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## 1.1 General

1. The unit and lump sum prices for all items in the Form of Tender “Schedule of Quantities and Unit Prices” shall be full compensation for the work of the Item and shall include the cost of furnishing all materials, labour, tools, and equipment necessary to complete the work in accordance with the Contract, the Drawings and Specification, and shall cover all costs of surety, mobilization, assistance to the Engineer and site offices. Each item shall include for all necessary supervision, labour, tools and equipment, materials, plant and services, Quality Assurance and all operations and allowances customary and necessary to complete each item and the Contract as a whole notwithstanding the fact that not every such necessary operation is mentioned or included specifically for measurement.
2. For each item include all of the following as required where individual quantities are not provided in the Tender Form: permitting and/or permissions in accordance with requirements of Authorities having jurisdiction, mobilization, demobilization, site offices, traffic control, coordination with all utilities, environmental protection, protection of existing trees, site grading, sheeting, cofferdams, temporary works, temporary watercourse control and diversion, protection and supporting of existing services, dust control (including supply, application and maintenance of dust control measures to reduce dust from escaping the site, such as regular use of a water truck, application of calcium, temporary asphalt, etc., as well as cleaning and mitigation measures in the immediately impacted areas), control of water and runoff, removal and disposal of existing infrastructure (as required or as noted on drawings, including supply of documentation regarding disposal at an approved off-site facility), protective coating, adjustments of frames, covers, grates and valve boxes, reinstatement exploratory or advance investigations, relocation of existing infrastructure where required, support of power/communication poles and guys where required (including design), testing, field records and survey, supply of record and O&M information, painted markings, protection of open excavation using concrete jersey barriers or fence barriers as per Nova Scotia Department of Labour Guidelines, repairs to pavement, temporary steel plates if required (including design by a Professional Engineer licensed in Nova Scotia, supply, installation and incidentals), commissioning and operator training and all incidentals.

Working in proximity to utility lines (clearance), hydro-excavation around live mains, trench boxes, preconstruction survey of existing site features, solution for working around existing mature trees, import of material, flowable fill, asphalt and concrete saw cutting, prime coat, reinstatement tape, temporary pavement markings.

In paved areas within the Public Right of Way, include backfilling up to and

including base lift of asphalt (including full depth gravels and base asphalt) as outlined on the drawing reinstatement details, and reinstatement of all disturbed surfaces to HRM standards.

In areas outside of the roadway, all items include reinstatement and restoration to minimum standards as indicated on the Drawings or better, but not less than the preconstruction condition.

3. Additionally, for water main, sanitary sewer, pressure sewer, and storm sewer, include all of the following as required by the Project Documents where individual quantities are not provided in the Tender Form: clearing, grubbing, common excavation, shoring, dewatering, geotextile, bedding, backfilling, compaction, disposal of surplus materials, joint restraints, thrust blocks, thrust anchors, anodes, insulation, temporary bypassing for sanitary and storm works, V-Bio polyethylene encasement, flushing, pressure testing, vacuum testing, mandrel testing, disinfection, chlorination/de-chlorination, anticorrosion petrolatum paste, tape, and mastic, cleaning, closed circuit television inspections, marker stakes, marker tape, tracer wire, and test stations, repair of all existing water and sewer service laterals that are damaged during construction to existing conditions or better.
4. All measurement shall be along a horizontal plane unless otherwise indicated.
5. The numbers of the items described below correspond to the numbers of the items in Section 00 41 43, subsection 1.4 - Schedule of Quantities and Unit Prices.
6. Halifax Water will retain a materials testing engineer for quality assurance of materials placed on site. Halifax Water will pay for this service with the exception of re-testing due to failed materials test results. Any additional costs incurred by Halifax Water due to failed materials test results will be back charged to the Contractor.
7. Provisional items shall mean that the unit price as tendered shall be included in the estimated Contract Price and that the Owner reserves the right to delete all or portions of this item from the estimated Contract Price.
8. Where required, each item to include all items necessary to maintain traffic control as per the Nova Scotia Temporary Workplace Traffic Control Manual, Current Edition, all other applicable local specifications, and the Contract Documents.
9. Where required, each item to include all items necessary for all work that affects removal, securing and reinstatement of utility poles, streetlights, underground wiring/conduit, gas mains, guardrail, stairs, and walls including coordination with infrastructure owner.

