



**CONSTRUCTION SPECIFICATION FOR ADJUSTING OR  
REBUILDING MAINTENANCE HOLES, CATCH BASINS,  
DITCH INLETS, AND VALVE CHAMBERS**

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| <b>408.01</b> | <b>SCOPE</b>   |

This specification covers the requirements for adjusting or rebuilding maintenance holes, catch basins, ditch inlets, and valve chambers.

**408.02 REFERENCES**

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

**Ontario Provincial Standard Specifications, Construction**

|          |   |
|----------|---|
| OPSS 353 | Concrete Curb and Gutter Systems  |
| OPSS 402 | Excavating, Backfilling, and Compacting for Maintenance Holes, Catch Basins, Ditch Inlets, and Valve Chambers |
| OPSS 404 | Support Systems   |
| OPSS 407 | Maintenance Hole, Catch Basis, Ditch Inlet, and Valve Chamber Installation                                    |
| OPSS 490 | Site Preparation for Pipelines, Utilities, and Associated Structures  |
| OPSS 491 | Preservation, Protection, and Reconstruction of Existing Facilities   |

|          |  |
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| OPSS 492 | Site Restoration Following Installation of Pipelines, Utilities, and Associated Structures     |
| OPSS 510 | Removal  |
| OPSS 904 | Concrete Structures  |
| OPSS 920 | Deck Joint Assemblies, Preformed Seals, Joint Fillers and Joint Sealing Compounds - Structures |
| OPSS 928 | Structure Rehabilitation-Concrete Removal  |

### **Ontario Provincial Standard Specifications, Material**

|           |  |
|-----------|--|
| OPSS 1004 | Aggregates - Miscellaneous   |
| OPSS 1212 | Hot Poured Rubberized Asphalt Joint Sealing Compound   |
| OPSS 1301 | Cementing Materials  |
| OPSS 1302 | Water  |
| OPSS 1308 | Joint Filler In Concrete   |
| OPSS 1350 | Concrete - Materials and Production  |
| OPSS 1351 | Precast Reinforced Concrete Components for Maintenance Holes, Catch Basins, Ditch Inlets, and Valve Chambers   |
| OPSS 1440 | Steel Reinforcement for Concrete   |
| OPSS 1850 | Frames, Grates, Covers, and Gratings   |
| OPSS 1853 | Rubber Adjustment Units for Maintenance Holes, Catch Basins, and Valve Chambers  |
| OPSS 1854 | High Density Polyethylene (HDPE) and Expanded Polystyrene (EPS) Adjustment Units for Maintenance Holes, Catch Basins, Ditch Inlets, and Valve Chambers |

### **408.03 DEFINITIONS**

For the purpose of this specification, the following definitions apply:

**Adjusting** means changing the final grade or position of the frame with a cover or grate on an existing or new drainage structure:

- a) upwards by the addition of adjustment units,
- b) downwards by removal of existing adjustment units, regardless of the size or type of drainage structure, or
- c) lateral deviation from centreline.

**Adjustment Units** means as defined in OPSS 407.

**Drainage Structure** means as defined in OPSS 407.

**Lift Rings** means circular and rectangular pre-fabricated metal or high density polyethylene units used to adjust the elevation of the grates and covers only. They are inserted between the frame and the grate or cover.

**Rebuilding** means changing the final grade of the frame with grate or cover on an existing drainage structure:

- a) upwards by the addition of precast concrete sections or bricks and mortar or,
- b) downwards by the removal of precast concrete sections or bricks and mortar, regardless of the size or type of drainage structure.

**Steel Reinforcement** means as defined in OPSS 905.

**Valve Chamber** means as defined in OPSS 407.

**408.05 MATERIALS**

**408.05.01 Adjustment Units**

Precast concrete adjustment units shall be according to OPSS 1351.

Rubber adjustment units shall be according to OPSS 1853.

High density polyethylene (HDPE) and expanded polystyrene (EPS) adjustment units shall be according to OPSS 1854.

**408.05.02 Aluminum Safety Platforms**

Aluminum safety platforms shall be according to OPSS 1351.

**408.05.03 Bonding Agent**

Bonding agent shall be according to OPSS 904.

**408.05.04 Concrete**

Concrete for cast-in-place drainage structures shall be according to OPSS 1350 with a minimum 28-Day compressive strength of 30 MPa.

**408.05.05 Frames with Covers or Grates**

Frames with covers or grates shall be according to OPSS 1850.

**408.05.06 Grout**

Grout shall be non-shrink.

Cementing materials for grout shall be according to OPSS 1301. Sand for grout shall be mortar sand according to OPSS 1004. Water for grout shall be according to OPSS 1302. Admixtures for grout shall be according to OPSS 1303.

The workability of the grout mix shall be suitable for the application.

**408.05.07 Joint Fillers**

Joint fillers shall be according to OPSS 1308.

**408.05.08 Joint Sealing Compounds**

Joint sealing compounds shall be according to OPSS 1212.

**408.05.09 Joint Seal Systems**

Joint seal systems for precast concrete drainage structures shall be according to OPSS 1351.

