Okatie Village

Okatie Marsh

Development Agreement

Adopted: October 27, 2008

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The Okatie Village Design Guidelines utilize a format that was originally developed for the SmartCode. The SmartCode is a comprehensive form-based code that is transect oriented and purposely made available for free over the internet by DPZ of Miami http://dpz.com/. Beaufort County Planner Brian D. Herrmann worked with WK Dickso, John Thomas and the Okatie Village Development team to customize these guidelines so that all metrics would reflect the intensity and character intended for Okatie Village.

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AN ORDINANCE TO APPROVE A DEVELOPMENT AGREEMENT (OKATIE MARSH) BETWEEN BEAUFORT COUNTY AND LA CASA REAL ESTATE AND INVESTMENT PURSUANT TO SECTION 6-31-30 OF THE *CODE OF LAWS OF SOUTH CAROLINA*, 1976, AS AMENDED.

WHEREAS, the General Assembly of the State of South Carolina has enacted the "South Carolina Local Government Development Agreement Act" as set forth in Section 6-31-10 through 6-31-160 of the *Code of Laws of South Carolina*, 1976, as amended; and

WHEREAS, the Act authorizes local governments, including Beaufort County through its County Council, to enter Development Agreements with developers for the purpose of providing a continuous agreement for development of projects and for the protection and advance payments for the impact upon the citizens of Beaufort County.

NOW, THEREFORE, in consideration and pursuant to Section 6-31-10, of the *Code of Laws of South Carolina*, 1976, as amended, Beaufort County Council herein adopts this Ordinance, which is necessary to provide the authority to execute a Development Agreement with La Casa Real Estate and Investment.

Adopted this 27th day of October, 2008.

COUNTY COUNCIL OF BEAUFORT COUNTY

By: _____
Wm. Weston J. Newton, Chairman

APPROVED AS TO FORM:

_____
Ladson F. Howell, County Attorney

ATTEST:

_____
Suzanne M. Rainey, Clerk to Council

First Reading: September 8, 2008
Second Reading: October 13, 2008
Public Hearings: September 22, 2008 and October 13, 2008
Third and Final Reading: October 27, 2008

STATE OF SOUTH CAROLINA	)	
	)	**DEVELOPMENT AGREEMENT**
COUNTY OF BEAUFORT	)	**(OKATIE MARSH)**

This Development Agreement ("Agreement") is made and entered this 20th day of May, 2009, by and between La Casa Real Estate and Investment, LLC (Owner), and the governmental authority of Beaufort County, South Carolina ("County").

WHEREAS, the legislature of the State of South Carolina has enacted the "South Carolina Local Government Development Agreement Act, (the "Act"), as set forth in Sections 6-31-10 through 6-31-160 of the South Carolina Code of Laws (1976), as amended; and

WHEREAS, the Act recognizes that "The lack of certainty in the approval of development can result in a waste of economic and land resources, can discourage sound capital improvement planning and financing, can cause the cost of housing and development to escalate, and can discourage commitment to comprehensive planning." [Section 6-31-10 (B)(1)]; and

WHEREAS, the Act also states: "Development agreements will encourage the vesting of property rights by protecting such rights from the effect of subsequently enacted local legislation or from the effects of changing policies and procedures of local government agencies which may conflict with any term or provision of the Development Agreement or in any way hinder, restrict, or prevent the development of the project. Development Agreements will provide a reasonable certainty as to the lawful requirements that must be met in protecting vested property rights, while maintaining the authority and duty of government to enforce laws and regulations which promote the public safety, health, and general welfare of the citizens of our State." [Section 6-31-10 (B)(6)]; and,

WHEREAS, the Act further authorizes local governments, including county governments, to enter Development Agreements with developers to accomplish these and other goals as set forth in Section 6-31-10 of the Act; and,

WHEREAS, Owner has acquired a tract of land containing a total of approximately 97.7 acres of highland and wetland located in Bluffton Township, Beaufort County, South Carolina, and as more particularly described on Exhibit "A" attached hereto; and,

WHEREAS, Owner proposes to develop a residential community with attendant amenities, along with recreational opportunities and commercial, office and retail space to support it and the surrounding area on the Property described in Exhibit A; and

WHEREAS, Owner has developed a Comprehensive Master Plan (Exhibit "B" attached) for the entire tract (collectively hereinafter sometimes referred to as the "Property"); and,

WHEREAS, the County finds that the proposal for this property is consistent with the County's Comprehensive Plan, will further the health, safety, welfare and economic well being of the County, and presents an unprecedented opportunity to secure quality planning and growth in an environmentally sensitive manner; and

WHEREAS, the County has determined that there exists a shortage of public parks, public access to the navigable waters surrounding the County, affordable housing and a shortage of funds available to the Beaufort County Board Education to build schools and other public education facilities in the County; and,

WHEREAS, the County of Beaufort desires to protect the important natural environment of the area, while encouraging quality growth and economic opportunity for its citizens, and to do so in a manner which avoids adverse financial impact upon the County or its citizens; and,

WHEREAS, this Development Agreement is being made and entered between Owner and County, under the terms of the Act, for the purpose of providing assurances to Owner and any Secondary Developer that it may proceed with a development plan under the terms hereof, as hereinafter defined, without encountering future changes of law which would materially affect the ability to develop or the cost of future development under the plan, and for the purpose of providing important protections to the natural environment and the financial stability of the County of Beaufort.

NOW THEREFORE, in consideration of the terms and conditions set forth herein, and other good and valuable consideration, including the potential economic benefits to both County and Owner by entering

into this Agreement, and to encourage well planned development, the receipt and sufficiency of such consideration being hereby acknowledged, County and Owner hereby agree as follows:

I. **INCORPORATION.**

The above recitals are hereby incorporated into this Agreement.

II. **DEFINITIONS.**

As used herein, the following terms mean:

"Development" means the land disturbance of portions of the Property and/or vertical or horizontal construction of improvements thereon as contemplated by the Zoning Regulations.

"Development Plan" means the layout and development scheme contemplated for the Property, as more fully set forth in the PUD approval for Okatie Marsh, attached as Exhibit B, and as may be modified per the terms of this Agreement.

"Development Rights" shall mean Development undertaken in accordance with the Zoning Regulations and this Development Agreement.

"Homeowner's Association" or "Owner's Association" shall mean a duly constituted Owner's Association under South Carolina law pursuant to a Declaration of Covenants and Restrictions filed of record in Beaufort County at or about the time of land subdivision, providing regulations for the governance of such subdivision, the upkeep of common elements, including assessment provisions, and other related matters.

"Owner" means La Casa Real Estate and Investment LLC.

"Property" means that certain tract of land described on Exhibit A.

"Purchaser" or "Developer" means any person or entity which may take title to all or a portion of the Property in the future for the purpose of development thereof under the terms hereof.

"Secondary Developer" means any and all successors in title to Owner who or which undertake or cause to be undertaken development activity on the Property. Should Owner undertake or cause to be undertaken development activity on the Property, Owner shall also be deemed a Secondary Developer.

"Term" means the duration of this agreement as set forth in Section III hereof.

"Zoning Regulations" means all terms and conditions of the Okatie Marsh PUD approval, the Zoning and Development Standards Ordinance (ZDSO) of Beaufort County, in effect at the time of the execution of this Agreement, and the terms of this Development Agreement. In case of any conflict, the terms of this Development Agreement shall take precedence, followed by the terms and conditions of the PUD approval, followed by the terms of the ZDSO.

III. **TERM.**

The term of this Agreement shall commence on the date this Agreement is executed by the County and the Owner, and terminate five (5) years thereafter, unless extended by the mutual agreement of the County and the Owner.

IV. **DEVELOPMENT REQUIREMENTS AND DEVELOPMENT OF THE PROPERTY.**

A. **Affordable, Workforce Housing.** Owner agrees to provide certain housing that is affordable for workforce housing. To this end, Owner agrees to abide by the Affordable/Workforce Housing Agreement between the County and Owner a copy of which is attached hereto. Changes to the attached Affordable/Workforce Housing Agreement may be agreed to between Owner, Developers and Beaufort County officials as may be designated by the County Administrator, without formal amendment hereto. Owner's obligation to provide such affordable workforce housing as described in the attached Affordable/Workforce Housing Agreement, shall be fulfilled upon making such housing available to income qualified buyers or renters as scheduled and otherwise described in Exhibit D attached hereto. If no qualified buyers or renters are available when such units are certified for occupancy, Owner shall not be obligated to hold such units beyond 180 days, and thereafter, Owner may otherwise convey or lease such units. This provision that the Owner, or its assigns, shall not be obligated to hold such units beyond 180 days from the time the units are certified for occupancy, applies only so long as a sufficient number of approved units remain to be built within the Property to satisfy the full obligation of Owner to provide the total number of affordable units for sale and for rent as provided under the attached Affordable/Workforce Housing Agreement. Furthermore, before Owner shall be allowed to convey or lease such units as described immediately above, Owner must give the County notice of the unavailability of qualified buyers

and/or renters at least 30 days prior to the expiration of the 180 day period, together with a description of the efforts made by Owner to comply with the Affordable/Workforce Housing Agreement and cooperate with Beaufort County affordable housing officials as required by the Affordable/Workforce Housing Agreement. If qualified buyers and/or renters are not put forward to Owner or its Assignees by the County within such 30 day notice period, then Owner or its Assignee shall be allowed to otherwise convey or lease such units at the end of 180 days from the Certificate of Occupancy, as described and qualified above. Pursuant to that Affordable/Workforce Housing Agreement, Owner is committed under this Development Agreement to actively cooperate with Beaufort County officials to seek qualified applicants for the affordable, workforce housing, and ultimately, Owner is committed and obligated to provide the total number of affordable units established under the Affordable/Workforce Housing Agreement.

B. **ZDSO Applicability.** The Property shall be developed in accordance with the Zoning and Development Standards Ordnance (ZDSO) of Beaufort County, as supplemented and altered by the terms of the Okatie Marsh PUD Zoning district, and the following Development Requirements:

C. **Permitted Uses.** Permitted uses on the Property include family dwellings and accessory uses thereto, recreational uses such as parks, water-related amenities and the like, and commercial, office and retail uses as shown and depicted on the attached Okatie Marsh PUD approval that is labeled Exhibit B. No more than two hundred sixty seven (267) single family dwellings units, one hundred twenty eight (128) multifamily units, and sixty-four thousand eight hundred (64,800) square feet of nonresidential commercial, office and/or retail building space shall be constructed on the Property designated as commercial and colored red on the attached Exhibit B. Owner or its assigns shall be allowed to convert up to ten percent (10%) of the total residential units allowed to additional commercial square footage allowed, at the rate of one residential unit equal to two thousand four hundred (2,400) square feet of commercial as a matter of right hereunder. An additional ten percent (10%) of total residential units may be converted to additional commercial square footage allowed at the same conversion rate, to accommodate economic development opportunities only, for above average wage jobs, within the original commercial area or adjacent thereto, if such additional conversion is approved by the Land Management Committee of

County Council, after consultation with the Planning Department. Such additional square footage of commercial shall be developed within the commercial area of the PUD or within reasonably close proximity thereto, so as to preserve the general pattern of uses established under the PUD, and no amendment hereto or to the PUD shall be required. Timesharing or fractional ownership uses shall not be permitted.

D. **Development.** The locations and layouts and development standards of permitted uses are shown on the Development Plan, included as part of the PUD approval, attached hereto as Exhibit B and made a part hereof. The Development Plan specifies location of roads, building types, uses, amenities and recreational facilities. It is acknowledged that Developer may not materially deviate from the layout shown on the Development Plan without the prior consent of County. Minor changes to development locations and layouts which do not alter approved uses, densities, allowed conversion or development concept shall not require Amendment of the Agreement or the Exhibit B PUD approval.

More specifically, on the subject of minor and major changes to the Development Agreement and PUD, it is first noted and agreed that all uses, densities, conversions and flexibility standards which are specifically provided under the Okatie Marsh PUD and this Development Agreement are not considered changes, but are allowed. Beyond these stated allowances, further changes to the development plan which are the result of final engineering and planning may be approved as minor changes at the Development Review Team (DRT) level, provided such changes do not change the basic road layout system, the function of the required pathway systems, or negatively impact the open space requirements. Minor changes in the location of housing units or non-residential elements, roads and right-of-way widths may be allowed as minor changes, so long as the uses and densities approved under the PUD and this Development Agreement are not exceeded. All other changes shall be considered major changes, and require amendment hereof and/or amendment of the PUD, unless otherwise provided in this Development Agreement. If an applicant and the DRT fail to agree on whether a particular requested change is major or minor, the matter may be brought to the Land Management Committee of Council, whose decision shall be final.

E. **Multiuse Recreational Plan**. Exhibit B to this Development Agreement reflects along the southern border a "multiuse recreational trail" that extends from Highway 170 to the Park on the Okatie River. Public access of this trail shall be available during the hours when the Park is open. No motor driven vehicles, motor bikes, or means of conveyance shall be permitted, other than bicycles. The Owner envisions that portions of the multi-use recreational trail may become incorporated as a part of the East Coast Pathway System.

Owner shall construct the "multi-use recreational trail" from Highway 170 to the Park area according to the schedule as set forth and described on Exhibit D hereto; provided, however, that Owner shall prepare and record a land use covenant, in a form to be approved by the County, with such approval not to be unreasonably withheld, to commit to the completion of the "multi-use recreational trail" if said improvements have not been completed by the fourth anniversary of the execution of this Development Agreement by the County and the Owner.

In addition to the "Multi-use Recreational Trail," the Owner shall work in conjunction with the owners and developers of the adjoining Osprey Point and River Oak PUDs so as to encourage and permit walking and recreational trails between the property and the adjacent tract.

F. **Interconnecting of Roads and 170 Access**. The Owner shall work in cooperation with the owner and developer of the Osprey Point PUD so as to require interconnecting of roads, walking and multiuse/recreational trails, bike paths and roads between the two properties, as more particularly described in the PUD approval.

In addition, Owner acknowledges the right of the Osprey Point property to the joint right of ingress and egress onto Highway 170 from both properties so that there exists a common access on to Highway 170 from both properties, as depicted on Exhibit B hereto.

Owner agrees that the frontage road connection from the main shared entrance road (Pritcher Point Road) with Osprey Point PUD, connecting to the Beaufort County School District Property, shall be planned and permitted at the time of the Development Permit approval for Phase I of Osprey Point. To assure that this important frontage road is built on the Osprey Point property, Owner agrees to build the road as part of

the Phase I development or provide adequate bonding in accordance with Beaufort County law to guarantee construction of the road. Owner will provide and record an easement grant to Beaufort County, establishing perpetual rights for the general public to travel upon such frontage road, and such easement shall be recorded within sixty (60) days of final development approval to construct the frontage road. All other roads, pathways and trails within Okatie Marsh, as shown on the Exhibit B Master Plan, shall be constructed at the time of associated development permitting for subsequent phases.

G. **School Capital Construction Fee**. The laws of the State of South Carolina do not permit the imposition of impact fees for the effect and impact that development has or will have upon the public school systems servicing the Property. Owner agrees to pay to Beaufort County the sum of $6,000 per residential dwelling unit which is 2400 square feet or greater, and a prorated sum of $2.50 per square foot for all residential units less than 2400 square feet (heated interior). All commercial development shall pay a fee of $2.50 per square foot of interior heated space to Beaufort County. These sums shall be payable at the time that a lot or residential unit or commercial building is initially transferred to an end user from a Developer or Secondary Developer. These fees shall not be applicable to transfers to service providers or Property Owner Association(s) or governmental related entities.

At the end of five (5) years from the date of this Development Agreement, if this Development Agreement is extended beyond the initial 5 year period, the amount of the School Capital Construction fee shall be increased by the sum of the increase in the Consumer Price Index for All Urban Areas (CPI-U) and annually thereafter on each succeeding anniversary, as such increase is measured against the immediately preceding year.

The adjustment from the $6,000 base fee for smaller residential units as set forth above is justified by the following factors specific to this Development Agreement and the Okatie Village development area:

1. The parties recognize that the Lowcountry Economic Network has stated that smaller units, located near commercial/business areas of an integrated mixed-use village, need to be kept as affordable as possible to facilitate workforce housing and help attract desirable economic development within the commercial area.

2. Beaufort County Affordable Housing officials have expressed the desire that workforce housing be kept as affordable as possible within Okatie Village.
3. Specific economic studies performed by Strom Thurmond Institute, for Okatie Village, suggest that a majority of residents in Okatie Village will not be new to Beaufort County because of Okatie Village development, but would have moved to Beaufort County anyway.
4. Specific design concepts of Okatie Village as a walkable, mixed-use community adjacent to schools, should lower service costs, including school transportation and equipment costs.
5. Substantial other public donations and public benefits are included under the PUD and this Development Agreement, as endorsed by the Beaufort County Planning Staff and the Planning Commission.
6. Additional infrastructure funds are provided under paragraph H, below, which could be utilized by Beaufort County for various infrastructure needs, including further school needs.

Notwithstanding the above, should the State of South Carolina adopt legislation which allows local governments to impose Development Impact Fees for Schools, and should Beaufort County adopt such a School Impact Fee Ordinance, the fees provided for hereunder shall be adjusted to the extent necessary, so that School Capital Construction fees hereunder do not increase or decrease, when combined with any future adopted Development Impact Fees for schools. In other words, the total of School Capital Construction Fees established hereunder, and any future adopted School Impact Fees, shall not exceed the total of School Capital Construction Fees hereunder, and the time of payment shall not change. Furthermore, should Beaufort County approve any PUD or Development Agreement in the future which imposes lesser School Capital Construction Fees than are imposed upon the Property hereunder, after due allowance for potential differences in circumstance such as land contributions or other forms of contribution or compensation, then the School Capital Construction Fees hereunder shall be automatically reduced to

the amounts being charged under such future approved PUD or Development Agreement after appropriate adjustments for such differing circumstances as mentioned above as may be equitably and reasonably determined by Beaufort County Council. In the event residential or commercial development is permitted as reflected by a County approved subdivision plat filed with the Beaufort County Register of Deeds Office prior to the expiration of the Term of this Development Agreement, and sums due hereunder are not yet payable, the Owner shall record a covenant in a form approved by the County encumbering such subdivided portions of the Property obligating the Owner, Purchaser, Developer, or Secondary Developer to pay the School Capital Construction Fee at the time that a residential or commercial lot or unit is transferred to a third-party purchaser, notwithstanding the expiration of the term of the Development Agreement, so long as the County continues to respect and honor its obligations under the Development Agreement, notwithstanding the expiration of the term of the Development Agreement with respect to said permitted and subdivided residential and commercial development.

H. **Additional Fees and Assessment for Road and Other Infrastructure Purposes.** In order to offset the cost of Highway 170 improvements that are made necessary by the impact of Okatie Marsh traffic on Highway 170, and to provide for other potential infrastructure needs, Owner agrees that all residential and commercial property within Okatie Marsh PUD will be submitted to an Owner's Association, by recorded covenant, or a Horizontal Property Regime by recorded Master Deed, under the terms of which each property will be required to make annual payments for delivery to Beaufort County for an Infrastructure Fund, as set forth below. Each property will make annual Infrastructure Fund payments beginning the first year after a residential unit or commercial space is certified for occupancy by Beaufort County. Such fees shall be payable prior to December 31 of each year, and continuing for twelve (12) years, and shall be collected by the respective Owner's Association or Regime, as assessments under the Declaration or Master Deed. As such, these assessments shall be collectable and enforceable by lien rights and foreclosure rights as any other assessment, but the County shall be named as a third party beneficiary with the collateral power to lien and collect, including reasonable attorney's fees, for any amounts not timely collected by the Association or Regime and paid to the County. Beaufort County shall

have the right to review and approve the language to be contained in such documents to assure that the above principles are appropriately set forth.

The annual fees (assessments) for Infrastructure Fund purposes hereunder, shall be $180 per year for each residential dwelling unit, payable for 6 years for each unit, and thereafter, shall be $195 for each residential unit for the following 6 years, and $0.25 per heated, interior square foot for all commercial space, payable for 6 years for all commercial space, and thereafter shall be $0.30 per heated interior square foot for the following 6 years.

Final Association and/or Regime documents must be completed and recorded prior to the sale of any property within Okatie Marsh for the area containing such property. It shall be the responsibility of Owner, Developers or their assigns to track and report all activity related to such assessments and payments and to report timely to Beaufort County. During the term of this Development Agreement, such reporting shall be done at the time of annual reports to the County provided elsewhere hereunder. After the expiration of this Agreement, such reporting shall be the responsibility of the respective Association or Regime, and the initial documents shall so provide.

All fees and assessments payable hereunder shall be payable to Beaufort County for use on infrastructure needs such as road improvements to Highway 170 (targeted for a total of approximately $1.85 million for River Oaks, Osprey Point and Okatie Marsh combined, excluding the Preacher density at this time), improvements to public access to waterways in Bluffton Township, needed funds for public safety infrastructure purposes such as fire, police or correctional facility purposes, school purposes, or library improvement purposes. While certain funds are targeted hereunder for road improvement purposes, Beaufort County shall be permitted to utilize all funds, except the designated School Capital Construction Fees, for such other purposes as Beaufort County may deem appropriate.

I. **Public Park and Access to Waterway.** Exhibit B to this Agreement reflects a park by the Owner consisting of approximately **10.7** acres. The location is approximately shown as Exhibit B, and Owner shall have the park surveyed and submit the plat of survey to the County. The park shall include those features described in the PUD approval for the Property. In addition to this right of access to

the Park itself, Owner agrees to allow access to the adjacent waterway for non-motorized boats (canoes, kayaks, etc.). The Owner reserves the right to make and enforce reasonable rules and regulations regarding the use of the park and water access, including restrictions upon hours of operation and allowed activities, and charge reasonable use fees.

In the event said public park and waterway access is not completed as set forth and described in the Development Schedule attached hereto as Exhibit D, the Owner shall encumber the 10.7-acre site for the public park with covenants and restrictions requiring the 10.7-acre site only to be used as a park open to the public providing water access subject to reasonable rules and regulations regarding such use, as described above, or an easement with similar language in favor of the County. Said covenants and restrictions or easement shall be subject to the County's prior review and approval, which approval shall not be unreasonably withheld, and shall be drafted and recorded within sixty (60) days of the estimated time for completion set forth on Exhibit D, but in no event later than the fourth anniversary of the execution of this Development Agreement by the County and the Owner.

J. **Commercial Property**. The Owner agrees that the Property may contain no more than 64,800 square feet of commercial, office and retail space, except as otherwise stated herein for allowed residential conversion and other compatible commercial purposes and shall also provide for the necessary parking spaces as is set by the Zoning Regulations unless modified by the Design Guidelines. The areas designated "Clubhouse and Pool", passive recreation and picnic area, the crabbing dock and the other amenities to the residential area shall not be deemed commercial. The area designated for commercial is so designated on Exhibit B in red or the attached Design Guidelines, and shall be restricted in use to those uses and standards as set forth in the PUD approval, or elsewhere hereunder.

K. **Restrictive Covenants.** Owner agrees to encumber the Property with Conditions, Covenants and Restrictions (CC&R) to carry out the provisions of this Development Agreement, which CC&R shall be subject to the reasonable approval of the County, such approval not to be unreasonably withheld.

L. **Design Guidelines.** Owner and Beaufort County agree that the adoption of Design Guidelines to regulate certain development activities within the Okatie Village area, including Okatie Marsh PUD, is desirable and necessary to ensure that the basic development theme for the area is carried out over time. To this end, the Design Guidelines attached hereto as Exhibit F are hereby incorporated herein and made a part of this Agreement and a material part of the attached Exhibit B PUD approval. Reasonable flexibility to accommodate changing market conditions and public preferences will be allowed, and minor changes may be approved at the Development Review Team level

V. LEGAL STATUS OF WORKERS/COMMITMENT TO EMPLOYMENT OPPORTUNITIES FOR RESIDENTS.

Owner and the County recognize the importance of having legal workers, only, performing construction and other work on the Property. Owner agrees to supplement current County and State laws by requiring all contractors and subcontractors to sign sworn affidavits that all workers in their employ have been verified as to legal status and that to the best of their knowledge, after reasonable diligence, the contractor or subcontractor has verified such status. Additionally, construction sites will be posted with notices of the legal status requirement and the fact that verification of status may be demanded on the site at any time by Owner, Developers, Secondary Developers and/or the County. Any provision of this paragraph may be altered with consent of the County Administrator to reflect evolving legal and policy decisions on this subject, without formal amendment hereto.

Owner is an equal opportunity employer and demands the same from all its contractors. Owner also recognizes that it is important that citizens of County have opportunity for gainful employment and future advancement in the immediate County area. In order to facilitate opportunity for County residents, Owner agrees to use its best efforts to post notices of all job opportunities within the Property in a conspicuous location at County Office Building on Bluffton Parkway, Bluffton, South Carolina.

VI. DEVELOPMENT SCHEDULE.

The Property shall be developed in accordance with the development schedule, attached as **Exhibit D**, or as may be amended by Owners or Developer(s) in the future to reflect actual market absorption. Pursuant to the Act, the failure of the Owners and any Developer to meet the initial development schedule shall not, in and of itself, constitute a material breach of this Agreement. In such event, the failure to meet the development schedule shall be judged by the totality of circumstances, including but not limited to the Owners' and Developer(s)' good faith efforts to attain compliance with the development schedule. These schedules are planning and forecasting tools only, and shall not be interpreted as mandating the development pace initially forecast or preventing a faster pace if market conditions support a faster pace. The fact that actual development may take place at a different pace, based on future market forces causing modifications to the development schedule, shall not be considered a default hereunder as long as the Owner demonstrates good cause for such modifications, which good cause may include market conditions. The Parties acknowledge that residential and commercial development activity may occur faster or slower than the forecast development schedule, depending upon market conditions. Furthermore, periodic adjustments to the development schedule which may be submitted unilaterally by Owners and/or Developer(s) as a result of market conditions shall not be considered a material amendment or breach of the Agreement, as long as the Owner and/or Developer demonstrates good cause for such adjustments, such as market conditions.

VII. EFFECT OF FUTURE LAWS.

It is the intent of the parties that only the Zoning Regulations and any other laws, regulations and ordinances of the County applicable to the development of land in the County be vested for the Term, subject to the provisions of Section V hereof. All other laws, regulations and ordinances of the County, and those as may be enacted in the future, shall be applicable to the Developer, and its successors and assigns, so long as they do not conflict with the Zoning Regulations or interfere with the ability to utilize and develop the Property in accordance with any then applicable Development Plan.

It is specifically acknowledged that this Agreement shall not prohibit the application of any current or

future building, housing, electrical, plumbing, gas, swimming pool or other standard codes of general application throughout the County, of any tax or fee of general application throughout the County, or of any law or ordinance of general application throughout the County found by the Beaufort County Council to be necessary to protect the health, safety and welfare of the citizens of County. Specifically, the County may apply subsequently enacted laws to the Property in accordance with Section 6-31-80(B) of the Act.

It is specifically acknowledged that nothing in this Agreement shall be deemed to prohibit the County from including the Property in a tax increment financing district.

It is specifically acknowledged that nothing in this Agreement shall be deemed to exempt the Property from fees and taxes that may be imposed by governmental entities other than the County.

VIII. INFRASTRUCTURE AND SERVICES.

County and Owner recognize that services will be provided by the County and other governmental or quasi-governmental entities. For clarification, the parties make specific note and acknowledge the following:

A. Private Roads. All roads within the Property shall be constructed by the Developer, and maintained by it and/or a Homeowners' Association. The County of Beaufort shall not be responsible for the construction or maintenance of any roads within the Property, and the Developer and/or Homeowners' Association shall continue the maintenance until such time as the roads are accepted for maintenance by an appropriate governmental body. The County shall not be required to accept title to any roads. The roads will be open to the public, provided, however, the Developer or an empowered Homeowners' Association may restrict public access between the hours of 8 P.M. and 8 A.M. daily.

B. Public Roads. The major public road that serves the Property is Highway 170 and is under the jurisdiction of the State of South Carolina regarding construction, improvements and maintenance. County shall not be responsible for construction, improvements or maintenance of this or any other public roads which now or hereafter serve the Property, unless the County elects to do so in the future. It shall be the responsibility of the Developer to adhere to applicable state or county requirements regarding ingress and egress to Highway 170 or any other public roads that may serve the Property.

The Commercial property shall share access to Highway 170 with the other owners of property lots within, using frontage roads and/or back entrances, and shall have separate access onto Highway 170 only as shown on the Exhibit B Development Plan.

C. **Potable Water.** Potable water will be supplied to the Property by Beaufort-Jasper Water & Sewer Authority (BJWSA) pursuant to infrastructure in place. Owner will construct or cause to be constructed all necessary water service infrastructures within the Property, which will be maintained by it or the Authority or a Homeowner's Association. County shall not be responsible for any construction, treatment, maintenance or costs associated with water service to the Property. The Owner and its successors and assigns agree that all Development, with the exception of irrigation and facilities existing at the date of this Agreement, will continue until demolished, and with regard to all new construction service shall be provided by Beaufort-Jasper Water & Sewer Authority. Developer shall be responsible for all financial arrangements with the BJWSA.

D. **Sewage Treatment and Disposal.** Sewage collection, treatment and disposal will be provided by BJWSA. Owner will construct or cause to be constructed all necessary sewer service infrastructures within the Property, which will be maintained by it or the Authority or a Homeowner's Association. County shall not be responsible for any construction, treatment, maintenance or costs associated with sewer service to the Property. The Owner, and its successors and assigns, agree that all Development, with the exception of facilities existing at the date of this Agreement will be served by sewer prior to occupancy and that when the existing buildings are demolished all sewer disposal shall be through BJWSA. Developer shall be responsible for financial arrangements with BJWSA, although the County may participate in the case of work force housing and/or affordable housing. Owner agrees to seek an agreement with BJWSA regarding the use of treated waste water for irrigation purposes to the extent practical and legal as part of its development.

E. **Drainage System.** All storm water runoff and drainage system improvements within the Property will be designed utilizing best management practices, will be constructed by Owner, Developer or their assigns, and maintained by Owner, Developer and/or a Homeowners' Association. The

County of Beaufort will not be responsible for any construction or maintenance costs associated with the drainage system within the Property.

The Owner, its successors and assigns, shall be required to abide by all provisions of federal and state laws and regulations, including those established by the Department of Health and Environmental Control, the Office of Ocean and Coastal Resource Management, and their successors, for the handling of storm water.

The Owner has prepared a study of development drainage characteristics of the area, prepared a master plan of the storm water drainage systems, and shall construct such storm water drainage systems in accordance with the approved plans, and maintain the systems allowing proper operation and function.

Owner's study shall include documented baseline data of normal annual ranges of water quality conditions in adjacent tidal creeks to the Property for salinity, coli form bacteria, dissolved oxygen content, nitrogen and phosphorous. Baseline testing will include data collected by Owner beginning in the Spring of 2008. During all development activity, Owner shall ensure that the baseline water quality conditions demonstrated in Owner's baseline study are not exceeded or detrimentally impacted by construction development activities conducted on the Property. To ensure that water quality baseline activities are not exceeded due to development activity on the Property, water quality will be monitored, at Owner's expense, by an engineering firm mutually agreeable to the Owner and the County. In the event that water quality monitoring demonstrates a degradation in the water quality of tidal creeks adjacent to the Property as compared to the baseline data in the Owner's study and such degradation is due to development activity on the Property, modifications of the stormwater treatment system on the Property shall be required so that no further excess deviations from the baseline water quality data are experienced due to development activity on the Property. It is understood that the Owner shall not be responsible for deviations in water quality that result from natural conditions or activities on other property (other than Okatie Marsh), which deviation's causes are not with the control of the Owner;

Covenants and restrictions shall be placed on the developed portions of the Property to ensure that applicable Homeowner's Association(s) or other sustainable independent corporate entity or entities acceptable to the County, fund a water quality program through sustained assessments and/or special fees to ensure maintenance of stormwater drainage systems and appropriate monitoring of ongoing water quality samples.

In addition to the water quality safeguards as committed to by Owner above, notwithstanding Section V hereof, Developer and any Secondary Developers shall adhere to any and all future ordinances or regulations of the County (or portions thereof) governing detention, filtration, and treatment of storm water for any undeveloped areas of the Property, provided those ordinances and regulations apply county wide, and are consistent with sound engineering practices. It is specifically agreed, however, that any such future ordinances of the County that directly or indirectly affect the setback, buffer or open space requirements permitted pursuant to the Zoning Regulations will not be applicable to the Owner, Developer and any Secondary Developer within the Property without the Owner's, Developer's or any Secondary Developer's express written consent thereto, and any such future ordinances shall apply only to new phases, developed after the passage of such new laws, and not to previous phases of development.

Owner, Developers, Secondary Developers and/or Homeowner's Associations shall conduct private testing of stormwater quality and shall share results with Beaufort County, at a minimum, at the time of annual reporting hereunder. Owner, Developers and Secondary Developers will participate in any Beaufort County program regarding stormwater testing, including the payment of any county wide fees or assessments for such purposes provided however, that Owner may apply for credit against such fees to the extent that this development may exceed county wide stormwater standards, if the County establishes a policy for granting such credits.

F. **Solid Waste Collection**. Solid waste collection is currently provided by agreements with private companies. Solid waste collection shall be provided to the Property on the same basis as is provided to other residents and businesses within the County.

G. **Police Protection**. The County shall provide police protection services to the

Property on the same basis as is generally provided to other residents and businesses within the County.

H. **Emergency Medical Services.** Such services are now being provided by Beaufort County, and the County will continue to provide emergency medical services to the Property on the same basis as is provided to other residents and businesses within Bluffton Township.

I. **Library Services.** Such services are now provided by Beaufort County. The County of Beaufort shall provide library services to the Property as it currently provides on a County wide basis.

J. **School Services.** Such services are now provided by the Beaufort County School District and such service shall continue.

K. **Recycling Services.** Owner agrees to make recycling mandatory within the Property under a program consistent with Beaufort County laws and fees regarding recycling. These requirements for mandatory recycling shall be added to the Covenants and Restrictions which shall be binding upon all property owners within the Master Plan area. Solid waste collection shall be provided to the Property on the same basis as is provided to other residents and businesses within the County.

L. **Fire Services**. The County of Beaufort agrees to provide fire protection to the Property, on the same basis as is provided to other property within Bluffton Township.

M. **Subsequent Entities or Financing District**. Nothing in this Agreement shall be construed to prevent the establishment by the County, or governmental entity, or some combination of entities, solely or in conjunction with each other, of a Tax Increment District, FILOT, Multi-County Business Park, or other special tax district or financing vehicle authorized by applicable provisions of the Code of Laws of South Carolina (1976 as amended), so long as such do not operate to increase the ad valorem taxes or assessments against the Property, unless applied to all properties located within the County.

N. **Tree Preservation**. After any harvesting or clearing of pine crop areas which may be allowed under Silvaculture, the Developer will submit a survey or exhibit depicting all trees eight (8) inches diameter breast height (DBH) or greater within proposed development phase areas being submitted for development approval, and twenty-five (25) feet beyond. For pine trees existing as part of the planted

pine crop area of the Property, an exhibit shall be a representation of the tree planting pattern. The exhibit will show trees according to row, tree spacing and typical size. The information may be field-verified to ensure accuracy of these factors, but each tree in the remaining pine crop area need not be physically located by standard survey methods. Hardwood trees in excess of eight (8) inches DBH will be described by their actual location.

Individual trees over 24 inches DBH or specimen trees as defined in the Beaufort County ZDSO that are to be removed shall be replaced with trees having an individual caliper measurement in excess of 2.5 inches DBH. Replacement trees shall meet or exceed the total DBH caliper inches removed. Surveyed preserved trees in excess of 2.5 caliper inches may be counted as replacement or post development trees. Total post development tree coverage shall equal 3 hardwood trees per lot, on average, throughout the community, or 12 hardwoods per acre in the case of non-residential development. Developer will use its best efforts to preserve specimen trees.

IX. FEES AND RELATED AGREEMENTS

The County of Beaufort and Owner understand and agree that future development of the Property shall impose certain costs to the County. Eventually, property taxes collected from future development upon the Property are expected to meet or exceed the burdens placed upon the County, but certain initial costs and capital expenditures must be addressed in order to ensure that the present residents of the County are not called upon to pay higher taxes to accommodate the development of the Property. The following items are hereby agreed upon to be provided by Developer to offset such future costs and expenditures:

A. **Fee for Administrative/Public Services.** In order for the County to meet various expenses and obligations associated directly or indirectly with development of the Property, the parties agree that the various impact fees imposed by Beaufort County on other similar residential or commercial property in place at the time of the execution of this Agreement shall be payable by Owner or its successors or assigns as any other developer of property would pay. In addition, Owner agrees to pay the sum of Twenty-Five Thousand Dollars ($25,000) to Beaufort County within One Hundred Eighty (180) days of the recording hereof, to offset the costs of the Beaufort County Planning Department that may be incurred in the

development review and processing stages as development activity proceeds. This shall be a one-time payment.

B. **Attorneys Fees.** Each party to this Agreement agrees to pay their own fees and costs incurred by them.

X. **COMPLIANCE REVIEWS.**

Owner or its designee, shall meet with the County or its designee, at least once per year in the month of January during the Term of this Agreement to review development completed in the prior year, and the development anticipated to be commenced or completed in the ensuing year and any relevant information regarding fee payments, taxes and assessments, including an accounting by Owner or its designee regarding payments made under the Infrastructure Fund provision of Section IV(H) above. The Developer or its designee, shall be required to provide such information as may reasonably be requested, to include, but not be limited to, commercial square footage, acreage or lots of the Property sold in the prior year, commercial square footage, acreage or lots of the Property under contract, and the number of certificates of occupancy anticipated to be issued in the ensuing year and any relevant information regarding fee payments, taxes and assessments, including an accounting by Owner or its designee regarding payments made under the Infrastructure Fund provision of Section IV(H) above. The Developer or its designee, shall be required to compile this information for its development and that of Secondary Developers. Reporting of such information to the County will be made upon such forms as the County and Developer may agree upon from time to time. This Compliance Review shall be in addition to, and not in lieu of, any other reporting or filing required by this Agreement. If, as a result of a Compliance Review, the County determines that Owner, Purchaser, Developer, or a Secondary Developer has committed a material breach of the terms of this Development Agreement, the County shall serve such party in writing notice of such breach pursuant to the procedures set forth in Section 6-31-90 (B) of the Development Act, affording the breaching party the opportunity to respond as set forth in Section 6-31-90 (C) of said Act.

XI. **DEFAULTS**.

The failure of the Owner or County to comply with the terms of this Agreement shall constitute a default, entitling the non-defaulting party to pursue such remedies as deemed appropriate, including specific performance and the termination of this Development Agreement in accordance with the Act; provided, however, no termination of this Development Agreement may be declared by the County, absent its according the Owner, Developer or Secondary Developer the notice, hearing and opportunity to cure in accordance with the Act; and provided further that nothing herein shall be deemed or construed to preclude the County or its designee from issuing stop work orders or voiding permits issued for development when such development contravenes the provisions of the Zoning Regulations or this Development Agreement. A default by a Developer or Secondary Developer shall not be deemed to be a default by Owner hereunder, if Owner has transferred title of the property to such Developer or Secondary Developer unless said default involves a continuing obligation of Owner under Subsection XVI(G) hereof, which obligation has not been released by the County.

Notwithstanding the foregoing, it is acknowledged by all persons, firms or entities claiming or accorded interests in this Development Agreement that the following events shall constitute a default, entitling the County to pursue the termination of this Development Agreement, in accordance with the Act:

1. the failure to timely remit payments required hereunder to the County per the terms of this Development Agreement;

2. if at any time during the Term, prior to the Owner having fulfilled any of their payment obligations there shall be filed by or against them in any court, pursuant to any state or federal statue, a petition in bankruptcy or insolvency, or for reorganization or appointment of a receiver or trustee of all or part of the assets of the Owner, or if it makes an assignment for the benefit of creditors.

XII. MODIFICATION OF AGREEMENT.

This Development Agreement may be modified or amended only by the written agreement of the County and the Owner. No statement, action or agreement hereafter made shall be effective to change, amend, waive, modify, discharge, terminate or effect an abandonment of this Agreement in whole or in

part unless such statement, action or agreement is in writing and signed by the party against whom such change, amendment, waiver, modification, discharge, termination or abandonment is sought to be enforced. Any amendment to this Agreement shall comply with the provisions of Section 6-31-10, et seq. Any requirement of this Agreement requiring consent or approval of one of the parties shall not require amendment of this Agreement unless the text expressly requires amendment. Whenever such consent or approval is required, the same shall not unreasonably be withheld.

XIII. NOTICES.

Any notice, demand, request, consent, approval or communication which a signatory party is required to or may give to another signatory party hereunder shall be in writing and shall be delivered or addressed to the other at the address below set forth or to such other addresses such party may from time-to-time direct by written notice given in the manner herein prescribed, and such notice or communication shall be deemed to have been given or made when communicated by personal delivery or by independent courier service or by facsimile or if by mail, on the fifth (5th) business day after the deposit thereof in the United States Mail, postage prepaid, registered or certified, addressed as hereinafter provided. All notices, demands, requests, consents, approvals or communications to the County shall be addressed to:

The County of Beaufort
P.O. Box 1228
Beaufort, South Carolina 29901-1228
Attention: County Administrator

With Copy to:

And to the Developer Owner at: La Casa Real Estate and Investment, LLC

With Copy to:

Andrew A. Aun, Esq.
Aun & McKay
Post Office Box 3568
Irmo, S.C. 29063

and

Tom McKean - Senior Regional Counsel
Southeast Region KB HOME
1155 Mt. Vernon Hwy, Suite 800
Atlanta, Georgia 30338
Tel: 770-225-6389
Fax: 1-866-449-7385
e-mail: tmckean@kbhome.com

and

Vaux & Marscher, P.A.
Attention: Roberts Vaux, Esq.
Post Office Box 769
Bluffton, SC 29910
email: roberts.vaux@vaux-marscher.com

XIV. ENFORCEMENT.

Any party hereto and its successors and assigns shall have the right to enforce the terms, provisions and conditions of this Agreement by any remedies available at law or in equity, including specific performance and the right of the prevailing party to recover attorney's fees and costs associated with said enforcement. Any Court action concerning this Agreement shall be conducted in Beaufort County, South Carolina.

XV. CHANGES TO DEVELOPMENT REGULATIONS.

Unless authorized by the Act or as set forth hereafter, the Zoning Regulations as applied to the Property shall not be amended or modified during the Term, without the express written consent of the Owner; provided however, the County may amend the Zoning Regulations as they pertain to procedures for

processing land development applications and approvals, approvals of subdivision plats, or the issuance of building permits.

XVI. GENERAL.

A. **Subsequent Laws**: In the event state or federal laws or regulations are enacted after the execution of this Development Agreement or decisions are issued by a court of competent jurisdiction which prevent or preclude compliance with the Act or one or more provisions of this Agreement ("New Laws"), the provisions of this Agreement shall be modified or suspended as may be necessary to comply with such New Laws. Immediately after enactment of any such New Law, or court decision, a party designated by the Owner and the County shall meet and confer in good faith in order to agree upon such modification or suspension based on the effect that such New Law would have on the purposes and intent of this Agreement. During the time that these parties are conferring on such modification or suspension or challenging the New Laws, the County may take reasonable action to comply with such New Laws. Should these parties be unable to agree to a modification or suspension, either may petition a court of competent jurisdiction for an appropriate modification or suspension of this Agreement. In addition, the Developer and County each shall have the right to challenge the New Laws preventing compliance with the terms of this Agreement. In the event that such challenge is successful, this Agreement shall remain unmodified and in full force and effect.

B. **Estoppel Certificate**: The County and Owner may, at any time, and from time to time, deliver written notice to the other applicable party requesting such party to certify in writing:

1. that this Agreement is in full force and effect,

2. that this Agreement has not been amended or modified, or if so amended, identifying the amendments.

3. Whether, to the knowledge of such party, the requesting party is in default or claimed default in the performance of its obligations under this Agreement, and, if so, describing the nature and amount, if any, of any such default or claimed default, and

4. Whether, to the knowledge of such party, any event has occurred or failed to occur which, with the passage of time or the giving of notice, would constitute a default and, if so, specifying each such event.

C. **Entire Agreement**: This Agreement sets forth and incorporates by reference all of the agreements, conditions, and understandings between the County and the Owner relative to the Property and its development, and there are no promises, agreements, conditions or understandings, oral or written, expressed or implied, between these parties relative to the matters addressed herein other than as set forth or as referred to herein.

D. **No Partnership or Joint Venture**: Nothing in this Agreement shall be deemed to create a partnership or joint venture between the County and Owner or to render such party liable in any manner for the debts or obligations of another party.

E. **Exhibits**: All exhibits attached hereto and/or referred to in this Agreement are incorporated herein as though set forth in full. The exhibits are initialed and dated by each Party to this Agreement.

F. **Construction**: The parties agree that each party and its counsel have reviewed and revised this Agreement, and that any rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not apply in the interpretation of this Agreement or any amendments or exhibits hereto.

G. **Successors and Assigns:**

1. Binding Effect: This Agreement shall be binding upon the Owners' successors and assigns in the ownership or Development of any portion of the Property. A Purchaser, Developer or Secondary Developer of any portion of the Property shall be responsible for the performance of the Owner's obligations hereunder as to portion or portions of the Property so transferred during the term of this Agreement. Purchasers, Developers, Secondary Developers, and other Owner assignees of a portion of the Property with the intent to undertake Development shall be required to execute a written acknowledgement applicable to the portion of the Property being conveyed accepting

the Owner's obligations under this Agreement, said document to be in recordable form and provided to the County at the time of recording any deed transferring all or a portion of the Property for Development purposes. Following delivery of such documents to the county, Owner shall be released from any further liability or obligation with respect to said portion of the Property; provided, however, the Owner shall remain liable for developing affordable, workforce housing as set forth in Subsection IV(F), the public park and access to the waterway set forth in Subsection IV(I), the public safety site set forth in Subsection IV(K) in accordance with the provisions of this Agreement unless the County, at its discretion to be reasonably exercised, agrees to the transfer of such obligations to another Purchaser, Developer or Secondary Developer upon finding that the County's rights under the Development Agreement are adequately protected. This Subsection shall not be construed to prevent Owner from obtaining indemnification of liability to the County from Purchasers, Developers or Secondary Developers. Further, Owner shall not be required to notify the County of, nor shall this Subsection apply to, the sale of single-family dwelling units, multi-family dwelling units or lots in commercial or residential areas which have been platted, subdivided and approved in accordance with the terms of this Agreement and Zoning Regulations.

2. Transfer of Property: Owner shall be entitled to transfer any portion or all of the Property to a Purchaser, Developer or Secondary Developer subject to the following requirements:

a. Notice of Property Transfer. When the Owner intends to transfer all or a portion of the Property to a Purchaser, Developer or Secondary Developer, the Owner shall notify the County in writing thirty (30) days in advance of the transfer specifying the name, address, telephone number, facsimile number, and contact person for the Purchaser, Developer or Secondary Developer.

b. Assignment of Development Rights. Any and all conveyances of any portion of the Property to a Purchaser, Developer, Secondary Developer, or any entity seeking to undertake Development within the Property shall by

contract and covenant running with the land in the deed or recorded assignment agreement into such Purchaser, Developer or Secondary Developer assign a precise number of density units and/or commercial square footage, which assigned number shall reduce the Owner's number of density units and/or commercial square footage provided for herein.

3. Mortgage Lenders: Notwithstanding anything to the contrary contained herein, the requirements to transfer contained in this Subsection shall not apply: (i) to all mortgage lenders either as a result of foreclosure of mortgage secured by any portion of the Property or to any other transfer in lieu of foreclosure; (ii) to any third-party purchaser at such foreclosure; or (iii) to any third-party purchaser of such mortgage lender's interest subsequent to the mortgage lender's acquiring ownership of any portion of the Property as set forth above. Furthermore, nothing contained herein shall prevent, hinder, or delay any transfer of any portion of the Property to any such mortgage lender or subsequent purchaser.

4. Assignment Form: The parties hereto contemplate that the provisions of this Subsection XVI (G) shall be fulfilled and set forth in a form of a Partial Assignment and Assumption of Rights and Obligations Under Development Agreement, to be executed at the time of any transfer of property covered under this Subsection, by the Seller (Assignor), the Purchaser (Assignee) and the County, in a form to be approved by the County and recorded in the land records of Beaufort County.

H. **Governing Law**: This Agreement shall be governed by the laws of the State of South Carolina.

I. **Counterparts**: This Agreement may be executed in several counterparts, each of which shall be deemed an original, and such counterparts shall constitute but one and the same instrument.

J. **Agreement to Cooperate**: In the event of any legal action instituted by a third party or other governmental entity or official challenging the validity of any provision of this Agreement, the parties hereby agree to cooperate in defending such action; provided, however, each party shall

retain the right to pursue its own independent legal defense.

K. **Eminent Domain**: Nothing contained in this Agreement shall limit, impair or restrict the County's right and power of eminent domain under the laws of the State of South Carolina.

L. **No Third Party Beneficiaries**: The provisions of this Agreement may be enforced only by the County and the Owner, its successors and assigns. No other persons shall have any rights hereunder.

M. **Severability**: In the event applicable Federal or State law or regulation prevent or preclude enforcement or compliance with one or more of the provisions of this Agreement, said provisions shall be modified or suspended as may be necessary to comply with the applicable Federal or State laws, or regulations. The parties further agree that if any provision of this Agreement is declared invalid, this Agreement shall be deemed amended only to the extent necessary to make it consistent with applicable Federal or State law, and the balance of this Agreement shall remain in full force and effect.

N. **No Waiver**: Failure of any party hereto to exercise any right hereunder shall not be deemed a waiver of such right and shall not affect the right of such party to exercise at some future time said right or any other right it might have hereunder.

XVII. STATEMENT OF REQUIRED PROVISIONS.

The Act requires that a development agreement must include certain mandatory provisions, pursuant to Section 6-31-60(A). Although certain of these items are addressed elsewhere in this Agreement, the following listing of the required provisions is set forth for convenient reference. The numbering below corresponds to the numbering utilized under Section 6-31-60(A) for the required items:

1. **Legal Description of Property and Legal and Equitable Owners**. The legal description of the Property is set forth in Exhibit A, attached hereto. The present legal owner of the Property is: La Casa Real Estate and Investment, LLC.

2. **Duration of Agreement**. The duration of this Agreement is five (5) years, unless extended per Section III hereof.

3. **Permitted Uses, Densities, Building Heights and Intensities.** A complete

listing and description of permitted uses, building intensities and heights, as well as other development-related standards, are contained in the Zoning Regulations and on the Development Plan. Exhibit E sets forth anticipated population density of the Property at build out. Building heights will be limited to 45 feet unless otherwise permitted in the Design Guidelines attached hereto, measured from the average adjacent ground level to the building (as measured for federal flood elevation certificates) to the eave of the building (excluding chimneys, cupolas, and other such non-habitable spaces).

4. **Required Public Facilities**. The County will provide, or cause to be provided, police and fire services, as well as development application services to the Property. Beaufort-Jasper Water & Sewer Authority will provide water to the Property. Beaufort-Jasper Water & Sewer Authority will provide sewer collection services to the Property. Mandatory provisions and procedures of the Zoning Regulations and this Agreement will ensure availability of roads and utilities to serve the residents on a timely basis.

5. **Dedication of Land and Provisions to Protect Environmentally Sensitive Areas**. The Zoning Regulations, described above and incorporated herein, contain numerous provisions for the protection of environmentally sensitive areas. All relevant state and federal laws will be fully complied with, in addition to the provisions set forth in this Agreement, and as shown on Exhibit B.

6. **Local Development Permits**. Specific permits must be obtained prior to commencing development, consistent with the standards set forth in the Zoning Regulations. Building Permits must be obtained under County law for any vertical or horizontal construction, and appropriate permits must be obtained from the State of South Carolina (OCRM) and the Army Corps of Engineers, when applicable, prior to any impact upon critical area or freshwater wetlands. Access to Highway 170 will be in accordance with permitting procedures of the South Carolina Department of Transportation. It is specifically understood that the failure of this Agreement to address a particular permit, condition, term or restriction does not relieve the

Owner, and its successors and assigns, from the necessity of complying with the law governing the permitting requirements, conditions, terms or restrictions.

7. **Comprehensive Plan and Development Agreement.** The development permitted and proposed under the Zoning Regulations is consistent with the Comprehensive Plan and with current land use regulations of Beaufort, South Carolina, as amended.

8. **Terms for Public Health, Safety and Welfare.** The County Council finds that all issues relating to public health, safety and welfare have been adequately considered and appropriately dealt with under the terms of this Agreement, the Zoning Regulations, and existing law, and further, that entering this Agreement will further the public health, safety and welfare of the present and future residents of Beaufort County.

9. **Historical Structures.** Any historical or archaeological issues will be addressed through the permitting process at the time of Development under the Zoning Regulations and no exception from any existing standard is hereby granted.

IN WITNESS WHEREOF, the parties hereby set their hands and seals, effective the date first above written.

WITNESSES

OWNER:

La Casa Real Estate and Investment, LLC

By: _____

Its: _____

Attest: _____

STATE OF NORTH CAROLINA)
FORSYTH GS
COUNTY OF ~~DAVIE~~) **ACKNOWLEDGMENT**

I HEREBY CERTIFY that on this 29 day of May, 2009. before me, the undersigned Notary Public of the State and County aforesaid, personally appeared Bobby G Slate, and _____known to me (or satisfactorily proven) to be the person whose name is subscribed to the within document, as the appropriate official of LA CASA REAL ESTATE AND INVESTMENT, LLC, who acknowledged the due execution of the foregoing document.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal the day and year last above mentioned.

Susan B Anderson
Notary Public for North Carolina
My Commission Expires: June 20, 2010

OFFICIAL SEAL
SUSAN B. ANDERSON
Notary Public-North Carolina
COUNTY OF DAVIE
My Commission Expires
June 20 2010

SIGNATURES AND ACKNOWLEDGMENTS CONTINUE ON FOLLOWING PAGE

WITNESSES:

COUNTY OF BEAUFORT

Gary Kubic, County Administrator

Attest:
County Clerk - County of Beaufort

STATE OF SOUTH CAROLINA)
)
COUNTY OF BEAUFORT)

ACKNOWLEDGMENT

I HEREBY CERTIFY, that on this 7 day of August, 2009 before me, the undersigned Notary Public of the state and County aforesaid, personally appeared known to me (or satisfactorily proven) to be the persons whose name is subscribed to the within document, who acknowledged the due execution of the foregoing Development Agreement.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal the day and year last above mentioned.

Notary Public for South Carolina
My Commission Expires: August 22, 2009

ROBERT M. DEEB, JR. My Commission Expires NOTARY PUBLIC 08-22-2012 SOUTH CAROLINA

EXHIBIT A

PROPERTY DESCRIPTION

Parcel 3A Tract 1 - 20.527 acres

All that certain piece, parcel, or tract of land, situate, lying and being in Bluffton Township, Beaufort County, South Carolina, containing 20.527 acres, more or leas, and being particularly shown and described as " Parcel 3A Tract 1, 894,142 sq. ft., 20.527 acres" on that certain plat entitled KB Homes, A Boundary Survey of Parcels 3, 3A, 3B & 61, Okatie Highway, Cherry Point Area, Bluffton Township, Beaufort County, South Carolina" dated April 8, 2004 and last revised June 28, 2006, prepared by Forrest F. Baughman, S.C.R.L.S. No: 4922, and recorded in the Office of the Register of Deeds for Beaufort County, South Carolina in Plat Book 116 at Page 38. For a complete and accurate description of the metes, bounds, courses, distances and all other matter shown thereon reference to said plat of record shall be had.

Parcel 3 Tract 2 - 39.561 acres

All that certain piece, parcel, or tract of land, situate, lying and being in Bluffton Township, Beaufort County, South Carolina, containing 39.561 acres, more or leas, and being particularly shown and described as " Parcel 3 Tract 2, 1,723,256 sq. ft., 39.561 acres" on that certain plat entitled KB Homes, A Boundary Survey of Parcels 3, 3A, 3B & 61, Okatie Highway, Cherry Point Area, Bluffton Township, Beaufort County, South Carolina" dated April 8, 2004 and last revised June 28, 2006, prepared by Forrest F. Baughman, S.C.R.L.S. No: 4922, and recorded in the Office of the Register of Deeds for Beaufort County, South Carolina in Plat Book 116 at Page 38. For a complete and accurate description of the metes, bounds, courses, distances and all other matter shown thereon reference to said plat of record shall be had.

Parcel 61 Tract 3 - 35.721 acres

All that certain piece, parcel, or tract of land, situate, lying and being in Bluffton Township, Beaufort County, South Carolina, containing 35.721 acres, more or leas, and being particularly shown and described as " Parcel 61 Tract 3, 1,556,004 sq. ft., 35.721 acres" on that certain plat entitled KB Homes, A Boundary Survey of Parcels 3, 3A, 3B & 61, Okatie Highway, Cherry Point Area, Bluffton Township, Beaufort County, South Carolina" dated April 8, 2004 and last revised June 28, 2006, prepared by Forrest F. Baughman, S.C.R.L.S. No: 4922, and recorded in the Office of the Register of Deeds for Beaufort County, South Carolina in Plat Book 116 at Page 38. For a complete and accurate description of the metes, bounds, courses, distances and all other matter shown thereon reference to said plat of record shall be had.

Parcel 3B Tract 4 - 1.891 acres

All that certain piece, parcel, or tract of land, situate, lying and being in Bluffton Township, Beaufort County, South Carolina, containing 35.721 acres, more or leas, and being particularly shown and described as " Parcel 61 Tract 3, 1,556,004 sq. ft., 35.721 acres" on that certain plat entitled KB Homes, A Boundary Survey of Parcels 3, 3A, 3B & 61, Okatie Highway, Cherry Point Area, Bluffton Township, Beaufort County, South

Carolina" dated April 8, 2004 and last revised June 28, 2006, prepared by Forrest F. Baughman, S.C.R.L.S. No: 4922, and recorded in the Office of the Register of Deeds for Beaufort County, South Carolina in Plat Book 116 at Page 36. For a complete and accurate description of the metes, bounds, courses, distances and all other matter shown thereon reference to said plat of record shall be had.

EXHIBIT B

OKATIE MARSH PUD APPROVAL

The Okatie Marsh PUD Approval for the Property, as adopted October 27, 2008, is hereby incorporated by reference. A complete copy thereof, with all exhibits and attachments thereto shall be attached to constitute Exhibit B.

2008/41

BEAUFORT COUNTY ZONING MAP AMENDMENT FOR SOUTHERN BEAUFORT COUNTY R-600-13-3, 3A, 3B AND 61 (101.36 ACRES TO BE KNOWN AS OKATIE MARSH PUD, WITH 64,800 SQUARE FEET OF COMMERCIAL SPACE AND 395 DWELLING UNITS, LOCATED DIRECTLY SOUTH OF THE RIVER'S END SUBDIVISION AND ON THE EAST SIDE OF HIGHWAY 170 IN THE OKATIE AREA); FROM RURAL (R) ZONING DISTRICT TO PLANNED UNIT DEVELOPMENT (PUD) ZONING DISTRICT.

BE IT ORDAINED, that County Council of Beaufort County, South Carolina, hereby amends the Zoning Map of Beaufort County, South Carolina. The map is attached hereto and incorporated herein.

Adopted this 27th day of October, 2008.

COUNTY COUNCIL OF BEAUFORT COUNTY

BY: _____
Wm. Weston J. Newton, Chairman

APPROVED AS TO FORM:

_____
Ladson F. Howell, County Attorney

ATTEST:

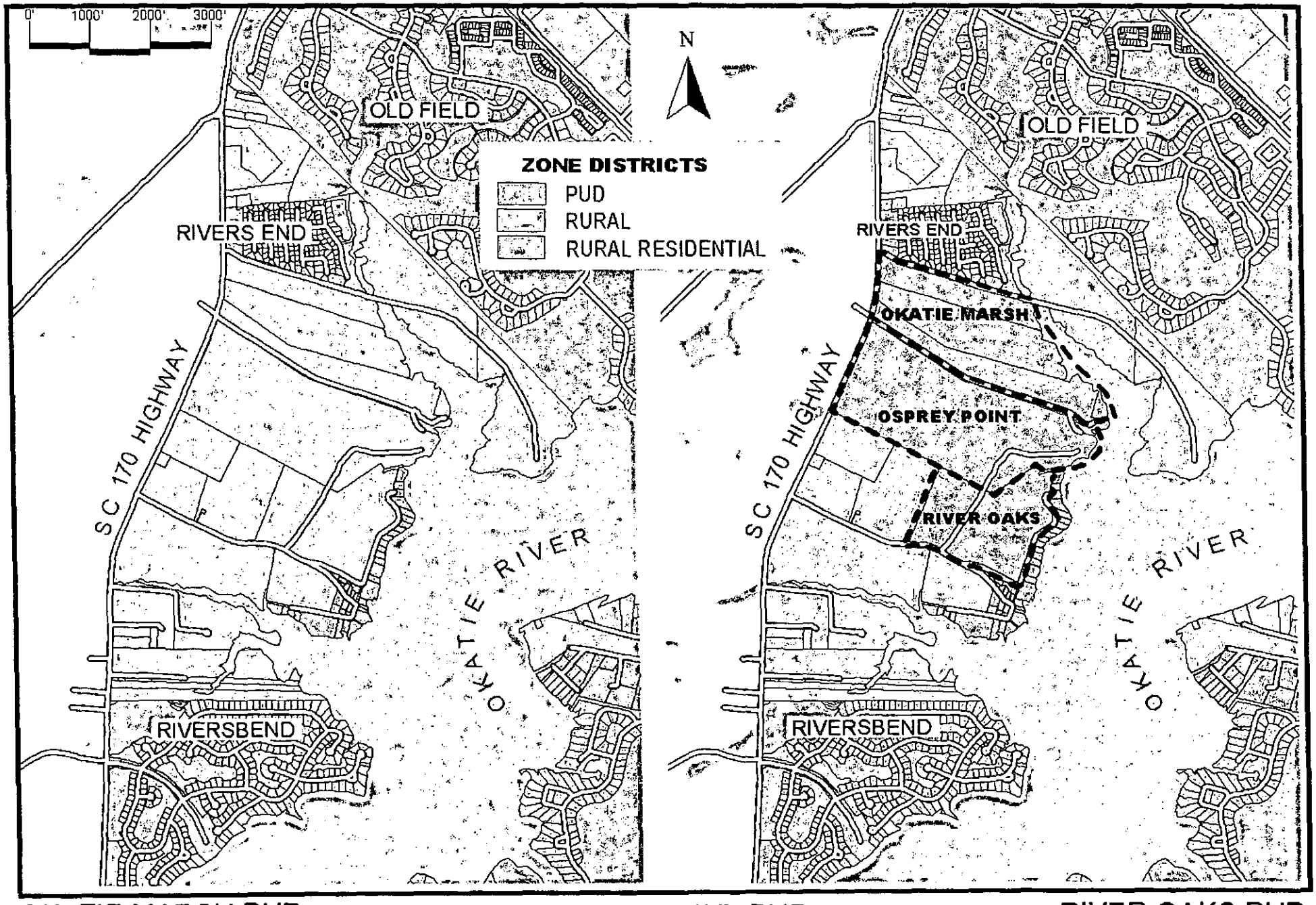
_____
Suzanne M. Rainey, Clerk to Council

First Reading: September 8, 2008
Second Reading: October 13, 2008
Public Hearing: October 13, 2008
Third and Final Reading: October 27, 2008

(Amending 99/12)

Southern Beaufort County Zoning Map Amendment

FROM RURAL [R] TO PLANNED UNIT DEVELOPMENT [PUD]



OKATIE MARSH PUD
R600 13 3,3A,3B&61

OSPREY POINT PUD
R600 13 6

RIVER OAKS PUD
R600 13 8C

Table of Contents

Okatie Marsh at Okatie Village
Highway 170, Beaufort County, SC
101.359 Acres

The above referenced project is proposed for rezoning to PUD as a mixed use, compact smart growth neighborhood in accordance with the overall community PUD plan known as Okatie Village.

PUD zoning will allow a unified site design approach that incorporates the proven principles of smart growth and addresses the goals of the Beaufort County Southern Regional and Comprehensive Plans by providing a well planned, mixed use community with inter-connectivity to surrounding parcels. The plan includes a frontage road running parallel to Highway 170, a +/-6 acre commercial parcel with approximate 64,800 sq. ft. of office/commercial space and 395 dwelling units planned on the remainder of the property. The entire site falls within the Corridor Overlay District and, as such, will require review and approval by the Corridor Review Board at the Development Plan stage.

The Frontage Road will continue through to the existing school property and Cherry Point Road.

Considering the surrounding development patterns and the exploding commercial development directly across the street in Jasper County, this proposed change is consistent with existing development patterns in the area.

The adjacent River End residential community is a typical ¼ acre lot subdivision at 3 units per acre and the River End development south of this parcel is developed at 3.1 units/acre. The overall density for the Okatie Village community is approximately 3.13 units per acre.

With 395 dwelling units proposed, the gross residential density for Okatie Marsh PUD is approximately 3.90 units/AC.

Rather than a single use subdivision, the overall Okatie Village PUD and the individual PUD's within will provide a dynamic, mixed use, compact community with a wide variety of housing choices and price ranges, including much needed "work force" housing.

The Okatie Elementary School and the possibility of a new Middle School next door would provide the opportunity for a truly neighborhood school where the majority of students would be within a 5-7 minute walk or a 2-3 minute bike ride to school, eliminating the need for busing or vehicle trips to take children to school and pick them up again in the afternoon.

The development parcel is well suited for the intended use by location, topography, and existing soil structure. The proposed PUD plan for Okatie Marsh maintains a 50' planted and natural buffer along Highway 170, providing approximately 35% open space rather than the 20% required under the PUD ordinance. The overall Okatie Village open space will be in excess of 44%, more than twice that required under the PUD ordinances. The proposed plan preserves the

great majority of wetlands on site, forest resources, and provides a river buffer that averages ± 175' with no less than a 50' buffer at any point.

The proposed development is consistent in density and make up with adjoining uses and would not adversely impact surrounding properties.

The existing rural zoning is no longer appropriate in this rapidly growing transitional area, as we now have a new Elementary School nearby and this property is now fronting on a 4 lane urban corridor, Highway 170. According to the goals of the Beaufort County Comprehensive Plan, areas without infrastructure, i.e., roads, water and sewer, are zoned rural to maintain that character and discourage the extension of utilities and capital investment that would promote sprawl. This property is already served by all necessary infrastructure at considerable public investment that recognizes the changing character of this rapidly developing transitional area. Such transitional areas are envisioned under the Comprehensive Plan as areas that logically should be allowed to develop at higher densities than true rural agricultural land.

As stated in the Beaufort County ZDSO section 106-2, paragraph (d) " Priority investment areas will be targeted for investment in publicly funded infrastructure, parkland, schools, roads, and sewer and water facilities. The transitional investment areas are to receive moderate levels of capital investment and are defined as those areas likely to become priority investment areas within a 10-15 year time horizon." One only has to look at this area of the 170 corridor and south to acknowledge that status has been realized in only 10 years from the adoption of this ordinance and comprehensive plan. By Beaufort County's own definition, this area is a transitional area with all necessary infrastructure already existing.

The proposed plan provides a use consistent with the goals of the comprehensive plan and allows the owner a more equitable use of this property with densities and uses comparable to that existing on adjacent and nearby properties.

The proposed plan also allows preservation of more open space and an archeological site, as well as providing a deeper river buffer than is required by code. The plan includes pedestrian trails, walks, linkage to adjacent properties, and a linear, passive, public park along the marshes of the Okatie River. This park will feature lagoons, trails, seating & picnic areas, a crabbing dock, and possible observation platforms along the marsh. The archeological site will be left undisturbed and preserved as an interpretive park, explaining the early history of the area and the Okatie Indian tribe that inhabited this region.

The proposed build-out schedule will be approximately 3 – 4 years, with sales expected to be 100 units/year. The owner will maintain sales offices on site as well as model homes areas that may be relocated in future phases.

Road rights-of-way, storm drainage, trails, open space, and recreation areas will be maintained by the developer during development and thereafter by the POA. Water and sewer systems will be owned and maintained by BJWSA with power being supplied by Palmetto Electric Co-op.

In addition to those buffers already mentioned, the plan provides for a 20' buffer along the north side of the property adjacent to the 66' access easement, which provides a total 86' buffer adjacent to the Rivers End Development. There is an existing 50' access easement along the southern boundary with 25' on each property owner's parcel. This easement will be converted to a buffer with a pedestrian trail leading from Highway 170 to the Linear Park along the Okatie headwater.

Some elements of this design feature walking and bike trails from the public right of way to the park on the marsh that is open to the public. Instead of a gated, closed community that blocks access to the marshes, this community promotes and incorporates a public sharing of these natural resources, which has long been a goal of the County's planners and residents.

SCGRID

CURVE	LENGTH	RADIUS	CHORD	BEARING
C1	1057.25	3569.33	1053.39	N10°04'56"E

LINE TABLE		
LINE	LENGTH	BEARING
L1	47.52'	S05°14'49"W
L2	33.68'	S58°56'38"W
L3	22.83'	S80°49'56"E
L4	31.33'	S79°04'53"E
L5	62.11'	S89°05'09"E
L6	47.60'	N68°07'41"E
L7	54.19'	N57°38'00"E
L8	31.13'	S33°19'44"E
L9	85.81'	S57°55'18"W
L10	33.83'	S06°26'13"E
L11	38.88'	S16°25'47"E
L12	47.81'	S19°15'59"E
L13	73.74'	S22°43'54"W
L14	74.41'	S37°44'23"E
L15	39.08'	S20°54'18"E
L16	92.76'	S2°19'46"E
L17	49.19'	S01°46'16"E
L18	11.72'	S72°58'00"E
L19	36.45'	S52°15'25"E
L20	59.68'	S24°50'14"E
L21	45.31'	S21°02'41"E
L22	38.18'	S38°34'49"W
L23	32.80'	S05°54'45"W
L24	10.78'	S05°03'09"W
L25	50.50'	N31°18'15"E
L26	49.21'	S86°48'25"E
L27	21.02'	S18°40'53"E
L28	83.11'	S50°15'50"E
L29	86.62'	S07°05'20"E
L30	25.08'	N87°48'54"E
L31	43.99'	S75°40'18"E
L32	36.78'	S69°35'03"E
L33	61.42'	S48°28'31"E
L34	50.33'	S74°23'38"E
L35	38.58'	S17°35'27"E
L36	85.98'	S13°30'33"E
L37	37.76'	S17°59'29"E
L38	53.93'	S59°26'16"W
L39	44.47'	N89°31'48"W
L40	48.12'	S55°28'59"E
L41	34.38'	S82°48'34"E
L42	27.73'	S56°08'25"W
L43	72.68'	S17°51'10"E
L44	28.45'	S58°55'16"E
L45	57.16'	S09°30'22"W
L46	34.37'	S36°50'28"W
L47	16.73'	S20°00'45"E
L48	25.73'	N74°49'40"E
L49	50.56'	N26°41'47"E
L50	24.74'	S69°02'52"E
L51	20.63'	N08°53'09"W
L52	53.75'	S68°04'24"E
L53	65.39'	N56°38'44"E
L54	82.39'	S49°36'48"E
L55	70.80'	S15°32'41"E
L56	61.07'	S53°30'38"E
L57	74.82'	N85°59'46"E
L58	37.76'	S42°51'54"E
L59	30.48'	S03°59'49"E
L60	36.28'	S49°35'21"E
L61	57.55'	S74°57'03"W
L62	28.37'	S31°52'59"E
L63	89.79'	S73°18'03"E
L64	68.56'	S38°24'05"E
L65	102.72'	S29°42'31"E
L66	29.60'	S20°25'53"E
L67	62.61'	S22°49'11"E
L68	27.91'	S15°37'54"W
L69	42.11'	S22°33'13"E
L70	41.78'	S19°21'00"W
L71	77.05'	S00°40'15"W
L72	56.03'	S06°47'09"W
L73	36.12'	S21°12'16"E
L74	51.65'	S11°38'46"E
L75	26.85'	S31°40'11"W
L76	45.73'	S58°38'32"W
L77	92.46'	S65°41'53"W
L78	80.12'	N63°30'30"W
L79	27.50'	S78°01'13"W
L80	36.40'	N68°24'24"W
L81	53.26'	S84°52'44"W
L82	10.86'	N15°12'10"E
L83	42.53'	N89°05'46"W
L84	12.38'	N29°30'13"E
L85	55.65'	N50°06'45"W
L86	34.35'	N34°04'06"W
L87	42.66'	N57°41'13"W
L88	34.78'	N43°11'55"W
L89	34.42'	S12°38'16"E
L90	12.87'	N58°11'20"W
L91	19.84'	N41°59'07"W
L92	23.24'	N49°37'28"W
L93	29.67'	N63°41'26"W
L94	120.91'	N69°22'01"W
L95	122.80'	N59°48'45"W
L96	148.95'	N89°08'05"W
L97	141.50'	N89°02'09"W
L98	134.32'	N89°31'39"W
L99	152.27'	N89°31'33"W
L100	151.29'	N69°19'48"W
L101	134.83'	N69°14'28"W
L102	138.41'	N59°39'44"W
L103	131.93'	N89°12'01"W
L104	116.03'	N69°29'10"W
L105	113.63'	N68°11'37"W
L106	47.94'	N69°29'31"W
L107	42.80'	N89°31'43"W
L108	72.07'	N58°49'15"W
L109	79.31'	N56°10'05"W
L110	111.64'	N53°48'40"W
L111	118.18'	N55°46'10"W
L112	110.27'	N50°41'48"W
L113	118.38'	S55°53'30"E
L114	143.21'	N55°17'48"W
L115	147.80'	N54°57'27"W
L116	157.34'	N54°48'12"W
L117	172.14'	N54°28'31"W
L118	153.39'	N55°08'38"W
L119	277.01'	N55°09'55"W

THIS AREA SHOWN ON THIS PLAT IS A GENERAL REPRESENTATION OF DHEC-OCRM PERMIT AUTHORITY ON THE SUBJECT PROPERTY. CRITICAL AREAS, BY THEIR NATURE, ARE DYNAMIC AND SUBJECT TO CHANGE OVER TIME. BY GENERALLY DELINEATING THIS PERMIT AUTHORITY OF THE DHEC-OCRM, THE OFFICE OF OCRM IN NO WAY WAIVES THIS RIGHT TO ASSERT PERMIT JURISDICTION AT ANY TIME IN ANY CRITICAL AREA ON THE SUBJECT PROPERTY, WHETHER SHOWN HEREIN OR NOT.

SIGNATURE _____ DATE _____

The critical line shown on this plat is valid for three years from the date of this signature, subject to the cautionary language above.

S.C. GRID COORDINATES
N 182161.2036
E 2022289.0659

JOEL W. OLSEN
CARY SCRAMM
DIST. 600, MAP 13, PARCEL 2A
#1505 OKATIE HWY.

RIVER'S END SUBDIVISION PHASE III

S72°02'02"E

2260.22'

OKATIE HIGHWAY R/W VARIES

50' ACCESS EASEMENT

WETLAND A
14,488 sq. ft.
0.33 acres

WETLAND B
1,747 sq. ft.
0.04 acres

USACE JURISDICTIONAL POND
76,114 sq. ft.
1.747 acres

JOEL W. PRITCHER JR
DIST. 600, MAP 13, PARCEL 61
#1533 OKATIE HWY.

AREA NORTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
83,897 sq. ft.
1.92 acres

NOTE: THE CENTERLINE OF TRAVELED SURFACE OF THE ROAD IS THE SOUTHERN PROPERTY LINE.

N/F SUZANNE T. SHEIK
DIST. 603, MAP 13, PARCEL 6
#95 PRITCHER POINT RD.

AREA SOUTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
92,113 sq. ft.
2.12 acres

LINE 1-LINE 88
REPRESENTS OCRM LINE
& EASTERN PROPERTY LINE

MARSH OF THE OKATIE RIVER

LINE 1-LINE 85
REPRESENTS OCRM LINE
& EASTERN PROPERTY LINE

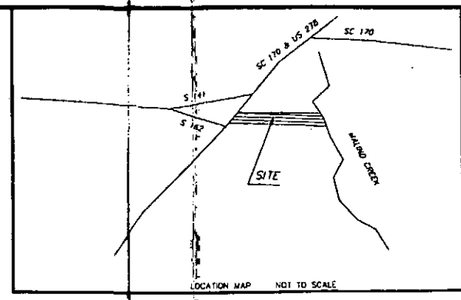
LINE 1-LINE 88
REPRESENTS OCRM LINE
& EASTERN PROPERTY LINE

MARSH OF THE OKATIE RIVER

LEGEND
WOK - WATER OAK
CDR - CEDAR
P - PINE
G - GUM
BAY - BAY
PLM - PALMETTO
MPL - MAPLE
HLY - HOLLY
LOK - LIVE OAK
PCAN - PECAN
MAG - MAGNOLIA
HIC - HICKORY
POP - POPLAR
ROK - RED OAK
CHY - CHERRY
DOG - DOGWOOD
CMF - CONCRETE MONUMENT FOUND
IRF - IRON PIN FOUND
TBM - TEMPORARY BENCH MARK
B.S.L. - BUILDING SETBACK LINE
- INDICATES STREET ADDRESS
TRANSFORMER
ELECTRIC BOX
TELEPHONE PEDESTAL/COMMUNICATOR
SANITARY SEWER MANHOLE
CATCH BASIN
RANDOM ELEVATION SHOTS
CONTOUR LINES

SOUTH CAROLINA T-SQUARE GROUP INC. No. C00229 CERTIFICATE OF AUTHORIZATION

GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)
1 inch = 200 ft.



TOTAL ACREAGE INCLUDING EASEMENTS AND WETLANDS
4,415,205 sq. ft.
101.359 acres

NOTE: RIGHT-OF-WAY INFORMATION TAKEN FROM SCDOT, AT 08 4910 @ PG 807, SURVEY STATIONS 4+880 TO 5+000 Rt.

NOTE: The Lot Appears To Lie In A Federal Flood Plain Zone C Minimum Required Elevation Not Y. MSL/NGVD

SPECIAL NOTE: THIS PROPERTY MAY BE SUBJECT TO EASEMENTS, PROTECTIVE COVENANTS AND OTHER FACTS THAT MAY BE REVEALED BY A CURRENT TITLE SEARCH.

REFERENCE PLAT:
A PLAT BY TGS LAND SURVEYING, DATED 11/28/2001, PREPARED FOR JOEL W. PRITCHER & GERALD M. PRITCHER (JOB #001567).

DATE: MARCH 16, 2004

THE ABOVE PLAT PREPARED BY ME AT THE REQUEST OF

PALMETTO TRADITIONAL HOMES, LLC

A TREE SURVEY OF A 101.359 ACRE TRACT, OKATIE HIGHWAY,
CHERRY POINT AREA, BLUFFTON TOWNSHIP, BEAUFORT COUNTY, SOUTH CAROLINA

DIST. 600, MAP 13, PARCEL 3
DIST. 603, MAP 13, PARCEL 3A
DIST. 603, MAP 13, PARCEL 3B
DIST. 603, MAP 13, PARCEL 61

I HEREBY STATE TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THE SURVEY SHOWN HEREON WAS MADE IN ACCORDANCE WITH THE REQUIREMENTS OF THE MINIMUM STANDARDS MANUAL FOR THE PRACTICE OF LAND SURVEYING IN SOUTH CAROLINA, AND MEETS OR EXCEEDS THE REQUIREMENTS FOR A CLASS A SURVEY AS SPECIFIED HEREIN.
ALSO THERE ARE NO VISIBLE ENCROACHMENTS OR PROJECTIONS AFFECTING THE PROPERTY OTHER THAN THOSE INDICATED.

FORREST F. BAUCHMAN, PLS # 4922

SOUTH CAROLINA LAND SURVEYOR No. 4922 REGISTERED

T-SQUARE GROUP, INC.
PROFESSIONAL LAND SURVEYORS
113 Brent Dr.
Suite 108
Bluffton, SC 29910
Phone 843-757-2830 Fax 843-757-3758
JOB No. 95-0897

C:\Land Projects 2004\95-0897.dwg 3/16/2004 4:14:19 PM EST

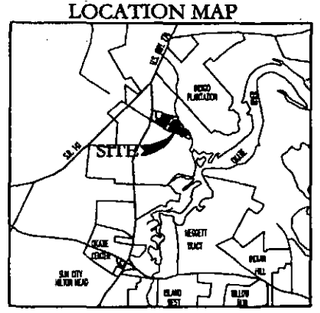
The base information utilized on these plans has been compiled from a variety of unverified sources at various times and as such is intended to be used only as a guide. Edward Pinckney / Associates, Ltd. assumes no liability for its accuracy or state of completion, or for any decision (requiring accuracy) which the user may make based on this information.

RIVERS END
SUBDIVISION PHASE III

US HIGHWAY 170

MARSHES OF THE
OKATIE RIVER

LOCATION MAP



OKATIE MARSH P.U.D
Overall Acreage: +/-101.3 AC
Commercial SF: +/-64,800 SF
Total Dwelling Units: 395 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128
Density: 3.89 units/AC
Open Space: 34.77 AC = 34.3%

epa
Edward Pinckney/Associates, Ltd.
Landscape Architects and Planners
14 Westbury Park Way
Bluffton, South Carolina 29910
843-757-9800
FAX 843-757-9801
www.pinckneyassociates.com

ENGINEERING BY:
THOMAS & HUTTON ENGINEERING CO.
SAVANNAH, GEORGIA
50 Park of Commerce Way
Savannah, Georgia 31405
www.thomas-hutton.com
912-234-5400
FAX 912-234-2950

OKATIE MARSH P.U.D.
EXISTING CONDITIONS & TOPOGRAPHY

OCTOBER 24, 2007

SCALE: 1"=100'
NORTH 0 100 200 300

Note:
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843-757-9800
FAX 843-757-9801

OKATIE MARSH P.U.D.

MASTER PLAN
OCTOBER 24, 2007

NORTH
SCALE 1"=100'
0 100 200 300

OKATIE MARSH P.U.D

Overall Acreage: +/-101.3 AC.
Commercial SF: +/-64,800 SF
Total Dwelling Units: 395 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128
Density: 3.89 units/AC
Open Space: 34.77 AC = 34.3%

128 UNITS MULTI-FAMILY/ APARTMENTS
50' BUFFER
95' WETLAND BUFFER
20' BUFFER
LAGOON
RECREATION AREA
PUBLIC TRAIL SYSTEM
PROPOSED FUTURE PROPERTY LINE
MARSH OF THE OKATIE RIVER
OVERLOOK PARK
INTERPRETIVE PARK
CRABBING DOCK
50' OCRM BUFFER
160 UNITS MULTI-FAMILY APARTMENTS

epd
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843-757-9800
FAX 843-757-9801

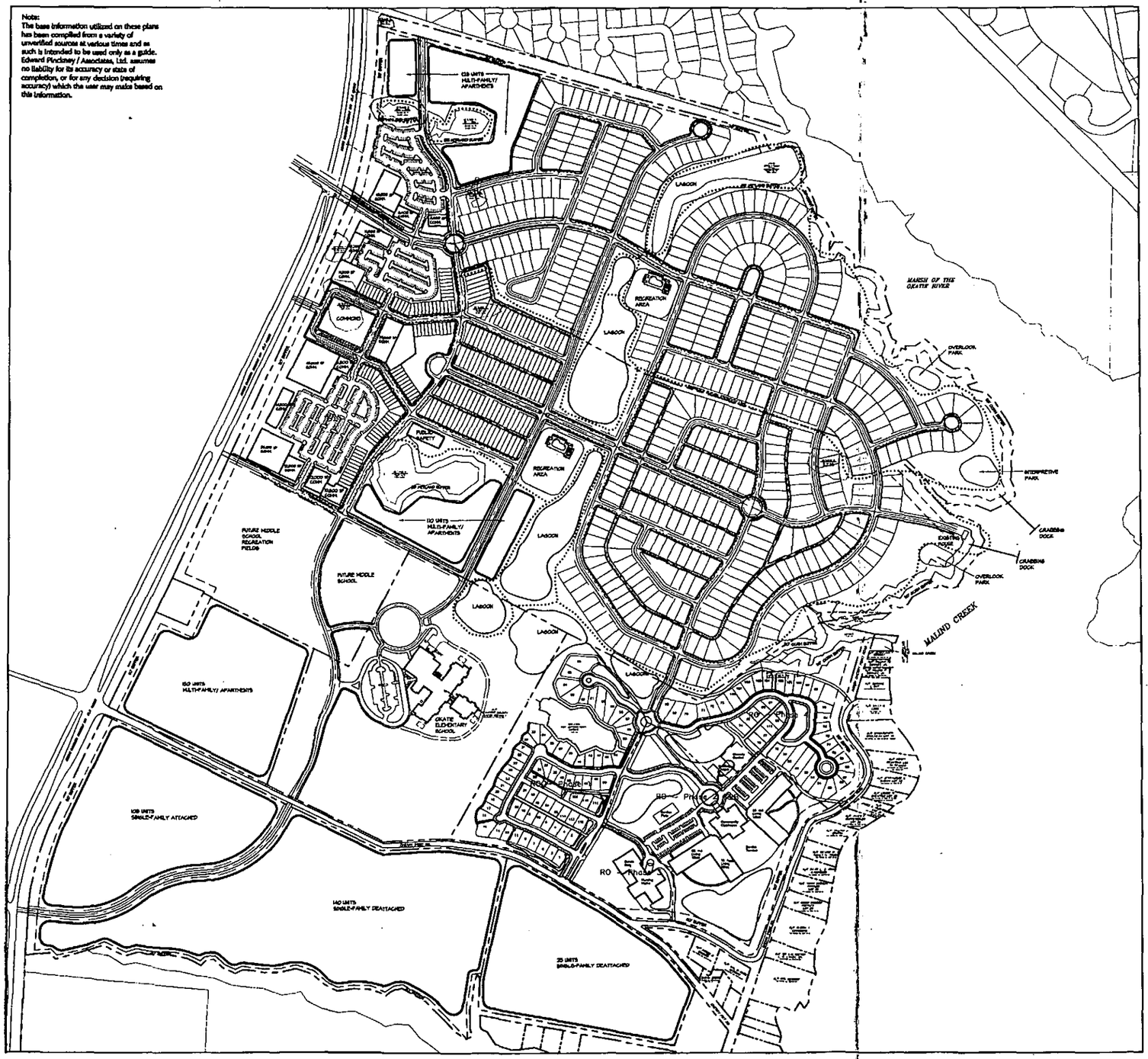
OKATIE MARSH P.U.D.

MASTER PLAN
DECEMBER 4, 2007

NORTH
SCALE: 1"=100'
0 100 200 300

OKATIE MARSH P.U.D
Overall Acreage: +/- 013 AC
Commercial SF: +/-64800 SF
Total Dwelling Units: 395 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128 units
Density: 3.84 units/AC
Open Space: 34.71 AC = 34.3%

Note:
The base information utilized on these plans has been compiled from a variety of unverified sources at various times and as such is intended to be used only as a guide. Edward Pinckney / Associates, Ltd. assumes no liability for its accuracy or state of completion, or for any decision (requiring accuracy) which the user may make based on this information.



epda

Edward Pinckney/Associates, Ltd.
Landscape Architects and Planners

14 Westbury Park Way www.pinckneyassociates.com 843-757-9800
Bluffton, South Carolina 29910 FAX 843-757-9801

OKATIE VILLAGE MASTER PLAN

MASTER PLAN
OCTOBER 24, 2007

NORTH SCALE 1"=200' 0 200 400 600

OKATIE P.U.D. MASTER PLAN (Okatie Marsh, Osprey Point, CCRC, and Other Parcels)

Overall Acreage: +/-428.31 AC
Commercial SF: +/-272,500 SF
Total Dwelling Units: 1340 units
Single-Family Detached: 636 units
Single-Family Attached & Village Condos: 316 units
Multi-Family/Apartments: 388 units
Other Parcels: 418 units
Density: 3.70 units/AC
Open Space: 191.47 AC = 44.7%

OKATIE MARSH P.U.D

Overall Acreage: +/-101.3 AC
Commercial SF: +/-64,800 SF
Total Dwelling Units: 345 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128 units
Density: 3.89 units/AC
Open Space: 34.77 AC = 34.3%

OSPREY POINT P.U.D

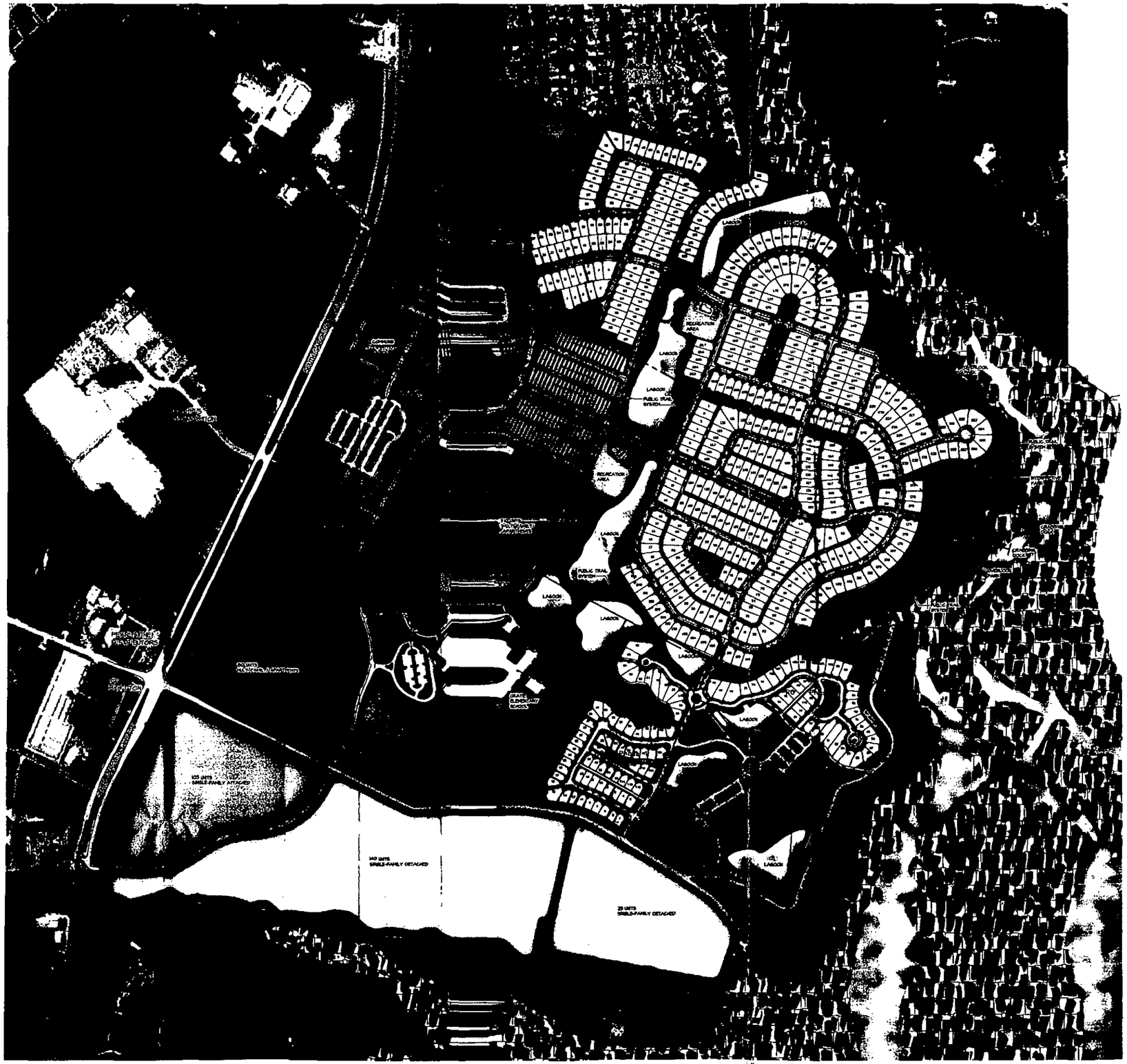
Overall Acreage: +/-119.25 AC
Commercial SF: +/-207,700 SF
Total Dwelling Units: 527 units
Single-Family Detached: 204 units
Single-Family Attached & Village Condos: 213 units
Multi-Family/Apartments: 110 units
Density: 4.41 units/AC
Open Space: 40.8 AC = 34.2%

OTHER PARCELS (incl. existing elementary school, future middle school, and future development)

Overall Acreage: +/-144.22 AC
Commercial SF: N/A
Total Dwelling Units: 418 units
Single-Family Detached: 165 units
Single-Family Attached: 103 units
Multi-Family/Apartments: 150 units
Density: 2.90 units/AC
Open Space: 87.5 AC = 60.7%

RIVER OAKS P.U.D

Overall Acreage: 63.54 AC
Commercial SF: N/A
Total Dwelling Units: 330 units
Density: 5.19 units/AC
Open Space: 28.4 AC = 44.7%



epa
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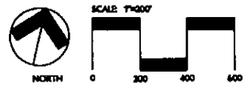
Bluffton, South Carolina 29910 FAX 843-757-9801

OKATIE VILLAGE MASTER PLAN

MASTER PLAN
NOVEMBER 20, 2007



OKATIE P.U.D. MASTER PLAN (Okatie Marsh, Osprey Point, RIVER OAKS, and Other Parcels)
Overal Acreage: +/-428.31 AC
Commercial SF: +/-272,500 SF
Total Dwelling Units: 1340 units
Single-Family Detached: 636 units
Single-Family Attached & Village Condos: 316 units
Multi-Family/Apartments: 388 units
Density: 3.13 units/AC
Open Space: 191.47 AC = 44.7%

OKATIE MARSH P.U.D
Overall Acreage: +/-101.3 AC
Commercial SF: +/-64,800 SF
Total Dwelling Units: 345 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128 units
Density: 3.89 units/AC
Open Space: 34.77 AC = 34.3%

OSPREY POINT P.U.D
Overall Acreage: +/-119.25 AC
Commercial SF: +/-207,700 SF
Total Dwelling Units: 527 units
Single-Family Detached: 204 units
Single-Family Attached & Village Condos: 213 units
Multi-Family/Apartments: 110 units
Density: 4.41 units/AC
Open Space: 40.8 AC = 34.2%

RIVER OAKS P.U.D
Overall Acreage: 63.54 AC
Commercial SF: N/A
Total Dwelling Units: 330 units
Density: 5.19 units/AC
Open Space: 28.4 AC = 44.7%

OTHER PARCELS (incl. existing elementary school, future middle school, and future development)
Overall Acreage: +/-144.22 AC
Commercial SF: N/A
Total Dwelling Units: 418 units
Single-Family Detached: 165 units
Single-Family Attached: 103 units
Multi-Family/Apartments: 150 units
Density: 2.90 units/AC
Open Space: 87.5 AC = 60.7%

Note:
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www.pinckneyassociates.com
843-757-9800
FAX 843-757-9801

OKATIE MARSH P.U.D.

OPEN SPACE EXHIBIT
OCTOBER 24, 2007

SCALE: NOT TO SCALE
NORTH 0 100 200 300

OKATIE MARSH P.U.D

Overall Acreage: +/-101.3 AC
Commercial SF: +/-64,800 SF
Total Dwelling Units: 345 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128
Density: 3.84 units/AC
Open Space: 34.71 AC = 34.3%

128 UNITS MULTI-FAMILY/ APARTMENTS
50' BUFFER
55' WETLAND BUFFER
40,000 SF COMM.
8,400 SF COMM.
8,400 SF COMM.
PROPOSED FUTURE PROPERTY LINE
LAGOON
RECREATION AREA
20' BUFFER
50' OCRM BUFFER
MARSH OF THE OKATIE RIVER
OVERLOOK PARK
INTERPRETIVE PARK
CRABBING DOCK

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Bluffton, South Carolina 29910 FAX 843-757-9801

OKATIE MARSH P.U.D.

PHASING EXHIBIT
OCTOBER 24, 2007

SCALE: NOT TO SCALE
NORTH 0 100 200 300

OKATIE MARSH P.U.D

Overall Acreage: +/-101.5 AC
Commercial SF: +/-64,800 SF
Total Dwelling Units: 345 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128
Density: 3.39 units/AC
Open Space: 54.71 AC = 54.9%

128 UNITS MULTI-FAMILY/ APARTMENTS
PHASE 1C
PHASE 1A
PHASE 1B
PHASE 2
PHASE 3
PHASE 4
PHASE 5
PHASE 6
95' WETLAND BUFFER
40,000 SF COMM.
8,400 SF COMM.
8,400 SF COMM.
MODEL PARK
RECREATION AREA
LAGOON
PROPOSED FUTURE PROPERTY LINE
OVERLOOK PARK
INTERPRETIVE PARK
CRABBING DOCK
MARSH OF THE OKATIE RIVER

COUNTY COUNCIL OF BEAUFORT COUNTY
BEAUFORT COUNTY PLANNING DEPARTMENT
Multi Government Center • 100 Ribaut Road, Room 260
Post Office Drawer 1228, Beaufort, SC 29901-1228
Phone: (843) 470-2724 • FAX: (843) 470-2731

October 26, 2005

Mr. John Thomas
EPA
14 Westbury Parkway, Suite 200
Bluffton, SC 29910

RE: Okatie Marsh (formerly Pritcher Tract)
Archaeological Permit of Approval

Dear John:

I am writing in response to your request for an archaeology review, as required in Section 6.5.1(I) of the Beaufort County Development Standards Ordinance, for the Okatie Marsh project.

An extensive examination of existing documentation has been conducted. The documents examined include the *Cartographic Survey of Historic Sites in Beaufort County, South Carolina; A Comprehensive Bibliography of South Carolina Archaeology;* copies on file with Beaufort County of the topographic maps located at the South Carolina Institute of Archaeology and Anthropology the identify all the recorded archaeological sites in Beaufort County; copies of the records of all the archaeological properties listed in the National Register of Historic Places in Beaufort County; and all other documentation maintained by the Beaufort County Planning Department regarding archaeological and historic resources. In addition, we have reviewed the letter dated April 21, 2004 from Valerie Marcil, the South Carolina State Historic Preservation Office Compliance Archaeologis, and have also have reviewed the project narrative and preliminary site plan submitted by EPA.

Only one archaeological site, 38BU2103, has been determined eligible for the National Register of Historic Places. The preservation plan you have presented and your statement that "The archaeological site will be left undisturbed and preserved as an interpretive park, explaining the early history of the area and the Okatie Indian tribe that inhabited this region", meets the requirements of Section 6.5.1(1) of the Beaufort County DSO. We request that once final plans for the interpretation of the archaeological site are completed a copy of the plans be provided to this office.

It is the opinion of the Planning Office that the proposed development will have no other effect on any archaeological resources listed in, or eligible for listing in, the National Register of Historic Places. Therefore I am authorized by the Planning Director to issue you a Permit of Approval.

If I can be of further assistance please call me at 843/470-2727.

Sincerely,

Ian D. Hill
Historic Preservationist

cc: Hillary Austin

October 13, 2005

Ian Hill
Archeological Resource Planner
Beaufort County
P.O. Drawer 1228
Beaufort, South Carolina 29901-1228

Ref: 101.359 Acres on Highway 170 known as the Okatie Marsh or Pritcher Tract.

Dear Ian:

Please find enclosed a copy of the letter from Valerie Marcil from SHPO relating to the archeological study completed by Brockington and Associates in 2004. All studies are complete and have been reviewed by the State.

We have preserved site 38BU2103 in our plans for development and will set this area aside as an undisturbed natural area and archeological interpretive park as indicated on the attached site plan for the "Okatie Marsh" proposed PUD for KB Home.

We would appreciate your review and approval of the above referenced information for inclusion in the PUD submittal that we will be making to the County on November 3, 2005.

If you have any questions or comments, please do not hesitate to contact me.

Respectfully submitted,

John R. Thomas, ASLA; AICP
Senior Associate

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www.pinckneyassociates.com

April 21, 2004

Mr. David S. Baluha
Brockington and Associates, Inc.
1051 Johnnie Dodds Boulevard, Suite F
Mt. Pleasant, SC 29464

RE: Draft Report, *Cultural Resources Survey of the Palmetto Traditional Homes Okatie Tract, Beaufort County, South Carolina*

Dear Dave:

I have reviewed the above referenced archaeological survey report, and find that the report meets both State and Federal standards for the identification, documentation, and assessment of cultural resources. I concur with the recommendations that site 38BU2103 is potentially eligible for the National Register of Historic Places and that sites 38BU2101 and 38BU2102 are not eligible.

Site 38BU2103 should either be protected from ground disturbance through preservation, or further tested for a definitive National Register evaluation. We recommend the development of a Memorandum of Agreement to manage this site. The remaining two sites warrant no further management considerations.

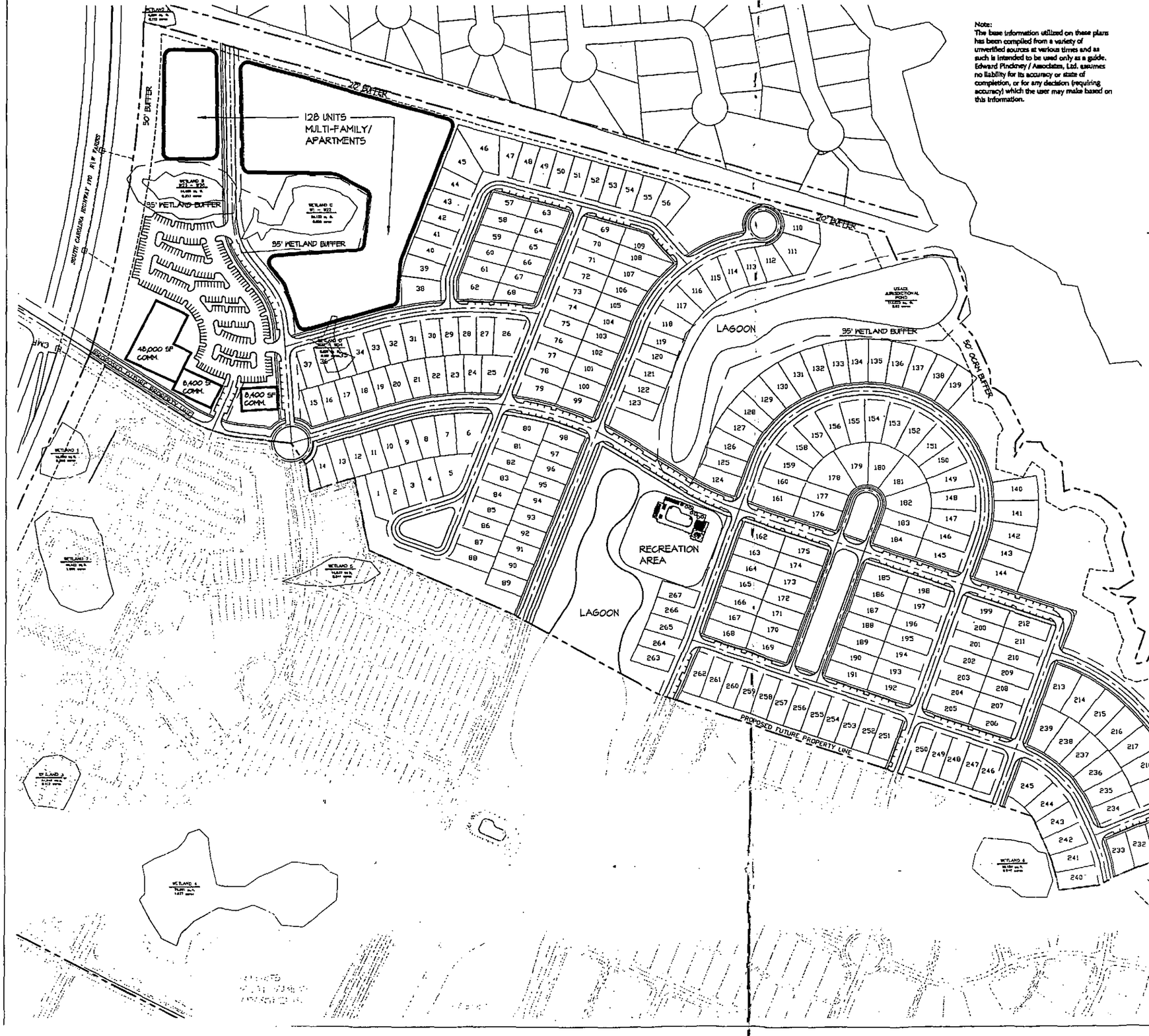
These comments are being provided to assist you with your responsibilities under the South Carolina Coastal Zone Management Act, as amended, and Section 106 of the National Historic Preservation Act, as amended. I can be contacted at (803) 896-6173 if you have any questions or comments.

