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LAYMAN’S BROCHURE

Guidelines for preparation of a site plan for single family and duplex lots in Monroe County

March 2020

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A. Stormwater Management – an important element of the site plan

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

Monroe County is home to the Florida Keys, lush islands surrounded by clear, aquamarine waters, and a myriad of underwater wonders. Most of the year, the Keys enjoy a sunny, near-tropical climate, but there comes a rainy season, from May through October. During these months, frequent thunderstorms last from a few minutes to a few days.

Heavy seasonal rains cause stormwater to run off commercial and residential rooftops, yards, and streets. This stormwater normally collects in the streets and works its way towards the nearest waterway. While street flooding 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 our most valuable resource, the coral reefs. Pollution also has negatively affected the quality and clarity of our waters. It has reduced our fish and wildlife populations.

Stormwater running off into the streets also wastes a valuable resource. After the rainy season come the dry months of November through April. With few exceptions, Monroe County 's drinking water comes from the mainland via a single pipeline. In the event of a hurricane, power and this water supply may be discontinued for days.

Monroe County has adopted a comprehensive development plan that establishes specific goals for safe management and disposal of stormwater and conservation of our water resources. To achieve these goals and to begin reversing the current negative trends, we must significantly reduce the potential pollution from new construction.

Our adopted Stormwater Management Ordinance Sec. 114-2 and 114-3 of the Land Development Code establishes guidelines for the safe management and disposal of stormwater runoff from developed areas. The ordinance is applicable to all developments and requires that all applications for building permits must contain a stormwater management plan.

The guidelines and recommendations in this brochure are designed to help you to address stormwater management in the site plan for your single family or duplex lot. Sample engineering calculations supporting the guidelines of the brochure are available in the current version of Monroe County' s "Manual of Stormwater Management Practices".

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B. Guidelines to prepare your site plan

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

In order to prepare a site plan, it is necessary to assess the existing site conditions, evaluate the proposed improvements and make provisions for stormwater management. This process begins with the collection of 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 in order to control stormwater runoff. The following steps detail the type of 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 (either from survey or LiDAR data) for your lot. The survey must be performed by a professional land surveyor licensed to practice in the State of Florida. The survey drawing must provide this information:

- a. Legal description of lot.
- b. Property line dimensions, bearings and/or angles.
- c. Location of existing improvements, to include adjacent street and waterway (if any).
- d. Three cross-sections, showing elevations from the street, across lot lines and center of the property.
- e. Location and identification of existing trees.
- f. Location sketch and identification of a nearby Mile Marker
- g. Scale (1"=10' recommended) and north arrow.
- h. LiDAR-based elevations may be used if available.

STEP TWO – SITE PLAN

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

- a. Locations, dimensions, and types of construction materials of the building, roof, patio, screened porch, deck, shed, pool, driveway, septic tank and drainfield.
- b. Proposed site grading showing existing and proposed elevations and/or contours.
- c. Proposed drainage directions and areas draining to each retention system. Site grading must drain towards retention system.
- 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 site plan

HOW do I address stormwater management in my site plan?

Much of Monroe County is beautiful and ecologically sensitive to manmade pollutants, many of which are carried to the ocean by stormwater runoff. Monroe County's objective is to keep the resident coral reef, fish, and animals alive and healthy, while allowing you to occupy the same bit of Florida paradise. To achieve this objective, Monroe County requires your new home to meet the following design and construction guidelines:

- Preserve Roadside Swales (Plate 2)
 1. Maintain the pervious cover of swales.
 2. Preserve existing swale elevations.
- Reduce Lot Fill (Plate 2)
 1. Carefully consider the need to import any fill for the lot.
 2. Limit building pad elevations to eight inches above the adjacent roadway.
- Flood Protection (Plate 3)
 1. Elevate the first habitable floor above the Federal Emergency Management Agency Base Flood Elevation using stilt-construction techniques.
- Reduce Impervious Surfaces
 1. Use pervious materials, such as gravel, pervious pavers on sand, native grasses, grass-covered porous pavement and wood for the construction of other site and landscaping improvements. Florida-Friendly Landscaping™ is encouraged.
 2. Do not place impervious layers, such as roofing paper or plastic under paved or landscaped areas.
- Conserve Water (Plate 4 & 5)
 1. Use cisterns to collect roof runoff and recycle for non-potable water uses.
 2. Use native plant materials for landscaping.
- Reduce Direct Discharges to Waterways (Plate 6)
 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 of 6" difference between the finished lot and the top of the bulkhead.
- Reduce Discharges to Roadway
 1. Use berms to contain runoff from 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 onsite 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 feet of impervious area on the site that is directly connected to the proposed retention system (typically this would be an onsite 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 onsite retention system. Pervious pavers would not be considered an impervious area.
 2. Determine square feet of impervious area on the site that is unconnected to the proposed retention system and has to drain over 20 feet or more of pervious area before entering the retention system. An example of this would be an area of the roof that is drained from a downspout but flows over 20 feet of landscaped area before reaching the onsite swale.
 3. Calculate the total effective impervious area by summing the directly connected area with half the unconnected area.

