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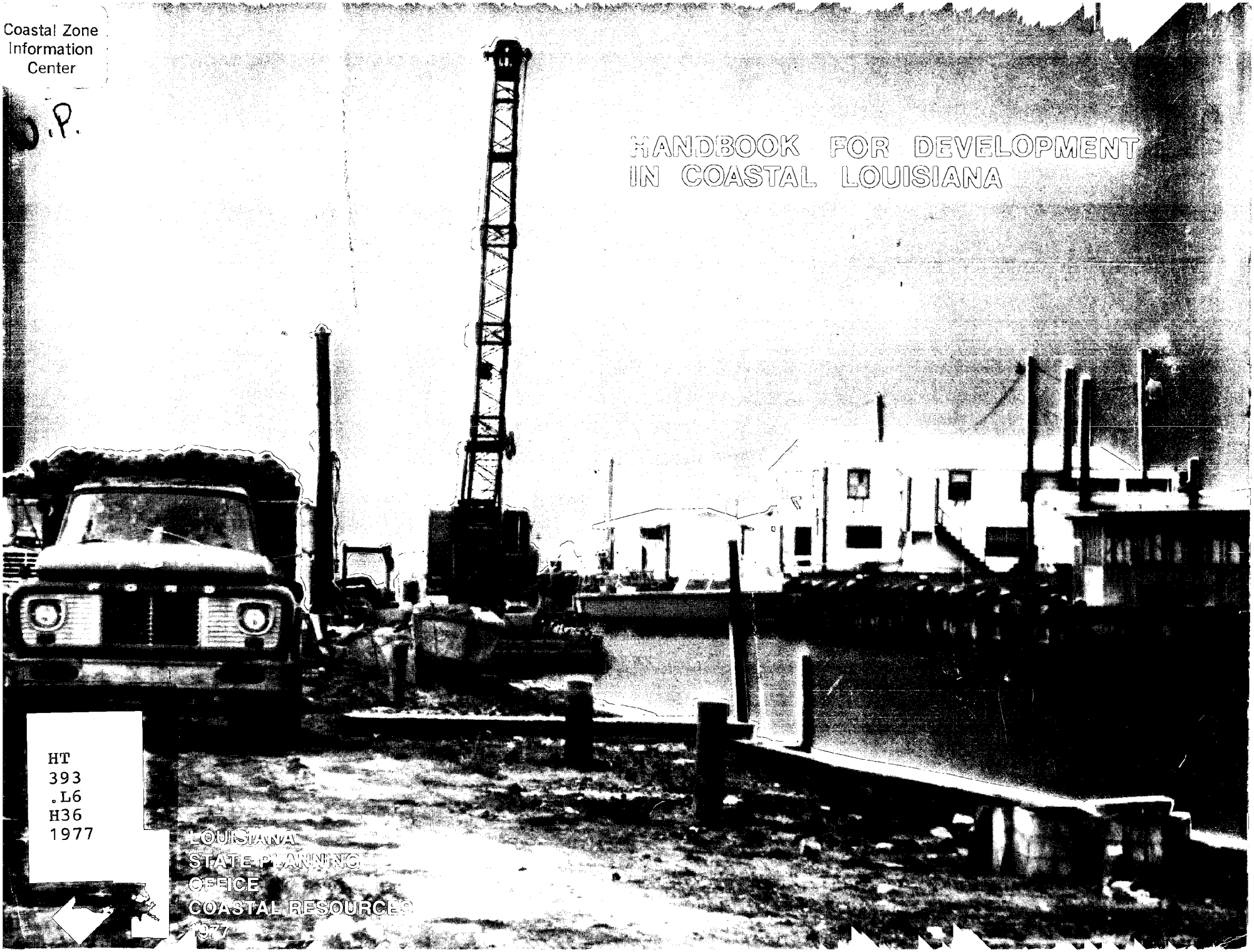
HANDBOOK FOR DEVELOPMENT IN COASTAL LOUISIANA



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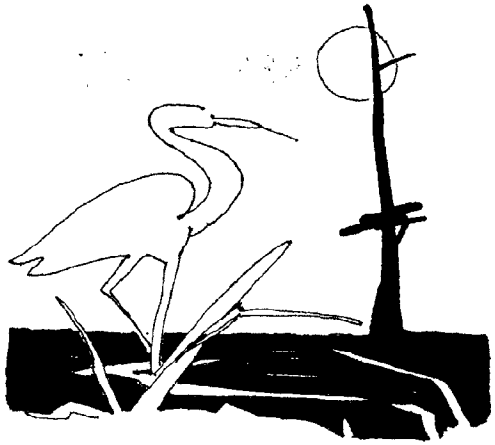

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Louisiana State Planning Office
Mr. Patrick W. Ryan, Executive Director

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PREPARED BY
Coastal Environments, Inc.
1260 Main Street
Baton Rouge, Louisiana 70802

JUNE 1977

State Planning Office

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PREFACE

This handbook was prepared as a part of the Louisiana coastal resources program to serve as a source book for developers in the Louisiana coastal area. The information may be used in relation to a specific development activity or it may be read for background. The way it is used will depend upon the developer, his project, and future coastal zone management practices at the federal, state, and local levels.

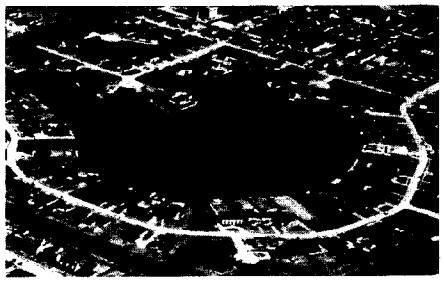
We believe this handbook provides important information for developers in a readable and useful format and hope that it will be of service to a broad range of development-oriented interests.

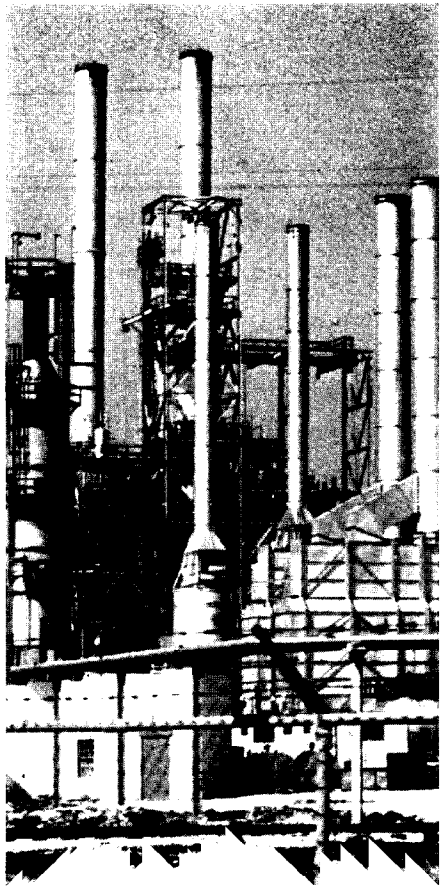
INTRODUCTION

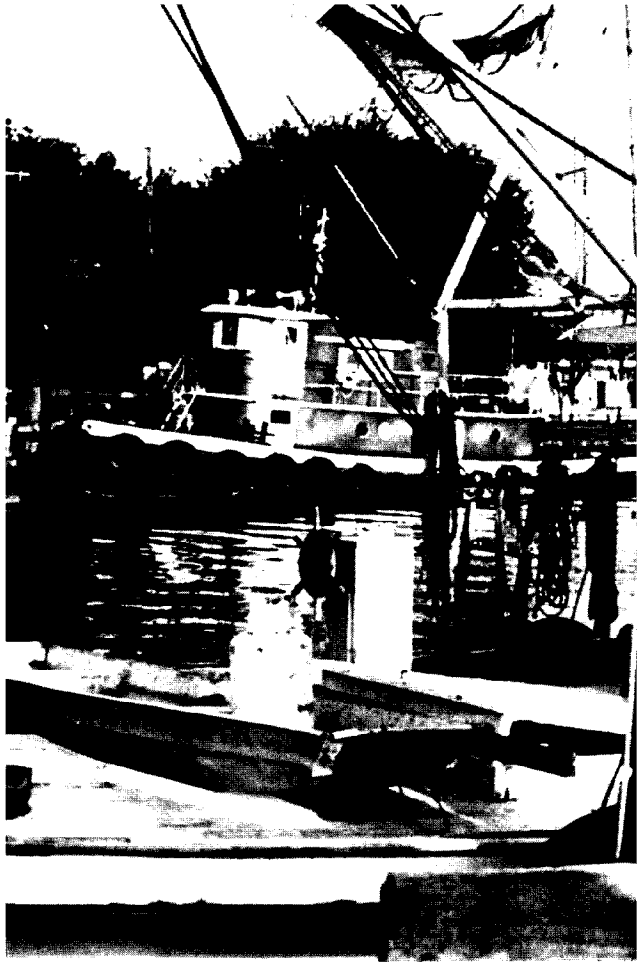
Development

Development is any site improvement or construction activity that results in a temporary or permanent alteration of land, vegetation, wildlife, water flow, or man-made elements. Typical development in coastal Louisiana includes improvements and activities to provide for the needs of:

- **URBAN AND SUBURBAN GROWTH**
- **TRANSPORTATION AND COMMUNICATIONS**
- **INDUSTRY AND PORTS**
- **RECREATION**
- **NATURAL RESOURCE EXTRACTION**
- **AGRICULTURE AND FORESTRY**







Developer

A developer may be an individual land owner or builder, a small company, a large corporation, or an international business. Developers, therefore, represent a broad range of concerns and operate within a wide variety of professional interests and project types.

Objectives

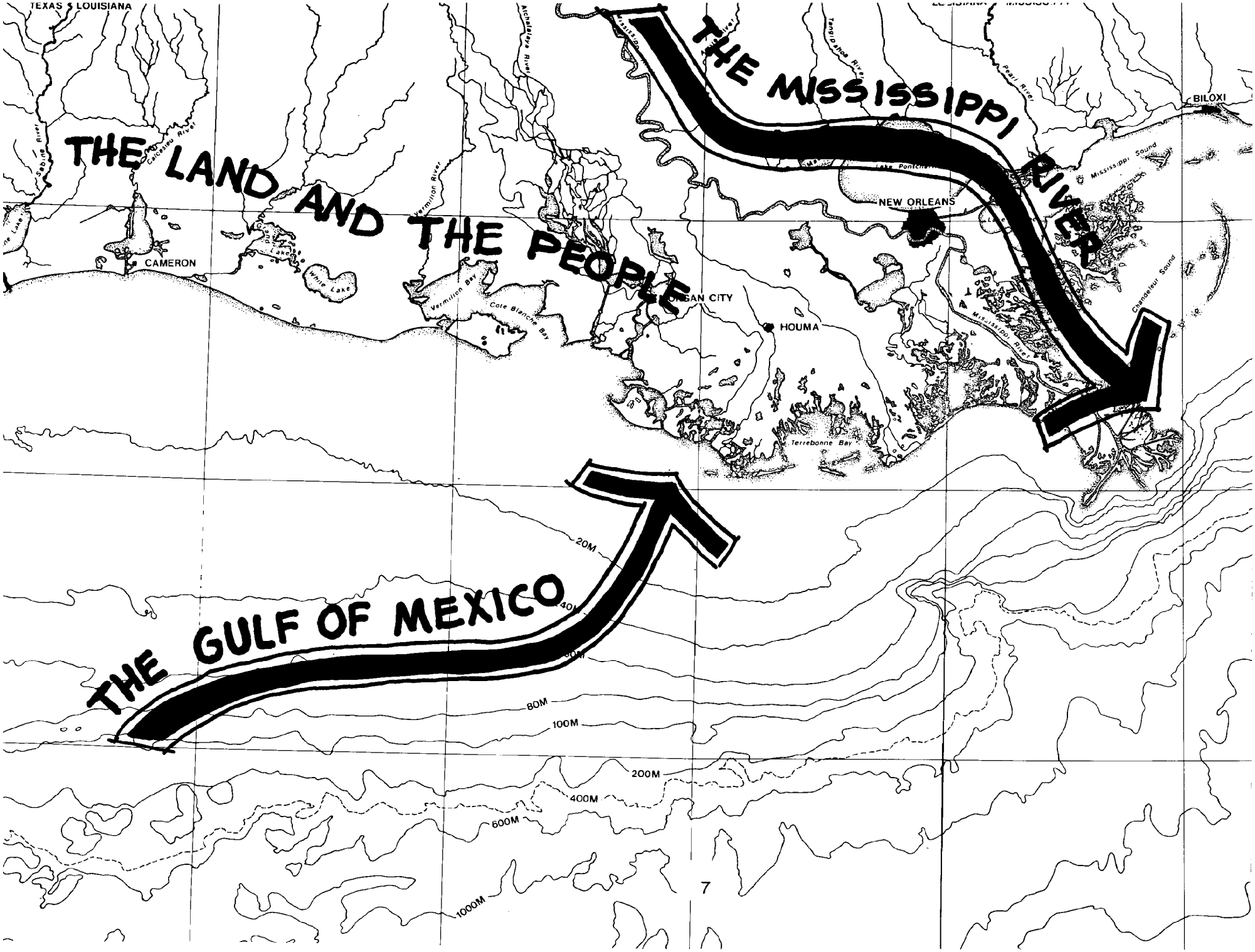
In coastal Louisiana the need for a handbook for developers arises because of special coastal conditions which may influence the way the developer is able to operate. By considering these special conditions the developer may: 1) take advantage of opportunities such as unique cultural elements or soils with good foundation characteristics, 2) avoid or neutralize constraints such as high subsidence soils or salt water intrusions, 3) insure that natural factors do not adversely affect a project or that the project does not adversely affect the environmental setting, and 4) incorporate governmental controls and regulations early in planning for development. Thus, the objectives of this handbook are to help the developer take advantage of environmental and cultural opportunities, identify permit procedures, avoid or neutralize environmental constraints, and minimize environmental impacts.

Approach

This handbook proceeds logically from general to more specific information. It begins with an overview of **Louisiana's Coastal Setting** to provide the developer with a basic understanding of the unique natural and cultural features that may be found. The section entitled **Developer's Plans** considers the processes of 1) determining the best use for a given site, 2) selecting a suitable site for a given project, and 3) coordinating project needs with site potential once the project and the site have been selected. The opportunities and constraints related to the various physical features and cultural elements are evaluated in the **Coastal Considerations** section. Laws, regulations, controls, and government programs are discussed in the section entitled **Institutional Factors**. **Development Activities** such as site selection, site improvements, construction activities, and management are then reviewed in relation to the coastal setting. Finally, an **Annotated Bibliography** is included to expedite the location of more specific information concerning topics presented in the handbook.

Use

This handbook provides coastal developers, planners, and other citizens with a basic reference that will help lead to development activities that are efficient and well suited to Louisiana's coastal wetland resources.


TEXAS & LOUISIANA
THE LAND AND THE PEOPLE
THE MISSISSIPPI RIVER
THE GULF OF MEXICO
Sabine River
Calcasieu River
Vermilion River
Atchafalaya River
Tangipahoa River
Pearl River
CAMERON
White Lake
Vermilion Bay
Cote Blanche Bay
MORGAN CITY
HOUMA
NEW ORLEANS
Lake Pontchartrain
Mississippi River
Terrebonne Bay
Mississippi Sound
Chandeleur Sound
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LOUISIANA'S COASTAL SETTING

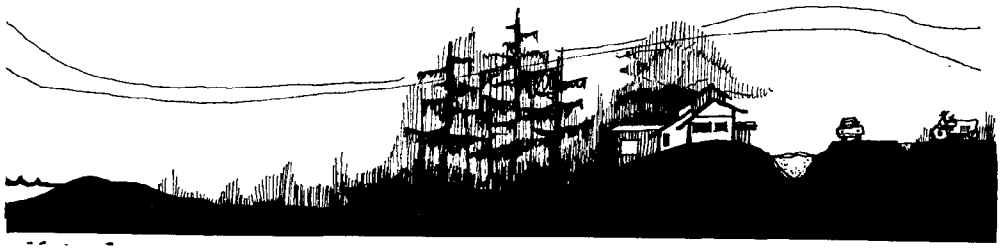
Natural Setting

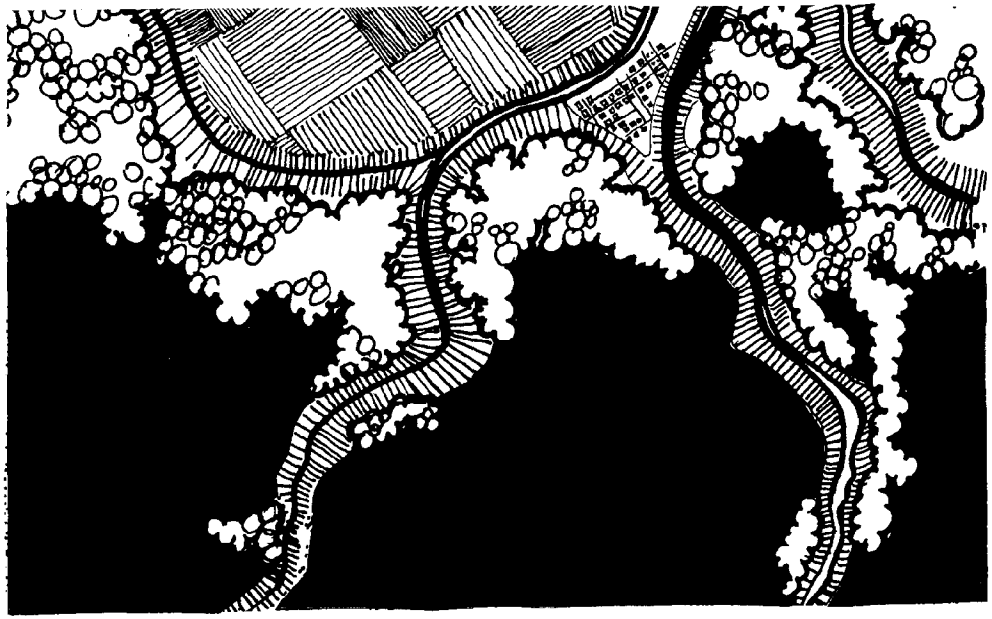
Louisiana has an extensive and unique coastal area. A vast network of ridges and wetlands was formed by the Mississippi River, modified by the Gulf of Mexico, and transformed by people of many cultural backgrounds. Coastal features and influences extend many miles inland from the gulf.

The Mississippi River has deposited silt along the gulf coast over many thousands of years. The soils deposited by the river into the Gulf of Mexico have been reworked by winds, tides, currents, and hurricanes. As a result of river and gulf processes, a variety of land features have been formed in the coastal area.

Coastal land features form the base upon which construction activities may take place. The **natural levee ridges** with relatively firm soils and high elevations provide spines of land along which development has traditionally occurred. **Distributary channels** provide water access, transportation routes, and drainage ways. Fringing **swamp and marsh basins** have provided man with valuable resources and an overflow area for flood protection. Along the coast, **barrier islands**, **chenier ridges**, and **oyster reefs** have provided a buffer against eroding tides and dangerous storms.

The **lakes, bays, tidal channels**, and other coastal water features have helped to make the Louisiana coastal area one of the richest estuarine regions in the world. The warm, humid climate and mixing of fresh and salt water is favorable for rapid growth of **vegetation** and **wildlife**. The Louisiana estuaries are major breeding grounds for many commercially important fish and shellfish. The estuarine marshes are also valuable for their ability to reduce the impact of storms upon development farther inland.





Cultural Change

It is no accident that people have found coastal Louisiana desirable for development. Both its geological setting and its biological production provide important resources needed by man. Long before Europeans arrived, Indian populations lived off of the land in the coastal area. They have left behind hundreds of **archaeological sites** as evidence of their occupancy. Significant changes in land and population occurred in the 1700's when French, Spanish, German, English, and African peoples settled and applied their particular techniques to farming, trapping, lumbering, and fishing. **Flood protection levees**, **bridges**, **roads**, and **canals** were introduced. Railroads and logging canals brought further changes. Now, **industrialization, oil** and **gas extraction,** and **shipping** are bringing rapid **urbanization** and requiring new techniques for modifying the coastal area to suit human needs.

Man and Land

While rich in natural and cultural resources, the Louisiana coastal area is a fragile system. The relationship between man and land which began in prehistoric times is still important today with expanding development needs.

For this reason, careful consideration of the impacts of construction techniques in the sensitive coastal area is necessary. The relationship between man and his various activities in the coastal area and the natural processes of the wetlands is of concern as Louisiana continues to enjoy the social, economic, and environmental benefits of its wetlands.

DEVELOPER'S PLANS

Development and Site

The variety of resources found in coastal Louisiana provides opportunities for many types of development. Agriculture, industry, mineral extraction, housing, commerce, and water-related activities all flourish. Though specific projects are not directly addressed in this handbook, the activities and processes presented apply to many types of development. In any development activity one of the following circumstances usually exists in the early planning stages:

1. **The developer has a piece of land and needs to define uses or techniques which are suitable for its development.**
2. **The developer has a project he wants to carry out and needs an appropriate site.**
3. **The developer has both a project and a site and needs a plan to integrate the two.**

In the first case, an evaluation of the site must be made to determine how it might best be used. In the coastal area both natural and legal restrictions exist which may limit the possibilities for use of a particular site. An inventory of a site's potential plus an analysis of limiting conditions will help determine a suitable range of uses for the site.

In the case where the developer already has a project and is looking for a suitable site, he must determine what supporting features are necessary for a successful development and then find a site which provides these features economically. A number of potential sites may be reviewed to obtain data on features such as water supply, land elevations, and transportation facilities. In addition, the surrounding land uses, population composition, and federal, state and local land use regulations need to be investigated. A comparison may then be made among available sites and the best one selected.

At some point, development reaches the stage where a site and a project have been selected. At this point, the developer must evaluate site and project requirements simultaneously to define how uses will best be arranged on the site. Modifications of the site or the project may be necessary to achieve a successful, efficient, and economical development.

