Z-19-12 – Homewood Banks Drive & Blue Ridge Road, Conditional Use – located on the corner of Homewood Banks Drive & Blue Ridge Road, west of Crabtree Valley Avenue, being Wake County PIN 0795580999, 0795594347, 0795583726, 0795488454, 0795580406, & 0795598141. Approximately 23.75 acres are requested to be rezoned from Shopping Center and Office & Institution-2 with Planned Development Overlay District to Shopping Center and Office & Institution-2 with Planned Development Overlay District (with new Master Plan). The proposed condition requires all development to be in accordance with the revised Master Plan.

Conditions Dated: 06/12/12

Conditional Use District requested:

Narrative of conditions being requested:

1. All development will be in accordance with the revised Master Plan which is attached hereto.

Crabtree Village

Raleigh, North Carolina

A Mixed-Use Urban Community

Planned Development District

Revised Master Plan

July 3, 2012
MP-1-12
Amending and Restating that Master Plan, denominated MP-4-05, approved November 21, 2006

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Section 1 - Summary Information

Property Owner:

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Jacksonville, FL 32207-5633

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801 Jones Franklin Road, Suite 300
Raleigh, NC 27606-3394

Section 2 - Property Information

The subject property is a triangular shaped land assemblage comprised of six (6) existing contiguous parcels bound by the following roads: Crabtree Valley Avenue to the north, Blue Ridge Road to the east, and Homewood Banks Drive to the west. It is anticipated that some of the lots will be recombined in the future. The property assemblage is approximately 23.75 acres in size, and is currently zoned Office and Institution – II (O&I-2), and Shopping Center (SC) with Planned Development Overlay District. The property falls within the City of Raleigh's Crabtree Valley Small Area which provides specific recommendations for the development of this site:

- Provide for extensive pedestrian connectivity
- Create a walkable urban community
- Provide a mix of uses in close proximity
- Site design shall incorporate multiple levels to utilize the change in topography

The subject parcel is located across Crabtree Valley Avenue from Crabtree Valley Mall, a regional shopping destination for the Triangle area and eastern North Carolina. This area offers many opportunities for shopping, work, recreation and housing and has ready access to many major roads including Interstate 440, Glenwood Avenue (U.S. Highway 70), Creedmoor Road, Blue Ridge Road and Edwards Mill Road.

The property is physically imposing, with over one hundred feet (100') of topographic grade change, providing expansive views of the Crabtree Creek Valley and the horizon beyond. House Creek crosses the northeast corner of the property, connecting to the larger Crabtree Creek on the Mall's property.

Several innovative developments are currently underway or contemplated in the Crabtree Creek Valley, and include a mixed use development to be executed by Weingarten Realty, proposed mixed use development on the north side of Glenwood Avenue and further development of Glen Lake Office Park and Residential neighborhood.

Nearby recreation opportunities are provided by the award-winning Crabtree Creek Greenway developed by the City of Raleigh, and nearby Glen Eden Pilot Park, which has been connected to the subject parcel via the recently constructed House Creek Greenway Trail.

Section 3 - Land Use & Intensity

A. Residential Buildings 1-6
Maximum 315 dwelling units
Minimum 275 dwelling units

The overall residential density for Crabtree Village will be capped at twenty-three dwelling units per acre (23 du/acre) for the entire property (23.75 acres), which yields a maximum of 525 Dwelling Units. A maximum of 315 dwelling units are proposed in Buildings 1-6 in Phase I of the development. The residential uses proposed for Crabtree Village will be

primarily apartments and condominiums containing studios, one, two and three bedroom dwelling units oriented around private courtyards offering recreation and private, secured open space reserved for residents. Phase I will include primarily apartments and/or condominiums and possibly a small amount of service retail which shall be either (i) developed as Residential Related Retail which shall mean service and retail uses serving multi-family residential developments which do not allow on-premises alcohol consumption ("Residential Retail") within that portion of the Property zoned O&I-II; or (ii) other retail development within that portion of the Property zoned SC, and office uses, and Phases II and III may contain additional dwelling units, subject to the overall residential cap of 525 dwelling units. These additional residential units in Phases II and III may include congregate care rooms, apartments, or residential condominiums.

B. Tower/Mixed Use Buildings. The Crabtree Village development proposes one or more building(s) with more than one land use, possibly including a tower building, not to exceed two hundred feet (200') in height. It is currently assumed that these buildings will be built as a later phase, apart from the initial residential components.

Building 7 (Tower) and Buildings 8-10 (exact number of buildings to be determined)

1. Retail

   Minimum 15,000 square feet (including at least one eating establishment)
   Maximum 60,000 square feet

   Only the following types of retail (and as defined by the City of Raleigh Code Section 10-2071) may be included:

   -Accessory Structures
   -Bank
   -Bar, Nightclub, Tavern or Lounge
   -Beauty, Nail and Manicure; Cosmetic Art; Barbershop
   -Eating Establishment with no Drive-Thru
   -Food Store – Retail
   -Movie Theater – Indoor
   -Retail Sales -Residential Related Services
   -Retail Sales – Personal Services
   -Retail Sales – Convenience
   -Retail Sales - General
   -Retail Brokerage Office
   -Telecommunications Tower

   The retail proposed for Crabtree Village envisions a variety of shopping venues including at least one (1) eating establishment to serve residents of the community, but also the visitors to the regional shopping destination, Crabtree Valley Mall. Retail shops varying in size shall provide a variety of shopping opportunities; no single retail user or retail tenant shall exceed 39,000 square feet (SF) (net) of floor area.

2. Office: 250,000 square feet maximum
3. Hotel:

Maximum: 200 rooms

4. Residential: Maximum shall be equal to 525 dwelling units, less the total number of dwelling units actually constructed in Buildings 1-6, including up to
    a) 300 Congregate Care Rooming Units (150 dwelling units) and/or
    b) apartments and/or condominiums

C. Planned Development District Retail Justification:

In accord with the Planned Development District goals established by City of Raleigh, the following components are incorporated into the Crabtree Village PDD to justify the overall project, and especially the inclusion of retail uses:

1. Mixture of Land Uses on contiguous tracts of property
2. Incorporate Transit Oriented Design; Transit Facilities (i.e.- Transit Shelters & Easements)
3. Open Space significantly exceeds the minimum requirement for PDD and non-PDD areas
4. Economic Arrangement of Buildings
5. Incorporate parking structures to improve appearance of Crabtree Village
6. Stream Preservation
7. Urban form of Crabtree Village protects thoroughfare corridors from strip development

For additional information regarding the mixed use buildings – please refer to Architect's Unity of Development Statement.

D. Alternate Means of Compliance for Transitional Protective Yards (TPYs"):

The reasons for requiring TPYs between different types of uses are as follows:

- To protect less intense uses from the adverse impacts of more intense uses;
- To prevent adverse community appearance;
- To protect the character of an area and conserve the values of buildings and land; and
- To provide adequate air and light.

The proposed development would require a "Type C" 20-foot wide TPY along the approximately 270-foot line between Phase I and Phases II-III if a traditional TPY was installed as required by Code; however, due to the integration of differing yet compatible land uses, the use of traditional landscape buffers to separate these land uses would not be in keeping with the goals of the Crabtree Area Plan, the 2030 Comprehensive Plan, and the City's Urban Design Guidelines. As an alternate means of compliance to traditional Transitional Protective Yards, the PDD proposes to:

- Locate alternate secondary tree conservation areas, which exceed the required 10% tree conservation areas, on steep slopes that are internal to the site and that are strategically located to provide visual buffering;

- Preserve environmentally sensitive land areas associated with the House Creek corridor, providing cumulative overall open space at a rate of no less than 20% for the PDD, which exceeds the required 15% open space requirement for PDDs;
- Provide pedestrian connections/internal vehicle circulation among the various land uses; and
- Provide a private street or driveway of at least twenty-five feet (25') in width with trees planted on both sides spaced a maximum of forty feet (40') on center (subject to the location of access drives, fire hydrants and utilities located therein) which will provide a separation between the residential and mixed use buildings.

The traditional TPY would provide approximately 5,400 square feet (270' x 20') of planted buffer area between the phases. The alternate TPY proposed which offers an increase from 15% to 20% Open Space on site provides approximately 1.144 additional acres of open space or an additional 49,832 square feet as compared to the 5,400 square feet of a traditional TPY buffer if the alternate were not approved. The proposed alternate clearly provides an equal or better substitute for the requirements for TPYs for the following reasons:

- The mixed use development will be developed in an integrated manner where convenient pedestrian connections between residential and retail/office/parking uses are desirable, and proximity to different but compatible types of uses is considered an advantage rather than an adverse impact
- The preservation of additional trees and steep slopes provide better visual buffering and actually enhance community appearance;
- The protection of environmentally sensitive areas on the perimeter of the site better protect the character and value of the land than traditional internal TPYs; no existing buildings are being preserved on site.
- Adequate air and light for the development and for adjacent sites will be ensured via the protection of environmentally sensitive areas, provision of more than 20% open space and provision of TCAs in excess of that required by Code. In addition, the fact that the subject development is bounded on all sides by public rights-of-way, all of which will be increased in width as a result of this development, will further support adequate air and light.

E. Parking Structures

Parking structures are encouraged for Crabtree Village where feasible, as they will contribute to preservation of the natural topography and reduce impervious surface area, however, surface parking is permitted.

The use of parking structures should be considered for:

- Office uses
- Retail/Restaurant use(s)
- Hotel use
- Residential buildings with higher density concentration

Structured parking is an excellent means of storing vehicles, with a reduction in convenience for those drivers who prefer front–door parking, and both types of parking are allowed. A side effect of structured parking is that a stored car encourages users to park and leave their car while in the community, encouraging pedestrian travel as a means of moving within the site.

Access to air and light are important components in the design of a parking structure, and aesthetic screening of parking facilities is a component of the City's landscape ordinance. Phase I parking decks have been designed to include one grade level and one elevated level. Phases II and III deck(s) may have more levels exposed but will be screened as provided below.

All parking decks shall either:

(1) Be constructed with a setback at least fifty (50) feet from the public street right-of-way and limited in height to three levels above grade; or

(2) Be designed such that

(a) the deck provides building articulation along public right-of-way frontage at least every fifty (50) feet;

(b) the deck is screened from the public right-of-way with tall growing trees located within the Street Protective Yard (such as Bald Cypress, Cryptomeria Hightower Willow Oaks, Water Oaks or comparable trees) spaced no more than 40 feet on center; and

(c) the deck facade adjacent to the public right-of-way incorporates at least two (2) of the following elements:

(i) louvers
(ii) decorative screens
(iii)vertical building elements
(iv)green screens

Section 4 – Transportation

Transportation Impact Analysis

A Transportation Impact Analysis (TIA) prepared by Stantec and dated as of May 11, 2012, has been submitted and approved by City Staff.

Circulation Plan /Pedestrian/Bicycle Plan

Crabtree Village is organized around the goal of creating a mixed and multi-use development which works with the unique topographic aspects of the site, preserves open space and provides for right-of-way for future transportation improvements as envisioned by the City of Raleigh's Comprehensive Plan (Crabtree Valley Small Area Plan). To achieve that goal, the pedestrian and bicycle circulation plan is emphasized by use of the following design initiatives:

A. Parking is provided in both structured and surface parking areas that will encourage residents and visitors to park their vehicles, and leave them while at Crabtree Village. Due to the extensive shopping, recreation and work opportunities near Crabtree Village,

residents will be able to leave their cars on the Crabtree Village Property and walk to nearby destinations or take advantage of the public transit routes that serve this property.

B. Extensive sidewalks and greenway trails are provided along all public streets adjoining the property, and along the internal private drives. The sidewalks along Homewood Banks Drive shall be no less than eight feet (8') wide and internal sidewalks adjoining mixed use buildings C-7-C-10 shall be no less than 14 feet wide. Those adjoining retail uses shall also include planting wells. In all locations, exceptions (reductions) are allowed to accommodate handicap access features, utilities, street trees or similar items. Other sidewalks internal to the site (parking areas; secondary entrances; service doors; etc) shall be no less than five feet (5') wide.

C. Bicycle racks shall be located in multiple locations within covered areas of the parking structure as follows:

Use	Short Term (uncovered) Bike Spaces Required	Long Term (covered) Bike Spaces Required
Residential	1 space per 20 units	1 space per 5 units
Office	1 space per 10,000 sf	1 space per 5,000 sf
Retail	1 space per 5,000 sf	None
Hotel	1 space per 10,000 sf	1 space per 5,000 sf

D. Right-of-way for the future interchange of Blue Ridge Road and Crabtree Valley Avenue will be reserved as a part of this Master Plan.

E. Transit easement deeds for future transit stops shall be provided along Homewood Banks Drive, Crabtree Valley Avenue and Blue Ridge Road. One transit shelter in an easement, with a bench and trash receptacle, is proposed to be built on site and two additional transit easements are to be dedicated. The locations of these features are to be finalized with the site permit drawings.

F. As the Crabtree Valley Small Area plan recommends the inclusion of pedestrian crossing features at the intersection of Crabtree Valley Avenue and Homewood Banks Drive such as activated crosswalk signals, striped walkways, signage; these features shall be provided per recommendation of the City of Raleigh and/or NCDOT.

G. Defined pedestrian routes shall be provided through the property to connect building entrances/exits to the pedestrian crossings at Crabtree Valley Avenue where it intersects Homewood Banks Drive and to the City greenway along House Creek and at the intersection of Homewood Banks Drive and Blue Ridge Road – see Pedestrian Circulation Plan.

