

CONNECTICUT COASTAL MANAGEMENT MANUAL

SECTION 4

SITE PLAN EXAMPLES

Section 4 contains examples of site plans for the following types of coastal development activities:

Site Plan #1 - Single Family

Site Plan #2 - Multi-family

Site Plan #3 - Subdivision

Site Plan #4 - Commercial

Each plan is accompanied by descriptions and an analysis of coastal site plan deficiencies and coastal management issues specific to that plan, and a discussion of potential solutions to those problems.

Site Plan # 1

Residential Development

Coastal Site Plan Deficiencies

- 1) Tidal datums (i.e., mean high water and high tide line) and vertical datum (NGVD 1929) not shown.
- 2) Extent of beach resource not fully depicted.
- 3) No S&E controls.
- 4) Drainage not shown.

Coastal Management Issues

- 1) Proposal of shoreline flood and erosion control structure requires mandatory referral to OLISP in accordance with section 109d of the CCMA.
- 2) Seawall may be located on the beach.
- 3) Proposed dwelling in the V-Zone
- 4) Potential adverse impacts to coastal water quality - no stormwater best management practices (BMPs) proposed.
- 5) State coastal permits required for fill/stormwater discharge structures in tidal wetlands or areas below the high tide line.

Analysis

The site contains significant topographic relief. With only 10' contours shown, it is difficult to determine specifically where the steep slopes on the property are. The proposal meets the town's building setback regulation and, since the portion of the dwelling located in the V-Zone is pile supported, it meets FEMA construction standards. However, the proposal is inconsistent with CCMA policies. First, proposed residential development in the V-Zone, even if it can be constructed to meet FEMA standards, should be located outside the V-Zone where possible to minimize hazards to life and property. In this case, the entire structure could not only be located outside the V-Zone, but landward of the A-Zone as well. Keep in mind that the flood zone boundary lines are not exact and given the scale (1" = 500') of the Flood Insurance Rate Maps (FIRMs), it is prudent to err on the side of caution (i.e. locate structures as far landward as possible). Additionally, the boundary lines on the FIRM maps are not drawn for specific properties, but for longer stretches along the coast. Thus, there are inherent inaccuracies built into the maps when they are applied to a particular parcel.

The proposal is also inconsistent with the CCMA's policy regarding shoreline flood and erosion control structures. Structural solutions are not allowed in this case since the house could be relocated such that no shoreline protection would be required during the expected useful life of the house. For more detailed information, please see the fact sheet for *Shoreline Flood and Erosion Control Structures*.

From a coastal permitting perspective, an application to construct the seawall as proposed including fill waterward of the high tide line could not be approved.

Potential Solutions

- In this example, the modifications required to render the site plan consistent with CCMA policies would drastically change the site plan. So much so that there would be no alternative but to deny the application without prejudice.
- The board/commission should clearly document the inconsistencies in its written finding.