Project Planning

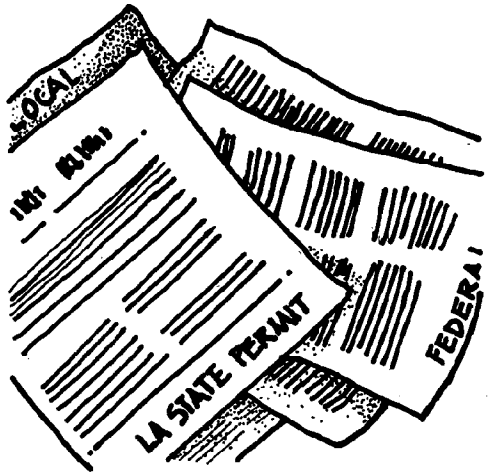
Some of the potential commitments of time and money to the project that should be considered in the planning stage include:

1. **Surveys of existing site conditions — vegetation, soils, wildlife, hydrology.**

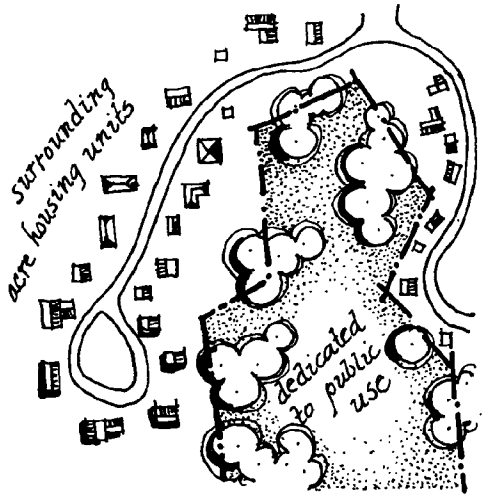
2. **Planning and design consultants—landscape architects, architects, engineers.**

3. **Environmental specialists—biologists, geologists, hydrologists, archaeologists.**

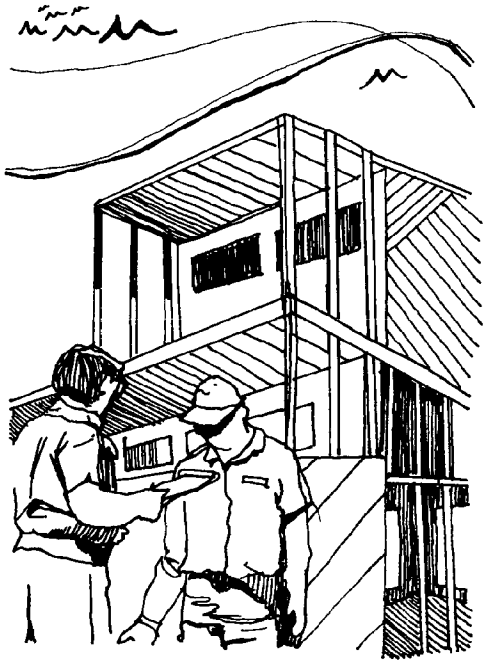
4. **Impact assessments and statements—dredging, filling, air and water emissions, waste disposal.**



5. **Permit applications—dredging, filling, air and water emissions, waste disposal.**



6. **Mitigation of adverse impacts—land trade off, scenic easements, deed restrictions.**

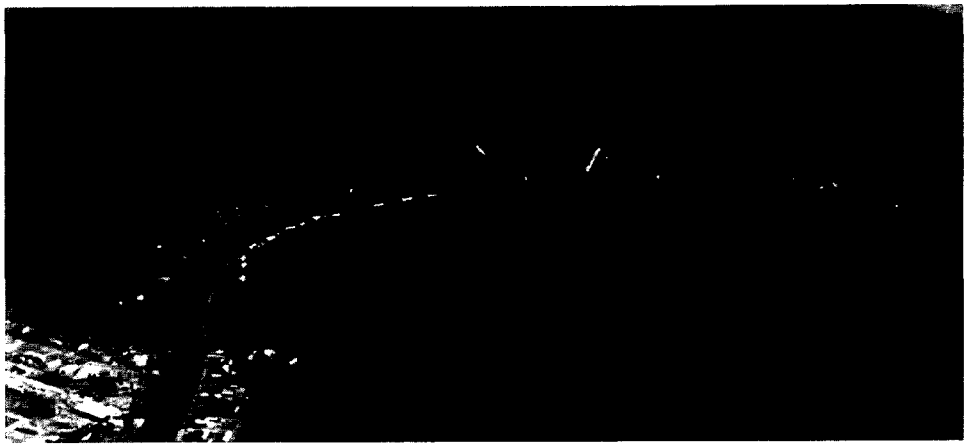


7. **Construction inspection—government and permitting officials, design consultants.**

8. **Future maintenance and energy use.**

Various aspects of these considerations in relation to development in the coastal area are considered later in the text.

COASTAL CONSIDERATIONS



PHYSICAL FEATURES

The different biological and physical elements of the coastal area affect development activities. The interaction of water, sediment, vegetation, wildlife, soils, and climate has produced natural environments such as natural levees, swamps, marshes, barrier islands, cheniers and stream channels.

The individual characteristics of these environments determine their usefulness for development. In some of these areas the constraints on or impacts of development are not critical. In other places special design or construction methods may be necessary to offset problems which may exist. In still other environments, extensive engineering or expensive design techniques will be needed to make a project feasible.

An understanding of the various wetland elements is useful in predicting potential opportunities or hazards likely to be encountered. The geographic features described below provide both opportunities and constraints for development in Louisiana's coastal area.

Natural Levees

Natural levees result when streams or rivers flood and deposit silt and clay along their banks. These levees are composed of stable soils and are higher in elevation than the surrounding wetlands. Because they are stable and remain relatively dry, the natural levees are suitable for many types of development. There is a transition zone between the firmer soils of the levee crest and the wet soils of the swamp or marsh. Although stable soils for foundations are usually available at or near the surface in this transition zone, the hazard of flooding may limit the usefulness of this fringe area for development.

Swamps

Swamps are low, wet, tree covered areas. The soil, which is generally saturated with water, is composed of fine clays and organic matter. Because of the severe limitation caused by the unstable soils and the expense associated with drainage, mucking, and backfilling, swamps are usually considered of low suitability for residential and commercial development or for agriculture.

Marshes

Marshes are wet areas that are covered with grasses or other aquatic plants. Because of their high biological productivity they are known to be very good habitats for wildlife and recreation. Marsh soils range from clays to very spongy peats and mucks. Flooding caused by rainfall or storm surge poses a substantial hazard to development.

Marshes may be divided into three groups for more detailed consideration.

Freshwater Marsh

Freshwater marshes depend almost entirely on rainfall and local runoff for water supply. Seasonal stream flooding serves not only to supply additional fresh water but also to flush the system and to supply nutrients. The marsh soil is composed primarily of peat beds, often as deep as 15 feet. When drained, these peaty soils decompose and the land subsides. Long-range impacts resulting from this subsidence can be very costly to developers and residents. Fire is also a potential hazard since dried peat soils can burn.

Brackish Marsh

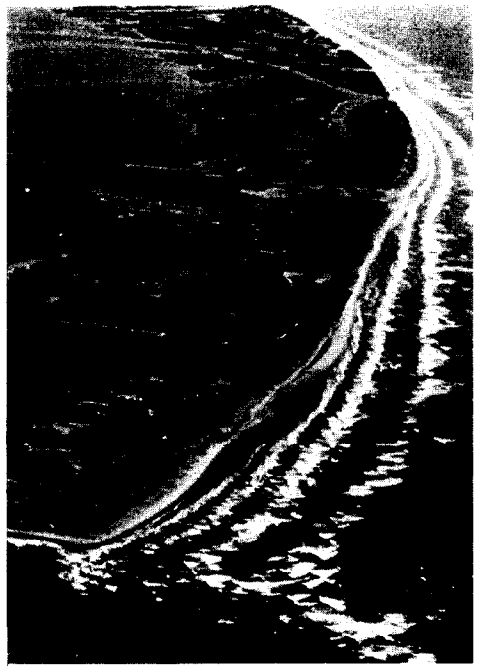
Brackish marshes occur in the intermediate area between the freshwater and saline marshes. The location of this marsh may fluctuate over time according to characteristics of freshwater flow and tidal action. Soils contain a large amount of peat, though not generally as deep as in the freshwater marsh. Tidal action serves to flush detritus and other nutrients out into the salt marshes and estuaries. The brackish marsh is not well suited to development that would be damaged by the subsidence of drained soils or that would hinder free water exchange between the fresh and saline marshes.

Shorelines

Saline Marsh

Saline marshes occur in a zone adjacent to the coastline. Their water level is largely dependent on tidal exchange and wind direction. The peat layers are generally thin and underlain by clay, silt and sand. Of the three types of marshes, the saline marsh has the most stable soils. A major value of the saline marsh is to supply nutrients to marine fish and shellfish nursery areas. Development in this area must be designed in such a way that the normal flow of tidal waters is not hampered.

Shorelines are those areas at the interface between land and water. Erosion, subsidence and exposure to storms are specific problems that may be encountered along Louisiana shorelines. These problems sometimes require shoreline modification to stabilize or enhance shore conditions. The shore areas, however, are extremely sensitive to man's activities. Their development possibilities are primarily linked to selected water related activities that must be on the water's edge. This includes certain types of recreation, transportation, port facilities, and industrialization.



Barrier Islands

Barrier islands are elongated islands or narrow peninsulas which front the seacoast. These islands are composed of sand or shell and their shape and location change in response to changes in sea level, currents, sediment supply, and storms. Of primary importance to the stability of these islands is the maintenance of the dunes and their vegetation. The constantly moving land mass, the fragility of the dunes, and the threat of intense storms are the principal constraints to development on these islands.

Stream Channels

Stream channels include rivers, streams and creeks, and intermittently flooded drainage-ways, sloughs, and swales, which convey land runoff toward the gulf. Development along stream channels should avoid changing the natural rate or pattern of flow of water to prevent the possibility of impounding water or erosion of channel banks. Vegetation along the waterway should be pro-

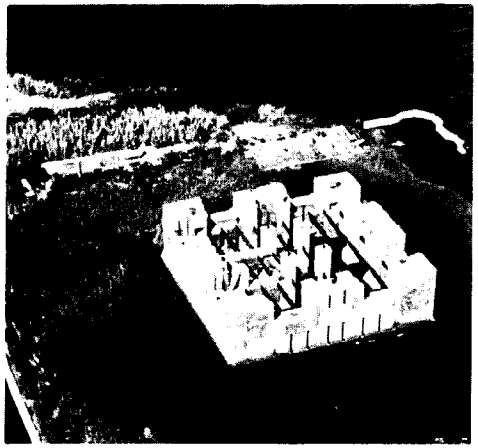
tected so that runoff can be filtered before entering the rivers and streams.

Chenier Plains

The Chenier Plain is composed of a series of shallow-based sandy beach ridges interspersed with marsh. The chenier ridges rest on marsh clay near sea level. Each chenier ridge is generally narrow but may extend for miles paralleling the shoreline. The space between the ridges is often marshland. The ridges of the Chenier Plain are quite stable and suitable for development. The narrow configuration of the ridges, the potential danger of saltwater intrusion into the freshwater marshes if the chenier is breached to facilitate drainage, and the seasonal hazards of storms and high water present some constraints.

CULTURAL ELEMENTS

In addition to respecting the delicate natural coastal area, developers will want to weigh the effect of their activities on established human needs and life styles. The unique cultural aspects of coastal Louisiana result to a great extent from the interaction of man and the natural environment. Historically, man has developed the higher lands along natural levees, beach ridges, salt domes, and upland terraces, has taken advantage of the network of waterways for transportation, and has used the wetlands for their natural resource values.



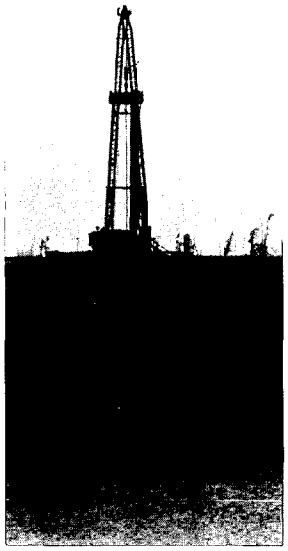
Pre-Historic

This land use trend is seen even among the earliest Indian inhabitants. Many earth mounds and shell middens can be found adjacent to bayous and stream channels. Earth mounds are very distinctive visual features in the coastal landscape since they are elevated from the surrounding flatter topography. They are believed to have been built as burial structures or for religious ceremonies. Middens represent sites inhabitated by Indians. They are usually shell accumulations, ridge shaped, and elevated a few feet above the ground. The age and culture periods of many of the recorded sites have been established from potsherds and other artifacts. Early Indian inhabitance in coastal Louisiana has been dated as far back as 10,000 B.C. These cultures offer a record of how earlier people used and coped with the coastal Louisiana environment. The discovery of prehistoric Indian sites on any large tract of land would not be unusual.

Historic

European settlers also took advantage of the rich natural levee soils and higher grounds which provided them with ample space to grow their crops and to build their homes. Many historic homes and other historic structures remain today.

A wide variety of cultural groups settled in coastal Louisiana. The first European settlers were French. They were explorers, soldiers, and farmers, many of whom later became plantation owners. Louisiana was controlled by Spain in the latter part of the 18th century. The Spanish were successful plantation owners and sugar cane growers. Acadians, who settled in the coastal area, engaged in farming and were also fishermen and trappers. The other major cultural groups in the coastal area included Germans, Italians, Africans, and Irish. These settlers developed distinctive cultural patterns based in part on their heritage and in part on their adaptation to the unique physical features of the land as they tried to modify the existing environment to suit their needs for land and expansion. Early settlement took place mostly on naturally drained lands and some attempts were made to protect marginal areas from flooding.



Contemporary

After the Civil War, Louisiana's plantation economy slowly began to change. Small vegetable and fruit farms appeared in the landscape. At the turn of the century, nearly all the virgin cypress forests were cut for lumber. Agriculture, fishing, and trapping remained important resources.

Modern times brought rapid changes in the coastal Louisiana landscape. Exploration and recovery of natural resources such as petroleum and gas were added to the list of wetland uses. As industrialization and urbanization occurred, the area's economy began to change. Modification of the natural systems was made to accommodate contemporary development needs. Some of these changes have greatly altered the original character of many areas of the coast, eliminating some of the past attributes which initially attracted settlers and adding other attributes to meet present needs.

Cultural elements from all periods can be incorporated into development plans. In this way the sense of continuity between people and their past can be preserved. Even more important, the variety and vitality of the region can be expressed through development as coastal Louisiana continues to prosper.

INSTITUTIONAL CONSIDERATIONS

Regulations, permits, and government programs established by law play an important role in shaping development activities in the coastal area. Regulations interpret legislative action and set appropriate standards that must be met to accomplish development goals. Permits are a vehicle for administering laws or regulations and are usually related to specific types of development activity. Programs may supply technical information, grants, loans, or other assistance to development but may also stipulate certain standards that must be met to participate. The process of coastal development will be more efficient if the developer has a basic comprehension of regulations, permits, and programs related to use of coastal areas at various levels of control.

- **FEDERAL**
- **STATE**
- **LOCAL**
- **PRIVATE**

The institutional controls concerning environmental quality or development procedures may change from time to time as continuing research or practical experience indicates a need. This section of the handbook is to help developers understand the various requirements and programs as they presently exist in regard to Louisiana's coastal area.

FEDERAL

The involvement of the federal government with land-use activities and concern for wetlands of our nation goes back over a hundred years. In 1850 the Swamp Land Grants permitted states to reclaim the swamp land inside their borders. Later the Federal Swamp Lands Acts authorized the draining and filling of millions of acres of wetlands.

As experience showed some devastating side effects of these reclamation programs on wetland ecosystems, new attitudes developed. The Migratory Bird Conservation Act, 1929, the Wildlife Restoration Act, 1934, and the Fish Restoration Management Act, 1950, were designed for the protection of fish and wildlife that might use wetland areas. In 1972 the Estuarine Areas and the Coastal Zone Management Act were created. In 1973 the Environmental Protection Agency developed its policy to protect and preserve the nation's wetlands. In 1974 the Corps of Engineers developed a set of wetland regulations related to the Rivers and Harbors Act.

The following is a description of some of the existing federal agency requirements for development activities in the coastal areas.

Navigable Waterways-Corps of Engineers

Under Section 404 of the Federal Water Pollution Control Act Amendments of 1972, all residential, commercial, or industrial development activities which take place in areas under the definition of navigable waters and unprotected flood areas are subject to permit requirements issued by the Corps of Engineers. The term

navigable waters is defined as: "All coastal wetlands, mudflats, swamps and similar areas that are contiguous or adjacent to other navigable waters. Coastal wetlands include marshes and shallows and means those areas periodically inundated by saline or brackish waters and that are normally characterized by the prevalence of salt or brackish marsh vegetation capable of growth and reproduction." The present regulations for implementing permit programs under Section 404 may be found in the Federal Register of July 25, 1975, Volume 40, Number 144.

How to Apply for a Permit

The Corps of Engineers District Office will supply upon request a pamphlet, **Applications for Department of the Army Permits for Activities in Waterways**, containing a description of how to file permit applications. Those activities which are determined by the Corps of Engineers to have no, or insignificant, impact on the public interest are granted a General Permit. This permit is usually issued by the district office.

Following is a summary of the procedures which anyone proposing to undertake an activity requiring Corps of Engineers authorization must follow to comply with requirements. The procedures exclude public works projects which are funded by Congress and administered by the Corps of Engineers; these follow a different procedure.

A. Apply for a permit using the prescribed Corps of Engineers Form 4345. The application must have a complete description of the proposed action including location, purpose, and objectives for use. It should be accompanied by drawings and sketches, names and addresses of adjoining property owners, and approvals of letters of no objection or denials from the other appropriate federal agencies, and also from other state or local agencies. The application goes to the District Engineer, Corps of Engineers.

B. The District Engineer receives the application and reviews it.

C. The District Engineer will issue a public notice to advise all interested parties of the proposed activity. This includes federal, state, and local agencies.

D. The District Engineer receives comments and/or previous denials of permits by other federal, state and local agencies.

E. Based on comments received and his review procedures, the District Engineer will issue or deny a permit, or refer it to the Division Engineer for authorization of issuance or denial.

F. The District Engineer may find an Environmental Impact Statement (EIS) is needed; this statement must be prepared in accordance with appropriate standards.

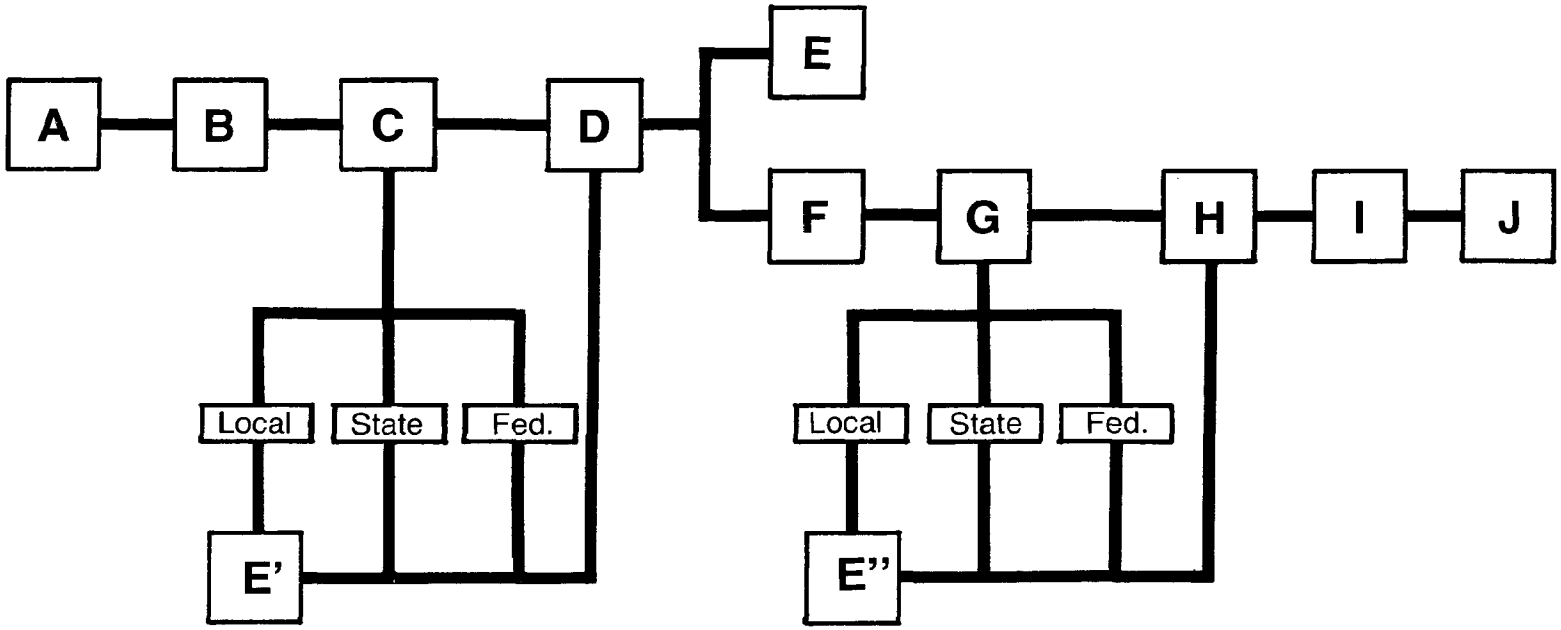
G. The District Engineer makes the completed EIS available to federal, state, and local agencies prior to a public hearing if a hearing is required.

H. Comments from federal, state, and local agencies and the general public are received at a scheduled public hearing and for thirty days thereafter.

I. The District Engineer determines, in accordance with the record and applicable regulations, whether or not the permit should be issued and takes final action, or he submits a statement of findings and recommendations to an official authorized to make a final decision.

J. The results of final decision are made known.

Existing procedures flow diagram (Corps of Engineers authorization).



A — Filing Application
B — District Engineer receives it, and reviews it.
C — Public Notice
D — District Engineer receives comments, previous denials, etc.
E — At this point he may deny permit, or if there are not unfavorable comments, he will make final decision. If there is denial of permits by any state or local agency, the Corps as a matter of policy, denies permit.
F — District Engineer may deem necessary an EIS.
G — Makes EIS available for federal, state, and local agencies
H — Public Hearings and 30 days to receive comments.
I — District Engineer takes final actions or submits statement of findings and recommendations to official authorized to make final decisions, takes final action.
J — Results of final action known.

The Public Notice

The public notice, one aspect of the permit procedure outlined above, is the manner in which the agency receiving the application for a proposed action informs all interested parties and invites them to comment on the plan. The list includes all federal, state, and local agencies known to have an interest in the proposed work. Private parties may also get copies of the public notices upon request. A number of agencies presently coordinate with the Corps of Engineers on permit applications.

Letters of no objection are required from:

- Department of Public Works
- Wildlife and Fisheries Commission
- Stream Control Commission
- Local Governing Body
- Levee District (if applicable)
- Port Commission (if applicable)

Copies of public notices are sent to these state agencies:

- State Health Department
- State Mineral Board
- Department of Commerce and Industry
- Department of Conservation
- Department of Highways
- State Land Office
- State Planning Commission
- State Parks and Recreation Commission

Copies of public notices are sent to other state and local agencies and officials:

- Police Juries
- Other public governing bodies
- State legislators
- U. S. Representatives and Senators
- Planning Commissions
- Special districts for the area where the proposed action will take place.

Copies of public notices and drawings of proposed action are sent to these federal agencies:

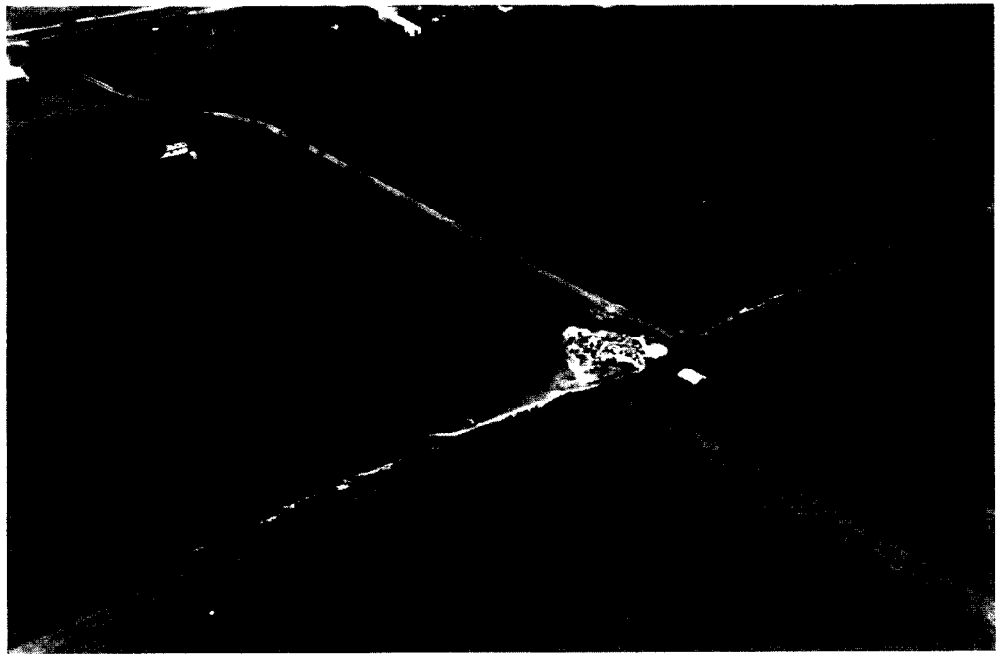
- Environmental Protection Agency
- Fish and Wildlife Service
- National Marine Fisheries Service
- U.S. Interior Department Field Representative

Public notices are also sent to these other federal agencies:

- Soil Conservation Services
- U. S. Coast Guard
- Coast and Geodetic Survey
- Maritime Administration
- Geological Survey
- Bureau of Outdoor Recreation
- National Parks Service
- Bureau of Land Management
- Eighth Naval District, Department of the Navy
- Department of Housing and Urban Development

Navigable Waterways-Coast Guard

Permits from the Coast Guard are needed for construction of bridges or causeways over navigable waters, including tidal wetlands. The Coast Guard also requires permits for handling explosives or dangerous cargo within contiguous waterfront facilities and for deepwater ports. There are also regulations in effect concerning fixed islands or other fixed structures in offshore areas. A pamphlet, **Applications for Coast Guard Bridge Permits**, includes instructions on how to apply for a permit. It is available from the Eighth Coast Guard District in New Orleans.



