CITY OF OAKLAND
PUBLIC WORKS

Oakland Public Works
Bureau of Design and Construction
Watershed and Stormwater Management

Standard Operating Procedure

SUBJECT:	**Full Trash Capture Requirements for Public Works and Department of Transportation Projects**
INTENT:	Ensure compliance with Municipal Regional Stormwater NPDES Permit trash reduction requirements and provide adequate record keeping of full trash capture devices
RESPONSIBLE PERSON(S):	Watershed and Stormwater Management Division
CRITICAL TIMING:	Design phase of projects
INVOLVED INDIVIDUALS:	Division Managers, Supervisors, Project Managers, and Resident Engineers in OPW—Bureau of Infrastructure and Operations; Infrastructure Maintenance; Bureau of Design and Construction; Watershed and Stormwater Management; and Department of Transportation
OBJECTIVES:	Provide directives on which City projects require installation of full trash capture devices
REVIEW:	Reissuance of Municipal Regional Stormwater NPDES Permit (2021)

Overview

The City of Oakland is regulated by the San Francisco Bay Regional Water Quality Control Board's (Regional Water Board) Municipal Regional Stormwater NPDES Permit (Permit No. CAS612008, Order No. R2-2015-0049) (MRP). The MRP requires the City to reduce a designated volume of trash from reaching waterbodies by 2022. The City is achieving this requirement by implementing measures that prevent trash from reaching, or removing trash from, the municipal separate storm sewer (storm drain) system (MS4). These trash prevention and control actions include installation of full trash capture devices (FTC).[1] The OPW and DOT Directors have authorized this Standard Operating Procedure (SOP) for use by staff responsible for the design and construction of projects (see Table 1 for project types subject to this SOP) to ensure that FTC are incorporated into projects to help the City meet its trash reduction requirement.

Regulatory Authority for Trash Capture Devices

Section C.10 of the MRP specifies the City shall reduce trash discharge to stormwater according to the following schedule: 80% by July 1, 2019; and 100% by July 1, 2022.