H. Driveway entrances into the community have been carefully planned and located to reduce the overall number of driveways, and to locate them so as to afford good sight distance and incorporate pedestrian refuges where driveways exceed two lanes in width. Traffic safety concerns and severe topography prevent the placement of a third access point as required

for more than 300 dwelling units in the Group Housing Standards. Therefore, the PDD proposes that two access points, as shown on the Master Plan drawings, be approved as an alternative means of compliance to City Code Section 10-2103(c)(2) which requires one access point for every 150 dwelling units unless traffic safety, surrounding development, severe topography or other physical features prevent such additional access. Traffic safety issues and severe topography on the Crabtree Village site and the limitation of access points on Blue Ridge Road (1) and Crabtree Valley Avenue (0) may prevent additional access points; however, the proposed design provides equivalent or better environmental and safety benefits and provides comparable utility and accessibility as required under City Code Section 10-2103(h).

I. Pedestrian Circulation improvements such as crosswalks, countdown signals, guide signs, etc will be provided at the Homewood Banks intersection on Crabtree Valley Avenue. Pedestrian amenities will be ADA-compliant to the extent reasonable due to the existing site topography and the gradient of existing roadways.

J. The developer will provide all traffic control devices, including signing, pavement markings, traffic signal modifications, etc necessary for the safe and efficient operation of Homewood Banks Drive as directed by the City and NCDOT.

K. Site retaining walls shall be primarily constructed of stacked, concrete modules. The face of the building blocks shall not be a "faceted" style. The City of Raleigh Appearance Commission shall approve the retaining wall material specification prior to building permit issuance. The developer shall provide evergreen trees in front of the retaining wall(s) that are in excess of twelve feet (12') in height, and which are spaced no more than twenty-five feet (25') on center.

Parking Requirements

As a mixed and multi-use development, the following parking standards shall be utilized:

A. All proposed uses for the project shall be calculated according to City of Raleigh parking requirements under the City Code in effect as of the date of adoption of this Revised Master Plan.

B. As supported by a Parking Study prepared by Stantec and dated June 13, 2012 and submitted to the City Planning Department June 14, 2012, the overall parking count requirement for this project shall be reduced by up to 30% based on the following considerations:

1. Mixed Use and Shared Use parking requires less parking than stand-alone use projects and in this case will reduce the parking need by nineteen percent (19%) .
2. Internal Trip Capture of twelve percent (12%) requires less parking than traditional developments.

3. Adjacent thoroughfares with transit service will allow reduction in parking requirements. The site is located in close proximity to a transit hub at Crabtree Valley Mall and the project will dedicate three (3) transit easements on site. The availability of convenient transit service will reduce necessary parking by five percent (5%).
4. The mixture of uses will not simultaneously have a peak time of use placing a heavy burden on the parking facilities.
5. It is anticipated that a portion of the retail, hotel and office visitors will be from the adjacent hotels adjoining the site and from pedestrian traffic from nearby developments and the City greenway which will reduce necessary parking by two percent (2%).
6. Section 10-2082.6(c)(6) of the City Landscape Ordinance provides for a ten percent (10%) reduction in the parking requirement if landscaped areas as proposed in this development are provided.
7. Additional Bike Parking in excess of the Code requirement which will reduce necessary automobile parking spaces by 1%.
8. Proposed hotel with a covered entrance allowing transportation by taxi or shuttle will reduce necessary parking by 10%.

Section 5 - Utilities & Stormwater

Existing public utilities (water and sanitary sewer) exist on the site or are located in the public rights-of-way that bound the property. These facilities are adequate to serve the needs of Crabtree Village's proposed uses and densities. A layout of proposed extension of public facilities and private service to serve the project are shown on the Utility Plan of the master plan documents.

Stormwater runoff will be collected and treated with surface wet ponds which shall be landscaped as site amenities, and/or with underground storage/treatment facilities such as sand filters and pipe storage facilities. These items will be designed to meet City of Raleigh and/or State of North Carolina requirements.

The current FEMA flood plain and floodway lines in the northeast corner of the property, effective May 2006, are also shown.

A fifty-foot (50') Neuse River Riparian Buffer (NRRB), is located on each side of House Creek, as measured from top of bank. This stream buffer has re-vegetated under a "no-mow" policy since the initial approval of the PDD, and the emerging forest is composed primarily of tulip poplar, sweetgum, sycamore and some loblolly pine. Brambles and native grasses are also present. The floodway shall not be developed except for the installation of trees, shrubs, related plantings, and utility and storm drain features within designated easements.

Section 6 - Open Space/Greenway/Tree Preservation

Open Space in the amount of twenty percent (20%) of the overall site shall be provided which is in excess of the fifteen percent (15%) open space requirement for PDDs. As mentioned in earlier

sections of this document, the City of Raleigh has completed construction of the House Creek Greenway where it crosses to the west side of Blue Ridge Road and onto the Crabtree Village property. Additional open space and greenway easement shall be provided near House Creek. Since the Crabtree Village PDD was initially approved in 2006, trees and other vegetation have been allowed to emerge in the area of House Creek under a "no-mow" natural succession practice.

The establishment of Tree Conservation Area(s) in accord with City of Raleigh Code requirements shall be provided. No less than 11% of the overall site (gross land area) shall be dedicated to Tree Conservation Areas. Fee-in-lieu payment shall not be utilized, unless a jurisdictional mandate requires this method of compliance. Tree Conservation guidelines for this property shall recognize the unique topographical features, and the following criteria shall be utilized when establishing tree conservation areas:

STREAM BUFFER: Preserve the environmentally sensitive House Creek Corridor.

GREENWAY EASEMENT: Prior to building permit issuance, the property owner shall dedicate a Greenway Easement of the City of Raleigh along House Creek. Subject to right of reservation/dedication, the greenway easement shall dedicate seventy-five feet (75') from the top of the stream bank. The major purposes for the Greenway Easement are to provide a protected view-shed along House Creek and to protect House Creek.

WOODED SLOPES: Where feasible, preserve existing wooded portions of the site located on slopes as recommended by the Crabtree Area Plan (Policy AP-C2). Due to the unique physical qualities of the subject property, the benefit of preserving trees on slopes is considered equal to the criteria listed for Secondary Tree Conservation, including tree conservation along thoroughfares, as there are direct environmental and aesthetic benefits. Proposed tree conservation areas on slopes shall still demonstrate that the trees meet minimum trunk caliper and basal density.

In view of the above factors, an alternate means of compliance for tree conservation areas is proposed to include the following TCAs.

Crabtree Village Tree Preliminary Conservation Area:

1. Zone II Neuse River Riparian Stream Buffer: Refer to Preliminary Tree Conservation Plan, Sheet C5
2. Greenway Easement: Floodway of House Creek, outside Zone II: Refer to Preliminary Tree Conservation Plan, Sheet C5
3. Forested Steep Slopes: Refer to Preliminary Tree Conservation Plan, Sheet C5

Section 7 - Buildings

Building Guidelines

A.	Floor Area Ratio	N/A
B.	Building Lot Coverage Limitation (Entire Project)	70%
C.	Impervious Surface Limitation (Entire Project)	85%
D.	Maximum Height of Tower/Hotel/Office/Retail/ Residential Mixed Use Building (C-7 or C-8)	200'*
E.	Maximum Height of Residential or Mixed Residential (R-1 thru R-6)	90'*
F.	Maximum Height of Retail/Mixed Use Buildings (C-9 and C-10)	60'*
G.	Maximum Height of Office/Hotel/Retail/Residential Mixed Use Buildings (C-7 or C-8)	135'*
H.	Maximum Height of Residential Parking Decks (Parking Decks 1 and 2; measurement is from lower level finished floor parapet).	15'*
I.	Maximum Height of Mixed Use Parking Deck(s) (Parking Deck 1; measurement is from the finished floor elevation of the main level at the deck entrance near the southwest corner of the deck.)	65'*

**Except as otherwise provided above, height shall be measured from proposed finish grade – average of all corners of building. Vertical projections from structures, including but not limited to stairwells, elevator shafts, mechanical equipment and lighting, shall not be considered when measuring height.*

A.	Zoning Category	**Maximum Height**
	Existing SC Zoning	200'
	Existing O&I-2 Zoning	90'
	Proposed PDD	See above

B.	Building Setbacks (Proposed R.O.W.)	**Minimum Setback**
	Internal (lot to lot, building to building)	Zero Feet (0')
	Blue Ridge Road	Twenty Feet (20')
	Homewood Banks Drive	Twenty Feet (20')
	Crabtree Valley Avenue	Thirty Feet (30')

(Non-conditioned space building structures (i.e., Transit Shelter) or features, i.e., Pedestrian Gateway) are exempt from building setback).

Note: Building Setbacks proposed by this PDD document cannot reduce building setbacks or building separations required by North Carolina Building Code, National Fire Code or applicable provisions of the City of Raleigh Zoning Code.

Section 8 - Committed Elements

Committed Elements

A. Parking will be provided in multiple decks in proximity to the uses they support, as shown on the Master Plan drawings. Parking structures that are either within fifty feet (50') of a public right-of-way or are greater than three (3) levels above grade in height shall be constructed and screened in accordance with Section 3E above. Not less than 50% of the portions of the parking structure(s) (excluding fenestration and air vents) visible from public right-of-way shall be treated with architectural materials that incorporate masonry materials found on the principal buildings. The treatment of the parking decks visible from the right-of-way shall be incorporated into the Unity of Development Statement specified by this PDD Document.

B. With the exception of the C-7 and C-8 Buildings, no buildings shall exceed more than seven (7) floors, or ninety feet (90') in height.

C. The C-7 and C-8 Buildings shall be located in the Phase II-Phase III portion of the site and one may be up to two hundred feet (200') in height, or twelve (12) stories, and the other may be up to one hundred thirty-five feet (135') in height, or nine (9) stories; not including parking levels below the conditioned space levels and that constitute classification as 'basement' per the NC Building Code.

D. Not less than 50% of building materials on the conditioned buildings, exclusive of fenestration, shall incorporate but not be limited to, masonry materials (i.e. – stucco, brick, CMU, pre-cast concrete, stone). No hardboard siding, vinyl siding or wood railings on balconies may be used in the development., EIFS shall be permitted only as an accent or trim feature.

E. The fenestration (doors, windows) of the elevation(s) of the building(s) fronting Crabtree Valley Avenue shall be no less than 20% of the overall wall area.

F. Trash dumpsters/compactors shall be enclosed within buildings or within freestanding masonry structure(s) (i.e. – dumpster enclosure with doors) with the siding material of the enclosure to match the materials used on the building; opaque doors shall screen the opening.

G. No driveway access shall be permitted from Crabtree Valley Avenue.

H. No more than one (1) driveway access shall be allowed from Blue Ridge Road. Such driveway shall be a full-movement driveway.

I. The developer acknowledges that the City of Raleigh or the North Carolina Department of Transportation has jurisdiction over the right-of-way that fronts Crabtree Village, and that in the future the City and/or the State may alter the roads, right-of-way, median breaks and traffic patterns. Such changes to these facilities shall not invalidate the PDD Master Plan approval.

J. In lieu of traditional City of Raleigh Transitional Protective Yards, transitions between adjoining internal uses shall be through use of architectural elements (walls, fences, etc), building offsets, courtyards, common areas (parking facilities, private streets, etc). No planted buffer yards shall be required. As supporting uses (i.e. - parking,) are shared, and principal uses (retail, residential) are purposefully incorporated in the same development, there is no need for buffering of differing uses, including parking facilities. Open space equal to at least 20% of the site (as compared to the required 15%) and tree conservation areas along with vegetation in close proximity to the House Creek riparian buffer and/or greenway shall be utilized in lieu of traditional transitional protective yards. The vegetation for House Creek features can be both existing and/or proposed plantings, and shall constitute alternate means of compliance for Transitional Protective Yards.

K. As the majority of parking areas are shared among all users, and located within the interior of the project, there is no need to separate parking from other uses.

L. Upon approval of Encroachment Agreements by the City of Raleigh and/or NCDOT, street yard planting requirements may be provided within the public right-of-way. (Refer to cross sections- plan set)

M. Open space area requirements may be provided through street yards, stream buffer, tree conservation areas, flood plain areas, landscape areas, and outdoor shopping plaza/sidewalk.

N. Three 15' x 20' transit easements shall be provided to the City of Raleigh along (1) Crabtree Valley Avenue, (2) Blue Ridge Road, and (3) Homewood Banks Drive. The developer shall provide a transit shelter in one of the easements, the specific location of which shall be determined by City Staff. The materials and design elements of the transit shelter shall be addressed in the Unity of Development Statement specified elsewhere in this PDD Document.

O. HVAC equipment, utility meters, transformers, generators and similar equipment shall be screened from view with plant material or architectural screen.

P. Provision has been made to accommodate a pedestrian circulation connection (See Pedestrian Plan) between the Crabtree Village PDD and Crabtree Valley Mall. Such connection shall include wide sidewalks along Homewood Banks Drive and a crosswalk crossing Crabtree Valley Avenue.

Q. The major erosion control device for the site shall be designed per the revised regulations proposed by the NCDENR, Land Quality Section, Division of Land Resources for sites in High Quality Water (HQW) Zones; these improved regulations became effective in 2007. Although this site is not in an HQW zone, the use of Efficiency-Based Sediment Basins that are site specifically designed to convey the twenty five year peak storm event in lieu of the required ten year event shall increase the sediment trapping efficiency as well as provide for a greater control of larger storm events. Interim sediment devices used for redundancy, brief amounts of time as required by the phasing of construction, and public road improvements shall be designed to comply with all City of Raleigh sedimentation control regulations.

R. Outdoor lighting will be designed to provide minimum lighting necessary to ensure adequate security and comfort, while not causing excessive glare onto adjacent properties and public rights-of-way. All pole mounted fixtures over sixteen feet (16') tall shall be full cutoff. The maximum height of any pole mounted light fixture located on top of a parking structure shall be no greater than twenty-four feet (24'). All floodlights shall be directed away from right-of-way and shall be used only to accent architectural elements, or site features, but shall not illuminate entire portions of buildings. The maximum illumination at public rights-of-way shall be 2.0 foot candles maintained. All light fixtures installed within public right-of-way for illuminating streets are exempt from these standards.

