

**PERMANENT WATER QUALITY CONTROL MEASURE
AS-CONSTRUCTED SURVEY**

Section 208 of the Standard Specifications is hereby revised as follows:

Subsection 208.10 (b) is revised as follows:

CONSTRUCTION REQUIREMENTS

5-1 As-Constructed Survey. The Contractor shall complete an as-constructed survey of the Permanent Water Quality (PWQ) control measures to confirm that the PWQ control measures conform to the location, configuration, grade, and volume shown on the plans. The Engineer reviewing this information will use the as-constructed survey to confirm that the constructed condition as per the design plans. The Contractor shall submit the as-constructed survey to Region Hydraulics Engineer for review. The electronic as-constructed survey shall conform to the requirements of Section 625, the Survey Tabulation sheet under Minor Structures, **using** TMOSS codes, and the entire electronic file submitted shall include the following information:


1. An electronically signed **PDF document**. A CADD model with the field-collected information report and items 2-10 signed, sealed, and dated by a Colorado Professional Land Surveyor licensed in the state of Colorado who is in responsible charge of the work. The Contractor shall submit survey data files and 3D CADD digital terrain model **with as-constructed information to the Project Engineer for final submittal into ProjectWise and with the CDOT Finals Unit archives.**
2. **Include the project benchmark (BM) description, elevation, and datum (NAVD 88 or project datum). Record BM on the Project Control Diagram established and set; electronically stamped by a Colorado Professional Land Surveyor. Include two to three benchmarks on relative stormwater facilities to allow for future monitoring of pond volume and inspections.**
3. Contours shown at 1-foot intervals with major contours labeled at 5-foot increments.
4. Bottom of basin elevations along the toe of embankment slope and top and bottom of trickle channel to verify positive drainage throughout the basin with labels of feature and elevation. Include the **Water** Quality Capture Volume (WQCV) elevation as shown on plans.
5. Include top of wall shots or **dam** elevation statement on the survey to verify freeboard along the basin perimeter. Show the top width of the embankment along the perimeter of the basin.
6. A detail of each forebay located at outfall of each incoming storm drain into the basin, including plan dimensions; tops of walls, tops of slabs, pipe invert elevations; and pipe **diam**eters.
7. The basin location related to property lines (measured distances), right-of-way lines, buildings, roads, access paths, and other easements.
8. Details of the outlet control structure, including micropool, showing all dimensions (length, width, depth, diameter, and initial surcharge volume); elevations of structures; and materials of weirs, orifices, orifice plates, and outfall pipes, including labels of feature and elevations. (Show on the as-constructed deliverable CADD file and Survey report).

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9. Include details of all grates, racks, screens, and any other materials intended to prevent clogging of the outlet structure orifices by debris of any kind, including large woody debris as well as grasses and trash. Label all features and elevations on the as-constructed deliverable CADD file and Survey report. A digital photo image is not solely sufficient.


10. Access and maintenance easements per the ROW plans around the basin, including the maximum slope of the access easement. 

11. The submitted CADD 3D model shall include the following:

- a. Electronic check to all control marks set per paragraph 2 and other Project Controls as shown on the stamped Project or Land survey Control diagram; ensure that contour lines are continuous, closed, unbroken polylines.
- b. Grade spot elevations and breaklines used to create the contours.
- c. Show all item elevations listed in items 2-10 in the model.
- d. Ensure all contours are  correct.
- e. Initial basin volume calculation report certified by the PLS in responsible charge of the data collection.

CDOT will return field survey data and electronic model files to the Contractor to have the PLS add missing information in the submittal and correct errors in the electronic model file submittal. All changes requiring the Contractor to rectify missing information and errors are at the Contractor's expense to resubmit.

PWQ control measures that do not meet the Contract requirements will be identified in writing by the Engineer and shall be repaired or replaced at the Contractor's expense. Perform correction surveys to confirm the locations, dimensions, and certified data collected by the PLS in responsible charge. Perform these surveys at the Contractor's expense. Correction Survey reports will be re-certified by the PLS in responsible charge with the date of the recertification shown on the PLS Stamp and Seal. The Hydraulics Engineer will use the PLS re-certified correction reports for as-constructed Pond Information Certification (water quality capture volume structures only) of each PWQ control measure. All survey certification reports will remain on file until final acceptance.

The Engineer, CDOT Hydraulics Engineer for the region (optional), Headquarters Permanent Water Quality Manager, and Headquarters Maintenance staff will perform a walkthrough of the PWQ control measures to confirm conformance to material requirements, locations, and dimensions. Before the walkthrough, the Contractor shall provide the corrected certified PLS stamped survey to the Engineer, Regional, and Headquarters Permanent Water Quality  Managers. The as-constructed survey must be certified and accepted before final acceptance of the project. The walkthrough will use the CDOT Permanent Water Quality Checklist.

Subsection 208.12 shall include the following:

Pay for the as-constructed survey for wet and dry detention basin and associated items, including creating the electronic 3D CADD model, under 625 Construction Surveying.