

Chapter 2. Stormwater Management Policy & Principles

2.0 Principles

When planning stormwater management facilities, the following principles shall be applied where possible.

- 2.0.1 Drainage is a regional phenomenon that does not respect the boundaries between government jurisdictions or between properties.** This makes it necessary to formulate programs that include both public and private involvement. Overall, the governmental agencies most directly involved must provide coordination and master planning, but drainage planning must be integrated on a regional level if optimum results are to be achieved.
- 2.0.2 A stormwater management system is a subsystem of the total urban water resource system.** Stormwater management system planning and design for any site must be compatible with regional comprehensive plans, and should be coordinated with planning for land use, open space, and transportation corridors. Urban stormwater management must consider and address the interrelated issues of erosion and sedimentation control, flood control, site grading, and regional water quality.
- 2.0.3 Every urban area has an initial (i.e., minor) and a major drainage system, whether or not they are actually planned and designed.** The initial drainage system, referred to in these Criteria as the “minor drainage system”, is designed to provide public convenience and to accommodate moderate, frequently occurring flows. SEMSWA requires that the minor drainage system be designed to convey runoff from a 5-year storm event. The major drainage system carries greater volumes of water and operates when the rates and / or volumes of runoff exceed the capacity of the minor system(s). SEMSWA requires that the major drainage system be designed to convey runoff from the 100-year storm event. To provide for orderly urban growth, reduce costs to future generations, and avoid loss of life and major property damage, both systems must be planned and properly engineered.
- 2.0.4 Runoff routing is primarily a space allocation problem.** The volume of water present at a given point in time in an urban region cannot be compressed or diminished. Adequate space must be provided, during initial planning stages, for storm drainage runoff conveyance, quality enhancement, and storage, if not, stormwater runoff will conflict with other land uses, resulting in damages and the disruption of other urban systems.
- 2.0.5 Planning and design of stormwater management systems generally shall not be based on the premise that problems can be transferred from one location to another.** Urbanization tends to increase downstream peak flows by increasing runoff conveyance rates and volumes. Stormwater management and detention storage systems shall be designed and provided so as not to adversely impact upstream and / or downstream properties.

Chapter 2. Stormwater Management Policy & Principles

- 2.0.6 An urban storm drainage strategy should be a multi-objective and multi-means effort.** Competing demands placed upon available space and resources require a stormwater management strategy that meets a number of objectives, including water quality enhancement, groundwater recharge, recreation, wildlife, wetland creation, protection of landmarks/amenities, control of sediment and erosion, and creation/preservation of open spaces.
- 2.0.7 Design of the stormwater management system shall consider the features, capacity, and function of the existing drainage system.** Good designs incorporate the effectiveness of the natural systems rather than negate, replace or ignore them. Existing features such as natural drainageways, depressions, wetlands, floodplains, permeable soils, and vegetation provide for infiltration, help control the velocity of runoff, extend the time of concentration, filter sediments and other pollutants, and recycle nutrients.
- 2.0.8 In new developments, attempts should be made to reduce stormwater runoff rates and pollutant load increases after development to the maximum extent practicable.** To the extent feasible, the imperviousness of the site should be minimized, the rate of runoff should be slowed by maximizing vegetative and porous land cover, and a series of best management practices must be provided for water quality enhancement and protection.
- 2.0.9 The stormwater management system shall be designed, beginning with the outlet or point of outflow from the project, giving full consideration to downstream effects and the effects of off-site flows entering the system.** The design of the stormwater management system shall take into account runoff from upstream sites, assuming fully developed conditions, and shall evaluate the downstream conveyance system to ensure that it has sufficient capacity to accept design discharges without adverse backwater or downstream impacts such as flooding, stream bank erosion, channel degradation, and sediment deposition.
- 2.0.10 The stormwater management system must receive regular maintenance to ensure long-term function and effectiveness and stormwater management facilities shall be designed with ease of maintenance, long-term functionality, and accessibility as primary considerations.** Operation and maintenance procedures and activities must be developed and documented along with the facility design. Clear assignment of maintenance responsibilities shall be identified, and assigned to an established agency with the resources and understanding, which are required to ensure proper maintenance.
- 2.0.11 Floodplains need to be preserved where feasible and practicable.** Preservation of floodplains serves to minimize hazards, preserve habitat and open space, create a more livable urban environment, and protect the public health, safety, and welfare. Floodplain encroachment is highly discouraged and will only be considered on a case-by-case basis.

