payment

Payment at the unit price tendered shall be considered to be payment in full for the supply of all labour, equipment, and material required to complete the work.

Reference

- OPSS.PROV 441
- All materials and procedures must conform to the latest edition of the referenced standards.

General

MATERIALS

Pipe

PVC pipe shall be as follows:

a) designed to accommodate the operating pressure plus surge pressure

b) certified by the CSA to CSA B137.3

c) manufactured by Ipex, Royal Pipe Co. or another approved equivalent by the City of Timmins

d) the pipe shall be DR 18

e) each end of pipe length shall be factory sealed

Gaskets and Joints

Gaskets shall be made of SBR. Gaskets shall be removable from the pipe gasket face in order to aid cleaning the bell and spigot prior to assembly.

Measurement of Payment

The measurement for payment of PVC pressure pipe shall be in linear metres measured along the profile of pipe installed.

Basis of Payment

Payment at the unit price tendered shall be considered to be payment in full for the supply of all labour, equipment, and material required to install the pressure pipe watermain as indicated.

Fittings and Specials

These shall be of cast iron or ductile iron (cement lined) with mechanical joints and be suitable for a pressure rating of 1035 KPa. The fittings shall conform to CSA or B131.10, ASA A21.10 (AWWA C110) Specifications.

The mechanical joint shall be manufactured in accordance with CSA B131.0, ASA A22.11 (AWWA, CIII).

Note: All valves, hydrants, boots and fittings such as tees, crosses, bends, etc. shall be mechanical joint to allow the installation of the tie bolts and rods where required.

Gate Valves and Valve Boxes

Gate valves shall conform to AWWA Specification C500 or to resilient seat gate valve C507. The valves shall be solid wedge with non-rising stems and shall turn counter-clockwise to open.

Valves shall be either No. 55 as manufactured by Canada Valve and Hydrant Company Limited, with non-rising spindle or Mueller gate valve Designation A-2380-21. Valve boxes shall be MVB polymer bottom section complete with cast iron lid and 300mm ductile iron adjustable **non-tapered top,** suitable for a trench depth of 2.4m as manufactured by Mueller or approved equivalent. Jenkins valves in sizes 100mm to 300mm are also acceptable. AVK valves are also approved and may be used. Testing of conductivity shall be conducted for entire length of watermain.

Hydrants

Hydrants shall be Darling Century as manufactured by the Canada Valve and Hydrant Company Limited or McAvity Hydrants as manufactured by Crane, and must conform to AWWA Specification C502. (or most recent AWWA specification)

The hydrants shall have a compression shut-off, two-piece barrel with flange at ground line, 115mm main gate valve, two 63mm diameter hose nozzles plus one 115mm diameter steamer as per CSA 889.2, 150mm inlet connection with mechanical joints, 32mm drains are to be plugged unless otherwise specified.

Frost uplift protection is to be provided by wrapping the hydrant barrel with either 8 mil thick or greater polyethylene sheeting or 55 lb. roofing paper.

Valve Appurtenances

All surfaces that are in contact with water shall be disinfected. All fittings on the service line shall be properly disinfected with a 1-5% chlorine solution. This includes curb stop and corporation (main) stop valves and the copper service line.

Curb Valve Boxes (19mm and 25mm Diameter)

For services up to and including 25 mm dia., the valve boxes shall be either Cambridge Brass Series 161, size 12 with Series 163 ribbed cover, or Mueller Designation A-726 with A-800 ribbed cover.
All curb valve boxes shall be complete with stationary stainless-steel rod of a length to suit the application.

Curb Valve Boxes (38mm and 50mm Diameter)

For service lines 38mm and 50mm diameter, the valve boxes shall be either Cambridge Brass Series 161-1, size 12 with Series 163 ribbed cover, or Mueller Designation A-753 with A-806 flat cover.

Single Curb Stops

Single curb stops shall be either Cambridge Brass Series 128 or Mueller Designation A-616.

Double Curb Stops

Double curb stops shall be either Cambridge Brass Series 173 or Mueller Designation A-650.

Corporation Mains Stops

Corporation main stops shall be either Cambridge Brass Series 102 or Mueller Designation A-220.

Service Lines

Service connections shall be 19mm diameter minimum copper pipe unless otherwise designated and shall be type “K” (soft) copper.

Service Insulation

Tundra Plus or Tundra Seal Plus foam wrap 3/4” pipe insulation shall be used.

Bleeders

Bleeders must be equipped with a copper fitting at the outlet end for bacteriological testing.

Reference

- OPSS. MUNI 441
- SP WAT-11
- All materials and procedures must conform to the latest edition of the referenced standards

General

The work under this item shall include the following, but not necessarily limited to:

- all excavation, dewatering, bracing, supply and placement of indicated bedding material
- supply and placement of watermain pipe of the size and type indicated
- supply and installation of all necessary fittings required to match bends and change of directions as per the contract documents. All fittings shall be installed as per manufacture specifications.
- supply and install, with each valve, a geotextile collar (1m x 1m), to be placed above body of valve, below guide plate. After installation of geotextile, re-install guide plate and valve box. Secure geotextile around body of valve prior to backfilling.
- adjust all existing main and service waterline valve boxes to grade. Where a new valve box is required to adjust an existing valve to finished grade, obtain this material from the City of Timmins Environmental Services Department and install the material.
- supply and install the tracer wire throughout the length of the watermain and connect it as shown in SD 401-R6.
- continuity test shall be performed to ensure proper installation
- supply and installation of required concrete thrust blocks to size and shape indicated, in conjunction with mechanical joint restraints
- supply placement and compaction of required cover material
- backfilling of trench with compacted selected native materials as indicated on drawings
- Backfill included to top of Granular B or Existing Ground (As indicated on the Contract Drawings) prior to completing the Hydrostatic Testing.

Installation

Bedding

Bedding material to support the pipe shall be Granular “A”. It shall extend to the spring line of the pipe.

Restrained Joints and Thrust Blocking

Mechanical joint restraints shall be Sigma (PV Lok), Romac Grip Ring & Star 3500 Series and shall conform to ASTM F1674-96 and manufacturer’s specification. Restraining collars shall be attached to the fitting bell behind the gasket face. Tie rods shall run from the collar behind the bell to a suitable collar on the connecting pipe.

Concrete thrust blocks shall conform to OPSS MUNI 1350 with compressive strength of 20 MPa. Thrust blocks shall be constructed as per OPSD 1103.010 and OPSD 1103.020.

PVC Pressure Pipe

The construction and installation of PVC pressure pipe and fittings shall be completed in accordance with CSA B137.3. Recommended practice for installation of PVC pressure pipe and fittings.

Bleeders

Any bleeder lines needed to take water samples of the main, to prevent stagnant water or used for any other purpose, shall be removed to the main cock.

Sanitary Work Practices

The Contractor shall see to it that any materials that will be used for conveying drinking water are handled as per AWWA Standard C651 Disinfecting Watermains for complete instructions on how to handle and store pipe used for drinking water.

Dirt Entering the Pipe

Keep pipes clean and dry. Take precautions to protect the interiors of pipes, fittings, and valves against contamination. Cap all openings with watertight plugs/seals. Remove plugs only when making connections. As per AWWA C651, any dirt entering the pipe during construction shall be promptly removed and the pipe wiped with a 1-5% chlorine solution.

End of Day Housekeeping

As per AWWA C651, the new watermain shall be capped with a mechanical water-tight seal as per manufacturer's recommendation.

Disinfection

The work under this item shall require that the Contractor not connect to the existing system until the new system has been pressure tested successfully and disinfected as per the most recent revision of MECP's Watermain Disinfection Procedure and AWWA C651 and that they have received acceptable water bacteriological results. The final connection can only be made once written approval has been granted by the City's Overall Responsible Operator (ORO). The Contractor shall also either provide their own water to the newly constructed main or from the existing main by tapping each line and using a double backflow preventer when filling the newly constructed main from the existing main. Note that water supply from hydrants will require additional testing by Environmental Services to meet C651 Standards. An alternate hydrant location may be required to supply water.

Service Lines

Immediately prior to installation, the disinfection of the tapped watermain must be completed as per section 1.5 of MECP's Watermain Disinfection Procedure. The City of Timmins requires a contact time of at least 15 minutes.

Watermain

Refer to SP WAT-11.

Measurement of Payment

The measurement for payment shall be in lineal metres measured along the profile of watermain installed.

Basis of Payment

Payment at the unit price tendered shall be considered to be payment in full for the supply of all labour, equipment, and material required to install the watermain as indicated.

Payment at the unit price tendered shall be considered to be compensation in full for all required restoration.

Tests

The Contractor shall coordinate with the City of Timmins Public Works staff to carry out a minimum of 400 ampere thawing test using the City of Timmins DBH thawing machine.

Sections shall be tested as follows:

- 100% of water services shall be tested
- each service tested shall conduct a minimum of 400 amperes of current
- each service tested shall be identified on a log showing date tested and results of the test
- each test shall be certified from the City of Timmins staff and an original copy of this certification and log provided to the Engineering Department.

In sections where, Ductile Iron pipe is repaired with a PVC pipe a thaw cable shall be Cad Welded to ensure conductivity for water service thawing.

Cad weld area shall be encompassed with Corrosion Protection.

General

The watermain diversion, if required, shall be done as shown on the Drawings.

Measurement for Payment

This item shall be measured for each watermain diversion.

Basis of Payment

Payment for each watermain diversion shall be considered to be payment in full for the supply of all labour, equipment, and material required to complete the work to the satisfaction of the Contract Administrator.

Reference

- OPSS.PROV 441
- City Standard Detail Drawing #420

General

Hydrants shall be Darling Century as manufactured by the Canada Valve and Hydrant Company Limited or McAvity Hydrants as manufactured by Crane, and must conform to AWWA Specification C502.