S. Extensive sidewalks and/or greenway trails are provided along Blue Ridge Road and Homewood Banks Drive adjoining the property, and along the internal private drives. The sidewalks along Homewood Banks Drive shall be no less than eight feet (8') wide and internal sidewalks adjoining retail storefronts shall be no less than 14 feet wide and shall include planting wells. In all locations, exceptions (reductions) are allowed to accommodate handicap access features, utilities, street trees or similar items. Other sidewalks internal to the site (parking areas; secondary entrances; service doors; etc) shall be no less than five feet (5') wide.

T. To provide transitions in scale, at least two (2) of the residential buildings in Phase I shall be constructed on a 3-4 basis such buildings will be three (3) stories adjacent to the street and transition to four (4) stories away from the street and more central to the site.

U. All buildings directly adjacent to and within fifty feet (50') of public rights-of-way shall include prominent entrances emphasized with architectural treatments such as pediments along the right-of-way with direct and convenient pedestrian access to the public sidewalk.

V. The orientation and general location of the proposed buildings, parking structures and parking fields as well as the inter-relationships between these features and public rights of way as shown on the Master Plan Drawings shall be maintained. Adjustments to specific sizes of these features and exact building and parking locations shall be allowed as long as the proposed orientation, height maximum, square footage maximums and minimums and required setbacks are honored.

Section 9 -Phasing:

Following is an explanation of phasing for the development. Phases may be sequential or done at the same time, but Phases II and III may not precede Phase I. Phases II and III shall both be located on the property labeled as Phase II property. Phases II and III may be combined or done in two (2) separate phases as provided herein. Within ninety (90) days after approval of the Revised Master Plan and prior to conveyance of any parcel of the Property, Applicant shall execute and record a Declaration allocating residential and retail density and impervious coverage availability among the separate lots within Crabtree Village. Said Declaration, which must be approved by the City Attorney, shall allocate maximum residential units and square footage amounts of non-residential uses (which are collectively within the maximum densities allowed under this Master Plan) to each Phase of the development. Such Declaration may be modified at any time with a written and recorded modification signed by the owners of the affected Phases and approved by the City Attorney. In the event of a conveyance of any parcel which is less than an entire Phase, said conveyed parcel shall be deemed to have an allocation of density equal to the pro rata share (determined on an acreage basis) of density for each type of use for the entire Phase.

A. Phase I – Residential Apartments – Buildings 1-6

1. Planned Development: The initial phase shall include
   (a) a minimum of 275 Residential dwelling units and a maximum of 315 dwelling units;
   (b) Residential Retail uses as determined by Developer of up to a maximum of 5,000 square feet;
   (c) up to three (3) parking decks as determined by Developer containing up to 315 parking spaces, provided that parking located under a building shall not be considered a "deck;"
   (d) surface parking of at least 150 parking spaces, but not more than 250 parking spaces; and
   (e) Recreation facilities as determined by Developer, which may include but which shall not be limited to swimming pool(s), recreational facilities and open space areas.

2. Required Road Improvements/Dedications.
   (a) dedicate right-of-way on the southeast side of Homewood Banks Drive as necessary to establish one-half of a 60' right-of-way;
   (b) widen and improve one-half of Homewood Banks Drive to a 41' back-to-back paved road;
   (c) dedicate right-of-way on the northwest side of Blue Ridge Road as necessary to establish one-half of an 80' right-of-way;
   (d) widen and improve 850 feet of Blue Ridge Road adjoining the site to a 53' back-to-back paved road;

(e) pay a fee in lieu of improving the northern 700' of Blue Ridge Road adjoining the site in an amount to be determined as of building permit issuance;
(f) pay a fee in lieu of improving Crabtree Valley Avenue in an amount to be determined as of building permit issuance;
(g) dedicate three 15x20 Transit Easements along (1) Homewood Banks Drive; (2) Blue Ridge Road; and (3) Crabtree Valley Avenue; and
(h) construct a transit shelter within one of the Transit Easements at a location to be determined by City Staff, which shall include shelter, trash receptacle and bench.

B. Phase II – Tower and/or Mixed Use Buildings - Buildings C-7 - C-10

1. Planned Development. Some or all of the following may be developed as a part of Phase II;
(a) Retail uses in the minimum amount of at least 5,000 square feet and the maximum amount of 60,000;
(b) Office uses of up to 250,000 square feet;
(c) Residential uses to the extent not developed in Phase I up to a maximum number of units of 525;
(d) Hotel uses of up to 200 rooms;
(e) Non-Residential Retail Uses, which shall mean eating establishments and service retail uses serving primarily a building's other occupants opened no earlier than 6:00 a.m. or later than 11:00 p.m. ("Non-Residential Retail") and which shall not exceed seven percent of the floor area (net) per building in Buildings C-7 – C-10 and which shall not be counted against the maximum allowable retail square footage of 60,000 square feet; and
(f) Parking and recreational facilities to serve additional uses.

2. Required Road Improvements/Dedications.
None.

Phase II may include any mix of the above uses, provided that projected trip generation numbers for such a mix of uses for am and pm peak hour traffic is not increased over the trip generation levels shown on Table 4: 1TE Trip Generation Proposed Crabtree Village Development-Full Build Out included in the TIA for Crabtree Village, dated May 2012, prepared by Stantec, a copy of which is attached hereto.

C. Phase III – Mixed Use Building(s)

1. Planned Development.
(a) Retail uses in the amount of 15,000 square feet less the amount of retail constructed in Phases I and II, and up to a maximum of 60,000 square feet, to the extent not developed in Phase II;
(b) Office uses up to a maximum square footage of 250,000 square feet, to the extent not developed in Phase II;
(c) Residential uses up to a maximum number of units of 525, to the extent not developed in Phases I and II;

(d) Hotel uses up to a maximum amount of 200 rooms, to the extent not developed in Phase II;
(e) Non-Residential Retail Uses which shall not exceed seven percent of the floor area (net) per building in Buildings C-7 – C-10 and which shall not be counted against the maximum retail square footage of 60,000 square feet, to the extent not developed in Phase II; and
(f) Parking and recreational facilities to serve additional uses.

2. Required Road Improvements/Dedications.
None.

Phase III may include any mix of the above uses, provided that projected trip generation numbers for such a mix of uses for am and pm peak hour traffic is not increased over the trip generation levels shown on Table 4:1TE Trip Generation Proposed Crabtree Village Development-Full Build Out included in the TIA for Crabtree Village, dated May 2012, a copy of which is attached hereto.

The developer commits to the following infrastructure phasing requirements:

A. The above required easements, dedications and fees in lieu shall be made, conveyed, recorded and paid prior to the earlier of the issuance of a building permit or recordation of a subdivision plat.

B. The above required road improvements shall be completed prior to the issuance of Certificates of Occupancy for any building on the property.

C. The one (1) transit shelter specified for Crabtree Village shall be constructed by the landowner prior to receiving a certificate of occupancy for the 275th dwelling unit.

Section 10 – Revisions to Master Plan

Changes to Master Plan

A. Changes to:
- increase building height,
- increase square footage of retail area and/or office area,
- decrease specified minimum square footage or unit minimum(s)

that are no greater than ten percent (10%) from this Revised PDD standard may be approved administratively by the staff of the City of Raleigh. Such changes which exceed ten percent (10%) but do not exceed thirty percent (30%) may be approved by the Raleigh City Council. In addition, changes to the Master Plan, which are of a type which the then applicable Raleigh City Code allows to be approved by City of Raleigh Staff or Planning

Commission may be approved by City Staff or Planning Commission, as applicable. All other changes shall require approval by the Raleigh City Council.

B. Changes to and adjustments to building and parking locations within either the Phase I area or the Phase II-III area, utility line locations, internal drive locations and landscaping location and plant materials, which do not modify required maximum or minimum building heights, square footage or density, may be made by City Staff without review or approval by Planning Commission or City Council. Changes for building and/or parking locations which move such items to inside or outside either the Phase I area or the Phase II-III area must be made by City Council, unless the applicable City Code permits changes of such a nature to be approved by City Staff.

C. City of Raleigh Staff shall be able to grant administrative approval to changes in the Master Plan pertinent to the Floodway and Floodplain of House Creek; such approvals shall be contingent upon prior approval by FEMA for such changes to the floodway and floodplain.

D. City of Raleigh Staff shall be able to grant administrative approval to changes in the Master Plan pertinent to greenway easements, sidewalks, stormwater facilities, utilities, transit easements and shelters, provided that changes to easement locations may be made only prior to recordation of easements and no changes to greenway easement widths may be made by Staff; the relocation of the House Creek Sanitary Sewer Interceptor and its easement along House Creek.

E. The PDD may be developed with a smaller footprint and expanded parking area for the mixed use buildings upon approval by the City Staff; provided that such changes shall not modify any committed element of the Crabtree Village PDD.

F. Changes to Committed Elements may be approved by City Staff if the applicable City Code permits changes of such a nature to be approved by City Staff.

Section 11 – Urban Design Guidelines

Note: The following criteria for the City's Urban Design Guidelines must be addressed per Code Section 10-2057:

Elements of Mixed-Use Areas

1. *All Mixed-Use Areas should generally provide retail (such as eating establishments, food stores, and banks), office, and residential uses within walking distance of each other.*

RESPONSE: The proposed revised Master Plan envisions a mixed use development with high density residential as well as retail, office and hotel.

2. *Within all Mixed-Use Areas, buildings that are adjacent to lower density neighborhoods should transition (height, design, distance and/or landscaping) to the lower heights or be comparable in height and massing.*

RESPONSE: *There are only two* ***low density residential uses*** *adjacent to the project. Both are well separated from the development by public streets. .*

3. *A mixed use area's road network should connect directly into the neighborhood road network of the surrounding community, providing multiple paths for movement to and through the mixed use area. In this way, trips made from the surrounding residential neighborhood(s) to the mixed use area should be possible without requiring travel along a major thoroughfare or arterial.*

RESPONSE: Development of the subject property will not include access on Crabtree Valley Avenue owing to topographic considerations but is anticipated to provide connections to Homewood Banks Drive and Blue Ridge Road and will provide appropriate pedestrian, bicycle and vehicular connections. There are no contiguous properties which are not separated by a public street.

4. *Streets should interconnect within a development and with adjoining development. Cul-de-sacs or dead-end streets are generally discouraged except where topographic conditions and/or exterior lot line configurations offer no practical alternatives for connection or through traffic. Street stubs should be provided with development adjacent to open land to provide for future connections. Streets should be planned with due regard to the designated corridors shown on the Thoroughfare Plan.*

RESPONSE: Access will be provided via Homewood Banks Drive and Blue Ridge Road which connect to adjacent development and efforts will be made to provide bicycle, pedestrian and vehicular connections.

5. *Block faces should have a length generally not exceeding 660 feet.*

RESPONSE: No new public streets are contemplated for the proposed development.

Site Design/Building Placement

6. *A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use. Streets should be lined by buildings rather than parking lots and should provide interest especially for pedestrians. Garage entrances and/or loading areas should be located at the side or rear of a property.*

RESPONSE: Given that the subject property is enclosed by three public streets, it is possible that some parking will be adjacent to a street; however, most parking will be located to the sides or rear of buildings or in a parking deck and will be well buffered with landscaping.

7. *Buildings should be located close to the pedestrian street (within 25 feet of the curb), with off-street parking behind and/or beside the buildings.*

RESPONSE: Many buildings will be located close to pedestrian streets.

8. *If the building is located at a street intersection, the main building or part of the building placed should be placed at the corner. Parking, loading or service should not be located at an intersection.*

RESPONSE: Buildings are located on the corner of Blue Ridge Road and Homewood Banks Drive Locating a building at the corner of Homewood Banks Drive and Crabtree Valley Avenue is difficult because of floodplain issues. Floodplain, tree conservation and City requested right-of-way reservation preclude a building at the corner of Blue Ridge Road and Crabtree Valley Avenue.

Site Design/Urban Open Space

9. *To ensure that urban open space is well-used, it is essential to locate and design it carefully. The space should be located where it is visible and easily accessible from public areas (building entrances, sidewalks). Take views and sun exposure into account as well.*

RESPONSE: The Master Plan includes sidewalks on all public streets and a minimum of 20% open space. Wide sidewalks are contemplated for private drives in the vicinity of mixed use areas as well. The Master Plan will include courtyards, public art and other open spaces.

10. *New urban spaces should contain direct access from the adjacent streets. They should be open along the adjacent sidewalks and allow for multiple points of entry. They should also be visually permeable from the sidewalk, allowing passersby to see directly into the space.*

RESPONSE: Open spaces will be accessible from public streets. It is anticipated that some open spaces will be visible from public streets

11. *The perimeter of urban open spaces should consist of active uses that provide pedestrian traffic for the space including retail, cafés, and restaurants and higher-density residential.*

RESPONSE: Perimeters of open spaces will consist of active uses, including residential, retail, restaurant, recreation and perhaps hotel uses.

12. *A properly defined urban open space is visually enclosed by the fronting of buildings to create an outdoor "room" that is comfortable to users.*

RESPONSE: See above response.

Site Design/Public Seating

13. New public spaces should provide seating opportunities.

***RESPONSE: Public benches will be provided along mixed use private drives and at a new transit shelter** to be located **on** one of the three adjacent streets.*

Site Design/Automobile Parking and Parking Structures

14. Parking lots should not dominate the frontage of pedestrian-oriented streets, interrupt pedestrian routes, or negatively impact surrounding developments.

RESPONSE: A substantial amount of parking will be in parking decks. Parking will not consume a majority of the frontage along any of the streets.

