Okatie Village

Okatie Marsh

Planned Unit Development

Adopted: October 27, 2008

Table of Contents

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:

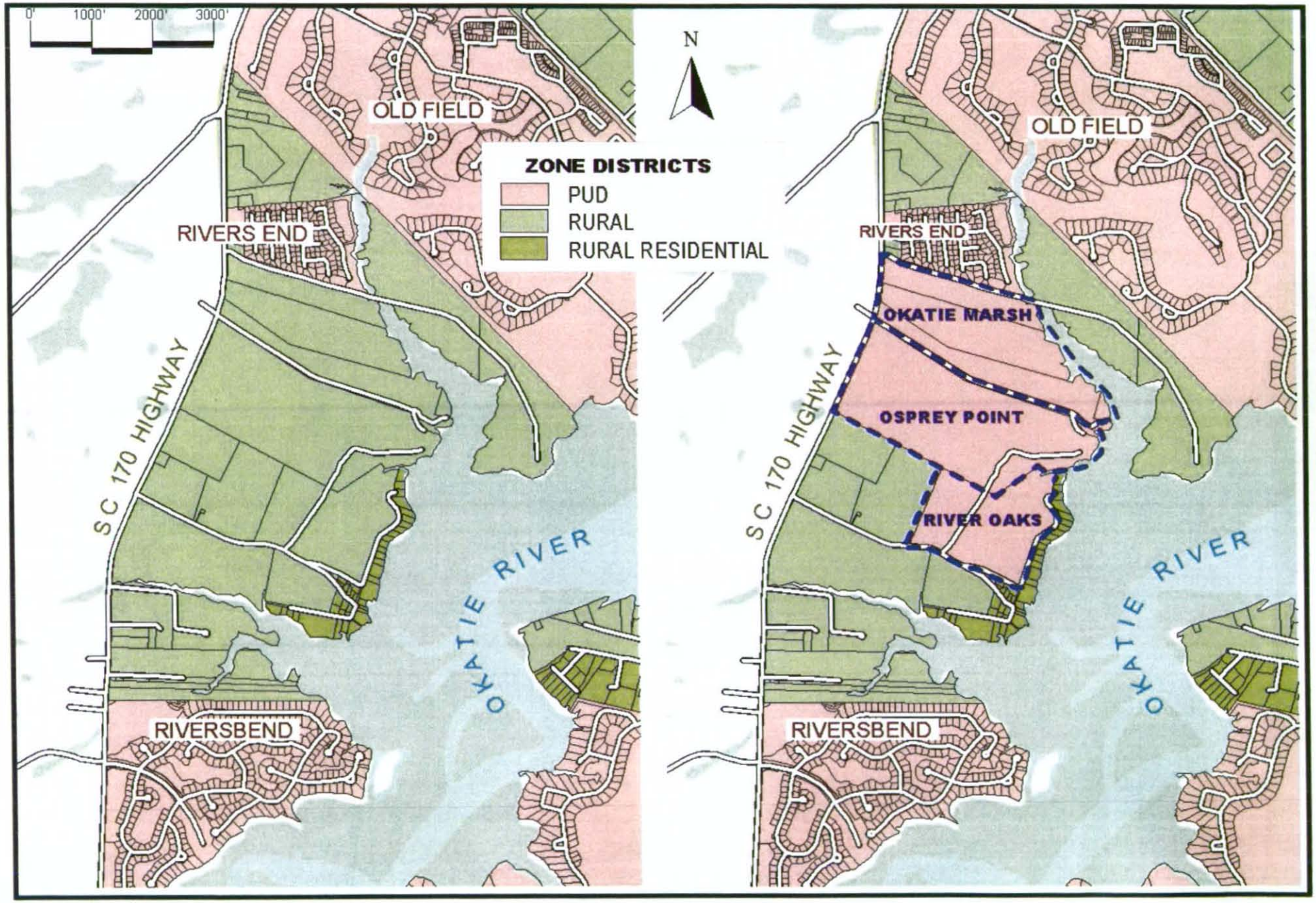
_____
Suzanne M. Rainey, Clerk to Council

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

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.

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

LINE TABLE

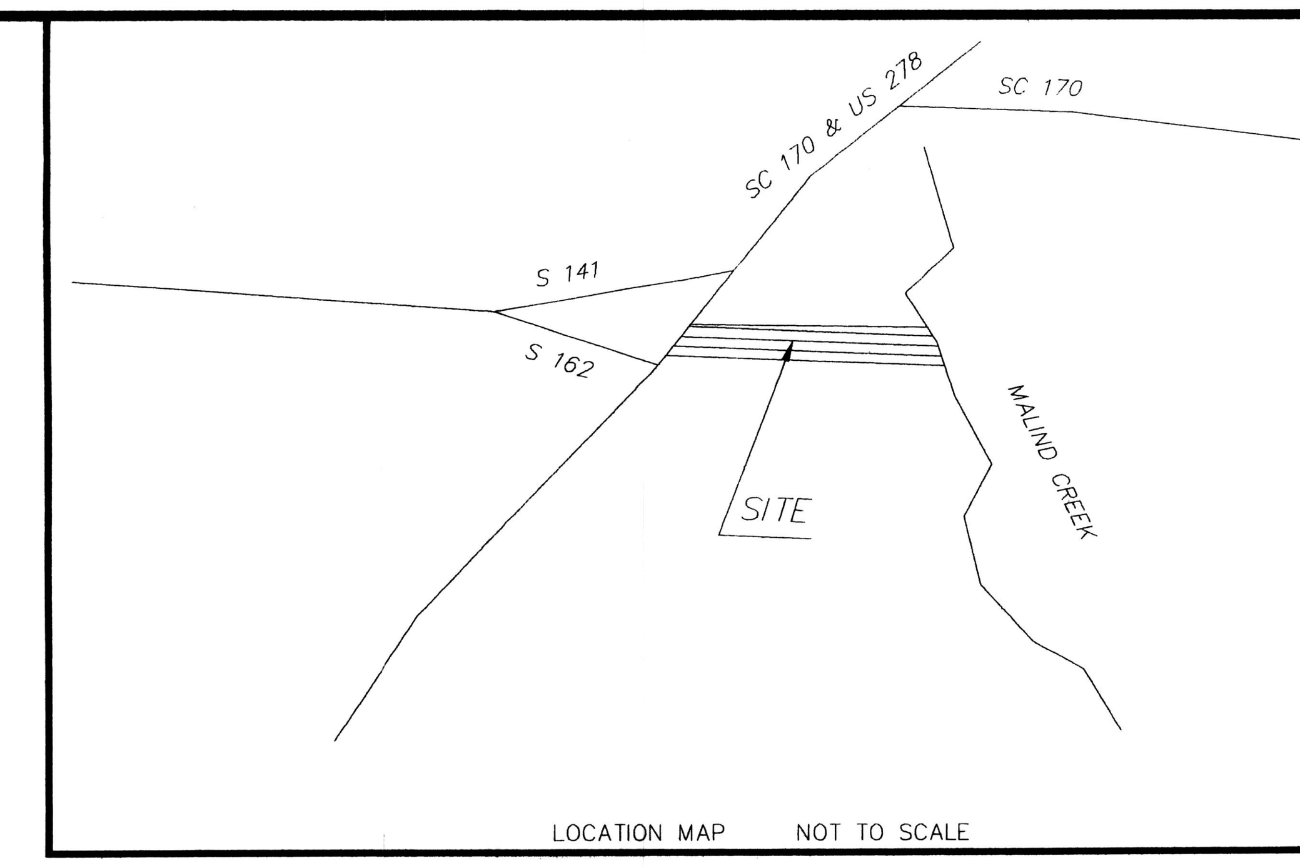
LINE	LENGTH	BEARING
L1	47.52'	S05°14'49"W
L2	33.68'	S59°56'38"W
L3	22.83'	S60°49'56"E
L4	31.33'	S79°04'53"E
L5	62.11'	S89°05'09"E
L6	47.60'	N68°07'41"E
L7	54.19'	N57°38'00"E
L8	31.13'	S33°19'44"E
L9	95.81'	S57°55'18"W
L10	33.63'	S06°26'13"E
L11	36.88'	S16°25'47"E
L12	47.81'	S15°15'39"E
L13	75.74'	S22°43'54"W
L14	74.41'	S37°44'23"E
L15	39.08'	S20°54'16"E
L16	62.78'	S22°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	69.66'	S24°50'14"E
L21	45.51'	S23°02'41"E
L22	38.18'	S38°34'49"W
L23	32.89'	S05°24'45"W
L24	10.28'	S05°03'09"W
L25	50.50'	N31°18'15"E
L26	49.21'	S86°46'25"E
L27	21.02'	S18°40'53"E
L28	63.11'	S50°15'50"E
L29	86.62'	S02°05'20"E
L30	25.08'	N67°48'54"E
L31	43.99'	S72°40'18"E
L32	36.78'	S69°35'03"E
L33	61.42'	S48°26'31"E
L34	55.33'	S24°23'38"E
L35	38.58'	S17°35'27"W
L36	85.96'	S13°30'33"E
L37	37.76'	S17°59'29"E
L38	53.93'	S59°26'16"W
L39	44.47'	N82°31'46"W
L40	46.12'	S55°28'59"E
L41	54.38'	S82°46'34"E
L42	27.73'	S56°08'25"W
L43	72.88'	S17°51'18"E
L44	26.45'	S58°25'16"E
L45	52.16'	S09°30'22"W
L46	34.37'	S36°50'28"W
L47	16.73'	S20°00'46"E
L48	25.73'	N74°49'40"E
L49	55.56'	N26°41'47"E
L50	24.74'	S69°02'52"E
L51	20.83'	N08°53'09"W
L52	53.75'	S88°04'24"E
L53	65.39'	N56°38'44"E
L54	82.39'	S46°38'48"E
L55	70.80'	S15°32'41"E
L56	83.02'	S53°30'36"E
L57	74.82'	N85°59'46"E
L58	37.76'	S42°51'54"E
L59	30.48'	S03°59'49"E
L60	36.26'	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°42'51"E
L66	29.85'	S28°25'53"E
L67	62.61'	S22°49'11"E
L68	57.91'	S15°37'54"W
L69	42.11'	S22°33'13"E
L70	41.76'	S19°21'00"W
L71	77.05'	S00°40'15"W
L72	56.63'	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°38'52"W
L77	92.46'	S65°41'53"W
L78	80.12'	N63°30'30"W
L79	27.50'	S78°01'13"W
L80	38.40'	N68°24'24"W
L81	63.28'	S84°52'44"W
L82	10.86'	N15°12'19"E
L83	42.33'	N89°05'46"W
L84	12.39'	N29°30'13"E
L85	65.65'	N50°06'45"W
L86	34.35'	N34°04'08"W
L87	42.66'	N57°41'13"W
L88	54.78'	N33°11'55"W
L89	54.42'	S12°38'16"E
L90	12.87'	N38°11'20"W
L91	19.84'	N41°59'07"W
L92	23.24'	N49°37'28"W
L93	29.87'	N63°41'26"W
L94	120.91'	N69°22'01"W
L95	122.86'	N69°48'45"W
L96	148.95'	N69°08'05"W
L97	141.59'	N69°02'09"W
L98	134.32'	N69°31'39"W
L99	152.27'	N69°31'33"W
L100	151.29'	N69°19'48"W
L101	134.83'	N69°14'28"W
L102	138.41'	N69°39'44"W
L103	131.92'	N69°12'04"W
L104	116.03'	N69°29'10"W
L105	113.63'	N68°11'37"W
L106	47.94'	N65°29'31"W
L107	42.80'	N62°31'43"W
L108	72.07'	N58°49'15"W
L109	79.31'	N56°10'05"W
L110	111.64'	N55°48'40"W
L111	118.18'	N55°46'10"W
L112	119.27'	N55°41'48"W
L113	118.58'	S55°53'30"E
L114	143.21'	N55°17'46"W
L115	147.60'	N54°57'27"W
L116	157.54'	N54°48'12"W
L117	172.14'	N54°28'31"W
L118	153.39'	N55°08'38"W
L119	272.01'	N55°09'55"W

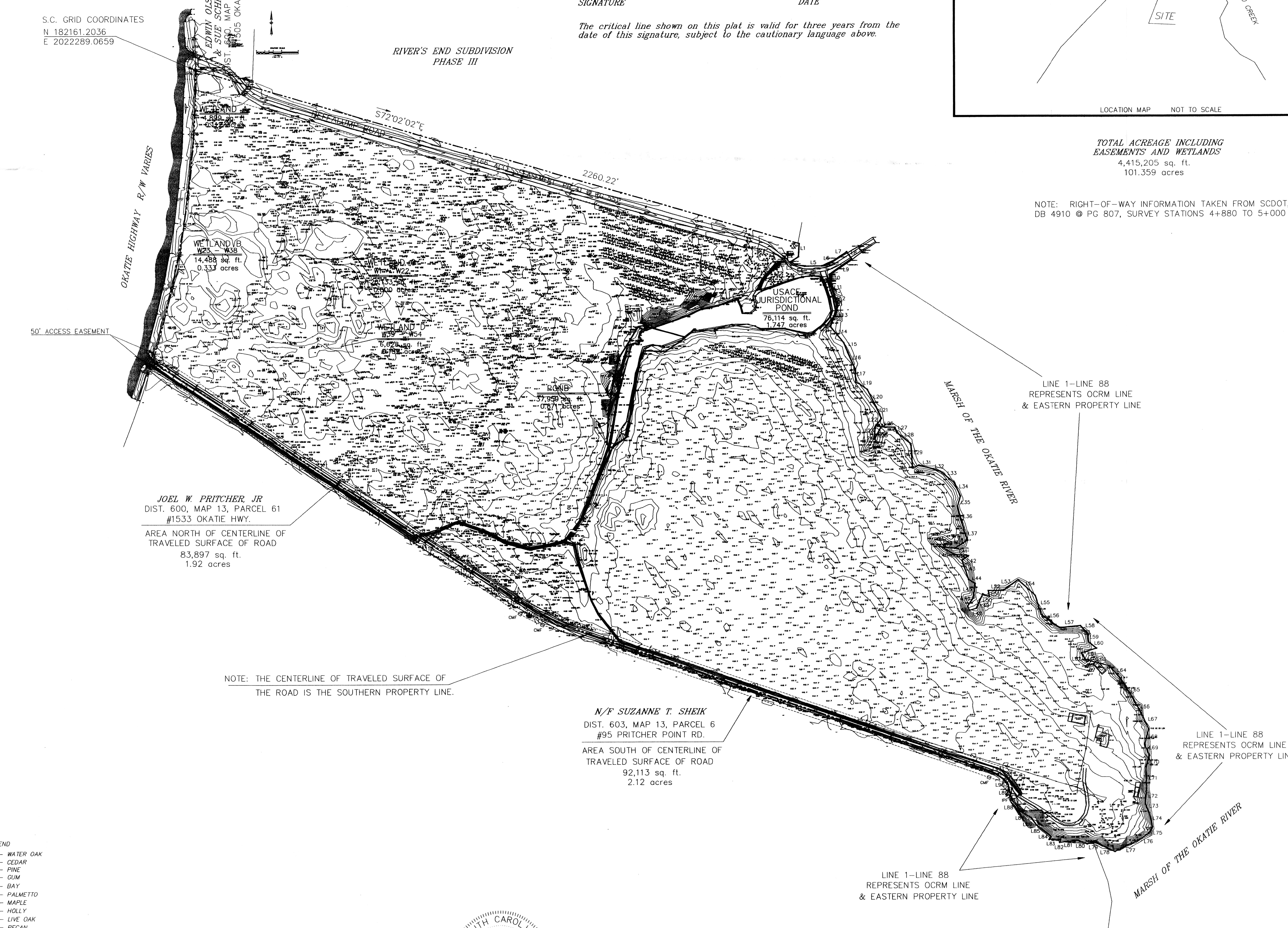
SCGRID

THE 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 THE PERMIT AUTHORITY OF THE DHEC-OCRM, THE OFFICE OF OCRM IN NO WAY WAIVES THE 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
EDWIN OLSEN & SUE SCHRANK
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
USACE JURISDICTIONAL POND
76,114 sq. ft.
1.747 acres
MARSH OF THE OKATIE RIVER
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
LINE 1-LINE 88 REPRESENTS OCRM LINE & EASTERN PROPERTY LINE
LINE 1-LINE 88 REPRESENTS OCRM LINE & EASTERN PROPERTY LINE
MARSH OF THE OKATIE RIVER

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

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

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*
- ○ *IPF – 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.

C:\Land Projects 2004\95-089T.dwg 3/16/2004 4:14:19 PM EST

NOTE: This Lot Appears To Lie In A Federal Flood Plain Zone C, Minimum Required Elevation N/A ft. NGVD29

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

REFERENCE PLAT:
A PLAT BY TGS LAND SURVEYING, DATED 11/08/2001, PREPARED FOR JOEL W. PRITCHER & GERALD M. PRITCHER (JOB #00156C).

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

STATE OF SOUTH CAROLINA REGISTERED LAND SURVEYOR No. 4922 FORREST F. BAUGHMAN

I HEREBY STATE TO THE BEST OF MY KNOWLEDGE, INFORMATION & 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 THEREIN.

ALSO THERE ARE NO VISIBLE ENCROACHMENTS OR PROJECTIONS AFFECTING THE PROPERTY OTHER THAN THOSE INDICATED.

FORREST F. BAUGHMAN, PLS # 4922

T-SQUARE GROUP, INC.
PROFESSIONAL LAND SURVEYORS
P.O. Drawer 330
Burnt Church Road
Bluffton, S.C. 29910
Phone 843-757-2650 Fax 843-757-5758

JOB No. 95-089T

10

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.

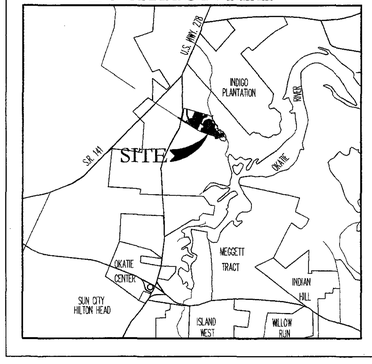
RIVERS END
SUBDIVISION PHASE III

US HIGHWAY 170

WETLAND

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%

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

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

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Bluffton, South Carolina 29910 FAX 843-757-9801

OKATIE MARSH P.U.D.

MASTER PLAN
OCTOBER 24, 2007

SCALE: 1"=100'
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%

epa
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OKATIE MARSH P.U.D.

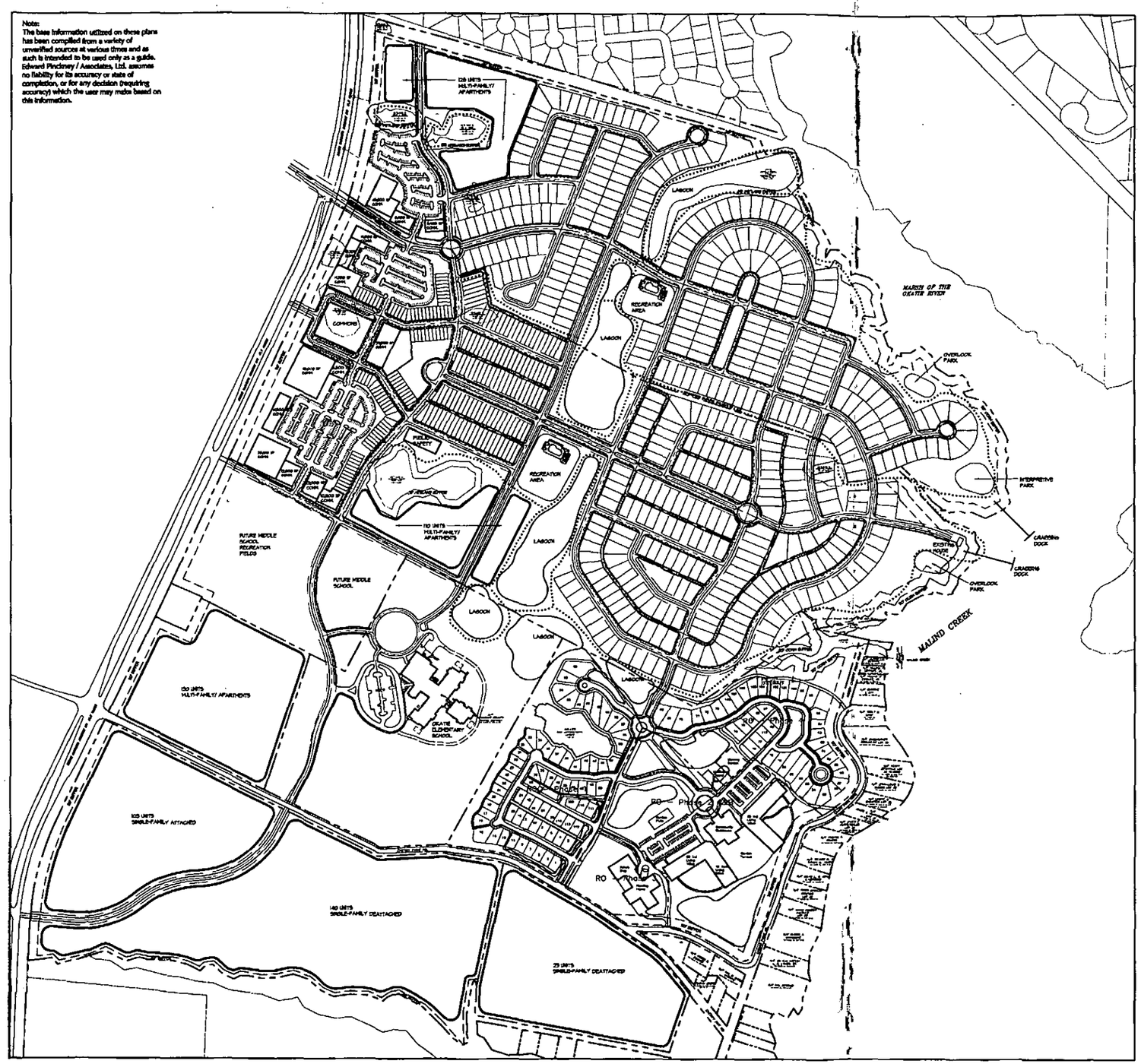
MASTER PLAN
DECEMBER 4, 2007

NORTH SCALE 1"=100' 0 100 200 300

OKATIE MARSH P.U.D

Overall Acreage: +/-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 units
Density: 3.89 units/AC
Open Space: 34.77 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.