Hydrant length shall be determined by the Contractor and the flange elevation shall match the elevation detail on the contract drawings.

Measurement of Payment

Hydrants shall be measured per unit installed and shall include the hydrant, valve, valve box, tee, and length of pipe required to make the lateral connection to the main.

Basis of Payment

Payment at the contract unit price(s) for the items of work listed in the Schedule of Prices shall be full compensation for the supply of all materials, labour, and equipment necessary to complete the work as shown on the contract drawings and as specified herein, including pressure testing, disinfection, and flushing of the lateral and the appropriate length of watermain.

Removal of Hydrant

Fire hydrant removal shall include removal of existing hydrant, lead, and valve.

On watermains not abandoned, cap existing tee and place thrust block.

Fire hydrants that are not salvageable shall be disposed of by the Contractor and to a site approved by the Contract Administrator.

All fire hydrants and valves that are removed shall be taken to the City of Timmins Public Work's yard or to the City of Timmins' South Porcupine Public Work's yard, whichever is closest.

Measurement for Payment

Measurement shall be for each fire hydrant removed or each fire hydrant removed and salvaged.

Basis of Payment

Payment at the contract price shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- OPSS.MUNI 441

General

- Remove existing fire hydrant including the valve and valve box up to the tee at the watermain

- Cap existing tee at the main and pour thrust blocks

- Place salvaged hydrant, valve, and valve box at the location indicated on the drawing

- Provide all necessary pipes, fittings, tees, thrust blocks and hydrant extensions required to connect the salvaged hydrant, valve and valve box at the location indicated on the drawings

- Backfill all excavations with compact native material unless otherwise specified

Basis of Payment

Payment at the contract unit price for the Item “Fire Hydrant Relocation” shall be compensation in full for all labour, equipment, and materials necessary to complete the work as shown on the contract drawings and specified herein, including pressure testing, disinfection, and flushing of the lateral and the appropriate length of watermain.

Reference

- OPSS.MUNI 441

General

Service Connection

A service connection shall include all work and materials necessary to install a new continuous water service including; valves, valve boxes, and service connection pipe from the water main to the property line. The service connection pipe shall be insulated with foam wrap.

The Contractor shall locate any existing services for future connection to the new water service.

Pipe bedding and cover material shall be bedding sand.

Service Reconnection

A service reconnection shall include all work and materials necessary to install a new continuous water service including; valves, valve boxes, and service connection pipe from the water main to the existing pipe at the property line. The service reconnection pipe shall be insulated with foam wrap.

The Contractor shall connect the new water service to the existing pipe at property line by means of an approved mechanical connector to ensure a proper leak-proof connection.

The Contractor shall disconnect the old service connection from the water main and remove from excavation.

Pipe bedding and cover material shall be bedding sand.

Safety Precautions

Under certain fault conditions, metal water pipes may provide the return electrical path instead of a neutral conductor. When working on metal water pipe under these conditions there is a risk of electrical shock, serious or even fatal injury. Before repairing or replacing metal water services, workers should plan and use a safe system of work to prevent or minimize the risk of electrical shock.

Notify the Contract Administrator and the home owner immediately upon discovering these conditions.

Measurement for Payment

The cost of bedding and cover material, native backfill material, as well as the disconnection and removal of existing water service connection shall be included in the "Water Service Connection and Reconnection" item.

A service connection and reconnection shall be measured per connection.

The unit of measurement for a service connection and reconnection shall be each.

Basis of Payment

Payment at the contract unit price for the items of work listed in the "Schedule of Prices" shall be full compensation for the supply of all material, labour, equipment, and testing to complete the work. It shall also include the location of the existing services.

General

The Contractor shall plug the abandoned watermain/sewer pipes by grouting at the ends of the pipe.

Measurement for Payment

Measurement for payment will be made for each abandoned watermain.

Basis of Payment

Payment for each abandoned watermain shall be payment in full for the supply of all labour, equipment, and material required to complete the work.

References

- OPSS MUNI 441
- AWWA C651[1]
- MECP Watermain Disinfection Procedure[2]

Scope of Work

This procedure covers the disinfection of watermain systems. including new mains, cleaned mains, cleaned and relined mains, repaired mains, temporary mains and mains that have been out of service for a significant period of time. The MECP Watermain Disinfection Procedure shall supersede any/all procedures mention in this document.

Disinfection Procedure

Two weeks prior to the start of construction, the Contractor shall submit a detailed disinfection procedure, sealed by a qualified Professional Engineer licensed in the Province of Ontario with demonstrated experience of a minimum of 5 yrs., for approval that meets the requirements outlined below. (These requirements can be found in greater detail in the Ministry of the Environment, Conservation and Parks (MECP) Watermain Disinfection Procedure and the AWWA Standard C651, which are the regulated standard for disinfecting watermains in Ontario.) **Note that hydrant locations will require additional testing by Environmental Services to meet C651 Standards and the Watermain Disinfection Procedure. An alternate hydrant location may be required to supply water.**

A physical separation (Air Gap) between active watermain and new watermains shall be maintained throughout the duration of the project. The final connection can only be made once written approval has been granted by the City's Overall Responsible Operator (ORO).

Water supplied to the new main shall be through a double check valve. Flushing and disinfecting operations shall be conducted under the supervision of the Contract Administrator.

The watermain shall be flushed to achieve a minimum velocity of 0.91 m/sec. in the main (if this method is used calculations shall be supplied with disinfection procedure); otherwise the watermain shall be swabbed. The Contract Administrator shall be notified

[1] AWWA Standard C651 is an Official Provincial document adopted by reference in Ontario Regulation 170/03 or latest version and as such shall be followed. Any failure to follow this document can result in criminal charges levied by the Ministry of the Environment, Conservation and Parks.

[2] MECP Watermain Disinfection Procedure is an Official Provincial document in Ontario Regulation 170/03 or latest version and as such shall be followed. Any failure to follow this document can result in criminal charges levied by the Ministry of the Environment, Conservation and Parks.

at least 2 Business Days in advance of the proposed date on which flushing and disinfecting operations are to commence.

Watermains shall be flushed in a sequence approved by the Contract Administrator. The Engineer and/or Contract Administrator may permit or require the flushing to be carried out in stages as sections of the system are completed. Flushed sections shall be protected from contamination.

Liquid chlorine solution and water shall be introduced so that the chlorine is distributed homogenously throughout the section being disinfected. Disinfection chemical must meet the requirements of both the AWWA and NSF/ANSI/CAN 60 Standards. The disinfection procedure shall be by the continuous feed method as per the procedures in ANSI/AWWA Standard C651, the minimum contact times, initial chlorine concentrations, and maximum allowable decreases in chlorine concentration as listed in Table 1 of the MECP Watermain Disinfection Procedure shall be used. If the tests do not meet the requirements or if chlorine concentration varies, the chlorination procedure shall be repeated until satisfactory results are obtained as per the City's ORO.

The Contractor under the supervision of the Contract Administrator shall carry out all microbiological sampling. The Contract Administrator will measure the chlorine residual. One set of samples shall be collected each day for two (2) consecutive days, the first of which shall be collected **Monday to Thursday only, between 8:00 a.m. to 4:00 p.m**.

The **Contractor shall be responsible for all additional costs associated with sampling on all other days**. A sample set consists of one sample collected from every 350 m of the new watermain plus one sample from the beginning and one from the end of the main and one sample from the end of each branch main. If there is indication of contamination in the second or any subsequent sets of samples, the disinfection procedure shall be repeated until satisfactory bacteriological results and chlorine residuals of minimum 0.2 mg/L are achieved for two consecutive days.

Bacteriological samples shall not be sent to a testing laboratory unless chlorine residuals are above 0.2 mg/L.

The system shall not be put into operation until the Contract Administrator has given clearance. At no time shall the contractor operate valves on the distribution system. This function shall be carried out by the City of Timmins Environmental Services Department only. In the submitted disinfection procedure, the Contractor shall identify on a site map, the water sampling points for the disinfection. All sampling points shall be individually named. In the field, each sampling pipe shall have its own unique, non-removable identifier that shall correspond with the name given to it on the water sampling map required.

Invoicing

The City of Timmins will assume the cost of testing the first set of samples only.

Temporary Watermain Installation

Temporary water supply for all residents and commercial buildings shall be provided by means of PVC or High-density Polyethylene (HDPE) pipes for both the main and the services. The Contractor shall only use new piping and materials or piping and materials that have only contained or conveyed potable water. (Garden hoses shall not be used under any circumstances.) Unless otherwise specified on the drawings, the Contractor shall supply services of equal size or larger.

The connection at the house shall be by means of a brass or metal "Y" to allow the resident continued use of his/her exterior hose bib. The temporary service line shall have its own valve and the service line and valve shall be tied and suspended from the hose bib in order to prevent them resting on the ground or on any other potential source of contamination. A plastic bag secured in place over the valve shall provide additional protection. The Contractor shall take additional precautions in order to prevent anyone from using the unapproved service lines. (This may be done by removing the valve key on the service line or locking it out in some way.)

The connection at the fire hydrant shall include a double check valve assembly (backflow protection), a control valve, and a chlorine injection point. The main shall have a sampling point at the beginning, at each end, and after a maximum interval of at most 350 m.

Once the main is loaded with the minimum initial chlorine concentration of 50 mg/L, each of the service lines shall be flushed so as to introduce the chlorinated water into each of these as well. It will not be necessary to verify the chlorine residual level of these after the 24-hour holding period.

After having received the second set of successful bacteriological results and the Contract Administrator has given clearance, the Contractor shall notify all residents that they will now receive water supplied by the temporary line and make the house connections. Before connecting to the hose bib, the contractor shall also disinfect (allow a 1-5% chlorine solution a contact time of at least 15 minutes) the inside walls of the exterior hose bib.

