

# Forest Ridge

Prepared for the Town of Hillsborough, North Carolina  
Original Submission December 19, 2008  
Revised January 7, 2009  
Revised March 27, 2009

Owner:  
Burroughs Land Investors, LLC

Prepared By:  
Withers & Ravenel, Inc.

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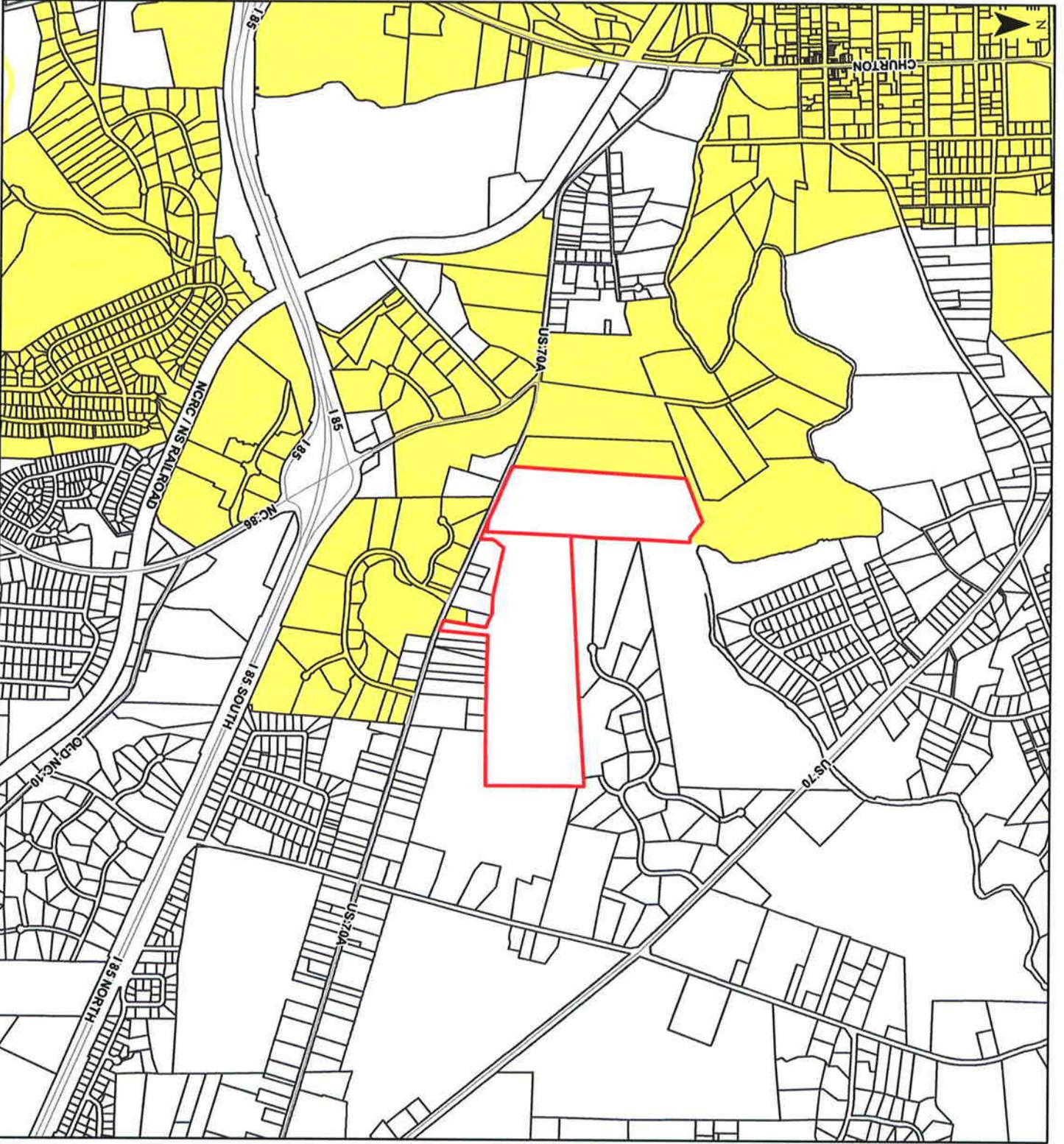


### Property Description for Annexation Purposes

Being certain parcels of land situated in Hillsborough and Eno Townships, Orange County, North Carolina and being more particularly described as follows;

Beginning at a *point on the northern right of way of Business HWY 70, said point being the southwestern corner of Lot 12 as recorded in PB 1 PG 34*; thence **S 66°07'33" E** a distance of **856.03** feet to a *point*; thence **N 02°21'25" E** a distance of **39.10** feet to a *point*; thence **S 89°08'35" E** a distance of **90.00** feet to a *point*; thence **N 00°31'27" E** a distance of **57.70** feet to a *point*; thence **N 30°05'30" E** a distance of **59.12** feet to a *point*; thence **N 37°35'41" E** a distance of **121.84** feet to a *point*; thence **S 77°23'35" E** a distance of **586.36** feet to a *point*; thence **S 86°45'50" E** a distance of **228.83** feet to a *point*; thence **S 65°11'14" E** a distance of **176.23** feet to a *point*; thence **S 08°53'09" W** a distance of **83.63** feet to a *point*; thence **S 47°58'36" E** a distance of **3.35** feet to a *point*; thence **S 42°00'20" W** a distance of **5.13** feet to a *point*; thence **S 08°53'09" W** a distance of **146.10** feet to a *point*; thence **S 09°02'38" W** a distance of **274.53** feet to a *point*; thence **S 67°56'11" E** a distance of **134.63** feet to a *point*; thence **N 05°14'59" E** a distance of **554.46** feet to a *point*; thence **N 89°46'53" E** a distance of **775.57** feet to a *point*; thence **N 89°20'37" E** a distance of **391.79** feet to a *point*; thence **S 89°46'29" E** a distance of **659.40** feet to a *point*; thence **N 00°02'35" E** a distance of **1122.90** feet to a *point*; thence **N 00°25'55" E** a distance of **78.94** feet to a *point*; thence **S 86°41'25" W** a distance of **102.25** feet to a *point*; thence **S 86°37'04" W** a distance of **976.22** feet to a *point*; thence **S 86°35'22" W** a distance of **1957.63** feet to a *point*; thence **N 03°25'38" E** a distance of **309.92** feet to a *point*; thence **N 03°24'41" E** a distance of **543.54** feet to a *point*; thence **N 84°31'59" W** a distance of **20.04** feet to a *point*; thence **N 03°48'41" E** a distance of **569.52** feet to a *point*; thence **N 87°19'43" W** a distance of **62.00** feet to a *point*; thence **N 54°09'43" W** a distance of **235.61** feet to a *point*; thence **S 69°13'01" W** a distance of **553.23** feet to a *point*; thence **S 03°37'51" W** a distance of **2076.76** feet to the *point of beginning*, and containing **5,173,473** square feet or **118.77** acres, more or less.

**FOREST RIDGE -  
HILLSBOROUGH  
ANNEXATION AREA**  
ORANGE COUNTY, NORTH CAROLINA



- Legend**
- Site
  - Existing City Limits

0 800 1,600  
 Feet  
 1 inch = 1,600 feet

**WITHERS & RAVENEL**  
 ENGINEERS | PLANNERS | SURVEYORS  
 111 MacKenzie Drive Cary, North Carolina  
 Telephone: 919.469.3340  
 www.wITHERSRAVENEL.com



**REZONING REQUEST  
HILLSBOROUGH, NC**

Project title: Forest Ridge Tax Map: 4.37.C.21 and 4.40.B.1

Owner: Burroughs Land Investors, LLC

Address: 1000 Darrington Dr. Suite 105 Cary, NC 27511 Phone: (919)462-0775

Applicant: Withers & Ravenel, Attn: Charles Smith, ASLA

Address: 111 MacKenan Drive Cary, NC 27511 Phone: (919) 469-3340

Engineer: Withers & Ravenel

Address: 111 MacKenan Drive Cary, NC 27511 Phone: (919) 469-3340

Location/Streets accessed: North of US 70 Business (US 70A)

Current Zoning: Rural Residential (R-1) Orange County & Agricultural-Residential (AR)

Proposed Zoning: Entranceway Special Use (ESU) District

Acreage to be rezoned: 118.77

Dimensions: See Attached Boundary Survey

Water/Sewer/Septic providers: Town of Hillsborough

Structures:

Existing:

Proposed: Maximum of 233 dwelling units and a maximum of 28,000 square feet of floor area in the Mixed Use building.

Critical Areas: Flood √ Drainage/stream √ Pond N/A

Steep Slopes √ Cemetery N/A Easements √

Historic N/A Other Existing Water Storage Tank

**Reasons for requesting the change (See Section 20.3.2):**

See Project Overview

I certify that I am the property owner or truly represent the property owner and that the information provided above is correct.

03.25.09

*B. K. [Signature]*

Property owner/representative

---

**Requirements for Public Hearing**

Survey showing:

- 100'=1" to 20'=1" scale
- Existing structures
- Critical Areas (above)
- Rights-of-way and width
- Driveways (existing and new)
- Deed Copy
- Fee

\* See Special Use Permit Site Plan

\*\* The deed copies and fee were submitted with the original application on December 19, 2008.

FILED Joyce H. Pearson  
Register of Deeds, Orange Co, NC  
Recording Fee: \$23.00  
NC Real Estate TX: \$3750.00 *20*

20080821000207600 DEED  
BK:RB4592 Pg: 204  
08/21/2008 10:43:39 AM 1/4



*MM*

*3*  
*MM*

Rev. \$ 3,750.00 (For Recording Data)

Parcel Identifier/Tax Account/PIN No.: 9874-53-8717 4.37.C.21 and 9874-72-~~7769~~ 4.40.B.1  
*7826*

Brief Description for the Index: Tracts 10, 12 and 13 of the Occoneechee Farm and Tract 13  
of the C.P. Whitfield Farm  
*This per TH*

Prepared by:

RAGSDALE LIGGETT, PLLC  
2840 Plaza Place, Suite 400  
Raleigh, North Carolina 27612  
Attention: William A. Mann, Esq.

Return to after recording: Barringer Law Firm, LLP,  
111 Commonwealth Court, Ste. 101, Cary, NC 27511

**NORTH CAROLINA SPECIAL WARRANTY DEED**

This Special Warranty Deed (the "Deed") is made as of the 20 day of August, 2008, by and between **POU FAMILY INVESTORS, LLC**, a North Carolina limited liability company ("Grantor"); and **BURROUGHS LAND INVESTORS, LLC**, ("Grantee"), a North Carolina limited liability company with a mailing address of 1000 Darrington Drive, Suite 105, Cary, North Carolina 27513.

For valuable consideration paid by Grantee to Grantor, the receipt and sufficiency of which are hereby acknowledged, Grantor has and by these presents does hereby grant, bargain, sell and convey unto Grantee in fee simple all of that certain lot or parcel of land located in the Township of Hillsborough, Orange County, North Carolina (the "Premises") and more particularly described as:



**SEE EXHIBIT A ATTACHED HERETO**

**TO HAVE AND TO HOLD** the Premises and all privileges and appurtenances thereto belonging to Grantee in fee simple absolute.

GRANTOR hereby covenants with Grantee that Grantor has done nothing to impair such title as Grantor received, and Grantor will warrant and defend the title against the lawful claims of all persons claiming by, under or through Grantor.

The designation of Grantor and Grantee as used in this Deed includes the parties expressly named herein, their heirs, successors, and assigns and shall include the singular, plural, masculine, feminine or neuter as required by context.

**IN WITNESS WHEREOF**, Grantor acting through its manager has executed this instrument under seal by authority duly given all as of the day and year first written above.

(separate signature and acknowledgement page attached hereto)



Signature Page to Special Warranty Deed

**POU FAMILY INVESTORS, LLC**, a North Carolina limited liability company (SEAL)

By: Virginia Douglas Finley  
Name: Virginia Douglas Finley  
Title: Manager

STATE OF NORTH CAROLINA

COUNTY OF Wake

I, a Notary Public of the County and State aforesaid, certify that Virginia Douglas Finley the manager of **POU FAMILY INVESTORS, LLC**, a North Carolina limited liability company, personally appeared before me this day and either (i) being personally known to me; or (ii) having provided satisfactory evidence in the form of a: (circle one)

- (a) state issued driver's license;
- (b) state issued identification card; or
- (c) United States Passport

acknowledged to me that he voluntarily signed the foregoing instrument for the purpose stated therein as manager of the limited liability company, under authority duly given, on this the 20<sup>th</sup> day of August, 2008.

(SEAL)



Lorie Strickland  
Printed Name: Lorie Strickland  
Notary Public

My commission expires: 11-12-2012



**EXHIBIT A**  
**Legal Description**

TRACT ONE:

Being Tracts Number 12 and 13 according to map of Occoneechee Farm Lot number 5 made by S.M. Credle, C.E. in November 1925, and recorded in the Registry of Orange County in Plat Book Number 1, at Page 34, reference to said map being hereby made for a more perfect and detailed description; and being the same land conveyed to Annie W. Pou by deed dated 16 December 1925, and recorded in the Registry of Orange County, North Carolina in Book 86 at Page 67.

