



# Technical Procedure Document

**Subject:** Equalization Pipes and Submerged Systems

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## Introduction

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As a result of low-lying areas of Charleston and the City of Charleston's (City) emphasis on preserving mature vegetation while minimizing the placement of fill material associated with new development and redevelopment projects, the City acknowledges that in some cases equalization pipes and submerged systems may be an appropriate design approach. Much debate has occurred over the past several years on how to balance the use of these systems while protecting the City from the increased cost and complexity of maintenance of such systems. In response to this matter, the new Stormwater Design Standards Manual (SWDSM) now allows the use of submerged systems as a design exception so long as provisions for inspection and maintenance are incorporated into the design.

The new SWDSM defines an equalization pipe as a pipe that maintains equal water surface elevation in all connected ponds in a closed system. Additionally, a submerged system is a system in which the permanent pool of water is above the flowline invert elevation of the outlet.

This Technical Procedure Document outlines the requirements for equalization pipes and submerged systems as accounted for in the SWDSM.

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## Design Requirements (SWDSM Sections 3.4.6.1.4 and 3.11)

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Equalization pipes and submerged system requirements are included in **Sections 3.4.6.1.4 and 3.11 of the SWDSM**. The requirements are as follows:

- Isolator boxes must be installed at both ends of a conduit designed to be submerged to facilitate draining and for maintenance purpose as detailed by the City Engineering Division. These are provided by the Engineering Division, but not listed on the City website.
  - For pipe runs of greater than 600 feet, the maximum distance between isolator boxes shall be 600 feet. Maintenance access points are required every 200 feet (SWDSM 3.4.6.1.13)
  - The minimum pipe size shall be 24 inches in diameter
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## Design Exceptions (SWDSM 4.10)

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**Section 4.10 of the City's SWDSM** accounts for how to present design exceptions from the SWDSM requirements. In order to obtain approval of a design exception from the City, an exceptional circumstance applicable to the site must exist, such that the adherence to the provisions of the SWDSM will not fulfill the intent of the SWDSM. A written request will be required by the City and must contain:

- Specific design exception(s) sought



- Rationale for the proposed design exception
- Supporting data

Per SWDSM Section 3.4.6.1.4, the design exception request for an equalization pipe or submerged system must also include the following at a minimum:

- Pretreatment for sediment loading into the submerged system must be provided in the post-construction conditions.
- Description of the proposed construction method to replace the submerged system (including dewatering and excavation without the need for shoring). This includes the need to provide cross section details demonstrating the necessary easement width to accommodate replacement of submerged pipe system has been provided including excavation, dewatering, equipment location and other necessary items without the use of additional support of excavation materials. Examples of additional support of excavation materials would include sheet piling, trench boxing, etc.
- Description of the maintenance method for the submerged pipes and isolator boxes. This must include drawdown and be maintenance methods must be able to be completed within a day.

The City understands that the need for an exception may not be known during the planning stages and may only be evident after a portion of design work has been completed. The City intends to work with the developer and designers during the design process to find a resolution if the above items are adequately demonstrated.

Once an exception is approved, it must be fully documented and be included on the title sheet of the approved stamped construction drawings and project record drawings.