Planning and Implementation: Tools for Louisiana's Coastal Communities

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February 12, 2016

CPEX.org

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.org

Planning + Implementation

+

Policy + Advocacy

+

Communication + Outreach

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

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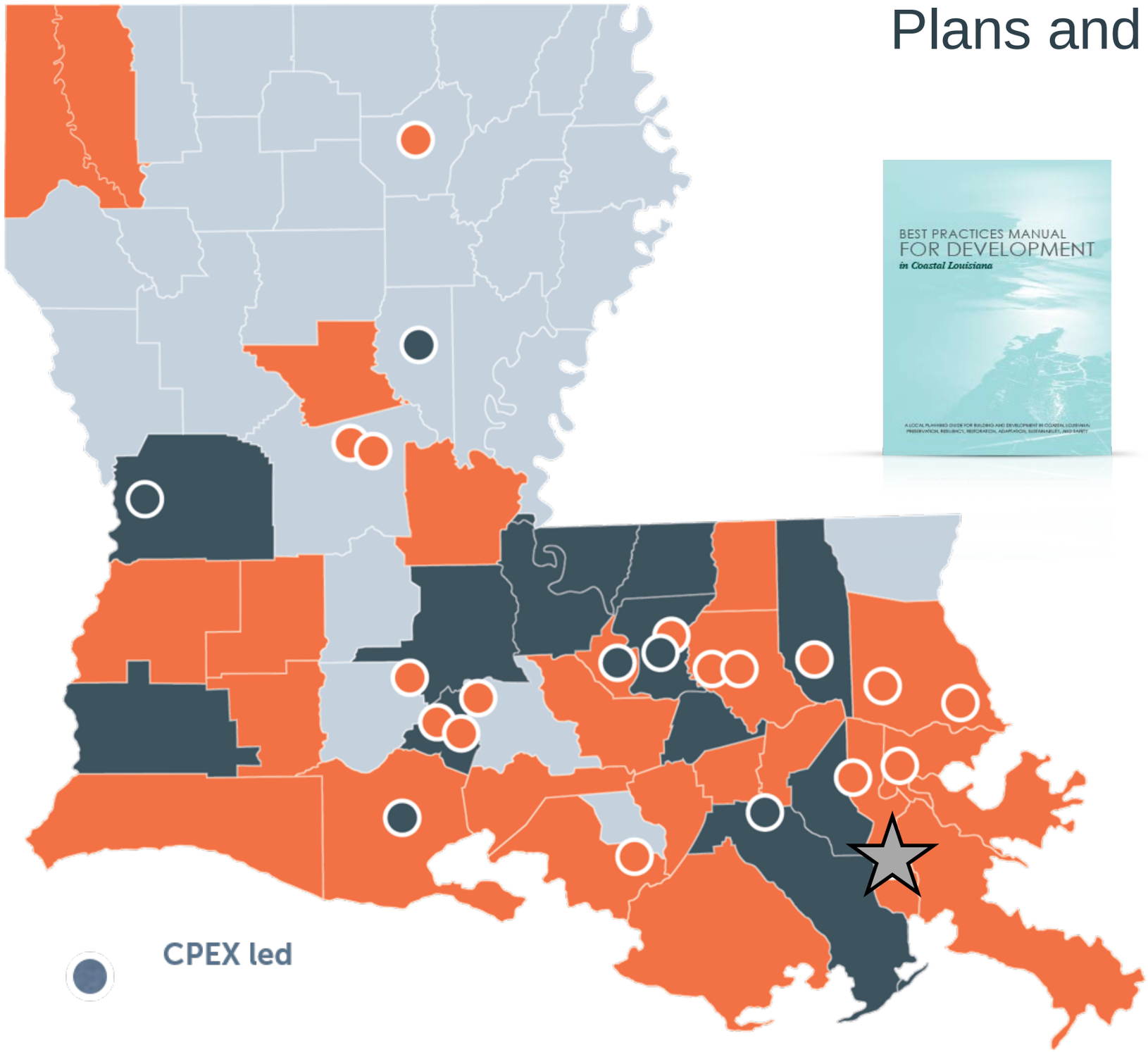
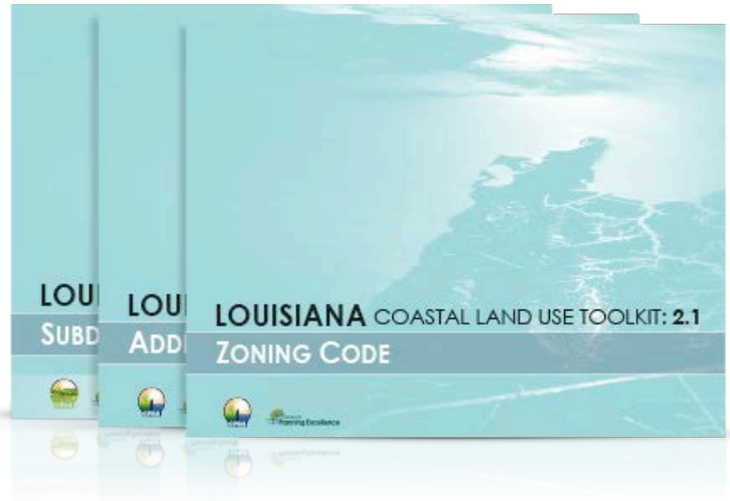


