

# **Attachment A**

## **Automatic Retractable Screens (ARS) Requirements**

The ARS prevents trash and debris from entering a catch basin during dry weather and moderate storm flows by keeping the trash and debris in the street gutter for collection by street sweepers. ARS are not allowed on CBs connecting to drains of less than 4-year frequency design storm.

The City and its contractor shall adhere to the requirements, conditions, and provisions listed below and on the Permit:

1. The City's contractor will be required to perform a field operational test on all of the CBs in which ARS units were installed, as required in the Public Works' specifications for ARS contracts (Attachment B). Any units that do not open, close, and lock closed automatically under the test conditions, shall be repaired or replaced and retested. This process shall be repeated until the failed unit passes the test.
2. The exposed ends of the protection bar, when removed, must be drilled out to a minimum depth of 1/4-inch and refilled with neat "Sikadur 32, Hi-Mod" or Agency-approved equal. When CB protection bars are removed, each ARS unit shall be fitted with a permanent, fixed horizontal, 3/4-inch diameter solid stainless steel bar located at the same distance above the flow line as the existing protection bar. Butt welding of the protection bar will not be allowed. The new protection bar shall remain fixed when the unit opens and shall not protrude beyond the projected curb face. However, the protection bar replacement will be waived when both of the following conditions are met:
  - Where CB curb face height is 12 inches or less.
  - When the opening, between the ARS unit, in fully open position, and the flow line is such that a sphere of 4 inches in diameter cannot pass through.
3. The City shall, during storm events; patrol the locations where ARS units are installed and clear any trash lodged on the screen to allow storm flows to enter the catch basin.

## **Attachment A** (cont.)

### **Connector Pipe Screen (CPS) Requirements**

The CPS prevents trash and debris from entering the storm drain system during dry weather and moderate storm flows by keeping the trash and debris inside the catch basin.

The CPS shall be designed to retain all trash larger than 5 mm (0.197 inches) in the catch basin, and shall comply with the following items:

1. The CPS shall be sized, fabricated and installed conforming to the configurations shown in the CPS Sizing Table 1, Appendices A-1, A-2, and A-3.
2. The CPS shall not interfere with the operation of an existing or proposed ARS.
3. The CPS unit shall have a sufficient structural integrity to withstand a lateral force of standing water (62.4 lb/ft<sup>3</sup>) within the catch basin area when the screen becomes 100% clogged. The CPS unit shall be bolted to the catch basin walls.
4. The CPS shall be configured with deflector plates or screens preventing trash from falling between the screen and connector pipe. The deflector plate shall be designed to withstand a vertical load of 10 lbs per square foot.
5. The gap at the bottom, sides, and joints of the CPS unit shall not exceed 5mm (0.197 inches).
6. The perimeter of the CPS shall include a structural frame for stiffness, a bolting surface to fasten the CPS to the wall of the catch basin, and support for the upper portion of the CPS unit referred to as the "bypass" (see Appendix A-1).
7. All parts/components of the CPS unit must be sized to fit through the catch basin's manhole opening.
8. When the CPS unit encroaches more than 4 inches into the manhole opening, the Contractor shall install a Removable CPS unit. The Removable CPS unit shall be designed and installed with a removable panel allowing access into the catch basin. The removable panel shall be easily disengaged from the rest of CPS assembly upon entry or from the outside of the catch basin. The Contractor shall submit shop drawings for review and approval of the Agency. It is the responsibility of the Contractor to field verify the location and dimensions of these basins.
9. The CPS frame shall be fabricated from S-304 stainless steel, or an Agency approved equal stainless steel alloy. The Structural members shall have a minimum thickness of 3/16 inches.
10. The CPS screen shall be fabricated from perforated metal of Type S-304 stainless steel, or an Agency approved equal stainless steel alloy. The screen shall have a minimum thickness of fourteen (14) gauge (0.0781 inches) The geometrical opening shape shall have a diameter of 5mm (0.197 inches).

## Attachment A (cont.)

11. The screen material used shall have at least 45% open area.
12. Any edge of the CPS that is not flush with the wall or floor of the catch basin shall be smooth with no prongs or jagged edges.
13. The assembly bolts, screws, nuts, and washers shall be fabricated entirely from S-316 stainless steel. The concrete anchor bolts shall use a Red Head Multi-Set II drop-in anchor, SSRM-38, with Type 316 stainless steel threaded rods, nuts and washers, or Agency approved equal.