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**EARTHWORK**

.1 Clearing

Unit of Measurement: hectare (ha)

Method of Measurement: slope measure of indicated area.

This item includes: cutting and disposal of all trees and brush from areas indicated.

.2 Grubbing

Unit of Measurement: hectare (ha)

Method of Measurement: slope measure of indicated area.

This item includes: removal and disposal of all stumps, roots, downed timber, embedded logs, rootmat, and humus from areas indicated. Excavation and disposal of topsoil is included, if individual quantity not provided.

.3 Mass Excavation and Embankment – Common

Unit of Measurement: cubic metre (m<sup>3</sup>) of cut

Method of Measurement: surface-to-surface volume method between topographical survey taken after grubbing and topsoil removal and lines and elevations indicated.

This item includes: excavation, placement and compaction to lines and elevations indicated, and disposal of surplus or unsuitable material.

.4 Mass Excavation and Embankment – Rock

Unit of Measurement: cubic metre (m<sup>3</sup>) of cut

Method of Measurement: surface-to-surface volume method between topographical survey taken after rock is exposed and lines and elevations indicated. Boulders greater than one cubic metre will be classified as rock. Boulders removed from the excavation shall be measured along the three maximum perpendicular axes.

This item includes: rock breaking, drilling and blasting, excavation, placement and compaction to lines and elevations indicated, and disposal of surplus or unsuitable material.

.5 Mass Excavation – Unsuitable Material

Unit of Measurement: cubic metre (m3)

Method of Measurement: truck measure or surface-to-surface volume method between topographical survey taken before and after excavation of unsuitable material.

This item includes: all excavation of unsuitable material and disposal. Written authorization of Engineer required.

.6 Borrow

Unit of Measurement: cubic metre (m3)

Method of Measurement: surface-to-surface volume method between topographical survey taken before placement of borrow and lines and elevations indicated.

This item includes: supply, placement and compaction.

.7 Breaking Mass Rock without Removal

Unit of Measurement: cubic metre (m3)

Method of Measurement: surface-to-surface volume method between topographical survey taken after rock is exposed and lines and elevations indicated excluding the volume of mass excavation.

This item includes: breaking of rock to the size indicated, and excavation and backfilling test holes

.8 Reserved

.9 Reserved

.10 Reserved

**WATER MAIN**

.11 Pipe

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through fittings, valves and valve chambers.

This item includes: removal and disposal of existing water main pipe within or partially within theoretical trench, supply and installation of pipe complete with all fittings.

.12 Fire Hydrants

Unit of Measurement: each (ea)

This item includes: supply and install of hydrant complete with lead, anchor tee, valve and valve box, connection of new hydrant lead to the new transmission main, reinstatement and stabilization of area around hydrant, permanent reflective marker, painting of hydrant, and installation of hydrant extensions (as required).

Includes removal of existing hydrant to be returned to Halifax Water. If new hydrant location does not match existing, includes capping of the existing lead and filling with flowable grout, and disconnection and installation of mechanical joint plug at the existing connection to the existing main.

.13 Valve Chambers

Unit of measurement: each (ea)

This item includes: valve chamber as indicated, including all auxiliary piping, valves, drains, insulation, grouting, miscellaneous metals and other incidentals.

.14 Direct Buried Valves

Unit of Measurement: each (ea)

This item includes: supply and install direct buried valve complete with valve box, appurtenances.

.15 Water Services

.1 Reconnect Existing Water Services

Unit of Measurement: each (ea)

This item includes: saddle as required, tapping, corporation stop, service pipe (if required), couplings (if required), and coordination with homeowner. For large services, greater than 50mm diameters this item shall include tee, valve and fittings. One coupling will be permitted to connect to existing lateral.

.2 Replace Existing Water Service (Lead Service) – Public

Unit of Measurement: each (ea)

This item includes: supply and installation of service pipe (to any length) and fittings from the main to curb stop, removal and disposal of existing pipe within or partially within theoretical trench, saddle as required, tapping, corporation stop, curb stop, tee, gate valve as required, service box (c/w finish grade adjustment), and coordination with homeowner. For large services, greater than 50mm diameter, this item shall include fittings and couplings.