Plans and Resources Developed



Flood Risks in Louisiana

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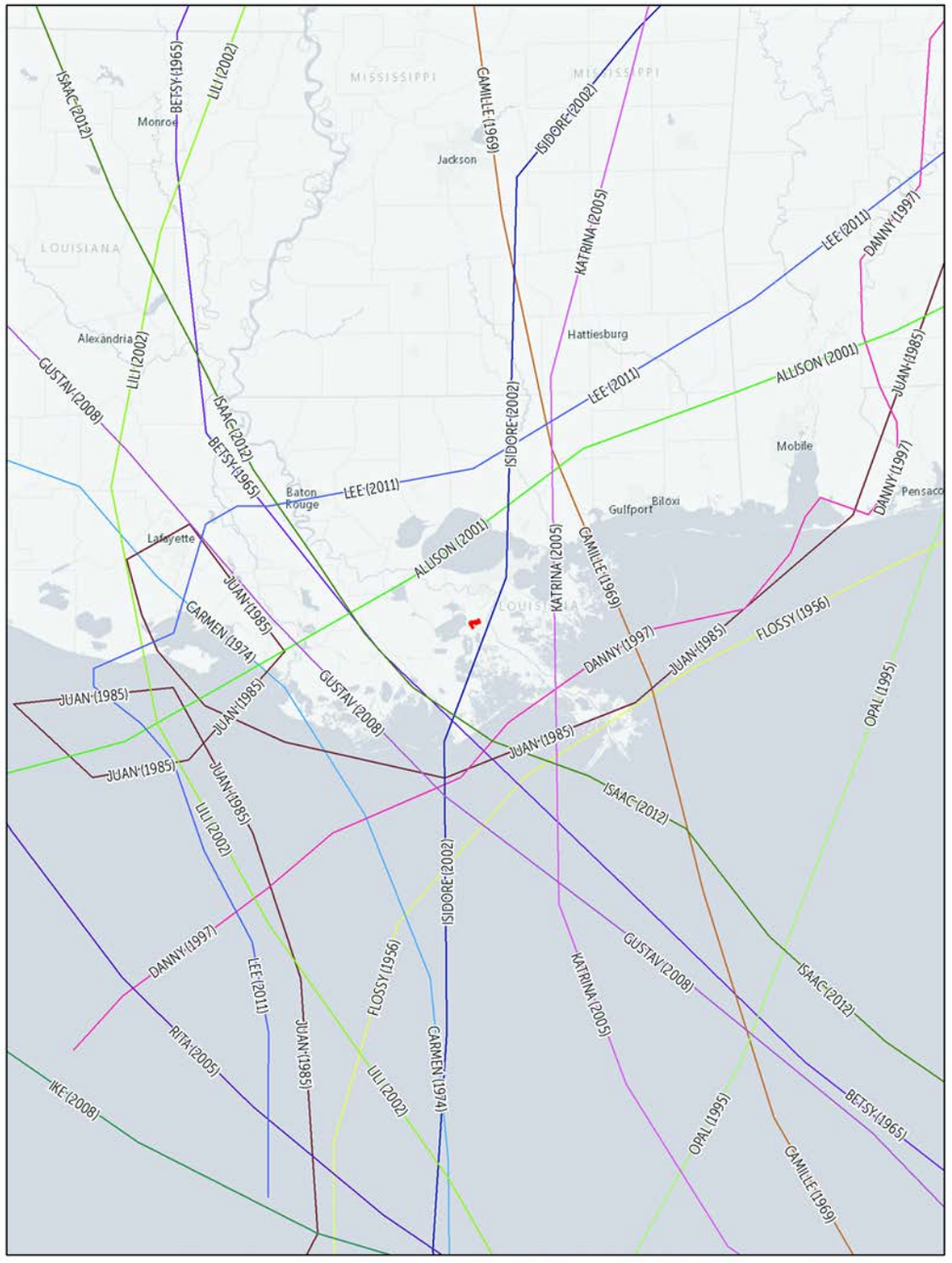
Named Weather Occurrences



Land Loss (Erosion, Subsidence)