Sincerely,

Valerie Marcil
Staff Archaeologist
State Historic Preservation Office

cc: Keith Derting, SCIAA

S.C. Department of Archives & History • 8301 Parklane Road • Columbia • South Carolina • 29223-4905 • 803-896-6100 • www.state.sc.us/scdah



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OKATIE MARSH P.U.D.

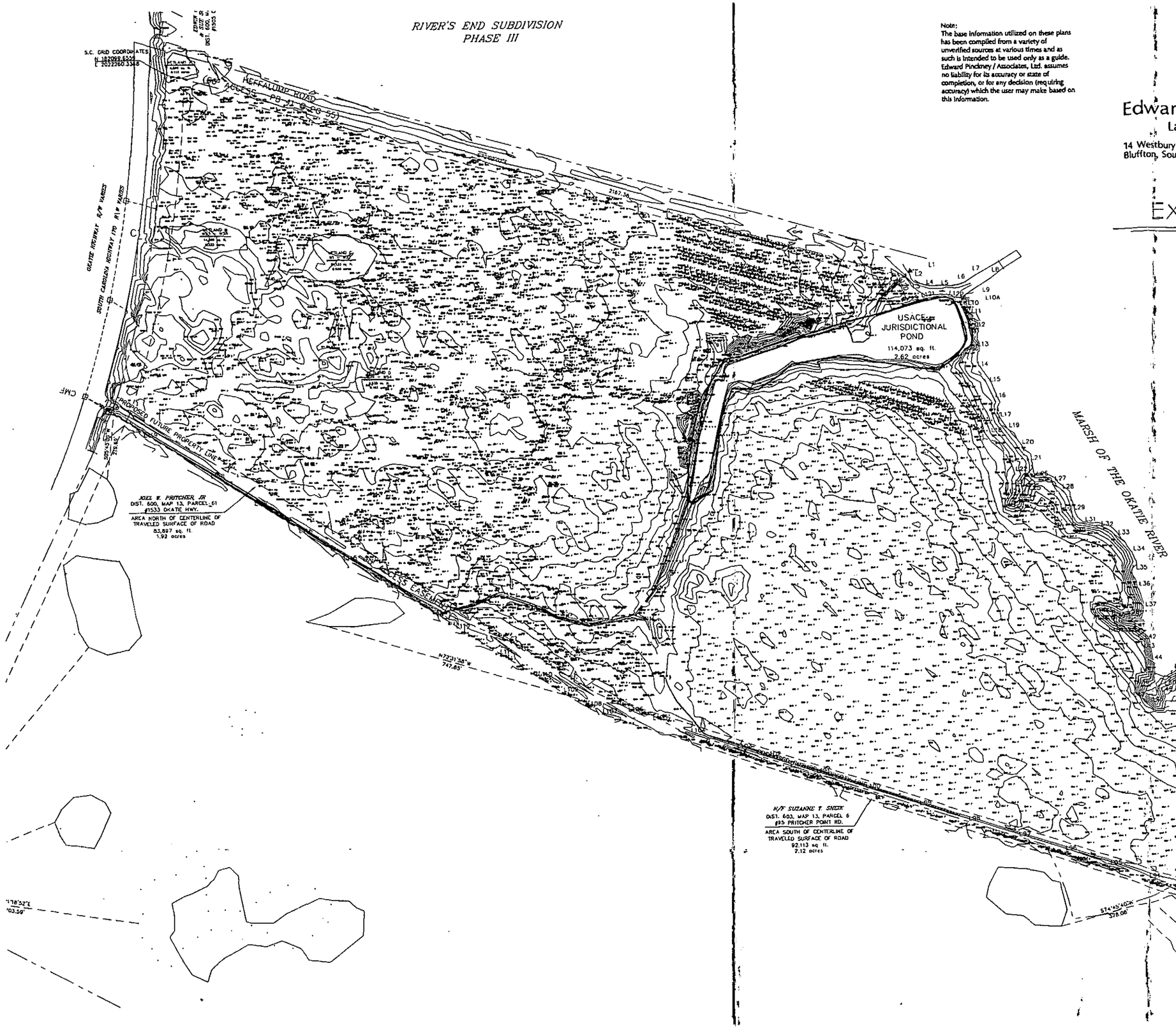
MASTER PLAN
OCTOBER 24, 2007

SCALE NOT TO SCALE
NORTH 0 100 200 300

OKATIE MARSH P.U.D

Overall Acreage: +/-101.3 AC
Commercial SF: +/-64,800 SF
Total Dwelling Units: 395 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128
Density: 3.89 units/AC
Open Space: 34.77 AC = 34.3%

MARSH OF THE OKATIE RIVER



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EXISTING CONDITIONS

OKATIE MARSH
OCTOBER 18, 2007

SCALE: NOT TO SCALE
NORTH 0 100 200 300

OKATIE MARSH P.U.D

- Overall Acreage: +/-101.3 AC
- Commercial SF: +/-64,800 SF
- Total Dwelling Units: 395 units
- Single-Family Detached: 267 units
- Single-Family Attached & Village Condos: N/A
- Multi-Family/Apartments: 128
- Density: 3.89 units/AC
- Open Space: 34.77 AC = 34.3%

RIVER'S END SUBDIVISION
PHASE III

Note:
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Bluffton, South Carolina 29910 FAX 843-757-9801

MASTER PLAN

OKATIE MARSH
OCTOBER 18, 2007

SCALE: NOT TO SCALE
NORTH 0 100 200 300

OKATIE MARSH P.U.D

Overall Acreage: +/-101.9 AC
Commercial SF: +/-64,800 SF
Total Dwelling Units: 395 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128
Density: 3.89 units/AC
Open Space: 34.77 AC = 34.3%

128 UNITS MULTI-FAMILY/ APARTMENTS
PARKING
20,000 SF COMM.
6,400 SF COMM.
6,400 SF COMM.
USACE JURISDICTIONAL POND 114,073 sq. ft. 2.62 acres
LAGOON
RECREATION AREA
LAGOON
OVERLOOK PARK
INTERPRETIVE PARK
MARSH OF THE OKATIE RIVER
MARSH OF THE OKATIE RIVER
THE OKATIE
HEFFALUMP ROAD
(66' ACCESS P/B 41 PG 551)
ACCESS EASEMENT
SOUTH CARLOLINA HIGHWAY 170 R/W VARIES
50' BUFFER
35' WETLAND BUFFER
JOEL W. PRITCHER, JR
DIST. 600, MAP 13, PARCEL 61
#1533 OKATIE HWY.
AREA NORTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
83,897 sq. ft.
1.92 acres
M/I SUZANNE T. SHEEN
DIST. 600, MAP 13, PARCEL 6
#26 PHILLIES POINT RD.
AREA SOUTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
92,513 sq. ft.
2.12 acres

OKATIE MARSH (PRITCHER TRACT)

Highway 170

Beaufort County, South Carolina

ENVIRONMENTAL IMPACT ASSESSMENT

November 17, 2005

Prepared By:

Edward Pinckney/Associates, Ltd.
14 Westbury Park Way, Suite 200
Bluffton, South Carolina 29910

History:

This 101.359 acres parcel has been owned for several generations by the Pritcher family. The property has primarily been used for agricultural purposes and is currently under Silviculture by the family.

Mr. Jody Pritcher currently resides on the property. Mr. Pritcher's home faces on the Okatie marshes at the end of Pritcher Point Road.

Project Description:

Okatie Marsh is proposed as a 101.359 acres PUD with a mixture of attached and detached residential uses and approximately 2 acres of neighborhood mixed use commercial fronting on Highway 170.

The site is relatively flat with storm drainage from the site being directed into the lagoon system for additional bioremediation prior to ultimate discharge into the natural environment.

The Master Plan, as proposed, contains 324 residential single family lots which include attached town homes and detached single family lots.

The site, having been under Silviculture in recent years, is comprised mostly of young growth pine and mixed gum and hardwoods. The area along the marsh frontage and at the identified archeological preservation site contains some significant hardwoods and specimen cedar trees that are all intended to be preserved.

As demonstrated in the previously submitted Resource Calculations and the attached Resource Protection exhibit, all required resource protection levels are met and in most cases exceeded with this Master Plan. In fact, the total resources actually preserved are 100% greater than that required by code. Likewise, the actual open space provided is 175% of that required by code.

Planning Considerations:

In addition to the above planning and design considerations, the following areas were considerations that affected this outcome of this plan:

1) Protection of the river and marsh environment through larger buffers than that required by code. In some places this buffer reaches well over 300' from the critical line and averages approximately 175' from the critical line.

2) Protection of the river, wetlands and water body through stormwater bioremediation techniques that include filtration areas, lagoons, plant

materials and other measures that augment the stormwater system that will be engineered by Thomas & Hutton Engineering Company.

3) The project is designed for extensive pedestrian access throughout the site with trails, pathways, walks and parks for use by the community.

4) The plan provides public access to the Riverfront Park and a bicycle trail from Highway 170 to the park.

5) Vehicular interconnectivity is provided to adjacent parcels at appropriate points. A frontage road is also provided running roughly parallel with Highway 170, which will serve as access to the proposed 2 acre mixed use commercial parcel.

It is our professional opinion that this proposed plan and the developers have gone far beyond the minimum requirements of Beaufort County and the State of South Carolina in these areas. In accordance with Beaufort County requirements as outlined in the ZDSO section 106-367 the following evidences are offered in support of the above statement.

1) This project is designed in strict accordance with all applicable standards of the Beaufort County ZDSO and PUD Ordinance.

2) Alternate sites that meet the unique qualities of this site are not available in this area of the Highway 170 corridor. All parcels in this area bear the same environmental characteristics so there is no useful purpose in evaluating other comparable sites in the area for the intended use.

3) Alternate designs have been explored for this site considering the market demand for the housing mix, economic feasibility of the design options and their environmental impact on the site and surroundings. Two alternate designs at significantly higher densities are included in this report. The proposed plan presented here fits the unique environmental characteristics of this particular site, preserves the maximum amount of open space, meets the County's stated goals of river protection, environmental preservation, interconnectivity and meets the client's minimum program for development.

4) This project has no identifiable environmental impacts on adjoining land uses, communities, or on users of public or private roads. This project will contribute greatly to the County's goal of river protection and providing public access and recreational opportunities along the Okatie River.

5) The site is typical of Lowcountry Silviculture operations with some larger hardwoods and cedars along the river. The primary plant colonies are loblolly pine, sweet gum and several varieties of oaks. One stand of specimen eastern red cedar has also been identified and preserved on the site. Shrubs and vines

are typical, being composed primarily of wax myrtle, vomitoria holly, native grasses and vines.

6) There are no known or perceived environmental safety risks to site users.

7) A site study by Sligh Environmental of Savannah Georgia has established that there are no threatened or endangered species on this site and none are known to exist within 500 feet of the project area.

8) Wetland verification for the site has been received from the Army Corps of Engineers and all surveyed wetlands are preserved on the proposed plan. A copy of this verification is included with the PUD submittal.

9) Also included with this report is a copy of the Threatened and Endangered Species Survey Report prepared by Sligh Environmental Consultants, Inc.

OKATIE MARSH

(PRITCHER TRACT)
CHERRY POINT SECTION
BEAUPORT COUNTY, SOUTH CAROLINA

NATURAL RESOUCE PROTECTION

PREPARED FOR:
KB HOME

PREPARED BY:

Edward Pinckney/Associates, Ltd.
Landscape Architects and Planners
14 Westbury Park Way www.pinckneyassociates.com 843-757-9800
Bluffton, South Carolina 29910 FAX 843-757-9801

OCTOBER 18, 2005

SCALE : 1" = 100'-0"
0 50 100 200 300 400 500

NORTH

VICINITY MAP
N.T.S

MARSH OF THE OKATIE RIVER

RIVER'S END SUBDIVISION PHASE III

HEFFALUMP ROAD (66' ACCESS PB 41 @ PG 55)

OKATIE HIGHWAY (U.S. 17)

SC 170

JOEL W. PRITCHER JR
DIST. 600, MAP 13, PARCEL 61
#1533 OKATIE HWY.
AREA NORTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
83,697 sq. ft.
1.92 acres

JOEL W. PRITCHER JR
DIST. 600, MAP 13, PARCEL 61
#1533 OKATIE HWY.
AREA SOUTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
92,113 sq. ft.
2.12 acres

N/F WILLIAMS T. SLOCK UNDEVELOPED
DIST. 600, MAP 13, PARCEL 6
#95 PRITCHER POINT RD.
AREA SOUTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
92,113 sq. ft.
2.12 acres

NOTE: THE CENTERLINE OF TRAVELED SURFACE OF THE ROAD IS THE SOUTHERN PROPERTY LINE.

USACE JURISDICTIONAL POND
111,073 sq. ft.
2.62 acres

LINE 1—LINE B1 REPRESENTS OCRM LINE & EASTERN PROPERTY LINE

LINE 1—LINE B8 REPRESENTS OCRM LINE & EASTERN PROPERTY LINE

LINE 1—LINE B6 REPRESENTS OCRM LINE & EASTERN PROPERTY LINE

NON-TIDAL WETLANDS

50' RIVER BUFFER

MIXED UPLAND FOREST - MATURE

MIXED UPLAND FOREST - YOUNG

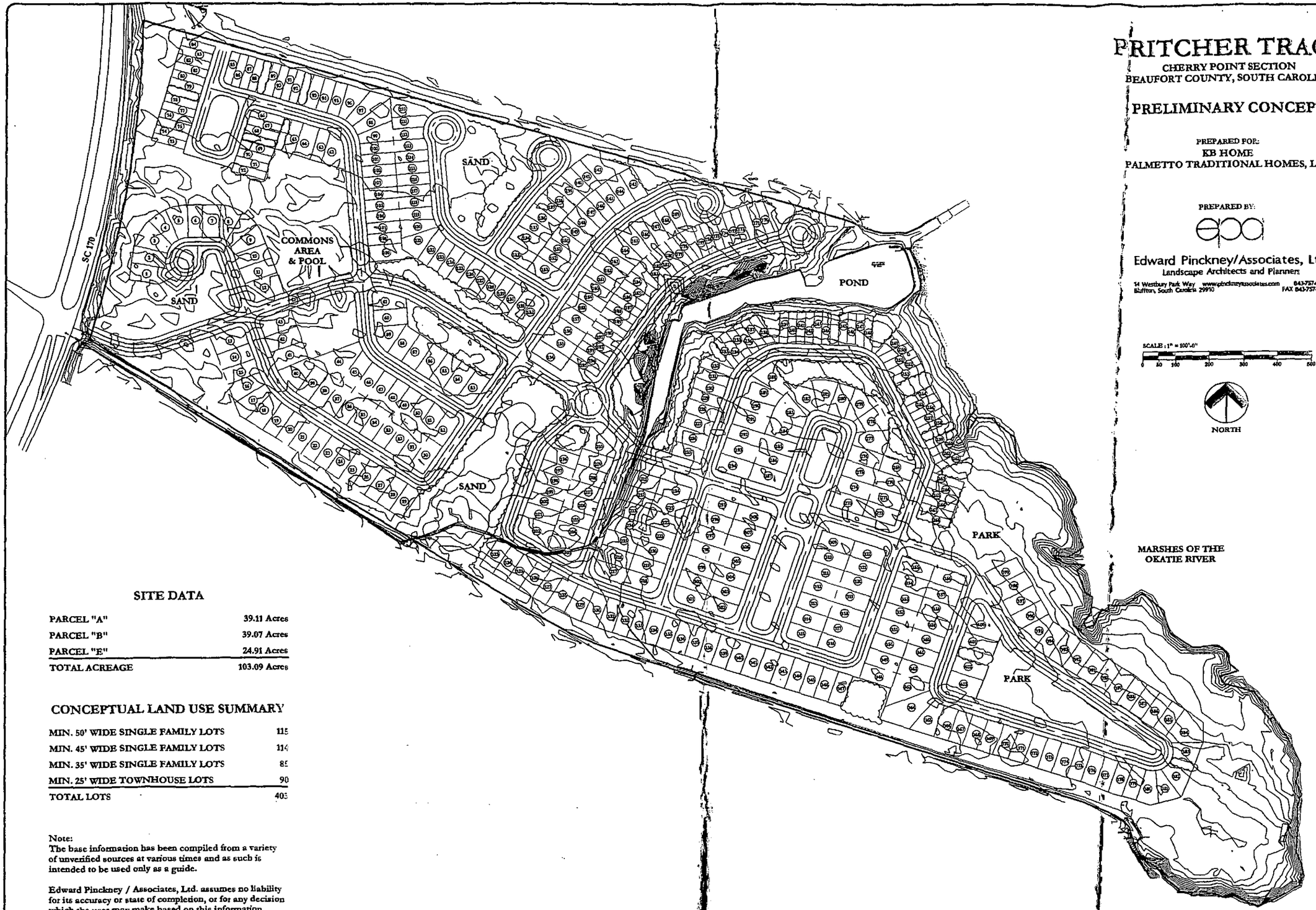
REQUIRED RESOURCE PROTECTION

NON-TIDAL WETLANDS:	2.07 AC = 60%
50' RIVER BUFFER:	2.75 AC = 100%
MIXED UPLAND FOREST - MATURE:	1.84 AC = 20%
MIXED UPLAND FOREST - YOUNG:	3.59 AC = 10%
TOTAL:	10.25AC

ACTUAL (PROVIDED) RESOURCE PROTECTION

NON-TIDAL WETLANDS:	3.45 AC = 100%
50' RIVER BUFFER:	2.75 AC = 100%
MIXED UPLAND FOREST - MATURE:	4.20 AC = 46%
MIXED UPLAND FOREST - YOUNG:	11.40 AC = 32%
TOTAL:	21.80AC

NOTES:
**ALL ROADS SHALL BE PRIVATE AND MAINTAINED BY THE P.O.A.
**MASTER PLAN GRAPHICS ARE FOR ILLUSTRATIVE PURPOSES AND ARE ONLY MEANT TO INDICATE THE FORM AND INTENT OF THE DEVELOPMENT. ALL DESIGN AND CONSTRUCTION WILL ADHERE TO THE STANDARDS REQUIRED IN THE BEAUFORT COUNTY Z.D.S.O.



PRITCHER TRACT

CHERRY POINT SECTION
BEAUFORT COUNTY, SOUTH CAROLINA

PRELIMINARY CONCEPT

PREPARED FOR:
KB HOME
PALMETTO TRADITIONAL HOMES, LLC.

PREPARED BY:

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Landscape Architects and Planners
14 Westbury Park Way Bluffton, South Carolina 29910
www.pinckneyassociates.com
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FAX 843-757-9801

SCALE : 1" = 100'-0"
0 50 100 200 300 400 500

NORTH

SITE DATA

PARCEL "A"	39.11 Acres
PARCEL "B"	39.07 Acres
PARCEL "E"	24.91 Acres
TOTAL ACREAGE	103.09 Acres

CONCEPTUAL LAND USE SUMMARY

MIN. 50' WIDE SINGLE FAMILY LOTS	115
MIN. 45' WIDE SINGLE FAMILY LOTS	114
MIN. 35' WIDE SINGLE FAMILY LOTS	85
MIN. 25' WIDE TOWNHOUSE LOTS	90
TOTAL LOTS	403

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MAY 17, 2004

PRITCHER TRACT

CHERRY POINT SECTION
BEAUFORT COUNTY, SOUTH CAROLINA

PRELIMINARY CONCEPT

PREPARED FOR:
KB HOME
PALMETTO TRADITIONAL HOMES, LLC.

PREPARED BY:

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843-757-6800
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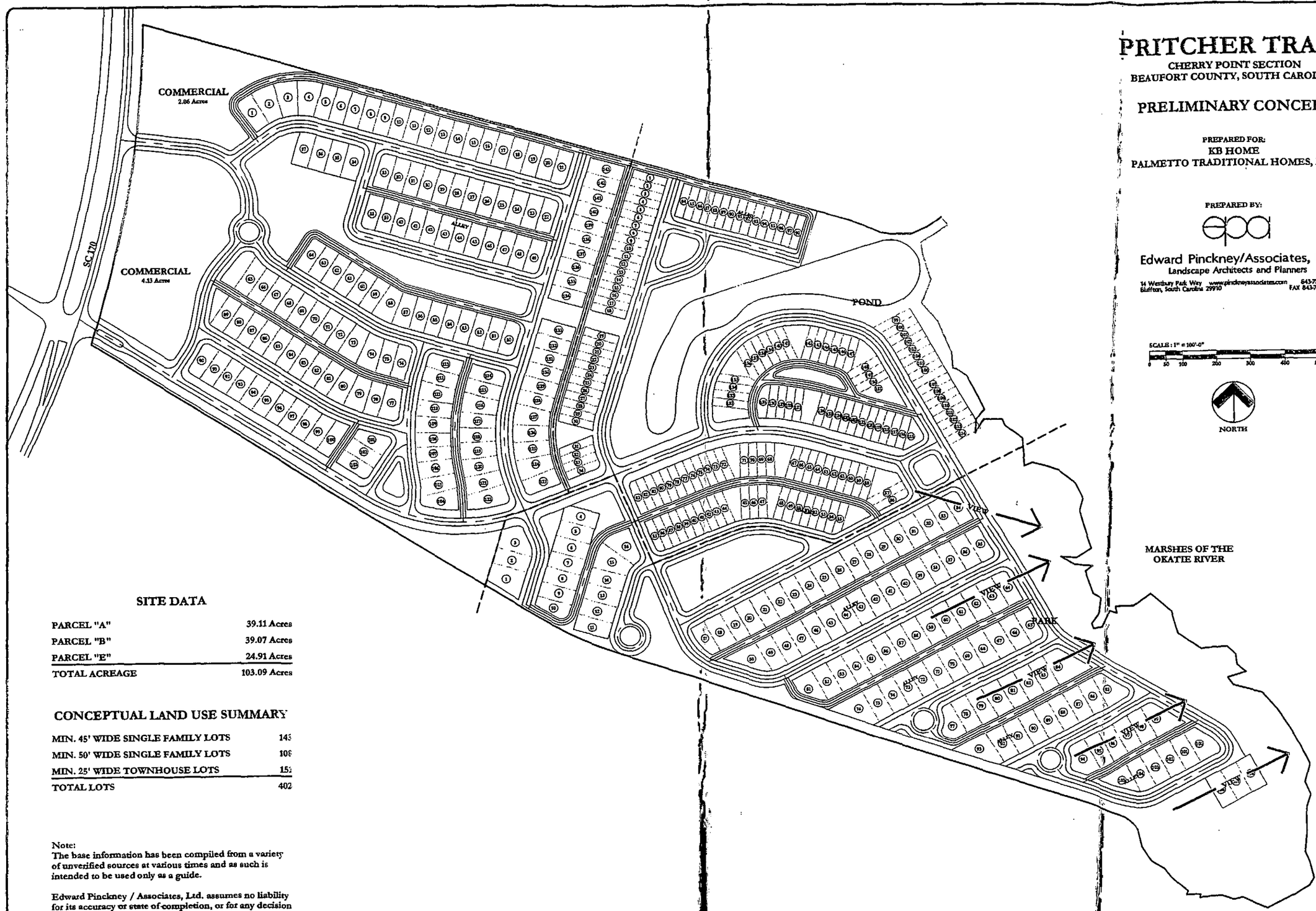
SCALE: 1" = 100'-0"
0 50 100 200 300 400 500

NORTH



SITE DATA

PARCEL "A"	39.11 Acres
PARCEL "B"	39.07 Acres
PARCEL "E"	24.91 Acres
TOTAL ACREAGE	103.09 Acres

CONCEPTUAL LAND USE SUMMARY

MIN. 45' WIDE SINGLE FAMILY LOTS	143
MIN. 50' WIDE SINGLE FAMILY LOTS	108
MIN. 25' WIDE TOWNHOUSE LOTS	151
TOTAL LOTS	402

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MARCH 25, 2004

Threatened and Endangered Species Survey Report
Okatie Tract
Beaufort County, South Carolina

1.0 Introduction:

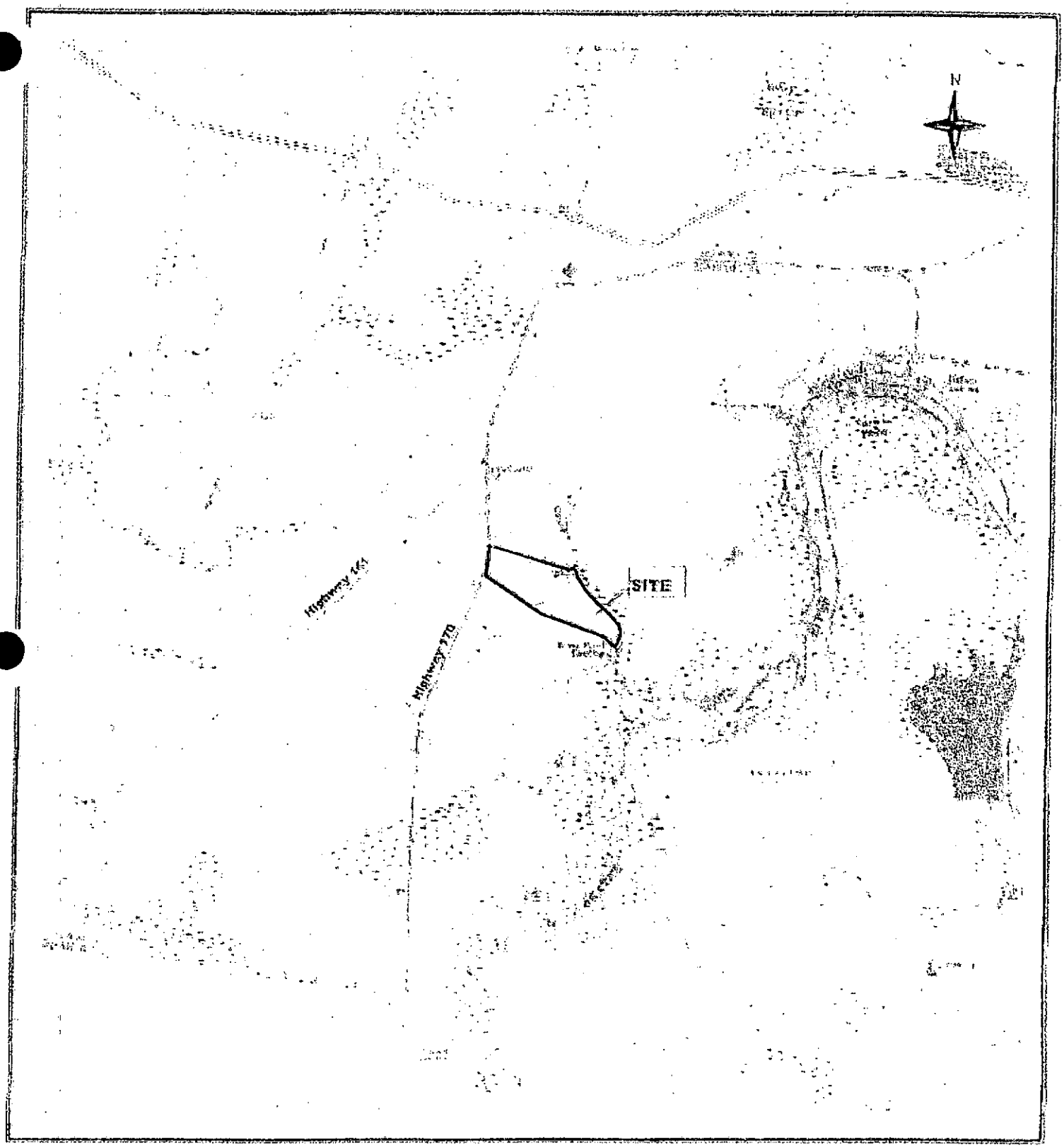
A preliminary threatened and endangered species survey was completed on the Okatie Tract on May 20, 2004. The tract is located adjacent to and east of Highway 170 and is situated approximately five miles north of the intersection of Highway 170 and U.S. Highway 278 in Beaufort County, South Carolina (Figure 1). The threatened and endangered species survey was conducted to determine the potential occurrence of animal and plant species listed as endangered or threatened by current state and federal regulations [Federal Endangered Species Act of 1973 (16 USC 1531-1543) and the South Carolina Non-Game and Endangered Species Conservation Act of 1974 (58-2384)].

2.0 Methods:

The threatened and endangered species survey consisted of a thorough pedestrian survey of the project site. If the potential habitat for a listed species was found on the site, all plants were identified at least to the genus taxonomic unit level to determine if the listed species was present.

The U.S. Fish and Wildlife Service (USFWS) list the following plant and animal species as threatened or endangered in Beaufort County, South Carolina.

SPECIES	STATUS
Right whale (*Balaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Finback whale (*Balaenoptera physalus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter catodon*)	Endangered
Eastern indigo snake (*Drymarchon corais couperi*)	Threatened
West Indian manatee (*Trichecus manatus*)	Endangered
Bald eagle (*Haliaeetus leucocephalus*)	Threatened
Piping plover (*Charadris melodus*)	Threatened
Kemp's ridley sea turtle (*Lepidochelys kempi*)	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
Leatherback sea turtle *(Dermochelys coriacea)*	Endangered
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Green sea turtle (*Chelonia mydas*)	Threatened
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Red-cockaded woodpecker (*Picoides borealis*)	Endangered
Flatwoods salamander (*Ambystoma cingulatum*)	Threatened
Wood stork (*Mycteria americana*)	Endangered
Canby's dropwort (*Oxypolis canbyi*)	Endangered
Pondberry (*Lindera melissifolia*)	Endangered



sligh environmental consultants, inc.
49 Park of Commerce Way, Suite 203
Savannah, Georgia 31405
p. (912) 232-0451
f. (912) 232-0453

Figure 1
97-Acre Okatie Tract
Beaufort County, South Carolina

Not-to-Scale

U.S. Geological Survey
Jasper Quadrangle

May 20, 2004

Chaff-seed (*Schwalbea americana*) Endangered

3.0 Existing Site Conditions:

The project site is composed of wetland and upland habitats which are typical for southern Beaufort County, South Carolina. The habitat types found on the site are upland pine plantation gum pond depressional wetland, and open water pond. Photographs of the habitats present are in Appendix A. The past land use for this property has been long timber rotations within the wetland areas and the upland areas being managed for short term pine pulp production. The trees in the wetland areas range in age from ten to thirty years in age. These habitat types and the potential for the habitats on site to support threatened and endangered species are discussed below.

Upland Pine Plantation:

The upland pine plantation habitat is dominated in the overstory by loblolly pine (*Pinus taeda*) which is approximately twenty years old. The understory species include sweet gum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), live oak (*Quercus virginiana*), red maple (*Acer rubrum*), and red bay (*Persea borbonia*). The shrub layer includes wax myrtle (*Myrica cerifera*), American beautyberry (*Callicarpa americana*), fetter-bush (*Lyonia lucida*), sweet pepperbush (*Clethra alnifolia*), and blueberry (*Vaccinium spp.*). The herbaceous species present include bracken fern (*Pteridium aquilium*), cinnamon fern (*Osmunda cinnamomea*), greenbrier (*Smilax spp.*), dogfennel (*Eupatorium capillifolium*), blackberry (*Rubus betulifolius*), muscadine (*Vitis rotundifolia*), poison ivy (*Toxicodendron radicans*), and giant cane (*Arundinaria gigantea*). A portion of this habitat type has been thinned within the past five years and supports an open canopy with little shrub and mid-story species. The portion of this habitat type that has not been thinned supports a relatively thick mid-story and understory layer.

Gum Pond Depressional Wetland:

The mixed hardwood depressional wetland habitat type is dominated by swamp tupelo (*Nyssa biflora*), red maple, sweetgum, willow oak (*Quercus phellos*), and loblolly pine in the overstory. The understory saplings and shrub species include red maple, sweetgum, wax myrtle, button bush (*Cephalanthus occidentalis*), fetter-bush, blueberry, and swamp tupelo. The herbaceous layer is dominated by Virginia chainfern (*Woodwardia virginica*), royal fern (*Osmunda regalis*), cinnamon fern, sedges (*Carex spp.*), netted chainfern (*Woodwardia areolata*), broomsedge, blackberry, giant cane (*Arundinaria gigantea*), and dogfennel. The majority of this habitat type supports a relatively closed canopy limiting understory and herbaceous growth. These wetland areas appear to remain relatively intact with the exception of periodic logging activities.

Open Water Ponds:

The open water pond found on site is a man-made open water aquatic habitat that is inundated year round. The dominant species found along the edges of this habitat type include black willow (*Salix nigra*) and soft rush (*Juncus effusus*).

4.0 Findings

4.1 Endangered Plants Habitat Descriptions:

Chaff-seed:

Chaff-seed (*Schwalbea americana*) is listed by the USFWS as an endangered species. It grows in open pine savannas and openings in sandy longleaf forests, and is generally found in habitats described as open, moist pine flatwoods, fire maintained savanna's, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. The plant flowers from May to June with yellow to purple flowers borne in the axils of the reduced upper leaves. Typically chaff-seed is associated with longleaf pine, blackjack oak (*Quercus marilandica*), goat's rue (*Tephrosia virginiana*), and black root (*Pterocaulon pycnostachyum*).

Evidence of the endangered chaff-seed plant was not observed on the subject site during our pedestrian survey. The upland habitat was not considered suitable habitat for this endangered plant due the silvicultural bedding operations associated with planting the loblolly pine, and the lack of prescribed burning on the tract. The species commonly associated with chaff-seed were not observed or was the chaff-seed plant, thus we do not anticipate the populations of this plant species would be adversely impacted by site development.

Pondberry:

Pondberry (*Lindera melissifolia*) is a small shrub that grows in sandy sinks and pond cypress (*Taxodium ascendens*)/gum pond margins. The site includes small depressional wetland habitats which are considered marginal habitat for the endangered pondberry. There are no pond cypress depressional wetland areas found within the project area which are considered the favorable habitat. The edges of the depressional wetland areas were typically thick with vegetation including fetter-bush and *Vaccinium* species. Evidence of the endangered pondberry was not observed in these depressions during our pedestrian survey of the site. Thus, we do not anticipate the populations of the pondberry plant species would be adversely impacted by site development.

Canby's Dropwort:

Canby's dropwort (*Oxypolis canbyi*) is found in the coastal plain of South Carolina where it occupies pond cypress savannas, the shallow edges of cypress/pond pine sloughs and wet pine savannas. These sites require that the groundwater regime remain stable and the sites must be protected from adverse alterations such as ditches, dams, etc. for dropwort to occupy the site. The white flower is visible August through October. The depressional wetlands found on the site are not considered suitable habitat for this endangered plant due to the closed canopy these wetlands support. It should be noted that our survey was conducted during the time of the year when the flower is not usable and therefore impossible to identify individuals or populations of the endangered plant. Based on our experience of known habitats it is our opinion that the site contains no habitat for the endangered plant. Thus, we do not anticipate the populations of the Canby's dropwort plant species would be adversely impacted by development of the site.

4.2 Endangered Animals:

Right, Humpback, Finback, Sei and Sperm Whales:
These whales are known to inhabit the waters of the Atlantic Ocean including waters off the coast of South Carolina. The tract does not contain suitable habitat for any of these whales. Thus, it is not anticipated that any individual or population of these species will be adversely impacted by project related activities.

Eastern indigo snake:
The eastern indigo snake is found in South Carolina along dry longleaf pine/turkey oak sandhill communities. The eastern indigo snake spends the daylight hours foraging along the edge of wetlands, where frogs and other snakes are abundant during the warmer months. During the winter months, they are relatively concentrated to upland sand ridges where they spend much of their time in underground burrows and feed on rodents, birds, other snakes, and frogs. They often use gopher tortoise burrows as suitable dwellings. Due to the lack of suitable habitat on the tract and no evidence of wintering burrows commonly associated with eastern indigo snakes, it is unlikely that the proposed project would affect any population of eastern indigo snakes.

West Indian manatee:
The west Indian manatee is a large aquatic mammal whose habitat consists of warm coastal and spring fed waters. During winter months these mammals are primarily confined to the coastal waters of the southern half of Florida and the spring fed rivers of Florida and Georgia. During the summer months as the water temperature rises, the manatees range expands to as far north as Virginia and it is during these months that the manatees may occasionally utilize the estuaries of coastal South Carolina. Critical habitat for this species has been identified as large portions of coastal Florida including the St. Mary's River on the Georgia-Florida border[1]. Due to the lack of suitable habitat on the tract for the manatee, we do not anticipate adverse impacts to any individual or population of the protected manatee.

Bald eagle:
The bald eagle is a riparian species whose general habitat consists of the coasts, rivers and lakes near their nesting sites. Although tree selection and nesting sites vary, these birds typically nest in the tallest tree to allow for an open and clear viewing point and within 0.8 kilometers (0.5 miles) from the water body used for feeding. These birds are opportunistic feeders and will take a variety of prey, with both living and dead fish being the prey of choice. Decline of this threatened species has been attributed to environmental contamination resulting from the wide use of pesticides. This species is present within the coastal areas of South Carolina; however, no active or abandoned bald eagle nest sites are located on the tract. Therefore, it is not anticipated that any development activities will adversely affect this species.

---

[1] U.S. Fish and Wildlife Service. 1992. Endangered and Threatened Species of the Southeast United States (The Red Book). Prepared by Ecological Services, Division of Endangered Species, Southeast Region, Government Printing Office, Washington D.C. 1,242 pp. (two volumes).

Piping plover:
The piping plover forages and nests on sandy beaches on the Atlantic Coast from South Carolina to the north shore of the Gulf of St. Lawrence, on sandy shores of the Great Lakes, and on alkaline wetlands and prairie river sandbars of the Northern Great Plains. Sparse clumps of grass or herbaceous vegetation are important habitat components. They feed on invertebrates found in the sand including insects, crustaceans, and mollusks. Due to the fact that no suitable habitat exists for feeding or nesting, no adverse impact to the piping plover is expected to result from project related activities.

Loggerhead, Green, Kemp's Ridley, and Leatherback sea turtles:
These large marine turtles inhabit the offshore waters of the Atlantic and Caribbean. During nesting periods which fall within the summer months, these species leave the water to nest on sandy beaches and primary dunes of the Atlantic and Caribbean coasts. Turtle nests are not uncommon on the barrier islands of South Carolina and have been located in the past. Since the project area does not contain suitable habitat, it is not anticipated that the proposed project will adversely impact these species.

Shortnose sturgeon:
This large (up to 43") fish, which is easily recognized by the shovel shaped snout, large fleshy barbels, and ventrally located mouth, is known to inhabit the waters of coastal South Carolina. This species inhabits river mouths, bays and estuaries and depending on the water temperature enters freshwater to spawn during January through May. Acknowledged spawning periods for this area normally occur from February through March. Normal spawning locations are characterized by swift currents over gravel, rubble, or submerged timber/logs. Nursery habitat for this species is normally found downstream of the freshwater/saltwater line and is associated with a sandy bottom. No suitable sturgeon habitat is present within the project area and due to the lack of suitable habitat, it is not expected that any individual or population of the shortnose sturgeon will be adversely affected by the proposed project.

Red-cockaded woodpecker:
The red-cockaded woodpecker (RCW) survey included the entire tract and was conducted using the "Guidelines for the Preparation of Biological Assessments and Evaluation for the Red-Cockaded Woodpecker".[2] These guidelines include methods for identifying areas to survey as well as actual survey methods for determining the presence of the RCW. The guidelines state that timber stands that exhibit the following criteria should be surveyed when making a determination for the likely occurrence of RCW's. The criteria are:

- mixed pine and hardwood stands over 60 years of age
- mixed pine and hardwood stands under 60 years of age that contain clumps of pine trees over 60 years of age
- stands containing pine sawtimber, including stands thought to be generally less than 60 years of age but containing scattered or clumped trees over 60 years of age

[2]Henry, V. Gary. Guidelines for the Preparation of Biological Assessments and Evaluations for the Red-Cockaded Woodpecker. U.S. Fish and Wildlife Service Southeast Region. September 1989. Not Paginated.

- hardwood-pine over 60 years of age adjacent to pine and pine-hardwood over 30 years of age.

The RCW requires old growth pine forest habitat for cavity excavation, foraging and nesting. The upland area found on the tract is dominated by planted loblolly pine which is approximately fifteen years old. Neither evidence of the endangered RCW nor the specific pine old growth forest habitat it requires for foraging and nesting was observed during the pedestrian survey. Thus, we do not anticipate populations of the endangered RCW will be adversely affected by site development.

Flatwoods salamander:
The USFWS has listed the flatwoods salamander as a threatened species under the authority of the Endangered Species Act of 1973, as amended. The flatwoods salamander requires open, mesic woodland of longleaf/slash pine maintained by frequent fire. Pine flatwoods are typically flat, low-lying open woodlands that lie between the drier sandhill community up slope and wetlands down slope. Wiregrasses (*Aristida spp.*), especially *Aristida beyrichiana*, are often the dominant grasses in the herbaceous layer. Adult flatwoods salamanders move to their wetland breeding sites during rainy weather from October to December. The breeding sites are isolated pond cypress (*Taxodium ascendens*), swamp tupelo, or slash pine dominated depressions which dry completely on a cyclic basis. These wetlands are generally shallow and relatively small and have a marsh-like appearance with sedges growing throughout; wiregrasses, panic grasses, and other herbaceous species are concentrated in shallow water edges. A relatively open canopy is necessary to maintain the herbaceous component which serves as cover for the flatwoods salamander larvae. Although there are gum pond depressional wetlands on site, the gum ponds found do not support the herbaceous component vital to flatwoods salamander occupation. Due to the fact that the upland habitat found on the site has been bedded and planted with loblolly pine, the specific upland habitat for this species is not present within the Okatie tract. Since no evidence or the specific habitat requirements of the flatwoods salamander was observed within the project area and no species were found; it is not anticipated that the proposed project will adversely affect the flatwoods salamander.

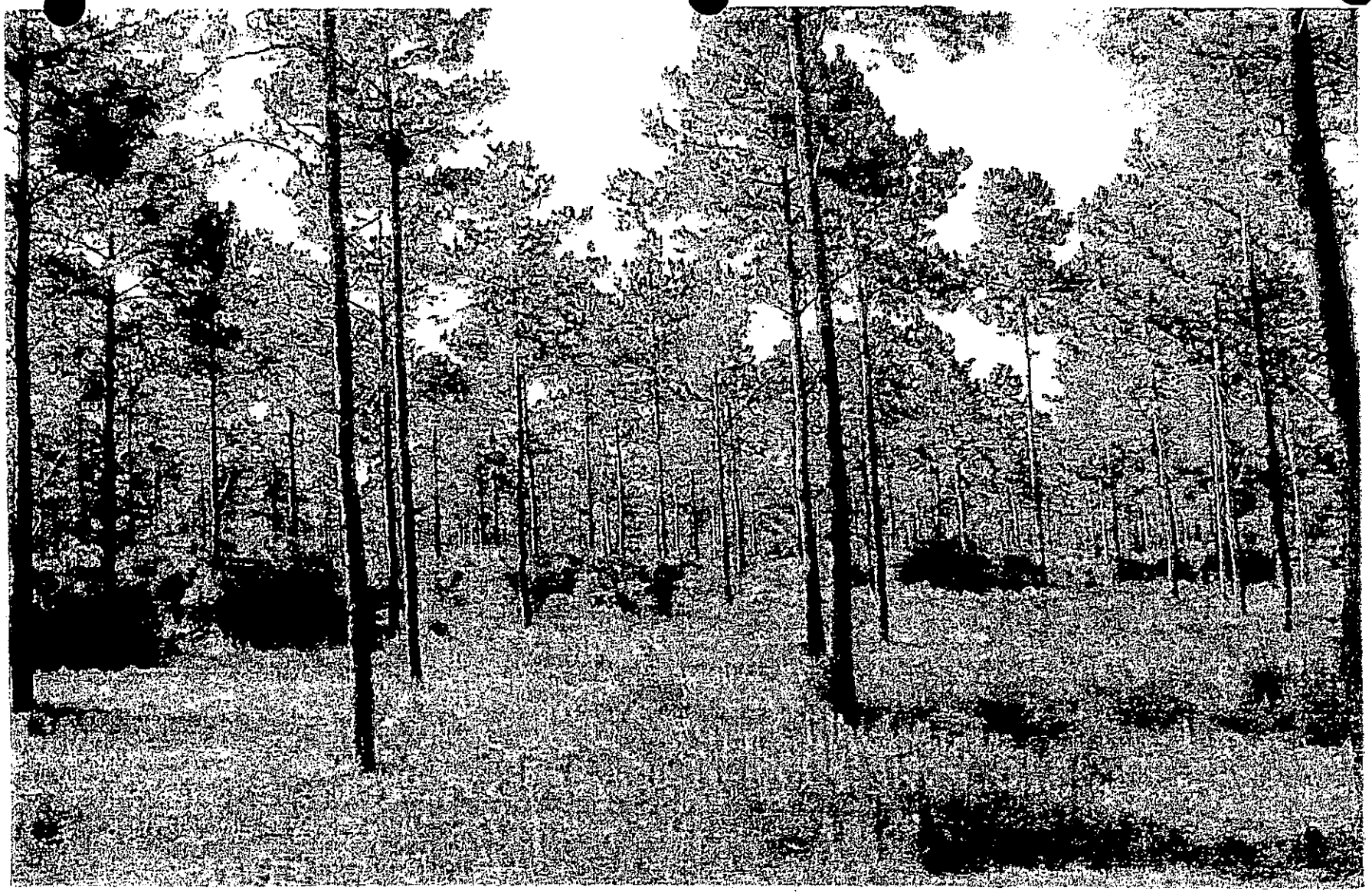
Wood stork:
The wood stork was listed endangered by the USFWS on 28 February 1984 (Federal Register 49 (4):7332-7335). Wood storks use freshwater and estuarine wetlands as feeding, nesting, and roosting sites, and annual population fluctuations are closely related to the year-to-year differences in the quality and quantity of suitable habitat. The overall decline in wood stork numbers is attributed to the loss or degradation of essential wetland habitat primarily in southern Florida. No critical nesting habitat or any wood stork rookeries were located within the project area and no individuals were observed on the site during the time of our site visit. Therefore, it is not anticipated that the proposed project will adversely affect any individual or population of wood storks.

5.0 Conclusion
The subject property was assessed for the potential occurrence of listed species and habitats suitable to sustain listed species for Beaufort County, South Carolina. Based on our assessment,

the site affords little suitable habitat to support threatened or endangered species due the recent logging activities and changes in recent management including lack of prescribed burning. During our extensive survey, no evidence of any listed species was found. Although the current absence of any listed species does not necessarily preclude the possibility of the future occupation, the available habitats found on the subject property are common throughout the region and the proposed project should not adversely affect existing populations.

Appendix A

Site Photographs



sligh environmental consultants, inc
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Photograph 1 depicts the upland pine plantation habitat type which has been thinned within the past five years. Note the lack of mid-story species present within this portion of this habitat.

May 20, 2004

sligh environmental consultants, inc.
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Savannah, Georgia 31405
p: (912) 232-0451
f. (912) 232-0453

Photograph 2 depicts the upland pine plantation habitat type which has not been thinned. Note relatively thick mid-story and understory vegetation present.

May 20, 2004

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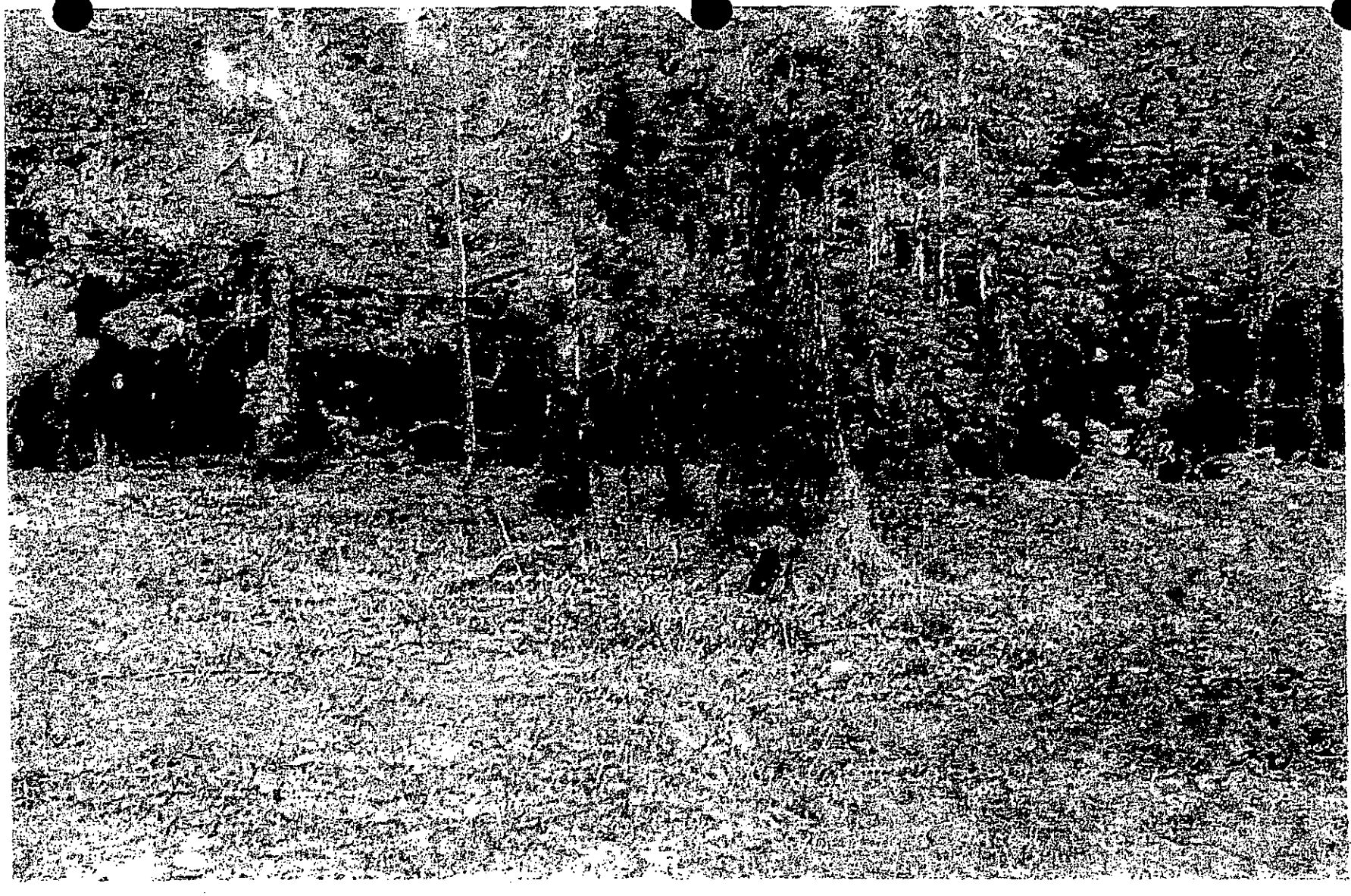
49 Park of Commerce Way, Suite 203
Savannah, Georgia 31405
p. (912) 232-0451
f. (912) 232-0453

Photograph 3 depicts the gum pond depressional wetland habitat type. Note the lack of a herbaceous layer due to the closed canopy this habitat supports.

May 26, 2004



sligh environmental consultants, inc.
49 Park of Commerce Way, Suite 203
Savannah, Georgia 31405
p. (912) 232-0451
f. (912) 232-0453

Photograph 4 depicts the gum pond depressional wetland habitat type. Note the thin herbaceous layer and the naturally regenerating saplings present.

May 20, 2004

sllgh environmental consultants, inc.
49 Park of Commerce Way, Suite 203
Savannah, Georgia 31405
p. (912) 232-0451
f. (912) 232-0453

Photograph 5 depicts the open water pond habitat type. Note the lack of vegetation present in this deep water aquatic habitat.

May 20, 2004

October 11, 2005

Mr. John Holloway
Natural Resources Planner
Beaufort County Planning Department
100 Ribaut Road – Room 260
P. O. Drawer 1228
Beaufort, SC 29901-1228

Re: Pritcher Tract, 101.359 Acres Located on Highway 170 Adjacent to the River End Subdivision Currently Known as Okatie Marsh.

Dear Mr. Holloway:

We are requesting a natural resources review for the 101.359-acre tract referenced above. We are submitting this site on November 3, 2005 as a residential PUD at the Master Plan level. The project is an old farm site with planted pine and some native vegetation. The site possesses both jurisdictional and non-jurisdictional wetlands and borders the headwaters of the Okatie River on the Eastern boundary of the property.

We are proposing a mixed residential neighborhood to provide housing for young families and professionals who will utilize the nearby Okatie Elementary School. The plan, as proposed, will preserve all of the isolated wetlands and all the jurisdictional wetlands while providing a river buffer that will be substantially larger than that required by code. The plan also protects a significant stand of very large cedar trees along the southeastern boundary of the site and an archeological site in the same area. The site will ultimately accommodate ± 324 SF units to be sold in fee simple and a small neighborhood commercial tract at the entrance on highway 170.

I have included the tree and topo and wetland delineation provided by T-Square Surveying Company and Thomas & Hutton Engineering. Sligh Environmental has completed a rare and endangered species report, which is included with this request.

Brockington Associates has completed the archeological study and has made submittal to the state. Initial comments have been received from the state and that information will be forwarded to Ian Hill.

Attached is the required aerial photo with wetlands shown, and the referenced exhibits, if you need any additional information, please do not hesitate to contact me.

Respectfully submitted,

John R. Thomas, ASLA; AICP
Senior Associate

F:\Projects\04002\04002-01\PADMIN\Correspondance\Admin_Corsp\101105_Holloway_ltr.doc

14 Westbury Parkway
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Sec. 106-1814. Step 3: calculation of base site area and total protected resource land.

Table 106-1814 provides a simple method for determining base site area and total protected resource land for a site based on existing conditions and the protected resource survey

TABLE 106-1814 BASE SITE AREA AND TOTAL PROTECTED RESOURCE LAND

CALCULATION 1: Determine Base Site Area	ac.
Enter gross site area as determined by actual survey	101.35 AC
Subtract land within existing roads' ultimate rights-of-way; or land within major utilities' rights-of-way (minimum 50-foot width within subject property)	0 AC
Subtract land cut off from use by railroad, highway, or water body	0 AC
Subtract all existing natural water bodies and tidal wetlands	0 AC
Subtract land previously dedicated as open space	0 AC
Equals base site area	101.35 AC

CALCULATION 2: Measure all natural resources in the base site area and enter in the acres measured column 2. If resources overlap, measure only that resource with the highest resource protection ratio. These numbers provide each resource's area of land. Multiply by resource protection ratio for the district (column 3, 4, or 5) and insert result in column 6.

		Multiply Column 2 by Resource Protection Ratio			
Column 1 Protected Resource	Column 2 Acres Measured	Column 3 R, RQ, RC districts	Column 4 S, CS districts	**Column 5 All other districts**	Column 6 Protected Land
Nontidal wetlands	3.70 AC	1.00		**0.60**	2.22 AC
Beach-dune	0 AC	1.00		**1.00**	0 AC
Headwaters buffer (RQD only)	0 AC	1.00		**1.00**	Reserved
River buffer	2.75 AC	1.00		**1.00**	2.75 AC
Maritime forest	0 AC	0.70		**0.60**	0 AC
Mixed upland forest, mature	9.18 AC	0.55		**0.20**	1.84 AC
Pine forest, mature	0 AC	0.40		**0.20**	0 AC
Mixed upland forest, young	35.9 AC	0.25		**0.10**	3.59 AC
Endangered species areas	0 AC	1.00		**1.00**	0 AC
CALCULATION 3: Total resource land equals the sum of all protected resources listed above. Enter this figure to the right: -->	51.53 AC				

CALCULATION 4: Total protected resource land equals sum of column 6 at right: --> 10.4 AC

(Ord. No. 99-12, & 1 (05.130), 4-26-1999

Sec. 106-1815. Step 4: calculation of residential/nonresidential capacity.

Tables 106-1815(1) and 106-1815(2) provide the procedures for calculating residential or nonresidential use capacity of a site based on protected resources. Where the site is in more than one zoning district, or where the site is to be developed for both residential and nonresidential uses, separate calculations are required. Final capacity calculations shall be rounded down to a whole dwelling unit (du) or square footage.

TABLE 106-1815(1) RESIDENTIAL USE CAPACITY CALCULATION

Calculation 1:	Take base site area (table 106-1814, calculation 1)	95.6 AC
	Subtract total resource land (table 106-1814, calculation 3)	51.53 AC
	Equals total unrestricted land	44.07 AC
	Enter protected resource land (table 106-1814, calculation 4)	10.4 AC
Calculation 2:	Enter base site area (table 106-1814, calculation 1)	95.6 AC
	Multiply by minimum open space ratio (table 106-1526)	x 0.2
	Equals minimum district required open space	19.12 AC
Calculation 3:	Enter base site area (table 106-1814, calculation 1)	95.6 AC
	Subtract protected resource land (calculation 1 or 2, whichever is greater)	19.12 AC
	Equals net buildable site area	76.48 AC
	Multiply by maximum net density (table 106-1526)	x 2.2
	Equals site specific maximum density yield	168 DU
Calculation 4:	Enter base site area (table 106-1814, calculation 1)	95.6 AC
	Multiply by maximum gross density (table 106-1526)	x .45
	Equals district maximum density yield	43 DU
Calculation 5:	Maximum yield for site (calculation 3 or 4, whichever is less)	43 DU

Note: Density calculations based on underlying Rural zoning. Property is being submitted as P.U.D. with (395) dwelling units and a +/-5.75 AC mixed-use commercial site within the P.U.D. on 101.359 AC.

TABLE 106-1815(2) NONRESIDENTIAL USE CAPACITY CALCULATION

Calculation 1:	Enter base site area (table 106-1814, calculation 1)	5.75 AC
	Subtract protected resource land (table 106-1814, calculation 4)	0 AC
	Equals buildable land, site	5.75 AC
Calculation 2:	Enter base site area (calculation 1)	5.75 AC
	Multiply by minimum landscape surface ratio (table 106-1526) **[Mixed-use Commercial]**	x 0.2
	Equals minimum landscaped area	1.15 AC
Calculation 3:	Enter base site area (calculation 1)	5.75 AC
	Subtract minimum landscaped area (calculation 2)	1.15 AC
	Equals buildable land, district	4.60 AC
Calculation 4:	Enter calculation 1 or 3, whichever is less	4.60 AC
	Multiply by maximum net floor area ratio (table 106-1526)	x 1.4
	Equals maximum floor area in acres	6.44 AC
		x 43,560
	Multiply by 43,560 to determine maximum floor area in square feet	280,526 SF
Calculation 5:	Minimum landscaped surface calculation 1 (total protected land) or calculation 2 (minimum landscaped area), whichever is greater	1.15 AC

(Ord. No. 99-12, & 1 (05.140), 4-26-1999)

OKATIE MARSH

(PRITCHER TRACT)
CHERRY POINT SECTION
BEAUFORT COUNTY, SOUTH CAROLINA

NATURAL RESOUCE PROTECTION

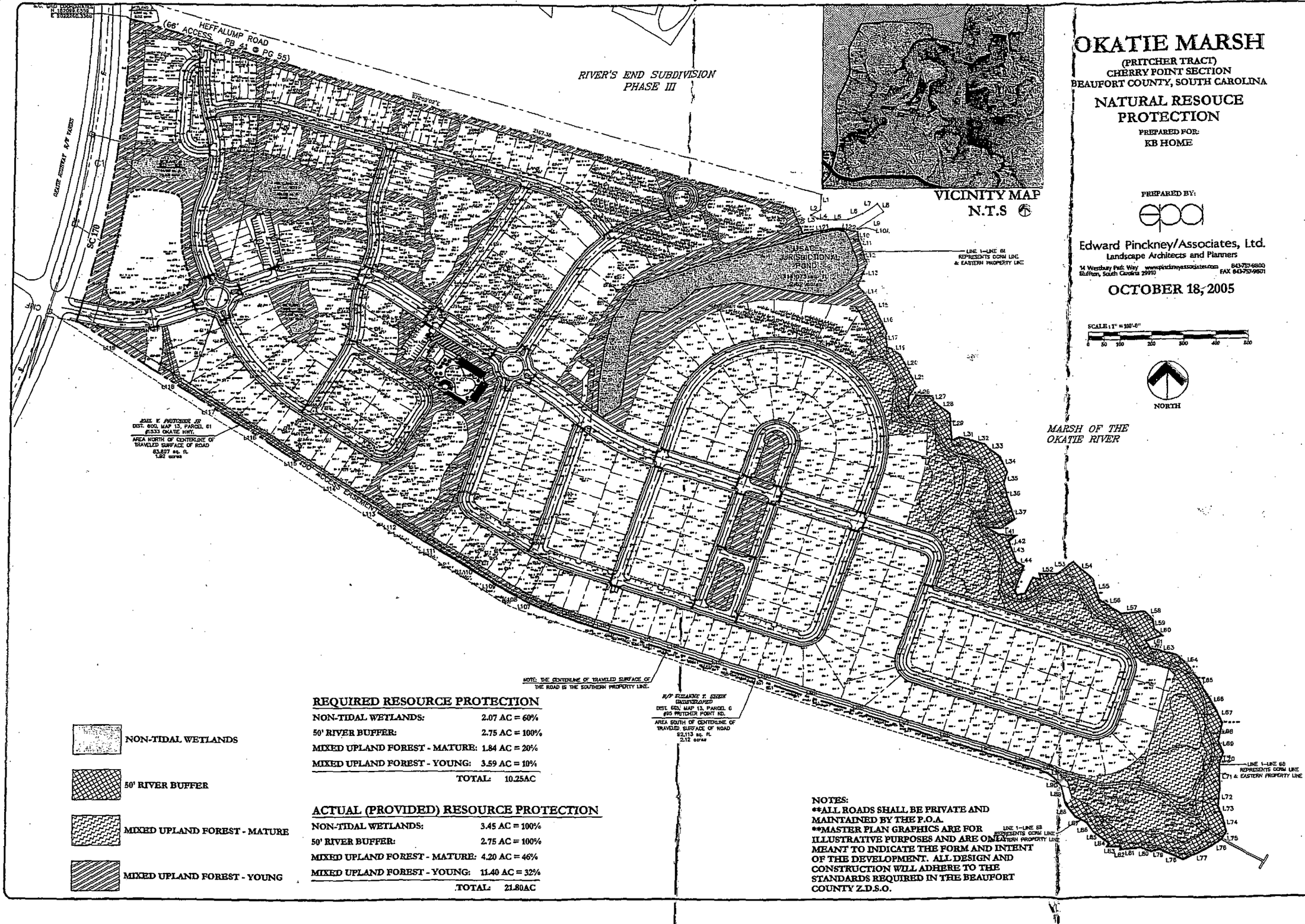
PREPARED FOR:
KB HOME

PREPARED BY:

Edward Pinckney/Associates, Ltd.
Landscape Architects and Planners
14 Westbury Park Way www.pinckneyassociates.com 843-757-9800
Bluffton, South Carolina 29910 FAX 843-757-9801

OCTOBER 18, 2005

VICINITY MAP
N.T.S



NON-TIDAL WETLANDS

50' RIVER BUFFER

MIXED UPLAND FOREST - MATURE

MIXED UPLAND FOREST - YOUNG

REQUIRED RESOURCE PROTECTION

NON-TIDAL WETLANDS:	2.07 AC = 60%
50' RIVER BUFFER:	2.75 AC = 100%
MIXED UPLAND FOREST - MATURE:	1.84 AC = 20%
MIXED UPLAND FOREST - YOUNG:	3.59 AC = 10%
TOTAL:	10.25AC

ACTUAL (PROVIDED) RESOURCE PROTECTION

NON-TIDAL WETLANDS:	3.45 AC = 100%
50' RIVER BUFFER:	2.75 AC = 100%
MIXED UPLAND FOREST - MATURE:	4.20 AC = 46%
MIXED UPLAND FOREST - YOUNG:	11.40 AC = 32%
TOTAL:	21.80AC

NOTES:
**ALL ROADS SHALL BE PRIVATE AND MAINTAINED BY THE P.O.A.
**MASTER PLAN GRAPHICS ARE FOR ILLUSTRATIVE PURPOSES AND ARE ONLY MEANT TO INDICATE THE FORM AND INTENT OF THE DEVELOPMENT. ALL DESIGN AND CONSTRUCTION WILL ADHERE TO THE STANDARDS REQUIRED IN THE BEAUFORT COUNTY Z.D.S.O.

PRITCHER TRACT

CHERRY POINT SECTION
BEAUFORT COUNTY, SOUTH CAROLINA

PRELIMINARY CONCEPT

PREPARED FOR:
KB HOME
PALMETTO TRADITIONAL HOMES, LLC.

PREPARED BY:

Edward Pinckney/Associates, Ltd.
Landscape Architects and Planners
14 Westbury Park Way Bluffton, South Carolina 29910
www.pinckneyassociates.com
843-757-6800
FAX 843-757-6801

SCALE : 1" = 100'-0"
0 50 100 200 300 400 600

NORTH

SITE DATA

PARCEL "A"	39.11 Acres
PARCEL "B"	39.07 Acres
PARCEL "E"	24.91 Acres
TOTAL ACREAGE	103.09 Acres

CONCEPTUAL LAND USE SUMMARY

MIN. 50' WIDE SINGLE FAMILY LOTS	115
MIN. 45' WIDE SINGLE FAMILY LOTS	114
MIN. 35' WIDE SINGLE FAMILY LOTS	85
MIN. 25' WIDE TOWNHOUSE LOTS	90
TOTAL LOTS	405

Note:
The base information has been compiled from a variety of unverified sources at various times and as such is intended to be used only as a guide.

Edward Pinckney / Associates, Ltd. assumes no liability for its accuracy or state of completion, or for any decision which the user may make based on this information.

MAY 17, 2004

PRITCHER TRACT

CHERRY POINT SECTION
BEAUFORT COUNTY, SOUTH CAROLINA

PRELIMINARY CONCEPT

PREPARED FOR:
KB HOME
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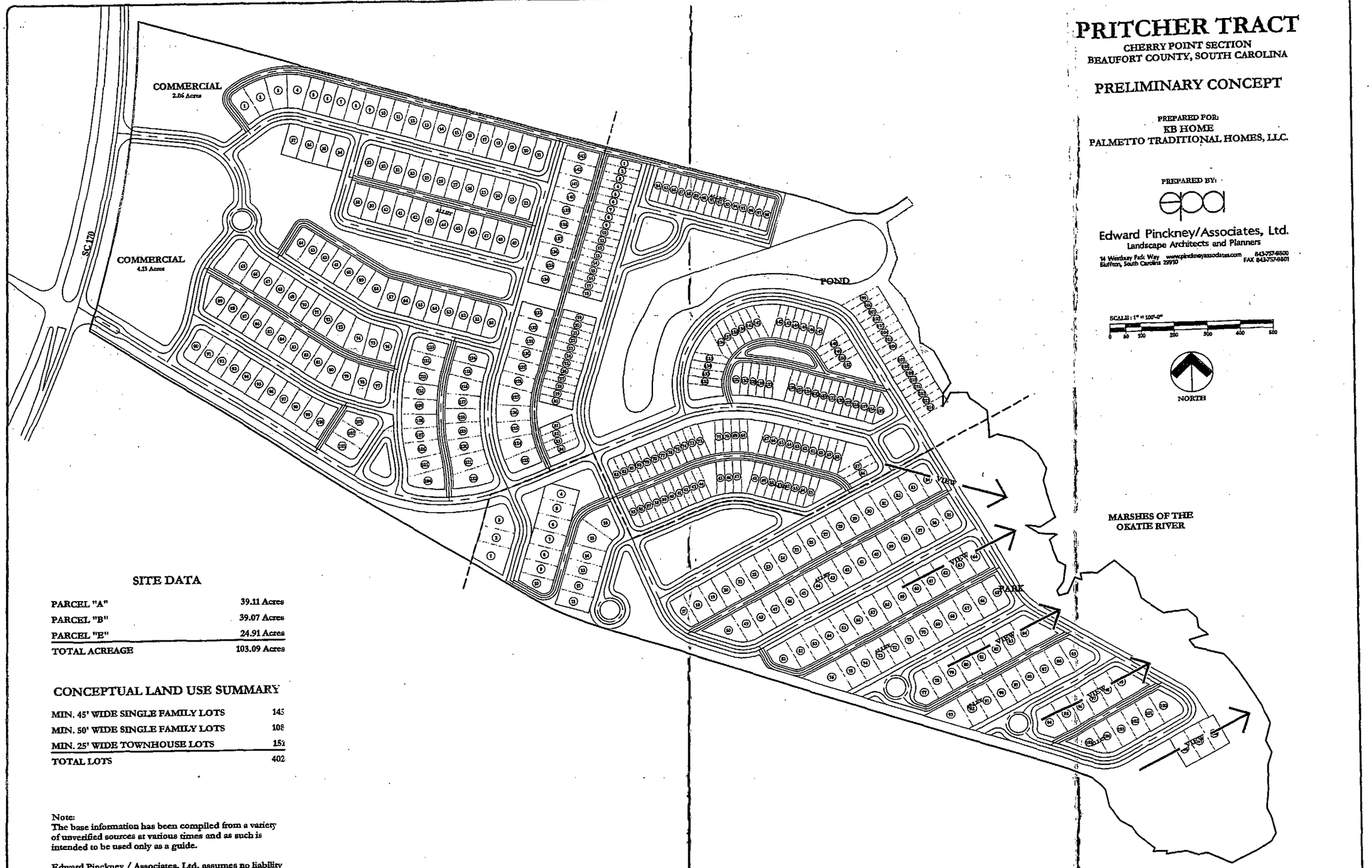
SCALE: 1" = 100'-0"
0 50 100 200 300 400 500

NORTH



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PARCEL "E"	24.91 Acres
TOTAL ACREAGE	103.09 Acres

CONCEPTUAL LAND USE SUMMARY

MIN. 45' WIDE SINGLE FAMILY LOTS	145
MIN. 50' WIDE SINGLE FAMILY LOTS	108
MIN. 25' WIDE TOWNHOUSE LOTS	151
TOTAL LOTS	402

Note:
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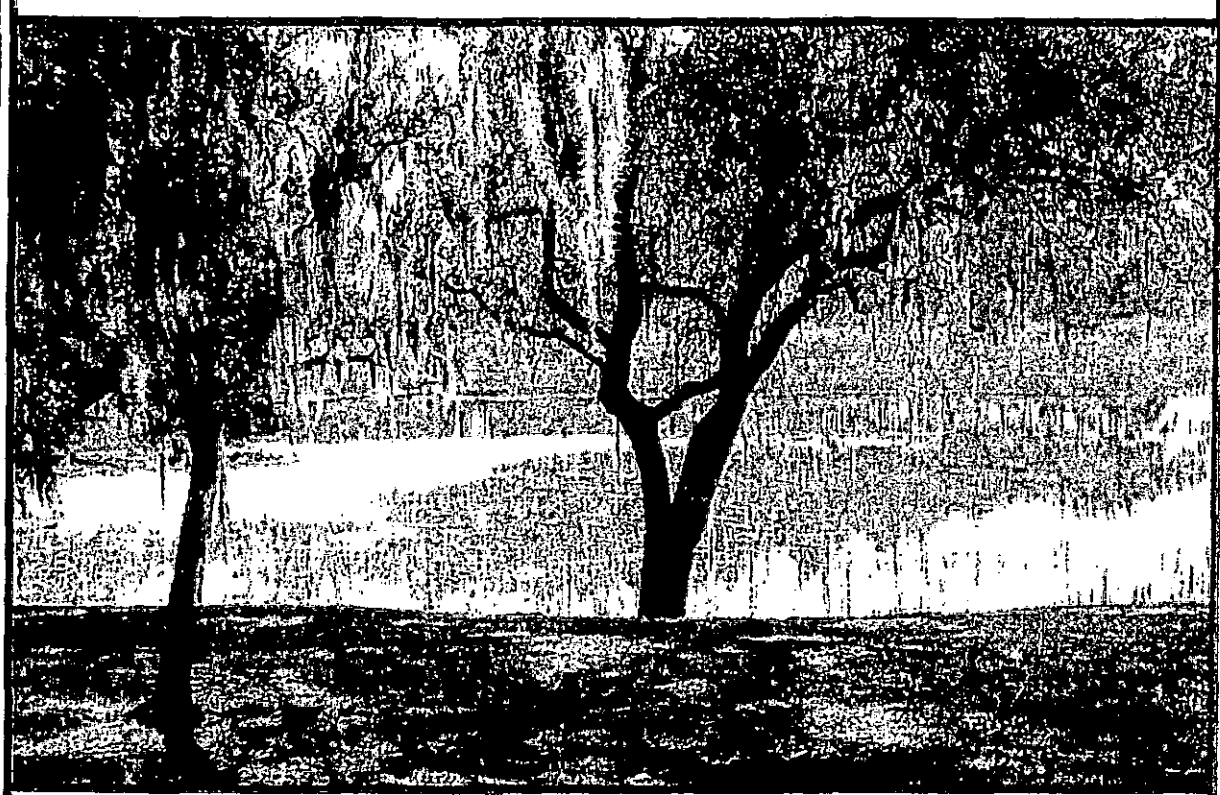
MARCH 25, 2004

Cultural Resources Survey of the Palmetto Traditional Homes Okatie Tract Beaufort Count, South Carolina

Final Report



Brockington and Associates, Inc.
Atlanta Charleston Raleigh
2004

Cultural Resources Survey of the Palmetto Traditional Homes Okatie Tract Beaufort County, South Carolina

Final Report

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Abstract

In February 2004, Brockington and Associates, Inc., undertook a cultural resources survey of the 38.4 hectare Palmetto Traditional Homes Okatie Tract. The project tract is located in western Beaufort County, South Carolina east of US Route 278/SC Route 170 (Okatie Highway) and west of the Okatie River. This survey includes a review of the history of land ownership and use through public documents, a review of previous investigations within 1.6 kilometers of the project tract, and the excavation of shovel tests at 15 and 30 meter intervals on the tract. This cultural resources survey was undertaken to provide information concerning the kinds of cultural resources present on the tract and how future use of the tract may affect these resources. This cultural resources survey provides compliance with current state and federal regulations regarding the management of cultural resources in the Coastal Zone of South Carolina as administered by the regulatory program of the South Carolina Office of Ocean and Coastal Resource Management.

We identified no historic buildings on the project tract. We identified three archaeological sites (38BU2101-38BU2103) and three isolated finds (Isolates 1-3) on the project tract. We recommend sites 38BU2101 and 38BU2102 and Isolates 1-3 not eligible for the National Register of Historic Places (NRHP). No further management consideration of these archaeological sites and isolated finds is warranted. We recommend site 38BU2103 potentially eligible for the NRHP. If proposed land disturbing activities cannot avoid site 38BU2103, then appropriate archaeological testing should be implemented.

Acknowledgments

The authors would like to thank Jason Bryant of Thomas and Hutton Engineering and Jeremy Graves of Palmetto Traditional Homes for their assistance during this project. Susannah Munson conducted the background investigations. The field crew consisted of Mallory Chambliss III, Bret Davis, Jimmy Lefevre, and Chris Maisey. Laboratory work was conducted by Allison Moore and Catherine Runyan. Inna Burns prepared the report graphics. Carol Poplin provided editorial assistance and produced the report.

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Chapter I. Introduction

In February 2004, Brockington and Associates, Inc., conducted an intensive cultural resources survey of the Palmetto Traditional Homes Okatie Tract in western Beaufort County, South Carolina. The 38.4 hectare project tract is bordered to the north by Heffalump Road, to the south by Pritcher's Point Road, to the west by US Route 278/SC Route 170 (Okatie Highway), and to the east by Malind Creek, a tributary of the Okatie River. Figure 1 shows the location of the the Palmetto Traditional Homes Okatie Tract and all identified archaeological sites within 1.6 kilometers (1.0 mile).

Palmetto Traditional Homes, LLC, proposes to develop a master planned residential community at the project tract; they sponsored these investigations in advance of compliance procedures to meet state and federal regulations concerning the management of historic properties (i.e., sites, buildings, structures, objects, and districts eligible for or listed on the National Register of Historic Places [NRHP]) affected through development activities in Beaufort County and the Coastal Zone of South Carolina. The Area of Potential Effect (APE) is the project tract. Compliance will be administered by the regulatory programs of the US Army Corps of Engineers (USACE - 33 CFR Part 325) and the South Carolina Office of Ocean and Coastal Resource Management (OCRM - 15 CFR Part 930). These laws and regulations include:

Section 404 of the Clean Water Act of 1948 (33 USC 1344), as amended;
National Historic Preservation Act of 1966 (16 USC 470), as amended;
36 CFR Part 800: Protection of Historic Properties;
Coastal Zone Management Act of 1972 (16 USC 1451 seq.), as amended; and
Coastal Zone Management Act of 1976 (Chapter 39, Title 48, SC Code), as amended.

Since the 1870s, members of the Pritcher family owned the Palmetto Traditional Homes Okatie Tract. Over the years, the Pritchers have used the tract in a number of ways. For example, the flat, poorly drained, frequently saturated western half of the property has remained densely forested in mixed pines and hardwoods; the north-central and southeastern portions of the tract have been used as agricultural fields although these areas currently are planted with pine. In the northern portion of the tract a drainage has been dammed to form a small, freshwater pond. The eastern portion of the tract is landscaped and contains a modern, single family residence and three modern outbuildings that are part of the Joel W. Pritcher, Jr., estate.

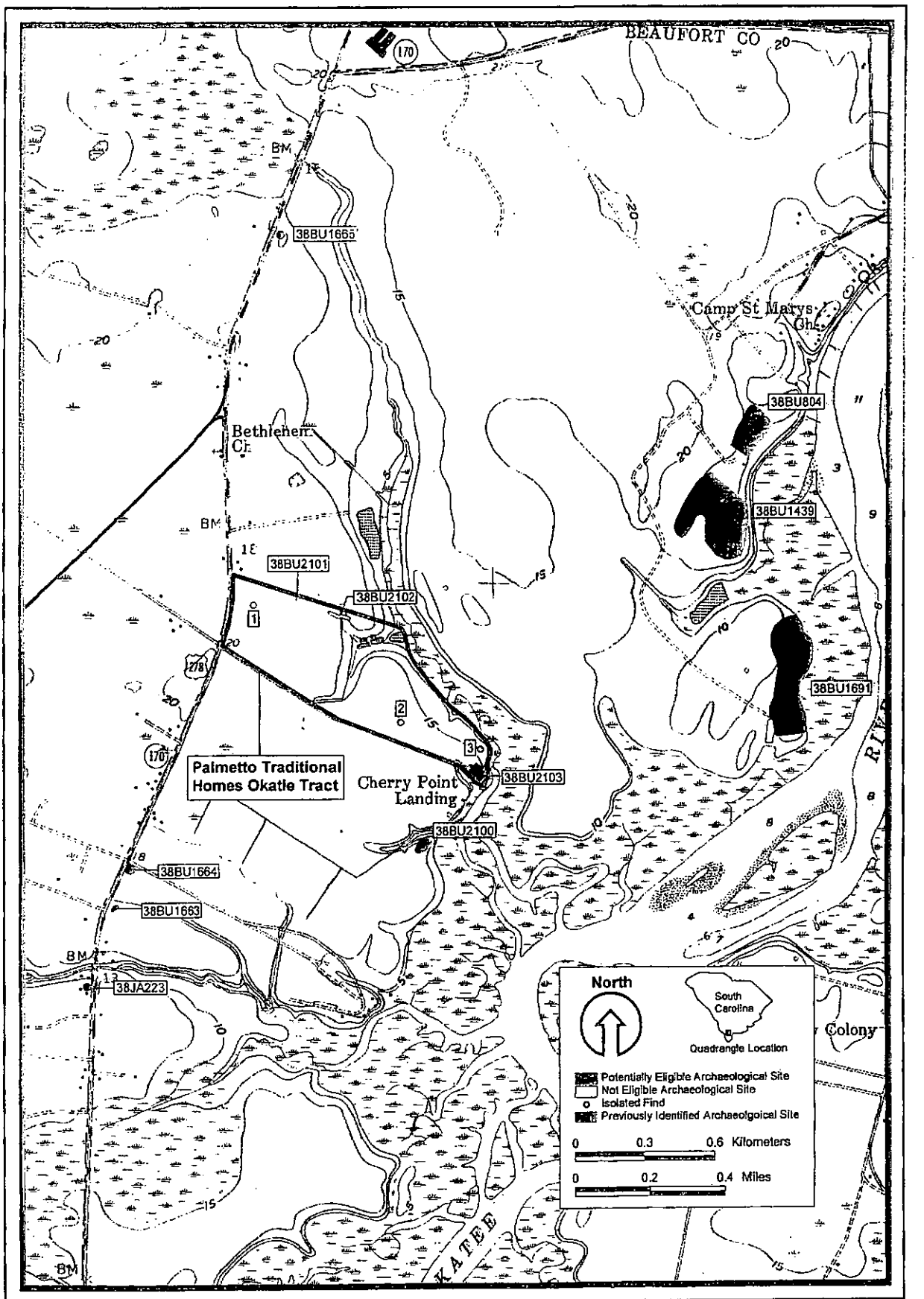

Figure 1. The location of the Palmetto Traditional Homes Okatie Tract and all nearby cultural resources (USGS 1979 *Jasper*, SC quadrangle).

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Archaeologists examined the entire 38.4 hectare Palmetto Traditional Homes Okatie Tract through the pedestrian traverse of transects spaced at 30 meter intervals and the excavation of shovel tests at 15 and 30 meter intervals along each transect. We identified three archaeological sites (38BU2101-38BU2103) and three isolated finds (Isolates 1-3) within the project tract. We recommend sites 38BU2101 and 38BU2102 and Isolates 1-3 not eligible for the NRHP. We recommend site 38BU2103 potentially eligible for the NRHP. Site 38BU2103 should be preserved. However, if proposed land disturbing activities cannot avoid site 38BU2103, then appropriate archaeological testing should be implemented to determine definitively its NRHP eligibility.

Chapter II explains the methods of investigations. Chapter III discusses the environmental and cultural setting of the project tract. Chapter IV presents the results of the investigations and management recommendations. Appendices A and B present the artifact inventory and the resumes of the project principals, respectively.

Chapter II. Methods of Investigation

Project Objectives

The objectives of the cultural resources investigation of the Palmetto Traditional Homes Okatie Tract were to locate and assess the significance of all cultural resources that may be affected by development activities on the project tract. Tasks performed to accomplish these objectives include background research, archaeological survey, laboratory analyses, and NRHP assessment. Methods employed for each of these tasks are described below.

Background Research

Background research included examination of archival, documentary, and cartographic resources in various libraries and repositories. These resources included the archaeological site files maintained by the South Carolina Institute of Archaeology and Anthropology (SCIAA) and the NRHP listings maintained by the South Carolina Department of Archives and History (SCDAH). Maps from the South Caroliniana Library at the University of South Carolina and the South Carolina Historical Society (SCHS) were reviewed. The history of ownership of the tract was obtained from the Beaufort County Records of Mesne Conveyance. Deeds and plats of the project tract also were reviewed. The purpose of this research was to identify potential Post-Contact or Pre-Contact sites and buildings, and to develop a historic context that would assist in evaluating cultural resources identified on the project tract. Chapter III concludes with a more detailed discussion of the known sites and previous investigations within 1.6 kilometers of the project tract that occurred in close proximity to the project tract.

Archaeological Survey

Archaeological survey of the Palmetto Traditional Homes Okatie Tract followed the *South Carolina Standards and Guidelines for Archaeological Investigations* (SCDAH 2000). Investigators examined the entire project tract through the pedestrian traverse of transects spaced at 30 meter intervals. Shovel tests were excavated at 15 or 30 meter intervals along each transect. These efforts resulted in the excavation of 424 shovel tests along 43 transects to provide systematic examination of the entire project tract. The field director oriented the transects and grid north perpendicular to

Pritcher's Point Road (32° east of north). Figure 2 presents a map showing all transects, sites, isolates, biomes, and landscape features encountered during the survey.

Each shovel test measured approximately 30 centimeters (cm) in diameter and was excavated to sterile subsoil. The fill from these tests was sifted through ¼ inch wire mesh hardware cloth. All identifiable or suspected cultural materials were collected and bagged by provenience. Excavators recorded provenience information, including the transect, shovel test, and surface collection numbers on re-sealable acid-free artifact collection bags. Information relating to each shovel test also was recorded in field notebooks. This information included the content (e.g., presence or absence of artifacts) and context (e.g., soil color, texture, stratification) of each test. Excavators flagged and labeled positive shovel tests (those where artifacts were present) for relocation and site delineation. In areas where very saturated, wetland soils were present, the subsurface soil was inspected but not screened.

An archaeological site is defined as a locale that produces three artifacts from the same occupation within a 30 meter radius. Locales that produce less than three artifacts are identified as isolated finds (SCDAH 2000). Locales that produced artifacts from shovel testing or surface inspection were subjected to reduced interval shovel testing. Investigators defined the boundaries of sites and isolated finds by excavating additional shovel tests at 15 meter intervals according to grid north around the positive tests until two consecutive shovel tests failed to produce artifacts or until reaching natural or cultural features. A map showing the location of each shovel test, the extent of surface scatters, and the approximate site boundary was prepared in the field for each site.

Archaeologists used Wide Area Augmentation System (WAAS) enabled Global Positioning System (GPS) receivers to record Universal Transverse Mercator (UTM) coordinates at selected locations in the survey universe. The GPS receivers were calibrated to the 1927 North American Datum (NAD-27) to correlate with the appropriate USGS 7.5 minute series quadrangles. WAAS-enabled receivers are capable of sub-three meter accuracy. This information was recorded in field books and on site maps.

Laboratory Analyses

All recovered artifacts were transported to the Brockington and Associates, Inc., Mt. Pleasant laboratory facility, where they were washed, cataloged, and analyzed. Laboratory personnel assigned distinct provenience numbers to artifacts from each supplemental shovel test. They separated artifacts from each provenience by class/type and assigned catalog numbers.

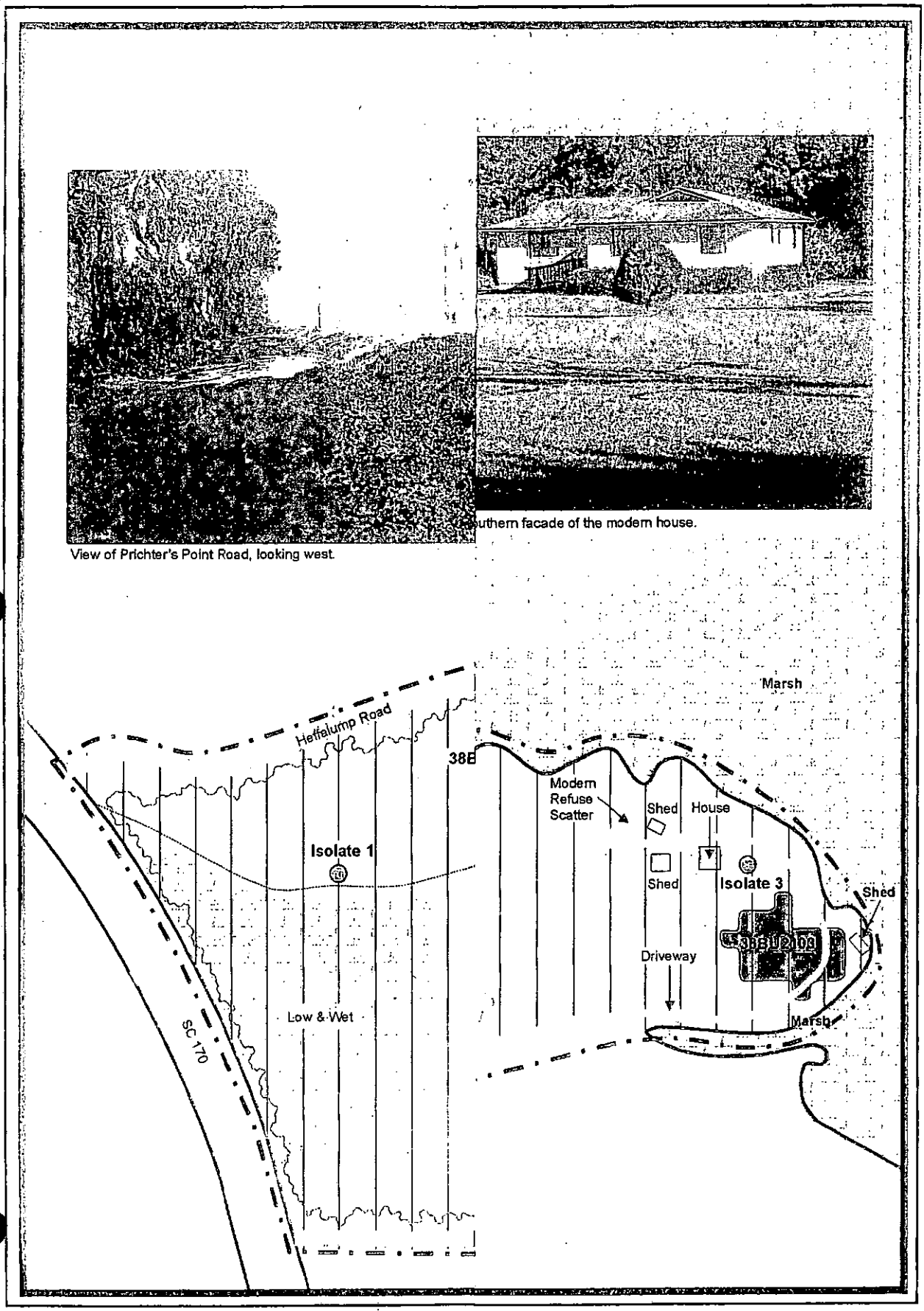

Figure 2. A map of the project tract showing

Typological identification as manifested by technological and stylistic attributes served as the basis for Pre-Contact artifact analysis. Laboratory personnel classified all Pre-Contact ceramic sherds larger than 2 by 2 cm by surface decoration and aplastic content. When recognizable, diagnostic attributes were recorded for residual sherds, i.e., those smaller than 2 by 2 cm. Nondiagnostic residual sherds were tabulated as a group. Sherds and other diagnostic artifacts then were compared to published type descriptions from available sources (Anderson et al. 1982; Blanton et al. 1986; DePratter 1979, 1984; Espenshade and Brockington 1989; South 1976; Trinkley 1980, 1981a, 1981b, 1981c, 1989, 1990; Williams and Shapiro 1990). Following Crabtree (1972), among others, lithic artifacts are described by material and morphological characteristics. Categories identified include flake fragments and shatter.

Post-Contact artifact analysis also was based on observable stylistic and technological attributes. Artifacts were identified by material of manufacture (e.g., ceramic, glass, metal), color, function, and method of manufacture, when possible. Temporally diagnostic artifacts were compared to published analytical sources. Artifact analysts utilized sources typically used for the types of artifacts recovered in the region (Brown 1982; Cushion 1972; DeBolt 1988; Godden 1964; Ketchum 1983; Kovel and Kovel 1953, 1986; Miller 1980; Nelson 1968; Noël Hume 1970; South 1977).

Artifacts and research materials associated with this project currently are stored at the Mt. Pleasant office of Brockington and Associates, Inc. Upon acceptance of the final report, Brockington and Associates, Inc., will deliver the curation package to the SCIAA.

Assessing NRHP Eligibility

Cultural resources identified in the Palmetto Traditonal Homes Okatie Tract were evaluated for eligibility to the NRHP. As per 36 CFR 60.4, there are four broad evaluative criteria for determining the significance of a particular resource and its eligibility for the NRHP. Any resource (building, structure, site, object, or district) that:

A. is associated with events that have made a significant contribution to the broad pattern of history;

B. is associated with the lives of persons significant in the past;

C. embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, possesses high artistic value, or represents a

significant and distinguishable entity whose components may lack individual distinction; or

D. has yielded, or is likely to yield, information important to history or prehistory

may be eligible for the NRHP. A resource may be eligible under one or more of these criteria. Criteria A, B, and C are most frequently applied to historic buildings, structures, objects, non-archaeological sites (such as battlefields, natural features, designed landscapes, or cemeteries), or districts. The eligibility of archaeological sites is most frequently considered with respect to Criterion D. Also, a general guide of 50 years of age is employed to define "historic" in the NRHP evaluation process. That is, all resources greater than 50 years of age may be considered. However, more recent resources may be considered if they display "exceptional" significance (Sherfy and Luce n.d.).

Following *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* (Savage and Pope 1998), evaluation of any resource requires a twofold process. First, the resource must be associated with an important historic context. If this association is demonstrated, the integrity of the resource must be evaluated to ensure that it conveys the significance of its context. The applications of both of these steps are discussed in more detail below.

Determining the association of a resource with a historic context involves five steps (Savage and Pope 1998). First, the resource must be associated with a particular facet of local, regional (state), or national history.

Secondly, one must determine the significance of the identified historical facet/context with respect to the resource under evaluation. As an example, if the project contained no buildings that were constructed during the early nineteenth century, then an Antebellum Agricultural context would not be significant for the development of the project area or any of its internal resources. Similarly, a lack of Native American archaeological sites within the project would preclude the use of contexts associated with the prehistoric use of a region.

The third step is to demonstrate the ability of a particular resource to illustrate the context. A resource should be a component of the locales and features created or used during the historical period in question. For example, early nineteenth century farm houses, the ruins of African American slave settlements from 1820s, and/or field systems associated with particular Antebellum plantations in the region would illustrate various aspects of the agricultural development of the region prior to the Civil War. Conversely, contemporary churches or road networks may have been

used during this time period but do not reflect the agricultural practices suggested by the other kinds of resources.

The fourth step involves determining the specific association of a resource with aspects of the significant historic context. Savage and Pope (1998) define how one should consider a resource under each of the four criteria of significance. Under Criterion A, a resource must have existed at the time that a particular event or pattern of events occurred and activities associated with the event(s) must have occurred at the site. In addition, this association must be of a significant nature, not just a casual occurrence (Savage and Pope 1998). Under Criterion B, the resource must be associated with historically important individuals. Again, this association must relate to the period or events that convey historical significance to the individual, not just that this person was present at this locale (Savage and Pope 1998). Under Criterion C, a resource must possess physical features or traits that reflect a style, type, period, or method of construction; display high artistic value; or, represent the work of a master (an individual whose work can be distinguished from others and possesses recognizable greatness [Savage and Pope 1998]). Under Criterion D, a resource must possess sources of information that can address specific important research questions (Savage and Pope 1998). These questions must generate information that is important in reconstructing or interpreting the past (Butler 1987). For archaeological sites, recoverable data must be able to address specific research questions.

After a resource is specifically associated with a significant historic context, one must determine which physical features of the resource reflect its significance. One should consider the types of resources that may be associated with the context, how these resources represent the theme, and which aspects of integrity apply to the resource in question (Savage and Pope 1998). As in the Antebellum Agriculture example given above, a variety of resources may reflect this context (farm houses, ruins of slave settlements, field systems, etc.). One must demonstrate how these resources reflect the context. The farm houses represent the residences of the principal landowners who were responsible for implementing the agricultural practices that drove the economy of South Carolina area during the antebellum period. The slave settlements housed the workers, who conducted the vast majority of the daily activities necessary to plant, harvest, process, and market crops.

Once the above steps are completed and the association with a historically significant context is demonstrated, one must consider the aspects of integrity applicable to a resource. Integrity is defined in seven aspects of a resource; one or more may be applicable depending on the nature of the resource under evaluation. These aspects are *location, design, setting, materials, workmanship, feeling, and association* (36 CFR 60.4; Savage and Pope 1998). If a resource does not possess integrity with respect to these aspects, it cannot adequately reflect or represent its associated

historically significant context. Therefore, it cannot be eligible for the NRHP. To be considered eligible under Criteria A and B, a resource must retain its essential physical characteristics that were present during the event(s) with which it is associated. Under Criterion C, a resource must retain enough of its physical characteristics to reflect the style, type, etc., or work of the artisan that it represents. Under Criterion D, a resource must be able to generate data that can address specific research questions that are important in reconstructing or interpreting the past.

Chapter III. Environmental and Cultural Settings

Environmental Setting

Present Environment

Elevations on the Palmetto Traditional Homes Okatie Tract range from 1.5-6.0 meters above mean sea level (amsl). The project tract is located east of US Route 278/SC Route 170 (Okatee Highway), north of Pritcher's Point Road, and south of Heffalump Road, overlooking the tidal marshes of Malind Creek to the east. Malind Creek drains into the Okatee River, which joins the Colleton River and finally the Broad River. The project tract is covered in a combination of mixed pines and hardwoods, fallow agricultural fields, maritime forest, and landscaped yard. Figures 3 and 4 display views of the project tract.

Climate and Soils

Beaufort County lies in the southernmost portion of South Carolina, and has the mildest climate in the state (Stuck 1980). The climate is subtropical, with long hot summers followed by short mild winters. Precipitation is abundant and is fairly well distributed throughout the year. The abundant supply of moist, warm, relatively unstable air produces frequent scattered showers and thunderstorms.

Average annual rainfall is approximately 1.2 meters (Stuck 1980). The low monthly average occurs in November (4 cm), and the high monthly average occurs in July (19 cm). The average annual temperature is 65.5° F. January is the coldest month with an average temperature of 49.9° F, and July is the hottest month with an average temperature of 80.5° F. Beaufort County averages 249 frost free days per year. The first freezing temperatures tend to occur in November.

The tropical storm season runs from July through October (Stuck 1980). Hurricanes are somewhat rare for the area, but tropical storms with winds up to 81 kilometers per hour occur on an average of every two to three years. Tornado season runs from March through October, but April and May are the months of greatest tornado hazard. Many reported tornados are actually waterspouts that do not come ashore.

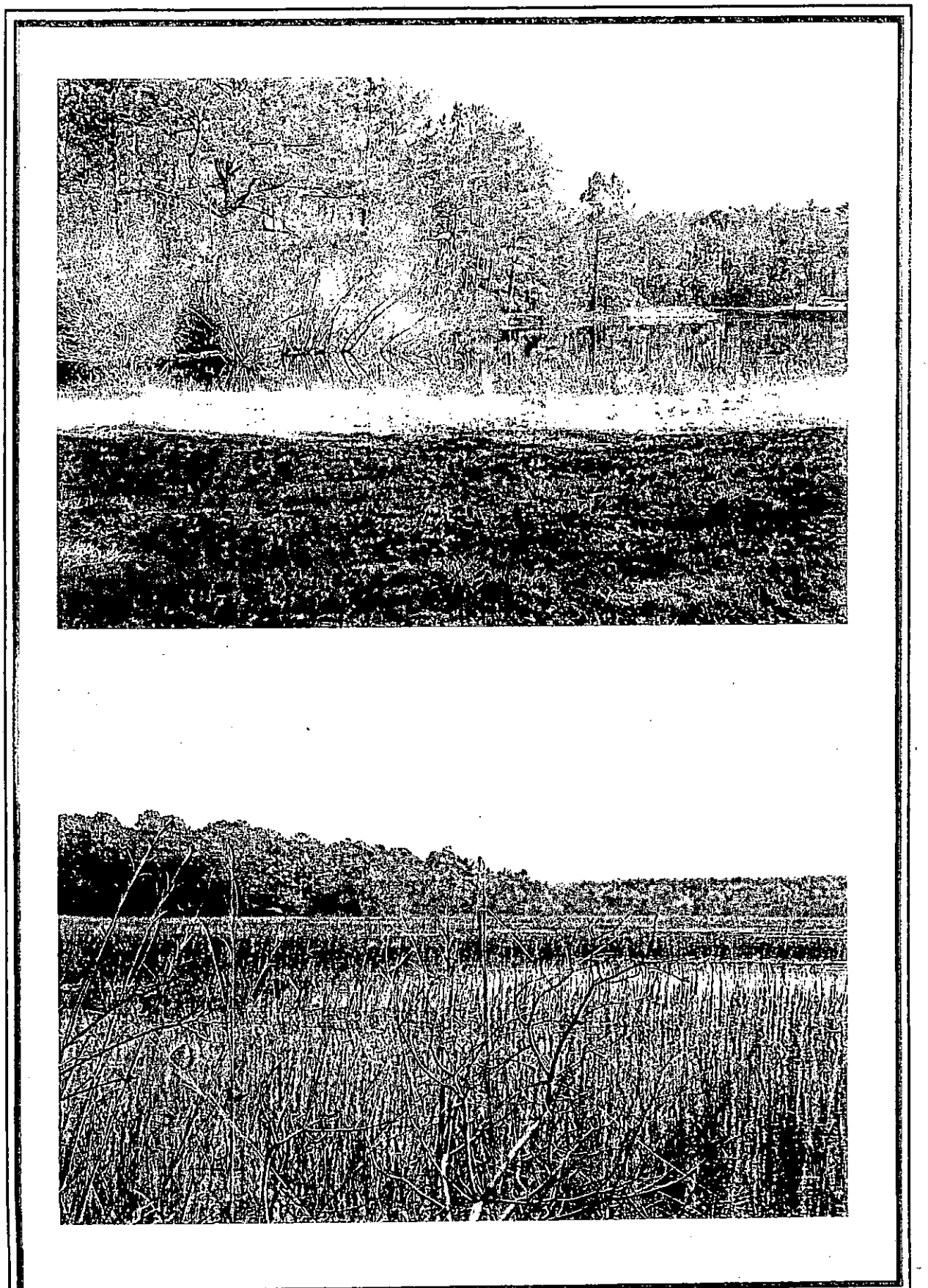

Figure 3. Typical views of the Palmetto Traditional Homes Okatie Tract showing the pond looking south (top) and the marsh along Malind Creek looking northeast (bottom).