4. Determine the square feet of lot area that is disturbed during construction. This is any area that is accessible to construction vehicles or construction staff during construction. Undisturbed areas need to be clearly sign posted and taped off during construction.
5. Calculate the ratio of the effective impervious area to the disturbed area.
6. Use Table 1 below to determine the required retention depth. The effective impervious area to the disturbed 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 disturbed area in square feet (Step 4).

Table 1. Required Retention Depth

| Effective Impervious Area to Disturbed Area Ratio (Step 5) | Required Retention Depth (feet) | Required Retention Depth (inches) |
|--|---------------------------------|-----------------------------------|
| 0.20 | 0.138 | 1.66 |
| 0.25 | 0.146 | 1.75 |
| 0.30 | 0.153 | 1.84 |
| 0.35 | 0.164 | 1.97 |
| 0.40 | 0.177 | 2.12 |
| 0.45 | 0.188 | 2.26 |
| 0.50 | 0.203 | 2.44 |
| 0.55 | 0.215 | 2.58 |
| 0.60 | 0.228 | 2.74 |
| 0.65 | 0.243 | 2.92 |
| 0.70 | 0.256 | 3.07 |
| 0.75 | 0.271 | 3.25 |
| 0.80 | 0.286 | 3.43 |

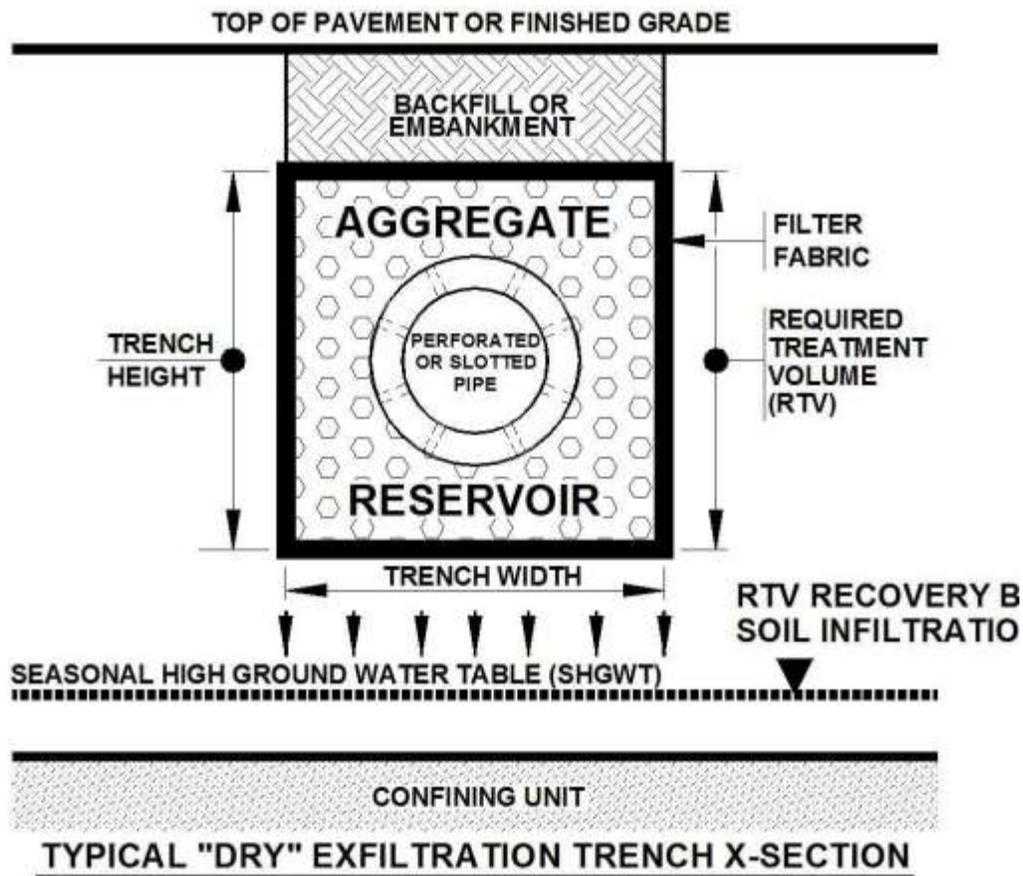
If swale(s) are used they must meet the following criteria:

- Runoff from site must be drained to swale.
- Swale length must be greater than its width.
- Swale side slope must be 4:1 or shallower (horizontal to vertical).
- Swale must not disturb any natural areas.
- Swale must be 6 inches or deeper.
- Swales should be vegetated. If a swale is not vegetated than a 6-inch layer of nutrient sorption soil amendment 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 County 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).

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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 must not be within 10 feet of a building.
- Exfiltration systems cannot be 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 must be more than 12 inches above the wet season water table. Wet season water table can be determined using the 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.