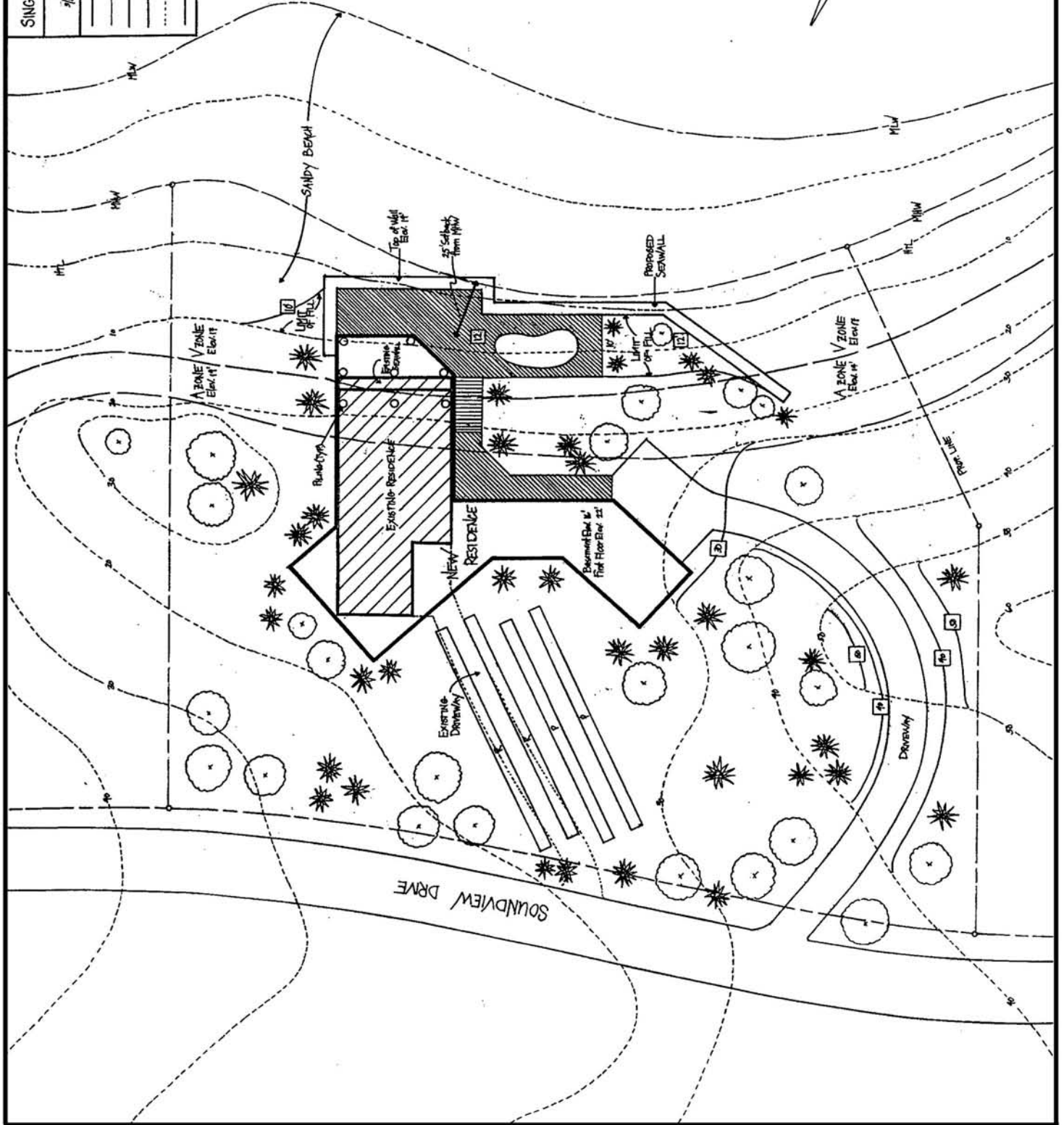
- In making a subsequent proposal, the applicant should be informed that the residence should be located outside of the flood hazard area. In this case, that could be landward of elevation 14', even though the transposed A-Zone boundary crosses the 20' contour. Additionally, the applicant should be made aware that no shoreline flood and erosion control structures could be permitted now or in the future to protect the dwelling. Thus, the need to relocate the house as stated becomes evident.
- Due to the significant topographic relief on the property, appropriate and specific S&E controls should be shown on the plans.
- Stormwater BMPs should be shown on the plans. Potential solutions could include the use of depression storage, infiltration swales, vegetated buffers, and overland flow (runon). Structural measures such as catch basins and drywells should be avoided if possible.

SINGLE-FAMILY RECONSTRUCTION

SCALE
 $\frac{3}{16}'' = 20'$

	High Low Water
	Mean High Water
	High Tide Line
	Proposed Boundary
	Existing Easement
	Proprietary Easement

LONG ISLAND SOUND



Site Plan #2

Multi-Family Development

Coastal Site Plan Deficiencies

- 1) No vertical datum shown (plans should reference NGVD of 1929). This is particularly important in evaluating the accuracy of tidal datums (e.g., mean high water).
- 2) Accuracy of high tide line (HTL) is questionable. HTL is shown on plan at the same elevation as the tidal wetland boundary. Typically, the HTL is upland of the tidal wetland boundary.
- 3) Flood hazard area elevations are not shown.
- 4) The upland extent of the A zone not indicated on the plan.
- 5) Incomplete labeling of coastal resources at or adjacent to the site (e.g., intertidal flats?).