Chapter 2. Stormwater Management Policy & Principles

2.0.12 Reserve sufficient right-of-way for lateral channel movement of incised floodplains. Whenever a floodplain is contained within a narrow (i.e., degraded) channel, the channel should be provided with grade control structures and a right-of-way corridor to account for lateral movement. Lateral movement over time can cause extensive damages to public and private structures and facilities.

2.0.13 Stormwater management improvements must be designed and constructed concurrently with Development within a watershed. Development within a watershed creates an impact to the watershed that must be addressed through the design and construction of improvements. Development proposals must address these impacts and include the cost and implementation of stormwater management improvements within the Subdivision Improvements Agreement.

2.1 Planning Policies

When planning stormwater management facilities, the following planning policies shall apply where possible.

2.1.1 All land development proposals shall receive full site planning and engineering analyses. A drainage report and plan, consistent with the submittal requirements in these Criteria shall be required for all new development and redevelopment within the City's jurisdiction.

2.1.2 Stormwater management planning shall be required in the initial planning stages, for all developments, to ensure that adequate space is allocated for the required stormwater management facilities.

2.1.3 SEMSWA will continue to participate in, and encourage the development of detailed regional master plans, which will set forth site requirements for development and identify the required public improvements. Master plans will be approved, adopted, and revised as necessary to accommodate changes that occur within the specific drainage basin.

2.1.4 Where practicable and feasible, site planning and design techniques shall be incorporated, which promote the concept of minimizing directly connected impervious areas in order to decrease the volume and velocity of stormwater runoff from a site.

2.1.5 SEMSWA shall encourage the development of multipurpose, aesthetic stormwater management facilities that are safe, maintainable, and viewed as community assets.

2.1.6 SEMSWA defines a major drainageway as any drainage flow path with a tributary area of 130 acres or more.

2.1.7 SEMSWA recognizes that some intra-watershed transfer or diversion of runoff occurs within major drainageway watersheds, as sub-watershed boundaries are changed with development. Those diversions and transfers should be

Chapter 2. Stormwater Management Policy & Principles

minimized, to the extent possible. Historic outfall locations to natural drainageways shall be maintained, and any potential adverse impacts that result shall be mitigated with the stormwater management design.

- 2.1.8** Inter-watershed transfer or diversion of runoff from one major drainageway watershed to another major drainageway watershed shall.
- 2.1.9** There are areas within the City with specific drainage and / or water quality concerns. SEMSWA will require additional jurisdictional cooperation and drainage analysis in these specified planning areas. In some cases, additional improvements may be required.
- 2.1.10** Encroachment into the 100-year floodplain through floodplain fringe filling is strongly discouraged.
- 2.1.11** Groundwater or sub-surface water can adversely impact the construction, capacity and long-term function and maintainability of stormwater management facilities. Those potential impacts shall be quantified to the extent possible, and considered during the design of stormwater management facilities.

2.2 Design Policies

When planning stormwater management facilities, the following design policies shall apply where possible.

- 2.2.1** Stormwater management planning and design within the City shall adhere to these Criteria, and in accordance with the criteria established in the UDFCD Manual.
- 2.2.2** All development, redevelopment and expansion must include planning and design for both the initial and major drainage systems. The initial drainage system shall be designed for the 5-year storm recurrence interval. The major drainage system shall be designed for the 100-year storm recurrence interval.
- 2.2.3** The initial drainage system, as a minimum, shall be designed to transport runoff with minimum disruption to the urban environment. Minor storm drainage can be conveyed in the curb and gutter area of the street or roadside ditch (subject to street classification and capacity, as defined herein), by storm sewer, (without surcharge), channel, or other conveyance facility, provided that capacity exists when future development is considered. The initial drainage system shall be sized without accounting for peak flow reductions from upstream detention.
- 2.2.4** The major drainage system shall be designed to convey runoff in a manner, which minimizes health and life hazards, damage to structures, and interruption to traffic and services. Major storm flows can be carried in the urban street system (within acceptable depth criteria as provided herein), channels, storm sewers and other facilities, provided that capacity exists when future

Chapter 2. Stormwater Management Policy & Principles

development is considered.