**408.05.10 Mortar**

Mortar for joints shall be according to OPSS 904.

**408.05.11 Precast Concrete Components for Maintenance Holes, Catch Basins, Ditch Inlets, and Valve Chambers**

Precast units shall be according to OPSS 1351 and as specified in the Contract Documents.

**408.05.12 Steel Reinforcement**

Steel reinforcement for cast-in-place drainage structures shall be according to OPSS 1440.

**408.05.13 Steps and Ladders**

Steps shall be according to OPSS 1351.

Ladders shall be as specified in the Contract Documents.

**408.07 CONSTRUCTION**

**408.07.01 General**

The work of adjusting or rebuilding drainage structures shall:

- a) Include the removal and subsequent replacement of the frame with grate or cover.
- b) Be plumb, true to alignment and grade, and flush with adjacent finish grade of the shoulder.

During the progress of the work and until Contract Completion, all drainage structures in service shall be kept clean and free of all extraneous material.

Prior to adjusting or rebuilding a drainage structure, or the installation of a temporary frame and grate, the existing frame with cover or grate shall be carefully removed and salvaged according to OPSS 510. Suitability of the salvaged frame with cover or grate for reuse shall be determined by the Contract Administrator.

Adjustment units, frames, covers, grates, lift rings, precast concrete components, cast-in-place aprons, and joint seal systems shall be of the type specified in the Contract Documents.

All existing brickwork and mortar or adjustment units shall be removed from the top of the existing drainage structure.

When there are adjustment units on a drainage structure:

- a) There shall be a minimum of one adjustment unit on the top of the drainage structure.
- b) No more than three adjustment units are permitted on the top of the drainage structure without prior written approval from the Contract Administrator.

Adjustments shall be completed prior to placing the frame with grate or cover.

The maximum allowable total lateral deviation of catch basin covers and grates from the centreline of the drainage structure is 75 mm.

If the first step is greater than 450 mm from the adjusted cover or grate reference elevation written approval from the Contract Administrator is required.

Alterations to ladders, valve extension stems and boxes, and frost straps shall be as specified in the Contract Documents.

After adjusting or rebuilding a valve chamber, insulation shall be installed according to the manufacturer's recommendations on the roof, wall, or access way of the valve chamber when specified in the Contract Documents.

**408.07.02 Site Preparation**

Site preparation shall be according to OPSS 490.

**408.07.03 Preservation and Protection of Existing Facilities**

Preservation and protection of existing facilities shall be according to OPSS 491.

**408.07.04 Cold Weather Work**

All work shall be protected from freezing.

**408.07.05 Transporting, Unloading, and Storing and Handling**

Transporting, unloading, storing, and handling shall be according to manufacturer's recommendations. Materials that are damaged shall be rejected.

**408.07.06 Excavating, Backfilling, and Compacting**

Excavating, backfilling, and compacting for the adjustment or rebuilding of drainage structures shall be according to OPSS 402.

**408.07.07 Support Systems**

Support systems shall be according to OPSS 404.

**408.07.08 Adjusting**

**408.07.08.01 General**

The type of adjustment unit to be used shall be as specified in the Contract Documents. The different types of adjustment units are as follows:

- a) Precast concrete.
- b) High density polyethylene (HDPE) or expanded polystyrene (EPS).
- c) Rubber.

#### **408.07.08.02            Precast Concrete Adjustment Units**

Precast concrete adjustment units shall be used to set the frame with grate or cover at the required position and elevation.

A minimum of one adjustment unit, but not more than three adjustment units are required at each drainage structure to a maximum height of 300 mm.

The first adjustment unit shall be laid in a full bed of mortar and aligned with the opening in the drainage structure. Successive adjustment units shall be laid plumb to the first adjustment unit and sealed according to manufacturer's recommendations.

#### **408.07.08.03            High Density Polyethylene (HDPE) and Expanded Polystyrene (EPS) Adjustment Units**

When specified in the Contract Documents, HDPE or EPS adjustment units shall be used to set the frame with grate or cover at the required position and elevation.

A minimum of one adjustment unit is required at each drainage structure up to a maximum height of 100 mm.

HDPE or EPS adjustment units shall be installed and sealed according to the manufacturer's recommendations.

#### **408.07.08.04            Rubber Adjustment Units**

One rubber adjustment unit is used to replace the top precast concrete adjustment unit per drainage structure and shall be used in conjunction with one or two precast concrete adjustment units. More than one rubber adjustment unit may be placed when wedge shaped rubber units are used to provide slope to the frame with grate or cover. In either instance, the total height of the rubber units shall be greater than 25 mm and less than 75 mm. The rubber unit is to be placed on the precast concrete adjustment unit so it provides the surface on which the frame rests.

The rubber adjustment unit shall be bonded firmly in place on the precast concrete adjustment unit by laying a continuous strip of butyl tape on the top surface of the precast concrete unit. If more than one rubber unit is used, a continuous strip of butyl tape shall be laid between each rubber adjustment unit.

Rubber adjustment units shall not be used in conjunction with HDPE or EPS adjustment units.