15. Parking lots should be located behind or in the interior of a block whenever possible. Parking lots should not occupy more than 1/3 of the frontage of the adjacent building or not more than 64 feet, whichever is less.

RESPONSE: Again, neither parking structures nor parking lots dominate street frontage or occupy more than 1/3 of the street frontage of most planned buildings.

16. Parking structures are clearly an important and necessary element of the overall urban infrastructure but, given their utilitarian elements, can give serious negative visual effects. New structures should merit the same level of materials and finishes as that a principal building would, care in the use of basic design elements cane make a significant improvement.

RESPONSE: Parking structures will be partially clad in the same or similar materials and will have some of the same design elements as the primary structures.

Site Design/Transit Stops

17. Higher building densities and more intensive land uses should be within walking distance of transit stops, permitting public transit to become a viable alternative to the automobile.

RESPONSE: The subject site is located within 1/4 mile of an existing Capital Area Transit bus stop at Crabtree Valley Mall, and the development will offer 3 transit easements and construct a bus shelter along** one of the public streets **to facilitate bus usage.

18. Convenient, comfortable pedestrian access between the transit stop and the building entrance should be planned as part of the overall pedestrian network.

RESPONSE: It is anticipated that convenient access between building entrances and transit stops will be provided.

Site Design/Environmental Protection

19. All development should respect natural resources as an essential component of the human environment. The most sensitive landscape areas, both environmentally and visually, are steep slopes greater than 15 percent, watercourses, and floodplains. Any development in these areas should minimize intervention and maintain the natural condition except under extreme circumstances. Where practical, these features should be conserved as open space amenities and incorporated in the overall site design.

RESPONSE: The subject property will be redeveloped with particular sensitivity to preservation of steep slopes and existing trees on the subject site. The revised Master Plan is much more protective of and requires far less grading of Kidd's Hill than the previously approved Master Plan. In addition, it is anticipated that tree conservation areas will preserve more trees than previously approved TCAs. Finally a greenway easement will be granted for the House Creek greenway trail.

Street Design/General Street Design Principles

20. It is the intent of these guidelines to build streets that are integral components of community design. Streets should be designed as the main public spaces of the City and should be scaled for pedestrians.

RESPONSE: Although no new public streets are contemplated, the private drives will offer wide sidewalks, street trees, public benches, bicycle racks and trash receptacles near mixed use buildings.

21. Sidewalks should be 5-8 feet wide in residential areas and located on both sides of the street. Sidewalks in commercial areas and Pedestrian Business Overlays should be a minimum of 14-18 feet wide to accommodate sidewalk uses such as vendors, merchandising and outdoor seating.

RESPONSE: It is anticipated that sidewalks will be 5-8 feet wide in residential areas and 14-feet wide adjacent to mixed use buildings C-7, C-8, C-9 and C-10.

22. Streets should be designed with street trees planted in a manner appropriate to their function. Commercial streets should have trees which compliment the face of the buildings and which shade the sidewalk. Residential streets should provide for an appropriate canopy, which shadows both the street and sidewalk, and serves as a visual buffer between the street and the home. The typical width of the street landscape strip is 6-8 feet. This width ensures healthy street trees, precludes tree roots from breaking the sidewalk, and provides adequate pedestrian buffering. Street trees should be at least 6 1/4" caliper and should be consistent with the City's landscaping, lighting and street sight distance requirements.

RESPONSE: Although the final landscaping plan has not been completed, we anticipate meeting the spirit of this objective.

Street Design/Spatial Definition

23. Buildings should define the streets spatially. Proper spatial definition should be achieved with buildings or other architectural elements (including certain tree plantings) that make up the street edges aligned in a disciplined manner with an appropriate ratio of height to width.

RESPONSE: Due to the unique physical qualities of the subject properties, specifically topography and flood plain, the sole use of buildings to define the street edge is neither feasible nor appropriate. A combination of built elements, including buildings, site retaining walls, and street tree plantings will be utilized to create spatial definition. Slopes adjacent to the streets, especially along Crabtree Valley Avenue, will also be utilized as a means of establishing spatial definition along the right-of-way.

Building Design/Facade Treatment

24. The primary entrance should be both architecturally and functionally on the front facade of any building facing the primary public street. Such entrances shall be designed to convey their prominence on the fronting facade.

***RESPONSE:** Prominent entrances to Buildings R-1, R-2 and R-6 with architectural enhancements such as pediments will be architecturally and functionally facing the public street; however, because these buildings will also be accessed from parking areas to the rear, these buildings will also have functional rear entrances. Buildings R-3, R-4, R-5, C-7, C-8, C-9 and C-10 are oriented toward courtyards and recreational areas, private drives and open spaces since the grade of the site does not lend itself well to having prominent street frontages on all sides.*

25. The ground level of the building should offer pedestrian interest along sidewalks. This includes windows entrances, and architectural details. Signage, awnings, and ornamentation are encouraged.

RESPONSE: Pedestrian oriented features, including signage, fenestration and other architectural detail and ornamentation are contemplated for the ground floors of building in this development.

Building Design/Street Level Activity

26. The sidewalks should be the principal place of pedestrian movement and casual social interaction. Designs and uses should be complementary to that function.

RESPONSE: The objective of this project is to develop a pedestrian oriented product in this area.

Section 12 – Architect's Unity of Development Statement

Design Intent

The proposed development represents a multi-use district consisting of high density residential, retail, office and hotel uses organized around an outdoor plaza located at the top of Kidd's Hill. The project is located on a 23.75 acre sloped site bordered by Crabtree Valley Avenue, Homewood Banks Drive, and Blue Ridge Road. In the first phase of the project, components include up to 315 multifamily residential dwelling units, a clubhouse of approximately 2,500 sf, and associated outdoor amenities. Parking for the residents will be provided in a combination of surface parking spaces, freestanding parking structures, and podium parking facilities below residential buildings. In future phases, components could include up to 210 additional multifamily residential units, 15,000-60,000 square feet of retail, up to 250,000 square feet of office, a hotel comprised of up to 200 rooms and at least one full service restaurant. In this phase additional parking structures will be utilized to supplement the surface parking.

The City of Raleigh's Crabtree Valley Small Area Plan designation establishes specific goals for future development. This project satisfies those objectives by creating a unique and dynamic, pedestrian friendly, urban destination that takes advantage of the natural topography with appealing, well appointed buildings providing a wide range of services for the community.

Site Design

Petitioner proposes a site layout which minimizes necessary grading in order to take maximum advantage of the unique topography while creating a logical and environmentally friendly plan. In the first phase, the judicious use of landscaping is combined with sensitive building placement to create public and private spaces for the benefit of the residents of the multifamily portion of the project. View corridors of downtown Raleigh and the Crabtree Creek Valley are developed to take advantage of the site's unique topography. Large sections of the southern part of the site are left undeveloped to protect existing trees and slopes, tie into the House Creek Greenway Connector system, manage stormwater, and prepare for a possible future cloverleaf intersection.

In the second phase the hotel/retail/office/multifamily structures are positioned to take advantage of the significant topography to the northeast portion of the site, while providing convenient access for pedestrians and vehicles from both the first phase entry road between Homewood Banks Drive and Blue Ridge Road. Convenient pedestrian pathways will be provided to access adjacent properties, internal amenities, the trail system, bicycle storage areas, and internal commercial development. Outdoor dining areas will be permitted adjacent to proposed restaurant(s). All service areas are screened from view.

Parking area and roadway lighting will have similar pole lights (20' maximum pole/fixture height) and fixtures. Sidewalk lighting will be decorative fixtures based on human scale. All fixtures will be consistent throughout the site. Building lighting will be provided where appropriate to highlight architectural features and landscape lighting will be focused on lighting of specimen trees at certain strategic locations. A minimum of twelve benches, not including those at the transit shelter, will be located in open space areas.

Building Design

In the first phase, buildings are proposed of varying heights from one to five stories in height to promote visual interest in the different massings. A variety of roof forms, covered balconies, awnings and entryways will create pedestrian scale detail and provide variety and interest to the building facades. Surface parking areas are distributed between the proposed buildings to allow convenient resident access while eliminating large expanses of parking fields. The two parking structures are constructed with one grade level and only one elevated level to minimize their visual impact on the project.

In the later phase, the Tower building shall incorporate distinctive architectural design features, as it is a signature component of the plan.

At least 50% of building materials will be masonry, brick and stucco. Complimentary accent bands will be utilized as required to define the scale of the buildings. The residential windows shall be clear glass and the retail shop windows shall be lightly tinted glass to provide some insulating qualities. Flat roofs will be covered with roll roofing and pitched roofs will be covered with asphalt shingles. Standing seam metal roofing of a complementary color may be located in limited locations to provide additional appeal. Specific unifying elements will be incorporated throughout the project to maintain the overall character and architectural composition of the development.

In witness whereof, the undersigned has submitted the foregoing Crabtree Village Master Plan as of the date set forth below.

REDUS NC LAND, LLC, a Delaware limited liability company (SEAL)

By: REDUS PROPERTIES, INC., Manager

By: _____
Name: Thomas C. Heath Jr.
Title: Attorney

DATE: July 3, 2012

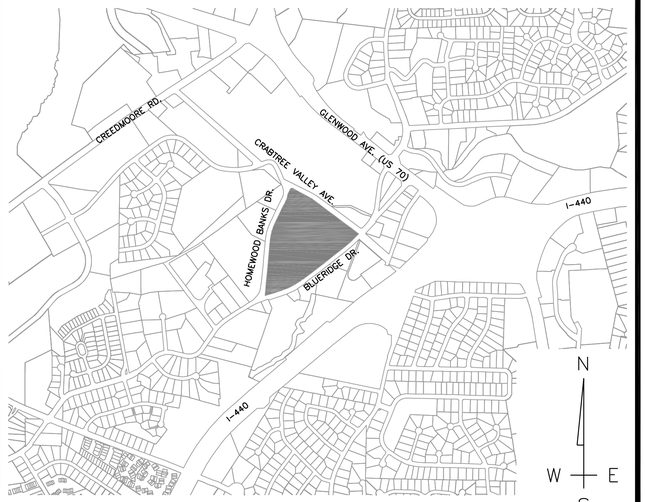
MASTER PLAN / REZONING PETITION

CRABTREE VILLAGE

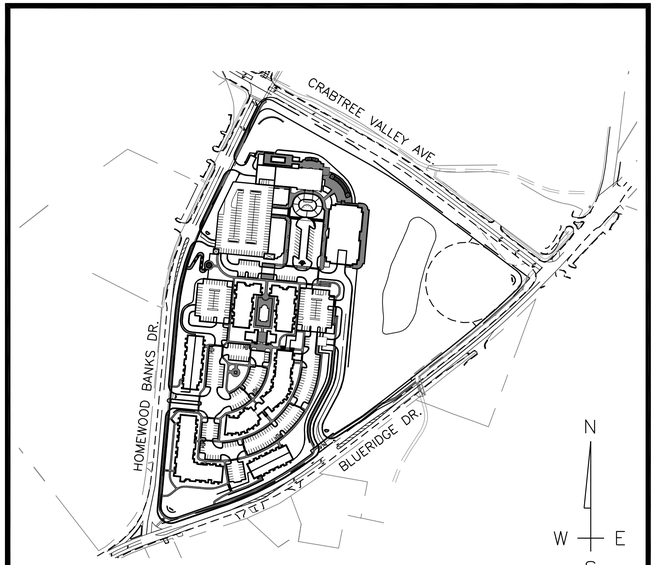
MP-1-12 / Z-19-12
RALEIGH, NC

06/13/2012

VICINITY MAP



1" = 1000'



1" = 250'

INDEX OF SHEETS

SURVEY / EXISTING CONDITIONS	SHT C1.0
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UTILITY PLAN	SHT C5.0
PLANTING PLAN	SHT C6.0
TREE CONSERVATION PLAN	SHT C7.0
PEDESTRIAN CIRCULATION PLAN	SHT C8.0
OPEN SPACE PLAN	SHT C9.0
STREET SECTIONS	SHT C10.0
SITE CROSS SECTIONS	SHT C11.0

NORTH CAROLINA PROFESSIONAL ENGINEER 37994 W.E.A. - W.E.A.