NO
PASS
ZONE

Flood Risks in Louisiana

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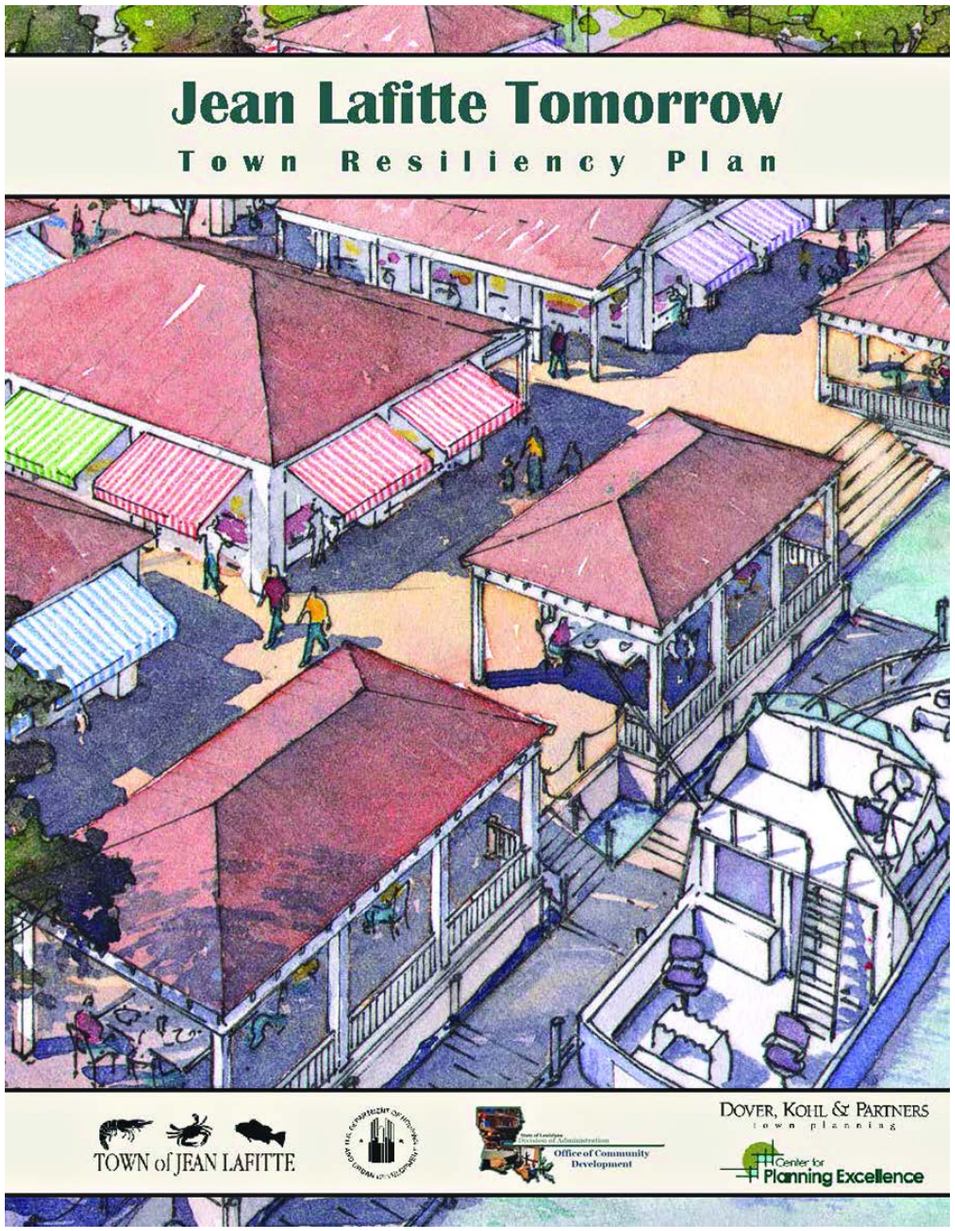
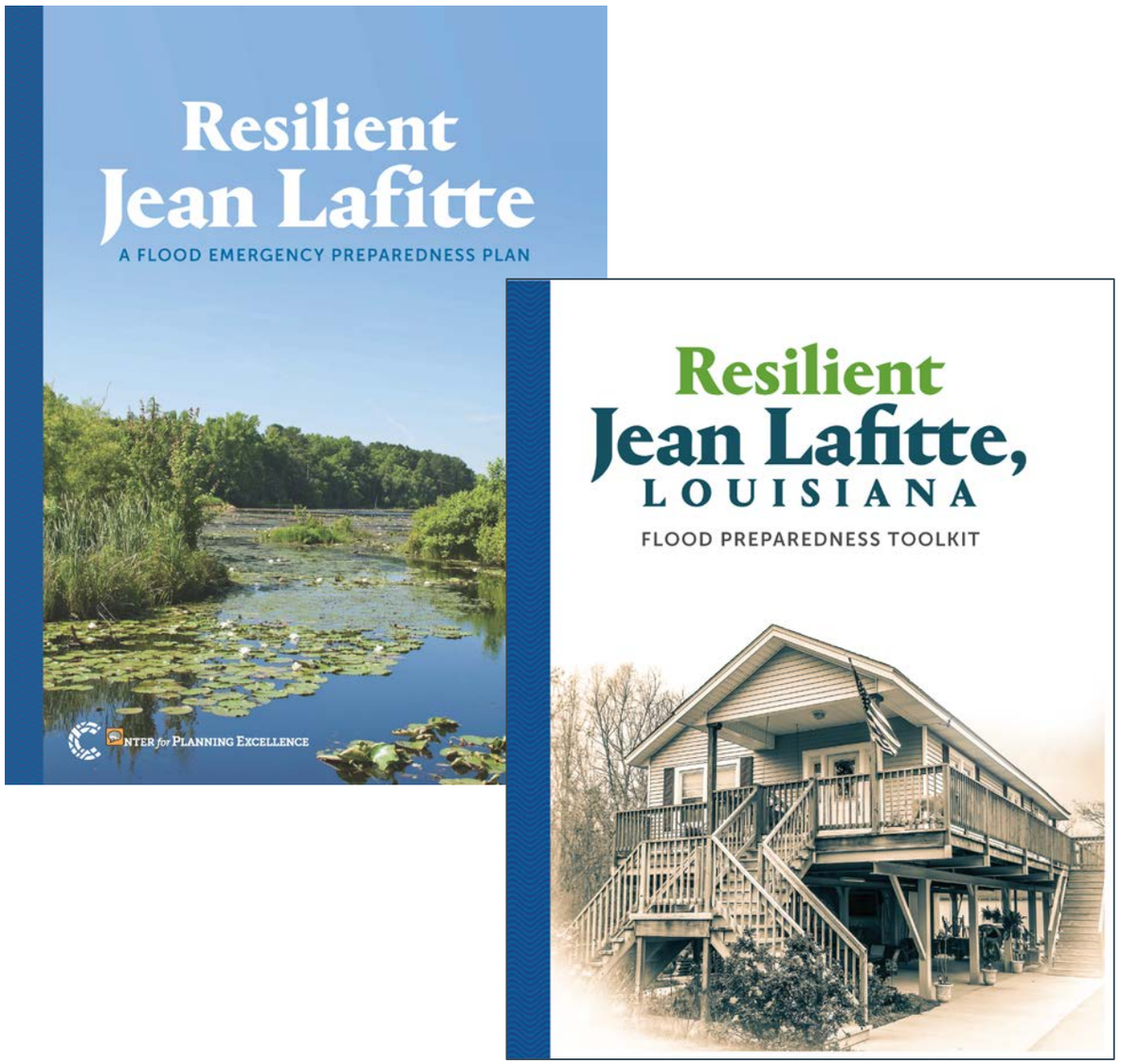
Resiliency Plan



