Planning and Implementation: Tools for Louisiana’s Coastal Communities

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Overview

- Introduction to CPEX
- Flood Risk in Louisiana
- Tools to assist coastal communities

Jean Lafitte Flood Preparedness Toolkit
Louisiana’s Only Non-profit Planning Organization

CPEX is a non-profit organization that coordinates urban, rural, and regional planning efforts in Louisiana.

We provide best-practice planning models, innovative policy ideas, and technical assistance to individual communities that wish to create and enact master plans dealing with transportation and infrastructure needs, environmental issues, and quality design for the built environment.

We advocate for a more livable Louisiana through visionary planning.
Planning and Where We Work

Plans and Resources Developed
Flood Risks in Louisiana

Resiliency Plan

Flood Emergency Preparedness Plan and Preparedness Toolkit
Flood Preparedness Toolkit - Elevation

TYPICAL METHODS OF ELEVATING STRUCTURES

There are several methods to elevate structures, depending on the need and desires of the homeowners. These include increasing the height of existing foundation walls or piers, increasing the height of walls, abandoning the lowest floor, and raising the entire structure. The method used often depend on the scale of the elevation needed to ensure that all material components of the building are located above the BFE.

Depending on particular structural and site conditions, an engineer can recommend the most appropriate alternative to elevate an existing structure. Depending upon the amount of elevation needed, there are a number of alternative methods to raise the building above the flood. For properties where only minor adjustments to building elevation (<4 feet) are found to be necessary, small elevation adjustments, such as extending foundation walls or increasing the height of existing walls, may be best. For properties where larger adjustments to building elevation are found to be necessary, it might be more appropriate to abandon the lowest floor or raise the entire structure. Typical elevation methodologies are defined below, along with their applicability to Jean Lafitte.

**Elevation methods by type**

**Increasing the height of existing foundation walls or piers**
- This alternative requires removing the building form to setting foundations, and extending foundation walls or piers such that the lowest to create member is outside of the base flood.
- Utilities must be relocated and accommodated as space to be removed from the structure. Openings that will be added to the structure are generally not adequate to go above the BFE. However, there may be many existing conditions that limit the ability to go higher.

**Increasing the height of walls**
- This alternative requires removing the excess from the existing structure in order to extend the height of walls. Walls must be extended to a sufficient height in order to accommodate raising the finish floor level above the base flood elevation.
- In the case of the event of the building, the new floor level may either be constructed for or wood framed system generally raising of beams and piers.

**Abandon the lowest floor**
- This alternative requires that existing habitable living space on the ground level be removed to only function as storage.
- Avance foundation may need to be added to provide living space. In some cases, the second floor already exists, it may need to be removed for the final living space.
- Acceptable. There are slab foundations and they are generally the best candidates for this method.

**Raise the entire structure**
- This alternative requires removal of the structure from an existing foundation and construction of a new foundation to elevate the building above the base flood, or raising a home on an existing site.
- Additional testing may be necessary during the elevating process to monitor the integrity of the foundation. Foundation design should accommodate the anticipated pressures due to wind and water.
- Preferred. Additional considerations for particular types of foundations are outlined in more detail later in this chapter.

**Understanding**
- How high does the foundation need to go?
- How deep does the foundation need to go?

**What type of work best suits your needs?**

**Flood risk in Jean Lafitte**
- is 1% per year (Zone AE).
- Design flood is 11 feet above sea level (3 ft BFE + 2 ft setback).
- Jean Lafitte is subject to storm surge from Bayou Barataria, as well as levee failure and overtopping.

**Elevation Process**

**Surge**
- Debris
- Waves
- Water Flow

**Wind**
- 129 mph from tropical systems

**Make sure the foundation can withstand all of the destructive forces that might act upon it.**

** CRS credit opportunity**

1. **Credit Criteria for FDR 1:**
   - All new buildings in the regular floodplain:
     - Must be on fill that has appropriate protection from erosion and scour, and
     - Must meet a compensatory storage requirement (for the building and fill) that meets the credit criteria of Section 432.a. Development Limitations (A-1).