Item includes solution for working around existing trees (such as hydro excavation, directional drilling, pipe bursting, etc.). Lateral locations shown on the drawings are approximate in nature and are to be reviewed and confirmed in the field during construction. Installation either open trench or directional drill. If directional drilling, this item also includes access pits and directional drilling.

Note: this item does not cover repair or replacement of services damaged during construction, which shall be at the expense of the Contractor.

.3 Replace Existing Water Service (Lead Service) - Private

Unit of Measurement: each (ea.)

This item includes: supply and installation of service pipe (to any length) and fittings from the curb stop to within the building, removal and disposal of existing pipe within or partially within theoretical trench, service entry to buildings, isolation valve at meter, connection to existing meter, associated restoration and waterproofing at the entry point, saddle as required, tapping, corporation stop, curb stop, tee, gate valve as required, service box (c/w finish grade adjustment), and coordination with homeowner. For large services, greater than 50mm diameter, this item shall include fittings and couplings.

Item includes solution for working around existing trees or infrastructure (such as hydro excavation, directional drilling, pipe bursting, etc.). Lateral locations shown on the drawings are approximate in nature and are to be reviewed and confirmed in the field during construction. Installation either open trench or directional drill. If directional drilling, this item also includes access pits and directional drilling.

Note: this item does not cover repair or replacement of services damaged during construction, which shall be at the expense of the Contractor.

.16 Connections to Existing Mains

.1 Transmission Main

Unit of Measurement: Lump Sum (L.S.)

This item includes: locating existing mains, cutting and removal of pipe section, removal and disposal of existing piping, supply and installation of all pipe as indicated, nipples, couplings, reducers, bends, fittings, gaskets, caps, concrete sidewalk, and landscaping. This item also includes producing and distributing temporary shutdown notices to affected customers and providing traffic control for Halifax Water Operation to facilitate the shutdown.

Item also includes exploratory investigation including excavating to the underside of existing pipes using hydrovac methods, measurement of pipe or fittings, backfilling, reinstatement, and traffic control.

.2 Intersections

Unit of Measurement: Lump Sum (L.S.)

This item includes: locating existing mains, cutting and removal of pipe section, removal and disposal of existing piping, supply and installation of nipples, couplings, reducers, fittings, bends, gaskets, caps, tapping sleeves, concrete sidewalk, landscaping. This item also includes producing and distributing temporary shutdown notices to affected customers and providing traffic control for Halifax Water Operation to facilitate the shutdown.

Item also includes exploratory investigation including excavating to the underside of existing pipes using hydrovac methods, measurement of pipe or fittings, backfilling, reinstatement, and traffic control.

.17 Corrosion Protection

.1 Zinc Anodes

Unit of Measurement: each (ea)

This item includes: zinc anodes, wire, and accessories.

.2 Polyethylene Encasement

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through fittings and valves.  
This item includes: polyethylene tube or sheet and tape.

.18 Temporary Water



Unit of Measurement: lump sum (LS)

This item includes: supply of all labour, material and equipment required for installing, maintaining and removing temporary main line (min 50mm) and service laterals complete with valves, pipe, backflow prevention device, meter (supplied by Halifax Water), temporary pressure reducing valves (to match temporary main size), vacuum breakers at the connection to homes, road cuts and temporary asphalt if required, testing and disinfection, and reinstatement as required. All pipe must be disinfected in accordance with Halifax Water Supplementary Standard Specification Water Mains, Section 33 11 00 (Part 3). Coordinate connection to homes with homeowners. Limits of temporary water service may extend outside the limits of construction. Larger temporary lines may be required to ensure that an adequate supply of water is provided to all customers. Submit a proposed plan two (2) weeks prior to installation for review by Halifax Water. This item also includes installation of approved vehicle and pedestrian crossing protective measures, frost protection as required, producing and distributing notice to customers that will be placed on temporary water and/or affected by shutdowns to facilitate temporary connections to the main.

.19 Water Main Protection

.1 Rigid Insulation

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: area along center line of pipe.

This item applies to main line pipe only (Item 11 - Watermain Pipe).

This item includes: supply and install 50 mm H140 rigid insulation as directed by the engineer.

