



# Residential Stormwater Guidelines Brochure

for  
Single-Family & Duplex Residential Lots

February 2022

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## A. Stormwater Management – An Important Element of the Site Plan

### ***WHY all the fuss, you ask? Here's why...***

The Village of Tequesta enjoys a waterfront environment between the Loxahatchee River, Indian River, and Atlantic Ocean. Most of the year, Tequesta enjoys a sunny, near-tropical climate, but a rainy season comes – from May through October. During the rainy months, frequent thunderstorms can last from a few minutes to a few days.

Heavy seasonal rains cause stormwater to flow from (“run-off”) commercial and residential rooftops, yards, and streets. This stormwater normally collects in the streets and works its way toward the nearest drainage inlet and waterway. Although ponding on streets is a temporary nuisance, the pollutants carried in the stormwater create a less visible but longer-lasting effect. These pollutants include automobile oil and grease, lawn fertilizers and pesticides, a variety of chemicals from commercial/industrial areas, and silt and floating debris from highways.

Continued pollution of Florida’s coastal area has severely degraded one of our most valuable resources, our waterways. Pollution also has negatively affected the quality and clarity of our waters as well as reduced our fish and wildlife populations.

Stormwater running off into the streets also wastes a valuable resource. After the rainy season comes the dry months of November through April.

The Village of Tequesta has adopted a comprehensive development plan that establishes specific goals for sustainable growth and development without compromising the biodiversity and intrinsic value of its natural resources. To achieve these goals and to begin reversing the current negative trends, we must significantly reduce the potential pollution from new development and redevelopment.

Our current *Stormwater Management Practices Manual* establishes guidelines for the safe management and disposal of stormwater runoff from developed areas. The *Stormwater Management Practices Manual* is applicable to all development and requires that all applications for building permits that increase impervious area contain a stormwater management plan.

The guidelines and recommendations in this *Residential Stormwater Guidelines Brochure* are designed to help you address stormwater management for your residential lot. Sample engineering calculations supporting the guidelines of the Brochure are available in the current version of the Village’s *Stormwater Management Practices Manual*.

## B. Guidelines to Prepare Your Site Plan

### ***OKAY, what must I do to prepare a stormwater site plan for my single-family or duplex home?***

To prepare a stormwater site plan, you must assess the existing site conditions, evaluate the proposed improvements, and make provisions for stormwater management. This process begins with collecting site-specific data by performing a lot survey. The lot survey is then used as a base to locate the proposed improvements and grade the lot to control stormwater runoff. Grading is reshaping or sloping your land in a way that surface drainage from runoff is directed away from the buildings and is controlled in a manner that eliminates or minimizes the impact on adjacent properties and public rights-of-way. The following steps detail the data to be collected for the lot survey and the information to be provided in the site plan.

#### **STEP ONE – SURVEY DRAWING**

Obtain a boundary survey and topographic information (from survey or publicly available light detecting and radar [LiDAR] data) for your lot. The survey must be performed by a professional land surveyor licensed to practice in Florida. The survey drawing must provide the following information:

- a. Legal description of lot.
- b. Property line dimensions, bearings, and/or angles.
- c. Location of existing improvements including adjacent properties, street, and waterway (if any).
- d. Three cross-sections showing elevations from the street, across lot lines, and center of the property (LiDAR-based elevations may be used if available).
- e. Location and identification of trees.
- f. Location sketch and identification of a nearby Mile Marker if run-off is directed toward the Indian River or Loxahatchee River.
- g. Drawing scale (1-inch = 10 feet, recommended) and a north arrow.

#### **STEP TWO – SITE PLAN**

Prepare a stormwater site plan showing the proposed improvements, utilities, landscaping, and site grading. The stormwater site plan, which must meet the guidelines described later in this Guideline, should be prepared at a recommended scale of 1 inch = 10 feet and provide the following information:

- a. Locations, dimensions, and types of construction materials of the building, roof, patio, screened porch, deck, shed, pool, and driveway.
- b. Proposed site grading showing existing and proposed elevations and/or contours (include proposed first floor and garage elevations and top of foundation elevation).
- c. Proposed drainage directions and areas draining to each retention system. Site grading must drain toward a retention system. Your run-off must not impact your neighbor's property.
- d. Locations, dimensions, and types of materials to be used in landscaping features, such as planters, walks, privacy walls, fences, trees, and shrubs.
- e. A cross-section (elevation view) across the center of the lot showing proposed improvements and site grading.