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843-757-9800
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: 217 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

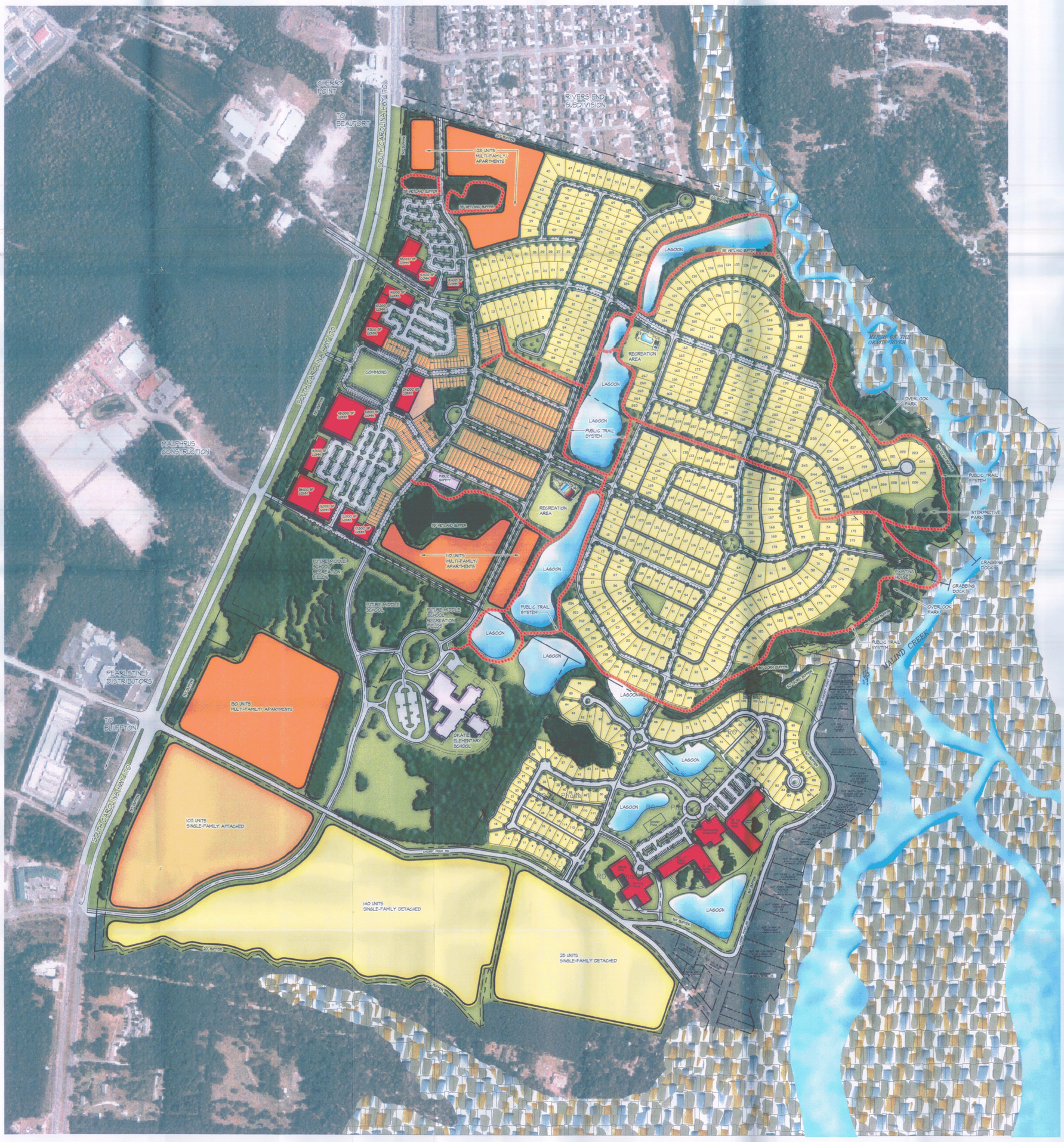
Overall Acreage: +/-119.25 AC
Commercial SF: +/-207,700 SF
Total Dwelling Units: 527 units
Single-Family Detached: 204 units
Single-Family Attached & Village Condos: 213 units
Multi-Family/Apartments: 110 units
Density: 4.41 units/AC
Open Space: 40.8 AC = 34.2%

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%



epda

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Bluffton, South Carolina 29910 FAX 843-757-9801

OKATIE VILLAGE MASTER PLAN

MASTER PLAN
NOVEMBER 20, 2007

NORTH

SCALE: 1"=200'
0 200 400 600

OKATIE P.U.D. MASTER PLAN (Okatie Marsh, Osprey Point, RIVER OAKS, 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
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: 395 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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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 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: 3.89 units/AC
Open Space: 34.77 AC = 34.3%

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

F:\Projects\04002\04002004 - DATA\SHEETS\OKATIE MARSH PUD\2007-10-04 OKATIE MARSH PUD.dwg, 30x42 OKATIE MARSH PUD, 10/24/2007 8:03:29 AM, DannyWilson, 1:2.77583

Note:
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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: +/-101.9 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 = 34.5%

128 UNITS MULTI-FAMILY/ APARTMENTS
PHASE 1C
PHASE 1A
PHASE 2
PHASE 3
PHASE 1B
PHASE 4
PHASE 5
PHASE 6
48,000 SF COMM.
8,400 SF COMM.
8,400 SF COMM.
55' WETLAND BUFFER
55' WETLAND BUFFER
LAGOON
55' WETLAND BUFFER
MODEL PARK
RECREATION AREA
LAGOON
PROPOSED FUTURE PROPERTY LINE
MARSH OF THE OKATIE RIVER
OVERLOOK PARK
INTERPRETIVE PARK
CRABBING DOCK

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

F:\Projects\04002\04002-01\PADMIN\Correspondance\Admin_Corsp\101305_IanHill_ltr.doc

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e-mail: info@pinckneyassociates.com
www.pinckneyassociates.com

South Carolina Archives & History Center
History & Heritage For All Generations

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.

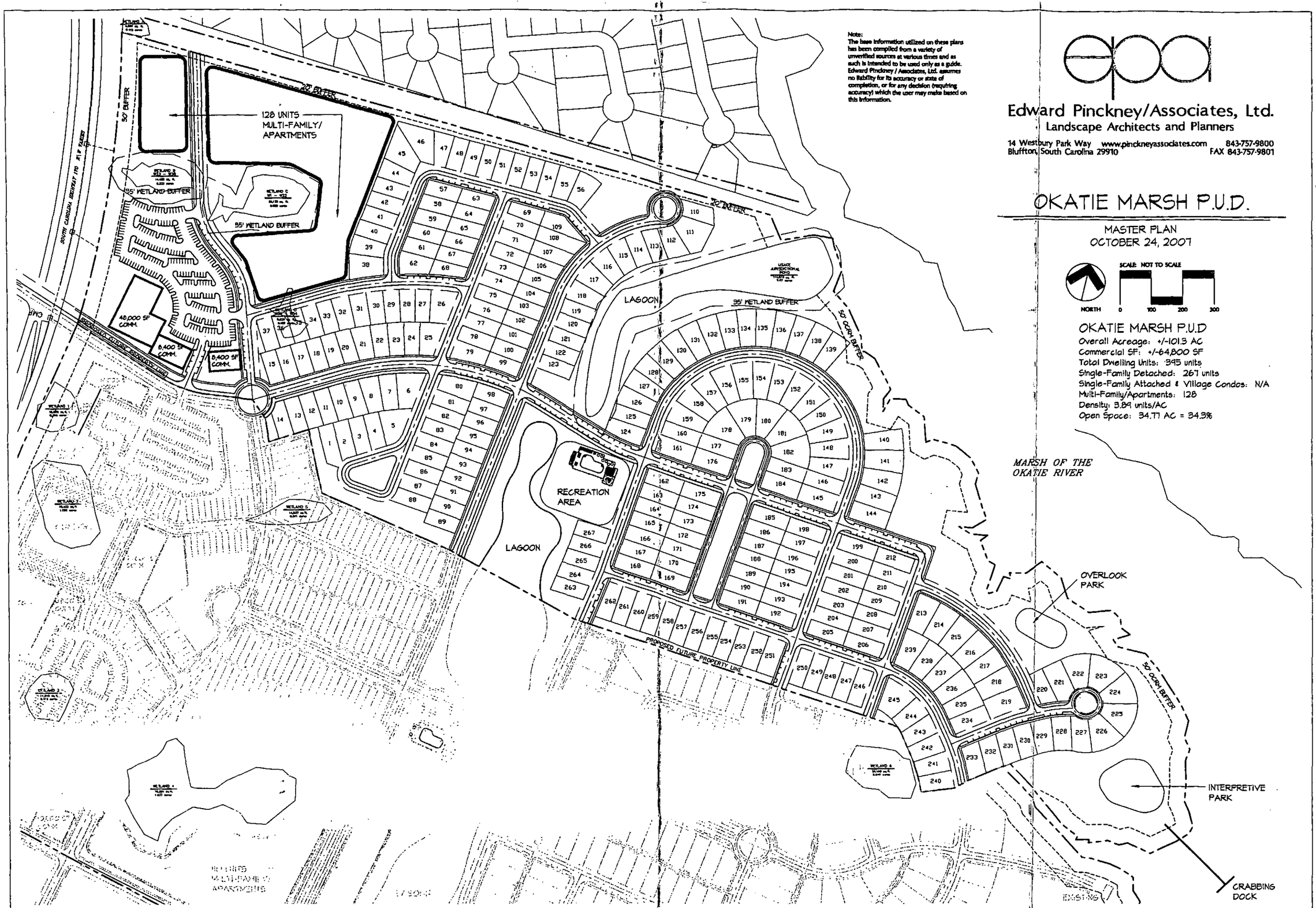
Site 38BU2103 should either be protected from ground disturbance through preservation, or further tested for a definitive National Register evaluation. We recommend the development of a Memorandum of Agreement to manage this site. The remaining two sites warrant no further management considerations.

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



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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: 345 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

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MASTER PLAN

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%

128 UNITS MULTI-FAMILY/ APARTMENTS
HERITAGE ROAD ACCESS PB 41 @ PG 551
30' BUFFER
50' WETLAND BUFFER
PARKING
48,000 SF COMM.
6,400 SF COMM.
6,400 SF COMM.
PROPOSED FUTURE ROADWAY LINE
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAPS
OKATIE HIGHWAY R/W VARIES
JOEL W. FRITCHER, I/II
DIST. 600, MAP 13, PARCEL 61
#5533 OKATIE HWY.
AREA NORTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
83,897 sq. ft.
1.92 acres
USACE JURISDICTIONAL POND
114,073 sq. ft.
2.62 acres
LAGOON
RECREATION AREA
MARSH OF THE OKATIE RIVER
OVERLOOK PARK
INTERPRETIVE PARK
THE OKATIE
W/E SULLIVANS 1 SHEIK
DIST. 600, MAP 13, PARCEL 8
#5 PRITCHER POINT RD.
AREA SOUTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
92,113 sq. ft.
2.12 acres

MARSH OF THE OKATIE RIVER

RIVER'S END SUBDIVISION
PHASE III

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

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%

MARSH OF THE OKATIE RIVER

USACE JURISDICTIONAL POND
114,073 sq. ft.
2.62 acres

JOE F. PRITCHER JR
DIST. 800, MAP 13, PARCEL 61
#5533 OKATIE HWY.
AREA NORTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
83,897 sq. ft.
1.92 acres

M/T SUSANNE T. SHEEK
DIST. 803, MAP 13, PARCEL 6
#95 PRITCHER POINT RD.
AREA SOUTH OF CENTERLINE OF TRAVELED SURFACE OF ROAD
92,113 sq. ft.
2.12 acres

HERITAGE ROAD
ACCESS PB 41 PAGE 55
PROPOSED FUTURE PROPERTY LINE
OKATIE RIVER
SOUTH CAROLINA RIGHTWAY 170 R/W VARIES
OKATIE RIVERWAY R/W VARIES
CMF
S74°45'40"W 328.08
N73°31'58"W 747.85

MARSH OF THE OKATIE RIVER

THE OKATIE

MARSH OF THE OKATIE RIVER

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

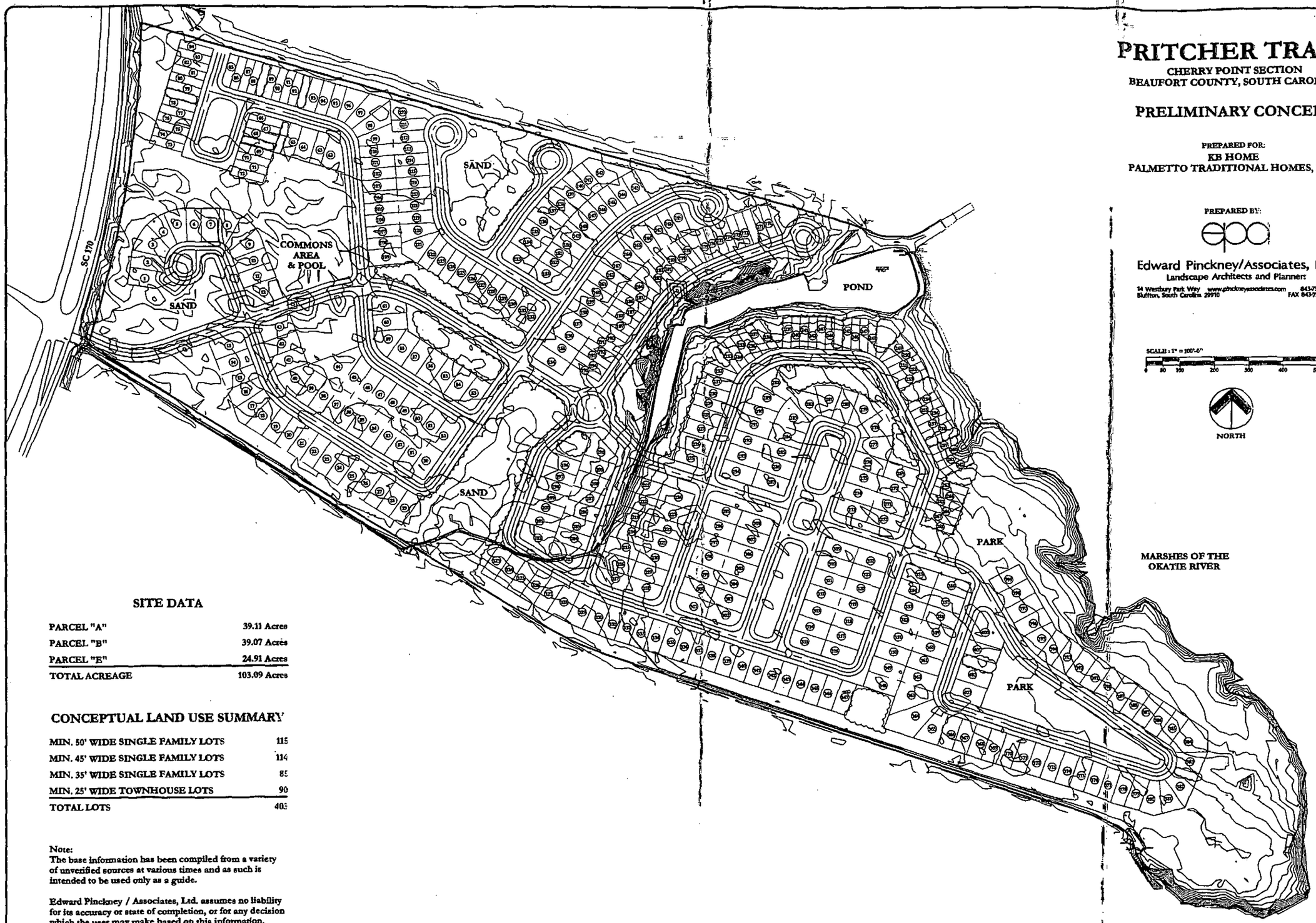
are typical, being composed primarily of wax myrtle, vomitoria holly, native grasses and vines.

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.



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" = 200'-0"
0 80 100 200 300 400 500

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

Note:
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MAY 17, 2004

OKATIE MARSH

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

NATURAL RESOUCE PROTECTION

PREPARED FOR:
KB HOME

PREPARED BY:

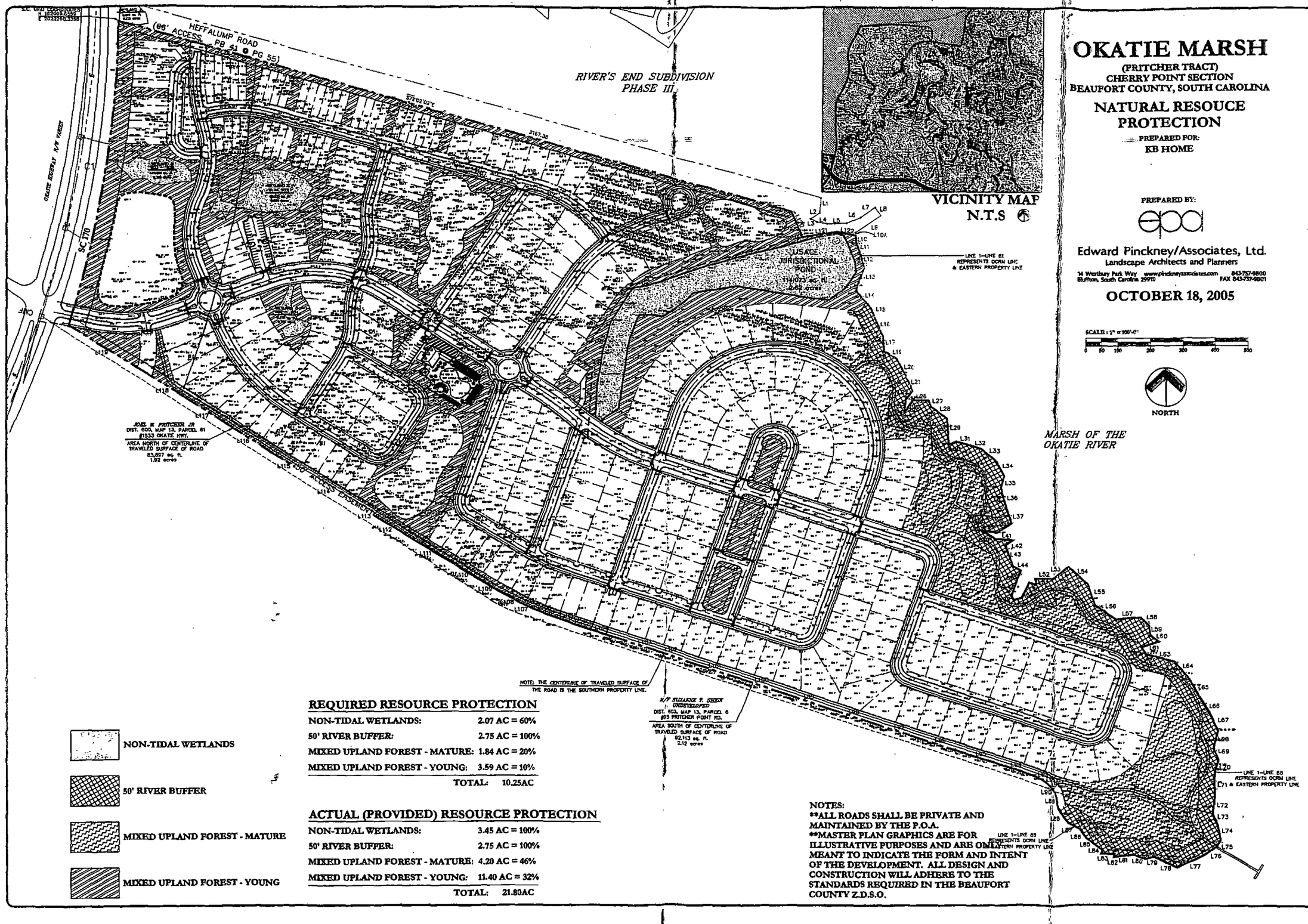
Edward Pinckney/Associates, Ltd.
Landscape Architects and Planners
14 Westbury Park Way www.pinckneyassociates.com 843-757-9800
Bluffton, South Carolina 29910 FAX 843-757-9801

OCTOBER 18, 2005

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

NORTH

VICINITY MAP
N.T.S



NON-TIDAL WETLANDS

50' RIVER BUFFER

MIXED UPLAND FOREST - MATURE

MIXED UPLAND FOREST - YOUNG

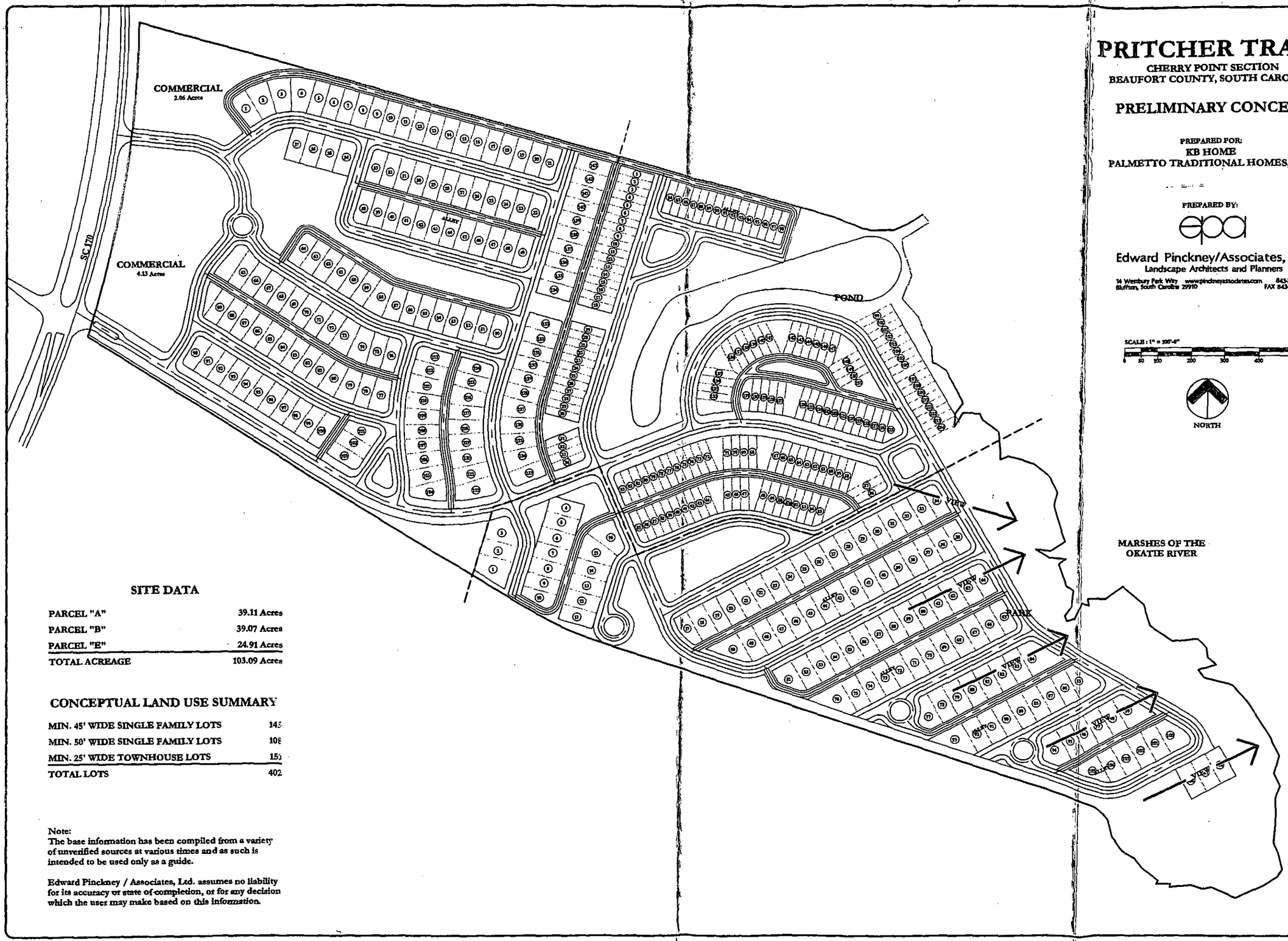
REQUIRED RESOURCE PROTECTION

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 www.pinckneyassociates.com 843-757-9800
Bluffton, South Carolina 29910 FAX 843-757-9801

SCALE : 1" = 200'-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	145
MIN. 50' WIDE SINGLE FAMILY LOTS	106
MIN. 25' WIDE TOWNHOUSE LOTS	151
TOTAL LOTS	402

Note:
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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.