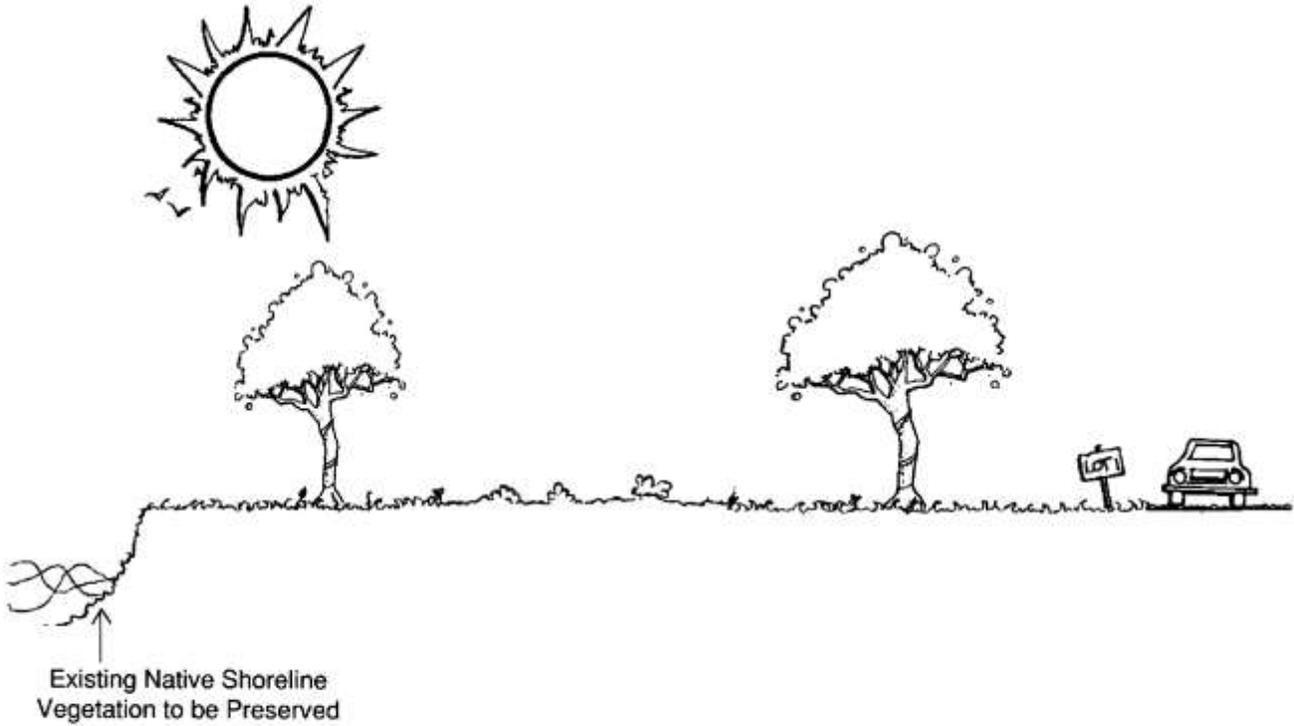


Source. Florida Department of Environmental Protection and Water Management Districts
Environmental Resource Permit Stormwater Quality Applicant's Handbook (March 2010 – Draft)

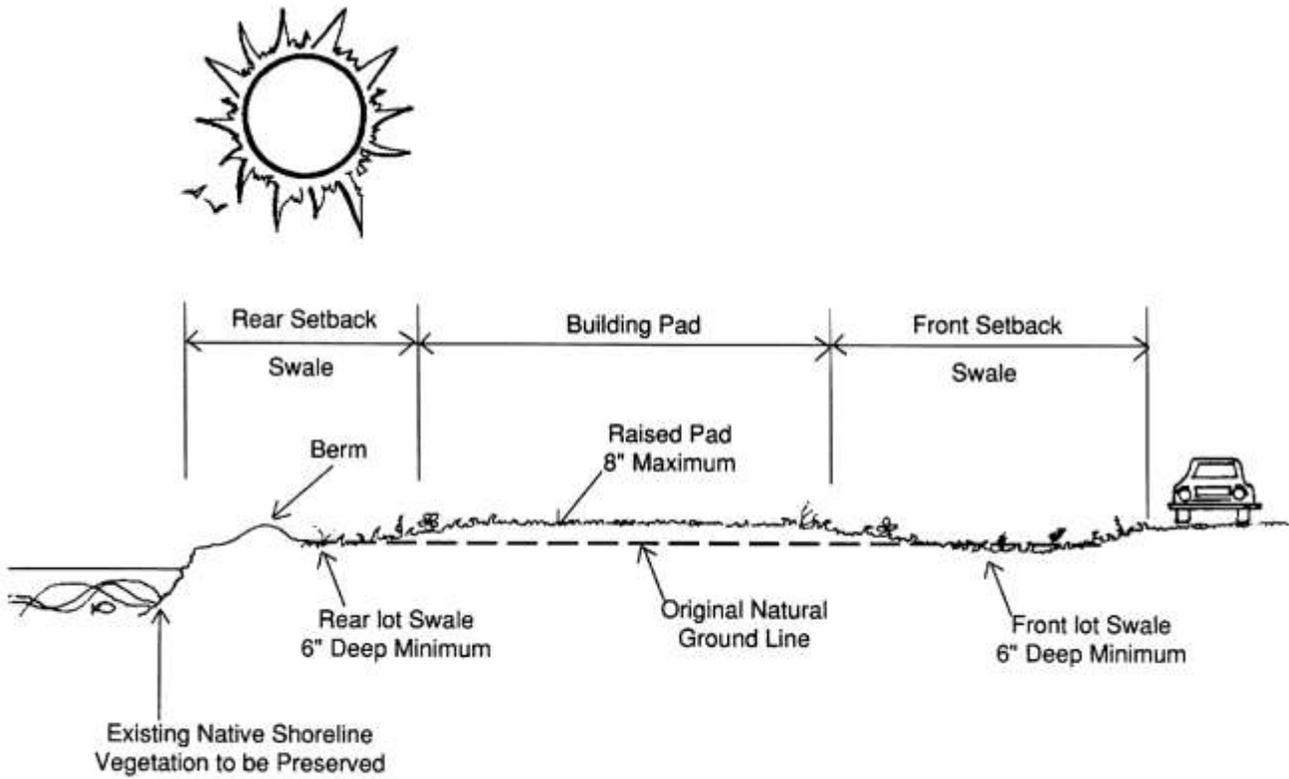
The following diagrams illustrate the above design and construction guidelines and a sample site plan (Plate 7). If you have other questions, call the Planning and Environmental Resources Department at 305-289-2500.