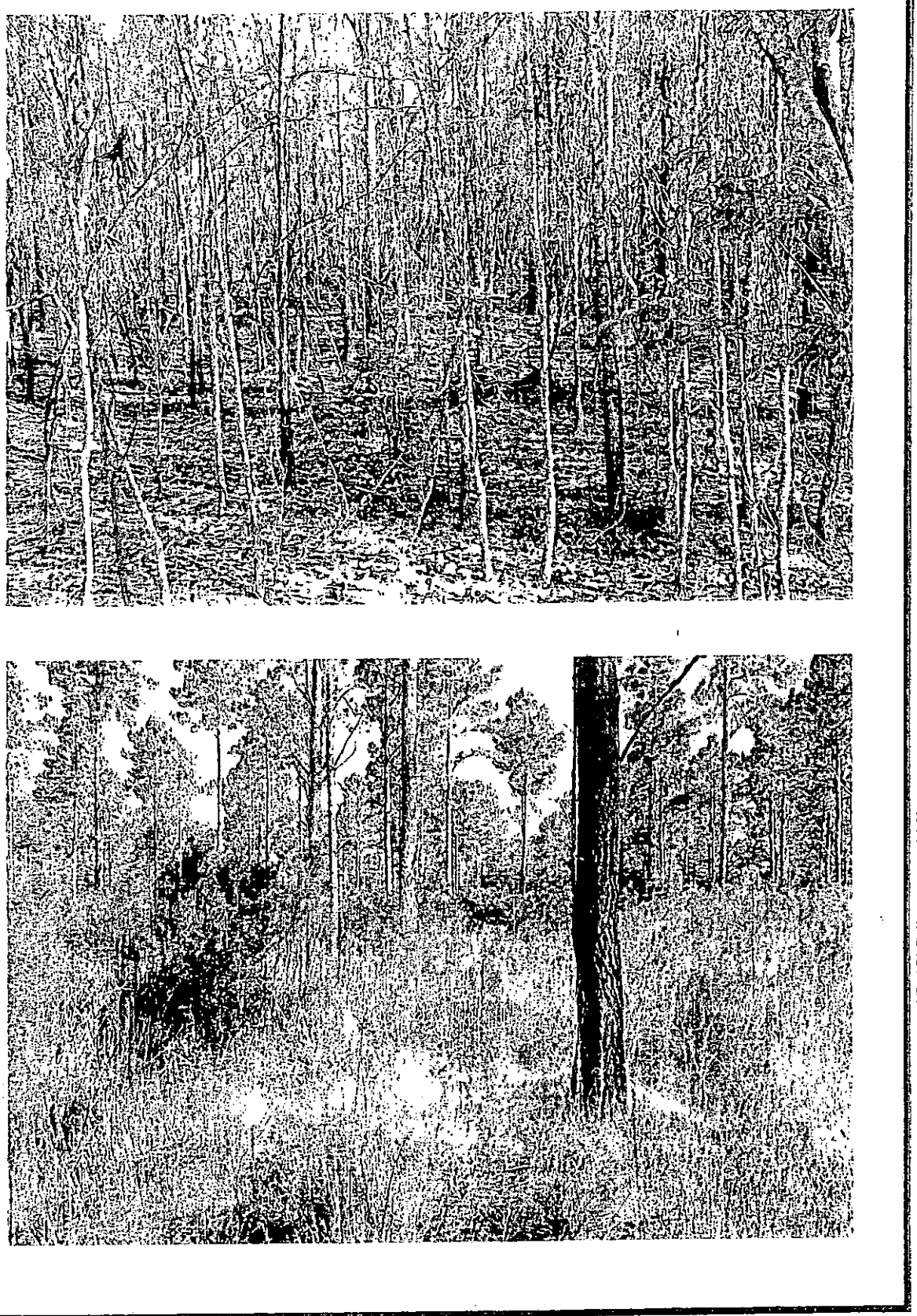

Figure 4. Typical views of the Palmetto Traditional Homes Okatie Tract showing the mixed pine and hardwood forest in the western portion of the tract (top) and the planted pine forest in the central portion of the tract (bottom).

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Several types of soils are present at the Palmetto Traditional Homes Okatie Tract. These soils include Bladen fine sandy loam, Coosaw loamy fine sand, Nemours fine sandy loam, Tomotley loamy fine sand, and Yemassee loamy fine sand. Bladen soils are low-lying, somewhat poorly drained, and typically are saturated during the winter and early spring. These soils are found in the northwestern portion of the tract. Coosaw loamy fine sand is deep and somewhat poorly drained. This soil type occurs on low ridges of the Lower Coastal Plain (Stuck 1980:21). These soils extend across most of the interior portion of the tract. Nemours soils are moderately well-drained upland soils. At the project tract, these soils extend along the bluff edge. Tomotley loamy fine sand is poorly drained. Tomotley soils occur on slight depressions and low flats of the Lower Coastal Plain (Stuck 1980:41). Yemassee soils occur on low ridges and are somewhat poorly drained (Stuck 1980:43). Tomotley and Yemassee soils are found in the southwestern portion of the project tract.

Floral and Faunal Resources

The primary tree canopy of the Palmetto Traditional Homes Okatie Tract consists of a dense stand of mixed pines and hardwoods, especially in the western half of the tract. The hardwoods provide some mast for game animals. At one time, the east-central portion of the project tract was an agricultural field; today it is covered with loblolly pines and grass. The adjacent wetlands provide ready access to the shellfish and fish resources of the tidal marsh.

Inhabitants in the area of the project tract have a broad range of resources available to them. The four resource zones identified by Espenshade et al. (1994) are tidal marsh, maritime forest, deep open water, and shallow open water. The tidal marsh would provide significant populations of oyster, clam, whelk, periwinkle, ribbed mussel, crab, shrimp, and small estuarine fishes. The maritime forest provides a habitat for deer, raccoon, opossum, squirrels, turkey, and quail. Deep open water is inhabited by the full range of estuarine fishes, sharks, rays, and marine turtles. Shallow open water provides estuarine and brackish water fishes, alligators, aquatic turtles, snakes, and a feeding area for wading birds and waterfowl.

Holocene Changes in the Environment

Regional research in palynology, historic biogeography, and coastal geomorphology allows a general reconstruction of Holocene changes in the environment. Data from Florida, Georgia, South Carolina, North Carolina, and Virginia indicate that the Late Pleistocene was a time of transition from full glacial to Holocene environmental conditions (Gardner 1974; Watts 1980; Whitehead

1965, 1973). Upper Coastal Plain forests of the Late Pleistocene (as reflected in the White Pond pollen record) were dominated by oak, hickory, beech, and ironwood (Watts 1980:192). This deciduous forest occurred in a cooler, moister climate than exists in the region today (Barry 1980; Braun 1950).

Sea level changes resulted from the general warming trend at the onset of the Holocene. Beginning approximately 17,000 years before present (BP), sea level began to rise from its Late Pleistocene low of approximately 90 meters below modern mean sea level (Brooks et al. 1989; Colquhoun and Brooks 1986; Howard et al. 1980). By 7,000 years BC, sea level had risen to within 6.5 meters of present levels.

As drier and still warmer conditions became prevalent during the Early Holocene, pines and other species suited to more xeric (dry) conditions increased. Many large Pleistocene mammals became extinct during this time. The southern forest at 5,000 years BC began to resemble that of modern times (Watts 1980:194).

On a regional level, vegetation and climate have remained effectively static since the Early Holocene. Along the coast of South Carolina, however, the continued changes in sea level undoubtedly affected the local plant and faunal communities. Shellfish resources were important to the Pre-Contact, Contact, and Post-Contact inhabitants of the region, and the sea level changes starting after 2500 BC probably produced conditions conducive to island shellfish beds. Table 1 presents the sea level curve proposed by Brooks et al. (1989); the dates in the table reflect high or low stands that occurred within an overall rise in sea level.

Cultural Setting

The cultural history of North America is divided into three eras: Pre-Contact, Contact, and Post-Contact. The Pre-Contact era refers to the Native American groups and cultures that were present for at least 10,000-12,000 years prior to the arrival of Europeans. The Contact era refers to the time of exploration and initial European settlement on the continent. The Post-Contact era refers to the time after the establishment of European settlements, when Native American populations usually were in rapid decline. Within these eras, finer temporal and cultural subdivisions are defined to permit discussions of particular events and the lifeways of the peoples who inhabited North America at that time.

Table 1. South Carolina Sea Level Data (after Brooks et al. 1989).

Calendar Date	Sea Level	Condition
5000 BC	6.5 meters	In continuing rise
3000 BC	4.5 meters	Significant low stand
2800 BC	1.5 meters	High stand
2500 BC	3.5 meters	Low stand
2200 BC	1.0 meters	High stand
1900 BC	3.2 meters	Low stand
1700 BC	0.8 meters	Significant high stand
1300 BC	4.0 meters	Significant low stand
1000 BC	1.0 meters	High stand
800 BC	1.9 meters	Low stand
600 BC	0.7 meters	High stand
400 BC	3.0 meters	Significant low stand
AD 300	0.4 meters	High stand
AD 600	0.6 meters	Low stand
AD 900	0.4 meters	High stand
AD 1300	1.2 meters	Low stand
AD 1989	0.0 meters	In continuing rise

*Sea level in meters below present high marsh surface.

Pre-Contact Overview

In South Carolina, the Pre-Contact era is divided into eight temporal periods. Specific technologies and strategies for procuring resources define each of these periods. A brief description of each period follows. Readers are directed to Goodyear et al. (1989) for more detailed discussions of particular aspects of these periods in South Carolina.

Paleoindian Period (10,000-8000 BC). The earliest documented human presence in the Coastal Plain of South Carolina occurred in the Paleoindian period (Anderson 1992). This cultural period corresponds with the terminal Pleistocene. The climate was generally much colder than today, and sea level was over 60 meters below present levels. Although the project area was in the Coastal Plain during the Paleoindian period, the distance to the ocean was much greater than at present. Another notable feature of the terminal Pleistocene was the presence of large mammalian species (megafauna).

The pattern of human adaption for this period has been reconstructed from data from other areas of the country and from distributional data on the diagnostic fluted projectile points within the Southeast. Investigators have excavated very few Paleoindian sites in the Southeast (Brockington

1971; Claggett and Cable 1982), and only recently have South Carolina sites received attention. However, data from surface finds of Paleoindian points suggest that cultures of this period were focused along major river drainages, especially in terrace locations (Anderson and Logan 1981:13; Goodyear 1979; Michie 1977). If the pattern from other areas of the country holds true in South Carolina, then the adaptation was one of broad range, high mobility, hunting and gathering with a possible focus on megafauna exploitation (Gardner 1974; Goodyear et al. 1989).

Researchers have recovered Paleoindian points in Beaufort County (Charles and Michie 1992; Michie 1977; Waring 1961), but have been unable to document any intact sites. Populations were probably centered on the coast (farther east at that time) and along major river drainages such as the Savannah and Santee. Although a Paleoindian point has been recovered from the surface of nearby Spring Island, the area lacks the cryptocrystalline raw material favored by the Paleoindian knappers (Goodyear 1979). Southerlin et al. (1997) identified a Paleoindian tool cache on Spring Island (38BU306). Micro-wear analysis indicates that the tools were primarily used for hide and bone working (Southerlin et al. 1997).

Early Archaic Period (8000 - 6000 BC). The Early Archaic corresponds to the adaptation of native groups to Holocene conditions. The environment in coastal South Carolina during this period was still colder and moister than today, and an oak-hickory forest developed on the Coastal Plain (Watts 1970, 1980; Whitehead 1965, 1973). The megafauna of the Pleistocene had disappeared, and a more typical woodland flora and fauna were established. The Early Archaic adaptation in the South Carolina lower Coastal Plain is not clear, as Anderson and Logan (1981:13) report:

> At the present, very little is known about Early Archaic site distribution, although there is some suggestion that sites tend to occur along river terraces, with a decrease in occurrence away from this zone.

Early Archaic finds in the lower Coastal Plain are most typically corner- or side-notched projectile points determined to be Early Archaic through excavation of sites in other areas of the Southeast (Claggett and Cable 1982; Coe 1964). Early Archaic sites generally are small, indicating a high degree of mobility. Trinkley (1987:17) reports that "Archaic period assemblages are rare in the Sea Island region." However, Anderson and Hanson (1988) propose a model of seasonal movement in the Early Archaic. By this model, the sea islands and adjacent coast would see only limited use in the early spring (see also Anderson 1992).

Middle and Preceramic Late Archaic Periods (6000 - 2500 BC). The trends initiated in the Early Archaic (i.e., increased population and adaptation to local environments) continued through the Middle and Late Archaic. The study area climate was still warming, and an oak-hickory forest dominated the coast until circa 2000 BC, when pines became more prevalent (Watts 1970, 1980). Stemmed projectile points and ground stone artifacts characterize this period, and sites increased in size and density through the period.

Blanton and Sassaman (1989) and Sassaman et al. (1990) argue that the Middle Archaic was a time of "settling in." Groups became more localized, and more adapted to their local environments. The large ranges seen in the Early Archaic became increasingly restricted.

Middle and Preceramic Late Archaic period sites are not common in Beaufort County, but numerous projectile points have been recovered from surface proveniences on Hilton Head and Spring Islands. Site 38BU115/248 on Parris Island yielded a variety of Archaic points from disturbed beach contexts (Butler et al. 1995:9).

Ceramic Late Archaic (2500 - 1000 BC). The Ceramic Late Archaic witnessed the final shift to modern climates. As a result of increasingly predictable resources, populations increased, resulting in the movement of groups into previously uninhabited areas (Hudson 1976:49-52; Smith 1986). The size of sites increased during this period, and there is more evidence of house floors and pits. This may indicate an increase in sedentism during this time (Hudson 1976:51-52; Smith 1986; Bense 1994:90; Rafferty 1994). Seemingly, the importance of horticulture increased during the Late Archaic, and full domestication may have occurred at least by the end of this period.

By the end of the Ceramic Late Archaic period, two developments occurred that changed the lifeways of the South Carolina Coastal Plain. Sea level rose to within one meter of present levels and the extensive estuaries now present were established (Colquhoun et al. 1981). These estuaries were a reliable source of shellfish, and the Late Archaic period saw the first documented emphasis on shellfish exploitation. The first pottery also appeared on the South Carolina coast during this period. In the Beaufort area, the earliest pottery was the fiber tempered Stalling series, although it was quickly joined by the sand tempered (or untempered) Thom's Creek series. Table 2 presents the ceramic sequence for the southern coast of South Carolina.

The most conspicuous sites of this period are shell rings, which are encountered along the tidal marsh between northeastern Florida and the Georgetown area of South Carolina. These are round or oval rings of shell and other artifacts, with a relatively sterile area in the center. Many of them are currently in tidal marshes, and have been interpreted as actual habitations adjacent to or

Table 2. Ceramic Sequence for the Southern Coast of South Carolina.

Period	Date	Ceramic Types
Contact	AD 1600 - 1750	Altamaha Burnished Plain Altamaha Complicated Stamped Altamaha Incised Altamaha Red Filmed
Mississippian	AD 1400 - 1600	Irene Complicated Stamped Irene Burnished Plain Irene Incised
	AD 1000 - 1400	Savannah Complicated Stamped Savannah Burnished Plain Savannah Cord Marked Savannah Check Stamped
Late Woodland	AD 700 - 1000	St. Catherines Cord Marked St Catherines Net Impressed Wilmington Fabric Impressed Wilmington Cord Marked Wilmington Plain
Middle Woodland	AD 200 - 700	Wilmington Check Stamped Wilmington Cord Marked Wilmington Fabric Impressed Wilmington Plain Deptford Cord Marked Deptford Fabric Impressed Deptford Check Stamped Deptford Linear Check Stamped Deptford Simple Stamped Deptford Plain
Early Woodland	1000 BC - AD 200	Deptford Check Stamped Deptford Linear Check Stamped Deptford Simple Stamped Deptford Plain
	1500 - 1000 BC	Refuge Plain Refuge Punctate Refuge Dentate Stamped Refuge Simple Stamped Refuge Incised
Ceramic Late Archaic	2500 - 1000 BC	Thom's Creek Plain Thom's Creek Linear Punctate Thom's Creek Drag and Jab Punctate Stallings Incised Stallings Simple Stamped Stallings Drag and Jab Punctate Stallings Linear Punctate Stallings Plain

within productive shellfish beds. These sites attest to a high degree of sedentism, at least seasonally. Both Thom's Creek and Stallings shell rings have been documented on the South Carolina coast (Trinkley 1985, 1989f, 1990b).

Coastal Stallings and Thom's Creek sites without shell have only recently been examined. The Fish Haul site (38BU805) contained separate Thom's Creek and Stallings components with very little shell present. Trinkley (1986) viewed the Stallings phase remains at Fish Haul as evidence of repeated late fall-early winter visits to exploit shellfish, fish, and hickory nuts.

The temporal/cultural border between Late Archaic and Early Woodland is the subject of much discussion. Trinkley (1989f, 1990b) argues that the Woodland period begins with pottery production, and that there are no ceramics datable to the Late Archaic period. In contrast, Anderson et al. (1982) argue that the Late Archaic is recognizable by either Stallings or Thom's Creek pottery. Sassaman (1993) notes that Stallings and Thom's Creek ceramics are diagnostic of the Late Archaic period and well represented on the upper South Carolina Coastal Plain.

Early Woodland Period (1500 BC - AD 200). The disappearance of fiber tempered ceramics marks the beginning of the Early Woodland period. Thom's Creek ceramics continued to be made but were produced in conjunction with the Refuge series. For this reason the estimated time frames of the Ceramic Late Archaic and Early Woodland periods overlap by approximately 500 years. The Refuge series is poorly understood; its sand tempered pottery (with incising, simple stamping, punctating, or dentate stamping) has been recovered from few intensively studied sites (DePratter 1979; Lepionka et al. 1983; Waring 1968; Waring and Holder 1968). Excavations at 38GE46 (Minim Island, Georgetown County, SC) suggest that both Thom's Creek and Refuge pottery were produced by 1400 BC (Espenshade and Brockington 1989), but the established regional chronology has Refuge following the Thom's Creek manifestation.

The Refuge phase is considered a transition to the succeeding Deptford lifeways. The Deptford assemblage is dominated by check stamped decoration. The general lack of cord marked or fabric impressed decorations helps distinguish the Early Woodland Deptford from similar types in the Middle Woodland period.

The subsistence and settlement pattern of the later Early Woodland period suggests population expansion into areas minimally used in earlier periods. Early and Middle Woodland sites are the most common on the South Carolina coast; these sites generally consist of shell middens near tidal marshes and ceramic and lithic scatters in a variety of other environmental zones (Espenshade et al. 1994; Milanich 1971). It appears that the semi-permanent occupation of shell midden sites and

short-term use of interior Coastal Strand sites was the basis of the group organization during this period.

Deptford components are the most common site elements recorded on nearby Hilton Head Island. Trinkley (1987:49) reports "some Deptford sites, such as 38BU853 and 38BU856, represent large shell midden accumulations, although most sites are characterized by a thin zone of primarily oyster shell.

Middle and Late Woodland Periods (AD 200-1000). The typological manifestations of the Middle and Late Woodland periods on the South Carolina coast are unclear. The check stamped tradition of the Early Woodland Deptford series continues through most of the Middle Woodland, and check stamping reappears late in the Late Woodland period. Cord marked and fabric impressed ceramics appear in the Middle and Late Woodland periods, generally on grog or clay tempered pastes. There is no single decorative mode that can be associated with this period, and recent research has only begun to sort out the confusion (Anderson et al. 1982; Blanton et al. 1986; DePratter 1979; Kennedy and Espenshade 1991; Trinkley 1983). Shell midden sites continue to be common in this period, although the total site frequency is lower than for the Early Woodland.

The most common Middle and Late Woodland ceramic series in Beaufort County are Wilmington (coarse grog tempering with cord marking prevalent) and St. Catherines (smaller grog tempering with cord marking and net impressing). The Middle and Late Woodland periods are not well represented (Trinkley 1987). Recent excavations in the Hilton Head area (Espenshade et al. 1994; Kennedy and Espenshade 1991; Trinkley 1991) suggest that the Deptford technological tradition continued well into the Wilmington period. Deptford and Wilmington components are common on Spring, Callawassie, Dataw, and Hilton Head Islands.

Mississippian Period (AD 1000 - 1521). The Mississippian period was marked in many parts of the Southeast by a heavy reliance on maize agriculture, by a highly stratified society with elaborate public architecture, and by the production of shell tempered pottery. None of these traits, however, was widespread on the South Carolina coast (Ferguson 1971, 1975). Instead, it appears that settlement and subsistence remained very similar to the Late Woodland pattern, although some platform mounds were constructed in the area. The ceramics of this period, in chronological order, include Savannah Fine Cord Marked, Check Stamped, Complicated Stamped, and Burnished Plain followed by Irene Complicated Stamped, Incised, and Burnished Plain (Anderson 1989, 1990; DePratter 1979; Howard et al. 1980).

Recent studies have identified several manifestations of the Mississippian period in coastal South Carolina and Georgia. Caldwell and McCann (1941) found mound centers at the Irene Site. Trinkley (1987) found large shell middens at 38BU63, while Braley (1982) identified single household sites at the Pinckney Island Wildlife Refuge. Savannah and Irene sites have been encountered on Hilton Head Island (Trinkley 1987), Spring Island (Trinkley 1989a, 1989b, 1989c, 1989d, 1989e, 1990d, 1990a, 1990c, 1991), and Dataw Island (Jones 1993). Mississippian households on Spring Island (38BU306 and 38BU789) were investigated by Southerlin et al. (1997). These home sites may have been seasonal or year-round residences, and likely were associated with a larger settlement system which would have included large village and mound sites (Southerlin et al. 1997).

Contact Overview

The Contact era begins in South Carolina with the first European explorations of the area in the 1520s. Indian groups encountered by the European settlers probably were living in a manner similar to the late Pre-Contact Mississippian groups identified in archaeological sites throughout the Southeast. Initial European forays into the Southeast contributed to the disintegration and collapse of the aboriginal Mississippian structures. Disease, warfare, and European slave raids all contributed to the rapid decline of the regional Indian populations (Dobyns 1983; Ramenosfsky 1982; Smith 1984).

The ethnohistoric record from southern South Carolina suggests that the Native American groups of the region continued to follow a seasonal pattern which included summer aggregation in villages for planting and harvesting domesticates, and dispersal into one to three family settlements for the remainder of the year (Waddell 1980). Ceramic technologies underwent significant changes during this period. Altamaha Red Filmed, Incised, Burnished, and Complicated Stamped types dominate the ceramic assemblages, with limited continuation of previous decorative styles.

By the late 1600s, Indian groups in the area apparently lived in small politically and socially autonomous semi-sedentary groups (Waddell 1980). By the middle eighteenth century, very few Indians remained in the region; all had been displaced or annihilated by the ever-expanding English colonial settlement of the Carolinas (Anderson and Logan 1981).

Of particular interest for the project area are the Yamasee. These Native Americans occupied portions of Colleton, Beaufort, and Jasper Counties during the late seventeenth and early eighteenth centuries. Prior to coming to South Carolina, the Yamasee lived in lower coastal Georgia, along and

near the Altamaha River, as well as in Florida (McKivergan 1991:34-44). Eventually, the government of South Carolina allowed the Yamasee to move to the Sea Islands at Port Royal/St. Helena (McKivergan 1991:44). The Scottish settlement of Stuart's Town was located on Port Royal Island. As increasing numbers of Yamasee settled in the area, they felt they required more land. Before this grant could be bestowed, the Spanish attacked twice in 1686. Stuart's Town and the surrounding Indian villages were destroyed, and the English and Scottish left the area (Crane 1929). Without the protection provided by the English and the Scottish, the Yamasee left the area in 1686 (McKivergan 1991:48). Some of the Yamasee moved northward to the Ashepoo and Combahee Rivers where they remained until around 1700 (McKivergan 1991:49).

By 1700, the English wanted to return to the Port Royal area. They encouraged the Yamasee to settle along the frontier of the Carolina colony (Moore 1988:73-79). These Yamasee settlements provided a buffer to protect the British colony from its enemies (Thomas 1904:41). The creation of the Indian Lands by the Lords of Proprietors in 1707 set aside a large amount of land bounded by the Combahee River, the Coosaw and Port Royal Rivers, and the Savannah River (Cooper and McCord 1836:I:317). The Yamasee established 10 towns throughout these lands, including three near the project tract. The Yamasee village of Chechessee is located to the northeast of the project tract, in the area now referred to as Fripp Landing or Cedar Point. The village of Okatee is located to the northwest of the project tract. The village of Altamaha is located within the project tract.

Battles and disease took a severe toll on the Yamasee; by 1715, there were only 1200 Yamasee in the area. Frequent abuses heaped on the Yamasee by the British caused an increasing rift in their alliance. By 1712, the English were aware that the Yamasee were not raiding Spanish missions as they had in the past (Carroll 1836:192). The Yamasee believed that they were going to be enslaved by the British when they arrived to conduct a census in 1715. This suspicion led to a Yamasee attack on the European settlers in the Pocotaligo area (Crane 1929; Milling 1969; Rivers 1856). The Yamasee War followed shortly thereafter and lasted for three years. By 1718, the Yamasee had settled with the Spanish at St. Augustine (Hann 1989).

Post-Contact Overview

This brief historic overview of Beaufort County and the area once designated as St. Luke's Parish is presented in order to provide a context for potential Post-Contact archaeological sites that may be present on the project tract. Beaufort County has changed names and boundaries several times throughout the years; a brief synopsis is offered here to clarify these changes.

In the late seventeenth century, the proprietary government of Carolina laid out three coastal counties in what would become South Carolina; these include Craven (1664), Berkeley (1682), and Colleton (1682). The southern boundary of Colleton County was the Combahee River. The region south of the Combahee was beyond these initial county lines. However, with the settlement of Stuart's Town at Port Royal in 1684, and the subsequent granting of large tracts in the area, the district between the Combahee and Savannah Rivers often was referred to as Port Royal County. This county was officially designated Granville County in 1707; so named for Lord Proprietor John Lord Granville who died that year. Lord Granville's proprietorship passed to his stepson Henry Seymour, the second Duke of Beaufort, from whom the port town of Beaufort (established 1712) and ultimately the county derived their name. During this period the area was without a county seat and was administered from Charleston, where all official records were kept. With the formation of circuit court districts in 1769, Granville County became Beaufort District and encompassed the previously established parishes of St. Helena (1712), Prince William (1745), St. Peters (1747), and St. Luke's (1767).

In 1785, Beaufort District was subdivided into Shewsbury, Lincoln, Hilton, and Granville Counties; however, the counties created at this time in the coastal districts failed to supplant the earlier parishes as political entities and soon were abandoned (Stauffer 1994). The larger area remained Beaufort District until 1868, when the newly ratified state constitution redesignated South Carolina's judicial districts "Counties." In 1878, Hampton County was created from northern and western Beaufort County. Thirty-four years later, Jasper County (1912) was created from southern Hampton County, thus containing what was, prior to 1878, western Beaufort County.

Contact, Colonialism, and the American Revolution. Spanish exploration of the South Carolina coast began as early as 1514 (Rowland 1978:1), and in 1520 a landing party went ashore in the Port Royal vicinity (now Beaufort County) at a spot they named Santa Elena (Hoffman 1983:64; Rowland 1978:1). From that time on, the Port Royal area was of great interest to both the Spanish and the French. The Spanish attempted to establish the settlement of San Miguel de Gualdape in 1526, but were unsuccessful. The location of this settlement is not known, although it is thought to have been north of Port Royal Sound in the vicinity of Winyah Bay (Quattlebaum 1955). The French, under Jean Ribaut, attempted to establish a settlement on the South Carolina coast in 1526. This settlement, in the Port Royal Sound area, was called Charlesfort, and also was unsuccessful.

A successful Spanish settlement was finally established on Parris Island at Port Royal Sound in 1566. Local Indians were less than friendly, but in spite of numerous attacks and several burnings, the town was not abandoned until 1587 (Rowland 1978:25-57; Lyon 1984). The Spanish

maintained their interest in Santa Elena through a series of missions on the Sea Islands from St. Augustine into Georgia (Covington 1968:8-9), and Spanish friars were at "St. Ellens" when William Hilton visited in 1663 (Hilton 1664:2). During its twenty year existence, this settlement served as the base for the first serious explorations into the interior of the state.

Spain's claim to the region was disregarded by Charles II of England; in 1662 he granted Carolina to the Lords Proprietors. The next year William Hilton was hired by a group of planters on Barbados to explore the acquisition. He spent over a month in the waters of both Port Royal and St. Ellens, leaving with a high opinion of the area's potential as a colony (Hilton 1664). Prompted by the accounts of tall pines and good soils, a small colony set out for Port Royal. Tales of hostile Indians convinced them to move farther north, where they founded Charles Towne in 1670 (Holmgren 1959:39). One of the first orders of business for the settlers was initiating trade with the Indians as a way of ensuring both economic and physical survival (Covington 1978:9).

In 1684, Lord Cardross of Scotland led a group of dissenters to Port Royal Island and established Stuart's Town. Traders in Charles Towne were convinced the Scots were stealing their customers and withheld material support. During the winter of 1685, Yamasee Indians moved into the Port Royal region of South Carolina from settlements around St. Augustine and among the Lower Creeks (Green 1992:23). Afraid of the Spanish and forced to survive on their own, the Scots' solution was to forge ties with their Yamasee neighbors. The Yamasee, who were unhappy with the Spanish missionaries in coastal Georgia, began fleeing to Stuart's Town, where they settled in a defensive perimeter of villages on neighboring islands. Lord Cardross recruited and armed a raiding party of Yamasee to attack the Spanish mission on St. Catherines Island. The raid was successful, but the Spanish retaliation a year later destroyed Stuart's Town (Covington 1978:8-11). With the destruction of Stuart's Town, the Yamasee moved further north to the Ashepoo and Combahee Rivers (Green 1992:27; see also McKivergan 1991).

After the Spanish withdrew, colonial South Carolina Indian traders continued to operate from semi-permanent posts in the area of the Yamasee villages. Sometime between 1687 and 1695, the Yamasee moved back toward Port Royal to escape the pressures of increased English settlement along the Combahee and Ashepoo Rivers (Green 1992:28). At the inducement of the Indian traders the South Carolina proprietary government began, in 1698, to award a series of large land grants in the Port Royal area. In February, 1703, the Euhaw Indians took refuge in South Carolina, settling north of the southernmost Yamasee villages, and quickly became identified with the latter tribes. Within a year after the town of Beaufort was chartered (1711), the Yamasee had ten villages in what are now Beaufort and Jasper Counties. These settlements were divided geographically into the Upper and Lower Towns. The Lower Towns of Altamaha, Oketee, Chechesee, and Euhaw

represented the "descendants of the interior Georgia chiefdoms encountered by de Soto in 1540, while the [U]pper [T]owns, Huspaw, Saupalau, Sadketche and Tulifina, Pocotaligo, Pocosabo, and Tomatley were comprised of remnants of the Guale, Yamacraw, and other groups of less certain origin" (Green 1992:25-26). As Green (1992:26) asserts: "That these groups remained distinct, yet were all called Yamasee by the English, may indicate that the concept of a 'Yamasee Nation' was more product of European perception than of Native American identification."

Relations between Indians and whites rapidly deteriorated, as contact between the groups increased. In 1707, the colonial government sought to curb abuses to the Indians through a treaty which, among other things, limited white settlement of the Sea Islands and established the mainland south and west of the Broad River as Indian territory. This area, subsequently St. Peter's, St. Luke's, and Prince William's Parishes, became known as the "Euhaws" or "Indian land" and was referred to as such through the mid-eighteenth century (Rowland 1993:9). The treaty provided little succor to the harassed Indians, and on 15 April 1715 (Good Friday) the Yamasee, angered by mistreatment from traders (which included a flourishing trade in Indian slaves) and encroachment of the white settlers land claims and livestock on their territory, slaughtered a number of colonial Indian commissioners and traders. This action sparked the Yamasee War (1715-1717), a coordinated attack by the Yamasee and 9,000 of their Creek allies against the British in South Carolina. The war is significant as one of the most serious colonial Indian conflicts because it nearly succeeded in driving the British from the province. By midsummer of 1715, the white colonials were confined within a defensive perimeter thirty miles outside of Charleston. The Indian success was short lived however. Once mobilized, the South Carolina militia proceeded to subjugate the Indians enough to force a peace treaty with the Creeks and Cherokees late in 1717. The remaining Yamasee refused to sign the treaty and fled to St. Augustine and the protection of Spanish Florida, from which they continued to stage raids into the Port Royal region. As a result, lasting peace was not achieved until 1728, when South Carolina provincial troops destroyed the Yamasee settlements near St. Augustine.

At the time, the Yamasee War was blamed on Spanish influence from Florida, but a more likely cause was the Indian traders' practice of seizing Indian women and children as slaves to meet Indian debts. No Spanish forces were actually involved in the conflict, but Spanish Florida became a refuge for the defeated Yamasee. Gallay (1986:12) believes that the traders' desire for the fertile mainland, described as the best part of the province, led them to provoke the Indians into attacking, thus forcing the government to take action against the Indians. After the war, South Carolina's provincial government could not induce any other Indian group to settle in the so-called buffer zone between Carolina and Florida. This left Carolina open to invasion from the Spanish in Florida. Port Royal's available money was used for defense rather than development, and the area's economy stagnated.

Despite this economic slump, the opening of the Indian lands to white settlement in 1716 promoted expansion into the district. With the establishment of Savannah, Georgia in 1733 and Purrysburg (on the South Carolina side of the Savannah River) in 1734, the region's population increased. The King's Highway was extended from Charleston to Savannah, fostering the crossroads settlement of Coosawhatchie which became the first major commercial center in the district's interior. Similarly, settlements and stores were established at Okatee (not to be confused with the former Indian village by the same name) and Pocotaligo. In the late 1730s, a number of Charleston area planters acquired holdings in lower Granville County and commenced rice planting, particularly in the swamps between the Coosawhatchie and Savannah Rivers. These planters included, among others, members of the Heyward, Manigault, Middleton, and DuPont families.

As the area's population grew, so did the need for social and political representation. Prior to 1707, this region between the Combahee and Savannah Rivers was referred to as Port Royal County. After 1707, the area was established as Granville County. In 1712, St. Helena's Parish (which encompassed the Sea Islands between St. Helena and Calabogue Sounds) was formed. Prince William, between the Combahee and Coosawhatchie Rivers, and St. Peter's, hugging the eastern shore of the Savannah River, were created in 1745 and 1747 respectively. The intervening area became St. Luke's Parish in 1767. The colonial act creating the parish was disallowed for political reasons by the British government, and as a result, the parish was never part of the Anglican Church's establishment in South Carolina. In fact, the Baptist church at the Euhaws (1738) was the first local house of worship, followed closely by the formation of Stoney Creek Presbyterian Church.

Meanwhile, this southern frontier of South Carolina remained vulnerable to Spanish attack. In the late 1730s, the Spanish in Florida offered freedom to all slaves who escaped from the English and came to St. Augustine. Georgia, which had no slaves at that time, was not affected, but the South Carolinians were worried. Fifty slaves escaped from St. Helena's Parish, and the Stono Rebellion was supposedly connected with the Spanish. England and Spain soon were at war, and the study area was too close to St. Augustine for comfort (Gallay 1986). To counter Spanish inducements to slaves, the South Carolina Assembly passed a bill in 1756 giving freedom to any bondsman (negro or Indian) who escaped from the Spanish and returned to South Carolina (Easterby 1958:82-83). The Spanish were defeated in 1742, but the declaration of war between Great Britain and France in 1744 again threatened South Carolina. St. Helena's Parish petitioned the colonial government in Charleston for military assistance, but were refused. A drought and a smallpox epidemic added to their troubles and prices for rice fell 70 percent in five years. The result was an economic depression which ended only with the development of indigo agriculture several years later (Gallay 1986).

The economy of Granville County and of St. Luke's Parish during the period from 1680 to the mid-1700s grew apace with the district's demographic development. It evolved from the early days of trading with the Yamasee and other Indians into a diversified plantation economy by the mid-eighteenth century. Indigo was cultivated on the Sea Islands, while rice flourished in the fresh water tidal marshes of the mainland. Livestock and provision farming were prevalent, and the region's live oak and long leaf pine forests provided shipbuilding materials and naval stores. The deep waters of the sounds surrounding the Sea Islands fostered a small, shipbuilding industry. Due to location, commercial and social ties tended to be with Savannah rather than Charleston.

Early Statehood and the Antebellum Period. The colonies declared their independence from Britain in 1776, following several years of increasing tension due in large part to what colonists considered to be unfair taxation and trade restrictions imposed on them by the British Parliament. The Royal Navy attacked Fort Sullivan near Charleston in 1776. They failed to take the fort, but they captured Savannah in late December 1778 and were successful in taking Charleston in May 1780. The British held Charleston until December 1782, at which time the last of the troops left to join others in New York before they all returned to Britain.

South Carolinians were divided during the war. The people of the Lowcountry were predominately, but not completely, rebels, while most of the loyalists resided in the interior of the state and in Charleston. After the United States won independence, many of the loyalists left South Carolina, going to Britain, the Bahamas, Jamaica, or moving further west in America. Some of these loyalists later returned to the state. In many cases their confiscated property was returned and their punishment for assisting the British was reduced to paying a fine (Lambert 1987).

Economic prosperity played a leading role in the events of the American Revolution in St. Luke's Parish and Beaufort County. As one scholar of Beaufort County history states: "Indigo, shipbuilding and the overflow from burgeoning Savannah made the 1760s and 1770s the most prosperous period in the eighteenth century for the Beaufort District and most of the local citizens were not anxious to disturb the new prosperity with a political Revolution." (Rowland 1978:9) Riches led to rivalries and sea islanders and mainlanders opposed one another over independence. As a result, the inhabitants of Beaufort were known for their loyalty, while those of St. Luke's tended to support the Revolution. Yet, even these divisions broke down, as Loyalists on Daufuskie Island waged a bloody feud with their patriot neighbors on Hilton Head and the May River Neck. Toward the war's end, the partisan war was especially violent.

When the British Army, under General Augustine Prevost advanced from Savannah to the environs of Charleston in 1779, his force passed through the project area on its way up the Union

Causeway to Coosawhatchie. The invading troops plundered plantations and carried away slaves. Thus, the residents of St. Luke's Parish were affected by both the internecine nature of the American Revolution in South Carolina and by the British military presence in and around Savannah and Charleston from 1779 to 1782.

After the Revolution, the economy of the region underwent a fundamental change as the 1790s witnessed the introduction of Sea Island cotton and the advent of the cotton gin on the nearby Savannah River. The cultivation of cotton spread and it became the most lucrative agriculture commodity in the region. Even so, rice culture in the area flourished during the first half of the 1800s, particularly along the Savannah River. Prior to 1860, neighboring St. Peter's Parish consistently held second place among South Carolina's rice producing regions. In 1849, Beaufort District led the state in production of the commodity (Rowland 1985:122). Throughout this period, large agricultural plantations were the dominant form of landholding in the district.

According to the first census of the United States taken in 1790, the population of Beaufort District was 18,753, of which 14,236 (75.9 percent) were slaves. There were 4,364 whites (23.3 percent), and 153 other free persons (0.8 percent) in the district (US Census 1790). By 1860, these figures had increased to a total population of 40,053, 16.7 percent (6714) of which were whites, 81.2 percent (32,530) were slaves, and 2.0 percent (809) were free persons of color.

In the third and fourth decades of the nineteenth century, St. Luke's Parish contained the largest slave population in South Carolina, and was the richest district in the southern portion of the state. Coosawhatchie, the county seat for Beaufort District from 1783 to 1844 when it was moved to the healthier location of Gillisonville, was the commercial hub of the rice district of St. Luke's. The center of the parish's cotton district was located on the May River at the planters' retreat of Bluffton, officially laid out in 1830. Wealthy area planters were instrumental in the state's drive toward secession, founding the short-lived Bluffton Movement in 1844 which advocated disunion. Figure 5 is a portion of Mills' 1825 map of the Beaufort District showing the approximate location of the project tract.

The Civil War. Increasing sectional tensions on a national level led to the outbreak of the Civil War in April 1861, with the opening shots fired on Fort Sumter in Charleston Harbor. The harbor of Port Royal was attacked by a Union fleet on 7 November 1861. Five hours later the two Confederate forts guarding the entrance, Fort Walker on Hilton Head and Fort Beauregard on St. Phillips, lowered their flags. Sea Island plantation owners fled to the mainland, leaving behind an black populace convinced they would soon be free (Rose 1964:11-12). Union troops landed on Hilton Head uncertain of the rebel retreat. Scouting parties soon discovered evidence of a hasty and

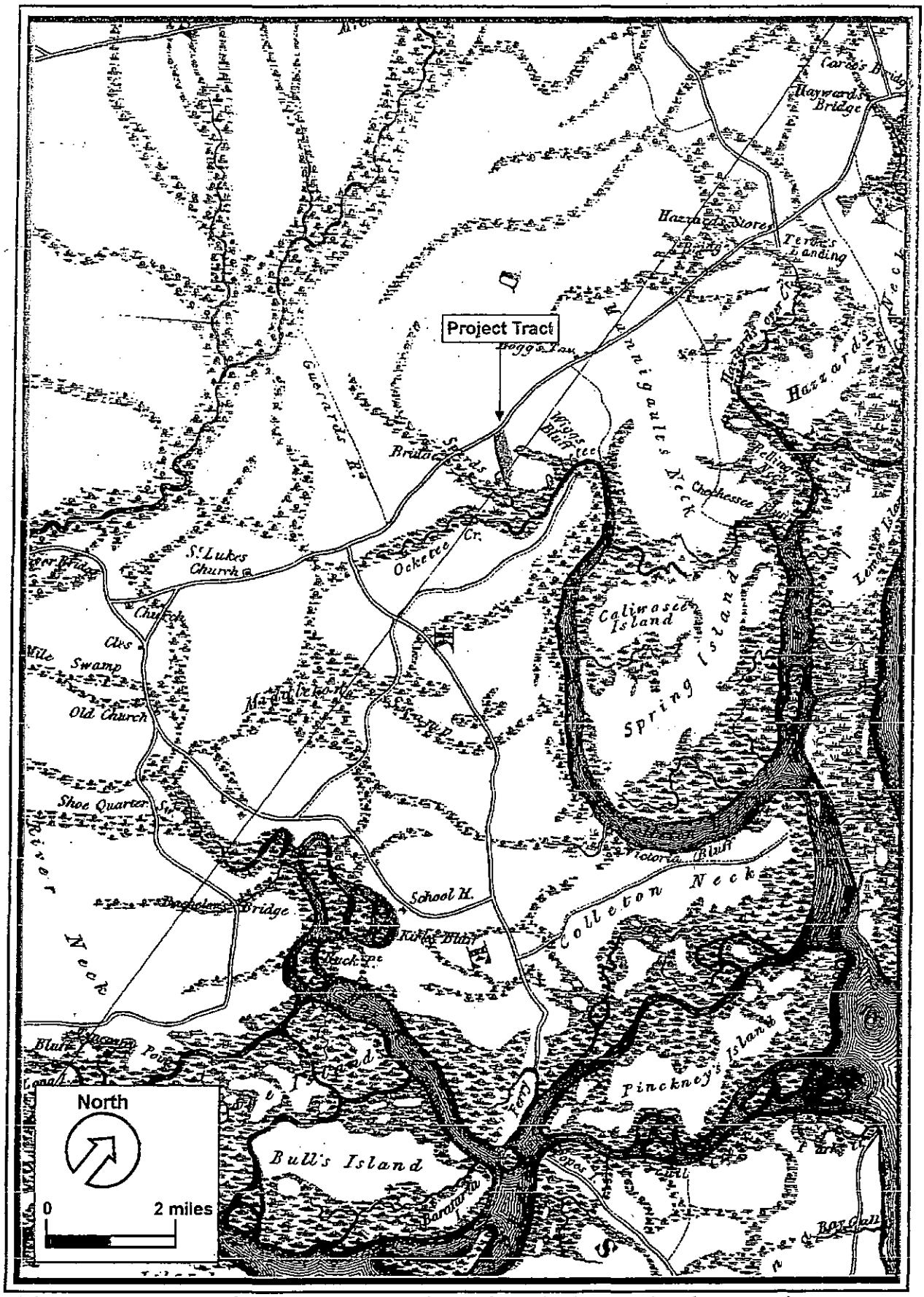

Figure 5. A portion of Mills, 1825 map of Beaufort District showing the approximate location of the project tract (Mills 1979).

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ill-planned evacuation (Eldridge 1893:67). One account of the Confederate retreat from Fort Walker reports:

> In this extremity, it was determined to abandon the fort. Back of this work there was an open space of a mile, over which the defeated troops ran in panic, subject every moment to the fire of the fleet. They found shelter in the woods, through which they made their way across the peninsula to the mainland. The ground over which they fled was covered with their muskets and knapsacks (Guernsey and Alden 1866:181).

With the occupation of the Sea Islands by Federal troops early in the Civil War, most of the inhabitants fled the project area. The white owners moved further inland, while most of their slaves took refuge with the Union forces headquartered at Hilton Head. Confederate troops encamped at a number of locations on the mainland, from which they guarded the approaches to the Charleston and Savannah Railroad. The area did see limited action in the form of Federal gunboat raids up the May, New, Colleton, and Okatee Rivers, culminating with the two Union excursions against Bluffton in 1862 and 1863, and the engagements at Pocotaligo. Figure 6 is a portion of a Civil War map, drawn by A. Lindenkoh in the 1860s, showing the approximate location of the project tract. The Lindenkoh map shows a road that is probably Pritcher's Point Road, which defines the southern tract boundary.

During the war, the United States government confiscated property in occupied territory for unpaid taxes. It was hoped by many that this would allow the freed slaves to purchase small tracts at auction and encourage them toward economic independence through farming (Rose 1964).

Postbellum Adaptation. The Civil War brought an end to the slave/plantation system in South Carolina. The relatively abrupt disintegration of the antebellum economic system resulted in a period of freed black migration, reshuffling of land ownership, a variety of freed black labor systems, and a period of redefinition of the socio-economic relationships between the freed blacks and the white land owners.

Consideration and discussion of the agricultural and economic evolution in South Carolina from the end of the Civil War until the beginning of the twentieth century may be found in Edgar (1992) and Foner (1988). Archaeological implications for this period can be found in Brockington et al. (1985), Orser and Holland (1984), and Trinkley (1983). A brief overview of the socio-economic conditions believed to be in existence in Beaufort County at the end of the nineteenth century and the beginning of the twentieth century is outlined below.

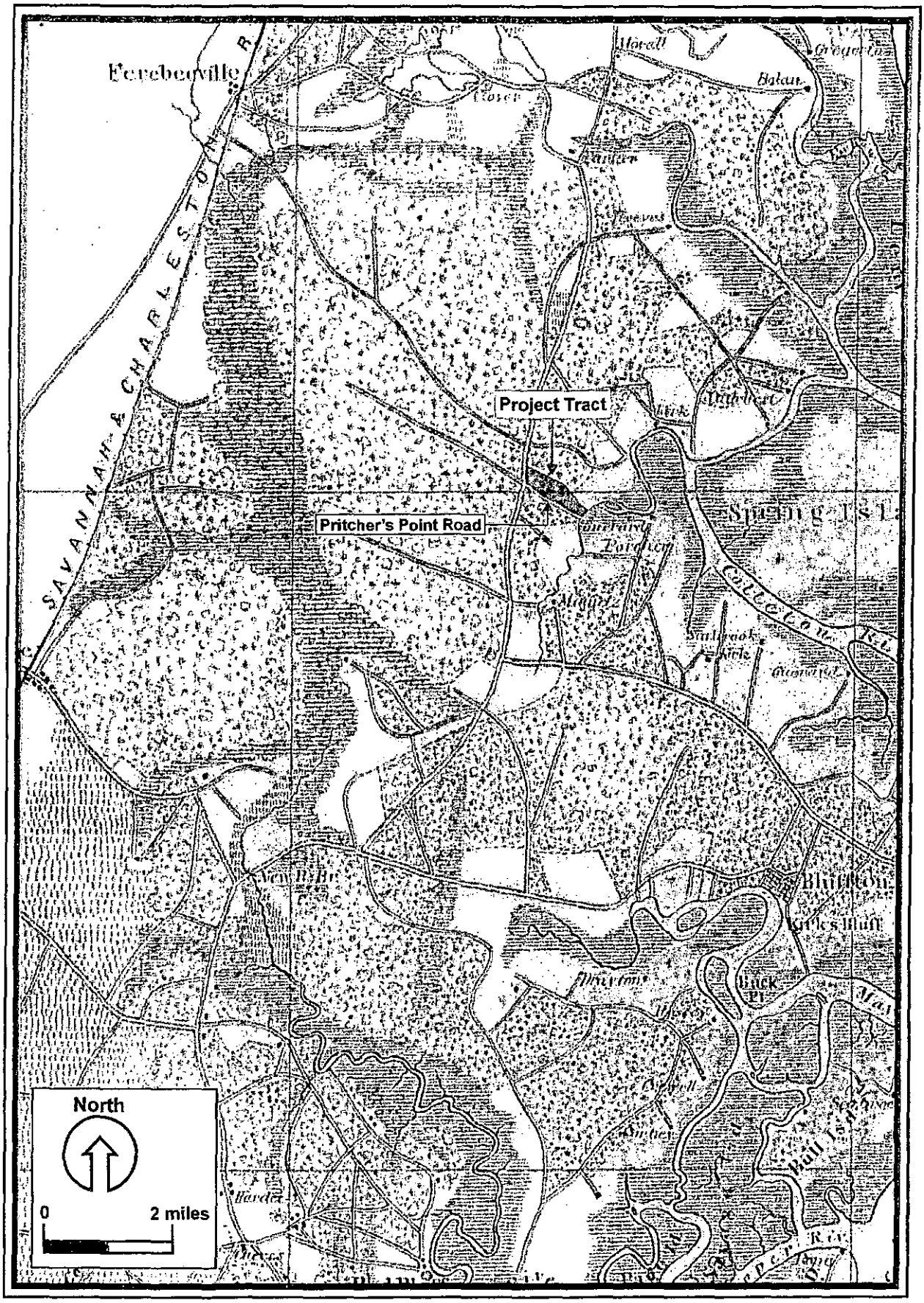

Figure 6. A portion of a Civil War map of the Charleston to Savannah coastal region showing the approximate location of the project tract (Lindenkoh 1865).

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Table 3 summarizes census data from 1850 to 1910 and details the population distribution between whites, freed blacks, and slaves for Beaufort County. By 1870, the population of Beaufort County consisted of 29,050 black freedmen (84.55 percent) and 5,309 whites (15.4 percent). In 1910, over 75 percent of the Beaufort County population was black, showing the continued dominance of the black population in Beaufort County through the beginning of the early twentieth century.

Table 3. Population Statistics for Beaufort County (includes present-day Jasper).

	Aggregate	White		Free Black		Slave	
Date	(count)	n	%	n	%	n	%
1850	38805	5947	15.3	579	1.4	32279	83.1
1860	40053	6714	16.7	809	2.0	32530	81.2
1870	34395	5309	15.4	29050	84.4	-	-
1880	30176	2442	8.0	27732	91.9	-	-
1890	34119	2695	7.8	31421	92.0	-	-
1900	35495	3394	9.4	32137	90.5	-	-
1910	30355	3063	13.0	26376	86.8	-	-

US Census 1854, 1864, 1872, 1883, 1895, 1901, 1913.

Land Ownership Patterns and Ethnicity. By the end of the nineteenth century, a small farmer in Beaufort County could either own and crop his own land, enter into a rent contract with a large land owner, or squat on unused and unattended property. Farm tenancy emerged as a dominant form of agricultural land management toward the end of the nineteenth century in South Carolina, and presented itself in two basic forms (Brockington et al. 1985; Orser and Holland 1984; and Trinkley 1983):

> *Sharecropping* was a system whereby the landowner provided all that the renter might need to tend and cultivate the land (i.e., draft animals, farming implements and tools, seed, and fertilizer). A variety of methods of payment by the renter could be arranged. However, usually an agreed portion of the crop (i.e., a share) would be surrendered to the landowner. Sharecropping was appropriate when tenants could not afford the capital outlay necessary to purchase seed, animals, and tools.
>
> *Cash renting* on the other hand, generally represented arrangements where an agreed sum of money was paid to the landowner by the tenant farmer. In these instances, the farmer was more independent and further removed from the landowner, and would provide his own animals, feed, seed, and equipment. This system generally allowed small farmers to accrue larger sums of money, and according to Brockington et al. (1985), was the preferred arrangement for tenant farmers, as it was regarded as a profitable operation which would help tenants to eventually acquire their own property. Cash renting was desirable to the land-lord because it removed him from

the uncertainties of market prices; removed the capital burden of supplying seed, fertilizer, and equipment; and assured a steady cash income.

The tenancy tenure system was such a dominant land management force by the end of the nineteenth century that the 1890 census, for the first time, detailed the many forms of tenancy. Table 4 summarizes the census data of 1890 and 1900. The average farm size in Beaufort County in 1890 was 42 acres; it increased slightly to 48.2 acres by 1900. Hence, at the end of the nineteenth century, the average farm size was relatively small, and relatively close to the Freedmen's Bureau ideal of "40 acres and a mule." Census data also provide insight into the numbers and varieties of crops and products cultivated and sold by the largely rural population of Beaufort County in 1880, and 1890. Cattle and swine were the preferred livestock, and an annual crop of corn and cotton provided needed income.

Table 4. Beaufort County Land Tenure in 1890 and 1900 (includes present-day Jasper).

Farms	**1890**		**1900**	
Total	3762		5476	
Average Size	42 acres		48.2 acres	
Aggregate	**n**	**%**	**n**	**%**
Owned	2710	71.60	3332	67.65
Fixed Cash Rent	1028	27.80	1582	32.12
Sharecropping	44	1.16	11	0.22
Total	3782	100.00	4925	99.99
Farms worked by blacks	*		5241	95.71
Farms worked by whites	*		235	4.29
Black			**n**	**%**
Owners	*		3189	60.85
Part Owners	*		517	9.86
Owners/Tenants	*		1	0.02
Managers	*		8	0.15
Cash Rent	*		1517	28.94
Sharecropping	*		9	0.17
Total			5241	99.99
White				
Owners	*		143	60.85
Part Owners	*		15	6.38
Owners/Tenants	*		2	0.85
Managers	*		8	3.40
Cash Rent	*		65	27.66
Sharecropping	*		2	0.85
Total			235	99.99

*Data not available in census. US Census 1895, 1902

Table 4 not only summarizes the census data for 1890 and 1900, it details the ethnicity of landowners. By 1900, the majority of the freedman population of Beaufort County (approximately 60 percent) owned and operated farms; the same proportion of whites in Beaufort County owned and operated farms. These data illustrate the desire of the African Americans throughout the years following the Civil War to own land, thereby confirming and consolidating their freedom.

The census data also illustrate that the preferred tenancy system in Beaufort County was cash renting. By 1900, only eleven farms in all of Beaufort County operated under sharecropping contracts. Further, the figures do not imply that either black or white families were more or less prone to entering cash renting contracts. Cash renting is practiced by 28.9 percent of black families and 27.6 percent of white families. Such data imply that the goals of black and white families residing in Beaufort County at the end of the nineteenth century were similar (i.e., to own their own farms, or to work toward that end). The relative proportions of black and white families owning land suggest that the social climate at the time did not prevent or hinder either race from achieving this goal.

The above data encapsulate the general agricultural and economic conditions in Beaufort County, and to a certain extent other agricultural areas of South Carolina, and of its residents at the end of the nineteenth century. What it does not provide, however, is a picture of the dynamic processes that shaped land ownership patterns after the Civil War and prior to 1880. Similarly, these data do not appear to reflect late nineteenth and early twentieth century land utilization in the area historically encompassed by St. Luke's Parish, where sharecropping played little or no role.

Indeed, recent historical and archaeological studies of lands situated in former St. Luke's Parish reveal that the trend in land ownership after the Civil War was toward consolidation of previously sizable individual holdings into even larger tracts. Typically, they were held by corporations, developers, and wealthy non-Southern capitalists and utilized as livestock rangelands, timber and naval store stands, and hunting preserves. Interspersed among these large tracts were occasional, smaller outparcels owned by individuals and located along the roads and waterways. The dynamics of the tenant properties and dwellings observed on historic plats support the conclusion that cash rental was the preferred form of tenancy in Beaufort County during the last decades of the nineteenth century and the first half of the twentieth century (Eubanks et al. 1993 and 1994; Hill et al. 1994; Hill and Poplin 1994). However, the economy of this region revolved around the utilization of the larger tracts for timber harvesting, naval stores production, livestock ranching, hunting, and to a lesser extent truck crop farming. In fact, early twentieth century promotional literature called for the establishment of small farms (160 to 240 acres) in the county to break up the traditional land use patterns.

> A great portion of the lands of Beaufort County have been owned in large blocks and used to produce turpentine and rosin, (naval stores), or lumber. Much of the farming that has been carried on has been done . . . without a knowledge of farming, or else by men who engaged in the highly hazardous or speculative phases of agricultural industry - trucking - instead of using modern methods and practicing and intelligent system of diversification (Maul n.d.12)

The disruption to the plantation economy caused by the abolition of slavery, the physical deterioration of plantations as a result of neglect during the Civil War, the subsequent crop failures, and the poor economic conditions of the post-war years all contributed to the demise of rice agriculture and cotton (especially Sea Island varieties) in the study area. Most of the land lay idle, although there were limited timber and cattle raising activities during Reconstruction. Limited attempts were made at reviving rice culture, but the loss of a stable, experienced labor force, the increased production of new rice lands in Louisiana, Arkansas, and Texas, and a series of severe storms thwarted these efforts. In addition to these short term factors, Heyward (1993:220, 241) asserts that competition in the world market ultimately sounded the death knell for the South Carolina rice industry. From the 1750s until 1830, "Carolina Gold" rice had been principally raised for export to Europe. During that period, it dominated the world market. After 1830, rice from India and Southeast Asia captured the overseas market. By the end of the Civil War, the United States was importing rice and continued to do so for half a century. In 1910, the only rice grown in South Carolina was concentrated on a few plantations north of Beaufort County, between the Edisto and Combahee rivers. Shortly thereafter, rice disappeared as an agricultural crop in the state.

Cotton proved to be a crop more adaptable to the change in labor force after the Civil War. Under the crop lien system, sharecropping, and tenant farming, it prospered as the state's main agricultural crop. In the 1880s and 1890s, Savannah, rather than Charleston, enjoyed the distinction of being the premier cotton port along the Atlantic seaboard. Cotton production peaked in 1926 when 18 million bales were produced on 44.5 million acres.

Postbellum southerners found lumber and turpentine (products of the region's oldest industry) readily available and lucrative commodities with which they could quickly recoup capital losses suffered during the war. From the mid-nineteenth century onward, large scale product manufacturing was a linchpin of the Deep South's economy. Expanded uses of pine timber in the manufacture of cross ties, building materials, and wood pulp for paper manufacturing, as well as advances in equipment technology fueled the growth of this industry. By 1890, Georgia led the region in both naval stores and lumber production. Factors in Savannah and the Gulf ports dominated the trade. The Georgia port city controlled the world price of naval stores from 1880 to 1950 (Wilson and Ferris 1989:39-40, 752-753, and 1428-1429).

Historically linked to and compatible with Southern forestry operations was livestock ranching. This farming practice was as old as the colonial timber and naval stores industry and certainly more extensive. Pasturage (cleared or uncleared) may have represented the largest form of land use in the South by 1800. In 1860, there were an estimated ten million hogs and eight million cattle grazing in the Deep South. Wholesale destruction of livestock during the Civil War seriously thwarted the industry and the emergence of fence laws in the postbellum period effectively kept herd sizes down. Yet, in the pine forests of the South stockmen and lower class residents alike gave their animals free range (Wilson and Ferris 1989:23-25). A number of cattle dips have been located on historic plats (Eubanks et al. 1993; Hill et al. 1994). It is believed that by the twentieth century, large scale cattle operations (like that on Belfair Plantation, currently Rose Hill Plantation) were characteristic of the project area.

In contrast to the livestock industry, truck farming is a late nineteenth and twentieth century phenomenon. This type of agriculture grew as the result of increased urban demand for fresh fruits and vegetables, and a simultaneous expansion of the railroads enabling rapid access to the market centers. Unlike many cotton farmers who were tied to the crop-lien or sharecropping system, truck farmers tended to be small, independent farmers. The railroads fostered this type of farming in the coastal plain of South Carolina, and particularly in Georgia and Florida, where a warm climate fostered a long growing season. Around the turn of the century, a promotional brochure on the Beaufort District, distributed by the Charleston & Western Carolina Railway, advertized 300 frost free days a year (Maull n.d.). Lettuce was the principal crop, while cabbages, cucumbers, peas and beans placed second, with radishes and string beans coming third in order of importance. Watermelons, cantaloupes, Irish potatoes were among the other crops that could be grown on places like Daufuskie and Savage Island. Prominent physical facilities connected truck cropping were packing sheds--with their adjacent "hot spots" where buyer and seller conducted business, and ice plants (Wilson and Ferris 1989:49 and 50).

Perhaps the most radical post Civil War change in land utilization of Beaufort County and the study area occurred during the last quarter of the nineteenth century, when the ailing and abandoned rice lands of the Lowcountry were revived as hunting preserves by northern capitalists. This movement was influenced by several factors. Sporting magazines became popular in the 1870s and, at the same time, the refinement of the 10-gauge double barrel, breech-loading shotgun popularized bird hunting. Northern capitalists with large amounts of discretionary wealth sought to escape the overcrowded conditions of the industrial northeast, which, ironically, was the source of their wealth. The expansion of the railroad infrastructure combined with improved Pullman and private cars made travel to the Deep South not only possible but comfortable. Southern railroad, real

estate, and timber interests encouraged this invasion while former rice planters were happy to recoup their lost capital through the sale of property.

The former rice fields lent themselves to duck and quail hunting while deer, turkey, and Feral hogs thrived on the "hard" marsh and woodlands. A number of these hunting preserves were established in Beaufort and Jasper Counties, most notably, the Okatee Hunt Club and Chelsea Plantation. In all, an estimated 159 plantations were purchased by wealthy northerners in South Carolina prior to World War II.

Thus, by the early twentieth century the majority of the property in the Bluffton/Okatee area of Beaufort and Jasper Counties was owned by timber interests or by wealthy outsiders who converted the former plantations to suit their recreational needs. Today, most of the plantations are being actively developed as recreational communities for both permanent and seasonal residents.

A History of the Project Tract

The history of the project tract, as with most property in Beaufort County, is incomplete. Because of the destruction of the courthouse records during the Civil War, there are many gaps in the history of this parcel of land. Note the following discussion is presented in English measurements without metric conversion in keeping with archival documents and records.

While it is uncertain who owned this land before the Civil War, it appears that after the Civil War, Asbury M. Preacher (also Pritcher) purchased several parcels ranging from 39 to 50 acres each. These parcels were purchased from Ellen A. Crosby in 1877 (BCDB 30:68), Mary Agnes Stoney in 1879 (BCDB 24:339), Jesse P. Williams in 1886 (BCDB 30:69), Joseph Bailey in 1891 (BCDB 24:340), and Frank Alston in 1899 (BCDB 24:341). While all these tracts are in Bluffton Township, it is difficult to determine their exact locations.

In 1925, Asbury M. Preacher, Sr., conveyed 100 acres described as "on Cherry Point Creek" to A. M. Preacher, Jr. (BCDB 44:49). Three years later, he conveyed another 50 acre parcel to A. M. Preacher, Jr., that was located on the Okatie River and bounded by "Cherrypoint Crick" (BCDB 45:937). Figure 7 is a portion of the 1937 Beaufort County General Highway map showing the approximate location of the project tract. The USGS 1979 *Jasper, SC* quadrangle shows a creek leading northwest from its confluence with the Okatee River past Cherry Point Landing (see Figure 1). The 1978 Beaufort County General Highway map refers to the creek as Malind Creek.

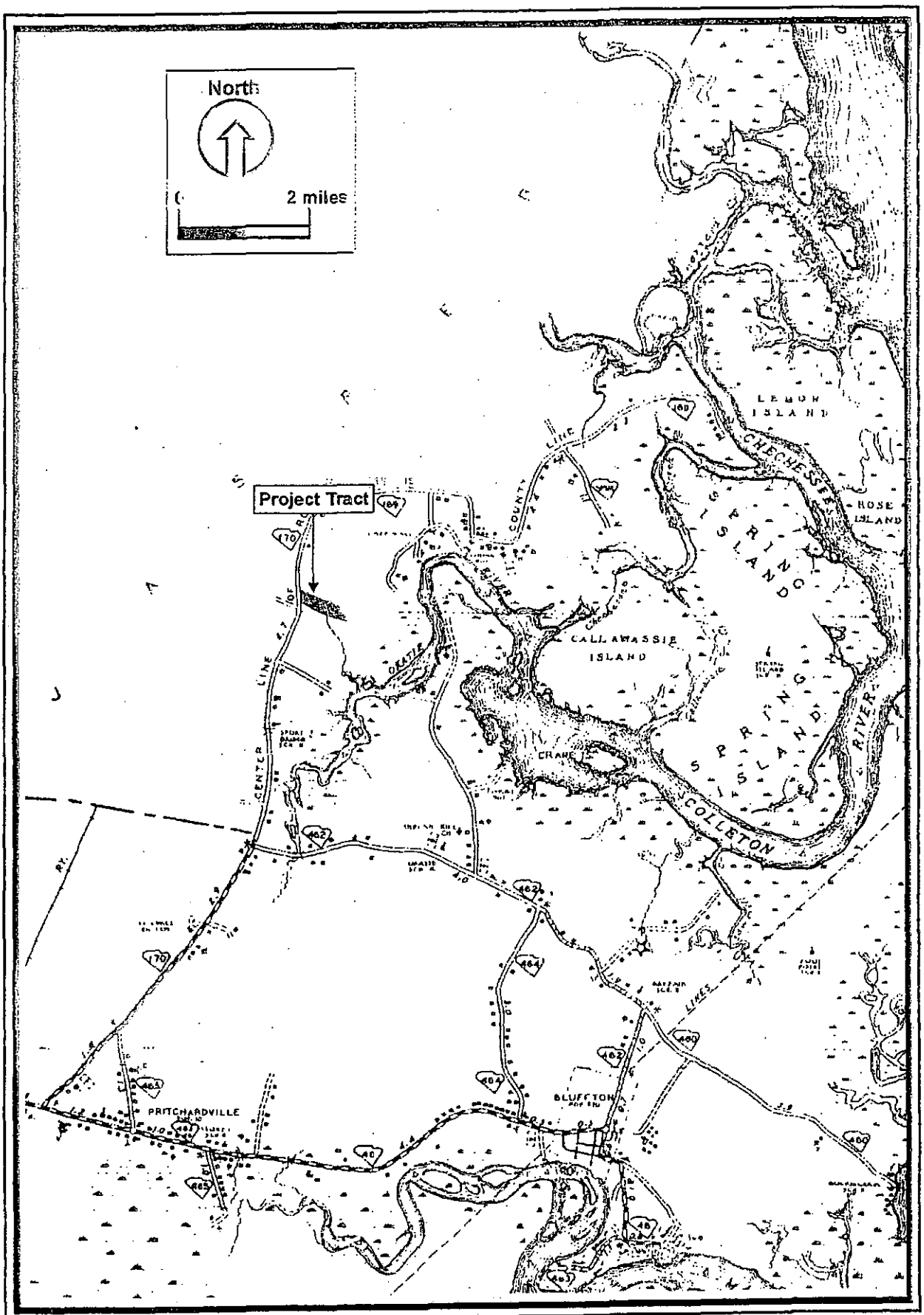

Figure 7. A portion of the 1937 Beaufort County General Highway map showing the approximate location of the project tract.

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A. M. Pritcher (Preacher), Jr., owned the land until 1964, when he conveyed all 150 acres to Gerald M. Pritcher and Joel W. Pritcher. In this same deed there is a statement that "it is agreed and understood that we, A. M. Pritcher, Jr., and Ina B. Pritcher shall have, hold and enjoy said premises so long as we shall live and we also reserve the right to sell or sign lease to dispose of part or all of timber that we so desire so long as we shall live" (BCDB 176:229).

A deed from 1981 shows that Gerald M. Pritcher conveyed his one-half interest and A. M. Pritcher, Jr., conveyed one-half his life estate to Joel W. Pritcher (BCDB 315:1713). This piece of land was the southernmost 75 acres of the 150 acre conveyance that A. M. Pritcher, Jr., made to Joel W. And Gerald M. Pritcher in 1964.

Joel W. Pritcher, Sr., conveyed 1.771 acres to Joel W. Pritcher, Jr., and his wife Bonnie J. Pritcher in 1990 (BCDB 550:1744). This 1.771 acres was on the far eastern edge of Joel Pritcher, Sr.'s southern 75 acres. The small piece of land was bounded on the east and north by the marsh, and otherwise, it was bounded by the rest of the property owned by Joel Pritcher, Sr.

Finally, in 1995, Joel W. Pritcher, Sr., conveyed the northern half of his 75 acres (less the 1.771 acres he had previously conveyed to Joel Pritcher, Jr.) to his daughter, Dale P. Drinkwater (BCDB 780:272). The southern half of the 75 acres went to Joel W. Pritcher, Jr. (BCDB 780:268).

Previous Investigations

NRHP Listed Properties. Three properties listed on the NRHP are located near the Palmetto Traditional Homes Okatie Tract. These are Altamaha Town (38BU20/1206), St. Luke's Church (38BU1131), and the Rose Hill Plantation House. Although none of these historic properties are located within 1.6 kilometers (1.0 mile) of the project tract, we discuss these cultural resources to provide insight into the rich and diverse historic fabric of the Bluffton/Okatie area of Beaufort County. Development of the project tract will not affect these historic properties.

St. Luke's Church (38BU1131) is located approximately 6.8 kilometers south-southwest of the project tract and was recorded as part of a regional survey of Beaufort County (Low Country Council of Governments 1979). The church was built in 1824 and is the oldest extant Episcopal church in Beaufort County. St. Luke's Church retains many interesting architectural features (e.g., an original slave gallery) and is listed on the NRHP for its architectural merit.

Archaeological site 38BU20/1206, the early eighteenth century Yamasee Indian town of Altamaha, is located approximately 4.0 kilometers northeast of the project tract. This site also contains earlier Native American components, including Middle-Late Woodland or Mississippian mounds, and a colonial/antebellum component. Site 38BU20/1206 may be the best preserved eighteenth century Native American settlement in coastal South Carolina (Green 1992; Fletcher and Harvey 2000). The site is listed on the NRHP for its information potential.

Rose Hill Plantation House, a Gothic Revival residence initially built by Dr. John Kirk circa 1860, is approximately 5.0 kilometers southeast of the project tract on the Colleton River. Construction of the house was interrupted by the Civil War but in 1946, the owners restored the building according to plans originally drafted by Dr. Kirk. The detail of the restoration gives the property exceptional historic integrity. Rose Hill is arguably the finest example of Gothic Revival architecture in the Lowcountry and is listed on the NRHP for its architectural merit.

Archaeological Sites within 1.6 Kilometers of the Project Tract. We reviewed the archaeological site files at the SCIAA and identified seven archaeological sites (38BU804, 38BU1439, 38BU1663-38BU1665, 38BU1691, 38BU2100, and 38JA223) within 1.6 kilometers of the project tract (see Figure 1). All of the these sites were identified by professional organizations.

The South Carolina Department of Transportation (SCDOT) has sponsored several cultural resources surveys in the project area. These include surveys of the US Route 17/278 Connector (Trinkley 1978; Roberts 1986), the Route S-27-141 Widening Project (Bailey 1999) south and west of the project tract, the US Route 278 Widening Project (Roberts 1996), and the SC Route 170 Widening Project (Adams 1996) west of the project tract. Adams (1996), Bailey (1999), Roberts (1986), and Trinkley (1978) did not identify any sites within 1.6 kilometers of the project tract during their respective SCDOT surveys. Roberts (1996) identified four sites (38BU1663-38BU1665 and 38JA223) east of the project tract during a survey of the US Route 278 Widening Project for the SCDOT. All four of these sites are nineteenth to twentieth century artifact scatters and are not eligible for the NRHP.

In 1995 and 1997, Brockington and Associates, Inc., surveyed the 375 hectare Indigo Plantation Tract in Beaufort County, South Carolina and identified sites 38BU1349 and 38BU1691 (McMakin 1997; Poplin et al. 2000; Rust et al. 1995). Site 38BU1439 contains artifacts associated with Middle-Late Woodland, Post-Contact Yamasee Indian, and eighteenth-nineteenth century plantation occupations. Recent agricultural activities and land clearing severely disrupted the site but the presence of Altamaha ceramics and the association of the site with "Indian Old Fields" on a 1732 plat suggest that remnants of Yamasee households may remain at the site. Additionally, the

Yamasee remains found at 38BU1439 may be associated with site 38BU1231, which yielded remains of the Yamasee Indian village of Oketee, occupied between 1698 and 1715. Therefore, Poplin et al. (2000) recommends 38BU1439 potentially eligible for the NRHP. Site 38BU1691 is a multi-component site dating from the Woodland period and the eighteenth, nineteenth, and twentieth centuries. Deposits at the site are restricted to the plowzone and surface. Thus, Poplin et al. (2000) recommend 38BU1691 not eligible for the NRHP.

Other sites recorded within 1.6 kilometers of the project tract include sites 38BU804 and 38BU2100. Site 38BU804, a Middle Woodland and eighteenth/nineteenth century site with extensive shell middens, is located 1.7 kilometers northeast of the project tract on the Okatee River (see Figure 1). Tommy Charles of the SCIAA recorded 38BU804 during his collector's survey and recommended the site potentially eligible for the NRHP. Archaeologists with R.S. Webb and Associates, Inc., identified site 38BU2100, 0.5 kilometers south of the project tract on the Okatee River (see Figure 1). On the SCIAA site form, Styer (2003) recommends 38BU2100 not eligible for the NRHP. At present, the final report documenting site 38BU2100 is not on file at the SCIAA.

Chapter IV. Results and Recommendations

Archaeological survey of the project tract involved the excavation of 424 shovel tests along 43 transects to provide systematic examination of the Palmetto Traditional Homes Okatie Tract. These efforts resulted in the identification of three archaeological sites (38BU2101 - 38BU2103) and three isolated finds (Isolates 1-3). Detailed descriptions of all cultural resources identified in the project tract follow. Figure 1 depicts the location of each identified site and isolated find in the project tract.

Site 38BU2101

Cultural Affiliation *- Woodland (?)*
Site Type *-Pre-Contact ceramic scatter*
Site Dimensions *- 30.0 meters by 15.0 meters, oriented northeast/southwest*
Soil Type *- Yemassee loamy fine sands*
Elevation *- 4.6 meters amsl*
Nearest Water Source *- Malind Creek, a tributary of the Okatee River*
Present Vegetation *- Mixed pine/hardwood forest*
NRHP/Management Recommendations *- Not eligible/no further work recommended*

Site 38BU2101 is a subsurface scatter of Pre-Contact ceramics located in the northwestern portion of the project tract (see Figure 1). The site covers 30 by 15 meters, oriented northeast/southwest. Vegetation at the site consists of mixed pines and hardwoods. The site is 30 meters south of Heffalump Road. The nearest water source is approximately 200 meters to the east. The landform slopes down to a low and wet area 40 meters to the south. Two consecutive negative shovel tests at 15 meter intervals define the site boundaries. Figure 8 displays a plan of 38BU2101.

Archaeologists excavated 15 shovel tests in and around 38BU2101; two (13 percent) of these shovel tests produced artifacts. We encountered very dark gray loamy fine sand Ap horizon soils from 0-20 cm bs, yellowish brown loamy fine sand A2 horizon soils from 20-40 cm bs, and pale brown to light brownish gray fine sandy loam to sandy clay loam B horizon soils from 40-60+ cm bs. Stuck (1980) describes these soils as Yemassee loamy fine sands. Archaeologists recovered artifacts from 0-45 cm bs. We encountered no evidence of cultural features or artifact concentrations on the surface or in any shovel test.

We recovered three Pre-Contact ceramic artifacts from shovel tests at 38BU2101. Shovel Test 2.1 produced one plain body sherd with very coarse sand temper at 30-45 cm bs. Shovel Test 3.1 produced one plain rim sherd and one plain body sherd, each with very coarse sand temper, at 0-30 cm bs. The paucity of artifacts precludes a definitive temporal assessment of the site.

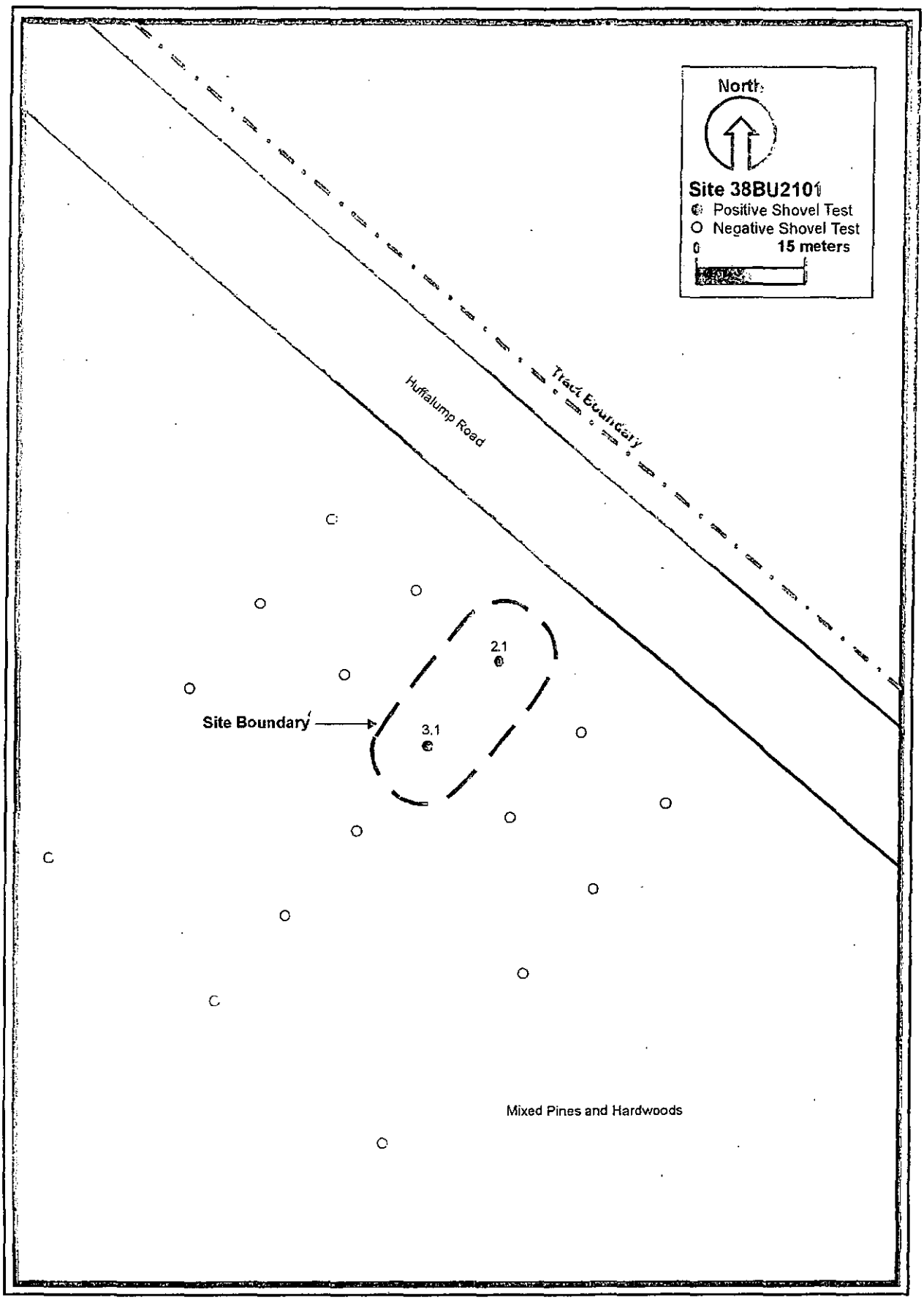

Figure 8. Plan of 38BU2101.

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However, the Pre-Contact artifacts likely are associated with a Woodland occupation. The low density of artifacts suggests a short-term seasonal occupation.

Archaeologists assessed site 38BU2101 with respect to Criterion D, its ability to add significantly to our understanding of the history of the region. Due to the low density of artifacts recovered from the site, archaeologists identified no vertically or horizontally distinct archaeological deposits. Also, archaeologists encountered no evidence of subsurface features or artifact clusters. Additional archaeological investigations at 38BU2101 cannot generate information beyond that recovered to date. Therefore, we recommend 38BU2101 not eligible for the NRHP. Site 38BU2101 warrants no further management consideration.

Site 38BU2102

Cultural Affiliation *- Early/Middle Woodland; early 19th to early 20th century*
Site Type *-Pre-Contact ceramic scatter; Post-Contact isolated find*
Site Dimensions *- 30.0 meters by 105.0 meters; oriented northeast/southwest*
Soil Type *- Coosaw loamy fine sands*
Elevation *- 3.8 meters amsl*
Nearest Water Source *- Malind Creek, a tributary of the Okatee River*
Present Vegetation *- Mixed pine/hardwood forest*
NRHP/Management Recommendations *- Not eligible/no further work*

Site 38BU2102 is a subsurface scatter of Pre-Contact ceramics and a Post-Contact isolated find located in the north-central portion of the project tract (see Figure 1). The site covers 30 by 105 meters, oriented northeast/southwest. Vegetation at the site consists of mixed pines and hardwoods. The site is 30 meters south of Heffalump Road. The nearest water source is approximately 120 meters to the east. Two consecutive negative shovel tests at 15 meter intervals define the site boundaries. Figure 9 displays a plan of 38BU2102.

Archaeologists excavated 43 shovel tests in and around 38BU2102; six (14 percent) of these shovel tests produced artifacts. We encountered very dark grayish brown loamy fine sand Ap horizon soils from 0-20 cm bs, light brownish gray loamy fine sand A2 horizon soils from 20-70 cm bs, and brownish yellow fine sandy loam B horizon soils from 70-80+ cm bs. Stuck (1980) describes these soils as Coosaw loamy fine sands. Archaeologists recovered artifacts from 0-40 cm bs. We encountered no evidence of cultural features or artifact concentrations on the surface or in any shovel test.

We recovered seven Pre-Contact and Post-Contact artifacts from shovel tests at 38BU2102. Shovel Tests 2.1-6.1 produced all of the Pre-Contact artifacts, including two residual sherds, one eroded sherd, one plain sherd, and two Deptford Linear Check Stamped sherds. All of these sherds

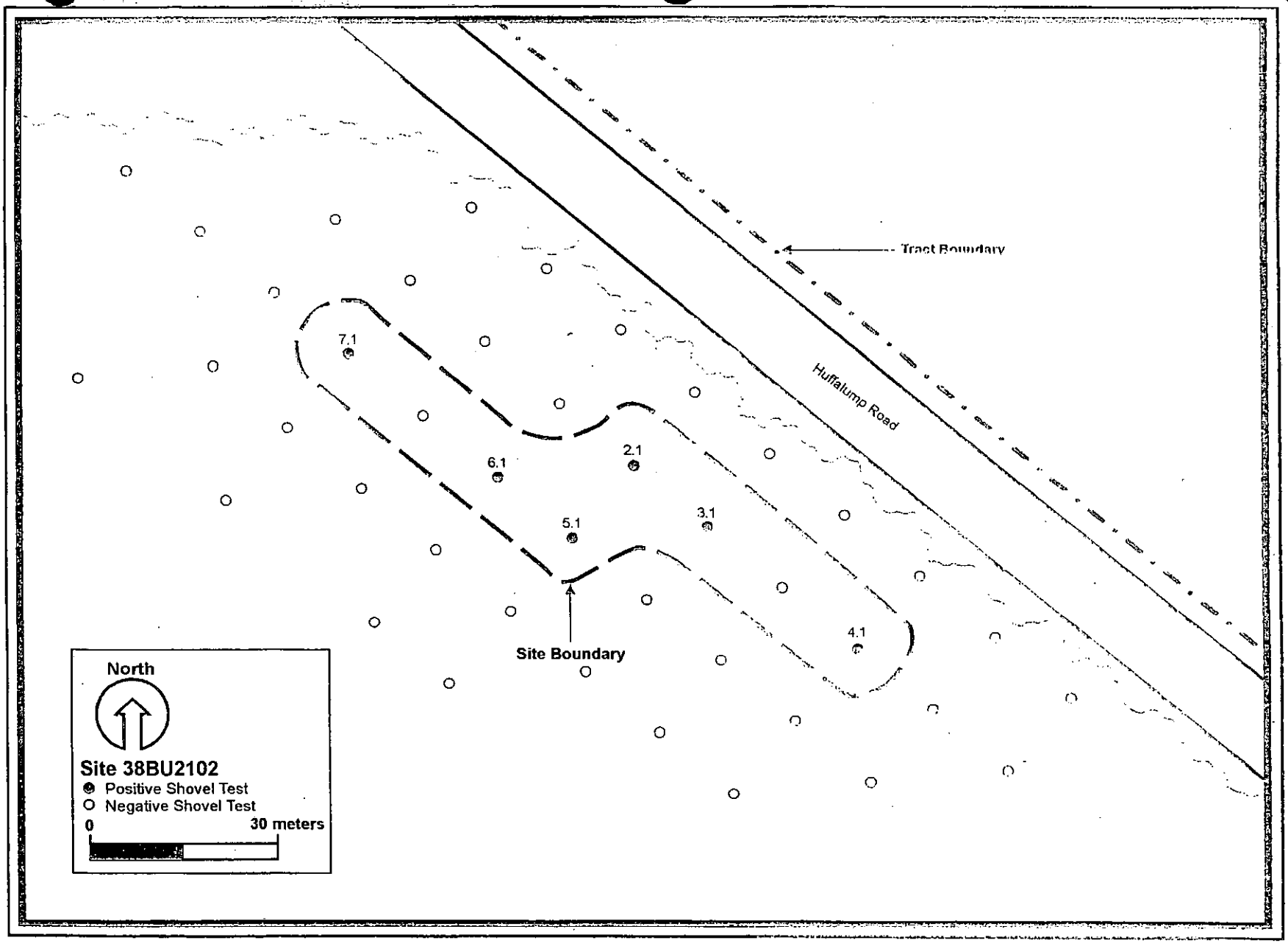

Figure 9. Plan of 38BU2102.

have coarse to very coarse sand temper. Shovel Test 7.1 produced one undecorated whiteware sherd. For a complete artifact inventory, see Appendix A.

The Deptford sherds are associated with an Early/Middle Woodland period occupation. The other Pre-Contact sherds likely are associated with this occupation as well. The site's location would have provided access to a variety of resources. At most sites, the presence of large, temporally diagnostic sherds and faunal materials such as shell suggest the presence of intact subsurface features. Shovel tests excavated at 38BU2102 produced no shell. Thus, the lack of shell combined with the low density of artifacts suggests a minor, short-term seasonal occupation.

The whiteware sherd indicates an early nineteenth to early twentieth century presence at 38BU2102. The location of the site along the northern portion of the tract near Heffalump Road suggests that this artifact could be associated with a Post-Contact occupation north of the project tract or is simply roadside refuse.

Aerial photography from the 1970s indicates that the north-central portion of the project tract was cleared and possibly cultivated (Stuck 1980:Sheet 74). These factors combined with the site's proximity to Heffalump Road suggest that the archaeological deposits at 38BU2102 are degraded.

Archaeologists assessed site 38BU2102 with respect to Criterion D, its ability to add significantly to our understanding of the history of the region. Due to the low density of artifacts recovered from the site and the extent of ground disturbance, archaeologists identified no vertically or horizontally distinct archaeological deposits. Also, archaeologists encountered no evidence of subsurface features, such as large temporally diagnostic sherds, shell, or faunal materials. Additional archaeological investigations at 38BU2102 cannot generate information beyond that recovered to date. Therefore, we recommend 38BU2102 not eligible for the NRHP. Site 38BU2102 warrants no further management consideration.

Site 38BU2103

Cultural Affiliation *- Woodland(?); colonial/antebellum; postbellum; modern*
Site Type *-Pre-Contact ceramic and lithic scatter; Post Contact scatter*
Site Dimensions *- 90 meters by 105 meters, oriented northeast/southwest*
Soil Type *- Nemours fine sandy loam*
Elevation *- 4.7 meters amsl*
Nearest Water Source *-Malind Creek, a tributary of the Okatie River*
Present Vegetation *- Manicured lawn; grassy arboretum; maritime forest*
NRHP/Management Recommendations - Potentially Eligible/preserve or test

Site 38BU2103 is a subsurface scatter of Pre-Contact ceramic and lithic artifacts and Post-Contact ceramics, glass, and architectural materials located on a point overlooking Malind Creek in the eastern portion of the project tract (see Figure 1). The site covers 90 by 105 meters, oriented northeast/southwest. Vegetation at the site includes a maritime forest along the bluff edge; a grassy arboretum with a variety of trees planted in rows in the central portion of the site, and manicured lawn in the northern portion of the site. The site extends east of Pritcher's Point Road and is circumnavigated by a driveway that leads to the Pritcher residence. Two consecutive negative shovel tests at 15 meter intervals define the northern and western site boundaries; the bluff edge defines the southern and eastern site boundaries. Figure 10 displays a plan of 38BU2103 and Figure 11 provides views of the site.

Archaeologists excavated 52 shovel tests in and around 38BU2103; 19 (37 percent) of these shovel tests produced artifacts. We encountered dark grayish brown fine sandy loam Ap horizon soils from 0-15 cm bs and pale brown fine sandy loam A2 horizon soils from 15-25 cm bs. These soils were underlain by red clay Bt horizon subsoils from 25-40 cm bs. Stuck (1980) describes these soils as Nemours fine sandy loam. Archaeologists recovered artifacts from 0-25 cm bs. Shovel Test 18.1 produced 83 percent of the oyster shell and may have exposed a shell lense. Shovel Tests 12.1 and 16.1 produced bone fragments and may have exposed cultural features. Shovel Test 20.1 produced brick fragments and may have exposed evidence of a brick foundation.

We recovered 55 Pre-Contact and Post-Contact artifacts from shovel tests at 38BU2103. Table 5 summarizes the artifacts recovered from shovel tests at 38BU2103. Pre-Contact artifacts include five eroded/residual sherds, two plain sherds, one chert flake, one chert flake fragment, and one retouched chert flake. Post-Contact artifacts include 29 ceramic artifacts, seven glass artifacts, nine unidentifiable nail fragments, and 3.21 grams of brick fragments. Ceramic artifacts include one ironstone sherd, one Delft sherd, three pearlware sherds, two stoneware sherds, and 22 whiteware sherds. These sherds provide a Median Ceramic Date (MCD) of 1841 and indicate a colonial/antebellum and postbellum occupation at 38BU2103. Glass artifacts include three aqua bottle glass fragments and four dark olive green bottle glass fragments. Additionally, we recovered

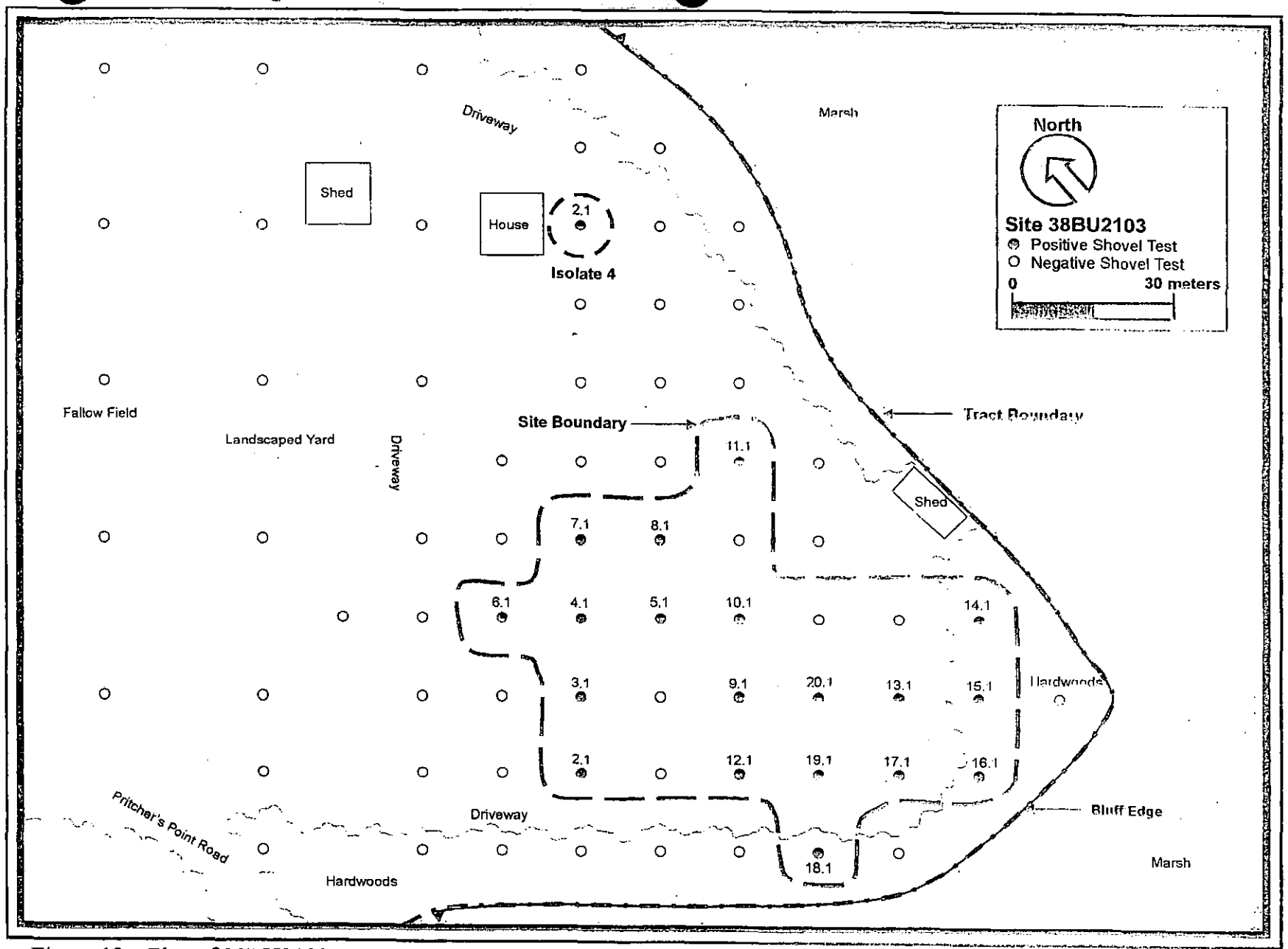

Figure 10. Plan of 38BU2103.

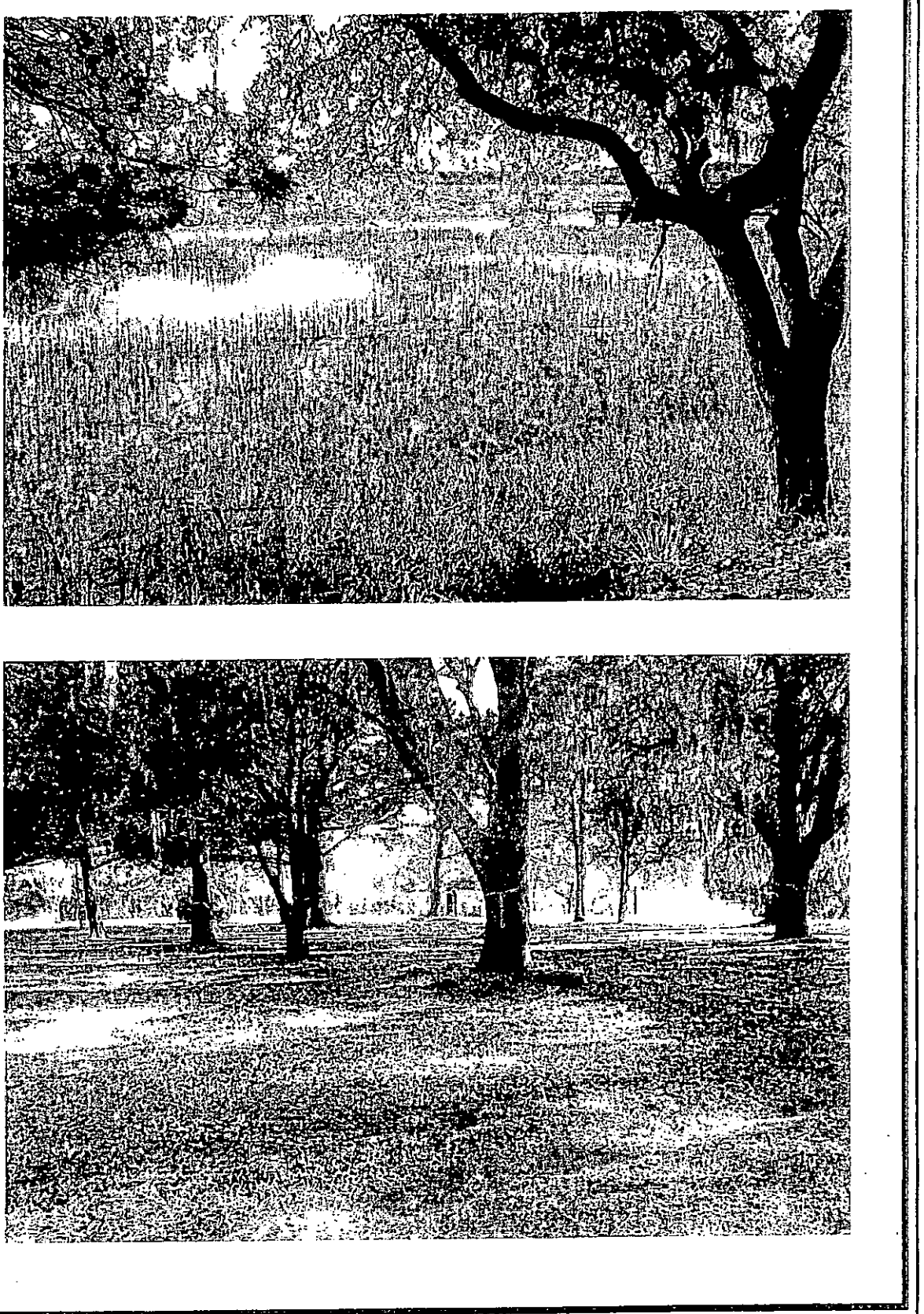

Figure 11. Views of 38BU2103 showing the marsh looking south (top) and the arboretum looking northeast (bottom).

Table 5. Artifacts Recovered from Shovel Tests at 38BU2103.

Era	Artifact Type	Artifacts	Date Range	Count	Weight
Pre-Contact	Ceramics	eroded	-	2	
		plain	-	2	
		residual	-	3	
	Lithics	chert flake	-	1	
		chert flake fragment	-	1	
		chert retouched flake	-	1	
	Subtotal			10	
Post-Contact	Ceramics	Ironstone (undecorated)	1845 - 1925	1	
		Delft (undecorated)	1640 - 1750	1	
		Pearlware (transfer printed)	1795 - 1840	3	
		Stoneware (Bristol slip)	1835 - present	1	
		Stoneware (white salt-glazed)	1740 - 1775	1	
		Whiteware (hand painted)	1815 - 1925	1	
		Whiteware (shell edged)	1815 - 1860	4	
		Whiteware (transfer printed)	1815 - 1860	5	
		Whiteware (undecorated)	1815 - 1925	12	
	Glass	Bottle glass (aqua)	-	3	
		Bottle glass (dark olive green)	-	4	
	Architectural	unidentifiable nail fragments	-	9	
		brick fragments (grams)	-	-	3.21
	Subtotal			**45**	**3.21**
	Total			**55**	**3.21**
Other	Faunal	oyster shell fragments (grams)	-	-	605.46
		bone fragments (grams)	-	-	1.56
	Rock	granite	-	2	161.11
		non-cultural rock	-	1	1.46
		split pebble	-	1	10.97

605.46 grams of oyster shell fragments, 1.56 grams of bone fragments, two pieces of granite, one non-cultural rock, and one split pebble. For a complete artifact inventory, see Appendix A.

No historic maps that we reviewed show buildings on or near the project tract. The Lindenkoh map possibly shows Pritcher's Point Road (see Figure 6). Pritcher's Point Road provides access to the Pritcher estate and Cherry Point Landing, which is south of the project tract, and leads directly to site 38BU2103.

Archaeologists assessed site 38BU2103 with respect to Criterion D, its ability to add significantly to our understanding of the history of the region. At 38BU2103, we encountered evidence of subsurface artifact concentrations and cultural features. These archaeological deposits are evidence of a previously undocumented building. Therefore, additional archival research of the project tract and archaeological investigations at 38BU2103 could generate important information beyond that recovered to date. Therefore, we recommend 38BU2103 potentially eligible for the NRHP. Site 38BU2103 should be preserved in place. However, if proposed land disturbing

activities cannot avoid site 38BU2103, appropriate archival research and archaeological testing should be conducted to determine definitively the site's NRHP eligibility.

Isolated Finds

In addition to sites 38BU2101 - 38BU2103, we identified three isolated finds (Isolates 1-3). All of these isolated finds were recovered from shovel tests at 0-40 cm bs. The location of each isolated find is shown in Figure 1. Isolated finds consist of cultural materials that occur in a context too limited to be designated an archaeological site. We identified Isolate 1, a chert flake fragment, in the northwestern portion of the project tract. We identified Isolate 2, an undecorated whiteware sherd, in the east-central portion of the project tract. We identifed Isolate 3, a thermally altered chert projectile point/knife tip, 15 meters east of the Pritchard residence in the northeastern portion of the project tract. These isolated deposits cannot meet any of the requirements for eligibility to the NRHP and therefore are recommended not eligible for the NRHP. Further management consideration of Isolates 1-3 is not warranted.

Summary and Management Recommendations

In February 2004, investigators from the Brockington and Associates, Inc., Charleston office, conducted a cultural resources survey of the 38.4 hectare Palmetto Traditional Homes Okatie Tract in Beaufort County, South Carolina. We identified no historic buildings on the project tract. We identified three archaeological sites (38BU2101-38BU2103) and three isolated finds (Isolates 1-3) on the project tract. Site 38BU2103 is a multi-component subsurface scatter of Pre-Contact ceramic and lithic artifacts, Post-Contact ceramic artifacts, glass artifacts, and architectural fragments, shell, and bone and possible intact cultural features. These cultural features may be related to either an unknown Pre-Contact occupation or a colonial/antebellum and/or postbellum occupation at the site. Therefore, we recommend site 38BU2103 potentially eligible for the NRHP. Site 38BU2103 should be preserved in place. However, if proposed land disturbing activities cannot avoid 38BU2103 appropriate archival research and archaeological testing should be conducted. Sites 38BU2101 and 38BU2102 and Isolates 1-3 do not have the potential to contribute significant information regarding past uses of the project area or the region. Therefore, we recommend sites 38BU2101 and 38BU2102 and Isolates 1-3 not eligible for the NRHP. These resources warrant no further management consideration. Land disturbing activities with respect to archaeological resources 38BU2101, 38BU2102, and Isolates 1-3 at the Palmetto Traditional Homes Okatie Tract should be allowed to proceed as planned.

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Appendix A.