Water Quality

A license or permit is required by the federal government for any activity which may result in any discharge into the navigable waters of the United States. The Federal Water Pollution Control Act designated the Environmental Protection Agency (EPA) as the administrator.

How to Apply for a Permit

Applicants should submit an application for a permit with an accompanying certification by a certifying agency. A certifying agency is the person or agency named by the Governor of the state or a governmental act to certify compliance with applicable water quality standards. The applicant for a license or permit must include such information relating to water quality considerations as may be required by the agency or administrator in charge of the program.

The agency to contact in Louisiana is the Louisiana Stream Control Commission which implements and enforces its regulations through the Division of Water Pollution Control of the Louisiana Wildlife and Fisheries Commission.

Contents of Certification

A certification made by the certifying agency includes the following:

1. **The name and address of the applicant.**
2. **A statement that the agency has examined the application made by the applicant and has sufficient information to make a statement concerning the request.**
3. **A statement that there is reasonable assurance that the activity will be accomplished in a manner that will not violate water quality standards.**
4. **A statement of any conditions the agency deems necessary or desirable with respect to the discharge or the activity.**
5. **Other information the agency deems appropriate.**

Other Controls

The Environmental Protection Agency regulates directly or through the state several other forms of pollutants or emissions that may be related to some forms of development.

Air Quality—The Clean Air Act mandates states to regulate air pollution following standards and rules from the federal agency. The Louisiana Air Control Commission is the state agency which implements and enforces these regulations. However, some air pollution sources are still regulated by the EPA to prevent significant deterioration that might be caused by certain kinds of development.

Noise—Noise emission standards for construction equipment are controlled by Title 40 of the Code of Federal Regulations.

Environmental Impact Assessments and Statements

The National Environmental Policy Act (NEPA) of 1969 made it a requirement that all agencies of the federal government put into written form detailed environmental impact statements on proposals for legislation and other major federal actions which could significantly affect the quality of the human environment. An Environmental Impact Assessment (EIA) is an analysis submitted to a Federal Agency. It describes the environmental impacts of the proposed work undertaken with the economic help of the same federal agency. The assessment is used by the agency to make a decision whether or not an Environmental Impact Statement (EIS) is necessary. The assessments and statements assure that the applicant for a permit is considering the environmental impacts of his proposed project early in the planning process.

Requirements of EIS

An EIS must cover the following topics:

- **Description of the proposed activity.**
- **The relationship of proposed actions to existing plans, policies and goals.**
- **Probable adverse and beneficial impacts of the proposed action including no action, rescheduling, plan modification, design, change in location, and compensation for losses.**
- **Adverse impacts which cannot be avoided.**
- **The relationship between short-term use and long-term productivity.**
- **Any irreversible or irretrievable commitments of labor, materials, natural resources, and cultural resources.**
- **Review by the public and appropriate government agencies.**

While the federal agency has the responsibility to see that EIS's are factual and comprehensive, it expects that assessments and the data presented be accurate and complete. It may be difficult for a developer to conduct an in-house EIA or EIS since they often involve sophisticated data collection and interpretation available from consultants. It is to the developer's advantage to consider environmental factors at the earliest possible time in the development process to reduce time and cost factors.

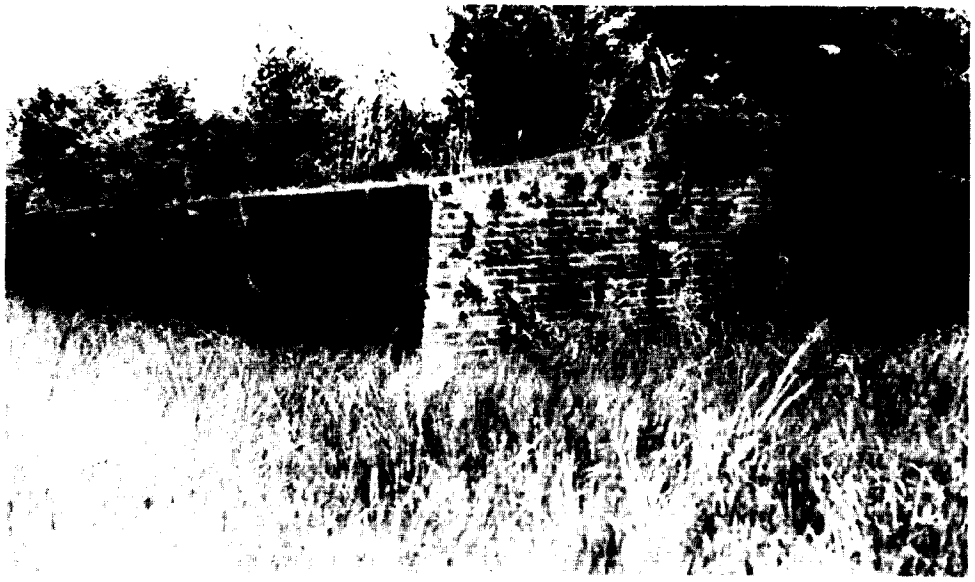
Review of EIS

There are a number of agencies and private organizations that review permit applications, environmental assessments, and environmental statements. All federally assisted projects require review by several federal and state agencies through the application process. The depth of their review procedures depends on the nature of the proposed project, the existing regulations of each of these agencies, and regulations of the existing program under which the project is being partially or totally funded. Private parties frequently request statements on particular projects for their review and comment.

Historical and Archaelogical Sites

The National Historic Preservation Act of 1966 and the Archaelogical and Historic Preservation Act of 1974 have statutes and regulations establishing independent environmental review procedures for the purpose of ensuring preservation of significant historic and archaelogical sites. If a proposed action may affect properties with historic, architectural, archaeological, or cultural value which are listed in the National Register of Historic Places, the procedures established by the Advisory Council on Historic Preservation should be followed. The State Historic Preservation Officer should be consulted in compliance with the Archaeological and Historic Preservation Act. In addition, park land, federally owned refuges, and any other area of local, state, or national historic or cultural significance is covered under Section 4(f) in Environmental Impact Statements.

Developers should check with the State Historic Preservation Officer and with the Louisiana Archaeological Survey and Antiquities Commission to determine the historical value of any such features on their land. There are programs which offer matching funds for professional excavations and restoration of sites on the National Register. Other programs of protection, exploration, or restoration may be available for other qualifying sites.



Project Coordination

Circular A-95

Office of Management and Budget Circular No. A-95 is a regulation to help establish coordination of planning and development activities of federal and federally assisted projects. It also helps state and local governments to see the relationship of an action to state, areawide, and local plans and programs, and secures state and local inputs to environmental impact statements as required by the National Environmental Policy Act.

Notification and Review

Projects that are covered by the A-95 program pass through a process of review at state and areawide clearinghouses. The general process is as follows:

1. **Applicant seeks federal financial assistance for a proposed project and inquires at federal agency.**

2. **Federal agency informs applicant of requirement that proposed project must be submitted to both state and areawide clearinghouses.**

3. **Applicant notifies clearinghouses of project.**

4. **State clearinghouse notifies state agencies which might have programs or regulations affected or affecting proposed project, and areawide clearinghouse notifies local governments and agencies which might have interests or regulations affected or affecting proposed project.**

5. **State and areawide clearinghouses receive comments back from state agencies, local governments, or others to whom notification has been sent.**

6. **If there are no unfavorable comments, the clearinghouses may sign-off on the project. If there are any problems or questions, the applicant has the opportunity to discuss and clarify the questions or problems.**

7. **After issue is resolved, clearinghouses may sign-off on the application. If the issues have not been resolved, the applicant, the clearinghouse and any other state and local interests will work together in resolving the issues.**

8. **After a 30 day period, if issues have not been resolved, the clearinghouse would review the complete application.**

9. **Applicant submits completed application for information or for review and comment when issues have not been resolved. He may submit the application to the funding agency at the same time, if it is only for information purposes. When it is submitted for review and comment, the applicant should allow 30 days for receiving comments from the clearinghouse.**

10. **At the end of this waiting period or after the applicant receives comments of the clearinghouse, whichever comes first, he may submit his application to the funding federal agency accompanied by all comments or sign-off from state and areawide clearinghouses.**

11. **Application is considered by funding agency which informs clearinghouses of its decision.**

The A-95 review process for federal housing assistance programs of -

HUD - Housing and Urban Development

USDA - U.S. Department of Agriculture

VA - Veterans Administration

- varies from the format outlined above. It is a shorter review process and usually the federal agency and the clearinghouses handle the matter directly between themselves. The steps in the process are:

1. **Developer contacts clearinghouse prior to submitting the application to a federal agency.**
2. **Developer submits preliminary application to federal agency with a description of the project. It is not necessary to include construction plans at this time.**
3. **Federal agency sends copies to the clearinghouse.**
4. **After a period of 30 days the clearinghouse submits comments back to federal agency.**
5. **Federal agency notifies developer of decision.**

In the review process the clearinghouse considers such environmental matters as suitability of soils to support the proposed project, flood hazards, and water and waste disposal facilities. These elements may be particularly critical in coastal areas because of soil types, elevation, and groundwater levels.

Programs Requiring A-95 Review

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Popular Name Index	Federal Program Index
	Flood Insurance
236	Interest Reduction Payments - Rental and Cooperative Housing for Lower Income Families.
235(i)	Interest Reduction - Homes for Lower Income Families
234(d)	Mortgage Insurance - Construction or Rehabilitation of Condominium Projects
234	Development of Sales—Mortgage Insurance - Development of Sales-Type Cooperative Projects
	Mortgage Insurance - Group Practice Facilities
203(b)	Mortgage Insurance - Homes
203(b)	Mortgage Insurance - Homes for Certified Veterans
203(h)	Mortgage Insurance - Homes for Disaster Victims
221(d) (2)	Mortgage Insurance - Homes for Low and Moderate Income Families
203(i)	Mortgage Insurance - Homes in Outlying Areas
220 Homes	Mortgage Insurance - Homes in Urban Renewal Area
213 Investor Sponsor	Mortgage Insurance - Investor Sponsored Cooperative Housing
Title X	Mortgage Insurance - Land Development and New Communities
213 Management Type	Mortgage Insurance - Management Type Cooperative Projects
207 Mobile Homes	Mortgage Insurance - Mobile Home Parks
242	Mortgage Insurance - Hospitals
232	Mortgage Insurance - Nursing Homes and Related Care Facilities
207	Mortgage Insurance - Rental Housing
221(d) (4)	Mortgage Insurance - Rental Housing for Moderate Income Families
221(d) (3) Market Rate	Mortgage Insurance - Rental Housing for Low and Moderate Income Families, Market Interest Rate
231	Mortgage Insurance - Rental Housing for the Elderly
220 Multifamily	Mortgage Insurance - Rental Housing in Urban Renewal Areas
106(b) Non Profit Sponsor Loan Funds	Nonprofit Housing Sponsor Loans - Planning Projects for Low and Moderate Income Families
Title 1, Section 2, 1(a), 1(b), 2(a) & 2(b)	Property Improvement Loan - Insurance for Improving All Existing Structures and Building of New Nonresidential Structures
	Low Income Housing - Acquisition (Turnkey and Con-

	ventional Production Methods)
	Rent Supplements - Rental Housing for Lower Income Families
233 (Multifamily)	Mortgage Insurance Experimental Housing—Mortgage Insurance - Experimental Rental Housing
	Lower - Income Housing Assistance Program
701	Comprehensive Planning Assistance
Title VII Guarantees	New Communities - Loan Guarantees
	Community Development Block Grants/Discretionary Grants
	Community Development Block Grants/Entitlement Grants
	State Disaster Preparedness Grants

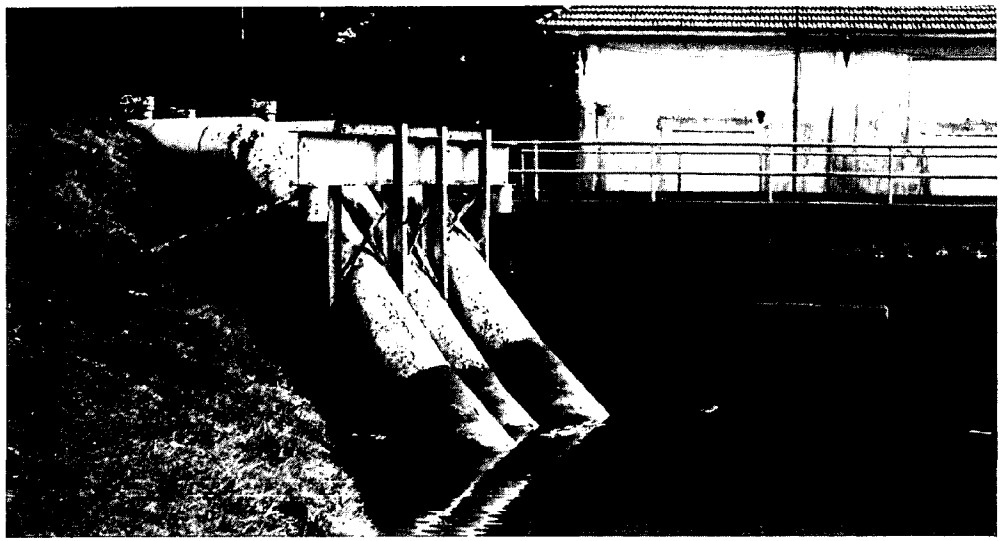
VETERANS ADMINISTRATION

Popular Name Index	Federal Program Index
	Grants to States for Construction of State Nursing Home Care Facilities
	Grants to States for Remodeling of State Home Hospital/Domiciliary Facilities
	Assistance in the Establishment of New State Medical Schools
	Grants to Affiliated Medical Schools - Assistance to Health Manpower Training Institutions
GI Home Loans	Veterans Housing - Guaranteed and Insured Loans

U.S. DEPARTMENT OF AGRICULTURE

Popular Name Index	Federal Program Index
Labor Housing	Farm Labor Housing Loans and Grants
	Irrigation, Drainage, and other Soil and Water Conservation
Rural Housing Loans Section 502	Low to Moderate Income Housing Loans
Section 523 & 524 Site Loans	Rural Housing Site Loans
	Resource Conservation and Development Loans
	Rural Rental Housing Loans
	Water and Waste Disposal Systems for Rural Communities
	Watershed Protection and Flood Prevention Loans
Section 523 Technical Assistance	Rural Self-Help Housing Technical Assistance
	Business and Industrial Loans
	Community Facility Loans
	Industrial Development Grants
Forest Insect and Disease Control	Cooperative Forest Insect and Disease Management
	Resource Conservation and Development
Small Watershed (or PL-566) Program	Watershed Protection and Flood Prevention

A list of Environmental Protection Agency Programs which must comply with A-95 procedures is published in the Code of Federal Regulations, Title 40, July 1, 1976. Additions to this listing can be found in the Catalog of Federal Domestic Assistance.



Clearinghouses

Following is a list of coastal area clearinghouses at the state, metropolitan, and areawide levels. Parishes which fall within a metropolitan clearinghouse jurisdiction should send notifications to both the metropolitan and areawide clearinghouses.

State Clearinghouses

Department of Urban and Community Affairs

Metropolitan Clearinghouses

Capital Region Planning Commission, Baton Rouge

Lafayette Council of Governments, Lafayette

Calcasieu Regional Planning Commission, Lake Charles

Regional Planning Commission for Jefferson, Orleans and St. Bernard Parishes; New Orleans

Areawide Clearinghouses—Acadian Regional Clearinghouse, c/o Evangeline Economic Development District Council, Lafayette.

Florida Regional Clearinghouse, c/o Capital Regional Planning Commission, Baton Rouge

Metropolitan Regional Clearinghouse, New Orleans

Southwest Regional Clearinghouse, c/o Imperial Calcasieu Regional Planning and Development District, Lake Charles

Teche Regional Clearinghouse, c/o South Central Planning and Development Commisssion, Thibodaux

National Flood Insurance Program

The flood insurance program is important to development in coastal Louisiana since in the past social disruption and losses in human life and property have resulted during periods of high water. The Federal Flood Disaster Protection Act of 1973 makes flood insurance available to property owners in communities participating in the program.

All cities and towns in the coastal area which lie in flood-prone lands are eligible for federally subsidized

flood-insurance protection if they entered the program before July 1, 1975, or within one year of their flood-hazard maps publication. The Flood Disaster Protection Act mandates that all lending institutions with federally insured savings or deposits require flood insurance on all new mortgages in high risk areas.

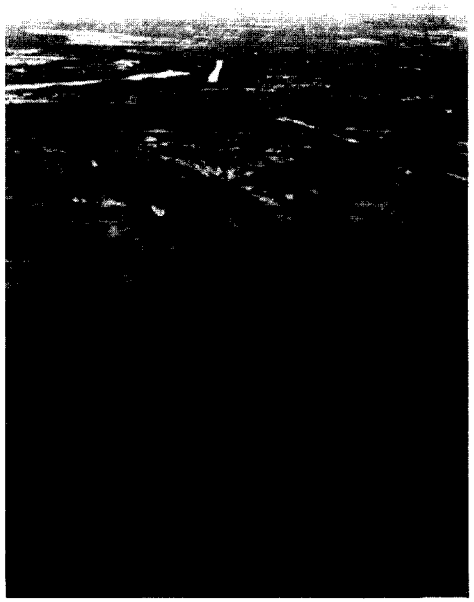
For a town to become eligible for insurance protection, it adopts regulations based on the flood related characteristics of its area. The regulations include formulation of zoning ordinances, building permits, and other controls and enforcement procedures. The controls help to assure that development is reasonably well protected from flooding before permits are issued. After a community becomes eligible for insurance, individuals may secure protection against structural and personal property damages. Any new development which does not comply with regulations is not granted flood insurance protection. If flood-prone communities do not participate, then individuals in these communities will be denied federally financed construction loans and federal assistance in the event of flood. Developers should, therefore, be aware if the land on which they intend to build is potentially flood-prone and if the community is participating in the federal program. Local officials should be contacted to get this information and their regulations affecting development.

Coastal Zone Management Programs

In the Coastal Zone Management Act of 1972, the Congress established a federal program to help participating states develop programs to protect and manage their coastal areas. The Office of Coastal Zone Management has the responsibility for managing the program. Regulations have been developed to implement the act and to further understanding of some of its stipulations. The state Office of Coastal Zone Management has copies of the most recent federal regulations.

The goal of coastal resource management is to balance conservation and development by encouraging reasonable and suitable uses of coastal lands. At the present time no state level coastal zone management regulations are in effect for Louisiana. However, the state is developing a management program to be eligible for coastal aid from federal sources. A significant source of aid will be available through the Coastal Zone Management Energy Impact Program. Grants and loans to state and local governments will be used to mitigate impacts and accommodate growth resulting from offshore energy development.

The Louisiana State Planning Office is the state agency in charge of the development of a coastal zone management program. This agency will provide information to developers interested in getting information about existing land uses and controls, availability of recreational opportunities, types and levels of construction activity, and other related facts and figures pertinent to the coastal area. As the Coastal Zone Management Program for Louisiana evolves, developers will want to keep abreast of new developments concerning regulations and assistance available from the program.



STATE

The state role in coastal development and management is rapidly changing. Regulations and permitting procedures are intended to help Louisiana maintain the quality of its environment as development continues. The state has a wide variety of interests in areas such as natural and scenic rivers, discharge of material into water and air, pipelines, and waste facilities. Technical and legal information is available at the state level.

Natural and Scenic Rivers

The Natural and Scenic River System was created to protect and enhance some Louisiana streams considered to have special qualities. The Louisiana Wildlife and Fisheries Commission is the agency in charge of administering the system. Their booklet **Natural and Scenic Streams System** has the latest list of rivers in the system and a compilation of administrative procedures and other information that may be of use to the developer.

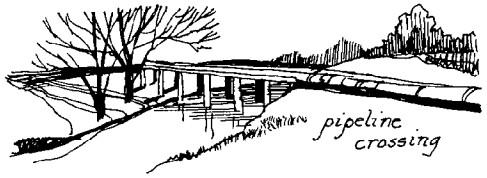
Activities Prohibited

Activities which are prohibited are:

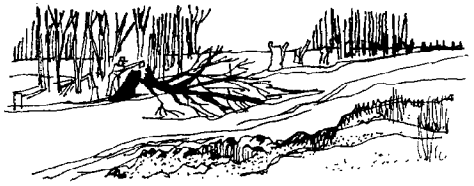
- **CHANNELIZATION**
- **CLEARING AND SNAGGING**
- **CHANNEL AND REALIGNMENT**
- **RESERVOIR CONSTRUCTION**

Activities Requiring a Permit

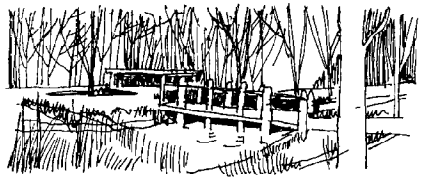
Activities which require a permit are:



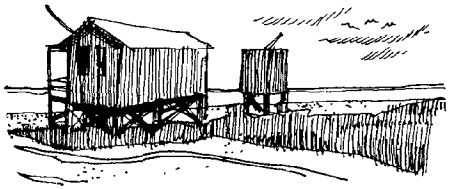
- **PIPELINING**



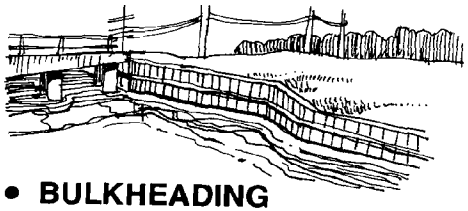
- **TREE CUTTTING**



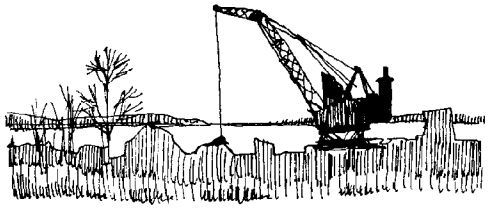
- **BUILDING OF BRIDGES**



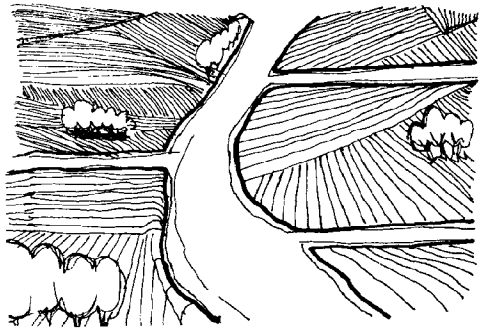
- **BUILDING OF CAMPS**



- **BULKHEADING**



- **DREDGING**



- **CANALLING OF ADJACENT LAND AREAS**

How to Apply for a Permit

A petition in four copies is submitted to the Wildlife and Fisheries Commission and should include:

1. **Name and address of the applicant**
2. **Background information on the use**
3. **Exact description of proposed action**
4. **Plans of the proposed action**
5. **Photographs of the area**
6. **A complete evaluation of how the proposed project would affect:**

   a) wilderness qualities
   b) scenic values
   c) ecological elements
   d) recreation
   e) fishing
   f) wildlife
   g) archaeological sites
   h) geology of the area
   i) botany of the area
   j) water quality
   k) other natural and physical features and resources of the area

7. **Alternatives to the proposed use**
8. **Information about measures that will be taken to mitigate any possible damage to the river or stream**
9. **Any other permits or letters of no objection to the proposed project from any other authorizing agency or agencies.**

Review

If the administrator finds the petition in compliance with all the above requirements he will distribute copies to:

- **Wildlife and Fisheries Commission technical staff**
- **State Planning Office**
- **Governor's Council on Environmental Quality**
- **State Parks and Recreation Commission**

These agencies evaluate the petition and submit their comments to the administrator no later than thirty days after the time of receiving the petition for their review.