MARCH 25, 2004

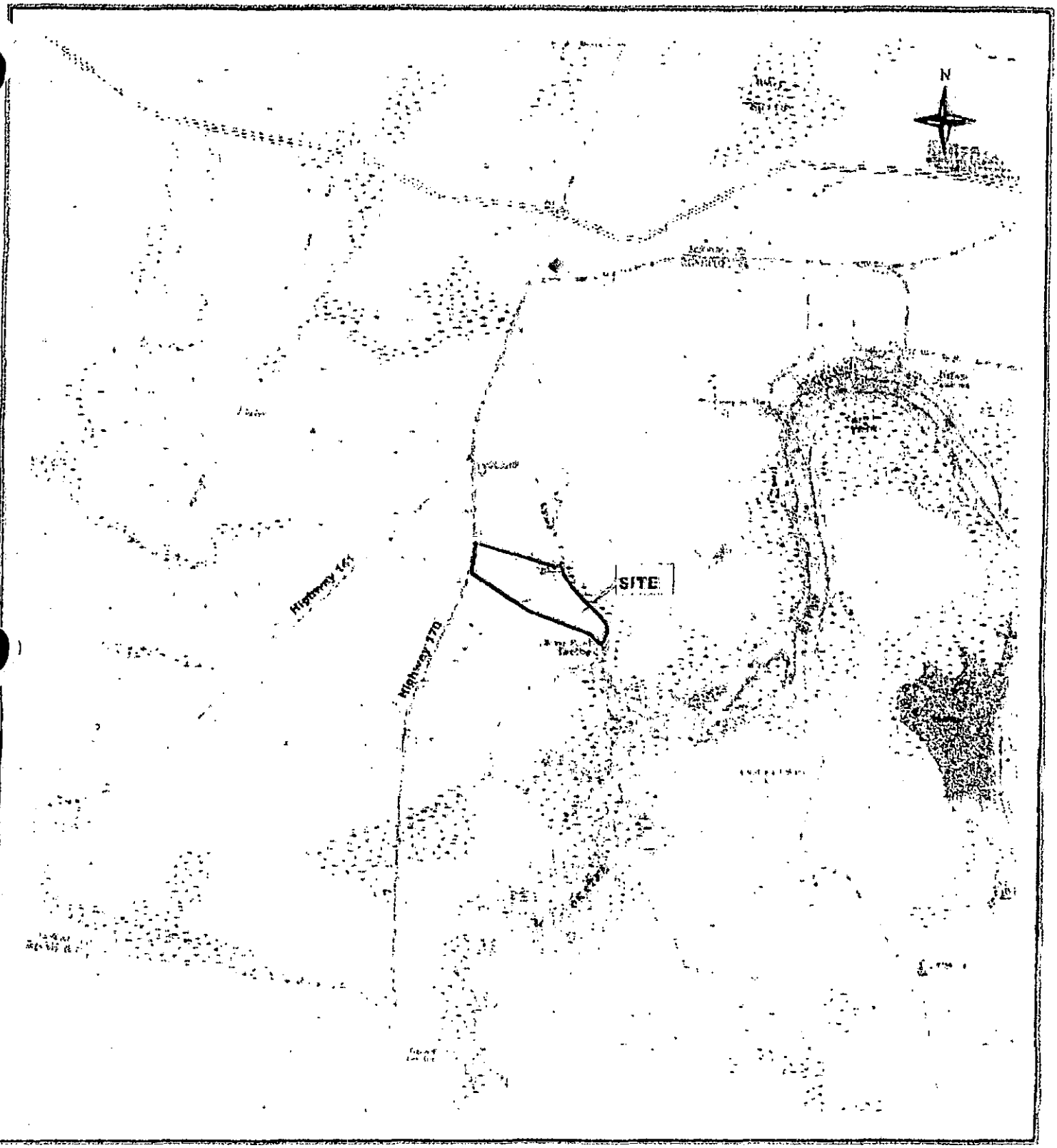
Threatened and Endangered Species Survey Report
Okatie Tract
Beaufort County, South Carolina

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

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.
49 Park of Commerce Way, Suite 203
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

sligh environmental consultants, inc.
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 20, 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

sligh 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.
Suite 200
Bluffton, SC 29910
(843) 757-9800
Fax (843) 757-9801
e-mail: info@pinckneyassociates.com
www.pinckneyassociates.com

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

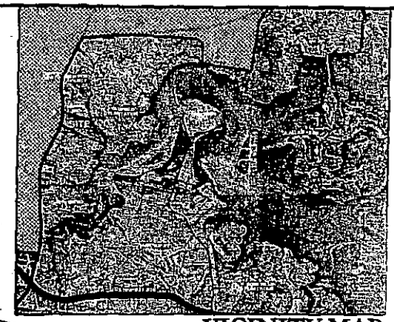
NATURAL RESOUCE PROTECTION

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

MARSH OF THE OKATIE RIVER

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

NORTH

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.

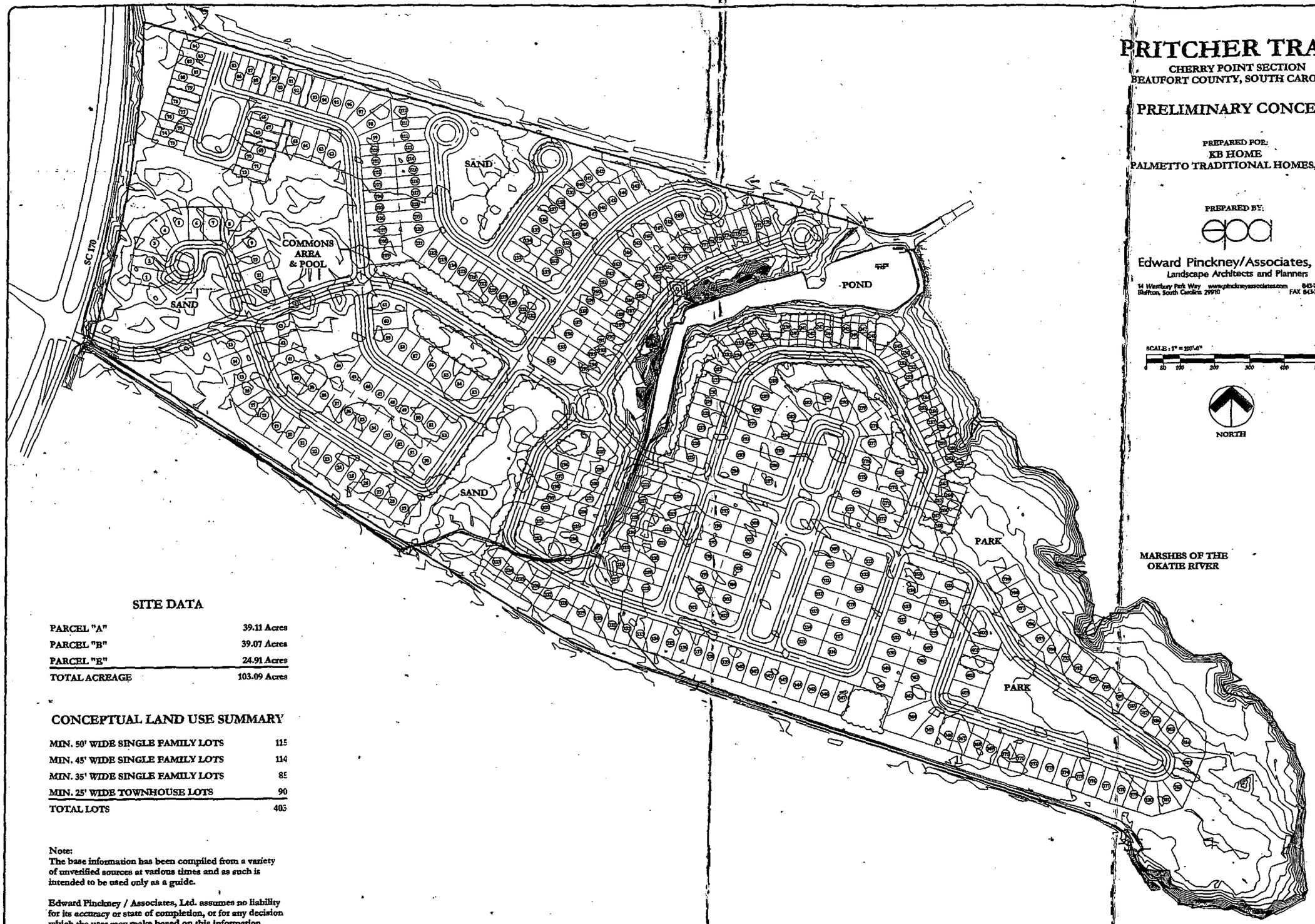
PREPARED BY:

Edward Pinckney/Associates, Ltd.
Landscape Architects and Planners
14 Westbury Park Way www.pinckneyassociates.com 843-757-6800
Bluffton, South Carolina 29910 FAX 843-757-9801

SCALE: 1" = 200'-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	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
PALMETTO TRADITIONAL HOMES, LLC.

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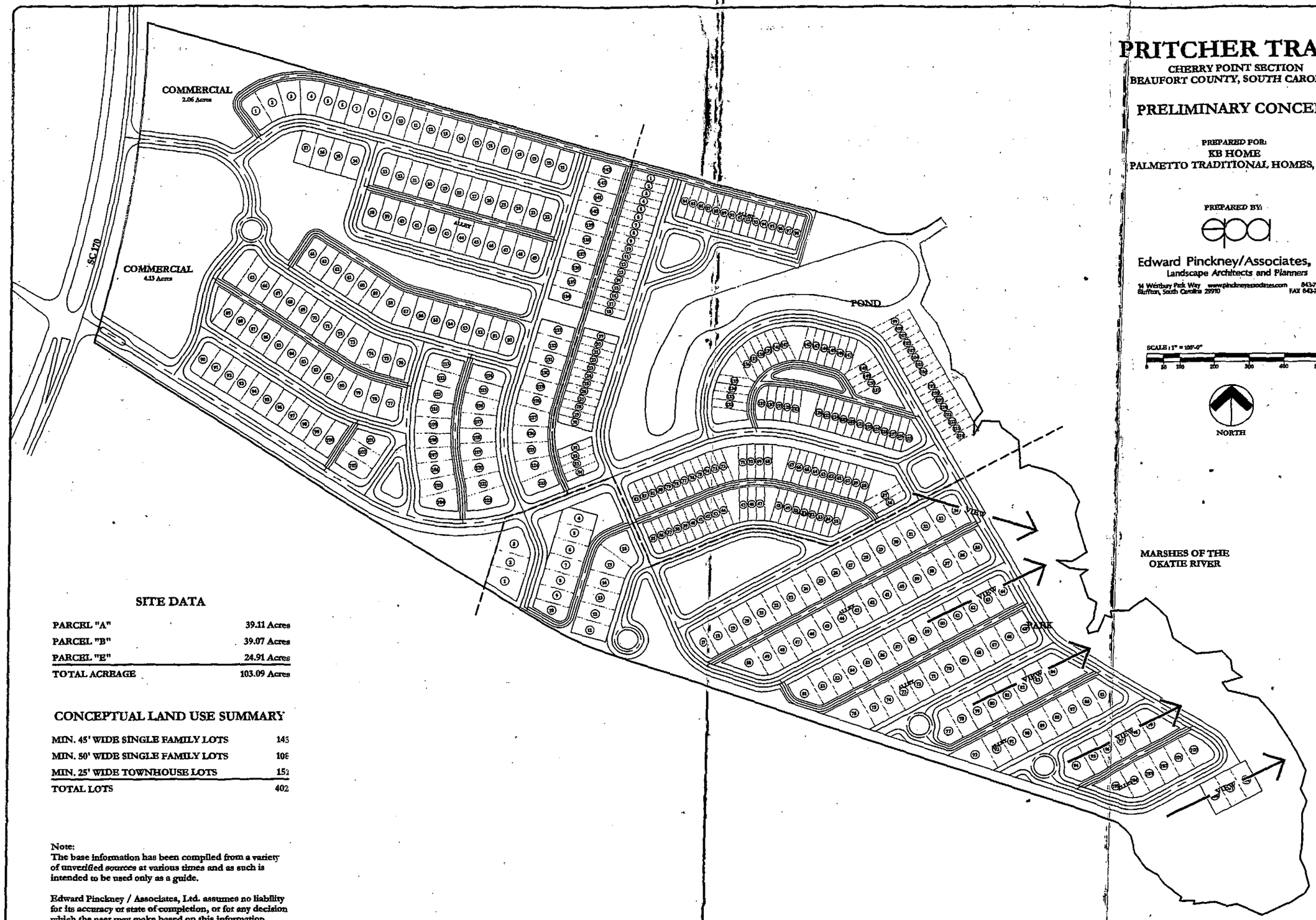
SCALE: 1" = 100'-0"
0 50 100 200 300 400 500

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	145
MIN. 50' WIDE SINGLE FAMILY LOTS	106
MIN. 25' WIDE TOWNHOUSE LOTS	151
TOTAL LOTS	402

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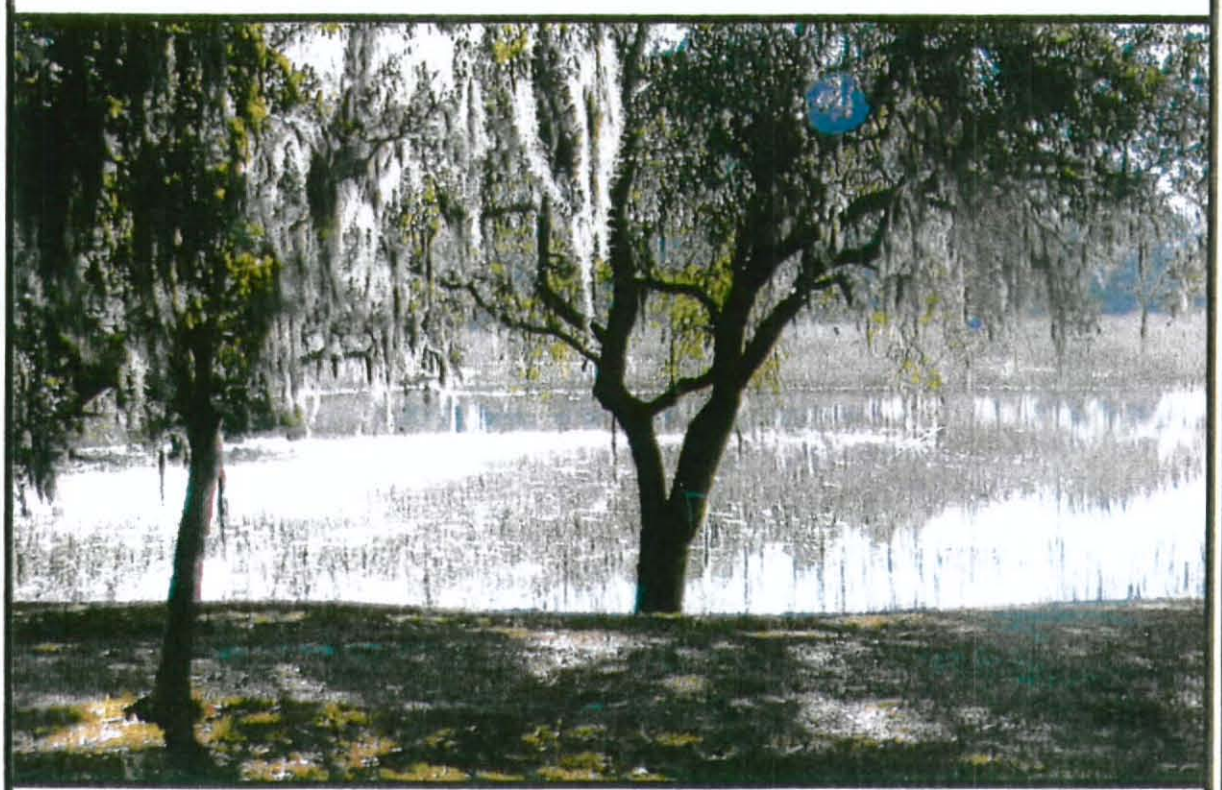
Edward Pinckney / Associates, Ltd. assumes no liability for its accuracy or state of completion, or for any decision which the user may make based on this information.

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

Prepared for:

Palmetto Traditional Homes
Columbia, South Carolina

Prepared By:

David S. Baluha
Archaeologist

and

Susannah Munson
Historian

under the direction of

Ralph Bailey, Jr.
Principal Investigator

Brockington and Associates, Inc.
Atlanta Charleston Raleigh
May 2004

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

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Table of Contents

List of Figures

List of Tables

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.

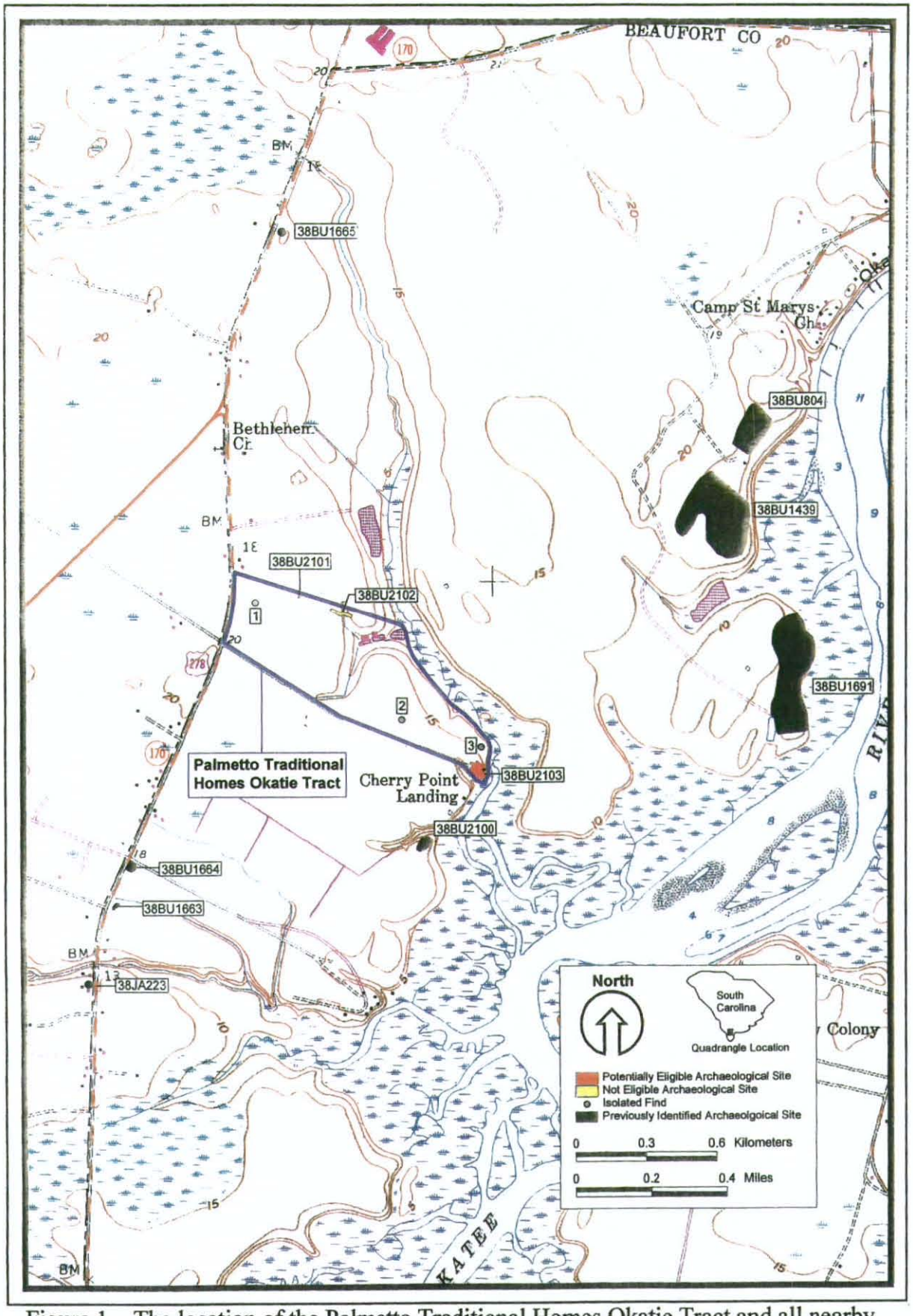

Figure 1. The location of the Palmetto Traditional Homes Okatie Tract and all nearby cultural resources (USGS 1979 *Jasper*, SC quadrangle).

067

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.

View of Prichter's Point Road, looking west.

uthern facade of the modern house.

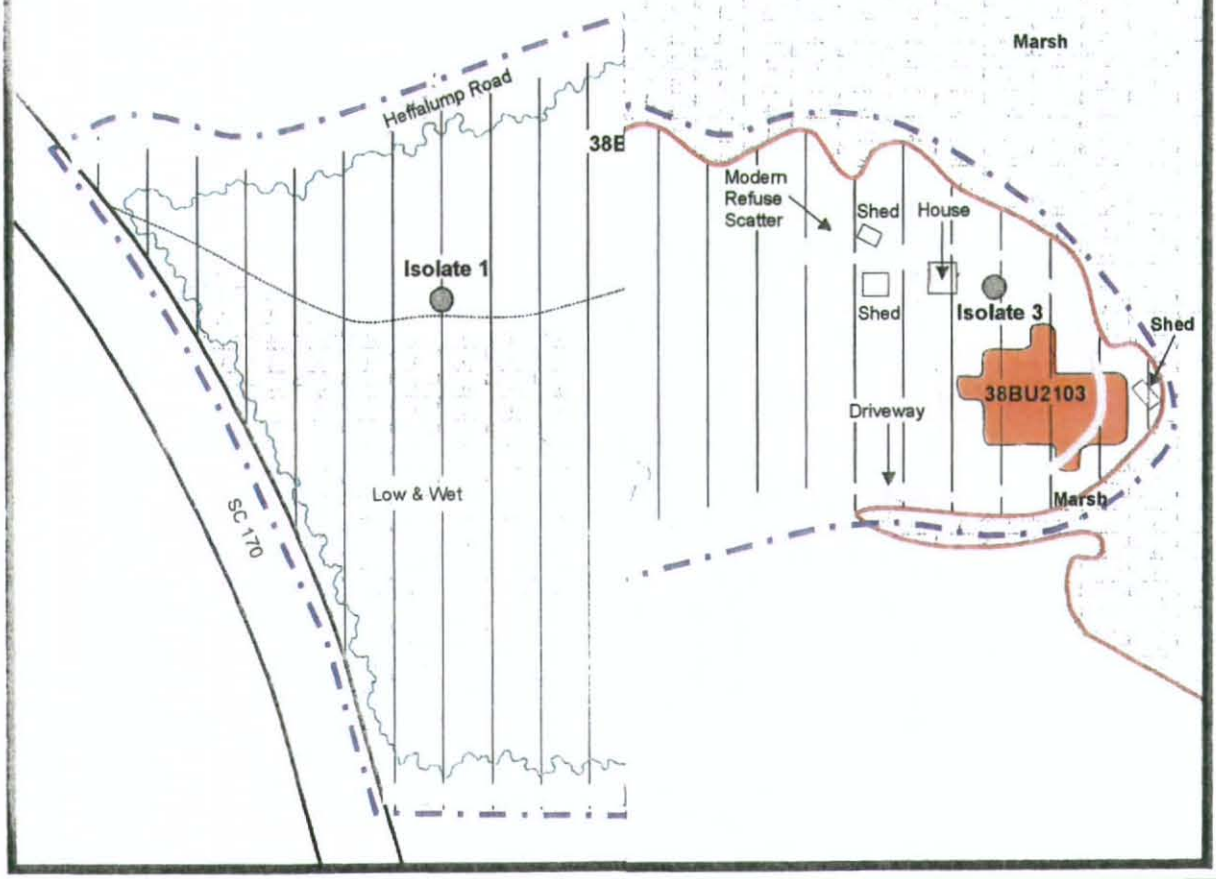

Figure 2. A map of the project tract showing

071

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.