#### **408.07.09                Rebuilding**

##### **408.07.09.01            Cast-In-Place Drainage Structures**

When the top of the drainage structure is to be lowered, the concrete shall be carefully removed to the elevation specified in the Contract Documents and exposed steel reinforcement shall be cut off. The upper section of the drainage structure shall then be rebuilt to its original configuration using cast-in-place concrete and steel reinforcement.

To raise the top of drainage structures with a tapered upper section, the concrete in the drainage structure shall be removed according to OPSS 928 for the entire depth of the taper. The upper section, including straight walls and taper shall then be rebuilt to the original configuration using cast-in-place concrete and steel reinforcement.

To raise the top of straight walled drainage structures, the existing roof section, if any, shall be removed.

The existing walls shall then be extended upward and the roof section rebuilt to the original configuration using cast-in-place concrete and steel reinforcement.

When cast-in-place units are to be raised or lowered with cast-in-place concrete, the top surface of all existing walls shall be roughened and a concrete bonding agent according to OPSS 904 shall be applied to the joint before the walls are extended upwards.

All inside wall projections, such as fins and bulges, shall be removed once the forms are stripped.

#### **408.07.09.02            Precast Concrete Drainage Structures**

Precast concrete drainage structures shall be installed according to OPSS 407.

#### **408.07.09.03            Catch Basin Apron**

Curb and gutter with concrete aprons on existing catch basins shall be constructed at the locations specified in the Contract Documents.

The work shall include, but not be limited to, the following:

- a) Remove existing curb and gutter and existing pavement by saw cutting to the limits shown in the Contract Documents.
- b) Construction of concrete curb and gutter shall be according to OPSS 353.
- c) Placement of concrete for concrete apron shall be according to OPSS 904.
- d) Concrete for curb and gutter and apron shall be a continuous pour.
- e) Placement of joint sealing compound and joint filler in construction joints shall be according to OPSS 920.
- f) The horizontal limits of the concrete apron shall be field-fit.

#### **408.07.09.04            Breaking into Maintenance Holes, Catch Basins, Ditch Inlets, Culverts and Sewers**

To accommodate inlet and outlet pipe installation into existing or rebuilt drainage structure, the appropriate size opening in the wall shall be constructed as specified in the Contract Documents.

Openings shall be made as necessary in an existing maintenance hole, catch basin, ditch inlet, pipe culvert, or pipe sewer to install the new pipe sewer and connect it to the drainage structure according to OPSS 407. Benching in existing maintenance holes shall be altered to accommodate the flow in the new pipe sewer system.

When specified in the Contract Documents, the opening for the connection of a subdrain outlet shall be formed by coring. The subdrain outlet pipe shall be sealed into place using grout. When specified in the Contract Documents, a 50 mm diameter weep hole shall be cored into the same wall as the subdrain connection and at the same invert elevation.

#### **408.07.10                Temporary Frame and Grate**

The installation and removal of a temporary frame and grate to the maintenance hole or catch basins shall be at the locations and of the type specified in the Contract Documents.

The temporary frame and grates shall be installed prior to opening the detour to traffic.

The maintenance holes or catch basins shall be adjusted to match the grade of the pavement required during the construction stages.

The temporary frame and grate shall be removed according to OPSS 510. The salvaged original frame and grate shall be reinstalled after the temporary frame and grate is removed.

**408.07.11 Site Restoration**

Restoration shall be according to OPSS 492.

**408.07.12 Maintenance Hole Leakage Testing**

Sanitary sewer maintenance holes and storm sewer maintenance holes shall be tested for leakage according to OPSS 407.

**408.07.13 Management of Excess Material**

Management of excess material shall be according to the Contract Documents.

**408.09 MEASUREMENT FOR PAYMENT**

**408.09.01 Actual Measurement**

**408.09.01.01 Adjusting and Rebuilding Maintenance Holes, Catch Basins, Ditch Inlets and Valve Chambers  
Catch Basin Apron  
Temporary Frame and Grate**

For measurement purposes, a count shall be made of the number of drainage structures and catch basin aprons adjusted or rebuilt, and temporary frames and grates installed.

All adjustments of an existing drainage structure including those required by construction staging and winter shutdown as specified in the Contract Documents shall count as one adjustment.

**408.09.01.02 Breaking into Maintenance Holes, Catch Basins, Ditch Inlets, Culverts and Sewers**

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

**408.09.01.03 Interim Adjustments of New Drainage Structures**

All interim adjustments of a new drainage structure required by construction staging including winter shutdown as specified in the Contract Documents shall count as one adjustment.

**408.09.02 Plan Quantity Measurement**

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



**408.10 BASIS OF PAYMENT**

- 408.10.01 Adjusting and Rebuilding Maintenance Holes, Catch Basins, Ditch Inlets and Valve Chambers - Item**  
**Breaking into Maintenance Holes, Catch Basins, Ditch Inlets, Culverts and Sewers - Item**  
**Catch Basin Apron - Item**

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

**408.10.02 Temporary Frame and Grate - Item**

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

For progress payment, 70% of the Contract price shall be paid after the installation of the temporary frame and grate. The remaining 30% of the Contract price shall be paid after the reinstallation of the existing salvaged frame and grate.