Petitions are granted or denied by the administrator after all permitting procedures, public notices, and public hearings (if required) are finally completed.

Discharge Into Waters

If any type of development activity will discharge waste into the state's waters, the developer is required to submit a report to the Louisiana Stream Control Commission before construction starts. The report is to describe the proposed disposal system and the measures which will be followed to protect the state's waters against pollution.

Certificate of Approval

The proposed construction cannot start before a report has been submitted and granted a certificate of approval by the Stream Control Commission. The report must contain:

1. Description of the proposed action.
2. Location of the proposed action and exact location of the point of discharge.
3. Volume and concentration of waste to be discharged.
4. Description of waste treatment system to be installed, or measures that will be taken to prevent pollution of the Louisiana waters to be affected.
5. Estimated quality of improvement of the waste by the proposed treatment and measures that will be taken to control pollution.
6. An estimate of the rate of low flow of the receiving waters.
7. An estimate of the alteration of the receiving water's quality by the proposed treatment work.
8. Any other pertinent data for a better understanding of the proposed action.

Coliform Standards

The developer is also likely to want to contact the Louisiana State Department of Public Health which is the agency responsible for determining if the coliform content of wastes discharged is within their criteria of standards.

Emissions into the Air

If a facility will release matter into the air, its developer is required to submit a report to the Louisiana Air Control Commission through the Louisiana State Board of Health. The report must be submitted before construction starts and is to describe the proposed action and measures that will be taken to protect air quality.

Permit Requirements

The proposed construction cannot be started before the report has been granted approval and a permit has been issued by the Louisiana Air Control Commission.

The report should contain:

1. Description of the proposed action.
2. Location of the proposed action.
3. Location of sources of emissions, the size of their outlets, the rate and temperature of the emission, and the composition and description of the air contaminants being emitted.
4. Description of measures for diminishing air pollution that will be utilized, or any other methods that will be used to prevent emissions of undesirable levels of pollutants into the air.
5. Estimate of how much emissions from the proposed action will alter the quality of the air.
6. Any other pertinent data for a better understanding of the proposed action.

Reports submitted to both the Louisiana Stream Control Commission and the Louisiana Air Control Commission must be prepared and approved by a professional engineer duly licensed in Louisiana.

The pamphlet, **Louisiana Air and Water Pollution Control Regulations**, available from the Louisiana Department of Commerce and Industry, provides additional information on this subject.

Pipelines

Louisiana's coastal area is crossed by numerous pipelines carrying oil and gas into and across the state. Large tracts of land for development may frequently have one or more pipelines crossing them. The developer should be aware that any pipelines crossing waterways and levees in the state have had approval by the Louisiana Department of Public Works. A review of the permit application will provide specific information about particular pipelines that may be encountered.

How to Apply for a Permit

If the developer is planning a pipeline his application for a permit must include a general plan, a sectional view, and a location map showing the proposed facility in relation to levees and waterways. The planned work must be in compliance with general criteria set by the Department of Public Works. This criteria is available upon request.

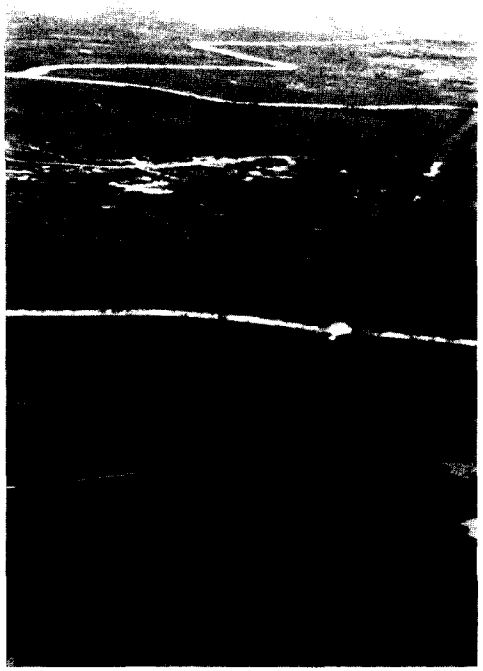
Copies of the permit request are sent to:

- **District Engineer - Corps of Engineers, Department of the Army**
- **Registrar of State Land Office**
- **Wildlife and Fisheries Commission**
- **Louisiana Stream Control Commission**
- **Chief Engineer - Louisiana Department of Public Works**

Right-of-Way

If access across or through any public lands of the state is needed, a permit is required. A copy of the rules and regulations in relation to the granting of right-of-way is available from the State Land Office. Applicants for permits should submit the standard application form and plat map of the proposed access.

Any projects, including pipeline crossings and driveways, within any highway right-of-way require a permit prior to construction. Further details and permit applications are available from the Office of Highways, Louisiana Department of Transportation and Development.



Waste Facilities

The Louisiana Health and Human Resources Administration requires permits for the following development activities:

- **construction of water supply**
- **sewerage systems**
- **solid waste facilities**
- **swimming pools**
- **bathing beaches**
- **food and ice manufacturing plants**

The Sanitary Code of the state will help in completion of the permit application which should include complete construction and operating plans and sufficient engineering data to help in project evaluation.

Information Sources

There are a number of agencies and groups in the state that will supply technical and legal information or provide other assistance to developers:

On Comprehensive Planning

- Environmental Protection Agency (EPA)
- Louisiana Air Control Commission
- Louisiana Stream Control Commission
- Bureau of Environmental Services, Louisiana Health and Human Resources Administration
- Governor's Council on Environmental Quality
- Wildlife and Fisheries Commission

On Resource Utilization

- Agricultural Experiment Station, Louisiana State University
- Department of Conservation
- National Marine Fisheries
- Louisiana Wildlife and Fisheries Commission
- Louisiana Archaeological Survey and Antiquities Commission
- Department of Art, Historical and Cultural Preservation
- U.S. Soil Conservation Service
- State Parks and Recreation Commission
- Cooperative Extension Service, Louisiana State University
- State Soil and Water Conservation Committee

On Economic and Physical Development

- Louisiana Department of Commerce and Industry
- State of Louisiana Department of Transportation and Development
- Louisiana Tourist Commission
- U.S. Army Corps of Engineers, New Orleans District

LOCAL

Regional planning bodies and parish and local governments have considerable interest in the development process. They provide services, act as coordinating agencies, or administer regulations that will affect development in their area.

At the regional level, the Regional Planning Commisssions oversee physical, social, and economic trends in a multi-parish area. They administer community development grants and act as clearinghouses for A-95 reviews. They also act in an advisory capacity to local groups and agencies. State Enabling Acts grant regulatory powers to parish and local governments to implement zoning regulations, subdivision regulations, building and health codes.

Regional Planning Commission

The following Regional Planning Commissions are involved with Louisiana's coastal area.

District 1 - St. Tammany, St. Bernard, Orleans, Jefferson and Plaquemines Parishes - **Regional Planning Commission for Jefferson, Orleans, St. Bernard and St. Tammany Parishes,** 333 St. Charles Ave., Suite 900, New Orleans, La. 70130

District 3 - Assumption, St. James, St. John the Baptist, St. Charles, Lafourche and Terrebonne Parishes - **South Central Planning and Development Commisssion**, Post Office Box 846, Thibodaux, La. 70301

District 4- Evangeline, St. Landry, Acadia, Lafayette, St. Martin, Vermilion, Iberia and St. Mary Parishes - **Acadiana Planning and Development District**, Post Office Box 3322, Lafayette, La. 70502

District 5 - Beauregard, Allen, Calcasieu, Jefferson Davis and Cameron Parishes - **Imperial Calcasieu Regional Planning and Development Commission** - Post Office Box 3164, Lake Charles, La. 70601

Parish and Municipal

Planning commissions and other governmental bodies, such as the Police Jury, are primarily concerned with zoning and subdivision regulations, floodplain regulations, and building and health code compliance. In addition, special institutions such as the port authorities and levee boards have authority over specific areas or activities.

Therefore, developers will want to consider local regulations and ordinances early in their planning process prior to design and construction. While controls vary among coastal parishes, several broad categories of regulations are currently in effect—zoning ordinances, subdivision regulations, building codes and building permits. All coastal parishes have adopted or developed codes in some or all of the categories.

Zoning Ordinances

Parish zoning ordinances are a method of land use control. The ordinances define and specify allowable

land uses within different zones or districts. They are subject to periodic revision and application can be made for specific changes.

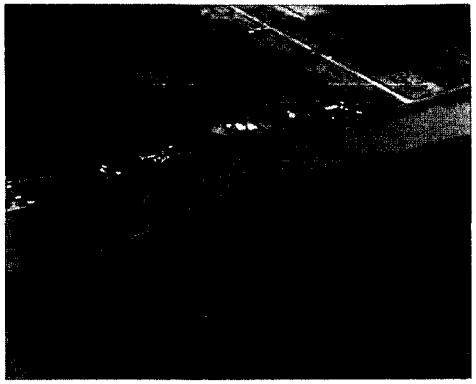
Parishes may have different codes for identification of land use zones within their boundaries. However, the uses incorporated in the Louisiana State Planning Office classification will normally be considered.

Urban and Built-Up Land

- Residential (often at several density levels)
- Commercial and Services (light and heavy)
- Industrial (light and heavy)
- Extractive
- Transportation, Communications, and Utilities
- Institutional
- Strip and Clustered Settlement
- Mixed
- Open, Public and Other

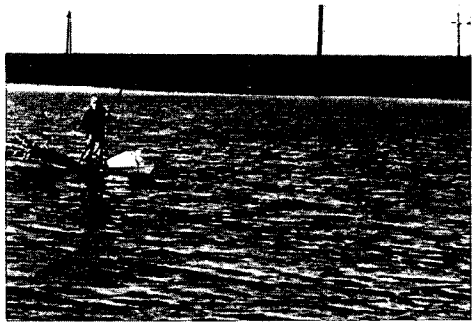
Agricultural Land

- Cropland and Pasture
- Orchards, Groves, Bush Fruits, Vineyards
- Horticultural Areas
- Feeding Operations



Rangeland - Forest Land

- Deciduous
- Evergreens (coniferous and other)
- Mixed

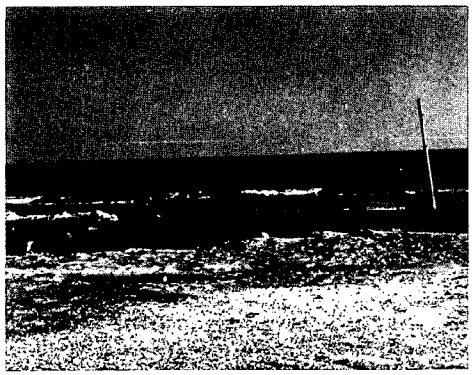


Water

- Streams and Waterways
- Lakes
- Reservoirs
- Bays and Estuaries

Wetland

- Forested
- Non-forested



Barren Lands

- Salt Flats
- Beaches
- Sand other than beaches
- Bare Exposed Rock

Subdivision Regulations

Subdivision regulations provide standards and layout requirements for residential development. In general, subdivision regulations would define standards for such items as:

- Street improvements, lot sizes, utility servitudes, drainage, building lines, sidewalk servitudes
- Sanitary sewer disposal, public water supply provisions, drainage system lay-outs

Although there will be variations in requirements for plan approval among the parishes or municipal subdivision regulations, existing procedures follow this general pattern:

1. **Developer or project designer reviews proposed action with appropriate Planning Commission, Police Jury, or other local governmental or regulatory agencies before proceeding with development plans.**
2. **Preliminary plans are submitted to appropriate agency in compliance with all specified requirements including utility arrangements for service to the subdivision.**
3. **Preliminary approval or denial.**
4. **Before construction of the proposed improvements actually starts, the developer or project designer checks any standards, specifications or certifications of approval by other city-parish agencies such as the Department of Public Works or the Parish Health Unit.**
5. **Construction of street, drainage, utility improvements starts subject to field inspection and final certification of approval.**
6. **Submission of final plat and certification that all improvements have been completed as required.**
7. **Building construction starts subject to field inspection and certification of approval at different stages during the process and at the end of the subdivision construction.**

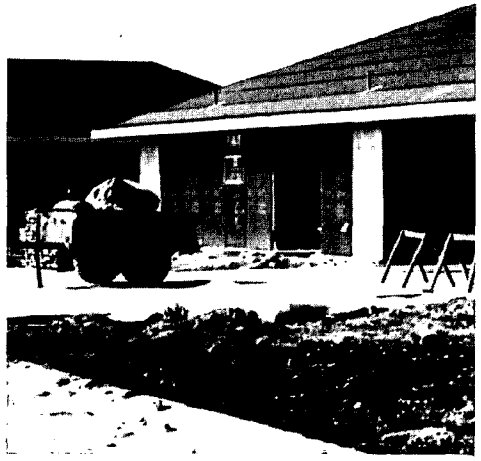
Building Codes

Building codes define structural, aesthetic, and service requirements for building and are designed with the objective of protecting the community's well being. Most of the building code standards of the Louisiana coastal parishes are drawn from the following standard national codes:

1. Building Officials and Code Administrators (BOCA) **BOCA Basic Building Codes. 1975**
2. American Insurance Association (AIA) **National Building Code. 1967**

3. Southern Building Code Congress, International (SBCC) **Southern Standard Building Code.** 1973, with 1975 supplements
4. International Conference of Building Officials (ICBO) **Uniform Building Code**. 1973

The most comprehensive building code available among those of the coastal parishes is the Orleans Parish building code. Using the standard national codes as a basis, Orleans Parish has designed a code with restrictions that are sensitive to local conditions.



Building Permits

A building permit is required prior to any construction or improvement on a site. This permit can be obtained from the permitting office at the proper parish or municipal agency. Although the procedure for obtaining the permit may vary from one area to another it generally follows these steps:

1. **Bring to permitting office at least two plot plans showing: a) lot size, dimensions, boundaries, etc. b) location of proposed structure or structures on the site, access points, and other pertinent data that would help in understanding the proposed work c) a legal description of the lot.**
2. **Municipality would then assign a "number" to the structure.**
3. **A review of the plans would be made according to parish or municipality building code specifications.**
4. **If no conflicts exist, a building permit will be issued.**
5. **Several inspections would be made during construction.**
6. **After construction is completed, a final inspection would be made, and approval for occupancy would be given, if all requirements of the building code are fulfilled.**

PRIVATE

The developer can make use of a number of protective controls that are designed for and carried out within the community itself. These controls may be employed in a creative manner to ensure the type and quality of development desired. The application of these site or subdivision area standards is relatively simple yet very effective in helping the developer reach his desired goals. Several techniques available include:

Design Review

Design review may be used when many different designers are involved on a project. To be effective, the review board must have clear criteria for evaluation. The standards include the same concerns involved in covenants and local controls, but in a more flexible manner. To avoid the necessity of a review board, developers may choose to have the same designers involved in the whole project.

Owner Association

Owner associations may be established to continue development quality on a long-term basis. The community elects officers and democratically sets up development standards and regulations. The association reviews request for changes and thus can fairly represent the interests of the owners.

Protective Convenants

Protective covenants are written by the developer as standards for development quality. Covenants may be used to control architectural standards, project concept, land uses, and pollution sources.

Deed Restrictions

Deed restrictions are controls written into land transactions between landowners, developers, and clients. The sale of land is conditional upon the stipulations made in the deed agreement.

The developer must keep abreast of changes in regulations. New regulations involve new standards and have different review time requirements. Permit applications at all levels of government need to be planned and scheduled in advance. Understanding institutional considerations avoids wasting time and money and speeds preliminary planning and legal procedures. An explanation and a step by step problem identification procedure for urban development in coastal areas, including current regulations, is presented in **Urban Development in the Louisiana Coastal Zone: Problems and Guidelines.** This booklet was developed by the Urban Studies Institute at University of New Orleans.

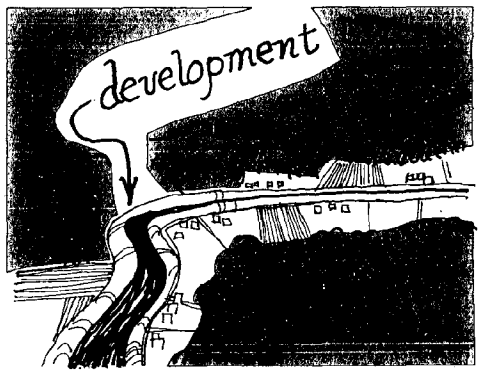
DEVELOPMENT ACTIVITIES

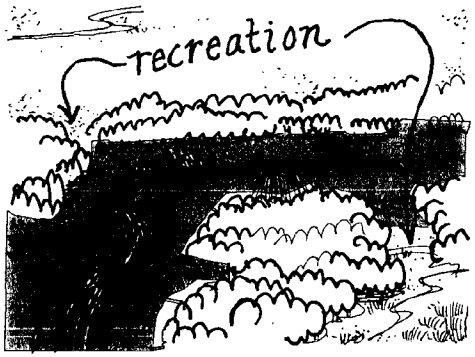
This section of the handbook provides the developer with a wide range of information concerning specific development activities. Various ideas for making development compatible with conditions found in the coastal area are illustrated and described. The material is organized in a logical progression of project development from site selection to management phases. It includes consideration of land types, site selection opportunities and constraints, roads and parking, building grouping, utility systems, waterways, agriculture, surveying, dredging, draining, filling, clearing, building, clean-up, and post-construction management.

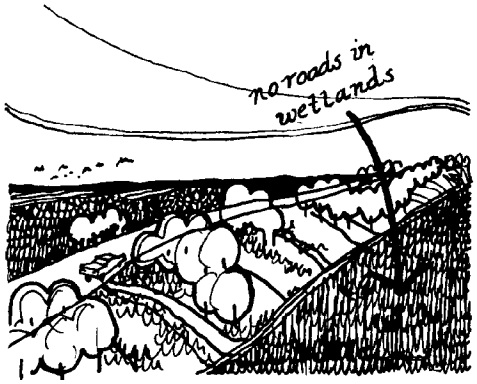
SITE SELECTION

LAND TYPES

Natural levees represent the highest elevations encountered in the Louisiana coastal area and have the most stable fertile soils. They are suitable for a variety of land-uses, including urban, industrial, and agricultural development. Wetlands impose severe restrictions for development because of unstable soil and flooding conditions: The economical, recreational, and ecological value of wetland resources makes protection important.

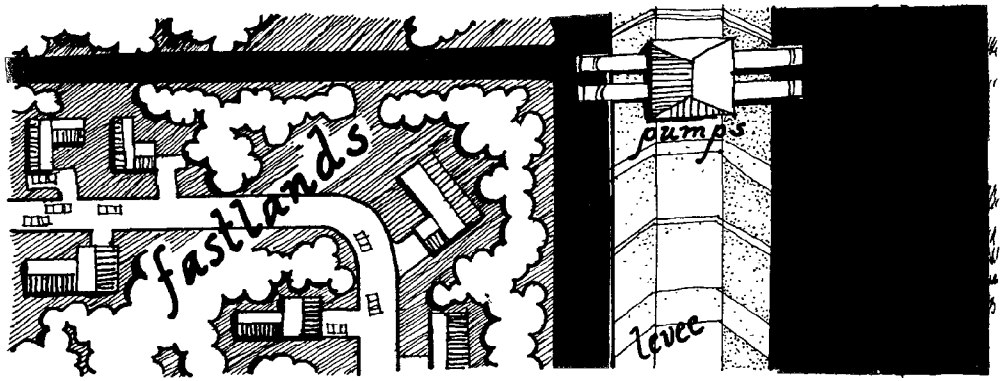






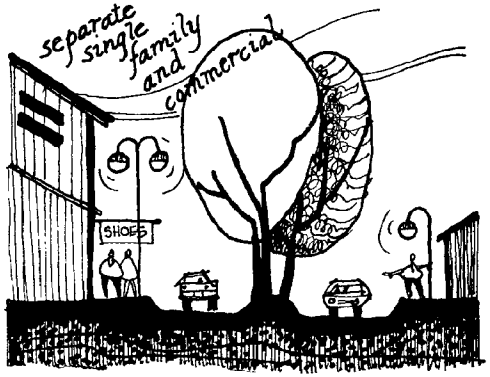
Sites on natural levees usually offer good access to water and land transportation systems. Access to development in wetland areas may be difficult and costly. Land access from existing main arteries to the development site should follow the higher grounds and more stable soils.

Reclaimed lands, often called fast lands, are wetland areas which have been protected with levees and drained for agricultural, industrial, or residential development purposes. These areas frequently are somewhat limited for development by their underlying wet soil characteristics and severe building maintenance problems can be encountered. In many instances, fill material is added to increase elevation or stability and thereby improve development potential.

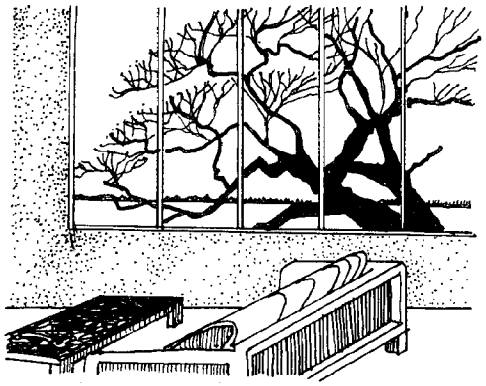


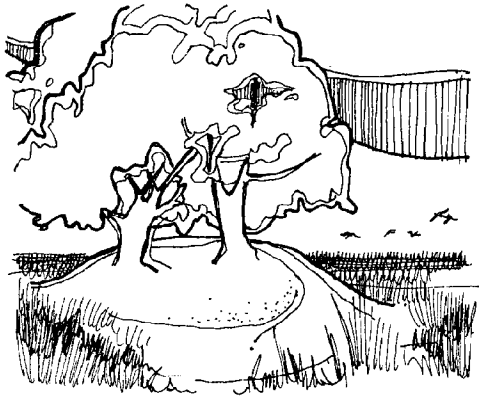
SOME OPPORTUNITIES

The immediate surroundings of a site affect its character and function. The proposed development for a particular site should be compatible with the area's other land-uses. Compatability is an asset since the development may take advantage of common services and share certain kinds of facilities. Respecting surrounding land uses also helps to maintain harmony and unity of scenery.