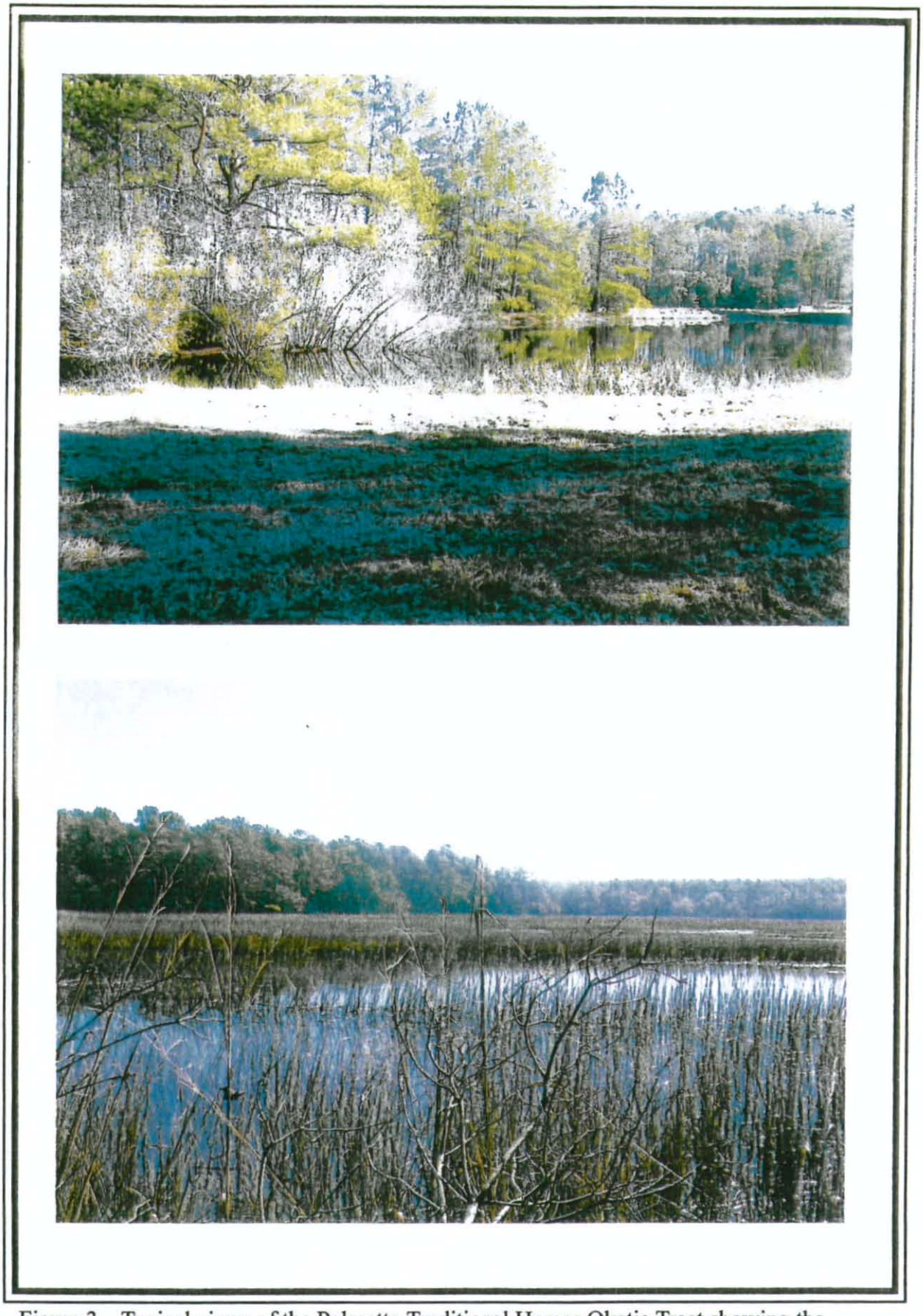

Figure 3. Typical views of the Palmetto Traditional Homes Okatie Tract showing the pond looking south (top) and the marsh along Malind Creek looking northeast (bottom).

077

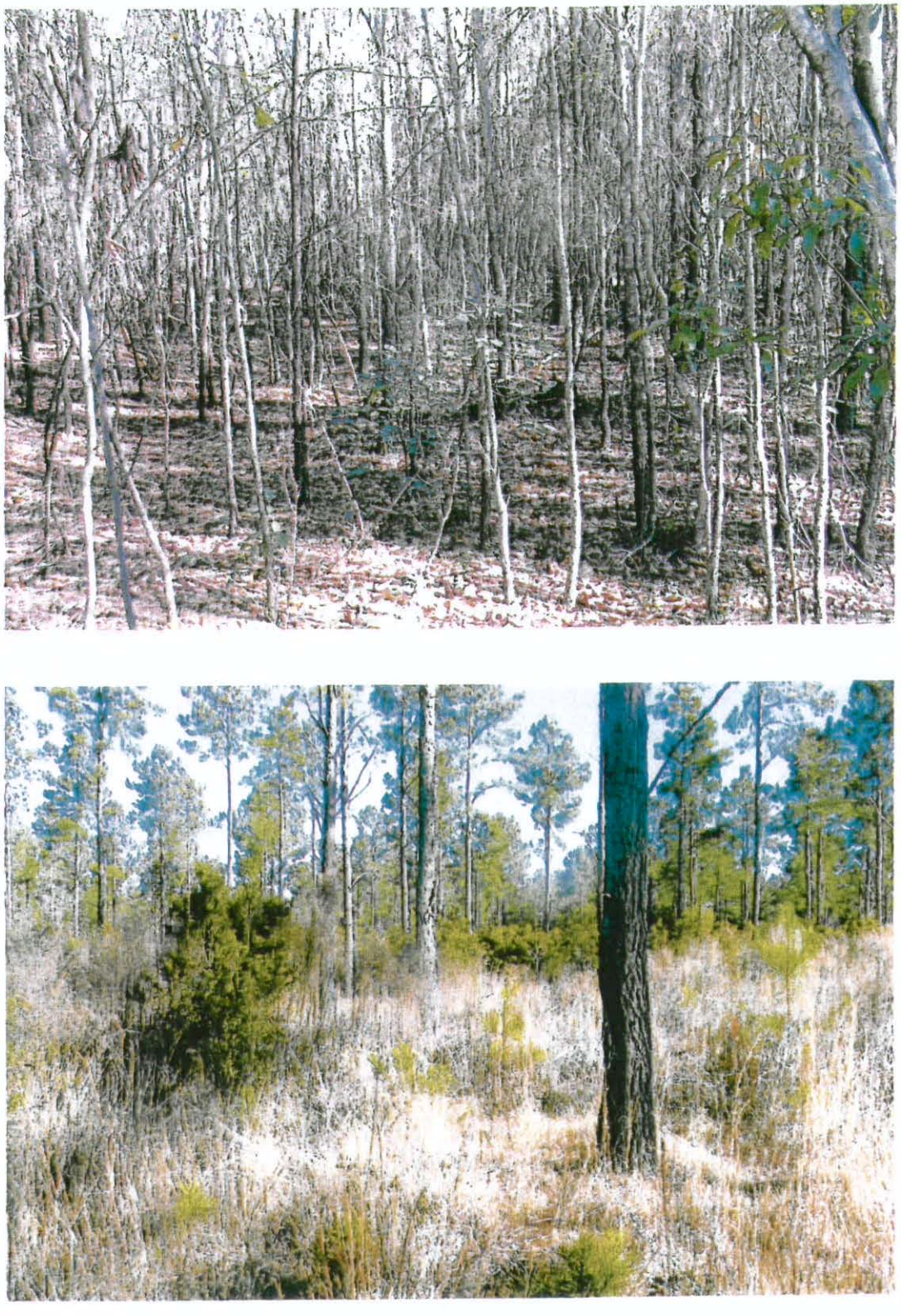

Figure 4. Typical views of the Palmetto Traditional Homes Okatie Tract showing the mixed pine and hardwood forest in the western portion of the tract (top) and the planted pine forest in the central portion of the tract (bottom).

078

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

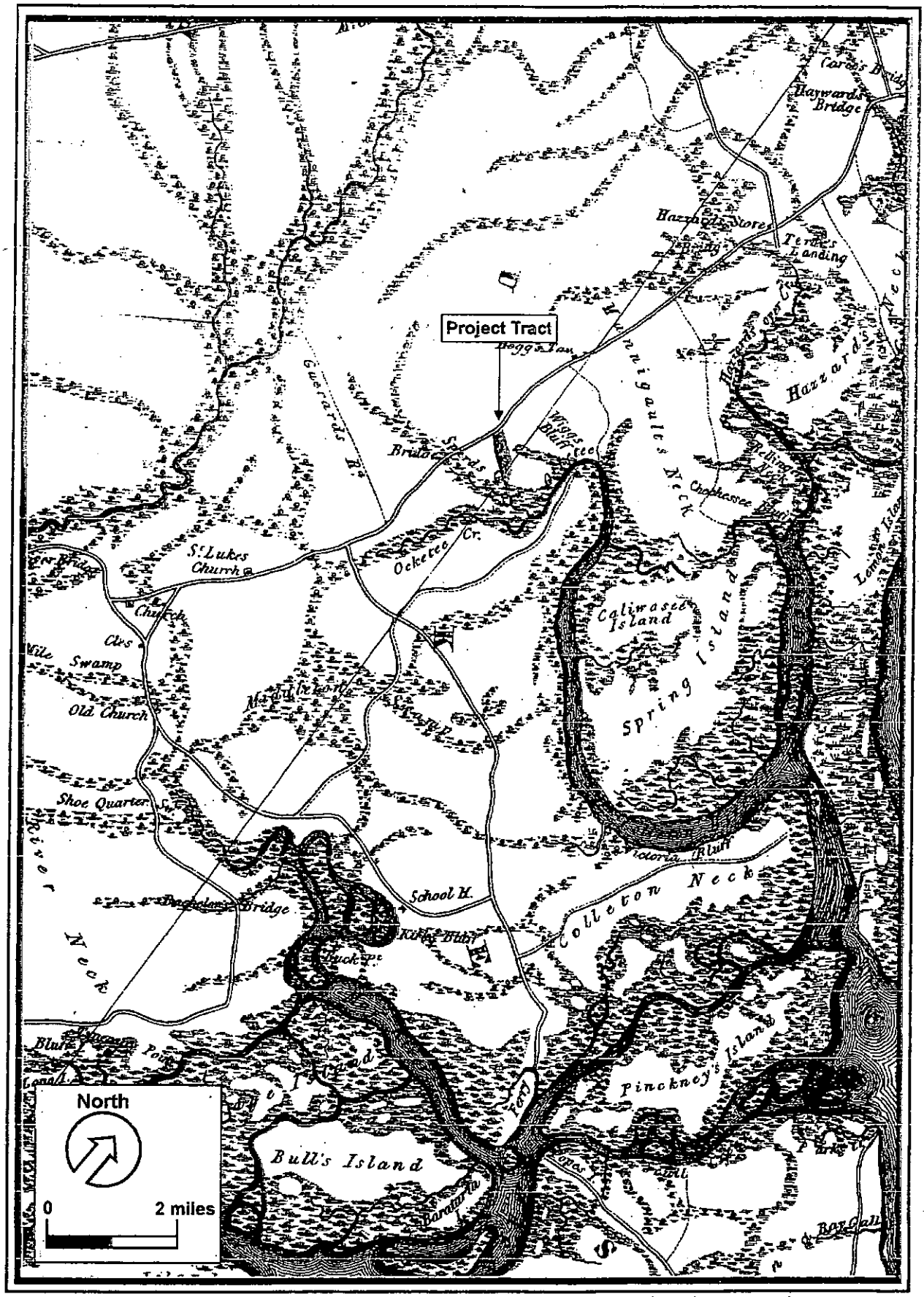

Figure 5. A portion of Mills, 1825 map of Beaufort District showing the approximate location of the project tract (Mills 1979).

095

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.

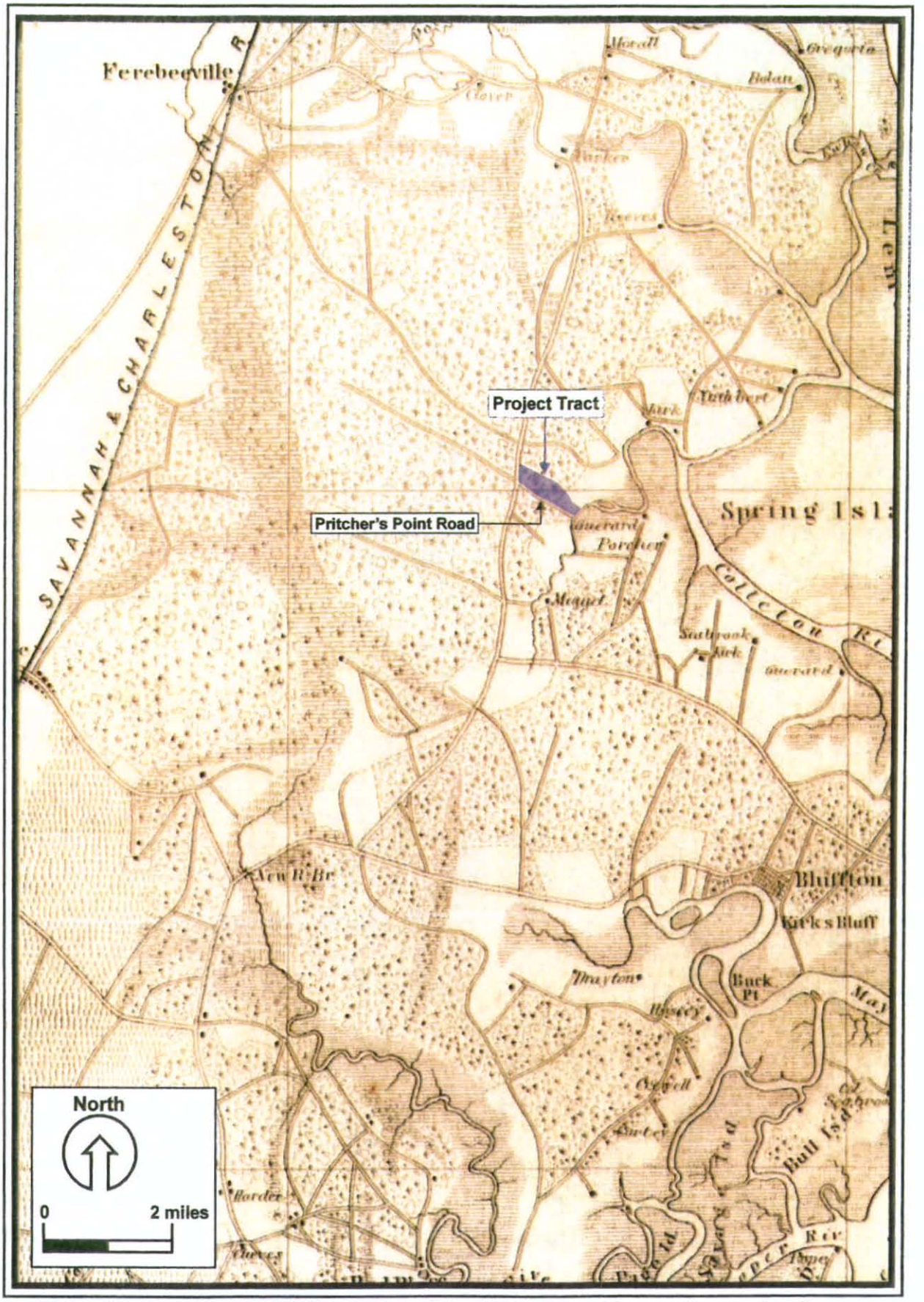

Figure 6. A portion of a Civil War map of the Charleston to Savannah coastal region showing the approximate location of the project tract (Lindenkoh 1865).

097

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.

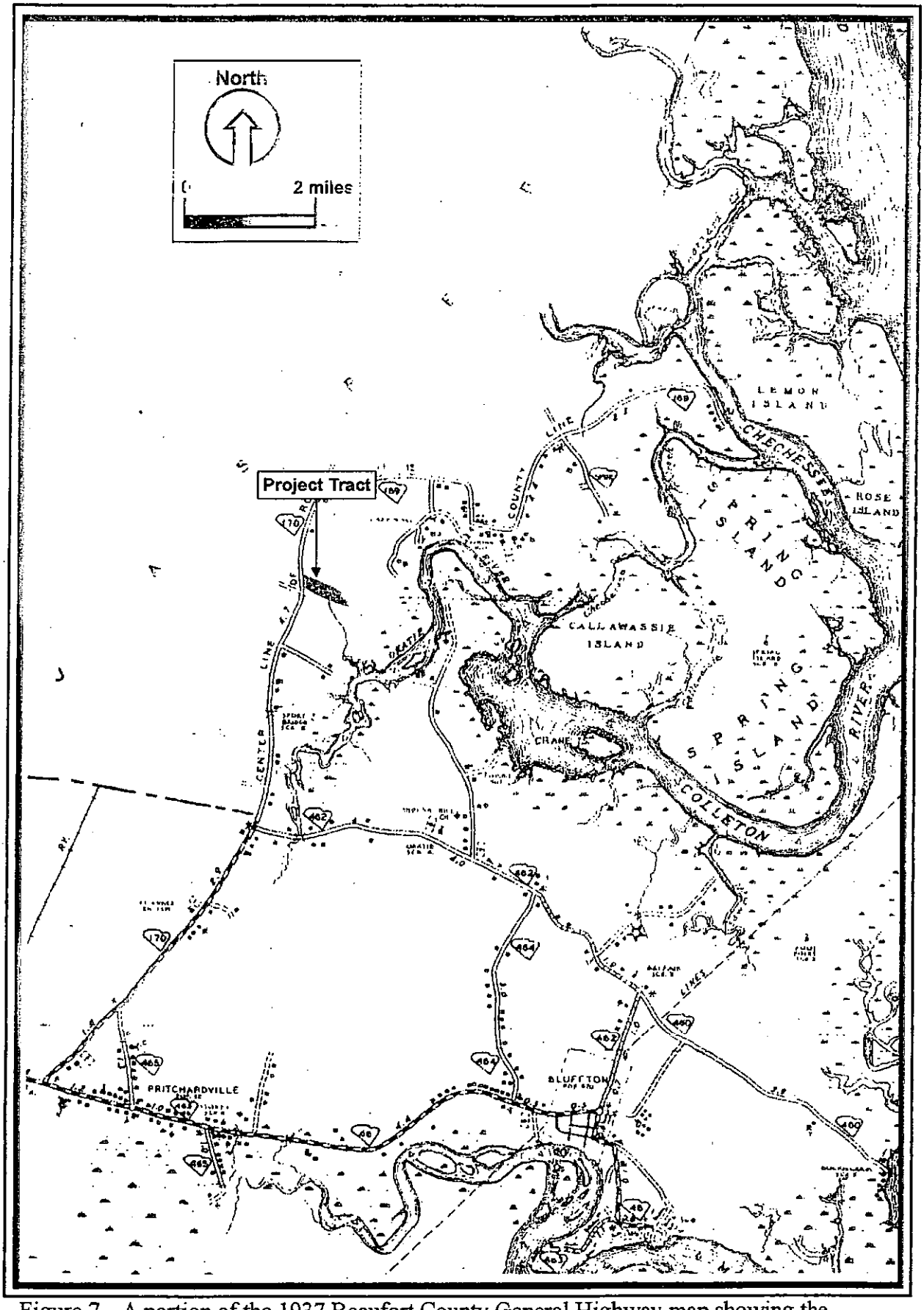

Figure 7. A portion of the 1937 Beaufort County General Highway map showing the approximate location of the project tract.

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.

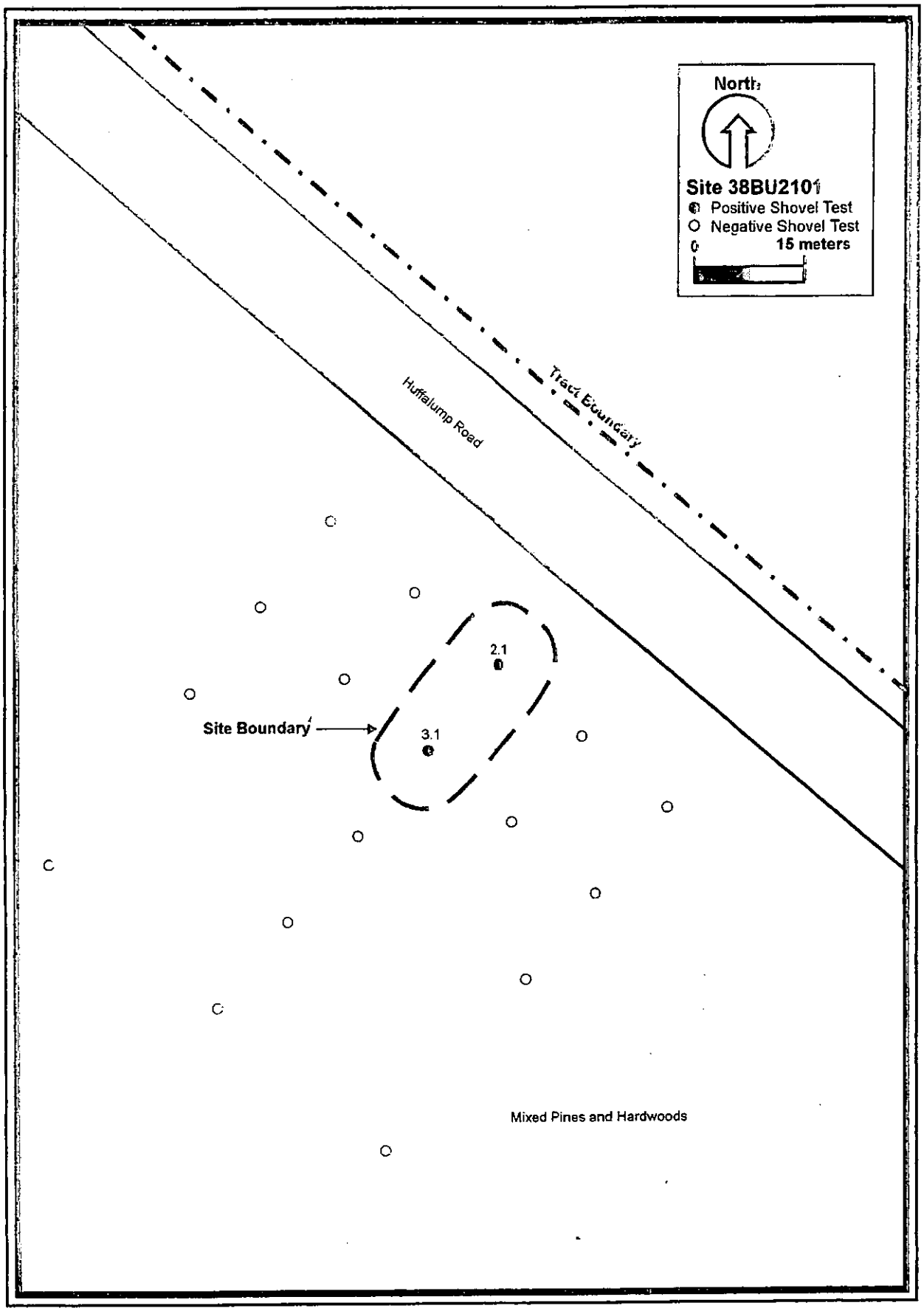

Figure 8. Plan of 38BU2101.