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT 1303 SITE GLENN SMITH

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

DEVELOPER

PAPPAS PROPERTIES, LLC
1111 METROPOLITAN AVENUE, STE. 325
CHARLOTTE, NORTH CAROLINA, 28204

OWNER

REDUS NC LAND LLC
3563 PHILLIPS HWY STE 601E
JACKSONVILLE, FL, 32207-5633

PREPARED BY:

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TYPE OF PLANS - MASTER PLAN / REZONING PETITION
FOR: CRABTREE VILLAGE
W&R PROJECT NO.: 021102650.00

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LINE TABLE		
LINE	LENGTH	BEARING
L1	5.71	N72°38'11"E
L2	42.70	S60°00'03"W
L3	25.31	N19°06'27"E
L4	3.25	N26°17'58"E
L5	62.09	S60°00'03"W
L6	15.78	N68°38'31"W
L7	24.38	N88°41'38"W
L8	56.83	N73°02'11"E
L9	55.55	N86°47'42"E
L10	101.95	N00°27'40"W
L11	53.22	N12°24'40"W
L12	53.27	N29°03'10"W
L13	48.64	N38°17'23"W
L14	41.69	N18°02'46"E
L15	61.30	N02°15'20"E
L16	56.39	S28°18'27"E
L17	50.18	N84°42'02"W
L18	19.42	S50°17'58"W
L19	47.88	S81°40'50"W
L20	30.37	N24°19'43"E
L21	46.67	N24°19'43"E
L22	19.80	S51°55'45"W
L23	16.97	S51°55'45"W
L24	20.42	S66°04'45"W
L25	46.57	N05°17'51"E

CURVE TABLE						
CURVE	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD	TANGENT
C1	48.67	30.00	92°56'45"	S72°46'21"W	43.50	31.58
C2	78.54	100.00	44°59'58"	N72°47'57"E	76.54	41.42
C3	54.77	100.00	31°22'52"	S65°59'24"W	54.09	28.09

NOTES:

1. SURVEY INFORMATION PROVIDED BY MURPHY SACKS, BOUNDARY PROVIDED BY WITHERS AND RAVENEL.

N/F
ZH 75
DB 10558 PG 612
BM 1996 PG 1283
PIN #0795499713

N/F
WINSTON RALEIGH HS SPE LLC
DB 11268 PG 390
BM 1996 PG 1283
PIN #0795496409

N/F
BANKS DAYTON & DOROTHY KERR
DB 11268 PG 390
BM 1996 PG 1283
PIN #0795496409

N/F
CVM HOLDINGS LLC
DB 9356 PG 1431
BM 1994 PG 1416
PIN #0796502569

N/F
McDONALDS CORPORATION (32-521)
DANIEL MARTIN
DB 6467 PG 503
PIN #0795690454

N/F
EDWIN G BRANDLE
DB 2591 PG 165
BM 1980 PG 46
PIN #0795488212

N/F
GFM II LLC
ENGLERT LLC
DB 12519 PG 1364
PIN #0795479879

N/F
PAUL E CASTELLOE
DB 13022 PG 2701
BM 1996 PG 444
PIN #0795581396

N/F
CITY OF RALEIGH
DB 13247 PG 2299
BM 1983 PG 623
PIN #0795584691

N/F
SMITH, MARTHA M
DB 13977 PG 1600
BM 1982 PG 1119
PIN #0795588896

N/F
(N/F) EDWARDS, RICKEY G
DB 11268 PG 390
BM 1996 PG 1283
PIN #0795496409

HOMEWOOD BANKS DRIVE (60' R/W)

BLUE RIDGE ROAD (80' R/W)

CRABTREE VALLEY AVENUE (90' R/W)

LOT 1
9.07 AC

LOT 2
1.94 AC

LOT 3
9.91 AC

LOT 4
2.11 AC

LOT 5
0.44 AC

LOT 6
0.22 AC

TOTAL AREA
23.74 AC

SANITARY SEWER TO BE ABONDONED

SANITARY SEWER AND EASEMENT TO BE ABONDONED

SANITARY SEWER AND EASEMENT PREVIOUSLY ABONDONED

HOUSE CREEK SEWER, LOCATION FROM AS-BUILT DATA, SANITARY SEWER AND EASEMENT PREVIOUSLY ABONDONED

HOUSE CREEK SEWER, EASEMENT, 10' FROM EXISTING R/W.

2006 FEMA 500 YR. FLOODPLAIN

2006 FEMA 100 YR. FLOODPLAIN

2006 FEMA FLOODWAY

NEUSE RIVER BUFFER

EXISTING 12" WATERLINE

EXISTING PEDESTRIAN BRIDGE

EXISTING GREENWAY PATH

SCATTERED LARGE TREES

ZONING: ZONING: OX-3-SH

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

GRAPHIC SCALE
60 0 30 60 120
1 inch = 60 ft.

No.	Revision	Date	By
1	REVISED PER 1ST COR COMMENTS	3/15/12	LAW
2	REVISED PER 2ND COR COMMENTS	4/2/12	LAW
3	REVISED PER 3RD COR COMMENTS	5/9/12	LAW
4	REVISED SITE PLAN	6/13/12	LAW

Designer W&R	Scale 1" = 60'
Drawn By	Date 02/17/12
Checked By LGS	Job No. 2110265.0

CRABTREE VILLAGE

RALEIGH WAKE COUNTY NORTH CAROLINA

EXISTING CONDITIONS

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Sheet No.
C 1.0

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT CITY OF RALEIGH AND NCDOT STANDARDS AND SPECIFICATIONS.
2. THE INTERSECTION OF RIGHTS-OF-WAY SHALL BE ROUNDED WITH A RADIUS OF 25 FEET UNLESS OTHERWISE SPECIFIED ON THE PLANS.
3. ALL SIGHT TRIANGLES SHOWN SHALL MEET CITY OF RALEIGH AND NCDOT STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL CLEAR AND GRADE AS NECESSARY TO INSURE PROPER SIGHT TRIANGLE DIMENSIONS.
4. NO SIGHT-OBSTRUCTING OR PARTIALLY OBSTRUCTING WALL, FENCE, FOLIAGE, BERM, PARKED VEHICLES, SIGN OR OTHER OBJECTS BETWEEN THE HEIGHTS OF TWO (2) FEET AND EIGHT (8) FEET ABOVE THE CURB LINE ELEVATION SHALL BE PLACED WITHIN A SIGHT TRIANGLE.
5. NITROGEN REDUCTION AND STORMWATER RUNOFF CONTROLS IN ACCORDANCE WITH CITY OF RALEIGH CODE REQUIREMENTS SHALL BE FULFILLED.
6. FEMA FLOODPLAIN SHOWN ON THIS SITE PER FEMA MAP 3720079500J EFFECTIVE DATE MAY 6, 2006. NO MORE THAN 50% OF THE FLOOD FRINGE, AS CALCULATED FROM THE PROPERTY BOUNDARY PRIOR TO RIGHT OF WAY DEDICATION, SHALL BE FILLED PER TC 22-04.
7. ONE TRANSIT SHELTER IN AN EASEMENT, WITH A BENCH AND TRASH RECEPTACLE, IS PROPOSED TO BE BUILT ON SITE AND TWO ADDITIONAL TRANSIT SHELTER EASEMENTS ARE TO BE DEDICATED. THE LOCATIONS OF THESE FEATURES ARE TO BE FINALIZED WITH THE SITE PERMIT DRAWINGS.
8. A FEE-IN-LIEU OF IMPROVEMENTS WILL BE MADE FOR CRABTREE VALLEY AVENUE AND THE LOWER PORTION OF BLUE RIDGE ROAD ADJACENT TO THE FLOODPLAIN.
9. WITH PERMIT DRAWINGS THE ORIENTATION AND GENERAL LOCATION OF THE PROPOSED BUILDINGS AND PARKING FIELDS AS WELL AS THE INTER-RELATIONSHIPS BETWEEN THESE FEATURES AND PUBLIC RIGHTS OF WAY SHALL BE MAINTAINED. ADJUSTMENTS TO SPECIFIC SIZES OF THESE FEATURES AND EXACT BUILDING AND PARKING LOCATIONS SHALL BE ALLOWED AS LONG AS THE PROPOSED ORIENTATION, HEIGHT MAXIMUM, SQUARE FOOTAGE MAXIMUMS AND MINIMUMS AND REQUIRED SETBACKS ARE HONORED.

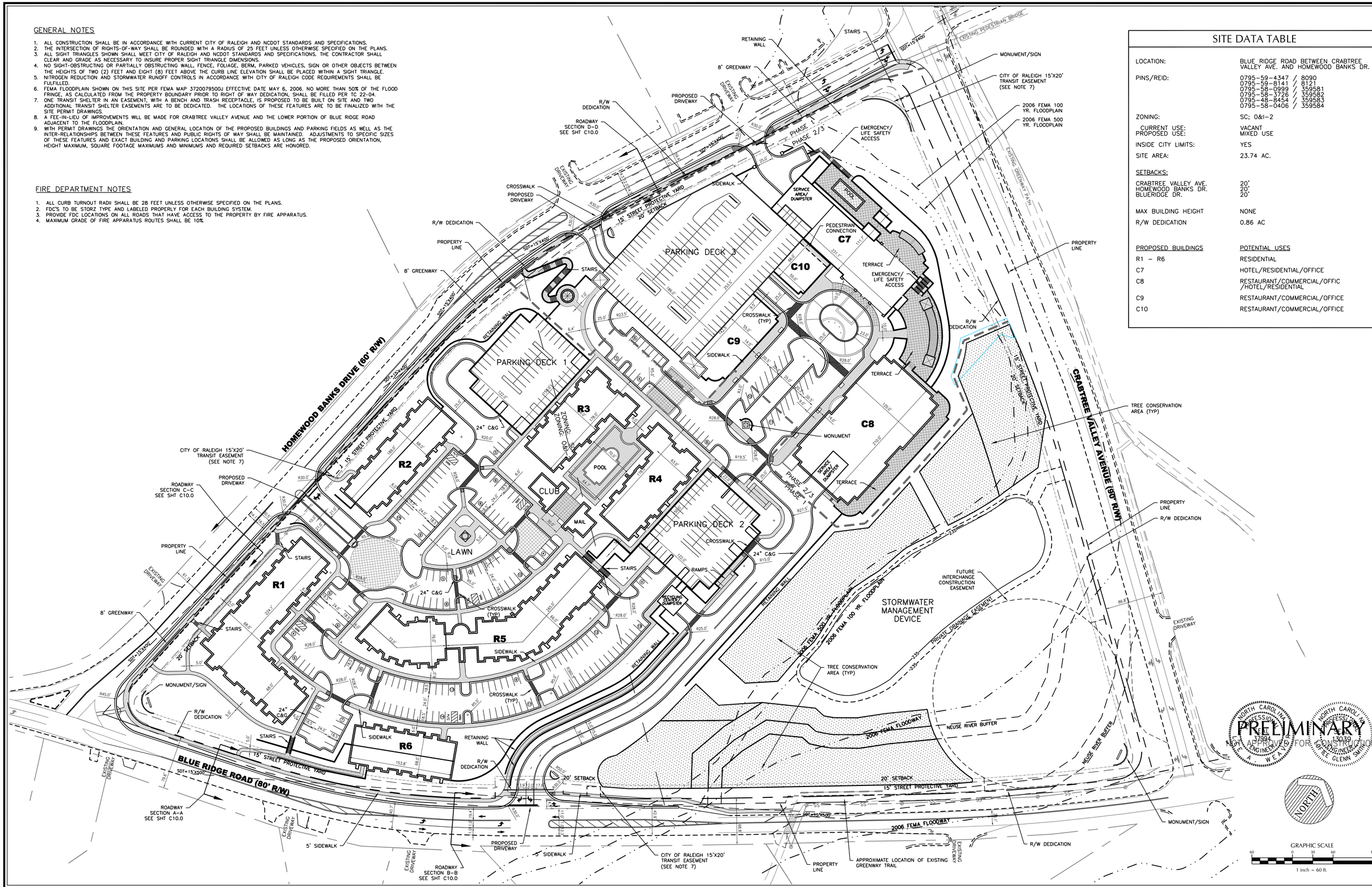
FIRE DEPARTMENT NOTES

1. ALL CURB TURNOUT RADII SHALL BE 28 FEET UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FDC'S TO BE STORZ TYPE AND LABELED PROPERLY FOR EACH BUILDING SYSTEM.
3. PROVIDE FDC LOCATIONS ON ALL ROADS THAT HAVE ACCESS TO THE PROPERTY BY FIRE APPARATUS.
4. MAXIMUM GRADE OF FIRE APPARATUS ROUTES SHALL BE 10%.

SITE DATA TABLE

LOCATION:	BLUE RIDGE ROAD BETWEEN CRABTREE VALLEY AVE. AND HOMEWOOD BANKS DR.
PINS/REID:	0795-59-4347 / 8090 0795-59-8141 / 8121 0795-58-0999 / 359581 0795-58-3726 / 359582 0795-48-8454 / 359583 0795-58-0406 / 359584
ZONING:	SC; O&I-2
CURRENT USE: PROPOSED USE:	VACANT MIXED USE
INSIDE CITY LIMITS:	YES
SITE AREA:	23.74 AC.
SETBACKS:	
CRABTREE VALLEY AVE. HOMEWOOD BANKS DR. BLUERIDGE DR.	20' 20' 20'
MAX BUILDING HEIGHT	NONE
R/W DEDICATION	0.86 AC

PROPOSED BUILDINGS	POTENTIAL USES
R1 – R6	RESIDENTIAL
C7	HOTEL/RESIDENTIAL/OFFICE
C8	RESTAURANT/COMMERCIAL/OFFIC /HOTEL/RESIDENTIAL
C9	RESTAURANT/COMMERCIAL/OFFICE
C10	RESTAURANT/COMMERCIAL/OFFICE



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3	REVISED PER 3RD COR COMMENTS	5/9/12	LAW
4	REVISED SITE PLAN	6/13/12	LAW
5	REVISED PER COR COMMENTS	6/21/12	GAS

Designer: W&R	Scale: 1" = 60'
Drawn By: LGS	Date: 02/17/12
Checked By: LGS	Job No.: 2110265.0