Coastal Management Issues

- 1) No water-dependent use of a waterfront site proposed (boat slips are accessory to a non-water-dependent use/boardwalk not available for public use).
- 2) Intense residential development in flood hazard V-zone
- 3) Flood and erosion control structure (i.e., seawall) extends onto dune/beach (such structures require mandatory referral to OLISP) would replace existing dune which provides a non-structural flood and erosion control and potential plant and wildlife habitat.
- 4) Protection of tidal wetlands and beach/dune system
- 5) Structural stormwater management system proposed which does not include any stormwater quality renovation measures. Includes direct discharge of stormwater to tidal wetlands without prior treatment.
- 6) Structures (walkway/gazebo) proposed in tidal wetlands require permit from OLISP.

Analysis

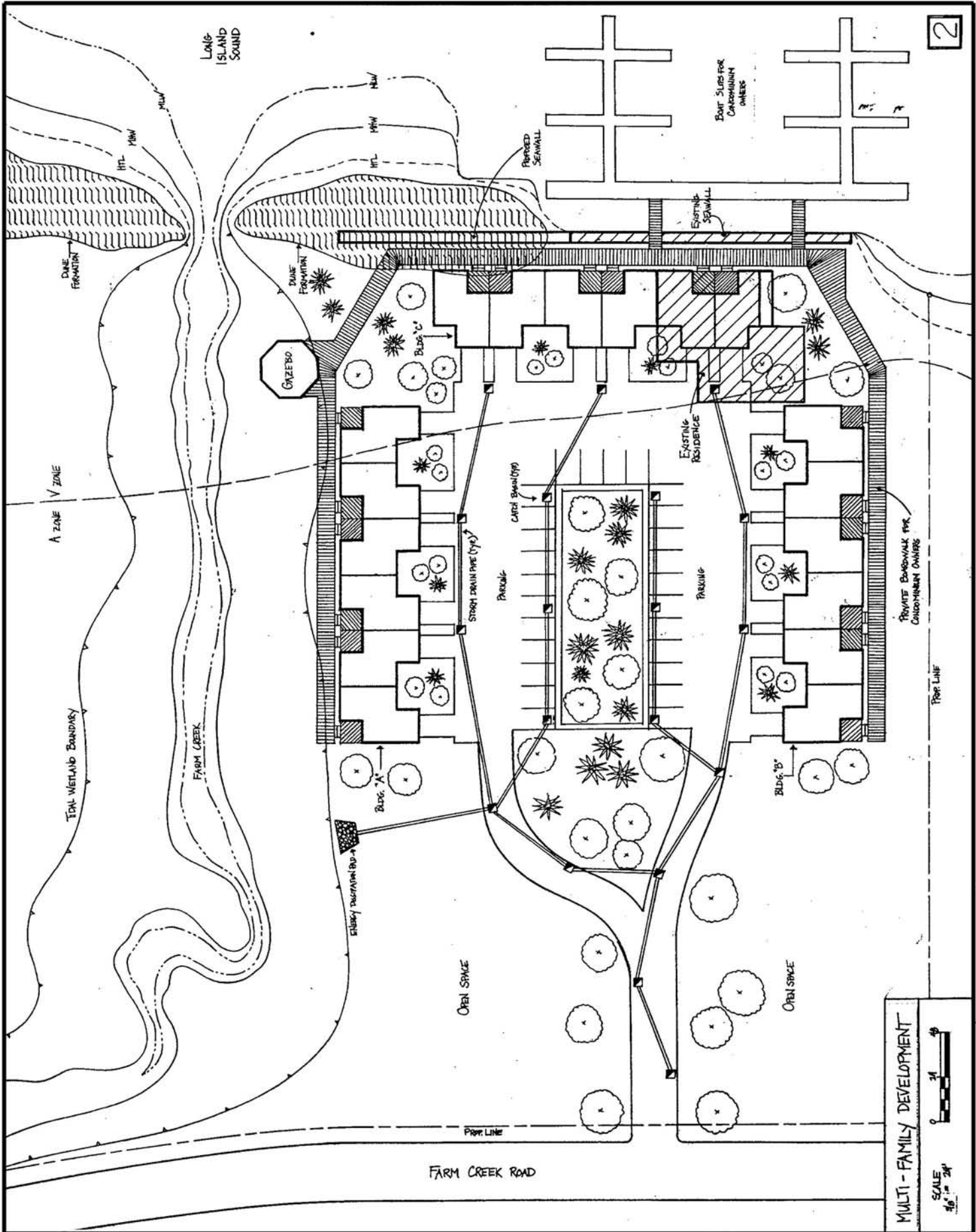
There are no water-dependent uses proposed for this waterfront site. Developable waterfront property, particularly property that can support an active water-dependent use, such as a boat basin, is extremely rare and valuable in Connecticut. Many former water-dependent uses such as marinas, boat yards, and boat building operations have been replaced with office, residential, and other uses that need not be located along the water's edge. Because the proposed private boat slips and private boardwalk demonstrate that the site is capable of supporting water-dependent uses, the coastal site plan must be modified to incorporate some type of water-dependent use in order to ensure that future water-dependent use opportunities at the site are not lost. In this case, the zoning district may allow for residential use. If there is no requirement under the existing zoning to require an active water-dependent use (e.g., marina), the commission should require that general public access, commensurate with the size of the site, be incorporated into the site design.