109

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

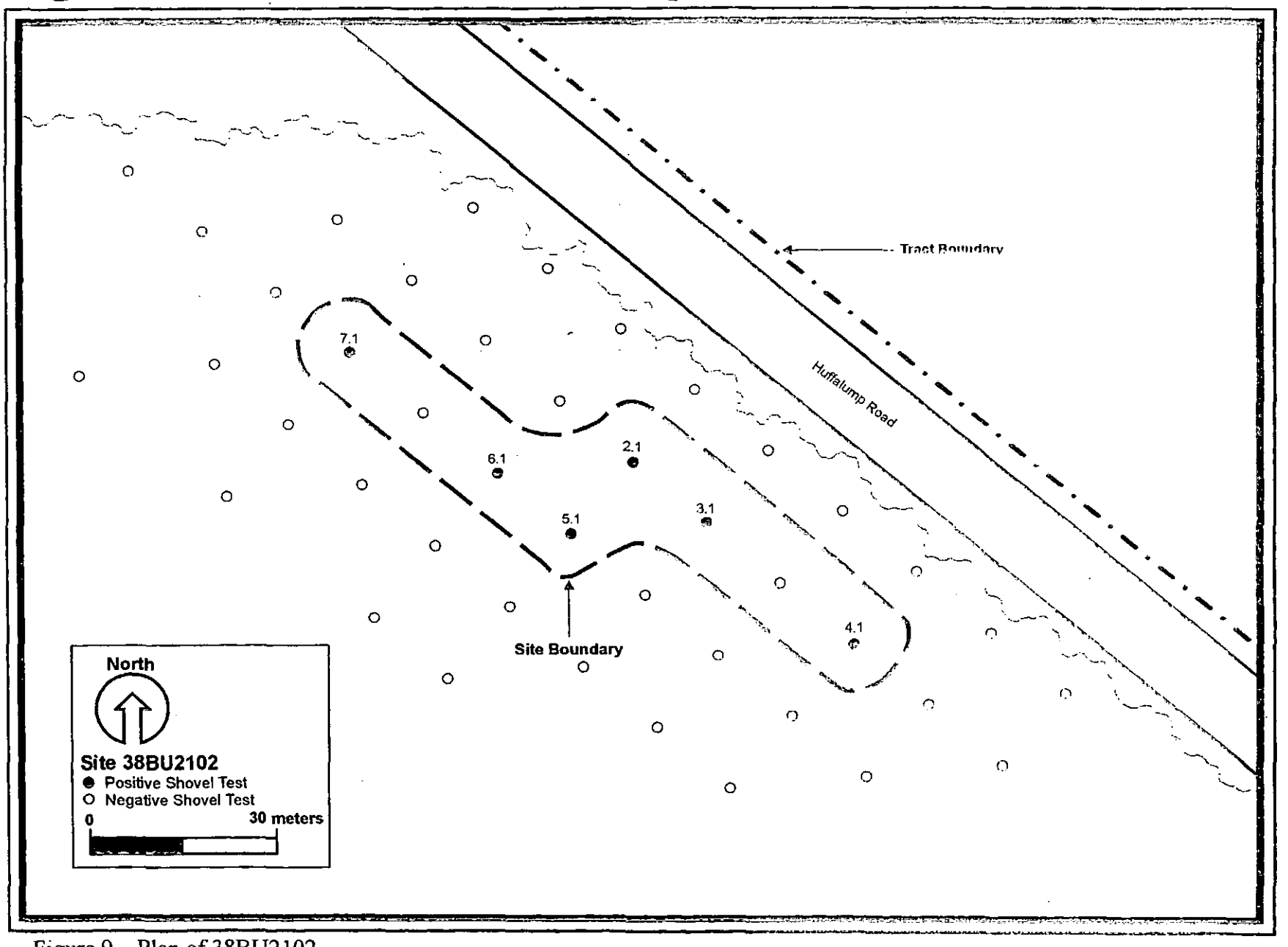

Figure 9. Plan of 38BU2102.

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

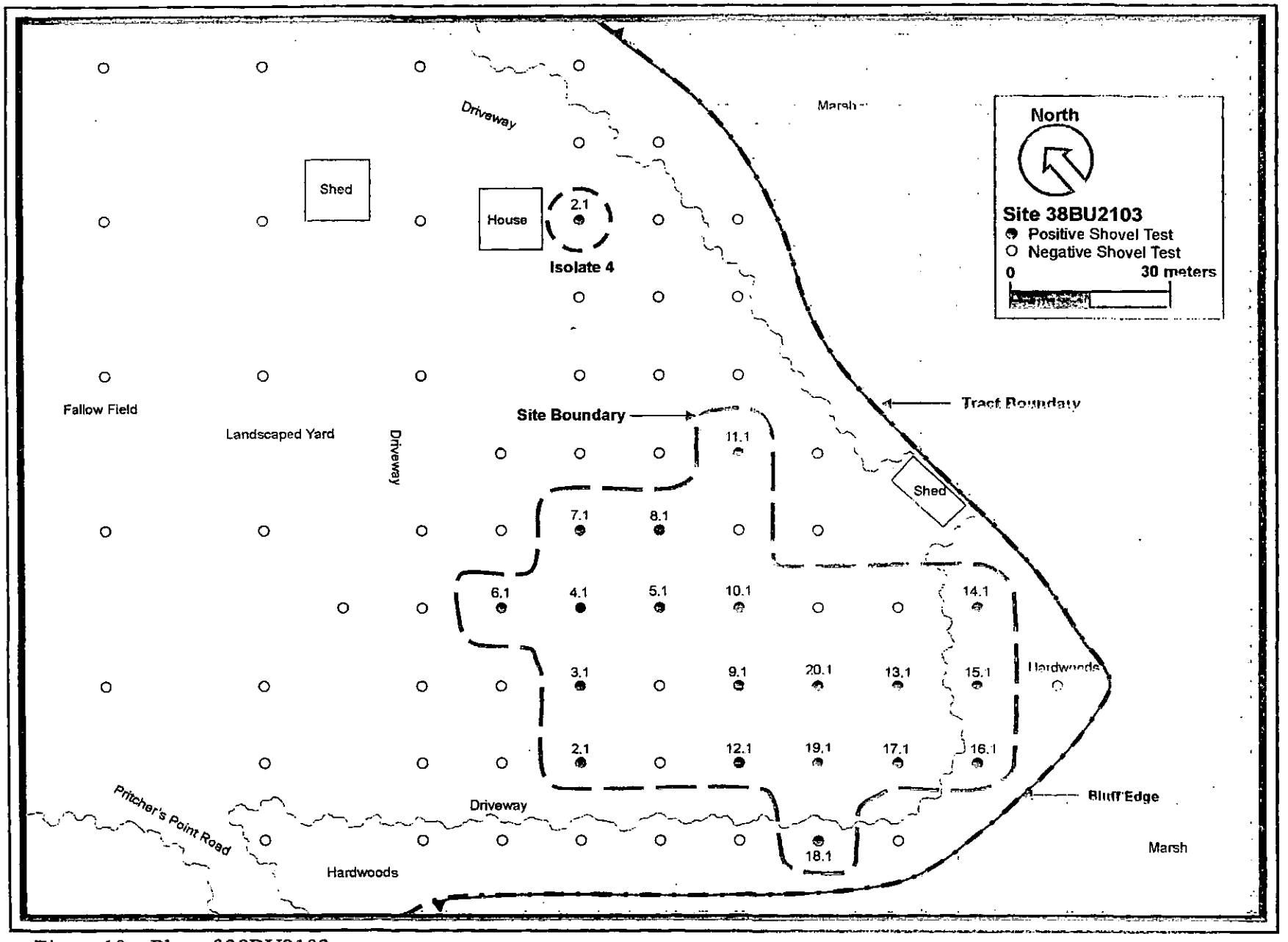

Figure 10. Plan of 38BU2103.

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: 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: 38BU2103

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

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: 38BU2102

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: 38BU2103

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.

Ralph Bailey, Jr.
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Mt. Pleasant, South Carolina 29464
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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)
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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.

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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						Prtcher Property POD (Estimated Land-Uses)			
Period	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 [(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 [(g to k)]	164 Apartment Units (l)	152 Townhome/ Condo (m)	171 Single Family Units (n)	Total Prtcher Property POD [(l to n)]
Daily	0	610	2,230	1,810	240	4,890	930	980	1,520	1,240	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	82	13	203	50	30	69	40	328	62	599	18	28	64	130
Total	0	58	226	168	16	468	96	91	186	114	765	75	1,231	108	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	270.2	-	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.

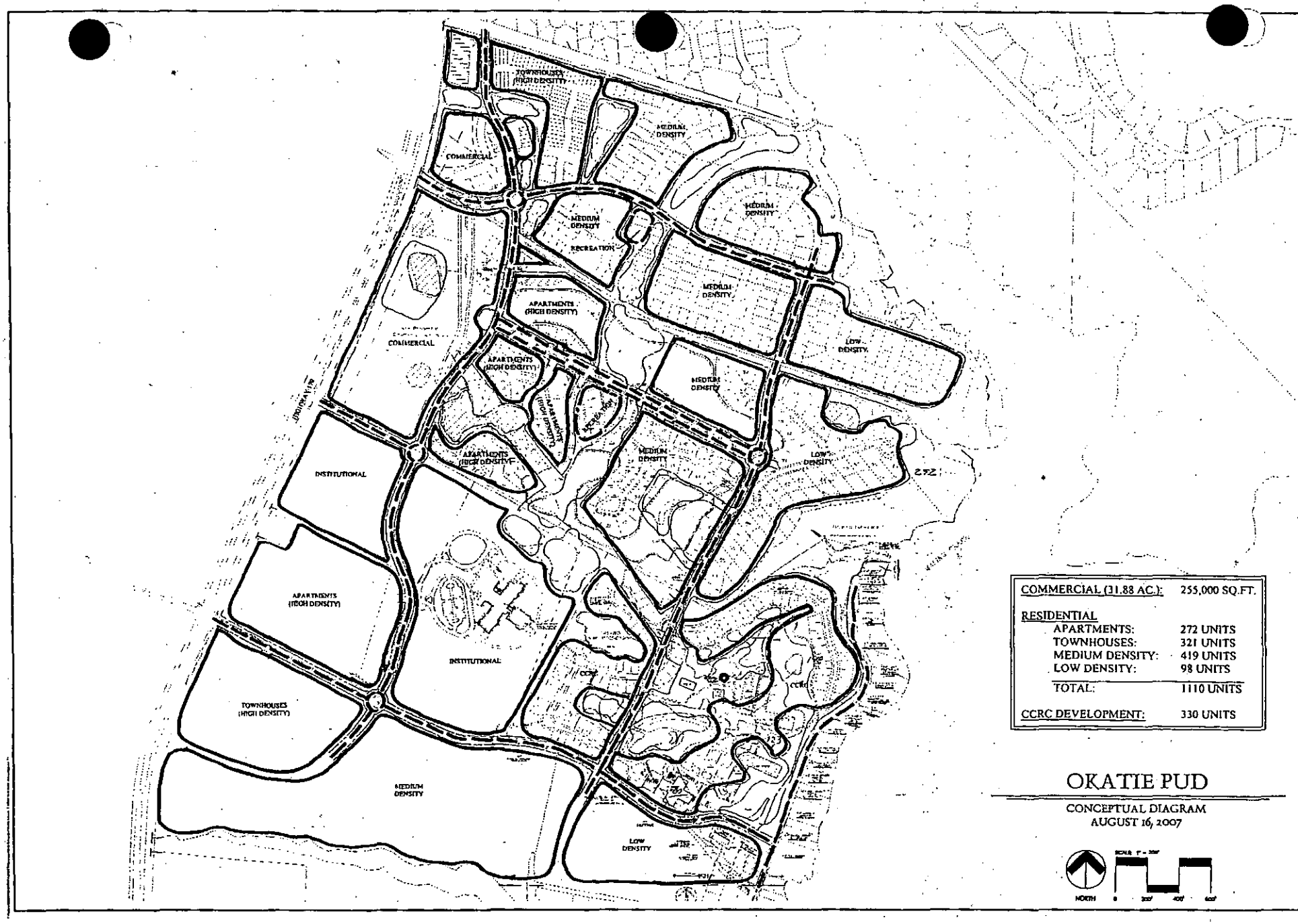
The Okatie PUD plans a total of 1,340 residential units, 330 CCRC units, and 244,000 sf of commercial space which will be provided access via five access drives along SC 170. As planned, the development is anticipated to be constructed and fully-operational by 2015.