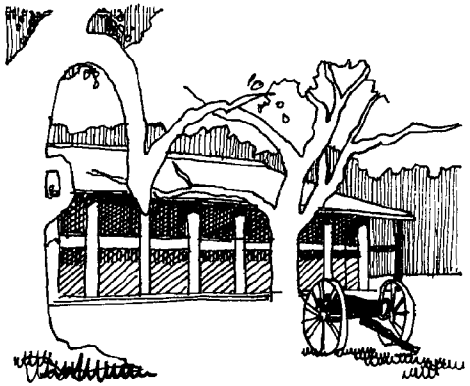


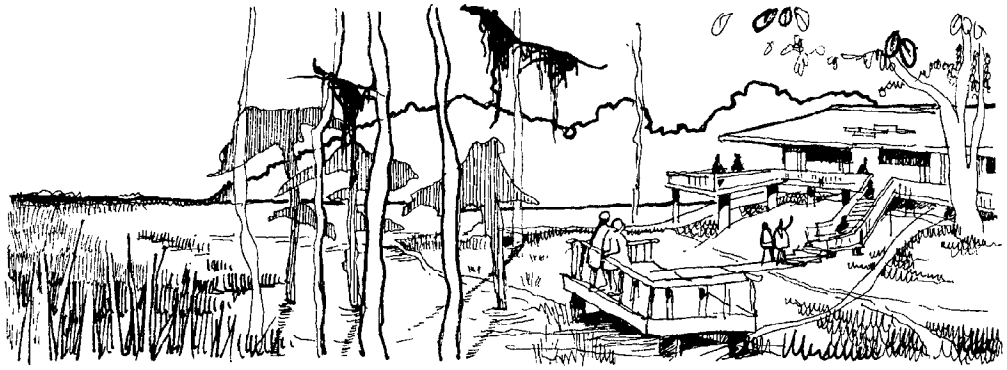
The natural and man-made scenic values and character of the site may be respected and incorporated in the development design as an asset to it. Structures and other man-made features should not destroy these qualities by obstructing views and vistas. Manipulation of design features should enhance the area's attractions. Locating buildings on high ground makes views of scenic Louisiana wetlands available.





Because of coastal Louisiana's archaeological richness it is common to find Indian sites and mounds on prospective development sites. Findings of shell accumulations, artifacts, and features must be reported to the State Historic Preservation Office for their action. Louisiana also has many historic sites of value. These include antebellum homes, commercial buildings, gardens, and churches. New development may include historic elements as feature attractions.

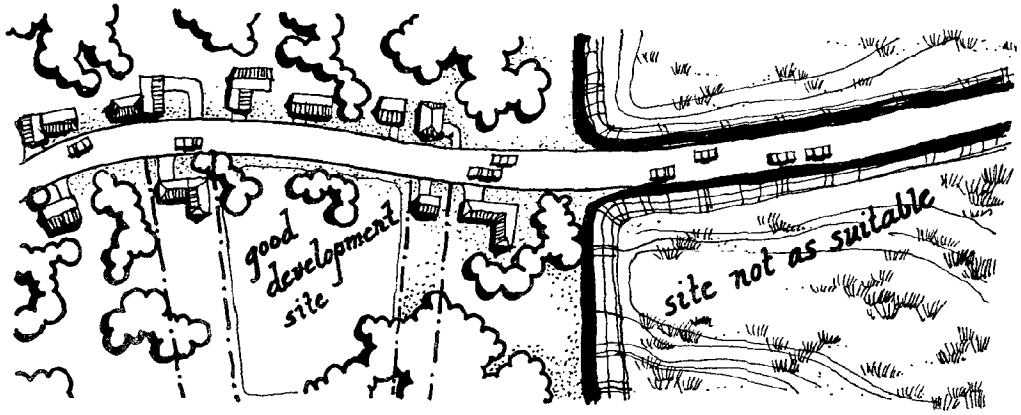


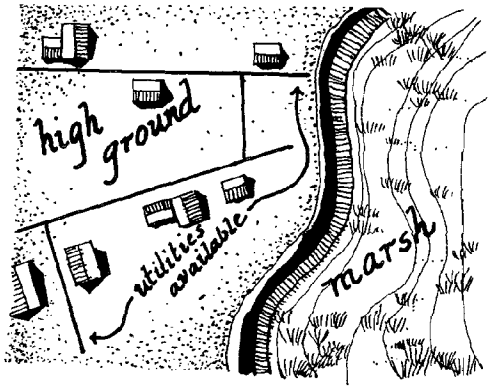


The type, quantity, and quality of existing vegetation on a site is an important factor in its selection. Healthy vegetation can increase the value of a site and its visual quality. Existing trees and shrubs in good condition can be incorporated into the development design. They may be used for providing shade, wind protection, screening, noise control, and beauty.

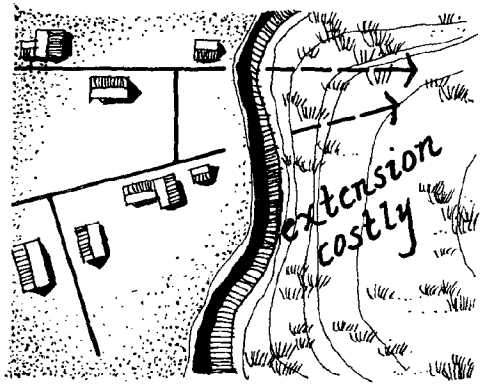
SOME CONSTRAINTS

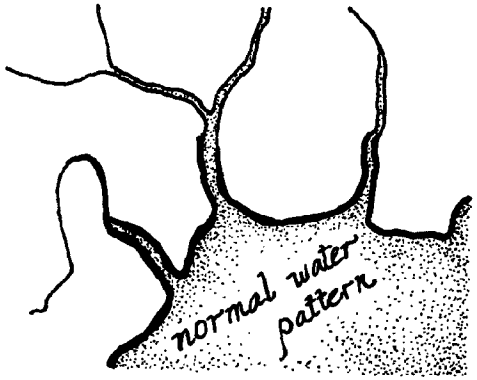
The opening of new lands for development in isolated and undeveloped areas could prove to be more costly than developing available pockets of land in already partially developed areas. Utilities and services are more easy to bring in if developments are in close proximity. Dispersed developments make accessibility and communication among residential, commercial, and work areas more difficult. Dispersal increases traveling distances and fuel and energy consumption.



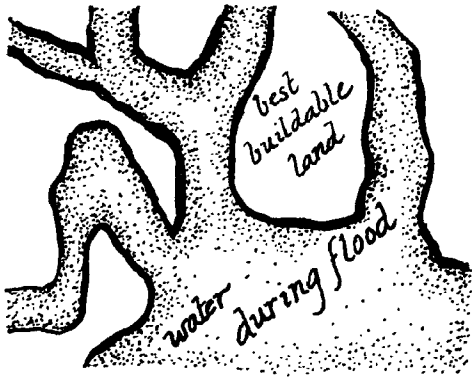


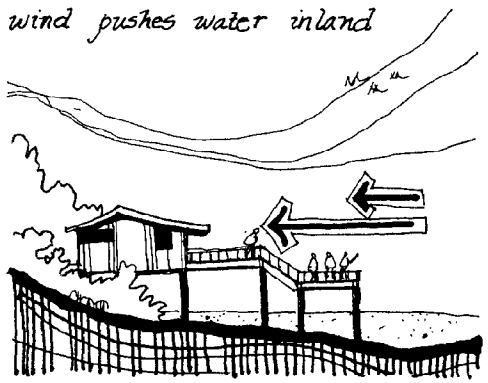
Availability and access to public and private service facilities and utilities is a primary concern in site selection. Bringing these services from long distances or across wetland areas often is impractical in coastal Louisiana. The poor structure and wet soil characteristics of the swamplands and marshes increase the expense of installing necessary systems.



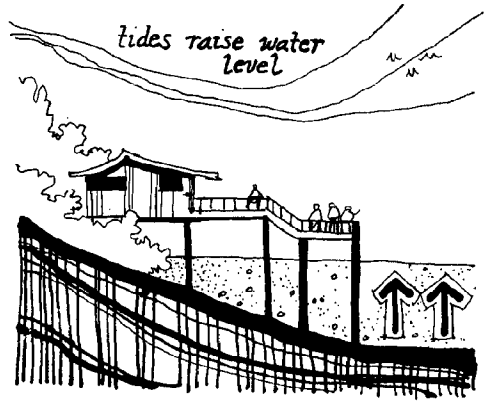


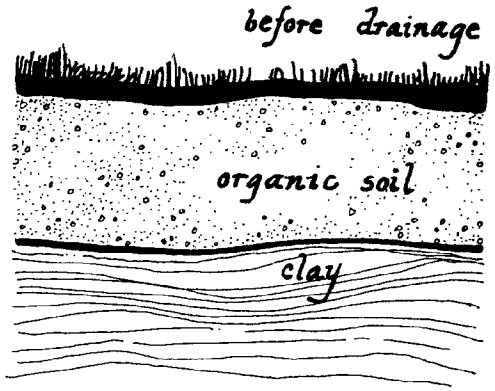
When coastal water levels are high, water flow in major lakes and bayous may be restricted. This may cause flooding of sites adjacent to the coast. The flood plains of streams running into coastal waters may be subject to the backwater flooding. This intermittent flooding may damage developed areas.

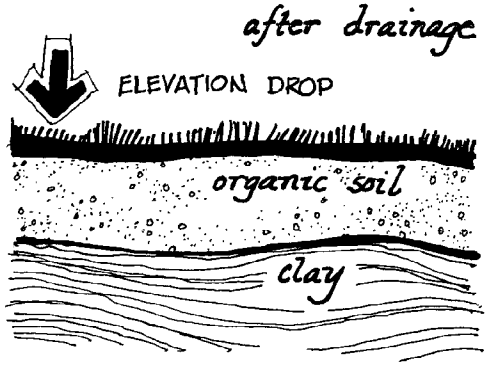




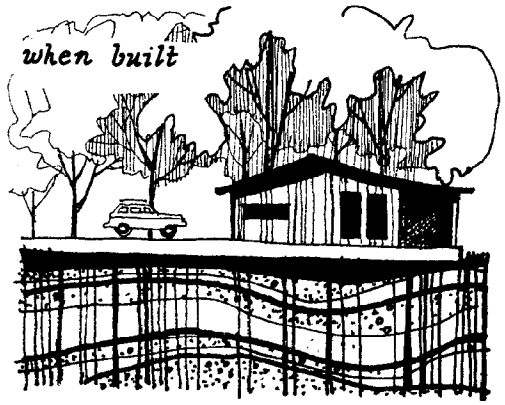
Low areas surrounding Louisiana's coastline and its estuaries are subject to flooding due to wind and tide influences. Storm damage is also a serious threat. These low areas are limited in their development potential to water-related recreation activities such as fishing and boating. Other types of development may require special design or engineering to avoid problems.



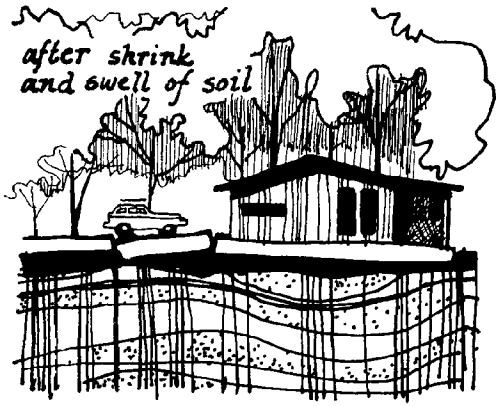




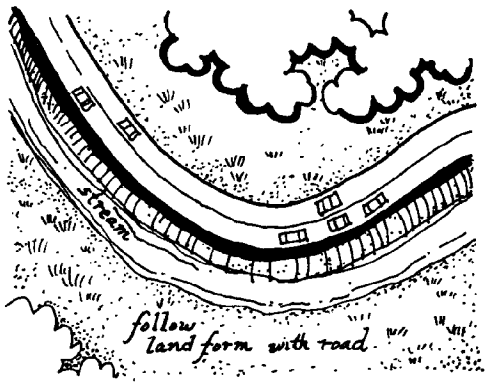
Subsidence is a major problem for development in former wetlands. When organic or semifluid mineral layers are drained there is always a loss of surface elevation. After drainage, initial soil subsidence accounts for a decrease in the overall soil volume of about 50 percent. Sinking may continue for years as organic soils decompose.



Some soils with a high clay content shrink or reduce their volume when dried, and swell back when wet. Building slabs, walks, drives and other structural elements may be put under stress and crack or tilt because of this soil movement. The Soil Conservation Service can help in identifying these critical soil areas.

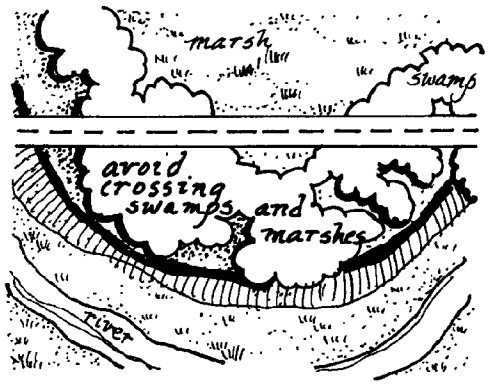


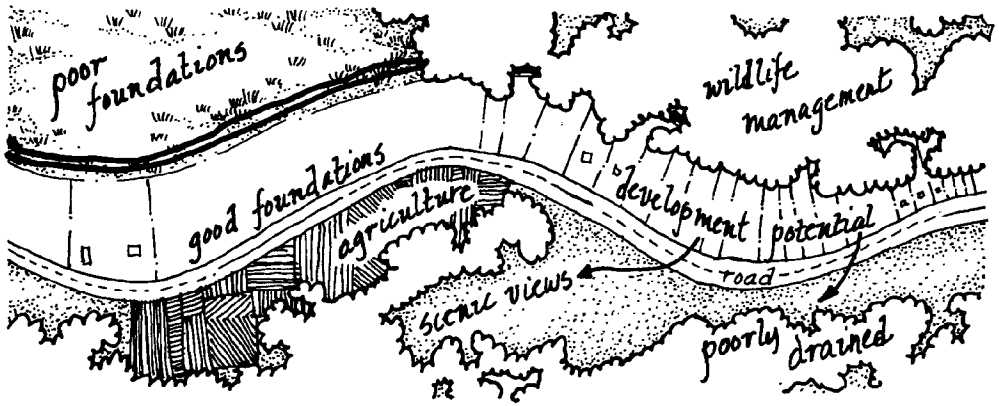
SITE IMPROVEMENTS



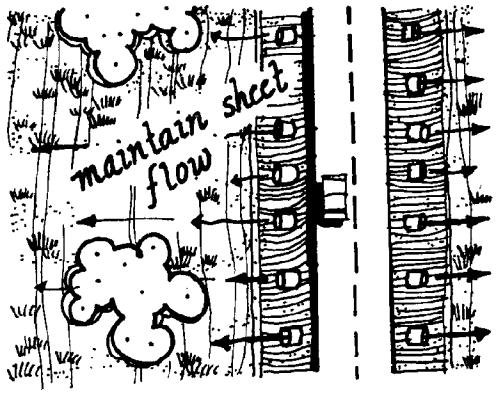
ROADS AND PARKING

In coastal Louisiana roads should follow the natural levee crests where soils are stable and ground is higher than in the surrounding wetlands. This reduces construction expenses considerably. Maintenance cost is also reduced, as cracking of the surface and other problems related to poor wetland foundation conditions are avoided.

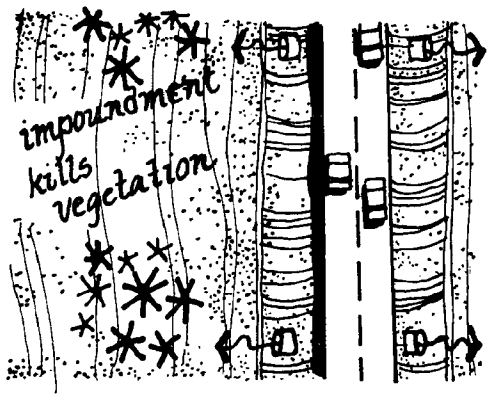


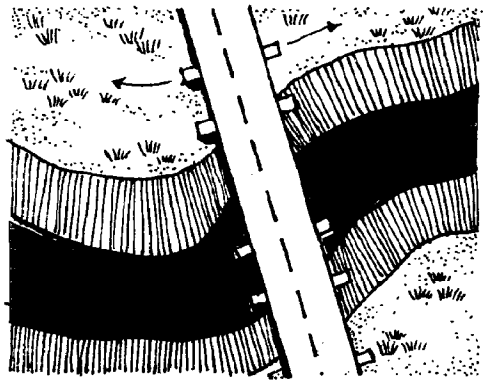


The design of highway routes should follow land forms as closely as possible to preserve natural features. This practice avoids construction and maintenance problems, preserves the aesthetic quality of the area, and aids development in the road corridor. A road design that takes into consideration views and vistas into the area it traverses avoids monotony and enhances scenic amenities.

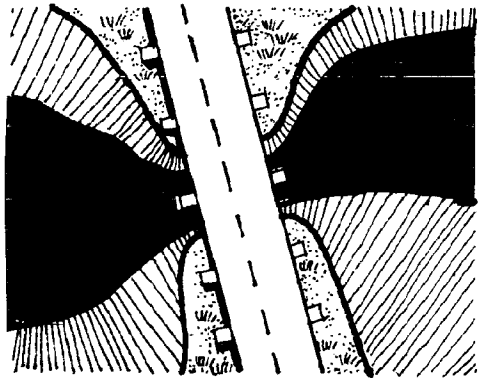


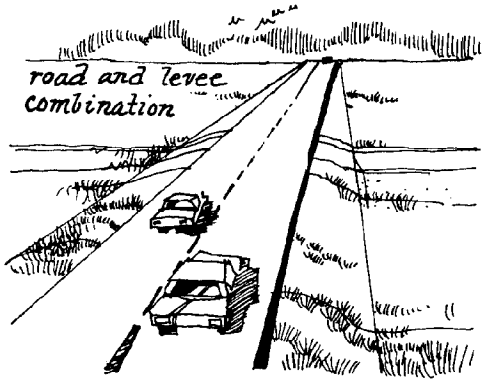
Roads in coastal wetlands should not impede natural sheet drainage. Such action would cause areas of impoundment. The change of the surface drainage pattern of an area can adversely affect the existing vegetation and wildlife and the productivity of other living organisms. It may also reduce aesthetic values if the impoundment causes vegetation to die.



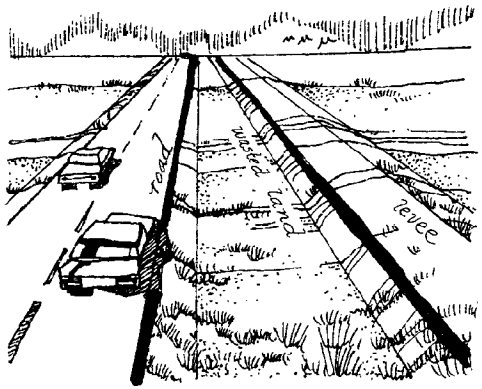


Placement and design of roads should avoid blocking drainage ways which are important for water circulation in wetlands. Building elevated road structures supported by piles is one practical method for crossing wetlands. This system permits water to flow from marshes into estuaries and tidal flats, assuring the preservation of the natural surroundings.

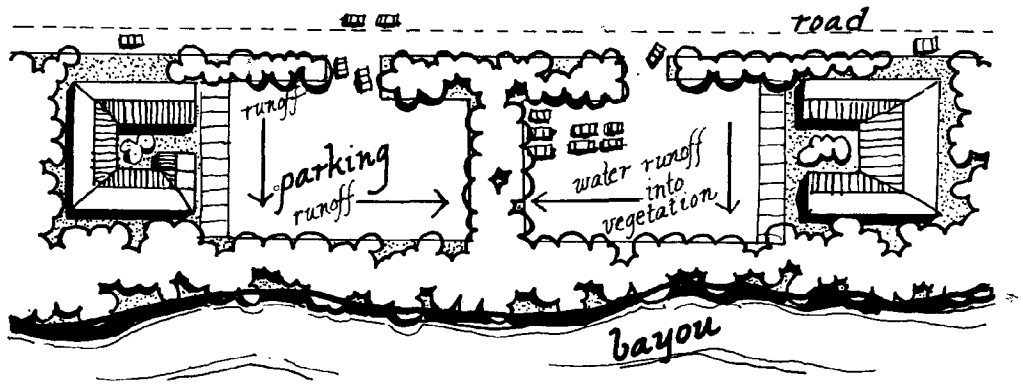


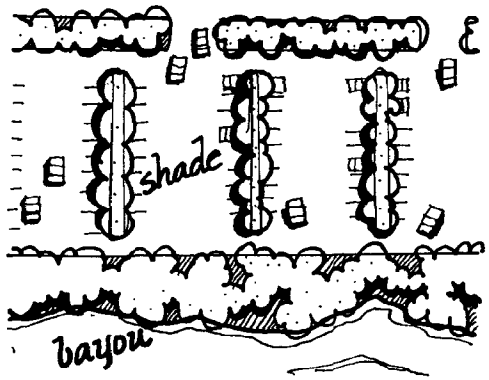


In areas where protection from floods is needed and levees have to be built, expense, effort, and time can be reduced by placing the road on top of the levee. Using this sytem the levee serves a dual purpose - as a flood protection device and as the base and foundation for the road.

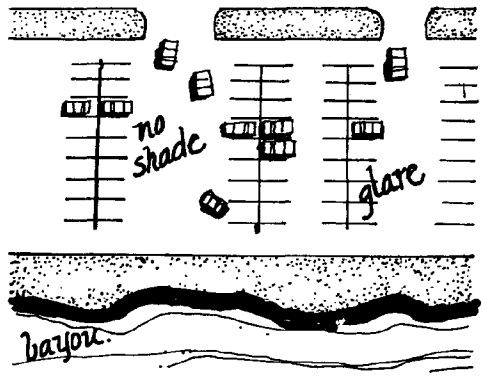


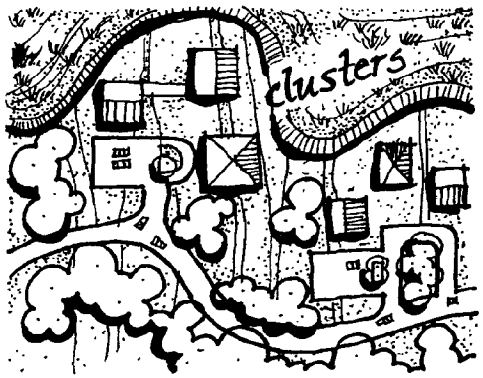
Extensive paving of areas for parking lots increases the amount of run-off into surrounding areas. This can create problems of erosion, flooding, and pollution. Breaking continuous areas of paving with green spaces which partially absorb run-off is a good practice. The use of surfacing materials that allow water percolation is another method of avoiding excessive run-off.

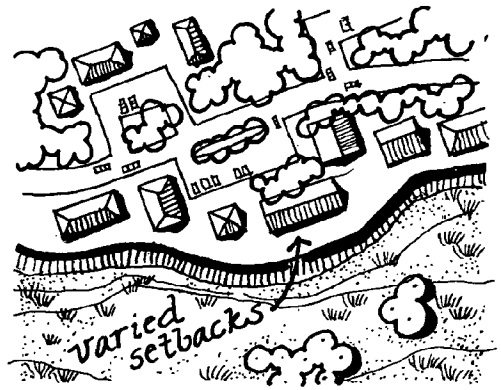




A good parking lot design would allow for green spaces and planting strips in the overall organization of the parking area. Reflection and glare from the paved areas is softened by planting. Plants also act as filters removing dirt, dust, odors, and fumes from the air. Trees provide shade and have a cooling influence during the hot summer months.

