



The University of Texas at Austin

Project Management and Construction Services

Design and Construction Standards

Supplemental Document

Standard Operating Procedure Dye Testing

All renovation and new construction activities on The University of Texas at Austin campuses are required to meet the UT Austin Design and Construction Standards (DCS). This includes the very first planning and design stages through actual construction and facilities maintenance and management. They reflect the planning, design, construction, maintenance, and other facilities asset expertise of University personnel. These documents are to be used as a guideline on all UT Austin projects, and are not to be used for bidding, permitting, construction or any other purpose. Any deviations must be approved by the respective Division Champion, and will be submitted in writing by the Project Manager. The Design and Construction Standards are controlled by Project Management and Construction Services, The University of Texas at Austin. This document is the property of UT Austin, and use of this document, in part or in whole, for any purpose other than for a UT Austin project may not be done without written permission of the University.

For any comments or questions related to UT Austin Design and Construction Standards, please contact the Project Management and Construction Services Planning group at: campus_standards@austin.utexas.edu or by phone at (512) 471-0665.

The issuance and revision history of this Section is tabulated below. Please destroy any previous copy in your possession.

Rev Date	Pages	Remarks	Documents Referenced
12/15/2020	All	New Supplemental Document submitted by EHS.	
6/1/2021	All	New Supplemental Document published.	

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 or visually verified to be connected to sanitary sewer. In new construction, before walls cover piping, Environmental Health and Safety (EHS) personnel can visually inspect plumbing lines and verify proper connections, in conjunction with CPC or PMCS inspections as required. 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. Contractor or UT Shop personnel (for projects constructed by shops) to identify all new or modified plumbing fixtures and develop a dye test plan.
 - a. 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.
 - b. Submit the proposed plan to EHS and Utilities and Energy Management -Mechanical Distribution (UEM-MD) at least seven business days prior to desired dye test date or building walk through.

2. Contractor or UT Shop personnel will provide underfloor plumbing and utility site plans to show intended drain connections relative to the overall building system. UEM-MD will use these drawings to identify the discharge points of the sanitary sewer and the storm drain piping systems for the area of the test.
 - a. Contractor to use available as-built and or utility drawings may to identify drains and the nearest exterior sanitary sewer manhole(s) to the building that receives wastewater flow from the building.

Contractor to identify any sanitary sumps within the building that may receive flow prior to discharge to the exterior manhole. If fixtures first drain to a sump, the Contractor's Construction Inspector (CI) will need to coordinate with Facilities Services – Zone Maintenance staff to do the dye test. Contractor to coordinate with facilities to provide operation sump pumps and plumbing expertise to do proper dye testing. The pumps may need to be operated in manual mode in order to ensure flow to the sanitary manhole, allowing for verification of the presence of dye.

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

Contractor to determine if the building storm water drains to Waller Creek or to Shoal Creek. If the building drains to Waller Creek, contractor to 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, contractor to watch for dye in the nearby manholes.

3. Prepare the following materials prior to the test.

- a. Contractor to provide communications systems. (radios are preferred over mobile phones due to poor reception in building lower levels)
- b. Contractor or UT Shop, via the CI will provide building “as-built” plumbing drawings and UT Austin Utility drawings.
- c. Contractor or UT Shop will provide garden hose(s) of sufficient length to reach from bib to fixtures in the floor.
- d. Contractor’s or UT Shop’s completed Dye Test Log.
- e. 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.
- f. UEM-MD will provide outfall/manhole observers. UT Construction Inspector must coordinate with UEM-MD and EHS to ensure all appropriate personnel are present.

- g. UEM-MD will only provide access to exterior UT -owned manholes as necessary to complete the dye test. Any access required in the building or elsewhere is the responsibility of the contractor and will need to be coordinated with UT Facilities Services – Zone Maintenance staff. .
- h. Flashlights.

Test Notification and Personnel:

1. Construction Inspector will notify EHS and UEM-MD at least seven to ten business days prior to the proposed testing date to allow for dedication of staff and notification to the City of Austin.
 - a. Submit contractor’s or UT Shop’s prepared dye test plan, with drawings, at this time.
2. Appropriate staff will be needed to observe and record dye introduction into the drains, as well as being posted at the designated sanitary and storm sewer observation points. Typical roles include:
 - a. PMCS or CPC Construction Inspector to request and schedule dye test with EHS and UEM-MD, and coordinate between all relevant contractor/UT Shop and UT team members during the test.
 - b. EHS to contact the City of Austin for notification of testing, witness dye test and record entries in dye test log, and provide the signed, final report.
 - c. Contractor or UT shop representative(s) to administer EHS-provided dye to fixtures and handle hoses/equipment. Must provide a person knowledgeable of plumbing installations and adequate support personnel to assist with conducting the test.
 - d. UEM-MD 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-MD 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. Contractor or UT Shop personnel to add approximately one tablespoon of dye to each fixture (water closet, urinal, floor drain, sink, etc.) plumbed to sanitary sewer to be tested. EHS will 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. Contractor or UT Shop personnel will 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 by UEM-MD at the sanitary observation point and no dye is observed in the storm sewer observation point, the test is successful. EHS will 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. EHS will document all observations. After the test, EHS will prepare and submit the dye test report to UEM-MD, Facilities Services, the contractor or UT Shop, and the PMCS/CPC representative.

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, to be completed by EHS, summarizes the activities and results of the test. The test report is made up of the following:

1. Signed and completed dye test log indicating the fixtures, color, time in, time observed and location the dye was observed.

NOTE: For any drains that were found to be improperly plumbed, the contractor or UT Shop must provide a timeline of necessary corrections. A follow up dye test must be scheduled by the CI with EHS and UEM-MD, and the results must be documented per the above procedures, to prove that the corrections were 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.