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

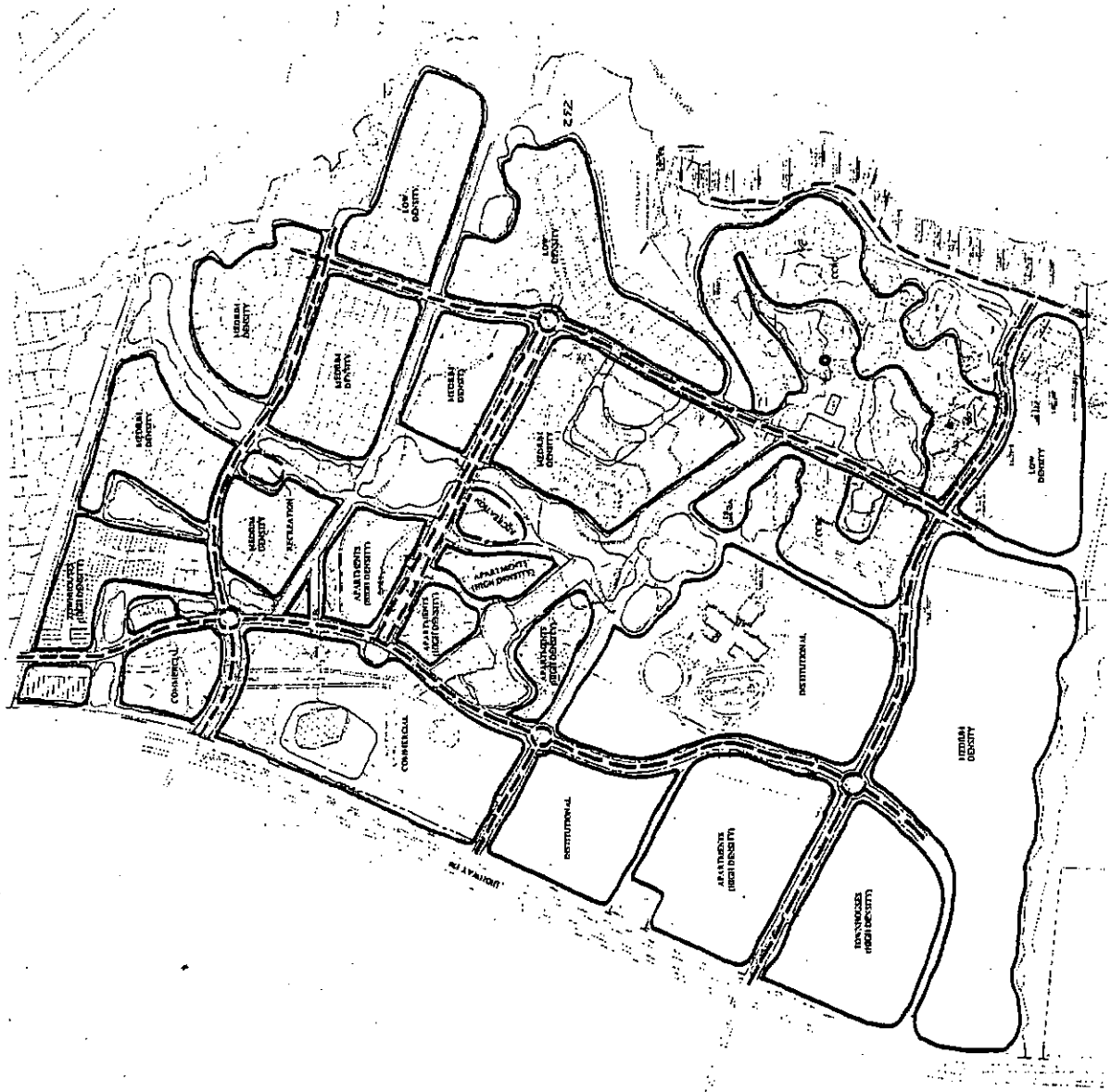


Figure 1

SITE DEVELOPMENT PLAN

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

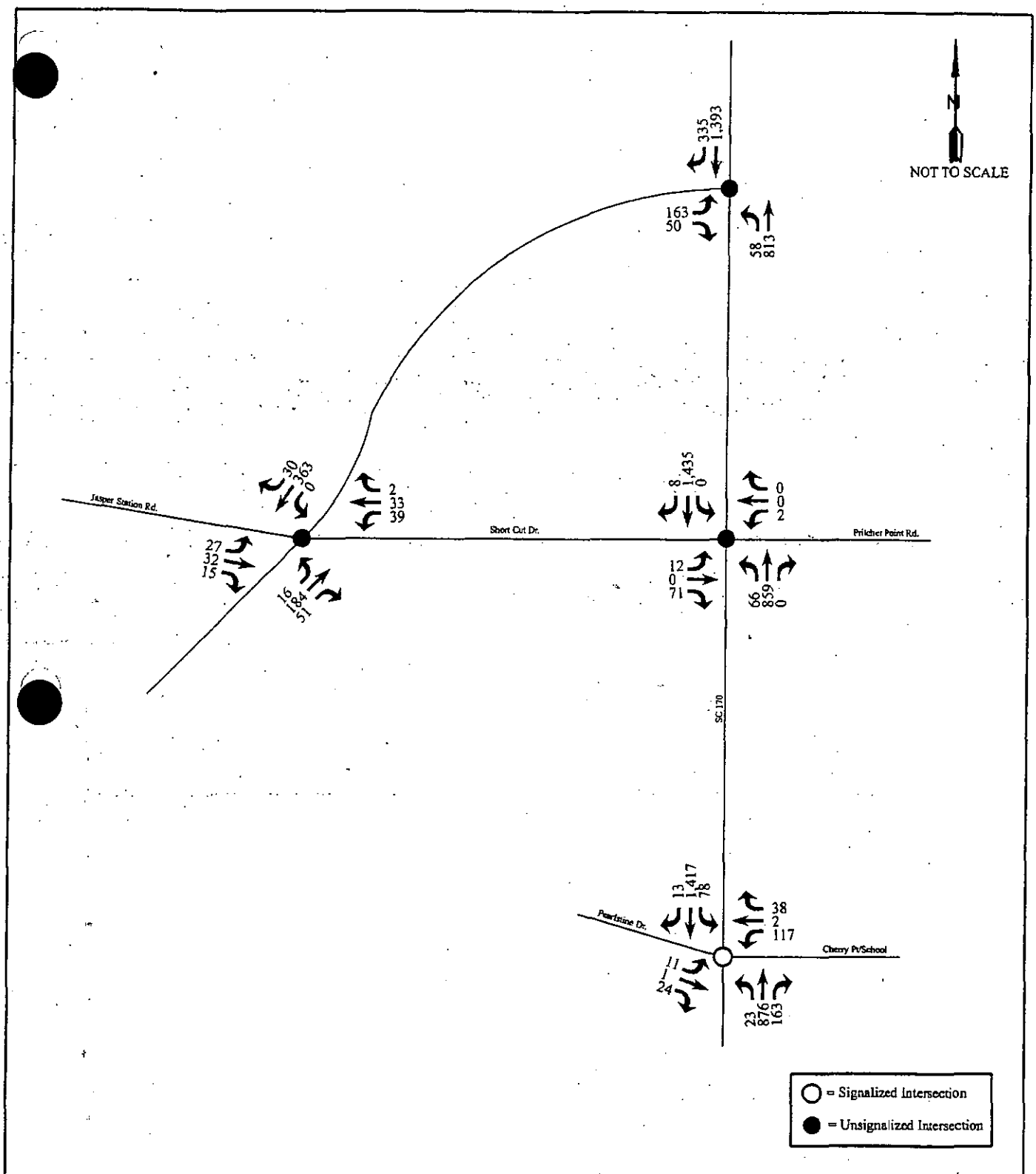


Figure 2

EXISTING TRAFFIC VOLUMES
AM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

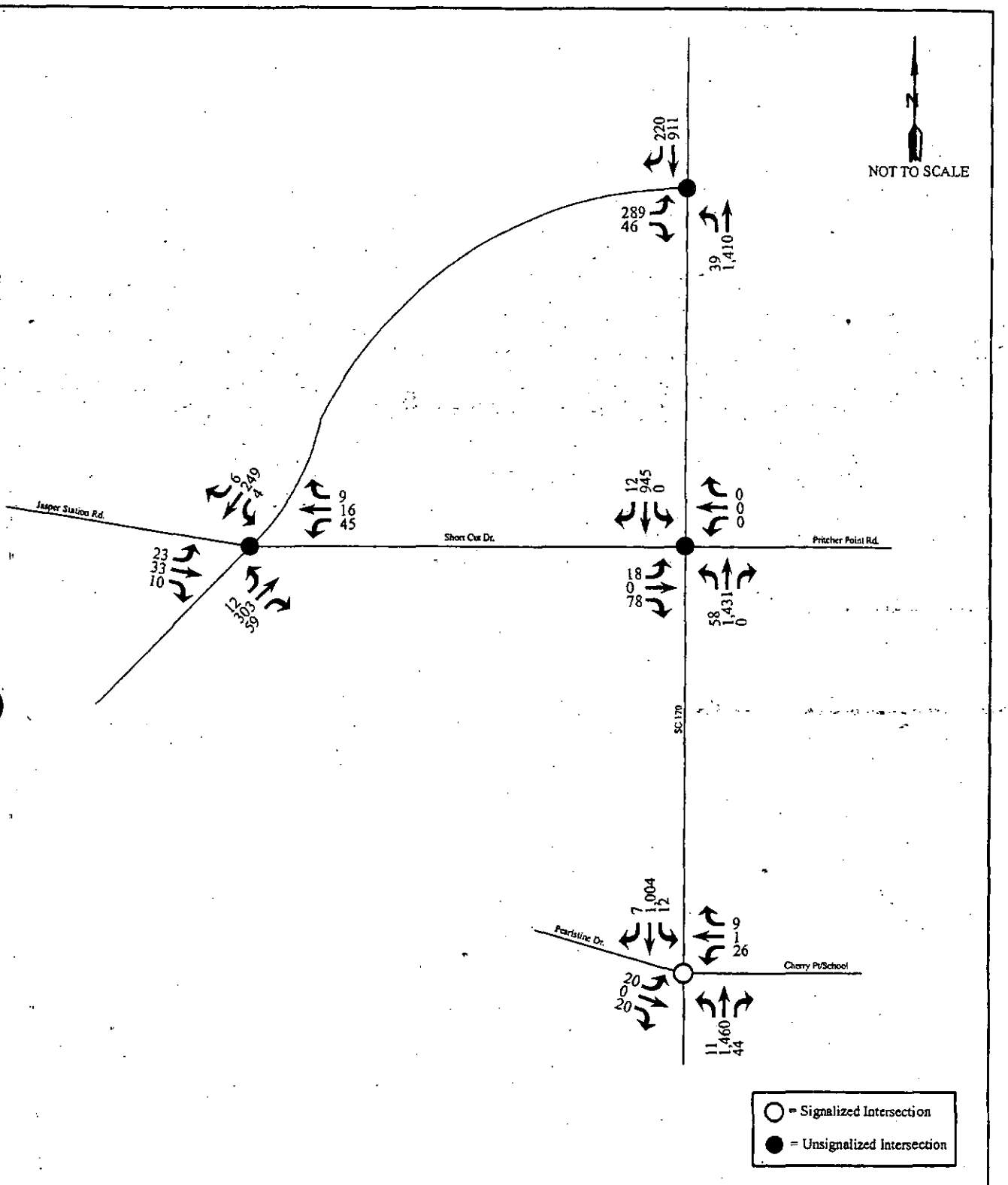


Figure 3

EXISTING TRAFFIC VOLUMES
PM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

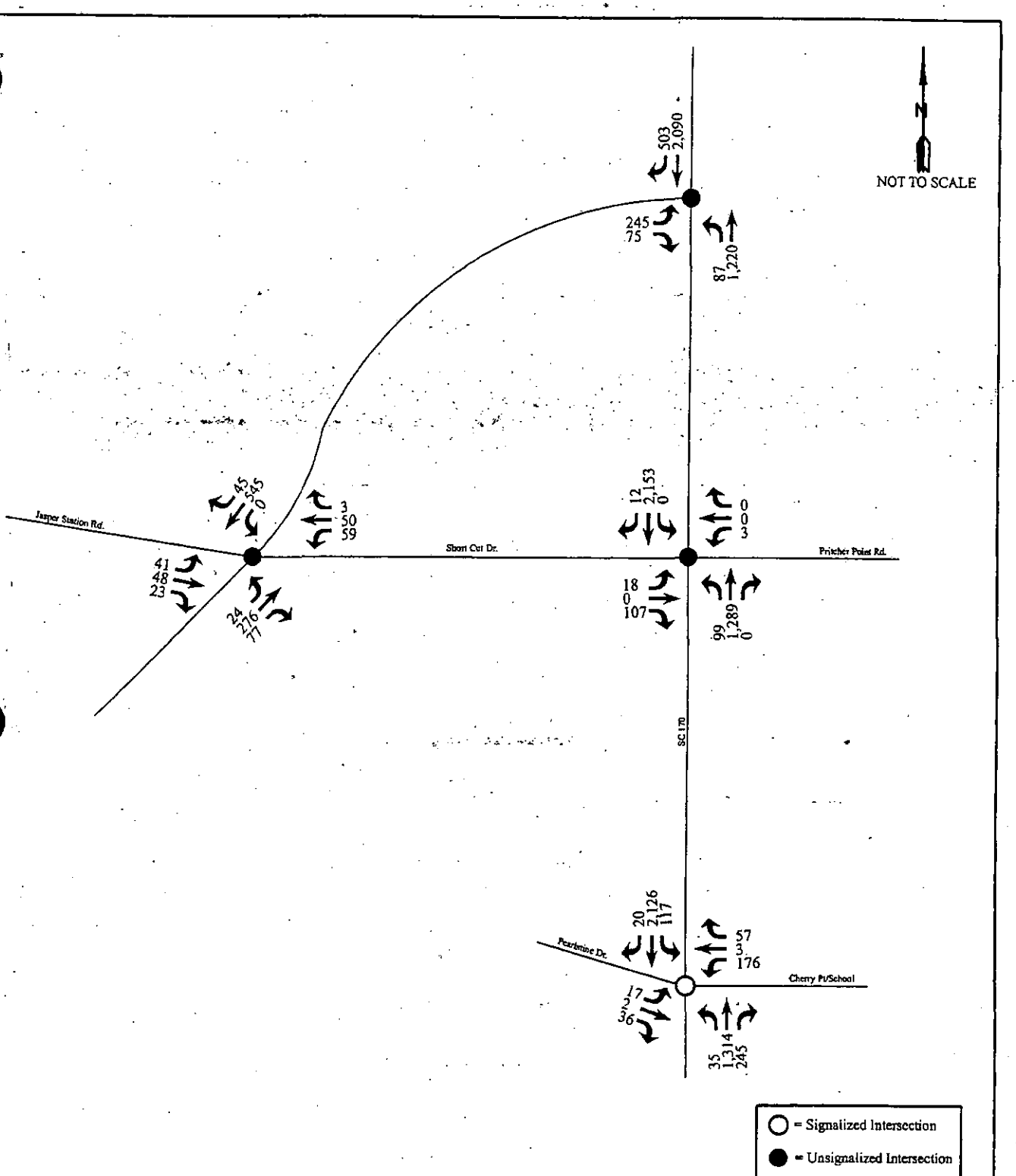


Figure 4

2015 NO-BUILD TRAFFIC VOLUMES AM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

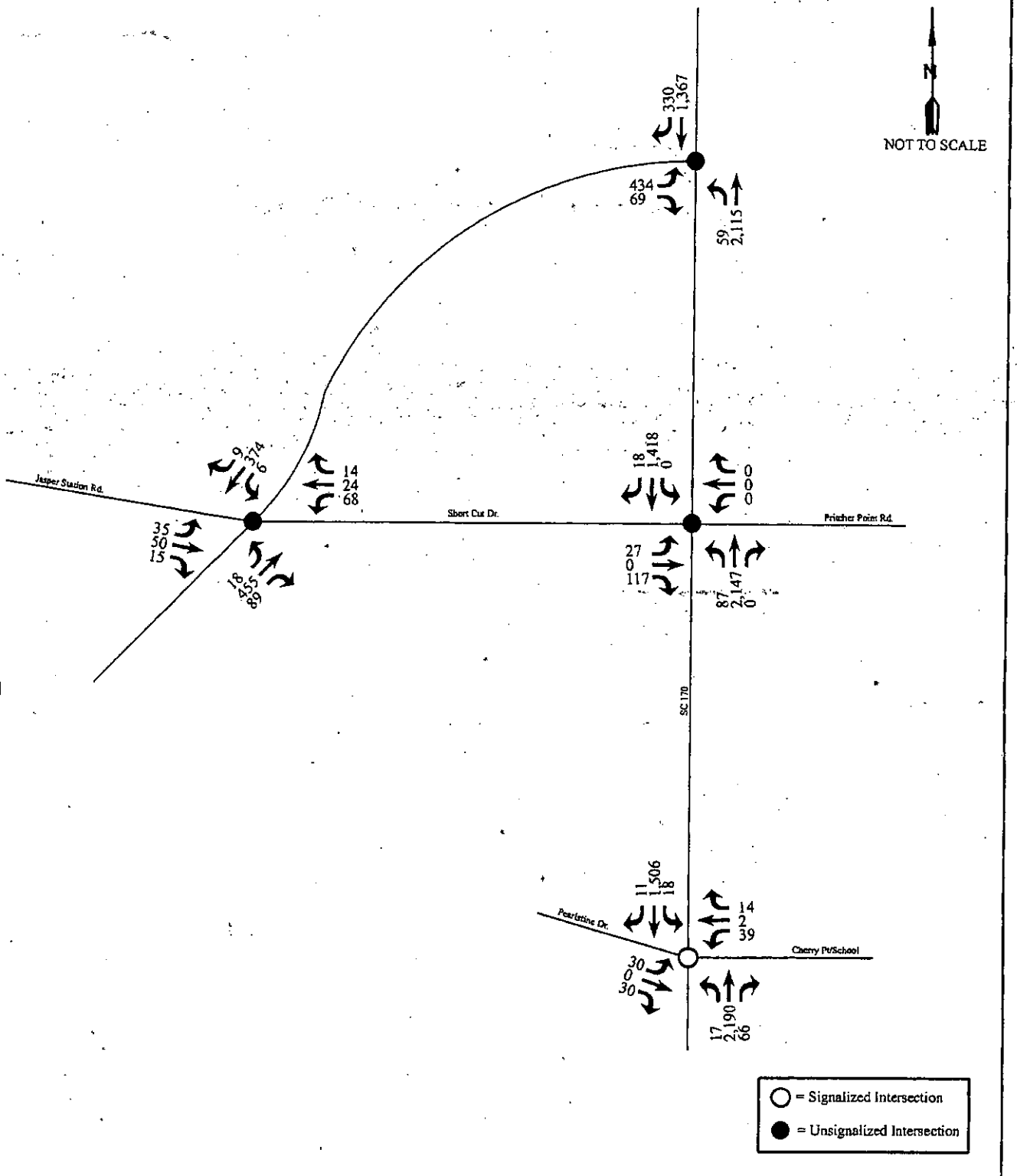


Figure 5

2015 NO-BUILD TRAFFIC VOLUMES
PM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

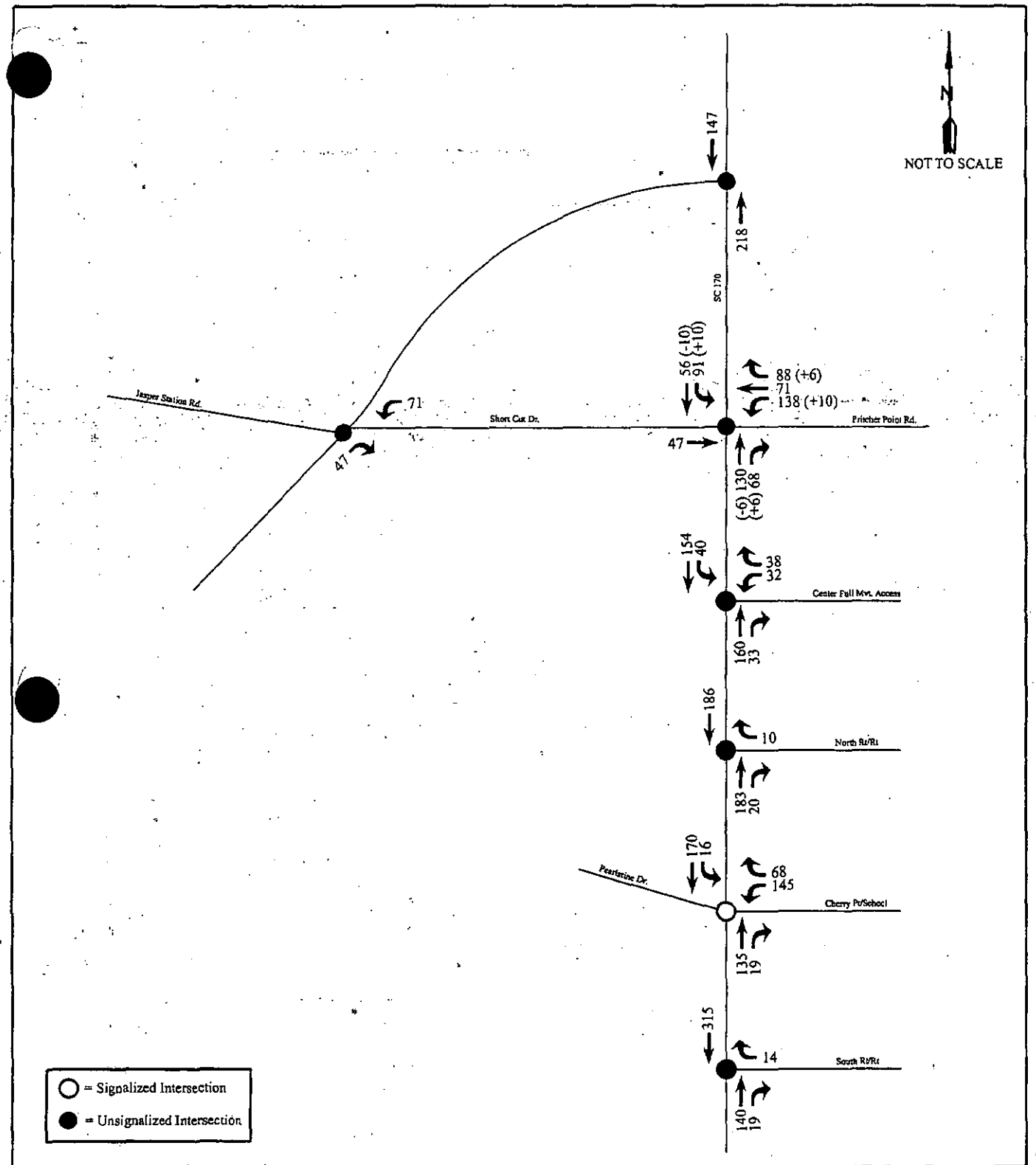


Figure 6

SITE-GENERATED TRAFFIC VOLUMES
AM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

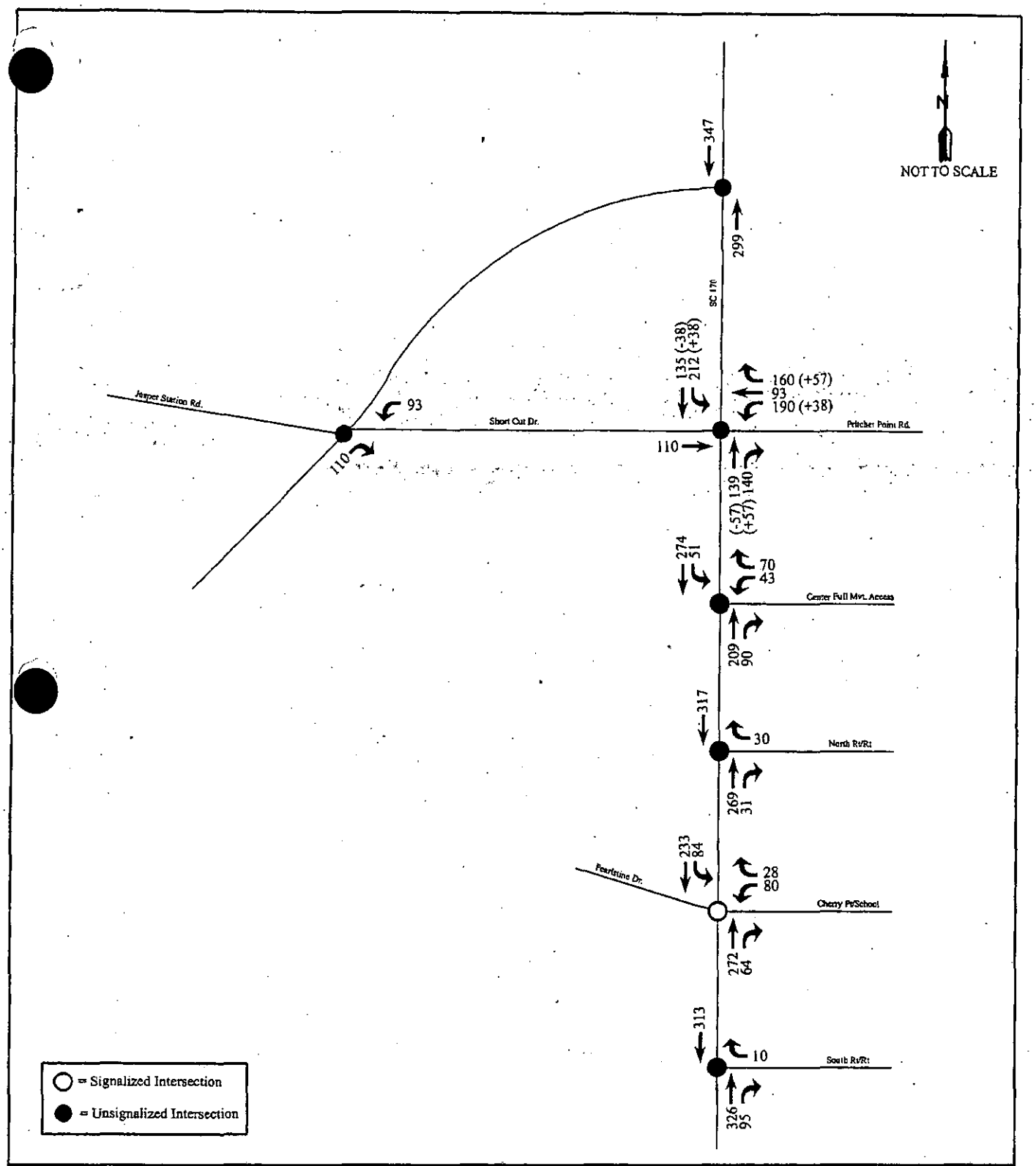


Figure 7

SITE-GENERATED TRAFFIC VOLUMES
PM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

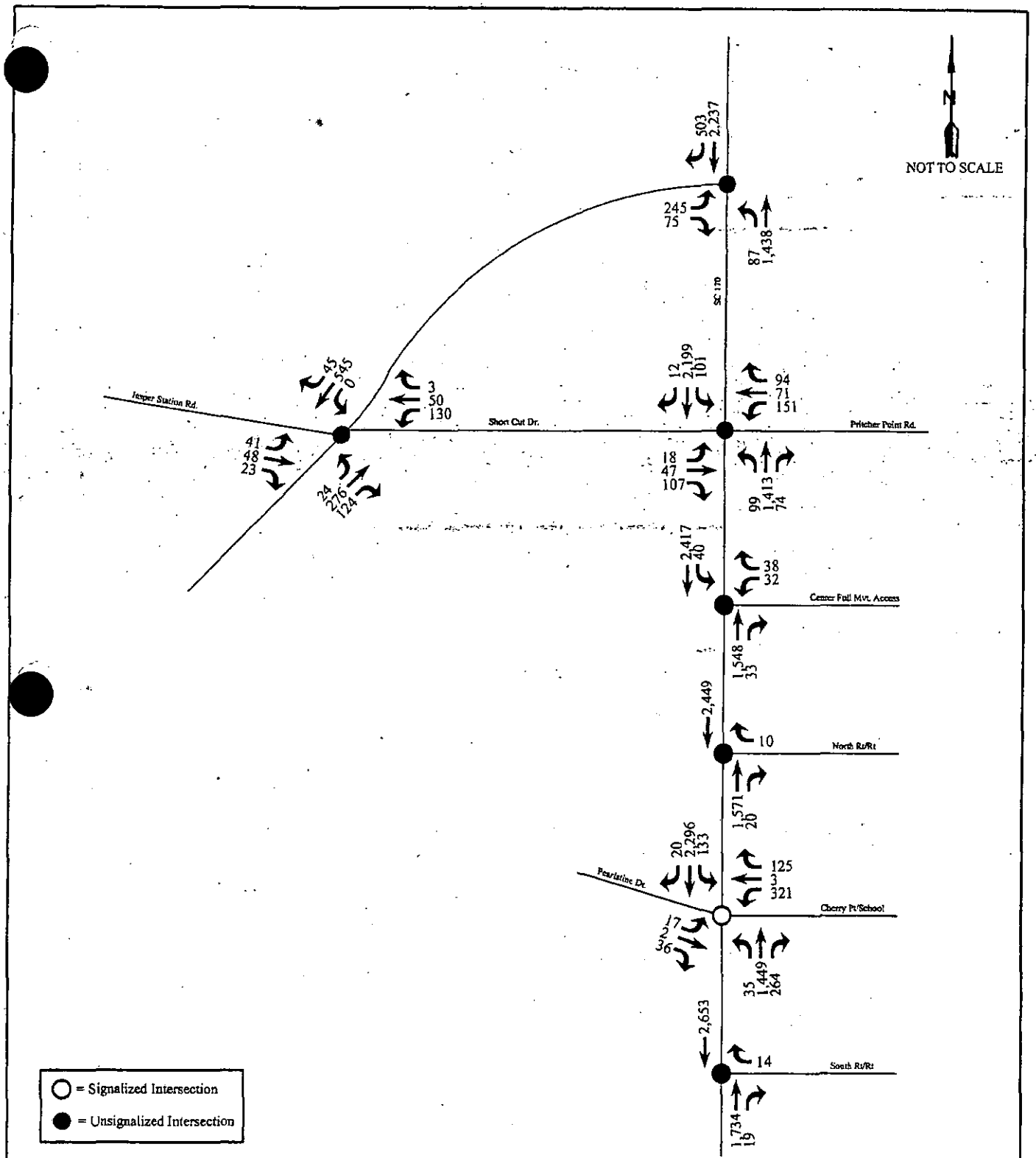


Figure 8

2015 BUILD TRAFFIC VOLUMES AM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING
Traffic, Transportation, & Parking Consultants