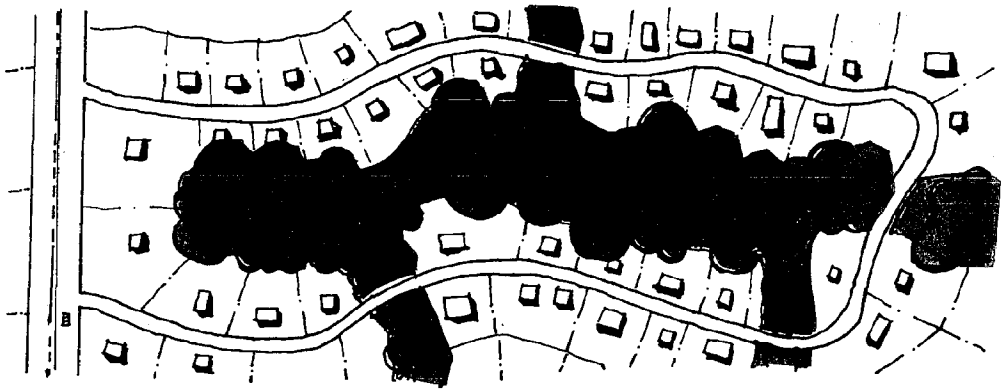




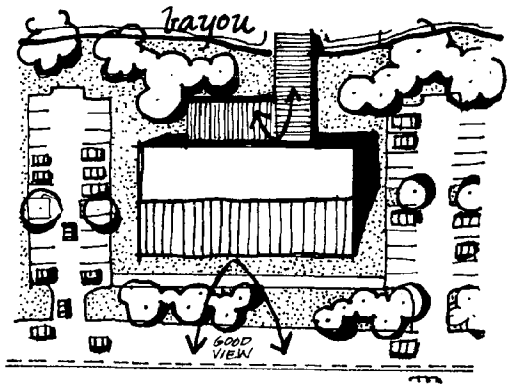


BUILDING GROUPING

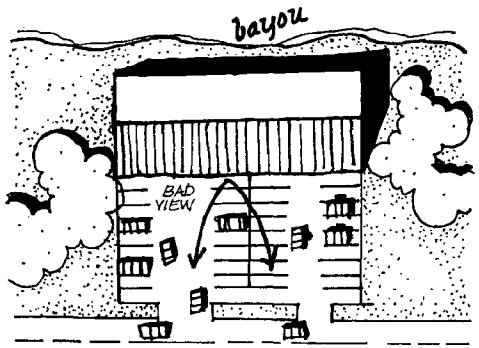
The placement of buildings on a site should take site forms and features into consideration. The natural assets of the site can be used to advantage and be maintained with careful site planning. Development along bayous and lineal features should try to avoid monotony in spatial organization. Arrangement of buildings in a cluster fashion increases potential for development of open space amenities.



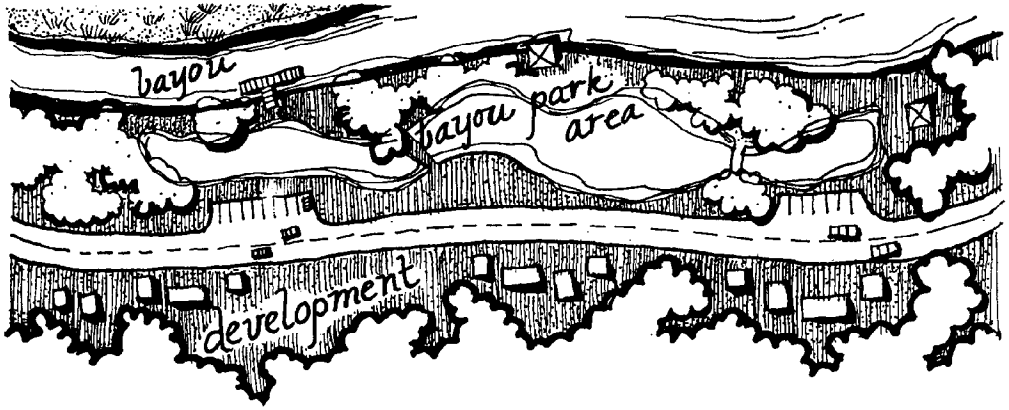
Grouping buildings around existing vegetation preserves the natural character of the site by taking advantage of its natural plant growth. The arrangement of buildings can incorporate existing trees and shrubs into the layout. Trees and shrubs can frame vistas, open up views, reduce reflection, let the sun in during the winter season, and provide privacy where needed.

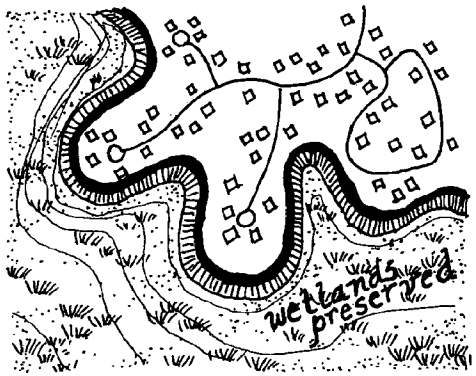


Along the banks of streams and bayous, roads and developments might be set back from the shoreline. Locating them away from the bayou's shore will keep the areas closer to the water free for open spaces and recreational activities. The visual quality of the bayou's shores may be preserved and the view from the road maintain a scenic quality.

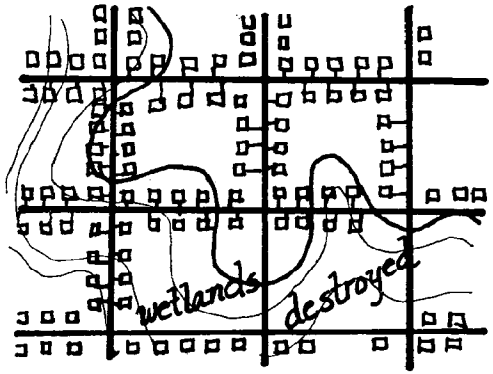


The natural attractiveness of sites along bayous and water bodies can be enhanced by sensitive development. Dwellings might be grouped and set back, sharing facilities such as parking lots, piers and docks. The water banks should be kept clean. Raw sewerage should not be discharged into the waters to avoid danger of pollution and for aesthetic reasons.

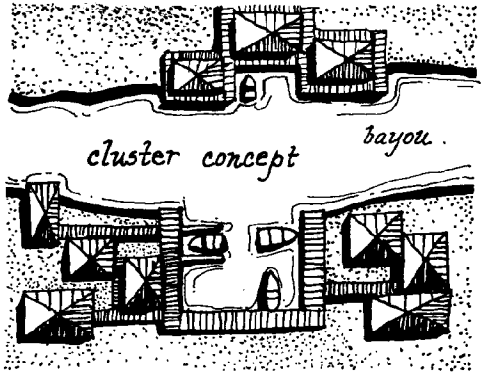




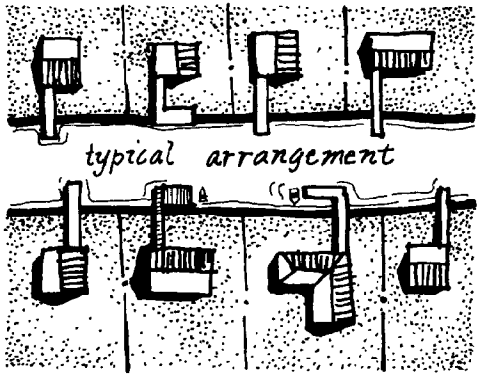
In cluster development, buildings are grouped together on those areas of the site most suitable for development purposes, leaving more fragile areas as natural open spaces. This type of development allows for separation of pedestrian and vehicular traffic, increases safety and privacy, and reduces cost installation of roads and utilities. It also preserves the ecological value of sensitive environments.

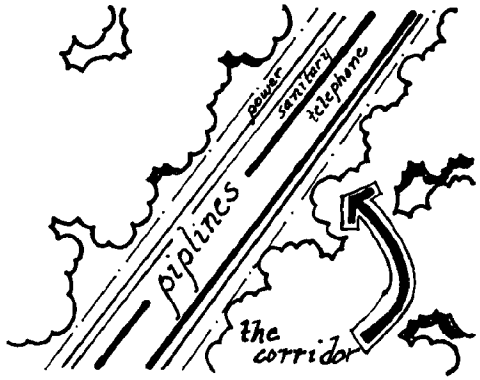


Leaving open spaces in the spatial organization of buildings enhances the visual quality of the development. Such arrangement also helps in preserving the natural character of the site. Open spaces can act as transitional areas among different site uses. They offer a variety of opportunities for recreational activities, such as bike paths, walk and horse trails, and nature study.



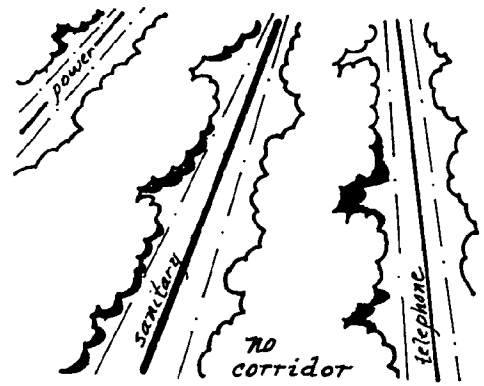
Camp developments along streams and bodies of water in Louisiana coastal areas are common. Camps can be grouped together to form small clusters sharing common facilities, such as restrooms, utilities and docks. This reduces expenses, duplication of facilities, and diminishes pollution into the surrounding waters and wetlands.

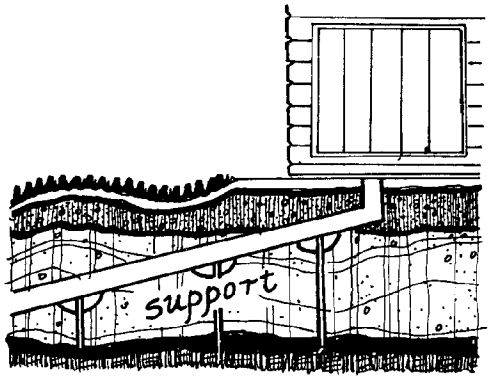




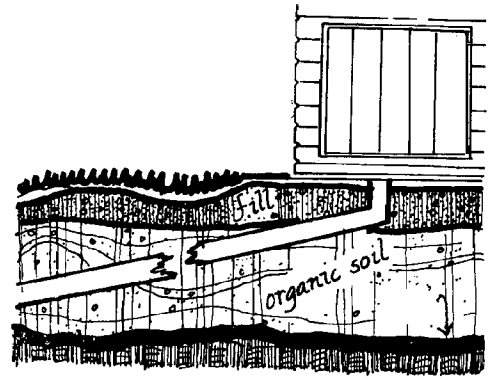
UTILITY SYSTEMS

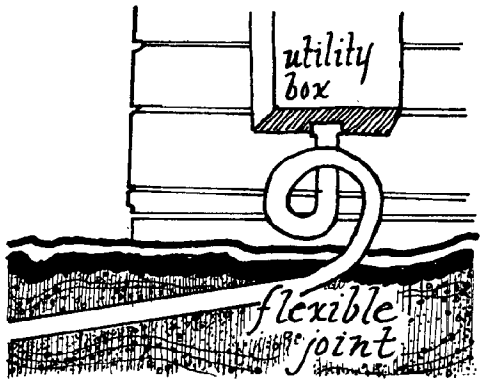
Grouping utility systems into one lineal corridor has the advantage of concentrating services in one place instead of subdividing the land in many sections by different lineal systems. Less environmental impact results from this practice since less land and dredging is required.



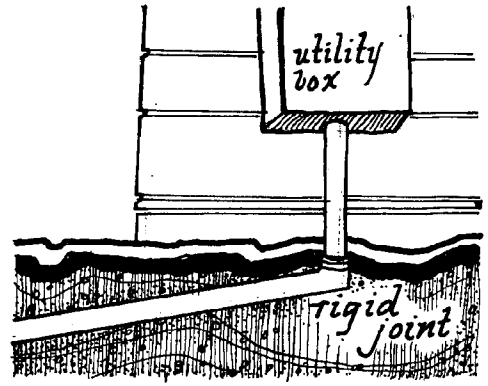


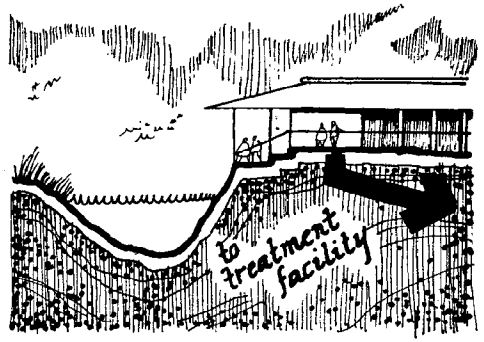
Underground utility lines in coastal Louisiana wetlands may encounter the problem of subsidence. When organic soils shrink as the water table is lowered, a general sinking of the ground takes place. Unsupported utility lines may split apart or crack at joints. This increases the need for maintenance and repair resulting in a financial burden to the owner. Utilities may require supporting structures in some areas.



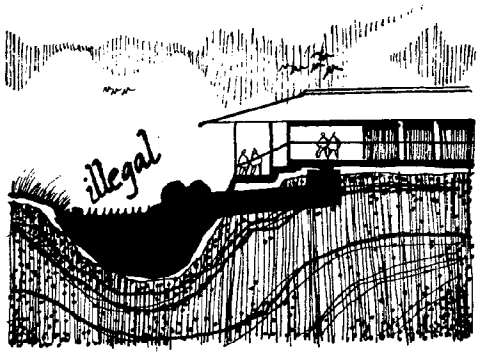


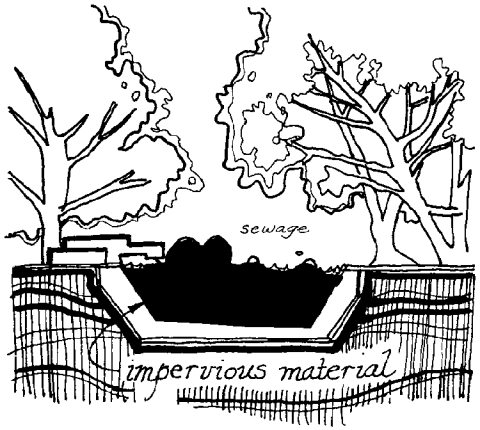
A partial solution to the existing problem of utility line joints breaking because of soil subsidence is the use of flexible joints. As the soil shrinks and reduces its volume, flexible joints adapt and conform to the soil movements. Rigid joints may crack as they present a resistant force to these soil movements because of their lack of flexibility.





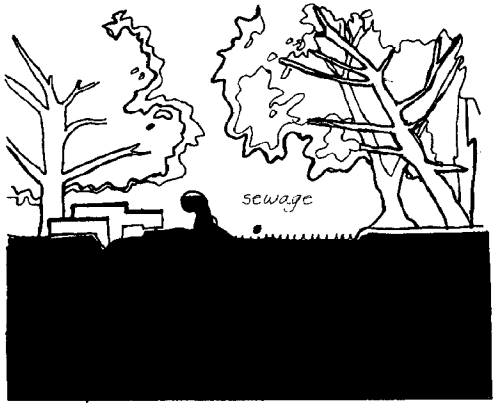
Raw sewerage discharge into streams and water bodies is illegal. It can cause serious health problems. It affects the water quality and makes it unsuitable for other uses. Added nutrient matter increases the amount of algae and reduces the amount of oxygen in the water consequently adversely affecting the fish production of the stream or lake.





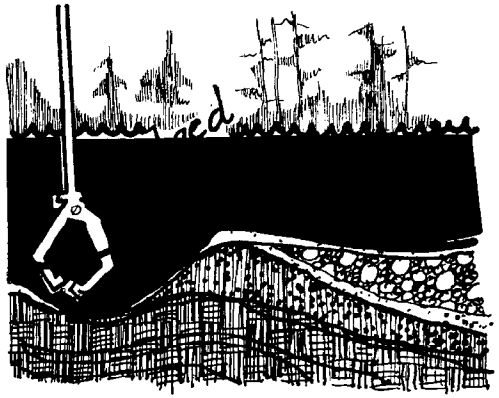
Sewerage lagoons are used as secondary sewerage treatment in many subdivision developments throughout coastal Louisiana. The types of soils existing on any particular site may impose limitations to lagoon function. Basic soil requirements for constructing sewerage lagoons are:

- slow rate of seepage
- nearly level basin floor
- little or no organic matter
- almost impervious materials for the basin floor

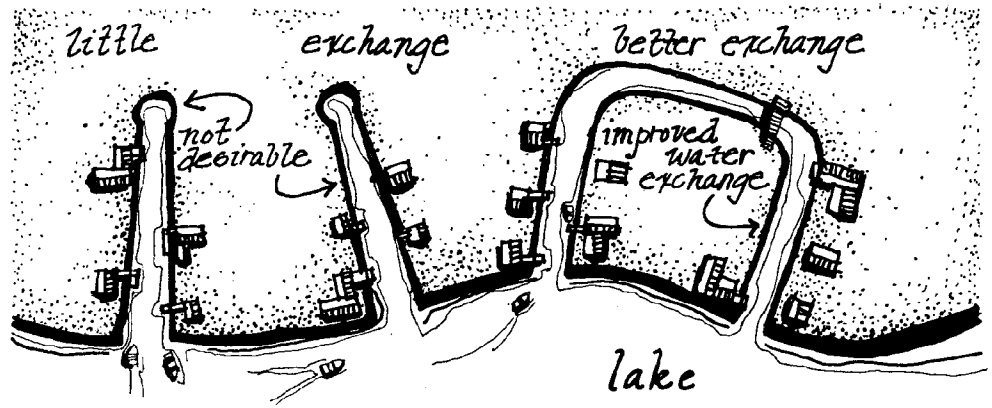


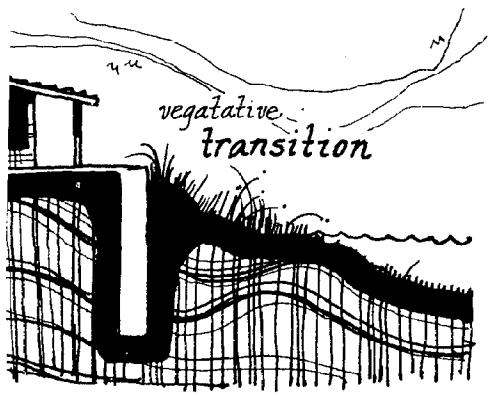
WATERWAYS

The dredging of streams and waterways is sometimes required to remove silt deposits from channels. The fine materials disturbed by dredging cause turbidity in the water. Water circulation at the bottom of the channel may be restricted because it is lower than surrounding areas. Heavily silted areas with little circulation are poor habitats for most organisms living on the bottom of channels.

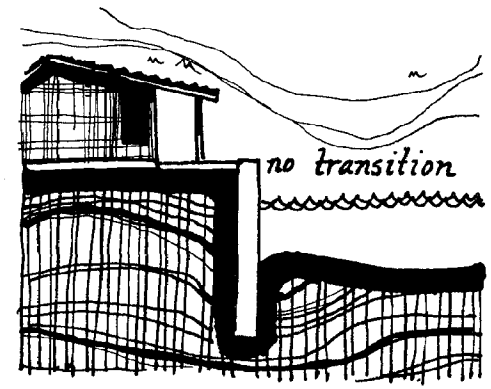


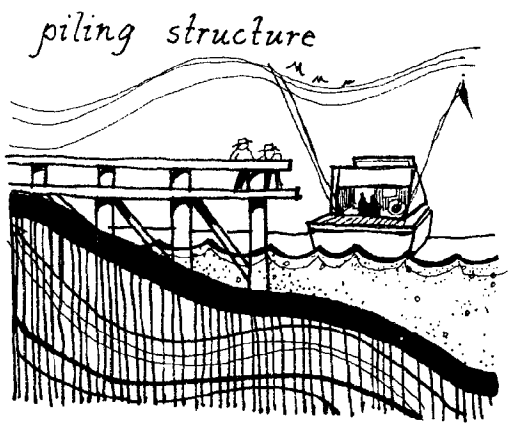
Where channels are to be dug off of an existing water body, it is better to form a loop system to help with water circulation. Dead end systems have little water exchange with the adjacent water body, become stagnant, and concentrate any pollution that may occur because of use of the channel or runoff from adjacent land areas.



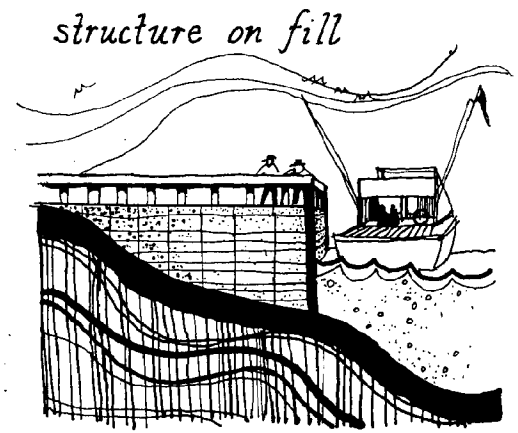


Because of development activities, shoreline protection of streams and water bodies sometimes becomes necessary. When placing a bulkhead it is better to leave a transitional zone where vegetation will grow between the structure and the water. This protects the bulkhead from weakening under water attack and provides a better wildlife habitat.

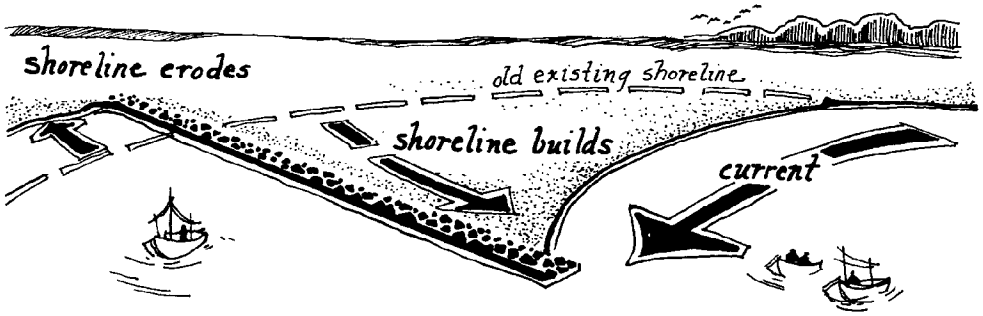


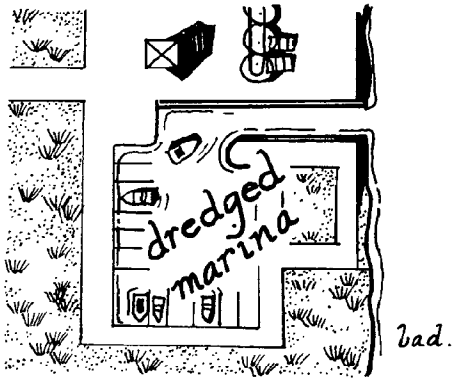


Structures in tidal waters should be constructed on pilings rather than fill. Filling for structures creates an obstruction to water circulation which changes the transportation of sediments in shallow areas. Pilings allow for free movement of water, sediments and aquatic life underneath the structure.

