CONSTRUCTION SPECIFICATION FOR UTILITY ADJUSTMENTS

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TS 4.50.01 SCOPE

This Specification covers the requirements for the adjustment of all utilities, including catch basins, maintenance holes, valve boxes and water chambers.

TS 4.50.02 REFERENCES

This Specification refers to the following specifications and publications:

Ontario Provincial Standard Specifications, Construction

OPSS 180	-	Management and Disposal of Excess Material	(Jan. 1994)
OPSS 919	-	Formwork and Falsework	(Jan. 1995)

City of Toronto Specifications

TS 3.40	-	Construction Specification for Concrete Road Base	(June 2001)
TS 4.00	-	Construction Specification for Catch Basins and Catch Basin Connections	(June 2001)
TS 13.00	-	Specification for Non-Structural Concrete	(June 2001)
TS 501	-	Amendments to OPSS 501 – Construction Specification for Compacting	(June 2001)
TS 1010	-	Amendments to OPSS 1010 – Material Specification for Aggregates – Granular A, B, M, and Select Subgrade Material	(June 2001)

Canadian Standards Association

CAN/CSA A82.1-M87 (R1999)	-	Burned Clay Brick (Solid Masonry Units Made From Clay or Shale)	(Current Edition)
CAN3-A82.2-M78	-	Methods of Sampling and Testing Brick	(Current Edition)

TS 4.50.03 DEFINITIONS – Not Used

TS 4.50.04 SUBMISSION AND DESIGN REQUIREMENTS

TS 4.50.04.01 General

Any required submissions shall be in writing. All submissions shall be submitted to the Commissioner at least three weeks prior to the beginning of the work.

The requirements for submissions and design requirements are given in TS 3.40.

TS 4.50.05 MATERIALS

TS 4.50.05.01 Supply of Materials

Unless otherwise specified in the Contract, the Contractor shall supply all materials necessary for the execution and completion of the work.

TS 4.50.05.02 Granular Material

All granular material shall be Granular 'A' and shall meet the requirements of TS 1010.

TS 4.50.05.03 Concrete

Concrete shall be as specified in TS 3.40 for concrete road base.

TS 4.50.05.04 Precast Adjustment Units

Adjustment units for maintenance holes and catch basins shall be approved precast adjustment units.

Approved precast adjustment unit tape shall be used between the units. The tape shall be stored in a dry location where the temperature does not exceed 25°C or falls below 10°C. Any such tape that experiences temperatures outside the above range shall not be used.

TS 4.50.05.05 Adjustment Bricks

Bricks shall be of hard, dense, thoroughly burnt clay and shall meet the requirements of CAN/CSA A82.1-M87 (Type FBS). They shall be of compact texture, free from injurious cracks or checks and shall be free from stones, pebbles and organic impurities. The sides, ends, and faces shall be plane surfaced, at right angles and parallel to each other.

Bricks shall not be less than 57 x 95 x 203 mm nor more than 76 x 102 x 216 mm. Minimum compressive strength shall be 20 MPa and absorption shall not exceed 15% as determine by CAN3-A82.2-M78.

Concrete bricks shall **not** be used.

TS 4.50.05.06 Cement Mortar

Cement mortar shall consist of three parts sand and one part Portland Cement meeting the requirements of OPSS 1004 for mortar sand, except that the gradation shall be as follows:

Sieve Number	Per Cent Passing
2.36 mm	100
300 µm	15-40
150 µm	0-10
75 µm	0-5

TS 4.50.06 EQUIPMENT

TS 4.50.06.01 Forms

Forms shall be of steel, wood or metal plate and shall meet the requirements of OPSS 919. They shall be of sufficient cross section and strength, and secured so as to resist the pressure of the concrete when placed, and the impact and vibration of any construction equipment they support without springing or settlement.

Forms shall be cleaned and coated with form oil before each use.

TS 4.50.07 CONSTRUCTION

TS 4.50.07.01 General

The Contractor shall adjust all water services, raise or lower tops of all maintenance access units and other related castings, gratings and appurtenances within the area of work, to the required grade, providing for the transverse and longitudinal slope of the finished surface. The tolerance from the plane of the finished pavement shall not exceed ± 3 mm when tested with a 3 m straightedge.