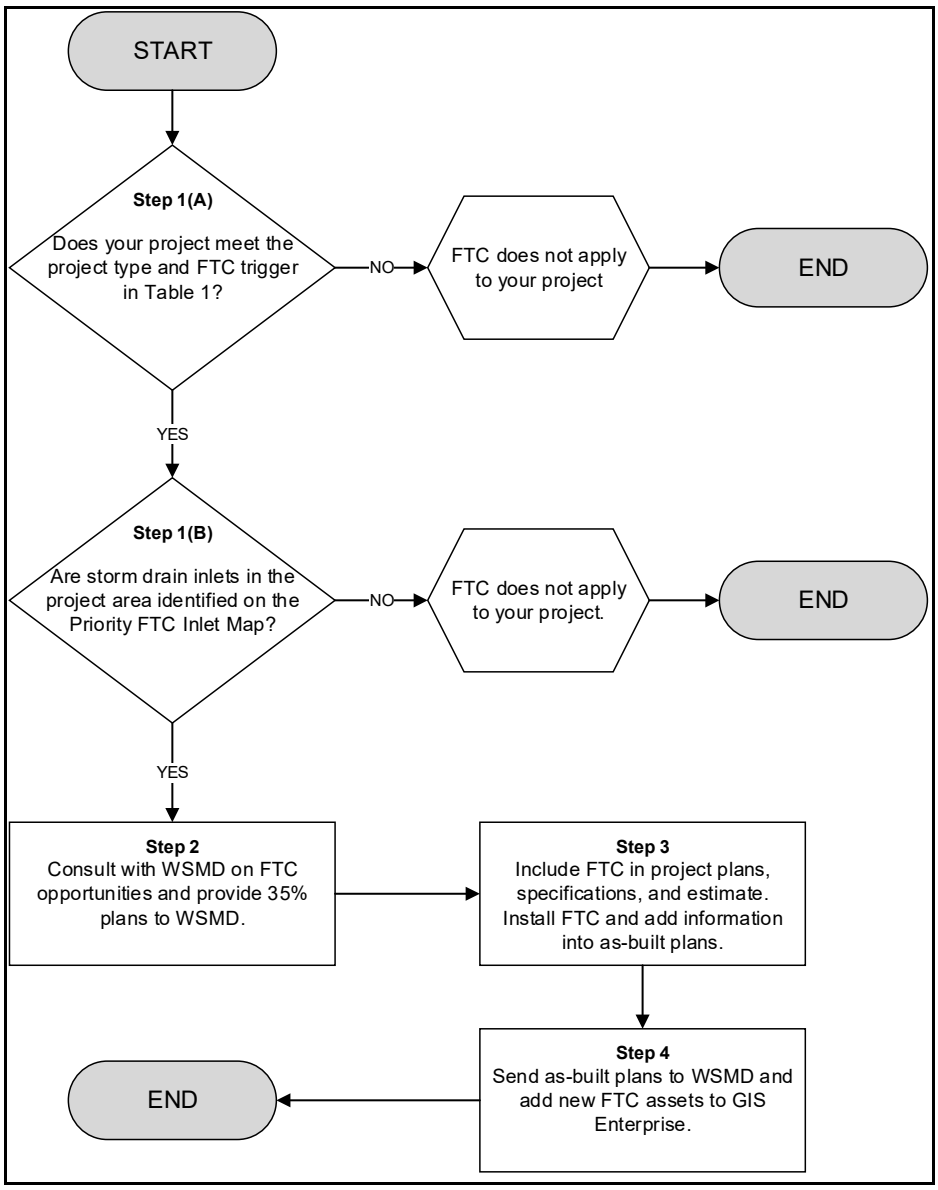
[1] The MRP defines full trash capture device as, "any device or series of devices that traps all particles retained by a 5mm mesh screen and has a design treatment capacity of not less than the peak flow rate resulting from a one-year, one-hour, storm in the tributary area (p. 147)."

Installation of FTC provides trash reduction credit towards the percent reduction requirements outlined above. The trash load reductions are measured from a 2009 baseline generation rate and are compared annually to trash observations and reduction measures. Current trash reductions are determined by the extent of FTC, on-land visual assessments, reductions via source controls (such as the single-use plastic bag ban), and creek and shoreline cleanups.

SOP Implementation Procedure

This SOP is implemented in 4 steps which are shown in Figure 1 and described below.

Figure 1: Full Trash Capture Implementation Flowchart[2]



[2] "WSMD" in Figure 1 = Watershed and Stormwater Management Division staff.

Step 1: Trash Capture Device Installation Requirements—Does it Apply to My Project?

Installation of FTC at storm drain inlets in the project area are required for any project that meets the project type and FTC trigger as described in Table 1. Project Managers should review Table 1 in the project planning phase to determine if their project is subject to this SOP. If the project requires FTC, the Project Manager will request the current map of priority storm drain inlets to be treated with FTC (Priority FTC Inlet Map[3]) from the Watershed and Stormwater Management Division. Priority storm drain inlets include areas with a very-high, high, or moderate trash generation rate and are located outside of areas covered by an existing FTC device (see Attachment A). FTC is only required for projects that both: A) meet the project type and trigger from Table 1; and B) have storm drain inlets in the project area that are included in the Priority FTC Inlet Map.

Table 1: Full Trash Capture Requirements by Project Type and Trigger

PROJECT TYPE	FTC TRIGGER AND REQUIREMENT
Streetscapes	Install FTC in all inlets within 40 feet from curb returns[4] in the project area.[5] Green stormwater infrastructure can be installed in lieu of, or in combination with, FTC.[6]
New Traffic Signals	Install FTC in all inlets within 40 feet from curb returns in the project area.
Buildings and Parks Projects	Install FTC in all inlets within, or along, frontage of project parcel.
New Bulbout Construction	Painting and striping projects are exempt. Install FTC in all inlets within 40 feet from curb returns on the same corner of bulbout in the project area. Green stormwater infrastructure can be installed in lieu of, or in combination with, FTC.
Storm Drains	New or replacement storm drains only. Install FTC in all inlets within 40 feet from curb returns in the project area.