**Preliminary Measurement.** The Contractor shall make detailed measurements of each catch basin, including the size and location of the connector pipe, for the proper fabrication of the devices. The Contractor shall submit written records of its measurements to the District for review and approval prior to fabrication of the CPS units. Improper fabrication of devices due to errors in the measurements shall be corrected at the Contractor's expense.

**Cleaning of Existing Catch Basins.** The Contractor shall furnish all materials, equipment, tools and labor to cleanout (i.e. remove and dispose of all debris from within and around) all catch basins in which retrofit devices will be installed under this Contract to the maintenance standards specified. Cleanout shall also include the catch basin connector pipe openings and the first 6 feet thereof. The catch basin shall be clean at the time of the installation of the retrofit device. Any trash and debris that accumulates between the dates the catch basin is cleaned and the date the device will be installed shall be removed prior to installation of the device at the Contractor's expense.

Maintenance Conditions and Maintenance Standards. Following are deficiencies in maintenance conditions and their corresponding maintenance standards which shall apply to this Contract. The cleanout of each catch basin shall meet the maintenance standards listed as follows:

|    | Description of Maintenance Condition Deficiency                                                                                                         | Description of Maintenance Standard                                                                                   |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 1. | Trash and debris located immediately in front of curb opening or side opening of catch basin, and on top or between metal grates of grated catch basin. | No trash and debris located immediately in front of catch basin opening, and on top or between metal grates.          |
| 2. | Vegetation growing across and/or blocking the basin opening.                                                                                            | No vegetation blocking catch basin opening.                                                                           |
| 3. | Trash and debris in the basin.                                                                                                                          | No trash and debris within the catch basin.                                                                           |
| 4. | Trash and debris in the connector pipe opening, upstream or downstream.                                                                                 | No trash and debris in connector pipe opening and/or in the connector pipe for a distance of 6 feet from the opening. |

## **Attachment A** (cont.)

Trash and debris shall include, but is not limited to, mud, vegetation, and garbage.

Upon completion of a cleanout operation at a catch basin and before leaving it, the Contractor shall sweep the top surface of the catch basin and the area 2 feet around the basin, and shall remove any trash and debris resulting from the cleanout operations. No debris is to be left at a catch basin for future pick-up.

**Method of Removal.** All trash and debris required to be removed from the catch basins shall be removed in a manner to be determined by the Contractor. The Contractor shall not allow any trash or debris to enter the connector pipe or main line as a result of the cleanout operations.

**Debris Disposal.** All trash and debris removed under this Contract shall become the property of the Contractor and shall be legally disposed of away from the basin sites. The Contractor is responsible for proper disposal of the trash and debris, including obtaining approvals from all jurisdictional agencies, as applicable. The contractor shall contact LA County Animal Care and Control for pickup and disposal of dead animals. However, the Contractor shall be responsible for removing any dead animal from inside a catch basin. The Contractor shall also be responsible for contacting and coordinating with Animal Care and Control, a list of local Animal Care and Control offices may be obtained at <http://animalcare.lacounty.gov/locationByCity.asp>.

**Staff Gauge.** The contractor shall paint a staff gauge per Appendix A-2. The staff gauge shall be located such that it is visible through the curb opening or grating of the catch basin.

## **Attachment B**

### **Field Testing of ARS Units**

**Onsite Test.** Each unit shall be manually operated upon completion of the installation to ensure that the screen and all moving parts move freely and the screen locks securely in the closed position. Units that are determined by Public Works to be malfunctioning shall be repaired or replaced at the sole expense of the Contractor.