## C. Guidelines to Address Stormwater Management in Your

### Stormwater Site Plan

#### ***HOW do I address stormwater management in my site plan?***

The Village of Tequesta's waterfronts are beautiful and ecologically sensitive to pollutants, many of which are generated by stormwater runoff. The Village's goals are for sustainable growth and development without compromising the biodiversity and intrinsic value of our natural resources and while meeting state water-quality standards. To achieve these objectives, the Village requires your new home or improvement to meet the following design and construction guidelines:

- Preserve Roadside Swales
  1. Maintain the pervious cover of swales.
  2. Preserve existing swale elevations.
- Reduce Lot Fill
  1. Carefully consider the need to import any fill for the lot.
- Flood Protection
  1. Elevate the finished flood floor above the Federal Emergency Management Agency Base Flood Elevation.
- Reduce Impervious Surfaces
  1. Use pervious materials, such as gravel, pervious pavers on sand, native grasses, and wood for the construction of other site and landscaping improvements. Do not place impervious layers such as roofing paper or plastic under paved or landscaped areas.
  2. Use pervious concrete or pavers for driveways in accordance with Section 78-693 of the Village Code.
  3. Florida-Friendly Landscaping™ shall be used when required under Section 78-402 of the Village Code and is encouraged in all instances.
- Conserve Water
  1. Use of cisterns to collect roof runoff and recycle for non-potable water uses is encouraged.
  2. Use native plant materials for landscaping.
- Reduce Direct Discharges to Waterways
  1. Use berms to contain runoff onto adjacent waterways.
  2. If your lot has an existing bulkhead, lower the adjacent ground to provide a minimum 6-inch difference between the finished lot and the top of the bulkhead.
- Eliminate Discharges to Adjacent Properties
  1. Grade the site to prevent runoff from your lot entering adjacent properties.
- Reduce Discharges to Roadway
  1. Use berms to contain runoff from your lot onto adjacent roadways.
  2. Use traffic-rated trench drains across driveways to reduce discharges to the roadway. These trench drains should be drained to an on-site retention area. Trench drains are not needed where the driveway is below or at the same elevation as the roadway swale.
- Calculate Required Retention Volume Using the Following Steps:
  1. Determine square footage of the impervious area on the site that is directly connected to the proposed retention system (typically this would be an on-site swale). Directly connected would be any area when stormwater runoff passes over less than 20 feet on pervious area (e.g., grassed or landscaped area) before entering the on-site retention system. Pervious pavers would not be considered an impervious area.
  2. Determine square footage of the impervious area on the site that is unconnected to the proposed retention system and drains over 20 feet or more of pervious area before entering the retention system. An example would be an area of the roof that is drained from a downspout but flows over 20 feet of landscaped area before reaching the on-site swale.
  3. Calculate the total effective impervious area by summing the directly connected area with half the unconnected area.

4. Determine the square footage of the lot.
5. Calculate the ratio of the effective impervious area to the property area.
6. Use Table 1 to determine the required retention depth. The effective impervious area to the property area ratio from Step 5 should be rounded to the nearest ratio in Table 1.
7. Determine the required retention volume (cubic feet) by multiplying the required retention depth in feet (Step 6) by the impervious area in square feet (Step 3).