Watermain Breaks and Repairs as a Result of the Work

The Contractor shall be responsible for the costs and repairs of all watermain breaks caused or occurring as a result of the Work. No extra costs of any kind will be allowed by the City nor will any claims be considered for such repairs by the Contractor. In the event of any watermain break the Contractor shall forthwith:

a) Notify the City of the watermain break;

b) Coordinate with the Environmental Services Distribution Collection ORO or designate to isolate the watermain break, and perform related certified functions for quality control and reinstatement of the watermain back to service;

c) Cooperate with the City for the notification of affected persons or; business; and

d) Repair the watermain with its own forces or through sub-contractors provided that all work is performed by persons qualified and experienced in performing work on watermains all of which shall be in accordance with City specifications and industry standards for watermains. To be approved by the Environmental Services Distribution Collection ORO or designate at the time that they are notified of the damage.

The Contractor shall, in all cases, provide the City with the opportunity to inspect the watermain break repair.

Where, in the City's opinion, the Contractor is not proceeding expeditiously with any aspect related to a watermain break, the City may, at its sole discretion, upon notice to the Contractor, take any required steps and perform the repairs with its own forces or its chosen contractor for watermain repairs. Any and all costs, damages or losses incurred or suffered by the City will be charged to the Contractor and deducted from any monies owed to it by the City.

Reference

- Petrolatum Products Specification Guide (www.densona.com)

General

- This Specification shall be used for the installation of Corrosion Protection - Denso taping and the installation of anodes.

- The priming, caulking and wrapping with Denso petrolatum products on any of the following surfaces:
    - Valve and valve assembly, the complete hydrant assembly up to surface level, including all valves and fittings, all mechanical ductile iron fittings such as Tees, elbows, crosses, restraining assemblies, couplers, (nuts, bolts, flanges etc.) also all service and bleeders' saddles.

- Contractor shall comply with all written recommendations of the manufacturer regarding applications of the specified system.

Denso

Materials for Denso Taping

Denso Primer

The Primer is an integral component for the preparation of metal surfaces prior to wrapping.

Denso Mastics

Denso mastics shall be cold applied self-supporting Mastics for moulding around irregular shaped surfaces i.e. valves, saddles, flanges and fittings to provide a suitable profile for applying anti-corrosion tapes.

Denso Petrolatum Tapes

Petroleum Tapes shall be non-hardening and non-cracking. The tape shall be highly resistant to mineral acids and alkalis.

*****Requirements for General Surface Preparation and the Application of the Denso Tape, the Application of Denso Mastics refer to the

PETROLATUM PRODUCTS SPECIFICATION GUIDE AT www.densona.com

Denso North America Inc.
Toronto On
Tel: 416-291-3435

Anodes

Materials for Anodes

Anodes – Duratron DZP-24-48, or approved equal

Service Clamp – ¾" Hydro ground clamp

Construction

The Contractor shall thermite weld the anode to any exposed Ductile Iron Watermain Pipe, and attach the anode by means of a service clamp to copper service lines.

After installation, and prior to backfill, each anode shall be soaked in water until saturated. The connecting wires shall not lift anodes. Connecting wires shall be tied round the main and sufficient slack shall be left to prevent stress during backfilling.

After cooling, the completed weld shall be checked to ensure that a secure connection has been achieved. Each weld and service clamp shall be sealed with T.C. mastic tapecoat.

Basis of Payment

Denso

Payment at the unit price tendered for all valves, hydrants, fittings, services, and bleeders etc. shall include all the materials and labour of the Denso application.

Denso application for tees, elbows and crosses shall be paid under the unit price tendered for under watermain and shall include all materials and labour to complete the application.

Anodes

The total cost of installing anodes on Services shall be included in the price tendered for the Water Service Connection or Reconnection. The total cost of installing anodes on Existing Ductile Iron Watermain shall be included in the price tendered for the watermain installation.

Measurement of Payment

Anodes installed on existing ductile iron watermains shall be paid per unit installed under the tendered Anode Item.

Reference

- OPSS MUNI 411

General

The City of Timmins will provide a water source from a Hydrant fitted with a backflow preventer at 912 Pine St. South in Timmins.

An alternate source of water will be provided at 6075 King St. in Porcupine.

If a closer water source is desired, one may be made available upon approval from the Contract Administrator. The contractor shall provide an approved certified backflow preventer and a heated, lockable hut for the hydrant if ambient temperature is lower than acceptable.

The contractor shall provide proof of certification if a backflow preventer is required to be installed on a hydrant. The contractor is also responsible for heating and locking the hut.

Prior to the commencement of work, arrangements shall be made for a site meeting to review the filling locations with authorized personnel.

Management of Excess Material

Liquid can be decanted into a Sanitary Manhole as designated by the Contract Administrator.

Material can be dumped at the City of Timmins Deloro Landfill at 2180 Pine St. South. Landfill hours and any applicable tipping fees shall be coordinated through the City of Timmins Sanitation Department and shall be included as part of the item.

Prior to dumping waste material an account shall be set up through accounting@timmins.ca.

Basis of Payment

Payment at the contract price for Sewer Line Cleaning shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Measurement of Sewer Line Cleaning shall be by the hour, satisfactorily inspected and reported.

Reference

- OPSS MUNI 409 & 411

Scope of Work

This special provision covers the requirement for the closed-circuit television camera inspection of sewer mains, all being of a minimum nominal pipe size of 100mm in diameter or larger.

This special provision shall include all items that require CCTV inspections.

General

The accuracy and quality of these digital image recordings and reports are of paramount importance. The City's corrective actions are based solely on the information provided and for this reason, they must be correct and complete. The contractor shall supply a digital report saved on a portable hard drive with digital closed-circuit televisions camera inspection work as per the specification OPSS MUNI 409 and this special provision.

The contractor shall have an online database, such as Google Drive or equivalent, accessible to the contract administrator. This database shall include all pipes mentioned in the contract with details mentioned below in "Deliverable section 3". All progress and quantities matching contract items shall be tracked online and up to date within 48 hours of the work performed.

Coding Accuracy

Prior to commencement of the CCTV inspection, a formal coding accuracy verification system, based on accuracy as a function of the number of defects or construction features not recorded and the correctness of the coding and classification recorded, shall be developed, submitted to the Contract Administrator, and implemented when approved. Verification of coding accuracy shall be completed on a random basis on a minimum of 10% of the inspection reports or one per video, whichever is greater. A minimum of two accuracy verifications shall be done for each operator for each week working. Inspections not satisfying the accuracy requirements shall be re-coded to meet the accuracy requirements and the accuracy of the inspections, immediately preceding and following the non-compliant inspection, shall be verified. This process shall be repeated until the preceding and subsequent inspections meet the accuracy requirements. Coding accuracy checks shall be submitted to the Contract Administrator along with the corresponding video recording.

Requirements

1) Prior to the video camera inspection work, the sewer main, shall be cleaned and flushed immediately prior to CCTV inspection as per OPSS MUNI 411.

2) Flow control measures shall be implemented to ensure a **minimum of 80%** of the height of the pipeline is visible. Should a by-pass pumping system be required, it shall be the responsibility of the Contractor. A plan shall be submitted to the city 48 hours in advance for approval. All necessary work shall be included in the item price. As per SP SEW-22.

3) The camera lens shall be positioned centrally (at spring line) within the pipeline. Modifications may be required to achieve this in larger diameter pipes.

4) Additional lighting may be required for larger diameter pipe to achieve optimum results.

5) Complete camera inspection as per OPSS MUNI 409 (latest version).

6) Contractor must account for all building/residence laterals located within the identified project area.

7) Video images shall only be accepted if they are clear in order to properly see 80% of the pipe circumference.

8) Provide an executive summary of major issues requiring immediate attention at the time of discovery.

9) If there are any elbows, “Y”, “Tees”, or dead ends discovered, the contractor shall be responsible to locate them on surface and record the location with GPS coordinates.

Deliverables

The City intends to import the information produced through the inspections into an asset information repository that will be utilized by staff for reference as well as city-wide system level asset management analysis. The following identifies requirements necessary to facilitate the information for this purpose:

1) Inspection data provided in electronic format as detailed in a report with the following format:

(MH FROM) – (MH TO) (STREET NAM) (STAGE OF VIDEO)

Example: ***1550-691 Maple Street North V2***

2) One Portable USB drive containing video inspection files and reports after all work has been completed.

3) Reports including:

   a) Microsoft Excel spreadsheet including the following information:

      i. Street Name
      ii. Maintenance hole from (upstream)

iii. Maintenance hole to (downstream)
iv. Length in Meters
v. Pipe size (Inside Diameter)
vi. Type of Material
vii. Number of Laterals
viii. Condition Rating
ix. Additional Information: Rim to invert (outgoing) measurements to the nearest centimeter. As well as the number of pipes within the manhole.

b) Detail Pipe Inspection report separated by pipe segment (structure to structure).

4) Structure locations shall be complete with a GPS co-ordinate. GPS shall be within 150mm accuracy, follow the U.T.M. Zone 17 co-ordinate system with the NAD 83 geodetic system. A point file is required to upload the survey information into AutoCAD Civil 3D. **The point file shall be submitted with the detailed reports.**

All detailed reports and videos shall be coded in accordance with Pipeline Assessment Certification Program (latest edition). ***All data shall conform to NASSCO data model and be submitted in a Microsoft Access Database.***

Measurement of Payment

CCTV (linear meter)

Measurement of Closed-Circuit Television Camera Inspection shall be by length in meters along the horizontal centerline length of the pipe between connecting points or, if there is no connecting point to the end of the product.

CCTV (With Robotic Cutting)

Measurement of Closed-Circuit Television Camera Inspection shall be by length in meters along the horizontal centerline length of the pipe between connecting points or, if there is no connecting point to the end of the product.