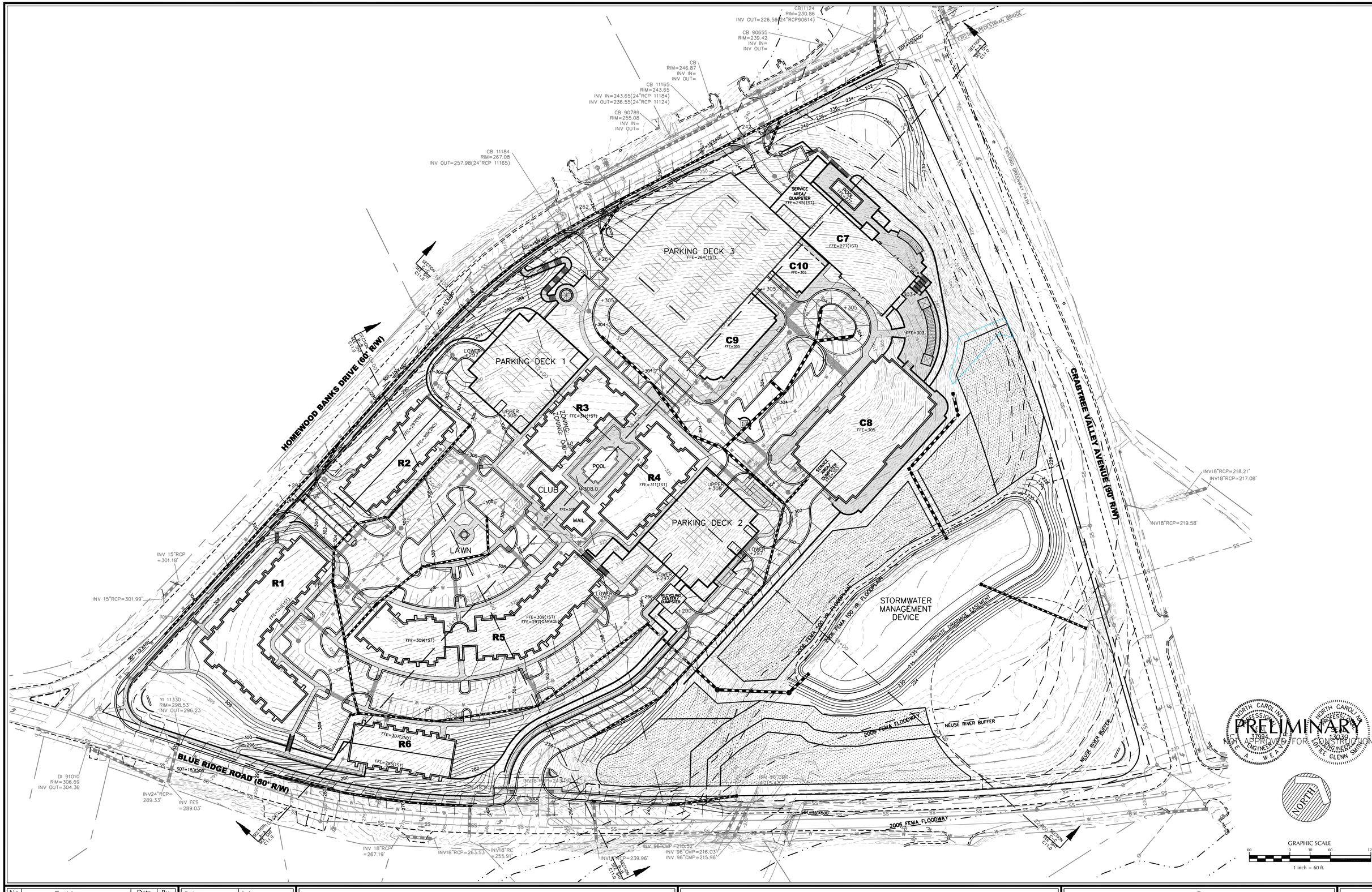
CRABTREE VILLAGE

RALEIGH WAKE COUNTY NORTH CAROLINA

SITE PLAN

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5	REVISED PER COR COMMENTS	6/21/12	GAS

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CRABTREE VILLAGE

RALEIGH WAKE COUNTY NORTH CAROLINA

GRADING PLAN

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FOREBAY [18"-30" BELOW NORMAL POOL] (10%) +/- 3,500 SF

DEEP POOL [18"-30" BELOW NORMAL POOL] (10%) +/- 3,500 SF

SHALLOW WATER [0-6" BELOW NORMAL POOL] (40%) +/- 14,000 SF

SHALLOW LAND [NORMAL POOL - HIGH WATER] (40%) +/- 14,000 SF

NOTES:

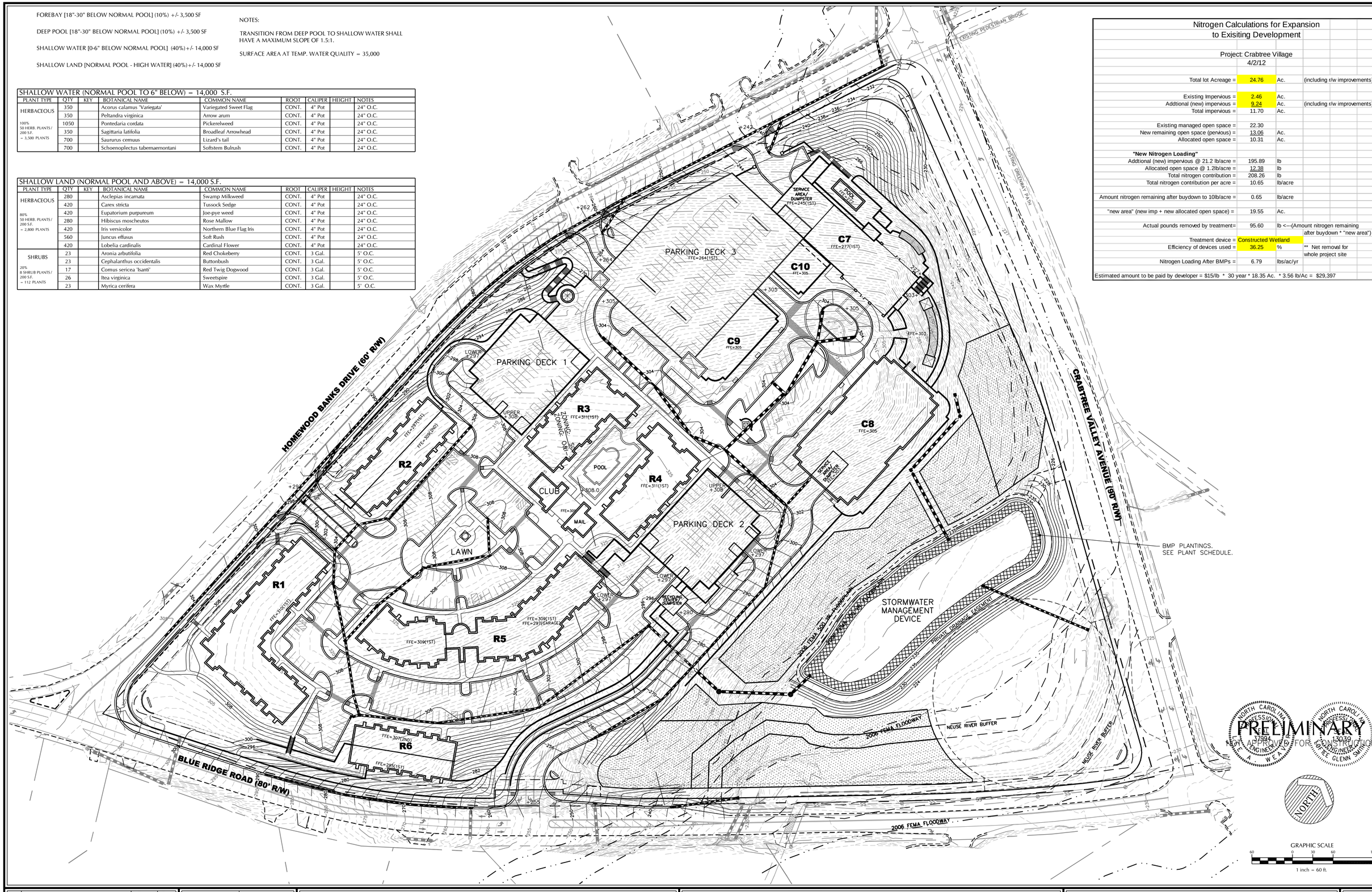
TRANSITION FROM DEEP POOL TO SHALLOW WATER SHALL HAVE A MAXIMUM SLOPE OF 1.5:1.

SURFACE AREA AT TEMP. WATER QUALITY = 35,000

SHALLOW WATER (NORMAL POOL TO 6" BELOW) = 14,000 S.F.								
PLANT TYPE	QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	CALIPER	HEIGHT	NOTES
HERBACEOUS	350		Acorus calamus 'Variegata'	Variegated Sweet Flag	CONT.	4" Pot		24" O.C.
	350		Peltandra virginica	Arrow arum	CONT.	4" Pot		24" O.C.
100% 50 HERB. PLANTS / 200 S.F. = 3,500 PLANTS	1050		Pontedaria cordata	Pickerelweed	CONT.	4" Pot		24" O.C.
	350		Sagittaria latifolia	Broadleaf Arrowhead	CONT.	4" Pot		24" O.C.
	700		Saururus cernuus	Lizard's tail	CONT.	4" Pot		24" O.C.
	700		Schoenoplectus tabernaemontani	Softstem Bulrush	CONT.	4" Pot		24" O.C.

SHALLOW LAND (NORMAL POOL AND ABOVE) = 14,000 S.F.								
PLANT TYPE	QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	CALIPER	HEIGHT	NOTES
HERBACEOUS	280		Asclepias incarnata	Swamp Milkweed	CONT.	4" Pot		24" O.C.
	420		Carex stricta	Tussock Sedge	CONT.	4" Pot		24" O.C.
	420		Eupatorium purpureum	Joe-pye weed	CONT.	4" Pot		24" O.C.
80% 50 HERB. PLANTS / 200 S.F. = 2,800 PLANTS	280		Hibiscus moscheutos	Rose Mallow	CONT.	4" Pot		24" O.C.
	420		Iris versicolor	Northern Blue Flag Iris	CONT.	4" Pot		24" O.C.
	560		Juncus effusus	Soft Rush	CONT.	4" Pot		24" O.C.
	420		Lobelia cardinalis	Cardinal Flower	CONT.	4" Pot		24" O.C.
SHRUBS	23		Aronia arbutifolia	Red Chokeberry	CONT.	3 Gal.		5' O.C.
	23		Cephalanthus occidentalis	Buttonbush	CONT.	3 Gal.		5' O.C.
20% 8 SHRUB PLANTS / 200 S.F. = 112 PLANTS	17		Cornus sericea 'Isanti'	Red Twig Dogwood	CONT.	3 Gal.		5' O.C.
	26		Itea virginica	Sweetspire	CONT.	3 Gal.		5' O.C.
	23		Myrica cerifera	Wax Myrtle	CONT.	3 Gal.		5' O.C.

Nitrogen Calculations for Expansion to Exisiting Development			
Project: Crabtree Village			
4/2/12			
Total lot Acreage =	24.76	Ac.	(including r/w improvements)
Existing Impervious =	2.46	Ac.	
Addtional (new) impervious =	9.24	Ac.	(including r/w improvements)
Total impervious =	11.70	Ac.	
Existing managed open space =	22.30		
New remaining open space (pervious) =	13.06	Ac.	
Allocated open space =	10.31	Ac.	
"New Nitrogen Loading"			
Addtional (new) impervious @ 21.2 lb/acre =	195.89	lb	
Allocated open space @ 1.2lb/acre =	12.38	lb	
Total nitrogen contribution =	208.26	lb	
Total nitrogen contribution per acre =	10.65	lb/acre	
Amount nitrogen remaining after buydown to 10lb/acre =	0.65	lb/acre	
"new area" (new imp + new allocated open space) =	19.55	Ac.	
Actual pounds removed by treatment=	95.60	lb <—(Amount nitrogen remaining after buydown * "new area")	
Treatment device =	Constructed Wetland		
Efficiency of devices used =	36.25	%	** Net removal for whole project site
Nitrogen Loading After BMPs =	6.79	lbs/ac/yr	
Estimated amount to be paid by developer = $15/lb * 30 year * 18.35 Ac. * 3.56 lb/Ac = $29,397			



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CRABTREE VILLAGE

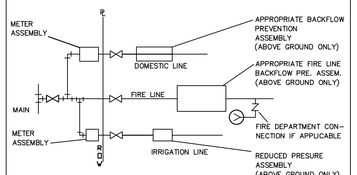
RALEIGH WAKE COUNTY NORTH CAROLINA

STORMWATER PLAN

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MINIMUM ENCLOSURE (INSIDE DIMENSIONS)	
4"	4' 9" x 7' 2"
6"	5' 0" x 8' 2"
8"	5' 2" x 9' 7"
10"	5' 5" x 11' 6"



1. SERVICE TAPS FOR 2" AND SMALLER DOMESTIC SERVICES MAY BE BY CORPORATION COCKS. LARGER SERVICES WILL REQUIRE A TEE AND GATE VALVE OR TAPPING SLEEVE AND VALVE ASSEMBLY AND 90 ° BEND.
2. DOMESTIC SERVICE TAPS SHALL BE ALLOWED ONLY ON 6" OR LARGER FIRE LINES BEFORE THE BACKFLOW ASSEMBLY.
3. ONE DOMESTIC TAP PER FIRE LINE ON STREET SIDE OF BACKFLOW.
4. FIRE LINE SHALL HAVE A FIRE HYDRANT OR BLOW OFF ASSEMBLY AT ITS END TO FACILITATE FLUSHING WHEN NEEDED.
5. ALL PRIVATE DISTRIBUTION SYSTEMS SHALL HAVE A MINIMUM OF A DCA (FOR FIRE HYDRANTS A DCDA IS NEEDED).
6. ALL SERVICE CONNECTIONS SHALL HAVE A PRIVATE SERVICE GATE VALVE INSTALED BEFORE BACKFLOW ASSEMBLIES AND AFTER THE METER.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
FIRE, DOMESTIC & IRRIGATION OPTIONS SCHEMATIC

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-34	RRH	5-31-05	DHL	6/18/08
	A.B.B.	7-10-04	PAP	4/15/10

STANDARD UTILITY NOTES:

1. ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS (REFERENCE: COR PUD HANDBOOK, CURRENT EDITION)
2. UTILITY SEPARATION REQUIREMENTS:
   - A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL
   - WHEN INSTALLING WATER &/OR SEWER MAINS, THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'. IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS, THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER & MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER
   - WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS
   - MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS; MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS & A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER COR PUD DETAILS W-41 & S-49)
   - ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN. VERTICAL SEPARATION REQUIRED
3. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION
4. CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT
5. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCEMAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS
6. INSTALL 2" COPPER WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'x2' WATERLINE EASEMENT IMMEDIATELY ADJACENT
7. INSTALL 4" PVC SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM
8. PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE
9. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE &/OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND &/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION
10. GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919) 250-7825 OR TIMOTHY.BEASLEY@RALEIGHNC.GOV FOR MORE INFORMATION

UTILITY & STORM LEGEND

- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER BFP
- SEWER CHECK VALVE
- CLEAN OUT
- W — WATER LINE
- SS — SANITARY SEWER
- STORM SEWER
- EASEMENT

PRELIMINARY
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GRAPHIC SCALE
60 0 30 60 120
1 inch = 60 ft.