.20 Watermain Abandonment In-Place

Unit of Measurement: metre (m)

Method of Measurement: area along center line of pipe

This item includes: locating existing watermain, abandonment of pipe in place complete with filling of the pipe with flowable grout and supply and placement of caps at pipe ends such that they are completely full of grout and water tight, common excavation, backfilling and reinstatement as required to complete the work as indicated on the drawings.

.21 Gravity Pipe

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through manholes.

This item includes: removal and disposal of existing gravity pipe within or partially within theoretical trench, supply and installation of pipe, complete with all fittings.

.22 Pressure Pipe

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through fittings.

This item includes: removal and disposal of existing pressure pipe within or partially within theoretical trench, supply and installation of pipe, complete with all fittings.

.23 Manholes

Unit of Measurement: each (ea)

This item includes: manhole, frame, cover, grout, and grade adjustment.

.24 Sanitary Services

.1 Sewer Lateral Reconnection to Existing

Unit of Measurement: metre (m)

This item includes: supply and installation of pipe complete with all fittings, removal and disposal of existing pipe, approved fittings at connection points, connection to existing lateral and coupling, coordination with homeowner, exploratory hydro-excavation/investigation to locate existing pipe, concrete sidewalk and landscaping.

Lateral locations shown on the drawings are approximate in nature and are to be reviewed and confirmed in the field during construction. One coupling will be permitted to connect to existing lateral.

Note: this item does not cover repair or replacement of services damaged during construction, which shall be at the expense of the Contractor.

.2 Sewer Lateral Replacement

Unit of Measurement: each (ea.)

This Item includes: at the direction of the engineer - supply and installation of pipe complete with all fittings between the main and the property line, removal and disposal of existing pipe, approved fittings at connection points, connection to existing lateral and coupling, coordination with homeowner, exploratory hydro-excavation/investigation to locate existing pipe, concrete sidewalk, and landscaping.

Lateral locations shown on the drawings are approximate in nature and are to be reviewed and confirmed in the field during construction. One coupling will be permitted to connect to existing lateral.

Note: This item only applies to service replacements at the direction of the Engineer. This item does not cover repair or replacement of services damaged during construction, which shall be at the expense of the Contractor.

.25 Connections to Existing Main

Unit of Measurement: each (ea)

This item includes: locating existing line or structure, and supply and installation of all fittings or manhole as indicated.

.26 Closed Circuit Television Inspection

.1 Main

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through manholes.

This item includes: closed circuit television inspections before and after construction, records and reports. Includes video inspection of all existing combined sewer mains within the project limits. CCTV inspections are to be completed before work commences and after all excavation for water main and sanitary and storm services are complete, and roadway is graveled and compacted for water main pressure test. Copy of CCTV inspection and report shall be provided to Halifax Water for review prior to placement of asphalt.

.27 Pumping Station

Unit of Measurement: Lump Sum (LS)

This item includes: supply, installation, and commissioning of pumping station in accordance with Project Documents.

.28 Removal of Existing Structures

Unit of Measurement: Each or metre (m)

Method of Measurement: number of structures removed or horizontal measurement of pipe.

This item is intended for removal of pipes/structures that are outside of the theoretical trench or excavation limits for new pipes/structures and includes: locating existing pipe or structure, excavation, disposal, replacement of required volume with select material, backfilling, and reinstatement up to and including Type 2 gravels as specified. This item also includes capping of all remaining pipes or plugging of holes in structures and delivery of removed items as specified.

.29 Reserved.

.30 Reserved.

## **STORM SEWER**

.31 Pipe

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through manholes.

This item includes: removal and disposal of existing pipe within or partially within theoretical trench, supply and installation of pipe, complete with all fittings.

.32 Manholes

Unit of Measurement: each (ea)

This item includes: manholes, frame, cover, grout, and grade adjustment.

.33 Catch Basins

.1 Installation of Catch Basins

Unit of Measurement: each (ea)

This item includes: Removal and disposal of existing catch basin, granular base, backfilling supply and placement of catch basins as indicated and in accordance with Standard Detail HWSD – 1570 or as otherwise indicated on

the drawings, including all pipe connections as indicated, insulation, adjustment to finished grade. Includes backfilling including full depth gravels, concrete sidewalk, and landscaping.