[3] As projects with FTC are completed, Watershed and Stormwater staff will update the Priority FTC Inlet Map.
[4] A curb return is a curved section of a curb located at a corner of an intersection, connecting a curb on one street to another curb on the intersecting street. A curb return starts at the point where the curb begins to turn toward the direction of the intersecting street and ends at the point where it meets the curb on the intersecting street.
[5] Please note that inlets to be treated with FTC may be outside of the project boundary.
[6] Green stormwater infrastructure may not be able to treat the equivalent watershed area draining to the storm drain system that inlet specific FTC could, and if that is the case, inlet specific devices shall be installed.

PROJECT TYPE	FTC TRIGGER AND REQUIREMENT
Pavement Rehabilitation	Preventative maintenance projects exempt. For projects covering at least one city block or 300 linear feet, install FTC in all inlets within 40 feet from curb returns adjacent to project area.
Sewer Main Replacement in Right of Way	Install FTC in all inlets within 40 feet from curb returns in the project area. Project area defined as the beginning and end of pipeline work projected out to the curb lines including inlets within adjacent curb returns.

Step 2: Consult with Watershed and Stormwater Management Staff/Considerations for Trash Capture Devices

Project Managers will take the following measures in compliance with this SOP:

A. **Consultation**: In the project planning phase (before beginning design), review the FTC opportunities and feasibility with Watershed and Stormwater Management Division staff. Provide 35% plans to Watershed and Stormwater Management Division staff. Watershed and Stormwater Management Division staff are also available to consult on Steps 1 and 3 and items 2(B) and (C) below.

B. **FTC Type**: Consider what type of FTC[7] is appropriate based on site-conditions and sizing requirements. The minimum FTC required are connector pipe screen (CPS) units. CPS units shall be installed in conjunction with auto-retractable screens (ARS) where technically feasible.[8] The FTC device type and manufacturer must be on the list of approved devices meeting requirements for full trash capture as certified by the State Water Resources Control Board (see Attachment B). ARS are considered partial trash capture and have not been certified by the State Water Resources Control Board. If green stormwater infrastructure is installed as FTC, it must be designed, installed, and maintained to perform in accordance with five requirements specified by the State Water Resources Control Board (see Attachment C). Attachment D provides a summary of trash capture device types.

C. **FTC Location***:* Consider which storm drain inlets will be treated with FTC based on the Priority FTC Inlet Map. The Priority FTC Inlet Map is an approximation of inlets that should be treated and each potential FTC location and device type should be discussed with a qualified engineer and the vendor of the selected/proposed FTC. For those inlets that are “daisy-chained” together, it may be possible to install one FTC in the furthest downstream inlet and treat the entire land area draining to that inlet and the areas draining to connected upstream inlets. Do not install single CPS unit in the most downstream inlet if the entire upstream area that drains to the single CPS unit is greater than two acres.

[7] See Attachment D for more information on FTC types.
[8] See Table 2 below for storm drain inlet compatibility with ARS.

Storm drain pipe, inlet size, and/or inlet type (see Table 2 below) constraints may eliminate the ability to install an FTC. For example, the dimensions of the storm drain inlet may be too small to adequately house an FTC. Additionally, in areas with older infrastructure, many inlets are too shallow, have an uneven bottom, or the outflow is through the bottom of the catch basin, which makes installation of a CPS likely infeasible.