All of the catch basins (CBs) in which ARS units will be tested using water supplied from a fire hydrant or water truck. The Contractor shall be responsible for providing the source of water, including written approval from the water agency if a hydrant is used. Sufficient water shall be provided to cause the ARS units to open with no other assistance as follows:

#### Flowing Water Test

1. Sandbags shall be placed around the CBs opening to allow the water to pond in front of the CB to a depth of 3 inches-, measured from the flow line of the CB opening local depression. The sandbags shall be located 5 feet upstream and downstream of the end of the local depression. Sandbags shall also be placed 7 feet from and parallel to the curb face.
2. An impermeable rigid membrane/barrier shall be placed covering the CB opening to allow the water to pond in front of the CB. The membrane/barrier shall be capable of sealing the CB opening without leakage so that the water ponds to the depth required.
3. Once the water reaches the depth described herein, the impermeable membrane shall be removed in one quick and continuous motion to allow the ponded water to instantaneously enter the CB and cause the ARS to open. A continuous flow of water shall be provided for at least two minutes after the initial opening of the ARS units in sufficient quantity to maintain the units open. At the end of the two minutes, the flow of the water shall be stopped and the unit shall fully close automatically prior to or immediately after the flow into the CB stops.
4. This process shall be successfully completed at least two consecutive times without adjustments and/or calibration between trials.
5. Any units that do not open, close, and lock closed automatically under the test conditions, described herein, shall be repaired or replaced at the sole expense of the Contractor and retested. This process shall be repeated until the failed unit passes the test at the sole expense of the Contractor.

## **ATTACHMENT C**

1. A minimum of five (5) working days Notice to District designated representative prior to Preconstruction Meeting. A Preconstruction meeting is required before commencement of the Work authorized under this Permit.
2. The Permittee shall provide Construction Schedule to District's field representative before starting work on this Permit. The schedule shall indicate the Catch Basins that the Permittee will complete each week, identified by the assigned Identification Number listed in the attached "LOS ANGELES COUNTY FLOOD CONTROL DISTRICT CATCH BASINS IDENTIFICATION LIST". Also, Permittee shall submit to the District's representative paper copy of the updated Construction Schedule on the first working day of each month.
3. County will be administering CB Cleanout contracts within the City that may take place concurrent with City's Project. Work on District's Catch Basins, under County Contract, shall have priority and/or testing be completed without interruption.
4. Permittee shall coordinate with District designated representative to schedule inspection for selected Catch Basins. District designated representative will select the Catch Basins to be inspected and/or tested.
5. Permittee shall be responsible for enforcing Section 7-10 PUBLIC CONVENIENCE AND SAFETY of the GREENBOOK, (e.g. Traffic and Access, Safety, Confined Spaces etc.). The inspection provided by the District shall not be construed as a Safety Inspection.
6. Upon Completion of the installations and testing, Permittee shall produce Inspection Records for each Catch Basin.
7. Any damage resulting from the Permittee's operations shall be restored and/or repaired at Permittee's expense and to the satisfaction of the District's field representative.
8. When removing and reinstalling the catch basin manhole covers, the Permittee shall grease all catch basin cover screws with a high temperature thread lubricant and seal grease (Jet-Cube by Koper-Kote or equal). Screws or bolts that are missing or cannot be reused shall be replaced with new ones meeting the requirements specified in applicable Standard Plans as directed by the District's field representative. If the catch basin cover screws are frozen (e.g. rusted in place) the Contractor shall remove the frozen cover screws. If during their removal the manhole covers or screws should become damaged, it shall be the Contractor's responsibility to replace them in accordance with the applicable standard plan and to re-drill and tap new holes, if necessary.
9. Permittee shall be responsible for collecting the retaining trash and debris within the street by street sweeping and other equipment.

## **ATTACHMENT C** (cont.)

- 10.** Permittee shall furnish eight (8) copies of a Technical Manual for ARS and CPS Units and eight (8) electronic copies on CD-Rom in Portable Document Format (PDF). The Technical Manual shall be submitted prior to field acceptance of the permitted work. Each manual shall, at minimum, include the following:

  - a.** Title Sheet.
  - b.** Table of Contents.
  - c.** Manufacturer, supplier, spare parts, and servicing location information including name, address, phone number of the manufacturer and local representative.
  - d.** Recommended installation, adjustment, calibration and troubleshooting procedures.
  - e.** Lubrication recommended if applicable.
  - f.** Recommended preventive maintenance and maintenance procedure.
  - g.** Complete parts list, by generic title and identification number, with isometric views and schematics of each assembly.
  - h.** Recommended spare parts list and list of special tools and equipment required for O&M.
  - i.** Disassembly, overhaul, reassembly, and realignment instructions.
  - j.** A discussion of the warranty and how to obtain warranty service.
- 11.** Manufacturer's Warranty, all ARS and CPS units shall be covered by a three (3)-year manufacturer's warranty starting on the date of acceptance of the work authorized under this Permit by the District. The warranty shall cover the units against corrosion, excessive wearing of moving parts, and operational malfunction. The manufacturer shall provide, at no cost to the District, all labor, material and equipment required to repair or replace the units during the warranty period, including but not limited to calibration and adjustment of moving parts to ensure the unit operates properly.
- 12.** Detailed shop drawings for the ARS and CPS units shall be submitted to the District. No ARS or CPS fabrication shall start until the shop drawings are approved by the District. The Shop Drawings must clearly describe the details and mechanical operation of the ARS and CPS Units, and, at a minimum, must contain:

## **ATTACHMENT C** (cont.)

- a. Drawings descriptions and details of the units.
  - b. Materials used.
  - c. Connection details.
  - d. Assembly details.
  - e. Mounting details.
  - f. Dimensions of all parts.
  - g. Any other information needed to manufacture, install, and use the units.
  - h. Correct title of the City Project.
  - i. Names of the City and Permit Number(s).
- 13.** Upon completion of the contract, the City must submit an as-built spreadsheet, for each permit, containing the following data:
- a. County approved ARS manufacturer name and contact information.
  - b. ARS name and model.
  - c. For each catch basin:
    - i. City CB No.
    - ii. County CB No.
    - iii. County Drain Name.
    - iv. Street Name.
    - v. Nearest cross street
    - vi. Thomas Guide page and coordinates.
    - vii. GPS coordinates.
    - viii. CB type (SPPWC Std. Plan No.).
    - ix. W dimension.
    - x. Number of grates.
    - xi. V dimension.
    - xii. Curb face height.
    - xiii. Number of ARS units installed.
    - xiv. Whether or not a CPS was installed.

## **ATTACHMENT C** (cont.)

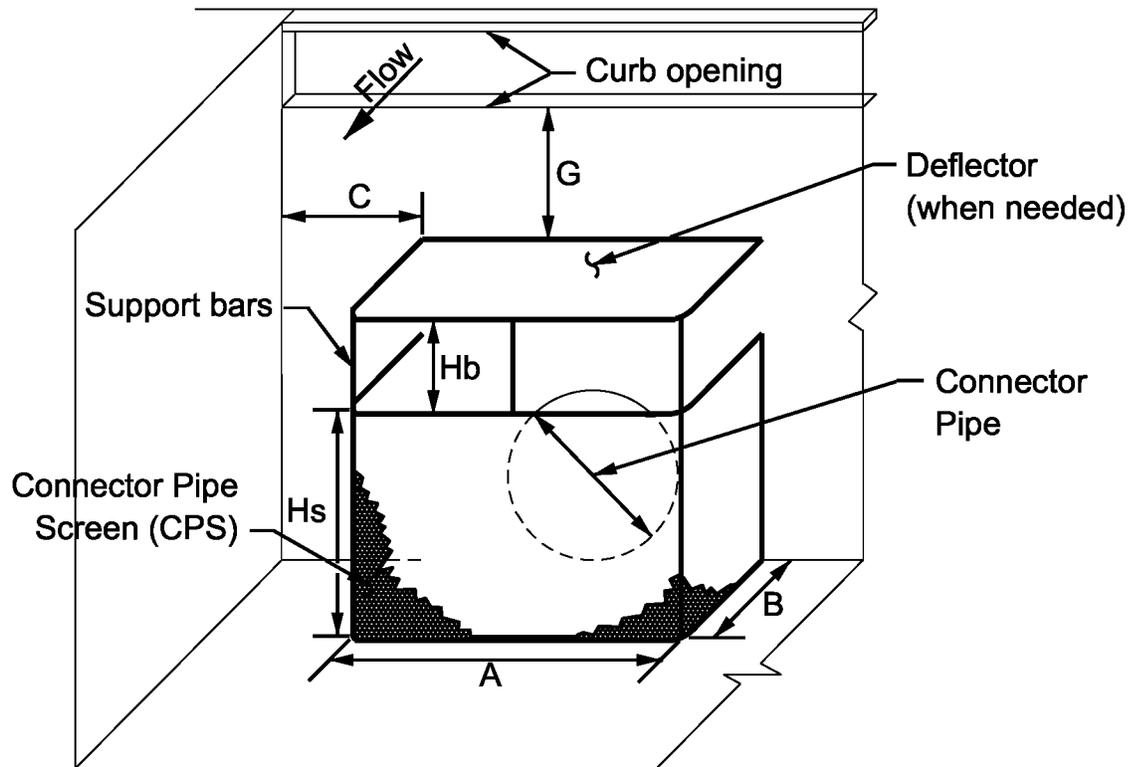
- 14.** No ARS or CPS may be installed in any CB in a sump. Any location where CB is found to be in a sump, in a cul-de-sac, or with flow entering the basin from two opposing directions, must be removed from the project.