**Table 1. Required Retention Depth**

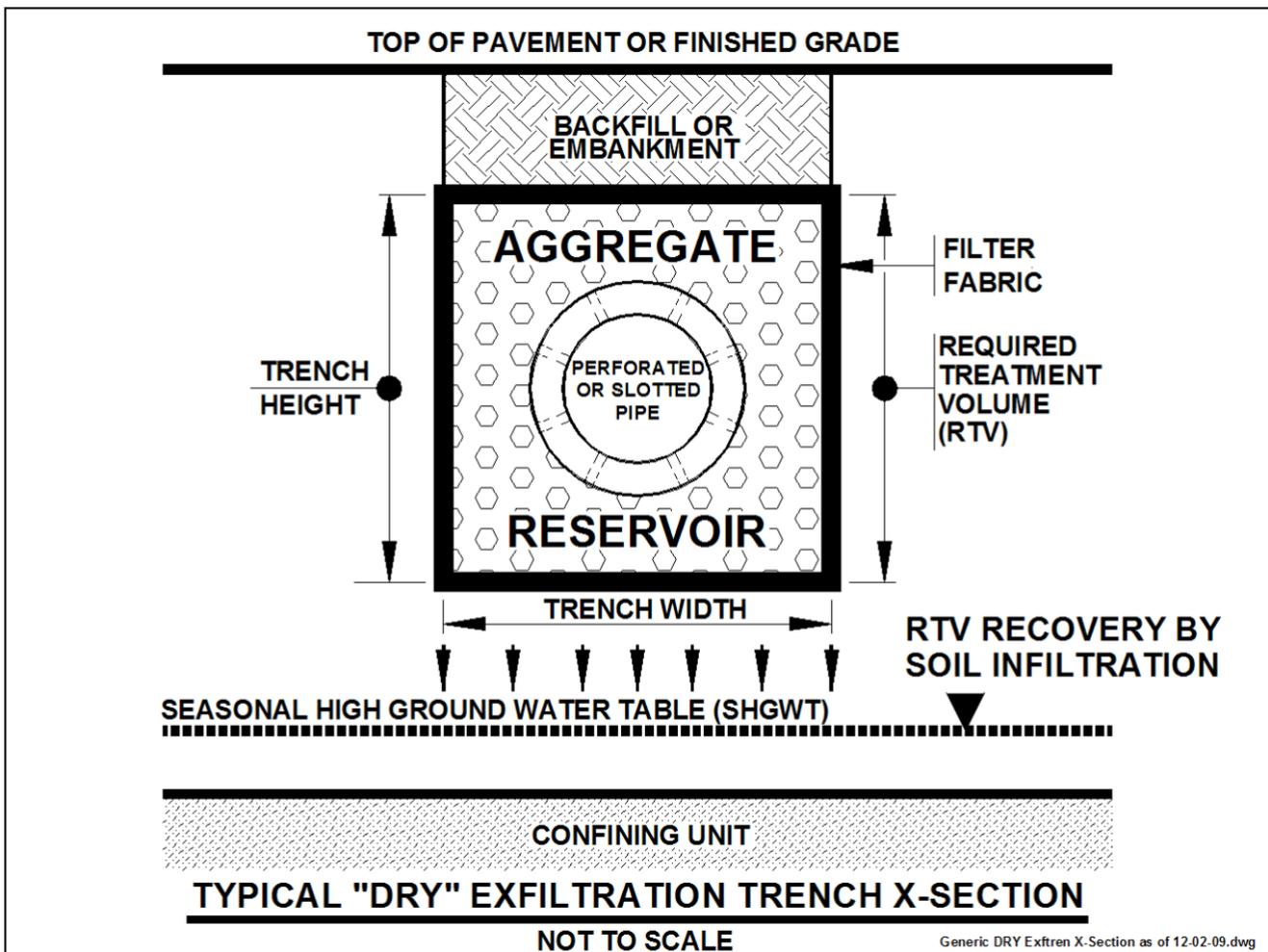
Effective Impervious Area to Property Area Ratio (Step 5)	Required Retention Depth (feet)	Required Retention Depth (inches)
0.20	0.138	1.66
0.25	0.142	1.70
0.30	0.15	1.80
0.35	0.161	1.93
0.40	0.175	2.10
0.45	0.186	2.23
0.50	0.201	2.41
0.55	0.214	2.57
0.60	0.228	2.74
0.65	0.242	2.90
0.70	0.256	3.07
0.75	0.269	3.23
0.80	0.283	3.40

If swale(s) are used, they must meet the following criteria:

- Runoff from the site drain to a swale.
- Swale length is greater than its width.
- Swale side slope is 4:1 (horizontal to vertical) or shallower.
- Swale does not disturb any natural areas.
- Swale is 6 inches or deeper.
- Swales is vegetated. If a swale is not vegetated, then a 6-inch layer of nutrient sorption soil amendment media formulated to reduce nutrient loading must be installed directly below the swale. Specifications and published nutrient reduction test results for the media must be provided for Village review at the time of permitting. Examples of acceptable media are NutriGone™ (distributed by EcoSense International) and Bold and Gold® (distributed by Environmental Conservation Solutions).