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D. Sample construction techniques

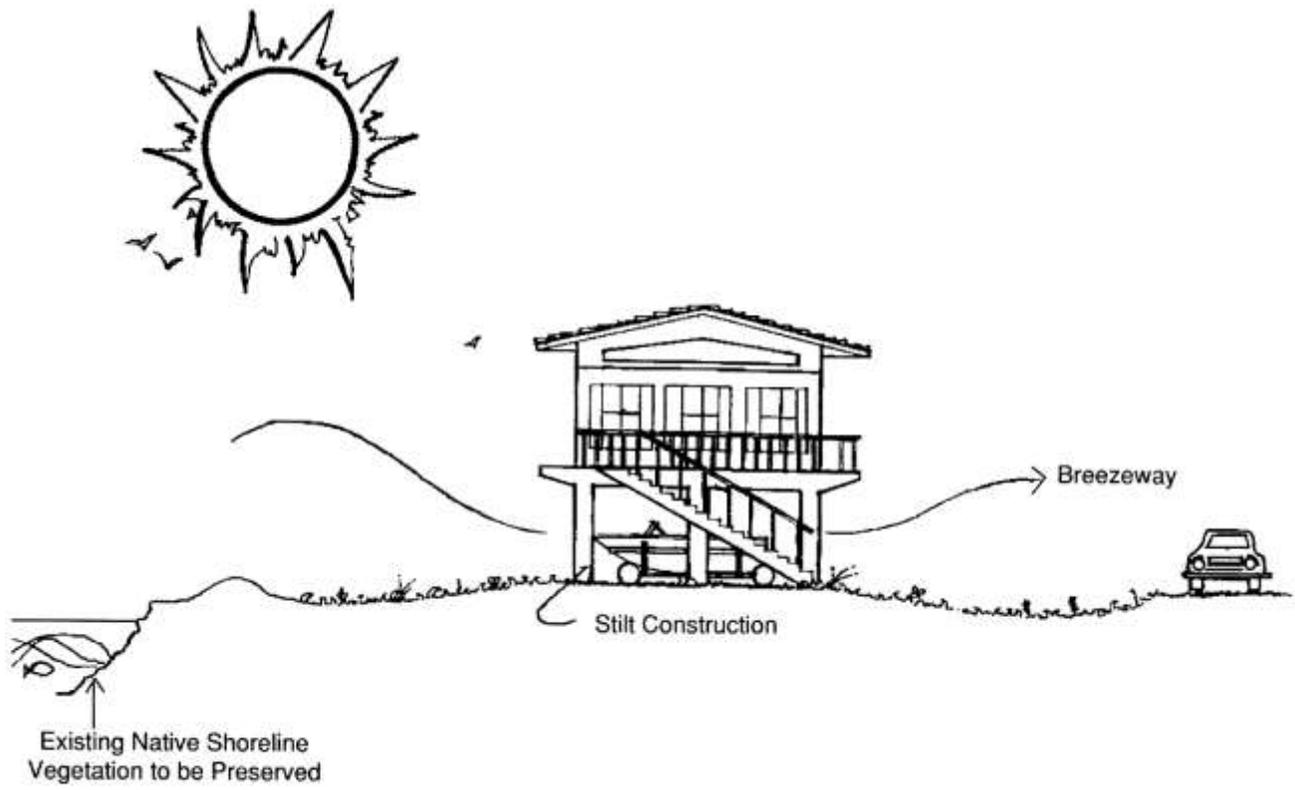


**Existing Ground
(Plate 1)**

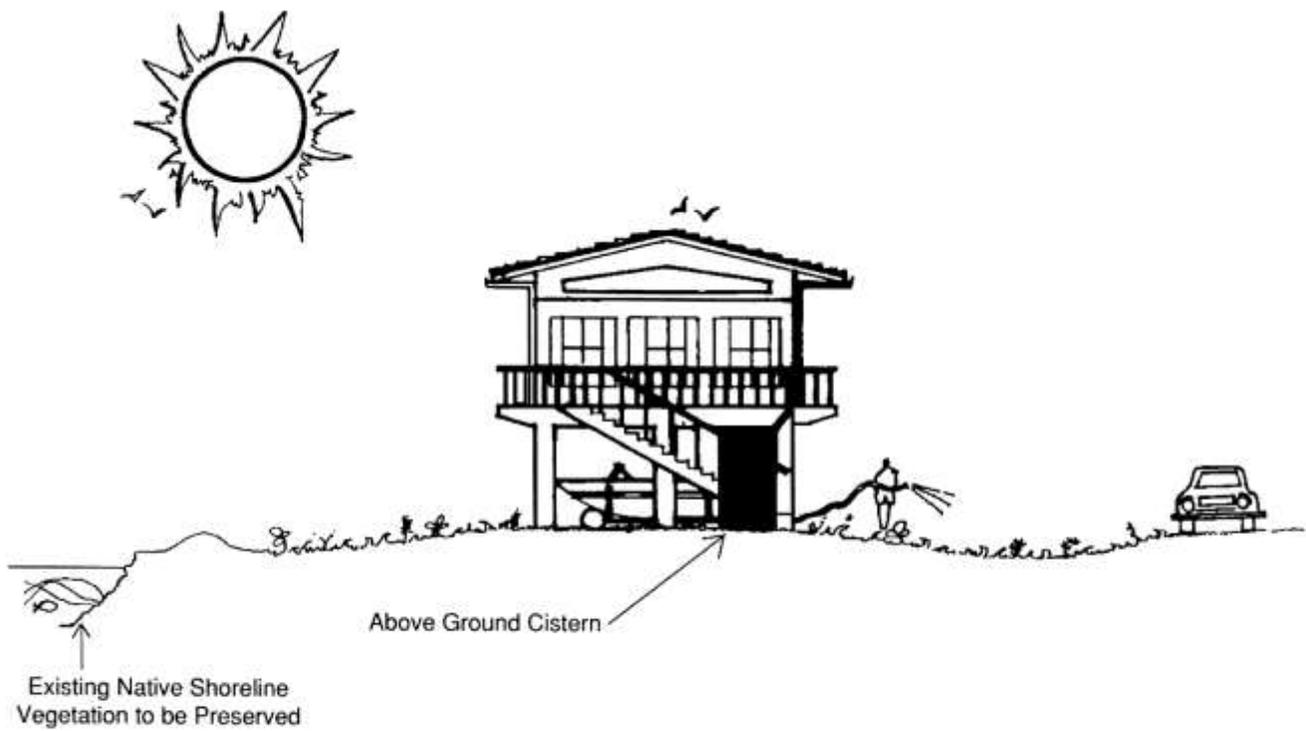


**Lot Grading
(Plate 2)**

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**House Elevation
(Plate 3)**