This item shall include any robotic cutting necessary to complete the CCTV work
Refer to SP TT-SEW-08 for Robotic Cutting Details.

Basis of Payment

Payment at the contract price for Closed Circuit Television Camera Inspection shall be compensation, in full, for all labor, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Work will be paid out as follows: 25% for the completion of the infield work and 75% for the specified deliverables.

Reference

- OPSS.MUNI 460

General

Scope of Work

The Contractor shall be responsible for confirming all information necessary for the final design of the liner prior to its manufacturing and that all conditions are suitable for the lining operation.

The contractor shall have an online database, such as Google Drive or equivalent, accessible to the contract administrator. This database shall include all pipes mentioned in the contract with details mentioned below in “Deliverable section 3”. All progress and quantities matching contract items shall be tracked online and up to date within 48 hours of the work performed.

The contractor shall be responsible for confirming all existing services and reinstating only active services. Any sump pumps connected to the system shall be properly shut off prior to the lining operation.

At least 7 Days prior to any interruption in service, the Contractor shall advise, in writing, all residents who may be affected by the rehabilitation process. The Contractor shall notify all affected residents or businesses of the specific time of the disruption to their service at least **48 hours** in advance and shall endeavour to minimize their inconvenience. During the course of the rehabilitation and any associated service interruption, the residents shall be kept regularly informed regarding any matters that affect them. When the interruption has ended, residents shall be advised immediately either verbally or in writing.

Under no circumstances shall the Contractor be permitted to discharge any flows into the storm system or overland.

It is the responsibility of the Contractor to select the appropriate tools or equipment for the preparation of the pipe.

There shall be favorable weather forecast, according to Environment Canada, for the duration of the lining operation.

Should a traffic control plan be required, it shall be the responsibility of the Contractor. A plan shall be submitted to the City 48 hours in advance for approval and all necessary work shall be included in the contract cost for the item. The traffic control plan shall adhere to Ontario Traffic Manual Book 7.

The Contractor shall notify the City 24 hours in advance of performing all CCTV inspections. A City representative shall be present at the time of the pre and post

inspections for viewing in real time. The CCTV inspection shall show full 360-degree view of each lateral reinstated.

In addition to OPS MUNI 460, there shall be a final CCTV inspection at end of warranty. This is to ensure there are no deficiencies before the two-year warranty is complete. **The cost of this work shall be included in the sewer lining contract item price.**

All detailed Camera Inspection reports shall be coded in accordance with Pipeline Assessment Certification Program (Latest Edition). Coding accuracy shall be 85% minimum. As per SP TT-SEW-02. ***All data shall conform to NASSCO data model and be submitted in a Microsoft Access Database and be compatible with CT Spec software.***

A sample of the liner for each different diameter shall be sent for testing, according to the guidelines in OPSS 460 to an independent, certified testing laboratory, approved by the City.

Should a by-pass pumping system be required, it shall be the responsibility of the Contractor. A plan shall be submitted to the City 48 hours in advance for approval and all necessary work shall be included in the per meter unit price for the Sewer Relining item, for the location necessary. As per SP SEW-22.

Basis of Payment

Payment at the contract price for Sewer Lining and Lateral Reinstatement shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Measurement of pipe sewers shall be by length in metres along the horizontal centerline length of the pipe between connecting points or, if there is no connecting point to the end of the product.

Sewer Lateral Reinstatements shall be paid each, no matter what the size of the lateral.

The cost of the End of Warranty CCTV inspection shall be included in the sewer lining contract item price.

Work will be paid out as follows: 25% for the completion of the field work and 75% for the specified deliverables.

Reference

- OPSS.MUNI 460 & 1351
- OPSD 405.010, 701.021, 1003.030
- ASTM D543, 638, 695, 790

General

Scope of Work

This special provision covers the requirement for Structure Rehabilitation. Structure rehabilitation shall eliminate water leakage into the manhole and prevent water or vapors to leak out of the manhole. It shall also protect against corrosion typically found in domestic sewage.

The Structure rehabilitation process shall cause no adverse effect to any of the Contract Administrator's processes or facilities during or after the application. The Contractor shall notify the contract administrator and identify any by-products produced as a result on the installation operations. The Contractor shall cleanup, restore existing surface conditions and structures, and repair any manhole rehabs determined to be defective.

Should a traffic control plan be required, it shall be the responsibility of the Contractor. A plan shall be submitted to the City 48 hours in advance for approval and all necessary work shall be included in the contract cost for the item. The traffic control plan shall adhere to Ontario Traffic Manual Book 7.

It shall be the contractor's responsibility to inspect every manhole prior to starting of work and notify the contract administrator of any issues or discrepancies in the scope of work. The contractor shall give the contract administrator sufficient time to do an inspection and decide the proper course of actions.

Submittals

Provide manufacturer's detailed description of the recommended procedures for handling and storing materials including a proposed method for monitoring temperatures of the storage location.

Provide manufacturer's detailed description of the recommended installation/ application process including mixing, additives, set time, cure time and all equipment required.

Structure Preparation

1. Maintain all flow in the structure throughout the duration of the project. Flow from existing active service connections entering the manhole shall be maintained or bypassed if the flow will affect proper installation. Should a by-pass pumping system be required, it shall be the responsibility of the Contractor. A plan shall be submitted to the City 48 hours in advance for approval and all necessary work shall be included in the contract cost for the item. As per SP SEW-22.

2. Clean interior surfaces of structure of debris, dirt, oil, grease, remains of old coating materials and any other extraneous materials.

3. Pressure wash manhole walls to remove loose mortar, concrete and debris. Pressure washing level shall be as recommended by the manufacturer.

4. Precautions shall be made to ensure no debris enters the sewer system. Remove debris from manhole and incoming sewer connections.

Structure Benching

1. Light Benching shall be used when there are surface imperfections in the benching or infiltration around the inlet/outlet of the pipe. Light benching shall be used to reduce any restriction of flow in the invert and bench.

Note: Trimming of intruding pipes shall be part of the benching price.


STRUCTURE LIGHT BENCHING – PRE


STRUCTURE HOLE LIGHT BENCHING - POST

2. Heavy Benching shall be used when there is no defined benching, or to create a proper channel when a drop structure is needed. Heavy Benching shall follow the OPSD 701.021.


STRUCTURE HOLE HEAVY BENCHING – PRE


STRUCTURE HOLE HEAVY BENCHING - POST

Structure Parging

1. Light Parging shall be used on the manhole walls to cover over cracks and small holes to eliminate infiltration. (typically used for brick manholes)


STRUCTURE HOLE LIGHT PARGING – PRE


STRUCTURE HOLE LIGHT PARGING - POST

2. Heavy Parging shall be used on the manhole walls when there are large craters or missing bricks are apparent and light parging is not sufficient to eliminate infiltration.


STRUCTURE HOLE HEAVY PARGING – PRE


STRUCTURE HOLE HEAVY PARGING - POST

3. Areas where reinforcing bars have been exposed and/or corroded shall then be abrasive blasted and coated with the polymer coating product.

Note: Prepping for structure grouting is not considered parging. It shall be included in the Manhole grouting Item.

Maintenance Hole Steps

1. Maintenance hole steps shall be driven into pre-cast or drilled holes.

2. Steps shall be installed no more than 300mm apart vertically.

3. Steps shall be located a minimum of 150mm from the ends of the sections.

4. The clearance between the wall face and the center of the inside surface of the step shall not be less than 150mm.

Internal Drop Structures

1. Shall be installed as per O.P.S.D. 1003.030 or as requested by the contract administrator.

Deliverables:

Pre and Post photos will be required to receive full payment. All photos shall be oriented so that north is orientated at the top of the photo.

Measurement of Payment

All items shall be per each.

Maintenance hole Steps shall be paid per maintenance hole.

Basis of Payment

Payment at the contract price per Structure Rehabilitation shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Work will be paid out as follows: 25% for the completion of the field work and 75% for the specified deliverables.

Reference

- ASTM F2304, F2454

General

Scope of Work

This special provision covers the requirement for Chemical Grouting and testing of pipe joints and lateral connections.

Equipment

Contract administrator may request the contractor to demonstrate a control test to ensure the accuracy, integrity and performance capabilities of the testing and grouting equipment.

Grouts

Must be able to react/ perform in the presence of water.
Ability to increase grout mix viscosity, density and strength and/ or the use of additives
Cured grout must withstand submergence in water without degradation
Resultant grout formation must be homogeneous and prevent the passage of water.
Grout must not be biodegradable
Cured grout shall be chemically stable and resistant to organics
Residual grout shall be easily removable from the sewer line to prevent blockage

Water based chemical grouts shall have the following characteristics:

1. A minimum of 10% acrylamide base material by weight in the total grout mix. A higher concentration of acrylamide base material is recommended to increase strength or offset dilution during injection.
2. The ability to tolerate some dilution and react in moving water during injection.
3. A viscosity of approximately 2 centipoise, which can increase with approved additives.
4. A controllable reaction time from 10 seconds to 1 hour.
5. A reaction (curing) that produces a homogenous, chemically stable, non-biodegradable, firm, flexible gel.
6. The ability to increase mix viscosity, density and gel strength by increased concentrations of the mix constituents or by the approved additives.

Acrylate based chemical grouts shall have the following characteristics:

1. A minimum of 10% acrylamide base material by weight in the total grout mix.
2. The ability to tolerate some dilution and react in moving water during injection.
3. A viscosity of approximately 1-3 centipoise, which can increase with approved additives.
4. A controllable reaction time from 10 seconds to 1 hour.
5. A reaction (curing) that produces a homogenous, chemically stable, non-biodegradable, firm, flexible gel.

6. The ability to increase mix viscosity, density and gel strength by increased concentrations of the mix constituents or by the approved additives.

Additives

When roots are present a root deterrent chemical shall be added to control root re-growth. The quantity of the inhibitor shall be as recommended by the manufacturer and approved by the contract administrator.