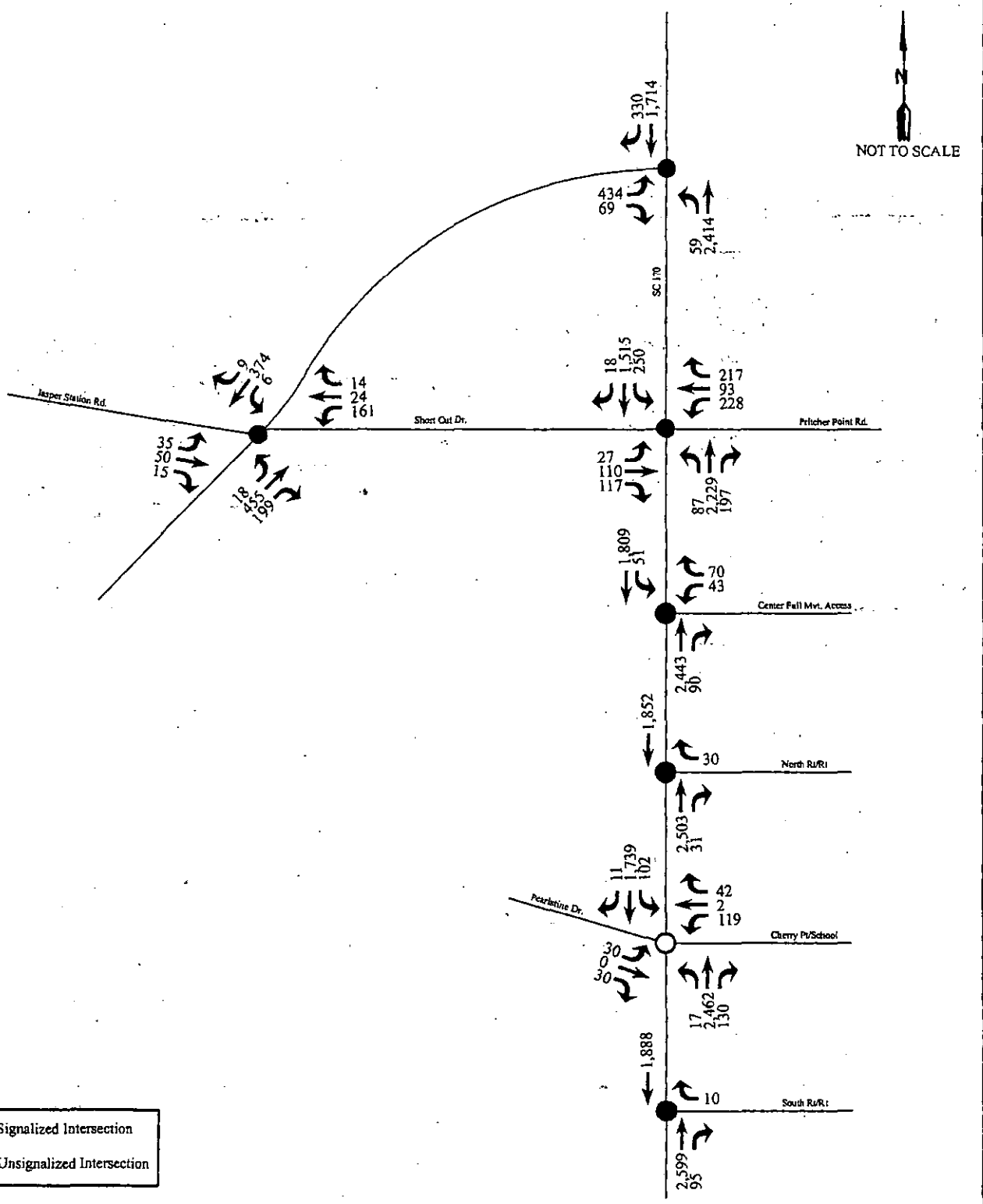


Figure 9

2015 BUILD TRAFFIC VOLUMES PM PEAK-HOUR

Okatie PUD: South Carolina

SRS ENGINEERING

Traffic, Transportation, & Parking Consultants

APPENDIX

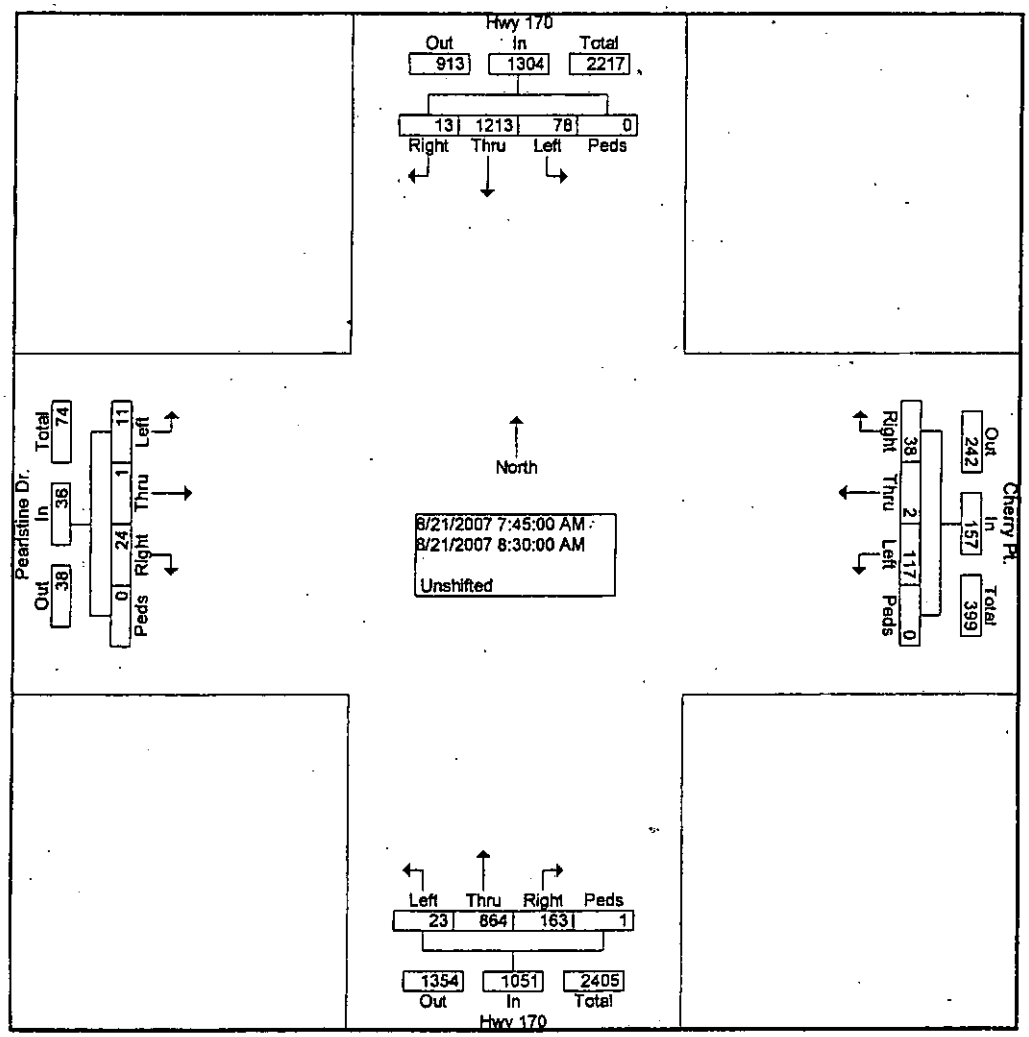
- Count Data
- SC 170 Access Plan
- Capacity Analysis

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
Page No : 2

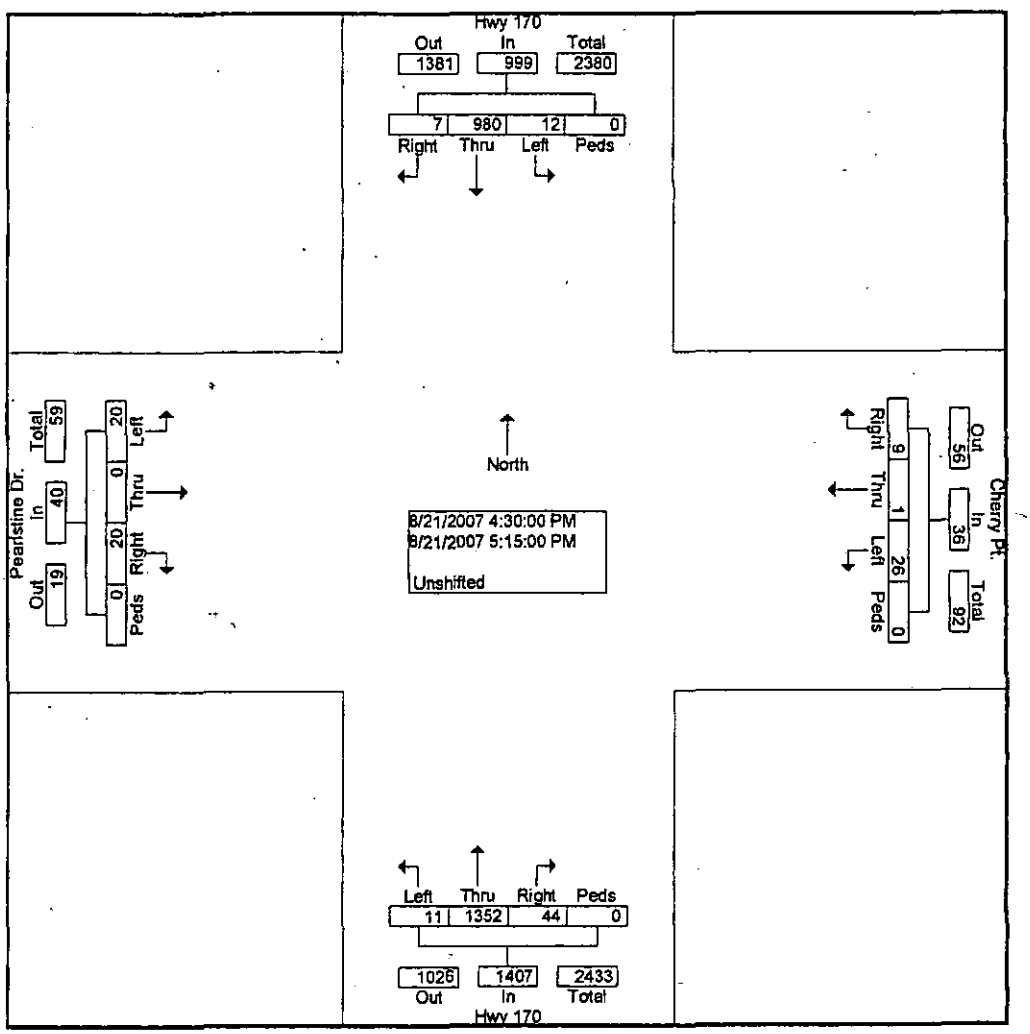
	Hwy 170 Southbound					Cherry Pt. Westbound					Hwy 170 Northbound					Pearlstine Dr. Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																					
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	



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

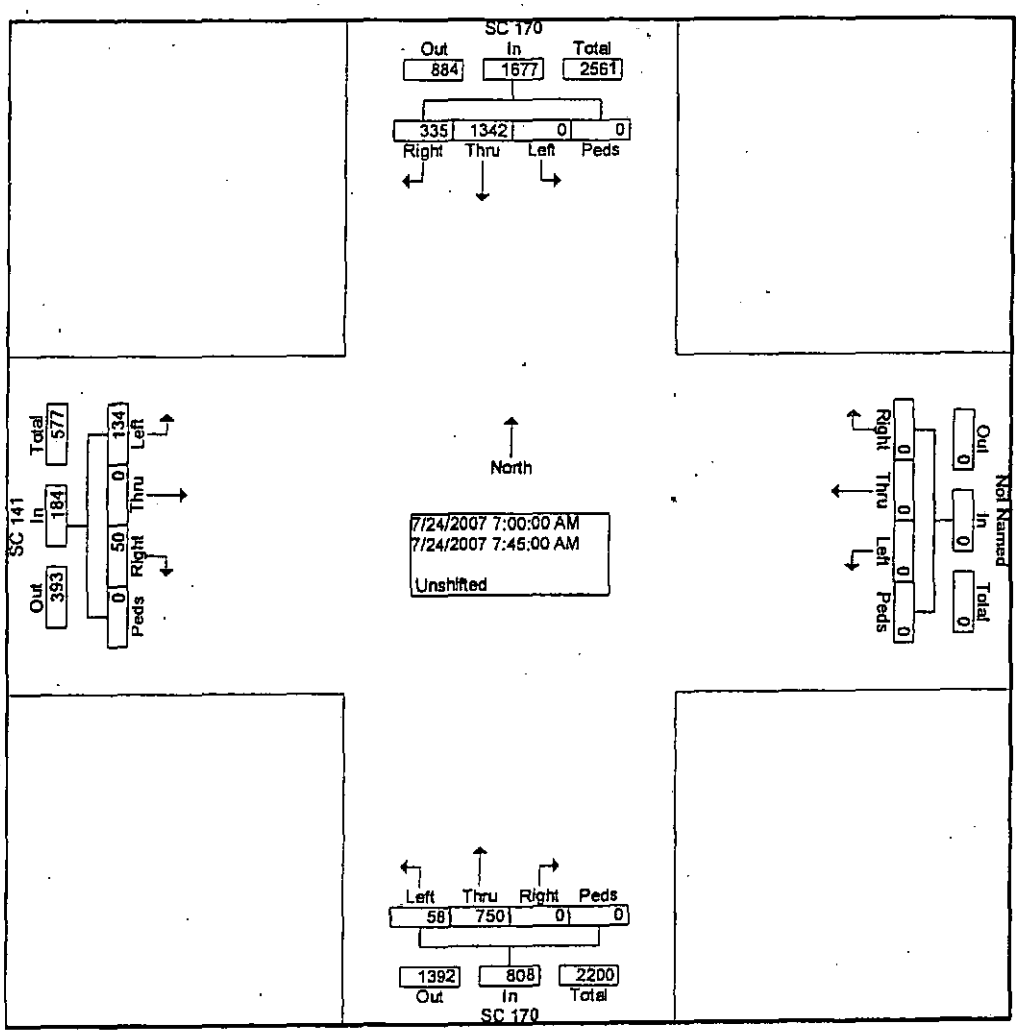
	Hwy 170 Southbound					Cherry Pt. Westbound					Hwy 170 Northbound					Pearlstine Dr. Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
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

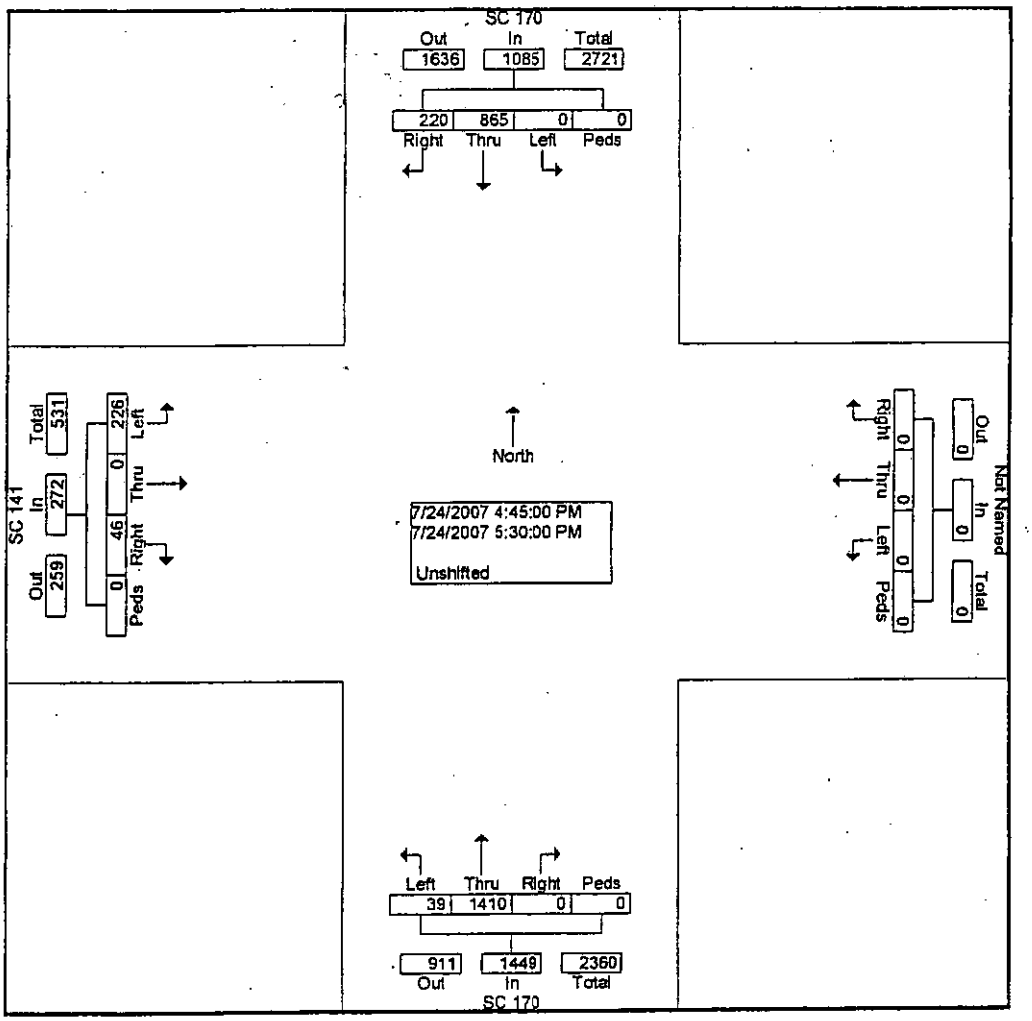
	SC 170 Southbound					Westbound					SC 170 Northbound					SC 141 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 07:00 AM to 12:30 PM - Peak 1 of 1																					
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

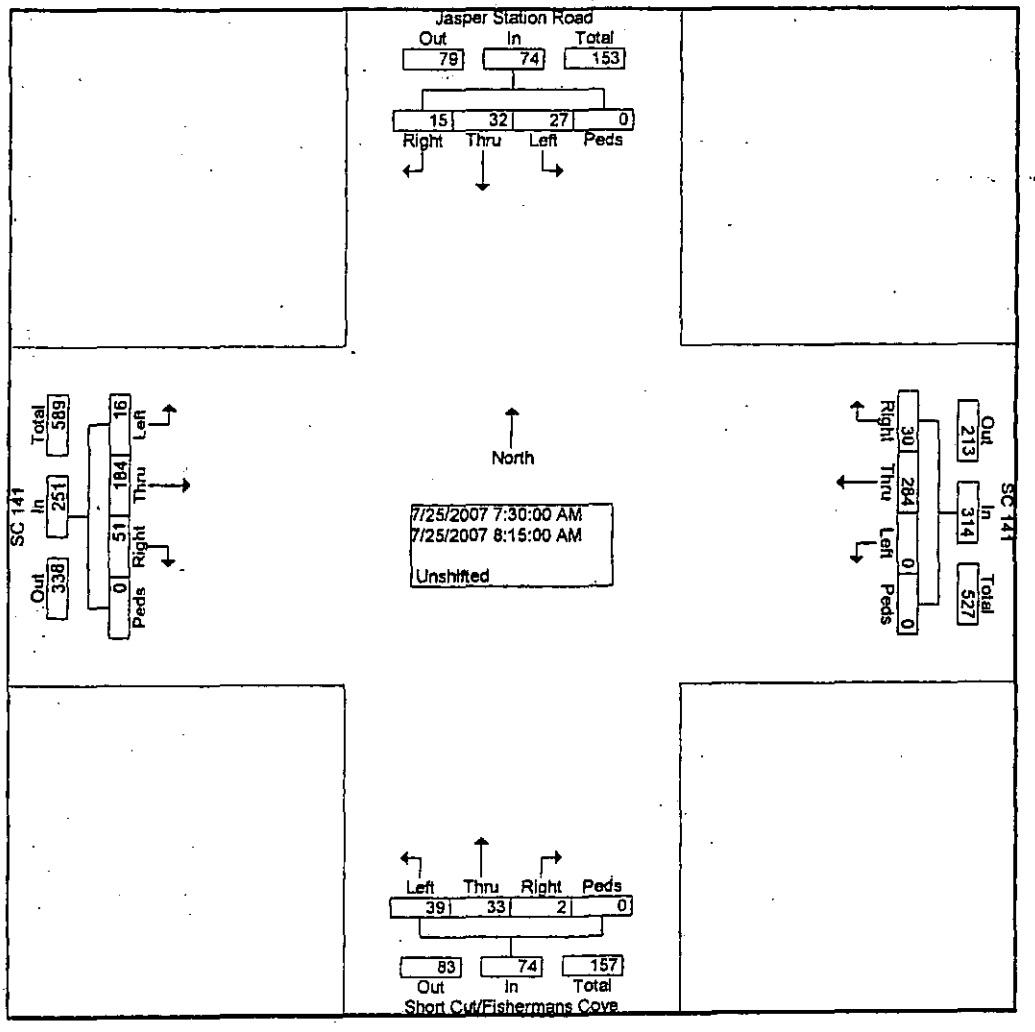
	SC 170 Southbound					Westbound					SC 170 Northbound					SC 141 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 12:45 PM to 05:45 PM - Peak 1 of 1																					
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
803-252-1788

File 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 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	

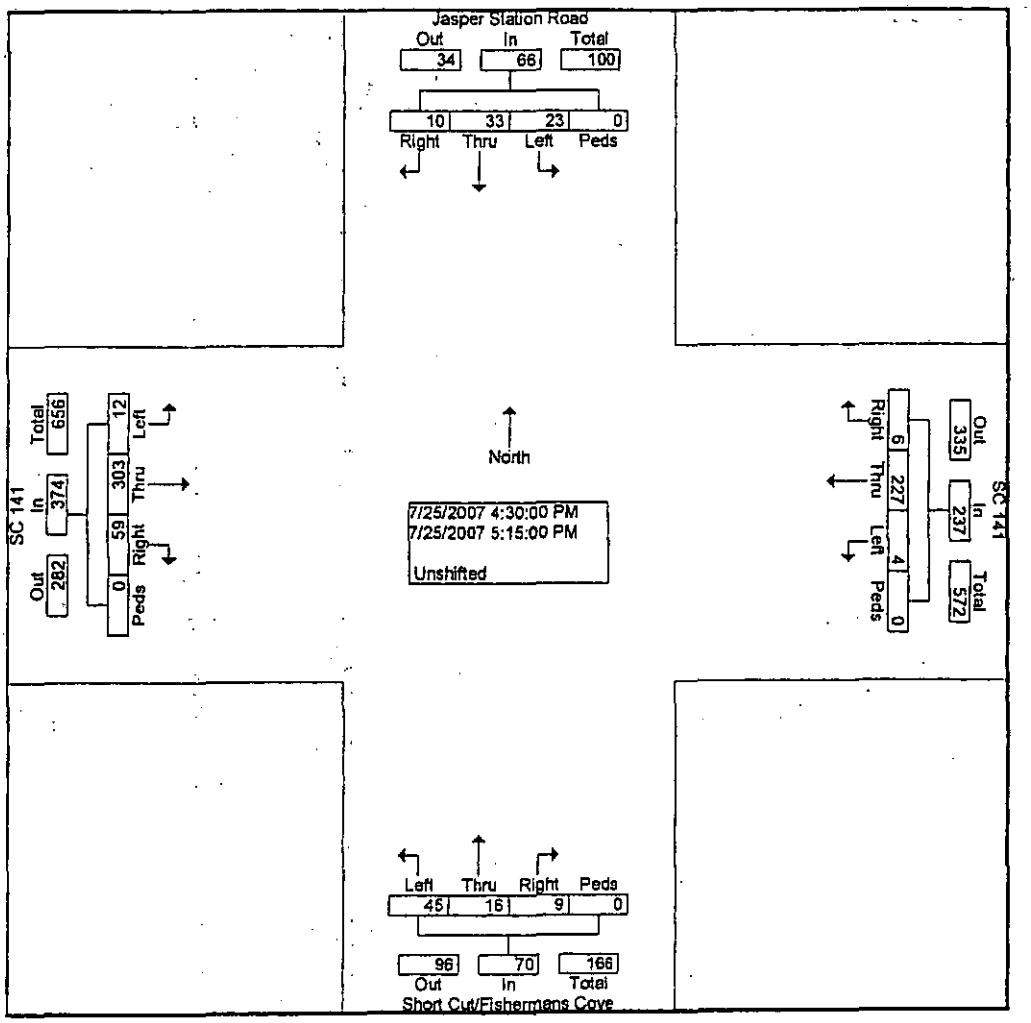


183

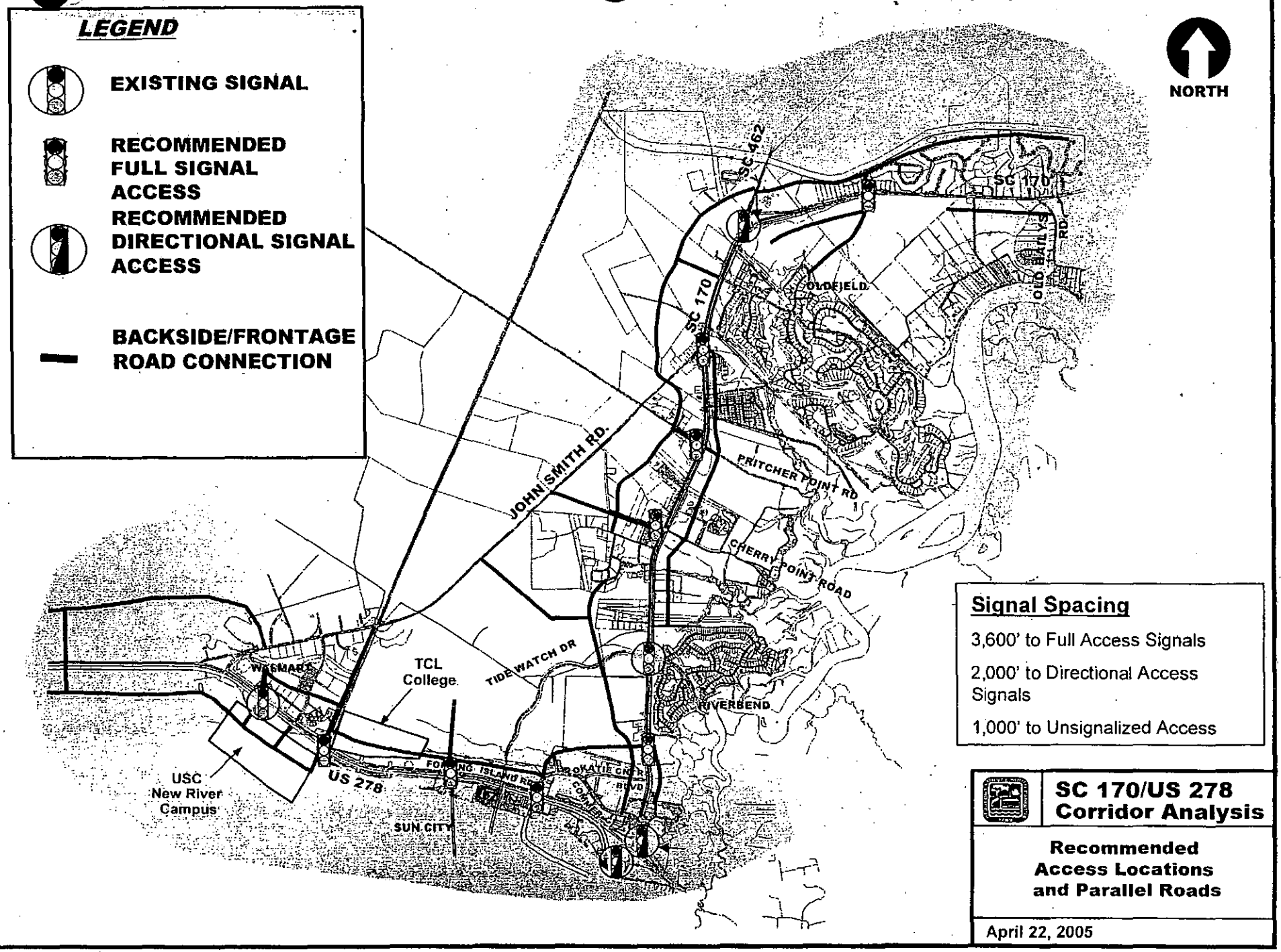
SRS Engineering, LLC
801 Mohawk Drive
West Columbia, SC 29169
803-252-1799

File Name : SC 141 at Fishermans Cove(short cut)
Site Code : 00000000
Start Date : 7/25/2007

Start Time	Jasper Station Road Southbound					SC 141 Westbound					Short Cut/Fishermans Cove Northbound					SC 141 Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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
OLDEFIELD
OLD BAILEY RD
JOHN SMITH RD.
PRITCHER POINT RD
CHERRY POINT ROAD
TIDEWATCH DR
RIVERBEND
TCL College
WALMART
US 278
FORDING ISLAND RD
SUN CITY
USC New River Campus
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		

C01

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		

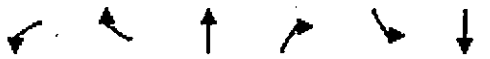
Direction, Lane #	EB 1	WB 1	NE 1	SW 1	SW 2
Volume Total	109	216	730	413	10
Volume Left	38	175	20	7	0
Volume Right	16	15	216	0	10
cSH	200	154	1143	889	1700
Volume to Capacity	0.54	1.40	0.02	0.01	0.01
Queue Length (ft)	71	342	1	1	0
Control Delay (s)	42.4	270.2	0.5	0.2	0.0
Lane LOS	E	F	A	A	
Approach Delay (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

OSS

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.