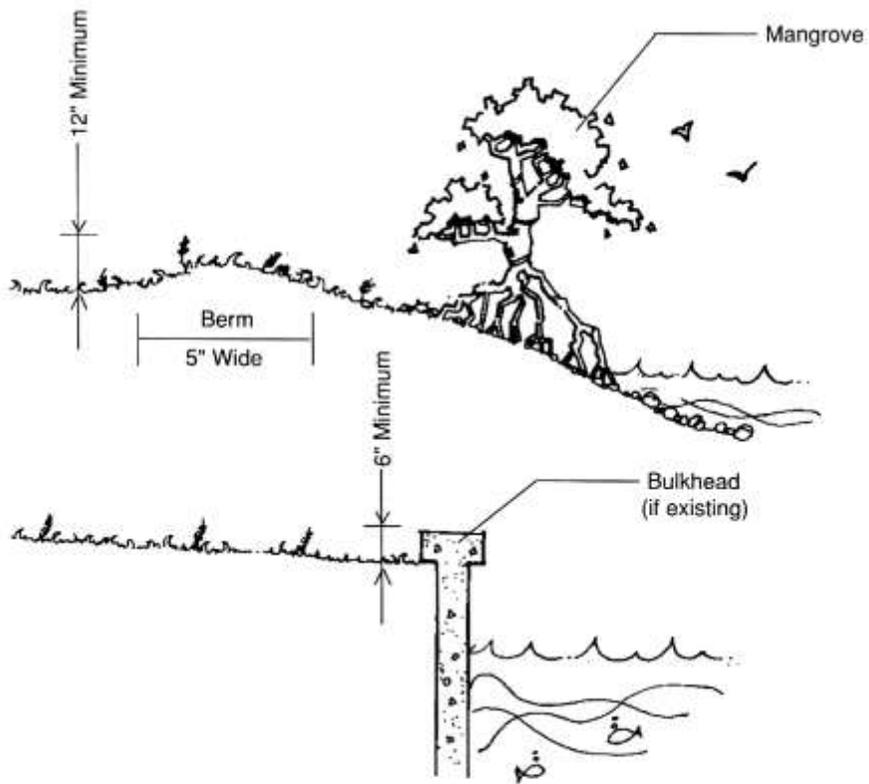


**Water Conservation
(Plate 4)**

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