

**Amendment to OPSS 493 (Nov 2009) –
Construction Specification for
Temporary Potable Water Supply Services**

OPSS 493.07 CONSTRUCTION

OPSS 493.07.08 Flushing and Disinfecting Temporary Watermains and Services

Subsection 493.07.08 of OPSS 493 is deleted in its entirety and replaced with the following:

Flushing and disinfecting temporary watermains and services shall be according to TS 7.30.



**ONTARIO
PROVINCIAL
STANDARD
SPECIFICATION**

**METRIC
OPSS 493
NOVEMBER 2009**
(Reissued November 2010)

**CONSTRUCTION SPECIFICATION FOR
TEMPORARY POTABLE WATER SUPPLY SERVICES**

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493.01 SCOPE

This specification covers the requirements for the installation of temporary watermains, service connections, and associated appurtenances prior to disconnecting service of an existing watermain on a temporary basis.

493.01.01 Specification Significance and Use

This specification has been developed for use in provincial and municipal-oriented Contracts. The administration, testing, and payment policies, procedures, and practices reflected in this specification correspond to those used by many municipalities and the Ontario Ministry of Transportation.

Use of this specification or any other specification shall be according to the Contract Documents.

493.01.02 Appendices Significance and Use

Appendices are not for use in provincial contracts as they are developed for municipal use, and then, only when invoked by the Owner.

Appendices are developed for the Owner's use only.

Inclusion of an appendix as part of the Contract Documents is solely at the discretion of the Owner. Appendices are not a mandatory part of this specification and only become part of the Contract Documents as the Owner invokes them.

Invoking a particular appendix does not obligate an Owner to use all available appendices. Only invoked appendices form part of the Contract Documents.

The decision to use any appendix is determined by an Owner after considering their contract requirements and their administrative, payment, and testing procedures, policies, and practices. Depending on these considerations, an Owner may not wish to invoke some or any of the available appendices.

493.02 REFERENCES

When the Contract Documents indicate that provincial-oriented specifications are to be used and there is a provincial-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.PROV, unless use of a municipal-oriented specification is specified in the Contract Documents. When there is not a corresponding provincial-oriented specification, the references below shall be considered to be to the OPSS listed, unless use of a municipal-oriented specification is specified in the Contract Documents.

When the Contract Documents indicate that municipal-oriented specifications are to be used and there is a municipal-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.MUNI, unless use of a provincial-oriented specification is specified in the Contract Documents. When there is not a corresponding municipal-oriented specification, the references below shall be considered to be the OPSS listed, unless use of a provincial-oriented specification is specified in the Contract Documents.

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

Ontario Provincial Standard Specifications, Construction

OPSS 206 Grading
OPSS 441 Watermain Installation in Open Cut

CSA Standards

B64.5-07 Double Check Valve (DCVA) Backflow Preventers [Part of B64 Series-07, Backflow Preventers and Vacuum Breakers Compendium]

American Water Works Association (AWWA)

C510-07 Double Check Valve Backflow Prevention Assembly

ASTM International

D 1784-08	Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
D 2241-05	Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
D 3139-98 (2005)	Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
F 477-08	Elastomeric Seals (Gaskets) for Joining Plastic Pipe

NSF International

61-2008 Drinking Water System Components - Health Effects

493.03 DEFINITIONS

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

Associated Appurtenance means structures, devices, and appliances, other than pipe and conduit that are used in connection with a water distribution system, such as valves, hydrants, corporation cocks, services, and thrust restraints.

Excavation, Earth and Rock means the excavation classified as earth and rock according to OPSS 206.

Temporary Hydrant means temporary fire hydrant and all associated temporary appurtenances.

Temporary Potable Water Supply Services means temporary watermains, services, hydrants, and all associated appurtenances.

Temporary Services means temporary potable water supply services installed on or just below the ground surface for the purpose of providing potable water to customers while the existing watermain is out of service.

Temporary Watermain means temporary potable water supply hose or pipe installed on or just below the ground surface for the purpose of providing potable water to temporary services and temporary fire hydrants while the existing watermain is out of service.

Watermain means an installation designed for the conveyance of water under pressure using circular pipe.

493.04 DESIGN AND SUBMISSION REQUIREMENTS

493.04.01 Submission Requirements

The following information shall be submitted to the Contract Administrator 14 Days prior to the commencement of any work requiring temporary potable water supply services:

- a) Temporary potable water supply services plans including installation, operation, testing procedures, and a list of material and equipment to be used.
- b) Temporary hydrant details.

493.05 MATERIALS

493.05.01 General

The pipe size, type, and class shall be as specified in the Contract Documents.

Fittings shall be suitable for and compatible with the pipe material and class with which they are used.