If exfiltration trenches or French drains are used on single-family or duplex lots, they must meet the following criteria:

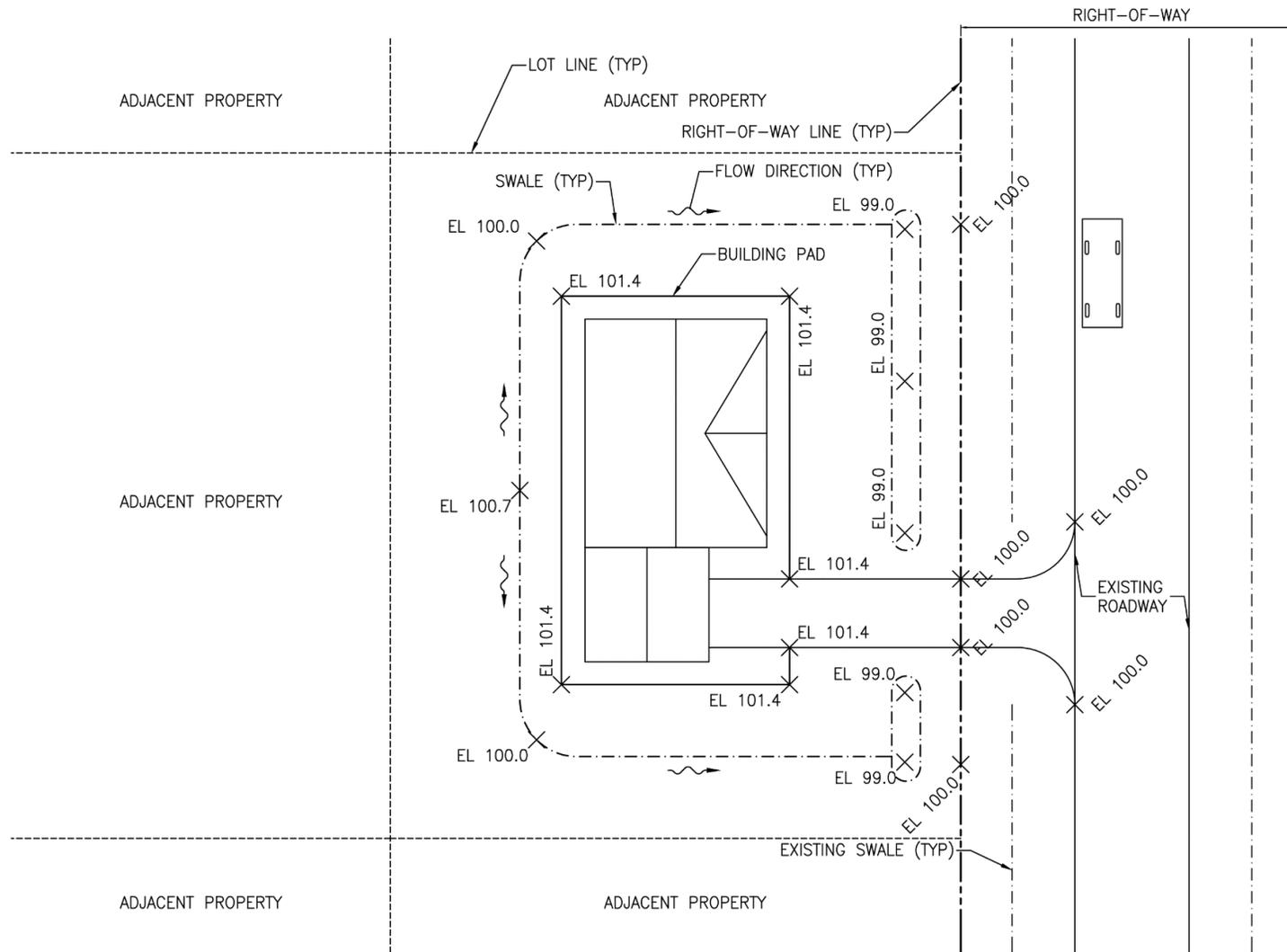
- Minimum of 8 inches of cover.
- Use at least a 4-inch or greater perforated pipe. A prefabricated shallow vault or drainage well may be used.
- Inlets to exfiltration system must include a fabric filter.
- Exfiltration system are not within 10 feet of a building.
- Exfiltration systems are not installed under driveways or other areas that may receive frequent vehicular traffic, unless designed by a Florida-registered and -licensed professional engineer.
- Bottom of exfiltration system is more than 12 inches above the wet-season water table. The wet-season water table can be determined using the US Department of Agriculture (USDA) Web Soil Survey (<https://websoilsurvey.sc.egov.usda.gov>), SoilWeb app available on Android or iPhone devices, or determined by an appropriate Florida-registered and -licensed professional.
- Volume of an exfiltration trench in cubic feet can be approximated as:  $V = L \times W \times (D - 0.96) \times 0.4$ , where L = length in feet, W = average trench width, and D = average trench depth in feet.
- A typical cross section of an exfiltration trench is shown below.