Flood Emergency Preparedness Plan and Preparedness Toolkit



Flood Preparedness Toolkit - Elevation

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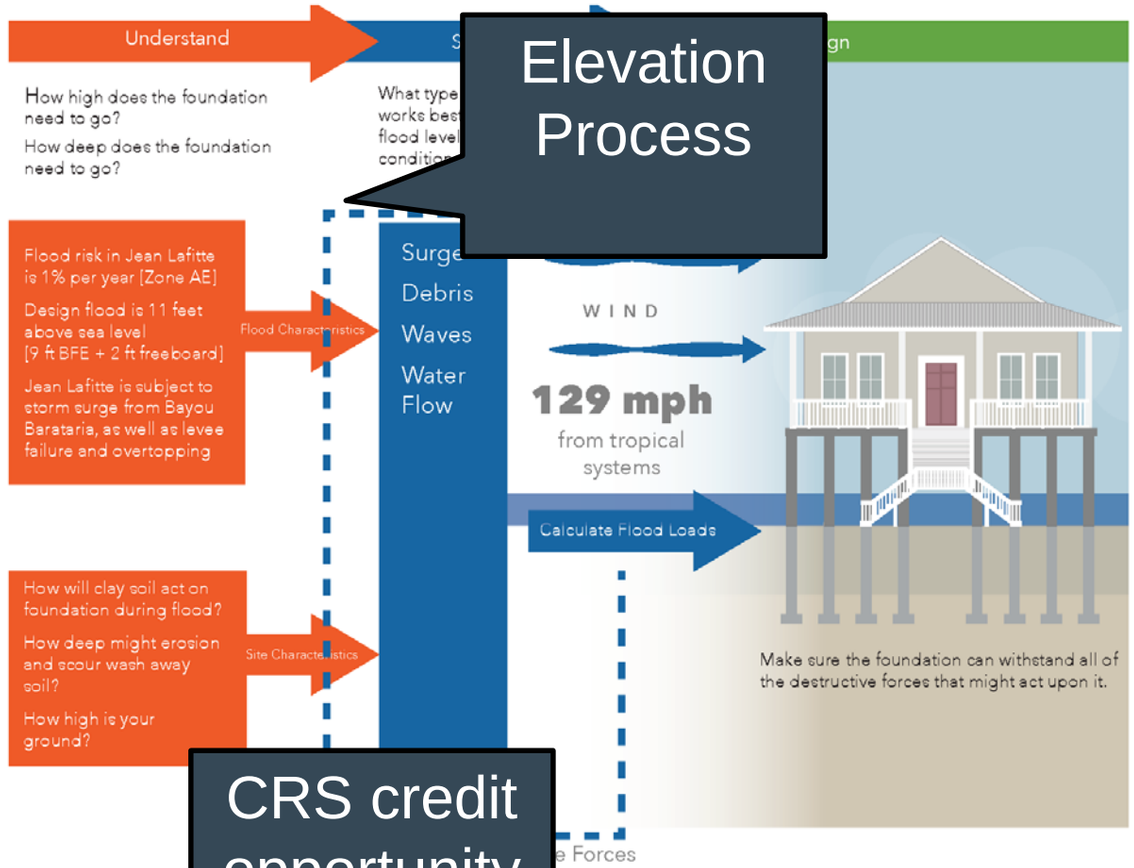
TYPICAL METHODS OF ELEVATING STRUCTURES

There are several methods to elevating 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:

	METHOD OF ELEVATION	DESCRIPTION	KEY CONSIDERATIONS	APPLICATION TO JEAN LAFITTE
SMALL ELEVATION ADJUSTMENTS	**Increasing the height of existing foundation walls or piers**	This alternative requires removing the building from its existing foundation, and extending foundation walls or piers such that the lowest horizontal member is outside of the base flood.	Utilities must be disconnected and new connections designed and accommod… In some instanc… to be removed … once the structu… Openings that a… be added to the… enter and exit… that …	This alternative is generally not adequate …ghts to get above the BFE …; however, there may be …rrently exist on mounds …ght be a viable option.
	Increasing height of walls	This alternative requires removing the roof from the existing structure in order to extend the existing walls. Walls must be extended to a sufficient height in order to accommodate raising the finish floor level above the base flood elevation. The new lowest floor may be either concrete slab or wood framed system generally consisting of beams and joists.	This alternative … windows to acc… providing new … elevation. For areas of the existing walls below the base flood elevation, adjustments may be required to accommodate flood waters flowing into and out of the lowest portion of the building if a wood frame floor system is used. If the new lowest floor is a slab, then fill dirt that is supporting the new slab should be properly compacted. Openings to equalize flood pressures are generally not required in this instance.	…ly discouraged given the …ssary to achieve desired …n, but could be appropriate for homes on slab foundations currently elevated on a mound where only a few additional feet is necessary to achieve desired flood protection.
LARGE ELEVATION ADJUSTMENTS	**Abandon the lowest floor**	This alternatives requires that existing habitable living space on the ground level be repurposed to only function as storage.	A second floor may need to be added to provide living space, or, if a second floor already exists, it may need to be remodeled to provide a complete living unit. Appliances and utilities may also need to be relocated to reduce the potential for flood damage. Consult engineer to determine if there are any structural adjustments or foundation reinforcements that are necessary in order to accommodate the additional load from a second floor, or to ensure that the existing ground floor structure and foundation are adequate to withstand the forces from an anticipated flood.	Acceptable. Homes with slab foundations and of masonry constructed are generally the best candidates for this method.
	Raise the entire structure	This alternative may require the removal of the structure from an existing foundation and constructing a completely new foundation to elevate the building above the base flood, or raising a home on an existing slab.	Adequate bracing may be necessary during the lifting process to maintain the integrity of the home. Foundation design should accommodate all anticipated stresses resulting from flood and wind forces. Additional considerations for particular types of foundations are outlined in more detail later in this chapter.	Preferred.