All materials in contact with potable water shall be NSF/ANSI 61 compliant and, if being reused, shall have been used exclusively for potable water services in the past.

All materials shall be capable of withstanding 860 kPa pressure and all other conditions of use.

493.05.02 Temporary Potable Water Supply Services

The pipe, hose, and all other materials used in conjunction with the temporary potable water supply services shall be as follows:

- a) Flexible hose jackets shall be abrasion resistant, either double jacket or specially coated, and be capable of being driven over by vehicles periodically without short term effects.
- b) Hose lining shall be of material that does not impart any taste or odour to the water according to NSF/ANSI 61.
- c) Hose shall come complete with aluminium couplings with threads.
- d) Rigid pipe shall be made of class 12454-B PVC material according to ASTM D 1784. Material shall have a minimum hydrostatic design stress of 14 MPa.
- e) PVC shall be formulated with impact modifiers, heat stabilizers, and ultraviolet inhibitors.
- f) Pipe extrusion shall meet or exceed all requirements of ASTM D 2241.
- g) Joints and couplings shall be according to ASTM D 3139.
- h) O-rings shall be according to ASTM F 477.
- i) Double check valve backflow preventers shall be according to CSA B64.5 and AWWA C510.

493.05.03 Valves

Valves shall be according to OPSS 441.

493.05.04 Temporary Hydrants

Temporary hydrants shall be as specified in the Contract Documents.

493.07 CONSTRUCTION

493.07.01 General

Written notices to all affected property owners are required a minimum of 24 hours prior to any disruption of water service as a result of the temporary by-pass.

Temporary water services shall be connected to the temporary watermain for each single residential unit or other building.

Connection to the private plumbing system of a residential unit shall be via a wye at an outside tap. The connection of single residential units in series is not permitted. Each temporary water service shall have its own valved connection to the temporary watermain.

Connection to other buildings shall be as specified in the Contract Documents.

An adequate water supply shall be available at all times. If the temporary potable water supply service fails, it shall be restored within the time period specified in the Contract Documents.

Care shall be exercised during the installation of temporary potable water supply services to avoid contamination of the services.

No work shall be done during freezing weather, unless directed by the Contract Administrator. No temporary watermains or temporary water services shall be installed or operated during freezing weather. Pipes already in use shall be removed or drained and existing services restored when so directed by the Contract Administrator.

493.07.02 Temporary Watermains

The temporary watermain shall be of a size to provide adequate water supply during peak demand of connected users.

At any connection of a temporary watermain to the water supply and distribution system (e.g., at hydrants) a double check valve backflow preventer shall be installed.

493.07.03 Temporary Potable Water Supply Services

Temporary potable water supply services for single residential units shall be 19 mm inside diameter. Temporary potable water supply services for other users, including flow to maintain fire protection systems, shall be as specified in the Contract Documents.

The temporary potable water supply service connections shall be valved near the point of connection to the temporary watermain and also valved near the point of connection to a private plumbing system so that both the temporary watermain and the temporary potable water supply services may be disinfected.

493.07.04 Temporary Hydrants

When a hydrant is removed from service, a temporary hydrant and the necessary valves and fittings shall be installed and maintained according to the Contract Documents.

Before permanently shutting down the existing watermain, the temporary hydrants shall be tested to ensure that they are in proper working order.

The hydrants that are out of service during construction operations shall be bagged and clearly marked with a "HYDRANT OUT OF SERVICE" tag.

Once in use, the temporary hydrants shall be maintained until the existing or new hydrants are restored to service.

All temporary potable water supply service attachments to fire hydrants shall be easily removable for fire fighting purposes.

All temporary hydrants shall have reflective tape on the barrel for increased visibility. The temporary hydrants shall stand in an upright position at all times.

493.07.05 Valves

Valves shall be installed at each branch of a temporary watermain.

Before permanently shutting down the existing watermain, the valves shall be tested to ensure that they are in proper working order.

493.07.06 Protection

The Contractor shall provide protection of the temporary potable water supply services at locations such as road crossings, sidewalks, driveways, and walkways.

When temporary watermains cross over the roadway, the asphalt pavement shall be saw cut and removed and the temporary watermain shall be buried. Under no circumstance is a pipe road crossing to remain open and unprotected from vehicular and pedestrian traffic. If a concrete base exists, it shall not be disturbed.

When temporary potable water supply services are used on full right-of-way reconstruction projects, the temporary potable water supply service piping shall also be buried at all sidewalks, driveways, and walkways.

When temporary potable water supply services are used on projects when the road surface is not being reconstructed, the temporary service piping shall be buried only at all road crossings. When temporary watermains or temporary potable water supply services cross a driveway or a sidewalk, asphalt or another acceptable material shall be mounded over the pipe. A polyethylene sheet shall be placed as a barrier on concrete or interlocking driveways. If the work performed or material used is not to the satisfaction of the Contract Administrator, action shall be taken to rectify the problem. Safety flashers and barricades, as may be required, shall be furnished and maintained. In general, the temporary potable water supply service pipe shall be laid where it causes the least obstruction and is least likely to be damaged.