TRACT TWO:

Being Tract Number 10 of Occoneechee Farm containing 78.7 acres, more or less, as shown by a plat of survey of Occoneechee Farm made by S.M. Credle, Engineer, dated November 12, 1923, which is recorded in the Registry of Orange County in Plat Book Number 1, at Page 6, reference to said plat being hereby made for a more perfect and detailed description; and being the same land conveyed to James H. Pou by deed dated 24 November 1925, recorded in Book 85 at Page 425 in the Registry of the Orange County, North Carolina.

**LESS AND EXCEPT** all that certain property conveyed out by deeds recorded in Book 4521, Page 331, and Book 4589, Page 571, Orange County Registry and Book 91, Page 559, Orange County Registry.

TRACT THREE:

Being Tract Number 13 of the C.P. Whitfield Farm as per plat and survey of R.M. Pickard, Surveyor, dated February, 1925, which is recorded in Plat Book 1, at Page 29, reference to said plat being hereby made for a more perfect and detailed description; and being the same land conveyed to James H. Pou by deed dated 24 November 1925, recorded in Book 85 at Page 424 in the Registry of Orange County, North Carolina.

**The property and premises herein described are subject to the rights, interests, terms and conditions set forth in that certain Consent Judgment for the benefit of the Town of Hillsborough recorded in Book 239, Page 1409, Orange County Registry.**

*Tracts Two and Three are to remain as one tax parcel.*

MM

16  
ML

2008091800227180 DEED  
Bk:RB4604 Pg:212  
09/18/2008 09:15:55 AM 1/1



FILED Joyce H. Pearson  
Register of Deeds, Orange Co, NC  
Recording Fee: \$14.00  
NC Real Estate TX: \$.00

LB

A= 9874.72-0389  
map: 9874.72-7827  
mab

Prepared by/Return to: John D. Loftin, PO Box 733, Hillsborough, NC 27278  
NORTH CAROLINA, ORANGE COUNTY

GENERAL WARRANTY DEED

THIS DEED, MADE AND ENTERED INTO THIS THE \_\_\_\_ DAY OF \_\_\_\_\_, 2008, BY AND BETWEEN  
Return to:  
Carl Edward Sain and wife, Leona Gail Robinson Sain 1016 US 70A Hillsborough NC 27278

PARTY OF THE FIRST PART AND  
~~Carl Edward Sain~~  
Burroughs Land Investors, LLC  
.1000 Darrington Dr. Ste 105  
Cary NC 27513

Excise Tax \$ 0.00

PARTY OF THE SECOND PART, WITNESSETH:

THAT THE SAID PARTY OF THE FIRST PART, IN CONSIDERATION OF THE SUM OF TEN DOLLARS AND OTHER GOOD, VALUABLE AND SUFFICIENT CONSIDERATIONS, PAID BY THE SAID PARTY OF THE SECOND PART, THE RECEIPT OF WHICH IS HEREBY ACKNOWLEDGED, HAS BARGAINED AND SOLD AND BY THESE PRESENTS DOES BARGAIN, SELL AND CONVEY UNTO THE SAID PARTY OF THE SECOND PART AND HIS HEIRS AND ASSIGNS ALL THAT CERTAIN TRACT OR PARCEL OF LAND IN Hillsborough TOWNSHIP, Orange COUNTY AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Containing 1,093 square feet and being designated as Area "A" according to plat of survey entitled "Boundary Resolution and Recombination Plat for: Carl E. Sain and Leona Gail Robinson Sain", prepared by S. D. Puckett & Associates, Professional Land Surveyors, dated August 12, 2008 recorded in the Orange County Registry in Plat Book 104, Page 86.  
Area "A" is to be merged with the existing lot owned by Grantee according to said plat of survey.

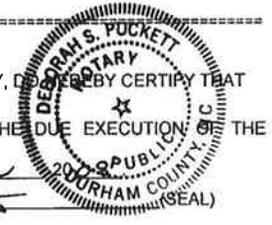
TO HAVE AND TO HOLD THE AFORESAID TRACT OR PARCEL OF LAND AND ALL PRIVILEGES AND APPURTENANCES THEREUNTO BELONGING TO THE SAID PARTY OF THE SECOND PART AND HIS HEIRS AND ASSIGNS IN FEE SIMPLE FOREVER, EXCEPT AS SET FORTH ABOVE.  
AND THE SAID PARTY OF THE FIRST PART DOES COVENANT THAT HE IS SEIZED OF SAID PREMISES IN FEE SIMPLE AND HAS THE RIGHT TO CONVEY THE SAME IN FEE SIMPLE; THAT THE SAME ARE FREE FROM ENCUMBRANCES EXCEPT AS SET FORTH ABOVE: AND THAT HE WILL WARRANT AND DEFEND THE SAID TITLE TO THE SAME AGAINST THE CLAIMS OF ALL PERSONS WHOMSOEVER.  
WHEREVER USED HEREIN, THE SINGULAR NUMBER SHALL INCLUDE THE PLURAL, THE PLURAL THE SINGULAR, AND THE USE OF ANY GENDER SHALL BE APPLICABLE TO ALL GENDERS, AS THE CONTEXT MAY INDICATE.

IN TESTIMONY WHEREOF THE SAID PARTY OF THE FIRST PART HAS HEREUNTO SET HIS HAND AND SEAL THE DAY AND YEAR FIRST ABOVE WRITTEN.

Carl Edward Sain (SEAL)  
CARL EDWARD SAIN

Leona Gail Robinson Sain (SEAL)  
LEONA GAIL ROBINSON SAIN

STATE OF NORTH CAROLINA COUNTY OF DURHAM NC  
I, Deborah S. Puckett, A NOTARY PUBLIC OF SAID COUNTY, DO HEREBY CERTIFY THAT  
Carl Edward Sain and Leona Gail Robinson Sain  
GRANTOR, PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE DUE EXECUTION OF THE FOREGOING DEED.



WITNESS MY HAND AND NOTARIAL SEAL, THIS THE 17th day of SEPTEMBER  
MY COMMISSION EXPIRES: 11-6-2010  
Deborah S. Puckett  
NOTARY PUBLIC

## APPLICATION FOR SPECIAL USE PERMIT

PROJECT TITLE: Forest Ridge  
 ADDRESS: North of US 70 Business (US 70A)

OWNER: Burroughs Land Investors, LLC  
 ADDRESS: 1000 Darrington Dr. Suite 105 Cary, NC 27511  
 PHONE: (919) 462-0775

APPLICANT: Withers & Ravenel, Attn: Charles Smith, ASLA  
 ADDRESS: 111 MacKenan Drive Cary, NC 27511 PHONE: (919) 469-3340

ENGINEER: Withers & Ravenel  
 ADDRESS: 111 MacKenan Drive Cary, NC 27511 PHONE: (919) 469-3340

ZONING: Rural Residential (R-1) Orange County & Agricultural-Residential (AR)  
 ADJACENT ZONING: Orange County Zoning Districts: R-1  
Hillsborough Zoning Districts: Office-Institutional (OI),  
Agricultural-Residential (AR), High Intensity Commercial  
(HIC), and Multi-Family Special Use (MFSU)

TAX MAP NUMBERS: 4.37.C.21 and 4.40.B.1  
 ACREAGE: 118.77 DIMENSIONS: See Attached Boundary Survey  
 PHASES: To Be Determined

PROPOSED STRUCTURES: Maximum of 233 dwelling units and a maximum of 28,000 square feet of floor area in the Mixed Use building.

### Detailed Description of Development Program

	13,000 + SF Lots	9,200 + SF Lots	6,000 + SF Lots	Townhomes	Mixed Use Building
Land Use(s)	Residential	Residential	Residential	Residential	Office & Retail
Typical Lot Width	95'	75'	60'	20'	
Minimum Lot Width	80'	60'	55'	18'	100'
Typical Lot Depth	140'	125'	110'	75'	
Minimum Lot Depth	125'	115'	100'	70'	200'

Maximum Floor Area	---	---	---	---	28,000 SF
Number of Dwelling Units	72	71	52	38	---
Front Setbacks (minimum)	25'	20'	10'	20'	50' (from US 70)
Rear Yard (minimum)	20'	20'	5' to alley	5'	20'
Side Yard (minimum)	10'	5' minimum 15' aggregate	3' minimum 8' aggregate	10' (between bldgs.)	20'
Building Height (max.)	45'	45'	45'	45'	50'

I certify that I am the owner or truly represent the property owner, and that the above information provided is correct, and that I will operate to the terms of the permit approval.

03/25/09

*B. K. Wald*

\_\_\_\_\_  
SIGNATURE OF THE PROPERTY OWNER OR REPRESENTATIVE

## Special Use Permit Review Checklist Town of Hillsborough

Please submit the cover application and this Checklist with the following:

1) Plans to be submitted:	Developer	Planning
Scaled site-specific development plan		
Buildings	<u>Yes</u>	_____
Parking lots	<u>Yes</u>	_____
Landscaping	<u>Yes</u>	_____
Outside Display Area	<u>N/A*</u>	_____
Outside Storage Area	<u>N/A*</u>	_____
Service Area	<u>N/A*</u>	_____
Dumpsters	<u>N/A*</u>	_____
Air handling units	<u>N/A*</u>	_____
Signage	<u>N/A*</u>	_____
Other permanent fixtures	<u>N/A*</u>	_____
Architectural elevations of all proposed structures and signs	<u>See Note 1</u>	_____

*\* Any individual non-residential site will be resubmitted for its own individual Special use Permit with all required construction drawings.*

*Note 1: Architectural elevations of the cabana and mixed use building have been provided. We request that architectural elevations for signs be submitted with detailed construction documents.*

Transportation plan		
Internal traffic flow	<u>Yes</u>	_____
Impacts at external connections	<u>Yes</u>	_____
Impacts on & improvements to existing facilities	<u>Yes</u>	_____
Utilities Plan		
Location	<u>Yes</u>	_____
Size	<u>Yes</u>	_____
Off-site improvements	<u>Yes</u>	_____
Stormwater Management Plan	<u>Yes</u>	_____
Landscaping Plan		
Parking areas	<u>Yes</u>	_____
Perimeter buffers	<u>Yes</u>	_____
Other	<u>Yes</u>	_____
Exterior Lighting Plan		
Fixture type	<u>No*</u>	_____
Intensity	<u>No*</u>	_____
Intensity at property line	<u>No*</u>	_____

*\* Request condition of approval requiring approval prior to issuance of Building Permit*

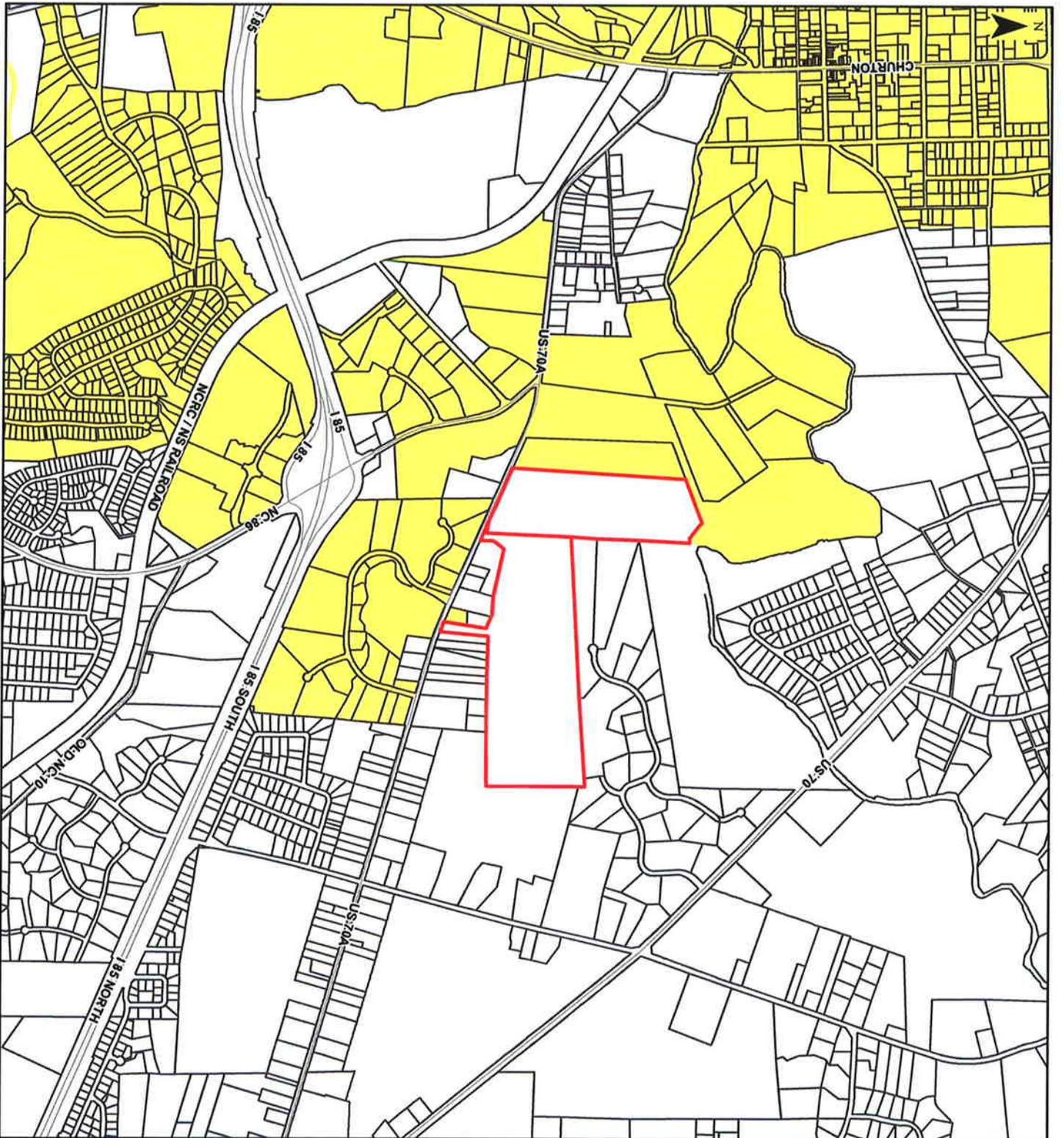
Land Suitability Analysis		
Topography	<u>Yes</u>	_____
Soil Types	<u>Yes</u>	_____
Hydrology	<u>Yes</u>	_____
Vegetated Areas	<u>Yes</u>	_____
Environmental Protection Plan	<u>See SUP Plan</u>	_____