Note: This item only applies to catch basin replacements at the direction of the Engineer. This item does not cover repair or replacement of catch basins damaged during construction, which shall be at the expense of the Contractor.

.34 Catch Basin Leads

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe from centre of catch basin to centre of main sewer, centre of manhole, or termination point indicated.

This item includes: supply and placement of pipe complete with all fittings, removal and disposal of existing infrastructure within or partially within theoretical trench, connections to existing mains/structures/incoming pipes including couplings, reducers, gaskets, coring into existing structures if required, grouting, testing.

.35 Storm Water Services

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe from centre of main to termination point indicated.

This item includes: pipe complete with all fittings.

.36 Connections to Existing Main

Unit of Measurement: each (ea)

This item includes: locating existing line or structure and supply and installation of all fittings, catch basin, or manhole as indicated.

.37 Culverts

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe.

This item includes: pipe, excavation and backfilling, pipe bedding, and pipe screens as indicated.

.38 Closed Circuit Television Inspection

Unit of Measurement: metre (m)

Method of Measurement: along centreline of pipe through manholes.

This item includes: CCTV inspections, deflection testing, records and reports. CCTV inspection is to be completed after all excavation for water main and sanitary and storm services are complete, and roadway is graveled and compacted for water main pressure test. Copy of CCTV inspection and report shall be provided to Halifax Water for review prior to placement of asphalt. Contractor to conduct two CCTV inspections 1) post construction, as referenced above, and 2) prior to the end of warranty period of two years.

.39 Headwall

Unit of Measurement: each (ea)

This item includes: headwall including excavation, backfilling, bedding, and grate as indicated.

.40 Reserved.

**STREET CONSTRUCTION**

.41 Gravels

Unit of Measurement: tonne (t) or square metre (m<sup>2</sup>)

Method of Measurement: scale tickets signed by Engineer or slope measure of indicated area at specified mean depth.

This item includes: supply, placement, and compaction of gravel as indicated.

.42 Prime

Unit of Measurement: square metre (m<sup>2</sup>) or litre (L)

Method of Measurement: slope measure of indicated area or by volume. This item includes: supply and application.

.43 Asphalt Concrete

.1 Full Road Width Top-Lift Asphalt

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: slope measure of indicated area.

This item includes: cleaning, supply, placement and compaction as indicated including tack coat, reinstatement tape, and saw cutting as necessary, adjustment of adjustable frames and cover to finished grade and reinstatement to match existing.

.2     Asphalt Milling (Outside of Trench)

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: slope measure of indicated area.

This item includes supply of all necessary materials, labour and equipment required for milling outside of excavation areas, including delivery of all milled material to the Contractors location of choice, sweeping milled surfaces prior to tacking. Contractor to maintain road safety after milling and prior too paving, includes protection of valves and manholes, connection to existing asphalt with ramp.

.44     Curb

Unit of Measurement: metre (m)

Method of Measurement: along top face of curb.

This item includes: curb, including supply and placing of base gravels and backfill as indicated.

.45     Sidewalk

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: slope measure of indicated area.

This item includes: sidewalk, including supply and placing of base gravels and backfill as indicated.

.46     Tactile Walking Surface Indicators

Unit of Measurement: each (ea)

This item includes: supply and installation of tactile walking surface indicators.

.47 Gabions

Unit of Measurement: cubic metre (m<sup>3</sup>) Method of Measurement: volume in place.

This item includes: excavation, foundation preparation, supply and installation of gabion baskets, stone fill, geosynthetic, and backfilling.

.48 Guardrail

Unit of Measurement: metre (m)

Method of Measurement: along the top of rail through posts.

This item includes: excavation, supply and placing posts, rail, and accessories.

.49 Adjust Existing Valve Box Covers

Unit of Measurement: each (ea)

This item includes: raising or lowering existing valve box covers to grades indicated.

.50 Adjust Existing Manhole Frames and Covers

Unit of Measurement: each (ea)

This item includes: raising and lowering existing frames and covers to grades indicated.

.51 Adjust Existing Catch Basin Frames and Covers

Unit of Measurement: each (ea)

This item includes: raising and lowering existing frames and covers to grades indicated.

.52 Segmental Retaining Walls

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: total area of wall face including buried portion.

