



Washington State Department of Transportation



American Public Works Association  
Washington State Chapter

# Technical Commentary for Standard Plan B-5.20 Catch Basin Type 1

## General Information

**Background:** Catch basins are primarily used to collect pavement runoff and to act as a junction for a storm drain system. Catch basins differ from manholes in that catch basins are constructed with a sump below the pipe invert. The sump collects sediment and debris entering the catch basin through the grate inlet. The collected material is typically removed by hand or by the use of a vacuum truck. Catch basins differ from grate and drop inlets in that the grate and drop inlets have much larger grates with more flow capacity, and have larger knockouts. Catch basins differ from the concrete inlet in that the concrete inlet has no sump to catch sediments that may enter through the grate.

**Maximum Pipe Size:** The maximum pipe size that can be placed in a Type 1 catch basin is dependent on the maximum knockout size and the outside diameter of the pipe. Type 1 catch basins are provided with a maximum knockout size of 20 inches. It is recommended that a gap of at least 1.5 inches be provided between the knockout wall and the outside of the pipe. The gap facilitates pipe installation into the catch basin. Once the pipe is installed, the gap is filled with concrete grout (joint mortar). Therefore, the maximum pipe outside diameter that should be inserted into the knockout is 17 inches.

The relationship between the inside diameter of the pipe and outside diameter of the pipe varies, depending on the pipe material used. If the inside diameter of the pipe to be used is larger than that shown on the plan, a larger catch basin, such as a Type 1L or Type 2, must be specified. Note that skew angles increase the diameter of pipes. A larger catch basin may be required for a pipe with a skew angle.

**Pipe Alternates:** Most contracts allow a number of pipe alternates to be used. A Type 1 catch basin should be chosen for use only if it is large enough to accept all of the specified pipe alternates for that location. For example, if a contract called for 12-inch diameter storm sewer pipe and all of the alternates listed in Pipe Allowances Table were specified, a Type 1 catch basin would be appropriate. However, if the contract called for 15-inch storm sewer pipe and all of the alternates listed in the Pipe Allowances Table

were specified, a Type 1 catch basin would not be appropriate. The next largest catch basin, a Type 1L, should be specified.

**Maximum Depth:** The maximum depth for this structure, as well as the Type 1L and Type 1P catch basins, is specified as 5 feet. The depth is measured from the lowest pipe invert to the finished roadway grade. Division 7-05.3 requires that all catch basins be watertight. In order to meet this requirement, it is often necessary to access the catch basin to regrout the sides of the catch basin or to remortar the joint between the pipe and the catch basin wall. Exceeding the 5-foot depth significantly increases the difficulty in performing these repairs. It is recommended that a Type 2 catch basin be specified when the maximum depth exceeds 5 feet.

The maximum depth is not a concern regarding routine maintenance such as cleaning because catch basins are cleaned with the use of a vactor truck. The vacuum systems on most vactor trucks can effectively draw material from depths up to 15 feet.

**Catch Basin Taper:** The catch basin is tapered to facilitate removing the catch basin from the forms after it has been fabricated. Often the catch basin is fabricated upside down, which results in the top being larger than the bottom. All thickness and width dimensions are measured at the top of the base section.

**Flow Rate Through the Catch Basin:** The flow rate through the catch basin is generally controlled by either the grate inlet or the pipes entering or exiting the catch basin. The storage capability provided by the catch basin is relatively small and should be ignored in storm sewer calculations.

**Frame and Grate:** The technical commentary for Standard Plan B-30.10 discusses installing the frame and grate with the flange down or integrally cast into the riser with flange up, as described in the notes of this Standard Plan.

### Updates / Comments

For revision history see <http://www.wsdot.wa.gov/Design/Standards/ManualArchive.htm>

### Applicable Specifications

6-02.3	Construction Requirements for Concrete Structures
7-05	Manholes, Inlets, Catch Basins and Drywells
9-04.3	Joint Mortar
9-05.15(2)	Metal Frame, Grate and Solid Metal Cover for Catch Basins or Inlets
9-05.50	Precast Concrete Drainage Structure
9-07.7	Wire Mesh

### **Referenced Standard Plans**

B-30.10	Rectangular Frame (Reversible)
B-30.20	Rectangular Solid Metal Cover
B-30.30	Rectangular Vaned Grate
B-30.40	Rectangular Bi-Directional Vaned Grate
B-30.90	Miscellaneous Details for Drainage Structures

### **Other Information**

This commentary sheet is maintained by Headquarter's Hydraulics Office. Please send any suggestions for additions or modifications to :

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