- 2.2.5** Determination of rainfall values and runoff quantities shall be based on the information and methodologies presented in Chapter 6, Hydrology.
- 2.2.6** Underground components of the stormwater management system must meet applicable structural requirements for their service locations.
- 2.2.7** SEMSWA requires that stormwater detention storage be provided for all new development, redevelopment, or expansion, as defined in these Criteria. Storage volume and release rate criteria are based on the Excess Urban Runoff Volume and the 100-year recurrence interval storm events or “Full Spectrum” detention.
- 2.2.8** Stormwater retention shall not be permitted, except as approved on a case-by-case basis by SEMSWA as an interim solution and as permitted by law. Stormwater retention may be used temporarily in areas where an outfall storm sewer system has been planned, but has not been constructed. Retention shall be converted to detention when the outfall system is available.
- 2.2.9** Rooftop detention is prohibited.
- 2.2.10** Major drainageways within the City shall be preserved in their natural state, to the extent possible, and stabilization measures shall be designed to complement and enhance the natural character. Improvements are generally needed to mitigate adverse impacts associated with development, but they can be designed to maintain or enhance the natural environment. Major drainageway flows shall not be conveyed in storm sewer pipes, culverts or other enclosed structures, except for the use of culverts at roadway crossings.
- 2.2.11** In order to preserve their natural character, limit excessive velocities, minimize future rehabilitation and maintenance costs, and eliminate potential safety hazards, major drainageway channels shall be designed to provide a natural, smooth transition from the channel to the natural topography. SEMSWA will not allow the use of constructed retaining walls or bank slopes greater than 4:1 for major drainageway channels. Varying of side slopes throughout the channels is encouraged, to provide a less structural, more natural appearance.
- 2.2.12** SEMSWA encourages the application of the major drainageway standards and criteria to minor drainageways. Alternative treatments for minor drainageways will be considered, consistent with the criteria provided in Chapter 12, Open Channel Design.
- 2.2.13** Design of stormwater facilities shall consider the potential impacts of groundwater. Investigations shall be performed and improvements constructed as needed to avoid and/or mitigate the potential impacts of groundwater on the stormwater facilities and the subdivision.

Chapter 2. Stormwater Management Policy & Principles

2.2.14 SEMSWA requires the implementation of permanent best management practices for enhancement of stormwater quality with all development, redevelopment and expansion within the City.

2.2.15 Underground permanent best management practices for enhancement of water quality are prohibited.

2.3 Operations and Maintenance Policies

2.3.1 All major drainageway improvements and regional detention or water quality enhancement facilities within the UDFCD boundary shall be made eligible for UDFCD maintenance assistance through the UDFCD Maintenance Eligibility Program. Design and construction must be approved by the UDFCD.

2.3.2 The design of all stormwater management facilities within the City must be performed with access and long-term operation and maintenance being priority considerations. An Operation and Maintenance Manual must be developed concurrent with the design and accepted by SEMSWA. Stormwater facility designs where access or long-term operation and maintenance considerations are compromised will not be accepted. See Section 4.8 for additional information.

2.3.3 The property owner shall be responsible for the maintenance of all stormwater facilities located on their property, unless those responsibilities are accepted by another party and documented via a legal agreement. Should the owner fail to adequately maintain the facilities, SEMSWA shall have the right to enter the property for the purposes of operation and maintenance and assess the costs for such maintenance to the property owner.

2.3.4 Drainage easements or tracts, including access easements, shall be provided for all stormwater management facilities required as part of these Criteria. On-site drainage facilities that are private, affect only the individual property owner, and are not required by these Criteria, need not be placed within public easements. Private detention ponds and outlet works are required by these Criteria for proper functioning of the public drainage system, and therefore are required to be placed within drainage easements or tracts.