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CRABTREE VILLAGE
RALEIGH WAKE COUNTY NORTH CAROLINA

UTILITY PLAN

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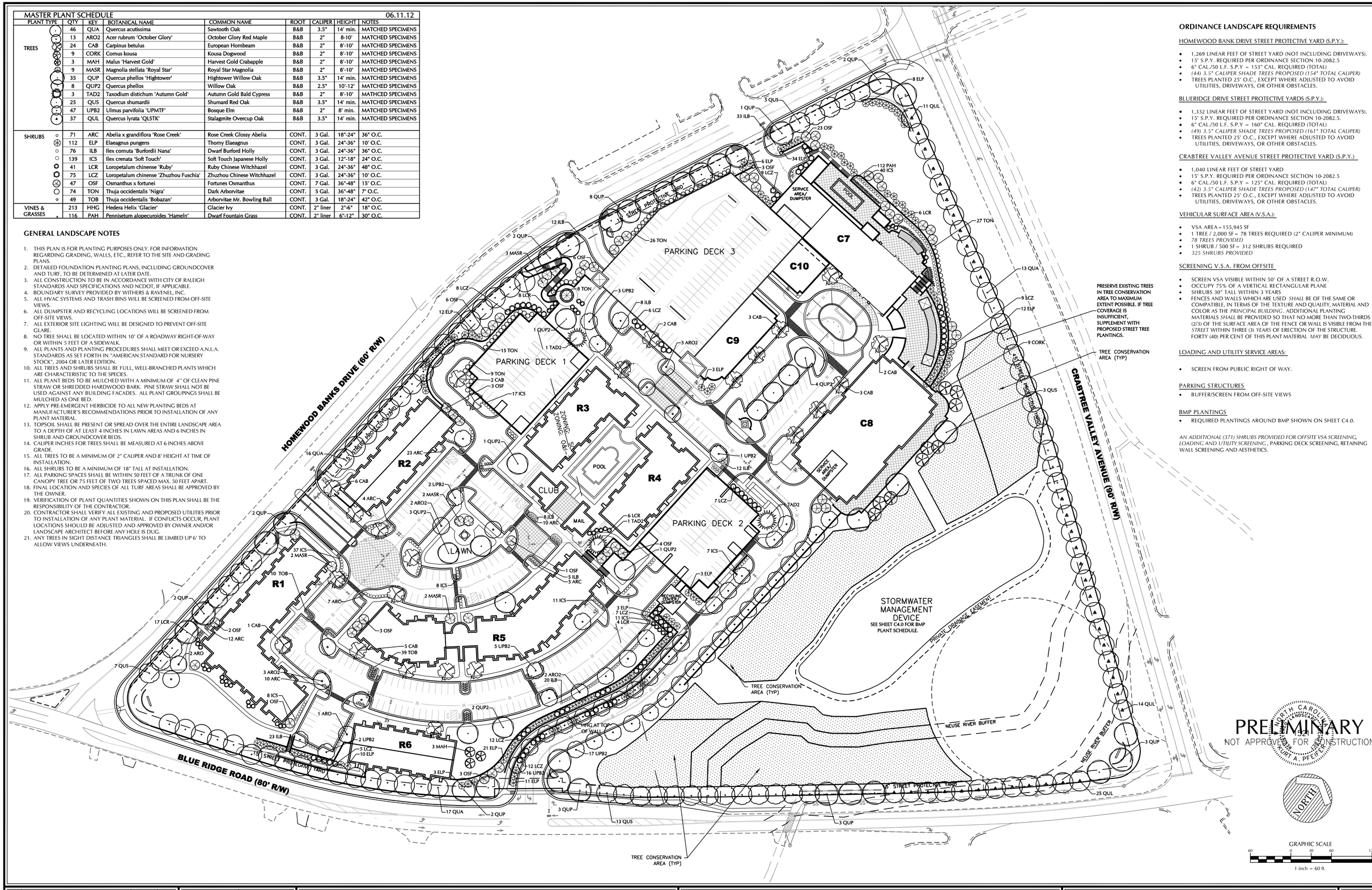
MASTER PLANT SCHEDULE

06.11.12

PLANT TYPE	QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	CALIPER	HEIGHT	NOTES
TREES	46	QUA	Quercus acutissima	Sawtooth Oak	B&B	3.5"	14' min.	MATCHED SPECIMENS
	13	ARO2	Acer rubrum 'October Glory'	October Glory Red Maple	B&B	2"	8-10'	MATCHED SPECIMENS
	24	CAB	Carpinus betulus	European Hornbeam	B&B	2"	8'-10'	MATCHED SPECIMENS
	9	CORK	Cornus kousa	Kousa Dogwood	B&B	2"	8'-10'	MATCHED SPECIMENS
	3	MAH	Malus 'Harvest Gold'	Harvest Gold Crabapple	B&B	2"	8'-10'	MATCHED SPECIMENS
	9	MASR	Magnolia stellata 'Royal Star'	Royal Star Magnolia	B&B	2"	8'-10'	MATCHED SPECIMENS
	35	QUP	Quercus phellos 'Hightower'	Hightower Willow Oak	B&B	3.5"	14' min.	MATCHED SPECIMENS
	8	QUP2	Quercus phellos	Willow Oak	B&B	2.5"	10'-12'	MATCHED SPECIMENS
	3	TAD2	Taxodium distichum 'Autumn Gold'	Autumn Gold Bald Cypress	B&B	2"	8'-10'	MATHCED SPECIMENS
	25	QUS	Quercus shumardii	Shumard Red Oak	B&B	3.5"	14' min.	MATCHED SPECIMENS
	47	UPB2	Ulmus parvifolia 'UPMTF'	Bosque Elm	B&B	2"	8' min.	MATCHED SPECIMENS
	37	QUL	Quercus lyrata 'QLSTK'	Stalagmite Overcup Oak	B&B	3.5"	14' min.	MATCHED SPECIMENS
SHRUBS	71	ARC	Abelia x grandiflora 'Rose Creek'	Rose Creek Glossy Abelia	CONT.	3 Gal.	18"-24"	36" O.C.
	112	ELP	Elaeagnus pungens	Thorny Elaeagnus	CONT.	3 Gal.	24"-36"	10' O.C.
	76	ILB	Ilex cornuta 'Burfordii Nana'	Dwarf Burford Holly	CONT.	3 Gal.	24"-36"	36" O.C.
	139	ICS	Ilex crenata 'Soft Touch'	Soft Touch Japanese Holly	CONT.	3 Gal.	12"-18"	24" O.C.
	41	LCR	Loropetalum chinense 'Ruby'	Ruby Chinese Witchhazel	CONT.	3 Gal.	24"-36"	48" O.C.
	75	LCZ	Loropetalum chinense 'Zhuzhou Fuschia'	Zhuzhou Chinese Witchhazel	CONT.	3 Gal.	24"-36"	10' O.C.
	47	OSF	Osmanthus x fortunei	Fortunes Osmanthus	CONT.	7 Gal.	36"-48"	15' O.C.
	74	TON	Thuja occidentalis 'Nigra'	Dark Arborvitae	CONT.	5 Gal.	36"-48"	7' O.C.
	49	TOB	Thuja occidentalis 'Bobazan'	Arborvitae Mr. Bowling Ball	CONT.	3 Gal.	18"-24"	42" O.C.
VINES & GRASSES	213	HHG	Hedera Helix 'Glacier'	Glacier Ivy	CONT.	2" liner	2"-6"	18" O.C.
	116	PAH	Pennisetum alopecuroides 'Hameln'	Dwarf Fountain Grass	CONT.	2" liner	6"-12"	30" O.C.

GENERAL LANDSCAPE NOTES

1. THIS PLAN IS FOR PLANTING PURPOSES ONLY. FOR INFORMATION REGARDING GRADING, WALLS, ETC., REFER TO THE SITE AND GRADING PLANS.
2. DETAILED FOUNDATION PLANTING PLANS, INCLUDING GROUNDCOVER AND TURF, TO BE DETERMINED AT LATER DATE.
3. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS AND NCDOT, IF APPLICABLE.
4. BOUNDARY SURVEY PROVIDED BY WITHERS & RAVENEL, INC.
5. ALL HVAC SYSTEMS AND TRASH BINS WILL BE SCREENED FROM OFF-SITE VIEWS.
6. ALL DUMPSTER AND RECYCLING LOCATIONS WILL BE SCREENED FROM OFF-SITE VIEWS.
7. ALL EXTERIOR SITE LIGHTING WILL BE DESIGNED TO PREVENT OFF-SITE GLARE.
8. NO TREE SHALL BE LOCATED WITHIN 10' OF A ROADWAY RIGHT-OF-WAY OR WITHIN 5 FEET OF A SIDEWALK.
9. ALL PLANTS AND PLANTING PROCEDURES SHALL MEET OR EXCEED A.N.L.A. STANDARDS AS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK", 2004 OR LATER EDITION.
10. ALL TREES AND SHRUBS SHALL BE FULL, WELL-BRANCHED PLANTS WHICH ARE CHARACTERISTIC TO THE SPECIES.
11. ALL PLANT BEDS TO BE MULCHED WITH A MINIMUM OF 4" OF CLEAN PINE STRAW OR SHREDDED HARDWOOD BARK. PINE STRAW SHALL NOT BE USED AGAINST ANY BUILDING FACADES. ALL PLANT GROUPINGS SHALL BE MULCHED AS ONE BED.
12. APPLY PRE-EMERGENT HERBICIDE TO ALL NEW PLANTING BEDS AT MANUFACTURER'S RECOMMENDATIONS PRIOR TO INSTALLATION OF ANY PLANT MATERIAL.
13. TOPSOIL SHALL BE PRESENT OR SPREAD OVER THE ENTIRE LANDSCAPE AREA TO A DEPTH OF AT LEAST 4 INCHES IN LAWN AREAS AND 6 INCHES IN SHRUB AND GROUNDCOVER BEDS.
14. CALIPER INCHES FOR TREES SHALL BE MEASURED AT 6 INCHES ABOVE GRADE.
15. ALL TREES TO BE A MINIMUM OF 2" CALIPER AND 8' HEIGHT AT TIME OF INSTALLATION.
16. ALL SHRUBS TO BE A MINIMUM OF 18" TALL AT INSTALLATION.
17. ALL PARKING SPACES SHALL BE WITHIN 50 FEET OF A TRUNK OF ONE CANOPY TREE OR 75 FEET OF TWO TREES SPACED MAX. 50 FEET APART.
18. FINAL LOCATION AND SPECIES OF ALL TURF AREAS SHALL BE APPROVED BY THE OWNER.
19. VERIFICATION OF PLANT QUANTITIES SHOWN ON THIS PLAN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
20. CONTRACTOR SHALL VERIFY ALL EXISTING AND PROPOSED UTILITIES PRIOR TO INSTALLATION OF ANY PLANT MATERIAL. IF CONFLICTS OCCUR, PLANT LOCATIONS SHOULD BE ADJUSTED AND APPROVED BY OWNER AND/OR LANDSCAPE ARCHITECT BEFORE ANY HOLE IS DUG.
21. ANY TREES IN SIGHT DISTANCE TRIANGLES SHALL BE LIMBED UP 6' TO ALLOW VIEWS UNDERNEATH.



ORDINANCE LANDSCAPE REQUIREMENTS

HOMEWOOD BANK DRIVE STREET PROTECTIVE YARD (S.P.Y.):

- 1,269 LINEAR FEET OF STREET YARD (NOT INCLUDING DRIVEWAYS).
- 15' S.P.Y. REQUIRED PER ORDINANCE SECTION 10-2082.5
- 6" CAL./50 L.F. S.P.Y = 153" CAL. REQUIRED (TOTAL)
- *(44) 3.5" CALIPER SHADE TREES PROPOSED (154" TOTAL CALIPER)*
- TREES PLANTED 25' O.C., EXCEPT WHERE ADJUSTED TO AVOID UTILITIES, DRIVEWAYS, OR OTHER OBSTACLES.

BLUERIDGE DRIVE STREET PROTECTIVE YARDS (S.P.Y.):

- 1,332 LINEAR FEET OF STREET YARD (NOT INCLUDING DRIVEWAYS).
- 15' S.P.Y. REQUIRED PER ORDINANCE SECTION 10-2082.5.
- 6" CAL./50 L.F. S.P.Y = 160" CAL. REQUIRED (TOTAL)
- *(49) 3.5" CALIPER SHADE TREES PROPOSED (161" TOTAL CALIPER)*
- TREES PLANTED 25' O.C., EXCEPT WHERE ADJUSTED TO AVOID UTILITIES, DRIVEWAYS, OR OTHER OBSTACLES.

CRABTREE VALLEY AVENUE STREET PROTECTIVE YARD (S.P.Y.)

- 1,040 LINEAR FEET OF STREET YARD
- 15' S.P.Y. REQUIRED PER ORDINANCE SECTION 10-2082.5
- 6" CAL./50 L.F. S.P.Y = 125" CAL. REQUIRED (TOTAL)
- *(42) 3.5" CALIPER SHADE TREES PROPOSED (147" TOTAL CALIPER)*
- TREES PLANTED 25' O.C., EXCEPT WHERE ADJUSTED TO AVOID UTILITIES, DRIVEWAYS, OR OTHER OBSTACLES.