**TABLE 1  
CPS SIZING TABLE FOR CBs IN NON-SUMP CONDITIONS WITH NO ARS**

| *V-depth (ft)  | CB Width (ft) | Bypass Height H <sub>b</sub> (in) | Screen Height H <sub>s</sub> (in) | Screen Length L (ft) | G (in)        |
|----------------|---------------|-----------------------------------|-----------------------------------|----------------------|---------------|
| 3.0            | 3.5           | 8                                 | 14                                | 3.0                  | 6             |
|                | 7             |                                   |                                   | 4.0                  |               |
|                | 10            |                                   |                                   | 5.0                  |               |
|                | 14            |                                   |                                   | 6.0                  |               |
|                | 21            |                                   |                                   | 8.0                  |               |
|                | 28            |                                   |                                   | 9.0                  |               |
| 3.5            | 3.5           | 10                                | 16                                | 3.0                  | 8             |
|                | 7             |                                   |                                   | 4.0                  |               |
|                | 10            |                                   |                                   | 5.0                  |               |
|                | 14            |                                   |                                   | 6.0                  |               |
|                | 21            |                                   |                                   | 8.0                  |               |
|                | 28            |                                   |                                   | 9.0                  |               |
| 4.0            | 3.5           | 12                                | 20                                | 3.0                  | 8             |
|                | 7             |                                   |                                   | 4.0                  |               |
|                | 10            |                                   |                                   | 5.0                  |               |
|                | 14            |                                   |                                   | 6.0                  |               |
|                | 21            |                                   |                                   | 7.0                  |               |
|                | 28            |                                   |                                   | 8.0                  |               |
| 4.5 or greater | 3.5           | 12                                | 22                                | 3.0                  | 10 or greater |
|                | 7             |                                   |                                   | 4.0                  |               |
|                | 10            |                                   |                                   | 5.0                  |               |
|                | 14            |                                   |                                   | 6.0                  |               |
|                | 21            |                                   |                                   | 7.0                  |               |
|                | 28            |                                   |                                   | 8.0                  |               |

\* for CBs with v-depth less than 3 feet, contact the District for H<sub>b</sub>, H<sub>s</sub>, L, and G values.

## APPENDIX A-1: CPS CONFIGURATION



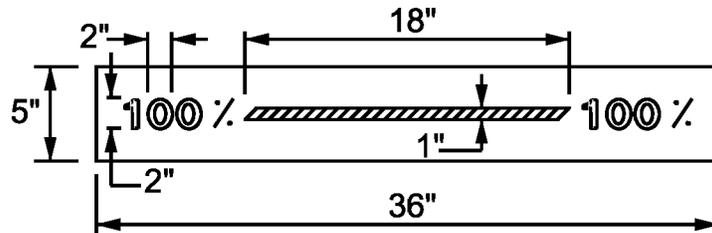
CATCH BASIN INTERIOR VIEW  
(Not to scale)

|                                        |               |
|----------------------------------------|---------------|
| CPS Length                             | $L = A + 2B$  |
| CPS Height                             | Hs            |
| Bypass Height                          | Hb            |
| Minimum Wall Clearance                 | C = 4 inches  |
| Minimum Interior Spacing               | B = 10 inches |
| Minimum Distance from Street Flow Line | G             |

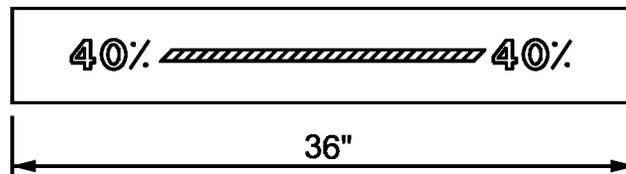
### NOTES

1. The CPS shown above is for illustrative purposes only. The catch basin connector pipe location and the shape and design of the CPS may deviate from the above example.
2. For L, Hs, Hb, and G values see attached CPS sizing Table 1.