Elevation methods by type



CRS credit opportunity

1 | Credit Criteria for FE…

ALL new buildings in the regulatory floodplain:

- **a** | Must be constructed on foundations that are designed and sealed by a registered design professional as complying with the requirements of the International Building Code, the International Residential Code, or ASCE 24, and
- **b** | Must not be constructed on fill.

2 | Credit Criteria for FDN 2 credit:

All new buildings constructed on fill in the regulatory floodplain:

- **a** | Must be constructed on properly designed and compacted fill (e.g., fill that meets the criteria of (1) Section 1803.5.8 and Section 1804.4 of the International Building Code, (2) Section 2.4 of ASCE 24, or (3) their equivalent);
- **b** | Must be on fill that has appropriate protection from erosion and scour; and
- **c** | Must meet a compensatory storage requirement (for the building and fill) that meets the credit criteria of Section 432.a, Development Limitations (DL1a).

3 | Credit Criteria for FDN 3 credit:

All new buildings built on fill in the regulatory floodplain

- **a** | Must be constructed on properly designed and compacted fill (e.g., fill that meets the criteria of (1) Section 1803.5.8 and Section 1804.4 of the International Building Code, (2) Section 2.4 of ASCE 24, or (3) their equivalent), and
- **b** | Must be on fill that has appropriate protection from erosion and scour.

Flood Preparedness Toolkit – Stormwater Management

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Filtration/Infiltration

As stormwater flows across surfaces, it picks up whatever sediments, oils, and other contaminants are on those surfaces. A number of filtration and infiltration methods can be used to protect the health of the water bodies into which this stormwater runoff ultimately flows. The use of certain plants in filtration methods such as constructed wetlands, rain gardens, and bioswales mimics the natural filtration ability of swamps and marshes.

In addition to filtering out pollutants from stormwater, areas like Jean Lafitte can benefit from allowing water to infiltrate the ground, which helps recharge and maintain the water table and reduce subsidence.

Benefits of bioretention include:

- Maintain water table, in turn reducing subsidence, by allowing water to soak into the ground instead of being removed by pipes and pumps
- Reduce flash floods by detaining water into already overtaxed storm sewer pipes during a storm event
- Plants soak up pollutants from delayed stormwater before they enter the water system

FILTRATION METHOD	RESIDENTIAL	COMMERCIAL	NATURAL
Constructed wetland or marsh			
Filtration pond			
Natural vegetated surface landscaping			
Bio-swale	✓	✓	✓
Rain garden	✓	✓	✓
Roof garden	✓	✓	

Options for stormwater management

WHAT IS STORMWATER MANAGEMENT AND WHY IT SHOULD BE MANAGED

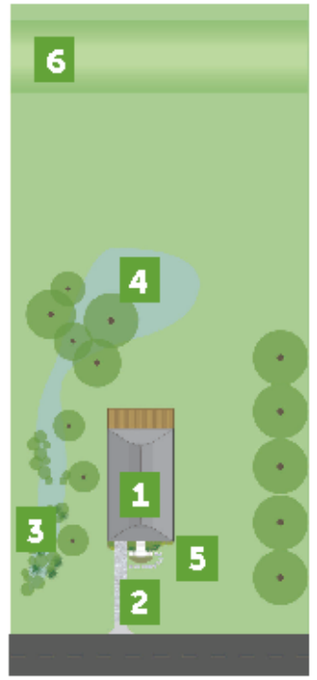
Stormwater is simply rainwater that runs off streets, lawns, and other sites. In areas with little or no development, this water is absorbed into the soil close to where it initially falls. From here, it recharges ground water sources and replenishes water bodies. In areas with more development and ultimately more impervious surfaces such as parking lots and roads, this water flows quickly across such impervious surfaces or it is channeled through pipes and can cause flooding, erosion, and serious infrastructure problems.

In areas prone to hurricanes and other intense storms, like Jean Lafitte, the management of stormwater through a variety of practices and methods at different scales is crucial to protect property and the surrounding environment from the damaging effects of these powerful storms. Despite our best efforts, flowing stormwater disregards property boundaries, and it flows from areas of higher elevation to lower elevations. With this in mind, it is important to view individual stormwater management practices as part of a larger, interconnected system.