2. **Credit Criteria for FDR 2:**
   - All new buildings constructed on fill in the regulatory floodplain:
     - Must be on fill that has appropriate protection from erosion and scour, and
     - Must be on fill that has appropriate protection from erosion and scour, and

3. **Credit Criteria for FDR 3:**
   - All new buildings built on fill in the regulatory floodplain:
     - Must be on fill that has appropriate protection from erosion and scour, and
     - Must be on fill that has appropriate protection from erosion and scour, and
Flood Preparedness Toolkit – Stormwater Management

Filtration/Retention
As stormwater flows across the landscape, it picks up sediment, oils, and other contaminants on these surfaces. A number of filtration and retention methods can be used to protect the health of the water bodies into which this stormwater is ultimately discharged. The use of various plants in filtration methods such as native vegetation can decrease sediments, oils, and nutrients and resemble the natural filter ability of wetlands and natural systems. These plants can help to filter out pollutants from stormwater, and some types of grasses and sedges can benefit from allowing water to infiltrate the ground, which helps recharge and maintain the water table and disperse runoff.

Benefits of Stormwater Infiltration
- Maintain water table, infiltration and subsurface drainage by allowing water to soak into the ground instead of being removed by pipes and pumps
- Reduce flash floods by delaying water infiltration over several hours during a storm event
- Plants use up pollutants from delayed stormwater before they enter the water system

Options for stormwater management

Site design consideration

What is stormwater management and why it should be managed

Stormwater is simply water that rains off streets, lawns, and other paved surfaces. When it is poured, this water is absorbed into the soil, and the flow is eventually released to the nearest water body. In areas with more developed environments, where rainwater flows directly to pipes and channels, this water flows quickly over such impervious surfaces or is channeled through pipes and ultimately flows into surface and subsurface water bodies. In such areas, the quality of stormwater runoff is affected by various factors, including the type of land use, the amount of impervious surfaces, and the design of the drainage system.

There are several ways in which stormwater runoff can be managed so that its potentially damaging effects can be minimized. The best practices used in this document can be grouped under one or more of the following methods: appropriate paving, channeling, storage, and infiltration.

Landscape design and stormwater management case studies

1. Traditional, elevated structure with deep porches on a larger cul-de-sac
2. Permeable driveway made of gravel, crushed shells, or permeable pavement
3. Vegetation tanks to accept stormwater and allow it to be detained
4. Retention pond that detains stormwater, protecting water bodies
5. Landscaping to facilitate landscape plant materials that have been selected for the site-specific conditions
6. Seepage area with detention basins

Example 1: New home on large cul-de-sac

Example 2: Home on a larger lot with detention basins

Example 3: Home on a smaller lot with detention basins

Example 4: Home on a smaller lot with permeable pavement

Example 5: Home on a smaller lot with infiltration basins

Example 6: Home on a smaller lot with infiltration basins and detention basins
Flood Preparedness Toolkit – Residential Site Design

**Example 2: Elevated Manufactured Home**

1. No parking under home reduces runoff
2. Gravel or crushed oyster shell driveway and parking area
3. Low-lying area of property planted with trees and other plants that are well adapted to wet soils
4. Open drainage ditch at street is planted with plant material that reduces erosion and cleanse stormwater
5. Stabilized native landscape area accepts runoff from yard, acting as a rain garden

**Example 3: Elevated Existing Home**

1. Permeable concrete driveway pads, with unnecessary concrete removed
2. Underground French drains channel water away from the house and allow it to infiltrate back into the soil
3. Open drainage ditch at street is planted with plant material that reduces erosion and cleanse stormwater
4. Space under home is only partially paved to reduce potential for runoff
5. Yard is sloped to existing low-lying areas that are planted with trees and plants tolerant of wet soils
Example 4: Elevated Multifamily Housing

1. Elevated multifamily housing units maximize efficiency by sharing elevators, decks, and stairs, and foundation elements.
2. A permeable materials driveway and parking area is also shared.
3. Low lying area of property planted with trees and other plants that are well-adapted to wet soils.
4. One side of the property utilized a planted bio-swale that filters stormwater, while providing a landscape buffer between the neighboring properties.
5. This multifamily development is appropriately scaled for surrounding single-family residential development.

Example 5: Elevated Commercial Building

1. This elevated commercial building is designed to fit in with the existing character of the community.
2. Generous decks, access ramps, and stairs make the elevated building accessible.
3. The parking lot utilizes permeable paving and landscaped drainage areas to reduce stormwater runoff.
4. Open drainage ditch at street is planted with plant material that reduces erosion and cleanse stormwater.
5. Low lying area of property planted with trees and other plants that are well-adapted to wet soils.
Flood Preparedness Toolkit – Community Tools

OPEN SPACE PRESERVATION AND CONSERVATION

Preserving critical floodplain areas and wetlands is critical to reducing risk from flooding. The Town of Jean Lafitte has informally established a “deserved open space and preservation area” to target for future open space. Jean Lafitte should adopt the Map 1 as their Open Space Preservation Plan for the Town of Jean Lafitte. Future land acquisition and donations can be made consistent with this map to establish permanent open space of these properties. If properties are developed in these preservation areas, they should have a minimum average requirement of ten acres, with uses restricted to very low impact uses.

