DYE TESTING PROCEDURE

Purpose:

Dye testing of sanitary sewer drains is required during all new building construction, building renovations, and any time a building plumbing fixture is connected to a drain line. Dye testing confirms that all sanitary sewer drains are properly plumbed and eliminates the chance of an inadvertent cross connection to the storm drain system. Sanitary sewer drains connected to the storm sewer system are illicit discharges which violate the minimum control measures in the campus Storm Water Management Program and expose the university to potential fines from the City of Austin and the Texas Commission on Environmental Quality (TCEQ).

The requirement is that ALL fixtures installed or renovated be tested with dye. In new construction, before walls cover piping, Environmental Health and Safety (EHS) and Utilities and Energy Management (UEM) personnel can visually inspect plumbing lines and verify proper connections. This will reduce the number of fixtures requiring testing and minimize the time needed for testing. In renovations or remodeling projects, and any projects involving kitchen areas or grease traps, each fixture requires testing.

Test Preparation

1. Identify all new or modified plumbing fixtures and develop a dye test plan.

   The dye test plan should include as-built or plumbing drawing marked to indicate fixtures or banks of fixtures for testing as well as a preliminary dye test log filled out with floor/room number/fixtures.

   Submit the proposed plan to EHS and UEM at least two weeks prior to desired dye test date or building walk through.

2. Verify the discharge points of the sanitary sewer and the storm drain piping systems for the area of the test.

   Utilize available as-built and utility drawings to identify drains and the nearest exterior sanitary sewer manhole(s) to the building that receives wastewater flow from the building. Identify any sanitary sumps within the building that may receive flow prior to discharge to the exterior manhole.

   Identify nearest exterior storm sewer manhole(s) that receives storm water flow from the building. Identify any storm sumps within the building that may receive flow prior to discharge to the exterior manhole.

   Determine if the building storm water drains to Waller Creek or to Shoal Creek. If the building drains to Waller Creek, select a day for testing when the water in Waller
Creek is clear, not muddy, and monitor the creek for signs of dye during the test. If the building drains to Shoal Creek, watch for dye in the nearby manholes.

3. Prepare the following materials prior to the test.

   a. EHS will provide liquid tracing dye of a minimum of 2 different colors, in either red, green, yellow or blue. All dyes must be non-toxic, biodegradable and NSF certified. Liquid dye tracers include Kingscote Bright Dyes and Plant Pro Water Tracing Dyes available from Grainger or Pollard Water or equal.

   b. Communications systems. (radios are preferred over mobile phones due to poor reception in building lower levels)

   c. UEM will provide outfall/manhole observers. Construction Inspector must coordinate with UEM and EHS to ensure all appropriate personnel are present.

   d. Building “as-built” plumbing drawings and UT Austin Utility drawings.

   e. UEM will provide tools to open manholes, floor drains/covers, sump lids, etc.

   f. Garden hose(s) of sufficient length to reach from bib to fixtures in the floor.

   g. Dye Test Log.

   h. Flashlights.

Test Notification and Personnel

1. Notify UT Austin EHS and UT Austin UEM Mechanical Distribution at least two weeks prior to the proposed testing date to allow for dedication of staff and notification to utility provider.

   Submit dye test plan, with drawings, at this time.

2. Appropriate staff will be needed to administer and record dye introduction into the drains, as well as being posted at the designated sanitary and storm sewer observation points. Typical roles include:

   PMCS Construction Coordinator or CPC Construction Inspector to request and coordinate dye test with EHS and UEM, record entries in dye test log and provide the signed, final report.

   EHS to contact the City of Austin for notification of testing and to witness dye test for accuracy with PMCS/CPC representative.
Contractor representative(s) to administer dye to fixtures and handle hoses/equipment.

UEM Mechanical Distribution will provide support in identifying and opening sanitary sewer and storm manholes on the exterior of the building to observe/witness dye exiting the building.

Test Procedure

1. Station UEM personnel at the selected observation points for sanitary sewer and storm sewer to watch for dye in the wastewater and storm water flows. Ensure all personnel have appropriate communication devices and necessary equipment.

2. Add approximately one tablespoon of dye to each fixture (water closet, urinal, floor drain, sink, etc.) plumbed to sanitary sewer to be tested. Record the time dye was added and color on the dye test log. Mark the location of the fixture being tested on the drawing. (Note: All drains/fixtures within the building or project shall be tested unless EHS or UEM staff have previously visually confirmed proper connections to the sanitary sewer riser. All fixtures within a room or location can be tested simultaneously in the same dye color.)

3. Continuously flush the fixture(s) with water until dye is detected at the observation point (sanitary manhole, cleanout, storm sewer outfall, or sump). The greater the flow of water the faster dye will be observed.

4. When dye of the proper color is observed at the sanitary observation point and no dye is observed in the storm sewer observation point, the test is successful. Record the time on the dye test log. Repeat steps 2 and 3 for each location identified on the dye test plan.

   a. If any dye is detected in the storm sewer observation point immediately begin to test each fixture in that location independently, alternating colors, until the cross connection is identified.

   b. Take the cross-connected fixtures out of service until they are properly connected to the sanitary sewer system

5. Document all observations. The contractor prepares and submits the dye test report to the project manager and PMCS/CPC representative. PMCS/CPC representative will then forward to EHS and UEM Mechanical Distribution.

Dye Testing Tips:
Each room or location may be tested simultaneously. (e.g. 6 water closets, 3 urinals, 4 sinks and 1 floor drain at one time)

Ensure that the dye has been flushed from lines completely before beginning the next room or location.

Alternate the color of dye from one room or location to the next to ensure observers are seeing dye from the current room or location.

Dye can be removed from the solution by adding chlorine. Add 4 grams of 12% bleach for every gram of dye in the solution.

Ensure dye is observed at the final outfall of the building (i.e. nearest exterior sanitary or storm manhole, or storm drain outfall at the creek).

**Test Report:**

The test report summarizes the activities and results of the test and is **required** to be submitted to EHS and UEM Mechanical Distribution. The format of the report is at the discretion of the report writer; however, at a minimum, the report must contain the following:

1. The number, type, and results of all drains tested. For any drains that were found to be improperly plumbed, a timeline of necessary corrections needed, and follow up dye testing results to document the corrections made.

2. Plumbing drawings for all drains tested. The drawing should be marked with numbered drains tested that correspond to the accompanying dye test log.

3. Signed and completed dye test log indicating the fixtures, color, time in and time observed.