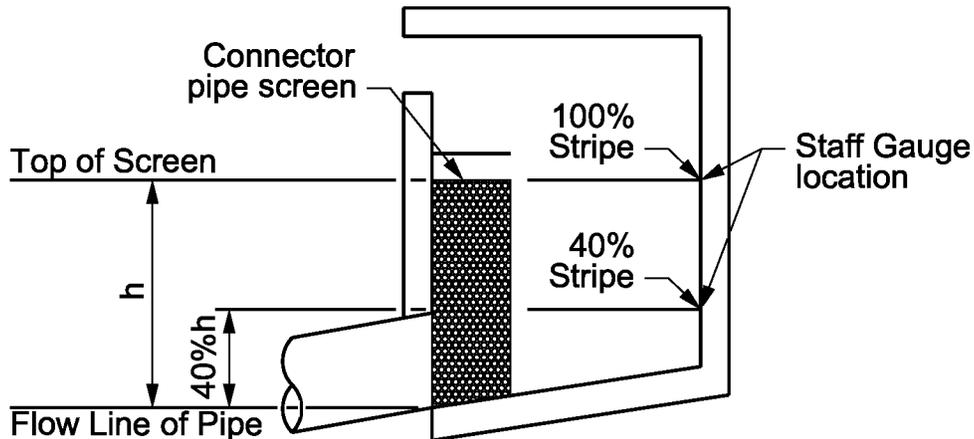
## APPENDIX A-2: STAFF GAUGE



**100% STRIPE**  
(Red Stripe and Numbers on White Background)



**40% STRIPE**  
(Red Stripe and Numbers on White Background)



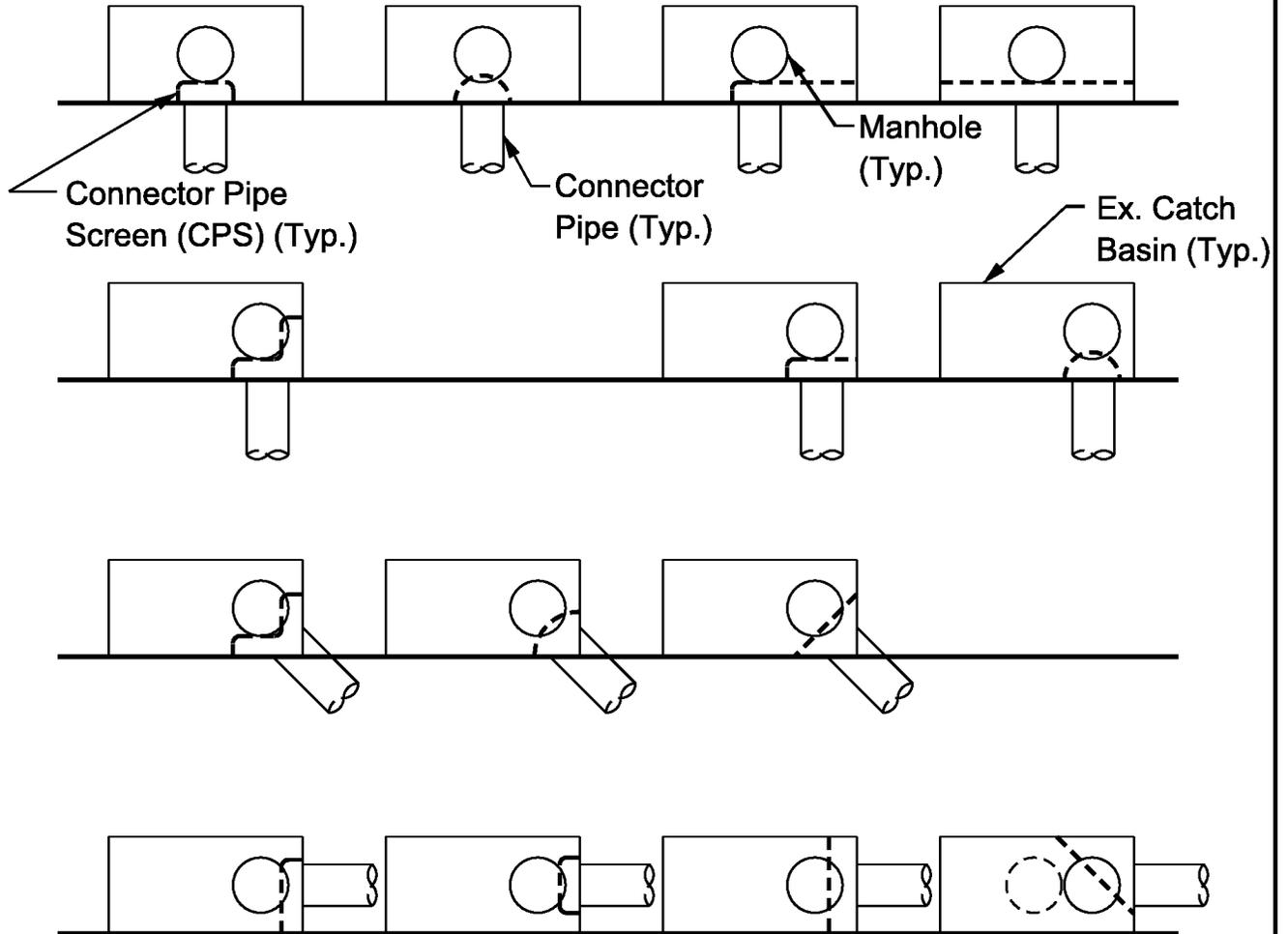
**EXAMPLE LAYOUT**

**"THE PAINT TYPE AND SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL PRIOR TO USE."**

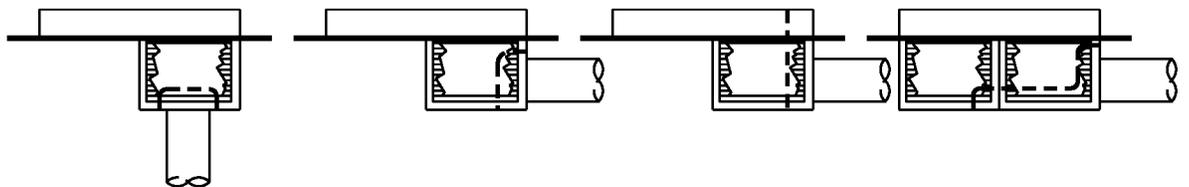
1. The Contractor shall paint a staff gauge as shown on an externally visible interior wall of each catch basin.