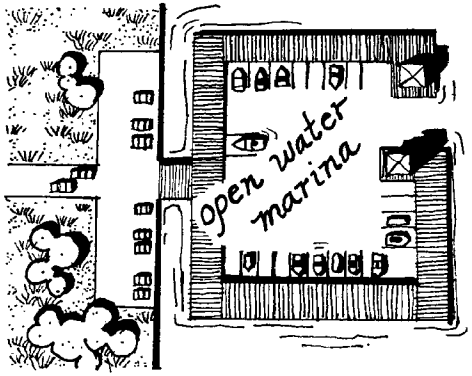


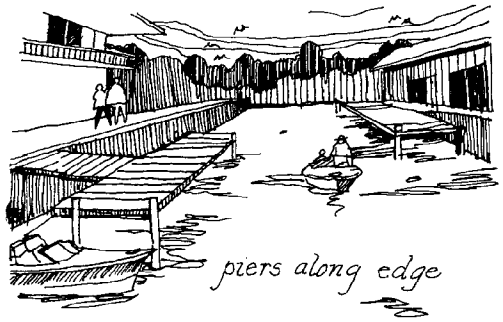
Structures placed at an angle with the shoreline cut sediment supply by altering water circulation. Sediments carried by wave movements are trapped on one side of the jetty or groin; the other side, lacking the necessary material to build it up, erodes away. Natural shoreline processes should be allowed to take place without interference from such structures.



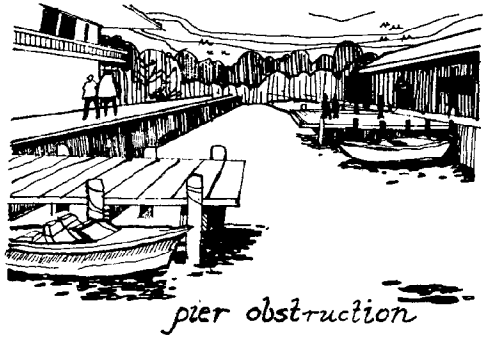


Marinas placed near the shoreline normally require expensive dredging and bulkheading and may alter the natural shoreline environment. Placing marinas farther out into the water body reduces construction costs and preserves the shoreline's valuable open spaces. Protection from storms and wave action should be considered when locating this kind of facility.



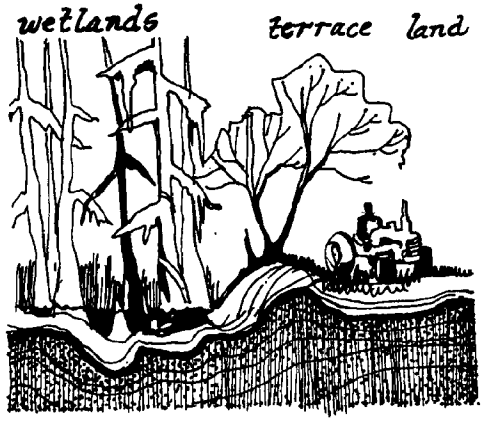


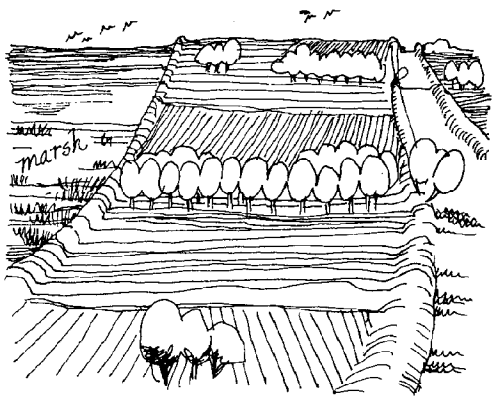
Docks and piers placed in channels and waterways should not obstruct circulation and traffic movement. Placing them along the banks of the waterways should not obstruct circulation and traffic movement. Placing them along the banks of the waterway permits more free space in the channel and may improve the use and appearance of the shore.



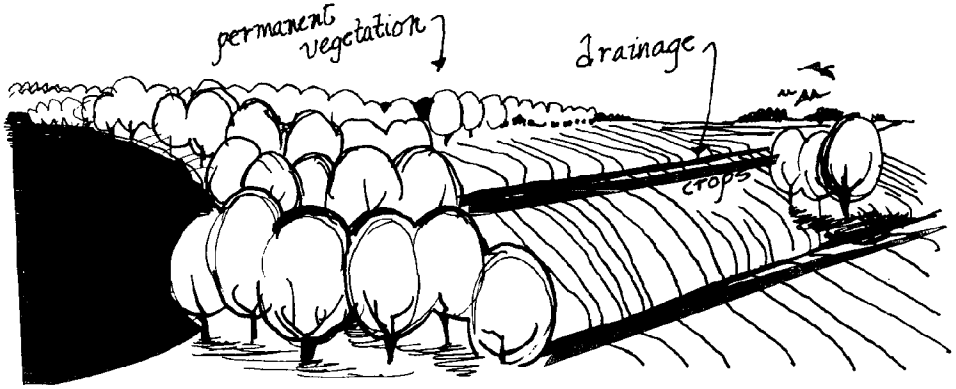
AGRICULTURE

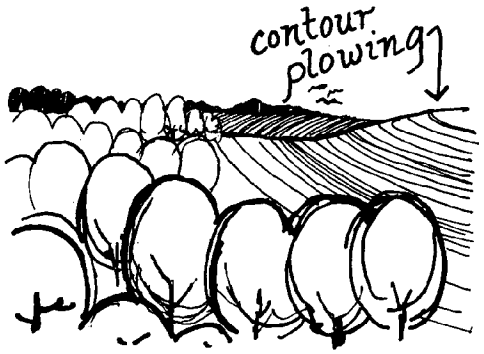
In coastal Louisiana, the higher and more suitable areas for agricultural activities usually can be found along the natural levees of streams and bayous or on terrace formations. Soils in these areas are usually well drained, protected from floods, highly fertile, and relatively easy to work.



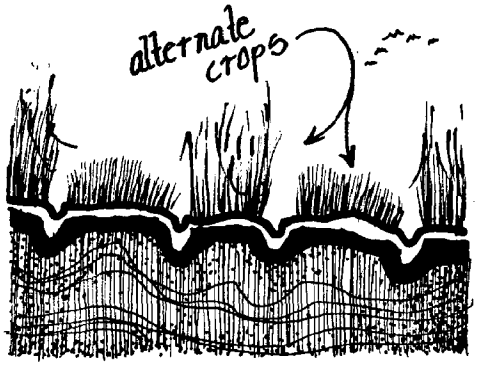


Runoff from agricultural areas can pollute streams and bayous with chemicals and silt. A transitional zone of permanent vegetation can act as a filter and reduce pollution problems. This zone traps sediments and slows the water flow, minimizing erosion and runoff from the agricultural fields.

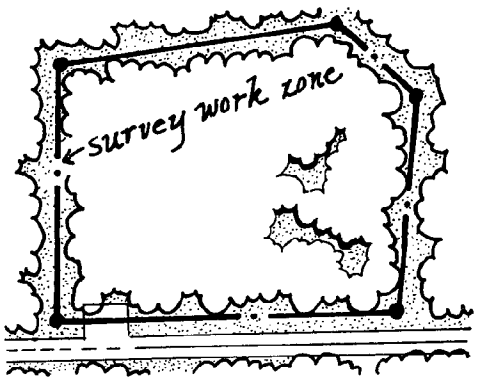




Runoff may be further controlled by techniques such as plowing parallel to the contour of the land, and planting bands of different crops that mature at different times. Maintenance of soil fertility and water quality are important to achieve long term use of agricultural lands in the coastal area.

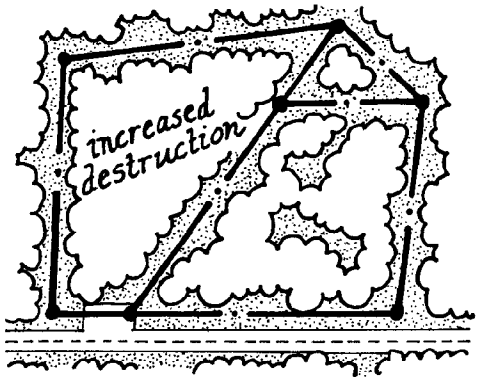


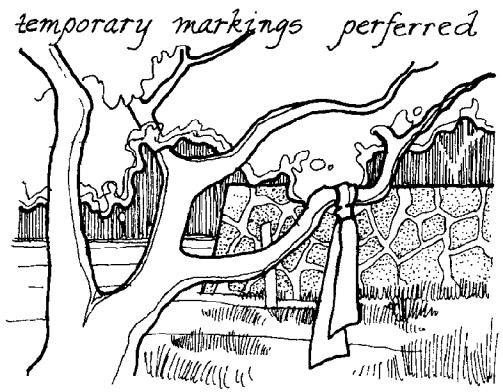
CONSTRUCTION ACTIVITIES



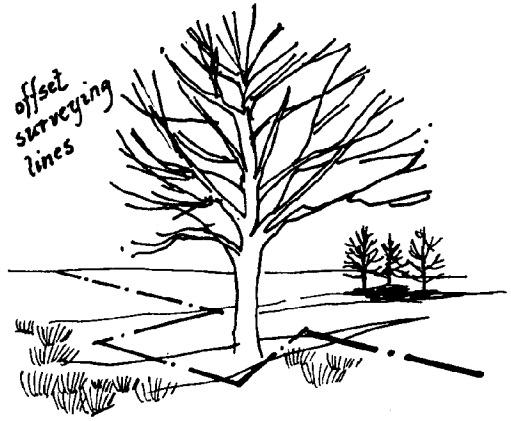
SURVEYING

Surveyors should keep equipment and personnel on survey lines as much as possible to keep site disturbance to a minimum. They should prevent unnecessary and indiscriminate cutting of trees and keep clearing operations during surveying operations within established limits. The use of permanent paints to mark survey points is discouraged.

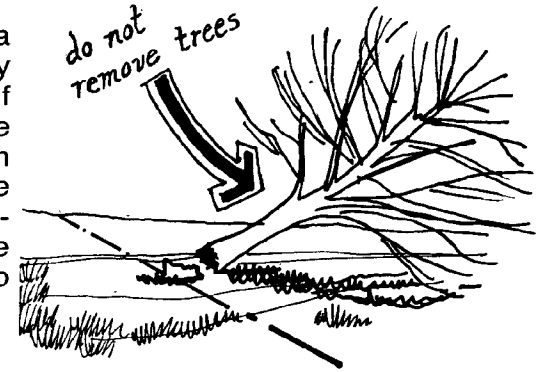


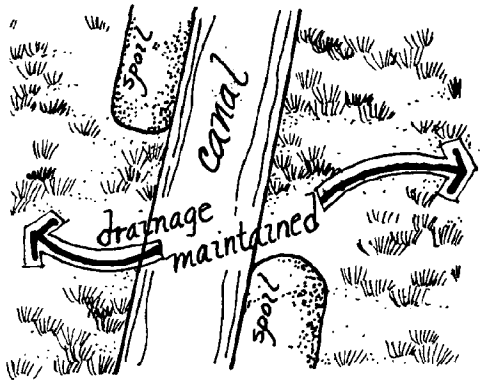


Surveying operations should not disfigure any landforms, trees or significant site features by painting, mutilating, or marking them in any permanent manner. Usually masonry structures or concrete posts are used as bench marks. Depending on the type of survey, survey points could be wooden stakes, marks on concrete surfaces, iron pipes or rods.



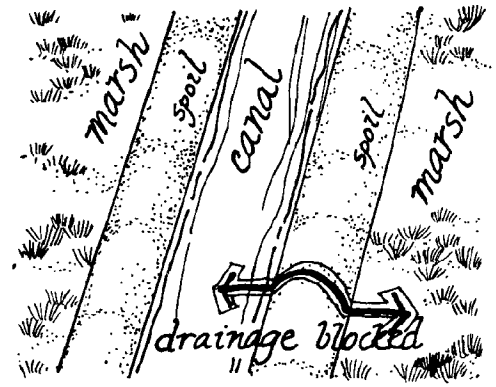
Surveying parties should keep to a minimum the cutting of understory vegetation and branches of trees. If any cutting is necessary it should be done with care and in a way which preserves as much as possible of the tree or shrub. All tree wounds resulting from surveyors' cutting should be treated with a pruning compound to prevent rotting and insect damage.

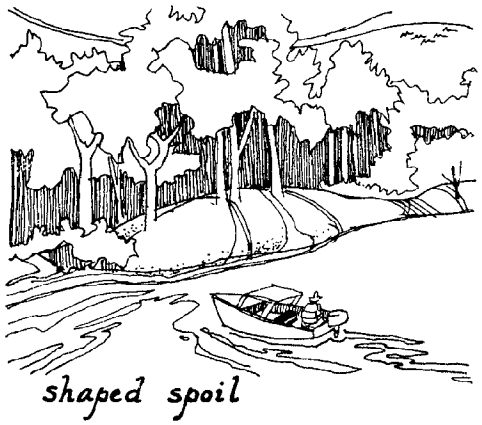




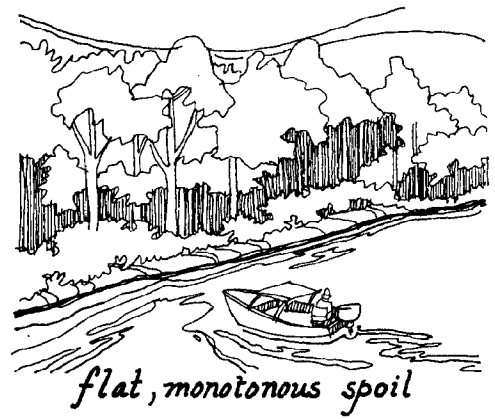
DREDGING

If dredging becomes necessary the amount of dregde spoil should be kept to a minimum. Spoil banks created by the deposition of dredge materials along the sides of the waterway usually obstruct natural runoff patterns. Avoid placing spoil in a continuous line. It is better to alternate its placement on both sides of the channel or break it at intervals to maintain runoff.

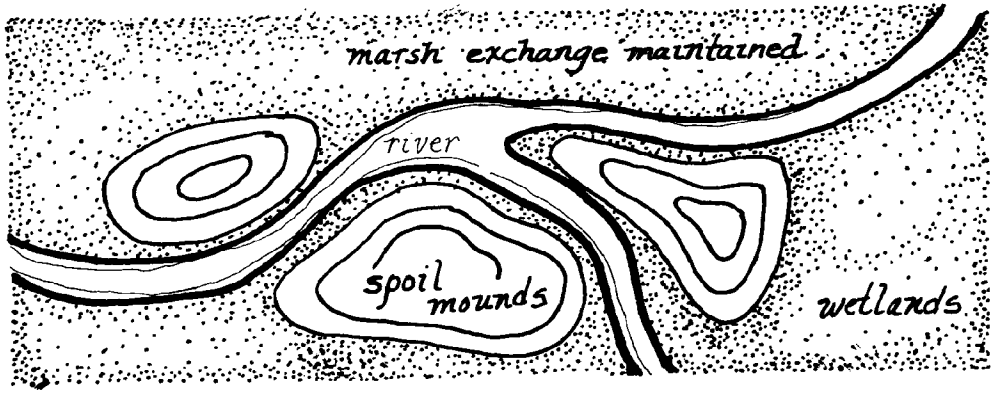


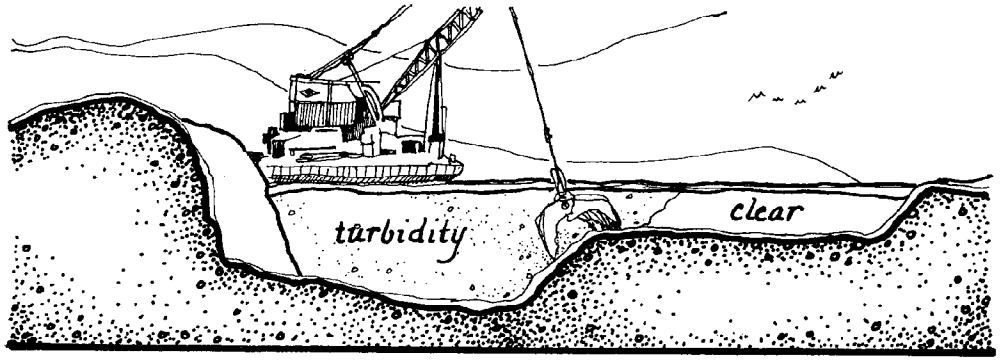


Long and continuous spoil banks along streams and channels give a monotonous and unattractive appearance. Giving contour and shape to the deposited material relieves this tedious appearance. Varying the height and shape of the spoil bank at the time of its placement results in more attractive views of the stream's banks.

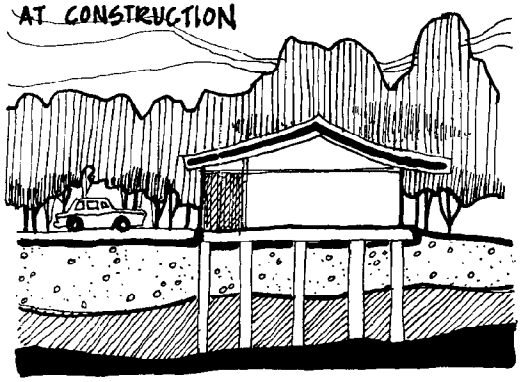


Spoil banks can become more attractive without interrupting runoff patterns by shaping the dredge material into small hills at appropriate places along the channel route. The aesthetic value of the stream is maintained and the natural runoff pattern more nearly preserved.



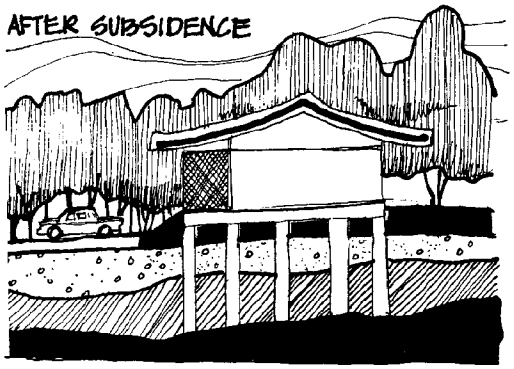


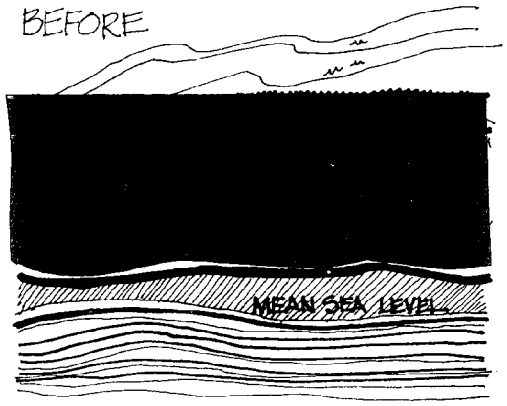
Dredging increases turbidity of streams and channels by disturbing the silt on the channel's bottom. These fine sediments cloud the water and damage the natural habitat of bottom organisms, at least temporarily. Pollutants from bottom sediments are freed by this action and moved by tides and currents thus affecting the quality of the water.



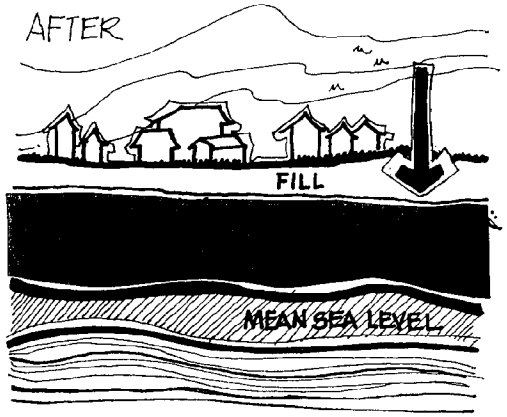
DRAINING

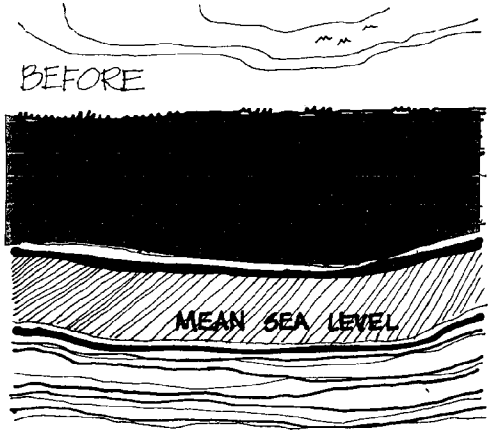
The development of land in the coastal area sometimes involves lowering ground water levels and pumping surface water over levees. Such drainage may cause the land to sink as soils dry and shrink or organic matter compacts and decomposes. If buildings, roads, utilities and other features are built before sinking is complete, structural elements may be damaged.



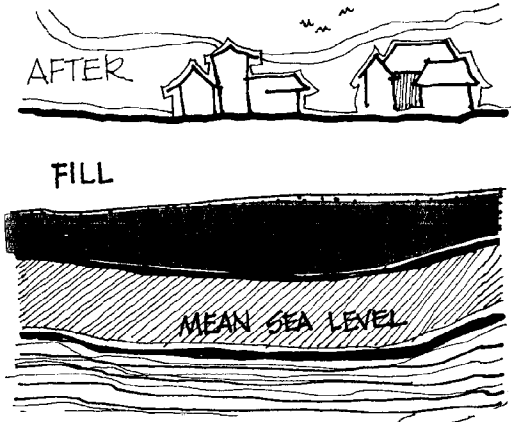


The 'wet method' of drainage is the most commonly used technique at present. The water table is lowered several feet by pumping, a thin layer of fill is placed on the site, and buildings, roads, and utilities are constructed. If the water table is lowered further after construction is complete, sinking occurs and structural elements are damaged. The developer, therefore, may want to use another method.

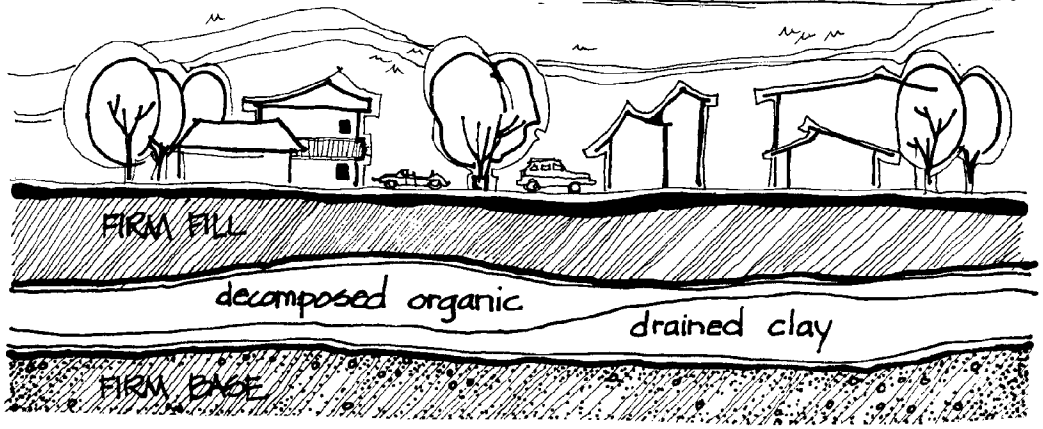




The 'fill method' of drainage is intended to reduce the sinking that damages construction. Prior to building, the water table is lowered to sea level. There is high initial subsidence as soils compact. Several feet of fill is placed on the site to aid in compaction, to provide a good foundation, and to provide for drainage. This drainage method can produce a reasonably stable surface for construction.