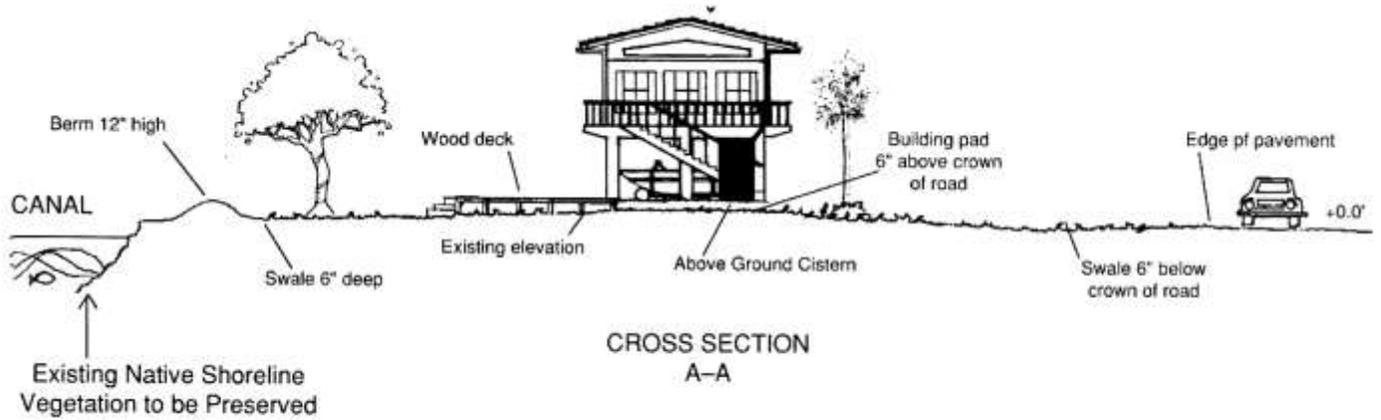
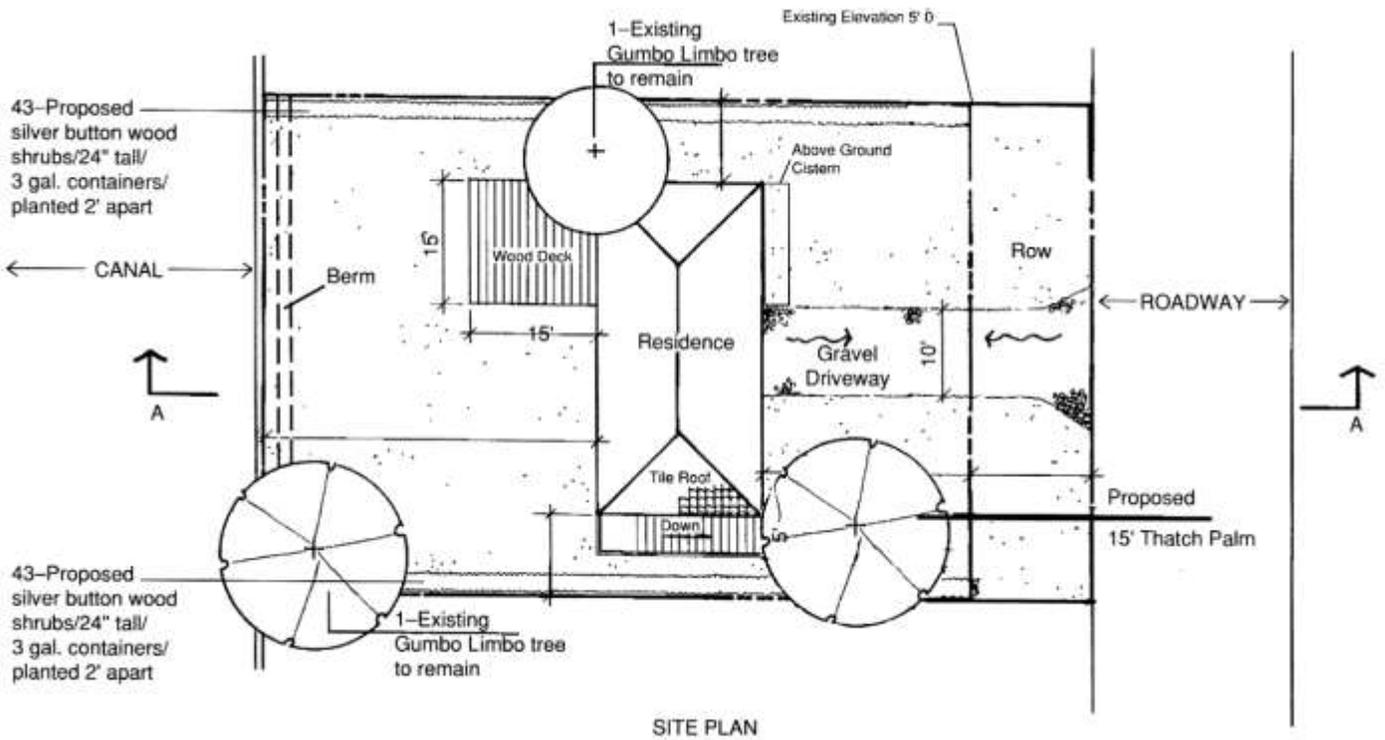