Artifact Inventory

Artifact Catalog

Brockington and Associates, Inc. uses the following proveniencing system. Provenience 1 designates general surface collections. Numbers after the decimal point designate subsequent surface collections, or trenches. Proveniences 2 to 200 designate shovel tests. Controlled surface collections and 50 by 50 cm units are also designated by this provenience range. Proveniences 201 to 400 designate 1 by 1 m units done for testing purposes. Proveniences 401 to 600 designate excavation units (1 by 2 m, 2 by 2 m, or larger). Provenience numbers over 600 designate features. For all provenience numbers except 1, the numbers after the decimal point designate levels. Provenience X.0 is a surface collection at a shovel test or unit. X.1 designates level one, and X.2 designates level two. For example, 401.2 is Excavation Unit 401, level 2. Flotation samples are designated by a 01 added after the level. For example, 401.201 is the flotation material from Excavation Unit 401, level 2.

Table of Contents

SITE NUMBER: 38BU2101

PROVENIENCE NUMBER: 2 . 1 Transect 6 Shovel Test 1 (30-45cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	17.02	plain body sherd, very coarse sand temper	

PROVENIENCE NUMBER: 3 . 1 Transect 6 Shovel Test 1 +15mS (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	8.55	plain rim sherd, very coarse sand temper	
2	1	3.20	plain body sherd, very coarse sand temper	

SITE NUMBER: 38BU2102

PROVENIENCE NUMBER: 2 . 1 Transect 12 Shovel Test 2 (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.39	residual sherd	

PROVENIENCE NUMBER: 3 . 1 Transect 12 Shovel Test 2 +15mE (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	23.95	linear check stamped body sherd, very coarse sand temper	Deptford

PROVENIENCE NUMBER: 4 . 1 Tranect 12 Shovel Test 2 +45mE (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	8.49	plain body sherd, coarse sand temper	

PROVENIENCE NUMBER: 5 . 1 Tranect 12 Shovel Test 2 +15mS (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	6.19	eroded body sherd, very coarse sand temper	

Site Number: 38BU210?

PROVENIENCE NUMBER: 6 . 1 Transect 12 Shovel Test 2 +15mW +15mS (0-25cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	2.11	residual sherd	

PROVENIENCE NUMBER: 7 . 1 Transect 12 Shovel Test 2 +15mS +45mW (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	4.38	undecorated whiteware	

SITE NUMBER: 38BU210?

PROVENIENCE NUMBER: 2 . 1 Tranect 37 Shovel Test 1 +15mN (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	2.86	blue transfer printed whiteware	

PROVENIENCE NUMBER: 3 . 1 Tranect 37 Shovel Test 2 (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.81	unidentifiable nail	

PROVENIENCE NUMBER: 4 . 1 Transect 37 Shovel Test 2 +15mN (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	1.76	residual sherd	

PROVENIENCE NUMBER: 5 . 1 Transect 37 Shovel Test 2 +15mE +15mN (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.56	undecorated Delft	
2	2	1.33	blue transfer printed whiteware	
3	1	2.21	undecorated whiteware	
4	1	0.44	aqua bottle glass	
5	1	2.48	unidentifiable nail	
6	1	1.63	chert flake fragment	

PROVENIENCE NUMBER: 6 . 1 Transect 37 Shovel Test 2 +15mN +15mW (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	34.15	dark olive green bottle glass	

PROVENIENCE NUMBER: 7 . 1 Transect 37 Shovel Test 3 (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	1.11	black transfer printed whiteware	

PROVENIENCE NUMBER: 8 . 1 Transect 37 Shovel Test 3 +15mE (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.82	undecorated whiteware	
2	1	0.44	Bristol slipped stoneware	
3	3	7.05	unidentifiable nail	

PROVENIENCE NUMBER: 9 . 1 Transect 38 Shovel Test 2 (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.85	blue transfer printed pearlware	
2	1	0.89	undecorated whiteware	
3	2	7.73	oyster	discarded in lab

Site Number: 38BU210

PROVENIENCE NUMBER: 10 . 1 Transect 38 Shovel Test 2 +15mN (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.68	green shell edged whiteware	
2	1	1.18	shell edged whiteware	
3		10.94	oyster	discarded in lab
4	1	0.89	dark olive green bottle glass	
5	1	10.97	split pebble	

PROVENIENCE NUMBER: 11 . 1 Transect 38 Shovel Test 2 +45mN (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.82	green shell edged whiteware	

PROVENIENCE NUMBER: 12 . 1 Transect 38 Shovel Test 2 +15mS (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.77	blue transfer printed whiteware	molded
2	1	2.64	undecorated whiteware	
3	1	0.95	faunal remains	
4		31.93	oyster	discarded in lab

PROVENIENCE NUMBER: 13 . 1 Transect 39 Shovel Test 2 (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	3.56	undecorated whiteware	

PROVENIENCE NUMBER: 14 . 1 Transect 39 Shovel Test 2 +15mE +15mN (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	1.30	undecorated whiteware	
2	1	1.09	hand painted whiteware	blue
3	1	0.42	aqua bottle glass	
4	1	2.04	eroded body sherd, fine/medium sand temper	
5	1	7.61	chert retouched flake	

PROVENIENCE NUMBER: 15 . 1 Transect 39 Shovel Test 2 +15mE (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	2.84	residual sherd	
2		17.85	oyster	discarded in lab

PROVENIENCE NUMBER: 16 . 1 Transect 39 Shovel Test 2 +15mE +15mS (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	1.04	green shell edged whiteware	
2	1	0.87	white salt glazed stoneware tableware	
3	1	0.46	undecorated whiteware	
4	1	2.06	undecorated ironstone	
5	1	0.61	faunal remains	
6		31.32	oyster	discarded in lab
7	1	6.05	unidentifiable nail	
8	1	0.29	chert tertiary bifacial reduction flake	

PROVENIENCE NUMBER: 17 . 1 Transect 39 Shovel Test 2 +15mS (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	2.16	undecorated whiteware	
2	2	12.95	plain body sherd, coarse sand temper	
3	1	1.46	non-cultural rock	

Site Number: 38BU2103

PROVENIENCE NUMBER: 18 . 1 Transect 39 Shovel Test 2 +15mW +30mS (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	6.12	unidentifiable nail	
2	1	5.08	eroded body sherd, coarse sand temper	
3		500.00	oyster	discarded in field
4	2	161.11	non-cultural rock	granite

PROVENIENCE NUMBER: 19 . 1 Transect 39 Shovel Test 2 +15mW +15mS (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	1.33	blue transfer printed pearlware	
2	2	8.76	dark olive green bottle glass	
3		5.69	oyster	discarded in lab
4	1	3.40	residual sherd	

PROVENIENCE NUMBER: 20 . 1 Transect 39 Shovel Test 2 +15mW (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	2.06	undecorated whiteware	
2	1	9.62	aqua bottle glass	
3		3.21	unglazed brick fragments	discarded in lab
4	1	2.15	unidentifiable nail	

SITE NUMBER: Isolate 1

PROVENIENCE NUMBER: 2 . 1 Transect 2 Shovel Test 4 (0-55cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.16	milky quartz small transverse tertiary reduction flake	

SITE NUMBER: Isolate 2

PROVENIENCE NUMBER: 2 . 1 Transect 29 Shovel Test 3 (0-25cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.38	undecorated whiteware	

SITE NUMBER: Isolate 3

PROVENIENCE NUMBER: 2 . 1 Transect 37 Shovel Test 5 (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	10.06	chert projectile point	heat treated, broken tip

Artifact Catalog

Brockington and Associates, Inc. uses the following proveniencing system. Provenience 1 designates general surface collections. Numbers after the decimal point designate subsequent surface collections, or trenches. Proveniences 2 to 200 designate shovel tests. Controlled surface collections and 50 by 50 cm units are also designated by this provenience range. Proveniences 201 to 400 designate 1 by 1 m units done for testing purposes. Proveniences 401 to 600 designate excavation units (1 by 2 m, 2 by 2 m, or larger). Provenience numbers over 600 designate features. For all provenience numbers except 1, the numbers after the decimal point designate levels. Provenience X.0 is a surface collection at a shovel test or unit. X .1 designates level one, and X.2 designates level two. For example, 401.2 is Excavation Unit 401, level 2. Flotation samples are designated by a 01 added after the level. For example, 401.201 is the flotation material from Excavation Unit 401, level 2.

Table of Contents

SITE NUMBER: 38BU2101

PROVENIENCE NUMBER: 2 . 1 Transect 6 Shovel Test 1 (30-45cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	17.02	plain body sherd, very coarse sand temper	

PROVENIENCE NUMBER: 3 . 1 Transect 6 Shovel Test 1 +15mS (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	8.55	plain rim sherd, very coarse sand temper	
2	1	3.20	plain body sherd, very coarse sand temper	

SITE NUMBER: 38BU2102

PROVENIENCE NUMBER: 2 . 1 Transect 12 Shovel Test 2 (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.39	residual sherd	

PROVENIENCE NUMBER: 3 . 1 Transect 12 Shovel Test 2 +15mE (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	23.95	linear check stamped body sherd, very coarse sand temper	Deptford

PROVENIENCE NUMBER: 4 . 1 Tranect 12 Shovel Test 2 +45mE (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	8.49	plain body sherd, coarse sand temper	

PROVENIENCE NUMBER: 5 . 1 Tranect 12 Shovel Test 2 +15mS (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	6.19	eroded body sherd, very coarse sand temper	

Site Number: 38BU2102

PROVENIENCE NUMBER: 6 . 1 Transect 12 Shovel Test 2 +15mW +15mS (0-25cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	2.11	residual sherd	

PROVENIENCE NUMBER: 7 . 1 Transect 12 Shovel Test 2 +15mS +45mW (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	4.38	undecorated whiteware	

SITE NUMBER: 38BU2103

PROVENIENCE NUMBER: 2 . 1 Tranect 37 Shovel Test 1 +15mN (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	2.86	blue transfer printed whiteware	

PROVENIENCE NUMBER: 3 . 1 Tranect 37 Shovel Test 2 (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.81	unidentifiable nail	

PROVENIENCE NUMBER: 4 . 1 Transect 37 Shovel Test 2 +15mN (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	1.76	residual sherd	

PROVENIENCE NUMBER: 5 . 1 Transect 37 Shovel Test 2 +15mE +15mN (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.56	undecorated Delft	
2	2	1.33	blue transfer printed whiteware	
3	1	2.21	undecorated whiteware	
4	1	0.44	aqua bottle glass	
5	1	2.48	unidentifiable nail	
6	1	1.63	chert flake fragment	

PROVENIENCE NUMBER: 6 . 1 Transect 37 Shovel Test 2 +15mN +15mW (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	34.15	dark olive green bottle glass	

PROVENIENCE NUMBER: 7 . 1 Transect 37 Shovel Test 3 (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	1.11	black transfer printed whiteware	

PROVENIENCE NUMBER: 8 . 1 Transect 37 Shovel Test 3 +15mE (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.82	undecorated whiteware	
2	1	0.44	Bristol slipped stoneware	
3	3	7.05	unidentifiable nail	

PROVENIENCE NUMBER: 9 . 1 Transect 38 Shovel Test 2 (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.85	blue transfer printed pearlware	
2	1	0.89	undecorated whiteware	
3	2	7.73	oyster	discarded in lab

Site Number: 38BU210

PROVENIENCE NUMBER: 10 . 1 Transect 38 Shovel Test 2 +15mN (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.68	green shell edged whiteware	
2	1	1.18	shell edged whiteware	
3		10.94	oyster	discarded in lab
4	1	0.89	dark olive green bottle glass	
5	1	10.97	split pebble	

PROVENIENCE NUMBER: 11 . 1 Transect 38 Shovel Test 2 +45mN (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.82	green shell edged whiteware	

PROVENIENCE NUMBER: 12 . 1 Transect 38 Shovel Test 2 +15mS (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	3.77	blue transfer printed whiteware	molded
2	1	2.64	undecorated whiteware	
3	1	0.95	faunal remains	
4		31.93	oyster	discarded in lab

PROVENIENCE NUMBER: 13 . 1 Transect 39 Shovel Test 2 (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	3.56	undecorated whiteware	

PROVENIENCE NUMBER: 14 . 1 Transect 39 Shovel Test 2 +15mE +15mN (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	1.30	undecorated whiteware	
2	1	1.09	hand painted whiteware	blue
3	1	0.42	aqua bottle glass	
4	1	2.04	eroded body sherd, fine/medium sand temper	
5	1	7.61	chert retouched flake	

PROVENIENCE NUMBER: 15 . 1 Transect 39 Shovel Test 2 +15mE (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	2.84	residual sherd	
2		17.85	oyster	discarded in lab

PROVENIENCE NUMBER: 16 . 1 Transect 39 Shovel Test 2 +15mE +15mS (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	1.04	green shell edged whiteware	
2	1	0.87	white salt glazed stoneware tableware	
3	1	0.46	undecorated whiteware	
4	1	2.06	undecorated ironstone	
5	1	0.61	faunal remains	
6		31.32	oyster	discarded in lab
7	1	6.05	unidentifiable nail	
8	1	0.29	chert tertiary bifacial reduction flake	

PROVENIENCE NUMBER: 17 . 1 Transect 39 Shovel Test 2 +15mS (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	2.16	undecorated whiteware	
2	2	12.95	plain body sherd, coarse sand temper	
3	1	1.46	non-cultural rock	

Site Number: 38BU210?

PROVENIENCE NUMBER: 18 . 1 Transect 39 Shovel Test 2 +15mW +30mS (0-30cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	6.12	unidentifiable nail	
2	1	5.08	eroded body sherd, coarse sand temper	
3		500.00	oyster	discarded in field
4	2	161.11	non-cultural rock	granite

PROVENIENCE NUMBER: 19 . 1 Transect 39 Shovel Test 2 +15mW +15mS (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	2	1.33	blue transfer printed pearlware	
2	2	8.76	dark olive green bottle glass	
3		5.69	oyster	discarded in lab
4	1	3.40	residual sherd	

PROVENIENCE NUMBER: 20 . 1 Transect 39 Shovel Test 2 +15mW (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	2.06	undecorated whiteware	
2	1	9.62	aqua bottle glass	
3		3.21	unglazed brick fragments	discarded in lab
4	1	2.15	unidentifiable nail	

SITE NUMBER: Isolate 1

PROVENIENCE NUMBER: 2 . 1 Transect 2 Shovel Test 4 (0-55cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.16	milky quartz small transverse tertiary reduction flake	

SITE NUMBER: Isolate 2

PROVENIENCE NUMBER: 2 . 1 Transect 29 Shovel Test 3 (0-25cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	0.38	undecorated whiteware	

SITE NUMBER: Isolate 3

PROVENIENCE NUMBER: 2 . 1 Transect 37 Shovel Test 5 (0-40cm)

Catalog #	*Count*	*Weight (in g)*	*Artifact Description*	*Comments*
1	1	10.06	chert projectile point	heat treated, broken tip

Appendix B.

Resumes of Project Principals

David S. Baluha

Brockington and Associates, Inc.
1051 Johnnie Dodds Blvd., Suite F
Mt. Pleasant, South Carolina 29464
phone: 843-881-3128; fax: 843-849-1776
davebaluha@Brockington.org

Professional Position: Field Director (1998-present)

Areas of Specialization: Archaeological Investigations, Cultural Resource Management

Education: B.A. *Anthropology and Geography*, Departments of Anthropology and Geography, University of North Carolina at Chapel Hill, 1992.

Relevant Experience:

Field Director and Principal Author for the archaeological testing at 38LX416, Lexington County, South Carolina, for the South Carolina Department of Transportation, Columbia.

Field Director and Principal Author for the archaeological survey and testing of a proposed natural gas pipeline in Dorchester, Colleton, Hampton, and Jasper Counties, South Carolina, for South Carolina Pipeline Corporation, Columbia.

Field Director and Principal Author for the archaeological survey and testing of the Parrot Point tract, Charleston County, for Ford Development Company, Dallas, TX.

Field Director and Principal Author for the archaeological survey of the Swygert Property tract, Charleston County, South Carolina, for Thomas and Hutton Engineering Company, Charleston.

Field Director and Principal Author for the archaeological survey and testing of the Bannockburn at Waterford tract, Georgetown County, South Carolina, for Overland Road, LLC, Garden City.

Field Director and Principal Author for the archaeological survey of the Ripley Light Marina Tract, Charleston County, South Carolina, prepared for General Engineering Company, Charleston.

Field Director and Principal Author for the archaeological survey of the US Route 17 Improvements Project, Charleston County, South Carolina, prepared for Transystems Inc., Greenville.

Field Director and Principal Author for the archaeological survey of 5.3 Hectares at the Sage Valley Golf Club, Aiken County, South Carolina, prepared for Sage Valley Golf Club, LLC., Aiken.

Field Director and Principal Author for the archaeological survey of the Proposed Richtex Brick Natural Gas Pipeline, Richland County, South Carolina, prepared for South Carolina Pipeline Corporation, Columbia.

Field Director and Principal Author for the archaeological survey of the PeeDee Commerce Center 69kV Tap Line, Florence County, South Carolina, prepared for South Carolina Public Service Authority, Moncks Corner.

Field Director and Principal Author for the archaeological survey of Fenwick Tract D, Johns Island, South Carolina., prepared for Trico Engineering Consultants, Inc., North Charleston.

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Education

1997 M.A. The Citadel and The University of Charleston, Charleston, S.C. (History)

1990 B.A. The George Washington University, Washington, D.C. (Anthropology)

Employment

Branch Chief, Brockington and Associates, Inc., 2002 to present

Archaeologist, Brockington and Associates, Inc., 1996 to 2001

Research Associate, Brockington and Associates, Inc., 1993 to 1995

Archaeological Field Technician, Brockington and Associates, Inc., 1992

Reports And Papers Presented

Historian

1993 (with Eric C. Poplin)
Cultural Resources Reconnaissance of the Hibri Tract, Charleston County, South Carolina. Prepared for the South Carolina Real Estate Development Board, Columbia, South Carolina.

1993 (with Eric C. Poplin and Elsie I. Eubanks)
Cultural Resources Survey of the Hibri Tract, Charleston County, South Carolina. Prepared for the South Carolina Real Estate Development Board, Columbia.

1993 (with Eric C. Poplin and David C. Jones)
An Intensive Cultural Resources Survey of a Lake Marion Transmission Line Right-of-Way, Berkeley and Clarendon Counties, South Carolina. Prepared for Newkirk Environmental Consultants, Inc., Charleston, South Carolina.

1993 (with Eric C. Poplin)
Cultural Resources Reconnaissance of Selected Portions of Sunny Point Farms, Wadmalaw Island, South Carolina. Prepared for Sunny Point Farms, Wadmalaw Island, South Carolina.

1993 (with Eric C. Poplin and Elsie I. Eubanks)
Cultural Resources Survey of the Silverman Tract, Charleston County, South Carolina. Prepared for the Southern National Bank of South Carolina, Charleston.

1994 (with Eric C. Poplin and David C. Jones)
An Intensive Cultural Resources Survey of Two Proposed New Mining Areas, Blue Circle Cement, Inc., Harleyville, Dorchester County, South Carolina. Prepared for Kilpatrick and Cody, Atlanta, Georgia.

1994 (with Eric C. Poplin and Elsie Eubanks)
Cultural Resources Survey and Testing of the Ellis Tract, Charleston County, South Carolina. Prepared for the Ellis Family, Charleston, South Carolina.

1995 (with Eric C. Poplin and Elsie Eubanks)
Cultural Resources Survey and Testing of the Bulls Bay Overlook Tract, Charleston County, South Carolina. Prepared for Reg Tisdale, Indianapolis, Indiana.

1995 *The Use of Plats in Historical Archaeology: The H.A.M. Smith Plat Collection at the South Carolina Historical Society.* Paper presented at the South Carolina Archaeological Society Annual Meeting, Columbia, 1 May.

1995 *Cultural Resources Survey of Selected Improvements of the Columbia Metropolitan Airport, Lexington County, South Carolina.* Prepared for LPA Group, Inc., Columbia.

1996 (with Eric C. Poplin)
Archaeological Survey of the Proposed East and West Access Shafts for the Bushy Park Water Tunnel, Berkeley County, South Carolina. Prepared for the Commissioners of Public Works, City of Charleston, South Carolina.

1996 (with Tina Rust)
Archaeological Survey of the Proposed Naval Nuclear Power Training Command Facility, Naval Weapons Station- Charleston, Berkeley County, South Carolina. Prepared for Naval Facilities Engineering Command, Southern Division, North Charleston, South Carolina.

1996 (with Todd McMakin and Eric C. Poplin)
Historic Resources Survey of 1,700 Acres of US Forest Service Land, Camp Shelby, Mississippi. Prepared for the Mississippi Military Department, Jackson.

1996 *Archaeological Reconnaissance of the Oak Park Tract, Mt. Pleasant, South Carolina.* Prepared for Marc Copeland, Mt. Pleasant.

1996 (with Tina Rust and Eric C. Poplin)
Cultural Resources Survey of a 15 Acre Tract, E.I. DuPont de Nemours' Cooper River Plant, Berkeley County, South Carolina. Prepared for E.I. DuPont de Nemours' and Company, Charleston.

1996 *Archaeological Reconnaissance of the Clubhouse Road Mine Site, Dorchester County, South Carolina.* Prepared for Sabine and Waters, Summerville.

1996 (with Eric C. Poplin)
Archaeological Survey of the McGinnis-Horres Tract, James Island, South Carolina. Prepared for Patrick N. McGinnis and Marietta M. Horres.

1996 (with Tina Rust and Eric C. Poplin)
Archaeological Monitoring of a Proposed Water Line Easement, Fort Johnson (38CH69), Charleston, South Carolina. Prepared for City of Charleston Commissioners of Public Works, Charleston.

1996 *Cultural Resources Overview of the Wescot Tract, Dorchester County, South Carolina.* Prepared for The Westvaco Corporation, Summerville.

1996 Archaeological Reconnaissance, Davis Road Mine Site, Beaufort County, South Carolina. Prepared for Cleland Construction Company, Hilton Head Island, South Carolina.

1997 (with Eric C. Poplin)
Archaeological Reconnaissance and Assessment, Legend Oaks Plantation and Country Club, Dorchester County, South Carolina. Prepared for Trico Engineering Consultants, Inc., North Charleston.

1997 (with Tina Rust and Eric C. Poplin)
Cultural Resources Survey of the Proposed Palmetto Parkway Corridor, Charleston and Dorchester Counties, South Carolina. Prepared for the Charleston County Department of Public Works, Charleston.

1997 (with Todd McMakin and Eric C. Poplin)
Cultural Resources Survey of the Godley Tract-Phase I, Chatham County, Georgia. Prepared for the Branigar Organization, Savannah.

1998 (with Todd McMakin)
Cultural Resources Survey of the Fabian Tract, Charleston County, South Carolina. Prepared for Albert Weber Manufacturing Company, Summerville, South Carolina.

1998 (with Keith Stephenson)
Archaeological Survey of the Carolina Nurseries Property Management Tract, Berkeley County, South Carolina. Prepared for Carolina Nursery, Inc., Charleston.

1998 (with Tina Rust and Eric C. Poplin)
Archaeological Data Recovery at 38CH1402 and 38CH1405, Park West Tract, Charleston County, South Carolina. Prepared for Land Tech Charleston, L.L.C., Charleston.

Archaeologist/Co-Author

1993 (with Eric C. Poplin and David C. Jones)
Fort Jackson Military Reservation Historic Preservation Plan- Volume I: Cultural Resources Management Plan. Prepared for the Fort Jackson Directorate of Public Works and the US Army Corps of Engineers- Savannah District, Savannah, Georgia.

1993 (with Eric C. Poplin)
Fort Jackson Military Reservation Historic Preservation Plan- Volume III: Archaeological Site Database. Prepared for the Fort Jackson Directorate of Public Works and the US Army Corps of Engineers- Savannah District, Savannah, Georgia.

1993 (with Eric C. Poplin an Kenneth F. Styer)
Cultural Resources Survey For FY 93 Timber Harvest Areas and Testing of 10 Separate Sites, Fort Jackson, South Carolina. Prepared for the US Army Corps of Engineers- Savannah District; Savannah, Georgia.

1996 (with Bruce Harvey and Eric C. Poplin)
Cultural Resources Inventory of Proposed Development Areas in the Kaminski Tract, Georgetown and Horry Counties, South Carolina. Prepared for Canal Industries, Incorporated, Conway.

1996 (with Bruce Harvey, W.A. McElveen, and Eric C. Poplin)
Archaeological and Architectural Survey for Proposed Improvements to McCrays Mill Road, Sumter, South Carolina. Prepared for LPA Group, Inc., Columbia.

1996 (with Bruce Harvey)
Cultural Resource Reconnaissance for the Extension of Red Bay Road, Sumter, South Carolina. Prepared for LPA Group, Incorporated, Columbia.

1997 (with Todd A. McMakin, Tina R. Rust, and Eric C. Poplin)
Archaeological Data Recovery in the SC151 Widening Project, Chesterfield County, South Carolina. Prepared for South Carolina Department of Transportation, Columbia.

1998 (with E. Poplin, B. Harvey, and T. McMakin)
Phase I Cultural Resources Survey of Selected Areas on the Marine Corps Air Station Beaufort, Beaufort County, South Carolina. Prepared for The United State Marine Corps and the US Army Corps of Engineers-Savannah District.

1998 (with Eric C. Poplin and Bruce Harvey)
Archaeological Data Recovery at 38GE334, Prince George River Tract, Georgetown County, South Carolina. Prepared for the Prince George Development Corporation, Georgetown.

2000 (with Eric Poplin and Bruce Harvey)
National Register of Historic Places Evaluation of 29 Archaeological Sites Charleston Naval Weapons Station, Berkeley and Charleston Counties, South Carolina. Prepared for US Navy, Southern Division, Naval Facilities Engineering Command, North Charleston, South Carolina.

Principal Investigator/Project Manager

1995 *Cultural Resources Survey of the Rice Fields South Tract, Georgetown County, South Carolina*. Prepared for Planning/Design Resources, Pawleys Island.

1995 *Cultural Resources Survey of the Proposed 46 Acre Catawba River Park, York County, South Carolina*. Prepared for the City of Rock Hill.

1995 *An Intensive Cultural Resources Survey of the McCurry Tract, Calhoun County, South Carolina*. Prepared for Blue Circle Cement Company, Harleyville, South Carolina.

1995 *An Archaeological Reconnaissance of the Sandpit Road Mine Site, Dorchester County, South Carolina*. Prepared for Banks Construction Company, North Charleston, South Carolina.

1995 *An Archaeological Reconnaissance of the Norman Landing Mine Site, Dorchester County, South Carolina*. Prepared for Truluck Construction Company, Charleston, South Carolina.

1995 *An Archaeological Reconnaissance of the Keiffer Tract, Jasper County, South Carolina*. Prepared for Coastal Concrete, Hilton Head Island, South Carolina.

1995 *An Intensive Archaeological Survey of a 34 Acre and a 7 Acre Portion of the Ponds Plantation Tract, Dorchester County, South Carolina*. Prepared for Ralph B. Simmons, Jr., Anderson.

1995 *Cultural Resources Survey of the Savannah Quarters Tract-Southwest Quadrant, Chatham County, Georgia*. Prepared for Hall Development Company, Myrtle Beach.

1996 *Archaeological Reconnaissance of the Cone Mine Site, Dorchester County, South Carolina*. Prepared for Palmetto Sand Company, Summerville.

1996 *Cultural Resources Overview, Tega Cay Development Tract, York County, South Carolina*. Prepared for Tega Cay Communities, LLC.

1996 *Cultural Resources Survey of the Waddell Road Realignment Corridor, Beaufort County, South Carolina*. Prepared for Andrews Engineering Company, Port Royal.

1997 *Cultural Resources Reconnaissance of the Palmetto Commerce Park, Charleston County, South Carolina*. Prepared for Palmetto Commerce Park, LLC, Charleston.

1997 *Cultural Resources Reconnaissance of the Whitehall II Tract, Dorchester County, South Carolina.* Prepared for Civil Site Environmental, Inc., Charleston, South Carolina.

1997 Intensive Cultural Resources Survey of the Myrtle Beach National Tract, Horry County, South Carolina. Prepared for Coastal Science Associates, Inc., Columbia, South Carolina.

1997 *Cultural Resources Reconnaissance of the Ingleside Plantation Tract, Charleston County, South Carolina.* Prepared for the Albert Weber Manufacturing Company, Summerville, South Carolina.

1997 *Archaeological Monitoring of Selected Areas of the Octagon House (38LU7), 619 East Main Street, Laurens, South Carolina.* Prepared for Landmark Asset Services, Winston-Salem, North Carolina.

1997 (with Bruce Harvey)
Cultural Resources Inventory of the I'On Development Tract, Mt. Pleasant, South Carolina. Prepared for The Graham Company, Mt. Pleasant.

1998 (with Eric C. Poplin)
Archaeological Survey of MGI Industry's Proposed Nitrogen Gas Line, Berkeley County, South Carolina. Prepared for Kenco Associates, Inc., Ashland, Kentucky.

1998 *Archaeological Reconnaissance Survey of the Proposed Dirt Cheap Inc. Borrow Pits, City of Charleston, Berkeley County, South Carolina.* Prepared for Bridge Creek, LLC, Mt. Pleasant, South Carolina.

1998 (with Harry Pecorelli and Todd McMakin)
Archaeological Survey of a Proposed Mine Site at the Ponds Plantation, Dorchester County, South Carolina. Prepared for Palmetto Sand Company, Inc., Ridgeville, South Carolina.

1998 *Cultural Resources Reconnaissance of Cummings Point, Charleston County, South Carolina. Prepared for Mr. Jack Theimer, San Francisco, California.*

1998 (with Scott Wolf)
Cultural Resources Survey of the Harmony Industrial Park, Georgetown County, South Carolina. Prepared for DDC Engineers, Inc., North Myrtle Beach, South Carolina.

1999 *Cultural Resources Inventory of the Appian Way Tract, Dorchester County, South Carolina.* Prepared for Ford Development, Inc., Dallas, Texas.

1999 *Archaeological Survey of the Whitehall II Tract, Dorchester County, South Carolina.* Prepared for Civil Site Environmental, Inc., Charleston, South Carolina.

1999 *Archaeological Testing of 38HR371 and 38HR372, Horry County, South Carolina.* Prepared for Taylor, Mahon, and Associates, Inc., Pawleys Island, South Carolina.

1999 (with Harry Pecorelli, III and Bruce G. Harvey)
Cultural Resources Inventory of Tilly Island, Colleton County, South Carolina. Prepared for Tilly Island, L.L.C., Charleston, South Carolina.

1999 (with Scott Wolf)
Archaeological Reconnaissance and Intensive Survey of Friendfield Plantation on the Sampit River, Georgetown County, South Carolina. Prepared for the National Trust for Historic Preservation, Washington, DC.

1999 *Archaeological Testing of 39 Hagood Avenue, Charleston, South Carolina*. Prepared for The Citadel Alumni Association, Charleston, South Carolina.

1999 *Cultural Resources Reconnaissance and Intensive Survey of Cherokee Plantation, Colleton County, South Carolina*. Prepared for The Carnegie Club, Ltd., England.

1999 *Cultural Resources Survey of Molasses Creek Crossing, Charleston County, South Carolina*. Prepared for George Christodal, Mt. Pleasant, South Carolina.

1999 *Archaeological Survey of The Hill at Legend Oaks, Dorchester County, South Carolina*. Prepared for Asset Corporation of the South, L.L.C., Charlotte, North Carolina.

1999 (with David Baluha)
Cultural Resources Reconnaissance of the 23.33 Acre Lowcountry Business Park, Mount Pleasant, South Carolina. Prepared for Seamon, Whiteside and Associates, Inc. Mount Pleasant, South Carolina.

1999 (with Kara Bridgman and Bruce Harvey)
Cultural Resources Inventory of the Briars Creek Tract, Johns Island, Charleston County, South Carolina. Prepared for Koenig Construction Company, Johns Island, South Carolina.

2000 (with Eric Poplin and Stephen Roberts)
Cultural Resources Survey of Darrell Creek Phase II Tract, Charleston, South Carolina. Prepared for Ed Goodwin, Charleston, South Carolina.

2000 (with Pat Hendrix)
Cultural Resources Survey of Rushland Plantation, Johns Island, South Carolina. Prepared for Hoffman, Lester, and Associates, Inc., Charleston, South Carolina.

2000 *Archaeological Reconnaissance Survey of the Proposed Expansion to the Basic Science Building College of Dental Medicine, Medical University of South Carolina, Charleston*. Prepared for The Medical University of South Carolina, Charleston, South Carolina.

2000 (with Kara Bridgman)
Cultural Resources Inventory of the Oyster Point Tract, Mount Pleasant, Charleston County South Carolina. Prepared for Pulte Home Corporation, Duluth, Georgia.

2000 (with Bruce Harvey and Joshua Fletcher)
Intensive Cultural Resources Survey of the New Long Point Road Right *of Way, Charleston, South Carolina.* Prepared for Transystems, Inc., Greenville, South Carolina.

2000 (with Gwendolyn Burns and Pat Hendrix)
Cultural Resources Survey of the Stono River at Limehouse Bridge Tract, Charleston County, South Carolina. Prepared for Ford Development Corporation, Dallas, Texas.

2000 (with Dave S. Baluha and Pat Hendrix)
Cultural Resources Survey of an 8 Hectare Parcel of the Ashley Park Tract, Charleston County, South Carolina. Prepared for Meridian Place, LLC, Charleston.

2000 (with Gwendolyn Burns and Pat Hendrix)
Cultural Resources Survey of the Bolton Bees Ferry Tract, Charleston County, South Carolina. Prepared for Getrag Precision Gear Company, North Charleston, South Carolina.

2000 (with Joshua N. Fletcher)
Cultural Resources Survey of the Reserve at Lake Keowee, Pickens County, South Carolina. Prepared for The Reserve at Lake Keowee, LLC, Sunset, South Carolina.

2000 *Archaeological Reconnaissance Survey of the Seabreeze Development, City of Charleston, South Carolina.* Prepared for Nelson, Mullins, Riley, and Scarborough, LLP, Charleston.

2000 (with Kara Bridgman)
Cultural Resources Inventory of the Elms at Charleston, Tracts A and B, Charleston County, South Carolina. Prepared for The Herman Group, LLC, Charleston.

2000 (with Dave Baluha and Pat Hendrix)
Cultural Resources Survey of Fenwick Tract D, Johns Island, South Carolina. Prepared for Trico Engineering Consultants, Inc., North Charleston, South Carolina.

2000 (with Pat Hendrix)
Archaeological Survey of 35 Acres in Port Royal, Beaufort County, South Carolina. Prepared for Tony Porter, Beaufort.

2000 Archaeological Testing of Selected Portions of Cedar Grove Plantation (38DR158), Whitehall II Development Tract, Dorchester County, South Carolina. Prepared for Floyd Whitfield.

2001 (with Dave Joyner and Pat Hendrix)
Cultural Resources Survey of Roddin's Island, Berkeley County, South Carolina. Prepared for The Daniel Island Company, Charleston, South Carolina.

2001 (with Pat Hendrix)
Cultural Resources Survey and Archaeological Testing of Rushland Plantation, Johns Island, South Carolina. Prepared for IBG Partners, LLC, Washington, DC.

2001 (with Bruce G. Harvey)
Cultural Resources Survey of the SC Route 290 Realignment, Spartanburg County, South Carolina. Prepared for the South Carolina Department of Transportation, Columbia and Davis and Floyd, Greenwood, South Carolina.

2001 (with Eric D. Sipes and Pat Hendrix)
Cultural Resources Survey of Alternate No. 2, Jasper County Greenway Business Park Entrance, Sergeant Jasper State Park, Jasper County, South Carolina. Prepared for Thomas and Hutton Engineering Company, Savannah.

2001 (with Kristrina A. Shuler and Bruce G. Harvey)
Intensive Cultural Resources Survey of the Butternut Road Tract, Dorchester County, South Carolina. Prepared for Merryland Investment Company, Inc., Augusta, Georgia.

2001 (with Josuah N. Fletcher)
Archaeological Testing of 38BU1843, Heyward Pointe Tract, Beaufort County, South Carolina. Prepared for D'Amico Management Associates, Hilton Head, South Carolina.

2001 (with J.N. Fletcher, K.A. Shuler, and P. Hendrix)
Intensive Cultural Resources Survey of the Eastern Sandhills at Buckwalter Tract, Beaufort County, South Carolina. Prepared for RRZ, L.L.C., Bluffton, South Carolina.

2001 *Archaeological Testing of 38BU1283, Habersham Tract, Beaufort County, South Carolina.* Prepared for the Habersham Land Company, Beaufort.

2001 (with David S. Baluha and Michael P. Hendrix)
Cultural Resources Survey and Testing of the Parrot Point Tract, Charleston County, South Carolina. Prepared for Ford Development Corporation, Dallas, Texas.

2001 (with Patrick Hendrix)
Cultural Resources Survey of the Battery Haig Development Tract, Charleston County, South Carolina. Prepared for Harry Huffman and Joe Vaughn, Greenville, South Carolina.

2001 *Cultural Resources Survey and Archaeological Testing of the Fenwick FHP Tract, Johns Island, South Carolina.* Prepared for Laplante Associates, Kiawah Island, South Carolina.

2001 *A Comparison of Life on Agricultural and Industrial Plantations in the South Carolina Lowcountry.* Paper presented at the Southeastern Archaeological Conference, Chattanooga, Tennessee.

2001 (with David S. Baluha and Michael P. Hendrix)
Cultural Resources Survey of Bannockburn at Waterford Plantation, Georgetown County, South Carolina. Prepared for Overland Road, LLC. Garden City, South Carolina.

2002 (with Eric D. Sipes and Pat Hendrix)
Cultural Resources Survey and Testing of the Persimmon Hill Tract, Berkeley County, South Carolina. Prepared for Hussey, Gay, Bel, and DeYoung, Inc., Mt. Pleasant, South Carolina.

2002 (with Kristrina A. Shuler and Pat Hendrix)
Cultural Resources Survey of the Summerville on the Ashley II Tract, DorchesterCounty, South Carolina. Prepared for Trico Engineering, Charleston, South Carolina.

2002 (with Joshua Fletcher and Pat Hendrix)
Cultural Resources Survey of The Orange Hill Tract, Charleston County, South Carolina. Prepared for Orange Hill Plantation, LLC, Johns Island, South Carolina.

2002 (with Joshua Fletcher)
Cultural Resources Reconnaissance of the Seven Eleven Tract, Pickens County, South Carolina. Prepared for Nexson, Pruitt, Jacobs, Pollard, and Robinson, Columbia, South Carolina and Greenwood Development Company, Greenwood, South Carolina.

2002 (with Joshua N. Fletcher and Pat Hendrix)
Cultural Resources Survey of of the Rose Bank Plantation Tract, Charleston County, South Carolina. Prepared for BB& T, Charleston, South Carolina.

2002 (with Eric D. Sipes and Pat Hendrix)
Cultural Resources Survey of the Proposed Shulerville/Honey Hill Water Extension Project in the Francis Marion National Forest, Berkeley County, South Carolina. Prepared for Berkeley County Water and Sanitation Authority, Goose Creek, South Carolina.

2002 (with Kristrina A. Shuler and Bruce G. Harvey
Cultural Resources Survey of the Proposed Mill Pond Road Extension Project, Horry County, South Carolina. Prepared for the LPA GROUP, INC., Columbia South Carolina, the City of Conway, South Carolina, and the South Carolina Department of Transportation, Columbia.

2002 (with David S. Baluha amd Bruce G. Harvey)
Archaeological Testing at 38LX416, Lexington County, South Carolina. Prepared for Wilbur Smith Associates, Inc., Columbia and the South Carolina Department of Transportation, Columbia.

2002 (with Joshua N. Fletcher and Jeff Bowdoin)
Late Discovery Investigations at 38BK1823 Harper Tract, Berkeley County, South Carolina. Prepared for Greenwood Development, North Charleston, South Carolina.

2002 (with Kristrina A. Shuler, David Dellenbach, Pat Hendrix and Bruce G. Harvey)
Intensive Cultural Resources Survey of the Carnes Crossroads Tract-South Parcel, Berkeley County, South Carolina. Prepared for Hoffman, Lester and Associates, Charleston, South Carolina.

2002 (with Eric D. Sipes and Michael P. Hendrix)
Cultural Resources Survey and Testing of a Proposed Residential Development at Kensington Plantation, Georgetown County, South Carolina. Prepared for Prince George Premier Properties, Georgetown, South Carolina.

2002 (with David S. Baluha, Kristrina Shuler and Michael P. Hendrix)
National Register of Historic Places Evaluation of Sites 38GE334 and 38GE550 at the Bannockburn at Waterford Plantation Tract, Georgetown County, South Carolina. Prepared for Overland Road LLC., Garden City, South Carolina.

2002 (with Pat Hendrix)
Cultural Resources Survey of the Proposed Seacoast Chapel and Education Building, Mt. Pleasant, South Carolina. Prepared for the Seacoast Church, Mt. Pleasant, South Carolina.

2002 (with Pat Hendrix)
Cultural Resources Investigations of 25 Lamboll Street,Charleston, South Carolina Charleston County, South Carolina. Prepared for Historic Charleston Foundation, Charleston, South Carolina.

2002 (with Pat Hendrix, Carol Poplin and Bruce Harvey)
Cultural Resources Management Plan for the City of North Charleston, Planning Area Three Dorchester County, South Carolina. Prepared for the City of North Charleston and The South Carolina Department of Archives And History.

2002 *Cultural Resources Investigations of the Charleston Orphan Chapel, Charleston County, South Carolina.* Prepared for McAlister Construction Company, Charleston, South Carolina.

2002 (with Pat Hendrix)
Cultural Resources Survey of the St. John's Golf Tract, Charleston County, South Carolina. Prepared for CHJM LLC, Charleston, South Carolina.

2002 (with Eric C. Poplin and Kristrina A. Shuler)
Archaeological Testing of 38AB633, 38AB1001, and the Little River Flood Plain Sc Route 72 Improvements Project, Abbeville County, South Carolina. Prepared for Wilbur Smith Associates, Inc. Columbia, South Carolina, and South Carolina Department of Transportation, Columbia, South Carolina.

2002 (with Pat Hendrix)
Archaeological Survey of North Main Street, (US 21/321) Improvements From near Elmwood Avenue (US 21/76/176/321) to near Fairfield Road (US 321). Prepared for the City of Columbia and South Carolina Department of Transportation, Columbia, South Carolina.

2002 (with David S. Baluha and Pat Hendrix)
Cultural Resources Survey of Hamlin Park, Mt. Pleasant, Charleston County, South Carolina. Prepared for the DR Horton Company, Charleston, South Carolina.

2002 (with Kristrina A. Shuler and Michael P. Hendrix)
Cultural Resources Survey of the Mixson Mines Tract, Dorchester County, South Carolina. Prepared for Landmark Construction, North Charleston, South Carolina.

2002 (with David S. Baluha, Pat Hendrix and Bruce Harvey)
Cultural Resources Survey of a Portion of the Oakland Plantation Tract, Mt. Pleasant, Charleston County, South Carolina. Prepared for Avtex Commercial Properties Corporation, Greenville, South Carolina.

2002 (with Eric D. Sipes and Michael P. Hendrix)
Cultural Resources Survey of the McLaura Hall Tract, Charleston County, South Carolina. Prepared for Habit Properties, Inc., Atlanta, Georgia.

2003 (with Eric C. Poplin and David S. Baluha)
Intensive Cultural Resources Survey of Selected Portions of the Charleston Naval Weapons Station, Berkeley County, South Carolina. Prepared for the US Navy, Facilities Engineering Command, North Charleston, South Carolina.

2003 (with Kristrina A. Shuler)
Archaeological Survey of The Berlin Myers Parkway (SC Route 165) Extension Project, Alternate 2 Dorchester County, South Carolina. Prepared for The South Carolina Department of Transportation, Columbia, South Carolina and Davis & Floyd, Inc. Greenwood, South Carolina.

2003 (with Joshua N. Fletcher and Pat Hendrix)
Cultural Resources Survey of the Morgan Tract Chatham County, Georgia. Prepared for Phillip Morgan, III Savannah ,Georgia.

2003 (with Eric D. Sipes and Susannah Munson)
Cultural Resources Survey of the Laurel Park Tract, Charleston County, South Carolina. Prepared for Meridian Development, Mt. Pleasant, South Carolina.

2003 (with Kristrina A. Shuler and Pat Hendrix)
Cultural Resources Survey of Ireland Creek Disposal Area, Colleton County, South Carolina. Prepared for the Natural Resources Conservation Service and US Army Corps of Engineers, Mobile District.

2003 (with David S. Baluha and Susannah Munson)
Cultural Resources Survey of the Rumphs Hill Creek Tract, Dorchester County, South Carolina. Prepared for Berenyi Incorporated, Charleston, South Carolina.

2003 (with Kristrina A. Shuler and Pat Hendrix)
Cemetery Relocation at the Future Site of the Children's Research Institute Medical University of South Carolina, Charleston County, South Carolina. Prepared for the Medical University of South Carolina, Charleston, South Carolina.

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

MEMORANDUM

SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
(803) 739-2548 fax

TO: Mr. Jim Robinson, **Emerson Partners, LLC**

FROM: Todd E. Salvagin, **SRS Engineering, LLC**

DATE: September 12, 2007

RE: **Traffic Impact & Access Study**
Proposed Okatie PUD Projects
Beaufort, South Carolina

SRS Engineering, LLC (SRS) has completed an assessment of the traffic impacts associated with the proposed development of the Okatie Planned Unit Development (PUD) which is comprised of five development pods (PODS), each of which are located on the east side of SC 170, west of Malind Creek in the vicinity and between Cherry Point Road and Pritcher Point Road in Beaufort County, SC.

PROJECT DESCRIPTION

The Okatie PUD site is located on the east side of SC 170 extending to the Malind Creek and includes the roadways of Pritcher Point Road to the north and Cherry Point Road to the south. The PUD has been broken down into five distinct development sites (PODS) which are described below:

1. KB Homes POD- 95 town homes, 229 single-family units, 33,000 square-feet (sf) of retail space and 11,000 sf of office space;

2. Sheik/Osprey Point POD- 165 town homes, 184 single-family units, 180 apartment units, 150,000 sf of retail space and 50,000 sf of office space;

3. CCRC POD- 330 Room CCRC (Continued Care Retirement Community);

4. Preacher Property POD- Estimated at 152 town homes, 171 single-family units and 164 apartment units; and

5. Beaufort County School POD– Anticipated as a 22-acre recreational park/green space per Beaufort County Planning staff.

As shown, the Okatie PUD plans a total of 1,340 residential units, 330 CCRC units, 244,000 sf of commercial space and a 22-acre recreational/green space/park. Access will be provided for the entire PUD to/from SC 170 via a total of five access drives. Three of these access drives will provide for full-movement and are Pritcher Point Road, Cherry Point Road and an undefined dirt road located between

Pritcher Point Road and Cherry Point Road. Each of these drives are proposed full-movement access locations. The remaining two drives are planned as limited movement unsignalized intersections, one located to the north of Cherry Point Road and the other located to the south of Cherry Point Road. Internal of the PUD, a collector roadway system is planned which will allow cross-access/inter-connectivity between the PODS. As such, a north/south collector roadway is planned within the property to the east of SC 170. As planned, the development is anticipated to be constructed and fully-operational by 2015. **Figure 1** illustrates the Okatie PUD project which includes the five previously referenced PODS.

EXISTING CONDITIONS

A comprehensive field inventory of the project study area was conducted in June 2006 and September 2007. The field inventory included a collection of geometric data, traffic volumes, and traffic control within the study area. The following sections detail the current traffic conditions and include a description of roadways/intersections serving the site and traffic flow in close proximity to the project site.

Study Area Roadway

SC 170- is a north/south major arterial which provides a four-lane divided cross-section where directional through traffic is separated by a grassed median. This roadway has a posted speed limit of 55 miles-per-hour (mph) and is under the jurisdiction of the SCDOT.

Study Area Intersections

SC 170 at Cherry Point Road- is a four-legged signalized intersection where SC 170 makes up the northbound and southbound approaches and Cherry Point Road make up the eastbound and westbound approaches. The northbound and southbound approaches of SC 170 provide a separate left-turn lane and two through lanes in each direction. The northbound approach provides a separate right-turn lane while right-turns on the southbound approach are made from the outside through lane. The eastbound approach provides a single-lane from which all turning movements are made. The westbound approach provides a shared left/through lane and a separate right-turn lane. This intersection operates under multi-phased traffic signal control where the northbound and southbound left-turn movements are provided protected/permissive phasing.

SC 170 at Pritcher Point Road/Short Cut Drive– is a four-legged unsignalized intersection where SC 170 makes up the northbound and southbound approaches, Pritcher Point Road make up the eastbound and Short Cut Drive makes up the westbound approach. The northbound approach of SC 170 provides a separate left-turn lane and two through lanes where right-turns are made from the outside through lane. The southbound approach provides two through lanes where left and right-turns are made from the respective inside/outside through lanes. The eastbound and westbound approaches each provide a single-lane from which all turning movements are made. It should be noted that the westbound approach (Short Cut Drive) is an unimproved/dirt roadway. This intersection operates under STOP sign control where vehicles entering the intersection from the eastbound and westbound approaches are required to stop.

SC 170 at SC 141– is a three-legged unsignalized intersection where SC 170 makes up the northbound and southbound approaches and SC 141 make up the eastbound approach. The northbound approach of SC 170 provides a separate left-turn lane and two through lanes. The southbound approach provides two through lanes and a separate right-turn lane. The eastbound approach provides a separate left-turn lane

and a separate right-turn lane. This intersection operates under STOP sign control where vehicles entering the intersection from SC 141 are required to stop.

SC 141 at Jasper Station Road/Short Cut Drive– is a four-legged off-set unsignalized intersection where SC 141 makes up the northbound and southbound approaches, Jasper Station Road makes up the eastbound approach and Short Cut Drive makes up the westbound approach. All approaches to this intersection provide a single-lane approach from which all turning movements are made with exception of the southbound approach of SC 141 which provides a separate right-turn lane. This intersection operates under STOP sign control where vehicles entering the intersection from the eastbound and westbound approaches (Jasper Station Road and Short Cut Drive and respectively) are required to stop.

Traffic Volumes

In order to determine the existing traffic volume flow patterns within the study area, manual turning movement counts were collected for the four above referenced intersections which make up the study area as defined by County staff. This information reflected weekday morning (7:00-9:00 AM) and evening (4:00-6:00 PM) peak period turning movement specific counts and has been used to determine the flow of traffic in the vicinity of the site. **Figures 2 & 3**, located at the end of this report, graphically depict the respective Existing AM and PM peak-hour traffic volumes at the study area intersections. Summarized count sheets for the study area intersections are included in the appendix of this report.

FUTURE CONDITIONS

Traffic analyses for future conditions have been conducted for two separate scenarios: first, 2015 No-Build conditions, which include an annual normal growth in traffic, all pertinent background development traffic, and any pertinent planned roadway/intersection improvements; and secondly, 2015 Build conditions, which account for all No-Build conditions PLUS traffic generated by the proposed development.

No-Build Traffic Conditions

Annual Growth Rate

An annual growth rate of 5-percent per year was developed and approved by County staff for use in this report which is consistent with other prepared reports for projects in the vicinity of this site. This 5-percent annual growth, which would account for all unspecified traffic growth, was applied to the Existing traffic volumes.

Background Development

In accordance with gathered information, there are no background development projects in the area of the project which are currently approved and/or permitted that will cause an increase in traffic volume (in excess of normal traffic volume growth) within the study area.

The anticipated 2015 No-Build AM and PM peak-hour traffic volumes, which include the 5-percent annual growth rate, are shown in **Figures 4 & 5**, which follow this report.

Planned Roadway Improvements

Currently there are no funded roadway projects planned within the immediate area of the site that will result in an increase in either roadway or intersection capacity. However, SC 170 has been extensively studied by the County in order to plan access and signal locations. According to the current plan for SC 170, the intersections of SC 141, Cherry Point Road and Pritcher Point Road are each planned to be signalized at some point in the future pending development trends and funding sources. A copy of the County's plan which illustrates the signalization of these intersections is provided in the appendix of this report.

Site-Generated Traffic

Traffic volumes expected to be generated by the proposed project were forecasted using the Seventh Edition of the ITE *Trip Generation* manual, as published by the Institute of Transportation Engineers. To estimate the traffic generated by each POD within the PUD, land-uses specific to each POD has been obtained/provided and each estimated individually. **Table 1** depicts the anticipated site-generated traffic for each specific POD within the Okatie PUD.

Table 1
PROJECT TRIP-GENERATION SUMMARY[1]
SPECIFIC POD GENERATIONS
Okatie PUD

	Beaufort School POD	KB Homes POD					CCRC POD	Shell/Osprey Point POD						Preacher Property POD (Estimated Land-Uses)			
	Regional Park[2] (a)	95 Townhome/ Condo (b)	229 Single Family Units (c)	33,000 sf Retail (d)	11,000 sf Office (e)	Total KB Homes POD Σ(b to e)	330 Units CCRC (f)	165 Townhome/ Condo (g)	184 Single Family Units (h)	180 Apartment Units (i)	150,000 sf Retail (j)	50,000 sf Office (k)	Total Shell/Osprey Pt. POD Σ(g to k)	164 Apartment Units (l)	152 Townhome/ Condo (m)	171 Single Family Units (n)	Total Preacher Property POD Σ(l to n)
Daily	0	610	2,230	1,810	240	4,890	930	980	1,820	1,140	8,250	780	13,070	1,100	920	1,700	3,720
Peak-Hour																	
Enter	0	9	43	21	28	101	38	13	35	19	95	95	257	17	12	32	61
Exit	0	41	127	13	4	185	21	64	103	75	60	13	315	67	60	97	224
Total	0	50	170	34	32	286	59	77	138	94	155	108	572	84	72	129	285
PM Peak-Hour																	
Enter	0	39	142	81	3	265	46	61	117	74	367	13	632	70	57	110	237
Exit	0	19	84	87	13	203	50	30	69	40	398	62	599	35	28	64	130
Total	0	58	226	168	16	468	96	91	186	114	765	75	1,231	105	85	174	367

1. Source: ITE Trip Generation Manual, Seventh Edition: LUC's 710 (Office), 230 (Townhome/Condo), 210 (Single-Family Dwelling Units), 820 (Shopping Center), 251 (CCRC) and 220 (Apartments).
2. Traffic generated by regional park is anticipated to be negligible.

Secondly, since the sum of the POD's makes up the Okatie PUD and the entire PUD proposes a mix of land-uses (i.e. residential, commercial, existing school, etc.) and an internal roadway network connecting each POD, an internal attraction/multi-purpose trip reduction has been assumed. For this project, a 15-percent internal capture has been calculated.

Total vehicle trips generated by the proposed development include: 1) those motorists with an ultimate destination to the development, commonly referred to as primary purpose trips, that is, *new* trips, and 2) motorists attracted to the site from the traffic passing the adjacent street, referred to as *pass-by* or *impulse* trips.

Pass-by trips are trips made to the proposed development as intermediate stops on the way from an origin to a primary trip destination. It is important to note that pass-by trips do not reduce the amount of traffic generated by the site, and the "total trips" generated are expected to enter and exit the site no matter what percentage of pass-by trips are used. Pass-by trips are simply that portion of the site-generated traffic that are not a function of the land uses in the area, but are only a function of the type of use proposed on the site and the volume of traffic on the adjacent roadways. For this particular project, a *pass-by* reduction of only 25-percent has been utilized for the retail land uses only.

Table 2 illustrates the entire project while accounting for the pass-by reduction and internal trip capture percentage.

Table 2
PROJECT TRIP-GENERATION SUMMARY[1]
PROJECT TOTALS
Okatie PUD

	Project POD Totals- Okatie PUD								
Time Period	Beaufort School POD (a)	Total KB Homes POD ∑(b to e)	330 CCRC POD (f)	Total Sheik/Osprey Pt POD ∑(g to k)	Total Preacher Property POD ∑(l to n)	Total Trips Okatie PUD a+∑(b to e)+f+∑(g to k)+∑(l to n)	15% Internal Capture[1] (o)	25% Pass-By[2] (p)	Total *New* Trips Okatie PUD a+∑(b to e)+f+∑(g to k)+∑(l to n)-o-p
Weekday Daily	0	4,890	930	13,070	3,720	22,610	3,392	2,138	17,081
AM Peak-Hour									
Enter	0	101	38	257	61	457	69	16	372
Exit	0	185	21	315	224	745	69	16	660
Total	0	286	59	572	285	1,202	138	32	1,033
PM Peak-Hour									
Enter	0	265	46	632	237	1,180	147	95	938
Exit	0	203	50	599	130	982	147	95	740
Total	0	468	96	1,231	367	2,162	294	190	1,678

1 Internal capture assumed between retail, office and residential uses on-site.

2 Pass-by percentage of 25% assumed based on information contained in the ITE Handbook.

As shown, in total, the proposed Okatie PUD can be expected to generate 17,081 *new* external trips on a weekday daily basis, of which a total of 1,033 *new* external trips (372 entering, 660 exiting) can be expected during the AM peak-hour. During the PM peak-hour, a total of 1,678 *new* external trips (938 entering, 740 exiting) can be expected.

Distribution Pattern

The directional distribution of site-generated traffic on the study area roadways has been based on an evaluation of existing and future projected travel patterns within the study area. Based on this information, an anticipated arrival/departure pattern for the residential and non-residential uses has been developed and is shown in **Table 3**.

Table 3
TRIP DISTRIBUTION PATTERN
Okatie PUD

Roadways	Direction To/From	Percent of Trips Enter/Exit	
		Residential	Commercial/Other
SC 170	North	30	50
	South	50	35
SC 141	West	10	15
Beaufort County School Connectivity	South	10	-
	Total	100	100

Note: Based on existing traffic flow.

This distribution pattern has been applied to the site-generated traffic volumes from Table 2 to develop the site-generated specific volumes for the study area as illustrated in **Figures 6 & 7**, which follow this report.

Build Traffic Conditions

The site-generated traffic, as depicted in Figures 6 & 7, have been added to the respective 2015 No-Build traffic volumes shown in Figures 4 & 5. This results in the peak-hour Build traffic volumes, which are graphically depicted in **Figures 8 & 9** for the respective AM and PM peak hours. These volumes were used as the basis to determine potential improvement measures necessary to mitigate traffic impacts caused by the project.

TRAFFIC OPERATIONS

Analysis Methodology

A primary result of capacity analysis is the assignment of Level-of-Service (LOS) to traffic facilities under various traffic flow conditions. The concept of Level-of-Service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A Level-of-Service designation provides an index to the quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six Levels-of-Service are defined for each type of facility (signalized and unsignalized intersections). They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst.

Since the Level-of-Service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of Levels-of-Service depending on the time of day, day of week, or period of a year.

Analysis Results

As part of this traffic study, capacity analyses have been performed at the study area intersections under both Existing and Future (No-Build & Build) conditions. The results of these analyses are summarized in **Table 4**.

Table 4
LEVEL-OF-SERVICE SUMMARY[1]
Okatie PUD

Signalized Intersection	Peak Hour	Existing Delay[2]	Existing V/C[3]	Existing LOS[4]	2015 No-Build Delay	2015 No-Build V/C	2015 No-Build LOS	2015 Build Delay	2015 Build V/C	2015 Build LOS
SC 170 at Cherry Point Road	AM	11.8	0.60	B	28.2	0.93	C	62.0	1.13	E
	PM	5.5	0.53	A	10.6	0.80	B	54.0	1.04	D
Unsignalized Intersections										
SC 170 at SC 141	AM	154.5	-	F	>500.0	-	F	>500.0	-	F
	PM	219.4	-	F	>500.0	-	F	>500.0	-	F
SC 170 at Pritcher Point Road	AM	43.6	-	E	>500.0	-	F	>500.0	-	F
	PM	20.7	-	C	93.5	-	F	>500.0	-	F
SC 141 at Jasper Station Road/Short Cut Drive	AM	18.6	-	C	52.6	-	F	183.3	-	F
	PM	17.8	-	C	47.8	-	E	270.1	-	F
SC 170 at Full-Movement Access	AM	To be Constructed by Development			To be Constructed by Development			93.4	-	F
	PM							>500.0	-	F
SC 170 at Northern RIRO Access	AM	To be Constructed by Development			To be Constructed by Development			17.4	-	C
	PM							38.9	-	E
SC 170 at Southern RIRO Access	AM	To be Constructed by Development			To be Constructed by Development			19.5	-	C
	PM							35.9	-	E

1. Calculations completed using the 2000 HCM methodology.
2. Delay in seconds-per-vehicle.
3. V/C= Volume-to-capacity ratio.
4. Level-of-Service.

GENERAL NOTES:

1. For unsignalized intersections, delay is representative of the minor street approach.
2. For signalized intersections, delay is representative of the over-all intersection.

As shown in Table 4, under Existing conditions, the signalized intersection of SC 170 at Cherry Point Road and the unsignalized intersection of SC 141 at Jasper Station Road/Short Cut Drive each operate at acceptable service levels. The remaining two unsignalized study area intersections along SC 170 which include the SC 141 and Pritcher Point Road intersections currently operate poorly. These poor service levels are due the minor street left-turn movements from the minor street approach which must wait for a gap in through traffic on SC 170

Under the future 2015 No-Build condition, which does not include traffic generated by the project, operating conditions are expected to be unacceptable at each of the unsignalized study area intersections and acceptable at the signalized intersection of SC 170 at Cherry Point Road. As under the Existing condition, the reasoning for the poor service levels at the unsignalized intersections is due to the minor street approaches; typically the left-turn movement.

Under Build conditions, each of the study area intersections, two of which will now provide access to/from the site, are expected to operate poorly during one or more of the peak hours evaluated. In addition, the three proposed site access drives; two of which are limited to right-turn in/right-turn out movements only (RIRO); are also expected to operate with some delay.

MITIGATION

The final phase of the analysis process is to identify mitigating measures which may either minimize the impact of the project on the transportation system or tend to alleviate poor service levels not caused by the project. The following describes measures necessary to mitigate the project's impact:

Site Access Intersections-

Access to/from the site will be provided via five access drives, two via existing roadway alignments (Pritcher Point Drive and Cherry Point Drive) and three via new curb-cuts two of which will be limited to right-turn in/right-turn out movements only. The following describe the suggested geometry and traffic control for each of the site access intersections:

SC 170 at Pritcher Point Road/Short Cut Drive

This intersection will serve as one of the primary/direct access drives to/from the site. To accommodate the expected site-generated traffic, the following geometrics and traffic control are suggested:

- Widen northbound SC 170 to provide a separate right-turn lane entering Pritcher Point Road. This lane should provide a taper length of 200-feet and a full storage length of 250-feet;
- Widen southbound SC 170 to provide a separate left-turn lane entering Pritcher Point Road. This lane should provide a taper length of 200-feet and a full storage length of 250-feet;
- Widen Pritcher Point Road (westbound approach) to provide dual left-turn lanes, a through lane and a separate right-turn lane;
- Reconstruct the eastbound approach of Short Cut Drive to provide adequate geometry to align/provide safe traffic flow at this intersection. For the purposes of this report, a minimum of a separate left-turn lane and a shared through/right-turn lane has been suggested. The geometry of this approach must not induce the need for split phased operations; and
- In accordance with the County's plan for SC 170, monitor intersection for the need for traffic signal control. When needed, install traffic signal control. It should be noted that the peak-hour traffic volumes as well as the suggested intersection geometry are sufficient to require traffic signal control criteria.

SC 170 at Cherry Point Road/Pearlstine Drive

This intersection is currently signalized and serves as the primary/direct access for the adjacent Beaufort County School. The development will impact this intersection resulting in the need for the following improvements:

- Widen Cherry Point Road (westbound approach) to provide dual left-turn lanes, a through lane and a separate right-turn lane exiting the site; and
- Reconstruct the eastbound approach of Pearlstine Drive to provide adequate geometry to align/provide safe traffic flow at this intersection. For the purposes of this report, a minimum of a separate left-turn lane and a shared through/right-turn lane has been suggested. The geometry of this approach must not induce the need for split phased operations.

SC 170 at Full-Movement Center Access

This intersection will serve as a secondary access drive for the site. To accommodate the expected site-generated traffic, the following geometrics and traffic control are suggested:

- Widen northbound SC 170 to provide a separate right-turn lane entering the site. This lane should provide a taper length of 200-feet and a full storage lane length of 250-feet;
- Widen southbound SC 170 to provide a separate left-turn lane entering the site. This lane should provide a taper length of 200-feet and a full storage lane length of 250-feet;
- Construct the site access to provide a three lane cross-section; one lane entering the site and two lanes exiting the site designated as a separate left-turn lane and a separate right-turn lane; and
- Place intersection under STOP sign control where vehicles exiting the site are required to stop.

SC 170 at Limited Access Drives (Two Locations)

These two intersections are to be located on either side of the Cherry Point Drive intersection. Sufficient separation will be needed in order to provide good operations as well as the allowance for separate turning lanes entering each access. To accommodate the expected site-generated traffic, the following geometrics and traffic control are suggested at each access:

- Widen northbound SC 170 to provide a separate right-turn lane entering the site. This lane should provide a taper length of 200-feet and a full storage lane length of 250-feet;
- Construct the site access to provide a two lane cross-section; one lane entering the site and one lane exiting the site designated as a right-turn only lane. Directional traffic entering and exiting the site will be separate by a raised delta median; and
- Place intersection under STOP sign control where vehicles exiting the site are required to stop.

It should be noted that the prohibition of no left-turns at these intersections will also be enforced by the exiting median within SC 170.

Off-Site Intersections

SC 170 at SC 141

This intersection currently operates poorly and is expected to continue to operate poorly without improvements. This intersection is anticipated to be placed under traffic signal control in accordance with the County's plan for SC 170. Review of the current traffic flow in the area indicates that signalization is likely warranted under current conditions. Based on the County plan and the current operating conditions at this intersection, signalization should be installed by the County/SCDOT prior to the development of the Okatie PUD project.

In addition to the signalization of this intersection, the construction of eastbound dual left-turn lanes should be considered. The current volume is approaching 300 vehicles during the PM peak-hour which is expected to increase under the future conditions network. It is suggested that these dual turning lanes be implemented when signalization of this intersection is installed.

SC 141 at Jasper Station Road/Short Cut Drive (Jasper County)

This intersection is anticipated to operate poorly under both future No-Build and Build conditions. To mitigate the impact that the development is expected to have on this intersection, the following improvements are recommended:

- Widen westbound Short Cut Drive to provide a two lane approach designated as a separate left-turn lane and a shared through/right-turn lane. The lane should provide a storage length of 200-feet with a taper of 180-feet; and
- Widen northbound SC 141 to provide a separate right-turn lane entering Short Cut Drive. This lane should provide a taper length of 180-feet and a full storage length of 200-feet.

It should be noted that the suggested widening of Short Cut Drive should help alleviate the existing off-set/skew of this intersection. The resultant service levels depicting the mitigation strategies identified above are shown in **Table 5**.

Table 5
MITIGATED LEVEL-OF-SERVICE SUMMARY[1]
Okatie PUD

	Peak	2015 No-Build			2015 Build			2015 Build Mitigated		
Signalized Intersections	**Hour**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**	**LOS**
SC 170 at Cherry Point Road	AM	28.2	0.93	C	62.0	1.13	E	55.4	0.98	E
	PM	10.6	0.80	B	54.0	1.04	D	47.5	0.99	D
SC 170 at SC 141	AM	See Unsignalized Below			See Unsignalized Below			16.5	1.40	B
	PM							12.8	0.94	B
SC 170 at Pritcher Point Road	AM	See Unsignalized Below			See Unsignalized Below			49.2	1.00	D
	PM							72.7	1.14	E
Unsignalized Intersections										
SC 170 at SC 141	AM	>500.0	-	F	>500.0	-	F	See Signalized Above		
	PM	>500.0	-	F	>500.0	-	F			
SC 170 at Pritcher Point Road	AM	>500.0	-	F	>500.0	-	F	See Signalized Above		
	PM	93.5	-	F	>500.0	-	F			
SC 141 at Jasper Station Road/Short Cut Drive	AM	52.6	-	F	183.3	-	F	86.8	-	F
	PM	47.8	-	E	270.2	-	F	141.4	-	F

1. Calculations completed using the 2000 HCM methodology.
2. Delay in seconds-per-vehicle.
3. V/C= Volume-to-capacity ratio.
4. Level-of-Service.

GENERAL NOTES:

1. For unsignalized intersections, delay is representative of the minor street approach.
2. For signalized intersections, delay is representative of the over-all intersection.

As shown, assuming the implementation of the recommended improvements, service levels at each of the study area intersections are expected to improve as compared to the Build condition and in most cases the No-Build condition.

CONCLUSIONS/RECOMMENDATIONS

SRS Engineering, LLC (SRS) has completed an assessment of the traffic impacts associated with the development of the Okatie PUD which is comprised of five individual/specific developments. In its entirety, the development proposes a mix of land-uses including commercial and residential which includes the existing Beaufort County School which is in operation.

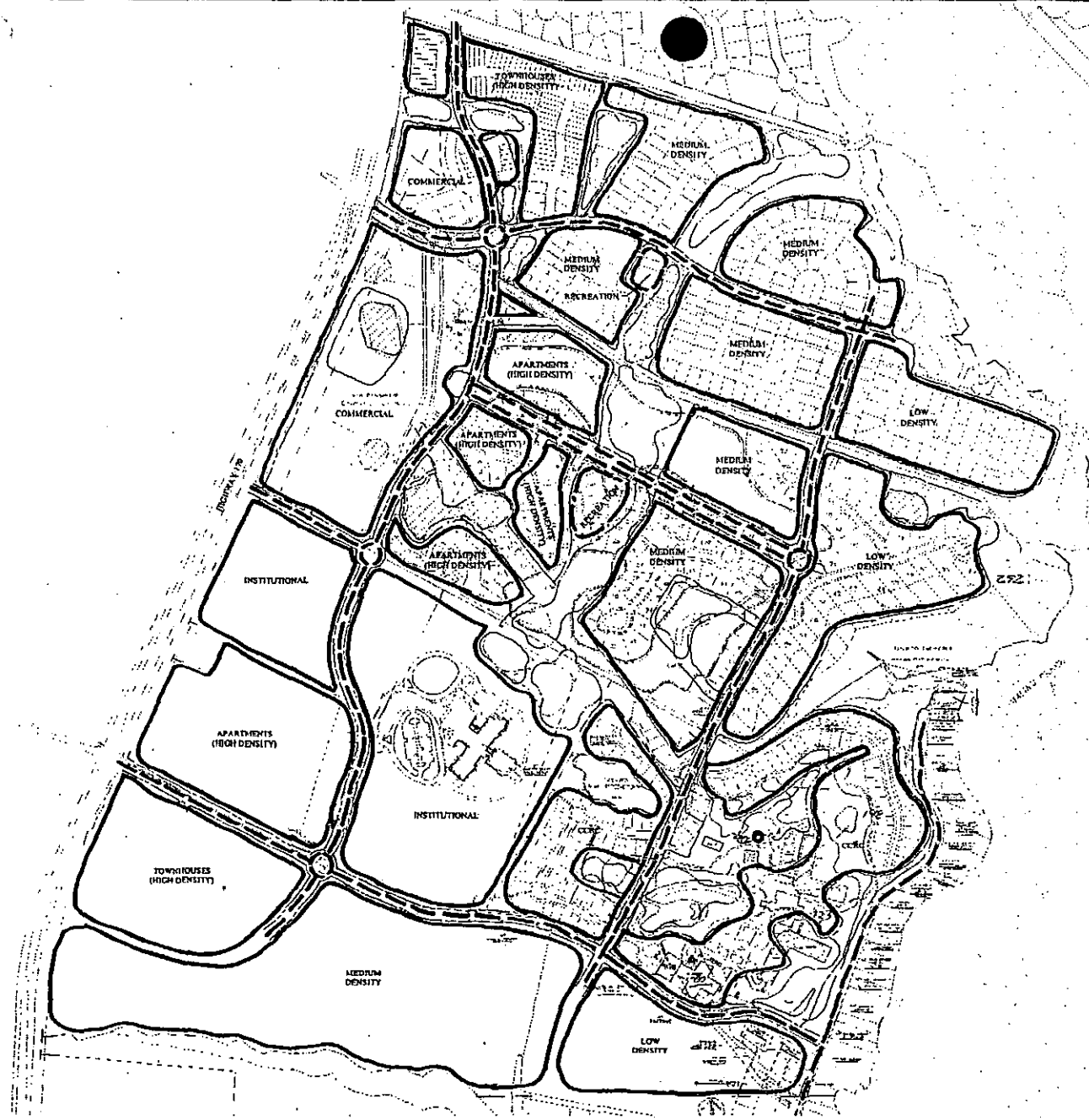
The Okatie PUD plans a total of 1,340 residential units, 330 CCRC units, and 244,000 sf of commercial space which will be provided access via five access drives along SC 170. As planned, the development is anticipated to be constructed and fully-operational by 2015.

As shown by this report, the PUD in its entirety will have an impact on SC 170 and at the SC 141 at Short Cut Drive/Jasper Station Road intersection located in Jasper County. Recommendations to improve operations at the impacted intersections have been made which include the addition of separate turning lanes and installation of traffic signal control. In total, three intersections are suggested to be signalized which is consistent with Beaufort County access management recommendations for SC 170.

As has been shown in this report, traffic volumes anticipated along SC 170 are expected to be significant such that operations at unsignlaized intersections (including right-in/right-out movement only intersections) are expected to operate with delays. Further detailed long-term analyses using the County's transportation model should be completed which includes the revision of model input data to reflect the land-uses specified in this report (TAZ's #72 & 74). This will enable the County to continue planning the SC 170 corridor and allow planning to keep up with development trends.

If you have any questions or comments regarding any information contained within this report, please contact me at (803) 252-1488.

Attachments



COMMERCIAL (31.88 AC.):	255,000 SQ.FT.
RESIDENTIAL	
APARTMENTS:	272 UNITS
TOWNHOUSES:	321 UNITS
MEDIUM DENSITY:	419 UNITS
LOW DENSITY:	98 UNITS
TOTAL:	1110 UNITS
CCRC DEVELOPMENT:	330 UNITS

OKATIE PUD

CONCEPTUAL DIAGRAM
AUGUST 16, 2007

NORTH

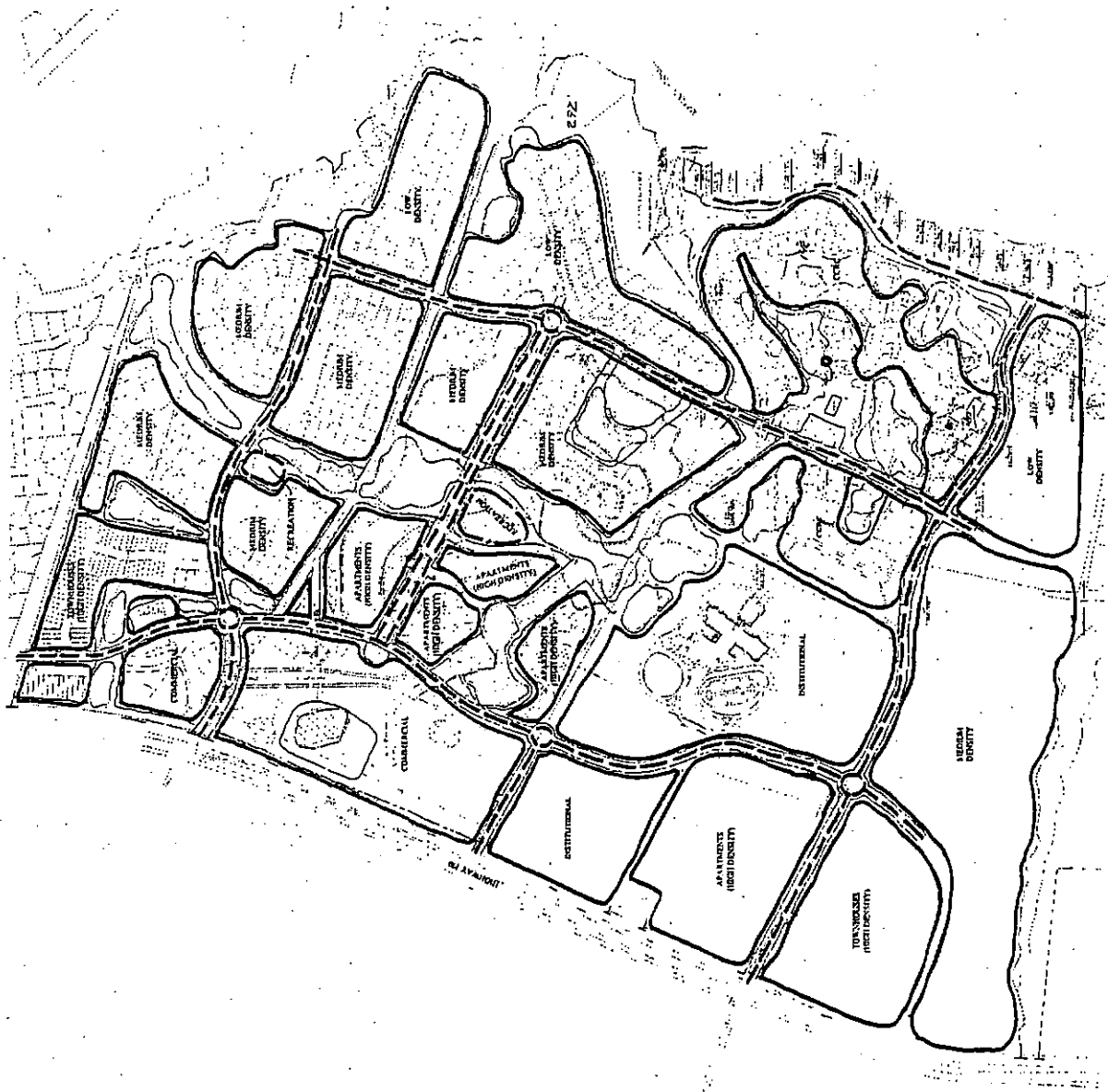


Figure 1

SITE DEVELOPMENT PLAN

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

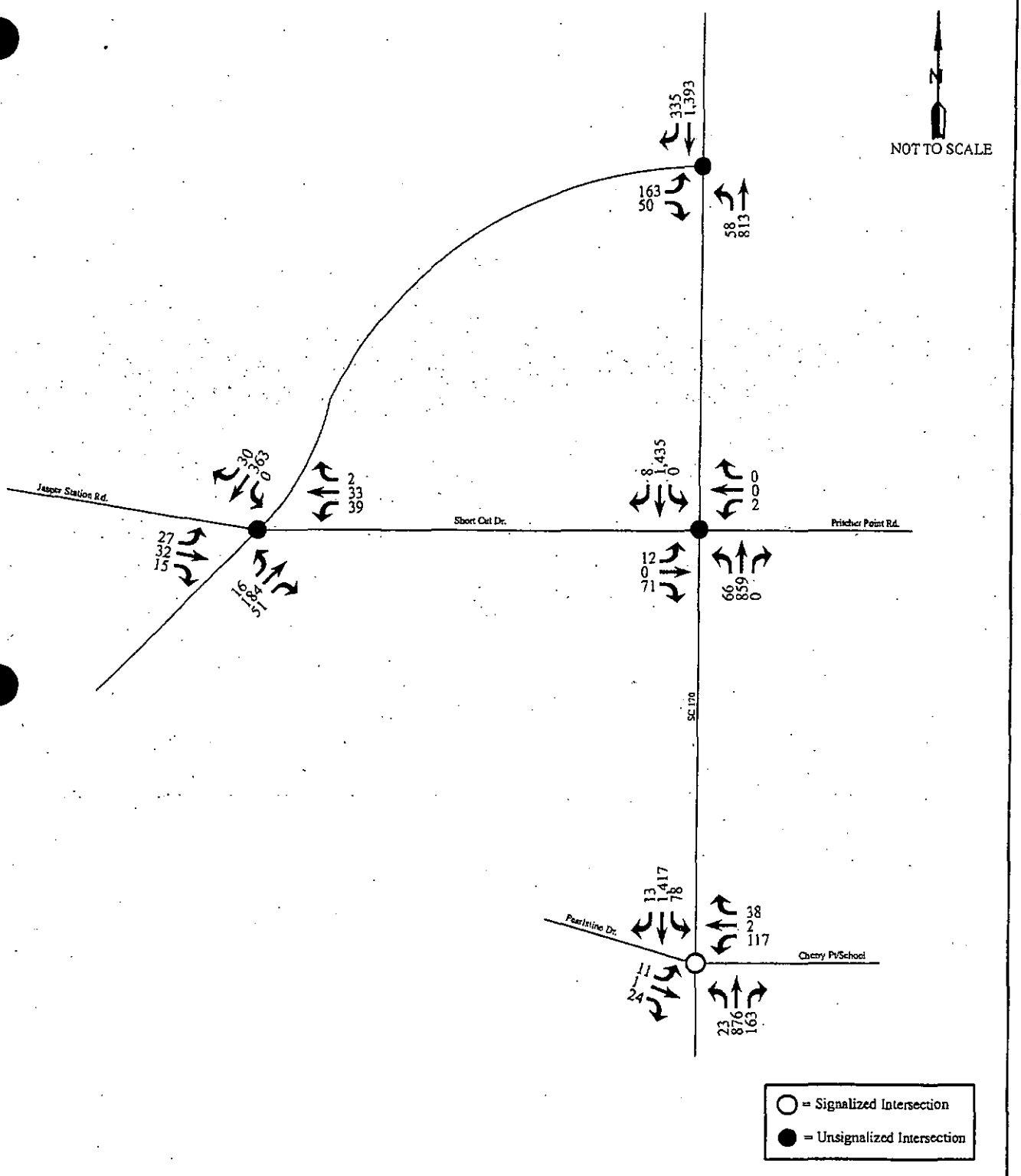


Figure 2

EXISTING TRAFFIC VOLUMES
AM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

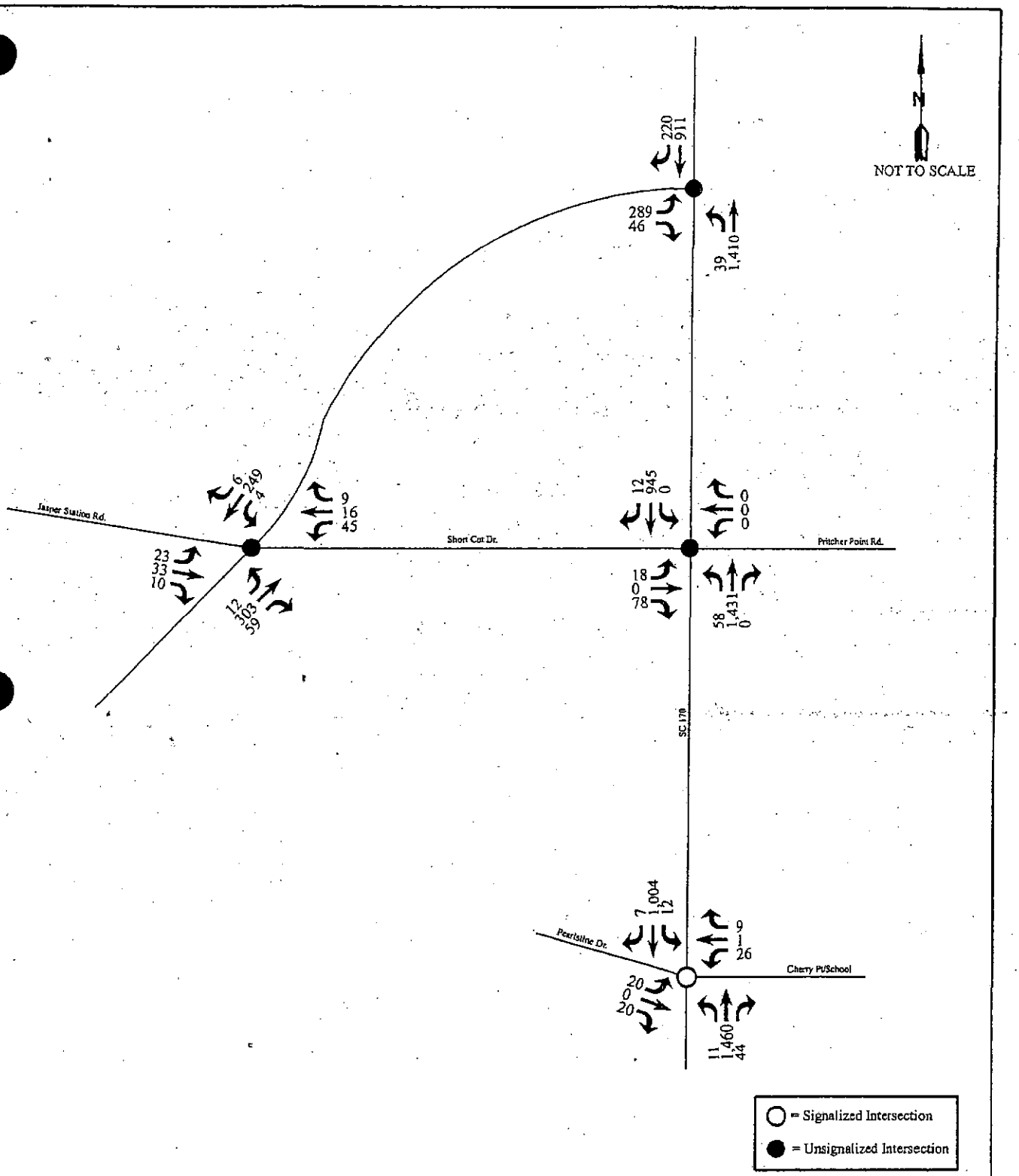


Figure 3

EXISTING TRAFFIC VOLUMES
PM PEAK-HOUR

Okatie PUD: South Carolina

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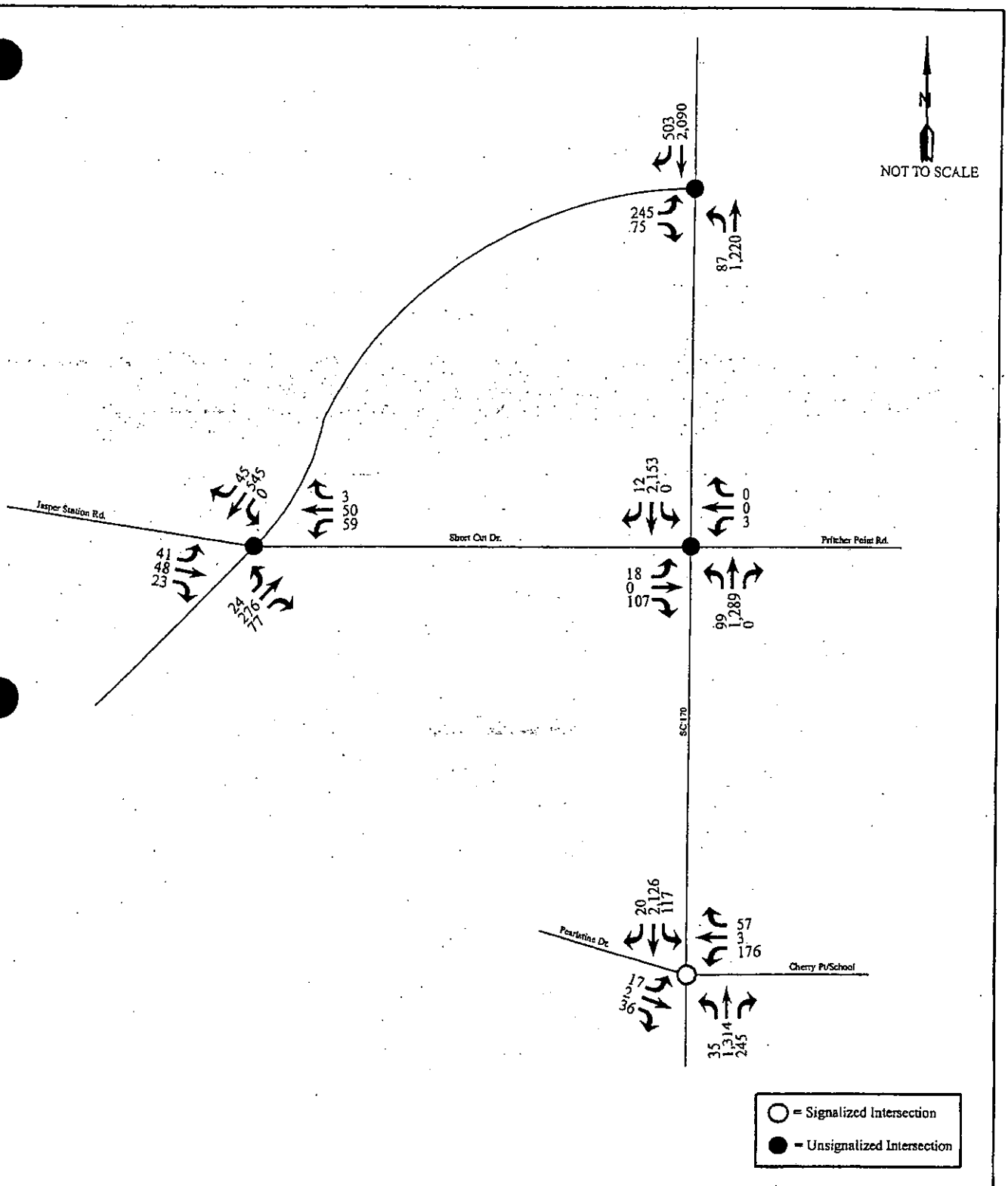

Figure 4

2015 NO-BUILD TRAFFIC VOLUMES AM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
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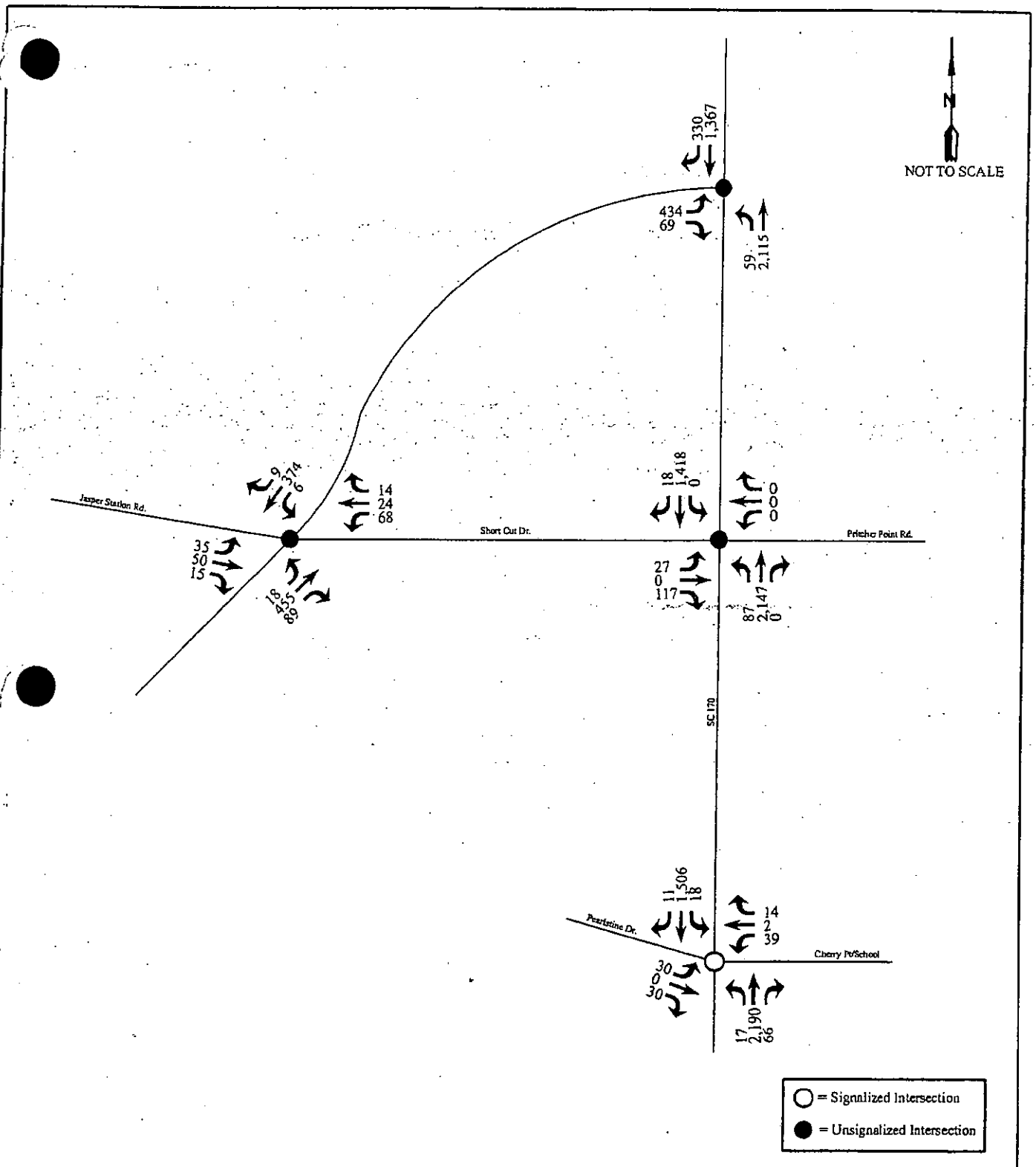


Figure 5

2015 NO-BUILD TRAFFIC VOLUMES

PM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING

Traffic, Transportation, & Parking Consultants

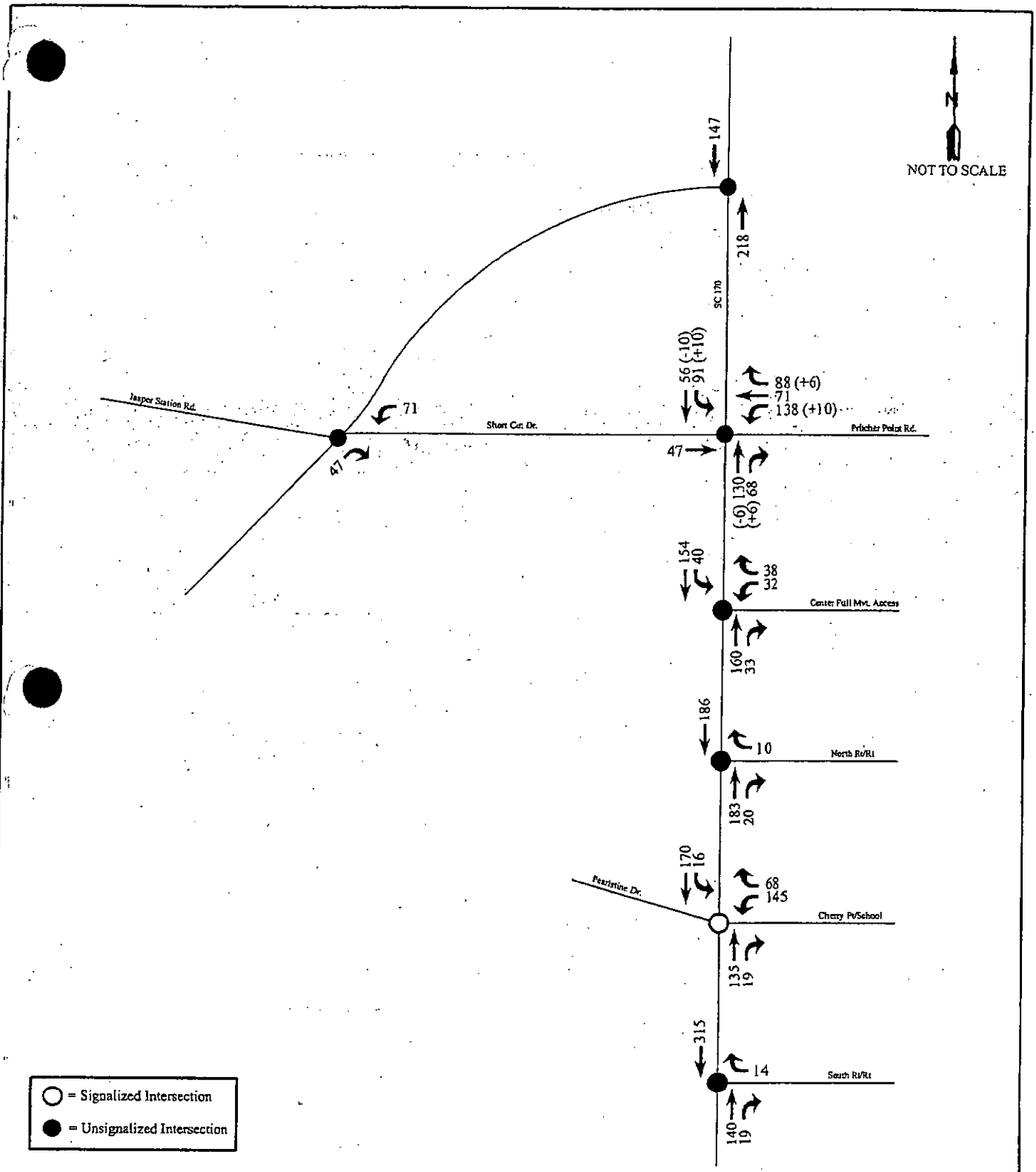


Figure 6

SITE-GENERATED TRAFFIC VOLUMES
AM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

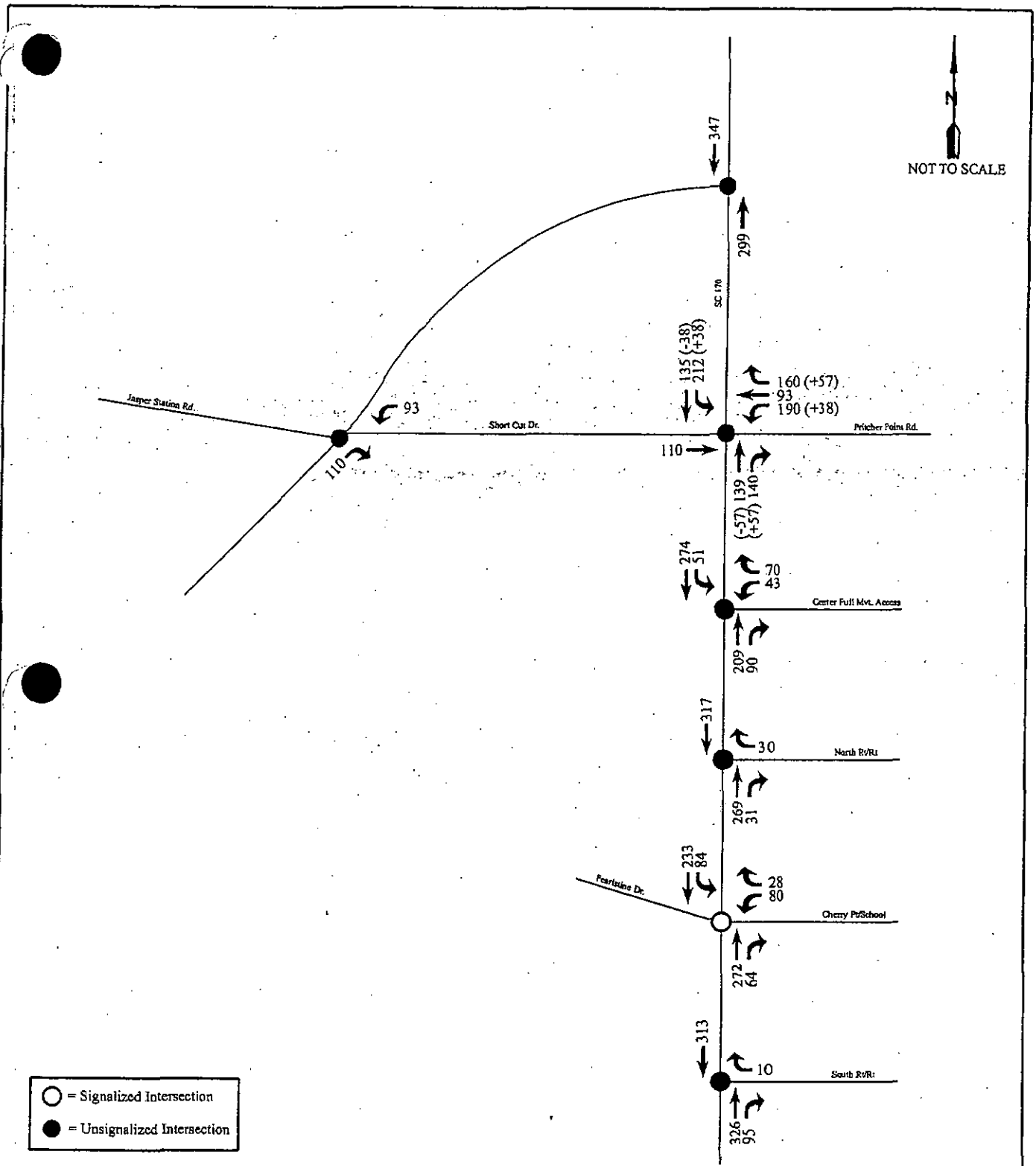


Figure 7

SITE-GENERATED TRAFFIC VOLUMES
PM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