While offering waterfront residential dwellings as close to the water as possible is an attractive prospect to developers, such a design often creates a myriad of coastal resource management concerns including: (1) proposals for future filling of coastal waters to construct flood and erosion control structures (e.g., seawalls) to protect new construction; (2) increased likelihood of future unpermitted or illegal filling of coastal waters/tidal wetlands; (3) loss of coastal public access; (4) estuarine habitat encroachment/disturbance; (5) increased flood hazards; and (6) loss of riparian buffers.

Potential Solutions

- The proposed development must be significantly modified to address the above-reference coastal management concerns, as described below:
- The proposed extension of the seawall into the dune should be eliminated. If the applicant is concerned about future flood and erosion in this area of the site, the dune could be modified/expanded with snow fencing and native beach grass plantings to enhance the dune's flood and erosion control properties.
- The residential units and boardwalk should be relocated towards the road out of the V-zone and dune. Such a redesign would decrease future potential hazards to life and property from flooding and erosion, relocate the open space adjacent to the water for use by the general public to access coastal waters and preserve riparian habitat. Coastal public access areas should always be carefully designed and include appropriate amenities to provide attractive and usable public facilities. It's also important to ensure that coastal public access is ensured through a duly executed and legally binding access easement.
- Stormwater should be retained and treated on-site to the maximum extent practicable using appropriate best management practices. The open space areas and parking lot islands could potentially be used as areas for retention basins or swales. Retention of the first inch of runoff onsite, if feasible, would reduce discharges of fresh water to tidal wetlands and minimize pollutant loadings to tidal wetlands and coastal waters.
- Proposed structures should be set back from both the tidal wetlands and the dune formations. Buffers between these resources will allow them to grow/migrate, protect them from potential adverse impacts of human activities, and reduce impacts to the wildlife that depend upon these resources for one or more parts of their life cycle.

Because of the extent of modifications necessary to render this proposed residential development consistent with the goals and policies of the Connecticut Coastal Management Act, the proposal should be denied.



MULTI-FAMILY DEVELOPMENT

SCALE 1/4" = 24'

0 24'

Site Plan # 3

Residential Subdivision

Coastal Site Plan Deficiencies

- 1) No vertical datum shown (plans should reference NGVD 1929)
- 2) Incomplete listing of coastal resources (coastal bluff/escarpment not indicated on plan).

Coastal Management Issues

- 1) Potential accelerated erosion of coastal bluff and escarpment and future erosion threats to inhabited structures
- 2) Potential adverse impacts to coastal water quality from accelerated bluff erosion and untreated stormwater runoff.
- 3) No water-dependent use at a waterfront site.
- 4) Degraded views and vista of bluff from the river opposite river bank.