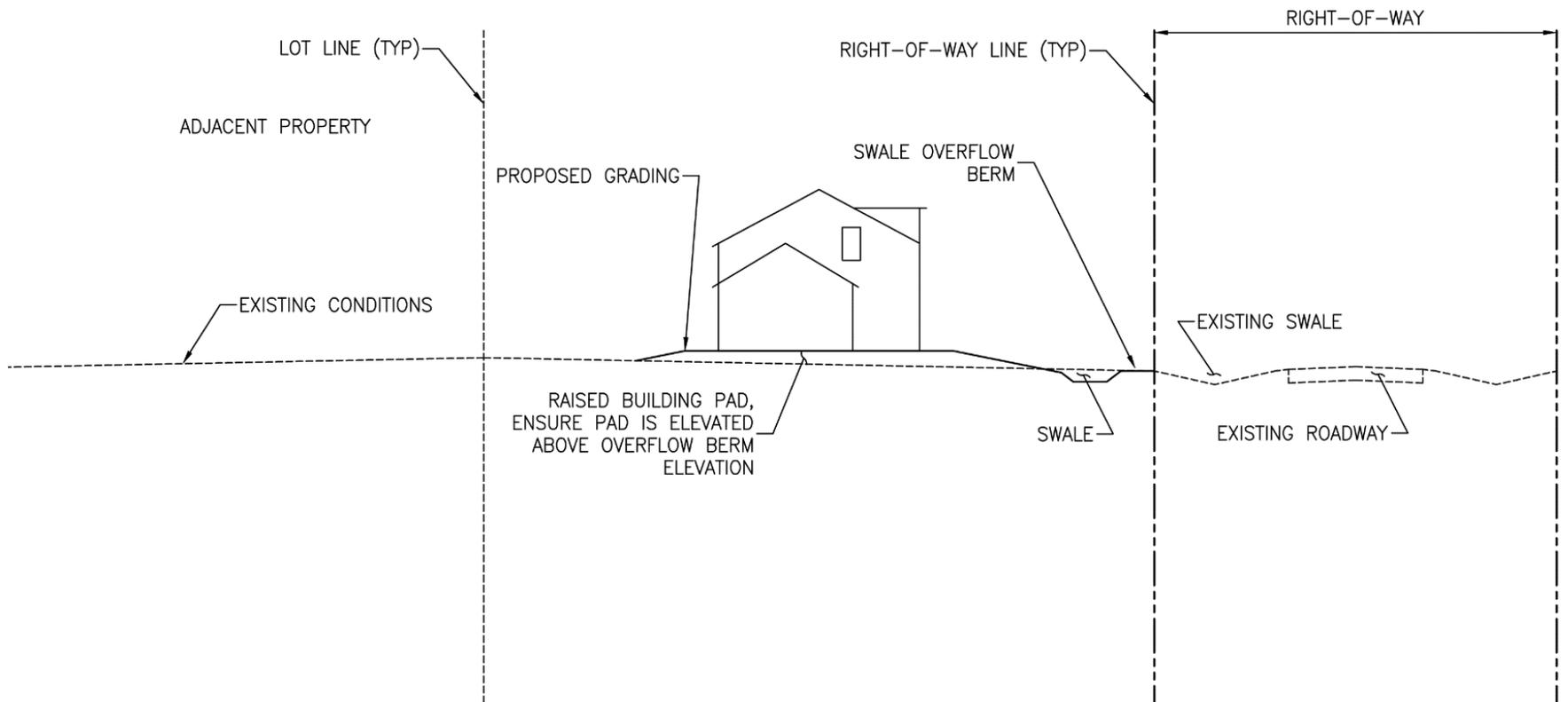
Source: Florida Department of Environmental Protection and Water Management Districts Environmental Resource Permit *Stormwater Quality Applicant's Handbook* (March 2010 – Draft).

The following diagrams illustrate the design and construction guidelines. If you have other questions, please call the Village of Tequesta Utilities Department at 561-768-0700.