This item includes: excavation, installation of foundation preparation, supply and installation of modular wall units, geotextile, guards, drainage, infill soil, and backfilling.



.53 Reserved

.54 Reserved

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.58 Reserved

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.60 Reserved

## **LANDSCAPING**

.61 Topsoil and Sod

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: slope measure of indicated area at mean depth.

This item includes: supply and placing of topsoil, lime and fertilizer, sod, required accessories, and maintenance.

.62 Topsoil and Seed

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: slope measure of indicated area at mean depth.

This item includes: supply and placing of topsoil, lime, fertilizer, mulch, erosion control agent, seed, and maintenance.

.63 Tree Removal

Unit of Measurement: each (ea)

This item includes: mass excavation and embankment – common, removal and disposal of all trees including stumps and roots (to size indicated) as indicated on plan,

backfill, and all reinstatement. Tree diameter shall be measured at 1.3 m from the ground.

Tree removal should be completed prior to April 15 or succeeding August 31. If this is not possible, a Migratory Bird Assessment shall be required, and the Contractor must provide the HRM Engineer with 48-hour notice prior to any work being conducted.

.64 Chain Link Fences and Gates

Unit of Measurement: metre (m)

Method of Measurement: along top of fence fabric through posts.

This item includes: excavation and backfill, supply and placing concrete footings, posts, rails, gates, fabric, fittings, and accessories.

.65 Interlocking Concrete Pavers

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: slope measure of indicated area at mean depth.

This item includes: excavation, pavers, edge restraint, geotextiles, bedding, and joint filler.

.66 Tree Trimming

Unit of Measurement: Lump Sump (LS)

This item is for tree trimming required for street construction only and includes: the careful trimming and pruning of trees and brush by a certified arborist. Trimming over sidewalks shall be to a maximum of 4.6 m and trimming over roadways to a maximum of 6 m unless otherwise directed by the Engineer. Trimming of branches greater than 7.6 cm in diameter shall be approved by the HRM Urban Forester. Confirm tree trimming and pruning locations with the HRM Representative prior to construction.

All tree trimming and pruning should be completed prior to April 15 or succeeding August 31. If this is not possible a Migratory Bird Assessment shall be required, and the Contractor must provide the HRM Engineer with 48-hour notice prior to any work being conducted.

.67 Reserved

.68 Reserved

.69 Reserved

.70 Reserved

### **ADDITIONAL ITEMS**

.71 Trench Excavation - Rock

Unit of Measurement: cubic metre (m<sup>3</sup>)

Method of Measurement: Average end area method between changes in rock cross section based on surveyed measurements in the field. Dimensions used to calculate end areas shall be theoretical payment trench width as detailed on the contract drawings, and depth from surface of rock as exposed on sides of trench after excavation to bottom of specified bedding for each pipe in trench. No additional volume will be allowed for excavation beyond the theoretical trench width or depth required for the valves, bends, and thrust blocks, manholes, structures, etc. Where existing infrastructure is present within the excavation zone, the volume occupied by the existing trench as surveyed in the field will be deducted from the rock volume calculated.

Boulders larger than one-half cubic metre (0.5 m<sup>3</sup>), any portion of which is within theoretical trench, will be classified as rock. Boulders removed from trench shall be measured along the three maximum perpendicular axes. Shatter material will not be classified as rock.

This item applies to main line pipe only (Item 11 - Watermain Pipe).

This item includes: all incremental work for rock excavation and disposal of surplus material over and above cost of common excavation which is included in price for pipe and related items. Also includes replacement of required volume with select material. Excludes disposal of Pyritic Slate Rock which is covered by Item 76.

.72 Trench Excavation - Unsuitable Material

Unit of Measurement: cubic metre (m<sup>3</sup>)

Method of Measurement: Average end area method based on surveyed measurements in the field.

Dimensions used to calculate end areas shall be theoretical trench width as detailed on the Contract Drawings. No additional volume will be allowed for excavation beyond the theoretical trench width or depth required for the valves, bends, thrust blocks, manholes, structures, etc. Where existing infrastructure is present within the excavation zone, the volume occupied by the existing infrastructure as surveyed

in the field will be deducted from the volume calculated.