Analysis

The Connecticut Coastal Management Act (CCMA) policy for managing coastal bluffs and escarpments is to preserve their toe and slope, discourage uses which modify natural rates of erosion, and disapprove uses that accelerate slope erosion and alter supply of sediments to the littoral transport system. A related CCMA coastal hazard area policy also applies. It requires that proposed development in these areas be allowed only upon a demonstration that coastal flood and erosion hazards are minimized and that only non-structural methods to control these hazards be allowed for construction permitted after January 1, 1980, the effective date of the CCMA. In order to better understand how these policies apply to a specific location, the board or commission should direct staff to determine if an erosion study of the local shoreline exists. The Connecticut Coastal Management Program funded studies of erosion along Connecticut's coast during the 1980's. These studies including maps and periodic aerial surveys can be used to determine how an area of the coast responds to coastal erosion and depositional processes. This information, along with any additional information the commission or board can require from the applicant, should be used to apply these policies to the coastal site plan under review.

All three proposed dwelling units would likely increase erosion of the site's bluff/escarpment and increase hazards to life and property. Stormwater is proposed to directly discharge over the face of the bluff on all three proposed lots, subjecting the bluff to accelerated erosion forces. Further, the deck proposed on lot #2 would encroach waterward of the top of bank of the bluff modifying the face of the bluff that could destabilize the bluff in this area. These site modifications, along with siting the proposed structures proximate to the top of the face of the bluff, would likely also imperil the proposed structures over time. Once the structures become threatened by erosion of the bluff, the homeowners would likely proposed flood and erosion control structures, which is inconsistent with CCMA policy, as described above.

Potential Solutions

Relocate the proposed structures landward toward Meadow Road and modify the stormwater drainage plan to eliminate direct discharge to the bluff. Such a site redesign, which would require realignment of the proposed Riverview Lane, driveways and lot dimensions, would minimize impervious cover, thereby reducing stormwater runoff, allowing stormwater to drain across a vegetated buffer between the relocated houses and the top of the bluff's bank and reducing the erosive force of stormwater runoff. A modified site design which maximizes building setback from the top of bank would also minimize potential future erosion hazards to these structures thereby reducing the potential for future structural flood and erosion

Site Plan #3

Residential Subdivision

control structures. The board or commission may wish to modify its setback requirements for areas with coastal bluffs and escarpments if setbacks in these areas are determined using distances measured from mean high water rather than the top of the bluff's bank. As evident in this development scenario, the appropriate reference point from which to measure a shoreline setback is from top of bank, not mean high water, to protect coastal bluffs/escarpments (and water quality).

The additional undeveloped area created by setting the structures further back from the top of bank could be used to treat stormwater runoff as well as reduce erosive velocities. This area could be used to support drywells or swales from which stormwater could "leak-off" as sheet flow toward the bluff. Riverview Lane could be constructed without curbs to allow stormwater runoff from this road as sheet flow into roadside swales for on-site infiltration.

A site redesign, as described above, would also better accommodate a water-dependent use at the site-specifically, coastal public access (the only appropriate water-dependent use for this site). A coastal public access area would likely be best accommodated in the open space area adjacent to lot #3. The coastal public access open space area should include two or three parking spaces off Meadow Road, if on-street parking is not allowed. A clearly defined path from the road/parking, with public access signs at street/path connection, to the shoreline should be provided. Some type amenities should be provided at the top of the bank at the end of the coastal public access path (bench with bollards) which clearly defines the extent and terminus of the access area.

Views of the undisturbed bluff from the river and opposite bank of the river may be altered by clearing vegetation from the bluff and construction of the proposed houses. The relevant CCMA policy is contained within the minimization of "adverse impacts on coastal resources" policy, which includes but are not limited to... (F) degrading visual quality through the significant alteration of the natural features of vistas and view points (CGS Sec. 22a-93(15)). Within this context, this policy recognizes the importance of the visual quality of the **natural resources** of the coastline and the visual access to them. We understand that these policies are general in nature and, therefore, difficult to implement without subjective interpretation. Vistas and view points have traditionally been interpreted by DEP-OLISP to mean "public" views of the coastline and coastal resources. They have not been interpreted to mean "personal or private" views. As such, they have not been applied as a means of protecting "personal or private" views but public views. For example, the policies were not intended to prevent obstruction of private views or view corridors of coastal resources. As such, a private waterfront development should not be considered to be an obstruction of any other private view.