Grouting material may be exposed to freeze/ thaw cycle and an additive approved by the contract administrator shall be used to prevent cracking once the grout is set.

Testing

Joint testing pressure shall be equal to 0.5 psi (3.5 kPa) per foot (0.3 m) pipe depth plus 2 psi (13.78 kPa). Test pressure shall not exceed 10 psi (68.95 kPa) without the approval of the Contract Administrator. Once the void pressure is observed to be equal or greater than the required test pressure it shall be tested for 15 seconds. If the pressure decays more than 1 psi (6.89 kPa) the joint will have failed the test and shall be sealed.

Lateral connection test pressure shall be equal to 0.5 psi (3.5 kPa) per foot (0.3 m) pipe depth plus 2 psi (13.78 kPa). Test pressure shall not exceed 10 psi (68.95 kPa) without the approval of the Contract Administrator. Once the void pressure is observed to be equal or greater than (not more than 2 psi (13.78 kPa) above the required pressure) the required test pressure it shall be tested for 15 seconds. If the pressure decays more than 2 psi (13.78 kPa) the joint will have failed the test and shall be sealed.

Grouting

Pump grout materials in stages if needed into the isolated area to refusal until the void or surrounding soil has been filled or solidified. Refusal is when the packer void pressure during grout pumping instantaneously rises by 4 to 5 psi (27.5 – 34.5 kPa). Upon completion deflate the packer and break away from the ring of gel formed by the packer void. The packer should then be re-inflated and the joint retested at a pressure equal to the initial test pressure. If the joint fails this air test, repeat the grouting procedure at no additional cost.

Excess grout shall be defined as a thickness of grout that could cause blockage. Excess grout shall be removed from the sewer system and properly disposed at no additional cost.

In laterals the contractor shall confirm lateral flow after sealing each connection. If a blockage exists the contractor shall immediately clear the lateral at no additional cost.

Record Keeping

Use standardized test and seal data sheets and PACP data codes

Record the void pressure drop before sealing, immediately after grouting and the amount of grout used.

After grouting is complete all pipe sections shall be inspected by means of CCTV. The inspection shall be conducted as per PACP program.

Should a by-pass pumping system be required, it shall be the responsibility of the Contractor. A plan shall be submitted to the City 48 hours in advance for approval and all necessary work shall be included in the contract cost for the item. As per SP SEW-22.

Basis of Payment

Payment at the contract price per linear meter for Pressure Test Pipe Joints shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Payment at the contract price per Chemical Grout Pipe Joints shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Payment at the contract price per Chemical Grout Laterals shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Work will be paid out as follows: 25% for the completion of the field work and 75% for the specified deliverables.

Reference

- OPSS.MUNI 409

General

Scope of Work

This special provision covers the requirement for the closed-circuit television camera inspection of sewer laterals, all being of a minimum nominal pipe size of 100mm in diameter or smaller.

The accuracy and quality of these digital image recordings and reports are of paramount importance. The City's corrective actions are based solely on the information provided and for this reason, they must be correct and complete. The contractor shall supply a digital report saved on a portable hard drive with digital closed-circuit televisions camera inspection work as per the specification OPSS MUNI 409 and this special provision.

Requirements

Laterals will not be cleaned prior to inspection. If cleaning is required, it shall be arranged and/or authorized by the Contract Administrator.

If access to the lateral is obtained from the sewer main using a mainline camera capable of launching into the lateral and fully inspecting the lateral, (preferred method) a complete video and computer-generated report is required (both for the private and public sides of the lot). A report on all deficiencies under the building is not required. The video must show the complete lateral.

If access to the lateral is obtained at the main through a maintenance hole (or an excavation done by others), a complete video and computer-generated report is required from the point of access to the building foundation and to the sewer main.

If access to the lateral is obtained from within a building, a complete video and computer-generated report is required, (both for the private and public sides of lot line). A report on all deficiencies under the building is not required. The video must show the complete lateral.

If the camera finds an obstruction and cannot proceed, the report shall state as such, and payment shall be made as a completed service.

Deliverables

The City intends to import the information produced through the inspections into an asset information repository that will be utilized by staff for reference as well as city-wide system level asset management analysis. The following identifies requirements necessary to facilitate the information for this purpose:

1. Inspection data provided in electronic format as detailed in a report format to be approved by the City prior to initiating the project.

2. One Portable hard drive containing video inspection files and reports.

3. Reports including:

    a) Microsoft Excel spreadsheet including the following information:
        i. Street Name – House address
        ii. Length in Meters
        iii. Pipe size (Inside Diameter)
        iv. Type of Material
        v. Condition Rating

All detailed reports and videos shall be coded in accordance with Pipeline Assessment Certification Program (latest edition).

Measurement for Payment

Measurement of closed-circuit television camera inspection lateral shall be by each.

Basis of Payment

Payment at the contract price for Lateral Inspection shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Work will be paid out as follows: 25% for the completion of the field work and 75% for the specified deliverables.

Reference

- OPSS.PROV 411

General

Robotic Cutting shall be used for materials or blockages that cannot be removed from standard flushing activities or reaming as stated in OPSS.PROV 411.

Robotic Cutting shall not damage existing pipelines or laterals.

The contractor shall also install a screen in the downstream maintenance hole in order to catch any material that may migrate downstream. Such material shall be removed from the maintenance hole and the existing pipeline.

Robotic Cutting (Each)

Robotic Cutting by each shall be used for well-defined obstructions such as lateral intrusions or severe calcite at one location that prevent equipment from passing through.

Robotic Cutting (Hourly)

Robotic Cutting by the hour may be used for consecutive obstructions such as lateral intrusions or continuous obstructions that cannot be removed by flushing which prevent equipment from passing through.

Deliverables

All daily work orders, PRE and POST CCTV videos and reports shall be submitted and reviewed prior to receiving full payment.

Measurement of Payment

Measurement of Robotic Cutting shall be by each or hourly as defined above.

Method of payment shall be agreed with the contractor administrator prior to performing the work.

Daily work records must clearly identify the work performed as part of proof of payment.

Basis of Payment

Payment at the contract price for Robotic Cutting shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Work will be paid out as follows: 25% for the completion of the field work and 75% for the specified deliverables.

General

The Contractor shall submit a trenchless technique to be approved by the Contract Administrator, which will not damage with existing pipeline or lateral.

The contractor shall also install a screen in the downstream maintenance hole in order to catch any material that may migrate downstream. Such material shall be removed from the maintenance hole and the existing pipeline.

Any necessary excavation shall be approved in writing by the Contract Administrator prior to the commencement of the work.

Measurement for Payment

Measurement of trenchless pipe repair shall be by each repair, satisfactorily inspected & reported.

Basis of Payment

Payment at the contract price for Trenchless Pipe Repair shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Reference

- OPSS.MUNI 460
- SP TT-SEW-03

General

Scope of Work

Refer to SP TT-SEW-03 for scope of work and deliverables

The length of repair shall be a minimum of two (2) meters. The liner shall overlap a minimum of 0.5 meters on both sides of the repair area.

It is the responsibility of the contractor to investigate the area of repairs to determine the length required to correct the repair successfully. The contractor shall submit its recommendations for repairing prior to ordering the liner for approval by the contract administrator.

Measurement for Payment

Measurement shall be for each Liner Spot Repair installed.

Basis of Payment

Payment at the contract price for Liner Spot Repair shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Work will be paid out as follows: 25% for the completion of the field work and 75% for the specified deliverables.

Reference

- OPSS.MUNI 411
- OPSD 701.021
- SP SEW-20
- SP SEW-22

General

Scope of Work

The work involved in the item “Pre-bench Preparation” shall include but is not limited to the following:

Manhole Preparation

1. Maintain all flow in the manhole throughout the duration of the project. Flow from existing active service connections entering the manhole shall be maintained or bypassed if the flow will affect proper installation. Should a by-pass pumping system be required, it shall be the responsibility of the Contractor. A plan shall be submitted to the City 48 hours in advance for approval and all necessary work shall be included in the contract cost for the item. As per SP SEW-22.

2. Clean interior surfaces of manhole of debris, dirt, oil, grease, remains of old coating materials and any other extraneous materials.

3. Precautions shall be made to ensure no debris enters the sewer system. Remove debris from manhole and incoming sewer connections.

4. Break existing benching if it does not have a suitable thickness or is not in good condition.

5. Cut existing mainline sewer pipe to spring line so that the inlet/outlet does not intrude beyond 100mm into manhole.

6. Remove excess material to allow for benching in accordance with OPSD 701.021.

7. Dispose of asbestos materials in accordance with SP SEW-20.

Notes:

1. Walkthrough is required with Contract Administrator prior to work performed to confirm what work is necessary.

2. Final preparation shall be inspected and approved by the contract administrator.

3. The contractor shall coordinate to have the benching completed immediately after the preparation is accepted.

4. No exposed granular bedding shall be subjected to live sewage or flows. It is the contractor's responsibility to ensure protection from erosion and contamination.

Deliverables:

Pre and Post photos will be required to receive full payment. All photos shall be oriented so that north is orientated at the top of the photo.

Measurement for Payment

Measurement shall be for each Pre-Bench Preparation.

Basis of Payment

Payment at the contract price for Pre-Bench Prep shall be compensation, in full, for all labour, equipment, and materials necessary to complete the work to the satisfaction of the Contract Administrator.

Work will be paid out as follows: 25% for the completion of the field work and 75% for the specified deliverables.