**Water Conservation
(Plate 5)**



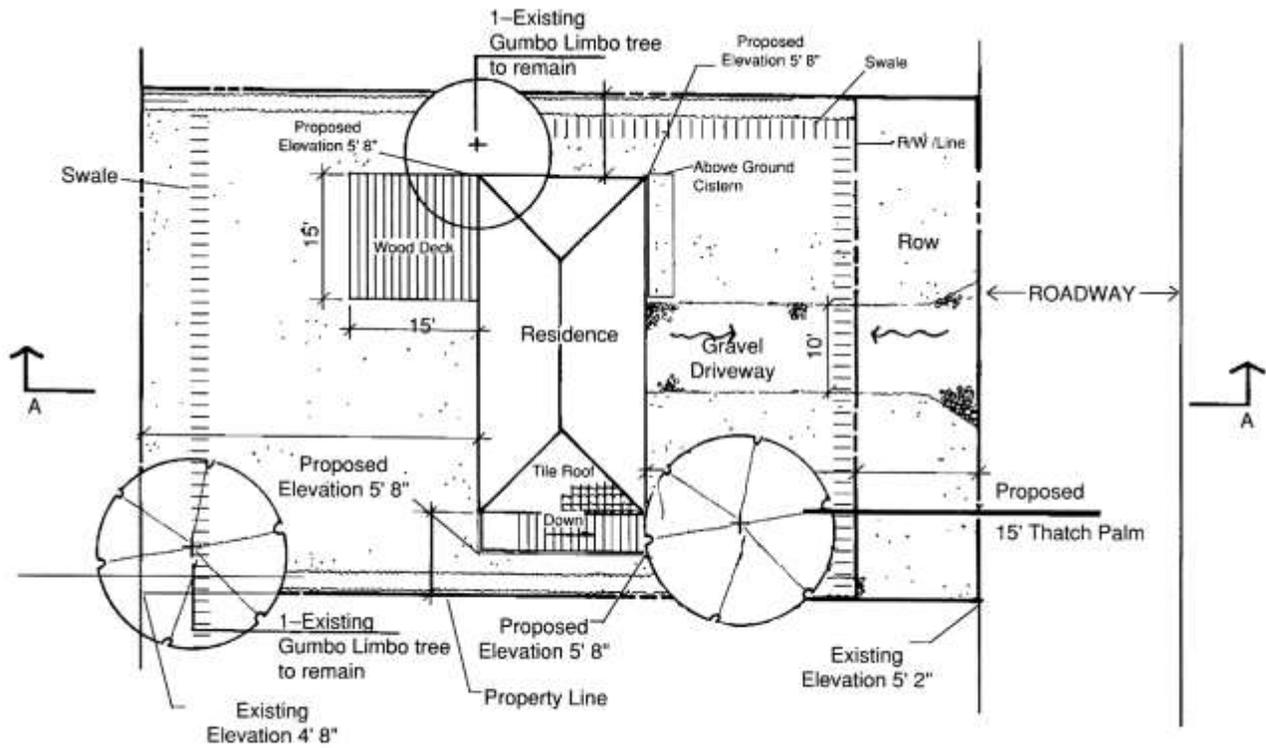
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**Side and Rear Lot Details
(Plate 6)**

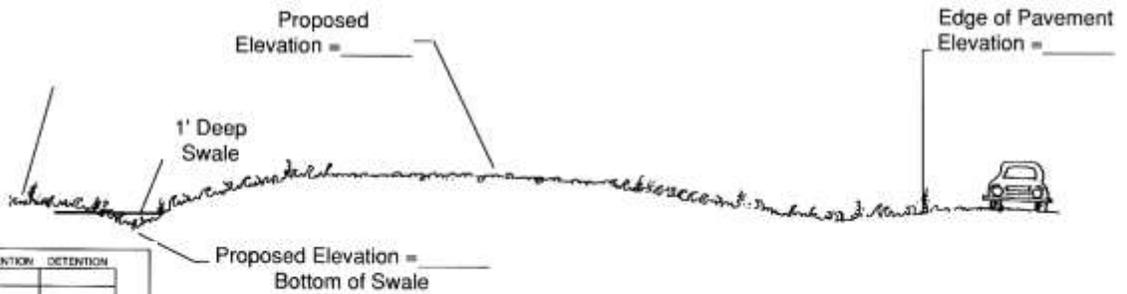


(Plate 7)