However, because the CCMA policies on visual quality are so general and non-specific, we strongly advise any municipality that is seriously interested in pursuing visual quality considerations in their coastal site plan review decisions not to rely solely on these standards. In order to more consistently and accurately apply these policies and provide much needed refinement and specificity, we recommend that the board consider amending their zoning regulations to customize policies regarding views and vistas. As such, the board may consider defining vistas and view points and developing standards regarding their implementation to further clarify adverse impacts to visual quality.

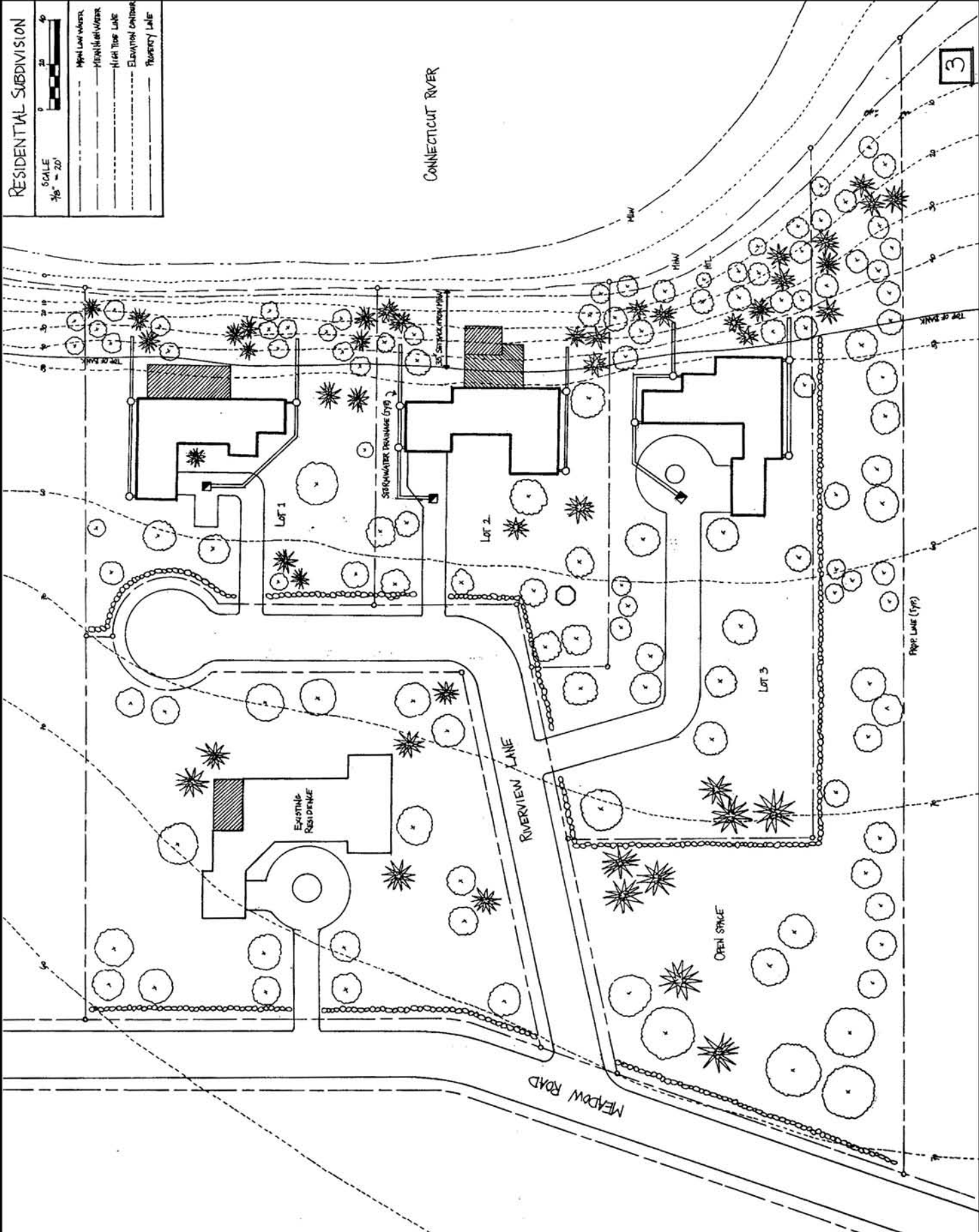
RESIDENTIAL SUBDIVISION

SCALE
1/8" = 20'