Reference

- OPSS.PROV: 180, 314, 360, 401, 421, 441, 492, 493, 501, 510, 803, 904, 908, 1001, 1002, 1004, 1010, 1350, 1801
- OPSS.MUNI: 353, 442, 460, 493, 506, 802
- OPSD: 310.010, 600.040, 600.060, 1103.010, 1103.020, 1104.010, 1104.020, 1105.010, 1109.011, 1109.012, 1109.025
- COT SP: ASP-04, ASP-05, RD-01, RD-02, RD-12, RD-13, RD-21, RD-32, RD-41, WAT-01, WAT-02, WAT-03, WAT-06, WAT-07, WAT-09, WAT-11, WAT-13
- COT SD: 131, 209, 210, 271, 341, 348, 401, 402-02, 411, 420, 440, 443
- AWWA: M28
- ASTM: F1216

General

MATERIAL, INSTALLER AND DESIGN REQUIREMENTS

Liner rehabilitation systems shall be designated as a Class IV Lining system as specified in Appendix A of AWWA M28, and shall be certified to NSF 61. Drinking Water System Components - Health Effects as Pipe Liner - Immediate Return to Service for the pipe sizes and conditions specified herein. Acceptable lining systems shall be qualified CIPP systems that meet the technical requirements identified herein. Spray-on lining systems will not be considered as acceptable lining systems for Class IV liners in this specification.

The following lining systems can be designed as Class IV lining systems under many loading situations and host pipe defect patterns; and are approved for use subject to meeting project specific requirements and required installer experience as noted herein:

a) Aqua-Pipe ® / Sanexen - CIPP based system
b) InsituMain TM / Insituform - CIPP based system
c) NordiPipe TM / Norditube Sekisui - CIPP based system
d) RS BlueLine TM / RS Technik - CIPP based system

Notwithstanding general approval for use of these products as Class IV liners, the proposed lining system shall be required to meet all project specific requirements to be considered for use in the City of Timmins.

SUBMITTALS

Pre-Design Submittals

Prior to Design provide proof that the liner product proposed for use can be considered a Class IV liner. Proof of being a Class IV liner can consist of Type testing including:

a) Short term tests
   - ASTM D1599 - Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings

b) Long term tests (if available)

- ASTM D2990 - 09 - Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics, or;
- ASTM D2992 - Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for “Fiberglass”; (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings.

c) Where no long-term basis for material properties as noted above is available provide rationale for the use of Material Adjustment Factors to convert short term testing results to conservative long-term values in a manner satisfactory to the Contract Administrator. Under no circumstances will short term tests as per ASTM D1599 be de-rated by less than a factor of 4 where no long-term testing results are available.

Pre-Construction Submittals

Provide the required submittals to the Contract Administrator Two (2) days prior to Preconstruction meeting.

Submit the close fit liner thickness design in accordance with the specified requirements herein and sealed and signed by a Professional Engineer licensed to practice in the Province of Ontario. Include the following information:

a) Wall thickness computations including all specified design checks.
b) For CIPP systems provide:
   - Name and manufacturer of each unique resin and tube proposed for use.
   - CIPP curing schedule provided by the resin supplier indicating the temperature, staging, duration and pressure required to achieve a proper cure of the resin and fabric tube composite.
   - Substantiation of material properties used in design based on previous installations and quality control tests.
c) Other information that may reasonably be required by the Contract Administrator to confirm the close fit liner design proposed conforms to the specified requirements and design intent.

For CIPP systems:

a) Arrange for the manufacturer of the resin to provide a Fourier transform infrared spectroscopy (FTIR) report such that blind testing can be carried out at the Owner’s discretion and expense to confirm that the same resin is indeed being incorporated into the works.

Submit a site planning and operations protocol that provides information on the following:
a) An excavation, staging, and sampling plan that details:
   - All required shaft locations, shaft sizes and shoring/excavation safety requirements.
   - Temporary water system layout.
   - Required storage and staging area.
   - Sampling locations and Demonstration Test set ups to comply with Required Acceptance Tests.
   - Traffic management to accommodate the full construction footprint at each site.
b) Details of the host pipe preparation requirements.

c) For CIPP systems, include a wet-out plan, including:
   - Resin impregnation method.
   - Designated location of the wet-out facility if wet out not carried out on site.
   - Documentation the resin to be used has not exceeded its shelf life as recommended by the manufacturer of the resin including on-site pot life for multi-component epoxy resins.
   - Volume and weight of resin to be impregnated into each liner and repair section including any excess allowance for polymerization and migration.
   - Methods used and required settings during the resin impregnation process to attain the required wall thickness.

d) Details system appurtenances such as fittings and new valve and hydrant installations.
   - Where non-metallic flanges are proposed, bolting materials shall be 316 stainless steel.

e) Stamped engineering drawings prepared by an Engineer licensed in the Province of Ontario, detailing liner termination treatment that provides sufficient axial restraint to protect against differential axial movement between the host pipe and the liner and is sealed to be watertight. The drawings shall include a plan view of the proposed installation, as well as any site-specific installation notes.

For Structural Steel Road Plates

a) Stamped engineering drawing and procedure prepared by a Structural Engineer licensed in the Province of Ontario, detailing the proposed steel plate installation. The drawings shall include a cross-section and plan view of the proposed installation, as well as any site-specific installation notes. A professional engineer reserves the right to inspect road plates at any given time to ensure conditions are in accordance with the certification.
b) If the drawing is not provided on the day that the road plates are first installed, resulting in lane closures or other traffic disruption, liquidated damages in the amount of $1,000 per calendar day shall apply until traffic flow is reinstated.

Submit a construction protocol that provides the following:

a) Minimum and maximum pressures to install the liner during the installation and curing process.
b) Maximum allowable axial and longitudinal tensile stress for the liner and the arrangement for monitoring pull-in forces during installation if liner insertion is to be by pull-in methods.
c) Number and location of heat source monitor gauges.

a) Earth Loads
- Include an allowance for an AASHTO HSS25 concentrated live load in the total external pressure on the pipe. Calculate minimum live load surcharge based on Cooper E80 distributed load for portions of CIPP installed under railway lines.
- Calculate dead load based on soil density of 1920 kg/m^3.
- Groundwater table is 2.0 m below the existing ground surface.
- Minimum value for ovality of the host pipe will be 2% unless a greater value is indicated on the Construction Drawings or as determined from observation of the CCTV inspection.
- Long-term value for flexural modulus of elasticity will be considered to be the projected value at 50 years of a continuous application of the design load based on the specific resin and felt composite as established by ASTM D2990.
- Modulus of soil reaction (E's) will be assumed to be 6900 kPa unless a higher or lower value is indicated on the Construction Drawings.
- Minimum factor of safety (N) of 2.

b) Pressure Loads
- Maximum sustained operating pressure - 690 kPa (100 psi).
- Transient short-term overpressure - 40% of maximum sustained operating pressure.
- Vacuum pressure allowance - 50 kPa (-7 psi).
- Maximum allowable operating pressure (MAOP) for design - 1034 kPa (150 psi).
- Test pressure - 862 kPa (125 psi).
- Long term values for hoop stress shall be the time adjusted values projected at 50 years of continuous load.

CONSTRUCTION

General

Asphalt removal shall be as per RD-32.

Earth Excavation shall be as per RD-01.

Access Shafts

The Contractor shall excavate pits as per O.H.S.A. for accessing the watermain for the CIPP lining process. Where possible, the Contractor shall use the locations of existing tees, crosses, reducers and valves for access pit locations. If the Contractor believes an alternative location for hydrants and valves will reduce the quantity of access pits, the Contractor shall inform the City. When an access shaft is excavated and a fitting is contained within it, the Contractor shall replace the fitting.

The Contractor shall note that the locations for all pits shall be approved by the City prior to the beginning of Construction. The work shall include all excavation, shoring, dewatering, bracing protection and restoration of access shafts. Valves and fittings in close proximity to access shafts shall be braced as required.

Structural Steel Road Plates

For locations where a pit must be excavated and road plates are required, driveway entrances or intersections that must remain open, approval is required from the contract administrator prior to work commencing.

Verification of Dimensional Requirements

Verify dimensional requirements of each water main to be rehabilitated prior to installation of the close-fit liner as follows.

a) Length of liner from access pit-to-access pit, with due consideration to closure details
b) Diameter and cross-section of the water main at each access shaft.
c) Use calibrated calipers or other suitable measuring device capable of measuring accurately to +/- 1 millimeter to confirm cross section geometry at clock positions of:
    i. 12:00 to 6:00,
    ii. 2:00 to 8:00,
    iii. 3:00 to 9:00 and
    iv. 4:00 to 10:00.
d) Estimate the remainder of the water main dimensional requirements based on recognized visual classification methods from the CCTV Inspections.

Watermain Cleaning

Cleaning and surface preparation:

a) The quality of pipe cleaning and surface preparation is critical to the successful application of CIPP liners requiring bond for either structural integrity or for sealing against the host pipe to facilitate hydrostatic integrity of the relined system.
b) The interior surfaces of the pipe to be lined shall be cleaned by methods to remove all sediment, corrosion products (rust and graphite), biology, chemicals or other deposits, loose and deteriorated remains of old coating materials, oil, grease, accumulations of water, debris and other foreign matter.
c) Disposal of effluent and solids shall be accomplished in accordance with any applicable regulatory disposal requirements.
d) Service connections and end seals are locations where particular attention must be paid when cleaning and preparing pipe sections to facilitate achieving hydrostatic integrity of the relined system. Care must be taken to clean and prepare the full circumference of services and end seals to ensure the liner bonds to a dry, corrosion-free pipe surface. These precautions are needed to prevent recurrence of corrosion and resist the shear loads induced by any recurring and occasional surge pressures within the lined pipe. The cleaning method(s) chosen shall meet the performance requirements of this section. The selection of cleaning and preparation method(s) shall consider the potential for damage to service connections, appurtenances and the host pipe and take precautions to minimize potential damage before selection and deployment.