In some cases, appurtenances owned by private utility companies shall not be adjusted by the Contractor; such work shall be performed by the utility company concerned under arrangement by the Contractor. The Contractor shall assist by excavating to the edge of the appurtenances and indicating the required grade of the new road for adjustment.

Prior to the adjustment of any maintenance hole or valve chamber frame and cover, etc. the Contractor shall contact the owner and make arrangements to pick up any new frames and covers, valve boxes, etc. required to replace old, worn, or broken equipment. The Contractor shall assume that all frame and covers, valve boxes, etc. shall require replacing, unless directed by the Commissioner, in writing. The Contractor is responsible for coordinating with the owners for the supply all of the necessary material, as the staging dictates. No additional payment will be made for any delays or extra work associated with the unavailability of material or for the restocking or returning of new material that was not used.

Frame and covers requiring replacement will generally be worn smooth, cracked or have covers sitting below frame rims.

The contractor shall also be responsible for the delivery to the owners' yards of old frames and covers equal to the number of new frames and covers originally received.

The owner shall be notified, by the Contractor, 48 hours prior to removal of any frame and cover.

At least two weeks prior to the commencement of any adjustment work, the contractor shall notify the Commissioner as to how many frames and appurtenances will receive replacement. This information shall be reviewed jointly by the contractor and the Commissioner. All appurtenances within the contract limits shall be reset or receive adjustment.

The contractor shall remove all frames that require adjusting, being careful not to damage that part of the structure that is to remain.

If the adjustment is by 500 mm or less, brick and mortar or precast concrete adjustment units shall be used. If the frame is to be raised more than 500 mm, poured concrete shall be used with one or two courses of brick or precast concrete adjustment units immediately below the frame.

Extensions made of poured concrete shall have a wall thickness of 225 mm and the concrete shall conform to TS 4.00.

Where adjustment requires the lowering of the frame, the contractor shall break out the concrete or masonry to the required level and seat the frame on a 12 mm mortar levelling pad.

For all adjustments, the remaining concrete, masonry and mortar shall be sound and solid, with no loose or separated joints or cracks.

All maintenance holes, catch basins, utility chambers, water chambers, valve boxes, etc. within the contract limits, whether they were adjusted or not, shall be thoroughly cleaned of debris prior to the completion of the contract, regardless of the source of the debris. The debris shall be disposed of off the site at the Contractor's expense, in accordance with OPSS 180.

All utilities are to be cleaned without any disruption to the normal flows. Under no circumstances shall the Contractor divert, block or interrupt the flow in the storm or sanitary sewers, by pumping or any other action. If the debris is such that it constitutes any impedance or blockage to normal flows or cannot be removed without diverting the flow by pumping or further interference with normal flows, the Contractor shall immediately advise the Commissioner who will seek assistance of the department with the responsibility for maintenance and operation of the sewer and its appurtenances. In the absence or unavailability of the Commissioner, the Contractor may directly contact the emergency section of the appropriate department for assistance. In either case, the Contractor shall provide whatever equipment and assistance necessary to facilitate actions by the operating department to overcome the difficulties, including providing and clearing a separate, clearly defined work area for the forces of the operating department.

TS 4.50.07.02 Precast Concrete Adjustment Units

TS 4.50.07.02.01 General

The use of precast modular concrete units for the adjustment of catch basins, maintenance holes, and valve chambers shall be permitted provided the following conditions are met:

(a) All existing bricks are removed.

(b) The walls are in sound condition or have been properly repaired using concrete material.

(c) The precast concrete units are fully and uniformly supported on the top of the walls of the catch basin, maintenance hole or valve chamber.

(d) The precast modular concrete units shall have reinforcing and be parallel faced.

(e) No cracked, broken or chipped units will be accepted.

Where adjustment to the chamber tops, of water valves or sewer chambers, is necessary, or if the chamber is constructed entirely of brick, only hard red clay sewer bricks shall be used.

TS 4.50.07.02.02 Installation Procedure

The foundation on which the adjustment units are to be placed must be sound and solid, with no loose or separated joints or cracks.

The installation of the adjustment units shall be as follows:

- A 10 to 15 mm layer of mortar shall be placed to level the top of the maintenance hole or catch basin. The adjustment units shall sit level. Adjustments for grade and slope are to be made on the final layer of mortar.

- The first unit shall be set upside down (feet up) on the levelling layer of mortar.