- 2) **Review by other agencies:** (submit confirmation of approval or comments)
- |   |                   |       |
|---|-------------------|-------|
| Orange County-Soil & Erosion Control Plan                       | <u>See Note 1</u> | _____ |
| Orange County-Solid Waste Management Plan                       | <u>See Note 1</u> | _____ |
| Fire Chief/Marshal-Fire Code compliance<br>& ability to protect | <u>See Note 2</u> | _____ |
| NCDOT-Driveway Permit   |                   |       |
| -Off-site Road Improvements                                     | <u>See Note 2</u> | _____ |
| -Thoroughfare Plan compliance                                   | <u>See Note 2</u> | _____ |

*Note 1: Will submit with detailed construction plans following Town Board approval.*

*Note 2: Will receive copy of plans following Town Staff review.*

- 3) **Other Documents:**
- |  |            |       |
|--|------------|-------|
| Survey of property boundaries  | <u>Yes</u> | _____ |
| Legal description indicating unified control over site                                 | <u>Yes</u> | _____ |
| Locations & widths of all easements & rights-of-way<br>within or adjacent to the site. | <u>Yes</u> | _____ |
| Names and address of owners & applicants   | <u>Yes</u> | _____ |
| A fee, as set by the Board of Commissioners  | <u>Yes</u> | _____ |



**FOREST RIDGE -  
HILLSBOROUGH**  
ORANGE COUNTY, NORTH CAROLINA  
**LOCATION MAP**

- Legend**
- Site
  - Existing City Limits

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
711 Baccarat Drive Cary, North Carolina  
Telephone: 919.459.5340 [www.witnersravenel.com](http://www.witnersravenel.com)

0      800      1,600  
 Feet  
 1 inch = 1,600 feet

# FOREST RIDGE

Hillsborough, North Carolina

## PROJECT OVERVIEW

Prepared by:

**Withers & Ravenel, Inc.**  
111 MacKenan Drive  
Cary, NC 27511

December 19, 2008  
Revised January 7, 2009  
Revised March 27, 2009

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# FOREST RIDGE

## Hillsborough, North Carolina

### Project Overview

This project overview is provided to give a detailed description of the proposed development program for the Forest Ridge project and to address key issues related to the project. Within each general category below are listed various topics or issues related to the proposed development.

#### I. General Information

##### A. Location

The site is located immediately north of US70 Business (also known as US70A), across from the Meadowlands Business Park and the Triangle SportsPlex. The site is adjacent to and immediately east of the recently approved Fox Haven development. The Poplar Ridge subdivision is generally located adjacent to the northern edge of the proposed development.

##### B. Proposed Site

The site consists of two large tracts of land that are specifically described as follows:

Tax Map 4.37.C.21 – PIN 9874-53-8717  
Tax Map 4.40.B.1 – PIN 9874-72-7827

##### C. Gross Land Area

118.77 Acres

##### D. Right-of-Way

This site has frontage in two different locations on US70 Business. In particular we believe that one-half of a 70-foot wide right-of-way has already been dedicated along this site's US70 Business frontage.

We anticipate that any NCDOT required road improvements can be achieved within the existing right-of-way. However, we are willing to dedicate additional right-of-way, if necessary, to accomplish any road widening/turn lane improvements required by NCDOT

#### II. Regulatory Information

##### A. Existing Zoning

Rural Residential (R-1) – Orange County  
Agricultural-Residential (AR)-Town of Hillsborough's planning jurisdiction

B. Proposed Zoning

Entranceway Special Use (ESU) – Town of Hillsborough

C. Proposed Use

A Special Use Permit has been submitted requesting approval of the following uses:

- 195 Single-Family Lots (includes 13,000+ SF Lots, 9,200+ SF Lots, and 6,000+ SF Lots)
- 38 Townhome Lots
- Recreation Center (including cabana & pool) with 46 parking spaces
- 28,000 SF Mixed Use Building with 143 parking spaces

D. Density

233 dwelling units on 118.77 acres (1.96 units/acre)

**III. Development Information**

A. Residential Program

The residential program proposed for the site consists of the four different housing products geared to serve a wide variety of families and individuals at a broad range of price points. It is the developer's intention that these homes will be built by a selected team of custom home builders.

More than 80% of these homes consist of traditional single family lots, with fairly traditional setbacks. Lots that are 13,000 square feet or more in size are utilized in areas of the site where steeper terrain might dictate the need for more foundation expense than elsewhere on the site, including provision of some walk-out basements. Lots that are 9,200 square feet or more in size are utilized in areas of the site with more gentle slopes. In general, the larger homes are expected to be constructed on the 13,000 square-foot lots when compared to the 9,200 square-foot lots, primarily due to the difference in lot widths (95 feet typically versus 75 feet typically). Finally, lots that are a minimum of 6,000 square feet are located in a central, flatter portion of the site. These lots will be served by rear-alleys that allow vehicular storage to occur in the rear yards with rear garages.

Finally, as a fourth type of residential product on the site, an attached townhome product will be offered along the common southern property line with the envisioned mixed-use re-development area to the south. This type of home will be situated on its own lot, but will share common walls with neighboring units. The developer does anticipate that these units will have their own individual driveways and garages. Given the attached nature of this product, these homes have also been situated on some of the site's flattest land.

We note that the developer's experiences with other similar communities indicate that some multi-generational transactions will occur where a family might purchase one of the single-family detached home products on site with a grandparent (or

grandparents) also choosing to live on site within a townhome that has no exterior maintenance responsibilities. Accordingly, the developer is proposing townhomes in order to create a legitimate alternative for those interested in lower-priced and/or exterior maintenance-free ownership residential options in this neighborhood.

B. Mixed Use Building

As a later phase of the site's development, a 28,000 square-foot two-story mixed use building will be constructed along the site's US70 Business frontage, just east of the primary entrance into the site. This building will be constructed on its own separate lot.

The ground floor of this Mixed Use Building will be available for limited retail opportunities, such as cafes and delis, boutique retail stores, or personal services businesses. In addition, offices that depend upon heavy foot traffic, such as insurance agents, may choose to locate on the ground floor of this Mixed Use Building. The second floor of the building will be available for lease as office space. Parking will be provided in a parking lot located primarily to the rear of the building from US70 Business and buffered from US70 Business in instances where the parking lot necessarily extends beyond the end of the building.

The timing of the construction of this building is deliberately delayed until there are enough occupied residential units on the site so as to not only begin providing a customer base for retail operations, but also generate potential office tenants who might wish to locate their business operations within walking and biking distance from their nearby homes.

C. Homeowners' Association

A Homeowners' Association will be formed to oversee the maintenance of all common areas that are not part of the individual lots. In addition, the Homeowners' Association will be responsible for the operation and maintenance of the various amenities associated with the recreation center, as well as the greenway natural-surface trails. Finally, the Homeowners' Association will also be responsible for the maintenance of the site's buffers, open space areas, and stormwater management facilities.

#### IV. Access & Circulation

##### A. Site Access

Two points of ingress and egress are proposed for the proposed development site. The westernmost entrance is proposed in the vicinity of the Mixed Use Building, while our easternmost entrance is proposed in the central portion of the site. We believe that these two points of ingress and egress will provide more than adequate site circulation while ensuring that appropriate access and response times can be achieved by emergency service vehicles.

In order to allow for appropriate turning movements at the westernmost entrance, we are proposing to construct an eastbound left turn lane into the site. This turn lane should serve to mitigate turning movements into the site, with minimal disruption to eastbound through traffic on US70 Business.

In order to establish neighborhood entry and identity points as well as facilitate interior traffic movement, a roundabout has been located at the terminus of the easternmost access in the site.

##### B. Streets

Also, all internal streets are proposed to be public streets, and will be constructed as 27-foot streets from back-of-curb to back-of-curb. All streets will be located within a dedicated 50-foot public right-of-way. (Please see the Preliminary Street Cross-Section in the Plan Set.)

##### C. Alleys

One of the unique features of the smaller 6,000 sq. ft. homes is that rear alleys are utilized to provide vehicular access to garages located in the rear yard area of the lot. Provision of vehicular storage in the rear allows these homes to be very close to the public street where interaction between front porches and the adjoining sidewalk becomes possible.

These alleys consist of sixteen (16') feet of asphalt pavement width with an inverted crown pavement cross section for stormwater drainage. Individual driveways provide access from the homes to these paved alleys. In addition, some underground utilities are routed along these rear alleys within utility easement strips. Whether or not these alleys become part of the Town of Hillsborough public street system and are therefore publicly maintained (i.e., eligible for Powell Bill money) or whether they are privately maintained within public access easements remains to be determined as this application continues to be reviewed by the Town staff and Town boards.

##### D. Sidewalks

In accordance with the Town of Hillsborough's sidewalk policy, five-foot wide sidewalks are proposed for both sides of all public streets, including the full

perimeter of all cul-de-sacs. Please note that based on this policy, the developer is proposing a sidewalk network with five (5) miles of sidewalk.

E. Greenways & Trails

A natural surface trail (approximately 6 feet wide) is provided in an existing 20' easement running north-south through the site extending from US70 to the Classical American Homes Preservation Trust Trail. This trail will also join the Mountain to the Sea Trail running through the northern portion of our site.

F. Stub-Out/Access to Adjacent Properties

A public street stub-out is provided to the adjoining property, wrapping the southeastern corner of Forest Ridge. The stub-out location was chosen in an effort to avoid potential environmental constraints that may exist due east of the common property line in the southeast corner of the site. In particular, the drainage feature and the pond located just east of the common property line in this area is part of the same stream system that originates our site.

The provision of a public street stub-out southward into the adjoining property creates the potential of a third connection point to US70 Business established by the future development. Public street stub-outs are not provided at any other location to the south or the north due to existing residential development patterns. However, pedestrian connection points are provided to any mixed-use redevelopment activity to the south and to the adjoining Fox Haven development to the west.

**V. Environmental Protection Plan**

A. Topography

For topographic analysis purposes, the site will be divided below into four general sub-areas: the western portion, the northern panhandle, the central portion, and the eastern portion of the site.

Western Portion: The western portion of the site includes the primary entrance drive and a portion of the 13,000+ square-foot single-family detached lots. The land form within this area is that associated with the western side slopes and drainage draws of a dominant north-south ridge feature that begins within the site's central area. From the central portion of the site, this feature runs northward along the rear of the Poplar Ridge subdivision lots that adjoin the site to the north of the recreational area and to the east of the 13,000+ square-foot single-family detached lots located in the northwestern corner of the site.

Two minor ridge features run east-west from the more dominant north-south ridge pattern in this area. Both of these minor ridge features are utilized by the site design for street purposes to minimize site grading. Drainage patterns within this area of the site are generally westward. The majority of this area includes slopes of 12% or more. Some lot walk-out basements will

be utilized to address the grade transitions on the detached single-family lots within this portion of the site.

A pedestrian connection to the Eno River open space corridor to the north of the site is also provided at the northern terminus of the public street system within this portion of the site.

Northern Panhandle: This portion of the site includes the northernmost portion of the site, which approaches the Eno River. The northern panhandle includes the north-facing slopes from the previously noted dominant north-south ridge pattern and minor east-west ridge features located in the western portion of the site.

