

# Deep Sump Hooded Catch Basin



Source: University of Illinois at Urbana-Champaign and UNH Stormwater Center (2017), <https://railtec.illinois.edu/wp/wp-content/uploads/pdf-archive/14.3.pdf>

## Description

Deep sumps catch basins are storm drain inlets that have a sump below the outlet pipe to capture trash, debris, and coarse sediment. Deep sump catch basins are unique pretreatment BMPs, in that they function very differently and therefore have very different design and maintenance needs than other pretreatment BMPs.

Stormwater runoff enters the catch basin via a grated or curb inlet at the top of the catch basin. The catch basin outlet pipe is located below the inlet and is equipped with a hood (e.g., an inverted pipe). Floatables such as trash and oil and grease are trapped on the permanent pool of water, while coarse sediment settles to the bottom of the catch basin sump. [Figure 13-6](#) shows a schematic of a typical deep sump hooded catch basin.

Deep sump hooded catch basins may be used in conjunction with other Pretreatment BMPs or for space constrained sites where no other Pretreatment BMPs are feasible. Deep sump hooded

### *Stormwater BMP Type*

Pretreatment BMP	■
Infiltration BMP	□
Filtering BMP	□
Stormwater Pond BMP	□
Stormwater Wetland BMP	□
Water Quality Conveyance BMP	□
Stormwater Reuse BMP	□
Proprietary BMP	□
Other BMPs and Accessories	□

### *Stormwater Management Suitability*

Retention	□
Treatment	□
Pretreatment	■
Peak Runoff Attenuation	□

### *Pollutant Removal*

Sediment*	<b>High</b>
Phosphorus	<b>Low</b>
Nitrogen	<b>Low</b>
Bacteria	<b>Low</b>

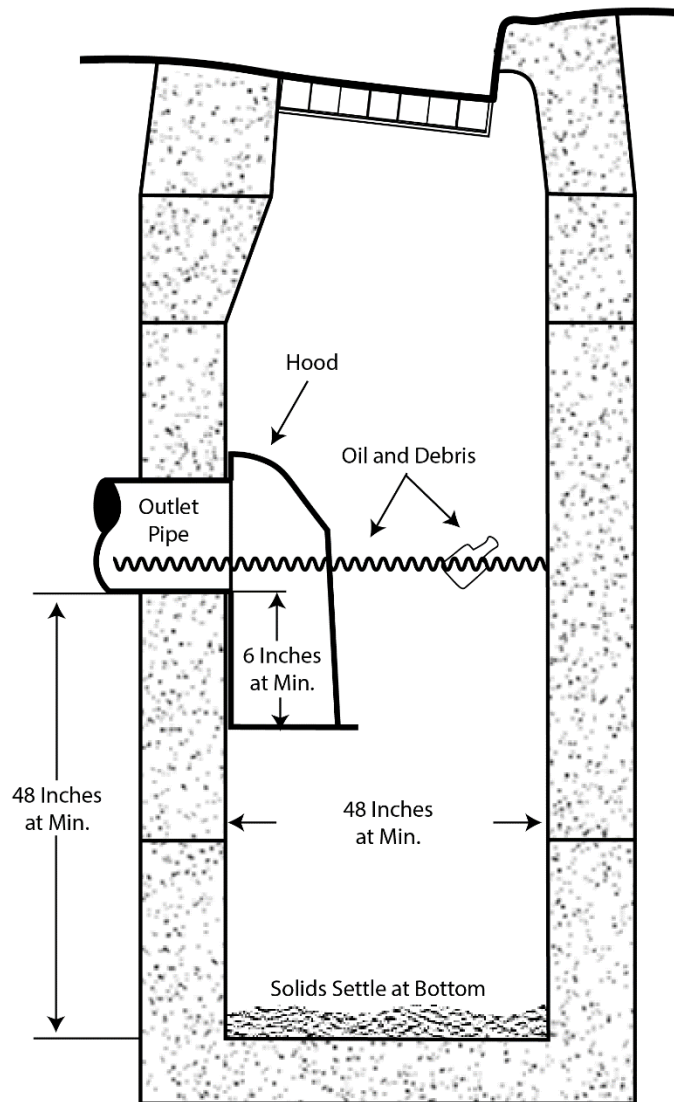
\*Includes sediment-bound pollutants and floatables

### *Implementation*

Capital Cost	<b>Low</b>
Maintenance Burden	<b>Moderate to High</b>
Land Requirement	<b>Low</b>

catch basins and can be impractical for use with surface stormwater BMPs due to the depth of the catch basin outlet pipe.

**Figure 13-6. Typical Deep Sump Hooded Catch Basin**



Source: Adapted from <https://upstreamtechnologies.us/docs/snout-design.pdf>

### Siting Considerations

- To be used as pretreatment for other stormwater BMPs or in conjunction with other Pretreatment BMPs. Recommended for space constrained sites where no other Pretreatment BMPs are feasible. Can be impractical for use with surface stormwater BMPs due to the depth of the catch basin outlet pipe.

- Only use deep sump hooded catch basins in an off-line configuration (i.e., catch basin-to-manhole, NOT catch basin-to-catch basin) to minimize re-suspension of sediment. On-line configurations (catch basin-to-catch basin) cannot be counted as pretreatment.
- Contributing drainage area to a single deep sump catch basin should not exceed 0.25 acres.
- Locate where:
  - Land use requirements prohibit use of other pretreatment approaches.
  - Underground features are necessary due to site conditions.
  - Can accept runoff from watersheds with high trash, debris, oil and grease and other floatable loads.
    - In areas with high groundwater, buoyancy and anchoring requirements must be considered.
- Siting limitations include:
  - Depth of bedrock
  - Presence of utilities
  - Unstable subsurface conditions that limit depth of excavation.

## Design Recommendations

### Sizing and Dimensions

- Inlet grate should be sized based on the contributing drainage area to ensure that the flow rate does not exceed the capacity of the grate. The grate should not allow flow rates greater than 3 cubic feet per second for the 10-year, 24-hour storm event.
- The sump depth (distance from the bottom of the lowest outlet pipe to the floor of the sump) should be a minimum of 48 inches.
- All outlet pipes in the catch basin that discharge to a stormwater BMP should be equipped with hoods (e.g., inverted elbow pipe, pre-manufactured PVC hood). The bottom of the hood opening should extend a minimum of 6 inches below the invert of the outlet pipe. Hooded outlets may be impractical for outlet pipes larger than 24 inches in diameter.
- Use catch basin hoods that reduce or eliminate siphoning.
- Catch basins should be watertight to maintain a permanent pool of water and provide higher floatable capture efficiency.

### Maintenance Needs

- Inspect catch basins twice per year – in late Spring after snowmelt and in late Fall after leaf fall and before the first snowfall. Establish a catch basin cleaning frequency such that the catch basin is no more than 50% full.

- Clean more frequently catch basins with known heavier sediment and debris loads, sensitive waterbodies, drainage problems, flat grades, etc.
- Cleaning should include:
  - Removal of sediment from catch basin sump
  - Removal of floatables and hydrocarbons from the water surface inside the catch basin
  - Removal of trash and debris from catch basin grate.
- The Operation and Maintenance (O&M) Plan should indicate the maximum allowable level of oil, sediment, and debris accumulation. These levels should be monitored during inspections to ensure that removal of these materials is performed when necessary.
- Dispose of material removed from the device, in accordance with CT DEEP guidelines (see [Chapter 6 - Source Control Practices and Pollution Prevention](#)) and other state and federal requirements, by a properly licensed contractor.