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SITE PLAN



Drainage Data:

| Type of Storage: | RETENTION | DETENTION |
|------------------|-----------|-----------|
| WET | | |
| DRY | | |

A Lot Size _____ sq. ft.
 B Impervious Area _____ sq. ft.
 C % Impervious B/A _____ %
 D Rainfall = 2.5 x % Impervious _____" (1" min)

Disturbed Area Impervious _____
 Other _____
 Other _____
 Other _____
 Total _____ E

Cubic ft. req. = $\frac{\text{Disturbed Area} \times \text{Rainfall}}{12} = \frac{E \times D}{12}$

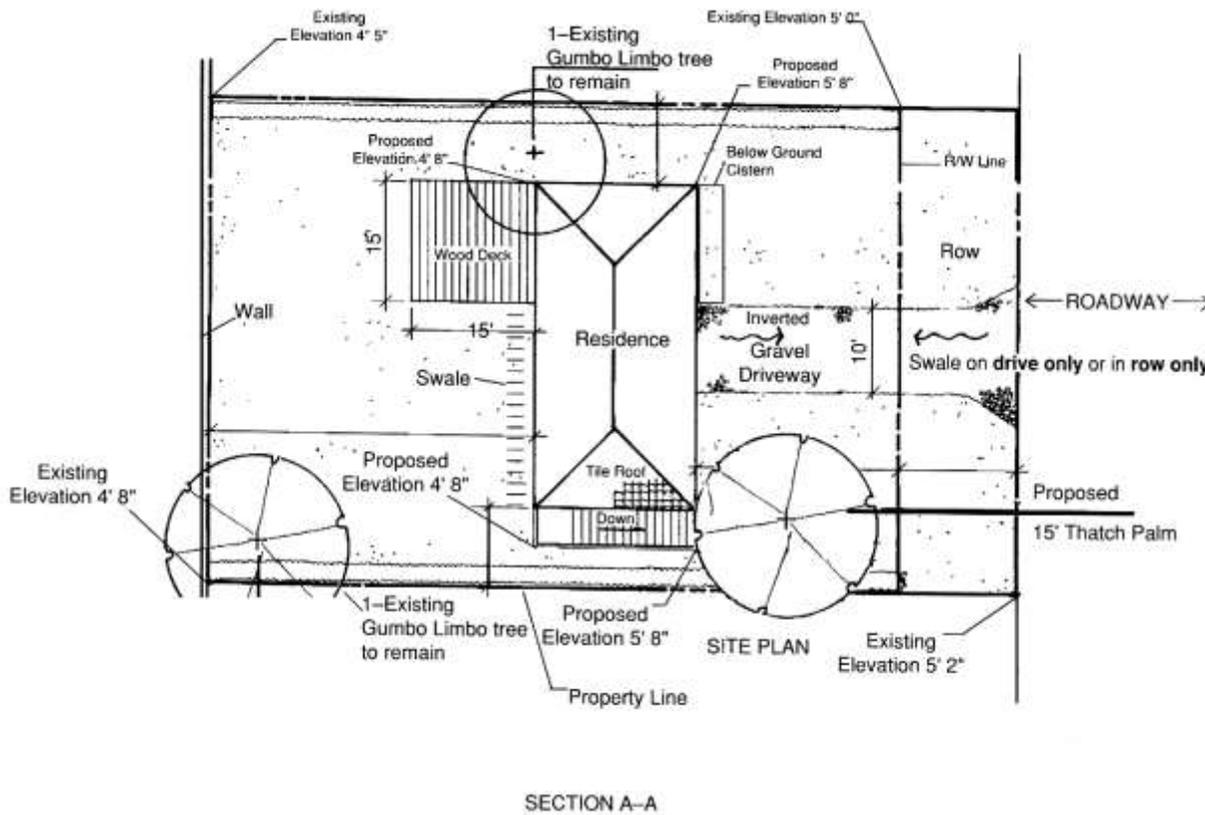
Cubic ft. supplied _____ Cu. ft.

CROSS SECTION SUPPLIED SWALE

SECTION A-A

Low Density Foliage Lot
 N.T.S.

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E. Guidelines for expansion of existing homes

WHAT if I just want to expand my home?

Any impervious area expansion of existing lot coverage, that is, roofs, decks, patios, pools, and pavements, must provide for the retention of two and half inches of runoff from the expansion area. Typically, this retention requirement can be met by construction of a shallow swale alongside the expansion's 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 feet of new impervious area:

| 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 |

Provisions for swales must be shown on the site plans submitted with your permit application. Just remember, you should still follow the steps outlined in this brochure, but you don't need to meet all of the design and construction criteria required for new homes.

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