2. The Contractor shall paint red stripes and numbers on white background labeling 40% and 100% screen height as shown above.
3. Surfaces must be clean, dry and free from all contaminants including rust that may impair adhesion.

### APPENDIX A-3: EXAMPLE CPS LAYOUTS

#### CURB OPENING CATCH BASINS (TYPES 300, 306)



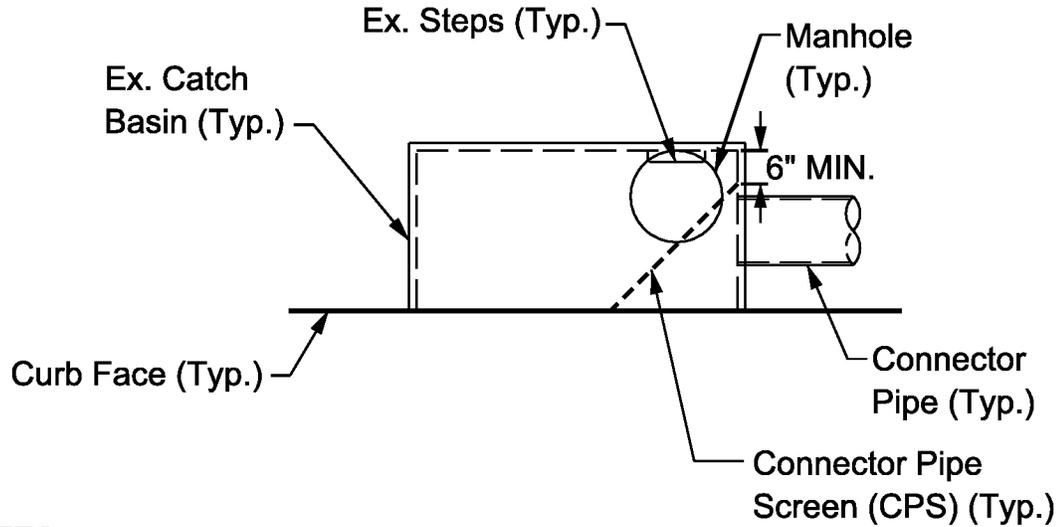
#### CURB OPENING CATCH BASINS WITH GRATES (TYPES 301, 302)