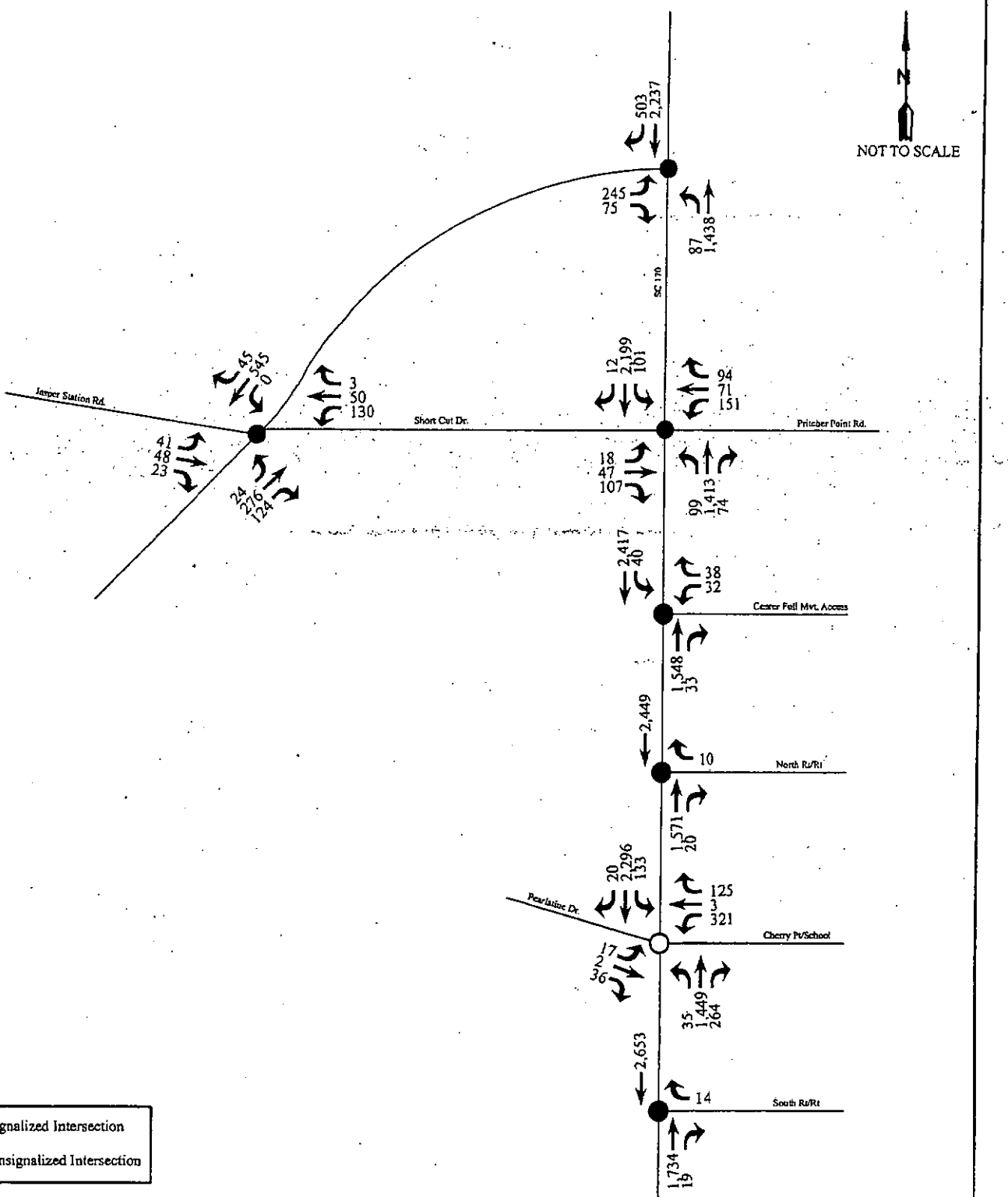


Figure 8

2015 BUILD TRAFFIC VOLUMES AM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

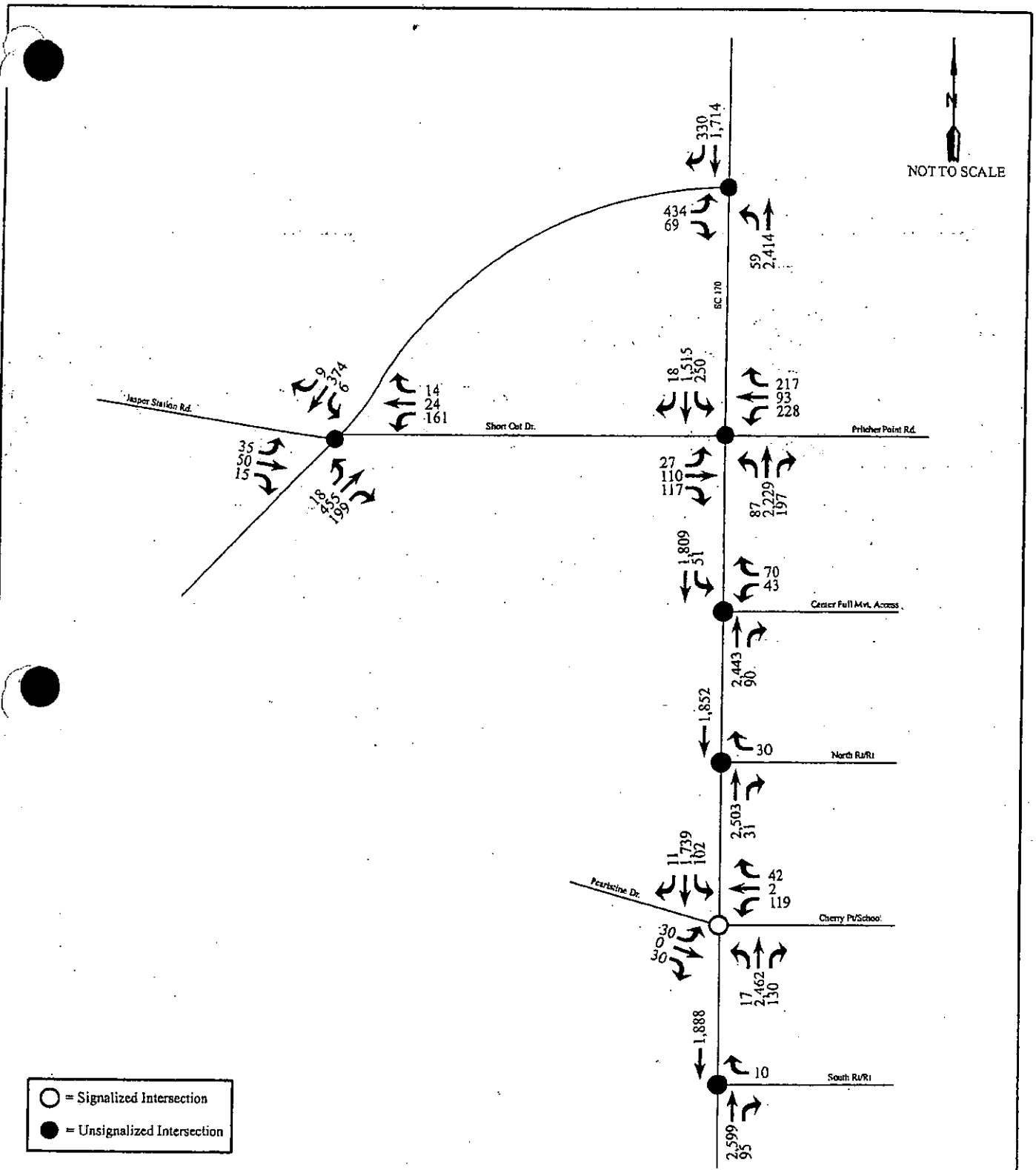


Figure 9

2015 BUILD TRAFFIC VOLUMES PM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING

Traffic, Transportation, & Parking Consultants

APPENDIX

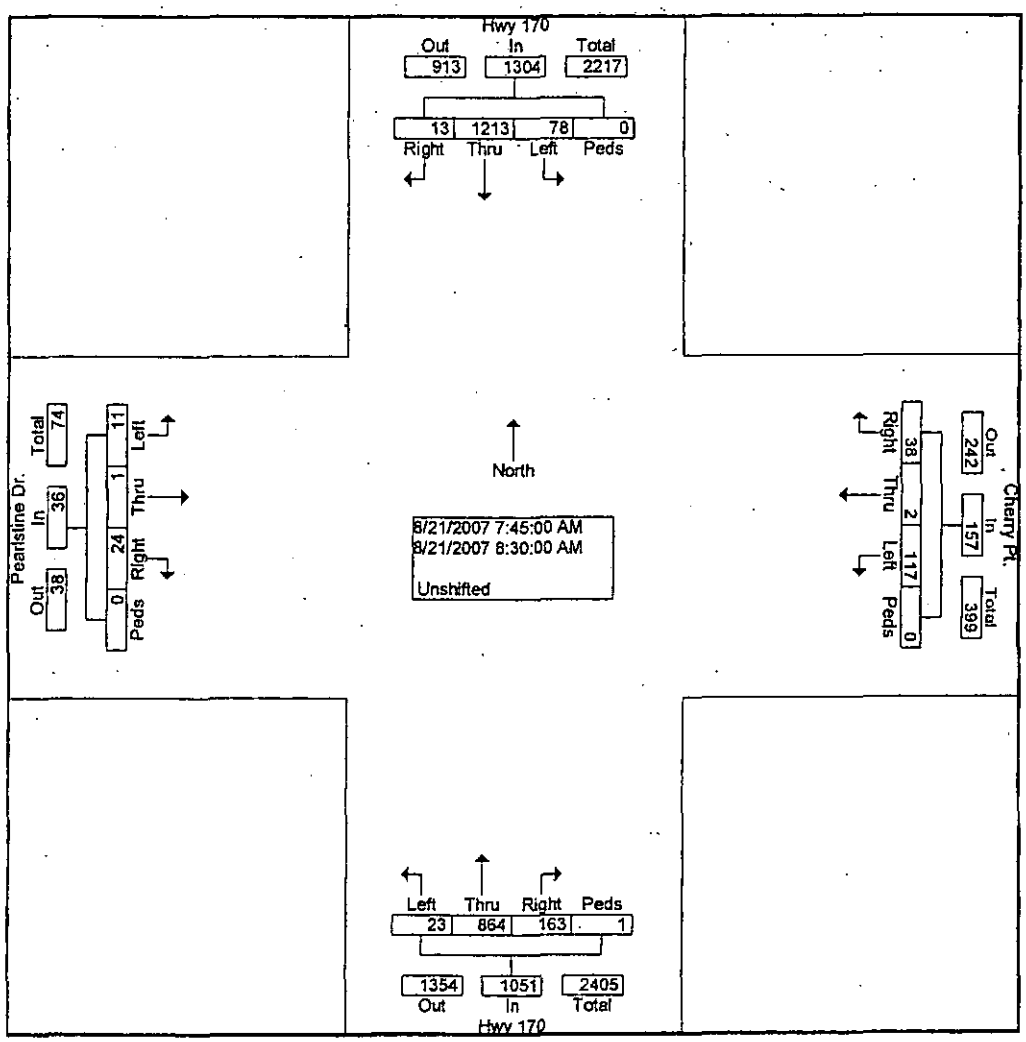
- Count Data
- SC 170 Access Plan
- Capacity Analysis

COUNT DATA

SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
803-252-1799

File Name : Hwy 170 @ Cherry Pt.
Site Code : 00082107
Start Date : 8/21/2007

	Hwy 170 Southbound					Cherry Pt. Westbound					Hwy 170 Northbound					Pearlstine Dr. Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Intersection	07:45 AM																				
Volume	13	1213	78	0	1304	38	2	117	0	157	163	864	23	1	1051	24	1	11	0	36	2548
Percent	1.0	93.0	6.0	0.0		24.2	1.3	74.5	0.0		15.5	82.2	2.2	0.1		66.7	2.8	30.6	0.0		
08:30 Volume	2	279	22	0	303	18	2	56	0	76	60	198	10	0	268	5	0	3	0	8	655
Peak Factor																					0.973
High Int.	08:00 AM					08:30 AM					07:45 AM					07:45 AM					
Volume	6	334	20	0	360	18	2	56	0	76	23	259	4	0	286	11	0	3	0	14	
Peak Factor					0.906					0.516					0.919					0.643	

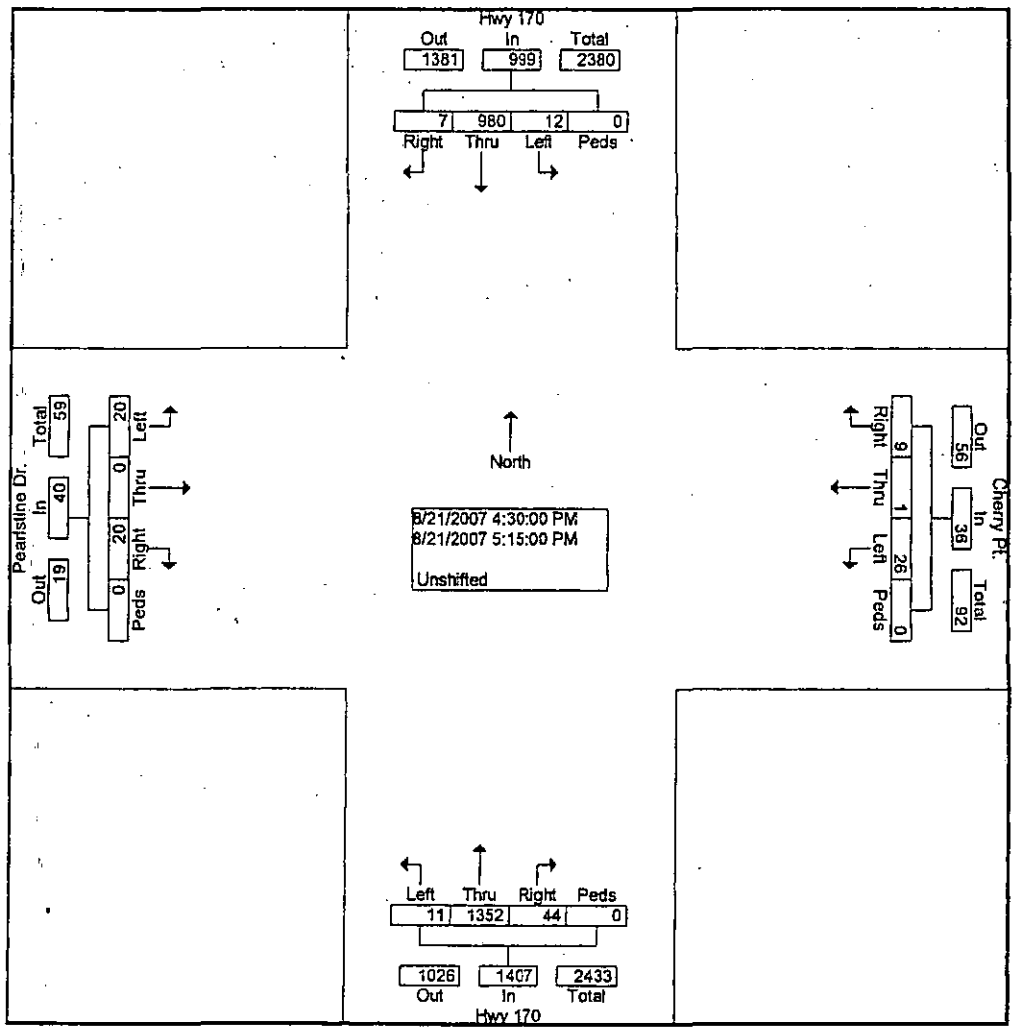


SLS

SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
803-252-1799

File Name : Hwy 170 @ Cherry Pt.
Site Code : 00082107
Start Date : 8/21/2007
Page No : 3

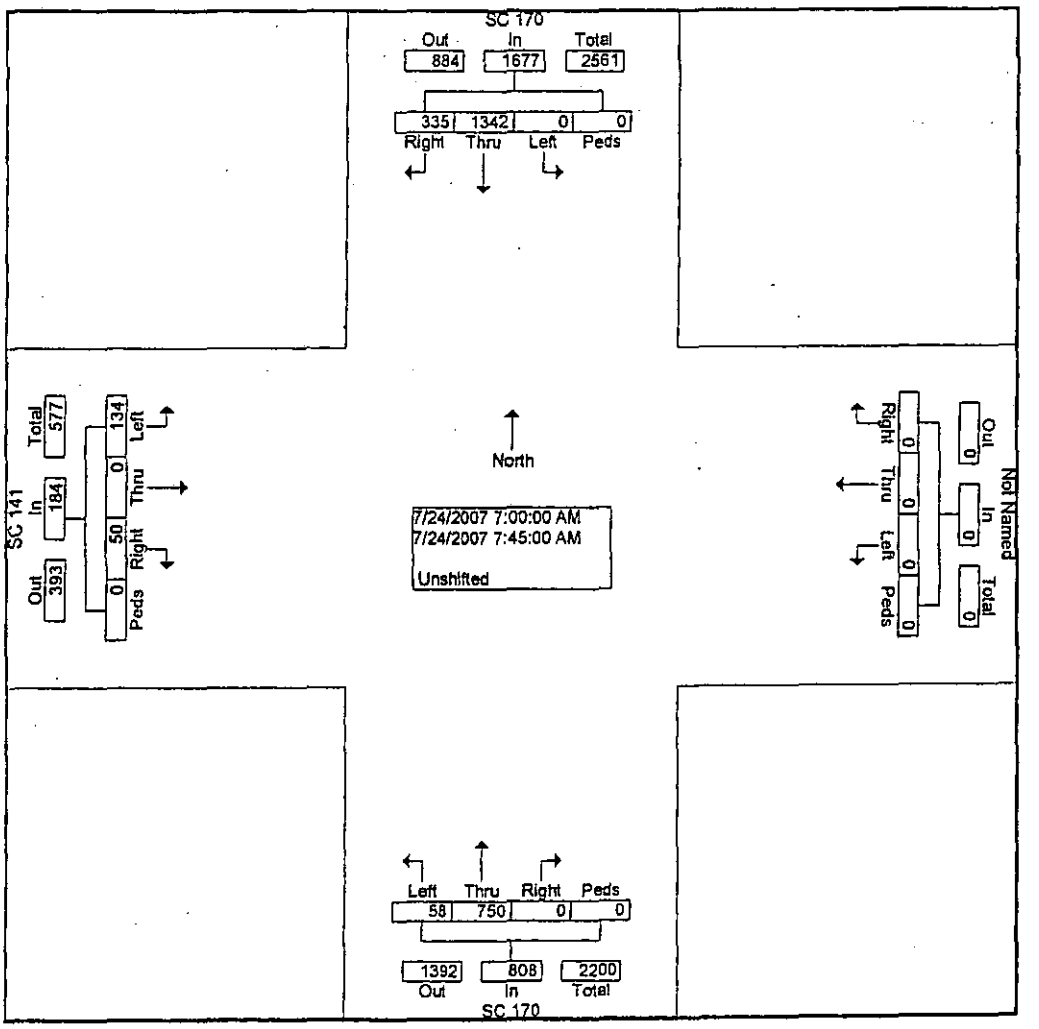
	Hwy 170 Southbound					Cherry Pt. Westbound					Hwy 170 Northbound					Pearlstine Dr. Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	7	980	12	0	999	9	1	26	0	36	44	1352	11	0	1407	20	0	20	0	40	2482
Percent	0.7	98.1	1.2	0.0		25.0	2.8	72.2	0.0		3.1	96.1	0.8	0.0		50.0	0.0	50.0	0.0		
05:15 Volume	1	288	4	0	293	2	0	5	0	7	21	365	2	0	388	8	0	6	0	14	702
Peak Factor																					0.884
High Int.	05:15 PM					05:00 PM					05:00 PM					05:15 PM					
Volume	1	288	4	0	293	2	0	11	0	13	10	382	1	0	393	8	0	6	0	14	
Peak Factor					0.852					0.692					0.895					0.714	



SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
803-252-1799

File Name : SC 141 at SC 170
Site Code : 00000000
Start Date : 7/24/2007

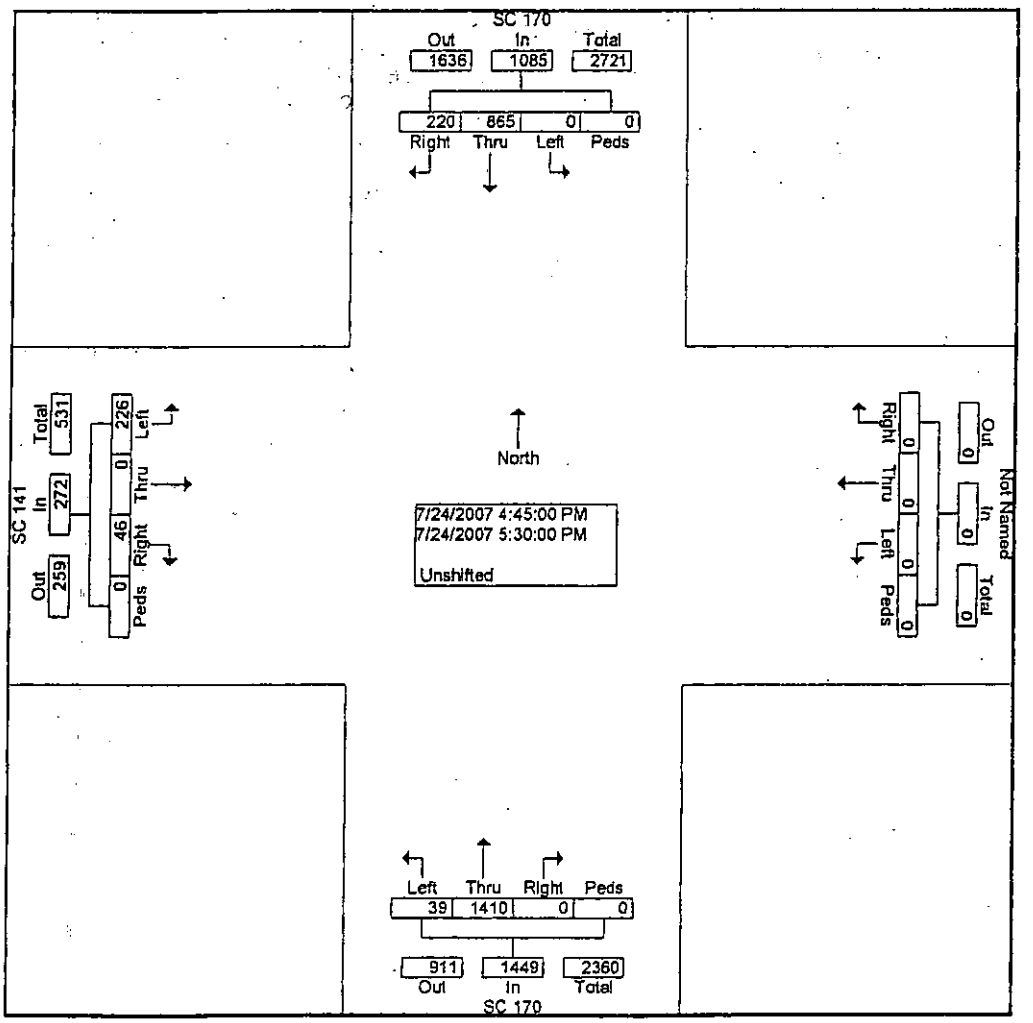
	SC 170 Southbound					Westbound					SC 170 Northbound					SC 141 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 07:00 AM to 12:30 PM - Peak 1 of 1																					
Intersection	07:00 AM																				
Volume	335	1342	0	0	1677	0	0	0	0	0	0	750	58	0	808	50	0	134	0	184	2669
Percent	20.0	80.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	92.8	7.2	0.0		27.2	0.0	72.8	0.0		
07:30 Volume	99	369	0	0	468	0	0	0	0	0	0	230	12	0	242	6	0	27	0	33	743
Peak Factor																					0.898
High Int.	07:30 AM					6:45:00 AM					07:30 AM					07:15 AM					
Volume	99	369	0	0	468	0	0	0	0	0	0	230	12	0	242	20	0	43	0	63	
Peak Factor					0.896										0.835					0.730	



SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
803-252-1799

File Name : SC 141 at SC 170
Site Code : 00000000
Start Date : 7/24/2007
Page No : 3

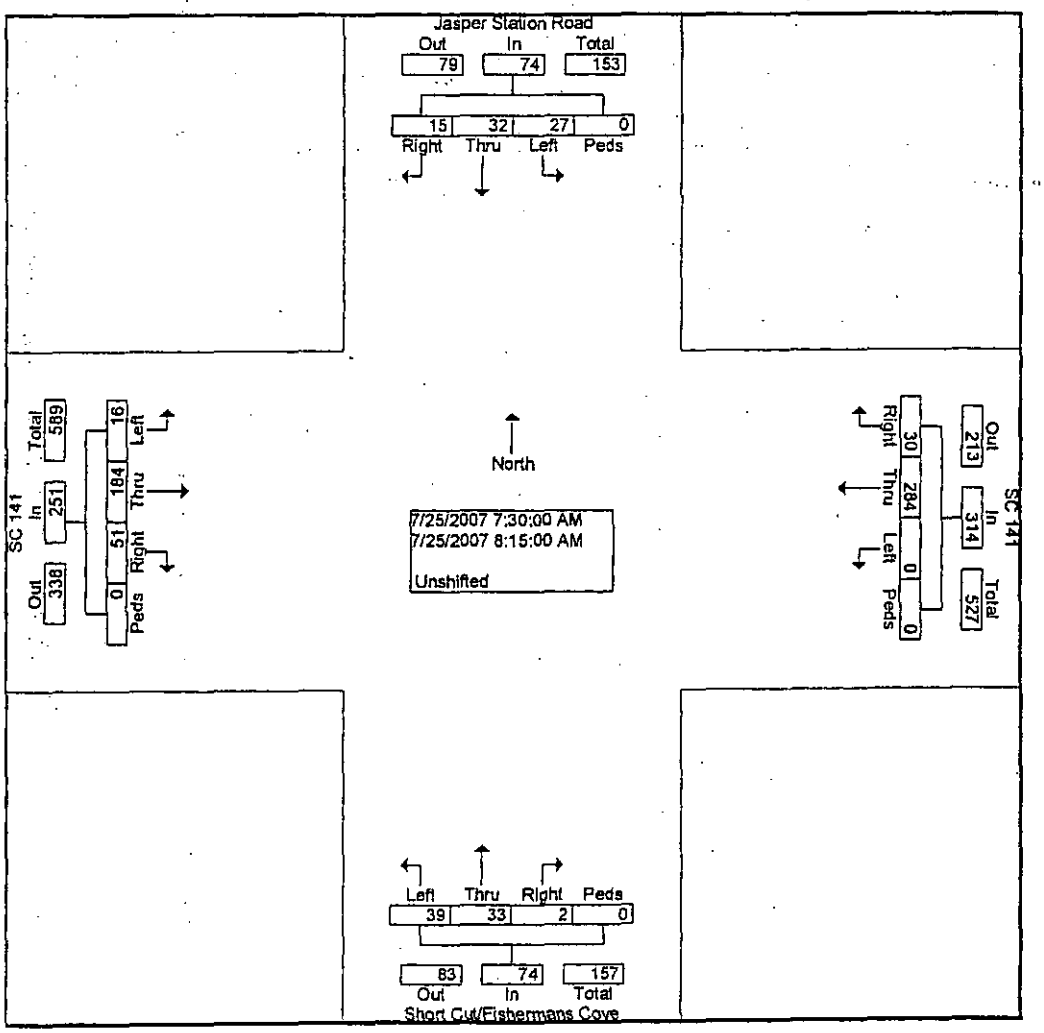
	SC 170 Southbound					Westbound					SC 170 Northbound					SC 141 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:45 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	220	865	0	0	1085	0	0	0	0	0	0	1410	39	0	1449	46	0	226	0	272	2806
Percent	20.3	79.7	0.0	0.0		0.0	0.0	0.0	0.0		0.0	97.3	2.7	0.0		16.9	0.0	83.1	0.0		
05:15 Volume	50	241	0	0	291	0	0	0	0	0	0	423	11	0	434	14	0	45	0	59	784
Peak Factor																					0.895
High Int.	05:15 PM										05:15 PM					05:00 PM					
Volume	50	241	0	0	291	0	0	0	0	0	0	423	11	0	434	10	0	70	0	80	
Peak Factor					0.932										0.835					0.850	



SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
803-252-1799

File Name : SC 141 at Fishermans Cove(short cut)
Site Code : 00000000
Start Date : 7/25/2007

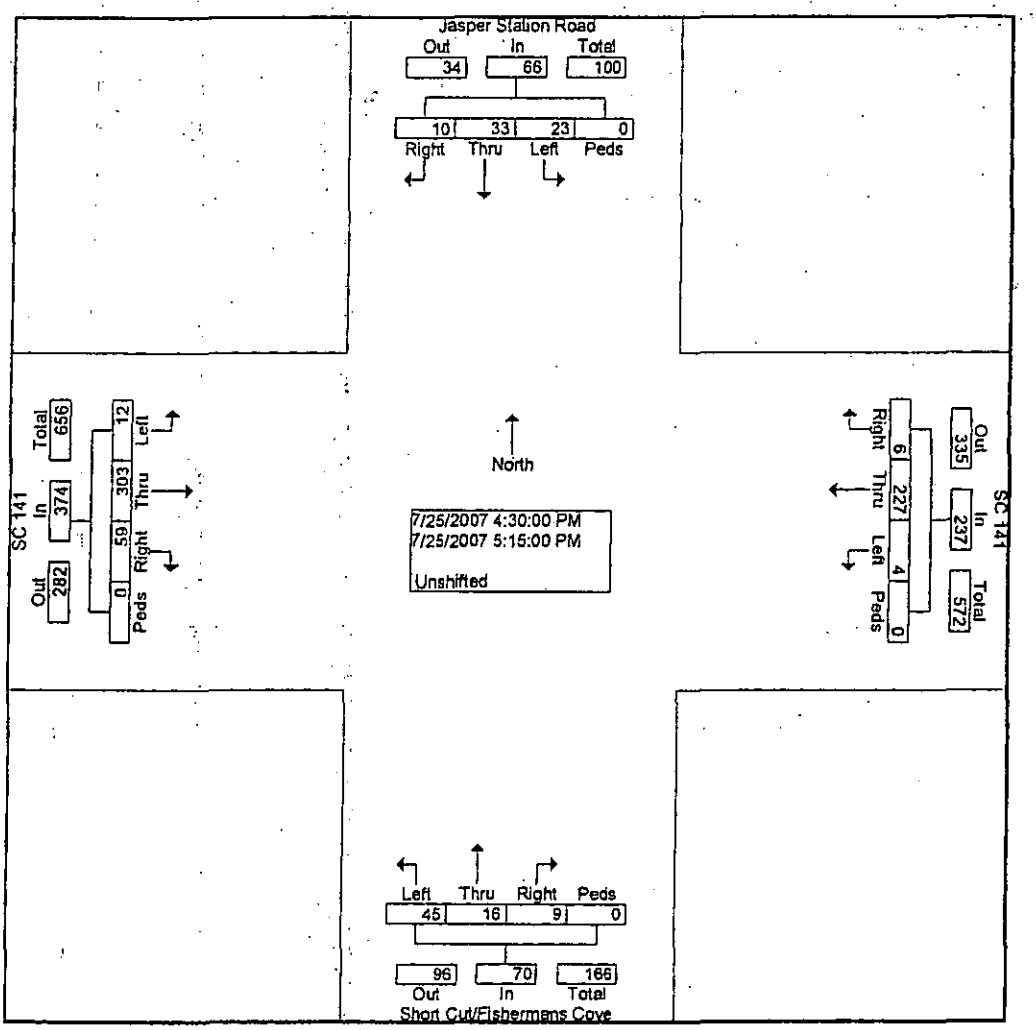
Start Time	Jasper Station Road Southbound Right	Thru	Left	Peds	App. Total	SC 141 Westbound Right	Thru	Left	Peds	App. Total	Short Cut/Fishermans Cove Northbound Right	Thru	Left	Peds	App. Total	SC 141 Eastbound Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 07:00 AM to 12:30 PM - Peak 1 of 1																					
Intersection	07:30 AM																				
Volume	15	32	27	0	74	30	284	0	0	314	2	33	39	0	74	51	184	16	0	251	713
Percent	20.3	43.2	36.5	0.0		9.6	90.4	0.0	0.0		2.7	44.6	52.7	0.0		20.3	73.3	6.4	0.0		
07:45 Volume	0	3	2	0	5	8	91	0	0	99	1	6	12	0	19	18	53	6	0	77	200
Peak Factor																					0.891
High Int.	08:00 AM					07:45 AM					07:45 AM					07:45 AM					
Volume	7	9	14	0	30	8	91	0	0	99	1	6	12	0	19	18	53	6	0	77	
Peak Factor					0.617					0.793					0.974					0.815	



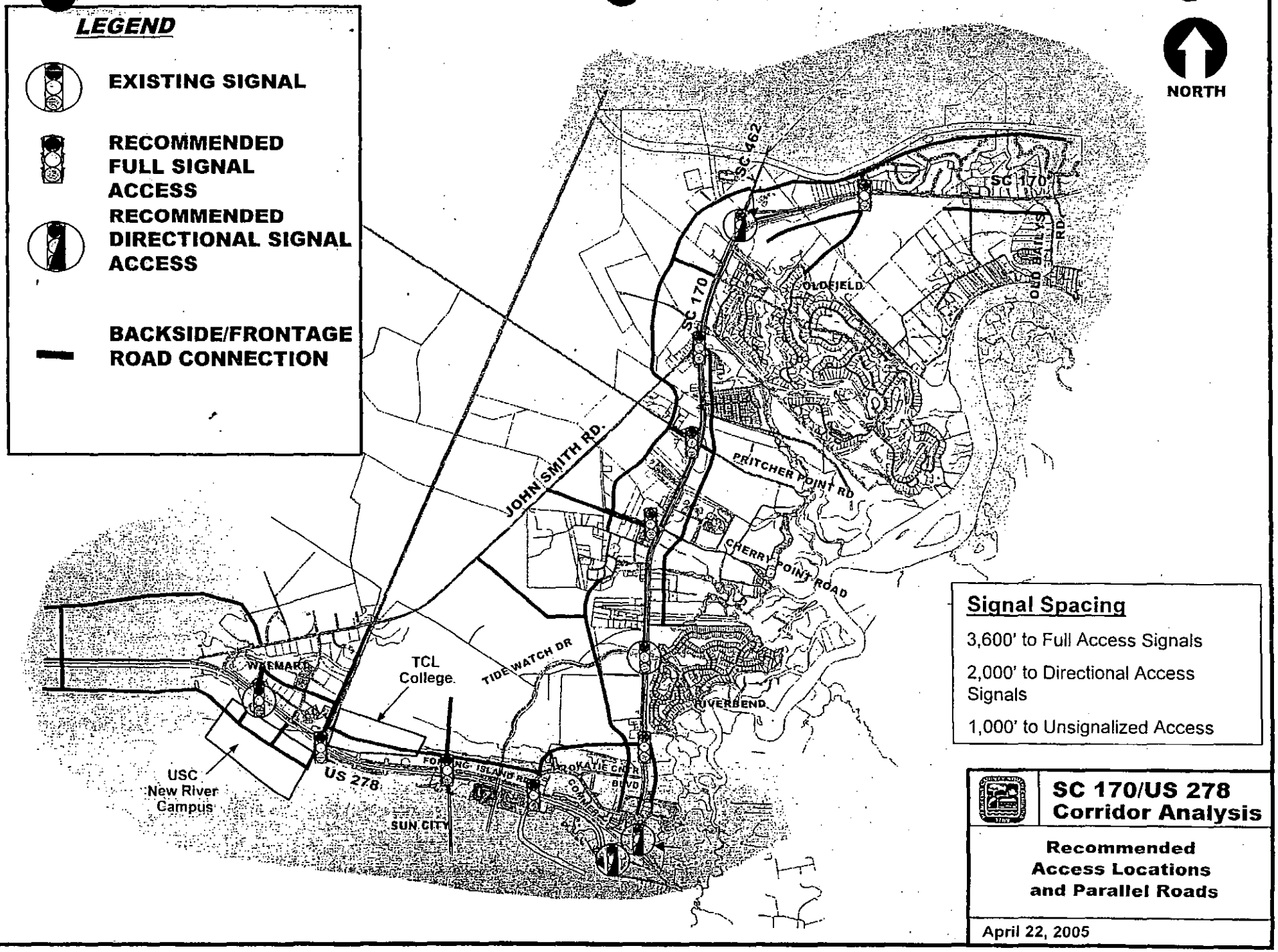
SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
803-252-1799

Site Name : SC 141 at Fishermans Cove(short cut)
Site Code : 00000000
Start Date : 7/25/2007

	Jasper Station Road Southbound					SC 141 Westbound					Short Cut/Fishermans Cove Northbound					SC 141 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:45 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	10	33	23	0	66	6	227	4	0	237	9	16	45	0	70	59	303	12	0	374	747
Percent	15.2	50.0	34.8	0.0		2.5	95.8	1.7	0.0		12.9	22.9	64.3	0.0		15.8	81.0	3.2	0.0		
05:00 Volume	5	15	4	0	24	0	50	2	0	52	3	5	9	0	17	19	102	5	0	126	219
Peak Factor																					0.853
High Int.	05:00 PM					04:30 PM					04:30 PM					05:00 PM					
Volume	5	15	4	0	24	5	63	0	0	68	5	3	12	0	20	19	102	5	0	126	
Peak Factor					0.688					0.871					0.875					0.742	



SC 170 ACCESS PLAN


LEGEND
EXISTING SIGNAL
RECOMMENDED FULL SIGNAL ACCESS
RECOMMENDED DIRECTIONAL SIGNAL ACCESS
BACKSIDE/FRONTAGE ROAD CONNECTION
NORTH
SC 462
SC 170
OLDFIELD
OLD GRIST MILL RD
JOHN SMITH RD.
PRITCHER POINT RD
CHERRY POINT ROAD
TIDE WATCH DR
RIVERBEND
WEEMAKO
TCL College
USC New River Campus
US 278
FORDING ISLAND RD
KATIE CREEK BLVD
SUN CITY
Signal Spacing
3,600' to Full Access Signals
2,000' to Directional Access Signals
1,000' to Unsignalized Access
SC 170/US 278 Corridor Analysis
Recommended Access Locations and Parallel Roads
April 22, 2005

CAPACITY ANALYSIS

- 2007 Existing
- 2015 No-Build
- 2015 Build/Mitigated

EXISTING

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.91			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1669			1775	1583	1770	3539	1583	1770	3534	
Flt Permitted		0.90			0.76	1.00	0.12	1.00	1.00	0.26	1.00	
Satd. Flow (perm)		1525			1418	1583	222	3539	1583	480	3534	
Volume (vph)	11	1	24	117	2	38	23	876	163	78	1417	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	26	127	2	41	25	952	177	85	1540	14
RTOR Reduction (vph)	0	22	0	0	0	35	0	0	54	0	0	0
Lane Group Flow (vph)	0	17	0	0	129	6	25	952	123	85	1554	0
Turn Type	Perm			Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		15.9			15.9	15.9	85.6	81.9	81.9	89.6	83.9	
Effective Green, g (s)		17.4			17.4	17.4	88.6	83.4	83.4	92.6	85.4	
Actuated g/C Ratio		0.14			0.14	0.14	0.74	0.70	0.70	0.77	0.71	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		221			206	230	231	2460	1100	448	2515	
v/s Ratio Prot							0.00	0.27		c0.01	c0.44	
v/s Ratio Perm		0.03			c0.09	0.03	0.08		0.11	0.13		
v/c Ratio		0.08			0.63	0.03	0.11	0.39	0.11	0.19	0.62	
Uniform Delay, d1		44.3			48.2	44.0	6.5	7.6	6.1	4.0	8.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			5.8	0.0	0.2	0.5	0.2	0.2	1.1	
Delay (s)		44.5			54.1	44.1	6.7	8.1	6.3	4.2	10.1	
Level of Service		D			D	D	A	A	A	A	B	
Approach Delay (s)		44.5			51.7			7.8			9.7	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1695			1777	1583	1770	3539	1583	1770	3535	
Flt Permitted		0.83			0.78	1.00	0.25	1.00	1.00	0.13	1.00	
Satd. Flow (perm)		1436			1446	1583	458	3539	1583	245	3535	
Volume (vph)	20	0	20	26	1	9	11	1460	44	12	1004	7
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	0	22	28	1	10	12	1587	48	13	1091	8
RTOR Reduction (vph)	0	21	0	0	0	9	0	0	9	0	0	0
Lane Group Flow (vph)	0	23	0	0	29	1	12	1587	39	13	1099	0
Turn Type	Perm			Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		5.4			5.4	5.4	97.0	95.8	95.8	99.2	96.9	
Effective Green, g (s)		6.9			6.9	6.9	100.0	97.3	97.3	102.2	98.4	
Actuated g/C Ratio		0.06			0.06	0.06	0.83	0.81	0.81	0.85	0.82	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		83			83	91	411	2870	1284	257	2899	
v/s Ratio Prot							0.00	c0.45		c0.00	0.31	
v/s Ratio Perm		c0.03			0.02	0.01	0.02		0.03	0.04		
v/c Ratio		0.28			0.35	0.01	0.03	0.55	0.03	0.05	0.38	
Uniform Delay, d1		54.2			54.4	53.3	1.8	3.9	2.2	2.6	2.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.8			2.5	0.0	0.0	0.8	0.0	0.1	0.4	
Delay (s)		56.0			56.9	53.3	1.8	4.7	2.2	2.6	3.2	
Level of Service		E			E	D	A	A	A	A	A	
Approach Delay (s)		56.0			56.0			4.6			3.2	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	163	50	58	813	1393	335
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	177	54	63	884	1514	364
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2082	757	1514			
vC1, stage 1 conf vol	1514					
vC2, stage 2 conf vol	568					
vCu, unblocked vol	2082	757	1514			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	84	86			
cM capacity (veh/h)	155	350	437			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	232	63	442	442	757	757	364
Volume Left	177	63	0	0	0	0	0
Volume Right	54	0	0	0	0	0	364
cSH	203	437	1700	1700	1700	1700	1700
Volume to Capacity	1.14	0.14	0.26	0.26	0.45	0.45	0.21
Queue Length (ft)	281	12	0	0	0	0	0
Control Delay (s)	154.5	14.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B					
Approach Delay (s)	154.5	1.0			0.0		
Approach LOS	F						

Intersection Summary			
Average Delay	12.0		
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	289	46	39	1410	911	220
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	314	50	42	1533	990	239
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	TWLTL					
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1841	495	990			
vC1, stage 1 conf vol	990					
vC2, stage 2 conf vol	851					
vCu, unblocked vol	1841	495	990			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	90	94			
cM capacity (veh/h)	239	520	694			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	364	42	766	766	495	495	239
Volume Left	314	42	0	0	0	0	0
Volume Right	50	0	0	0	0	0	239
cSH	268	694	1700	1700	1700	1700	1700
Volume to Capacity	1.36	0.06	0.45	0.45	0.29	0.29	0.14
Queue Length (ft)	478	5	0	0	0	0	0
Control Delay (s)	219.4	10.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B					
Approach Delay (s)	219.4	0.3			0.0		
Approach LOS	F						

Intersection Summary			
Average Delay	25.4		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↑↑↔			↔↑↔	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	0	71	2	0	0	66	859	0	0	1435	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	0	77	2	0	0	72	934	0	0	1560	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2174	2641	784	1934	2646	467	1568			934		
vC1, stage 1 conf vol	1564	1564		1077	1077							
vC2, stage 2 conf vol	610	1077		857	1568							
vCu, unblocked vol	2174	2641	784	1934	2646	467	1568			934		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	77	98	100	100	83			100		
cM capacity (veh/h)	88	100	336	96	71	543	417			729		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	90	2	72	622	311	780	789
Volume Left	13	2	72	0	0	0	0
Volume Right	77	0	0	0	0	0	9
cSH	239	96	417	1700	1700	729	1700
Volume to Capacity	0.38	0.02	0.17	0.37	0.18	0.00	0.46
Queue Length (ft)	42	2	15	0	0	0	0
Control Delay (s)	28.9	43.6	15.4	0.0	0.0	0.0	0.0
Lane LOS	D	E	C				
Approach Delay (s)	28.9	43.6	1.1			0.0	
Approach LOS	D	E					

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↑↑↔			↑↑↔	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	18	0	78	0	0	0	58	1431	0	0	945	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	85	0	0	0	63	1555	0	0	1027	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1938	2715	520	2280	2722	778	1040			1555		
vC1, stage 1 conf vol	1034	1034		1682	1682							
vC2, stage 2 conf vol	904	1682		598	1040							
vCu, unblocked vol	1938	2715	520	2280	2722	778	1040			1555		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	83	100	100	100	91			100		
cM capacity (veh/h)	135	93	501	68	87	339	664			422		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	104	0	63	1037	518	514	527
Volume Left	20	0	63	0	0	0	0
Volume Right	85	0	0	0	0	0	13
cSH	332	1700	664	1700	1700	422	1700
Volume to Capacity	0.31	0.00	0.09	0.61	0.30	0.00	0.31
Queue Length (ft)	33	0	8	0	0	0	0
Control Delay (s)	20.7	0.0	11.0	0.0	0.0	0.0	0.0
Lane LOS	C	A	B				
Approach Delay (s)	20.7	0.0	0.4			0.0	
Approach LOS	C	A					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↰	↱
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	27	32	15	39	33	2	16	184	51	0	363	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	35	16	42	36	2	17	200	55	0	395	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	677	685	395	691	690	228	427			255		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	677	685	395	691	690	228	427			255		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	90	98	87	90	100	98			100		
cM capacity (veh/h)	334	365	655	321	363	812	1132			1310		

Direction, Lane #	EB 1	WB 1	NE 1	SW 1	SW 2
Volume Total	80	80	273	395	33
Volume Left	29	42	17	0	0
Volume Right	16	2	55	0	33
cSH	387	344	1132	1310	1700
Volume to Capacity	0.21	0.23	0.02	0.00	0.02
Queue Length (ft)	19	22	1	0	0
Control Delay (s)	16.7	18.6	0.7	0.0	0.0
Lane LOS	C	C	A		
Approach Delay (s)	16.7	18.6	0.7	0.0	
Approach LOS	C	C			

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↰	↱
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	23	33	10	45	16	9	12	303	59	4	249	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	36	11	49	17	10	13	329	64	4	271	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	685	699	271	696	673	361	277			393		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	685	699	271	696	673	361	277			393		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	90	99	85	95	99	99			100		
cM capacity (veh/h)	340	359	768	321	371	683	1286			1165		

Direction, Lane #	EB 1	WB 1	NE 1	SW 1	SW 2							
Volume Total	72	76	407	275	7							
Volume Left	25	49	13	4	0							
Volume Right	11	10	64	0	7							
cSH	383	356	1286	1165	1700							
Volume to Capacity	0.19	0.21	0.01	0.00	0.00							
Queue Length (ft)	17	20	1	0	0							
Control Delay (s)	16.6	17.8	0.4	0.2	0.0							
Lane LOS	C	C	A	A								
Approach Delay (s)	16.6	17.8	0.4	0.2								
Approach LOS	C	C										

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

2015 NO-BUILD

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.91			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1671			1775	1583	1770	3539	1583	1770	3534	
Flt Permitted		0.86			0.70	1.00	0.05	1.00	1.00	0.11	1.00	
Satd. Flow (perm)		1460			1303	1583	98	3539	1583	210	3534	
Volume (vph)	11	1	24	117	2	38	23	876	163	78	1417	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%
Adj. Flow (vph)	18	2	39	191	3	62	38	1428	266	127	2310	21
RTOR Reduction (vph)	0	32	0	0	0	50	0	0	98	0	0	0
Lane Group Flow (vph)	0	27	0	0	194	12	38	1428	168	127	2331	0
Turn Type	Perm			Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.9			20.9	20.9	78.5	74.5	74.5	86.7	78.6	
Effective Green, g (s)		22.4			22.4	22.4	81.5	76.0	76.0	89.6	80.1	
Actuated g/C Ratio		0.19			0.19	0.19	0.68	0.63	0.63	0.75	0.67	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		273			243	295	143	2241	1003	282	2359	
v/s Ratio Prot							0.01	0.40		c0.04	c0.66	
v/s Ratio Perm		0.04			c0.15	0.04	0.17		0.17	0.30		
v/c Ratio		0.10			0.80	0.04	0.27	0.64	0.17	0.45	0.99	
Uniform Delay, d1		40.4			46.6	40.0	55.8	13.5	9.0	10.7	19.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			16.5	0.1	1.0	1.4	0.4	1.1	15.9	
Delay (s)		40.6			63.2	40.0	56.8	14.9	9.4	11.8	35.4	
Level of Service		D			E	D	E	B	A	B	D	
Approach Delay (s)		40.6			57.6			15.0			34.2	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1695			1778	1583	1770	3539	1583	1770	3536	
Flt Permitted		0.82			0.67	1.00	0.12	1.00	1.00	0.04	1.00	
Satd. Flow (perm)		1423			1257	1583	220	3539	1583	79	3536	
Volume (vph)	20	0	20	26	1	9	11	1460	44	12	1004	7
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%
Adj. Flow (vph)	33	0	33	42	2	15	18	2380	72	20	1637	11
RTOR Reduction (vph)	0	30	0	0	0	14	0	0	10	0	0	0
Lane Group Flow (vph)	0	36	0	0	44	1	18	2380	62	20	1648	0
Turn Type	Perm			Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		8.0			8.0	8.0	95.5	93.1	93.1	95.5	93.1	
Effective Green, g (s)		9.5			9.5	9.5	98.5	94.6	94.6	98.5	94.6	
Actuated g/C Ratio		0.08			0.08	0.08	0.82	0.79	0.79	0.82	0.79	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		113			100	125	231	2790	1248	120	2788	
v/s Ratio Prot							0.00	c0.67		c0.01	0.47	
v/s Ratio Perm		c0.05			0.04	0.01	0.06		0.05	0.13		
v/c Ratio		0.32			0.44	0.01	0.08	0.85	0.05	0.17	0.59	
Uniform Delay, d1		52.2			52.7	50.9	3.7	8.2	2.8	15.6	5.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.6			3.1	0.0	0.1	3.6	0.1	0.7	0.9	
Delay (s)		53.8			55.8	50.9	3.8	11.8	2.9	16.3	6.0	
Level of Service		D			E	D	A	B	A	B	A	
Approach Delay (s)		53.8			54.6			11.4			6.1	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	163	50	58	813	1393	335
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	266	82	95	1326	2271	546
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3123	1136	2271			
vC1, stage 1 conf vol	2271					
vC2, stage 2 conf vol	852					
vCu, unblocked vol	3123	1136	2271			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	58	57			
cM capacity (veh/h)	59	196	221			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	347	95	663	663	1136	1136	546
Volume Left	266	95	0	0	0	0	0
Volume Right	82	0	0	0	0	0	546
cSH	71	221	1700	1700	1700	1700	1700
Volume to Capacity	4.87	0.43	0.39	0.39	0.67	0.67	0.32
Queue Length (ft)	Err	50	0	0	0	0	0
Control Delay (s)	Err	32.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	D					
Approach Delay (s)	Err	2.2			0.0		
Approach LOS	F						

Intersection Summary			
Average Delay	758.1		
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	289	46	39	1410	911	220
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	471	75	64	2299	1485	359
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2762	743	1485			
vC1, stage 1 conf vol	1485					
vC2, stage 2 conf vol	1277					
vCu, unblocked vol	2762	743	1485			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	79	86			
cM capacity (veh/h)	124	358	449			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	546	64	1149	1149	743	743	359
Volume Left	471	64	0	0	0	0	0
Volume Right	75	0	0	0	0	0	359
cSH	136	449	1700	1700	1700	1700	1700
Volume to Capacity	4.01	0.14	0.68	0.68	0.44	0.44	0.21
Queue Length (ft)	Err	12	0	0	0	0	0
Control Delay (s)	Err	14.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B					
Approach Delay (s)	Err	0.4			0.0		
Approach LOS	F						

Intersection Summary			
Average Delay	1149.3		
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑↔			↑↑↔	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	0	71	2	0	0	66	859	0	0	1435	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	116	3	0	0	108	1401	0	0	2340	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3262	3962	1176	2901	3968	700	2353			1401		
vC1, stage 1 conf vol	2346	2346		1616	1616							
vC2, stage 2 conf vol	915	1616		1286	2353							
vCu, unblocked vol	3262	3962	1176	2901	3968	700	2353			1401		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	28	100	37	0	100	100	48			100		
cM capacity (veh/h)	27	34	184	2	1	382	205			484		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	135	3	108	934	467	1170	1183
Volume Left	20	3	108	0	0	0	0
Volume Right	116	0	0	0	0	0	13
cSH	100	2	205	1700	1700	484	1700
Volume to Capacity	1.35	2.12	0.52	0.55	0.27	0.00	0.70
Queue Length (ft)	241	30	68	0	0	0	0
Control Delay (s)	286.3	4112.0	40.3	0.0	0.0	0.0	0.0
Lane LOS	F	F	E				
Approach Delay (s)	286.3	4112.0	2.9			0.0	
Approach LOS	F	F					

Intersection Summary			
Average Delay	14.1		
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↑↑↔			↔↑↔	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	18	0	78	0	0	0	58	1431	0	0	945	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	0	127	0	0	0	95	2333	0	0	1541	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2906	4073	780	3420	4083	1167	1560			2333		
vC1, stage 1 conf vol	1551	1551		2522	2522							
vC2, stage 2 conf vol	1356	2522		898	1560							
vCu, unblocked vol	2906	4073	780	3420	4083	1167	1560			2333		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	49	100	62	100	100	100	77			100		
cM capacity (veh/h)	58	32	338	17	26	187	420			209		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	157	0	95	1555	778	770	790
Volume Left	29	0	95	0	0	0	0
Volume Right	127	0	0	0	0	0	20
cSH	177	1700	420	1700	1700	209	1700
Volume to Capacity	0.89	0.00	0.23	0.91	0.46	0.00	0.46
Queue Length (ft)	163	0	21	0	0	0	0
Control Delay (s)	93.5	0.0	16.1	0.0	0.0	0.0	0.0
Lane LOS	F	A	C				
Approach Delay (s)	93.5	0.0	0.6			0.0	
Approach LOS	F	A					

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↰	↱
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	27	32	15	39	33	2	16	184	51	0	363	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	44	52	24	64	54	3	26	300	83	0	592	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1016	1027	592	1036	1035	342	641			383		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1016	1027	592	1036	1035	342	641			383		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	74	77	95	61	76	100	97			100		
cM capacity (veh/h)	172	228	506	161	226	701	944			1175		

Direction, Lane #	EB 1	WB 1	NE 1	SW 1	SW 2
Volume Total	121	121	409	592	49
Volume Left	44	64	26	0	0
Volume Right	24	3	83	0	49
cSH	226	189	944	1175	1700
Volume to Capacity	0.53	0.64	0.03	0.00	0.03
Queue Length (ft)	71	92	2	0	0
Control Delay (s)	37.7	52.6	0.9	0.0	0.0
Lane LOS	E	F	A		
Approach Delay (s)	37.7	52.6	0.9	0.0	
Approach LOS	E	F			

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔			↔			↔			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	23	33	10	45	16	9	12	303	59	4	249	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	54	16	73	26	15	20	494	96	7	406	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1028	1048	406	1043	1010	542	416			590		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1028	1048	406	1043	1010	542	416			590		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	76	97	55	89	97	98			99		
cM capacity (veh/h)	186	222	645	161	234	540	1143			985		

Direction, Lane #	EB 1	WB 1	NE 1	SW 1	SW 2
Volume Total	108	114	610	412	10
Volume Left	38	73	20	7	0
Volume Right	16	15	96	0	10
cSH	229	192	1143	985	1700
Volume to Capacity	0.47	0.59	0.02	0.01	0.01
Queue Length (ft)	58	82	1	0	0
Control Delay (s)	33.9	47.8	0.5	0.2	0.0
Lane LOS	D	E	A	A	
Approach Delay (s)	33.9	47.8	0.5	0.2	
Approach LOS	D	E			

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

2015 BUILD
&
2015 BUILD MITIGATED

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.91			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1671			1775	1583	1770	3539	1583	1770	3535	
Flt Permitted		0.56			0.70	1.00	0.06	1.00	1.00	0.07	1.00	
Satd. Flow (perm)		955			1306	1583	104	3539	1583	135	3535	
Volume (vph)	17	2	36	321	3	125	35	1449	264	133	2296	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	2	39	349	3	136	38	1575	287	145	2496	22
RTOR Reduction (vph)	0	31	0	0	0	107	0	0	111	0	0	0
Lane Group Flow (vph)	0	28	0	0	352	29	38	1575	176	145	2518	0
Turn Type	Perm			Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		24.5			24.5	24.5	74.0	70.0	70.0	84.0	75.0	
Effective Green, g (s)		26.0			26.0	26.0	77.0	71.5	71.5	86.0	76.5	
Actuated g/C Ratio		0.22			0.22	0.22	0.64	0.60	0.60	0.72	0.64	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		207			283	343	143	2109	943	240	2254	
v/s Ratio Prot							0.01	0.45		c0.05	c0.71	
v/s Ratio Perm		0.06			c0.27	0.09	0.16		0.18	0.38		
v/c Ratio		0.14			1.24	0.09	0.27	0.75	0.19	0.60	1.12	
Uniform Delay, d1		37.9			47.0	37.5	55.8	17.7	11.0	20.6	21.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3			135.9	0.1	1.0	2.5	0.4	4.2	59.4	
Delay (s)		38.3			182.9	37.6	56.8	20.1	11.5	24.8	81.1	
Level of Service		D			F	D	E	C	B	C	F	
Approach Delay (s)		38.3			142.4			19.5			78.1	
Approach LOS		D			F			B			E	

Intersection Summary			
HCM Average Control Delay	62.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↰	↱	↰	↑↑	↱	↰	↑↔	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1695			1775	1583	1770	3539	1583	1770	3536	
Flt Permitted		0.75			0.69	1.00	0.07	1.00	1.00	0.05	1.00	
Satd. Flow (perm)		1309			1278	1583	126	3539	1583	89	3536	
Volume (vph)	30	0	30	119	2	42	17	2462	130	102	1739	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	0	33	129	2	46	18	2676	141	111	1890	12
RTOR Reduction (vph)	0	28	0	0	0	39	0	0	28	0	0	0
Lane Group Flow (vph)	0	38	0	0	131	7	18	2676	113	111	1902	0
Turn Type	Perm			Perm		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		16.7			16.7	16.7	80.9	78.4	78.4	92.3	84.3	
Effective Green, g (s)		18.2			18.2	18.2	83.9	79.9	79.9	93.8	85.8	
Actuated g/C Ratio		0.15			0.15	0.15	0.70	0.67	0.67	0.78	0.71	
Clearance Time (s)		5.5			5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		199			194	240	143	2356	1054	208	2528	
v/s Ratio Prot							0.00	c0.76		c0.04	c0.54	
v/s Ratio Perm		0.05			c0.10	0.03	0.08		0.09	0.37		
v/c Ratio		0.19			0.68	0.03	0.13	1.14	0.11	0.53	0.75	
Uniform Delay, d1		44.5			48.1	43.4	10.4	20.0	7.2	36.4	10.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5			8.9	0.0	0.4	67.0	0.2	2.6	2.1	
Delay (s)		44.9			57.1	43.4	10.8	87.0	7.4	39.0	12.7	
Level of Service		D			E	D	B	F	A	D	B	
Approach Delay (s)		44.9			53.5			82.6			14.1	
Approach LOS		D			D			F			B	

Intersection Summary			
HCM Average Control Delay	54.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	245	75	87	1438	2237	503
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	266	82	95	1563	2432	547
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3402	1216	2432			
vC1, stage 1 conf vol	2432					
vC2, stage 2 conf vol	971					
vCu, unblocked vol	3402	1216	2432			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	53	51			
cM capacity (veh/h)	48	173	191			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	348	95	782	782	1216	1216	547
Volume Left	266	95	0	0	0	0	0
Volume Right	82	0	0	0	0	0	547
cSH	58	191	1700	1700	1700	1700	1700
Volume to Capacity	6.04	0.49	0.46	0.46	0.72	0.72	0.32
Queue Length (ft)	Err	61	0	0	0	0	0
Control Delay (s)	Err	41.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	E					
Approach Delay (s)	Err	2.3			0.0		
Approach LOS	F						

Intersection Summary			
Average Delay	698.6		
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	434	69	59	2414	1714	330
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	472	75	64	2624	1863	359
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	Raised					
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3303	932	1863			
vC1, stage 1 conf vol	1863					
vC2, stage 2 conf vol	1440					
vCu, unblocked vol	3303	932	1863			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	72	80			
cM capacity (veh/h)	82	268	320			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	547	64	1312	1312	932	932	359
Volume Left	472	64	0	0	0	0	0
Volume Right	75	0	0	0	0	0	359
cSH	91	320	1700	1700	1700	1700	1700
Volume to Capacity	6.01	0.20	0.77	0.77	0.55	0.55	0.21
Queue Length (ft)	Err	18	0	0	0	0	0
Control Delay (s)	Err	19.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C					
Approach Delay (s)	Err	0.5			0.0		
Approach LOS	F						

Intersection Summary			
Average Delay	1002.1		
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↑↑↔			↑↑↔	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	18	47	107	151	71	94	99	1413	74	101	2199	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	51	116	164	77	102	108	1536	80	110	2390	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3740	4448	1202	3348	4414	808	2403			1616		
vC1, stage 1 conf vol	2616	2616		1791	1791							
vC2, stage 2 conf vol	1124	1832		1557	2623							
vCu, unblocked vol	3740	4448	1202	3348	4414	808	2403			1616		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	34	0	0	68	45			73		
cM capacity (veh/h)	0	0	177	0	0	324	196			399		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	187	343	108	1024	592	1305	1208
Volume Left	20	164	108	0	0	110	0
Volume Right	116	102	0	0	80	0	13
cSH	0	0	196	1700	1700	399	1700
Volume to Capacity	Err	Err	0.55	0.60	0.35	0.27	0.71
Queue Length (ft)	Err	Err	72	0	0	28	0
Control Delay (s)	Err	Err	43.7	0.0	0.0	16.2	0.0
Lane LOS	F	F	E			C	
Approach Delay (s)	Err	Err	2.7			8.4	
Approach LOS	F	F					

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	146.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑↱			↔	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	27	110	117	228	93	217	87	2229	197	250	1515	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	120	127	248	101	236	95	2423	214	272	1647	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3887	5026	833	4273	4929	1318	1666			2637		
vC1, stage 1 conf vol	2200	2200		2719	2719							
vC2, stage 2 conf vol	1687	2826		1554	2210							
vCu, unblocked vol	3887	5026	833	4273	4929	1318	1666			2637		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	59	0	0	0	75			0		
cM capacity (veh/h)	0	0	312	0	0	148	382			158		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	276	585	95	1615	1022	1095	843
Volume Left	29	248	95	0	0	272	0
Volume Right	127	236	0	0	214	0	20
cSH	0	0	382	1700	1700	158	1700
Volume to Capacity	Err	Err	0.25	0.95	0.60	1.72	0.50
Queue Length (ft)	Err	Err	24	0	0	486	0
Control Delay (s)	Err	Err	17.5	0.0	0.0	679.4	0.0
Lane LOS	F	F	C			F	
Approach Delay (s)	Err	Err	0.6			383.9	
Approach LOS	F	F					

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	176.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	↱
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	41	48	23	130	50	3	24	276	124	0	545	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	52	25	141	54	3	26	300	135	0	592	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1042	1079	592	1063	1061	367	641			435		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1042	1079	592	1063	1061	367	641			435		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	73	75	95	7	75	100	97			100		
cM capacity (veh/h)	163	212	506	152	218	678	943			1125		

Direction, Lane #	EB 1	WB 1	NE 1	SW 1	SW 2							
Volume Total	122	199	461	592	49							
Volume Left	45	141	26	0	0							
Volume Right	25	3	135	0	49							
cSH	214	168	943	1125	1700							
Volume to Capacity	0.57	1.19	0.03	0.00	0.03							
Queue Length (ft)	78	270	2	0	0							
Control Delay (s)	41.8	183.3	0.8	0.0	0.0							
Lane LOS	E	F	A									
Approach Delay (s)	41.8	183.3	0.8	0.0								
Approach LOS	E	F										

Intersection Summary			
Average Delay	29.5		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↰	↱
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	35	50	15	161	24	14	18	455	199	6	374	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	54	16	175	26	15	20	495	216	7	407	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1090	1170	407	1105	1071	603	416			711		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1090	1170	407	1105	1071	603	416			711		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	71	97	0	88	97	98			99		
cM capacity (veh/h)	166	188	644	140	215	499	1143			889		

Direction, Lane #	EB 1	WB 1	NE 1	SW 1	SW 2
Volume Total	109	216	730	413	10
Volume Left	38	175	20	7	0
Volume Right	16	15	216	0	10
cSH	200	154	1143	889	1700
Volume to Capacity	0.54	1.40	0.02	0.01	0.01
Queue Length (ft)	71	342	1	1	0
Control Delay (s)	42.4	270.2	0.5	0.2	0.0
Lane LOS	E	F	A	A	
Approach Delay (s)	42.4	270.2	0.5	0.2	
Approach LOS	E	F			

Intersection Summary			
Average Delay	42.9		
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	32	38	1548	33	40	2417
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	41	1683	36	43	2627
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	1					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3083	841			1718	
vC1, stage 1 conf vol	1683					
vC2, stage 2 conf vol	1401					
vCu, unblocked vol	3083	841			1718	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	52	87			88	
cM capacity (veh/h)	73	308			364	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	35	41	841	841	36	43	1314	1314
Volume Left	35	0	0	0	0	43	0	0
Volume Right	0	41	0	0	36	0	0	0
cSH	73	308	1700	1700	1700	364	1700	1700
Volume to Capacity	0.48	0.13	0.49	0.49	0.02	0.12	0.77	0.77
Queue Length (ft)	49	11	0	0	0	10	0	0
Control Delay (s)	93.4	18.5	0.0	0.0	0.0	16.2	0.0	0.0
Lane LOS	F	C				C		
Approach Delay (s)	52.7		0.0			0.3		
Approach LOS	F							

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	43	70	2443	90	51	1809
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	76	2655	98	55	1966
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised					
Median storage veh)	1					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3749	1328			2753	
vC1, stage 1 conf vol	2655					
vC2, stage 2 conf vol	1094					
vCu, unblocked vol	3749	1328			2753	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	48			61	
cM capacity (veh/h)	29	145			142	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	76	1328	1328	98	55	983	983
Volume Left	47	0	0	0	0	55	0	0
Volume Right	0	76	0	0	98	0	0	0
cSH	29	145	1700	1700	1700	142	1700	1700
Volume to Capacity	1.59	0.52	0.78	0.78	0.06	0.39	0.58	0.58
Queue Length (ft)	135	64	0	0	0	42	0	0
Control Delay (s)	587.2	54.1	0.0	0.0	0.0	45.7	0.0	0.0
Lane LOS	F	F				E		
Approach Delay (s)	257.0		0.0			1.3		
Approach LOS	F							

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑			↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	10	1571	20	0	2449
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1708	22	0	2662
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			804			
pX, platoon unblocked						
vC, conflicting volume	4370	854			1729	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4370	854			1729	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	1	302			361	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1
Volume Total	11	854	854	22	2662
Volume Left	0	0	0	0	0
Volume Right	11	0	0	22	0
cSH	302	1700	1700	1700	1700
Volume to Capacity	0.04	0.50	0.50	0.01	1.57
Queue Length (ft)	3	0	0	0	0
Control Delay (s)	17.4	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	17.4	0.0			0.0
Approach LOS	C				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	132.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑			↑↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	30	2503	31	0	1852
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	33	2721	34	0	2013
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			772			
pX, platoon unblocked						
vC, conflicting volume	3727	1360			2754	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3727	1360			2754	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	76			100	
cM capacity (veh/h)	3	138			142	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	33	1360	1360	34	1007	1007
Volume Left	0	0	0	0	0	0
Volume Right	33	0	0	34	0	0
cSH	138	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.80	0.80	0.02	0.59	0.59
Queue Length (ft)	22	0	0	0	0	0
Control Delay (s)	38.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	E					
Approach Delay (s)	38.9	0.0			0.0	
Approach LOS	E					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑	↱		↑↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	14	1734	19	0	2653
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	1885	21	0	2884
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						696
pX, platoon unblocked	0.38					
vC, conflicting volume	3327	942			1905	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5536	942			1905	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			100	
cM capacity (veh/h)	0	264			308	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	942	942	21	1442	1442
Volume Left	0	0	0	0	0	0
Volume Right	15	0	0	21	0	0
cSH	264	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.55	0.55	0.01	0.85	0.85
Queue Length (ft)	5	0	0	0	0	0
Control Delay (s)	19.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	19.5	0.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	10	2599	95	0	1888
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	2825	103	0	2052
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						598
pX, platoon unblocked	0.59					
vC, conflicting volume	3851	1412			2928	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5133	1412			2928	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	91			100	
cM capacity (veh/h)	0	127			121	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	11	1412	1412	103	1026	1026
Volume Left	0	0	0	0	0	0
Volume Right	11	0	0	103	0	0
cSH	127	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.83	0.83	0.06	0.60	0.60
Queue Length (ft)	7	0	0	0	0	0
Control Delay (s)	35.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	E					
Approach Delay (s)	35.9	0.0			0.0	
Approach LOS	E					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1597		3433	1863	1583	1770	3539	1583	1770	3535	
Flt Permitted	0.76	1.00		0.95	1.00	1.00	0.06	1.00	1.00	0.07	1.00	
Satd. Flow (perm)	1408	1597		3433	1863	1583	106	3539	1583	127	3535	
Volume (vph)	17	2	36	321	3	125	35	1449	264	133	2296	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	2	39	349	3	136	38	1575	287	145	2496	22
RTOR Reduction (vph)	0	37	0	0	0	66	0	0	87	0	0	0
Lane Group Flow (vph)	18	4	0	349	3	70	38	1575	200	145	2518	0
Turn Type	Perm			Prot		Perm	pm+pt		pm+ov	pm+pt		
Protected Phases		4		3	8		5	2	3	1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	6.0	6.0		12.1	23.6	23.6	72.5	68.5	80.6	85.4	75.9	
Effective Green, g (s)	7.5	7.5		13.6	25.1	25.1	75.5	70.0	83.6	86.9	77.4	
Actuated g/C Ratio	0.06	0.06		0.11	0.21	0.21	0.63	0.58	0.70	0.72	0.65	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	88	100		389	390	331	143	2064	1156	269	2280	
v/s Ratio Prot		0.03		c0.10	0.00		0.01	0.45	0.03	c0.06	c0.71	
v/s Ratio Perm	0.01					0.09	0.15		0.15	0.33		
v/c Ratio	0.20	0.04		0.90	0.01	0.21	0.27	0.76	0.17	0.54	1.10	
Uniform Delay, d1	53.4	52.9		52.5	37.6	39.3	55.8	18.8	6.3	22.2	21.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.75	1.64	
Incremental Delay, d2	1.2	0.2		22.4	0.0	0.3	1.0	2.7	0.1	0.2	47.6	
Delay (s)	54.6	53.1		74.9	37.6	39.6	56.8	21.5	6.3	16.8	82.7	
Level of Service	D	D		E	D	D	E	C	A	B	F	
Approach Delay (s)		53.5			64.8			19.9			79.1	
Approach LOS		D			E			B			E	

Intersection Summary			
HCM Average Control Delay	55.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583		3433	1863	1583	1770	3539	1583	1770	3536	
Flt Permitted	0.76	1.00		0.95	1.00	1.00	0.07	1.00	1.00	0.05	1.00	
Satd. Flow (perm)	1409	1583		3433	1863	1583	123	3539	1583	87	3536	
Volume (vph)	30	0	30	119	2	42	17	2462	130	102	1739	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	0	33	129	2	46	18	2676	141	111	1890	12
RTOR Reduction (vph)	0	31	0	0	0	26	0	0	33	0	0	0
Lane Group Flow (vph)	33	2	0	129	2	20	18	2676	108	111	1902	0
Turn Type	Perm			Prot		Perm	pm+pt		Perm	pm+pt		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	7.1	7.1		5.5	18.1	18.1	81.1	80.0	80.0	89.7	84.3	
Effective Green, g (s)	8.6	8.6		7.0	19.6	19.6	84.1	81.5	81.5	92.4	85.8	
Actuated g/C Ratio	0.07	0.07		0.06	0.16	0.16	0.70	0.68	0.68	0.77	0.71	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	101	113		200	304	259	122	2404	1075	164	2528	
v/s Ratio Prot		0.02		c0.04	0.00		0.00	c0.76		c0.04	0.54	
v/s Ratio Perm	c0.02					0.03	0.10		0.09	0.48		
v/c Ratio	0.33	0.02		0.65	0.01	0.08	0.15	1.11	0.10	0.68	0.75	
Uniform Delay, d1	52.9	51.8		55.3	42.0	42.5	10.9	19.2	6.6	38.4	10.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.54	0.61	
Incremental Delay, d2	1.9	0.1		7.0	0.0	0.1	0.6	57.4	0.2	6.1	1.2	
Delay (s)	54.8	51.9		62.2	42.1	42.7	11.4	76.7	6.8	65.2	7.7	
Level of Service	D	D		E	D	D	B	E	A	E	A	
Approach Delay (s)		53.3			56.9			72.8			10.8	
Approach LOS		D			E			E			B	

Intersection Summary			
HCM Average Control Delay	47.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.04	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	77	3539	3539	1583
Volume (vph)	245	75	87	1438	2237	503
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	266	82	95	1563	2432	547
RTOR Reduction (vph)	0	14	0	0	0	107
Lane Group Flow (vph)	266	68	95	1563	2432	440
Turn Type		Prot	Perm			Perm
Protected Phases	4	4		2	6	
Permitted Phases			2			6
Actuated Green, G (s)	13.9	13.9	95.1	95.1	95.1	95.1
Effective Green, g (s)	15.4	15.4	96.6	96.6	96.6	96.6
Actuated g/C Ratio	0.13	0.13	0.80	0.80	0.80	0.80
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	441	203	62	2849	2849	1274
v/s Ratio Prot	c0.08	0.05		0.44	0.69	
v/s Ratio Perm			c1.23			0.35
v/c Ratio	0.60	0.34	1.53	0.55	0.85	0.35
Uniform Delay, d1	49.4	47.6	11.7	4.1	7.3	3.2
Progression Factor	1.00	1.00	2.43	0.77	1.00	1.00
Incremental Delay, d2	2.3	1.0	290.6	0.6	3.5	0.7
Delay (s)	51.7	48.6	319.1	3.7	10.8	3.9
Level of Service	D	D	F	A	B	A
Approach Delay (s)	51.0			21.8	9.5	
Approach LOS	D			C	A	

Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.08	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	158	3539	3539	1583
Volume (vph)	434	69	59	2414	1714	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	472	75	64	2624	1863	359
RTOR Reduction (vph)	0	38	0	0	0	78
Lane Group Flow (vph)	472	37	64	2624	1863	281
Turn Type		Prot	Perm			Perm
Protected Phases	4	4		2	6	
Permitted Phases			2			6
Actuated Green, G (s)	16.7	16.7	92.3	92.3	92.3	92.3
Effective Green, g (s)	18.2	18.2	93.8	93.8	93.8	93.8
Actuated g/C Ratio	0.15	0.15	0.78	0.78	0.78	0.78
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	521	240	124	2766	2766	1237
v/s Ratio Prot	c0.14	0.05		c0.74	0.53	
v/s Ratio Perm			0.41			0.23
v/c Ratio	0.91	0.15	0.52	0.95	0.67	0.23
Uniform Delay, d1	50.1	44.2	4.8	11.1	6.0	3.5
Progression Factor	1.00	1.00	0.37	0.55	1.00	1.00
Incremental Delay, d2	19.2	0.3	1.4	1.0	1.3	0.4
Delay (s)	69.3	44.5	3.2	7.1	7.4	3.9
Level of Service	E	D	A	A	A	A
Approach Delay (s)	65.9			7.0	6.8	
Approach LOS	E			A	A	

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1669		3433	1863	1583	1770	3539	1583	1770	3536	
Flt Permitted	0.71	1.00		0.95	1.00	1.00	0.05	1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1317	1669		3433	1863	1583	100	3539	1583	169	3536	
Volume (vph)	18	47	107	151	71	94	99	1413	74	101	2199	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	51	116	164	77	102	108	1536	80	110	2390	13
RTOR Reduction (vph)	0	55	0	0	0	71	0	0	26	0	0	0
Lane Group Flow (vph)	20	112	0	164	77	31	108	1536	54	110	2403	0
Turn Type	Perm			Prot		Perm	pm+pt		pm+ov	pm+pt		
Protected Phases		4		3	8		5	2	3	1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	12.3	12.3		4.7	22.5	22.5	79.2	73.0	77.7	82.8	74.8	
Effective Green, g (s)	13.8	13.8		6.2	24.0	24.0	82.2	74.5	80.7	85.8	76.3	
Actuated g/C Ratio	0.12	0.12		0.05	0.20	0.20	0.69	0.62	0.67	0.71	0.64	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	151	192		177	373	317	176	2197	1117	248	2248	
v/s Ratio Prot		c0.10		c0.05	0.04		c0.04	0.43	0.00	c0.04	c0.68	
v/s Ratio Perm	0.02					0.06	0.38		0.05	0.28		
v/c Ratio	0.13	0.58		0.93	0.21	0.10	0.61	0.70	0.05	0.44	1.07	
Uniform Delay, d1	47.7	50.4		56.7	40.1	39.2	31.3	15.2	6.7	13.0	21.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.23	1.62	3.28	1.14	1.23	
Incremental Delay, d2	0.4	4.5		46.5	0.3	0.1	4.5	1.4	0.0	0.7	36.4	
Delay (s)	48.1	54.9		103.2	40.3	39.3	43.1	26.0	21.8	15.5	63.4	
Level of Service	D	D		F	D	D	D	C	C	B	E	
Approach Delay (s)		54.1			70.1			26.9			61.3	
Approach LOS		D			E			C			E	

Intersection Summary			
HCM Average Control Delay	49.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1719		3433	1863	1583	1770	3539	1583	1770	3533	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.07	1.00	1.00	0.06	1.00	
Satd. Flow (perm)	1288	1719		3433	1863	1583	124	3539	1583	104	3533	
Volume (vph)	27	110	117	228	93	217	87	2229	197	250	1515	18
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	120	127	248	101	236	95	2423	214	272	1647	20
RTOR Reduction (vph)	0	32	0	0	0	2	0	0	61	0	1	0
Lane Group Flow (vph)	29	215	0	248	101	234	95	2423	153	272	1666	0
Turn Type	Perm			Prot		pm+ov	pm+pt		pm+ov	pm+pt		
Protected Phases		4		3	8	1	5	2	3	1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	15.7	15.7		6.5	27.7	37.5	71.1	66.0	72.5	80.5	70.7	
Effective Green, g (s)	17.2	17.2		8.0	29.2	40.5	74.1	67.5	75.5	82.8	72.2	
Actuated g/C Ratio	0.14	0.14		0.07	0.24	0.34	0.62	0.56	0.63	0.69	0.60	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	185	246		229	453	587	167	1991	1049	229	2126	
v/s Ratio Prot		c0.14		c0.07	0.05	0.04	0.03	0.68	0.01	c0.11	0.47	
v/s Ratio Perm	0.02					0.11	0.32		0.12	c0.71		
v/c Ratio	0.16	0.88		1.08	0.22	0.40	0.57	1.22	0.15	1.19	0.78	
Uniform Delay, d1	45.0	50.3		56.0	36.3	30.4	17.9	26.2	9.1	42.7	18.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.91	0.35	0.14	0.89	0.94	
Incremental Delay, d2	0.4	27.3		83.3	0.3	0.4	0.4	98.1	0.0	112.5	2.2	
Delay (s)	45.5	77.6		139.3	36.6	30.9	34.5	107.3	1.3	150.4	19.1	
Level of Service	D	E		F	D	C	C	F	A	F	B	
Approach Delay (s)		74.2			77.8			96.4			37.5	
Approach LOS		E			E			F			D	

Intersection Summary			
HCM Average Control Delay	72.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	41	48	23	130	50	3	24	276	124	0	545	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	52	25	141	54	3	26	300	135	0	592	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	975	1079	592	996	993	300	641			435		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	975	1079	592	996	993	300	641			435		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	75	95	16	77	100	97			100		
cM capacity (veh/h)	186	212	506	169	238	740	943			1125		

Direction, Lane #	EB 1	WB 1	WB 2	NE 1	NE 2	SW 1	SW 2					
Volume Total	122	141	58	326	135	592	49					
Volume Left	45	141	0	26	0	0	0					
Volume Right	25	0	3	0	135	0	49					
cSH	227	169	248	943	1700	1125	1700					
Volume to Capacity	0.54	0.84	0.23	0.03	0.08	0.00	0.03					
Queue Length (ft)	71	144	22	2	0	0	0					
Control Delay (s)	37.7	86.8	23.9	1.0	0.0	0.0	0.0					
Lane LOS	E	F	C	A								
Approach Delay (s)	37.7	68.5		0.7		0.0						
Approach LOS	E	F										

Intersection Summary			
Average Delay	13.0		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	35	50	15	161	24	14	18	455	199	6	374	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	54	16	175	26	15	20	495	216	7	407	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	982	1170	407	997	963	495	416			711		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	982	1170	407	997	963	495	416			711		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	71	97	0	90	97	98			99		
cM capacity (veh/h)	201	188	644	166	249	575	1143			889		

Direction, Lane #	EB 1	WB 1	WB 2	NE 1	NE 2	SW 1	SW 2
Volume Total	109	175	41	514	216	413	10
Volume Left	38	175	0	20	0	7	0
Volume Right	16	0	15	0	216	0	10
cSH	216	166	315	1143	1700	889	1700
Volume to Capacity	0.50	1.06	0.13	0.02	0.13	0.01	0.01
Queue Length (ft)	64	217	11	1	0	1	0
Control Delay (s)	37.5	141.4	18.1	0.5	0.0	0.2	0.0
Lane LOS	E	F	C	A		A	
Approach Delay (s)	37.5	117.8		0.4		0.2	
Approach LOS	E	F					

Intersection Summary				
Average Delay	20.2			
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			

MEMORANDUM

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
(803) 739-2548 fax

TO: Mr. Jim Robinson, **Emerson Partners, LLC**

FROM: Todd E. Salvagin, **SRS Engineering, LLC**

DATE: November 19, 2007

RE: **SC 170 Long Range 2025 Analyses**
Proposed Okatie PUD Projects
Beaufort County, South Carolina

As requested, SRS Engineering, LLC (SRS) has conducted additional Long Range planning analyses for the SC 170 corridor as it pertains to the above referenced project. As requested, a comparison of expected future conditions have been completed for two scenario(s); first assuming the County's current transportation model/Socio-Economic (SE) data and secondly, modifying the SE data to reflect the proposed land-uses which are planned to be developed within the Okatie PUD. This memorandum is expected to serve as additional information to the submitted traffic study data September 12, 2007.

PROJECT DESCRIPTION

The proposed development within Okatie PUD remains the same as was stated in the September 12, 2007 report. As a review, the site had been broken down into five distinct development sites (PODS) which are described below:

1. KB Homes POD- 95 town homes, 229 single-family units, 33,000 square-feet (sf) of retail space and 11,000 sf of office space;
2. Sheik/Osprey Point POD- 165 town homes, 184 single-family units, 180 apartment units, 150,000 sf of retail space and 50,000 sf of office space;
3. CCRC POD- 330 Unit CCRC (Continued Care Retirement Community);
4. Preacher Property POD- Estimated at 152 town homes, 171 single-family units and 164 apartment units; and
5. Beaufort County School POD- Anticipated as a 22-acre recreational park/green space per Beaufort County Planning staff.

Access for this PUD is planned to/from SC 170 opposite Pritcher Point Road, Cherry Point Road and direct access drives to/from SC 170, some of which are restricted movement driveways (right-in/right-out).

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FUTURE CONDITIONS

Future 2025 traffic conditions have been developed using the County's Transportation model which is maintained by Wilbur Smith Associates (WSA). For the purposes of these analyses, two future year scenarios have been conducted: first, 2025 conditions as stated by the current SE data and secondly, 2025 conditions reflecting the changes in land-uses proposed as part of the Okatie PUD project.

The proposed Okatie PUD is contained within the Beaufort County Transportation model as Trip Analyses Zones (TAZ's) #72 & #74 which are located on the east side of SC 170 in the vicinity of Pritcher Point Road and Cherry Point Road. According to this data, these two trip zones contained the following SE data. For comparison, the proposed SE data assuming the Okatie PUD plan is also presented:

Current County SE Data

- 281 Residential Dwelling Units;
- 1,118 School Attendance; and
- 52 Employees comprised of 38 retail-based employees and 14 non-retail based employees.

Proposed Okatie PUD SE Data

- 1,718 Residential Dwelling Units;
- 1,118 School Attendance; and
- 357 Employees comprised of 221 retail-based employees and 136 non-retail based employees.

Using these two scenarios of SE data, the County's transportation model was run in order to obtain future 2025 daily volumes for the surrounding roadways. Print-outs of the two scenarios are contained in the appendix of this memorandum. **Table 1** presents a comparison summary of select roadway links along SC 170 and SC 141.

Table 1
2025 DAILY VOLUMES[1]
Okatie PUD

		2025 Existing + Committed Network- Daily Two-Way Traffic Volume (vpd)		
Arterial Roadways	Segments	Beaufort SE Data	Okatie PUD SE Data	Difference
SC 170	Between SC 462 and SC 141	43,653	45,117	1,464
	Between SC 141 and Pritcher Point Road	39,140	42,111	2,971
	Between Pritcher Point Road and Cherry Point Road	39,729	45,851	6,122
	South of Cherry Point Road	45,254	51,436	6,182
SC 141	South of Cherry Point Road	6,974	7,696	722

1. Source: WSA Transportation Model completed for Beaufort County.
vpd=Vehicles-per-day.

As shown, assuming the current County SE data, SC 170 ranges from a two-way daily volume of 39,140 trips (just south of SC 141) to a high of 45,254 trips south of Cherry Point Road approaching McGarvey's Corner. Along SC 141, nearly 7,000 two-way daily trips are expected.

Assuming the Okatie PUD SE data, SC 170 volumes are expected to range from 42,111 trips just south of Pritcher Point Road to a high of 51,436 trips south of Cherry Point Road. The last column indicates the difference in the 2025 daily volumes between the current County SE data and the Okatie PUD SE data.

As shown, the greatest difference is anticipated south of Cherry Point Road where a difference/increase of 6,182 daily two-way trips is expected.

It should be noted that the transportation model roadway network does not account for a connector roadway between SC 170 and SC 141. Pritcher Point Road (known as Short Cut Drive) extends from SC 170 (immediate access of the site) to SC 141. This link is assumed to provide a viable alternative for site traffic to/from SC 141 rather than travel through the SC 141 at SC 170 intersection to the north. This short cut allows the possibility of reducing the volume of site/zone specific traffic traveling on the segment of SC 170 between SC 141 and Pritcher Point Road.

TRAFFIC OPERATIONS

Roadway segment analyses have been conducted for both scenarios of the current County SE data as well as the Okatie PUD SE data. For these calculations, the ***Maximum ADT by Level of Service for Urban Facilities for SCDOT Travel Demand Model*** (table located in Appendix) has been used which related daily two-way volumes to specific roadway types and characteristics. For these analyses, SC 170 was identified as a 4-lane divided Principal Arterial and SC 141 was identified as a 2-lane undivided Minor Arterial. **Table 2** presents the result of these analyses.

Table 2
LEVEL OF SERVICE SUMMARY[1]
Okatie PUD

		2025 Existing + Committed Network-Daily Two-Way Traffic Volume (vpd)			
Arterial Roadways	Segments	Beaufort SE Data	LOS[2]	Okatie PUD SE Data	LOS
SC 170	Between SC 462 and SC 141	43,653	E	45,117	F
	Between SC 141 and Pritcher Point Road	39,140	E	42,111	E
	Between Pritcher Point Road and Cherry Point Road	39,729	E	45,851	F
	South of Cherry Point Road	45,254	F	51,436	F
SC 141	South of Cherry Point Road	6,974	B	7,696	B

1. Source: WSA Transportation Model completed for Beaufort County. Vpd=Vehicles-per-day.
2. LOS based on Maximum ADT by Level of Service for Urban Facilities for SCDOT Travel Demand Model.

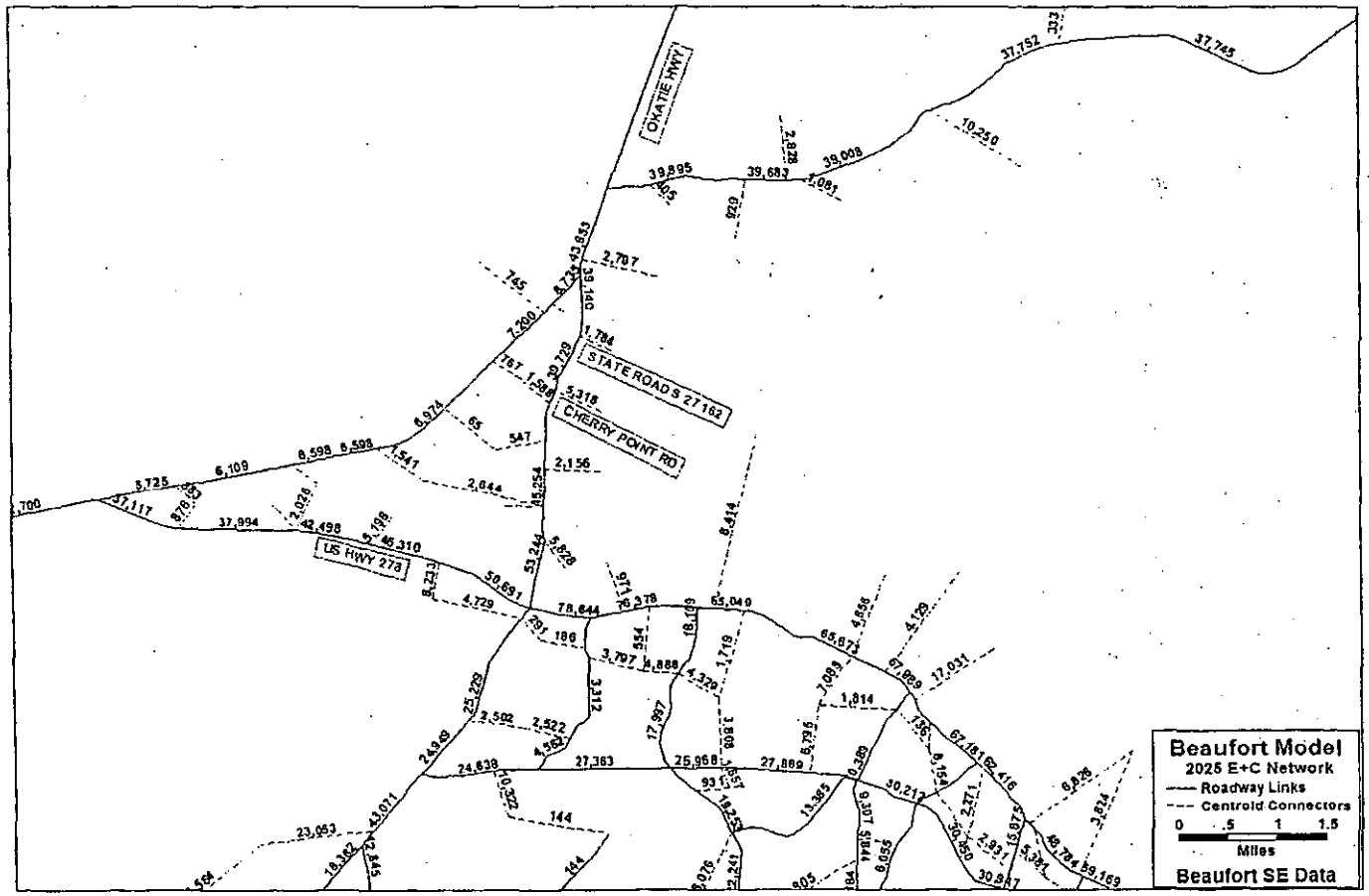
As indicated by Table 2, under the future 2025 conditions, SC 170 is anticipated to operate either at a LOS E or F under both the current County SE data scenario and the proposed Okatie SE data scenario. SC 141 is anticipated to operate at acceptable service levels for either condition.

Further review of the SC 170 service levels indicates that one segment is anticipated to de-grade in service level as compared to the current County SE data. The section of SC 170 between Pritcher Point Road and Cherry Point Road is anticipated to increase in two-way volume from 39,729 vpd to 45,851 vpd (increase of 6,122 vpd). This increase causes the LOS E under current County SE data to degrade to a LOS F under the Okatie PUD SE data scenario. It should be noted that this degradation in service level may not be entirely accurate due to the previously mentioned fact that the modeled roadway network does not include the link of Pritcher Point Road/Short Cut Drive between SC 170 and SC 141 which will attract traffic away from the section of SC 170 between Cherry Point Road and Pritcher Point Road. A reduction of approximately 800 daily two-way trips along this section of SC 170 and added to this connector roadway may result in this roadway segment operating the same as under the County SE plan at a LOS E.

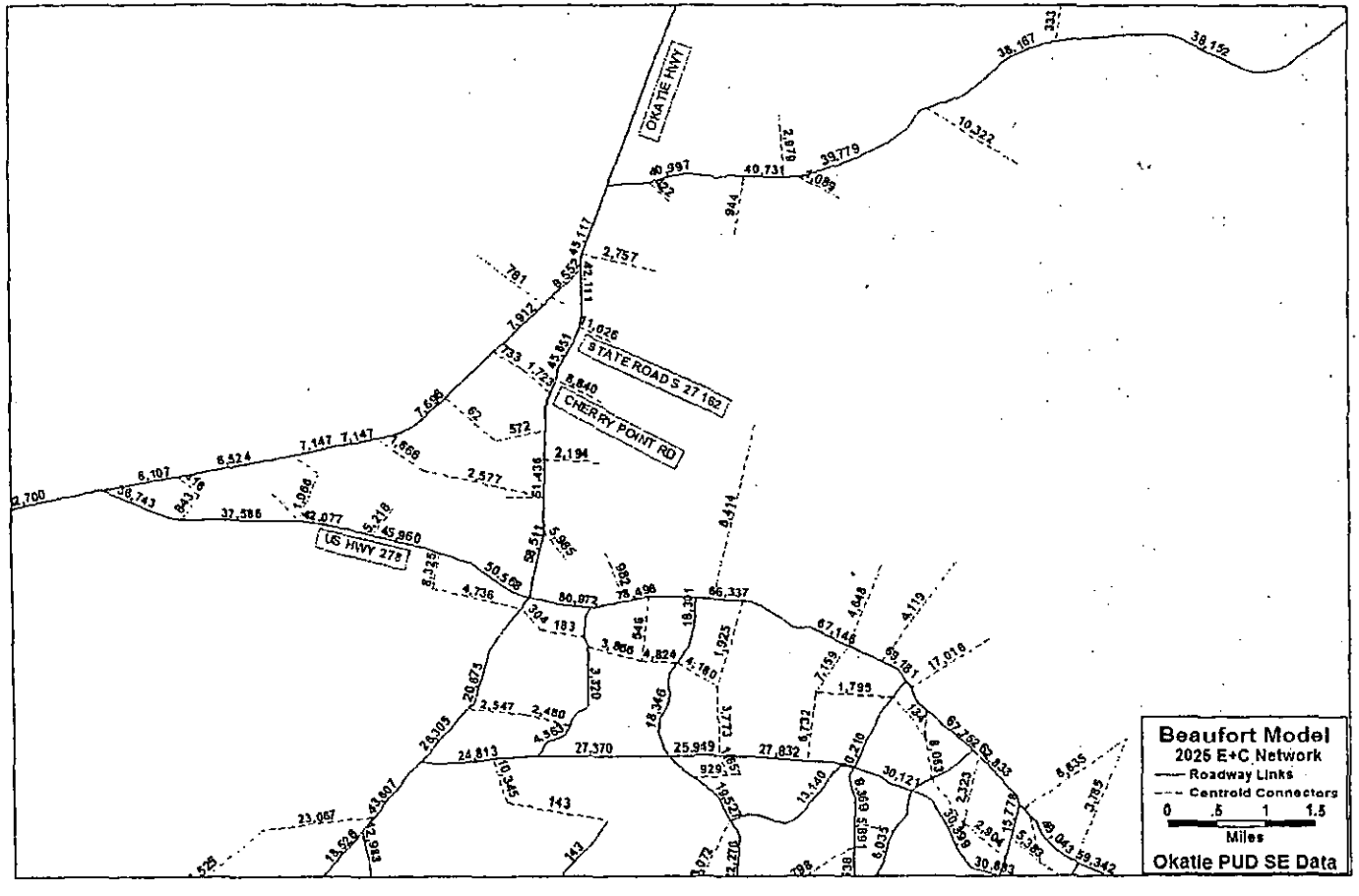
Roadway and intersection improvements were recommended in the original traffic study which outlined a mitigation scheme necessary to accommodate the development under the 2015 build condition. These suggested improvements included the addition of separate turning lanes as well as improved traffic control which is in compliance with the County's access management plan for SC 170. Also, improvements along SC 141 in Jasper County as well additional turning lanes on Pritcher Point Road and Cherry Point Road are recommended. While these improvements will not improve/alleviate the expected LOS E along SC 170 as the transportation model predicts, it does aid in the movement of traffic in the immediate area of the site as well as improve intersection operations.

If you have any questions, please contact me at (803) 252-1488.

Beaufort 2025 E+C Model without the Okatie PUD SE data.



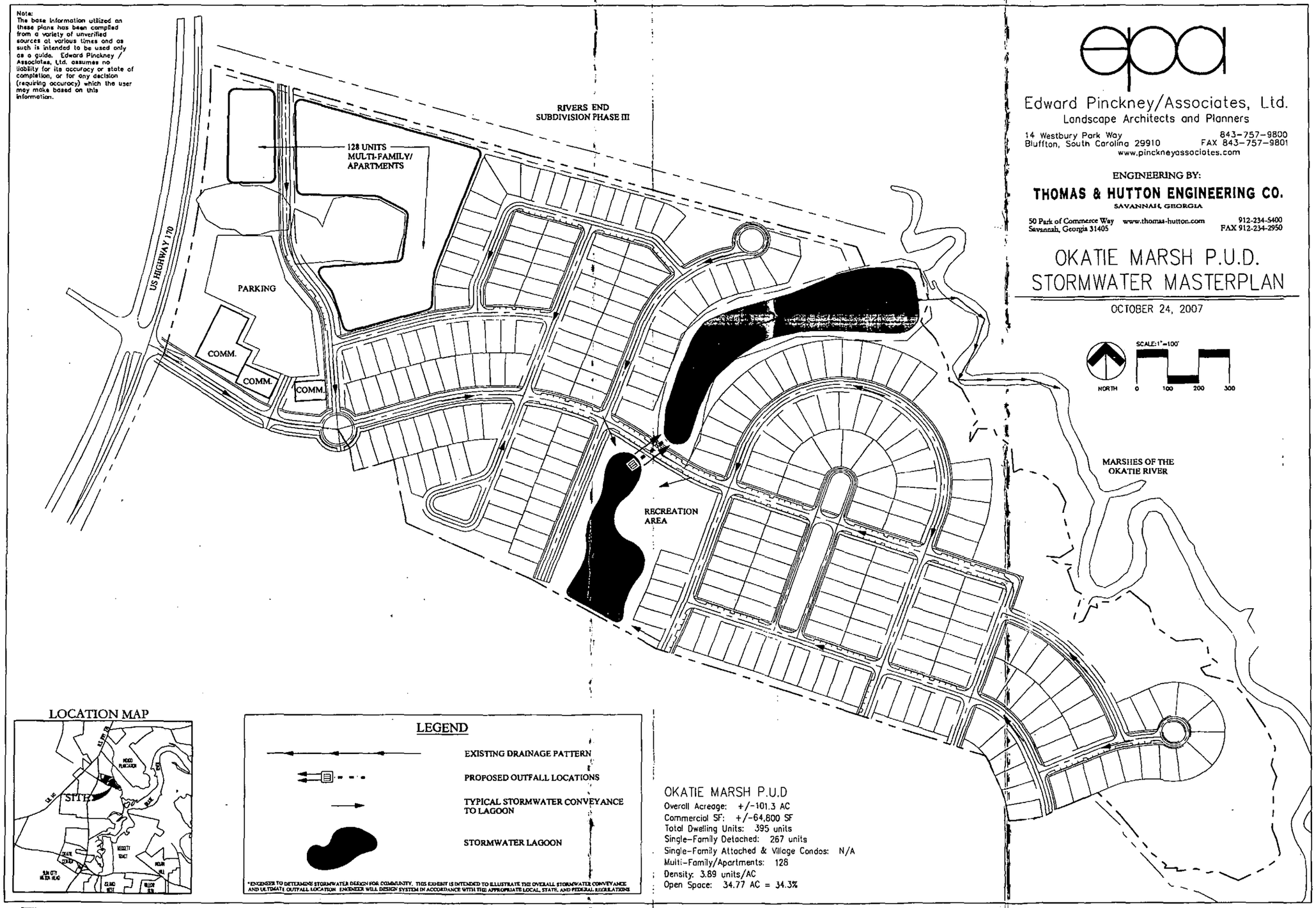
Beaufort 2025 E+C Model with the Okatie PUD SE data.



MAXIMUM ADT by LEVEL of SERVICE for URBAN FACILITIES
for SCDOT Travel Demand Models

Link Group 1 Coding	Functional Classification	Total # Lanes	LEVEL OF SERVICE A	B	C	D	E
1	Freeway	1	N/A	N/A	N/A	N/A	N/A
		2	14,357	21,682	28,300	33,695	39,262
		3	21,560	32,560	44,000	50,600	58,960
		4	28,714	43,364	58,600	67,390	78,524
		5	35,893	54,205	73,250	84,238	98,155
		6	43,071	65,046	87,900	101,085	117,786
		7	50,250	75,887	102,550	117,933	137,417
		8	57,428	86,728	117,200	134,780	157,048
		10	71,785	108,410	146,500	168,475	196,310
2	Expressway	1	N/A	N/A	N/A	N/A	N/A
		2	10,290	15,540	21,000	24,150	28,140
		3	11,809	17,834	24,100	27,715	32,294
		4	20,580	31,080	42,000	48,300	56,280
		5	23,643	35,705	48,250	55,488	64,655
		6	30,870	46,620	63,000	72,450	84,420
		7	35,476	53,576	72,400	83,260	97,016
		8	41,160	62,160	84,000	96,600	112,560
3	Ramps	1	3,675	5,550	7,500	8,625	10,050
		2	7,350	11,100	15,000	17,250	20,100
11	Principal Arterial Divided	1	4,116	6,216	8,400	9,660	11,256
		2	8,232	12,432	16,800	19,320	22,512
		3	N/A	N/A	N/A	N/A	N/A
		4	16,464	24,864	33,600	38,640	45,024
		5	N/A	N/A	N/A	N/A	N/A
		6	24,696	37,296	50,400	57,960	67,536
		7	N/A	N/A	N/A	N/A	N/A
		8	32,928	49,728	67,200	77,280	90,048
12	Principal Arterial Undivided	1	3,577	5,402	7,300	8,395	9,782
		2	7,154	10,804	14,600	16,790	19,564
		3	8,232	12,432	16,800	19,320	22,512
		4	14,308	21,608	29,200	33,580	39,128
		5	16,464	24,864	33,600	38,640	45,024
		6	21,462	32,412	43,800	50,370	58,692
		7	24,696	37,296	50,400	57,960	67,536
		8	28,616	43,216	58,400	67,160	78,256
13	Minor Arterial Divided	1	3,038	4,588	6,200	7,130	8,308
		2	6,076	9,176	12,400	14,260	16,616
		3	N/A	N/A	N/A	N/A	N/A
		4	12,152	18,352	24,800	28,520	33,232
		5	N/A	N/A	N/A	N/A	N/A
		6	18,228	27,528	37,200	42,780	49,848
		7	N/A	N/A	N/A	N/A	N/A
		8	24,304	36,704	49,600	57,040	66,464
14	Minor Arterial Undivided	1	2,646	3,996	5,400	6,210	7,236
		2	5,292	7,992	10,800	12,420	14,472
		3	6,076	9,176	12,400	14,260	16,616
		4	10,584	15,984	21,600	24,840	28,944
		5	12,152	18,352	24,800	28,520	33,232
		6	15,876	23,976	32,400	37,260	43,416
		7	18,228	27,528	37,200	42,780	49,848
		8	21,168	31,968	43,200	49,680	57,888
21	Collectors Divided	1	2,401	3,626	4,900	5,635	6,566
		2	4,802	7,252	9,800	11,270	13,132
		3	N/A	N/A	N/A	N/A	N/A
		4	9,604	14,504	19,600	22,540	26,264
		5	N/A	N/A	N/A	N/A	N/A
		6	14,406	21,756	29,400	33,810	39,396
		7	N/A	N/A	N/A	N/A	N/A
		8	19,208	29,008	39,200	45,080	52,528
22	Collectors Undivided	1	2,107	3,182	4,300	4,945	5,762
		2	4,214	6,364	8,600	9,890	11,524
		3	4,802	7,252	9,800	11,270	13,132
		4	8,428	12,728	17,200	19,780	23,048
		5	9,604	14,504	19,600	22,540	26,264
		6	12,642	19,092	25,800	29,670	34,572
		7	14,406	21,756	29,400	33,810	39,396
		8	16,856	25,456	34,400	39,560	46,096
32	Centroid Connectors	no lanes	These are loading points not actual facilities.				