---	High Low Water
---	High Water
---	High Tide Line
---	Elevation Contour
---	Property Line

CONNECTICUT RIVER

3



Site Plan #4

Commercial Development

Coastal Site Plan Deficiencies

- 1) Tidal datums (i.e., mean high water and the high tide line) and vertical datum (NGVD 1929) not shown.
- 2) “Wetlands” label does not indicate whether wetlands are tidal wetlands or inland wetlands.
- 3) No elevation contours shown upland of elevation 11.
- 4) Flood hazard areas (if present) not delineated.
- 5) Direction of stormwater flow not shown (optional, but helpful).
- 6) Coastal resources are not identified on site plan (shorelands, flood hazard areas, tidal wetlands, inland wetlands, coastal waters)

Coastal Management Issues

- 1) Stormwater management system does not minimize development’s potential adverse impacts to coastal water quality - no stormwater best management practices (BMPs) proposed.
- 2) Restored tidal wetland/inland wetlands adversely affected by stormwater discharges and discharge structures
- 3) If building is in a flood hazard area, building must be elevated or flood-proofed.
- 4) State coastal permits required for fill/stormwater discharge structures in tidal wetlands or areas below the high tide line.

Analysis

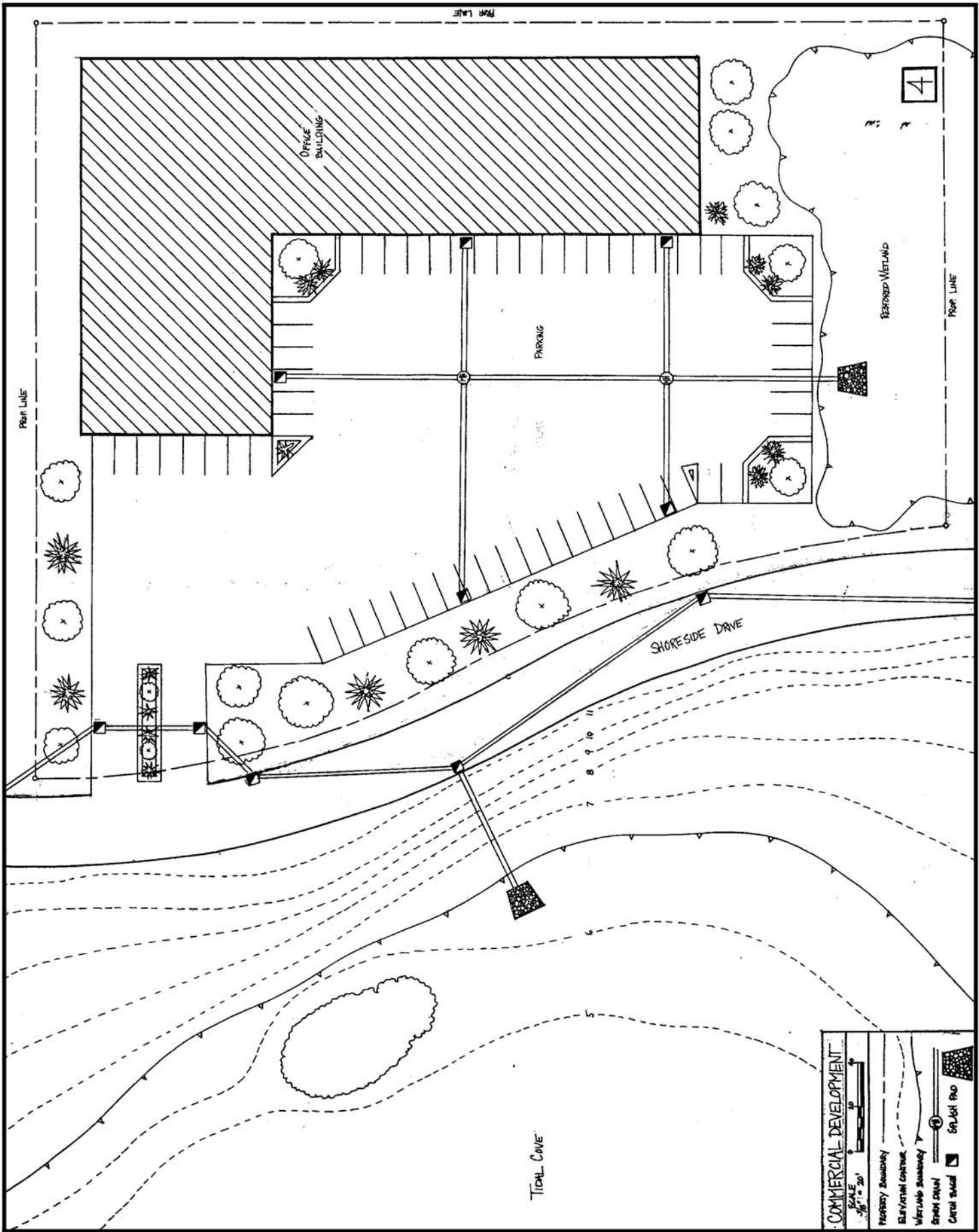
The stormwater drainage plan is unacceptable. To correct the problem, stormwater BMPs should be incorporated into the proposal. The first step in this process is to identify the potential pollutants in stormwater runoff at the site (see *Stormwater Management* fact sheet for description of parking lot runoff pollutants) and estimate the quantity of runoff generated by the “first-flush” of runoff generated by a 1 inch rainfall event. Next, the appropriate stormwater BMPs should be selected based upon the targeted pollutants, quantity of flow, and site conditions (e.g., soils, slope, available land area, etc.). To the extent possible, non-structural and low maintenance methods (e.g., vegetated swales) for treating stormwater that infiltrates runoff into on-site soils should be used. If necessary, structural methods (e.g., oil and gross particle separators) may be used, ideally in tandem with non-structural methods, if site conditions limit use of non-structural methods. It is particularly important that applicants be made aware that they may need to redesign a proposed development to accommodate non-structural stormwater management methods if insufficient space is provided on the coastal site plan submitted for review.