Drying the pipe interior:

a) A CIPP liner will not bond to a wet pipe surface. The constructor shall ensure that residual water and debris are removed from the pipe prior to lining. Excess water and any remaining debris may be removed by pulling tight fitting rubber disk squeegees through the pipe; but, they are not sufficient for drying the pipe. Oversized foam swabs must then be driven through the cleaned and prepared main using filtered compressed air. The filters must be capable of removing 100% of the compressor oil from the air discharge and must be checked and cleaned regularly. The number of swab passes required depends on the condition of the main; swabbing must continue until the swabs emerge clean and dry. Cleaned and prepared pipes may also be air-dried using a suitable, oil-free blower or vacuum system approved by customer. The inability to remove all debris or water suggests inadequate cleaning or leaking valves. These faults should be investigated and remedied before the lining begins. It is important to note that the pipe must be inspected prior to lining to ensure it is free of visible moisture and free-standing water along its length and in any pipe joints and recesses that are to be coated.

CCTV Inspections

Perform the following CCTV Inspections:

a) Pre-cleaning Inspection, to confirm intermediate dimensional requirements, cleaning requirements.
b) Pre-Lining Inspection after cleaning and preparation to confirm that the host pipe is ready for lining.
c) Post-Lining Inspection subsequent to installing the liner and all water service reconnections to assess the adequacy of the liner and reinstatements based on visual classification standards.

Use equipment suitable for potable water pipes.

Provide a copy of all CCTV inspections to the Contract Administrator.

Review the Pre-Lining Inspection videotape with the Contract Administrator at least 24 hours before installing the liner and obtain approval to install. The Pre-Lining Inspection shall confirm:

a) Necessary cleaning and pipe preparation work to meet visual standards for surface preparation to achieve objectives for adhesion in all areas where adhesion is required; and including any internal and external repairs/modifications have been satisfactorily completed.
b) Condition of the host pipe is consistent with the design conditions and the Specifications. Advise the Contract Administrator of any condition that is contrary to the design conditions or assumptions made that may affect either long or short-term performance of the liner prior to commencing lining.
c) Location, condition and operational status of all water services.

Post-Lining Inspection is to confirm the adequacy of water service reinstatements and the fit and finish of the CIPP.

Water Service Report

Confirm exact location of all water services connected to the water main being lined.

Submit a written Water Service Report for each liner location to the Contract Administrator providing the following information:

a) Location of connection (spatially referenced chainage to a visible surface feature and clock reference).
b) Size of the service.
c) Material type of water service.
d) Method of reinstatement (e.g. remote, by excavation) and special features required for reinstatement.
e) Status of connection (active, inactive or unable to determine).
f) Property serviced including the address.

Installation of Close-Fit Liners

Install CIPP liners by inversion methods in accordance with ASTM F1216 or by pull-in methods in accordance with ASTM F1743 or F2019 and the approved construction protocol submission for the site.

CIPP liners shall be cured by hot water, steam or ultra-violet light. Carry out workmanship in accordance with ASTM D5813.

Terminate ends of close fit liners per stamped engineering drawings.

Liner terminations shall be as per OPSS 460.

Flushing and Disinfection shall be as per OPSS 441 and SP WAT-11.

Reinstatement of Water Services

Reinstate all active water services to as great a degree as possible utilizing remote reinstatement methods.

Ensure that any debris created from water service reinstatement is contained within the new liner and flushed and removed from the liner prior to putting the main in service. Take reasonable precautions to confirm that no debris from water service reinstatements is discharged into the water service and confirm services are free of debris upon return to service.

Where reinstatement of Water Service connections is not possible via remote methods for large-diameter services of 50 mm or greater, reconnect water services by excavating the existing service and reconnecting the service to the rehabilitated main as specified in OPSS 441. In such cases, service saddle/valves shall be removed and replaced with tees.

Should remote reinstatement of service connections 50 mm diameter or less fail, the Contractor shall reinstate them via excavation at no additional cost to the Owner.

Site Restoration

Where the site is disturbed by the construction of watermains, watermain lining, sewer mains, appurtenances, services and structures, restoration shall be included in the unit price bid for the applicable contract items, as per but not limited to the following:

Backfill as per COT Standard Drawing #341/ Typical Cross Section

a) Roadway Restoration
   All roadway patches shall be restored to a minimum of one-half the lane width unless more than one-half lane width is disturbed during construction, in which case the restoration will occur to the nearest full lane width.
   - Saw cutting Asphalt
   - 150 mm Granular 'A' as per ASP-04 and 90mm Asphalt Grinding in lieu of asphalt restoration
   - 750 mm Granular 'B' Type I or match existing material as per Typical Cross Section
   - Driveway Restoration shall be per RD-21

b) Concrete Curb and Gutter / Concrete Sidewalk (City property)
   - Remove and reinstate any sections of concrete curb and gutter and/or concrete sidewalk removed or damaged by the construction, as per RD-13.

c) Driveway Curb and Retaining Walls (Precast Concrete, Moduloc Block, Native Rock and Timber) (City and Private Property)
   - Remove, salvage and reinstate all existing retaining walls and driveway curbs to original conditions per RD-12.

d) Open Drainage Ditches and Culverts (City and Private Property)
   - Affected drainage ditches and/or culverts will be reinstated to promote positive drainage or to match existing conditions. Re-grading of surrounding areas to be directed by the Contract Administrator.
   - The back slope and base of all affected ditches will be finished with 100 mm topsoil and sod, as per OPSS 802 and OPSS 803. The front slope of the ditch is to be left as a granular slope.

e) Planting Beds, Trees and Shrubs (Private Property)
   - Remove, salvage and reinstate all existing planting beds, trees and shrubs, including curbs/borders to original conditions.
   - Unless indicated elsewhere in this contract, existing planting beds, tree and shrubs on City property that are removed as a result of the work, are not to be replaced.

f) Grassed Areas (City and Private Property)
   - All restoration of grassed areas shall include 100 mm of topsoil and sod, as per OPSS 802, OPSS 803, and RD-41 unless specified otherwise. This shall include the areas on City property where planting beds, trees, shrubs, etc., have been relocated from.

g) Walkways (City and Private Property)
   - Reinstatement of all existing walkways to original conditions.

h) Other (City and Private Property)
   - All other items disturbed by construction in this Contract shall be restored to match existing conditions at the Contractor's expense.

Acceptance Testing

Carry out tests, secure samples and arrange for third party tests at the laboratory noted herein. The following Acceptance Testing is required:

a) Carry out a pressure test on each liner installed as per Clause 8.3 of ASTM F1216. Minimum test pressure shall be 862 kPa (125 psi). The City of Timmins Watermain Hydrostatic Test Report (OPSS 441 latest revision) must be completed by the Consultant and signed by the City representative on the site.
   - Leakage allowance is an "apparent" leakage allowance to account for entrapped air, etc. Any visible or readily apparent leaks shall be repaired irrespective of leakage allowance.
   - The pipe shall be pressurized at test pressure for 3 hours prior to test to allow for stabilization of the liner.
   - Allowable apparent leakage shall be calculated as 0.077 liters per millimeter of pipe diameter per kilometer per hour.
b) Confirm fit and finish meet the visual classification standards of ASTM D5813 and that the liner is free of excess wrinkling or other feature that reasonably may compromise its functional or structural performance design objectives.
c) Secure confined samples and arrange for testing to confirm the CIPP flexural strength, flexural modulus and thickness in accordance with the requirements of ASTM D5813, D790, and ASTM D3567 for every 500m. The City reserves the right to require additional samples to be collected and analyzed if potential concern are identified in the CCTV videos. If results of any additional sample(s) are acceptable, the City will reimburse the Contractor for collection and analysis. If the results of any additional sample(s) are unacceptable, the Contractor shall pay for collection and analysis.
d) Secure confined samples and arrange for testing to confirm the CIPP tensile strength and modulus in accordance with the requirements of ASTM D638 for each liner installed.
e) Secure confined samples and arrange for testing to confirm the CIPP hoop strength in accordance with the requirements of ASTM D2290 at each of the two sites.
f) Secure confined samples and arrange for testing to confirm adequate adhesion to the host pipe has been achieved to meet functional and/or structural objectives. Adhesion testing shall be in accordance with ASTM D4451 and one location per site shall be mutually designated to use Demonstration Methods to confirm that surface preparation visual standards and standard installation protocol is sufficient to meet design objectives.

All of the above testing shall be included in the price bid for liner installation. All testing, with the

exception of hydrostatic and bacteriological testing noted above shall be performed by:

> An accredited laboratory approved by the contract administrator during the submittals period.

If additional testing is required beyond the minimum testing noted above it shall be reviewed in the context as defective work testing or Owner requested additional testing. Owner requested additional testing shall be paid for by the Owner, while additional testing required as a direct result of deficient work shall be borne by the Contractor.

Infrared Spectroscopy (IR)

Where the Owner desires IR testing, the Contract Administrator will arrange for testing at the Owner's expense to compare the infrared spectrum of the resin field samples supplied from the wet-out to the reference spectrum generated from the resin sample provided by the resin manufacturer to verify installed material acceptability.

Post Construction Design Review for Total Performance

The Contract Administrator will perform a post-construction design review to ensure that the completed close fit liner meets the 50-year design life structural requirements prior to Completion of Construction Acceptance. The design review will utilize the measured values for tensile strength, flexural strength, flexural modulus, and liner thickness from the sample testing.

Close fit liner strength values will be further reduced to account for creep (tensile and/or flexural) based on the long-term material property values used in design to confirm that the 50-year design life requirement has been met. The use of full enhancement factors in this analysis will be limited to liners that are confirmed by visual classification to be close-fit liners based on the post-lining sewer inspection.

The Contract Administrator will advise of any discrepancies between the constructed liner and the design requirements.

Perform necessary remedial measures to confirm that a close fit liner deemed as structurally deficient will comply with the 50-year design life requirement such as additional testing to quantify the extent and nature of apparent defects and whether they compromise design intent.