Note:
The base information utilized on these plans has been compiled from a variety of unverified sources at various times and as such is intended to be used only as a guide. Edward Pinckney / Associates, Ltd. assumes no liability for its accuracy or state of completion, or for any decision (requiring accuracy) which the user may make based on this information.



epa

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OKATIE MARSH P.U.D.
STORMWATER MASTERPLAN

OCTOBER 24, 2007

LOCATION MAP

LEGEND

EXISTING DRAINAGE PATTERN

PROPOSED OUTFALL LOCATIONS

TYPICAL STORMWATER CONVEYANCE TO LAGOON

STORMWATER LAGOON

*ENGINEER TO DETERMINE STORMWATER DESIGN FOR COMMUNITY. THIS EXHIBIT IS INTENDED TO ILLUSTRATE THE OVERALL STORMWATER CONVEYANCE AND ULTIMATE OUTFALL LOCATION. ENGINEER WILL DESIGN SYSTEM IN ACCORDANCE WITH THE APPROPRIATE LOCAL, STATE, AND FEDERAL REGULATIONS

OKATIE MARSH P.U.D

Overall Acreage: +/-101.3 AC
Commercial SF: +/-64,800 SF
Total Dwelling Units: 395 units
Single-Family Detached: 267 units
Single-Family Attached & Village Condos: N/A
Multi-Family/Apartments: 128
Density: 3.89 units/AC
Open Space: 34.77 AC = 34.3%

Note:
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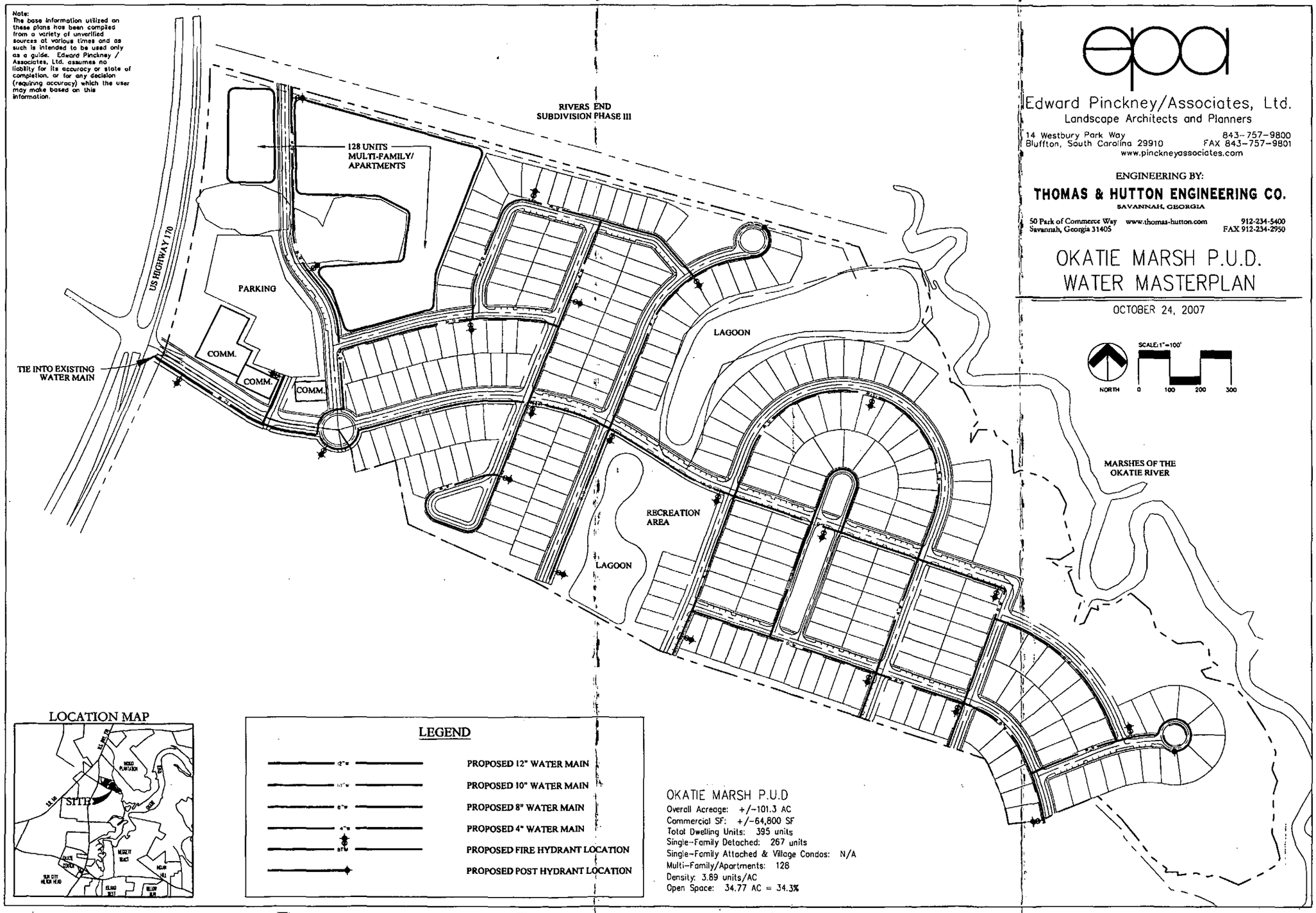

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OKATIE MARSH P.U.D.
WATER MASTERPLAN

OCTOBER 24, 2007

NORTH
SCALE: 1"=100'
0 100 200 300

LOCATION MAP

LEGEND

- PROPOSED 12" WATER MAIN
- PROPOSED 10" WATER MAIN
- PROPOSED 8" WATER MAIN
- PROPOSED 4" WATER MAIN
- PROPOSED FIRE HYDRANT LOCATION
- PROPOSED POST HYDRANT LOCATION

OKATIE MARSH P.U.D
Overall Acreage: +/-101.3 AC
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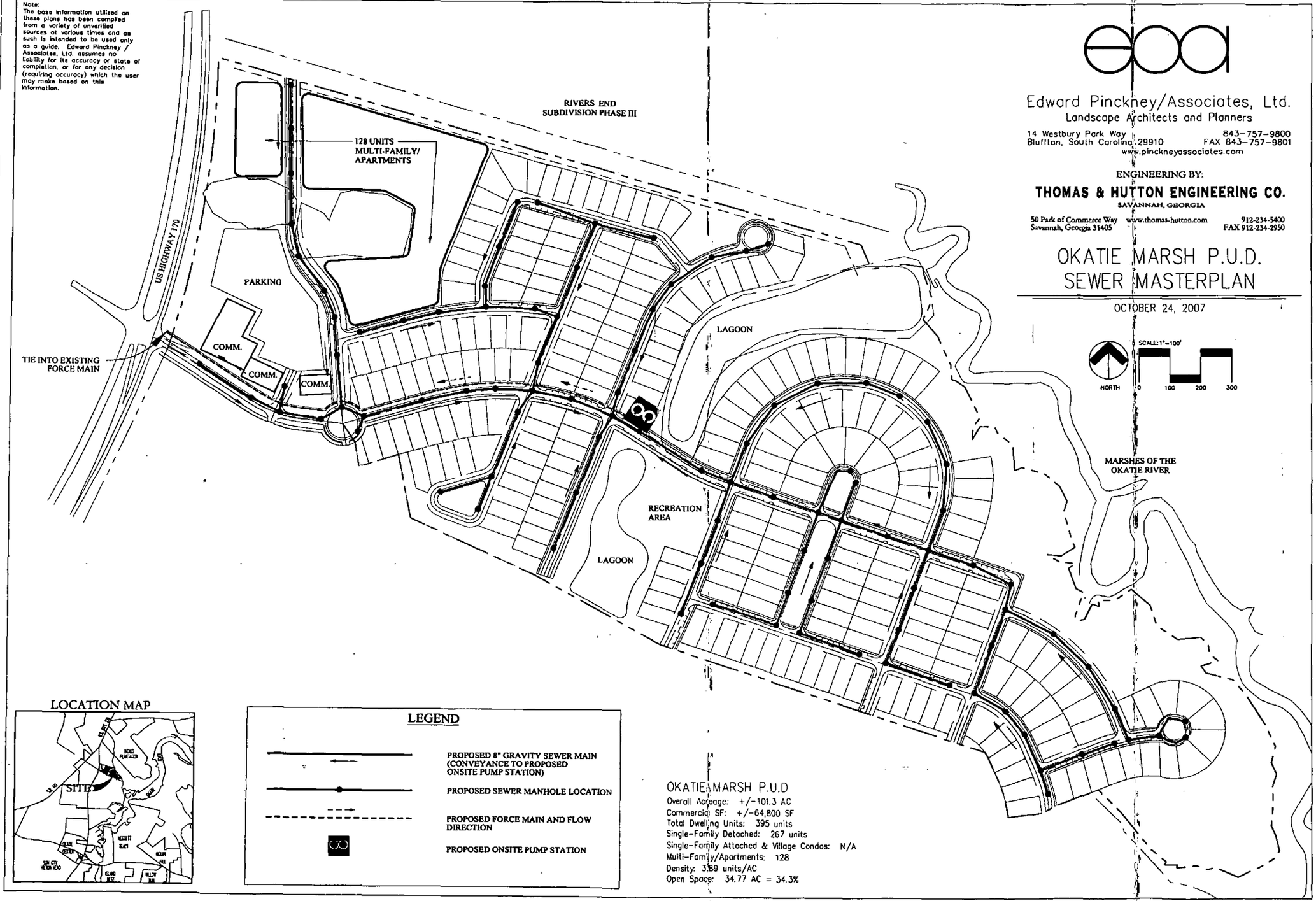

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OKATIE MARSH P.U.D.
SEWER MASTERPLAN

OCTOBER 24, 2007

SCALE: 1" = 100'
NORTH
0 100 200 300

LOCATION MAP

LEGEND

- PROPOSED 8" GRAVITY SEWER MAIN (CONVEYANCE TO PROPOSED ONSITE PUMP STATION)
- PROPOSED SEWER MANHOLE LOCATION
- PROPOSED FORCE MAIN AND FLOW DIRECTION
- PROPOSED ONSITE PUMP STATION

OKATIE MARSH P.U.D
Overall Acreage: +/-101.3 AC
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BJWSA
BEAUFORT - JASPER WATER & SEWER AUTHORITY

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6 SNAKE ROAD, OKATIE, SC 29909-3837
843/987-9202 FAX 843/987-9293
Customer Service 843/987-9200
Operations & Maintenance 843/987-9220 • Engineering 843/987-9250
www.bjwsa.org

DEAN MOSS, General Manager

May 20, 2004

Jason Bryant
Thomas & Hutton Engineering Co.
PO Box 2727
Savannah, GA 31407

Re: Pritcher Tract

Dear Jason,

Please be advised that BJWSA has sufficient water and sewer capacity available for the above referenced project. We have reviewed the preliminary water and sewer master plan. However, Thomas & Hutton must submit plans, specifications, and loading calculations to BJWSA for approval. At that time, capacity fees will be quoted. All fees must be paid in full before a commitment to provide service will be issued or construction begun.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

Sharon Gibson
Project Coordinator

SCE&G
A SCANA COMPANY

May 18, 2004

Jason Bryant
Thomas & Hutton

RE :Pritcher Tract

Dear Jason,

Thank you for giving us the opportunity to serve you.

We are pleased to inform you that SCE&G will be able to provide natural gas to the Pritcher Tract development. Cost associated with providing underground service will be determined when a finalized/approved plat is submitted to our office for engineering.

To ensure that your deadline is met, please submit a finalized/approved plat of the development to our office at least two (2) months prior to the start of construction. The finalized/approved plat of the development must include lot numbers, street names and 911 addresses for each lot.

SCE&G will install service on an "as needed" basis, according to the existing sales policy at the time of construction.

We look forward to working with you as your project moves forward. If you have any questions or need further assistance, please don't hesitate to call our office at (843) 815 - 6808.

Sincerely,

Steve LaMonica
Account Manager
SCE&G

HARGRAY

May 19, 2004

Jason J. Bryant
Thomas & Hutton Engineering
P.O. Box 2727
Savannah, GA 31402-2727

RE: Palmetto Traditional Homes – Pritchet Tract

Dear Mr. Bryant:

The above-reference property is in the Hargray Inc. service area and this is to advise that Hargray has the ability and willingness to accommodate all of the communications needs for this project. Pursuant to all necessary easements and right of way guarantees and service agreements.

If I can be of further assistance, please do not hesitate to call.

Sincerely,

Tom Brown
Design Engineering Supervisor

cc: Ed Heuck
Frankie Denmark
Rodney Cannon
Frank Mills

856 William Hilton Parkway • P.O. Box 5988 • Hilton Head Island, SC 29938 • (843) 686-6000 • (800) 726-1266 • Fax: (843) 686-1159
111 Shelton Road • Bluffton, SC 29910 • (843) 815-1600 • (800) 726-1266 • Fax: (843) 815-7060
705 Main Street • Hardeeville, SC 29927 • (843) 784-2211 • (800) 726-1266 • Fax: (843) 784-2666

EXHIBIT C

The Zoning Regulations hereunder shall be composed of the Development Agreement, the PUD Approval for Okatie Marsh (Exhibit B) and the now current Zoning and Development Standards Ordinance (ZDSO) of Beaufort County as of October 27, 2008 which is incorporated in its entirety herein by this reference thereto. Those sections of the ZDSO which are expected to be most relevant to this development in the future are attached hereto for convenient reference.

ARTICLE XIII. SUBDIVISION AND LAND DEVELOPMENT STANDARDS*

DIVISION 1. GENERALLY

Sec. 106-2766. Applicability.

All proposed land developments and subdivisions shall conform with the standards set forth in this article, unless expressly exempt from obtaining a development permit as specified in this article or elsewhere in this chapter.
(Ord. No. 99-12, § 1 (14.010), 4-26-1999)

Secs. 106-2767—106-2795. Reserved.

DIVISION 2. STREET STANDARDS

Sec. 106-2796. Access.

(a) *Access to county, state and federal thoroughfares.* In subdivisions access to county, state and federal thoroughfares shall be provided as follows:

(1) Street, driveway, or other access separation along county, state and federal highways shall be in accordance with the SCDOT, "Access and Roadside Management Standards," and county-approved access management plans. In no event, however, shall individual driveways and nonresidential curb cuts be permitted at spacing less than follows:

a. Major arterial road (divided four-lane): 1,500 feet.

b. Arterial road (two-lane): 800 feet.

c. Collector road and all others: 400 feet.

(2) If a road can be provided for lots (parcels), they shall be required, rather than permitting the stripping of lots (parcels) along the road frontage with individual and direct access to the roadway. The rural subdivision (subdivision II of division 4 of article XII of this chapter) is specifically designed to eliminate stripping of lots. If a property cannot be provided access through adjoining properties, a temporary access may be permitted as provided in subsection (b) of this section.

(3) Where a new internal road cannot be provided due to the depth and/or configuration of a parcel, lots (parcels) created along public road rights-of-way shall utilize shared access drives to meet the separation standards in subsection (1).

---

*Cross references—Recording of plats and deeds, § 2-616; environment, ch. 38; buildings and building regulations, ch. 74; floods, ch. 78; manufactured homes and trailers, ch. 86; planning, ch. 94.

(4) Where lots (parcels) within a major subdivision are created along unpaved public road rights-of-way, the developer shall be required to either pave the portion of the road that fronts the lots per county standards or provide in escrow to the county an amount equal to the paving of that portion of the road.

(b) *Temporary access.* No developer shall be denied a zoning permit or plan approval for the sole reason that a parcel of record, as of the effective date of the ordinance from which this chapter derives, cannot meet the permanent access standards, provided the development plan meets all other requirements of this chapter. A temporary access permit may be granted which shall expire when the permanent access to the property via adjoining parking lots, shared access with adjacent property, parallel access, or reverse frontage roads is achieved. The property owner shall bear the cost of closing the temporary access and connecting to the permanent access.

(c) *Driveway linkage for nonresidential development.* As determined by the DRT, linkages shall be required between adjoining properties to provide for movement from one development to another without requiring a return to the public roadway. This may be accomplished in several ways as follow:

(1) Where feasible, a continuous frontage or reverse frontage shall be provided either immediately behind the bufferyard or, if outlots are to be provided, along the rear property line of the outlots.

(2) Where a uniform setback line is established on a number of properties so that drives at the front of the building can be interconnected, this circulation road may be used as the linkage.

(3) A driveway stubout section can be used when it is adjacent to the vacant land, if that vacant land is located in a nonresidential zoning district, or where the DRT indicates the adjacent property will be developed as a nonresidential use (this requirement shall not apply where a frontage road system is planned or is in place.) All driveways and driving areas, including those through parking lots, designated for such movement shall be paved.

(4) The alignment of such accesses shall be linked in a straight line for as long a distance as is practical. The DRT may, in reviewing development, determine that one of the methods in this subsection is most appropriate and requires that all development provide such connections.

(d) *Legal access.* Legal access shall be provided as follows:

(1) While it is the intent of this chapter that all property proposed for development have legal and adequate access to public thoroughfares, it is recognized that often such legal right of access may not be clearly established at the time of proposed development activity. For development activity not involving the sale of lots or residential units to consumers, the concern over questionable legal access is not as great, except that such proposed development may impact other property across which access to the development depends. It is, however, of great concern that projects proposed for the sale of lots

or dwelling units to consumers have clear legal access to avoid potential legal litigation involving unsuspecting consumers. To this end, all applicants for development approval on property not immediately contiguous to deeded public rights-of-way shall submit the following:

a. Copies of recorded deeds, plats and easements clearly documenting access to the development property; or

b. In the absence of such recorded documents, evidence that reasonable effort has been made to acquire necessary easements from property owners whose lands over which access is dependent; and

c. Development involving the sale of lots, tracts, or units for which the provisions of subsection (d)(1)a of this section cannot be met must include on the face of recorded plats and surveys and in the body of associated deeds, master deeds, covenants and restrictions the following disclosure statement:

> "It has been determined by Beaufort County that access to all lots or units contained in this development are not clearly and legally established or defined at the time of approval of this development for construction and sale of lots or units to the general public."

For development not involving the sale of lots or units which cannot meet the provisions of subsection (d)(1)a of this section, the ZDA shall send notice of development intent by certified mail to all affected property owners whose land over which access to the proposed development property is dependent at least 14 days in advance of scheduled project review.

(2) The DRT shall review all applications for physical adequacy of access on a case-by-case basis and may deny development approval where access is inadequate for emergency vehicles or users may experience unwarranted inconvenience.

(3) Upon determination that reasonable access to adjoining property would be seriously affected by a proposed subdivision design, the ZDA will notify the adjacent property owner, by registered mail, of his findings and recommend that he take whatever action deemed necessary based on that finding. This is merely for the purpose of notifying an adjacent property owner and in no way obviates existing laws regarding access to properties by right of necessity.

(e) *Public access.* Accessibility is important for public health and safety and to promote the character of the community that the county finds desirable. If a developer wishes to build a gated community that prohibits general public access, the developer must meet the following standards:

(1) No local residential street shall have a peak hour volume of greater than 240 trips. Such developments shall be designed to ensure this volume cannot be exceeded.

(2) The county attorney, assisted by other county departments, shall determine if there are any water access areas that are subject to prescriptive right of use. If the county attorney issues an opinion that there is a prescriptive right of access and the applicant

refuses to acknowledge the prescriptive easement, no permit shall be issued until a final order resolving such question is entered by an appropriate court, or the developer posts a bond which, in the opinion of the court, protects the potential prescriptive users.

(3) Public access to existing cemeteries shall be ensured.

(4) Any roads designated by the DRT for providing adequate transportation to an area pursuant to an overall circulation plan affecting multiple land owners shall be public roads.

(5) All developments proposed for restricted access shall submit, as part of the TIA, an analysis of the potential effects from such restricted access on the future road capacities in the vicinity of the project.

(f) *Access management standards for Robert Smalls Parkway (SC 170).* The following access management standards apply to all properties within Beaufort County's jurisdiction on Robert Smalls Parkway (SC 170) between the intersection of SC 280 (Parris Island Gateway) and the Broad River Bridge.

(1) Signal spacing. The minimum spacing between full signalized access is 3,200 feet. The minimum spacing between directional signalized access is 1,900 feet.

(2) Future signal locations. The specific signalized access locations shall correspond to the Future Signal Locations provided in Map 1 in Appendix I: Robert Smalls Parkway Joint Corridor Plan of the Beaufort County Comprehensive Plan. If a modification of the defined signal locations is desired to meet the demands of a specific development, the following conditions shall be satisfied:

a. The modified location must meet the warrants for signalization with the proposed development as defined in the Manual on Uniform Traffic Control Devices (MUTCD) by the Federal Highway Administration (FHWA) with the analysis and specific application of traffic signal warrants to be approved by the Beaufort County traffic engineer.

b. The modified location must provide adequate spacing (as defined in the spacing standards indicated above) from existing traffic signals, programmed traffic signals, and future signalization of primary roadway intersections, including:

SC 170 at SC 280.

SC 170 at W.K. Alston.

SC 170 at Castle Rock Road.

SC 170 at Broad River Road.

SC 170 at SC 802.

c. The modified location shall not have an adverse impact on existing or future LOS based on comparative analysis of conditions with the recommended signal locations indicated in Appendix I: Robert Smalls Parkway Joint Corridor Plan of the Beaufort County Comprehensive Plan above. The developer shall be required

to conduct LOS and signal system progression analysis to demonstrate compatibility of the proposed signal location with operation of the remainder of the signal system.

(3) Driveway spacing. A minimum of one point of access to a property will be allowed. Additional access points above the one permitted may be granted provided the continuous roadway frontage of the property exceeds 500 feet. Single parcel access is strongly discouraged. Joint access driveways are encouraged for small parcels to adhere to the 500-foot spacing. Driveways should be limited to the number needed to provide adequate access to a property. Factors such as alignment with opposing driveways and minimum spacing requirements will have a bearing on the location and number of driveways approved. Refer to Table 106-2796.

TABLE 106-2796. MAXIMUM NUMBER OF DRIVEWAYS PER FRONTAGE

Length of Frontage	*Maximum Number of Driveways*
500 feet or less	1
500+ to 1,000 feet	2
1,000+ to 1,500 feet	3
1,500+ to 2,000 feet	4
More than 2,000 feet	4 plus 1 per each additional 500 feet of frontage

For parcels with frontage both on Robert Smalls Parkway and a secondary road, a minimum spacing of 500 feet shall be maintained along Robert Smalls Parkway between a driveway and a signalized intersection. Within 500 feet of signalized intersections, access shall be off a secondary road. Driveway spacing shall be measured from the closest edge of pavement to the next closest edge of pavement.

(4) Driveway design. Driveway width and turning radii shall conform to SCDOT's Access and Roadside Management Standards.

(5) Driveway linkages. See section 106-2796 (c).

(6) Deceleration lanes. Deceleration lanes shall be required when the volume of traffic turning at a site is high enough in relation to the through traffic to constitute the potential for disruption as indicated in the traffic impact analysis.

(7) Retrofitting existing driveways. As changes are made to previously developed property or to the roadway, driveways will be evaluated for the need to be relocated, consolidated, or eliminated if they do not meet the access management standards.

(8) Traffic impact analysis. A traffic impact analysis study shall be provided for proposed developments along the Robert Smalls Parkway corridor anticipated to generate at least 50 peak-hour trips. The procedures and guidelines for a traffic impact analysis as set forth in article XI, division 5, section 106-2450 shall be followed.

(g) *Access management standards for West Fording Island Road (US 278) and Okatie Highway (SC 170).* The following access management standards apply to all properties within Beaufort County's jurisdiction on Okatie Highway (SC 170) from Old Baileys Road (S-18) to McGarvey's Corner (US 278); and West Fording Island Road (US 278) from the Jasper County line to McGarvey's Corner (SC 170):

(1) *Signal spacing.* The minimum spacing between full signalized access is 3,600 feet. The minimum spacing between directional signalized access is 2,000 feet.

(2) *Future signal locations.* The specific signalized access locations shall correspond to the Future Signal Locations provided in Map 1 in Appendix J: West Fording Island Road (US 278) and Okatie Highway (SC 170) Joint Corridor Plan of the Beaufort County Comprehensive Plan. If a modification of the defined signal locations is desired to meet the demands of a specific development, the following conditions shall be satisfied:

a. The modified location must meet the warrants for signalization with the proposed development as defined in the Manual on Uniform Traffic Control Devices (MUTCD) by the Federal Highway Administration (FHWA) with the analysis and specific application of traffic signal warrants to be approved by the Beaufort County Traffic Engineer.

b. The modified location shall provide connectivity to adjacent properties to give the properties access to the signalized intersection.

c. The modified location shall not have an adverse impact on existing or future LOS based on comparative analysis of conditions with the recommended signal locations indicated in Appendix J: West Fording Island Road (US 278) and Okatie Highway (SC 170) Joint Corridor Plan of the Beaufort County Comprehensive Plan. The developer shall be required to conduct LOS and signal system progression analysis to demonstrate compatibility of the proposed signal location with operation of the remainder of the signal system.

(3) *Driveway spacing.* A minimum of one point of access to a property will be allowed. Additional access points above the one permitted may be granted provided the continuous roadway frontage of the property exceeds 1,000 feet. Single parcel access is strongly discouraged. Joint access driveways are encouraged for small parcels to adhere to the 1,000-foot spacing. Driveways should be limited to the number needed to provide adequate access to a property. Factors such as alignment with opposing driveways and minimum spacing requirements will have a bearing on the location and number of driveways approved. Refer to Table 106-2796.

MAXIMUM NUMBER OF DRIVEWAYS PER FRONTAGE

Length of Frontage	*Maximum Number of Driveways*
1,000 feet or less	1
1,000 to 2,000 feet	2

Length of Frontage	*Maximum Number of Driveways*
More than 2,000 feet	2 plus 1 per each additional 1,000 feet of frontage

For parcels with frontage both on West Fording Island Road or Okatie Highway and a secondary road, a minimum spacing of 1,000 feet shall be maintained along the principal arterial between a driveway and a signalized intersection. Within 1,000 feet of signalized intersections, access shall be off a secondary road. Driveway spacing shall be measured from the closest edge of pavement to the next closest edge of pavement.

(4) *Driveway design.* Driveway width and turning radii shall conform to SCDOT's Access and Roadside Management Standards.

(5) *Driveway linkages.* See section 106-2796(c).

(6) *Deceleration lanes.* Deceleration lanes shall be required when the volume of traffic turning at a site is high enough in relation to the through traffic to constitute the potential for disruption as indicated in the traffic impact analysis.

(7) *Retrofitting existing driveways.* As changes are made to previously developed property or to the roadway, driveways will be evaluated for the need to be relocated, consolidated, or eliminated if they do not meet the access management standards.

(h) *Access management standards for Buckwalter Parkway.* The following access management standards apply to all properties within Beaufort County's jurisdiction on Buckwalter Parkway between the intersection of US 278 and SC 46 (May River Road).

(1) *Signal spacing.* The recommended spacing between full signalized accesses is 2,000 feet.

(2) *Future signal locations.* The specific signalized access locations shall correspond to the programmed signal locations provided in Figure 5 in Appendix L: Buckwalter Parkway Access Management Plan of the Beaufort County Comprehensive Plan. If a modification of the defined signal locations is desired to meet the demands of a specific development, the following conditions shall be satisfied:

a. The modified location must meet the warrants for signalization with the proposed development as defined in the Manual on Uniform Traffic Control Devices (MUTCD) by the Federal Highway Administration (FHWA) with the analysis and specific application of traffic signal warrants to be approved by the Beaufort County traffic engineer.

b. The modified location must provide adequate spacing (as defined in the spacing standards indicated above) from existing traffic signals, programmed traffic signals, and future signalization of primary roadway intersections, including:

Buckwalter Parkway at US 278

Buckwalter Parkway at Cinema South (2,800 feet south of US 278)

Buckwalter Parkway at Sea Turtle South (2,050 feet south of Cinema South)

Buckwalter Parkway at Buckwalter Town Center South (2,550 feet south of Cinema South)

Buckwalter Parkway at Bluffton Parkway and the Townes of Buckwalter (this signal will be relocated once Phase 5b of the Bluffton Parkway is completed)

Buckwalter Parkway at Bluffton Parkway and Hampton Hall

Buckwalter Parkway at H.E. McCracken Circle and Old Bridge Drive

Buckwalter Parkway at SC 46 (May River Road)

c. The future signalized intersection location shall not have an adverse impact on existing or future LOS based on comparative analysis of conditions with the recommended signal locations indicated in Appendix L: Buckwalter Parkway Access Management Plan of the Beaufort County Comprehensive Plan above. The developer shall be required to conduct LOS and signal system progression analysis to demonstrate compatibility of the proposed signal location with operation of the remainder of the signal system.

(3) *Driveway spacing.* Additional access points above the full accesses indicated in subsection 106-2796(h)(2)b. may be granted for right-in/right-out or other controlled movement access with a minimum spacing of 500 feet. Single parcel access is strongly discouraged and connectivity to adjacent parcels should be provided. Joint access driveways are encouraged for small parcels to adhere to the 500-foot spacing. Driveways should be limited to the number needed to provide adequate access to a development. Factors such as alignment with opposing driveways and minimum spacing requirements will have a bearing on the location and number of driveways approved. For parcels/developments that have frontage on Buckwalter Parkway and have access to a signalized intersection location recommended in the Buckwalter Parkway Access Management Plan, minimum spacing shall be 800 feet unless specified in Figure 5 of the Buckwalter Parkway Access Management Plan.

(4) *Driveway design.* Driveway width and turning radii shall conform to SCDOT's Access and Roadside Management Standards.

(5) *Driveway linkages.* See subsection 106-2796(c).

(6) *Deceleration lanes.* Deceleration lanes shall be required when the volume of traffic turning at a site is high enough in relation to the through traffic to constitute the potential for disruption as indicated in the traffic impact analysis.

(7) *Retrofitting existing driveways.* As changes are made to previously developed property or to the roadway, driveways will be evaluated for the need to be relocated, consolidated, or eliminated if they do not meet the access management standards.

(i) *Access management standards for Bluffton Parkway.* The following access management standards apply to all properties within Beaufort County's jurisdiction on Bluffton Parkway between the intersection of SC 170 and US 278.

(1) *Signal spacing.* The recommended spacing between full signalized accesses is 2,640 feet (one-half mile).

(2) *Future signal locations.* The specific signalized access locations shall correspond to the programmed signal locations provided in Figures 2-A and 2-B in Appendix M: Bluffton Parkway Access Management Plan of the Beaufort County Comprehensive Plan. If a modification of the defined signal locations is desired to meet the demands of a specific development, the following conditions shall be satisfied:

a. The modified location must meet the warrants for signalization with the proposed development as defined in the Manual on Uniform Traffic Control Devices (MUTCD) by the Federal Highway Administration (FHWA) with the analysis and specific application of traffic signal warrants to be approved by the Beaufort County traffic engineer.

b. The modified location must provide adequate spacing (as defined in the spacing standards indicated above) from existing traffic signals, programmed traffic signals, and future signalization of primary roadway intersections, including:

Bluffton Parkway and SC 170

Bluffton Parkway and Lawton Station Access (1,750 feet east of SC 170)

Bluffton Parkway and Sandhill Tract (2,100 feet east of Lawton Station intersection)

Bluffton Parkway and Hampton Parkway (2,450 feet east of Sandhill Tract intersection)

Bluffton Parkway and Parcel 10B (2,550 feet east of Hampton Parkway)

Bluffton Parkway and Parcel 12A and 12B (2,600 feet east of Parcel 10B intersection)

Bluffton Parkway and Buckwalter Parkway and the Townes of Buckwalter (this signal will be relocated once Phase 5b of the Bluffton Parkway is completed)

Bluffton Parkway and Buckwalter Parkway and Hampton Hall

Bluffton Parkway and Buck Island Road

Bluffton Parkway and Simmonsville Road

Bluffton Parkway and SC 46 (roundabout)

Bluffton Parkway and Burnt Church Road

Bluffton Parkway and Malphrus Road

Bluffton Parkway and Buckingham Plantation Drive

c. The future signalized intersection location shall not have an adverse impact on existing or future LOS based on comparative analysis of conditions with the recommended signal locations indicated in Appendix M: Bluffton Parkway Access Management Plan of the Beaufort County Comprehensive Plan above. The developer shall be required to conduct LOS and signal system progression analysis to demonstrate compatibility of the proposed signal location with operation of the remainder of the signal system.

(3) *Driveway spacing.* Additional access points above the full accesses indicated in subsection 106-2796(i)(2)b. may be granted for right-in/right-out or other controlled movement access with a minimum spacing of 800 feet. Single parcel access is strongly discouraged and connectivity to adjacent parcels should be provided. Joint access driveways are encouraged for small parcels to adhere to the 800-foot spacing. Driveways should be limited to the number needed to provide adequate access to a property. Factors such as alignment with opposing driveways and minimum spacing requirements will have a bearing on the location and number of driveways approved. For parcels/developments that have frontage on Bluffton Parkway and have access to a signalized intersection location recommended in the Bluffton Parkway Access Management Plan, minimum spacing shall be 800 feet unless specified in Figures 2-A and 2-B of the Bluffton Parkway Access Management Plan.

(4) *Driveway design.* Driveway width and turning radii shall conform to SCDOT's Access and Roadside Management Standards.

(5) *Driveway linkages.* See subsection 106-2796(c).

(6) *Deceleration lanes.* Deceleration lanes shall be required when the volume of traffic turning at a site is high enough in relation to the through traffic to constitute the potential for disruption as indicated in the traffic impact analysis.

(7) *Retrofitting existing driveways.* As changes are made to previously developed property or to the roadway, driveways will be evaluated for the need to be relocated, consolidated, or eliminated if they do not meet the access management standards.

(Ord. No. 99-12, § 1 (14.110), 4-26-1999; Ord. No. 2004/26, 8-9-2004; Ord. No. 2005/19, 5-23-2005; Ord. No. 2008/17, 5-5-2008; Ord. No. 2008/19, 5-19-2008)

Sec. 106-2797. Street design standards.

(a) *Review.* While it is the intent of this division to provide ample flexibility in the layout of subdivision streets, proposed street systems will be reviewed as to their design, safety, and convenience of users, as well as adjacent property owners, provided such review shall be conducted in accordance with reasonable street design standards and with generally accepted engineering and development practices. Emphasis should be placed on safety at curves and intersections.

(b) *General requirements.* General requirements for street design are as follow:

(1) *Continuation of existing street pattern.* The location, layout, arrangement, width, and grade of the proposed streets should be coordinated with the adjoining street systems,

adjoining properties, topography, natural features, and drainage system. Minor residential streets shall be laid out so that their use by through traffic will be discouraged.

(2) *Naming of streets.* Proposed streets, which are obviously in alignment with other existing named streets, shall bear the assigned name of the existing street. Proposed street names shall not be phonetically similar to existing street names, regardless of the use of suffixes such as "street," "avenue," "boulevard," "drive," "place," "court," etc. In no case shall a name be used which will be confused with other existing streets. A house or lot numbering (address) system shall be designed, utilizing an extension of an existing system in the area where one exists, and shall be placed on the final plat (see street naming in subdivision VIII of division 3 of article III of this chapter).

(3) *Street name signs.* Street name signs, constructed to county specifications, shall be installed at all street intersections at the developer's expense. Street names proposed by the developer must first be approved by the E-911 Addressing Center, and then by the DRT.

(4) *Design drawings and certification.* Professional engineers, registered in the state, shall prepare plans, profiles, cross sections, and specifications for all subdivision roads and streets. The engineers shall certify roads/streets are built to their approved plans and specifications. Cross sections shall be developed every 100 feet at intersections and break points in grade. Cross sections shall show travelways; shoulders; ditches or curb and gutter, if applicable; and utility location.

(c) *General design requirements.* General design requirements are as follows:

(1) *Collector streets.* Where a subdivision abuts or contains an existing or proposed collector or through street, the DRT may require marginal access streets, reverse frontage with screen planting, deep lots, or other treatments as may be necessary for adequate protection of residential properties and to afford separation of through and local traffic.

(2) *Visual obstructions.* No fence, wall, tree, terrace, building, sign, shrubbery, hedge, or other planting or structure or object capable of obstructing driver vision will be allowed at intersections.

(3) *Street jogs.* Street jogs or centerline offsets in the horizontal alignment of streets across intersections of less than 150 feet shall be prohibited.

(4) *Intersections.* The centerline of no more than two streets shall intersect at any one point. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no streets shall intersect any other street at less than 60 degrees.

(5) *Minimum curb and street radius.* The lot line radius at intersecting streets shall be not less than 20 feet, unless the developer demonstrates to the county engineer valid reasons to utilize less than 20 feet radii. The centerline radius of all curvilinear streets shall be not less than 100 feet.

(6) *Dead-end streets and culs-de-sac.* Dead-end streets, designed to be so permanently, shall be no longer than 1,800 feet and shall be provided with a cul-de-sac. The cul-de-sac shall have a right-of-way radius of 50 feet and a solid paved circular area with a radius of 40 feet. Temporary dead-end streets shall be provided with a temporary turnaround area which shall be designed considering traffic usage, maintenance, and removal. Planned developments may utilize landscaping in the center of the cul-de-sac turnaround areas, or as approved by the county engineer.

(7) *Minimum right-of-way and pavement widths.* The standards for street widths varies with the type of traffic anticipated and whether parking on the street is required. Table 106-2797 provides the standards.

(8) *Additional right-of-way.* A proposed subdivision that includes a platted street which does not conform to the minimum right-of-way requirements of this chapter shall provide for the dedication of additional right-of-way along either one or both sides of the street, so that the minimum rights-of-way required by this chapter can be established. If the proposed subdivision abuts only one side of the street, a minimum of one-half of the required extra right-of-way shall be dedicated by such subdivision.

TABLE 106-2797 ROAD STANDARDS

Type	*Maximum Peak Hour Volume*	*Parking Lanes*	*Right-of-Way*	*Pavement*
Cul-de-sac, lot frontage more than 120 feet	20	None	50	20
Local residential	240	None	50	22
Local residential	240	1	50	26
Local residential	240	2	60	34
Local nonresidential	1,000	None	50	28
Residential collector	800	None	50	22
Collector	N.A.	None	60	24
Collector	N.A.	2	60	38
Arterial	N.A.	Per state requirements		

(d) *Street construction specifications.* Street construction specifications shall be as follows:

(1) *Reverse curves.* The minimum distance between reverse curves shall be 100 feet.

(2) *Construction of roads and streets.* All new roads intended to become county roads shall be paved to meet the minimum requirements for road construction as follows, in accordance with referenced sections of the South Carolina Highway Department Standard Specifications:

a. *Commercial subdivisions.* In commercial subdivisions state standards are as follows:

1. The wearing surface shall have a minimum thickness of two inches of asphalt pavement, as specified in section 400 titled, "Bituminous Pavements," and section 403 titled, "Hot Laid Asphalt Concrete Surface Course," type I.

2. Base course shall be a minimum thickness of eight inches and shall comply with section 306, titled "Stabilized Aggregate Base Course." Prime coat shall meet the requirements of sections 304.14 and 401.22.

b. *Residential subdivisions.* In residential subdivisions state standards are as follows:

1. The wearing surface shall have a minimum thickness of 1½ inches of asphalt pavement, as specified in section 400 titled, "Bituminous Pavements," and section 403 titled, "Hot Laid Asphalt Concrete Surface Course," type I.

2. Base course will be a minimum thickness of six inches of stone and shall comply with section 306 titled, "Stabilized Aggregate Base Course." Prime coat shall meet the requirements of sections 304.14 and 401.22.

(3) *Shoulder slope.* Maximum slope of shoulders shall be one inch per foot. Minimum slope of shoulders shall be one-half inch per foot.

(e) *Minimum construction specifications for unpaved roads.* For the purposes of this article, unpaved road shall not mean dirt road, per se, but shall be referred to as "stabilized aggregate" road. Unpaved roads are to be utilized for residential, low volume traffic usage only. For subdivision of land, low volume traffic shall mean that the highest traffic potential of traffic that can be generated based on the underlying zoning district. All minor subdivisions of land, as long as no more than four lots are served by the proposed road, may utilize a stabilized aggregate road, per county standards. All major subdivisions shall require paved roads, per county standards. Unpaved roads shall remain private roads and not be accepted by the county for maintenance or ownership. Construction specifications for unpaved roads are as follows:

(1) Normal crown cross section transverse slopes shall be a two-percent minimum.

(2) Longitudinal slopes shall be a one-percent minimum.

(3) A soil report and analysis shall be performed by a qualified soil professional to determine if the soil is suitable for unpaved roads. The water table elevation shall also be determined.

(4) The road cross section shall consist of the following:

a. Strip and remove all deleterious and organic material from subbase, and compact to a 95 percent of density in six-inch to eight-inch lifts, to a depth that will accommodate the vehicular loadings so structural failure will not occur.

b. Six-inch stabilized aggregate base course, that conforms to the requirements of section 306 of the South Carolina Highway Department Standard Specifications, with prime coat or other suitable approved means of dust control. Other techniques with similar performance may be approved by the county engineers.

(5) Road shall consist of 20-foot roadway with four-foot shoulders and roadside ditches.

(6) All intersections shall be designed to keep stormwater out of intersections.

(7) All discharges of stormwater in saltwater wetlands shall meet or exceed the water quality control standards of OCRM.

(8) Roads shall be designed so that potential for maintenance is reduced to a minimum (i.e., maintenance plan for roadway).

(9) The engineer shall design so that runoff will not create an erosion problem and damage the structural integrity of the road.

(10) The engineer designing the road will produce a summary on how these criteria are accomplished, including the following: The existing tree root systems within the right-of-way shall be trimmed and cut back to eliminate and reduce intrusion or presence within the road subgrade, including the 24-inch compact subgrade. No existing standing trees which are adversely impacted by the root pruning shall be left standing such that they would present a dangerous or hazardous condition within the right-of-way. The developer or its contractor shall use the services of a qualified arborist or forester in determining the impact and survivability of individual trees.

(11) All lots in minor subdivisions in rural/rural residential districts shall take access from an access easement having a minimum right-of-way width of 50 feet. The access easement shall be improved with gravel and ditches for drainage. A 40-foot access easement may be permitted with documentation provided to the DRT that emergency vehicles can be accommodated. Landowners with private accesses are exempt from the width and improvement (gravel and ditches) requirements with documentation that emergency vehicles can be accommodated.

(Ord. No. 99-12, § 1 (14.120), 4-26-1999)

Secs. 106-2798—106-2825. Reserved.

DIVISION 3. SERVICE STANDARDS

Sec. 106-2826. Minimum service requirements.

All development shall be provided with minimum services in conformance with this division. The property owner or developer, his agents or his assignees shall assume responsibility for the provision of basic services within the proposed development. The requirement of services, as a prerequisite for development, does not in any way obligate the county council or its departments or agents to furnish such services. No development shall be undertaken if provision has not been made for the following basic services, where applicable:

(1) Potable water supply of sufficient quantity to satisfy domestic needs;

(2) Water supply of acceptable quality and sufficient quantity to satisfy commercial and industrial demand;

(3) Means for treatment and disposal of domestic sewage and other liquid waste;

(4) Means for collection and disposal of solid wastes, except for single-family residential subdivisions;

(5) Vehicular access to existing streets or highways;

(6) All driveways shall be paved, from the property line to the edge of the roadway pavement, except for private dirt roads;

(7) Power supply, normally electricity; and

(8) Water supply for fire protection (see subsection 106-2828(b)).

(Ord. No. 99-12, § 1 (14.210), 4-26-1999)

Sec. 106-2827. Sewer standards.

(a) All public sewers in subdivisions shall be installed to the specifications of the water and sewer agency providing that service. The plans for such service shall be approved in writing to the county prior to final plan approval. A letter accepting the facilities as properly installed shall be submitted to the county prior to the release of surety or the issuance of occupancy permits.

(b) All on-site systems shall be properly installed and shall meet the standards of DHEC.

(Ord. No. 99-12, § 1 (14.220), 4-26-1999)

Sec. 106-2828. Water standards.

(a) *Water supply for public use.* All public water systems in subdivisions shall be installed to the specifications of the water and sewer agency providing that service. The plans for such service shall be approved in writing to the county prior to final plan approval. A letter from the water and sewer agency accepting the facilities as properly installed shall be submitted to the county prior to the release of surety or the issuance of occupancy permits.

(b) *Water supply for fire protection.* All new development serviced by a public or quasipublic water system and approved by the state DHEC shall provide firefighting capability through the provision and placement of fire hydrants and adequate flow pressure. The location and spacing of hydrants shall be as follows:

(1) *Subdivisions.* Fire hydrants shall be required for all subdivision of property except single-family subdivisions of four lots or less. Hydrants shall be placed along streets and roads at intervals not to exceed 1,000 feet. In no case shall the nearest property line of a subdivided lot exceed 500 feet from a fire hydrant.

(2) *Buildings.* All properties where buildings or portions of buildings, other than one or two-family dwellings, are located more than 150 feet from a public or quasipublic water main shall be provided with approved fire hydrants connected to a water system capable of supplying the required fire flow, unless the fire district has approved an alternate fire protection plan. The location and number of such on-site hydrants shall

be as designed by the fire official with the minimum arrangement being so as to have a hydrant available within 300 feet of the building, and allow for distribution of hose to any portion of any building on the property at distances not exceeding 500 feet.

(3) *Exemption.* Commercial buildings existing prior to the effective date of the ordinance from which this chapter derives shall not be required to meet fire safety standards for approved changes which do not involve or affect the structures. Refer to section 106-9 pertaining to nonconformities for other requirements.

(4) *Private water systems.* Private water systems shall be designed to handle fire flow in that subdivision by water mains or an approved alternative system, per fire safety standards. The required fire flow shall be established according to the 2006 International Fire Code Table B105.1.

(5) *Fire protection options.* In providing fire protection for the development, the developer shall have one of the following three options:

a. Tying into an existing public or quasipublic water system capable of providing required fire flow;

b. Installing an approved alternate system, as listed in the National Fire Prevention Code, and installed according to code; or

c. Presenting an approved engineering system designed to meet the required fire flow.

(c) *Alternative water supply.* An alternative method of water supply for fire protection can be utilized if first approved by the local fire official. The alternative method shall provide a degree of fire protection that is at least equivalent to that required by the adopted codes. In rural areas that have no suitable public or quasipublic water system available, water supply for fire protection shall be provided that complies with National Fire Protection Association 1142 as a viable alternative method of providing the required fire flow.

(d) *Other conditions for water supply.* If required water supply will not be contrary to the public interest and where, owing to conditions peculiar to the property and not resulting from any action on the part of the property owners, an enforcement of this standard would result in an unusual and undue hardship, the local fire official may approve alternate protection systems.

(Ord. No. 99-12, § 1 (14.230), 4-26-1999; Ord. No. 2008/36, 9-22-2008)

Sec. 106-2829. Fire safety standards.

(a) *Compliance with other laws and codes.* The fire safety standards prescribed in this section shall be in accordance with county Ordinance No. 89-5, as amended; with other life, fire, building and safety codes that are adopted by the county and the state; and shall apply to all development activity. The local fire official having jurisdiction shall review all new development for compliance with fire and life safety standards of the county.

(b) *Development plan review.* All proposed development site plans shall be reviewed by the local fire official having jurisdiction as they relate to fire and life safety standards contained in this article. Prior to the final plan approval, the local fire official shall make written recommendations to the DRT indicating approval of the design as submitted or delineating needed design changes consistent with fire and life safety standards and practices.

(c) *Inspection.* The local fire official shall inspect the completed development site for compliance with the approved plans and submit his findings to the ZDA prior to issuance of a certificate of compliance.

(d) *Building height restriction.* All occupancies, excluding one- or two-family dwellings, that exceed 35 feet in height or exceed a total fire flow demand of 3,500 gallons per minute (gpm) as referenced in the insurance service organization (ISO) requirements for specialized equipment must have adjustments to plans approved by the fire district fire chief and the county building official and, as necessary, reach financial arrangements acceptable to the fire district and the county council which provide assistance in purchasing the appropriate firefighting apparatus or equipment. This standard shall be applied to the fire management plan as defined for each fire district.

(e) *Emergency vehicular access.* No development shall be constructed in any manner so as to obstruct emergency vehicular access to the development property or associated buildings and structures. To ensure that access will not be impaired in any emergency situation, attention should be given to the design and layout of such features as signs, fences, walls, street intersections and curves, parking lots, sidewalks, ditches, lagoons, recreational amenities, landscaping, alleys and maintenance of roads. Where buildings are over 20,000 square feet in area, a wall is more than 300 feet from a fire hydrant, or over 35 feet in height, special all-weather fire access may be required to meet the local fire official's approval.

(f) *Combustibles.* For all subdivisions and land developments of property, except single-family subdivisions of four lots or less, prior to bringing any combustibles to a site the landowner shall get a determination as to whether they are in quantities deemed hazardous by the local fire official. The local fire official shall notify the county if they require a temporary or permanent water supply prior to the start of construction, and adequate access, as approved by the local fire official.

(Ord. No. 99-12, § 1 (14.240), 4-26-1999)

Cross reference—Fire prevention and protection, ch. 42.

Sec. 106-2830. General utility standards.

(a) *Compliance required.* All proposed development shall conform with all applicable standards, regulations, specifications, and permitting procedures established by any duly authorized governmental body or its authorized agents, for the purpose of regulating utilities and services. It shall be the responsibility of the developer to show that the development is in conformance with all standards, regulations, specifications, and permitting procedures.

(b) *Utility easements.* All proposed development shall provide adequate easements to accommodate all required or planned utilities and drainage. The developer shall also demonstrate that adequate provisions have been made for access to and maintenance of all easements.

(c) *Installation.* All electrical, cable, telephone, and gas utility lines in a development shall be installed according to plans and specifications approved by the respective utility companies providing such service. In addition, all such utility lines shall be installed underground, unless it is determined that a variance to allow for overhead facilities is warranted due to exigencies of construction, undue and unreasonable hardship, or other conditions to the development. Request and justification must be presented to the DRT by the respective utility company prior to final plan approval.
(Ord. No. 99-12, § 1 (14.250), 4-26-1999)

Secs. 106-2831—106-2855. Reserved.

DIVISION 4. STORMWATER MANAGEMENT STANDARDS

Sec. 106-2856. Purpose.

(a) All development shall provide adequate drainage and stormwater pollution control in conformance with this division.

(b) All development shall provide adequate stormwater runoff water treatment in accordance with the latest version of the county's manual for stormwater BMPs.

(c) No development shall cause an adverse increase in the surface runoff reaching adjacent or surrounding property. Surface runoff shall be dissipated by detention or retention on the development parcel, percolation into the soil, evaporation, or by transport by natural or manmade drainageway or conduit (protected by legal easement) to a county-approved point of discharge.

(d) Where private drainage systems and easements have been previously approved as private facilities, prior to the effective date of the ordinance from which this chapter derives, as well as all new projects, and have not been accepted by the county, such facilities shall not become county responsibility, and are to be so noted on any plat of subdivision or land development plan, as well as in the respective covenants and agreements which control or follow the property.

(e) Additionally, the county has the right to enter, enforce maintenance and/or cause maintenance of any stormwater management facility, either privately or publicly owned
(Ord. No. 99-12, § 1 (14.310), 4-26-1999)

Sec. 106-2857. Exemptions from site runoff control and drainage planning/design.

(a) Exemptions from site runoff control and drainage planning/design are as follows:

(1) Any maintenance, alteration, renewal use or improvement to an existing drainage structure as approved by the county engineer which does not create adverse environmental or water quality impacts and does not increase the velocity, volume or location of stormwater runoff discharge;

(2) Developments where adequate drainage exists of less than four residential dwelling units not part of a phase of a larger development, not involving a main drainage canal;

(3) Site work on existing one-acre sites or less where impervious area is increased by less than two percent;

(4) Site work on existing one-acre sites or less where impervious area is increased by less than two percent, and any earthwork that does not increase runoff and/or eliminate detention/retention facilities and/or stormwater storage;

(5) Agricultural activity not involving relocation of drainage canals; or

(6) Work by agencies or property owners required to mitigate emergency flooding conditions. If possible, emergency work should be approved by the duly appointed officials in charge of emergency preparedness or emergency relief. Property owners performing emergency work will be responsible for any damage or injury to persons or property caused by their unauthorized actions. Property owners will restore the site of the emergency work to its approximate preemergency condition within a period of 60 days following the end of the emergency period.

(b) Golf courses are required to comply with the latest version of the county's manual for stormwater BMPs; however, both golf courses and private lagoons shall be exempt from the flood control requirements of section 106-2859 subject to clear demonstration by the design engineer that no damaging flooding will occur during the 100-year/24-hour storm and that all other safety concerns are addressed.
(Ord. No. 99-12, § 1 (14.315), 4-26-1999)

Sec. 106-2858. Drainage easements.

(a) *Purpose; required.* Drainage easements are utilized to provide for the protection and legal maintenance of drainage systems not within a right-of-way. Drainage easements shall be required in subdivisions over any portion of a drainage system not within a right-of-way and necessary for the functioning of the system. Drainage easements for all facilities must be shown on construction drawings and approved by the county engineer. The easements shall be designated prior to issuance of a development permit and recorded in public records. The minimum allowable width of drainage easements shall be as follows:

TABLE 106-2858 DRAINAGE EASEMENTS

Drainage Systems	*Minimum Easement Width*
Closed drainage systems	(diameter + 4 feet + 2D)*
Open drainage systems	
Bottom width 20 feet or less	15 feet + BW + 2SD (30 feet minimum)**
Bottom width 20 feet to 40 feet	30 feet + BW + 2SD**
Bottom width greater than 40 feet	40 feet + BW + 2SD**
*Where:	
D = Depth from grade to pipe invert (20-foot minimum)	
**Where:	
BW = Bottom width	
S = Side slope	
D = Depth of opening	
Note: The minimum required width of drainage easements may be increased if deemed necessary by the county engineer, only for justifiable reasons.	

(b) *Location of drainage easements.* Location of drainage easements shall be as follows:

(1) *Platted subdivisions (greater than ten acres).* Drainage easements which are required within a platted subdivision shall be clearly identified on the face of the plat and included in the dedication of rights-of-way and easements. Retention/detention ponds within platted subdivisions shall be protected and platted as a separate tract of land dedicated to the entity responsible for its maintenance. If it is desired to place all or a portion of a detention/retention pond on a buildable lot, not more than 50 percent of the buildable lot can be used for this purpose, and the detention/retention pond shall be clearly marked on the recordable survey or plat of the lot indicating the location of the 25-year and 100-year storm. Additionally detention/retention ponds may be placed within the open space as permitted by this chapter. Public drainage facilities, which are located within a private subdivision, shall be granted a drainage easement by conveyance recorded in the official record books of the county.

(2) *Unplatted land.* Developments may contain drainage systems which traverse property not included in the plat. These may be adjacent lands which were not platted, future phases of the development to be platted at a later date, or may be part of an overall master plan. The drainage systems must be provided with an easement granted by conveyance recorded in the official record books of the county.

(3) *Off site.* Developments may require off-site drainage improvements in order to ensure the proper functioning of the on-site system. Such off-site improvements shall be provided with a drainage easement granted by conveyance and recorded in the official record books of the county.

(Ord. No. 99-12, § 1 (14.320), 4-26-1999)

Sec. 106-2859. Flood control design criteria.

(a) *Minimum standards.* The minimum standard for the design of stormwater facilities shall be as follows:

TABLE 106-2859 FLOOD CONTROL DESIGN STORM FACILITIES (MINIMUM)

Facility	*Design Storm*
Retention/detention ponds (with positive outfall)	25-year/24-hour
Retention/detention ponds (landlocked, w/o positive outfall)	100-year/24-hour total retention
Collector, local streets and closed drainage systems	25-year/24-hour hydraulic gradient line 1.0 feet below gutter line
Roadside swales	25-year/24-hour
Canals, major ditches	25-year/24-hour
Bridges	100-year

As an alternative to providing for the 100-year/24-hour storm, if the design engineer can clearly demonstrate that the 100-year/24-hour storm causes no flooding that is damaging within the subdivision upstream and/or downstream of the subdivision, the county engineer, at his discretion, may approve such a drainage system if it meets the intent of this chapter.

(b) *Hydrologic models.* The two accepted hydrological methods for computing surface runoff are the rational method and USDA SCS TR-55. Other methods approved by the county engineer are allowable. The rational method may only be utilized for developments up to 50 acres. TR-55 or other approved method can be used to model developments of any size. Proposed development design shall consider the hydrological features within the total watershed including the development site, upstream and downstream areas.
(Ord. No. 99-12, § 1 (14.330), 4-26-1999)

Cross reference—Floods, ch. 78.

Sec. 106-2860. General planning and design requirements.

(a) *Standards.* General planning and design requirements for stormwater management are as follows:

(1) Stormwater discharges from development including streets, parking areas, rooftops, and lawn surfaces may adversely impact water quality in county streams, lakes and tidal water bodies. Therefore, all proposed development shall comply with the stormwater pollution control requirements in the latest version of the county's manual for stormwater BMPs.

(2) Priority wetlands or other significant wetlands identified on the official county conservation district maps, or the federal National Wetlands Inventory, U.S. Department of Commerce, should not be injured by the construction of detention ponds in or near them, which deprives them of required runoff or lowers their normal water table elevations. Adjacent detention ponds that benefit retention of normal wetland water

table elevations are acceptable. If a retention or detention pond's proposed location is near a priority wetland, the applicant must provide data showing that impacts will not be detrimental to the wetland.

(3) Detention and retention ponds shall be designed with relatively flat side slopes along the shoreline, and with meandering shorelines where possible to increase the length of shoreline, thus offering more space for the growth of littoral vegetation for pollution control purposes.

(4) Detention and retention ponds shall be designed to provide at least one foot of vertical detention storage volume for runoff above the proposed design elevation. Major drainage canals shall not be used for storage where this may impact the storm hydrology upstream and downstream. Use of rectangular weir outlets will be allowed only where this weir will provide better outlet control needed for a given situation than that provided by a V-notched weir. V-shaped or V-notched weir outlets are recommended to achieve detention storage. Use of innovative outlet structures, such as pipe/culvert combinations, perforated riser pipe, or special graduated opening outlet control boxes, is encouraged as ways of reproducing predevelopment runoff conditions. Design data for storage volume and detention outlet requirements shall be submitted and approved by the county engineer prior to final plan approval, with the design of the stormwater pollution control components to be based on the latest version of the county's manual for stormwater BMPs.

(5) Where cleared site conditions exist around detention or retention areas, the banks shall be sloped to the proposed dry weather water surface elevation and planted for stabilization purposes. Where slopes are not practical or desired, other methods of bank stabilization will be used and noted on plans submitted for preliminary approval.

(b) *Direct stormwater discharge.* Planning and design requirements for direct stormwater discharge are as follows:

(1) Channeling runoff directly into natural water bodies from swales, pipes, curbs, lined channels, hoses, impervious surfaces, rooftops or similar methods shall not be approved for new development unless the county engineer has approved a stormwater pollution control plan which complies with the latest version of the county's manual for stormwater BMPs.

(2) Where specific site hardships require a modification to allow direct discharge into tidal areas without adequate stormwater pollution controls, prior approval by OCRM, DHEC, county engineer, corps of engineers (COE) and water resources commission approval is required. Granting of a modification by the county engineer will be based upon unique site hardships and the use of best available technology to reduce the water quality impacts of stormwater discharges.

(3) Dredging, clearing, deepening, widening, straightening, stabilizing or otherwise altering natural water bodies or canals may be permitted by the county engineer only when a positive benefit can be demonstrated. Such approval by the county does not obviate the need for state or federal agency approvals where applicable.

(4) Vegetative strips shall be retained or created along the banks or edges of all wetlands as part of the required setback distance. The following minimum setbacks shall be established (unless already established by OCRM Charleston, S.C. District, whichever is greater) for construction from the edge of all wetlands:

a. Single-family residential: 20 feet.

b. Multifamily residential: 50 feet.

c. Commercial or industrial: 50 feet.

d. Impervious parking areas: 30 feet.

Vegetative strips are areas completely pervious to the ground in nature and are intended to prevent pollutive runoff into fragile wetland systems. For this purpose, they shall be at least 15 feet in width and contain living plant material including but not limited to trees, shrubs, vines, ferns, mosses, flowers, grasses, herbs and ground cover. Slatted lawn furniture, accessories and decks are permitted in the vegetative strips.

A modification may be granted by the county engineer if the specific project design provides for the drainage or channeling of runoff away from natural watercourses, marshes, wetlands or tidal areas and if such runoff is filtered through a vegetated strip. Vegetative strips shall be retained or created in a natural vegetated or grassed condition to allow for periodic flooding, provide drainage access to the water body, and to act as filter to trap sediment and other stormwater pollution.

(5) No new stormwater discharge shall be permitted onto any beaches/shorelines.

(6) Final landscape designs and plantings shall not adversely impact the stormwater runoff controls and drainage concepts approved as part of the development permit approval process. Landscape design and plantings should enhance opportunities for percolation, retention, detention, filtration and plant absorption of site-generated stormwater runoff.

(7) The developer shall provide adequate outfall ditches, pipes and easements downstream from his proposed discharge if adequate public or private drainage facilities do not exist to carry the proposed discharge. If the outfall ditches, pipes and easements required for adequate drainage are larger than those needed to carry the additional proposed discharge from the development sought by the applicant, the county may bear those incremental costs which are greater than those properly allocable to the development. The county shall have the authority, however, to condition use of such expanded system by subsequent users on contributions by such users for allocable portions of the cost borne by the county.

(c) *Water surface elevations.* Planning and design requirements for water surface elevations are as follows:

(1) No developer will be permitted to construct, establish, maintain or alter the surface water elevation of any water body or wetland in such a way as to adversely affect the natural drainage from any upstream or to any downstream areas of the drainage basin on a permanent basis.

(2) The county engineer shall review and approve any water surface elevations proposed for lagoons or water bodies. The developer will submit sufficient groundwater and topographic elevation data around the proposed water body site to assist in establishing the water surface elevations.

(3) It may be required as a condition of drainage plan approval that adjustments be made to existing or approved water surface elevations if upstream or downstream areas require such adjustments to provide required drainage flows. The county may assist the developer in negotiating with the affected parties on an equitable distribution of cost under such conditions and, if necessary, initiate condemnation proceedings if the county council so deems appropriate and the developer pays all costs associated with any condemnation proceedings.

(Ord. No. 99-12, § 1 (14.340), 4-26-1999)

Sec. 106-2861. Retention/detention facilities.

(a) *Design criteria for developments.* Retention/detention facility design criteria for developments are as follows:

(1) *Peak attenuation.* The peak discharge as computed from the design storm for postdevelopment shall not exceed the peak discharge for the design storm for predevelopment or existing conditions.

(2) *Total retention.* Developments which are unable to secure a positive outfall for discharge shall retain all runoff resulting from the design storm as computed for the developed condition. As an alternate, the design engineer can comply with section 106-2859.

(3) *Water quality control.* All proposed development shall comply with the latest version of the county's manual for stormwater BMPs.

(b) *Design criteria for redeveloped sites.* Redevelopment which has no increase or a net decrease in impervious area yet lacks evidence of a functioning retention/detention facility may be required by the county engineer to retrofit the site to current county standards for peak attenuation and water quality control.

(c) *Design based on soils.* Design based on soils is as follows:

(1) The design of stormwater management facilities should be based upon soil conditions. In areas where soils have been classified under the Soil Conservation Service (SCS) Hydrologic Soil Classification System as type A or B (pervious), the overall stormwater management strategy should be that of on-site retention and infiltration into the ground.

(2) In areas where the soils have been classified under the SCS Hydrologic Soils Classification as types C and D (impervious) or A/D, B/D, and C/D (high groundwater table areas), the overall stormwater management system shall be that of providing detention basins to attenuate peak from the contributory drainage area and to settle solids washed off or eroded therefrom.

(3) Other standards are as follows:

a. Detention ponds shall be designed to attenuate peak outflows to predevelopment rates and to comply with the water quality control requirements in the latest version of the county's manual for stormwater BMPs.

b. Retention ponds intended to attenuate postdevelopment peak outflows shall be designed to provide for total retention of the design storm as computed for the developed condition, and to comply with the water quality control requirements in the latest version of the county's manual for stormwater BMPs.

c. Exfiltration systems intended to attenuate postdevelopment peak outflows shall be designed to store and exfiltrate over the duration of the storm the difference in runoff volume between predevelopment and postdevelopment. Exfiltration systems shall be designed with a safety factor 1.5 (design using 75 percent of the permeability rate or 75 percent of the time for drawdown), and to comply with the water quality control requirements in the latest version of the county's manual for stormwater BMPs.

(d) *Outfall.* Unless otherwise approved by the county engineer, outfall structures shall be as simple as possible and shall employ fixed control elevations (i.e., no valves, removable weirs, etc.). Design criteria are as follows:

(1) Detention ponds shall be required to have an outfall structure to limit peak off-site discharges to predevelopment rates. To achieve water quality control, the location of the structure and the shape of the pond shall be designed to comply with the water quality control requirements in the latest version of the county's manual for stormwater BMPs.

(2) Retention ponds may be required to provide outfall structures where deemed necessary by the county engineer. In all cases retention ponds shall be designed considering the event of a possible overflow. A path for such overflow shall be determined, and no structures in the development can be situated such that flood damage can occur either on site or off site.

(3) Exfiltration systems may be required to connect to an outfall system as deemed necessary by the county engineer. In all cases, exfiltration systems shall be designed considering the event of a system surcharge. A pathway for excess runoff shall be determined and structures in the development shall be situated such that no flood damage shall occur either on site or off site.

(Ord. No. 99-12, § 1 (14.350), 4-26-1999)

Sec. 106-2862. Open drainage systems ditches and ponds.

(a) *Access easement.* An access easement shall be provided to all drainage ponds and ditches.

(b) *Maintenance access.* Maintenance access shall be built and protected by drainage easements, as follows:

TABLE 106-2862(b) DITCH AND CANAL MINIMUM ACCESS

Ditch or Canal Width	*Minimum Unobstructed Access*
20 feet or less	15 feet, one side
20 to 40 feet	15 feet, both sides
Greater than 40 feet	20 feet, both sides
Ponds, with fencing	20 feet around pond
Ponds, without fencing	15 feet around pond
The cross slopes of maintenance berms shall be 15:1	

(c) *Grading.* Areas adjacent to open drainageways and ponds shall be graded to preclude the entrance of stormwater except at planned locations.

(d) *Side slopes without fencing.* Maximum side slopes permitted without fencing shall be allowed as follows:

TABLE 106-2862(d) MAXIMUM SIDE SLOPES WITHOUT FENCING

Open Drainageways	*Side Slopes*
Swale, ditch, or canal	3:1
Ponds (normally dry)	3:1
Ponds (normally wet)	4:1 (to 3 feet below the normal water level) 2:1 (from 3 feet to pond bottom)
Minimum bottom width for ditches or canals shall be two feet.	

(e) *Slope protection.* The disturbed areas in and around the ponds and ditches shall be revegetated as follows:

(1) Side slopes and berms: sod or hydroseed with maintenance bond.

(2) Bottom (dry ponds): grass seeded.

(f) *Fencing requirements if necessary for safety.* The following fencing recommendations are not required; however, the design engineer shall carefully take into account the following fencing criteria and determine or render a professional opinion as to the necessity of fencing as discussed:

(1) Canals will not be approved which, along easements or rights-of-way, do not meet the provisions of subsection (d) of this section.

(2) Ponds, which present a hazard, should have a six-foot chainlink fence or other accessproof fence to prevent entry to the facilities. Fences will be required for retention/detention areas where one or more of the following conditions exist:

a. Rapid stage changes that would make escape practically impossible for small children.

b. Dry bottom ponds where side slopes are steeper than 4:1 and the design high water elevation exceeds two feet.

c. Wet bottom ponds where the side slopes are steeper than 4:1 (to three feet below the normal water level and 2:1 to pond bottom).

(g) *Freeboard.* Open drainageways and ponds shall have a one-foot minimum freeboard above design high water elevation except retention ponds with positive outfall depending upon the design of the outfall structure.

(h) *Berms constructed on fill.* Where fill berms are proposed, calculations supporting the stability of the fill berms are to be submitted by the design engineer. Where excess seepage may be expected through the berm, a clay core may be required.
(Ord. No. 99-12, § 1 (14.360), 4-26-1999)

Sec. 106-2863. Roadway drainage planning and design standards.

Good roadway drainage design consists of the proper selection of grades, cross slopes, curb types, inlet location, etc., to remove the design storm rainfall from the pavement in a cost effective manner while preserving the safety, traffic capacity and integrity of the highway and street system. These factors are generally considered to be satisfied, provided that excessive spreads of the water are removed from the vehicular traveled way and that siltation at pavement low points is not allowed to occur. All proposed development shall comply with the following standards:

(1) *Roadway grade.* The minimum allowable centerline grade for all streets shall be 0.5 percent, unless otherwise approved by the county engineer only under extenuating circumstances.

(2) *Minimum centerline elevation.* Minimum centerline elevation shall be 7.5 feet NGVD. (NGVD is very close to MSL; however it is a more accurate measurement.)

(3) *Minimum cross slope.* Minimum cross slope for all streets shall be one-quarter inch per foot. All streets shall drain from the road centerline to curb and gutter or drainage ditches. Inverted crown roads shall not be permitted for roads intended for county acceptance and/or maintenance.

(4) *Drainage structures.* All drainage structures, unless specifically detailed in these guidelines, shall conform to the latest edition of the SCDOT standards or designed in conformance with good engineering practices and shall require approval by the county engineer.

(5) *Design criteria for underdrains.* All new streets shall be designed to provide a minimum clearance of one foot between the bottom of the base and the estimated seasonal high water table, or the artificial water table induced by an underdrain system. The following requirements and limitations apply to the design of underdrains:

a. The underdrain trench bottom should not be placed below the seasonal low water table elevation.

b. The distance between the bottom of the underdrain trench and the bottom of the roadway base shall not be less than 24 inches.

c. The bottom of the base course of underdrains shall be placed more than 24 inches below the seasonal high water table elevation.

d. The developer's design engineer shall provide the following design certification: This is to certify that the underdrain design for _____ road, extending from station _____ to station _____ has been designed such that the separation between the bottom of the base and the artificially induced wet season water table is no less than one foot for the entire width of pavement.

e. The installation shall be inspected by the project design engineer who shall then certify that the underdrain installation procedures and materials are in accordance with the approved plans.

f. The stormwater facilities shall be designed to accommodate expected flow contributed by the underdrain system.

g. The county shall inspect the underdrain system for compliance prior to the issuance of final approval.

(6) *Roadside swales.* Swale drainage will be permitted only when the wet season water table is a minimum of one foot below the invert of the swale. Where roadside swales are required, a positive outfall for the drainage may be required depending on the soil classification and topography. Roadside swales used for water quality control shall comply with the latest version of the county's manual for stormwater BMPs.

(7) *Curbs and gutters.* All roadway drainage not considered suitable for swale and/or ditch type drainage shall be designed as one of the following:

a. Mountable curb and gutter section: maximum 600 feet run between inlets.

b. Standard curb and gutter section: maximum 1,200 feet run between inlets.

c. Any modification to the runs in subsection (7)a. or b. of this section must be substantiated with calculations.

d. The width of curb and gutter shall be a minimum of 18 inches and shall be either standard or mountable (subdivisions only) curb and gutter, depending upon flow to be handled.

e. There shall be stabilized subgrade beneath all curbs and gutter for one foot beyond the back of curb.

f. No new water valve boxes, meters, portions of manholes, or other appurtenances of any kind relating to any underground utilities shall be located in any portion of a curb and gutter section.

g. The minimum allowable flow line grade of curbs and gutter shall be 0.5 percent, except in intersections where flatter grades shall be allowable. The tolerance for ponded water in curb construction is one-fourth inch maximum; if exceeded, the section of curb shall be removed and reconstructed to grade.

h. Plastering shall not be permitted on the face of the curb. Joints shall be sawed, unless an alternate method is used, at intervals of ten feet, except where shorter intervals are required for closures, but in no case less than four feet.

i. After concrete has set sufficiently, but in no case later than three days after construction, the curbs shall be backfilled.

j. All cross-street valley gutters shall be constructed of concrete.

(8) *Runoff determination.* The peak rates of runoff for which the pavement drainage system must be designed shall be determined by the rational method. The time of concentration, individual drainage areas and rainfall intensity amount shall be submitted as part of the drainage plans. A separate rational runoff coefficient (C) shall be determined for the specific contributing area to each inlet/catchbasin within the proposed storm sewer system. A composite C value shall be computed for each contributing area based on an individual C value of 0.9 for the estimated impervious portion of the actual area and an individual C value of 0.2 for the remaining pervious (grassed) portion of the actual area.

(9) *Stormwater spread into traveled lane.* Inlets shall be spaced at all low points, intersections and along continuous grades so as to prevent the spread of water from exceeding tolerable limits. The acceptable tolerable limits for collector roadways is defined as approximately one-half the traveled lane width. Acceptable tolerable limits for interior subdivision roadway are defined as a maximum of one inch above the crown of the road.

(10) *Low point inlets.* All inlets at low points (sumps) shall be designed to intercept 100 percent of the design flow without exceeding the allowable spread of water onto the traveled lanes as defined in subsection (9) of this section. On collector roadways, in order to prevent siltation and to provide for a safety factor against clogging of single inlet in a sump location, it is required to consider constructing multiple inlets at all sump locations or provide for other safety factors against clogging. Preferably two inlets should be constructed on each side of the roadway. Open bottom inlets are encourage in effective recharge areas.

(Ord. No. 99-12, § 1 (14.370), 4-26-1999)

Sec. 106-2864. Storm sewer design standards.

(a) *Generally.* Storm sewer design standards shall be as follows:

(1) *Design discharge.* Storm sewer system design is to be based upon a 25-year frequency event. The system shall be designed to handle the flows from the contributory area within the proposed subdivision. Then, the system shall be analyzed a second time to ensure that any off-site flows can also be accommodated. This second analysis shall consider the relative timing of the on-site and off-site flows in determining the adequacy of the designed system.

(2) *Minimum pipe size.* The minimum size of pipe to be used in storm sewer systems is 15 inches or equivalent elliptical. Unless otherwise approved by the county engineer, designs shall be based upon six-inch increments in sizes above 18 inches.

(3) *Pipe grade.* All storm sewers shall be designed and constructed to produce a minimum velocity of 2.0 fps when flowing full, unless site conditions do not allow. No storm sewer system or portion thereof will be designed to produce velocities in excess of ten fps.

(4) *Pipe clearance.* Unless otherwise authorized by the county engineer, the minimum clearance for all storm pipes shall be as follows:

a. From bottom of roadway base to outside crown of pipe: 1.0 foot.

b. Utility crossing, outside edge to outside edge: 0.5 foot.

(5) *Roadway cross pipes.* All pipes crossing arterials and collectors shall be reinforced concrete pipe.

(6) *Interference manholes.* Interference manholes shall be used only when there is no reasonable alternative design. Where it is necessary to allow a sanitary line or other utility to pass through a manhole, inlet or junction box, the utility shall be ductile iron or another suitable material. A minimum of one foot vertical clearance shall be required between the bottom of the manhole and face of utility pipe. Interference manholes shall be oversized to accommodate the decreased maneuverability inside the structure and flow retardant.

(7) *Maximum lengths of pipe.* The following maximum runs of pipe shall be used when spacing access structures of any types:

TABLE 106-2864(a)(7) PIPE SIZE AND RUN

Pipe Size (inches)	*Maximum Run of Pipe (feet)*
15	300
18	300
24 to 36	400
42 and larger	500

(8) *Design tailwater.* All storm sewer systems shall be designed taking into consideration the tailwater of the receiving facility. When the detention pond is the receiving facility, the design tailwater level can be estimated from the information generated by routing through the pond the hydrograph resulting from a 25-year frequency storm of duration equal to that used in designing the pond. Then the design tailwater level can be assumed to be the 25-year pond level corresponding to the time at which peak inflow occurs from the storm sewer into the pond. In lieu of the detailed analysis, however, a simpler design tailwater estimate can be obtained by averaging the established 25-year design high water elevation for the pond and the pond bottom elevation for dry bottom ponds or the normal water elevation for wet bottom ponds.

(9) *Hydraulic gradient line computations.* The hydraulic gradient line for the storm sewer system shall be computed taking into consideration the design tailwater on the system and the energy losses associated with entrance into and exit from the system, friction through the system, and turbulence in the individual manholes/catchbasins/junctions with the system. The energy losses associated with the turbulence in the individual manholes are minor for an open channel or gravity storm sewer system and can typically be overcome by adjusting (increasing) the upstream pipe invert elevations in

a manhole by a small amount. However, manholes can be significant for a pressure or surcharged storm sewer system and must be accounted for in establishing a reasonable hydraulic gradient line. Acceptable head loss coefficients (K) for various types of surcharged manholes/catch basins/junctions shall be used.

(b) *Culvert design.* Culvert design standards are as follows:

(1) *Minimum size.* Minimum size shall be as follows:

a. *Pipe.* The minimum size of pipes to be used for culvert installations under roadways shall be 18 inches. The minimum size of pipes to be used for driveway crossings shall be 12 inches or equivalent elliptical.

b. *Box.* Unless otherwise approved by the county engineer, box culverts shall be three feet by three feet minimum. Unless otherwise approved by the county engineer, increments of one foot in height or width should be used above this minimum.

(2) *Maximum pipe grade.* The maximum slope allowable shall be a slope that produces ten fps velocity within the culvert barrel. Erosion protection and/or energy dissipaters shall be required to properly control entrance and outlet velocities.

(3) *Maximum lengths of structure.* The maximum length of a culvert conveyance structure without access shall be as allowed in table 106-2864(a)(7). Note: For box culverts use 500 feet maximum.

(4) *Design tailwater.* All culvert installation shall be designed taking into consideration the tailwater of the receiving facility.

(5) *Allowable headwater.* The allowable headwater of a culvert installation should be set by the designer for an economical installation. When endwalls are used, the headwater should not exceed the top of the endwall at the entrance. If the top of the endwall is inundated, special protection of the roadway embankment and/or ditch slope may be necessary for erosion protection.

(6) *Design procedure.* The determination of the required size of a culvert installation can be accomplished by mathematical analysis or by the use of design nomographs.

(c) *Material specifications.* Material specifications for storm sewers are as follow:

(1) *Pipe.* Reinforced concrete pipe shall conform to the latest edition of the SCDOT Standard Specifications for Highway Construction. Corrugated aluminum pipe shall conform to AASHTO M-196, M-197, and federal spec. WW 442-C. Corrugated polyethylene pipe shall conform to AASHTO M-252, M-294, type S. All pipe shall have a minimum cover so as not to pose structural damage to pipe and as per the manufacturer's technical specifications and recommendation.

(2) *Inlets, manholes and junction boxes.* All materials used in the construction of inlets, manholes and junction boxes shall conform to the latest editions of the SCDOT Standard Specifications for Highway Construction.

(3) *Underdrains/exfiltration systems.* All materials used in the construction of underdrains shall conform to the latest edition of the SCDOT Standard Specifications for Highway Construction. The following is a list of underdrain materials acceptable for use in the county:

a. *Perforated corrugated tubing.* Corrugated, polyethylene tubing perforated throughout and meeting the requirements of AASHTO M-252 or M-294.

b. *Perforated PVC pipe.* Polyvinyl chloride pipe conforming to the requirements of ASTM D-3033. The perforations shall meet the requirements of ASTM C-508.

c. *Exfiltration pipe.* The following is a list of pipe materials acceptable for use in exfiltration systems:

1. Aluminum pipe perforated 360°, meeting the requirements of AASHTO M-196.

2. Perforated class III reinforced concrete pipe with perforations meeting the requirements of ASTM C-444.

3. Polyvinyl chloride pipe perforated 360°, meeting the requirements of ASTM D-3033.

d. *Coarse aggregate.* Clean stone containing no friable materials and a gradation equivalent to size number 56 or 57.

(4) *Drainage structures.* All materials used in the construction of drainage structures shall conform to the latest editions of the SCDOT Standard Specifications for Highway Construction. Riprap is not an acceptable material for drainage structure, but can be used for erosion control.

(5) *Fencing.* Unless otherwise approved by the county engineer, all fencing shall be six-foot chainlink or accesaproof fence with a minimum 15-foot-wide double gate opening conforming to the SCDOT specifications.

(6) *Sod, seed, hydroseed and mulch.* All sod, seed, hydroseed and mulch materials and installation shall conform to the latest edition of the SCDOT Standard Specifications for Highway Construction. See article VI of this chapter.

(7) *Modification of specifications.* The materials specifications can be modified by the county engineer based on new and/or proven technology.

(Ord. No. 99-12, § 1 (14.380), 4-26-1999)

Secs. 106-2865—106-2890. Reserved.

DIVISION 5. PARKING AND LOADING STANDARDS*

Sec. 106-2891. Applicability.

The standards and requirements contained in this division shall apply to all proposed vehicle parking areas.

(Ord. No. 99-12, § 1 (14.410), 4-26-1999)

*Cross reference—Parking, § 70-26 et seq.

Sec. 106-2892. Parking spaces required.

(a) *Determine base number of spaces.* Table 106-2892(a) lists the base number of parking spaces according to use that is allowable under this chapter. The following guidelines shall be adhered to when calculating the total number of parking spaces for all new development:

(1) The base parking space requirement may be reduced by up to 20 percent if a lower requirement is documented and certified by a transportation engineer and the request is approved by the DRT and the county transportation planner.

(2) The base parking space requirement may be increased by up to 20 percent if the additional area has a pervious surface.

TABLE 106-2892(a). OFF-STREET PARKING REQUIREMENTS FOR SPECIFIC USES

Uses	*Base Spaces Permitted*		
	Per 1,000 Sq. Ft. of Floor Area	*Per Dwelling Unit*	*Other Standard*
AGRICULTURAL			
Agriculture	—	—	—
Forestry	—	—	—
Clearcutting	—	—	—
Farmstead	—	4.0	—
Agricultural support service	2.5	—	—
RESIDENTIAL			
Single-family detached	—	3.0	—
Single-family cluster	—	3.0	—
Family compound	—	1.25	—
Planned	—	2.5	—
Multifamily (two or less bedrooms)	—	2.0	—
Multifamily (three or more bedrooms)	—	2.5	—
Commercial apartment	—	1.0	—
Community - small scale	—	—	Per individual use type and articles VI and XI
Community - medium scale	—	—	1 per bedroom
Community - large scale	—	—	
Group home	—	—	
Manufactured home community	—	2.25	—
Small single-family - affordable	—	1.25	—
HOME USES			
Day care, family	—	3.0	Plus 1 in driveway
Home occupation	—	3.0	—
Home business	—	5.0	—
Cottage industry	—	7.0	—

Uses	Base Spaces Permitted		
	Per 1,000 Sq. Ft. of Floor Area	*Per Dwelling Unit*	*Other Standard*
INSTITUTIONAL			
Auditorium, public	—	—	1 per 3 seats
Church	—	—	1 per 3 seats or per six feet of pews, whichever is greater
Clubs and associations (no food service)	8.0	—	—
Day care, commercial	—	—	1 per staff, 1 per 8 students and 1 vehicle
Fire station	—	—	4 per vehicle bay
Library or museum	3.5	—	Plus bus spaces, calculate auditorium separately at 0.75 rate
Local utility	1.0	—	—
Nursing home	—	—	0.33 per room
School: college and professional	—	—	1 per student plus 1 per teacher
School, neighborhood: elementary and middle	—	—	2 per classroom
School, community: senior high	—	—	0.25 per individual
Trade school	—	—	1.1 per student
Institutional residential, monastery, convent	—	—	1 per bedroom
Roominghouse and boardinghouse	—	—	1.5 per lodger
Police station	4.0	—	—
Post office	—	—	6 per 1,000 sq. ft. service area and 1 per vehicle
Public service	3.5	—	—
COMMERCIAL USES: OFFICE			
General	3.5	—	—
Government office	4.0	—	—
Medical	4.5	—	—
Bank/financial	4.5	—	—
COMMERCIAL USES: COMMERCIAL RETAIL			
General	4.0	—	—
Shopping center	4.0	—	—
Retail, freestanding	4.0	—	—
Furniture, carpet store	2.5	—	—
Hardware, paint and home improvement	4.0	—	—
Flea market	—	—	As required by ZDA
COMMERCIAL USES: VEHICULAR SALES, RENTAL, SERVICE			
Auto sales	15.0	—	—
General	1.5	—	Or 4 per bay, whichever is greater
Carwash (single car, automatic bay)	2.0	—	Plus 6 stacking spaces per bay and 1 drying
Carwash (multiple car, automatic bay)	4.0	—	Plus 12 stacking spaces per bay and 2 drying

Uses	Maximum Spaces Permitted		
	Per 1,000 Sq. Ft. of Floor Area	*Per Dwelling Unit*	*Other Standard*
Carwash (self-wash bay)	—	—	3 per bay
Gas station	—	—	1 per vehicular fueling position
Vehicle repair/service	1.0	—	5 per bay
COMMERCIAL USES: SERVICES			
Adult use	5.0	—	Or 1 per seat, whichever is greater
Barbershop	4.0	—	—
Beauty shop	5.0	—	—
Commercial laundry and dry cleaner	3.0	—	—
Funeral home	6.0	—	—
Laundromat	—	—	0.8 space per washer/dryer
Restaurant	12.0	—	—
All others	2.5	—	Plus 1 per employee and 1 for each company vehicle
COMMERCIAL USES: DRIVE-IN FACILITY			
Restaurant w/drive-in window	14.0	—	Plus 5 stacking spaces per window
Banking facility w/drive-in window	4.5	—	Plus 5 stacking spaces per window
Other w/drive-in window	5.0	—	Plus 3 stacking spaces per window
COMMERCIAL USES: COMMERCIAL LODGING			
Conference center w/lodging	—	—	1.2 per lodging room; if meeting space provided, 10 spaces/1,000 sq. ft.
Hotel, motel, inn, suite, w/o conference center	—	—	1 per guestroom
Bed and breakfast	—	—	1 per room including management spaces
Campground	—	—	1 per each tent, RV and trailer space
Resort	—	—	1 per room
COMMERCIAL USES: HEAVY RETAIL/SERVICE			
General	4.0	—	—
Building materials	2.0	—	—
RECREATION AND AMUSEMENT USES: OUTDOOR RECREATIONAL			
Camp, day or youth	—	—	1 per employee, plus bus
Golf course	—	—	3 per hole
Miniature golf course	—	—	2 per hole
Golf driving range or rifle range	—	—	1.25 per station
Park, playground	—	—	1 per 4,000 sq. ft. of area
Stable, commercial, equestrian facility	—	—	1 per 4 stalls, plus 1 per 2,000 sq. ft. of riding area
Swimming pool	—	—	1 per 400 sq. ft. pool surface area
Tennis court	—	—	3 per court
Athletic field	—	—	1 per 4 feet of bleacher area or 30 per field, whichever is greater
All other active recreation facilities	—	—	1 per 10,000 sq. ft.
All other passive recreation facilities	—	—	1 per acre; areas more than 50 acres: 1 per 3 acres over 50

Uses	Maximum Spaces Permitted		
	Per 1,000 Sq. Ft. of Floor Area	*Per Dwelling Unit*	*Other Standard*
RECREATION AND AMUSEMENT USES: INDOOR RECREATIONAL			
Swimming pool	—	—	2 per 200 sq. ft. pool, plus 1 per employee
Tennis/racquetball/handball	1.0	—	—
Community center	4.0	—	—
All others	4.5	—	—
RECREATION AND AMUSEMENT USES: OUTDOOR COMMERCIAL AMUSEMENT			
General	—	—	1 per 3 seats or 1.25 per playing station, whichever is greater
Outdoor arena	—	—	1 per 3 seats or per 6 ft. of bench length
RECREATION AND AMUSEMENT USES: INDOOR COMMERCIAL AMUSEMENT			
General	6.0	—	—
Amusement park	—	—	Special study
Bowling alley/pool room	—	—	5 per lane, 2 per pool/billiard table
Indoor arena	—	—	1 per 3 seats, or 1 per 30 sq. ft. of floor area used for seating, or 1 per 6 ft of bench length, whichever is appropriate
Skating rink	—	—	1 per 100 ft. surface
Theater	—	—	1 per 3 seats
INDUSTRIAL USES			
Airport	—	—	15 per daily airport movement
Commercial communication tower	—	—	3 spaces
Heavy industry	1.5	—	Plus 1 per vehicle
Light industry	2.0	—	—
Mining/resource extraction	—	—	1 per employee and 1 per vehicle
High technology industry	3.5	—	—
Regional utilities	—	—	1 per employee
Trucking (no loading or warehousing)	3.0	—	Plus 1 per vehicle operated from site
Warehousing/distribution	0.75	—	—
Waste transfer station	—	—	1 per employee and 1 per vehicle
Recycling/salvage	—	—	1 per 2,000 sq. ft. storage plus 1 per vehicle
TEMPORARY USES			
Christmas tree sales	—	—	1 per 500 sq. ft. display area
Construction staging or plant	—	—	1 per employee and 1 per vehicle
Contractor's office	4.0	—	—
Roadside stand	—	—	1 per 100 sq. ft. product area
Model home sales office	—	—	4 per unit and 1 per employee
Temporary sales	—	—	As required by ZDA
Public interest/special event	—	—	As required by ZDA

(b) *Existing nonconforming parking.* When an existing nonconforming parking lot is to incorporate additional spaces, either within the confines of the existing parking lot or through construction of new parking spaces, the parking shall be brought into conformance with this chapter.

(c) *Employee parking allowance.* When an applicant for development can demonstrate that the parking standards do not provide for sufficient employee parking, the applicant may submit a list of employees for each shift, which shall be evaluated by the DRT. The DRT may allow up to one additional parking space per each two employees not to exceed 50 percent of the total required parking spaces according to table 106-2892(a).

(d) *Shared and mixed use development parking.* The purpose of this subsection is to permit a reduction in the total number of parking spaces which would otherwise be required when any land and/or building is used or occupied by two or more uses which typically do not experience peak parking demands at the same time. Notwithstanding table 106-2892(a) pertaining to off-street parking requirements for specific uses, when any land or building is used for two or more distinguishable purposes listed in table 106-2892(d), the minimum total number of required parking spaces for land or building shall be determined by the following procedure:

(1) Multiply the minimum parking requirement for each individual use as set forth in table 106-2892(a) by the appropriate percentage as set forth in table 106-2892(d) for each of the five designated time periods.

(2) Add the resulting sums for each of the five vertical columns in the table.

(3) The minimum parking requirement is the highest sum among the five columns resulting from the calculation in subsection (d)(2) of this section.

TABLE 106-2892(d) SHARED PARKING FACTORS

	Weekday Daytime: 6:00 a.m. to 6:00 p.m. (%)	*Weekday Evening: 6:00 p.m. to midnight (%)*	*Weekend Daytime: 6:00 a.m. to 6:00 p.m. (%)*	*Weekend Evening: 6:00 p.m. to midnight (%)*	*Nighttime: Midnight to 6:00 a.m. (%)*
Residential	60	90	80	90	100
Office/industrial	100	10	10	5	5
Retail	60	90	100	70	5
Hotel, motel, inn	75	100	75	100	75
Restaurant	50	100	100	100	10
Entertainment/ recreational	40	100	80	100	10
Church	10	30	100	30	5
School	100	30	30	10	5
All other uses	100	100	100	100	100

(4) Mixed use development. The following conditions shall apply to any parking lot for mixed use development:

a. The mixed use property and shared parking lot must be located within 600 feet walking distance of the entrance to the establishment to be served.

b. The DRT shall determine, at the time of parking plan approval, concept plan approval or preliminary plan approval, whichever is applicable, that shared parking is possible and appropriate at the location proposed. Particular attention is needed to ensure that sufficient and convenient shortterm parking will be available to the commercial establishments during the weekday-daytime period. The shared parking spaces must be located in the most convenient and visible area of the parking facility nearest the establishment being served.

c. A subsequent change in use requires a new certificate of use and/or occupancy and proof that sufficient parking will be available.

d. Cross-access easements shall be established and noted on the parking plan.

e. The plat of subdivision or land development plan shall contain additional open areas in amounts equivalent to that needed to accommodate the total number of parking spaces required without applying the reductions permitted by this section.

(Ord. No. 99-12, § 1 (14.420), 4-26-1999; Ord. No. 99-21, 8-23-1999; Ord. No. 2000-14, 3-13-2000)

Sec. 106-2893. Parking lot design standards.

(a) *Surfacing.* The DRT shall encourage the use of pervious surfaces in parking lots wherever possible. Pervious surfaces may be required as part of the water quality plan for developments in the river quality overlay district. Alternative means of surfacing materials may also be authorized by the DRT in remote areas of large parking lots serving places of public assembly. Parking spaces, aisleways and access/egress lanes shall be paved and permanently maintained with asphalt, concrete or any other all-weather surface approved by the DRT.

(b) *Striping.* All parking spaces provided in conjunction with every use, with the exception of residential units with parking in garages and driveways, shall be appropriately striped and terminated with curbs, bumper blocks, or other approved marking.

(c) *Arrangements and markings.* All off-street parking areas shall be arranged and marked so as to provide for orderly and safe loading, unloading, parking and storage of vehicles, where necessary. Incidental parking spaces, aisleways, approach lanes, and maneuvering areas shall be clearly marked with directional arrows and pavement lines and markings to properly direct traffic. Each space or area for specialized parking (i.e., handicapped, employee, loading/unloading) or movement (fire lanes) shall be clearly marked or signed to indicate the intended use and shall be designed in accordance with the appropriate regulations. Dead-end parking aisles shall not be permitted unless there are no alternatives.

(d) *Curbs and wheel stops.* The location and placement of curbs and wheel stops shall take into consideration the need to manage stormwater and site drainage.

(1) *Curbs.* A continuous, minimum six-inch-high concrete curb or permanent border shall be installed around the entire parking lot. The function of such curb shall be to:

a. Serve as a wheel stop to prevent parked vehicles from extending beyond edges of parking lots;

b. Serve as edging for planting areas and islands;

c. Protect walls, buildings, and other structures;

d. Clearly define the limits of vehicular areas;

e. Physically delineate entrances and exits; and

f. Functionally separate vehicular ways from pedestrian ways.

(2) *Wheel stops.* Wheel stops shall be installed within individual parking spaces, where landscaped median or islands exist to protect landscaped areas, but shall not be used in lieu of required curbs or to delineate required interior islands.

(e) *Parking spaces in driveways.* Garages may be considered as required off-street parking spaces for all detached housing types. For attached dwellings, required parking shall be provided on driveways.

(f) *Backing movements.* With the exception of single-family or single-family attached dwellings on local streets, all required parking spaces shall be designed to prohibit backing directly onto a street right-of-way or sidewalk from the parking space.

(g) *Vehicular circulation and access.* Parking areas shall be designed to safely, conveniently and efficiently accommodate the maneuvering of all vehicles including delivery, emergency and public transit vehicles, where appropriate. For parking lots with 50 or more spaces, a minimum 40-foot deep channeled entrance/exit driveway free of turning movements shall be provided as measured from property lines.

(h) *Location of parking spaces.* Location of parking spaces shall be as follows:

(1) All parking shall be located on land zoned for the use which the parking is intended to serve. Required parking spaces shall be located not more than 600 feet from the building or use to which they are assigned. However, with the approval of the DRT, a maximum of ten percent of the spaces may be located beyond 600 feet. Valet parking may also be located over 600 feet away with DRT approval.

(2) Improved parking design and aesthetics shall be strongly encouraged through distribution of all or a percentage of parking spaces toward the rear and side areas of the proposed development.

(i) *Shared parking.* The parking spaces for separate buildings or uses may be combined in a single parking lot, provided that the number of parking spaces in the lot shall be equal to or greater than the sum of the parking spaces required for each building and use (see subsection (d) of this section).
(Ord. No. 99-12, § 1 (14.430), 4-26-1999)

Sec. 106-2894. Parking stall dimensions.

(a) *Dimensions.* The size of a typical parking space for one vehicle shall consist of a rectangular area, having dimensions of not less than nine feet by 20 feet, or according to table 106-2894, plus adequate area for ingress and egress. Parking accessibility standards for people

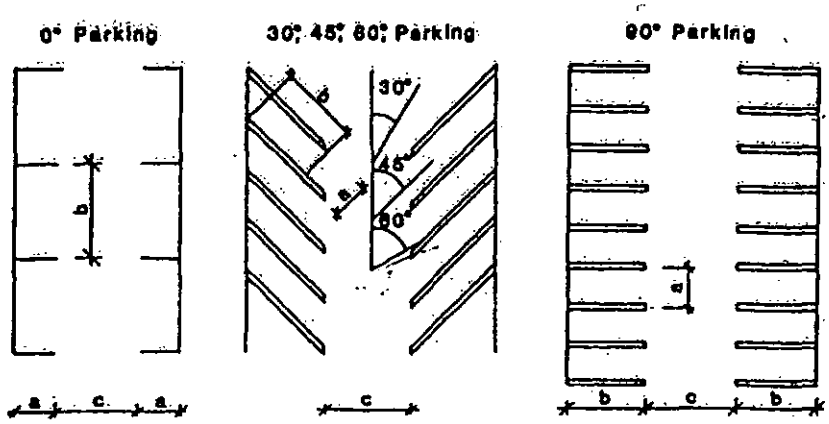
with disabilities are set forth in the Standard Building Code, 1997, table 1104.3, or as subsequently amended. Figure 106-2894 and table 106-2894 specify the minimum dimensions for standard parking rows and aisles.

(b) *Vertical clearance.* Parking spaces located within a parking structure shall have a vertical clearance of at least seven feet.

TABLE 106-2894 PARKING SPACE DIMENSIONS

Dimension from figure 106-2894	*0° Parallel (in feet)*	*30° Angle (in feet)*	*45° Angle (in feet)*	*60° Angle (in feet)*	*90° Perpendicular (in feet)*
a	8	9	9	9	9
b	21	18	18	18	18
c - one-way	12	14	16	18	22
c - two-way	22	22	22	22	22

Figure 106-2894 PARKING SPACE DIMENSIONS



(Ord. No. 99-12, § 1 (14.440), 4-26-1999)

Sec. 106-2895. Handicap parking.

(a) All uses, other than residential served by on-lot parking, shall provide parking spaces for motor vehicles which transport disabled persons in accordance with this section's standards and the Americans with Disabilities Act of 1990 (ADA), or as may be amended, whichever is more restrictive.

(b) Handicap parking spaces shall be a minimum of eight feet wide by 18 feet long with an adjacent parallel access aisle five feet wide. The adjacent parallel access aisle may be shared by two accessible parking spaces. One in every eight accessible spaces shall have an access aisle a minimum of eight feet wide (rather than five feet) and shall be signed "van accessible."

(c) Handicap parking spaces shall be located as close as possible to an entrance which allows such persons to enter and leave the parking area and building without assistance. Where feasible, this means locations where there is no need to cross vehicular access lanes or aisles. Ramps shall be provided at curbs.

(d) Handicap parking spaces shall be posted and marked with both a ground-mounted sign and pavement marking which includes the international symbol for barrier-free environments and a statement informing the public that the parking space is reserved for use by disabled persons.

TABLE 106-2895 REQUIRED NUMBER OF OFF-STREET HANDICAP PARKING SPACES

Number of Parking Spaces Provided	*Number of Handicap Spaces Required*
1—25	1
26—50	2
51—75	3
76—100	4
101—150	5
151—200	6
201—300	7
301—400	8
401—500	9
501—1,000	2%
1,001 or more	20 spaces + 1% of spaces over 1,000

(e) Residential units designed for occupancy by disabled persons shall provide one handicap parking space for each dwelling unit designed for such occupancy.

(f) Off-street parking spaces required for the disabled by this article shall count toward fulfilling this article's total off-street parking requirements.

(g) Other code guidelines for handicap accessibility to public facilities shall be in accordance with regulations issued by federal agencies, including the United States Department of Justice, under the Americans with Disabilities Act of 1990. More specifically, these regulations include 28 CFR 36 "Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities, Final Rule."
(Ord. No. 99-12, § 1 (14.450), 4-26-1999)

Sec. 106-2896. Loading.

(a) *Number of areas.* The number of loading areas shall be governed by table 106-2896.

(b) *Site plans.* Site plans involving uses which require loading facilities must be designed to ensure the functional separation between loading spaces/truck turnaround areas, and between vehicular/pedestrian areas.

(c) *Internal site circulation lanes.* Internal site circulation lanes are to be designed with adequate turning radii to accommodate the size and efficient maneuvering of delivery vehicles.

(d) *Outdoor loading bay area standards.* Outdoor loading bay area standards are as follows:

(1) *Dimensions.* Each outdoor loading bay area's minimum dimensions shall be 12 feet wide and 60 feet long. At no time shall any part of a truck or van be allowed to extend into a public thoroughfare or right-of-way while the truck or van is being loaded or unloaded. If the outdoor loading area is covered, but not totally enclosed, the minimum height of the outdoor loading bay area shall be 14 feet.

(2) *Maneuvering space.* Adequate off-street truck maneuvering space shall be provided on the lot and not within any public street right-of-way or other public lands.

(3) *Location.* All loading areas are required to be located on the same lot as the building or lot served by the loading area.

(4) *Obstructions.* All loading spaces and maneuvering spaces shall be accessible at all times.

(5) *Fire exit or emergency access.* Off-street loading facilities shall be designed to not interfere with any fire exits or emergency access facilities to either a building or site.

TABLE 106-2896 LOADING STANDARDS FOR SPECIFIC USES

Uses	*Loading Area Requirement*
AGRICULTURAL	
Agricultural support service	1 per 10,000 sq. ft.
HOME USES	
Cottage industry	1 space
INSTITUTIONAL	
Assembly	As required by ZDA
Schools, all	As required by ZDA
Protective care	As required by ZDA
Local utilities	1 space
Public services	As required by ZDA
Government office	As required by ZDA
Recreational institutional	As required by ZDA
COMMERCIAL USES: COMMERCIAL RETAIL	
Convenience store (no gas)	As required by ZDA
Paint, glass, wallpaper, hardware	1 per 25,000 sq. ft.
General merchandise	1 per 25,000 sq. ft.
Food	1 per 15,000 sq. ft.
Apparel and accessory	1 per 25,000 sq. ft.
Home furnishings	1 per 25,000 sq. ft.
Consumer electronics	1 per 15,000 sq. ft.