The north-facing slopes located in this area are very steep (predominantly 20% or greater) as they fall down to Cates Creek, which runs from west to east across this panhandle, before reaching its off-site confluence with the Eno River just northeast of the northern panhandle. The portion of the northern panhandle that is located north of Cates Creek is fairly flat (almost entirely 0-10% slopes) and includes floodplain areas associated with both Cates Creek and the Eno River.

Recognizing the environmentally sensitive nature of this portion of the site, the proposed development program is limited to cul-de-sacs located along the tops of the ridges, avoiding the steep portions of this north-facing slope, and protecting the Cates Creek stream corridor and associated floodplain areas. Please note that streets and lots have stopped short of the ridge in this area to prevent additional stormwater from flowing towards the Eno River and Cates Creek.

Central Portion: The central portion of the site includes the recreational area, the 6,000 sq. ft. single family detached homes, and the townhomes. The land form within this area is that associated with the southern terminus of the north-south ridge feature identified above, in conjunction with another minor north-south ridge form utilized by the site design for a cluster of single-family detached lots. These two ridge features combine to create an extensive area of gentle slopes, falling in the 0 to 10 percent range.

The types of housing proposed within this portion of the site require relatively flat terrain, which can be achieved here with far less grading than would be required elsewhere on the site. Drainage patterns in this portion of the site are generally to the north, although the southern edge of this portion of the site drains southward. Much of the development's storm drainage in this area will be diverted to the large stormwater pond located in the southwest corner of the site.

Eastern Portion: The eastern portion of the site includes a neighborhood of 9,200+ square-foot single-family detached lots to the south, 13,000+ square-foot single-family detached lots to the north and an open space area to the east. The land form within this area is that associated with a north-south ridge feature that has its southern terminus generally in the center of

this eastern portion of the site and runs northward into the Poplar Ridge subdivision that is located immediately north of the site.

Much of this portion of the site has gently sloping land with slopes of less than 12%. The southern slopes of the north-south ridge feature, however, do exhibit some slopes in the 5-12% range, with a few areas including slopes of 12-20%.

Drainage patterns within this area are in three separate directions due to this north-south ridge feature. The western portion of this area drains westward towards the easternmost of the two northern storm drainage ponds. A portion of this area that drains southward will be diverted westward to the large stormwater basin in the southwest corner of the site. The remaining portion of this area that drains southward will be diverted to the stormwater pond located where the current natural draw collects stormwater today.

The eastern portion of this site drains eastward, utilizing the unnamed east-west stream corridor that originates within the site.

An open space area is preserved in the eastern portion of this area of the site, including an extensive natural surface trail network to provide connectivity between streets where the stream limits street connectivity. This open space area encompasses and preserves the steepest land in this portion of the site – including the areas along the stream corridor where slopes exceed 20%.

## B. Vegetation

The entire site is presently covered with a fairly uniform mixture of relatively young, but mature, hardwood trees and a few scattered pines. Among the tree species observed in the field were oaks, maples, hickories, beeches, birches and other naturally occurring hardwood tree species typically found in this area. No larger “homestead” trees were observed on the property, since no tree has had an unconstrained area, free from competition from other trees for light and space, in which to grow and spread. Consequently, tree preservation is most effectively achieved by preserving clusters of trees instead of focusing upon individual specimens.

A forest assessment has been conducted and the report and supporting photographs have been included as Appendix D. Additionally, copies of the maps and the list of trees and trees’ diameter breast heights identified on-site, which are associated with the forest assessment, can be made available.

One area where the design focus is placed on preservation is at the central roundabout. Open space has been protected on all four quadrants plus inside the roundabout itself, allowing tree preservation at this important location.

The areas associated with naturally occurring drainage draws and streams would be expected to contain the largest specimens of various tree species, due to the proximity and availability of surface and ground water. Consequently, the site

design's respect for natural drainage patterns and open space preservation efforts maximize preservation of clusters of trees where the better specimens may be found. In addition, trees will be preserved on portions of individual single-family lots where practical. Finally, in instances where front yard tree preservation is not possible, builders will be required to plant new front yard trees (please see forthcoming "Front Yard Tree Program" section).

C. Buffers

Buffers shown in the plan set are based upon the Town of Hillsborough Subdivision Regulations. Portions of the required land use buffer along the project perimeter may be included within the lots. Perimeter buffers shall remain undisturbed, except for the construction of streets, pedestrian trails, utilities and stormwater management devices. Minor grading may be allowed within the buffers, provided that the buffer areas are re-vegetated as necessary to meet the required screening standards set forth in section 7 of the Town of Hillsborough Zoning Ordinance.

To the extent practical, existing vegetation is to remain within these designated buffer areas. Where clearing and/or grading must occur within these buffer areas, a vegetative screen is to be established by the installation of new plant material, according to a detailed planting schedule included with the final construction documents that identify buffer encroachment activity.

D. Front Yard Tree Planting Program

The developer fully appreciates the aesthetic and financial value of being able to preserve mature hardwood trees on single-family lots and intends to preserve such trees where practical on such lots. In portions of the single-family home areas however, there are steeper areas where maintaining design guideline street grades (15% or less) will necessitate grading and tree removal on the adjoining single family lots.

Consequently, in an effort to ensure that every front yard will have trees, the developer proposes to either preserve existing trees in accordance with the guidelines outlined in Section 4.7.2(c) of the Town's Subdivision Ordinance or to install new trees in accordance with Section 4.7.3(a) of the Town's Subdivision Ordinance.

In particular, Section 4.3.7(a) of the Town's Subdivision Ordinance prescribes a Front Yard Tree Planting Program by assigning a value in linear feet to each tree based on the average mature canopy spread. The values are 40 feet for large deciduous trees and 25 feet for small trees. Each lot must have at least one large tree (value of 40 feet) per street frontage. The number of trees to be planted on the remaining frontage is determined by dividing the remaining frontage by the value(s) assigned to the tree types selected for planting by the subdivider.

The tree planting shown on the site plan meets the Ordinance requirements and is intended to have a uniform spacing of large deciduous trees along the street frontage.

a. Preservation of Existing Trees

We now can assign value to existing trees that are preserved. Specifically, trees that are preserved according to these standards shall be assigned points as follows: Diameter at Breast Height (DBH) in inches multiplied by two. This means that if a 12" caliper tree is preserved, it will count as 24 points. The total number of points needed will be determined by the lot's applicable width.

Consequently, if the developer and builder can preserve enough trees (i.e. 95 points or more on a 95-foot wide lot), then new front yard tree plantings will not be needed. If the developer can preserve some trees, but not enough to fully meet the above requirements (one point per each foot of lot width as determined at the building setback) then he shall be responsible for planting an additional tree(s) in order to meet the point requirement for that particular lot.

b. Tree Planting Policy

These front yard trees will be installed by the individual homebuilders prior to the issuance of a Certificate of Occupancy. In order to minimize any chance of construction damage to these new trees, it is appropriate for the trees to be one of the last items installed by the builder.

In order to maximize the chance that these trees will survive and be healthy following the issuance of the Certificate of Occupancy however, we also note that such trees should typically be planted during certain periods of the year (avoiding hot summer months, and months immediately preceding this period of the year). Consequently, we believe that there will frequently be instances when a house has just been completed (and is ready for a Certificate of Occupancy); but, the season is not appropriate for front yard trees to be planted. Accordingly, we request that builders be allowed to post a Letter of Credit for such tree plantings, guaranteeing that such trees will be installed, but allowing installation to be delayed until the planting season arrives.

E. Street Tree Planting Program

Since the smaller single family and townhome products are located in close proximity to each other, and the general dimensional nature and spatial character of these lots does not always afford appropriate opportunities for front yard tree plantings, the developer is alternatively proposing a street tree planting program that can be utilized in this area. In particular, these street trees are proposed to be planted in a 6-foot wide planting strip located in between the back of the curb and the external edge of the sidewalk. Street Cross-Sections are provided in the plan set to conceptually illustrate our proposed street tree planting program.

These large deciduous street trees shall be a minimum of 3-inch caliper when installed, and will be planted every 55 feet on center. As indicated previously, we request that a Letter of Credit be accepted if necessary, to ensure that these trees get planted during an appropriate time of the year.

**F. Parking Lot Landscaping**

In an effort to beautify and provide shade for the parking lots associated with the Mixed Use Building and the Recreation Center, the developer is proposing to plant trees in regularly-spaced tree islands. These proposed trees are indicated on the site plan sheets.

**G. Open Space**

Over 34 percent of the site is preserved as open space. Consequently, our proposed amount of open space exceeds both the Town’s Zoning Ordinance requirements for multi-family development (5% of the site shall be preserved as open space) and the Town’s Subdivision Ordinance requirements for standard subdivisions (10% of the site shall be preserved as open space).

In particular, we note that the plan has sought to preserve the two most environmentally sensitive areas on the site: (1) the northern panhandle portion of the site, which includes steep slopes where the site drops down to Cates Creek and the Eno River, and (2) the unnamed stream corridor and associated areas of steep slopes located in the eastern portion of the site.

**VI. Recreational Program**

**A. Ordinance Requirements**

The Town of Hillsborough’s Zoning Ordinance requires that residential developments shall provide active recreational areas and facilities. In particular, the Ordinance uses a point system to determine the amount of recreational program that shall be provided for a given development.

Based on the Town’s Ordinance, the number of points to be provided by a site’s recreational program are determined per unit as follows:

- One bedroom = 6.0 points of recreational uses
- Two bedrooms = 9.5 points of recreational uses
- Three or more bedrooms = 12.0 points of recreational uses

Accordingly, the number of points required for our proposed development are calculated as follows:

Type of Unit	# Units	# Points Required per Unit	Points Required
13,000 SF Lots (3 or more BR)	72	12.0	864
9,200 SF Lots (3 or more BR)	71	12.0	852

6,000 SF Lots (3 or more BR)	52	12.0	624
Townhomes (3 or more BR)	31	12.0	372
Townhomes (2 BR)	7	9.5	67
TOTAL:	233		2779

B. Provided Recreational Facilities

The recreational program to fulfill this requirement (2,779 points) is based on the provision of various recreational facilities and the dedication of associated land for recreational use. In particular, points are given based on the size and nature of each recreational program component.

The developer is proposing to construct a neighborhood recreational center (please see Attachment B) that will serve to provide recreational and social opportunities for residents. The recreation center will include the following components:

- Swimming Pool – an approximately 2,700 square foot (35' x 75') pool will be provided for use by both adults and children. This allows a neighborhood swim team if desired by the residents.
- Baby Pool – a separate circular pool approximately 10-feet in diameter will be provided for infants and young children.
- Pool Deck – approximately 10,000 square feet of deck space will be provided for pool users.
- Cabana – a building provided adjacent to the pool deck that includes bathrooms and shower facilities, while also offering structurally covered space for use by pool users.
- Playground/Tot Lot – a large play structure, including slides, will be installed for use by children. This area will also include swings, a large sandbox and other playground amenities.
- Open Play Area – a flat, graded, unlit field (approximately 350' by 175', which is approximately 1.5 acres) will be planted with grass and made available for active recreational activities such as soccer, football and other recreational activities. Note that this area is intended to be flexible and multi-purpose in nature.
- Trails – natural surface walking trails (approximately 6-feet wide) are proposed in the site's natural open space areas.

The primary natural trail is located in an existing 20' easement on-site running north-south from US70 to the Classical American Homes Preservation Trust Trail and the Mountain to the Sea Trail which runs through the northern portion of Forest Ridge.

*Note that the use of the term "natural surface" is intended to reflect the desire to establish a natural trail that uses the existing forest floor surface (dirt, pine needles, and/or leaves). This trail would be field-located in order to avoid existing mature trees and to traverse steep slopes in the most appropriate manner. Observations of other natural walking trails (for example, Eno River State Park and Umstead Park) indicate that regular pedestrian foot traffic is sufficient to maintain such trails from season to season, throughout the year.*

*A natural trail surface is proposed over an asphalt trail surface primarily due to the environmentally sensitive nature of the areas where these walking trails are proposed. In particular, steep slopes (in the northwest corner of the site) represent an area that is more conducive to a non-intrusive natural surface trail with occasional steps, rather than a graded and paved asphalt trail.*

The following calculations document how this proposed recreational program exceeds the Town Development Ordinance’s requirements:

Recreational Amenity	Minimum Space Provided	Points Category	Points Ratio	Total Points
Swimming Pools (regular and baby pools)	2,900 SF	Swimming Pool	0.436	1,264
Pool Deck	10,000 SF	Pool Patio	0.020	200
Cabana (Internal space – restrooms, showers, storage)	1,064 SF	Clubhouse	0.508	541
Cabana (external covered space)	1,176 SF	Gazebo	0.326	383
Playground/Tot Lot	3,025 SF	Play Equipment	0.107	324
Open Play Area	45,000 SF	Soccer Field	0.011	495
Other Land at Recreation Center (excludes parking lot)	49,000 SF	Land	400 points/ac	450
Hiking Trails (6’ natural surface)	2,570 LF	Hiking Trail	0.016	247
<b>TOTAL:</b>				<b>3,904</b>

With a recreational program that provides a total of 3,904 recreational points, the development exceeds the required number of points (2,779) for the proposed development program by 40%.