- NOTES: 1. The CPS configurations shown above are for illustrative purposes only. This is not a comprehensive list.
2. When the CPS unit enchoaches more than 4 inches into the manhole opening, the Contractor shall install a Removable CPS unit per Attachment A, CPS Requirements, item 8.

## APPENDIX A-3: EXAMPLE CPS LAYOUTS (CONT.)

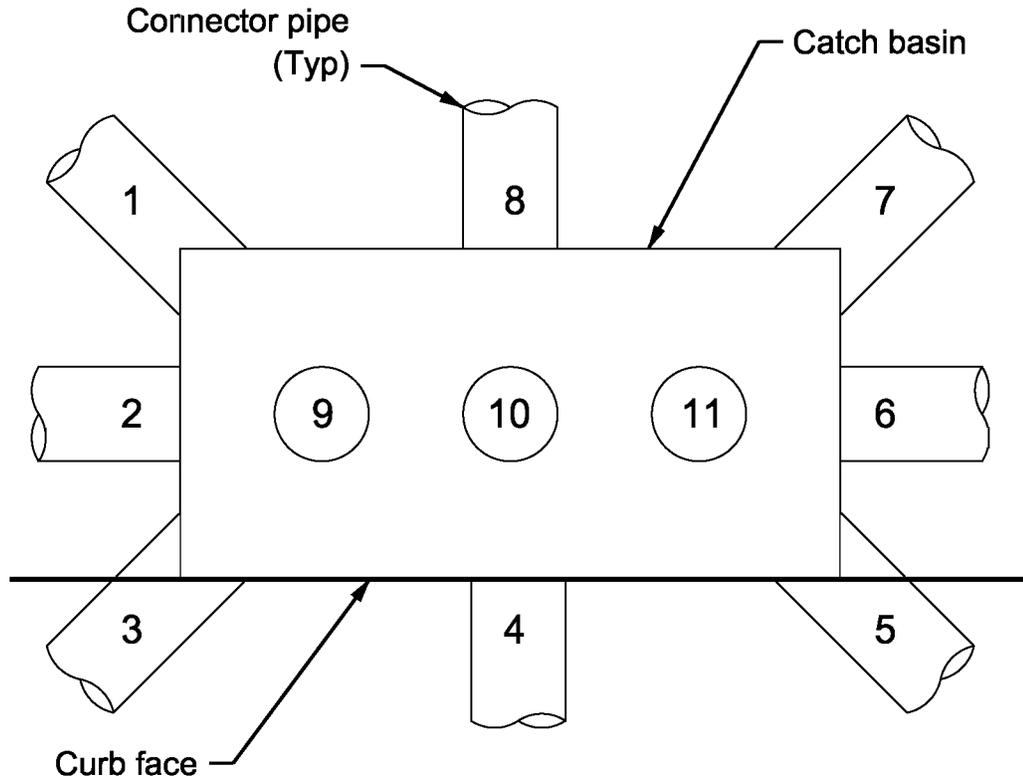
### CURB OPENING CATCH BASINS (TYPES 300)



#### NOTES:

3. The CPS configurations shown above are for illustrative purposes only. This is not a comprehensive list.

## APPENDIX A-4: CONNECTOR PIPE LOCATION KEY



### NOTE

1. This illustration shall be used to identify the location of a catch basin's connector pipe. The number chosen shall be that which most nearly represents the actual location of the connector pipe.