Potential Solutions

- *No* direct discharges to tidal wetlands should be allowed. Since runoff from the roof of the proposed building is cleaner than that from the parking lot, these sources of runoff should be separated and treated differently. Roof runoff can be discharged to a vegetated swale designed to enhance infiltration into the soil. Parking lot runoff can be treated using a variety of BMPs. Often BMPs used in series are the most effective. For example, surface drains containing adsorbent material to capture hydrocarbons could be used, as can modified catch basins with deep sumps and hooded outlets, to capture pollutants early in the stormwater conveyance system. Then, the stormwater could drain through a level spreader and over a vegetated buffer prior to discharge to the restored wetland. Alternatively, dry creeks could be installed adjacent to the parking lot. Again, water passing through the creeks could flow over the vegetated buffer on its way to inland wetlands. For parking lots with islands, dry creeks can be incorporated into the islands. It may be necessary to require the applicant

to eliminate proposed parking spaces to make an area available to accommodate the swales and dry creeks.

- Prior to the selection of stormwater BMPs, site design should first consider designing the building around significant trees and existing topography. Trees that overhang parking areas intercept rainfall, provide shade for the pavement (and vehicles), and transpire large quantities of water back to the atmosphere between rainfall events.
- Another potential solution could be to use infiltration galleries located below the parking surface. However, suitable soil condition *must* exist and pretreatment of stormwater prior to it entering the galleries to remove litter, suspended solids, and hydrocarbons is required.
- Other potential solutions might include the use of catch basin insert technology, depression storage, curbless parking areas with infiltration trenches, and drywells.
- Please note that maintenance of the stormwater management system is critical to its effectiveness. Stormwater management plans should include a scheduled maintenance plan with a dedicated funding source to ensure that periodic maintenance is performed.



COMMERCIAL DEVELOPMENT

SCALE: 1/8" = 20'

PROPERTY BOUNDARY

ELEVATION CONTOUR

WETLAND BOUNDARY

STREET DRIVE

CURB SWALL

SP-101 PAD