C. Walking/Jogging

Sidewalks are provided along both sides of all internal streets (a total of approximately 5 miles of sidewalk). In addition, a natural surface trail (approximately 0.45 miles of trail) is proposed to supplement the sidewalk network, in an effort to provide a comprehensive and diversified pedestrian circulation system for walkers and joggers. Consequently, the overall neighborhood will include a pedestrian network that consists of just over 5.4 miles of sidewalks and trails.

D. Triangle SportsPlex

The on-site outdoor recreational opportunities for Forest Ridge will complement the indoor recreational opportunities and programs that are provided by the neighboring Triangle SportsPlex facility located across US 70 Business. Due to the close proximity between the site and the SportsPlex, we envision that Forest Ridge will provide a significant number of additional members to support this existing recreational facility.

## **VII. Water and Sanitary Sewer Utilities**

### **A. Water**

A 12-inch water main exists on the northern side of US70 Business along the entire frontage of the site. In addition, a 12-inch water main runs northward through the site from US70 Business water main to a ground-mounted water storage tank that is located on the property along its northern common property line with the Poplar Ridge subdivision.

It is anticipated that the existing water storage tank will remain on-site, and the existing on-site 12-inch water main will be abandoned and replaced by a 12-inch water main to be installed within the proposed on-site public street system. In order to provide adequate fire-flow capacity to the site and address some of the existing water pressure deficiencies within this portion of the Town system, several water system improvements and upgrades are being examined by the Town and the project engineers. It is anticipated that the project will participate in improving the overall Town water system by both construction of improvements and financial contribution toward future capital improvement projects. The level of system improvements to be constructed, timing and degree of financial contributions will be determined as the details of the water modeling and analysis continues.

### **B. Sanitary Sewer**

The site design allows the entire site to be provided sanitary sewer service by gravity collection mains that drain westward toward an existing gravity main, located on the south side of US70 Business. As confirmed with the Town Engineer, no additional sanitary sewage pump stations will be required under this approach. There are approximately one half dozen lots near the extreme eastern portion of the site that might require privately-owned and privately-maintained individual house pump systems to convey sanitary sewage (especially from any fixtures located in a basement) to a gravity manhole located within the public street. Details for the final sewer system improvements will be coordinated with the Town Engineer during preparation of final construction drawings.

## **VIII. Stormwater Management**

### **A. Stormwater Control**

As required in Article 5.21, Forest Ridge will meet the associated requirements for High-density projects.

Since there are several different ridge forms within our site which serve to send stormwater in different directions, several stormwater ponds are proposed throughout the site in order to achieve the requirements of the Town's Zoning Ordinance. Stormwater ponds and/or Best Management Practice (BMP) measures will be located within open space areas of the development. In particular, these stormwater ponds will achieve the following performance standards:

- The first one-half inch (1/2") of rain shall be handled on-site with either structural or non-structural devices, subject to the review and approval of the Town Engineer.
- Stormwater control structures shall be designed to accommodate a 10-year storm event.
- The rate of run-off from the developed site shall not be greater than that of the undeveloped site, based on a 10-year storm event.
- Water flows shall not be diverted onto neighboring properties beyond preconstruction levels.

**B. Existing Runoff on Neighboring Properties**

The natural surface drainage patterns on our site are such that a certain amount of stormwater runs down the hillside towards the properties located south of our site, between our two proposed entrances. Per our neighborhood meeting on March 17, 2005, we learned from these neighbors that this existing run-off is significant and troublesome for these properties. As part of the pre-engineering for our site's development, we have identified the opportunity to actually capture and divert some of this run-off to a proposed stormwater pond in the southwest corner of the site. Consequently, we believe that our engineered post-construction water flows towards these properties will be less than our pre-construction water flow onto these properties.

**C. Provision of Engineered Stormwater Management Facilities**

Due to the various ridge forms located on this site, the developer proposes to utilize stormwater ponds in order to provide engineered stormwater management facilities for Forest Ridge in order to facilitate on-site stormwater management as previously noted above.

**IX. Performance Standards**

We believe that Forest Ridge meets the performance standards established in Section 4.53 of the Town of Hillsborough Ordinance. Below we will show how each of the performance standards in Section 4.53 are met.

**A. Standards Generally**

**a. *Harmonious and efficient organization***

The site plan has been organized harmoniously and efficiently in relation to the character of adjoining property and the type and size of the buildings. The majority of the site is proposed to be developed with multiple residential dwelling unit sizes, with a mixed use building proposed along US 70. The mixed use building will have a maximum first floor area of 15,000 SF so it is appropriately sized with the residential uses in the vicinity. The transition of uses and residential dwelling types is harmonious with the adjoining properties. The mixed use building is located along US70 and the residential uses places the townhomes closest to US 70, while the larger lots surround the townhomes and smaller single family dwellings to the west, north and east.

- b. *Preservation of natural state*  
Over 34 percent of the site is preserved as open space (including perimeter land designated for buffers or land being utilized for stormwater ponds). Consequently, our proposed amount of open space exceeds both the Town's Zoning Ordinance requirements for multi-family development (5% of the site shall be preserved as open space) and the Town's Subdivision Ordinance requirements for standard subdivisions (10% of the site shall be preserved as open space).

In particular, note that the plan has sought to preserve the two most environmentally sensitive areas on the site: (1) the northern panhandle portion of the site, which includes steep slopes where the site drops down to Cates Creek and the Eno River, and (2) the unnamed stream corridor and associated areas of steep slopes located in the eastern portion of the site.

- c. *Enhancement of residential privacy*  
The site's layout provides for reasonable visual privacy for all adjacent dwelling units. Specific lighting details will be provided in the construction documents.
- d. *Emergency Access*  
The residential units, recreational center and mixed use building have been arranged to permit practical emergency vehicle access to all buildings. There are two accesses proposed from US 70, which will allow convenient access for emergency vehicle to the development. The internal road network and development standards will allow for convenient emergency access to the structures on-site.
- e. *Access to public ways*  
Every structure or dwelling unit does have access to a public street, walkway or other area dedicated to common use. In addition to the internal road network that each structure or residence can access, sidewalks are provided along both sides of all internal streets (a total of approximately 5 miles of sidewalk). A natural surface trail (approximately 0.45 miles of trail) is proposed to supplement the sidewalk network, in an effort to provide a comprehensive and diversified pedestrian circulation system for walkers and joggers.
- f. *Non-motorized circulation*  
As mentioned above, a sidewalk and trail network has been provided which is direct, efficient and pleasant. The sidewalks and trails are complementary to the vehicular circulation system provided.
- g. *Design of access and egress drives*  
Forest Ridge has been designed to provide the necessary ingress and egress drives to move vehicular traffic efficiently and safely throughout the site. The circulation system shown limits the negative impacts on public streets and adjacent properties as much as possible. Forest Ridge is obtaining access from US 70, which minimizes, to the greatest extent practicable, any

negative impacts on adjoining properties by eliminating cut-through traffic in their neighborhood. Also, only 2 ingress/egress access points are shown along US 70. By only providing 2 access points off US 70, negative impacts are also reduced.

h. *Coordination with off-site circulation systems*

The arrangement of Forest Ridge's circulation system (both vehicular and pedestrian oriented) coordinate with the pattern of existing and planned streets and pedestrian pathways in the area. Street stubs connect adjacent properties to the west and southeast for improved vehicular connectivity.

i. *Stormwater control*

Several stormwater ponds are proposed throughout the site in order to achieve the requirements of the Town's Zoning Ordinance. Stormwater ponds and/or Best Management Practice (BMP) measures will be located within open space areas of the development. In particular, these stormwater ponds will achieve the following performance standards:

- The first one-half inch (1/2") of rain shall be handled on-site with either structural or non-structural devices, subject to the review and approval of the Town Engineer.
- Stormwater control structures shall be designed to accommodate a 10-year storm event.
- The rate of run-off from the developed site shall not be greater than that of the undeveloped site, based on a 10-year storm event.
- Water flows shall not be diverted onto neighboring properties beyond preconstruction levels.

j. *Exterior lighting*

An exterior lighting plan will be submitted with detailed construction drawings.

k. *Protection of Property Values*

Forest Ridge has been designed to have minimum negative impacts on adjoining property values and other on-site uses. By transitioning from higher intensity uses closest to US 70 to larger residential lots along the west, north and east perimeters, providing multiple circulation modes, providing open space, and minimizing the rate, any negative impact on property values have been minimized.

B. Specific Standards

a. *Relationships of buildings to site*

1. The site has been planned to provide for adequate planting, safe pedestrian movement and parking areas.
2. Items related to parking area treatments will be submitted with detailed construction drawings.
3. The height and scales of buildings are compatible within the site and existing or anticipated adjoining buildings. For instance, both the mixed use building and the pool cabana have been designed in scale

with existing and proposed residential units. The pool cabana elevations provided in Appendix C illustrates how the building will be harmonious with the residential dwelling units. Shutters around the windows on the rear and front elevations, as well as the height of the building will provide a compatibility with the proposed and existing residential dwellings. The roof will also be shingled and shingles are typically the primary roof material found on residential dwellings.

4. Details related to underground utility services will be addressed in detailed construction drawings.

b. *Relationship to buildings and site to adjoining areas*

1. Attractive landscape transitions to adjoining properties are being provided in the development's perimeter buffers and open space areas, which include environmentally sensitive lands within the northern panhandle portion and the unnamed stream corridor and associated areas of steep slopes located in the eastern portion of the site
2. A lighting plan demonstrating the intensity at the property lines adjacent to residential uses will be submitted with detailed construction drawings.

c. *Building design*

1. Architectural style is not restricted. The buildings shown in the Appendix, as well as the anticipated residential dwellings will be compatible with the proposed and existing development. Both the pool cabana and mixed use elevations included in the Appendix demonstrate that they will be in scale the proposed residential development.
2. Further specific items related to the building design of the plan will be submitted with detailed construction drawings.
3. Further specific items related to the building design of the plan will be submitted with detailed construction drawings.
4. Items related to the non-residential aspects (i.e. screening of mechanical equipment, utility hardware, etc.) of the plan will be submitted with detailed construction drawings.
5. An exterior lighting plan will be submitted with detailed construction drawings.
6. Items related to the non-residential aspects (i.e. recycling and waste removal areas, service yards, etc.) of the plan will be submitted with detailed construction drawings.
7. Appendix B demonstrates the variation of form, detail and material to create visual interest. The change in roof heights and pitches are just one example of how the variation in the building provides for visual interest.

d. *Landscaping and site treatment*

1. Natural or existing topographic patterns contributing to the beauty of the development have been considered in the design of Forest Ridge. For example, note that the plan has sought to preserve the

two most environmentally sensitive areas on the site: (1) the northern panhandle portion of the site, which includes steep slopes where the site drops down to Cates Creek and the Eno River, and (2) the unnamed stream corridor and associated areas of steep slopes located in the eastern portion of the site.

2. Grades of walks, parking spaces, terraces, and other paved areas provide an inviting and stable appearance.
3. Parking lot landscaping has been proposed in an effort to beautify and provide shade for the parking lots associated with the Mixed Use Building and the Recreation Center. As mentioned in the Project Overview, Front Yard Tree Planting Program, in an effort to ensure that every front yard will have trees, the developer proposes to either preserve existing trees in accordance with the guidelines outlined in Section 4.7.2(c) of the Town's Subdivision Ordinance or to install new trees in accordance with Section 4.7.3(a) of the Town's Subdivision Ordinance.
4. A specific planting plan identifying the different plant varieties will be submitted with detailed construction drawings. However, typically in an attempt to provide unity of design and repetition of plant varieties, the same plant variety will be planted along each street. Unity is also provided by considering plant spacing. By providing a typical spacing standard, unity is achieved through the appearance of each street planting within the development.
5. A specific planting plan identifying the different plant varieties will be submitted with detailed construction drawings.
6. Currently, the street trees are proposed to be planted behind the sidewalks in the lots, the sidewalk will help minimize vehicular damage.
7. Parking lot landscaping has been proposed in an effort to beautify and provide shade for the parking lots associated with the Mixed Use Building and the Recreation Center.
8. Items related to the landscaped screenings of service yards and other unsightly places will be submitted with detailed construction drawings.

e. *Signs*

1. We request that design and visual relationship to buildings and surroundings for signs be submitted with detailed construction drawings.
2. We request that architectural design for signs be submitted with detailed construction drawings.
3. We request that colors, materials and lighting details for signs be submitted with detailed construction drawings.
4. We request that specific number of graphic elements for signs be submitted with detailed construction drawings.
5. We request that heights and mounting details for signs be submitted with detailed construction drawings.

f. *Maintenance, planning and design factors*

1. More information related to the materials and finishes selected for durability, wear, and beauty will be discussed during staff's review of detailed construction drawings.
2. More information related to the cleaning of buildings and structures and control of dirt and refuse will be discussed during staff's review of detailed construction drawings.

g. *Transportation network capacity*

A Traffic Impact Assessment (TIA) was prepared in June 2005 and recently updated by CH Engineering.