Table 2: City of Oakland Standard Details for Public Works Construction (2015 Edition) Inlet Type Compatibility with Auto-Retractable Screens

STANDARD DETAIL INLET TYPE (DRAWING NUMBER)	ARS COMPATIBILITY
Type A (D-3)	Maybe
Type B (D-4)	Y
Type C (D-5)	Y
Type D (D-6)	N
Type D-3 (D-7)	N
Type E-3 (D-8)	Y
Type E-4 (D-8)	Y
Type F (D-9)	Y
Type 3-2 (D-10)	N

Notes:
1. CPS are typically compatible with all inlet types.
2. CPS and ARS standard technical specifications and standard details are provided in Attachment E, F, and G.
3. CPS manufacturer can help determine if a catch basin will work or not; there may be some physical limitations that don't allow a CPS installation at a specific location.
4. ARS compatibility will depend on height and length of curb face inlet. ARS manufacturer can help determine if actual conditions can accommodate an ARS.

Step 3: Incorporate Trash Capture Devices in Project Design and Install

Include FTC in project plans, specifications, and estimate. CPS and ARS standard technical specifications and standard details are provided in Attachment E, F, and G. Install FTC and incorporate information into the project as-built plans.

Step 4: Post-Project Requirements

Consistent with the *SOP: Asset Management Policy and Objectives, and Procedures for Creating, Editing, and Retiring an Asset in the City's Asset Inventory (GIS)*[9] the GIS staff of the Division implementing the project is required to update the City's GIS Enterprise with installed FTC once the as-built plans are approved. Updating the City's asset

[9] Available online at:
http://oaknetnews.oaklandnet.com/oak/groups/pwa/documents/standard/oak072151.pdf

inventory will ensure adequate maintenance[10] and tracking of the City's FTC. At a minimum, the GIS staff of the Division implementing the project shall update GIS Enterprise with the location, type, manufacturer, and installation date of the FTC and send the as-built plans to the Watershed and Stormwater Management Division.

Kristin Hathaway, Manager, Watershed and Stormwater Management Division

Date Issued: January 13, 2020

Date Revised: Not Applicable

Contact: Ben Livsey, Watershed and Stormwater Management Division

Phone: 238-6815

[10] The maintenance of each full capture device shall be adequate to prevent plugging, including plugging of the 5 mm screen leading to trash overflow and bypass, flooding, or a full condition of the device's trash reservoir causing bypassing of trash. **All full trash capture devices shall be inspected and maintained at least once per year [by City Storm Drainage Division staff]. All such devices in high or very high trash generation areas shall be inspected at least two times per year, with the inspections spaced at least three months or more apart.** If this frequency of inspection is found excessive after two inspections, the inspection frequency can be reduced to once per year. If any such device is found to have a plugged or blinded screen or is greater than 50 percent full of trash during a maintenance event, the maintenance frequency shall be increased so that the device is neither plugged nor more than half full of trash at the next maintenance event (MRP Provision C.10.b.i.a).

Attachments: *List of attachments included for reference only. Available upon request.*

Attachment A: Trash Generation Rate and Areas Covered by Trash Capture Devices
Attachment B: State Water Resources Control Board Certified Full Capture System List of Trash Treatment Control Devices
Attachment C: State Water Resources Control Board Requirements for Certified Multi-Benefit Trash Treatment Systems
Attachment D: Summary of Trash Capture Device Types
Attachment E: Standard Technical Specifications for Connector Pipe Screens and Auto-Retractable Screens
Attachment F: Connector Pipe Screen Standard Detail
Attachment G: Auto Retractable Screen Standard Detail

List of Acronyms and Abbreviations

ARS	auto-retractable screen
CPS	connector pipe screen
FTC	full trash capture device
MRP	Municipal Regional Stormwater NPDES Permit (NPDES Permit No. CAS612008, Order No. R2-2015-0049)
Priority FTC Inlet Map	Map of priority inlets to be treated with full trash capture devices
Regional Water Board	San Francisco Bay Regional Water Quality Control Board
WSMD	Watershed and Stormwater Management Division staff