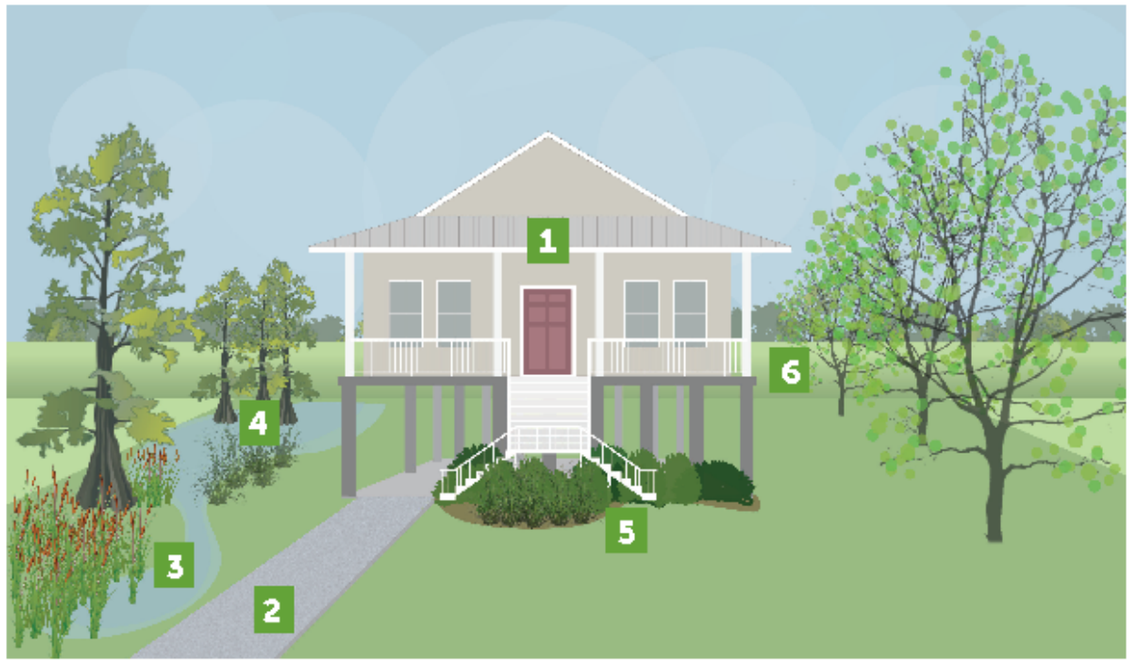
There are a number of ways in which stormwater runoff can be managed so that its potentially damaging effects can be minimized. The best practices used in this document can be categories under one or more of the following methods: appropriate paving, channeling, storage, and filtration.

1. Traditional, elevated structure with deep porches on a large rural lot
2. Permeable driveway made of gravel, crushed shells, or permeable pavements
3. Vegetated swale to accept stormwater and move it toward retention/detention areas
4. Retention/detention pond holds water on property, recharging water table. This water reduces the load on the Town's drainage system and it can be used for irrigation.
5. Landscape made of well-adapted native plant materials that have been selected for the site's specific conditions.
6. Protection levee with we

Site design consideration



Example 1: New home on Large rural lot



Flood Preparedness Toolkit – Residential Site Design

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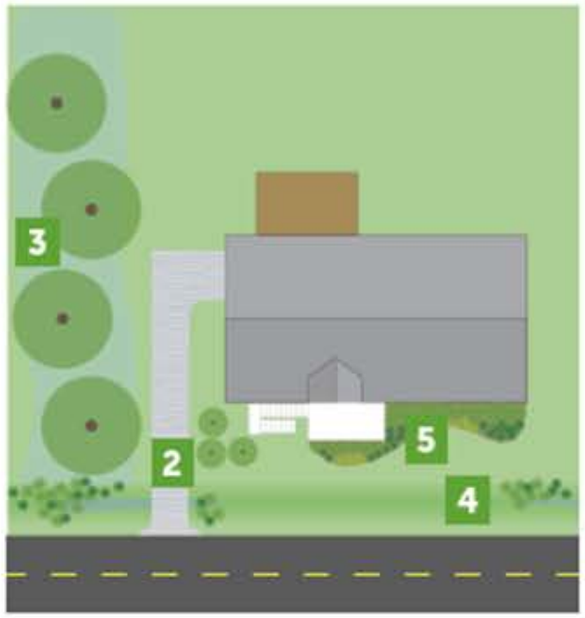
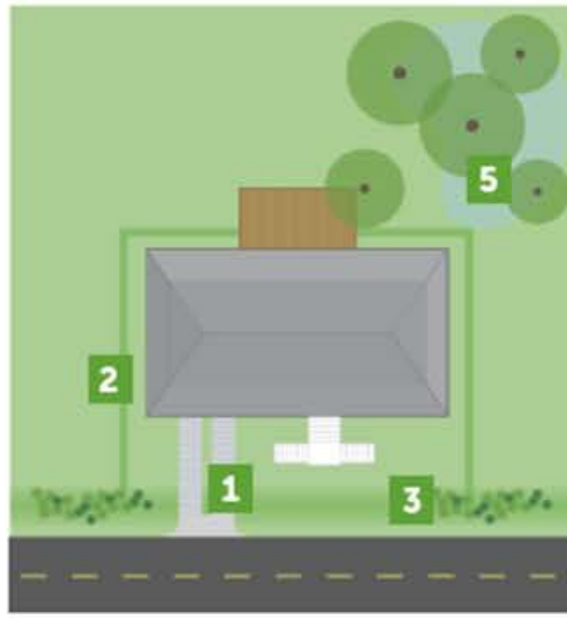