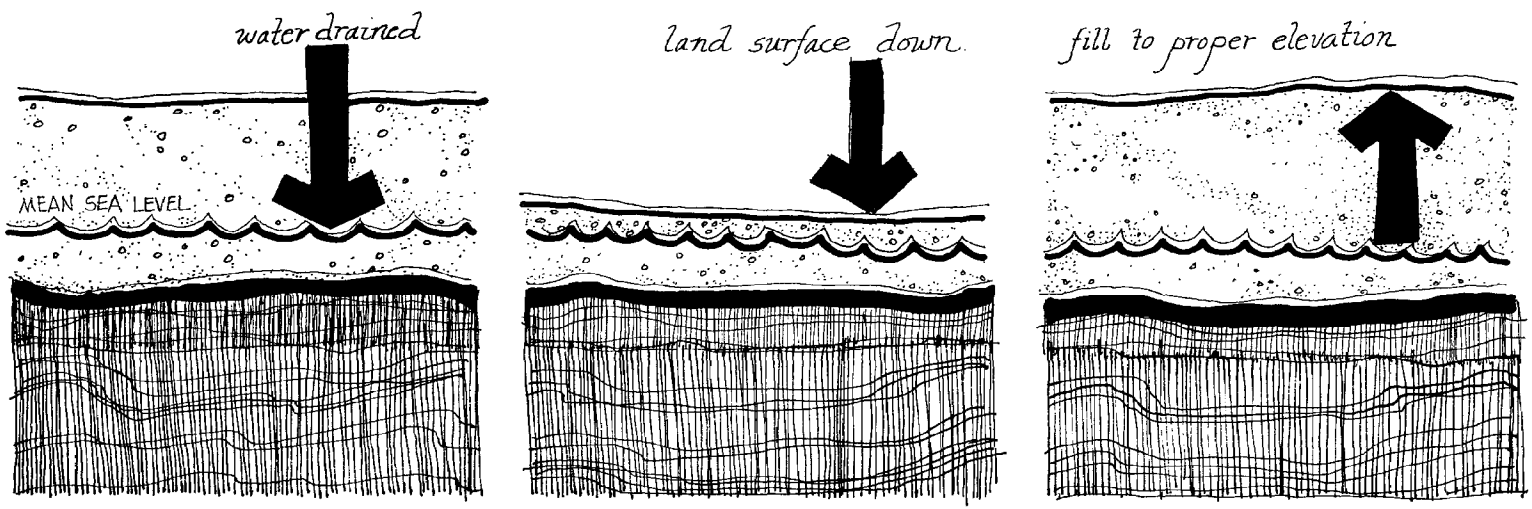


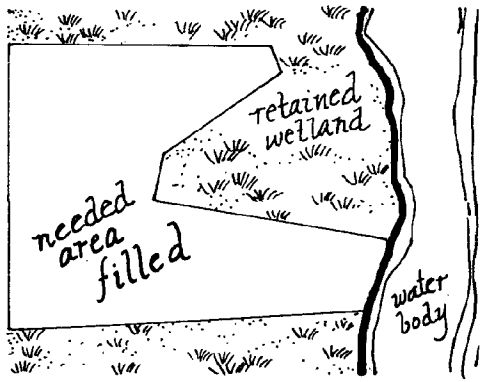
If a site has been drained for a number of years prior to development it may be more stable than a newly drained site. Soils that were once wet will have had a chance to dry and organic matter will have had time to decompose. Building sites in areas of previously completed drainage will, therefore, generally be preferable to those in recently drained areas.



To avoid land sinking after construction, the developer may consider a three phase approach to land preparation for construction:

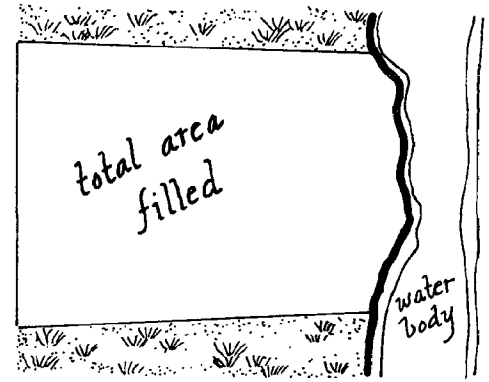
1. Drain land to bring the water table to sea level several years before construction is planned.
2. Allow land to settle for several years to consolidate soil and reduce organic matter.
3. Compact and fill land to an elevation above the 100 year flood plain for the area.



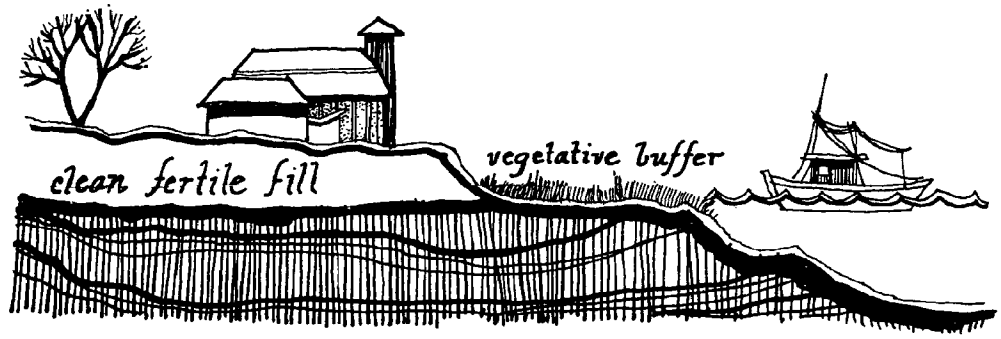


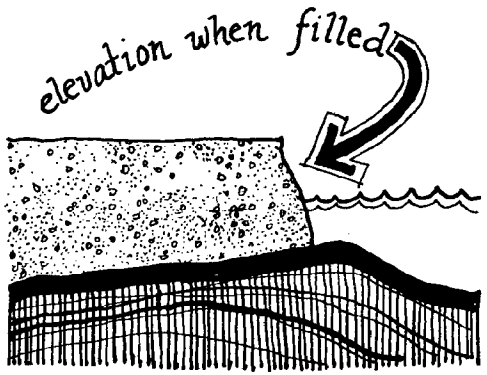
FILLING

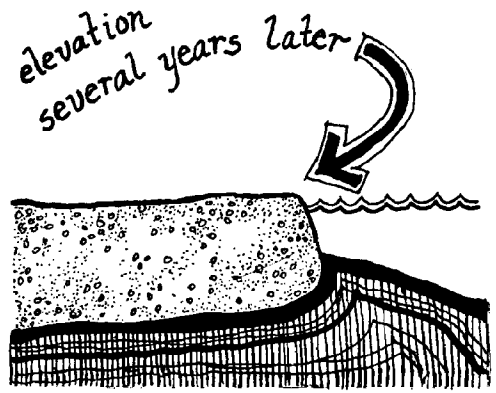
Filling is an expensive way of creating land for development in shorefront areas. Floodings may be a threat to low lying filled areas and erosion may occur. Filling destroys wildlife habitats and alters the water circulation and sediment transport patterns. Only areas that are absolutely necessary for development should be filled.



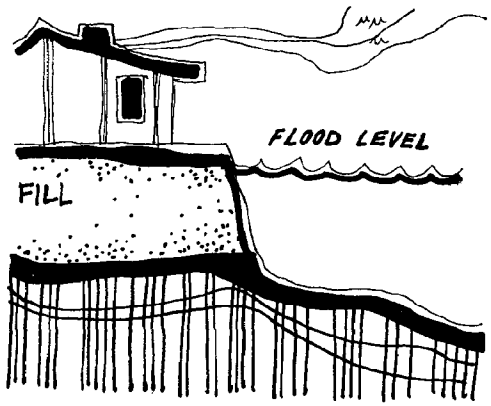
In limited cases, where wetland filling becomes absolutely necessary, the fill material should be clean, fertile, and free of contaminants. These characteristics help prevent pollution from runoff waters that get into adjacent areas and assure a healthy growth of plant materials on the filled site. Runoff may be filtered through preserved vegetation before it reaches the main water body.



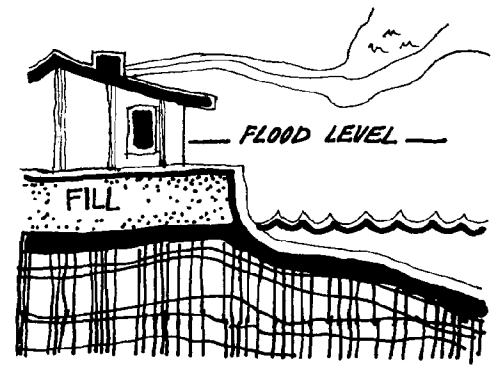




The placing of fill upon land that has been drained may be necessary to adjust elevations for soil subsidence. Initial subsidence of wetland soils may be as much as fifty percent of the original soil volume. The sinking process can continue for many years. Initially land should be filled to an elevation higher than that desired for development to allow for settlement before building.

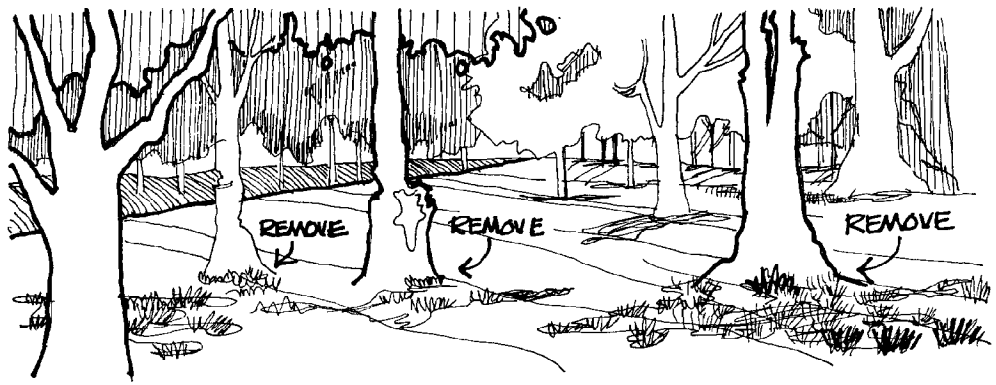


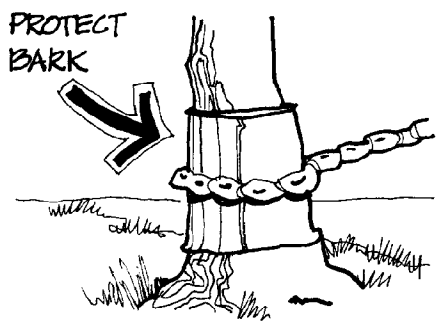
Filling in flood prone areas should raise land above the flood line level. This practice increases the development potential of the site by providing protection from flood hazards. The initial expense for extra filling material may reduce development costs later in the project.



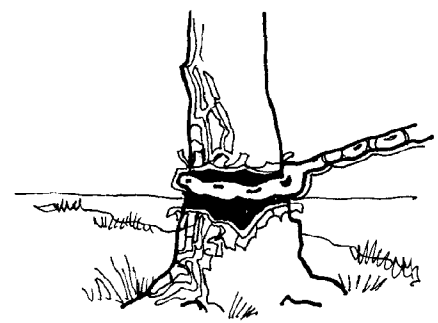
CLEARING

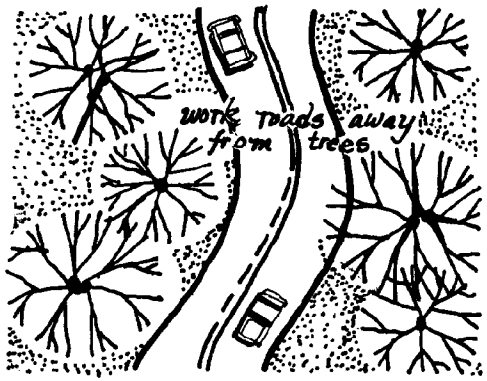
Before clearing a site for development, existing vegetation should be inspected to select young and healthy trees and shrubs that may remain on the site. Those trees that have signs of being diseased, rotten, or otherwise damaged, and those which would interfere with building installations, should be cut down.



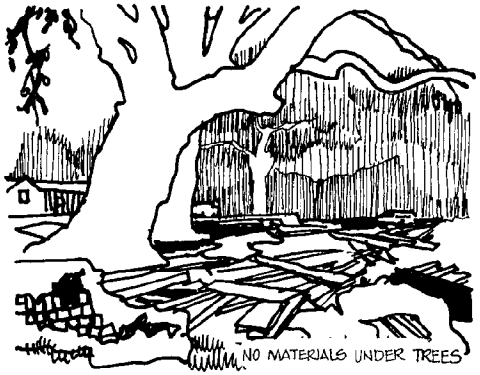


Damage to trees selected to remain should be avoided. If a tree is to be used for temporary anchorage, its trunk should be protected by wrapping it with several layers of burlap. Softwood cleats may then be placed over the protecting burlap, furnishing a grip to any rope, cable or wire around the tree trunk. Climbing spurs or other damaging devices should not be used.



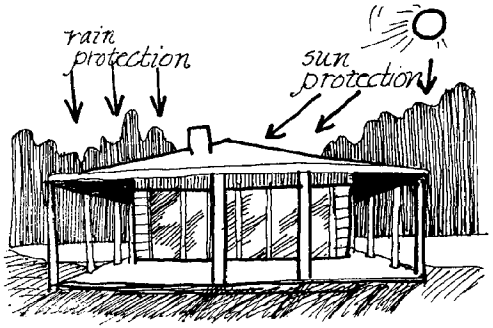


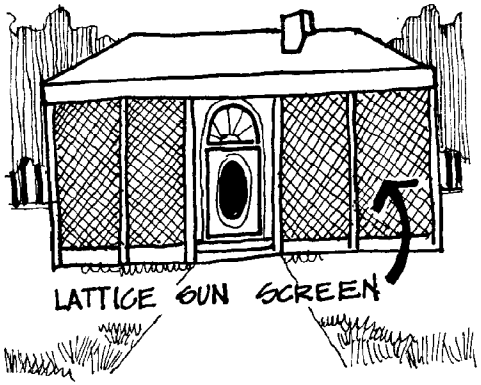
During clearing operations, damage to vegetation and other natural site features can be reduced by building roads only as wide as necessary for vehicles and equipment to maneuver. Bulldozers, graders, and trucks should not be operated beyond the established right-of-way. Topsoil that supports vegetation should be removed from building areas before construction operations, stockpiled, and replaced after construction is finished. Materials should not be stored or vehicles parked under trees.



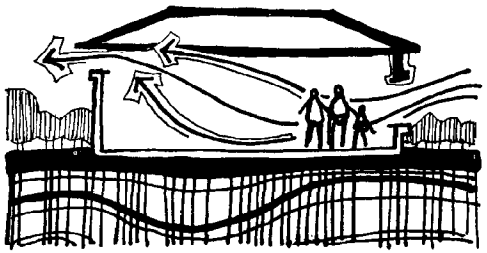
BUILDING

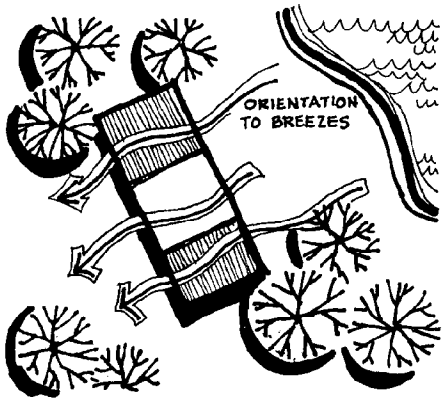
The use of architectural devices can effectively reduce harsh climatic factors found in coastal Louisiana. Placing verandas, porches, and eaves on sun-exposed sides of buildings helps relieve intense solar radiation. Walls and surfaces exposed to the sun can be painted in light colors to reflect rather than absorb the heat.





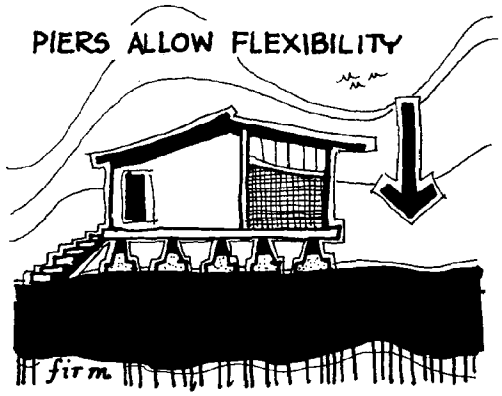
BUILDING DESIGN FOR BREEZE CONTROL





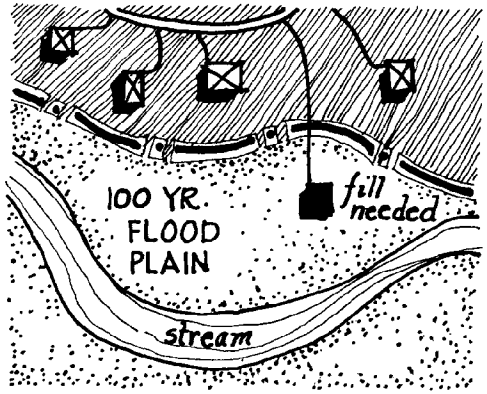
Temperatures are modified by breezes. Buildings may be oriented and vegetation planted to take advantage of coastal wind patterns. These patterns will differ depending upon season and exact site location but can be determined through a site study.

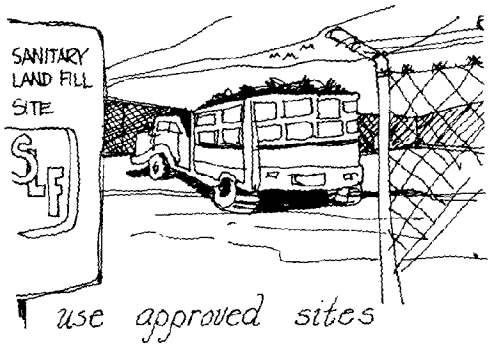
Foundation design is an important consideration in Louisiana coastal areas because of soil conditions. The use of on-grade slabs are only recommended when building on natural levee crests or on lands known to have firm soils. On-grade slabs in areas of organic soils or shrink-swell clays are subject to tilting or cracking because of differential settlement of soils.



Slab at grade on piles or houses raised on short piers are commonly used in coastal Louisiana. The piers or piles provide necessary support for the structure and allow some accomodation to soil subsidence. Since structures can be releveled after a period of years with a pier system, it has considerable advantage where subsidence is predicted.

Building in flood prone areas is now subject to regulations to meet flood insurance requirements. Structures have to be raised above a base level according to flood insurance elevation standards. The elevation of this base level is usually available through the parish engineers office or the Corps of Engineers.

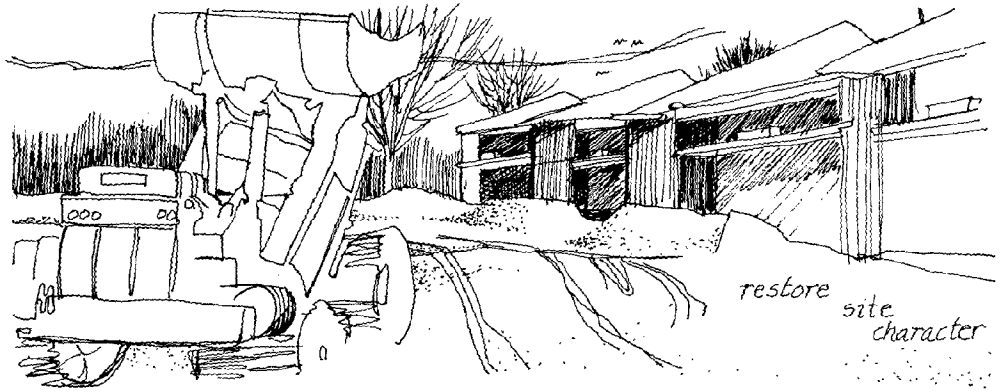


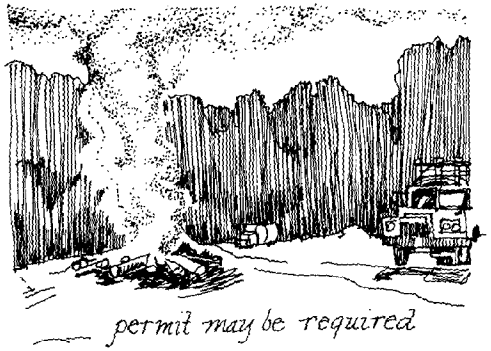


CLEANUP

Once the construction and building operations of a development are finished, the site should be cleaned up. Temporary building structures and equipment should be removed from the area. Surplus material, lumber, debris, and any other construction articles on the site should be picked up and disposed of at approved sites out of the wetlands.

In post-construction cleanup, earth cut and fill areas should be graded. If large areas of vegetation have been cleared they may be replanted with native trees and shrubs. Bare soil should be graded and seeded to prevent problems of erosion and to improve the visual quality of the site. Stored top soil should be redistributed.

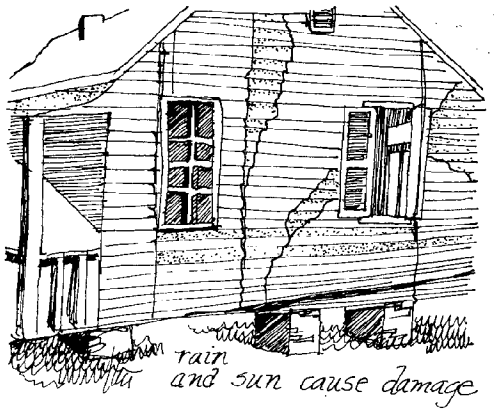


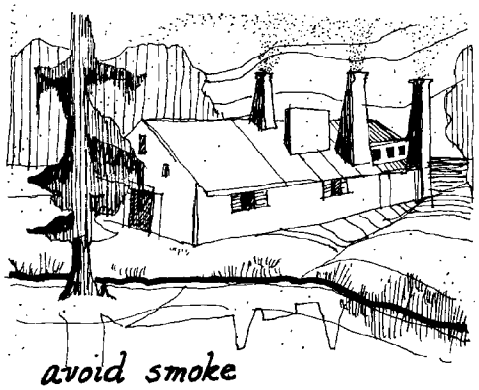


Methods of disposal of lumber, debris and other solid refuse from construction operations will vary with each project. Cleared timber may be saved for practical uses such as construction or firewood. Wood chips may be used in the planting operations as mulch for weed and erosion control in recently planted areas.

MANAGEMENT

Long term management entails protection of the development investment from environmental forces and protection of the environment from development side effects.



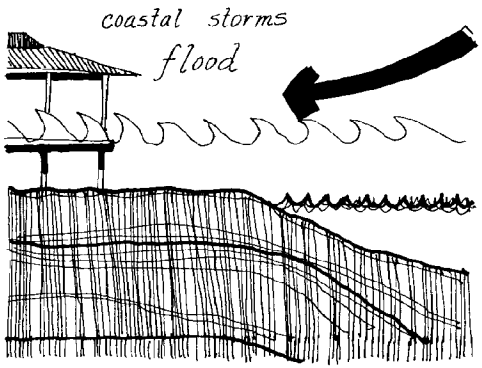


COASTAL CONSIDERATIONS

In the Louisiana coastal area development managers need to be aware of several environmental hazards. Intense solar energy and high rainfall cause materials to weather very rapidly. This increases the need for regular and adequate maintenance. Storm rainfall and hurricanes place stress upon drainage systems. To guard against flooding, pump and storm drainage systems must be kept in top condition. To reduce the chance of structural damage, areas of sinking land in a development should be filled on a regular basis.

The coastal area is a sensitive environment and development can have an adverse influence upon it. Smoke and dust may reduce air quality. Sewage and street runoff may pollute adjacent waterways. Solid wastes may clog drainage ways, introduce toxic substances into the wetlands, and be unattractive to residents and visitors. Development managers must be aware of factors that may be harmful to the surroundings.

Long term management is most efficient if the site is selected, improved, and constructed properly. The special characteristics of the coastal area should be taken into account at every step of the development process.



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Guidelines focus on structural methods of shoreline protection and modification. Detailed construction sections are included.

Credits

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INFORMATION CENTER

PROJECT GROUP

Project Director

Sherwood M. Gagliano

Writers

Maria M. Urrechaga
Daniel W. Earle
Andrew Moore
James C. Wescoat

Graphics and Layout

Judy Hanks
Daniel Earle

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