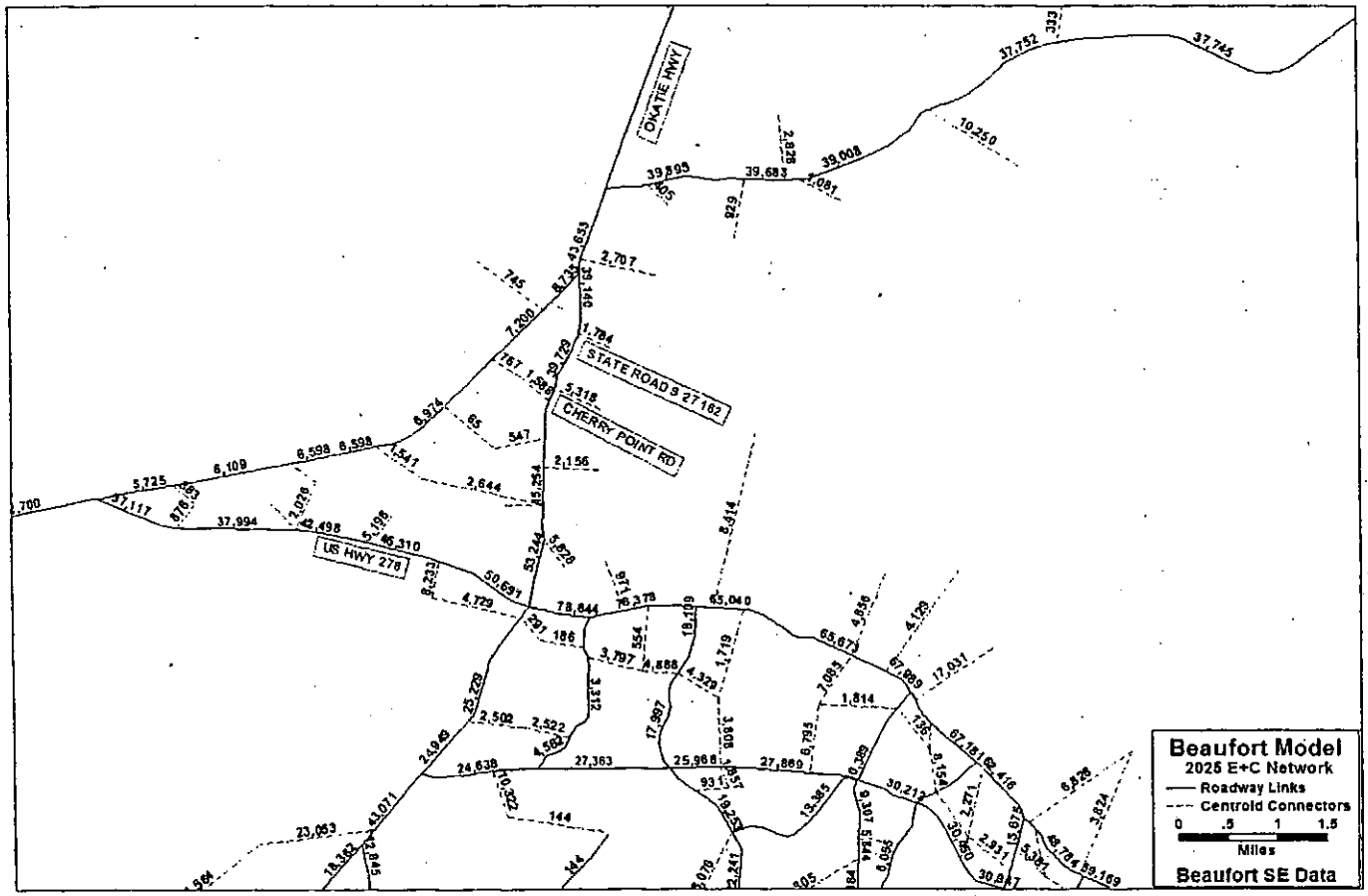
As indicated by Table 2, under the future 2025 conditions, SC 170 is anticipated to operate either at a LOS E or F under both the current County SE data scenario and the proposed Okatie SE data scenario. SC 141 is anticipated to operate at acceptable service levels for either condition.

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.

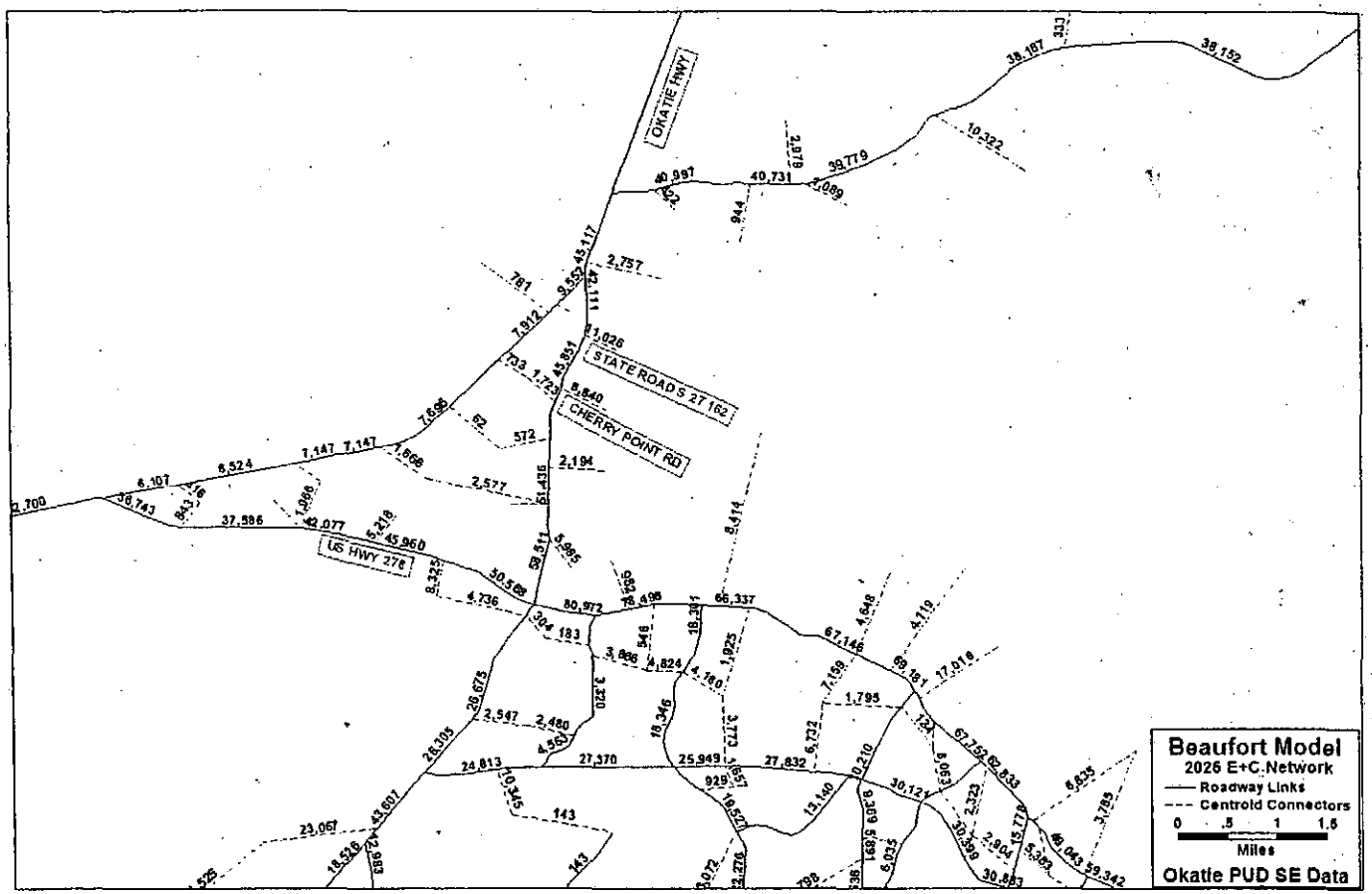
Roadway and intersection improvements were recommended in the original traffic study which outlined a mitigation scheme necessary to accommodate the development under the 2015 build condition. These suggested improvements included the addition of separate turning lanes as well as improved traffic control 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	29,300	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:
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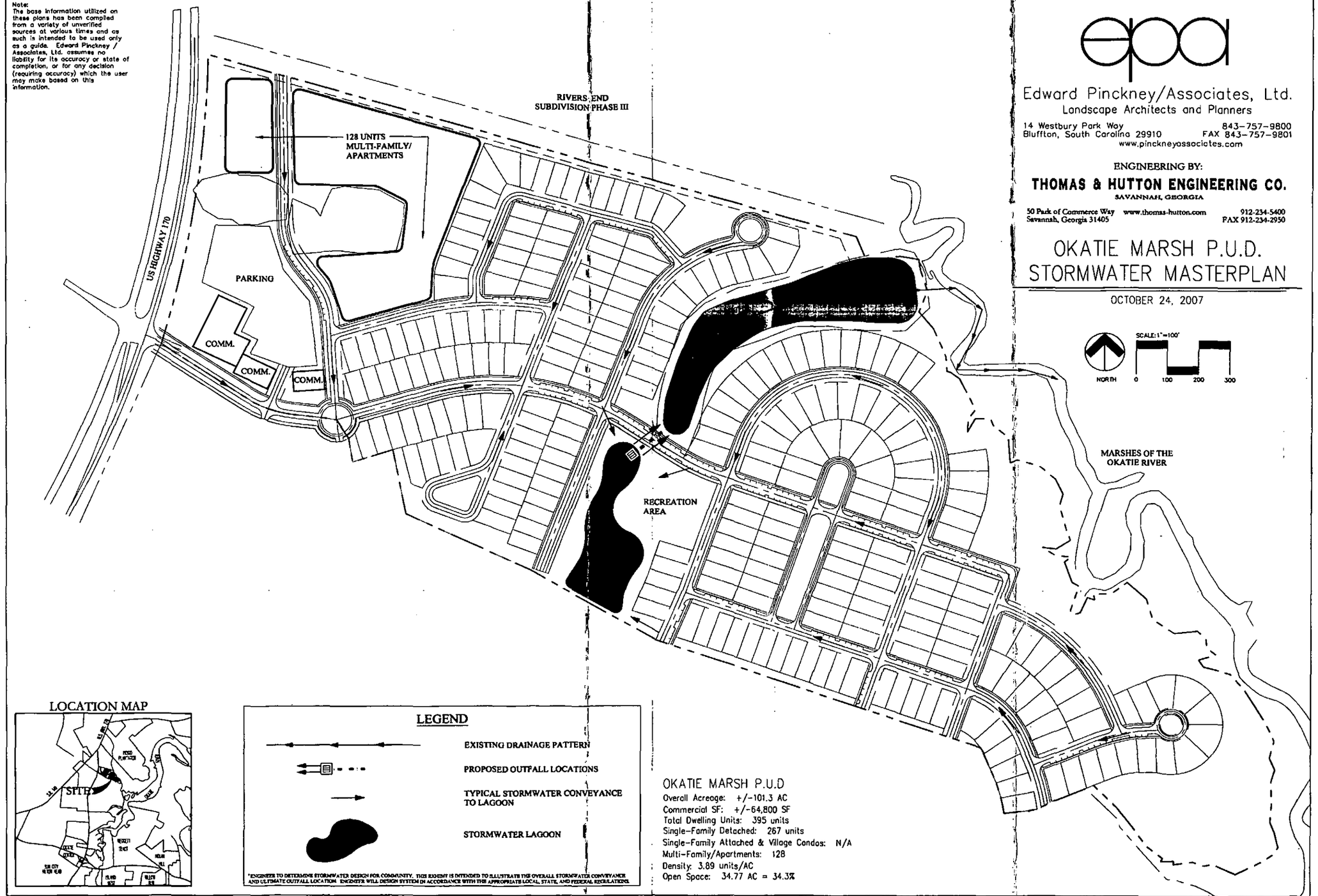

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OKATIE MARSH P.U.D.
STORMWATER MASTERPLAN

OCTOBER 24, 2007

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

LOCATION MAP

LEGEND

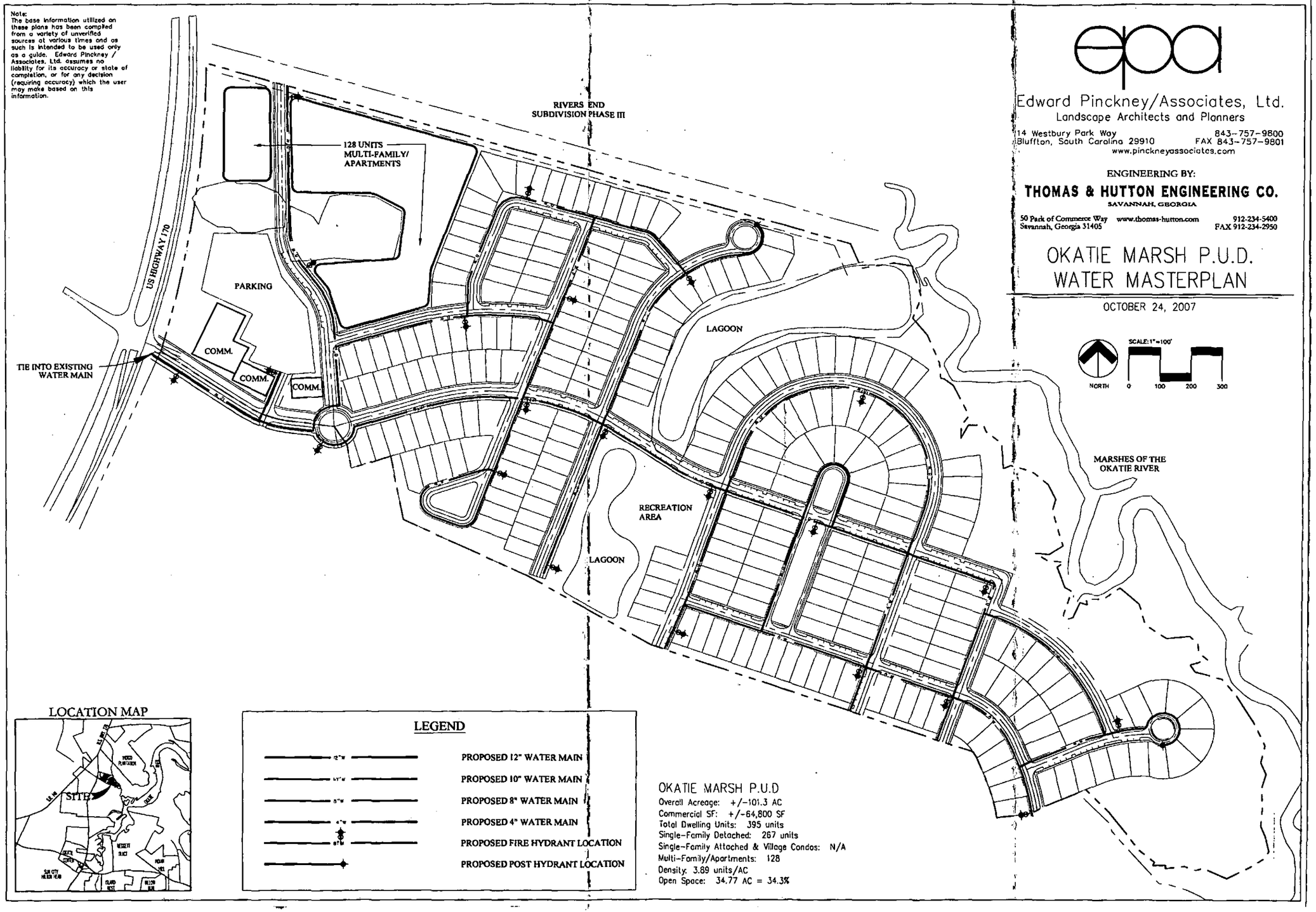
- EXISTING DRAINAGE PATTERN
- PROPOSED OUTFALL LOCATIONS
- TYPICAL STORMWATER CONVEYANCE TO LAGOON
- STORMWATER LAGOON

*ENGINEER TO DETERMINE STORMWATER DESIGN FOR COMMUNITY. THIS ELEMENT 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:
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.



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OKATIE MARSH P.U.D.
WATER MASTERPLAN

OCTOBER 24, 2007

SCALE: 1" = 100'
NORTH 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
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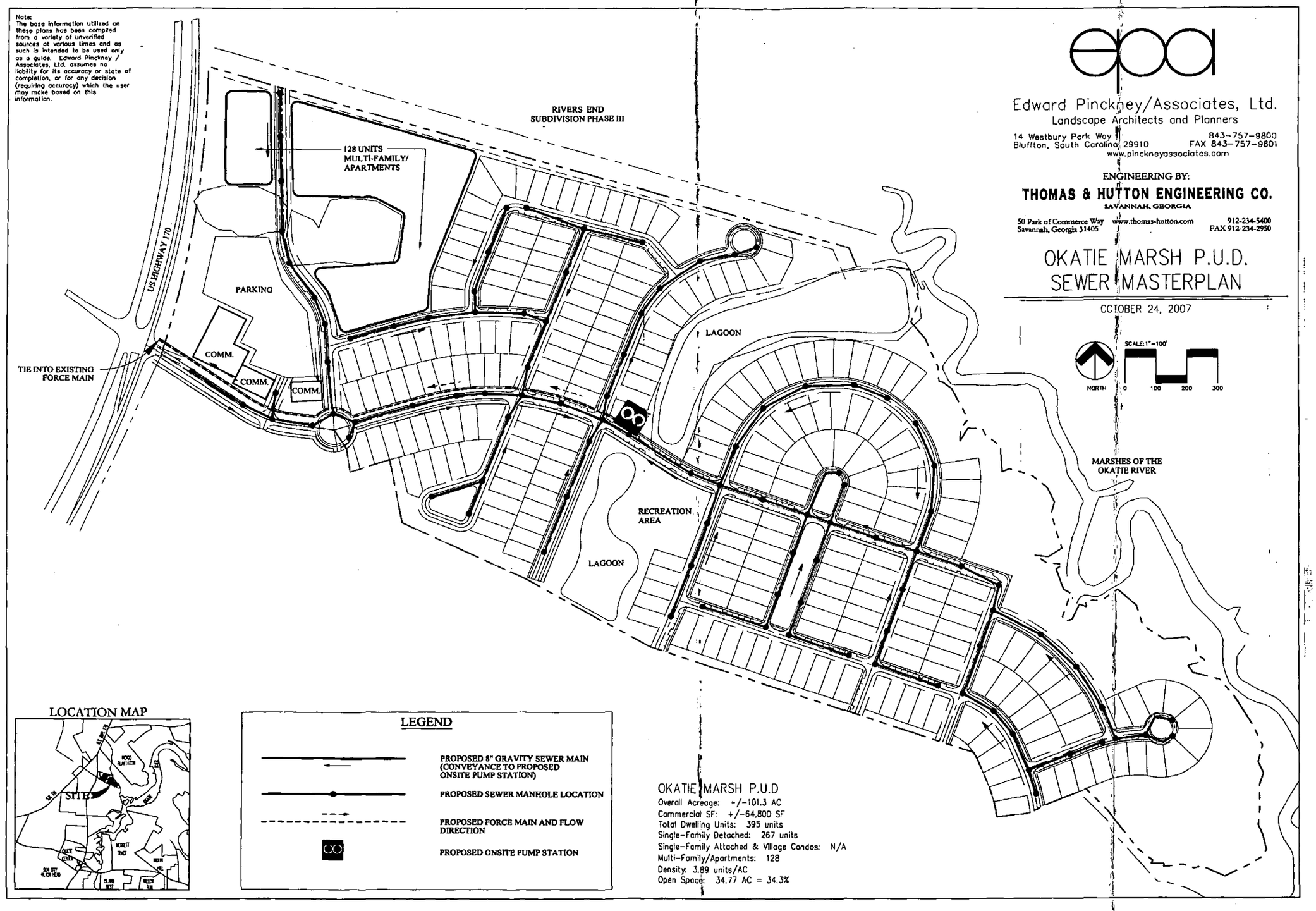

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OKATIE MARSH P.U.D.
SEWER MASTERPLAN

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
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BJWSA
BEAUFORT - JASPER WATER & SEWER AUTHORITY

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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 Carman
Frank Mills