This item includes: all excavation of unsuitable material over and above cost of common excavation which is included in price for pipe and related items, including disposal. Also includes replacement of required volume with Type 2 gravel or surge rock. Written authorization of Engineer required.

.73 Replacement of Unsuitable Material with Selected Site Material

Unit of Measurement: cubic metre (m<sup>3</sup>)

Method of Measurement: surface-to-surface volume method between topographical survey taken before the placement and compaction of select site material and the lines and elevations indicated.

This item includes: placing and compacting selected site material in locations where unsuitable material has been excavated. Written authorization of Engineer required.

.74 Topsoil Excavation

Unit of Measurement: cubic metre (m<sup>3</sup>)

Method of Measurement: surface-to-surface volume method between topographical survey taken before and after stripping topsoil.

This item includes: stripping and stock-piling or disposal of topsoil as directed.

.75 Breaking Trench Rock without Removal

Unit of Measurement: cubic metre (m<sup>3</sup>)

Method of Measurement: surface-to-surface volume method between topographical survey taken after rock is exposed and theoretical trench dimensions as indicated in Section 39 00 00 - Standard Detail 01 22 00 - 01.

This item includes: breaking of rock to size indicated and excavation and backfilling test holes.

.76 Disposal of Pyritic Slate Rock

Unit of Measurement: cubic metre (m<sup>3</sup>)

Method of Measurement: Average end area method between changes in rock cross section based on surveyed measurements in the field. Dimensions used to calculate end areas shall be theoretical payment trench width as detailed on the contract

drawings, and depth from surface of rock as exposed on sides of trench after excavation to bottom of specified bedding for each pipe in trench, where Geotechnical Engineer inspects and tests rock and determines it to be pyritic slate. No additional volume will be allowed for excavation beyond the theoretical trench width required for the valves, bends, and thrust blocks, etc. Where existing infrastructure is present within the excavation zone, the volume occupied by the existing trench as surveyed in the field will be deducted from the volume calculated.

This item includes: Removal and disposal Plan (including testing schedule, stockpiling and protection measures as required), removal from the project site, disposal, required testing, permits and approvals, storage and protection if required, and any tipping fees for pyritic slate at approved disposal sites; as approved by the Nova Scotia Department of Environment (the Contractor will assume all risk associated with the disposal of the pyritic slate).

.77 Reserved.

.78 Reserved.

.79 Reserved.

## **ENVIRONMENTAL PROTECTION**

.80 Silt Fence

Unit of Measurement: metre (m)

Method of Measurement: along top of fence fabric through stakes.

This item includes: supply, installation, maintenance, and removal including stakes and fabric.

.81 Flow Checks

Unit of Measurement: each (ea)

This item includes: supply, installation, and removal.

.82 Straw or Hay Cover

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: slope measure of indicated area.

This item includes: supply, installation, minimum thickness 50 mm, and maintenance until exposed soil has stabilized.

.83 Gravel Cover

Unit of Measurement: square metre (m<sup>2</sup>)

Method of Measurement: slope measure of indicated area at specified mean depth.

This item includes: supply, installation, and maintenance.

.84 Soaker Bags

Unit of Measurement: each (ea)

This item includes: supply, maintenance, and removal.

.85 Diversion Ditches

Unit of Measurement: metre (m)

Method of Measurement: along the centreline of ditch to the lines and elevations shown on the Project Drawings.

This item includes: laying out grades and lines, excavation, and lining as required.

.86 Rip Rap and Armour Stone

Unit of Measurement: tonne (t) or square metre (m<sup>2</sup>)

Method of Measurement: scale tickets signed by Engineer or slope measure of indicated area at specified mean depth.

This item includes: supply and installation.

.87 Bark or Wood Chips

Unit of Measurement: square metre (m<sup>2</sup>)

This item includes: supply and installation, minimum thickness 50 mm, and maintenance until the exposed soil has stabilized.

.88 Silt Curtain

Unit of Measurement: metre (m)

Method of Measurement: along top of curtain through floatation devices. This item includes: supply, installation, maintenance, and removal.

.89 Reserved

### **CONTINGENCY ALLOWANCE**

No payment will be made under this item unless authorized by Engineer.

Expenditures under the contingency allowance shall be authorized in accordance with Part 6, CHANGES - in the General Conditions.

**END OF SECTION**