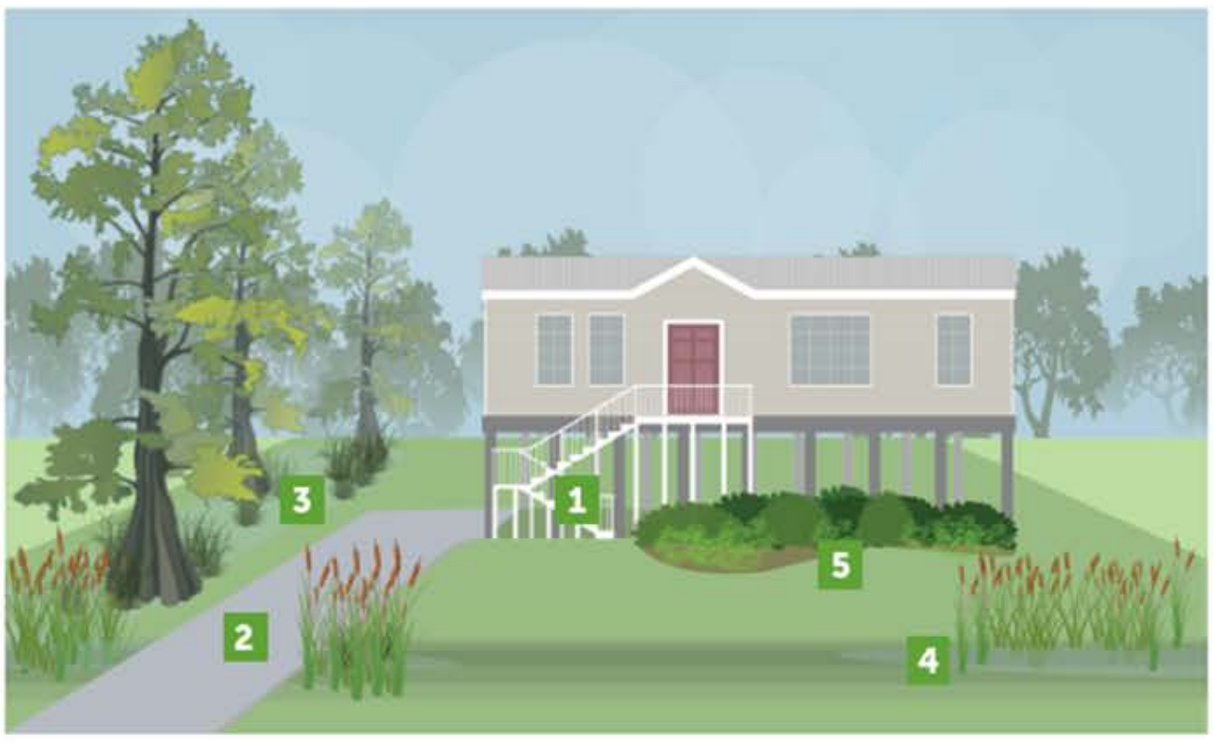
Example 2: Elevated Manufactured Home

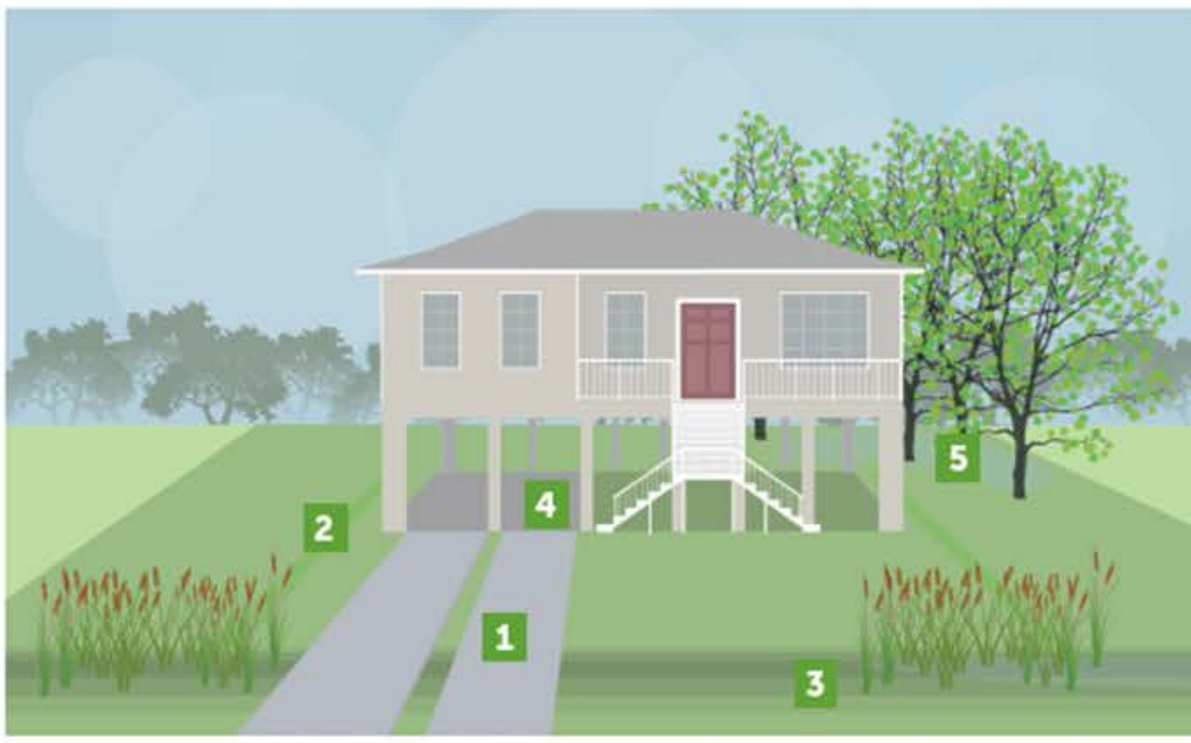
1. No paving under home reduces runoff
2. Gravel or crushed oyster shell driveway and parking area
3. Low lying area of property planted with trees and other plants that are well-adapted to wet soils
4. Open drainage ditch at street is planted with plant material that reduces erosion and cleanse stormwater
5. Sunken 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