Repair sections of liner removed for supplemental testing in a manner approved by the Contract Administrator.

Review remedial action with the Contract Administrator prior to implementation.

Perform further testing, monitoring and calculations and install structural enhancements at own cost.

Measurement for Payment

Measurement and Payment will be made in accordance to City of Timmins Standard Specifications for Watermains and Appurtenances, and as listed on the Schedule of Unit Prices, except as amended below.

Watermain Lining

Measurement for watermain lining shall be by length in meters along the horizontal centerline of the product between connecting points or, if there is no connecting point, to the end of the product.

When the connecting point is a structure, measurement for a product installation shall be in meters to the center of the structure.

Replacement of Existing Valves and Installation of New Valves

Replacement of existing valves and installation of new valves on relined watermains will be measured on a unit basis, and paid for at the Contract Unit Price. The number of units to be paid for will be the total number of valves replaced or installed in accordance with this specification, accepted and measured by the Contract Administrator.

Service Reinstatement by Excavation

Measurement for payment of Service Reinstatement by Excavation shall be by a count of the number of services greater than 50 mm diameter reinstated by excavation.

Structural Steel Road Plates

Measurement for payment of structural steel road plates shall be by a count of the number pits in which road plates are installed, regardless of the number of plates required to cover the pit.

Basis of Payment

This special provision supersedes the Basis of Payment sections in corresponding special provisions and/or standard specifications. Payment for the above items shall include but not be limited to all of the following items, where applicable:

1. 6.0 m depth earth excavation.
2. Any and all dewatering of the excavation.
3. Any and all shoring that is required for trench support to meet required OHSA.
4. Mobilization and demobilization, design, pre-inspection, isolation of the water main from the distribution system, pipe cleaning, supply and installation of Class IV liner including excavation and backfill of pits, post-installation testing, disinfection, and post-installation inspection and close-out submittals.
5. Bleeders for testing.
6. Traffic control.
7. Liner terminations per stamped engineering drawings.
8. Reinstatement of services 50 mm diameter and smaller.

9. Supply of PVC pipe to connect runs of lined watermain, or to connect lined watermain to valves, fittings or existing watermain pipes. ***All mechanical fittings shall conform with OPS Muni 441 and be approved by the Contract Administrator***
10. Connection to existing watermains.
11. Corrosion protection as per WAT-13.
12. Asbestos cement pipe handling and disposal as per SEW-20, including sanitary sewer repair as per SEW-13 and SEW-14.
13. Backfill, compaction and grading.
14. Culvert removal and replacement.
15. Site restoration.
16. Removal of service saddles and valves on services 50 mm diameter and larger.

The Contractor shall review the provided contract drawings to determine scope and constraints of the construction area. The City of Timmins shall not accept any additional fees for this item once the contract has been awarded.

Eighty (80) percent of the payment will be made upon satisfactory completion of the liner and returning the water main to service. The remaining twenty (20) percent of the payment will be made upon confirmation of the liner strength and delivery and acceptance of all required submissions, shop drawings, and reports.

This special provision supersedes the Basis of Payment sections in corresponding special provisions and/or standard specifications. Payment for each linear meter lined shall be payment in full for the supply of all labour, equipment, and material required to complete the work.

Reference

- OPSS.PROV 441, 492, 493
- SP WAT-11, ASP-01, ASP-05, ASP-07, RD-12, RD-13, RD-21, & RD-41

General

The Contractor shall submit a detailed plan sealed by a qualified Professional Engineer licensed in the Province of Ontario of the proposed system, showing type of pipe to be used, layout, restraint locations, thrust blocks, residential and business connection points, valves, check valves, feed connections, etc., to the City for approval, at the Pre-Construction Meeting.

Each temporary water service which crosses a sidewalk shall be ramped in order to prevent injury to pedestrians. If the work performed or the material used is not to the satisfaction of the Contract Administrator, action will be taken to rectify the problem to ensure the safety of the public. All cost incurred in such rectification shall be deducted from the Contractor's payment.

It is the Contractor's responsibility to layout the piping system so that it does not disrupt or cause harm to pedestrian or vehicular traffic. Protecting the piping system from damage is also the Contractor's responsibility. Any restoration shall conform to Special Provision ASP-01, ASP-05, ASP-07, RD-12, RD-13, RD-21, and RD-41

The temporary system shall be disinfected as per requirements outlined in the City of Timmins 400 Series-Special Provision WAT-11.

The temporary system shall be tested for leakage as per OPSS 493.

The Contractor must repair any leaks that are found or that may develop on any portion of the temporary bypass line. If a leak is not repaired, the Contract Administrator may deduct from the Contractor's progress payment the cost of the water lost as a result of the leak. Moreover, should it be necessary for City forces to repair any portion of the bypass system as a result of the Contractor not responding within a two (2) hour period, any costs incurred by the City for such repairs will be deducted from the Contractor's progress payment.

Wherein a temporary water service cannot be connected to an external hose bib due to its size, the Contractor shall connect to the buried service line beyond the existing curb stop. Costs for excavation, connection of the service to the temporary water supply, reconnection of the service to the main and restoration shall be included in the unit prices for the items requiring the work.

Measurements for Payment

Measurement for "Supply and Install Temporary Supply Systems" shall be by length in meters along the most direct route from the nearest suitable hydrant to the most distant connection points.

Measurement for "Temporary Water Services" shall be by count of the number of each size of service connected to the temporary water supply system.

Basis of Payment

On completion of the supply, installation, flushing, disinfecting and testing of the temporary water supply system prior to putting it into operation, a payment of eighty (80) percent will be made. The remaining twenty (20) percent of the payment will be made upon the removal of the system.

General

Removal and Replacement of Existing Hydrants

Fire hydrant removal shall include removal of existing hydrant, lead, and valve.

On watermains not abandoned, cap existing tee and place thrust block.

Fire hydrants that are not salvageable shall be disposed of by the Contractor and to a site approved by the Contract Administrator.

Hydrant Abandonment

Fire hydrant abandonment shall include riser removal to a depth of 0.5 metres of the existing ground. Hydrant Abandonment includes hydrant valve abandonment as per SP 2019-401-06.

All fire hydrants and valves that are removed shall be taken to the City of Timmins Public Work's yard or to the City of Timmins' South Porcupine Public Work's yard, whichever is closest.

Measurement for Payment

Measurement shall be for each fire hydrant removed or each fire hydrant removed and salvaged.

Basis of Payment

Payment at the contract price shall be full compensation for all labour, equipment, and material required to do the work.

General

Valve Chamber Abandonment

This work shall include the partial removal of maintenance holes, catch basins, ditch inlets, and valve chambers where structures and Utility systems therein are abandoned. Such partial removal, when within the roadway, shall be to a minimum of 0.3 meters below subgrade.

Prior to backfilling with Granular 'C' materials, the bottom of each structure designated for partial removal shall be broken to allow for the free movement of groundwater.

Valve Box Abandonment

This work shall include valve box removal TO 0.3m, placement of unshrinkable fill and site restoration.

All valves that are removed shall be taken to the City of Timmins Public Work's yard or to the City of Timmins' South Porcupine Public Work's yard, whichever is closest.

Measurement for Payment

Measurement shall be for each valve box or valve chamber abandoned, including the supply and placement of fill and restoration.

Basis of Payment

Payment at the contract price shall be full compensation for all labour, equipment, and material required to do the work.

Reference

- OPSS.MUNI 180, 310, 314, 353, 360, 401, 421, 442, 492, 493, 501, 506, 510, 802, 803, 904, 908, 1001, 1002, 1003, 1004, 1010, 1101, 1150, 1151, 1153, 1350, & 1801
- OPSS.PROV 441
- OPSD 310.010, 600.040, 600.060, 1103.010, 1103.020, 1109.011, 1109.012
- COT SP ASP-01, ASP-02, ASP-03, ASP-04, ASP-05, ASP-07, RD-01, RD-02, RD-12, RD-13, RD-32, RD-41, WAT-01, WAT-02, WAT-06, WAT-11, WAT-13
- COT SD 131, 209, 210, 271, 341, 348, 402-02, 440, 443

General

Scope of Work

This item relates to repairing watermain in open cut prior to the completion of watermain lining as directed by the Contract Administrator.

Excluded from this item is PVC pipe used to connect lengths of lined watermain within an access shaft, to connect lined watermain to the existing distribution system, to connect newly installed valves, fittings or hydrant leads.

The work involved in the item for the operation shall include but is not limited to the following:

1. Asphalt removal as per RD-32.
2. 4.5 m depth earth excavation as per RD-01.
3. Any and all dewatering of the excavation as per RD-46.
4. Any and all shoring that is required for trench support to meet required OHSA.
5. Mobilization and demobilization, design, pre-inspection, isolation of the water main from the distribution system, post-installation testing, disinfection, and post-installation inspection and close-out submittals.
6. Bleeders for testing.
7. Traffic control.
8. Liner terminations as per stamped engineering drawings.
9. Reinstatement of services as per WAT-03 and WAT-09.
10. Supply up to 4m PVC pipe to connect runs of lined watermain, or to connect lined watermain to valves, fittings or existing watermain pipes as per WAT-01, WAT-02 and WAT-11.
11. Corrosion protection as per WAT-13.
17. Asbestos cement pipe handling as per SEW-20, including sanitary sewer repair as per SEW-13 and SEW-14.
12. Backfill, compaction and grading as per Typical Section.
13. Site restoration as per ASP-01.

Measurement for Payment

Measurement for payment will be by each repair approved by the Contract Administrator.

Basis of Payment

This special provision supersedes the Basis of Payment sections in corresponding special provisions and/or standard specifications. Payment for each linear meter of watermain shall be payment in full for the supply of all labour, equipment, and material required to complete the work.