## D. Sample Site Plans and Profiles

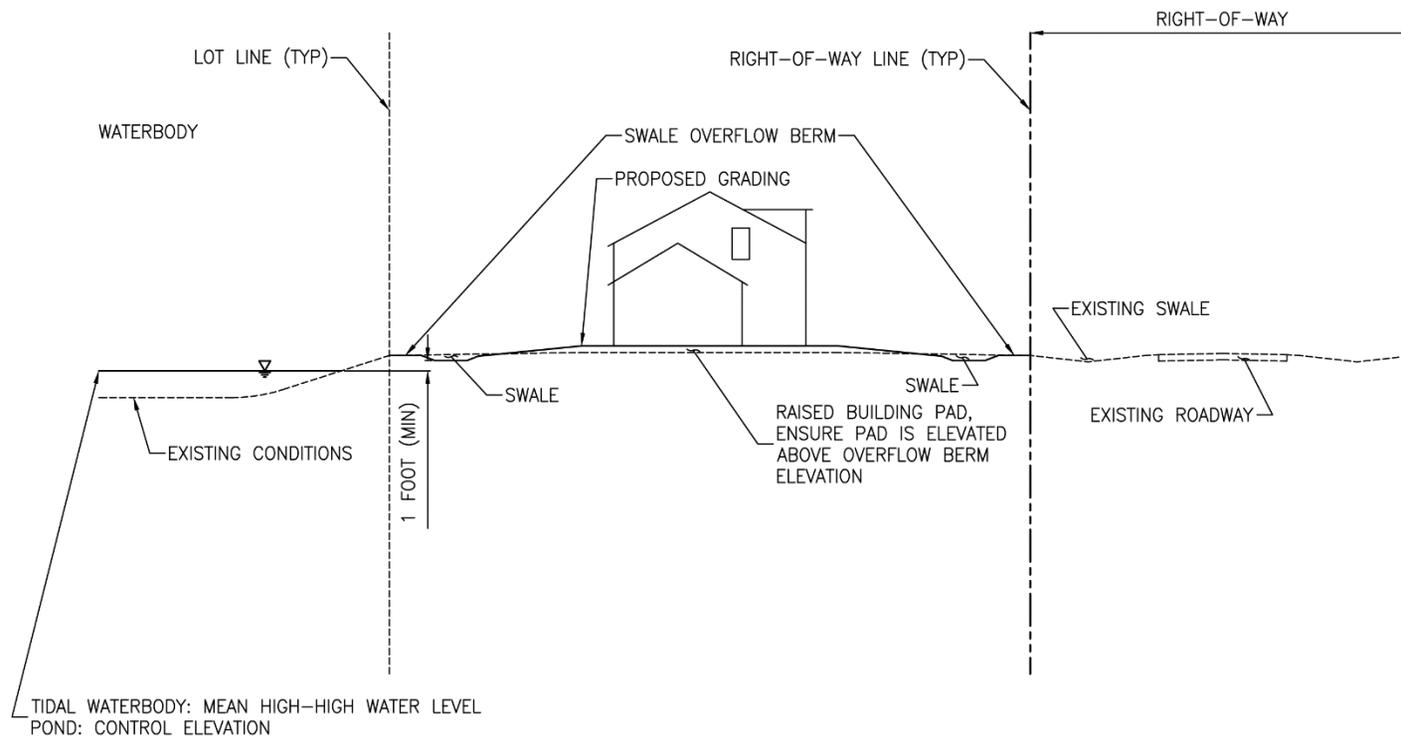


**Figure 1 – Example Site Plan (Interior)**



**Figure 2 – Example Site Profile (Interior)**





**Figure 4 – Example Site Profile (Waterfront)**

## E. Guidelines for Expansion of Existing Homes

### ***WHAT if I just want to expand my home?***

Any impervious area expansion of existing lot coverage –roofs, decks, patios, pools, and pavements – must provide for the retention of 2.5 inches of runoff from the expansion area. Typically, this retention requirement can be met by constructing a shallow swale along the expansion area. However, other approaches to retaining stormwater on the site will be considered. The following table shows the proportional stormwater retention storage required for every 25 square feet of new impervious area:

Provisions for swales must be shown on the site plans submitted with your permit application. Remember, you should still follow the steps outlined in this Guideline, but you do not need to meet all design and construction criteria required for new homes.

Square feet of new impervious area	Required cubic feet of retention storage
25	5
50	10
75	16
100	21
125	26
150	31
175	36
200	42