Flood Preparedness Toolkit – Commercial/Multifamily Site Design

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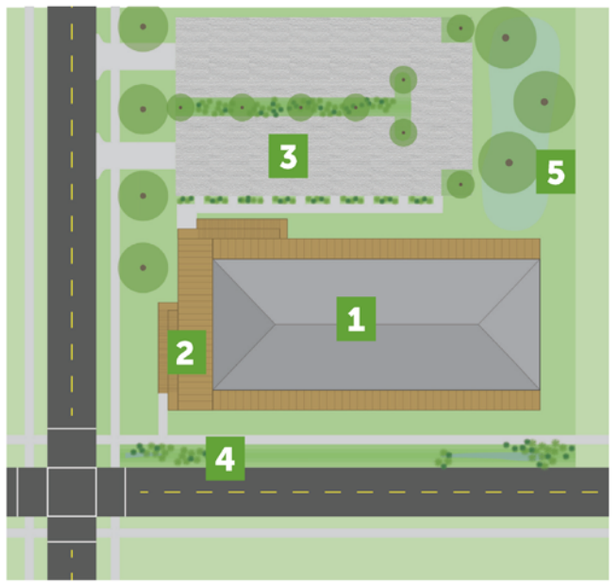
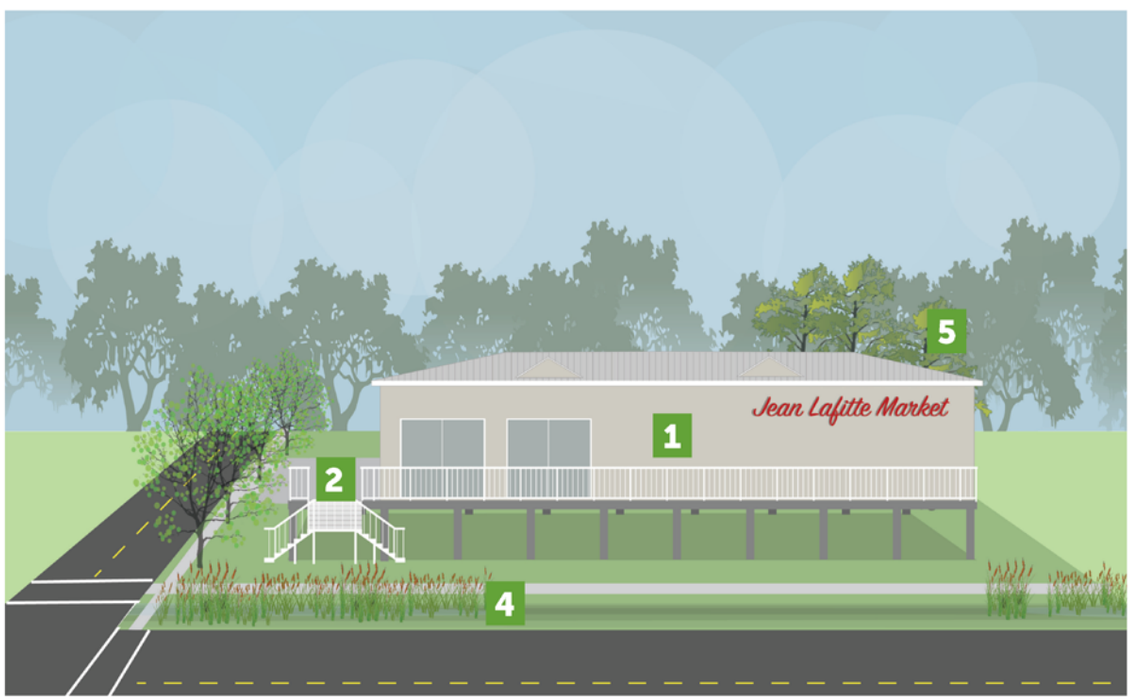
Example 4: Elevated Multifamily Housing

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 utlized 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 bulding 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

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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 "desired 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 acreage 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 minimal 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 ble area of Jean Lafitte.

Tree Preservation St

Trees and forests a cultural assets in southern Louisiana. In order to preserve these cultural assets and use these natural assets to reduce risk, the T llowing tree preservation standards.

Process for making community – wide changes

EXAMPLE ORDINANCE

Preservation of heritage trees:

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

1 | Any live oak, southern magnolia or bald cypress 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 as 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 to the tree mitigation fund.

3 | In the case of 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.

2 | Payment to tree mitigation / open space fund.

- a | When heritage tree replacement is infeasible, the applicant may request that the Town council allow a payment-in-lieu of tree replacement to the tree mitigation fund.
- b | The request for payment-in-lieu of tree replacement must be presented to the Town council for review and recommendations approval or denial.
- c | 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.

Exempt trees.

- a | Any heritage tree or areas of tree canopy determined by the Town to be diseased, dying or dead.
- b | 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.
- c | Any heritage trees or areas of tree canopy within twenty (20) feet of a residential building.
- d | Trees or areas of tree canopy that interfere with the clear sight distance for roadways as determined by the Town engineer.

Sample ordinance language

Thank you!

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