- For stepped maintenance holes, the Contractor shall place step units in proper sequence to provide the correct distance between steps, and be sure to set the first unit in the correct orientation so that the steps line up vertically.

- The Contractor shall place a continuous strip of precast adjustment unit tape sealer on the upper surface, pressing down firmly. The sealer shall be placed along the centre of the preacst adjustment unit section. The surface shall be clean and dry for the precast adjustment unit tape to adhere. The Contractor shall remove the paper backing from the precast adjustment unit tape.

- The Contractor shall place the second and subsequent units feet down, making sure that the units interlock. Precast adjustment unit tape shall be placed on each and every unit to provide a seal.

- A 3 to 15 mm layer of mortar shall be placed on the top of the final unit. The mortar shall be shaped to provide the necessary grade and slope for the frame.

- Under no circumstances, shall pebbles or broken pieces of masonry, brick or concrete be used to set frames to grade, crossfall and slope. Any adjustments completed using such material will be rejected and the units will be removed and replaced at the Contractor's expense.

TS 4.50.07.03 Adjustment Bricks

The installation of the adjustment bricks shall be as specified for the precast units, except for the following:

— No precast adjustment unit tape is required.

— All bricks shall be completely covered, on the sides adjacent to the structure, frame or other bricks, with a uniform layer of cement mortar having a thickness of 5mm. The inside face of the innermost bricks shall be fully parged with cement mortar.

TS 4.50.08 QUALITY ASSURANCE

Quality assurance for the concrete and mortar shall meet the requirements of TS 13.00.

The grade, crossfall and slope of the adjustment shall be within the specified surface tolerance of the adjacent material.

The Commissioner shall inspect all adjustments prior to the placement of the frame and cover. If the Contractor has been found to be using pebbles, broken pieces of masonry, brick, concrete or any other nonapproved methods of adjusting the utility, all adjustments to date shall be deemed to have been done in a similar fashion and therefore all adjustments shall be rejected.

Adjustments that do not meet the requirements of this specification will be rejected and shall be made good by the Contractor at his expense.

All rejected adjustments shall be completely removed to the full depth of the original adjustment, except those that have been rejected solely on the requirements surface tolerance. Adjustments rejected, based solely on surface tolerance, shall be removed only as deep as necessary to correct the situation.

If the adjustment was rejected, after the placement of the final lift of asphalt, the Commissioner may choose to leave the adjustment, as is. The cost for future repairs shall be set at $2,000.00 per rejected adjustment, which will be deducted from any monies owing the Contractor.

All costs associated with the repair of any and all rejected adjustments shall be borne by the Contractor.

TS 4.50.09 MEASUREMENT FOR PAYMENT

TS 4.50.09.01 Adjust Catch Basin, Maintenance Hole and Valve Chambers

Measurement for the above item shall be by each adjustment performed according to Table 1. Changes in height of 450 mm (measured from the top of the cover or grate) or less will be paid at the specified rate. For changes in height of more than 450 mm, the rate will be prorated based on a height of 450 mm. Measurements will be made to the nearest 10 mm increment.

TABLE 1

UTILITY	RATE
Standard frames and covers whose width or diameter of the frame is between 500 mm and 1000 mm	1
Small frames and covers whose width or diameter of the frame is less than 500 mm	$^1/_3$
Large frames and covers whose width or diameter of the frame is Larger than 1000 mm	2

TS 4.50.10 BASIS FOR PAYMENT

TS 4.50.10.01 Adjust Catch Basin, Maintenance Hole and Valve Chambers

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment, materials and incidentals to do the work. Payment shall include, but not be limited to, the removal and disposal of loose brick and material, the supplying and placing of precast or brick adjustment units, adjusting the appurtenance to final grade, the coordination of utility owners with the contract staging and the cleaning of all utility chambers, maintenance holes, valve boxes, catch basins, etc. within the contract limits.

No additional payment will be made for any interim adjustments to raise or lower the appurtenance, in order to perform the work as specified.

Payment for the hot mix asphalt shall be paid for under the appropriate contract item.

The Contractor is reminded of the penalty to be deducted for each adjustment failing to meet the specifications for surface tolerances following surface course paving. No responsibility will be accepted by the Commissioner for any appurtenance which is rejected for failing to meet the specifications for surface tolerance, the Contractor failing to identify the need for a new frame and cover, or for any other reason.