IMPLEMENTATION MEASURES

- Formally adopt an Open Space Preservation Plan
- Establish a standard requiring a minimum of ten acres per low-impact use.
- Create a mechanism for property owners to retain ownership of the property and adopt deed restrictions that ensure that parcels credited for CRS open space credits will never be developed.

Landscape Standards

Jean Lafitte currently does not have Landscape Standards. The following types of minimum landscape standards should be adopted for commercially zoned and used properties within Jean Lafitte. Minimum landscape standards, used in conjunction with stormwater management practices, will significantly reduce flood risk.

IMPLEMENTATION MEASURES

Implement minimum landscape requirements that include:

- A ten-foot street yard along each street frontage.
- One tree per every 40 linear feet of property along a street, using trees indicated in a preferred tree list.
- A three-foot hedge planted between the street and any parking areas located within 60’ of the street.
- Sidewalks in the designated traffic area of Jean Lafitte.

Tree Preservation

Trees and forested areas are cultural assets in southern Louisiana. In order to preserve these cultural assets and use these natural assets to reduce risk, the following tree preservation standards are recommended.

EXAMPLE ORDINANCE

Preservation of heritage trees:

A heritage tree is any tree or group of trees with the following characteristics:

1. Any live oak (Quercus virginiana) or bald cypress (Taxodium distichum) with a DBH of twenty (20) inches or more, or
2. Any tree or group of trees specifically designated by the Town Council for protection because of its historical significance, special character or community benefit, or
3. Any additional tree-designated on the Town’s heritage tree list an approved by the Town Council and maintained by the Town Council.

Heritage tree removal:

1. The removal of any heritage tree is prohibited unless the Town Council issues a tree removal permit.
2. The applicant for a tree removal permit must submit a heritage tree mitigation plan including, but not limited to, the following information:
   a. Location and type of tree to be removed;
   b. Number, size, and type of replacement trees;
   c. Location of replacement trees;
   d. Whether the applicant will pay into the tree mitigation fund.
3. In the case of an emergency, when a heritage tree is hazardous or dangerous to life or property, it may be removed without a tree removal permit.

Heritage tree mitigation:

Mitigation of the removal of a heritage tree may occur in one (1) of the following ways:

1. On-site replacement. When an applicant is proposing to mitigate the removal of a heritage tree with on-site replacement, the following standards apply:
   a. Replacement tree criteria.
      i. Each heritage tree must be replaced at a ratio of 3:1 replacement tree DBH to heritage tree DBH.
      ii. The replacement trees must be a minimum of two (2) inches DBH at the time of planting.
   b. Payment to tree mitigation / open space fund.
      i. The request for payment-in-lieu of tree replacement must be presented to the Town council for review and recommendations approval or denial.
      ii. The Town council may approve or deny an application for a payment-in-lieu of tree replacement to the tree mitigation fund.

Exemptions:

1. Exempt activities.
   a. Lands used for agricultural purposes.
   b. The clearing of understory trees and shrubs necessary to perform boundary surveying or to conduct tree surveys or inventories.
   c. Buildings and uses lawfully existing as of the effective date of this section may be renovated or repaired without providing additional tree conservation and heritage tree preservation, provided there is no change in use of existing floor area, or an increase of less than twenty (20) percent or two thousand (2,000) square feet in expansion or the addition of accessory buildings or structures.
   d. Any heritage trees or areas of tree canopy determined by the Town to be diseased, dying, or dead.
   e. Any heritage tree or areas of tree canopy determined to be causing a danger or be in hazardous condition as a result of a natural event such as hurricane, tornado, storm, flood or other natural event that endangers the public health, welfare or safety and requires immediate removal.
   f. Any heritage tree or areas of tree canopy within twenty (20) feet of a residential building.
   g. Trees or areas of tree canopy that interfere with the clear sight distance for roadways as determined by the Town engineer.

Process for making community-wide changes

Sample ordinance language
Thank you!

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