Uses	*Loading Area Requirement*
Miscellaneous retail	1 per 20,000 sq. ft.
Art	1 per 25,000 sq. ft.
Gifts	1 per 25,000 sq. ft.
Sporting goods	1 per 25,000 sq. ft.
Drug	1 per 25,000 sq. ft.
Liquor	1 per 5,000 sq. ft.
Books	1 per 25,000 sq. ft.
Toys	1 per 25,000 sq. ft.
Camera	None
Garden center	1 per 25,000 sq. ft.
Video rental	None
Movie theater	None
COMMERCIAL USES: OTHER COMMERCIAL	
Adult uses	As required by ZDA
Commercial lodging (hotel and motel)	1 per 10,000 sq. ft.
Conference center	1 per 60,000 sq. ft.
Convenience store with gas	As required by ZDA
Drive-through restaurant	1 per 25,000 sq. ft.
Government office	1 per 60,000 sq. ft.
Office	2 per 40,000 sq. ft.
Restaurant	1 may be in parking
Vehicular sales, rental and service	1.5 per bay
RECREATION AND AMUSEMENT	
Campground	1
Commercial amusement, outdoor	1
Indoor recreation	1
Outdoor recreation	1
Resort	1
Miniature golf course	1 per 33,000 sq. ft.
Stable, commercial/equestrian facility	1 per 40 stalls
INDUSTRIAL USES	
Airport	As required by ZDA
Heavy industry	1 per 15,000 sq. ft.
Light industry	1 per 25,000 sq. ft.
Mining/resource extraction	1 per 15,000 sq. ft. or 1.25 per bay
High technology industry	1 per 25,000 sq. ft.
Recycling/salvage	1 per 10,000 sq. ft.
Regional utility	1.25 per bay
Warehousing/distribution	1.5 per bay
Waste transfer station	1 per 20,000 sq. ft. or 1 per bay

Uses	*Loading Area Requirement*
TEMPORARY USES	
Model home sales office	1 per vehicle
Temporary sales	1 per vehicle

(Ord. No. 99-12, § 1 (14.470), 4-26-1999)

Secs. 106-2897—106-2925. Reserved.

DIVISION 6. SURVEY AND ENGINEERING REQUIREMENTS

Sec. 106-2926. Certificate of compliance.

All subdivision plats and land development plans shall include a certificate of compliance, signed by the county engineer, setting forth that the development complies with the standards set forth in this chapter and the specifications as approved by the DRT.
(Ord. No. 99-12, § 1 (14.500), 4-26-1999)

Sec. 106-2927. Survey requirements.

(a) *Generally.* Survey requirements for subdivisions specified in this chapter are only for control survey connections between geodetic survey monuments and land parcels. Boundary surveys shall be performed, in accordance with the state minimum standards published by the state board of registration for professional engineers and land surveyors unless more stringent requirements are specified. Insofar as possible, control surveys between geodetic monuments and property boundaries shall be extended from the nearest geodetic monument. County specifications for horizontal control are as provided in this section.

(b) *Survey ties to geodetic control monuments.* All subdivision and land development exceeding ten acres shall tie control of the survey to geodetic control monuments, as follows:

(1) State plane coordinates will be shown on the plan/plat, for at least two property corners. The geodetic monuments used for control will be shown on the plan/plat, with the grid distance and azimuth to the coordinated property corners shown.

(2) Horizontal ground distances (not grid distances) will be shown on the plan/plat for all segments of the boundary survey. A combined state plane coordinated, sea level reduction factor will be noted on the plan/plat. Area will be based on horizontal ground distances.

(3) All bearings will be referenced to state plan coordinate grid north.

(4) It is considered very desirable for surveyors to tie all surveys, whenever possible, to the state plane coordinate system. With the exception of closing/loan or mortgage surveys in existing subdivisions, all surveys not tied to geodetic control shall have two locator ties. A locator tie is defined as: a bearing and distance tie from a property corner to the nearest tie point; intersections of a street or right-of-way; and/or property corners on adjoining properties used in the establishment or verification of property corners.

(5) All locator tie points must be described on the plan/plat, with data given to show their location and type. The tie line shall be shown between the locator tie point and the property corner, with its bearing and distance, to an accuracy consistent with the class of survey.

(c) *Terrestrial surveys.* Standards for terrestrial surveys are as follow:

(1) If control is extended no more than one-half mile from control monument to property boundary, third-order class I (1/10,000) specifications shall be followed.

(2) If control is extended more than one-half mile from the control monument to the property boundary, second-order class II (1/20,000) specifications shall be followed.

(d) *Global positioning system (GPS) surveys.* If GPS is used, procedures shall be followed to ensure compatibility with the nearest geodetic control monuments to the accuracy specified under subsections (b)(1) and (2) of this section or two-tenths foot, whichever is the most stringent.

(e) *Electronic copy.* All subdivisions shall be required to submit a final copy of the land development plan or subdivision plat in an electronic file copy.

(f) *Monuments and markers.* Standards for monuments and markers are as follows:

(1) All property corners shall be identified with a concrete or iron rod monument. For horizontal control and to reestablish lost monuments, concrete control monuments shall be placed on each corner of the property boundary.

(2) To establish vertical control for use with setting finished floor elevations, construction of drainage systems, and benchmark monuments referenced to NGVD 1929, shall be located a minimum of one every four acres, and reference elevations shall be placed on the plan or plat.

(Ord. No. 99-12, § 1 (14.510), 4-26-1999)

Sec. 106-2928. Mapping criteria for natural or manmade features.

For subdivisions and land developments, mapping criteria for natural or manmade features are as follows:

(1) Streams (perennial, intermittent, mapped, and unmapped) with identifiable banks and beds shall have their boundaries set at the top of the bank.

(2) Initial identification of the watercourses/water bodies shall be made using the U.S. Geological Survey quadrangle maps or more accurate information, as available. Field survey verification to determine evidence and location of channelized flow is required for preliminary subdivision plats and land development plans. Vegetation shall be measured by the canopy line for the determination of areas of forest, woodlands, or trees. Other vegetation types shall be measured from the middle of the vegetation transition. Wetlands shall be measured by the U.S. Army Corps of Engineers criteria.

(3) Measurements for the boundary are to be made horizontally, perpendicular from or radial from any feature or point.

(4) Boundaries that are dependent on elevation shall be based on site elevations and shall not be interpolated.

(5) Topographic lines shall be at one-foot intervals. Where slopes exceed 25 percent, two-foot contour intervals are permitted. Five-foot intervals are permitted for slopes in excess of 50 percent.

(6) The width of existing impervious area such as roadways, parking lots, structures, sidewalks, etc., shall not count towards the area of any natural resource.

(Ord. No. 99-12, § 1 (14.520), 4-26-1999)

Sec. 106-2929. Drainage plan requirements.

(a) *General plan information.* A master drainage for a subdivision or land development plan showing all existing and proposed features shall be included in the construction plans. The plan is to be prepared preferably on a standard 24-inch by 36-inch sheet, at a scale not to exceed one inch equals 200 feet. When the drainage area will not fit on the sheet, and with the approval of the county engineer, a larger scale may be used. The following features are to be included on the drainage plan:

(1) Drainage bounds, including all off-site areas draining to the proposed development.

(2) Sufficient topographical information with elevations to verify the location of all ridges, streams, etc., at one-foot contour intervals.

(3) High water data on existing structures upstream and downstream from the development.

(4) Notes indicating sources of high water data.

(5) Notes pertaining to existing standing water, areas of heavy seepage, or springs.

(6) Existing drainage features (ditches, roadways, ponds, etc.), are to be shown a minimum of 1,000 feet downstream of the proposed development unless the ultimate outfall system is a lesser distance.

(7) Drainage features, including location of inlets, swales, ponding areas, etc.

(8) Delineation of drainage subareas.

(9) Include water quality control facilities, including ingress/egress areas, supplemental BMPs (e.g., swales), dedicated natural open space boundaries and other information required to comply with the latest version of the county's manual for stormwater BMPs.

(10) General type of soils according to the latest soil survey of the county.

(11) Flood hazard classification.

(12) Description of current ground cover and/or land use.

(13) Cross sections and/or profiles of retention/detention facilities, typical swales, ditches or canals.

(14) All driveway pipe size and inverts will be shown on the site plan and installed at time of and as part of the building and driveway construction. Minimum driveway pipe shall be 12-inch RCP with all pipe having flared ends or similar as approved by the county engineer.

(15) Drainage rights-of-way, or easements.

(16) Typical fencing detail.

(17) Note on the drainage plans that an erosion control plan will be submitted to the ZDA or DRT. The erosion control plan shall be in accordance with state and/or federal laws concerning erosion control, and shall require county engineer approval prior to any construction and permitting.

(b) *Final plat.* The overall drainage plan shall be placed on the final plat, showing proposed finished contour elevations for the entire subdivision and proposed minimum first floor elevations of all proposed structures. This overall drainage plan shall be prepared by a professional engineer and shall require approval by the county engineer.

(c) *Subsoil investigation.* A subsoil report by a professional engineer may be required by the county engineer. A minimum of two locations per retention/detention area shall be delineated in order to determine the location of groundwater elevation and/or soil conditions.

(d) *Stormwater calculations.* Stormwater calculations for retention/detention areas, including design high water elevations for the 25-year and/or 100-year storm events, shall include but not be limited to the following storm sewer tabulations:

(1) Locations and types of structures.

(2) Types and lengths of line.

(3) Drainage subarea tributary to each structure.

(4) Runoff coefficient per subarea.

(5) Time of concentration to structure.

(6) Hydraulic gradient for the 25-year frequency storm event.

(7) Estimated receiving water (tailwater) elevation with sources of information, if available.

(8) Diameters of pipe.

(9) Outlet and other pipe velocities.

(10) Calculation worksheet which demonstrates that the proposed water quality controls comply with the latest version of the county's manual for stormwater BMPs.

(e) *Off-site improvements.* Cross sections showing all existing and proposed topographic features within a right-of-way shall be plotted at 50-foot intervals or as approved by the county engineer, and at all locations where the roadway features change significantly. Plotted centerline profile of the existing and proposed roadways shall also be required.

(f) *Planning and design certification.* Planning and design certification is as follows:

(1) Professional engineers, registered in the state, shall prepare a detailed drainage report and design plan and certify all subdivision grading, drainage, roads, parking lots, and water and sewer systems. Tier B land surveyors, registered in the state, may design and certify drainage systems as limited by state regulations. An as-built field survey shall be submitted to the county engineer showing controlling stormwater invert elevations and spillways and outlet structures of commercial and industrial developments and residential developments requiring drainage systems.

(2) Landscape architects, registered in the state, shall certify drainage features pertinent to their landscape design drawings. Design engineers or landscape architects may perform, design and/or certify their plans in accordance with state rules and regulations governing their professions.

(Ord. No. 99-12, § 1 (14.530), 4-26-1999)

Secs. 106-2930—106-2955. Reserved.

DIVISION 7. PERFORMANCE GUARANTEES

Sec. 106-2956. Applicability.

All improvements required by this chapter for roads, water, sewer, drainage, and detention, as well as other improvements such as lighting, landscaping, and bufferyards, shall be installed prior to obtaining a certificate of occupancy or recording the plat. A developer may also submit surety.

(Ord. No. 99-12, § 1 (14.610), 4-26-1999)

Sec. 106-2957. Cost estimates and surety.

If surety is offered pursuant to this chapter, the developer's engineer shall submit a cost estimate for road, water, sewer, storm drainage, detention, lighting, and any off-site improvements. The designers of the landscaping, buffers, and/or other improvements shall submit cost estimates. Valid bids from contractors may be substituted for cost estimates. The DRT shall review all bids, checking for consistency with similar bids or public bids, to ensure they are reasonable. A surety shall be required in the amount of 125 percent of the cost estimates. Surety shall be valid until released by the ZDA and/or county engineer.

(Ord. No. 99-12, § 1 (14.620), 4-26-1999)

Sec. 106-2958. Form of surety.

Surety required under this chapter shall be cash, an irrevocable letter of credit approved by the county attorney, or other such equivalent surety.

(Ord. No. 99-12, § 1 (14.630), 4-26-1999)

Sec. 106-2959. Release of surety.

Upon completing all or part of required improvements under this chapter, the developer may request a reduction or closure of the surety. The DRT shall then have the development inspected by the ZDA and/or county engineer or designees. Any deficiencies shall be identified and the developer notified in writing of the deficiencies. If all work is complete and a maintenance bond provided, the surety shall be closed. If 25 percent of the work has been completed or is in stages identified in the original cost estimates, the surety shall be reduced. (Ord. No. 99-12, § 1 (14.640), 4-26-1999)

Sec. 106-2960. Calling surety.

Under normal circumstances pursuant to this chapter, the developer should finish construction of improvements well before the surety expiration date and will, on his own initiative, request inspection and reduction or closure of the surety. If construction has not been completed at least 60 calendar days prior to the surety expiration date, the DRT shall inspect and send a report to the developer indicating items to be completed by 30 calendar days prior to the expiration date. Should the developer want additional time, a new surety covering the time (minimum six months) shall be submitted to the DRT. If all work is not completed or an extended surety has not been presented at least 30 days prior to expiration, the ZDA or county engineer shall notify the county attorney to call the surety so the work can be completed. (Ord. No. 99-12, § 1 (14.650), 4-26-1999)

Sec. 106-2961. Maintenance guarantee.

Upon completing the improvements required under this chapter, the surety will be reduced or eliminated. A maintenance guarantee of ten percent of the actual construction cost for road and drainage facilities shall be deposited with the county for anticipated maintenance for a period of two years after the completion of all improvements.
(Ord. No. 99-12, § 1 (14.660), 4-26-1999)

Secs. 106-2962—106-3000. Reserved.

ARTICLE XIV. MODULATION OF STANDARDS

DIVISION 1. GENERALLY

Sec. 106-3001. Purpose.

This chapter uses established industry standards in many of the sections contained in this chapter. In other cases, uncommon situations that cannot meet the standards have been anticipated and logical modifications of the standards provided. Specific standards are

TABLE 106-1815(2) NONRESIDENTIAL USE CAPACITY CALCULATION

Calculation 1:	Enter base site area (table 106-1814, calculation 1)		ac.
	Subtract protected resource land (table 106-1814, calculation 4)	–	ac.
	Equals buildable land, site	=	ac.
Calculation 2:	Enter base site area (calculation 1)		ac.
	Multiply by minimum landscape surface ratio (table 106-1526)	×	
	Equals minimum landscaped area	=	ac.
Calculation 3:	Enter base site area (calculation 1)		ac.
	Subtract minimum landscaped area (calculation 2)	–	ac.
	Equals buildable land, district	=	ac.
Calculation 4:	Enter calculation 1 or 3, whichever is less		ac.
	Multiply by maximum net floor area ratio (table 106-1526)	×	
	Equals maximum floor area in acres	=	ac.
		×	43,560
	Multiply by 43,560 to determine maximum floor area in square feet	=	sq. ft.
Calculation 5:	Minimum landscaped surface calculation 1 (total protected land) or calculation 2 (minimum landscaped area), whichever is greater	=	ac.

(Ord. No. 99-12, § 1 (05.140), 4-26-1999)

Secs. 106-1816—106-1840. Reserved.

DIVISION 3. NATURAL RESOURCE PROTECTION STANDARDS

Sec. 106-1841. Scope.

This division contains performance standards and mitigation requirements for the various types of protected natural resources found in the county. Only certain uses are permitted in protected resource areas. Table 106-1876 lists use permissions for each type of resource.
(Ord. No. 99-12, § 1 (div. 05.200), 4-26-1999)

Sec. 106-1842. Tidal wetlands.

Water dependent facilities shall be the only use permitted in tidal wetland areas according to the following additional standards:

(1) All proposals for this use shall require the approval of a special use permit.

(2) An environmental impact assessment shall be submitted by the applicant that indicates the design: (i) minimizes the impact on the wetlands, and (ii) is such that

there is the maximum sharing of the facility to avoid having every property in the area seek a similar request. This may mean shared facilities for the entire development or facilities that can serve several adjoining properties.

(3) Approval by the Army Corps of Engineers and OCRM shall be required.

(Ord. No. 99-12, § 1 (05.210), 4-26-1999)

Sec. 106-1843. Nontidal wetlands.

(a) Farm ponds of less than three acres shall not be considered wetlands by the county and may be filled, provided their stormwater capacity is preserved at another location on the same stream, subject to Army Corps of Engineers' and/or OCRM approval.

(b) Where structures are necessary to a permitted use and cannot be located outside the wetland, the structure shall be located on piles. Where needed, access shall be provided on structures such as boardwalks.

(c) Cases may exist where protection is not a reasonable alternative and mitigation is an acceptable solution. Mitigation is permitted only under the following conditions:

(1) In the U, CR, CS, LI, IP and RD districts, the use intensity is so high that retained wetlands of less than one acre have increased potential to become degraded habitats or, if the retention of the wetland would be isolated, difficult to adequately provide proper water levels to preserve existing vegetation, subject to invasive, nonnative species, would have a greatly reduced habitat value, or serve no significant stormwater or water quality benefit, and subject to the following requirements when such areas are to be filled or severely disturbed:

a. A mitigation plan has been approved, designating the area in which the site is located as a mitigation area; or

b. Mitigation will actually provide larger, more easily protected and managed on-site wetland areas. This permits consolidating many small wetlands into a single wetland management unit. If the county and SCDHEC/OCRM develop a mitigation bank or the U.S. Army Corps of Engineers and other agencies establish a fee-based mitigation program, the county in consultation with SCDHEC/OCRM will permit off-site mitigation when the county finds that the mitigation meets all other standards of this chapter and the site cannot be developed to permitted development intensities without the mitigation, or would be an undesirable development without the off-site mitigation; and

c. The wetlands to be mitigated are not, and cannot, easily become part of an interconnected area that provides drainage and flood storage; and

d. The wetland area to be filled is not more than one acre or 20 percent of the mitigation area, whichever is less.

(2) In all districts where, due to parcel shape and interaction with topography, reshaping the wetland boundary is necessary to provide a reasonable building site, minor filling is permitted provided that:

a. Less than ten percent of the wetland area or less than two acres, whichever is less, is disturbed; and

b. High quality wetland areas and wetlands containing rookeries are avoided.

(3) In all districts where the wetlands are less than one-quarter acre and not connected to a stream or drainage corridor.

(4) All fill and mitigation shall meet this chapter's requirements or U.S. Army Corps of Engineers' permit requirements, whichever are more stringent. In either case, a permit shall be required.

(5) The current drainage pattern shall be submitted for all subdivisions or land developments containing a wetland. The stormwater management system shall ensure an adequate flow of water to maintain the wetland. OCRM shall sign off on the adequacy of the drainage before a final plat is approved.

(Ord. No. 99-12, § 1 (05.220), 4-26-1999)

Sec. 106-1844. Beach-dune.

(a) *Applicability.* The standards of this section shall apply to site design and development in the beach-dune area.

(b) *Preservation of sand dunes.* No primary dune shall be leveled, breached, altered, or undermined in any way, nor shall vegetation on the primary dune be disturbed or destroyed, with the exception of construction of boardwalks or similar beach accesses. Such pedestrian accesses shall be designed and oriented to have minimal effect on the natural features or vegetation of the dune. The county may require shared accesses by elevated walkways.

(c) *Public beach access required.* Public beach access shall be provided by the developer for any development including more than 1,000 feet of beach frontage, according to subsection (d) of this section.

(d) *Option to purchase beach access.* Upon filing of a preliminary application for an oceanfront development plan with the department, the county shall have an option to purchase reasonable beach access as deemed necessary for the benefit of the public. The county's option to purchase beach access shall run from the date of first submission of plans to the department to the date of the second regular county council meeting following the proposed permit issue date of the DRT, but in no case shall the option period be more than 90 days from the date of first submission of plans. The department shall review all proposed oceanfront development as to the need for public beach access and shall recommend to the county council what action it feels the county should take with regards to public beach access areas in the best interest of the general public. The county council shall notify the developer of its intentions on the option by the end of the specified option period and shall, if electing to purchase the beach access area, have a period of 30 days and one extension period of 30 days from the end of the option period

to negotiate the terms of the purchase with the developer. The county council may require an appraisal of the required beach access area by a board of at least three independent appraisers in order to establish the basis for a purchase offer to the developer for the beach access area.

(e) *Beach development setbacks.* No development shall be undertaken except in compliance with this section. Furthermore, the requirements of this section shall be included as covenants and restrictions for all subdivision development that contains beach-dune areas located on the seaward side only of the barrier islands (i.e., Bay Point, Capers, Daufuskie, Fripp, Harbor, Hilton Head, Hunting, Pritchards and St. Phillips Islands).

(1) No building or other structure shall be located or constructed in such a manner as to destroy, undermine, or alter any primary sand dune or disturb primary dune vegetation.

(2) At a minimum, no structure, septic tank, or tile field shall be constructed within 50 feet landward of the OCRM baseline, except for beach cabanas of 144 square feet or less in size. No cabana with a permanent roof shall be permitted seaward of the baseline. Shore perpendicular beach boardwalks shall also be permitted per section 106-1911(b) Beach-dune; however, no further encroachment towards the sea shall be permitted.

(f) *Additional studies/reports.* A beach protection plan shall be submitted as part of the required environmental impact assessment and will indicate how the developer plans to preserve sand dunes and shore vegetation.

(g) *Barrier island beach-dune lighting standard.*

The Beaufort County Council finds that the barrier island beaches of Beaufort County serve as nesting habitat for endangered and threatened sea turtles. Coastal development threatens the long-term survival of turtle hatchlings since evidence directly implicating lighting on barrier island beaches and reduced sea turtle nesting has been documented by numerous studies (Witherington 1992b). Artificial lighting near the nesting of sea turtles resulted in dramatic decreases in nesting attempts by sea turtles, including habitat loss, disorientation and eventual death (Raymond 1984a, Witherington and Martin 1996). The Endangered Species Act of 1973 prohibits all killing, harming and harassment of six species of sea turtles (including the Loggerhead). Therefore all lighting for parcels abutting barrier island beaches and dunes shall adhere to the following standards: Existing development abutting barrier island beaches and dunes shall be required to retrofit all lighting fixtures to conform to the following standards by May 1, 2002, in order to ensure that no light is visible from the barrier island beaches or dunes.

(1) Pole lighting shall be bollard louver lighting five feet tall or less that blocks the light source from view and contains illumination within an area of three to less than 73 degrees on the seaward side of the pole (refer to Figure 106-1743 for types of luminaries). Outdoor lighting shall be held to the minimum necessary and, where possible, shall be low pressure sodium for security and convenience.

(2) Bollard lighting shall be used in parking lots and shall be positioned so that no light is visible from the barrier island beaches or dunes.

(3) Lights mounted on walls, steps and balconies shall be fitted with louvers or hoods and at a height from the floor of three feet or less in order that the lights illuminate only the balcony and will not be visible from the barrier island beach or dunes.

(4) Tinted or filmed glass or solar screens and drapes shall be used in windows facing the barrier island beaches or dunes during the period indicated by subparagraph (g)(7).

(5) All lighting illuminating buildings or associated grounds for decorative or recreational purposes shall be shielded or screened such that it is not visible from any barrier island beaches or dune during the period of May 1 to October 31 of every year.

(6) Additional landscaping shall be required when necessary mitigate impacts from development on nesting areas.

(7) This section shall be in effect from dusk to dawn during the sea turtle nesting and hatchling period of May 1 to October 31 of every year.

(8) All other lighting must be shielded so that it is not visible from any barrier island beaches or dunes during the period of May 1 to October 31 of every year.

(Ord. No. 99-12, § 1 (05.230), 4-26-1999; Ord. No. 2001-15, 6-11-2001; Ord. No. 2005/7, 2-28-2005)

Cross reference—Public beaches, § 90-61 et seq.

Sec. 106-1845. River buffer.

The river buffer extends inland 50 feet from all tidal waters and wetlands beginning at the OCRM critical line. The following standards are required for all development affecting the river buffer:

(1) *Drainage.* The county engineer shall require BMPs according to the latest version of the county manual for stormwater BMPs in the design of drainage and detention basins. Additional special engineering may be required where the county engineer requires it to protect the nearby waters or wetlands. All drainage shall be diverted away from the OCRM critical line, and through a county-approved stormwater system employing BMPs. The lots adjoining the river buffer shall be designed and engineered to prevent direct discharge from impervious surfaces across the river buffer. All discharges shall be diverted into the development's stormwater system and treated as required by this chapter. Existing agricultural uses are exempt from this subsection, but are strongly urged to utilize BMPs. New agricultural uses shall comply.

(2) *Bulkheads, rip-rap and erosion control devices.* All bulkheads, rip-rap or other erosion control devices in the river buffer are limited uses, subject to the required standards below.

a. A permit to construct the bulkhead, rip-rap or erosion control device must have been issued by OCRM.

b. Application for a permit for the installation of a bulkhead, rip-rap or other erosion control device more than 48 inches in total vertical height from the existing

ground elevation must submit design plans, including certification from a South Carolina registered professional engineer as to the adequacy of the design standards included to prevent collapse or other failure.

c. The provisions of subsection 106-1846(b), tree protection and specimen trees, must be met.

d. Disturbance of more than 2,500 square feet of shoreline within the river buffer landward of the SC critical line shall require submission of a revegetation plan. A principal objective of the plan is to preserve and replace as much of the on-site preconstruction vegetation to the extent possible. Other acceptable landscaping plants are found in the SC DHEC publication entitled "Backyard Buffers", publication CR-003206 (11/00). Such plantings shall be in the quantities set forth in Table 106-1680(e) for a maritime forest on a disturbed area prorated acre basis, i.e., a one-tenth of an acre disturbance requires one-tenth of the bufferyard planting, unless soil conditions are unfavorable to establish this type of forestation, in which case a revegetation plan more suitable for the type of soil conditions will be accepted.

e. Revegetation of areas landward of the critical line, having sloping topography in excess of 1:3 slope, shall also include slope stabilization measures in compliance with SC DOT standards, as set forth in section 205, Embankment Construction, of the SCDOT Standard Specifications for Highway Construction, Edition of 2000.

f. Landscaping and construction design plans will be submitted to the zoning development administrator (ZDA), who shall issue a development permit for construction and land disturbance if these criteria are satisfied. Inspection of the construction and landscaping shall be done by the Beaufort County Building Inspection Department as provided for building permits.

(3) *View corridor.* The landowner may provide a view corridor through the river buffer. The following standards shall apply:

a. Such a view corridor shall not extend for more than 75 feet or one-third of the lot width, whichever is less.

b. The view corridor shall generally involve only pruning to provide views. However, a landowner may submit a selective clearing and selective landscaping program for the view corridor. This shall only be approved by the DRT if the net result provides both ample screening of the shoreline and filtering of runoff from lawns on the lots.

(4) *Setbacks.* The following setbacks from the OCRM critical line shall apply to all new development:

a. Single-family detached and duplex buildings shall be set back 50 feet.

b. All other residential buildings shall be set back 100 feet.

c. Nonresidential buildings, parking lots, and drives shall be set back 100 feet.

d. Tile fields or septic tanks are prohibited in the river buffer, and shall not be placed within 100 feet of the OCRM critical line.

e. Agricultural uses and golf courses shall be set back 150 feet.

(5) *Waiver.* Where existing conforming or nonconforming lots are so small that a single-family house cannot be built to meet the required critical line setbacks, the DRT may grant a waiver with strict adherence to following standards:

a. The test of whether a waiver can be granted shall be based on the average size of homes within five lots on either side of the proposed house. If there are no homes within this area, a floor area ratio on the lot of three-tenths or maximum building footprint (liveable area) of 15 percent of the total lot, whichever is less, shall guide the need for a waiver.

b. New homes shall be designed so that they do not encroach into the critical line setback area. Applicants for waivers shall prove to the DRT that design alternatives such as adding a second or third story, adjusting house dimensions, reducing overall house size, etc., would still render the noncritical line setback area as unbuildable.

c. The DRT shall be empowered to reduce the street or front yard setback by 30 percent in order to avoid the need for a waiver. In developments that are largely unbuilt, with lots still in common ownership, the county shall require the developer to revise covenants to grant reduced street setbacks. The street setback reduction shall be the minimum possible.

d. The critical line setback shall not be reduced to less than a 35-foot setback, except in areas where homes already existing on nearby lots are located closer than 35 feet. In those cases, the average critical line setback of adjoining lots shall be used, provided that in no case shall a setback of less than 20 feet be granted, unless the setback is to preserve a specimen tree, historic resource, or to prevent a lot from becoming unbuildable with comparable houses as described in subsection (4)a of this section.

e. If the house and lot do not drain to a stormwater management system that uses BMPs pursuant to subsection (1) of this section, the DRT shall require the individual landowner to provide the necessary stormwater management on the lot.

f. The DRT shall also be empowered to grant a waiver in order to protect specimen trees and historic resources or to prevent a lot from becoming unbuildable with comparable houses as described in a., above. In such cases, the DRT shall approve a building envelope that will optimize the protection of all resources.

(Ord. No. 99-12, § 1 (05.250), 4-26-1999; Ord. No. 99-21, 8-23-1999; Ord. No. 2000-6, 2-14-2000; Ord. No. 2002-34, 12-9-2002)

Sec. 106-1846. Forests.

(a) *Standards for cutting over large area.* In residential developments, forests may be cut over a greater area than permitted in table 106-1782 only if mitigation is provided and the following standards are met:

(1) The mitigation shall be required due to unique conditions on the site that make it impossible to meet the protection standards due to site size, shape, utilities, or other elements that are unique to the property.

(2) A tree survey (see subsection (c) of this section) of the site's forest is conducted. The best forests, in terms of percentage of climax vegetation, tree size, tree health, and habitat value, shall be preserved.

(3) The protection level given forests shall not be less than 80 percent of that required in table 106-1782. Thus, a forest with a protection level of 40 percent could be reduced to 32 percent.

(4) The land on which the mitigation is to occur may be on site where adequate land is available to achieve the required mitigation level. The land on which mitigation is to occur may be off site, if within an approved mitigation bank area only in the urban district where existing lots are too small to permit preservation. All land used for mitigation shall be preserved as permanent open space.

(5) Mitigation shall include planting 1.25 acres of new woodland of comparable species for every one acre of disturbed mature or young forest for which mitigation is required.

(6) The plant material in the mitigation area shall be determined based on a tree survey of the disturbed area in total inches dbh. The mitigation shall be 1.25 times the total inches of dbh and consist of similar species of trees. All trees shall be a minimum of 2.5 inches caliper.

(7) The plant species used in mitigation shall be similar in percentage to those destroyed.

(b) *Tree protection and specimen trees.* In areas of forest that are not protected per section 106-1782, or areas that are not classified as forests, all trees shall be protected as indicated in this subsection. Prior to any clearing or development approval, except bona fide forestry management, the applicant shall provide a tree survey (see subsection (c) of this section) of the

areas in which building or construction activities are planned. Areas that are to be preserved as protected forest need not be surveyed. A tree survey shall be made of all trees greater than eight inches dbh and all specimen trees (see appendix E). If feasible, all trees greater than eight inches and all specimen trees shall be preserved through careful site planning. Furthermore, on any individual single-family residential lot, where an existing dwelling unit is already present, a homeowner may remove any type of tree excluding specimen live oak (*Quercus virginiana*) trees in any zoning district. For purposes of this section, a specimen live oak (*Quercus virginiana*) tree shall be classified as a live oak (*Quercus virginiana*) tree greater than 12 inches dbh. The Beaufort County Codes Enforcement Officers shall be required through permitting to inspect to insure compliance. Nothing in this section shall be construed to allow the removal of trees from a required buffer.

(1) All trees covered by this subsection shall be protected unless the landowner can demonstrate that:

a. The site plan has used clustering to the maximum extent allowed to preserve trees.

b. The trees sought to be cut cannot be saved by modifying setbacks or construction envelopes in accordance with article XIV (Modulation of Standards).

c. The trees are in the rights-of-way of roads and small adjustments of individual lots cannot be made to the site plan to save the trees without losing lots or floor area.

(2) Conspicuous barrier fencing must be erected around a tree or group of trees to be preserved and protected from encroachment prior to site work or construction commencing and remaining in place until the certificate of compliance is issued (see section 106-1648). The tree protection zone shall be a circle with a radius of one foot for every one inch of dbh or five feet, whichever is greater. The DRT may approve an alternate tree protection zone, if it can be determined by a certified forester that a specific design or protection will not injure any tree under consideration. In no case shall the circle of protection be less than one half of the total diameter required by the formula in this subsection (b)(2).

(3) Excluding single-family homeowners as set forth in subsection 106-1846(b) above, tree removal shall be accomplished upon written certification only by a certified arborist or forester, stating that tagged trees are diseased and can be removed. The priority for preservation shall be healthy trees, as follows:

a. Highest priority: specimen trees over 24 inches dbh.

b. High priority: other trees over 24 inches dbh and specimen tree species over 12 inches dbh.

c. Medium priority: any tree over eight inches dbh and any specimen tree not meeting the requirements of the higher priorities.

d. Low priority: all other trees.

(4) Where individual trees over 24 inches dbh or specimen trees over 16 inches dbh are to be cut, the developer shall plant sufficient trees having a caliper in excess of 2.5 inches each so as to exceed the dbh of the tree or total trees lost. Such trees shall be of the same species as those cut unless the DRT requires other species to enhance the diversity to that similar to the native forest areas. All mitigation trees shall be planted within the disturbed area of the site.

(5) The saving of existing non-specimen trees is encouraged and may be utilized in some cases to meet the requirements of subsection (4) above pertaining to replacement of trees that are approved for removal. Existing trees used for mitigation must be located within the disturbed area of the site.

(6) Easements and rights-of-way. Removal of specimen trees during the construction or maintenance of easements or rights-of-way for water, sanitary sewer, electricity, telephone, natural gas, cable, storm drainage, telephone, or other service lines, shall be exempt from the requirements of this section provided that the applicable company or agency has executed an agreement with the county that:

a. Recognizes the need to minimize trimming of hardwood overstory trees that do not significantly interfere with the intended purpose of construction or maintenance;

b. Establishes, to the extent practicable, design guidelines for construction and maintenance which identifies the saving of hardwood overstory trees as a factor to be considered in the design process;

c. Establishes guidelines to avoid topping, or severe pruning of trees whenever reasonably practicable, and where it is unavoidable, to do so in the manner which is most aesthetically and ecologically acceptable to the county;

d. Provides for a consultation process with the planning department, including, when necessary, review by a certified arborist approved by the county, prior to the commencement of major construction or maintenance or the removal of any hardwood tree over 16 inches DBH;

e. Provides for submittal of annual line clearing plans to the planning department for review;

f. Provides that a breach of such agreement constitutes a violation of this subsection and thus a loss of exemption from the tree protection provisions of this article; and

g. Provides that appeals of administrative decisions made pursuant to such agreement shall be to the ZBOA in accordance with the procedures set forth in section 106-787.

(7) Where the DRT determines that the required replacement of trees is not feasible or not desirable due to the size and shape of property and/or structures, crowding of the trees to where thinning will be required, other design limitations, or other viable site constraints, such reduction shall be subject to a general forestation fee. This fee shall

be the actual and verified cost of the required tree replacement eliminated per tree reduced and shall be paid to the county treasurer before final approval is given for the development plan. The funds collected through this forestation fee shall be used by the county to plant trees and other landscaping in highway medians, along roads, to provide plants for affordable housing projects or on other public properties as deemed appropriate.

(8) Trees that are used as rookeries (even in nonwetland areas) shall not be cut.

(c) *Tree surveys.* Detailed tree surveys shall be required for any land development that is not exempt from the standards of this chapter. Tree surveys shall be required in all nonforested areas as indicated in subsection (b) of this section and consist of the following:

(1) Tree surveys shall include all trees eight inches dbh and larger, and dogwoods (*Cornus spp.)*, magnolias (*Magnolia spp.)* and redbuds (*Cercis canadensis)* 4 inches dbh and larger.

(2) In all forested areas, tree surveys shall first identify areas of forest by the various categories of forest listed in table 106-1782, and any endangered species area. A detailed tree survey locating individual trees shall be required only where areas of the forest are to be cut.

(3) The tree survey shall be conducted for 75 feet on either side of the tree protection line. This will permit accurate determination of the actual area of protection. The tree survey shall provide size and drip line for all trees in the area where cutting will occur. The actual protection line shall be drawn so that only trees having more than 75 percent of the diameter of their canopy outside the protection fence line may be counted as preserved (see figure 106-1846(c)).

(4) The tree survey may be conducted by a certified arborist, forester, wetland scientist, botanist or registered landscape architect or surveyor. All tree surveys shall be certified by a registered land surveyor. Each tree surveyed shall be referenced in the required report, including the type, size, and condition of the tree, and submitted as part of the application for development.

(5) A tree survey shall be less than five years old beginning from the application submission date for which the survey pertains. The ZDA or DRT shall require that a new tree survey be undertaken, at the applicant's expense, when it has been determined that a tree survey is invalid.

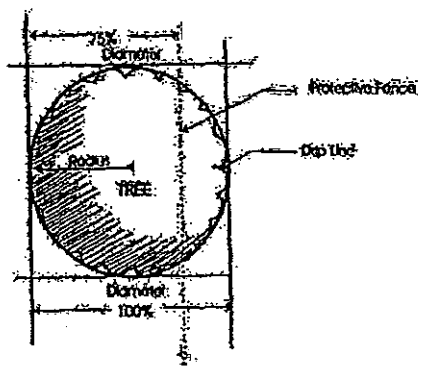


Figure 106-1846(c) TREE PROTECTION LINE

(Ord. No. 99-12, § 1 (05.260), 4-26-1999; Ord. No. 99-21, 8-23-1999; Ord. No. 2000-11, 2-28-2000; Ord. No. 2000-26, 6-12-2000; Ord. No. 2001-5, 3-12-2001; Ord. No. 2007/9, 2-12-2007)

Sec. 106-1847. Endangered species.

(a) The protection needs of endangered species are, in part, dependent on the type of species.

(b) The county shall maintain endangered species maps of the areas identified as having endangered species. Applicants shall refer to these maps and united states fish and wildlife service (USFWS) data to determine whether there are endangered species on a proposed development site. All endangered species areas shall be given 100-percent protection. In addition, secondary protection areas may be established. No development shall take place in these areas.

(c) Any site or development that contains an endangered species area or affects a nearby property containing endangered species shall require an endangered species protection plan for approval by USFWS, prior to approval of a plat of subdivision or land development plan by the DRT. The actual species location, primary protection area, and secondary protection areas shall be protected as an endangered species area in the site capacity analysis calculations, beginning with table 106-1814.
(Ord. No. 99-12, § 1 (05.270), 4-26-1999)

Sec. 106-1848. Flood hazard area.

(a) *Applicability.* All standards in this section shall apply to site design and development undertaken within the flood hazard area.

(b) *Flood hazard design standards.* Flood hazard design standards shall be as follows:

(1) All requirements of the county building codes related to construction in flood hazard areas shall be met.

(2) Engineering plans and specifications shall be submitted showing that adequate design has been incorporated to ensure to the maximum extent possible that:

a. Water supply systems will be constructed to preclude infiltration by floodwaters;

b. Wastewater disposal systems, including septic tanks, will be constructed to preclude infiltration by floodwaters; and

c. Types and construction of fill materials used for building foundations are such so as to minimize settlement, slope erosion, siltation and facilities drainage of potential surrounding floodwaters.

(c) *Indication of flood hazard areas.* The 100-year flood elevation, as shown on official county floodplain maps, shall clearly delineate the flood hazard area on the preliminary and final plat. The line shall be determined by field measurement of the elevation on the site.

(d) *Protective deed restrictions required.* Covenant or deed restrictions shall be placed in the deeds to all lots of a development lying within a flood hazard area stipulating to the owner that:

(1) Construction on lots within what is defined and designated as "Coastal High Hazard Areas: Velocity Zones" shall be elevated and securely anchored to well-anchored piles or columns and shall have the level of the bottom of the lowest horizontal support member one foot or more above the level of the 100-year flood. Space below the level of the first floor level shall be free of obstruction or covered by breakaway facade material capable of producing free obstruction for the impact of abnormally high tides or

wind-driven water. Residential structures on existing lots shall have a maximum floor area of 2,200 square feet per lot. A larger home may be built only by acquiring additional lots. In new developments, a maximum floor area ratio of one-tenth shall be required.

(2) All other requirements of the county building codes related to construction in flood hazard areas must be met.

(e) *Disclosure statement required.* On all plats of subdivision and land development plans for which lots, sites, or structures are to be sold or leased, the following statement shall be clearly affixed to the plats or plans and readily visible:

"The areas indicated on this plat/plan as flood hazard areas have been identified as having at least a 1% chance of being flooded in any given year by rising tidal waters associated with extreme wind and storm surge. Local regulations require that certain flood hazard protective measures be incorporated in the design and construction of structures in these designated areas."

Reference shall be made to the development covenants and restrictions of this development and requirements of the county building codes department. In addition, some agencies may require mandatory purchase of flood insurance as a prerequisite to mortgage financing in these designated flood hazard areas.
(Ord. No. 99-12, § 1 (05.280), 4-26-1999)

Cross reference—Floods, ch. 78.

Secs. 106-1849—106-1875. Reserved.

DIVISION 4. OPEN SPACE USES AND STANDARDS

Subdivision I. In General

Sec. 106-1876. Uses in open space.

Table 106-1876 lists uses that may be permitted in open space when required elsewhere in this chapter. Most of the uses listed are specific subuses from the generalized uses listed in table 106-1098. In so doing, a closer match of the permitted uses to the resource's tolerance is provided. Any use not listed shall be considered prohibited. Detailed standards for limited uses, special uses, or uses that must prepare an environmental impact assessment are listed in subdivision II of this division.

TABLE 106-1876 USES IN OPEN SPACE

Use	General Open Space*	Nontidal Wetland	Headwaters Buffer	River Buffer	Beach-Dune	All Forest Types (Sec. 106-1813)	Endangered Species
AGRICULTURAL							
Apiaries	Y	N	Y	Y	N	Y	N

Use	General Open Space*	Nontidal Wetland	Headwaters Buffer	River Buffer	Beach-Dune	All Forest Types (Sec. 106-1817)	Endangered Species
Field crops	Y	N	N	N	N	N	N
Orchards	Y	N	N	N	N	N	N
Pasture	Y	N	N	N	N	N	N
Forestry	Y	L	L	L	N	L	N
Kennels and stables	Y	N	N	N	N	N	N
Nursery	Y	N	L	N	N	N	N
RECREATION AND AMUSEMENT: OUTDOOR RECREATION							
Ballfields	Y	N	N	N	N	N	N
Beach	Y	N	N	Y	Y	N	N
Golf course	L	N	N	N	N	L	N
Nature area	Y	Y	Y	Y	N	Y	N
Nature center	Y	N	N	N	N	L	L
Picnic area	Y	N	Y	N	N	N	N
Pools/courts	Y	N	N	N	N	N	N
Trails	Y	L	Y	L	L	Y	L
COMMERCIAL/RESIDENTIAL WATER DEPENDENT							
Water dependent	Y	N	S/EA	S/EA	S/EA	N	N
Bulkheads, riprap and erosion control structures	L	L	L	L	L	L	L
UTILITIES, COMMUNITY/REGIONAL							
Public/private road	L	S/EA	S/EA	N	N	N	N
Essential access	Y	S/EA	S/EA	N	S/EA	N	N
Sewer/water	Y	S/EA	S/EA	N	N	N	N
Stormwater detention	Y	L	N	N	N	N	N
TEMPORARY USES							
Public interest event	Y	N	L	N	N	N	N
Special event	Y	N	N	N	N	N	N

* General open space is that land required by table 106-1526 as Min. OSR/LSR and not containing any specific natural resource.

Y = Permitted use

N = Prohibited

S = Special use

S/EA = Special use, with environmental impact assessment

L = Limited use

(Ord. No. 99-12, § 1 (05.310), 4-26-1999; Ord. No. 2002-34, 12-9-2002)

Secs. 106-1877—106-1905. Reserved.

Subdivision II. Standards for Open Space Uses

Sec. 106-1906. Scope.

Uses listed as limited uses, special uses, or requiring an environmental impact assessment shall, in addition to meeting the criteria in subsection 106-367(g) and subdivision IV of division 3 of article III of this chapter meet the conditions set forth in this subdivision.

(Ord. No. 99-12, § 1 (05.320), 4-26-1999)

Sec. 106-1907. Forestry.

(a) Clearcutting is prohibited in designated open spaces.

(b) BMPs of the South Carolina Forestry Association shall be employed.

(c) Forestry areas shall be harvested so that a canopy cover consisting of minimum basal area per acre remains well distributed throughout the area. The landowner shall retain a minimum of at least 25 overstory trees per acre after final harvest, in addition to the required forested buffer of 50 feet along all street frontages. The landowner shall immediately pursue planned natural regeneration methods, whereby four to 12 seed harvesting trees are left uncut, or 20 to 30 shelterwood harvesting trees are left uncut. Either method is acceptable as long as the required buffer is provided, and the method recognized by the state for responsible forestry practices. For any area of protected resources that exceeds more than five acres in total, or in an individual area, the harvesting shall be phased so that a balance is retained between the area cut, frequency of harvesting, area that is mature, and area growing back taking into account the time needed for the forest to return to its initial state or, in the case of young forest areas, to reach a mature state.
(Ord. No. 99-12, § 1 (05.321), 4-26-1999)

Sec. 106-1908. Nursery.

Plant nurseries may only be permitted in a headwaters buffer under the following conditions:

(1) The land had been previously used as follows:

a. Farming.

b. Farming had been discontinued, but the current stage of succession is grasslands with few woody plants established.

c. The land had been recently timbered, but replanted trees are not higher than five feet on the average.

(2) The drainage of the nursery was designed to flow away from the shoreline to a detention and settlement basin that protects the area's water quality.

(3) There shall be a strip of natural landscaping with high quality ground cover with a width of 50 feet between the nursery and the water body.

(Ord. No. 99-12, § 1 (05.322), 4-26-1999)

Sec. 106-1909. Active recreation uses exceeding ten acres.

(a) *Area counted toward open space.* Fifty percent of any active recreation use may be counted toward open space in rural districts.

(b) *Forests.* No area of protected forest shall be used for golf courses if the tree cover is to be disturbed. However, trees in the rough may be pruned to provide easy movement at the ground and still be part of the protected open space.
(Ord. No. 99-12, § 1 (05.323), 4-26-1999)

Sec. 106-1910. Nature center.

(a) *Forests.* Nature centers over 5,000 square feet shall require a special use permit. Nature centers not exceeding 5,000 square feet shall be permitted, provided the following conditions are met:

(1) A tree survey of the site shall be provided to assist in properly locating the building, to avoid destruction of larger trees, specimen trees, or rare trees. Where feasible, the building should be in an area with low tree density or trees that are in poor condition.

(2) Parking is not permitted in the protected open space.

(b) *Endangered species.* The plans for nature centers shall be reviewed by the agency on whose list the species was established (federal, state, or both) and who shall be given 60 days to review and comment on the appropriateness of the design and location. A detailed site plan of the endangered species area should be provided to ensure the most sensitive site design.
(Ord. No. 99-12, § 1 (05.324), 4-26-1999)

Sec. 106-1911. Trails.

(a) *Nontidal wetlands.* Trails may be installed in nontidal wetlands where essential to cross or where the trail has a natural history purpose. The trails shall be of boardwalk construction. The height of the boardwalk above normal high water shall be set to ensure the boardwalk minimally disrupts plant life below it.

(b) *Beach-dune.* Trails over the dunes shall all be of boardwalk construction. The boardwalk shall be located to ensure minimal erosion and constructed to avoid well-established vegetation.

(c) *River buffer.* Trails shall be permitted to cross the river buffer at reasonable intervals for access to the water. Such trails shall be designed and constructed in a manner that does not result in them becoming channels for stormwater, that does not result in erosion, or that does not damage surrounding vegetation. The county may require trails to be of boardwalk construction, pervious paving systems or stepping stones if needed to ensure meeting the objectives of the buffer, and for longterm maintenance of the trail.

(d) *Endangered species.* In general, trails shall be prohibited in these areas. However, if research values and preservation of the species are best achieved by having access on defined trails, they should be permitted. The plans for such trails shall be reviewed by the agency on whose list the species was established (federal, state, or both) and who shall be given 60 days to review and comment on the appropriateness of the design and location. A detailed site plan of the endangered species area should be provided to ensure that the most sensitive site design.
(Ord. No. 99-12, § 1 (05.325), 4-26-1999)

Sec. 106-1912. Water dependant uses.

Waterways are the domain of the public, and should be regulated to maintain their pristine quality for the citizens of Beaufort County. Areas of ecological significance should be identified and protected. Water dependent uses should be spaced as far apart as feasible, consistent with minimal adverse impacts. The following shall apply to all water dependent uses:

(a) *Navigational structures or aids.* The regulation of navigational structures or aids shall be under the jurisdiction of the state ocean and coastal resource management office or appropriate federal regulators.

(b) *Docks, piers, and wharfs.*

(1) Tidal creeks and shallows are the most sensitive, ecologically, and are, therefore, being regulated.

(2) Small tidal creeks and shallows, which fall within the county, are defined as those bodies of water, [being tidally influenced] as per the Beaufort County official small tidal creek delineation map. Private docks and community docks in small tidal creeks may be allowed on both existing lots of record, and new subdivisions under the following criteria:

a. Lots in new subdivisions must have a minimum of 250 feet of frontage along the waterbody. Existing lots of record are exempt from this requirement. Major subdivision of lots, as defined in section 106-18, fronting tidal creeks and shallows that includes construction of a community dock in lieu of private individual docks, shall also be exempt from the minimum frontage requirement of 250 feet. Major subdivisions with no proposed docking facility or a community dock shall be permitted at allowable lot widths set forth in section 106-1556 table, Lot and Building Standards, and provisions set forth in article XII, Subdivision Design.

b. Dock facilities will neither interfere nor adversely impact navigation. No dock shall be permitted to be constructed where the length of the dock shall exceed 300 feet in total length, inclusive of pierheads, floats, boatlifts, ramps, mooring, pilings and other associated structures, with the exception of existing lots of record where two or more owners of adjoining lots agree to create a community dock, in lieu of individual private docks. In these cases a bonus of one foot of dock length over 300 feet, for every foot of waterfront footage exceeding 300 feet shall be granted to permit a community dock with a maximum length of 500 feet.

c. The dock, pier, boat lift, floating dock, walkway and any appendages thereto allowed under this section shall normally be constructed within the extended property lines of the owner and shall further adhere to the setback requirements of the ZDSO, more specifically, be no closer than 20 feet from extended side property lines, however construction may be allowed closer than 20 feet, or over extended property lines where there is no material harm to the policies of this section.

d. The maximum width of the walkway or pier between the highland and the pier head shall be four feet, unless compelling circumstances exist whereunder the four-foot limit would render the dock unusable by the owner, members of his or her family, or reasonably anticipated users. The walkway may have a railing, but shall have no walls which impede the flow of air through the walkway. The walkway, pier head, and floating dock shall not be enclosed nor shall there be any walls of any kind on any side of the same. However, safety rails with slats at least two inches apart shall be allowed provided that they do not exceed three feet in height.

e. Electrical cutoff fixture lighting shall be allowed along the walkway and at the head of the dock, provided said lighting is shielded to direct the light down onto the dock and away from any adjoining residences and the creek, and further, provided the electrical power is constructed and attached in conformance with applicable electrical safety codes as delineated in the Southern Building Codes, as adopted by Beaufort County.

f. No plumbing shall be allowed, except for water sinks and faucets. All toilets, port-o-lets, or any other means of sewage collection or disposal is strictly prohibited.

g. Boat lifts shall be allowed, provided that no portion of the boat when fully elevated shall extend higher than 12 feet above mean high water, excluding masts, tower, antennae, and outriggers.

h. The use of docks shall be limited to private, non-commercial uses, unless allowed for as part of a Commercial Fishing Village Overlay District.

i. All docks, associated structures and boats secured thereto, shall be maintained to ensure safe usage and to prevent any potential hazard to navigation.

(3) Notwithstanding any other provision of this section, and pursuant to subsection (4) below pertaining to reconstruction or repairs, any owner of a lot on the date of enactment of this section [May 8, 2000] who has in his or her possession a permit for construction of a dock in a size or length exceeding these specifications, may construct the dock in compliance with the permit, as long as the permit remains valid.

(4) Notwithstanding any other provision of this section, any dock, pier, boat lift, floating dock or walkway, properly permitted prior to the date of enactment of this section and fully constructed within 12 months of the date of enactment of this section [May 8, 2000], may be repaired or reconstructed in the same size and length in the event any portion of the structure is damaged or destroyed. However, any dock, pier, boat lift, floating dock or walkway, constructed in a size and/or length exceeding this section pursuant to an existing permit at the date of enactment of this section, but not fully constructed within 12 months of the date

of enactment of this section, may not be repaired or reconstructed in a length or size exceeding this section in the event it is damaged by more than 50 percent of its replacement value.

(Ord. No. 99-12, § 1 (05.326), 4-26-1999; Ord. No. 2000-2, 1-24-2000; Ord. No. 2000-24, 5-8-2000)

Sec. 106-1913. Public/private roads.

(a) *Nontidal wetlands.* Crossings shall be permitted only where no reasonable alternative exists. Road shall be elevated and not constructed of or on fill material. Wildlife corridors should be provided under the road.

(b) *Headwaters buffer.* Roads shall be permitted only to provide access to water dependent uses, where county plans call for a new road and bridge, or where headwaters buffers overlap on an island so that a road to buildable areas cannot avoid headwaters buffers.

(c) *All open space.* All utilities shall be placed under the pavement to avoid additional destruction where the road is in wetlands or headwaters buffer.

(d) *General open space.* Where the development is to be set well into a site requiring more than 60 percent open space and the road right-of-way would use more than 20 percent of the

APPENDIX B. CORRIDOR OVERLAY DISTRICT GUIDELINES

Sec. 1. Objectives.

The primary objectives of reviewing projects lying within Beaufort County's Corridor Overlay (CO), is to establish continuity of each development within the overall corridor system. In addition, design review will promote the following:

- Protection of architectural and historical heritage of Beaufort County;
- Enhancement of the cultural image;
- Stabilization or strengthening of property values;
- Attraction of new residents, businesses, and tourists;
- Sense of place and character;
- Community unity;
- Climate for attracting investment;
- Minimization of sprawl; and
- Protection of open space and natural view sheds.

Corridor review offers protection and guidelines for the unique, special and desired character of development within and along certain highways in Beaufort County. The CO district shall overlay other zoning district classifications which shall be referred to as the base zoning. (Ord. No. 99-12, § 1 (app. B), 4-26-1999; Ord. No. 99-21, 8-23-1999)

Sec. 2. Applicability.

All proposed development lying within 500 feet of the centerline of designated highway corridors as defined in subdivision VI of division 2 of article II of this chapter and all proposed development lying within 1,000 feet from the centerline of designated Beaufort County view sheds (entrance gateways) as described below, shall be subject to the additional standards and review measures pertaining to this appendix.

Beaufort County Entrance Gateways include those areas where scenic vistas are present, as well as the major portals into the county. Each entrance gateway shall be defined as all developable land within a 1,000-foot radius of the centerline of the thoroughfare from which the entrance gateway crosses from a critical line to upland area, or where a jurisdictional boundary changes. Entrance gateways include all applicable lands as described above, and viewed from the following locations:

1. The Broad River and Chechesee Bridges;
2. Unincorporated lands on Lady's Island from the Beaufort River Bridge;
3. The Chowan Creek Bridge/Crossing;
4. The Harbor River and Johnson River Bridges;
5. The Whale Branch River Bridge;
6. Beaufort County lands from the Combahee Bridge;

7. Beaufort County lands at the Career Education Center intersection of S.C. 170; and

8. The intersection of U.S. 21 and U.S. 17 at Garden's Corner.

(Ord. No. 99-12, § 1 (app. B), 4-26-1999; Ord. No. 99-21, 8-23-1999)

Sec. 3. Nonconforming situations.

A. Existing nonconforming uses within a CO district, on the effective date of the ordinance from which this chapter derives, may be brought into full or partial compliance through a streamlined staff review process. Such situations shall require approval of the development review manager, and be exempt from CRB review. This option shall be permitted only for those uses whose owners or operators would like to continue the existing use, with no change of ownership, and where no abandonment has occurred. Only improvements in landscaping and minor building improvements shall be exempt from CRB review. Any expansion or other change shall be guided under the applicable process as required by this chapter.

B. All other nonconforming situations shall be brought into compliance with standards contained within sections 106-1 through 106-12 of this chapter; articles V, VI and XIII of this chapter; and this appendix when the nonconforming situation proposes any change, alteration or expansion to any portion of a building, structure or use, and/or has been abandoned according to table 106-9.

(Ord. No. 99-12, § 1 (app. B), 4-26-1999; Ord. No. 99-21, 8-23-1999)

Sec. 4. Architectural design guidelines.

The design of all applicable structures including habitable structures, walls, fences, signs, light fixtures and accessory and appurtenant structures shall be unobtrusive and of a design, material and color that blend harmoniously with the natural surroundings, and the scale of neighboring architecture, complying with the intent of this section. Innovative, high quality design and development is strongly encouraged to enhance property values and longterm economic assets along designated corridors.

A. *Exterior materials and architectural elements.*

1. *Roofs.* Roof overhangs and pitched roofs shall be incorporated into all building designs. Wood shingles, slate shingles, multilayered asphalt shingles, metal (raised seam, galvanized metal, corrugated metal, metal tile, etc.), or tiles are permitted.

   Not permitted:

   1) Partial (less than three sides) mansard roofs.

   2) Flat roofs (including a minimum pitch less than 4:12) without a pediment.

   3) Long, unarticulated roofs.

2. *Sides of buildings and structures.* Wood clapboard, wood board and batten, wood shingle siding, brick, stucco, tabby, natural stone, faced concrete block and artificial siding material which resembles painted wood clapboard are permitted. Wood siding may be painted, stained, weathered, or left natural.

   Not permitted:

   1) Long, unarticulated, blank facades.

   2) Plywood, cinder block, unfinished poured concrete, unfaced concrete block, and plastic or vinyl, not closely resembling painted wood clapboard. No metal buildings without exterior skin.

   3) Highly reflective glass or materials as the predominant material or visible texture.

3. *Colors.* Predominant color design shall be compatible with Lowcountry or coastal vernacular palette which include traditional historic colors, earth tones (greens, tans, light browns and terracotta), grays, pale primary and secondary colors (with less than 50% color value), white and cream tones, and oxblood red. Accent color design (i.e., black, dark blue, grays, and other dark primary colors) may be used on a limited basis as part of an architectural motif, at the discretion of the development review manager and/or the CRB.

   Not permitted:

   1) Color contrasts resulting in a clearly disturbing appearance.

   2) Primary colors.

4. *Accessory uses.* The design of accessory buildings and structures, if permitted within the applicable zoning district, shall reflect and coordinate with the general style of architecture inherent in the primary structure for the proposed development. Covered porches, canopies, awnings, trellises, gazebos, street/pedestrian furniture and open wood fences are encouraged.

   Not permitted:

   1) Unscreened chainlink or woven metal fences.

   2) Internally illuminated and/or neon lighted exterior architectural or structural element(s) that is/are visible from the highway.

   3) Exterior storage not completely hidden from view, and only if permitted per table 106-1711.

   4) Exterior display of merchandise except for landscape structure, plant materials and agricultural products.

B. *Entrance gateways.* Proposed development of any property contained within an entrance gateway shall comply with the following standards:

1. *River view sheds.*

   a) *Screening from river or bridge.* New development proposed for a site shall be adequately screened to allow no less than 50% opacity, as viewed from the river

or water body. Viewing boardwalks, platforms or docks made of wood shall be exempted from opacity calculation. Those portions of land with applicable river frontage, but otherwise located away from the view shed area, yet contained within the corridor overlay district shall be subject to the buffer requirements set forth elsewhere in this appendix.

b) *Building height.* Applicants for new development affecting a river view shed shall submit a visual study to determine how existing and newly planted vegetation or other natural features will adequately screen proposed buildings and structures from dominating the natural visual landscape. In no case shall more than 40% of a development's skyline exceed the canopy line of the total development.

2. *Portals.* All lands within a river view shed, located at a designated intersection or entrance into the county or planning area as defined above, and not otherwise having river frontage, shall be designated a portal and subject to design review and approval by the CRB based on the applicable minimum requirements of this appendix.

(Ord. No. 99-12, § 1 (app. B), 4-26-1999; Ord. No. 99-21, 8-23-1999)

Sec. 5. Landscape design guidelines.

All proposed projects shall require the appropriate amount of landscaping as determined by the landscape surface ratio (LSR) in table 106-1526 LSR refers to the area of land that must be devoted to pervious landscaping divided by the area of the lot or site. Pervious areas of individual planters larger than four sq. ft. may be counted, but may not consist of more that 25% of the total LSR requirements. Water shall not be considered a pervious surface. All standards pertaining to landscaping not contained in this section shall be guided by subdivision III of division 4 of article VI of this chapter.

A. *Bufferyards required.* Bufferyards shall be required rather than setbacks for all development within a corridor overlay. However, where the required setback in article VI of this chapter is greater than the bufferyard requirement for the corridor overlay, then the setback shall be required.

1. *Bufferyard uses.* Required bufferyards shall contain only vegetative landscaping materials, except for the following uses:

a) Vehicular access drives and passageways placed approximately perpendicular to the right-of-way;

b) Foot and pedestrian paths;

c) Walls and fences, as permitted in the CO, less than six feet in height;

d) Landscaping sculpture, lighting fixtures, trellises and arbors;

e) Bus shelters;

f) Signage, as permitted in the CO;

g) Utility lines that are placed approximately perpendicular to the right-of-way; where existing lines or planned lines must run parallel to the right-of-way, an

equivalent amount of buffer may be required beyond the required buffer width, if the character of the buffer is significantly disturbed; to the extent possible, such service lines should be consolidated with vehicular access routes; new utilities may be constructed within the required buffer area; however, the developer shall be required to restore the required bufferyard area to comply with the landscaping requirements of this appendix;

h) Proposed lagoons and drainage swales are not encouraged for placement in bufferyards, and may not be granted approval by the CRB; existing lagoons may require additional buffers at the discretion of the development review manager and/or the CRB, to satisfy the intent of this appendix; the CRB may grant limited flexibility in cases where substandard lots of record makes adherence to these standards impractical.

2. *Bufferyard locations.* Bufferyards are required for all development occurring within the corridor overlay district. District and street bufferyards that are greater in width than required below, as determined by table 106-1617, shall supersede the following width requirements:

a) *Highway corridor buffer.* Landscaped buffers are required for all lands fronting a designated highway corridor. This buffer shall be at least 50 feet in width providing a minimum of 75% opacity, measured from the right-of-way line into the site.

b) *Frontage roads.* Bufferyards shall not include any portion of a frontage road which shall be located toward the interior of the site, from the right-of-way line.

c) *Nonhighway corridor streets.* All streets not designated as highway corridors shall be designed with a 20-foot-wide natural buffer, providing a minimum of 30% opacity from the street.

d) *Perimeter buffer.* All side and rear property boundaries shall contain a ten-foot-wide natural buffer providing 30% opacity when vegetation is left in its natural state. When there is no existing vegetation, or it has been cleared, the installed buffer shall require 15 feet of width.

e) *Foundation buffer.* An eight-foot-wide landscaped buffer is required between any structure and parking or driving area, exclusive of loading and drive-through facility areas. Sidewalks and handicap ramps may be placed adjacent to the buffer on either side. Foundation buffers are not required in loading areas.

f) *Structural buffer.* Any opaque or 80% opaque wall or fences (brick, stucco, wood rail) installed along the front of the property, including those used for screening of parking areas, shall be softened with landscaping materials.

B. *Landscaping standards.* The CRB shall review particular plant selections and landscaping designs to ensure conformance with specific requirements of the CO. At the discretion of the CRB, additional or larger plantings to allow for adequate visual screening or enhancement of a particular situation may be required. All landscaping required by this appendix and

appendix F, and approved as part of an application for development, shall be maintained in healthy condition by the property owner. Plant material used for installation shall conform to the standards established by the American Association of Nurserymen in the "American Standards for Nursery Stock" provision. Landscaping requirements of this chapter shall not interfere with fire and life safety standards contained in this chapter.

1. *Installation requirements.* Installation and maintenance of landscaping materials shall adhere to section 106-1647 of this chapter and/or additional requirements by the CRB.

2. *Existing plant material counted.* The use of existing vegetation and plant species native to the Lowcountry is strongly encouraged, and shall be counted toward the landscaping requirement. No tree six inches in diameter at four feet diameter breast height (dbh) or larger shall be removed from any highway buffer, exclusive of access drive location, required sight triangle area, and diseased trees, subject to CRB and/or staff approval.

3. *Bufferyard planting requirements.* The corresponding tree list pertaining to the following requirements is included in this chapter as appendix F. The overstory and understory trees contained in the list are typically found throughout the Lowcountry region, and are recommended for use in meeting these landscaping requirements. Other trees proposed for a project shall be reviewed by CRB as to their compatibility and hardiness in the Lowcountry region. Bufferyards shall be landscaped as follows:

   a) *Highway corridor buffer.* 1) Four broad-leafed overstory trees; 2) 14 understory trees; 3) 30 shrubs per every 100 feet or portion thereof. Plant materials shall be generally distributed to avoid significant gaps in the buffer, and to achieve the required 75 percent opacity coverage.

   b) *Parking buffer.* Parking areas that remain visible from the highway shall require additional planting, walls, fences, berms, or a combination thereof, to provide effective screening.

4. *Parking lot planting requirements.* The CRB may require additional or larger plantings to allow for adequate visual screening or enhancement of a particular situation.

   a) *Landscaped median.* A minimum five-foot-wide landscaped median shall be installed alongside (perpendicular to) parking spaces on the interior portion of a parking lot with more than one parking bay. Wheel stops shall be placed within all parking spaces at the standards distance from every landscaped median to protect plantings.

      Shrubs and/or trees shall be installed in the median to provide for semicontinuous planting along the median. Shrubs shall be at least one foot in height at installation and reasonably projected to grow at least two feet in height within three years.

   b) *Landscaped peninsula.* A minimum nine-foot by 20-foot landscaped peninsula shall be installed parallel to the parking spaces every eight or fewer spaces, and

at the end of the parking aisle in order to separate the last space from any adjacent travelways. Each landscaped peninsula shall contain one broad-leafed overstory tree with a minimum size of 3½ caliper inches at dbh, and a minimum height of 12 feet.

C. *Berms and forms of noise abatement.* Berms (man-made mounds of earth 18 inches in height or higher) and man-made forms of noise abatement (such as dense walls) are not permitted to be constructed within the highway corridor that follows U.S. Highway 21 from Chowan Creek to the Harbor River on St. Helena Island or in the Chowan Creek gateway. Only those earthen berms required by the U.S. Army Corps of Engineers specifically for flood control may be permitted.

(Ord. No. 99-12, § 1 (app. B), 4-26-1999; Ord. No. 99-21, 8-23-1999; Ord. No. 2006/19, 8-28-2006)

Sec. 6. Signage.

Signage requirements for the corridor overlay district have been moved to article XV of this chapter The CRB will not have any review or approval authority for signage. Instead the ZDA, with assistance from the development review manager, shall administer and be responsible for signage applications and approvals.

(Ord. No. 99-12, § 1 (app. B), 4-26-1999; Ord. No. 99-21, 8-23-1999)

Sec. 7. Lighting.

A. *General standards.*

1. Exterior architectural, display and decorative lighting visible from the corridor shall be generated from a concealed light source with low-level fixtures.
2. Any lighting fixture used to illuminate parking areas, access drives or loading areas shall be of such design, so as to minimize the amount of ambient lighting perceptible from adjacent properties. In no case, shall any lighting impair the vision of motorists on the corridor.
3. All interior lighting shall be so designed to prevent the sight source or high levels of light from being visible from the corridor.
4. Entrances into developments from the highway may be lighted for traffic safety reasons, provided such lighting does not exceed the applicable footcandle requirements specified in subsection C, below.
5. A site lighting plan shall be submitted as part of the application submission.

B. *Light fixtures.*

1. Any light fixture shall be a cutoff luminaire whose source is completely concealed with opaque housing and shall not be visible from any street. This provision includes lights on mounted poles, as well as architectural display and decorative lighting visible from the corridor.

2. Fixtures shall be mounted in such a manner that the cone of light is not directed at any property line of the site.
3. Only incandescent, fluorescent, metal halide, mercury vapor or color corrected high-pressure sodium light may be used. The same type of lighting must be utilized for all fixtures and light sources on the site.
4. Only white or off-white (light yellow tones) may be used for any light source.
5. Lighting poles mounted within 50 feet of the highway right-of-way may not exceed a height of 20 feet, and only forward-throw, or type IV lights may be used to light entrances. The minimum mounting height for a pole shall be 12 feet.

C. *Illumination levels.* All site lighting shall be designed so that the level of illumination measured in footcandles (fc) at any one point meets the standards in table 03.455. The CRB shall have the discretion to allow limited flexibility as to variations in the minimum and average levels, if the proposed levels are below the following standards. The CRB shall not allow flexibility for proposed levels which exceed the maximum levels, unless such levels strictly conform to the recommended levels within the IESNA Lighting Handbook.

TABLE 03.455. ILLUMINATION LEVELS

Location or Type of Lighting	*Minimum Level (FC)*	*Average Level (FC)*	*Maximum Level (FC)*
Landscape and decorative	0.0	0.50	5.0
Commercial parking areas	0.6	2.40	10.0
Multifamily residential parking areas	0.2	1.50	10.0
Areas for display of outdoor merchandise	1.0	5.0	15.0
Walkways and streets	0.2	1.0	10.0
Notes: Minimum and maximum levels are measured at any one point. Average level is not to exceed the calculated value, and is derived using only the area of the site included to receive illumination. Points of measurement shall not include the area of the building, or areas which do not lend themselves to pedestrian traffic. If the major portion of the lighting is placed in front of a building, the average level should not be affected by adding any additional lighting elsewhere on the building.			

(Ord. No. 99-12, § 1 (app. B), 4-26-1999; Ord. No. 99-21, 8-23-1999)

Proposed Schedule D
Okatie Marsh Development Agreement

Type of Development	2008/9	2009/10	2010/11	2011/12	2012/13	
Commercial (Sq. Ft.)	40,000	24,500	-	-	-	
Residential, Single Family (1)	-	20	40	60	60	180
Residential, Multifamily	-	-	60	60	8	
Affordable/Workforce Housing	-	-	13	-	-	
Habitat for Humanity Lots	-	3	-	-	-	
Public Park - % complete	-	100%	-	-	-	
Bike Trails-% complete	-	25%	30%	30%	15%	

(1) Note 87 single family lots remain at the end of five years.

Exhibit E

Estimated Population at Build-out

Full Build-out is estimated at approximately 840 persons.

EXHIBIT "F"

DESIGN GUIDELINES

Design Guidelines
Okatie Village

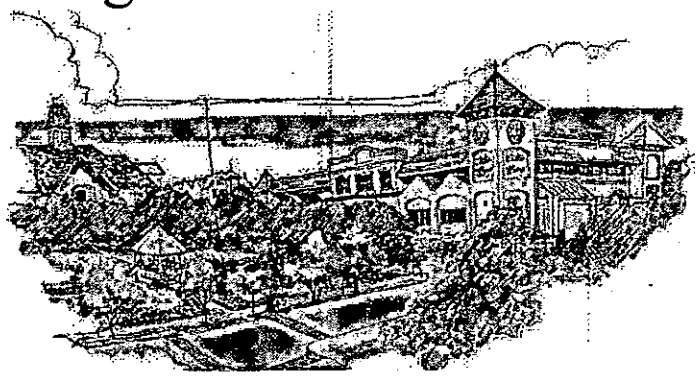
August 18, 2008

Design Guidelines for PUD's in Okatie Village
- Okatie Marsh
- Osprey Point
- River Oaks

Guidelines for the following Districts
- Commercial (D5)
  - Retail
  - Offices
  - Live Work Residential
- High Density Residential (D4)
  - Apartments / Townhomes
  - Starter Homes
- Suburban Zone (D3)
  - Single Family Residential
- Natural Zone (D1-D2)
  - Environmental Education Center
  - Park and Creek Access
  - Greenways
- Special District (SD)
  - Retirement Village

View of River Oaks Park

Okatie Village
Design Guidelines



August 18, 2008 (Rev 2/21/2009)

Design Guidelines for PUD's in Okatie Village
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- Townhomes
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- Retirement Village

Suburban Zone (D3)
- Single Family Residential

Natural Zone (D1- D2)
- Environmental Education Center
- Parks
- Greenways

Special Purpose Zone (SD)
- Institutional Use

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c. Public Frontage
d. Blocks
e. Street termination elements
f. Bicycle, golf cart and leisure trail network
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The Okatie Village Design Guidelines utilize a format that was originally developed for the SmartCode. The SmartCode is a comprehensive form-based code that is transect oriented and purposely made available for free over the internet by DPZ of Miami http://dpz.com/. Beaufort County Planner Brian D. Herrmann worked with WK Dickso, John Thomas and the Okatie Village Development team to customize these guidelines so that all metrics would reflect the intensity and character intended for Okatie Village.

Okatie Village
Design Guidelines

1. **Design Background** The commitment to design must extend beyond the community master plan and be carried forth at both the street and individual site level. The conceptual master plan provides a wonderful framework. However, it does not specifically address the character and placement of buildings, parking, streetscaping, etc. Yet, all of these items strongly influence the public realm, and are instrumental in determining whether a community functions as conventional suburbia, or actually affords the opportunities associated with traditional urbanism. These Design Guidelines provide standards that predicate the intensity and character that the developers of Okatie Village have agreed to follow as they build their community. These guidelines are both "form based" and "transect-based". As a result, they do not read in the same manner as many conventional guidelines or codes, but rather as a handbook for individual placemaking.
    a. The Transect – The transect is a relatively new planning tool that depicts the transition that occurs as one moves from a rural environment to an urban environment. It separates the built environment into a series of 7 zones, referred to as transect zones (T1 Natural, T2 Rural, T3 Sub-Urban (not suburban), T4 Neighborhood Center, T5 Village Center, T6 Urban Core, and SP Special District). Each of these zones depicts the transition in intensity and character of the built environment across a typical region (using traditional development patterns). Planners, urban designers, and developers use the transect to ensure that the overall development pattern for a particular zone is correct.

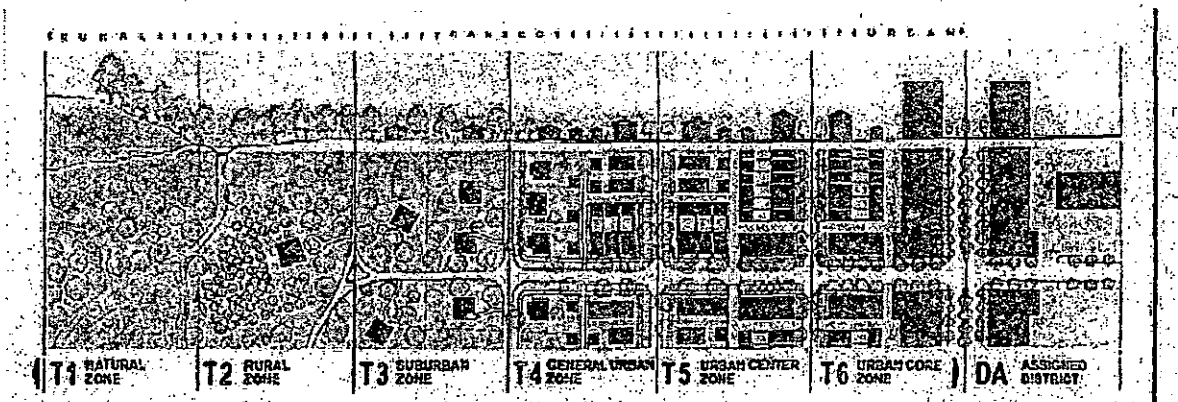


Diagram 1: Depicts the Full Rural to Urban Transect using a Traditional Development Pattern. The T6 "Urban Core Zone" is not part of Okatie Village. The DA "Assigned District" refers to the SP Special Use Institutional District.

This tool ensures that suburban style banks are not built in downtown settings, and three story office buildings are not placed in sub-urban or

rural zones. The same principles hold for every element of the built environment, from frontage types, streetscaping, means of drainage (i.e. curb & gutter vs. swale), etc. Thus, the transect is ideal for organizing the development of Okatie Village. The Developers have decided to utilize the letter D instead of T when representing the various zones.

Okatie Village is master-planned to contain a mixed use "Village Center" (D5 District) at the community's center along Highway 170. The area contains primarily commercial uses such as a bank, food store, pharmacy, pub, coffee shop, live/work units, apartments, civic spaces and civic buildings. Moving outward, the "Neighborhood Center" (D4 District) is a relatively intense mixed use district in which residential structures are the dominate use, including: apartments, rowhouses, townhomes, duplexes, and "porch and fence" single family homes. The Sub-Urban (D3 District) provides the transition from the more urban Village Center to the more natural Riverfront area. This district allows for a variety of single family lots and housing types, including: cottages, sideyard houses, houses, estate homes, and accessory units). As with all districts civic spaces and civic buildings are encouraged. Okatie Village is fortunate enough to contain an entire educational and medical campus. Because these are devoted to one general function and tend to dominate the regular transect zones, they have been grouped together in an Institutional District (SP Special District). The Rural (D2 District) is essentially the open space that surrounds the river and creeks and buffers development. This district includes a significant public park that fronts the water and an old family house that will be maintained and utilized for civic purposes. The Natural (D1 District) includes unbuildable natural lands that are protected, such as the River.

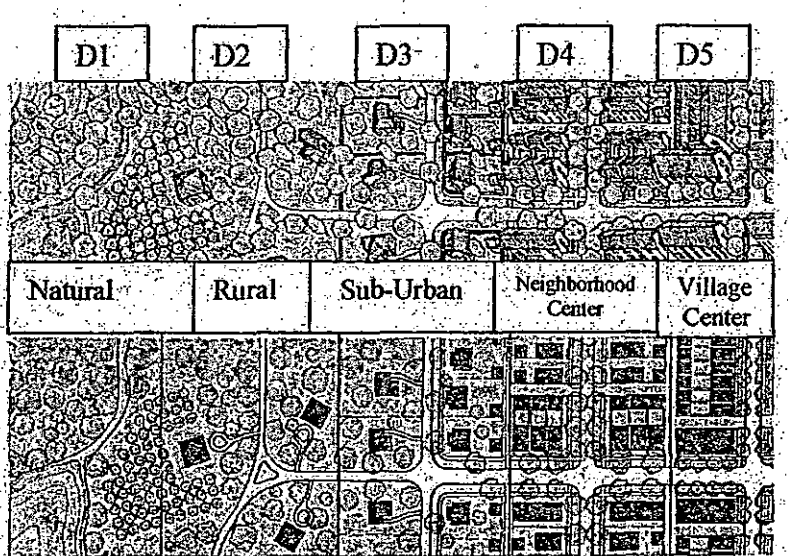


Diagram 2: The Districts as delineated in the Okatie Village

b. Form-Based Regulations – Form based refers to the fact that DESIGN, as opposed to USE shall drive the development of Okatie Village. In the pages that follow, the Okatie Village master plan is depicted with its assigned Transect Zones. The Design Guidelines contain both language and a series of Tables that convey and/or depict various form-based metrics that are appropriate for each transect zone of the Village. The metrics (setbacks, typologies, frontages, function, and parking, etc.) depicted in the Tables shall be utilized.

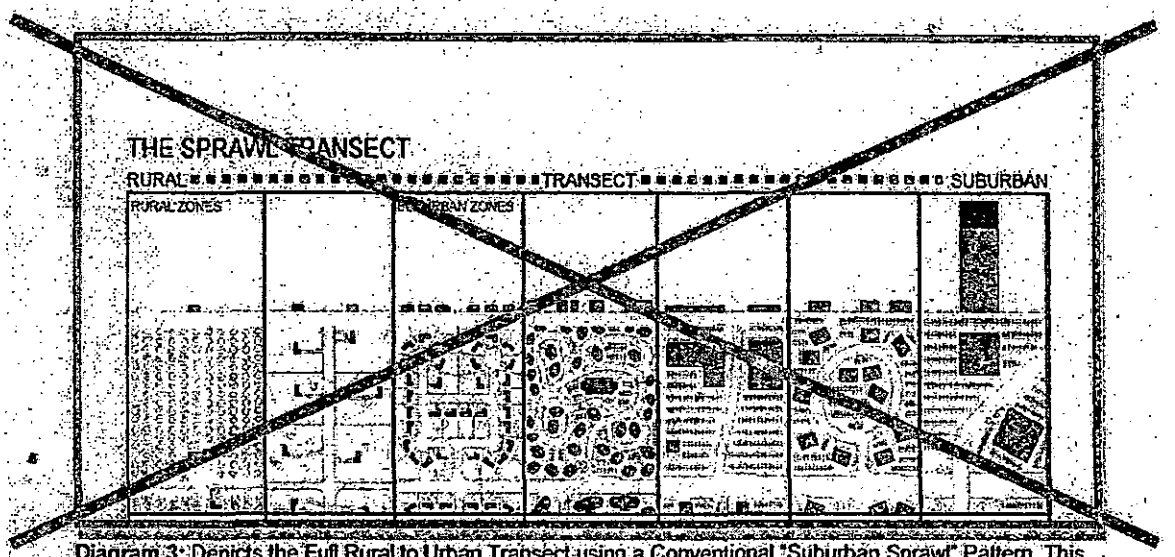


Diagram 3: Depicts the Full Rural to Urban Transect using a Conventional "Suburban Sprawl" Pattern. This diagram is intended to demonstrate what the built environment in Okatie Village will NOT resemble. In this diagram connectivity is limited, building disposition is set back, and parking is front-loaded. Okatie Village shall utilize a modified street grid with maximum connectivity. Buildings shall address the street, not surface parking areas. The building disposition shall be close to the street and promote the use of rear-loaded and on-street parking in the D5, D4, and SP Institutional District. This includes all attached housing and apartment structures in the Village.

2.General Information and Applicability – Historically, the term village has been used to refer to a "neighborhood" that is sited in a rural area. However, the term can also be used to refer to a grouping of smaller neighborhoods that combine to create a larger pedestrian oriented community (between a Hamlet and a Town). The Okatie Village Master Plan is intended to replicate the latterexample. The Village's three PUD's shall establish two neighborhoods and a Special Use district that are seamlessly inner-connected, contiguous and pedestrian oriented without buffers.

Okatie village is assembled to reflect the rural to urban transect (district). There is an identifiable Village Center along Hwy 170. The Village Center serves as the core. In addition the Master Plan incorporates two traditional mixed density, pedestrian residential communities. The Village includes one special district, which will include primary institutional uses of elder care and public education. The two pedestrian communities and the special district are inner-connected, contiguous and without buffers between them so as to create an identifiable larger community, referred to herein as Okatie Village. The Special District includes the existing elementary school and the land covered by the River Oaks PUD. There is an identifiable Village Center along Hwy 170. The Village Center is the urban core or center of this community. Other commercial activities that support the retirement component of the Village may be located in close proximity or within the bounds of the district. Commercial uses so located must provide services to those that live in the retirement component.

a. Applicability – This set of guidelines shall apply to all of the PUD Applications referred to as Okatie Marsh, Osprey Point and River Oaks. These Planned Unit Developments share portions of six distinct transect zones (D1/D2, D3, D4, D5, SD) and at build out will have the character and intensity of a Lowcountry Village. Throughout these guidelines the D1 and D2 districts are co-joined and treated as one district.
b. Purpose – This document is intended to define the design parameters under which Okatie Village will be developed and built. It is intended to cover an area of approximately 290 acres. The guidelines will define the four districts (transects) within the village and the patterns of development that are permissible within each. This document is to be a guide for the Association of Okatie Village Property Owners (AOVPO). The Master Association may assign its responsibility and define its responsibilities to Sub-Associations to administer in specific regions of the Village. Assignments when made should apply to entire Districts or sections of districts that represent a significant area and are expected to have shared concerns for the character, quality and functionality of the area so established.
c. Duration - It is expected that this document shall guide the development of Okatie Village for an extended period lasting numerous years. It is expected that the guidelines will need to be amended from time to time to reflect current conditions, to serve the best interest of the Community, the County or other governmental jurisdiction. They may be changed to adopt and incorporate such concerns as technological advances (for example;

environmental impact improvements), safer and healthier building practices, market conditions and community initiatives. Such Guideline changes may be initiated by the AOVPO or any of its Sub-Associations, the county or other governmental authority having jurisdiction and must be mutually acceptable to the Beaufort County Planning Department and the Board of the AOVPO.

d. Conflicts – Should a specific conflict arise between the text and one or more tables, the text shall supersede that which is shown in the tables. Table 15(a-c) shows one set of metrics that (f utilized) will lead to superior urbanism in each transect (district) zone; however, these tables 15 a-c) are for guidance only and are not intended to be regulatory in Okatie Village.

e. Definitions and Terms - Note: Table 12, provides additional illustrated definitions that supplement the definitions below.

   i. Accessory outbuilding or structure - A building or structure subordinate to the principal building or lot and used for purposes customarily incidental to the main or principal building and located on the same lot therewith. Accessory structures are permitted with all building types.

   ii. Adapted (or introduced) Plants – Plants that reliably grow well in a given habitat with minimal attention from humans in the form of winter protection, pest protection, water irrigation or fertilization once the root systems are established in the soil. Adapted plants should be low maintenance but not invasive.

   iii. Amphitheatre – An out door seating area, perhaps depressed used for community activities and special events. The amphitheatre may be located in proximity to an open shed or pavilion so that the two may work together.

   iv. Biking Network – A continuous network consisting of one or more of the following: bicycle lanes, or trails at least six feet (6') wide or roads designed for a speed of 10 miles per hour or slower.

   v. Bus Shelter – Bus Shelters are open sheds with seats for passengers awaiting transportation by bus, van or trolley. Vehicles can be publicly or privately operated.

   vi. Community – Community when used herein refers to the three PUD's of Okatie Marsh, Osprey Point, River Oaks and all components defined as the special district. The community is also referred to herein as Okatie Village.

   vii. Class I Bikeway – Class I bikeways are defined as bicycle or multi-use paths that are completely separated from the vehicular right-of-way. The standard Class I bikeway has pavement that is 8 feet wide however the developer may provide wider sections to accommodate golf carts or other motorized alternative vehicles. In order to traverse wetland areas or to save unique existing ecological communities paths may be reduced in width or raised above grade. In cases where the section deviates from the

standard, signage and design features should address safety concerns.

viii. Development Footprint – The total land area of a **project** site covered by buildings, streets, parking areas and other typically impermeable surfaces constructed as part of the project.

ix. Functional Entry – A door or opening for a retail commercial space that is designed to be used by pedestrians and is open during regular business hours. Doors that are for emergency egress only or garage doors that are not designed as an entrance for pedestrians are not considered to meet this definition.

x. LEED – A rating system intended to certify that a structure or group of structures utilized techniques that are "energy efficient" and/or environmentally friendly" during construction and operation. Certification is administered by the Green Building Council of America. Builders are encouraged to build green in Okatie Village.

xi. Low Impact Design (LID) – A system of storm drainage control that collects and holds storm water releasing it at slower rates than conventional storm drainage and eventually discharging the collected water into fore- ponds and retention ponds where it is cleaned by the plant life as it is moving toward a point of release at the edge of the property.

xii. Open Shed/Pavilion – Any open sided structure used for special events, community activities, temporary retail sales such as a farmers market or community yard sale. Specialized sheds or pavilions may be used as band stands, picnic shelters, or for shade at community activity areas. Sheds may include or be in close proximity to civic structures such as fireplaces, oyster pits, barbecue ovens, public rest rooms.

xiii. Property Owners Association (POA) – Property Owners Associations are established under the auspices of the Association of Okatie Village Property Owners. Property Owners Associations are organizations of property owners who share a common concern for the character quality, and functionality of the community where they own property. Property Owners Associations may be responsible for road and common area maintenance, drainage system monitoring and maintenance, maintenance of wetlands, security, architectural character of proposed development, and other responsibilities as assigned by the Master Association. Areas not covered by a specific homeowners association will be the responsibility of the Master Association. The Master Association and Sub-Associations will be governed by the by-laws of the specific entity.

xiv. Public and Private Frontages – Buildings in Okatie Village have public and private frontages. The Public frontage is the area from the edge of the street or back edge of the curb to the property line.

The private frontage is the area of each private lot that lies between the property line and the front façade of the building.

xv. Pedestrian Shed – A walking area of approximately ½ mile or 5 minutes and that is designed to encourage walking to and from destinations that are within the area.

xvi. Regional Community Development (RCD) – A development of over 200 acres or a development linking two or more PUDs with a collective land area of 200 Acres.

xvii. Rehab Facility or Rehabilitation Building is a building found in the Retirement Community of the Special District where various types of rehabilitation therapy services are offered to people in need of such services. Fees may be charged for services rendered.

xviii. Special District – Beaufort County School District owns a large portion of land within the boundaries of the overall master plan. This property abuts land proposed for an "age-restricted" community. These properties share similar uses and spatial dispensation. Combined they comprise more than 20% of the overall village. This area is considered a Special Institutional District. It is envisioned that this district will function much like a neighborhood incorporating and integrating the resources within.

xix. Specialized Nursing Unit – In the SD the Senior Community includes two specialized nursing units. One will be a Skilled Nursing Care Facility (SNIF) which will provide extended care for those needing extended nursing care by skilled licensed practitioners and staff. The Unit will provide care on a priority basis to those residing in the PUD but may offer the same care to non residents as well. The Special District also includes a Rehabilitation Therapy Unit for residents and non residents requiring such therapy. The PUD includes a Clubhouse that serves the residents of the PUD with services including food and beverage services, meeting spaces, recreation and exercise opportunities, and support services such as medical exam rooms, beauty and/or barber shop, administration, and other services as the residents may need.

xx. Storefront - Storefronts include entry doors, entry recesses, show windows and any associated structures and appurtenances.

xxi. Temporary Tent – Tents may be erected in any district in Okatie Village for special events, emergency recovery from a national or regional disaster. Tents may be left in place for special events for the shorter of the the duration of the event or thirty days. Tent shall be taken down within 24 hours of the end of such special event. Tents erected to support disaster recovery shall be authorized to stay in place until the AOVPO determines the need for the tents no longer exists. Nothing herein precludes the pitching of a small one or two man tent in the rear yard of any residence in Okatie Village for up to 48 hours.

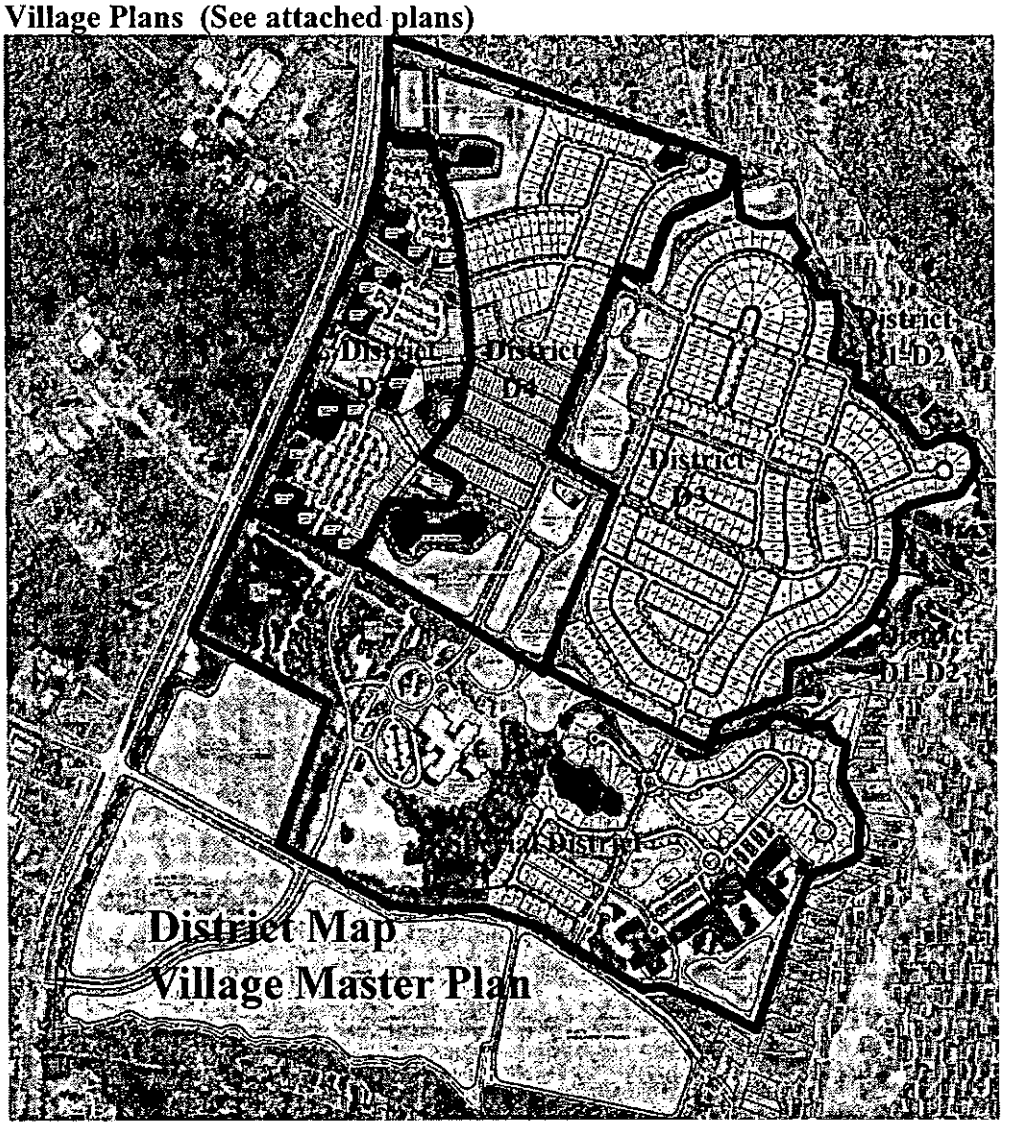
xxii. Traditional Neighborhood Development (TND) – A community type whose streets are interconnected in a grid-like pattern. The TND typically contains a mxed-use commercial center (often on the major throughfare) with a walking radius of about ¼ mile. In that radius housing types should be denser and get less dense as one moves from one transect zone to another. The grid pattern was developed in areas outside the Lowcountry of South Carolina and rivers, wetlands, other natural features and environmental concerns unique to the area may require adjustment to the rigidity of the grid.

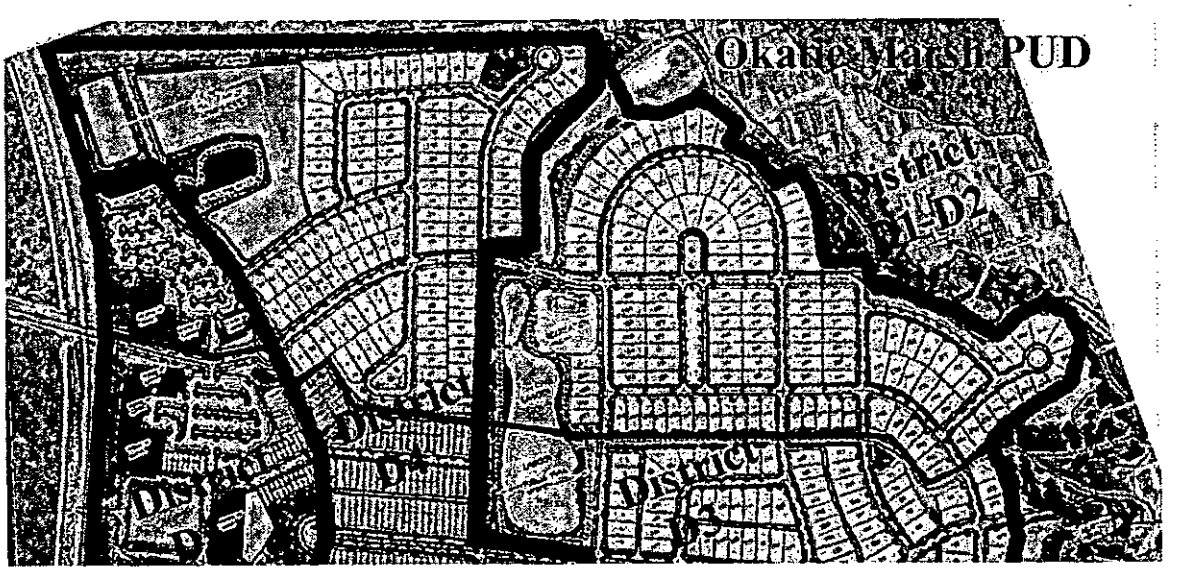
xxiii. Transect Zone or District (T=Zone and D=District) - Both terms are used interchangeably in this document (i.e. T4=D4) to indicate one of several areas on the PUD maps (Section 2) regulated by these design guidelines. Transect Zones are administratively similar to the land use zones in conventional ordinances (such as the Beaufort County Development Ordinance). The difference is that the Transect or District as defined herein also includes density, height, and setbacks as well as elements of the intended habitat are integrated (Privte Lot, and Public Frontage See tables 1-15).

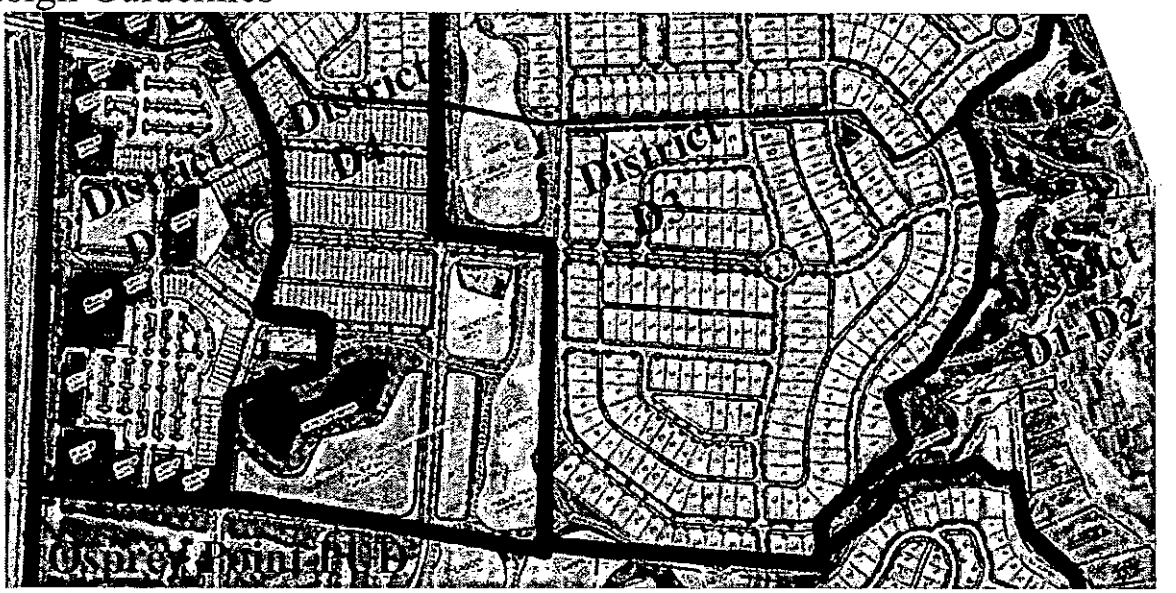
xxiv. Warrant – Justification provided by an owner to justify a specific requirement for the number of cars to be parked on site. Warrants are to be based on actual experience with parking needs at other locations. Warrants are provided to establish parking needs in the Institutional District and to justify variations from the parking ratios established by calculations using Tables 2 and 10.

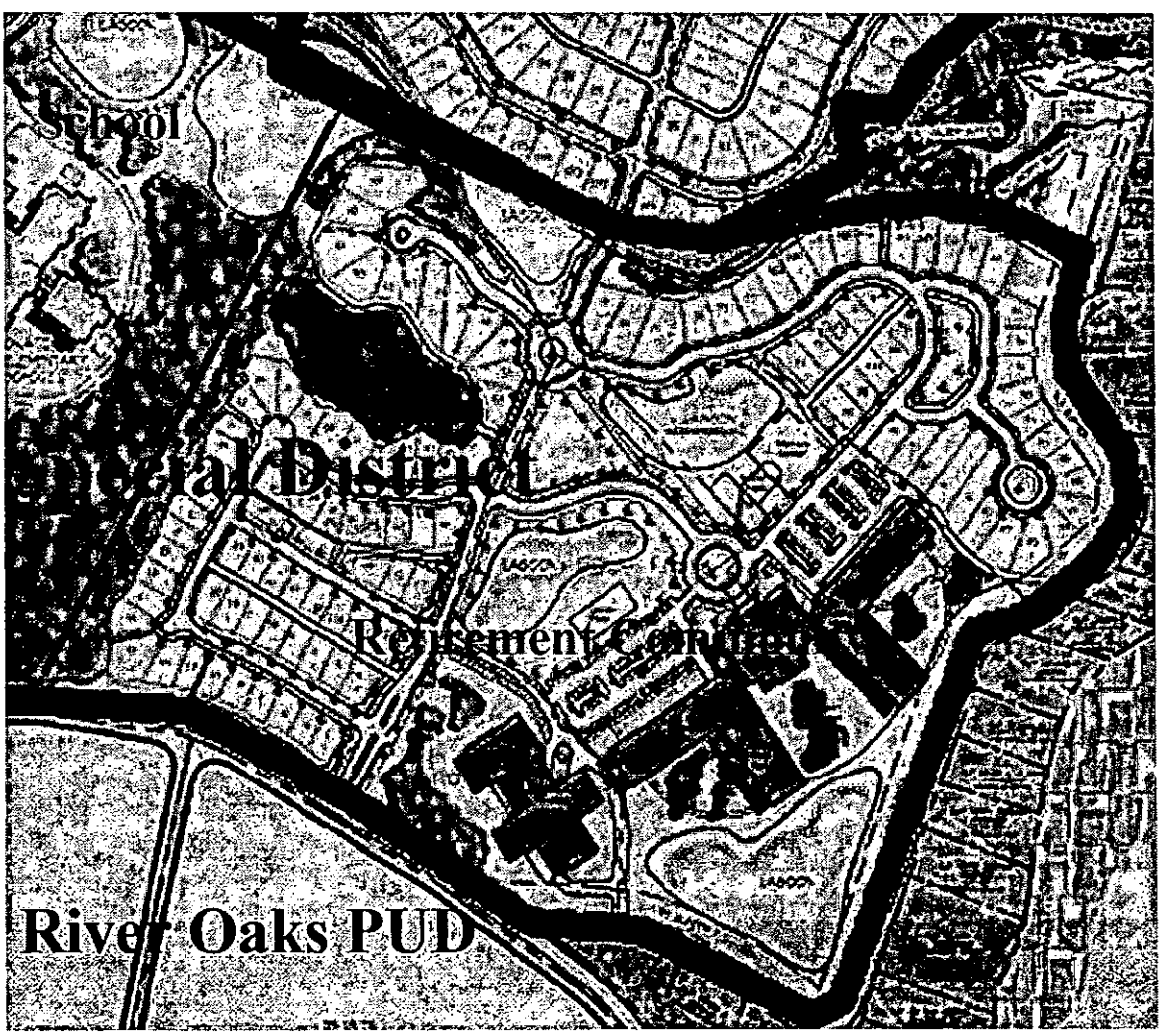
xxv. Wetland - An area delineated and certified by the US Army Corp of Engineers as a wetland. Wetlands may be isolated or contributive.