The Contractor shall protect the temporary potable water supply services installed across all road crossings, sidewalks, driveways, and walkways during the extent of the construction schedule. This shall include earth excavation, backfill, asphalt reinstatement, and ramping material required as directed by the Contract Administrator.

The Contractor shall provide adequate signage at locations where hoses are exposed and may present a public safety hazard, such as blow off hoses at catchbasins.

493.07.07 Leakage Testing

The temporary potable water supply service shall be watertight.

Leakage testing shall be conducted in the presence of the Contract Administrator upon completion of the watermain, including services. All leaks shall be repaired prior to covering the pipe.

493.07.08 Flushing and Disinfecting Temporary Watermains and Services

Flushing and disinfecting operations shall be conducted in the presence of the Contract Administrator. The Contract Administrator shall be notified 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. All temporary watermains and services shall be flushed at a flow velocity adequate to remove any foreign debris and until the discharged water runs clear.

After flushing is completed, water from the existing distribution system shall be allowed to flow at a controlled rate into the new temporary watermain. Liquid chlorine solution shall be introduced so that the chlorine is distributed throughout the section being disinfected at chlorine concentration of 50 mg/litre minimum throughout the section. The system shall be left charged with the chlorine solution for 24 hours.

Sampling and testing for chlorine residual shall be carried out by the Contract Administrator. The chlorine residual shall be tested in the section after 24 hours. If tests indicate a chlorine residual of 25 mg/litre minimum, the section shall be flushed completely and recharged with water normal to the operation of the system. If the test does not meet the requirements, the chlorination procedure shall be repeated until satisfactory results are obtained.

Twenty-four hours after the system has been recharged and ready for operation, the Contract Administrator shall take samples for bacteriological tests. Samples shall be collected from every 350 m of the new watermain plus one sample from each end of each line and at least one sample from each branch. If there is indication of contamination, the disinfection procedure shall be repeated.

The temporary water supply service shall not be put into operation or the existing watermain removed from operation until approval has been given by the Contract Administrator.

Regular sampling and testing for chlorine residual shall be carried out by the Contract Administrator.

493.07.09 Removal of Temporary Potable Water Supply Services

Temporary potable water supply services may be used from approximately mid-April to mid-October. All temporary services shall be completely removed by mid-November. Any variation from this schedule shall be approved by the Contract Administrator.

493.07.10 Management of Excess Material

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

All chlorinated water used for testing, flushing, or disinfecting watermains shall be directed to an acceptable outlet in a manner that meets the requirements of all applicable regulations. The method of disposal of chlorinated water is subject to the approval of the Contract Administrator.

493.10 BASIS OF PAYMENT

493.10.01 Temporary Potable Water Supply Services - 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.

On completion of the supply, installation, flushing, disinfecting, and testing of the temporary potable water supply services prior to putting it in operation, a progress payment to 60% of the above item shall be made. The balance shall be prorated over the remainder of the working period.

Removal or draining of the temporary potable water supply services during freezing weather and its subsequent return to service shall be at no additional cost to the Owner.

**Appendix 493-A, November 2009
FOR USE WHILE DESIGNING MUNICIPAL CONTRACTS**

Note: This is a non-mandatory Commentary Appendix intended to provide information to a designer, during the design stage of a contract, on the use of the OPS specification in a municipal contract. This appendix does not form part of the standard specification. Actions and considerations discussed in this appendix are for information purposes only and do not supersede an Owner's design decisions and methodology.

Designer Action/Considerations

The designer may consider including soil boring data, a geotechnical report, a subsurface report, or a soils report in the Tender Documents.

The designer should include the following in the Contract Documents:

- Pipe size, type, and class. (493.05.01)
- Temporary hydrant requirements. (493.05.04)
- Temporary potable water supply services connection requirements to buildings other than single residential units. (493.07.01)
- Time requirements for restoring the temporary potable water supply service should it fail. (493.07.01)
- Temporary potable water supply services to buildings other than single residential units, including flow to maintain fire protection systems. (493.07.03)
- Temporary hydrant and the necessary valves and fittings to be installed and maintained. (493.07.04)

Where conditions of high ground water exist, external fluids may enter via air release and air/vacuum release valves, therefore, appropriate measures shall be taken.

The designer should ensure that the General Conditions of Contract and the 100 Series General Specifications are included in the Contract Documents.

Related Ontario Provincial Standard Drawings

OPSD 1104.030 25 mm Blow Off Installation