C. Specific Standards by use:

Since specific uses to be located within the mixed use building are currently not known, any specific use standards that may be applicable in the future are not able to be addressed at this time. Any future specific use standards that may be applicable will be addressed once the uses operating in the mixed use building are known.

### Detailed Description of Development Program

	13,000+ SF Lots	9,200+ SF Lots	6,000+ SF Lots	Townhomes	Mixed Use Building
Land Use(s)	Residential	Residential	Residential	Residential	Office & Retail
Typical Lot Width	95'	75'	60'	20'	
Minimum Lot Width	80'	60'	55'	18'	100'
Typical Lot Depth	140'	125'	110'	75'	
Minimum Lot Depth	125'	115'	100'	70'	200'
Maximum Floor Area	---	---	---	---	28,000 SF
Number of Dwelling Units	72	71	52	38	---
Front Setbacks (minimum)	25'	20'	10'	20'	50' (from US 70)
Rear Yard (minimum)	20'	20'	5' to alley	5'	20'
Side Yard (minimum)	10'	5' minimum 15' aggregate	3' minimum 8' aggregate	10' (between bldgs.)	20'
Building Height (max.)	45'	45'	45'	45'	50'



**LEGEND**

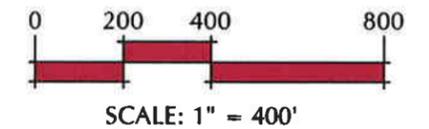
- SLOPES 0% TO 5% (+/- 18.3 AC.)
- SLOPES 5% TO 12% (+/- 43.9 AC.)
- SLOPES 12% TO 20% (+/- 33.5 AC.)
- SLOPES 20% OR MORE (+/- 18.4 AC.)
- FLOW DRAINAGE PATTERNS
- SOIL LIMIT BOUNDARY

**SOIL TYPES**

- Aa ALTAVISTA FINE SAND LOAM, 0-3% SLOPES
- Cp CONGAREE FINE SANDY LOAM
- GeB GEORGEVILLE SILT LOAM, 2-6% SLOPES
- GeC GEORGEVILLE SILT LOAM, 6-10% SLOPES
- GID GOLDSTON SALTY SILT LOAM, 6-15% SLOPES
- GIF GOLDSTON SALTY SILT LOAM, 15-45% SLOPES
- Hrc HERNDON SILT LOAM, 6-10% SLOPES
- TaD TATUM SILT LOAM, 8-15% SLOPES

**VEGETATION/MISC.**

THE SITE IS COVERED WITH HARDWOODS RANGING IN CALIPER FROM 2" TO 14" AND A FEW SCATTERED PINE TREES. THERE ARE A LOT OF TREES DOWN DUE TO HURRICANE FRAN (1996). A GRAVEL ROAD RUNS FROM NORTH TO SOUTH, BISECTING THE SITE AND PROVIDING ACCESS TO A TOWN OF HILLSBOROUGH GROUND WATER TANK.



APPENDIX A-1  
SITE ANALYSIS MAP

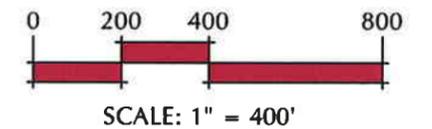
**FOREST RIDGE - HILLSBOROUGH**

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS



**LEGEND**

-  SLOPES 0% TO 8% (+/- 37.8 AC.)
-  SLOPES 8% TO 15% (+/- 41.0 AC.)
-  SLOPES 15% OR MORE (+/- 35.2 AC.)



**MATERIAL LIST**

**CENTER UNIT**

BRICK: OLD BRASSBORG (RED/NOV) WITH TAN GROUT  
 OR HARDPLANK SIDING (OFF WHITE WITH WHITE TRIM)  
 WINDOW TRIM: WOOD SIDING/SHIMS INCLUDING JACK ARCHES, KEYS, CURVE TOPS (OFF WHITE COLOR)  
 COLUMN: FINE COLUMN (FLUTED TRIM BOARD) (OFF WHITE COLOR)  
 CUPOLA: WOOD SIDING (OFF WHITE COLOR) WITH COPPER OR BLACK METAL ROOF  
 RAILS: WOOD/STAIN (BLACK)

**END UNIT**

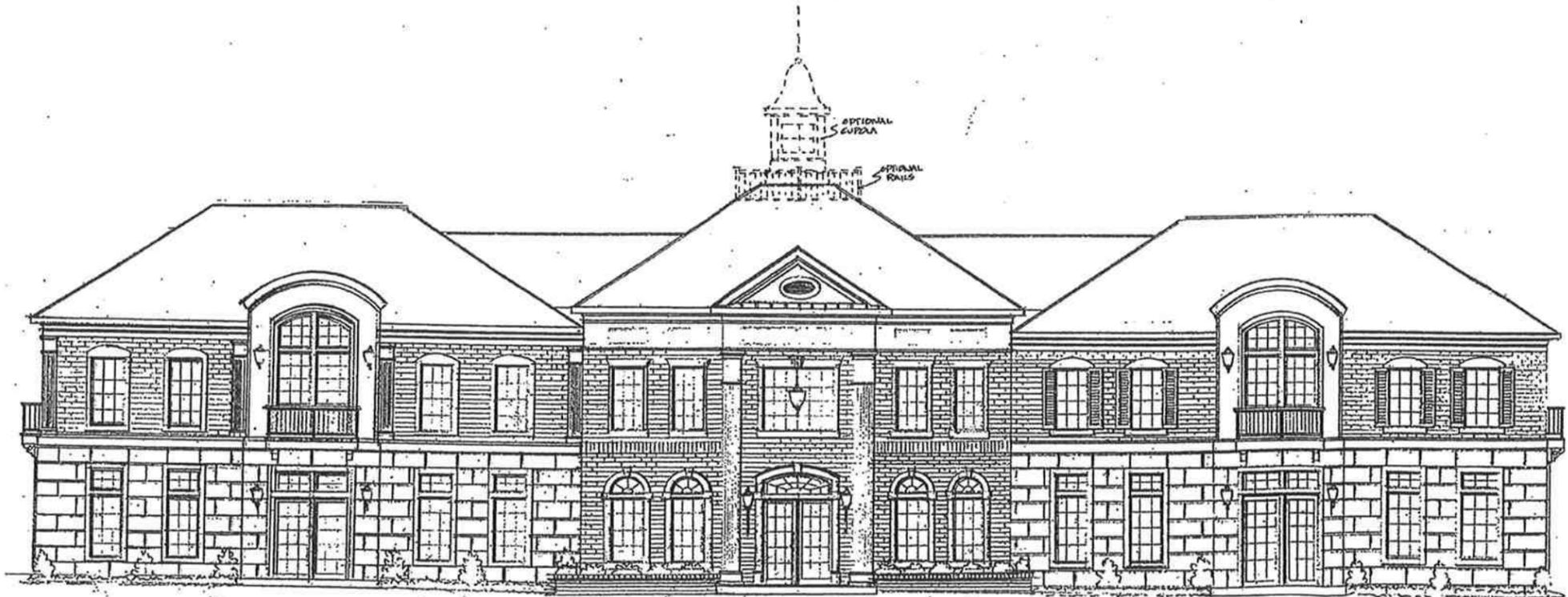
CONCRETE: 1st FLOOR STAINED OR CAST @ 50% 20" (TAN TRIM COLOR) (TAN GROUT)  
 BRICK: 2nd FLOOR (TAN/NOV) WITH TAN GROUT  
 WINDOW TRIM: 1st FLOOR CAST CONCRETE (TAN TRIM)  
 2nd FLOOR WOOD SIDING/SHIMS (OFF WHITE COLOR)  
 COLUMN: FINE COLUMN (FLUTED TRIM BOARD) (WHERE APPLICABLE)  
 RAFTERS: BLACK (WHERE APPLICABLE)  
 CENTER FACADE: SMOOTH BOARD PAINTER TAB  
 RAILS: WOOD/STAIN (BLACK)

**ROOF**

MAIN ROOF: SHINGLES (WEATHER WOOD) THROUGH OUT  
 DORMERS: COPPER OR BLACK METAL ROOF INCLUDING SOFT ARCH ROOFS  
 WATER TABLE: COPPER OR BLACK METAL ROOF

**LIGHT FIXTURES**

ANTIQUE FIXTURES (TO BUY) (BLACK)



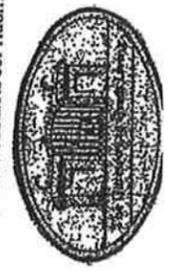
**FRONT ELEVATION # 1**

SCALE: 1/8" = 1'-0"

**APPENDIX B**  
**FOREST RIDGE**  
 Hillsborough, North Carolina  
**MIXED USE BUILDING**

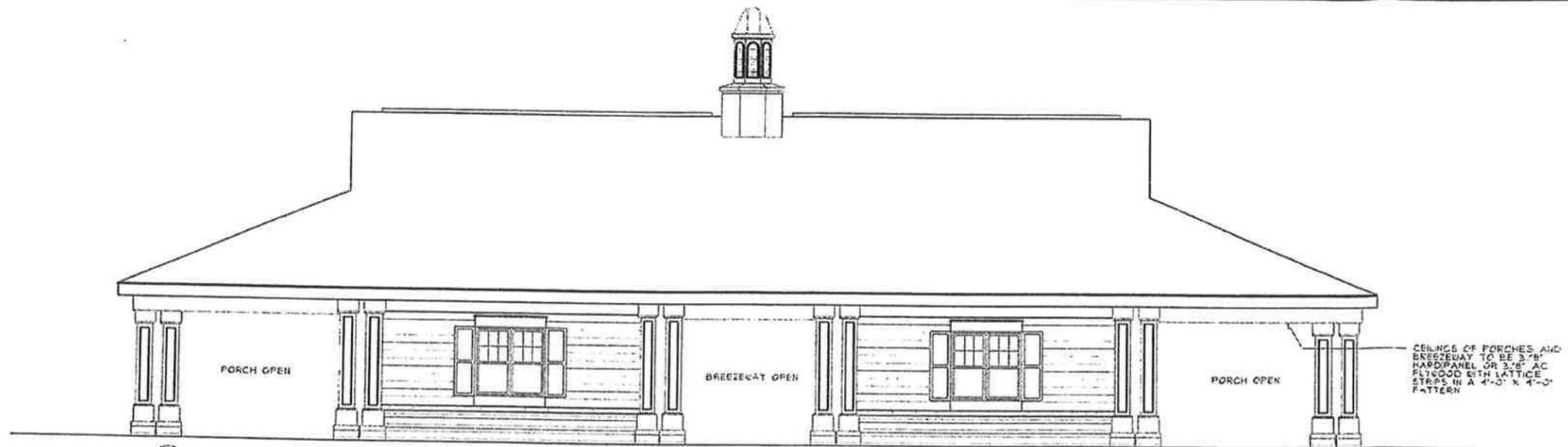
COPYRIGHT 2005 LIFESTYLE DESIGNS  
 ALL RIGHTS RESERVED

If this above seal is not in red ink, these plans are considered fraudulent and will be prosecuted to the fullest extent of the FEDERAL COPYRIGHT ACT

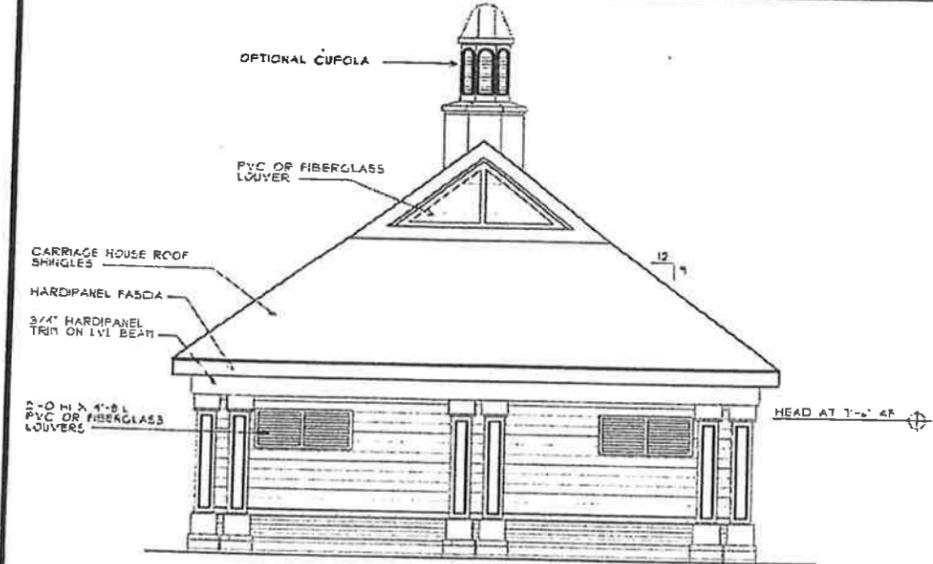


**LIFESTYLE DESIGNS**  
 1939 High House Road # 155 Cary, NC 27519 (919) 337-7818 FAX (919) 387-0850

DRAWN BY:  
 DATE:  
 CHECK BY:  
 DATE:  
 REVISION:  
 DATE:



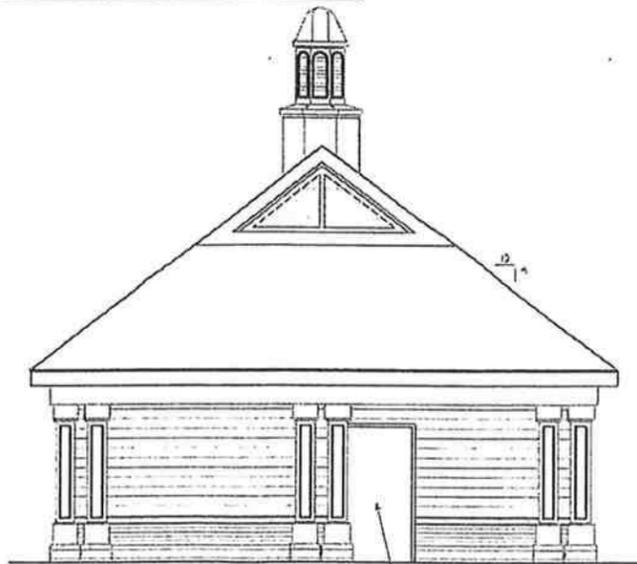
4 REAR ELEVATION  
A-1 1/4" = 1'-0"



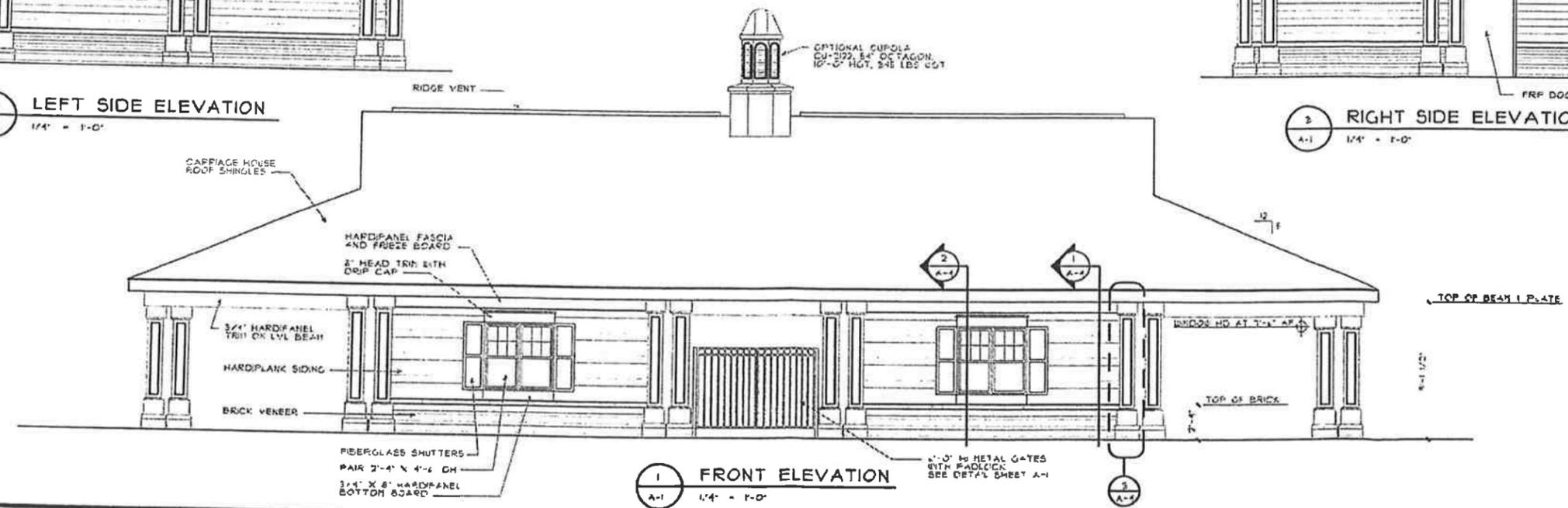
2 LEFT SIDE ELEVATION  
A-1 1/4" = 1'-0"

**EXTERIOR COLORS**

FACE BRICK:	GENERAL SHALE "PHOENIX" OR LEE "SCOTSDALE"
ROOF SHINGLES:	CERTAINTED HORIZON "SHADOW BLACK"
SIDING PAINT:	SHERWIN WILLIAMS "ANTIQUE WHITE"
SHUTTERS:	BLACK



3 RIGHT SIDE ELEVATION  
A-1 1/4" = 1'-0"



1 FRONT ELEVATION  
A-1 1/4" = 1'-0"

WILLIAM ROBERT WAKEHAM  
ARCHITECT

107 LAKE CLIFF COURT  
CARY, NORTH CAROLINA 27513  
TELEPHONE 919 468 7220

DATE	DESCRIPTION	REV.
	RELEASED FOR CONSTRUCTION	

POOL CABANA  
FOREST RIDGE  
HILLSBOROUGH, NC  
APPENDIX C

A-1

JOB NAME

## IDENTIFICATION AND LOCATION OF PROPERTY

The FOREST RIDGE property is located on US 70 Business (US 70A) in Orange County. The entire property lies north of road. See tax map 4.37.c.21 and 4.40.B.1

## GENERAL DESCRIPTION OF PROPERTY

This property contains approximately 118.77 acres. There are no ponds on the property. There are no fields on the property. This tract is best described as the "tale of two properties". Both tracts are long and narrow. Tract 1 is oriented in a north-south direction and tract 2 is oriented in an east-west direction. The main drainage on this tract runs toward the Eno River. There is no evidence of forest management for the last 25 years. Both blocks are referred to in forestry terms as a "climax forest". Forest succession goes from disaster species such as pine, which is intolerant of shade to a final stage called the oak/hickory forest, which is the climax stage. Both blocks are over mature. The trees have reached an age where their growth rate has declined and their health is starting to suffer. Block 1 received very little damage from Hurricane Fran whereas block 2 was severely damaged by the hurricane. Recent photographs show this damage.

Photograph 1 was taken facing downhill toward the Eno River. This was an attempt to show the steepness of the grade.

Photograph 2 was taken facing northwest from the corner where the designation of two blocks lies. This is of the only real pine stand on the property.

Photographs 3-6 were taken from the center of the western half of block 2. Photographs are facing north, east, south, west respectively. This gives a 360-degree view of the hurricane damage.

Photographs 7-10 were taken from the center of the eastern half of block 2. Photographs are facing north, east, south, west respectively. This gives a 360-degree view of the hurricane damage.

Photograph 11 was also taken on block 2. This photograph shows the continuing damage from Hurricane Fran. This also shows the potential danger that waits on the property.

## DISCUSSION OF TIMBER TYPE AREAS

### Block "HP": "Hardwood/Pine #1"

This block is a natural stand of 70+-year-old hardwood and pine. The block is long and narrow oriented in a north-south direction. The topography is rolling except for the north end of the property where it becomes extremely steep. Most of the hardwood is white oak with some red oak, maple, yellow poplar, sweetgum and hickory. Most of the pine is loblolly with a few stems of shortleaf and a small block of Virginia pine on the bluff overlooking the Eno River. There is virtually no undergrowth. The tract is mostly very open underneath the over mature trees. The height of the main canopy is 60 to 70 feet. DBH (Diameter Breast Height-4.5 feet) is from 2 to 32 inches. The average DBH of sawtimber trees is about 18 inches. The understory consists of sourwood, white oak, dogwood and red maple.

Block "H":  
"Hardwood Area #2"

This block is a natural stand that consists almost entirely of hardwood. This block is long and narrow oriented in an east-west direction. The majority of this block is a ridge top. This block was severely damage by Hurricane Fran back in 1996. Many thousands of board feet of timber were lost. There was no attempt to salvage the downed trees. Trees are still falling as a result of Hurricane Fran. Like Block "HP", the age of this block is also 70+ years. DBH in this block ranges from 2 to 36 inches. The average DBH of sawtimber trees is about 19 inches. The area is very open with the only understory tree being dogwood. The height of the main canopy is about 60 to 70 feet.



1



2



3



4



5



6



7



8



9



10



11



12

# Traffic Impact Assessment

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For  
Forest Ridge Subdivision  
HILLSBOROUGH, ORANGE COUNTY

**119** acres: Zoned R-1  
North of US 70 Business between Elizabeth Brady Road and  
Lawrence Road

OWNER:  
W & W Partners, Inc.  
1000 Darrington Drive, Suite 105  
Cary, North Carolina 27513



Prepared By:



CH Engineering, PLLC  
3200 Glen Royal Drive  
Raleigh, NC 27617  
February 13, 2009

## Executive Summary

The development consists of approximately 119 acres of land currently zoned R-1 (Rural Residential) located in Hillsborough, Orange County. The proposed zoning is Medium Density Residential. It borders north side of US 70A approximately 0.3 miles east of NC 86. See **Figure 1** for overall site location and layout. The proposed development will be comprised of 215 lots of single family residential, 32 town homes, and 20,000 square feet of mixed-use office/retail. Traffic generation for the proposed development is based upon land uses and rates found within the Institute of Transportation Engineers Trip Generation Manual 8th Edition. The following land use descriptions and codes were used in evaluating the impact of the proposed development:

- Single Family Detached Residential ITE CODE (210)
- Townhouses ITE CODE (230)
- Medical/Dental Office ITE CODE (720)

A capacity analysis was conducted at the four existing intersections and the proposed intersections proposed by this development as shown in Figure 5. The results of this analysis can be found in the following report. In summary, the signal at US 70A and NC 86/Elizabeth Brady Rd. has improved the operational nature of this corridor since its installation. The signal currently operates at LOS B and is not expected to change significantly in operation in 2015 under the traffic growth rate that was assumed and with the new traffic from the proposed development. Although not necessary, the operation of this intersection could be improved by the addition of a westbound exclusive left turn lane. Ironically, the signal heads are in place to accommodate such.

In 2009 and 2015 the only apparent problem existing is at the intersection of Lawrence Rd. and US 70A. The side street of Lawrence is stopped controlled and experiences an existing LOS E and is expected to drop to LOS F in 2015 with or without the addition of the proposed development traffic. With the addition of left turn lanes on the high volume approaches the delay was reduced but the LOS was not improved significantly. The addition of signalization would greatly improve it, therefore it is recommended that NCDOT monitor this intersection with consideration for adding a signal in the future as a safety improvement project

Based on a previous conversation with the NCDOT District Engineer's office, it was agreed that a left turn lane should be constructed at Access 1, but that due to right-of-way considerations, a left turn lane will not be required at Access 2. The left turn will operate at an acceptable Level of Service without a separate left turn lane. It is expected that the large majority of the left turns will enter the development at Access Point 1.

Recommended lane additions are shown in Figure 8.

## I. Introduction

The development consists of approximately 119 acres of land currently zoned R-1 (Rural Residential) located in Hillsborough, Orange County. The proposed zoning is Medium Density Residential. It borders north side of US 70A approximately 0.3 miles east of NC 86. See **Figure 1** for overall site location and layout. The proposed development will be comprised of 215 lots of single family residential, 32 town homes, and 20,000 square feet of mixed use office/retail. Two access points are proposed onto US 70A. Traffic generation for the proposed development is based upon land uses and rates found within the Institute of Transportation Engineers Trip Generation Manual 8th Edition. The following land use descriptions and codes were used in evaluating the impact of the proposed development:

- Single Family Detached Residential ITE CODE (210)
- Townhouses ITE CODE (230)
- Medical/Dental Office ITE CODE (720)

## II. Accessibility

Two entrances onto US 70A are proposed for the development. Access 1 (western most) is located approximately 1200 feet east of the US 70A intersection with NC 86. Access 2 is located approximately 1775 feet east of Access 1, and approximately 350 feet east of Meadowland Drive. See **Figure 1** for the subdivision street proposed layout.

## III. Existing Conditions

In addition to the proposed site entrances the following intersections are included in this study:

- US 70A at NC 86
- US 70A at Meadowland Drive West
- US 70A at Meadowland Drive East
- US 70A at Lawrence Road

**Figure 5** depicts the existing lane configurations at each of the intersections.

US 70A in the vicinity of the proposed site is a two-lane, two-way facility with a posted speed limit of 40 mph. The North Carolina Department of Transportation classifies the roadway as a major collector. NC 86 is a two-lane, two-way roadway with a posted speed limit of 45 mph. The North Carolina Department of Transportation classifies the roadway as a minor arterial.