3. Village Plans (See attached plans)






Osprey Point PUD


School
River Oaks PUD

4. **Location, Linkage and Community Design** – The Southern Beaufort County Comprehensive Plan requires that a development such as Okatie Village will address a number of issues in its planning. These criteria are for the entire community and while they impact the whole Community, projects within any PUD may not address all items but any development proposed within the community should contribute to and be a part of the fabric of the community.

a. **Automobile, pedestrian and biking network**

i. **Thoroughfare Connections** Roads within the PUDs that make up Okatie Village will be interconnected to the extent possible. The Master Plan for the development indicates inter-connection between Okatie Marsh and Osprey Point at three points and between Osprey Point and River Oaks and between Osprey Point and the Property of the Beaufort County School Board. The number of connection points shall not be decreased and additional connections may be added and are encouraged. Connection points may be relocated to address specific changes in the plan but must work with the transportation patterns of all affected PUD's.

ii. **Pedestrian Ways and Bike Ways** - In addition a network of bike trails, routes and lanes will inter-connect the districts within the Okatie Village Community and it is the intention to connect to the East Coast Bikeway, the Greater Okatie Community, and to the region. The bike network within the community shall connect to community destinations, such as the school, the river front park, the greenway, the community recreation facilities, the Village Center (D5) District, to transit stops and other points of civic interest within the community. Sidewalks along the streets will provide an additional connecting network and may at points be part of the network provided the design of the sidewalks is such that it facilitates the use of both the bike and pedestrian traffic anticipated. Sidewalks should not be considered a substitute for the bike and pathway system.

iii. People need places to store bicycles at destination points and at their residences. Bike racks or other means of bike storage is to be provided within 200' of all destination points. The spaces provided should be no less than 15% of the off-street parking

b. **Access** - The Okatie Village property fronts on Highway 170 and has access points at Cherry Point Road, Pritcher Point Road and a point approximately halfway between at a point where there is an existing median cut. In addition there is a right in right out access at the Village Green connecting it to Highway 170. Within the development are connector roads that connect the three PUDs and the school together. These roads also provide an alternate way for traffic on Highway 170 to travel between Cherry Point Road on the South and Pritcher Point Road on the North.

c. **Parking and Intensity** - On street parking is encouraged in all Districts and does not count against the calculations to determine the size of parking

lots. On street parking should be provided as illustrated by Table 7A with the parking lane width adjusted for street speed as shown in Table 7B. Cross easements may cross streets and district boundaries. The size of parking lots shall be determined as follows:

i. The required parking for each category of Function appears in Table 2.

ii. Table 2 (Required Parking) lists the amount of parking required for each function. These requirements may be increased or decreased by 15% without warrants. Additional adjustments can be made if warranted.

D. Parking Lot Calculations - In the event of mixed use (defined as two dissimilar functions occurring within any two adjacent blocks or in a single complex of buildings) the actual parking required is calculated by adding the total number of spaces required by each separate function and dividing the total by the appropriate sharing factor from Table 10. When three or more functions share parking use the lowest sharing factor to assure that enough parking is provided. When the functions sharing a parking area include a restaurant or theatre parking may be increased by ten percent.

i. For any office and congregate care buildings in D4, D5 and SD provide at least one (1) carpool parking space for each non-residential building on site. Space should be located next to or in the vicinity of the handicapped spaces or in the case of buildings in the SD zone near the employees entrance and needs to be clearly marked and signed as to its purpose. Such carpool parking bays can be counted against the required parking for the facility. Additional Carpool spaces may be provided and are encouraged.

E. Public Transit - Provide a covered and at least partially enclosed shelter, adequate to buffer wind and rain, with at least one bench at each major transit stop. One major transit stop shall be provided in each PUD. Stops and shelters should be sized to meet the anticipated needs of each stop. Shelters are to be lighted with a minimum of five (5) foot candles (light leveled may be reduced after hours). Provide kiosks, bulletin boards, or signs devoted to providing transit information as part of any transit stop in the D5 Zone. Additional kiosks, bulletin boards and signs may be provided at the developers' option for Community announcements.

4. **Infrastructure/Conservation**

A. Locate density adjacent to existing utility infrastructure – Beaufort Jasper Water Sewer Authority has existing water lines and sewer lines along Highway 170 that have adequate capacity to serve the community.

i. **Utilities** - Water and sewer lines will be extended to serve the new community, as well as sized to serve the residences along Cherry Point Road North. If determined financially feasible and desirable by BJWSA and the developer, a system for the

utilization of reclaimed water for landscape irrigation may be provided.

ii. **Wetland and Water Body Conservation** – The wetlands and water bodies on the property are bordered with buffers, greenways or parks that meet or exceed County and other agency requirements. The storm drainage system calls for the creation of wetlands along the shorelines of the detention ponds that will be used to capture and hold excess storm water. These shoreline plantings may be accomplished within the designated buffers. Littoral shelves will be built in the larger ponds and planted to create additional wetland habitat.

iii. **Inventory and plan to accommodate community resources** – The Master Plan for Okatie Village identifies a number of natural and other resources of the property. These features include wetlands, river frontage along Malind Creek, specimen Live Oaks, Walnut and Hickory trees along the portion of the property that fronts Malind Creek. In Osprey Point PUD the existing dock and boat ramp will be available for public use for crabbing and non motorized water craft. The existing house in the Osprey Point PUD is to be used as an environmental education center (nature center). The Okatie Marsh PUD calls for an interpretive area in the location of the archeologically significant portion of the PUD. Provisions of the Design Guidelines provide for adjustment to the plan to save and or replace specimen trees and to adjust for other resources found as the project develops

B. **Construction Activity Pollution Prevention** – An affective storm water collection and detention system will be in place during construction. As a minimum such plans shall be in accordance with the Beaufort County Development Standards Ordinance or the Water Quality model developed for Okatie Village. This system will be enhanced and designed to meet the needs of the community as it develops. In preparation the Community has established baseline data regarding the water quality in Malind Creek which is the water body that catches the run off from Okatie Village and the communities of Rivers End and the houses along Cherry Point Road. Baseline testing was done by an independent lab. Samples were taken in similar fashion to guidelines established for Bluffton's May River and for Palmetto Bluff.

C. **Okatie Village shall utilize infrastructure in place** – The development in Okatie Village can be supported by the existing infrastructure that is in place along Highway 170. Sewer lines will be extended to serve the whole community and the houses along Cherry Point Road North, and will feed back to the existing infrastructure that is in place. The existing school is also considered part of the infrastructure. As new schools approved by the voters are built in Southern Beaufort County it is projected that space will become available in the Okatie Elementary

School. The children from the Okatie Village Community will be within easy commuting distance of the existing school.

5. **Community Regulations** – This section operates by referencing Table 1 regarding the Density Requirements of the Community.
   A.. **Density transfers & Unit Mix** - If necessary commercial density and lodging will be swapped for housing units in the same or the abutting district at a ratio of two lodging units for each residence. The Master Plan calls for 272,500 sf of office and retail space in the center core district. If additional office or retail space is required in the D5 district it may be exchanged for residential at a ratio of 2400 sf per residential unit. In no case shall the exchange for additional retail or office space exceed 20% of the total number of units permitted within Okatie Village. The mix of density and commercial reflects the necessary and desirable complexity of urbanism. Adjustments to the mix should respond to conditions of the site and the market as determined by the owner of the property or the Property Owners Association.

   Should future conditions or regulations allow development transfer beyond the amounts listed above, then additional densities can be accommodated up to the limits defined by Table 1. Unit mix shall always be determined by parking to building function ratios Table 2 and Table 10 and must include a mix of housing types (see Table 4 for types) and in number of types as follows:
   District 5 may have up to seven types of buildings. District 4 may have up to eleven types and District 3 may have up to seven types. The retirement community may have up to five types as defined by Table 4.

6. **Environmental Requirements**
   a. In **District D2** the public frontage shall include trees of various species, naturalistically clustered, as well as low maintenance understory plantings (See Tables 5 for location and types of plantings & 6 for suggested plantings). Storm water design shall be Low Impact Design (LID) using bio-retention, rain gardens, fore ponds, retention ponds and other BMP's recommended by the storm management model.. To the extent possible water should be sheet drained to swales and collection points.
   b. In **District D3** the public and private frontage shall include trees of various species, naturalistically clustered, as well as low maintenance understory plantings (See Table 5 & 6). Storm water design shall be Low Impact Design (LID) using bio-retention, rain gardens, fore ponds, retention ponds and other BMP's recommended by the storm management model. 12" curbs and gutters are to be used but sheet drainage should be used where possible. Where greenbelts occur they are part of the drainage collection system and will be landscaped and contoured to provide green area between walks, streets and the waterways. In order to establish the

suburban character of this district, grass shall account for a minimum of 20% up to a maximum of 80% of the site not occupied by buildings and drives.

c. In **District D4** a minimum of one street tree shall be provided per single family attached dwelling and multi-family buildings shall have a minimum of one street tree per first floor dwelling unit in the front yard and one per every two first floor dwellings in the rear yard. Storm water design shall be Low Impact Design (LID) using bio-retention, rain gardens, fore ponds, retention ponds and other BMP's recommended by the storm management model. 12" curbs and gutters are to be used in front of residential and commercial lots to maintain an urban feel. Elsewhere sheet drainage should be used where possible. Where greenbelts occur they are part of the drainage collection system and will be landscaped and contoured to provide green area between walks, streets and the waterways.
d. In **District D5** a minimum of two street trees shall be provided per 50' of length. Such trees shall be in planters, grated tree wells or in islands provided for landscaping. Species shall be selected from the list in Table 6. Storm water design shall be Low Impact Design (LID) using bio-retention, rain gardens, fore ponds retention ponds and other BMP's recommended by the storm management model. 12" curbs and gutters are to be used but sheet drainage should be permitted along parking lot islands and where required for water collection. Off site management of underground storm drainage is permitted.
e. In **Districts 3 and 4** where existing trees 4" DBH are saved they can be substituted for street trees in yard areas regardless of specie.
f. In **District 5** where existing trees of specie listed in Table 6 are saved these can be substituted for new trees on a one for one basis.
g. In **Districts 4 and 5** understory plants should be located in defined planters either level with the existing grade or in beds raised above grade.
h. **Suitable private frontage trees** taken from the list of acceptable small trees and shrubs (Table 6) shall be planted in the front yard of each attached or detached single family unit and in the front and rear yards of multi-family and commercial buildings Shrubs and ground cover shall be used along with grass, sidewalks and courtyards to provide an attractive presentation to the street.
i. **Street trees** (Table 5 & 6) shall be provided at 50' intervals along all public streets in the D3 and D4 districts. Only one species of street tree is to be used in any one block. Selections can be changed at intersections on streets that feed into thoroughfares, cross streets or avenues. Specie of street trees may be changed from one District to another.
j. **Existing trees** of significant size (4" DBH or larger) may be substituted for required street tree plantings on a one for one basis.
k. **Raised planters** in sidewalk areas (District D5) should be a maximum of 15" high and 16" wide so as to provide casual seating for pedestrians.

Planters and planting beds should have a minimum internal dimension of 3'.

7. **Streetscape Requirements**
   a. **Thoroughfares and Streets** - The thoroughfares consist of vehicular lanes and public front yards (Table 7A & 7B). The lanes provide for traffic flow and parking. Vehicular lanes are in a variety of widths (14', 12', 10', etc.) designed to accomplish specific community objectives for speed control and community access. Parking on street is also provided in a variety of widths and lengths depending on location and vehicle speed of traffic in adjacent driving lane. The frontages contribute to the character of the zone in which they are located and therefore should include the sidewalks, curbing, planters and street trees as indicated in Table 5A and 5B and as described above.
   b. **Vehicular Lanes** - Standards for vehicular lanes shall be as shown in Table 7 A & 7B with the exception that divided roads can be provided in any district and should have an 11' traffic lane and an 8' parking lane where a parking lane is provided. Where parking is not provided the traffic lane width should be 14'.
   c. **Public Frontage (The area from the street edge to the property line)**
      i. The area between the back of the curb or the edge of pavement where no curb exists and the property line of properties and boundaries of Civic Spaces shall be considered Public Frontage.
      ii. Public Frontage shall be treated by district as shown in Tables 5A & 5B Public Frontages. In Districts 3, 4 and 5 and the Special District included in the River Oaks PUD a minimum of one street tree will be provided per lot abutting the street in addition to other requirements for street trees herein. Other public frontage improvements in these districts may include sidewalks, bike trails, street lights and lawn areas, etc. Ground covers and vines may be used in lieu of lawns (See Table 6 for suggestions). Generally Public Frontage treatments will be blended with front yard (Private Frontage) landscape and site improvement treatments to produce an integrated appearance. Care should be taken to blend adjacent yard areas together to produce an integrated and attractive streetscape.
      iii. Public frontage improvements in these districts shall include: sidewalks per Table 5B (Walkway)
         1. D3 District – one or both sides of all streets (except alleyways)
         2. D4 both sides of the street (except alleyways)
         3. D5 District – both sides of the street (except alleyways)

4. SD District = one or both sides of the street (except alleyways)

iv. Landscape treatments and site improvements are not to alter or obstruct the community storm drainage plan. This statement is not cause to avoid the planting of required street trees in the public frontage or street median.

d. **Blocks** - To the extent possible the thoroughfare network shall be as shown in the Master Plan for the PUD or if altered shall be designed to create blocks not exceeding the size prescribed in Table 1, subsection Block Size. The block perimeter shall be measured as the sum of the block faces from the thoroughfare right-of-way centerline to centerline.

e. **Street Terminations** - The layout of streets may be as shown on the Master Plan for the PUD but if altered then all thoroughfares in the altered design shall terminate at other thoroughfares forming a network. Internal thoroughfares shall connect to those on adjacent properties. Cul-de-sacs shall be permitted only when warranted by natural site conditions. Cul-de-sacs if used should be of adequate radius to allow for fire and emergency vehicles to turn through 360^0.

f. **Termination Elements** - Streets as shown on the Master Plan are acceptable but if altered termination points of streets shall terminate on a building, vertical element, or civic space such as the greenway, park, a monumented trail or natural area.

g. **Bicycle, Golf Cart and Leisure Trail Network** - An inter-connected bicycle network consisting of trails, routes, and lanes is to be a part of Okatie Village in all districts. Lanes may be provided in Districts where indicated in Table 1. Bicycle trails / leisure trails may be provided in any District. Where possible bicycle and leisure trails should have pervious surfaces. Bicycle trails shall also be available for use with other types of pedestrian vehicles, such as non motorized scooters, segues, golf carts, and roller blades. Specific vehicle uses may be restricted in the interest of public safety. The Eastcoast Bikeway which is planned to run in the ROW of Highway 170 will have bike paths that allow a cyclist to easily access the Commercial areas in the Village Center (D5 District)

h. **Front Yards (Private Frontage)** - Front yards are to be as shown in Table 8 and allocated to districts as shown in Table 1. Front yards may be fenced with fences that are less than 4' in height and are a minimum of 40% open. Landscape fences and hedges 4' or less in height are encouraged. (See also Sec 10.d)

i. **Street Trees** - Along thoroughfares street trees are to be provided. Street trees shall be of the varieties shown in Table 6 and shall be positioned as indicated in the section 5.i. above.

j. **Street Lighting** - Street lights shall be provided at intersections of public streets, at the intersection of streets, at 150' intervals if no intersection occurs and at mid points of blocks longer than 150' but less than three hundred feet in districts where street lighting is required per Table 11.

Fixture types will be street lights provided by the electric company or available from a dealer that are equivalent to lights shown in Table 11. All street lights regardless of source shall be cut-off fixtures. Pole heights in all districts shall be a maximum of 15'in height.

k. **Street Designations** - The network of streets should include streets designated by function as boulevards, standard roads, residential streets, standard streets and avenues, commercial streets and avenues, rear alleys and rear lanes. These terms are defined and illustrated in Table 5A. Streets may be designated one way or two way and serve the purposes of feeder streets (streets that connect residential units to other streets, collector streets (streets that gather the traffic from one or more feeder streets and connect them to thoroughfares) and thoroughfares that connect feeder streets to streets that connect to streets at the edge of the property or district.

l. **Business Street Entrances** - Businesses that abut public thoroughfares on the edge of the district shall have protected entrances and storefronts off of the thoroughfares that shall be accessible via any combination of sidewalks, plazas, passages and paths. Protection for entrances may be any of the diagrams f,g or h as illustrated in Table 8. Protective overhangs and awnings should cover a minimum of 1/3 of the building façade. Lodging buildings need protection over the entrance and any space allocated for guest waiting and loading..

m. **Village Center Street Facades** - Buildings along collector streets in the internal streets of the Village Center, District 5 shall provide for on street parking, and facades facing the street at street level are to be predominantly storefront (70% Min). Entrances are to be protected by any of the means shown in Table 8, diagrams f, g and h. Other methods of entrance protection may be considered and approved by the Architectural Review Board (ARB) provided they are appropriate to the District.

n. **Continuity and Interconnection** - Design patterns (Street alignment, pathway alignments, building massing, etc.) and materials (landscape materials, building finish materials, colors, etc.) should flow from one District within the community to the next.

8. Civic Spaces and Civic Structures

a. **General** - Civic spaces, structures and buildings are and should be a part of Okatie Village. Civic spaces and buildings serve the community needs for open space, for recreation, for delivery of services for the common good. Public spaces include but are not limited to parks, greenways, commons or greens, plazas, squares, leisure trails, paths, and bikeways, pools, fountains, playgrounds, and play yards. Civic buildings are buildings that serve a community need and include but are not limited to Fire and Rescue facilities, libraries, community recreation and meeting buildings, clubhouses, interpretive centers, community education buildings, transit facilities, hospitals, surgical centers and transit and municipal parking facilities. Also in the list of civic buildings would be governmental centers, churches, buildings dedicated to culture, and

education. Civic structures may include community crabbing docks, transit or pedestrian shelters, community picnic shelters, recreation courts, shared outdoor seating areas, amphitheater, public exhibition area, and public art.

b. **Civic Space** – Civic spaces can take many forms and shapes. Table 13 illustrates a number of typical patterns for various types of civic spaces. Civic spaces serve shared needs and should be open to all though fees may be charged for the services provided. Spaces may need to be closed at certain times for special events, cleaning, preparation for events, for maintenance and security.

c.. **Civic Space by District** – The Master Plan for the PUD includes civic spaces either within or adjacent to each District included in the PUD. If however the plan is modified then each District will need to maintain the same percentage of civic space as the Master Plan or in no case less than 20%. Civic space may be assigned within Districts as long as ratios are met within a radius of a 10 minute walk or ½ mile. Civic spaces shall be located to take advantage of natural resources, but should also be easily accessible to all community residents within any District. Civic spaces shall be accessible from community thoroughfares.

d. **Civic Structures** – To the extent possible Civic Structures should be located adjacent to or across the street from civic spaces. Where located across the street, pedestrian warning pavement should be used and crosswalks should be provided. Efforts to incorporate civic and institutional structures are to be encouraged.

e. **River Oaks Park** – River Oaks Park which runs along the river in the Okatie Marsh and Osprey Point PUD's is to be open to the public except for times blocked out for maintenance, special events, times and days as determined by the AOVPO and times closed due to inclement weather. The park is to be restricted to passive uses as proposed in the Master Plans for the PUD's.

f. **The Buffer along Highway 170** – The East Coast Bikeway runs along Highway 170 in the right of way. To offer a bit of diversion in the route the pathway may be diverted into a portion of the buffer in front of the Village Center (District D5). Buffer opacity for approximately 1/3 of the frontage may be reduced to 30% by limbing up the trees and pruning understory plantings to a minimum height of 3'. The area for diversion of the bikepath and for the decrease in opacity should overlap.

9. Site & Building Design

a. **General** – The requirements of this section control the disposition, configuration and function of buildings, and provide standards for the fabric (architecture, landscape, parking and ambience) of the community. It is anticipated that buildings within each PUD will conform to additional rules and guidelines set forth by the AOVPO or its sub-associations and administered by the Architectural Review Board having jurisdiction. In addition buildings within 500' feet of Highway 170 will be subject to review by the County Corridor Review Board. Each HOA will establish

and administer the issuance of such Guidelines and shall administer their compliance. Such Guidelines may incorporate the requirements of this document but failure to include such in any guidelines for a particular ARB shall not abrogate the requirements of this document. No provision of an ARB issued Guideline takes precedent over the provisions of this document. Changes can be made to this document only with the mutual consent of the County Planning Staff and the Board of the responsible Homeowners Association. The Master Association and each sub-association may assign this responsibility to an ARB to administer, and to ensure compliance. The POA may use the resources of the Security Department of the Community to assist with enforcement. Submissions for new construction and additions should include the following:

i. Site disposition of all vertical and horizontal structures
ii. Building function should be noted
iii. Architectural elements in Plan and Elevations
iv. Landscaping
v. Parking
vi. Building or structure typical Section

Building review and approval under these Guidelines does not replace or alter County requirements for issuance of a building permit.

b. **Parking Lot Planning (Localized Density)**

The size of parking lots shall be determined as follows:

i. The required parking for each category of Function appears in Table 2.
ii. Table 2 (Required Parking) lists the amount of parking required for each function.
iii. These requirements may be increased or decreased by 15% without warrants. Additional adjustments can be made if warrants are requested by a site developer and approved by the Development Review Team (DRT).
iv. Parking Lot Calculations - In the event of mixed use (defined as tw o dissimilar functions occurring within any two adjacent blocks or in a single complex of buildings) the actual parking required is calculated by adding the total number of spaces required by each separate function and dividing the total by the appropriate sharing factor from Table 10. When three or more functions share parking use the lowest sharing factor to assure that enough parking is provided. When the functions sharing a parking area include a restaurant or theatre parking may be increased by ten percent.

c. **On street parking** – On street parking is encouraged in all Districts and does not count against the calculations to determine the size of parking lots. On street parking should be provided as illustrated by Table 7A with the parking lane width adjusted for street speed as shown in Table 7B. Cross easements may cross streets and district boundaries.

d. **Building Disposition (D3,D4,D5, SD)**– Lots shall be dimensioned as shown graphically Master PUD Site Plan and/or according to the standards of Table 1 for the appropriate district.

i. **Multiple Buildings on Residential Lots** -One principal building is to be located at the front of the lot and one out-building which includes a garage may be located to the rear of any lot in districts 3 and 4. . Where this pattern of development is used rear yards may be reduced to 5 feet from the rear property line. Otherwise setbacks are to be as shown in Table 1. In order to reduce the impact of drives and garages, rear loaded attached and detached garages are strongly encouraged. Both front loaded and "side – front loaded" garages are permitted! These shall be recessed a minimum of 3 feet but greater recesses are preferred!) from the primary building façade, with a drive of no more than 10 feet in width. Pervious driveway medians are strongly encouraged!

ii. **Residential Building Yard Areas** – Buildings shall be located on the lots as shown in Table 9.

iii. **Lot Coverage** – Lot Coverage shall be within the limits shown in Table 1 for all districts (D3-D5).

iv. **Facades** – Facades are to be built parallel or tangent to the principal front yard property line. Where buildings front on two streets the one along the principal street (more urban) will be considered the principal front. The principal façade of residential and non-residential buildings shall front a dedicated public space such as a street, square, plaza, or village green, etc. Surface parking lots are not considered public spaces, and do not fulfill this requirement! The façade's principal, (fully functional) entry should also front onto the public space. If a street runs adjacent (parallel or tangent) to a square, plaza, green, park, greenway, or other public space structures shall front both the street and public space, unless shown otherwise on the PUD masterplan(s)!

v. In **D5 District 5 (Village Center)** Facades are to be built parallel to the principal front street along a minimum of 70% of the length of the setback. (Shown in Table 1) Buildings may be stepped back to allow for special functions such as a sidewalk dining area. A ratio of building height to street width of 1:3 is desirable but not mandatory. Building height is limited to 45' maximum as shown in table 9B.

vi. **Setbacks** – Setbacks for buildings are to be as shown in Table 1. In the case of a building on an infill lot, setbacks shall match the front façade of one of the two adjacent

buildings. In the D5 District Balconies and upper floors may built up to 8 ' in front of the ground floor façade and may encroach on the right of way for the street below. In no case can such an encroachment protrude beyond the curb of the street below.

vii. **Rear Setbacks** – Rear setbacks are to be as shown in Table 1 except the setback shall be reduced to 5' from the rear property line in Residential Districts with rear alleys. Where rear alleys are available they shall be used to access garages and for garbage pick up.

viii. **Encroachments** – In Districts D4 and D5 awnings may encroach over the public sidewalk to within two feet of the curb. In District D4 and D5 stoops and open porches may encroach to within three feet of the front property line. Open porches with awnings may encroach up to 50% of the depth of the required setback. Balconies and Bay Windows may encroach up to 25% of the depth of the required setback

e. **Building Mass** – Private Frontage Types shall be as described in Table 8 and allocated as shown in Table 1. Tables 9A and 9B show the disposition of buildings on site by district and 9B indicates building heights as limited below.
   a. **Building heights** – Building Heights shall not exceed 45' measured to a point as shown in diagrams for the specific District (See Table 9B).
      i. **First Floor Elevations above sea level** .- In all cases the first habitable floor of all buildings shall be above the established flood plane. In all other cases the first floor of the entrance at the porch shall be a minimum of 18" above the elevation of the sidewalk or curb (if there is no sidewalk) along the front of the lot. In the D5 District the elevation of the first floor shall be a minimum of 12" above the street curb and the sidewalk may be sloped to facilitate handicapped access.

f. **Building Function**
   a. **Building functions** shall be as defined in each District see Table 3
   b. The **parking in lots** in Districts D 4 and D5 shall be as defined earlier under Parking Lot Planning and as illustrated by Table 2 and 10
   c. Where **accessory outbuildings** are amenable to residential occupancy such as an above garage apartment such should be considered for rental. Such rental shall not count against caps or targets for initial residential development established in the PUD. In the D3, D4 and D5 Districts space in outbuildings may be used for home office and limited business uses provided parking is available that meets the provisions of this document..

g. **Parking standards**
   a. **Parking in District D4 and D5** shall be as defined under Parking Lot Planning and as illustrated by Table 2 as adjusted by factors in Table 10.
   b. **Parking Location general** - Except for on street parking, and parking in garages other parking shall be provided toward the rear of any lot and

shall be screened from the street if there are no buildings on the lot. This provision applies to Districts D2-D5

c. **Bicycle Racks** - In Districts D4 and D5 a minimum of 1 bicycle rack space shall be provided for every 10 vehicular parking spaces.

d. **Credit for Golf Cart and Compact Car Parking** - A minimum of 5% of the required parking places may be for golf carts. Golf cart spaces may be 6' x12' and labeled "CART". Up to 20% of the parking places may be for compact cars. Compact parking spaces will be 8' 6"x17'.

e. In all districts the use of **garages at the rear of the house** is encouraged. However where front loaded garages are used the front yard setback for the garage is increased to 20'. The Residence Building Line remains at 15' and stoops, front courts, porches and bay windows may encroach into the front setback as defined in the section above on Encroachments. Parking lots in District D4 and D5 shall be behind the building and access to the parking area shall be no more than 30' wide. Turning radii shall be adequate to accommodate safety vehicles and delivery vehicles.

10. Architectural Standards

Buildings in District D5 should have a linear quality with darker and more wearable surfaces nearer the ground. Designs for individual buildings should be coordinated with those of adjacent buildings.

Street screens if used to screen parking should be of either landscape hedges with opacity of 70% or built of materials to match the adjacent building on one of the two adjacent sides.

a. **Openings**, including porches, galleries, arcades, and windows will generally be orthogonal. Arches may be used over entrances or for emphasis in a façade. Small ovals may be used for bathrooms or secondary spaces where visibility needs to be limited.

b. **Upper story windows and doors** - Above the first floor in residential districts including district D4, openings for windows and doors shall not exceed in the aggregate 50% of the total building façade. Each façade shall be calculated independently. In district D5 upper floor windows shall not exceed 60% of the aggregate of the total building façade.

c. **Retail store facades** are to be detailed as storefronts. The Architectural Review Board shall define storefront design.

d. **Roofs** -Pitched roofs, if provided, shall be sloped no less than 5 in 12 except that porch and attached shed roofs may be no less than 2 in 12. Buildings with flat roofs should have parapets at least 42" high along the principal street. Such parapets may extend above the 45' height established for the Village. All mechanical equipment including kitchen exhausts are to be screened from view. (See Table 9B for Building heights)

e. **Building Design** - See Table 8 for illustrations of massing, attachments, etc appropriate to buildings in each District. The Architectural Review Board may add additional design requirements. Such changes can be made with approval of the HOA Board and do not take precedence over the provisions herein.

f. **Building Disposition** – The location of buildings on any given site should be in configurations on the lot as shown in Table 9A. Building heights are not to exceed 45' as measured shown in Table 9B.

11. Landscape Standards

a. **Front Yard Plantings** – A minimum of one tree from the small tree and shrub list (Table 6) shall be planted in each front yard. Trees selected should compliment the street trees selected for the particular street where the lot is located. Understory plantings of shrubs can be provided to supplement the required tree..

b. **Lawns** – lawns shall be permitted in all residential districts. (D3, D4, D5 and SD)

c. **Trees and large shrubs in D5 District** – Tree species should be selected and provided that mature to have shade canopies that remain clear of building frontages. Trees in this District need to be of varieties that perform well in an urban setting. If pole shaped trees as shown in Table 14 are used they are to be clustered in groups of three or more and spaced as a single tree.

d. **Fences** – Fences may be built on any lot to screen mechanical equipment. When used to screen equipment the height and opacity should be sufficient to screen the equipment. Service yards are not to encroach on building setbacks. In districts D3 and D4 privacy fences may be provided in rear yards and may extend into the side yard toward the front lot line up to 20% of the length of the side yard. Privacy fences may be up to six feet (6') in height and should be located a minimum of three feet (3') off the property line. Plantings should be provided between the fence and the lot line. In Private Frontages in districts D3 and D4 and in the Special District, fences when provide will be a maximum of 40% opaque and will not exceed 3' 6" in height. Fences in private frontages may be located immediately behind the property lines. Private frontage fences may extend into the side yards up to 80%. In all fences the height of the posts supporting fence panels may exceed the maximum fence height by up to additional eight inches (8").

12. Lighting Levels and Street Light Types

a. **Average lighting levels** measured in foot candles at the building front shall not exceed 1.0 foot candle for District D1, D2 and D3. In zone D4 average lighting levels shall not exceed 2.0 and for D5 the average shall not exceed 5.0 foot candles.

b. **Civic Building Average Light Levels** -Average Light levels may be 2.0 for all Civic Buildings and structures in any District from D1- D4 and may be 5.0 foot candles in District D5.

c. **Street lights** shall be the traditional standards and shall be the general type illustrated in Table 11. All fixtures shall be cut off fixtures. Maximum pole height 15'.

Table 1 (2 Pages) **Planning Parameters**

Perm = Permitted	Dist1 & 2	Dist3	Dist4	Dist5	
Base Residential Density	D1/D2	D3	D4/SD	D5	Remarks
By Right	1/ac	3/ac	5/ac	6/ac	Gross density limited to total allocation approved in the Master Plan
By Dev Transfer		6/ac	12/ac	24/ac	
Block Size					
Perimeter (Sec 9.d Blocks)	No Max	3000 ft Max	2500 ft Max	2000ft Max	If developed per Master Plan block lengths shown are acceptable
Public Frontage					
Hwy & Rur Road	Perm				
Boulevards		Perm	Perm	*Perm	* Perimeter only
Stnd Roads		Perm	Perm	*Perm	* Perimeter only
Residential Street		Perm	Perm		
Stnd Streets & Ave			Perm	Perm	
Comm Strts & Ave				Perm	
Rear Lane	Perm	Perm			
Rear Alley		Perm	Perm		
Path	Perm	Perm			
Passage		Perm	Perm	Perm	
Bicycle Trail	Perm	Perm	Perm		
Bicycle Lane		Perm	Perm	Perm*	* Perimeter only
Bicycle Route	Perm	Perm	Perm	Perm*	*Perimeter Only
Civic Spaces					
Park	Perm				
Greenway		Perm	Perm		
Square/Commons				Perm	
Plaza				Perm	
Playground		Perm	Perm		
Community Bldg	Perm*	Perm	Perm	Perm	* Existing Bldg only
Lot Occupation					
Lot Width		50' min/ 120'max	18min/ 96'max	18'min/ 150'max	
Lot Coverage		60%	70%	80%	
Setbacks					
Front		15' *	6'	0'	* Porches & oriels may encroach. With front load garage setback is 20'

Table 1 (2 Pages)				**Planning**	**Parameters**
Side		5' Min	0' min	0' min/ 28'max	
Setbacks (Con't)	D1/D2	D3	D4/SD	D5	Remarks
Rear		20'/ 5' *	20'/5'*	3'	*House /Garage
Res Building Types					
Detached	Perm	Perm	Perm		
Attached Side Yd			Perm	Perm	
Attached Rear Yd			Perm	Perm	
Private Frontage					
Common Yard		Perm	Perm		
Porch & Fence		Perm	Perm		
Terrace or Lght Ct			Perm		
Forecourts			Perm	Perm	
Stoop			Perm		
Shop w Awning				Perm	
Gallery				Perm	
Arcade				Perm	
Building Height					
Principal Bldg		3 Story Max	4 Story Max	4 Story max	
Out Building		2 Story Max	2 Story Max	2 Story Max	
Building Function					
Residential		Perm	Perm	Limited	
Lodging			Perm*	Perm	* Family accommodation in Age Restricted district
Office		In Home	In Home	Perm	
Retail				Perm	
Institutional			Perm*	Perm	*Age Restricted Dist
Religious		Perm	Perm	Perm	
Civic	Perm*	Perm**	Perm#	Perm	* Shelter and EEC
					** Shelters & Comm Rec
					#Shelters, Comm Rec & Plaza
	D2	D3	D4	D5	

The SD District Retirement Community shall be considered D4 District when using this Table

Table 2 Required Parking Ratios (See Table 10 for Adjustment factors)

Function	D2, D3	D4	D5
Residential	2.0/Dwelling	1.5/Dwelling	1.5/Dwelling
Lodging	1.0/Bedroom	1.0/Bedroom	1.0/Bedroom
Office	2.0/1000SF	3.0/1000SF	2.0/1000SF
Retail	4.0/1000SF	4.0/1000SF	4.0/1000SF
Restaurant/Civic/Institutional	By warrant	By Warrant	By Warrant
Environmental Education Center	20 /spaces pervious 1/space HC Impervious		
Other	By warrant	By Warrant	By Warrant

Table 3A Allowable Building Function by District

a. Residential	D2	D3	D4	D5	SD
Apartment Building			0	0	0
Row House			0	0	0
Town Home			0	0	0
Duplex			0	0	0
Sideyard House		0	0	0	0
Cottage		0	0		0
Single Family Detached	0	0	0		0
Estate House	0	0			
Specialized Nursing					0
Accessory Unit	0	0	0	0	
Live Work Unit		0	0	0	
Accessory Unit	0	0	0	0	0
Temporary Tent	0	0	0	0	0

b. Office	D2	D3	D4	D5	SD
Office Building			0	0	0
Live Work Unit		0	0	0	
Rehab Facility				0	0

d. Lodging	D2	D3	D4	D5	SD
Bed and Breakfast			0	0	
Hotel/Motel				0	
Rooms to Rent		0	0	0	0

e. Retail	D2	D3	D4	D5	SD
Market Building				0	
Retail Shop Building	0	0	0	0	
Furniture or Art Gallery			0	0	
Restaurant	0	0	0	0	0

e. Retail (Con't)	D2	D3	D4	D5	SD
Kiosk	0		0	0	
Push cart/ Ice Cream		0	0	0	
ABC Store/Wine Shop				0	
Pharmacy				0	
Fitness Center or Gym				0	0
Retail Shed/Pavilion	0	0	0	0	0
Salon			0	0	0
Laundramat				0	0
Services			0	0	0
Movie Theater				0	0

f. Civic	D2	D3	D4	D5	SD
Amphitheater	0	0	0	0	0
Bus Shelter	0	0	0	0	0
Convention Center				0	
Conference Center				0	
Exhibition Hall			0	0	0
Fountain/Public Art	0	0	0	0	0
Library				0	0
Live Theater			0	0	
Museum			0	0	
Parking Structure				0	
Playground	0	0	0	0	0
Sports Stadium					0
School					0
Parking Lot			0	0	0
Public Restrooms	0		0	0	0
Religious Assembly		0	0	0	0

0 = Permitted

Table 3B (2 pages) **Building Function Description**

Function	D3	D4	D5	SD
A. Residential	Restricted Residential: The number of dwellings on each lot is restricted to 1 within a principal bldg and 1 in an accessory bldg. 2 spaces are to be Provided for each. Both Dwellings are under one Ownership. Habitable area of ancillary units – 650sf max	Limited Residential: The number of dwellings on ea lot is limited by the parking requirement of 1.5 spaces per dwelling. Ratio may be reduced according to shared parking standards (Table 10)	Open Residential: The number of dwellings on each lot are limited by PUD Doc or requirement of 1.5 spaces for each dwelling. Ratio may be reduced according to the shared parking ratio (Table 10)	Limited Residential: The number of dwellings on ea lot is limited by the parking requirement of 1.5 spaces per dwelling. Ratio may be reduced according to shared parking standards (Table 10)
B. Lodging	Restricted Lodging: The number of bedrooms available on each lot is limited is limited by the requirement for 1 parking space per bedroom up to 3 in addition to parking required for principal dwelling	Limited Lodging: Number of bedrooms on each lot is limited by the parking space requirement - 1.0 per bedroom up to 12 plus spaces required for Principal Dwelling. AM food service may be provided.	Open Lodging: The number of bedrooms available on each lot for lodging is limited by requirement of 1.0 parking space per bedroom. Ratio may be reduced according to the shared parking ratio (Table 10). Food service may be provided at any time.	Limited Lodging: Number of bedrooms on each lot is limited by the parking space requirement - 1.0 per bedroom up to 12 plus spaces required for permanent residents. Food service may be provided.

Table 3B	(Con't)	Building	Function	Description
Function	D3	D4	D5	SD
C. Office	Restricted Office: Office use is restricted to home offices. Such activity may be located in the main house or an Ancillary outbuilding. Parking is to be provided for such use at the Ratio in Table 2	Limited Office: Office use area in this district is limited by the requirement for parking (see Table 2). Office use may be on the main floor of the principal building or in an ancillary outbuilding.	Open Office: The building area available for office use is limited by the parking standard (see Table 2) and may be reduced according to Table 10	Limited Office: Office use area in this district is limited by the requirement for parking (see Table 2). Office functions should be for personnel supporting the needs of the residents. Office use may be on any floor of the principal building or in an ancillary outbuilding.
D. Retail	Restricted Retail: The building area available for retail use is restricted to one corner lot for each 300 units and by the requirement for parking (see Table 2) Use shall be further limited to a neighborhood store or food service facility with a max of 20 seats.	Limited Retail: Building area for retail is limited to one corner location in each block on the first floor and by the parking requirement (see Table 2). Use shall be further limited to a neighborhood store or food service facility with a max of 40 seats. Dwelling parking is required in addition.	Open Retail: Building area for retail is limited PUD and by parking (see Table 2). Parking ratio may be reduced according to the shared parking ratio (Table 10).	Limited Retail: Retail uses are ancillary and are for the support of the Residents.
E. Civic	Limits are determined by parking (see Tables 2 and 3A)	Limits are determined by parking (see Tables 2 and 3A)	Limits are determined by parking (see Tables 2 and 3A)	Limits are determined by parking (see Tables 2 and 3A)

Table 4 (2 Pages) **Building Types**

Type Description	D1	D2	D3	D4	D5	SD
Single Family Home - House occupies center of lot with open space on all sides. Yards may be fenced as defined in Section 10.d. House may be up to three stories in height. See Table 1 for setbacks.		0	0	0		0
Cottage – Cottage occupies center of lot with open space on all sides. Yards may be fenced as defined in Section 10.d. Cottages may be a maximum of two stories in height.		0	0	0		0
Villa – Villas occupy center of lot or may have a party along one Side. Side setback for a party wall side of villa would be 3' and 7' on the non party wall side. Three foot setback is a visual easement to the adjacent neighbor but access for maintenance is retained as a right of the property owner. Villas may be up to 4 stories in height.			0	0		
Estate House – Estate houses are located on wider lots and may be up to 4 stories in height. Yards may be fenced as defined in Section 10.d. House must observe District setback requirements.		0	0			
Single House – Single houses are generally narrower and are located to one side of the lot. Access to the house may be from the front or the side of the house usually via a porch. Yards may be fenced per Section 10.d. House must observe district setback requirements. House may be up to three stories in height.		0	0	0		0
Zero Lot Line House – House is located to one side of the lot and party wall may be on the lot line. A party wall may be shared by two adjacent owners with legal consent of both parties. Both owners have a 5' easement to maintain the property on the lot line. . House may be up to three stories in height.				0	0	
Duplex – A duplex may be located only on a corner lot and contains two dwelling units. Duplexes may be up to three stories in height. Parking must be provided for each dwelling unit. Accessory outbuildings may be provided for garage and/or storage use only.			0	0		
Patio Home – Patio homes may occupy to the boundary of the property while internally defining one or more private patios or courtyards. House may be the lower of four stories or three stories above the lowest courtyard				0	0	

Table 4 (2 Pages) Building Types						
Type Description	D1	D2	D3	D4	D5	SD
Townhome – A townhome is built to the sideyard line and may share a common party wall with the adjacent lot owner or owners may each build a party wall immediately inside the property line. Sideyards are allowed for end or corner lots only. Townhomes may be up to three stories.				0	0	
Rowhouse – A Rowhouse is built to both side and front yard property lines. The rear yard is left open for parking and/or outdoor activities. Balconies may be built over the street sidewalks below. Rowhouses may be up to four stories. Rear yards of corner lots should be screened.					0	
Live Work Unit – This is a Residence built on an upper floor above commercial space. Live work units include commercial space at the street level and dwelling units on two or more floors above. Live Work units may be built to the property line on any side. Balconies and units may encroach into the area above the sidewalk below.				0	0	
Apartment – Apartment buildings may contain multiple units of either townhouse or garden design. Apartment buildings may be up to four stories. Setbacks and other requirements are as established for the district. Outbuildings may be provided for storage or garages only.				0	0	0
Specialized – This is a building to accommodate commercial, civic or institutional needs and requirements reflect the nature of the function. Such buildings are limited by other provisions of these guidelines.			0	0	0	0

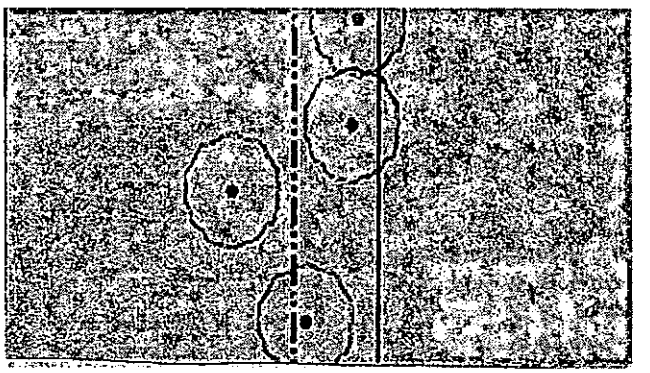
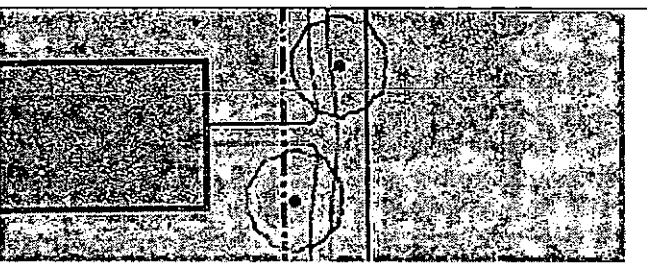
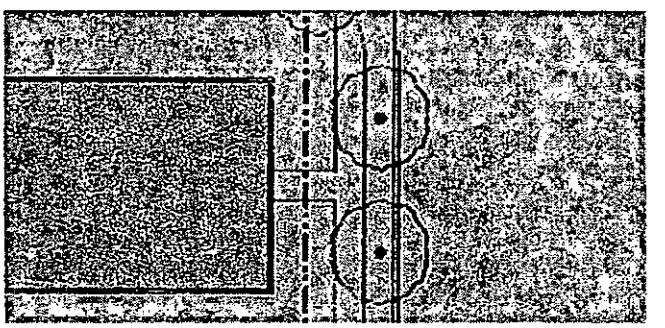
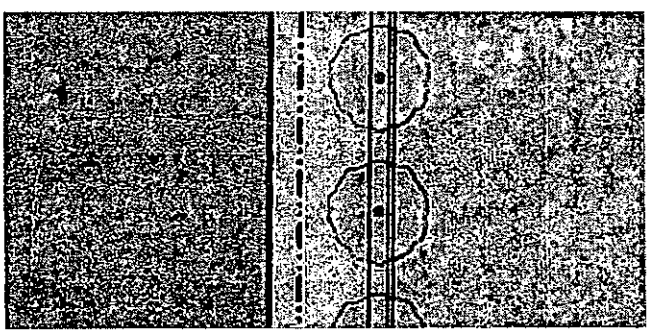
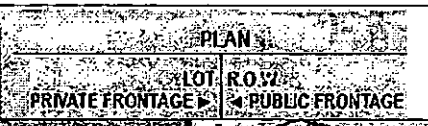
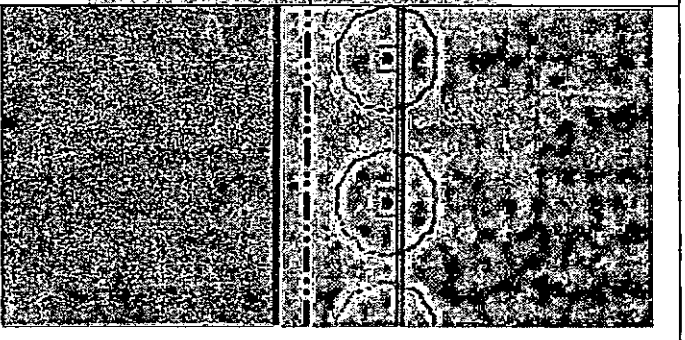
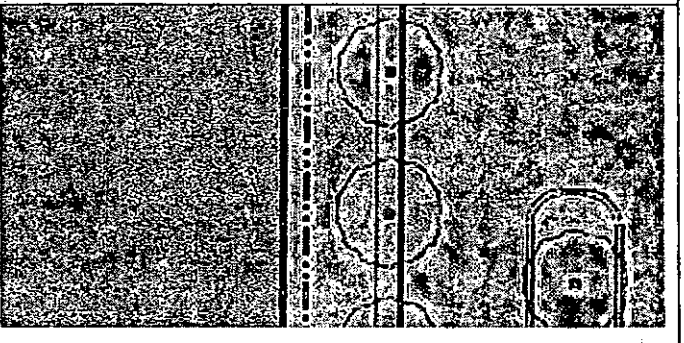
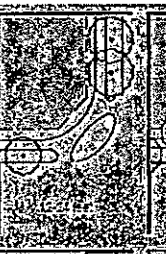
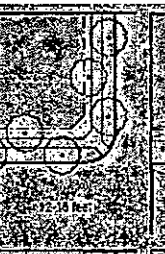
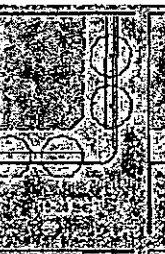
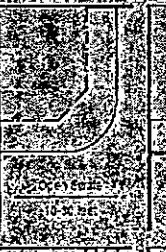
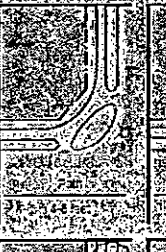
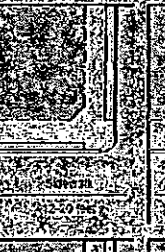
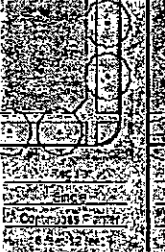
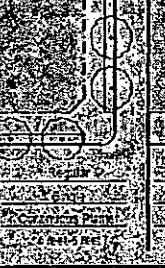
Table 5 A Public Frontages (2 Pages)		PLAN LOT R.O.W. PRIVATE FRONTAGE ▶ ◀ PUBLIC FRONTAGE
a. (HW) Highways - Frontage has no curbs, open swales drained by percolation, bicycle trails, walking paths and only pervious on-street parking except for required Handicapped Spaces,. Landscaping consists of natural conditions or multiple species arrayed in naturalistic clusters. Buildings are buffered by distance or berms. Highway 170 and Cherry Point Road abutting Okatie Village will be treated similarly, regardless of district.	D1 D2 D3 SD	
b. (SR) Standard Roads – Road Frontage has no curb and open swales drained by percolation. A walking path or bike trail may be provided along one or both sides. On street parking may be provided. Landscaping consists of multiple species arrayed in naturalistic clusters.	D3 D4 SD	
c. (RS) Residential Streets - Street has curbs along frontage drained into LID collection structures. The area adjacent and parallel to the street may include a narrow sidewalk separated from the vehicular lanes by a continuous planter or planting area. Parking may be provided in designated lane areas along one or both sides of the street. The landscaping consists of street trees of a single or alienating species aligned in a regularly spaced allee. Curbing may be omitted in sections to accommodate the LID drainage system	D3 D4 SD	
d. (SS)(AV) Standard Streets or Avenues – Street has curbs along frontage drained into LID collection structures. Frontage features sidewalks wider than other districts separated from vehicular lanes by a continuous planter with a minimum interior dimension of 3'. Street may have parking on one or both sides. The landscaping consists of a single street tree species aligned in a regularly spaced allee.	D5	

Table 5 A Public Frontages		
e. (CS)(AV) Commercial Streets or Avenues – Street has curbs along frontage drained into LID collection structures. Frontage features wide sidewalks separated from vehicular lanes by tree wells with grates, raised planters and small planters level with the sidewalk. Street may have parking on one or both sides. The landscaping consists of a single tree species aligned with regular spacing which may be adjusted or interrupted to clear shop front entrances.	D5	
f. (BV) Boulevards – Frontage has lanes divided by a central median. Curbs are required on the outboard street edges and may be provided on the median edge. Street drainage may be collected in swales in the median that percolate to drain. Sidewalks are to be provided along both sides in Districts D3, D4 and D5. Landscaping consists of street trees planted in continuous planter adjacent to the street on both sides and Street Trees in the Median. Trees should be aligned in a regularly spaced allee.	D1 D2 D3 D4 D5 SD	

Note: Curbs may be broken or omitted to accommodate LID drainage system. System shall be designed by a licensed civil engineer and shall be incorporated into the master drainage system for Okatie Village.

Table 5 B **Public Frontages (Intersections)**

TRANSECT ZONE	D1-D2-D3	D1-D2-D3	D3-D4	D4-D5	D5	D5
Public Frontage Type	**HW& RR**	**RR & SR**	**RS**	**RS-SS-AV**	**RS-CS-AV-BV**	**CS-AV-BV**
a. Assembly: The principal variables are the type and dimension of curbs, walkways, planters and landscape.						
b. Curb: The detailing of the edge of the vehicular pavement incorporating drainage.						
c. Walkway: The pavement dedicated exclusively to pedestrian activity.						
d. Planter: The layer which accommodates street trees and other landscape.						

Note: All D3 and D4 public frontages are applicable to the Special District

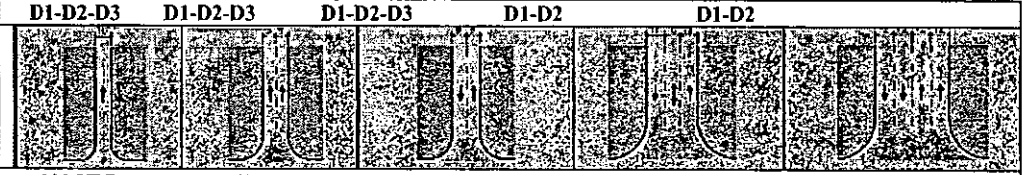
Table 6 **Landscape Materials**

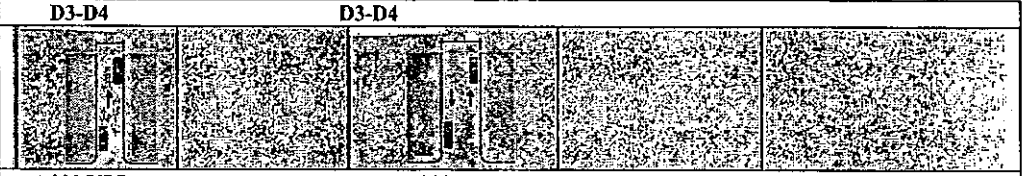
a. Street Trees	D1	D2	D3	D4	D5	SD
Live Oaks – Quercus Virginianas – 2" DBH – 10'-12' Height, 4' Spread, B&B	0	0	0	0	0	0
Holm Oak – Quercus macranthera – 2"DBH – 10'-12' Height, 4- Spread, B&B	0	0	0	0	0	0
Magnolia- Grandiflora, Exmouth or Little Gem – 2" DBH – 8' -10' Height, 3'-4' Spread, B&B	0	0	0	0	0	0
Palmetto Palm – Sabel Palmetto – 6"DBH – 12'-15' Height – Clipped for Transplanting – BR				0	0	0
Red Maple – Acer Rubrum – 2" DBH – 8'-10' Height, 3'-4' Spread- B&B				0	0	0
b. Existing Trees that can be substituted	D1	D2	D3	D4	D5	SD
Any Specie listed above – 4" DBH or better	0	0	0	0	0	0
Southern Red Oaks – 4"DBH or better	0	0	0	0	0	0
English or Black Oaks - 4" DBH or better	0	0	0	0	0	0
Pines, Any Specie -8" DBH or better	0	0	0			
Hickory – 4" DBH or better	0	0	0	0	0	0
Wax Myrtle – 4" DBH or better	0	0	0			
Walnut – 4" DBH or better	0	0	0			
Pecan – 4" DBH or better	0	0	0			
Bald Cypress – 4" DBH or better	0	0	0	0	0	0
Red Bay – 4" DBH or better	0	0	0	0	0	0
Palmetto Palm – 8" DBH or better			0	0	0	0
Persimmon – 4' DBH or better	0	0	0	0	0	0
Red Cedar – 4" DBH or better	0	0				
Cherry Laurel – 4" DBH or better	0	0	0			
Sweetbay Magnolia – 4" DBH or better	0	0	0	0	0	0
c. Suggested Understory Plantings & Private Frontage Plants						
Small Trees	D1	D2	D3	D4	D5	SD
Eastern Redbud – circus Canadensis- NA- 5'-6'Height, 4'-5' Spread, B&B	0	0	0	0	0	0
Wax Myrtle – Myrica Cerifera – NA 4'-5' Height, 3'-4' Spread, B&B, Multi Trunk, Full	0	0	0	0		0
Shrubs and Bushes						
Azalea Indica "GL Tabor" – NA – 24"-30" Height, 24"-30" Sprd, 5 Gal, Whte Flush Rose		0	0	0	0	0
Azalea Indica Formosa – Formosa Azalea- Plt @ 4' OC- 24"-30' Ht., 24'-30' Spread, 5 Gal		0	0	0	0	0
Bottle Bush – Callistemon –Plt Staggered @3'6" OC 4'-5' Height, 2'-3' Spread, 7 Gal		0	0	0	0	0
Viburnum - Viburnum Suspensum – Plt 3' 6" OC – 24"-3" Height, 24"–30" Spread, 7 Gal		0	0	0	0	0

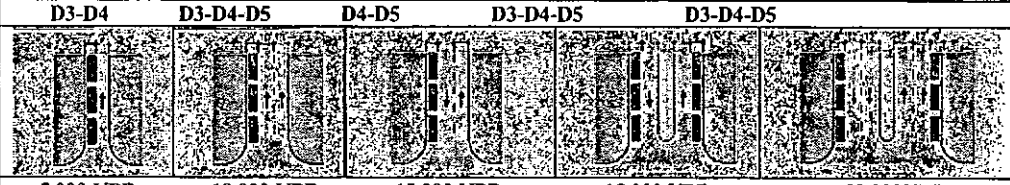
	D1	D2	D3	D4	D5	SD
Fragrant Tea Olive – Osmanthus Fragans – Full Spec – 3'-4' Height, 3'-4' Spread – 10 Gal			0	0	0	0
Yaupon Holly – Ilex Vomitoria – Plt 30" OC, Full Spec 24"-30" Height, 24"-30"Spread, 7 Gal		0	0	0	0	0
d. Suggested Ground Covers	D1	D2	D3	D4	D5	SD
Perennials						
Lantana – Red, Gold and Blue Flower – Plt 18" OC – 10"-12" Height, 10"-12" Spread, 3 Gal Plant in Clumps			0	0	0	0
Holly Fern – Cyrtomium Falcatum – Plt 2' OC, Full Specimen, Stagger – 2 Gal			0	0	0	0
Parson's Juniper – Juniperus Parsoni – 10"-12" Height, 12"-15" Spread, 3 Gal			0	0	0	0
Mondo Grass – Ophiopogon Japonicus – 4"-6" Height, ½ Gal, Plt 12" OC min 12-15 bib clump			0	0	0	0
Vines						
Fig Vine – Ficus Pumila – 15"-18" Runners Train to Walls – 1 Gal	0	0	0	0	0	0
Confederate Jasmine – Trachelospermum Jasminoides – 24"-30" Spread, 1 Gal – Plant in groups of 5 to 8 runners	0	0	0	0	0	0
Carolina Jasmine – Gelseminum Sempervirens – 8"-10" Height, 20"-26' Spread,, 1 Gal	0	0	0	0	0	0
Grasses						
St Augustine - Stenotaphrum Secondata – Recommended for Shady yards			0	0	0	0
Centipede – Recommended for Sunny Yards			0	0	0	0
e. Suggested Plantings for Rain Gardens	D1	D2	D3	D4	D5	SD
Society Garlic			0	0	0	0
Crepe Myrtle			0	0	0	0
Ligustrum			0	0	0	0

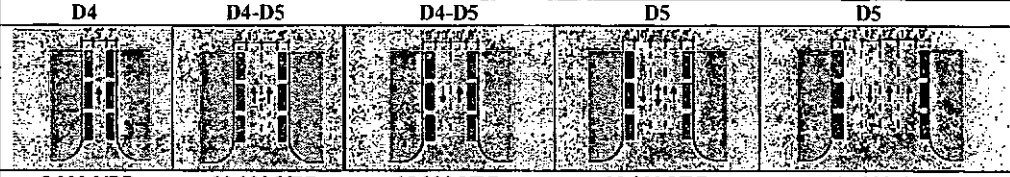
The trees and bushes listed in Sections c. d. and e. of this Table are for guidance only. These species are known to thrive in this area and are recommended for use. They are generally available in sizes and with preparations for transplanting as shown. Other species may be considered and used , subject to review and approval by the HOA-ARB having jurisdiction over the area where the project is located.

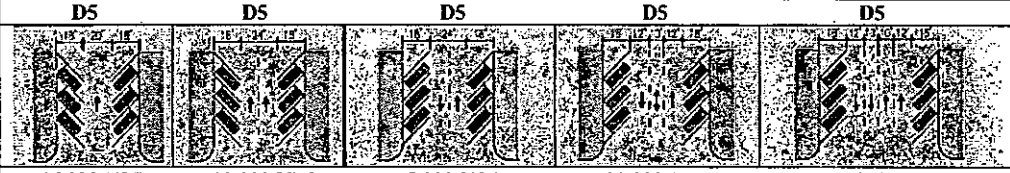
Table 7 A **Vehicular Lane Configurations**

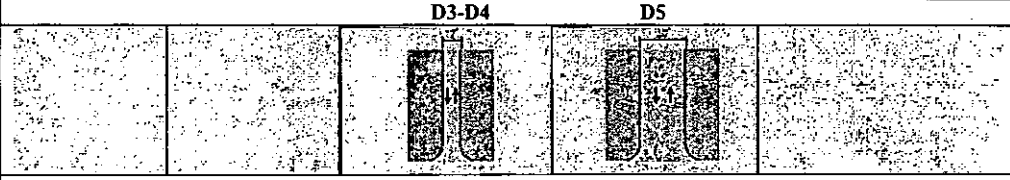
	1 WAY		2 WAY		
	D1-D2-D3	D1-D2-D3	D1-D2-D3	D1-D2	D1-D2
a. NO PARKING					
Design AADT	300 VPD	600 VPD	2,500 VPD	22,000 VPD	36,000VPD
Pedestrian Crossing	3 Secs	5 Secs	5 Secs	9 Secs	13 Secs
Design Speed	20-30 MPH	Below 20 MPH	20-25 MPH		35 MPH & Above

	D3-D4	D3-D4	
b. YIELD PARKING			
Design AADT	1,000 VPD	1,000 VPD	
Pedestrian	5 Secs	7 Secs	

	D3-D4	D3-D4-D5	D4-D5	D3-D4-D5	D3-D4-D5
c. PARKING ONE SIDE PARALLEL					
Design AADT	5,000 VPD	18,000 VPD	15,000 VPD	15,000 VPD	32,000VPD
Pedestrian	5 Secs	8 Secs	8 Secs	11 Secs	13 Secs
Design Speed	20-30 MPH		25-30 MPH	25-30 MPH	

	D4	D4-D5	D4-D5	D5	D5
c. PARKING BOTH SIDES PARALLEL					
Design AADT	5,000 VPD	20,000 VPD	15,000 VPD	22,000 VPD	32,000VPD
Pedestrian	7 Secs	10Secs	10 Secs	13 Secs	15 Secs
Design Speed	Below 20 MPH	25-30 MPH	25-30 MPH	25-30 MPH	35 MPH & Above

	D5	D5	D5	D5	D5
c. PARKING BOTH SIDES DIAGONAL					
Design AADT	16,000 VPD	20,000 VPD	15,000 VPD	22,000 VPD	31,000VPD
Pedestrian	13 Secs	17Secs	17 Secs	20Secs	23 Secs
Design Speed	Below 20 MPH	20-25 MPH	20-25 MPH	20-30 MPH	20 -30 MPH

			D3-D4	D5	
c. PARKING ACCESS					
Design AADT					
Pedestrian			4 Secs	8 Secs	

Note: Parking access shown in districts D3 and D4 apply also to alleys.
All D3 and D4 configurations are allowable in Special District

Table 7B **Speed and Street Dimensions**

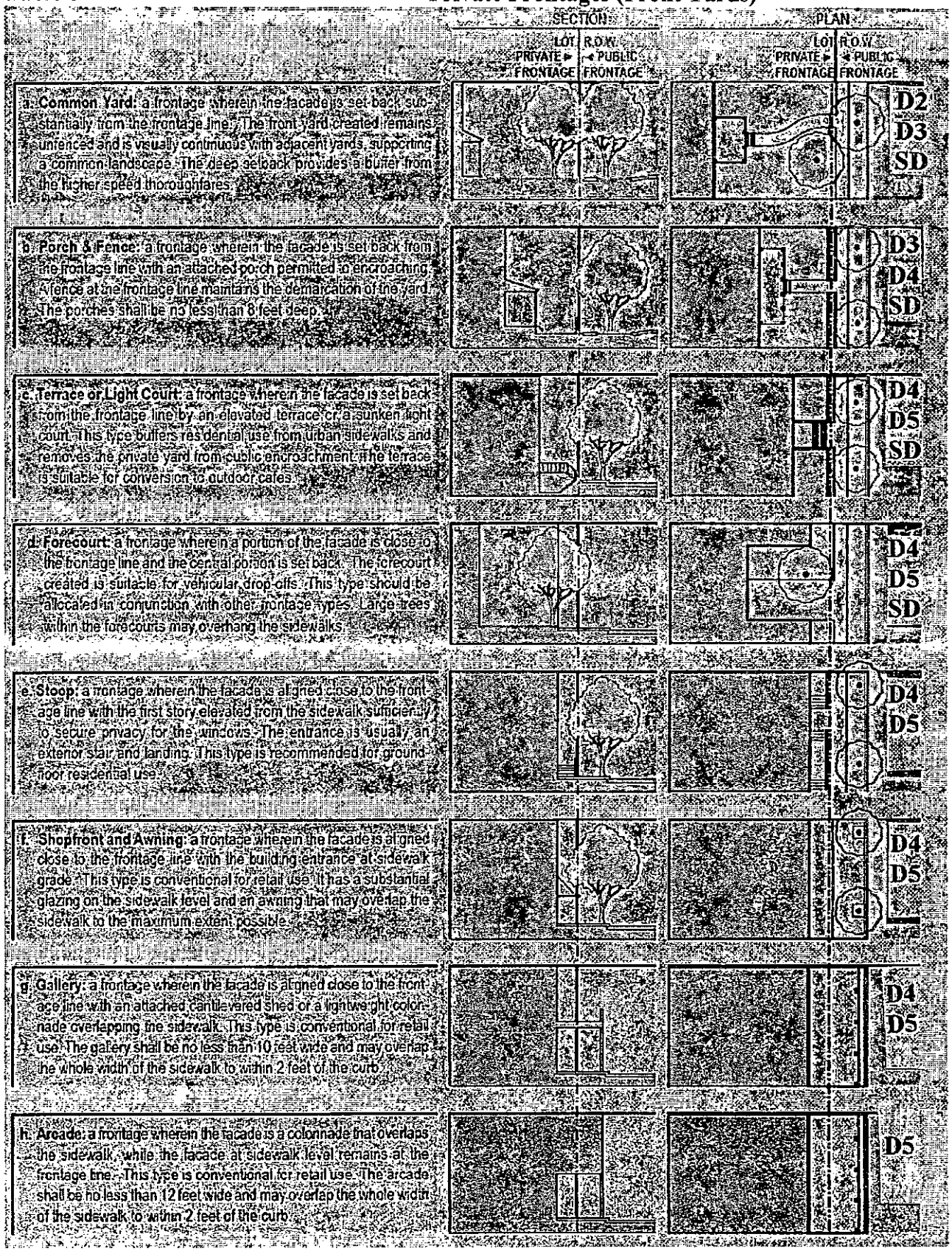
DESIGN SPEED	TRAVEL LANE WIDTH	D1	D2	D3	D4	D5
Below 20 mph	8 feet	▪	▪	▪	▪	▪
20-25 mph	9 feet	▪	▪	▪	▪	▪
25-35 mph	10 feet	▪	▪	▪	▪	▪
25-35 mph	11 feet	▪	▪	▪		▪
Above 35 mph	12 feet	▪	▪	▪	▪	▪

DESIGN SPEED	PARKING LANE WIDTH					
20-25 mph	(Angle) 18 feet	▪	▪	▪	▪	▪
20-25 mph	(Parallel) 7 feet	▪	▪			
25-35 mph	(Parallel) 8 feet	▪	▪	▪	▪	▪
Above 35 mph	(Parallel) 9 feet	▪	▪	▪	▪	▪

DESIGN SPEED	EFFECTIVE TURNING RADIUS					
Below 20 mph	5-10 feet	▪	▪	▪	▪	▪
20-25 mph	10-15 feet	▪	▪	▪	▪	▪
25-35 mph	15-20 feet	▪	▪	▪	▪	▪
Above 35 mph	20-30 feet	▪	▪	▪	▪	▪

Note: Speed and lane dimensions shown in districts D3/D4 apply also to alleys. All D3 and D4 speed/dimension ratios are applicable to the Special District

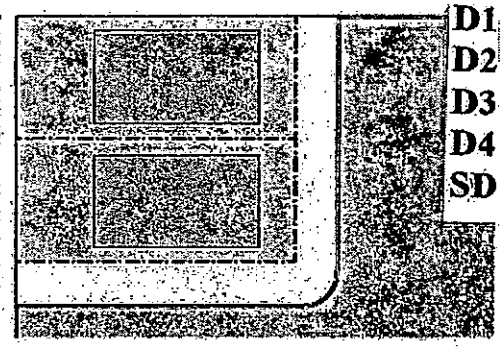
Table 8 **Private Frontages (Front Yards)**



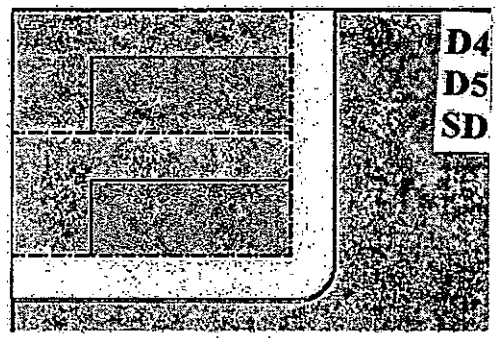
400

Table 9A **Building Configuration**

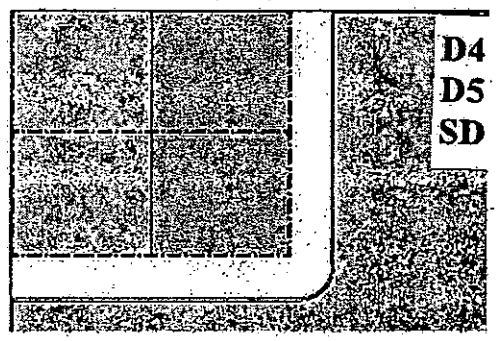
a. Edgeyard: Specific Types - Single family House, Cottage, Villa, Estate House, Urban Villa. A building that occupies the center of its lot with Setbacks on all sides. This is the least urban of types as the front yard sets it back from the frontage, while the side yards weaken the spatial definition of the public Thoroughfare space. The front yard is intended to be visually continuous with the yards of adjacent buildings. The rear yard can be secured for privacy by fences and a well placed Backbuilding and/or Outbuilding.



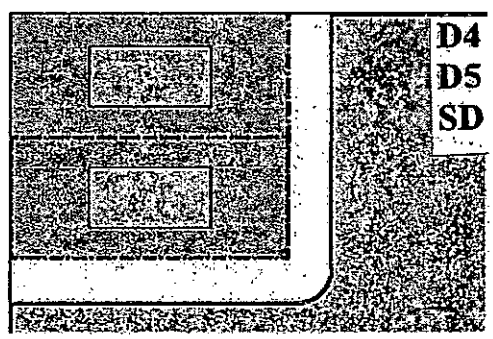
b. Sideyard: Specific Types - Charleston Single House, zero-lot-line house. A building that occupies one side of the lot with the Setback to the other side. The visual opening of the side yard on the street frontage causes this building type to appear free standing. A shallow frontage Setback defines a more urban condition. If the adjacent building is similar with a blank party wall, the yard can be quite private. This type permits systematic climatic orientation in response to the sun or the breeze.



c. Rearyard: Specific Types - Townhouse, Rowhouse, Live-Work unit, perimeter block. A building that occupies the full frontage, leaving the rear of the lot as the sole yard. This is a very urban type as the continuous Facade steadily defines the public Thoroughfare. The rear Elevations may be articulated for functional purposes. In its Residential form, this type is the Rowhouse. For its Commercial form, the rear yard can accommodate substantial parking.



d. Courtyard: Specific Types - Patio House. A building that occupies the boundaries of its lot while internally defining one or more private patios. This is the most urban of types, as it is able to shield the private realm from all sides while strongly defining the public Thoroughfare. Because of its ability to accommodate incompatible activities, masking them from all sides, it is recommended for workshops, Lodging and schools. The high security provided by the continuous enclosure is useful for crime-prone areas.



e. Specialized: A building that is not subject to categorization. Buildings dedicated to manufacturing and transportation are often distorted by the trajectories of machinery. Civic buildings, which may express the aspirations of institutions, may be included.

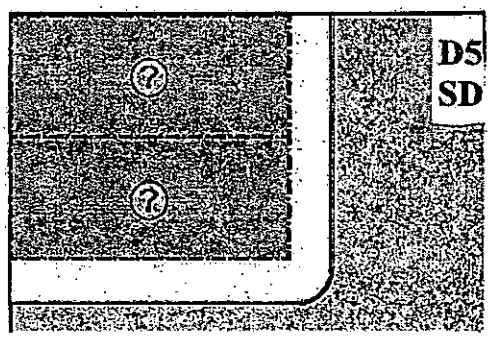


Table 9B **Building Height**

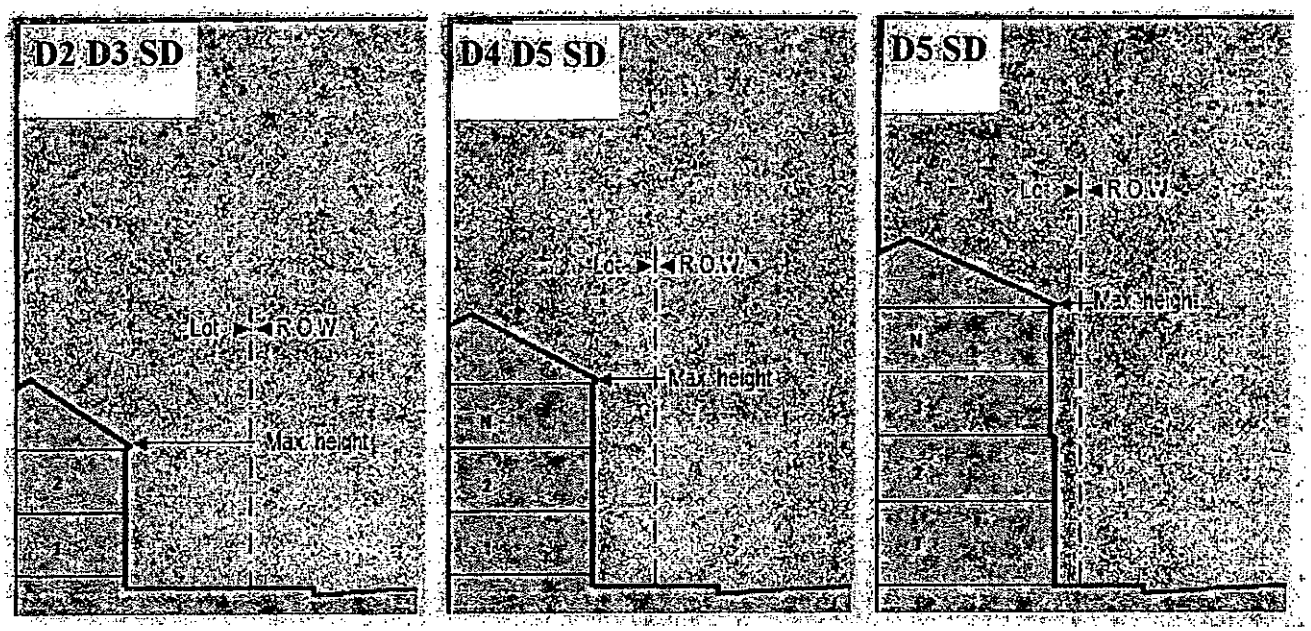


Table 10 **Shared Parking Factors**

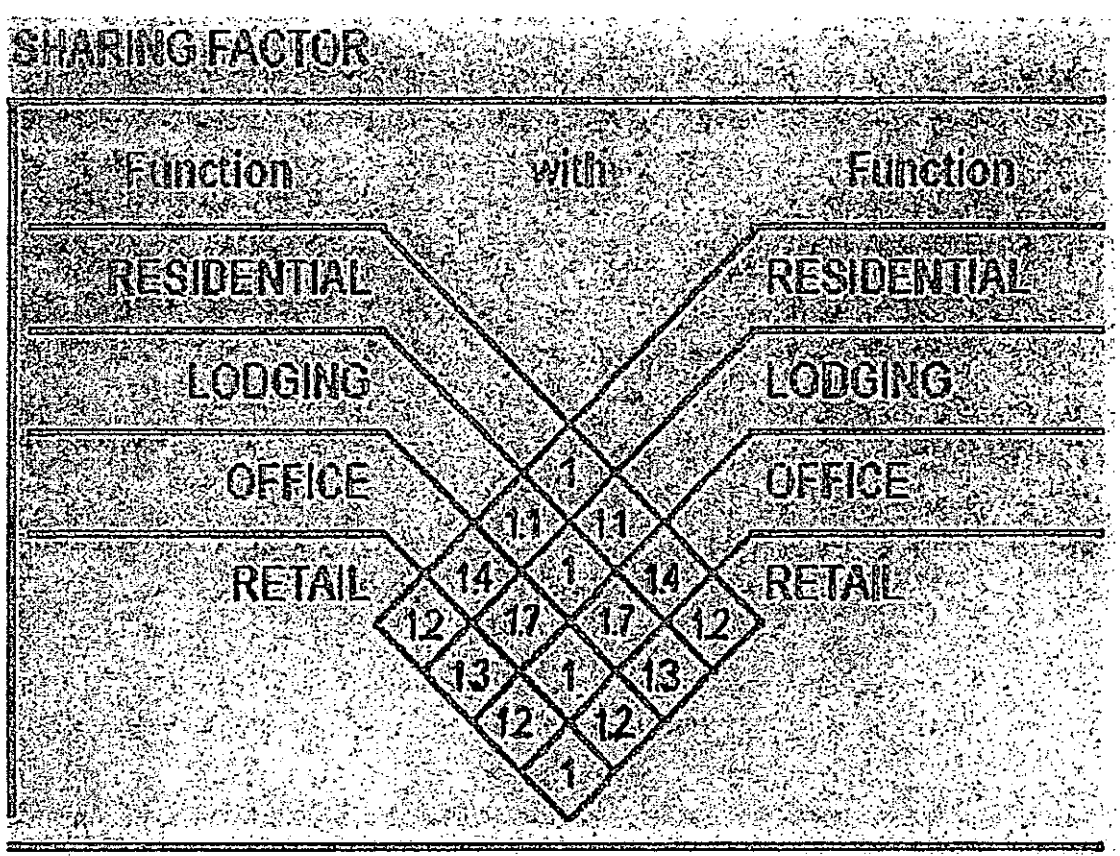


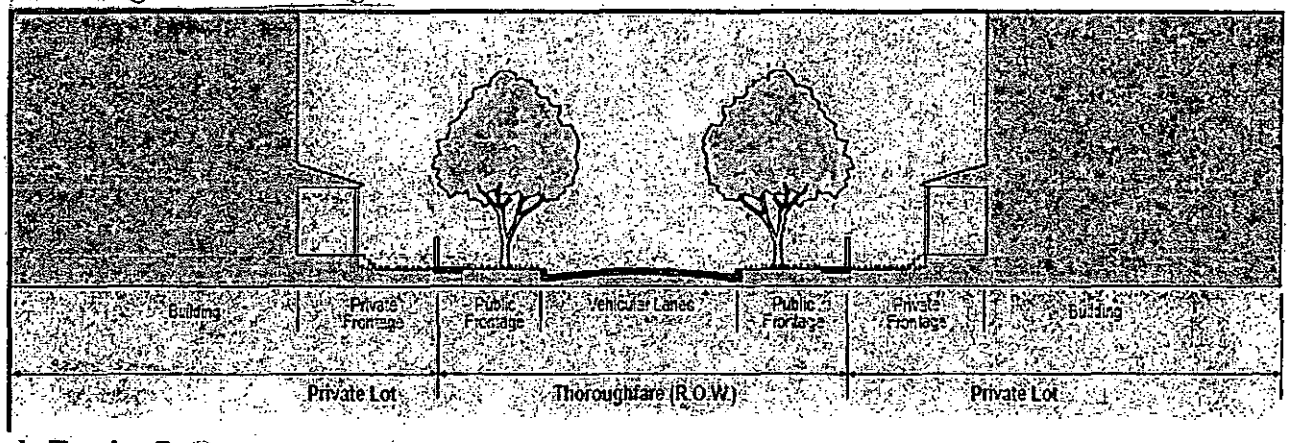
Table 11 **Street Lights**

	D1	D2	D3	D4	D5
Cobra Head	▪				
Pipe	▪	▪	▪		
Post		▪	▪	▪	
Column			▪	▪	▪
Double Column					▪

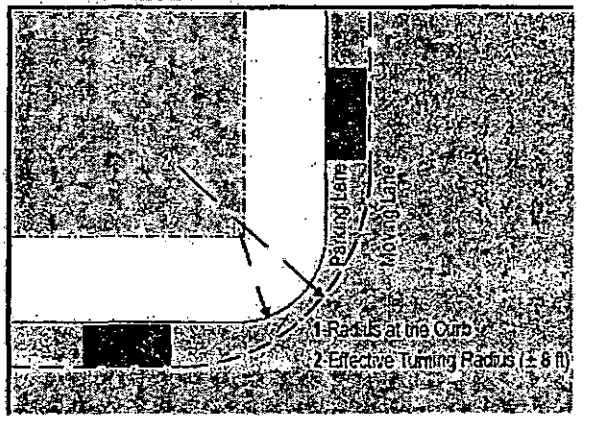
In Special District any of the fixtures shown may be used. In the retirement Community (River Oaks PUD) Use only Post, Column or Double Column Fixtures.

Table 12 **Illustrated Definitions**

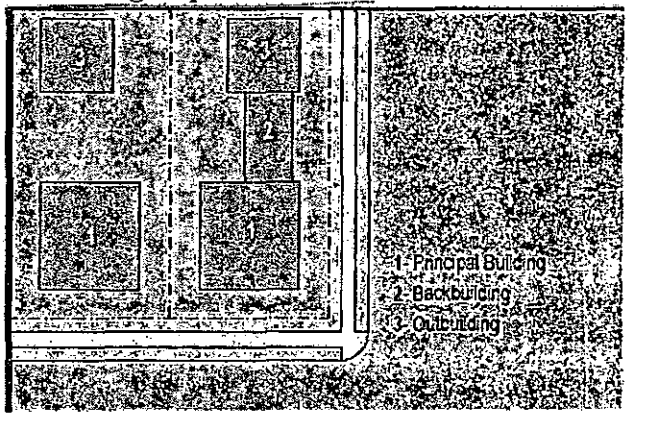
a. Thoroughfare and Frontages



b. Turning Radius



c. Building Disposition



d. Frontage & Lot Lines

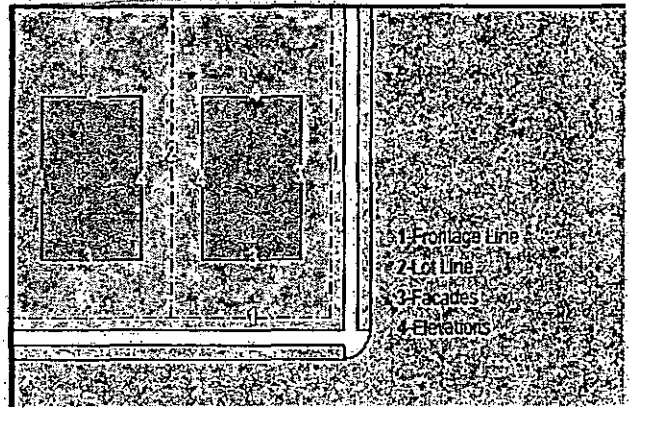


Table 13 **Illustrations of Civic Space**

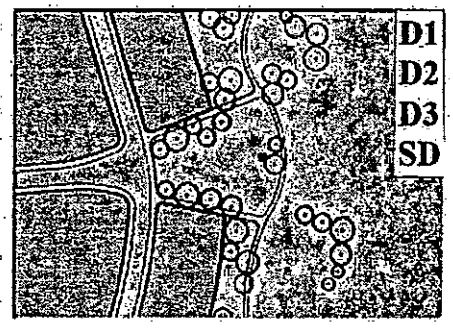
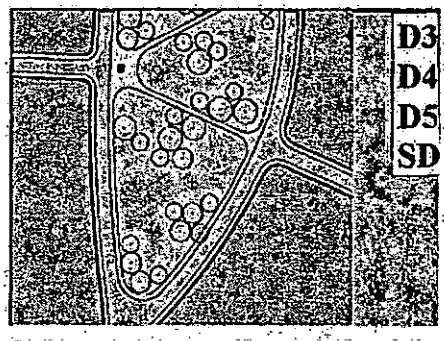
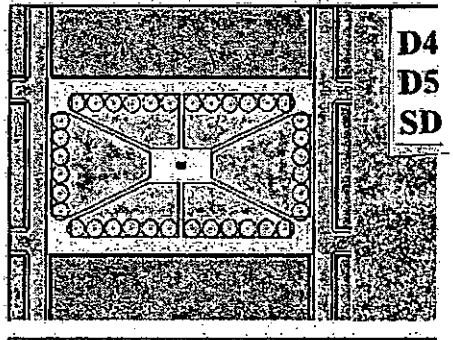
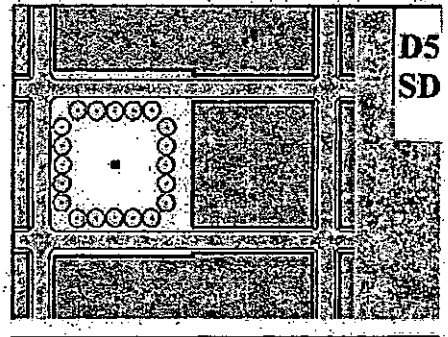
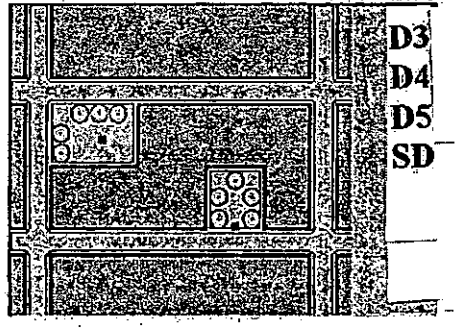
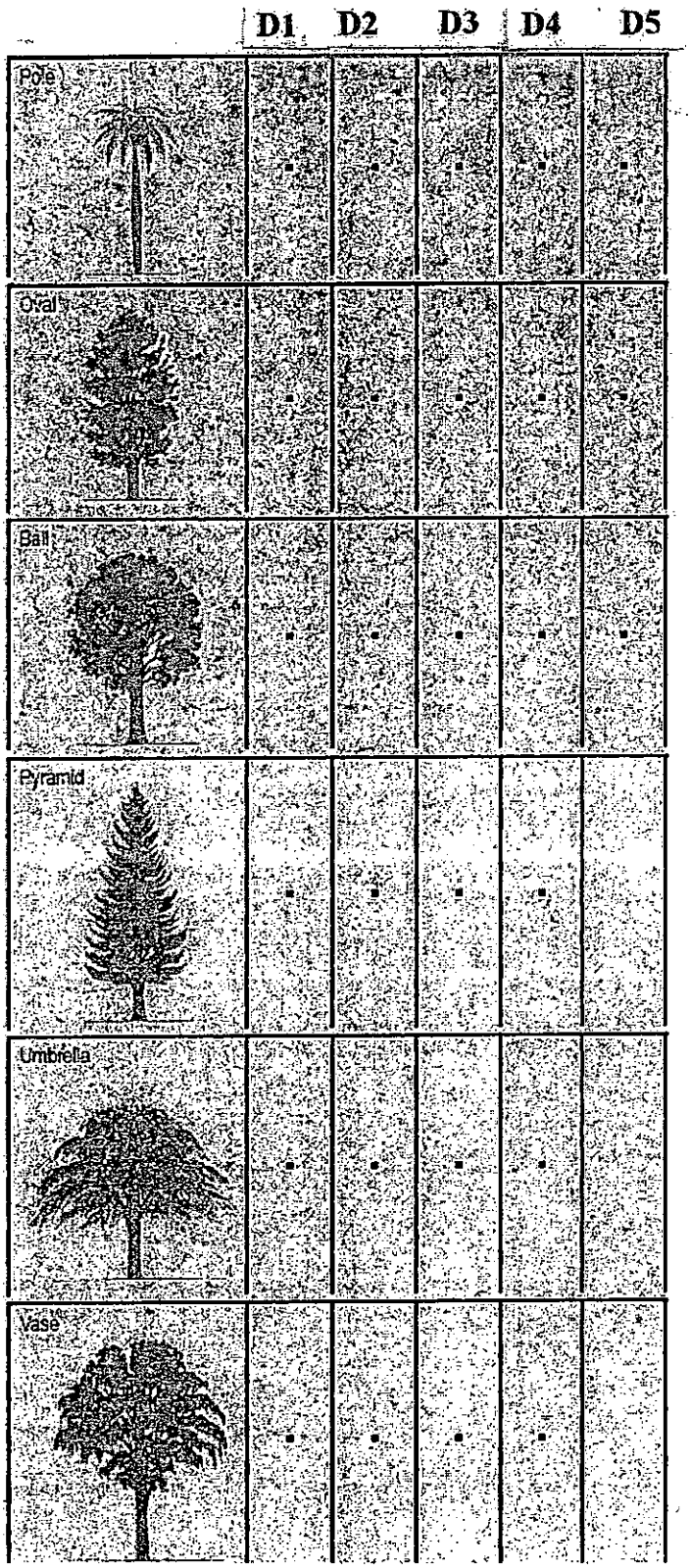
a. **Park:** A natural preserve available for unstructured recreation. A park may be independent of surrounding building frontages. Its landscape shall consist of paths and trails, meadows, woodland and open shelters, all naturalistically disposed. Parks may be lineal, following the trajectories of natural corridors. The minimum size shall be 15 acres. Larger parks may be approved by warrant as districts in all zones.	 D1 D2 D3 SD
b. **Green:** An open space available for unstructured recreation. A green may be spatially defined by landscaping rather than building frontages. Its landscape shall consist of lawn and trees, naturalistically disposed. The minimum size shall be 2 acres and the maximum shall be 15 acres.	 D3 D4 D5 SD
c. **Square:** An open space available for unstructured recreation and civic purposes. A square is spatially defined by building frontages. Its landscape shall consist of paths, lawns and trees, formally disposed. Squares shall be located at the intersection of important thoroughfares. The minimum size shall be 1 acre and the maximum shall be 5 acres.	 D4 D5 SD
d. **Plaza:** An open space, available for civic purposes and commercial activities. A plaza shall be spatially defined by building frontages. Its landscape shall consist primarily of pavement. Trees are optional. Plazas shall be located at the intersection of important streets. The minimum size shall be 1 acre and the maximum shall be 2 acres.	 D5 SD
e. **Playground:** An open space designed and equipped for the recreation of children. A playground shall be fenced and may include an open shelter. Playgrounds shall be interspersed within residential areas and may be placed within a block. Playgrounds may be included within parks and greens. There shall be no minimum or maximum size.	 D3 D4 D5 SD

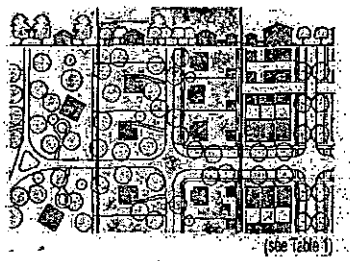
Table 14 **Street Trees**



Street Trees in Table 6

Live Oak – Umbrella
Holm Oak – Vase
Magnolia – Oval
Palmetto Palm – Pole
Red Maple - Vase

Table 15A — D3 District



(see Table 1)

BUILDING FUNCTION	
Residential	restricted use
Lodging	restricted use
Office	restricted use
Retail	restricted use
BUILDING CONFIGURATION	
Principal Building	2 stories max.
Outbuilding	2 stories max.
LOT OCCUPATION	
Lot Width	72 ft. min. 120 ft. max.
Lot Coverage	60% max.
BUILDING DISPOSITION	
Edgeyard	permitted
Sideyard	not permitted
Rearyard	not permitted
Courtyard	not permitted
SETBACKS - PRINCIPAL BUILDING	
Front Setback (P)	24 ft. min.
Front Setback (S)	12 ft. min.
Side Setback	12 ft. min.
Rear Setback	12 ft. min.
Frontage Buildout	40% min. at setback
SETBACKS - OUTBUILDING	
Front Setback	20 ft. min. - bldg setback
Side Setback	3 ft. or 6 ft.
Rear Setback	3 ft. min.
PRIVATE FRONTAGES	
Common Lawn	permitted
Porch & Fence	permitted
Terrace or LC	not permitted
Forecourt	not permitted
Stoop	not permitted
Shopfront & Awning	not permitted
Gallery	not permitted
Arcade	not permitted

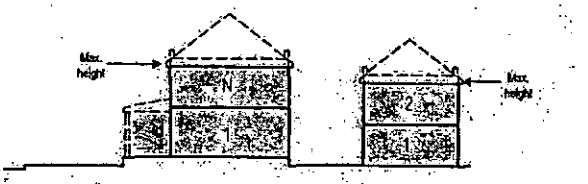
* or 15 ft. from center line of alley

Graphics are illustrative only. Refer to metrics for Setback and height information.

'N' stands for any Stories above those shown, up to the maximum. Refer to metrics for exact minimums and maximums.

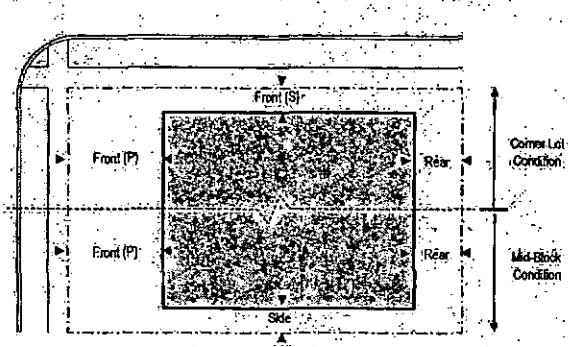
BUILDING CONFIGURATION

1. Building height shall be measured in number of Stories, excluding Attics and raised basements.
2. Stories may not exceed 14 feet in height from finished floor to finished ceiling, except for a first floor Commercial function which must be a minumum of 11 ft with no maximum.
3. Height shall be measured to the eave or roof deck as specified



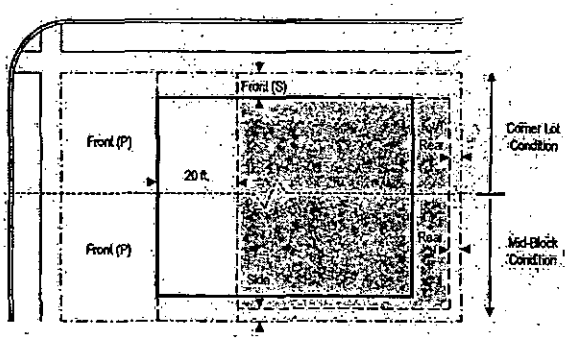
SETBACKS - PRINCIPAL BLDG.

1. The Facades and Elevations of Principal Buildings shall be distanced from the Lot lines as shown.
2. Facades shall be built along the Principal Frontage to the minimum specified width.



SETBACKS - OUTBUILDING

1. The Elevation of the Outbuilding shall be distanced from the Lot lines as shown.



PARKING PLACEMENT

1. Uncovered parking spaces may be provided within the 2nd and 3rd Layer as shown in the diagram.
2. Covered parking shall be provided within the 3rd Layer as shown in the diagram.
3. Trash containers shall be stored within the 3rd Layer.

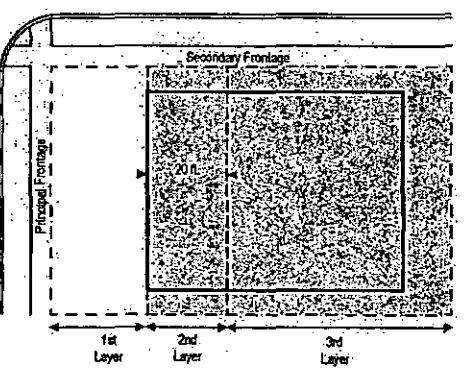
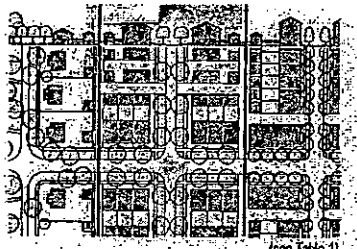


Table 15 B **D4 District**



(see Table 1)

BUILDING FUNCTION	
Residential	limited use
Lodging	limited use
Office	limited use
Retail	limited use
BUILDING CONFIGURATION	
Principal Building	3 stories max 2 min
Outbuilding	2 stories max
LOT OCCUPATION	
Lot Width	18 ft min 96 ft max
Lot Coverage	70% max
BUILDING DISPOSITION	
Edgeyard	permitted
Sideyard	permitted
Rearyard	permitted
Courtyard	not permitted
SETBACKS - PRINCIPAL BUILDING	
Front Setback (P)	6 ft. min 18 ft. max
Front Setback (S)	6 ft. min 18 ft. max
Side Setback	0 ft. min
Rear Setback	3 ft. min
Frontage Buildout	60% min at setback
SETBACKS - OUTBUILDING	
Front Setback	24 ft. min. - bldg. setback
Side Setback	0 ft. min. or 3 ft.
Rear Setback	3 ft. min
PRIVATE FRONTAGES	
Common Lawn	not permitted
Porch & Fence	permitted
Terrace or L.G.	permitted
Forecourt	permitted
Stoop	permitted
Shopfront & Awning	permitted
Gallery	permitted
Arcade	not permitted

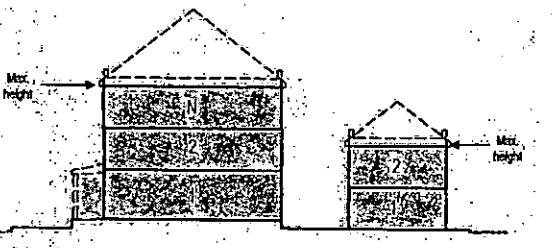
* or 15 ft. from center line of alley

Graphics are illustrative only. Refer to metrics for Setback and height information.

"N" stands for any Stories above those shown, up to the maximum. Refer to metrics for exact minimums and maximums.

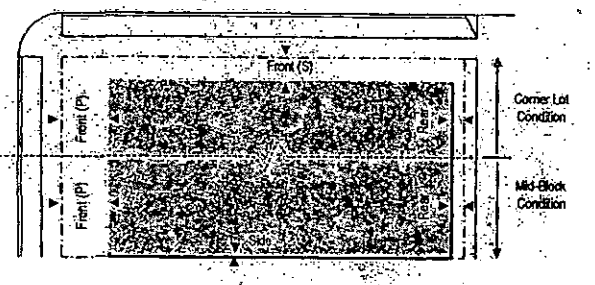
BUILDING CONFIGURATION

1. Building height shall be measured in number of Stories, excluding Attics and raised basements.
2. Stories may not exceed 14 feet in height from finished floor to finished ceiling, except for a first floor Commercial function which must be a minumum of 11 ft with no maximum.
3. Height shall be measured to the eave or roof deck as specified.



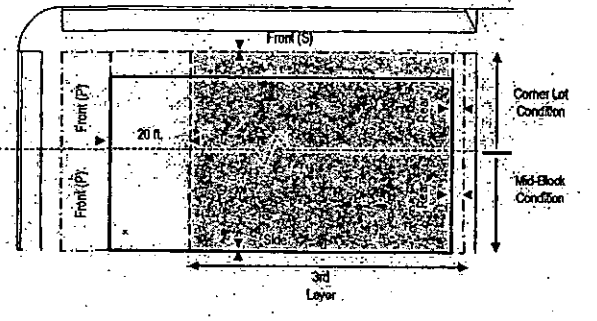
SETBACKS - PRINCIPAL BLDG.

1. The Facades and Elevations of Principal Buildings shall be distanced from the Lot lines as shown.
2. Facades shall be built along the Principal Frontage to the minimum specified width.



SETBACKS - OUTBUILDING

1. The Elevations of the Outbuilding shall be distanced from the Lot lines as shown.



PARKING PLACEMENT

1. Uncovered parking spaces may be provided within the 3rd Layer as shown in the diagram.
2. Covered parking shall be provided within the 3rd Laver as shown in the diagram.
3. Trash containers shall be stored within the 3rd Layer.

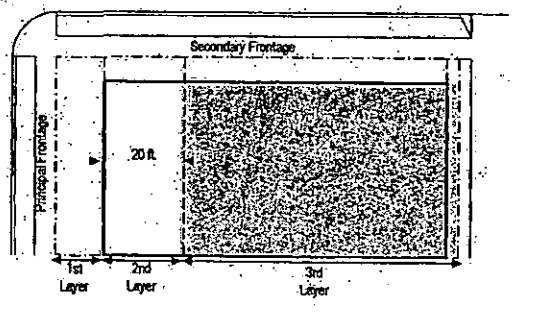
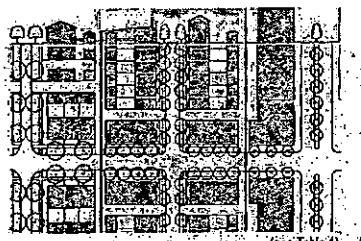


Table 15 C — D5 District



BUILDING FUNCTION	
Residential	open use
Lodging	open use
Office	open use
Retail	open use
BUILDING CONFIGURATION	
Principal Building	5 stories max/ 2 min
Outbuilding	2 stories max
LOT OCCUPATION	
Lot Width	18 ft min 180 ft max
Lot Coverage	80% max
BUILDING DISPOSITION	
Edgeyard	not permitted
Sideyard	permitted
Rearyard	permitted
Courtyard	permitted
SETBACKS - PRINCIPAL BUILDING	
Front Setback (P)	0 ft. min. 12 ft. max.
Front Setback (S)	0 ft. min. 12 ft. max.
Side Setback	0 ft. min. 24 ft. max.
Rear Setback	3 ft min.
Frontage Buildout	80% min at setback
SETBACKS - OUTBUILDING	
Front Setback	40 ft max. from rear prop.
Side Setback	0 ft. min.
Rear Setback	3ft. min.
PRIVATE FRONTAGES	
Common Lawn	not permitted
Porch & Fence	not permitted
Terrace or LC	permitted
Forecourt	permitted
Stoop	permitted
Shopfront & Awning	permitted
Gallery	permitted
Arcade	permitted

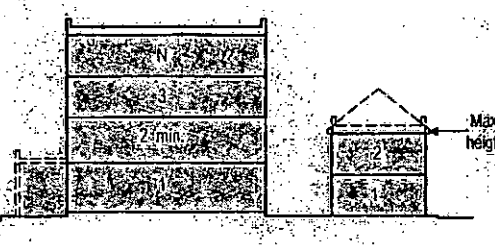
* or 15 ft. from center line of alley

Graphics are illustrative only. Refer to metrics for Setback and height information.

'N' stands for any Stories above those shown, up to the maximum. Refer to metrics for exact minimums and maximums.

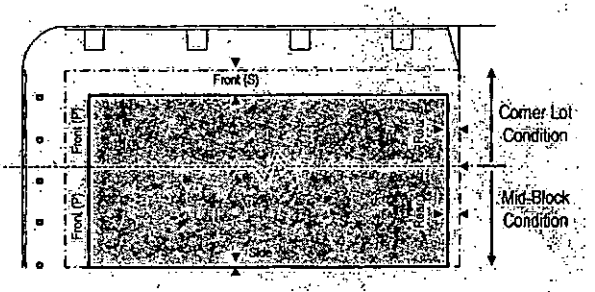
BUILDING CONFIGURATION

1. Building height shall be measured in number of Stories, excluding Attics and raised basements.
2. Stories may not exceed 14 feet in height from finished floor to finished ceiling, except for a first floor Commercial function which must be a minumium of 11 ft with no maximum.
3. Height shall be measured to the eave or roof deck as specified.
4. Expression Lines shall be as shown



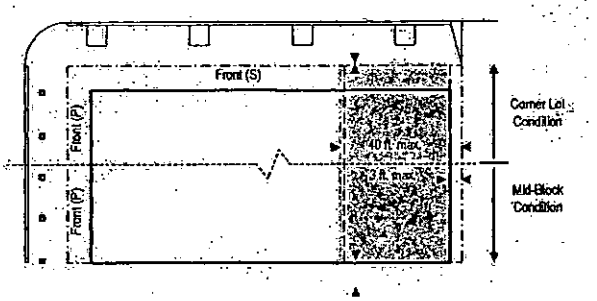
SETBACKS - PRINCIPAL BLDG.

1. The Facades and Elevations of Principal Buildings shall be distanced from the Lot lines as shown.
2. Facades shall be built along the Principal Frontage to the minimum specified width in the table.



SETBACKS - OUTBUILDING

1. The Elevations of the Outbuilding shall be distanced from the Lot lines as shown.



PARKING PLACEMENT

1. Uncovered parking spaces may be provided within the 3rd Layer as shown in the diagram (see
2. Covered parking shall be provided within the 3rd Layer as shown in the diagram
3. Trash containers shall be stored within the 3rd Layer.