2.3.5 SEMSWA recognizes that development, even with detention, alters the conveyance of stormwater runoff across downstream properties. SEMSWA will require upstream property owners to obtain easements across the downstream properties and to provide improvements to accommodate this altered conveyance to the major drainageway.

2.3.6 Developing properties shall convey runoff from upstream properties across their site within dedicated drainage easements or tracts.

Chapter 2. Stormwater Management Policy & Principles

2.4 Construction of Public Improvements Policies

- 2.4.1** Water quality best management practices as defined by the accepted Phase III Drainage Report and Plan must be designed and constructed with all new development and redevelopment.
- 2.4.2** All projects within a watershed must participate in the stabilization and improvement of major drainageways. The minimum improvements discussed in Section 12.1 shall be constructed with all development and new development.
- 2.4.3** The local drainage system, as defined by the accepted Phase III Drainage Report and Plan, including provisions necessary to convey developed flows from upstream properties, must be designed and constructed with all new development and redevelopment.
- 2.4.4** The connection of the local drainage system to a major drainageway or outfall system of adequate conveyance capacity, such as a master planned outfall, storm sewer, or drainageway, as defined by the accepted Phase III Drainage Report and Plan must be designed and constructed with all new development and redevelopment.
- 2.4.5** The major drainageway system and stabilization improvements, within and adjacent to the development, as defined by Master Drainage Plans, UDFCD Outfall Systems Planning Studies or as required by SEMSWA and defined by the Phase III Drainage Report and Plan must be designed and constructed with all new development and redevelopment.

2.5 Floodplain Policies

- 2.5.1** SEMSWA has adopted the minimum National Flood Insurance Program (NFIP) requirements and imposed additional requirements into its Land Development Code and this criteria manual. These additional requirements were adopted for consistency with the rules and procedures of the UDFCD Manual and to provide a higher level of floodplain management than required by FEMA.
- 2.5.2** SEMSWA shall require implementation of floodplain management criteria based on the 100-year storm event.
- 2.5.3** In order to ensure that development occurs outside of the 100-year floodplain, SEMSWA will regulate all major drainageways as floodplain. Floodplain mapping has been established for some of the major drainageways within the City and Areas of Special Flood Hazard have been identified. However it is recognized that not all floodplain areas have been studied, nor mapped.
- 2.5.4** In order to have an effective floodplain management program, the areas to be regulated must be consistently defined. SEMSWA's policy shall be to define a regulatory floodplain as any drainageway with a drainage tributary area of 130 acres or more, consistent with the UDFCD Manual definition of a major

Chapter 2. Stormwater Management Policy & Principles

drainageway. SEMSWA and the floodplain management requirements defined in these Criteria shall apply to all properties that meet this definition, whether or not they are currently mapped as floodplain by FEMA, the District, or others.

- 2.5.5** SEMSWA has designated a one-half foot floodway requirement. The floodway is defined as the channel, plus any adjacent floodplain area that must be kept free from encroachment so that the 100-year flood discharge can be conveyed without increases of more than one-half-foot in the Base Flood Elevation (BFE). Floodplain filling (encroachment) is highly discouraged by SEMSWA, and will be approved only on a case by case basis.
- 2.5.6** Encroachment and/or modifications to the floodway are prohibited unless it is demonstrated through an alternatives analysis, consistent with FEMA 44 CFR Part 60 Floodplain Regulations, that modifications to the floodway will be the best available option.
- 2.5.7** SEMSWA shall require a minimum 2-foot of freeboard between the 100-year water surface elevation and the lowest finished floor elevation of all structures. One-foot of freeboard must be contained within the floodplain channel easement.

2.6 Hazard Minimization & Public Safety Policy

- 2.6.1** Public safety shall be an essential objective when planning, designing and maintaining stormwater facilities.
- 2.6.2** Stormwater facilities within the City shall be designed with careful consideration of the potential hazards associated with the use, operation and maintenance of the facility. The design phase of all projects shall analyze the potential risks associated with the facility, and include appropriate design features to minimize these risks.