The intersection of US 70A and NC 86 is controlled by a signal, which was installed after the extension of Elizabeth Brady Road to the north into an industrial development. The signal is actuated with up to 3 phases during each cycle. Separate left turn lanes exist on the north and south approaches. An exclusive left turn arrow is allocated to the eastbound approach.

Meadowland Drive is a loop road, which intersects US 70A at two separate locations on the south side at approximately 800 feet apart. Triangle Sports complex and several other businesses are located along this loop road. The westernmost access onto US 70 has been improved to include a right turn and left turn lane on US 70. Meadowland is a median divided road with room for two narrow outbound lanes. The eastern intersection of Meadowland includes improvements of a right turn lane on US 70.

The Lawrence Road intersection with US 70A is a four-lane approach with basic two-lane two-way approaches. It is controlled by a flashing yellow and red signal on a span wire over the intersection with US 70 granted the right of way with a flashing yellow. All four approaches are See **Figure 5** for existing lane configurations at intersections.

#### **IV. Existing Traffic**

Peak hour traffic counts were taken at the subject intersections during the weekdays between 1/23/09 and 2/6/09 assuring that counts were obtained during days of normal school operation. In 2005 traffic counts were obtained at these same intersections and with the exception of the addition of the traffic signal at NC 86 and US70A/Elizabeth Brady Rd. things have not changed significantly. **Figure 2** represents the existing AM/PM peak hour volumes, which were counted in 2005 and 2009, respectively. Contrary to what would be expected no apparent increase in traffic occurred over the 4 year period.

#### **V. Projected Traffic Volumes:**

Based upon the observation of the traffic on US70A from the counts taken in 2005 and 2009 the annual growth rate during this period was 0%. The Town of Hillsborough's financial model projects to 2015, therefore this was used as the buildout year. As a liberal estimate of future traffic the 2009 traffic was projected forward to 2015 applying an annual growth rate of 2.0% and is shown in **Figure 3**.

#### **VI. Planned Roadway Improvements**

The North Carolina Department of Transportation currently has project U-3808 listed in the Transportation Improvement Program. The project description states: Elizabeth Brady Road Extension, south of US 70A to north of US 70 Bypass at SR 1002 (St. Mary's Road). Multi-lanes with a new crossing of Eno River. It is shown as currently in the planning and design phase with construction scheduled for 2011. This will change the traffic patterns on US 70A and NC 86, but it will be post build out year.

#### **VII. Proposed Build Out and Land Uses**

The development is proposed to consist of 247 total dwelling units (215 single family and 32 town homes), and 20,000 square feet of mixed-use office/retail. The Office/retail use was assumed to be medical/dental office as a maximum traffic generator during the AM/PM peak.

## VIII. Trip Generation

**Table 1** represents a breakdown of the traffic that might be generated by the proposed development as described based upon the 8<sup>th</sup> Edition of ITE trip generation. In suburban and CBD areas traffic has daily peak hours of operation, which are usually concentrated around the morning and evening commute to work. When a development is residential its impact on the peak hour of adjacent street traffic occurs in both the AM and PM peak hours, corresponding to the morning and afternoon commute to and from work. The specialty retail has impact only during the PM peak hour. Impact in the AM peak is negligible. Trip generation calculations are included in the **Appendix**.

**Table 1 – Traffic Volumes**

Land Use (ITE Code)	Units	ADT	AM Peak			PM Peak		
			Enter	Exit	Total	Enter	Exit	Total
Single Family (210)	215	2103	40	120	160	132	77	209
Townhouses (230)	32	239	4	17	21	16	8	24
Office-Med./Den. (720)	20	723	37	10	47	18	50	68
Totals		2850	81	146	227	166	135	301

The proposed development is projected to generate on the average 2850 trips per day, or slightly less than 11 trips per unit. The corresponding AM and PM total peak hour trip generation is 227 (AM) and 301 (PM). These trips will all be considered new trips, since the trips result from an origin or destination of a new resident in the subdivision. All of the trips were applied as a direct increase in the surrounding roadway traffic.

## IX. Trip Distribution:

Trip distribution was based on an evaluation of where the am destinations might be for the predominant residential traffic departing the subdivision. With the Town of Hillsborough and Mebane to the west and Chapel Hill to the south it is reasonable to assume that a majority of the traffic would head west through the intersection of US 70A and NC 86. Eastbound traffic would be headed toward RTP and Durham. There is a fraction of the traffic that might be destined to the Triangle Sports Complex and the surrounding businesses within this park. **Figures 4 and 5** show the proposed site trip distribution.

## X. Projected Total Traffic Volumes:

Traffic generated by the proposed development is shown on **Figure 6**. This site generated traffic was then added to the 2009 projected background traffic. The results of this are depicted on **Figure 7**.

## XI. Analysis:

In analysis of intersections, average vehicle delay is used as a measure of operating efficiency. The operational efficiency is broken down into categories called "Levels of Service" corresponding to the magnitude of delays. The following table summarizes how Level of Service relates to average vehicle delay:

LOS	Description	Signalized Delay	Un-signalized Delay
A	Little or no delay	< 10 sec.	< 10 sec.
B	Short delays	10-20 sec.	10-15 sec.
C	Average delay	20-35 sec.	15-25 sec.
D	Approaching long delays	35-55 sec.	25-35 sec.
E	Consistently long extended delays	55-80 sec.	35-50 sec.
F	Unacceptable delays	>80 sec.	>50 sec.

A capacity analysis was conducted at the four intersections listed previously in Section II using Synchro Software. The analysis was performed for the existing 2009 conditions and year 2015 no-build scenario as well as the 2015 build condition. The delay shown for the signalized intersection is the "intersection signal delay". The delay shown for unsignalized intersections is the weighted average of the control delay for each approach lane. The results of these analyses are shown in **Tables 2 through 4**.

**Table 2 – Existing Traffic LOS (Delay – secs.)**

	2009	
	AM Peak	PM Peak
US 70A at NC 86 (signalized)	B (16.4)	B (19.7)
US 70A at Access 1	N/A	N/A
US 70A at Meadowland Dr (west)		
• Northbound approach	B (12.5)	B (12.3)
• Westbound Left	A (8.1)	A (7.9)
US 70A at Access 2	N/A	N/A
US 70A at Meadowland Dr (east)		
• Northbound approach	B (10.2)	B (11.7)
• Westbound Left	A (1.4)	A (1.3)
US 70A at Lawrence Rd		
• Northbound approach (weighted avg.)	C (17.3)	E (38.3)
• Southbound approach (weighted avg.)	C (15.7)	C (16.9)
• Eastbound approach (weighted avg.)	A (3.5)	A (5.1)
• Westbound approach (weighted avg.)	A (1.5)	A (1.7)

**Table 3 – 2015 Projected Background Traffic – NO BUILD (no improvements) - LOS (Delay – secs.)**

	2015	
	AM Peak	PM Peak
US 70A at NC 86 (signalized)	B (19.6)	C (25.6)
US 70A at Access 1	N/A	N/A
US 70A at Meadowland Dr (west)		
• Northbound approach	B (13.4)	B (13.4)
• Westbound Left	A (8.2)	A (8.0)
US 70A at Access 2	N/A	N/A
US 70A at Meadowland Dr (east)		
• Northbound approach	B (10.5)	B (12.5)
• Westbound Left	A (1.4)	A (1.4)
US 70A at Lawrence Rd		
• Northbound approach (weighted avg.)	C (21.2)	F (73.7)/E(48)
• Southbound approach (weighted avg.)	C (18.8)	C (21.4)
• Eastbound approach (weighted avg.)	A (3.5)	A (5.2)/A(4.7)
• Westbound approach (weighted avg.)	A (1.5)	A (1.7)

**Table 4 – 2015 BUILD - Total Traffic LOS (Delay – secs.)**

	2015	
	AM Peak	PM Peak
US 70A at NC 86 (signalized)	B (19.5)	C (29.4)/B(19.7)
US 70A at Access 1		
• Southbound Left	C (18.0)	C (20.7)
• Southbound Right	B (11.2)	B (11.5)
• Eastbound Left	A (8.3)	A (8.6)
US 70A at Meadowland Dr (west)		
• Northbound approach	B (15.0)	C (15.5)
• Westbound Left	A (8.3)	A (8.1)
US 70A at Access 2		
• Southbound Left	B (12.6)	B (13.4)
• Southbound Right	B (10.2)	B (10.0)
• Eastbound approach	A (0.4)	A (0.6)
US 70A at Meadowland Dr (east)		
• Northbound approach	B (11.5)	B (12.1)
• Westbound Left	A (1.3)	A (1.1)
US 70A at Lawrence Rd		
• Northbound approach (weighted avg.)	D (28.7)	F (204)/F(122)
• Southbound approach (weighted avg.)	C (23.9)	F (err)/F(err)
• Eastbound approach (weighted avg.)	A (3.4)	A (5.4)
• Westbound approach (weighted avg.)	A (1.4)	A (1.1)

Signalization of US 70A and Lawrence Rd. will result in a LOS B with 13.9 seconds of delay.

## **XII. Mitigation:**

According to the North Carolina Department of Transportation Policy on Street and Driveway Access to North Carolina Highways:

“The applicant shall be required to *identify* mitigation improvements to the roadway network if at least one of the following conditions exists when comparing base network conditions to project conditions:

- The total average delay at an intersection or individual approach increases by 25% or greater, while maintaining the same level of service,
- The level of service degrades by at least one level,
- Or level of service :F”.

For turning lanes, mitigation improvements shall be identified when the analysis indicates that the 95<sup>th</sup> percentile queue exceeds the storage capacity of the existing lane. *The District Engineer will be responsible for final determination of mitigation improvements required to be constructed by the applicant.*”

A memo from the NCDOT District Engineer’s office dated August 5, 2005 addressed the potential impacts of this development based upon the review of a previously submitted Traffic Impact Assessment. Recommendations in this memo included aligning Access 1 with at that time a proposed Owl’s Wood development located on the south side of US 70A and construct an exclusive 100’ left turn lane with appropriate tapers. Parking and intersecting drives onto Access 1 should be prohibited within 200’ of the intersection with US 70A. Record of an Owl’s Wood development approval could not be found, hence the proposed Access 1 was located over 1400 feet west of the opposing existing entrance to Meadowland Drive, thereby eliminating turning conflicts. Except for the alignment the same recommendations were made for Access 2. The left turn lane at Access 2 would require extending the left turn into Meadowlands Drive to create a continuous left turn lane of approximately 350 feet in length. The existing taper would need to be modified to the east to accommodate this extension. These recommendations are reflected in Figure 8.

### **Summary of Corridor Operational Characteristics**

The signal at US 70A and NC 86/Elizabeth Brady Rd. has improved the operational nature of this corridor since its installation. A previous study of this corridor in 2005 resulted in a LOS F at this intersection under un-signalized conditions. Note that the signal currently operates at LOS B and is not expected to change significantly in operation in 2015 under the traffic growth that was assumed. When the proposed development traffic was added to the intersection delay did not increase significantly. Although not necessary the operation of this intersection could be improved by the addition of a westbound exclusive left turn lane. Ironically, the signal heads are in place to accommodate such.

Between 2009 and 2015 the only apparent problem existing is at the intersection of Lawrence Rd. and US 70A. The problem is predominately in the PM peak hour where the LOS on the stopped controlled approaches to this intersection is at an existing LOS E and is expected to drop to LOS F with or without the addition of the proposed development traffic. With the addition of turn lanes on the high volume approaches the delay was reduced but the LOS was not improved overall. The only thing that will bring this intersection into an acceptable LOS D or better would be a signal. It is noted that a signal would result in a LOS B.

### **XIII. Recommendations:**

Based the August 5, 2005 memo from NCDOT an exclusive left turn lane should be constructed at Access 1, and at Access 2 the existing left turn lane into Meadowlands should be extended to provide an exclusive left turn into Access 2. Appropriate left turn tapers shall be provided and designed for 40 mph. Both Access points should be evaluated to eliminate intersecting drives within 200 feet of the US 70A intersection. It is expected that the large majority of the left turns will enter the development at Access Point 1. After evaluation of the left turn queue in the existing left turn lane to Meadowland west, it was determined that there is minimum likelihood of overlapping conflicts in left turns. Right turn lanes are not recommended because of the limited amount of right turning traffic expected into the proposed access points.

Once the Elizabeth Brady Road Extension is completed, traffic patterns are likely to change considerably. Traffic utilizing Lawrence Road from the north in order to access NC 86 will have a more convenient route using the new extension. Thus reducing traffic on Lawrence Road and US 70A. Addition of lanes at Lawrence Rd. does not improve the operation of this intersection significantly, however the addition of signalization would greatly improve it. If the extension of Elizabeth Brady Road is not planned for implementation in the foreseeable future, it is recommended that NCDOT consider adding signalization at this intersection as a safety improvement project.

Recommended improvements are shown in Figure 8.