VEHICULAR SURFACE AREA (V.S.A.):

- VSA AREA = 155,945 SF
- 1 TREE / 2,000 SF = 78 TREES REQUIRED (2" CALIPER MINIMUM)
- *78 TREES PROVIDED*
- 1 SHRUB / 500 SF = 312 SHRUBS REQUIRED
- *325 SHRUBS PROVIDED*

SCREENING V.S.A. FROM OFFSITE

- SCREEN VSA VISIBLE WITHIN 50' OF A STREET R.O.W.
- OCCUPY 75% OF A VERTICAL RECTANGULAR PLANE
- SHRUBS 30" TALL WITHIN 3 YEARS
- FENCES AND WALLS WHICH ARE USED *SHALL* BE OF THE SAME OR COMPATIBLE, IN TERMS OF THE TEXTURE AND QUALITY, MATERIAL AND COLOR AS THE *PRINCIPAL BUILDING*. ADDITIONAL PLANTING MATERIALS *SHALL* BE PROVIDED SO THAT NO MORE THAN TWO-THIRDS (2/3) OF THE SURFACE AREA OF THE FENCE OR WALL IS VISIBLE FROM THE *STREET* WITHIN THREE (3) *YEARS* OF ERECTION OF THE STRUCTURE. FORTY (40) PER CENT OF THIS PLANT MATERIAL *MAY* BE DECIDUOUS.

LOADING AND UTILITY SERVICE AREAS:

- SCREEN FROM PUBLIC RIGHT OF WAY.

PARKING STRUCTURES

- BUFFER/SCREEN FROM OFF-SITE VIEWS

BMP PLANTINGS

- REQUIRED PLANTINGS AROUND BMP SHOWN ON SHEET C4.0.

AN ADDITIONAL (371) SHRUBS PROVIDED FOR OFFSITE VSA SCREENING, LOADING AND UTILITY SCREENING, PARKING DECK SCREENING, RETAINING WALL SCREENING AND AESTHETICS.

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NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT 3221 COURTNEY A. PFEIFER

NORTH

No.	Revision	Date	By
1	REVISED PER 1ST COR COMMENTS	3/15/12	LAW
2	REVISED PER 2ND COR COMMENTS	4/2/12	LAW
3	REVISED PER 3RD COR COMMENTS	5/9/12	LAW
4	REVISED SITE PLAN	6/13/12	LAW

Designer W&R	Scale 1" = 60'
Drawn By	Date 02/17/12
Checked By LGS	Job No. 2110265.0

CRABTREE VILLAGE

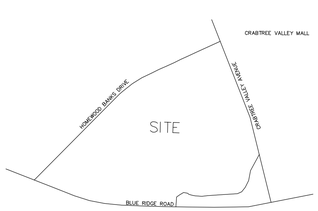
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Sheet No. C 6.0

Tree Conservation Plan Data Sheet	Date: 02.16..2011	(Revised:06.13.2012)
(Refer to Ordinance TC-7-04 and User's Manual for Instructions)		
Project Name: Crabtree Village	Total Site Acres: 23.74 Acres	
Total TCA required (15% or more for RR, R2, 10% or more for all other zoning districts) 10% or more required = **2.37 ac**		
	Number of Acres	**Percent of Tract**
(1) Primary Tree Conservation Areas		
(a1) SHOD 1 Yards	0.00	0.00%
(a2) SHOD 2 Yards	0.00	0.00%
(a3) SHOD 3 Yards	0.00	0.00%
(a4) SHOD 4 Yards	0.00	0.00%
(a5) Thoroughfare District Yards	0.00	0.00%
(a6) Conservation Management District	0.00	0.00%
(a7) Metro Park Overlay District	0.00	0.00%
(a8) Conditional Use Zoning Tree Save Areas	0.00	0.00%
(a9) Natural Protective Yards Required by Re-Zoning or Other Conditions	0.00	0.00%
(a10) Other Required Tree Save Areas	0.00	0.00%
(b) Champion Trees including their Critical Root Zones	0.00	0.00%
(c) Zone 2 of Neuse riparian buffers	0.17	0.72%
(d) Area with slopes of 45% or more adjacent to or within floodways	0.00	0.00%
Subtotal of Primary Tree Conservation Areas:	0.17	0.72%
Greenway Easement: (voluntarily inclusion of a portion of greenway)	0.73	3.07%
(2) Secondary Tree Conservation Areas		
(a) Major Thoroughfare: 50-foot Average Buffer	0.73	3.07%
(b) Minor Thoroughfare: 50-foot Average Buffer	0.00	0.00%
(c) PDD ALTERNATE TCA - SLOPES WITH TREES	0.00	0.00%
ALTERNATE COMPLIANCE AREA	0.99	4.17%
(d) 32-foot perimeter yard adjacent to vacant property	0.00	0.00%
(d) Alternate compliance area: 32-foot perimeter yard	0.00	0.00%
(e) Individual trees 10" dbh & larger within 65' of roadways or any non-vacant property	0.00	0.00%
(f) Individual trees 10" dbh & larger within 32' of any vacant property	0.00	0.00%
Subtotal of Secondary Tree Conservation Areas:	1.72	7.25%
TOTAL ALL TREE CONSERVATION AREAS:	2.62	11.04%



VICINITY MAP - NTS

SITE DATA:

SITE ADDRESS:	5301 HOMEWOOD BANKS DRIVE 3925, 3951, 3935, 4001, AND 4105 BLUE RIDGE ROAD
PIN NUMBER:	0795594347, 0795598141, 0795580999, 0795583726, 0795588454, 0795580406
ZONING(S):	CUD SC AND O & I-2 W/ PDOD
ACREAGE:	23.74 AC

NOTES:

1. PROPOSED ALTERNATE TREE CONSERVATION AREAS ON STEEPER SLOPE (1.4 TIMES) ARE THE ELIGIBLE SECONDARY TREE CONSERVATION AREAS NOT PROVIDED ALONG THE THOROUGHFARES.
2. PROPOSED ALTERNATE SECONDARY AREAS ARE EQUAL TO OR EXCEED AN AVERAGE DIMENSION OF FIFTY FEET (50') IN DEPTH, INCLUDING OTHER ADJACENT TCA
3. WITHIN PROPOSED ALTERNATE SECONDARY AREAS, WE HAVE FOUND NO EVIDENCE OF ANY GRADING THAT HAS OCCURRED IN RECENT TIMES (PRIOR TO ADOPTION OF THE TREE ORDINANCE).
4. PRIOR TO PRESENTATION OF THE CASE TO THE PLANNING COMMISSION FOR DELIBERATION, THE OWNER SHALL PREPARE A LETTER FOR THE PLANNING COMMISSION AND CITY COUNCIL OUTLINING THE RATIONALE FOR THE REQUEST FOR SECONDARY AREA(S) ALTERNATE, AND THE LETTER WILL INCLUDE A REPORT FROM A REGISTERED FORESTER DOCUMENTING BASAL AREA CALCULATIONS, AND A PANEL INVENTORY.
5. WE DO NOT BELIEVE THERE ARE MEASURABLE AREAS OF SLOPE THAT ARE BOTH GREATER THAN 45% AND IMMEDIATELY ADJACENT TO OR WITHIN THE FLOODWAY BOUNDARY.
6. THERE IS PROPOSED GREENWAY EASEMENT WITH EXISTING TRAIL AREA THAT IS NOT INCLUDED AS PROPOSED TREE CONSERVATION.
7. IF REQUESTED BY STAFF AT TIME OF GRADING PERMIT REQUEST, "NO MOW" SIGNAGE FOR GREENWAY EASEMENT TREE CONSERVATION AREAS WILL BE PROVIDED - SIGNAGE SHALL BE SIMILAR TO THE MEASURES OUTLINED IN THE CURRENT DRAFT OF THE RALEIGH UDO.
8. EXISTING SANITARY SEWER SERVICE FOR PREVIOUS DEVELOPMENT ON PROPERTY THAT IS LOCATED ON OR NEAR PROPOSED TREE CONSERVATION AREAS SHALL BE ABANDONED IN PLACE IN ACCORD WITH CITY OF RALEIGH PUBLIC UTILITIES MANUAL SPECIFICATIONS. PRESCRIPTIVE EASEMENT FOR THIS SEWER SHALL BE ABANDONED AND/OR RELINQUISHED.

CURVE TABLE		
CURVE	LENGTH	RADIUS
C1	4.24	37.50
C2	29.09	41.00
C3	56.60	28.50
C4	81.76	441.05
C5	15.83	441.05
C6	25.28	150.00
C7	20.92	150.00

LINE TABLE		
LINE	LENGTH	BEARING
L1	20.96	S 5°57'39" W
L2	38.50	S 52°16'8" W
L3	20.02	S 52°16'8" W
L4	25.03	S 52°16'8" W
L5	92.50	S 50°47'36" W
L6	38.43	S 57°17'0" W
L7	7.64	N 37°33'23" E
L8	25.32	N 31°32'50" E
L9	49.19	N 20°54'19" E
L10	35.28	S 48°35'50" W
L11	29.20	S 49°7'21" W
L12	17.13	S 20°54'19" E
L13	15.41	N 4°7'28" E
L14	14.19	N 2°46'36" E
L15	14.99	N 4°3'34" E
L16	14.30	N 6°28'11" E
L17	14.11	N 10°22'20" E
L18	6.32	N 7°24'56" E
L19	14.14	N 2°5'5" W
L20	14.54	N 4°47'20" W
L21	14.52	N 6°25'22" W
L22	14.59	N 2°34'8" W
L23	14.64	N 0°5'24" W
L24	13.48	N 2°1'47" E
L25	2.48	N 3°33'33" E
L26	5.85	N 5°29'09" E
L27	1.14	N 11°12'40" E
L28	1.21	N 11°3'42" E
L29	2.89	N 15°2'40" E
L30	12.47	N 18°26'55" E
L31	14.97	N 19°34'51" E
L32	14.36	N 20°28'24" E
L33	4.91	N 17°36'45" E
L34	13.28	N 12°30'19" E
L35	14.57	N 11°56'4" E
L36	14.69	N 12°30'13" E
L37	8.97	N 15°26'6" E
L38	14.70	N 25°0'14" E
L39	14.10	N 26°32'34" E
L40	14.22	N 25°26'26" E
L41	7.11	N 22°22'37" E
L42	1.49	N 65°7'14" E
L43	16.60	N 26°8'3" E
L44	14.38	N 28°5'40" E
L45	14.98	N 24°2'58" E
L46	13.75	N 21°41'52" E
L47	14.97	N 21°10'45" E
L48	12.44	N 18°52'20" E
L49	1.65	N 18°52'20" E
L50	5.55	N 14°17'24" E
L51	1.14	N 8°54'08" E
L52	34.18	S 53°31'4" W
L53	11.36	S 61°59'43" W
L54	4.18	S 65°43'37" W
L55	16.93	N 84°47'49" W
L56	15.34	S 84°47'49" E
L57	11.57	N 65°43'37" E
L58	14.08	N 61°59'43" E
L59	38.05	N 53°23'4" E
L60	72.01	S 47°17'30" W
L61	42.86	S 44°7'43" W
L62	41.14	S 53°23'4" W
L63	16.24	S 61°59'43" W
L64	17.49	S 65°43'37" W
L65	14.07	N 84°47'49" W
L66	48.76	S 58°7'22" W
L67	41.43	S 20°54'19" E
L68	38.82	S 12°24'8" W
L69	29.42	S 30°8'37" E
L70	5.00	N 40°7'22" E

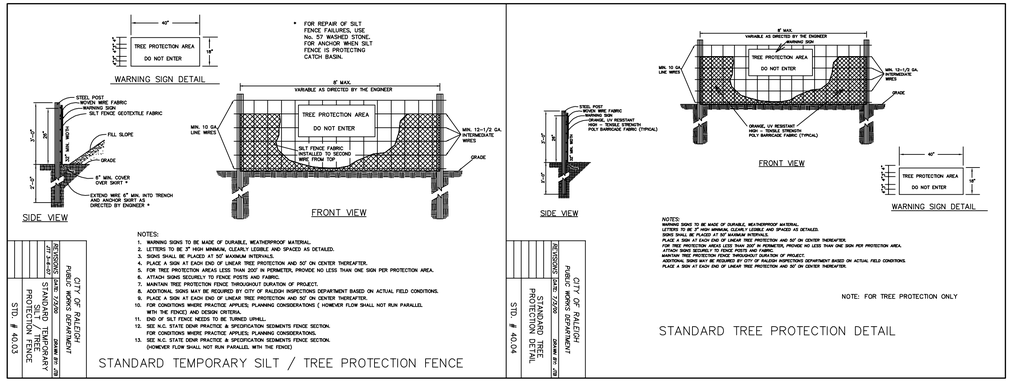
TCA 1 - 5 =	1.58 AC (6.66 %)
DEFAULT TCA =	0.80 AC (3.37 %)

GREENWAY EASEMENT

TREE CONSERVATION PLAN

80' 40' 0 80' 160'

SCALE: 1" = 80'



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JDAVIS ARCHITECTS
510 Glenwood Ave Suite 201 | Raleigh, NC 27603 | tel 919.835.1500 | fax 919.835.1510

Master Plan / Rezoning Petition
Crabtree Village
Raleigh, North Carolina

PRELIMINARY

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

		DATE
PROJECT:	12008	02.16.2012
ISSUE:	Preliminary Master Plan	02.16.2012
REVISIONS:	MP Review Comments	03.15.2012
	MP-Planning Commission	05.22.2012
	MP Review Comments	06.13.2012
DRAWN BY:	SB	
CHECKED BY:	DB	
CONTENT:	TREE CONSERVATION PLAN	

C5

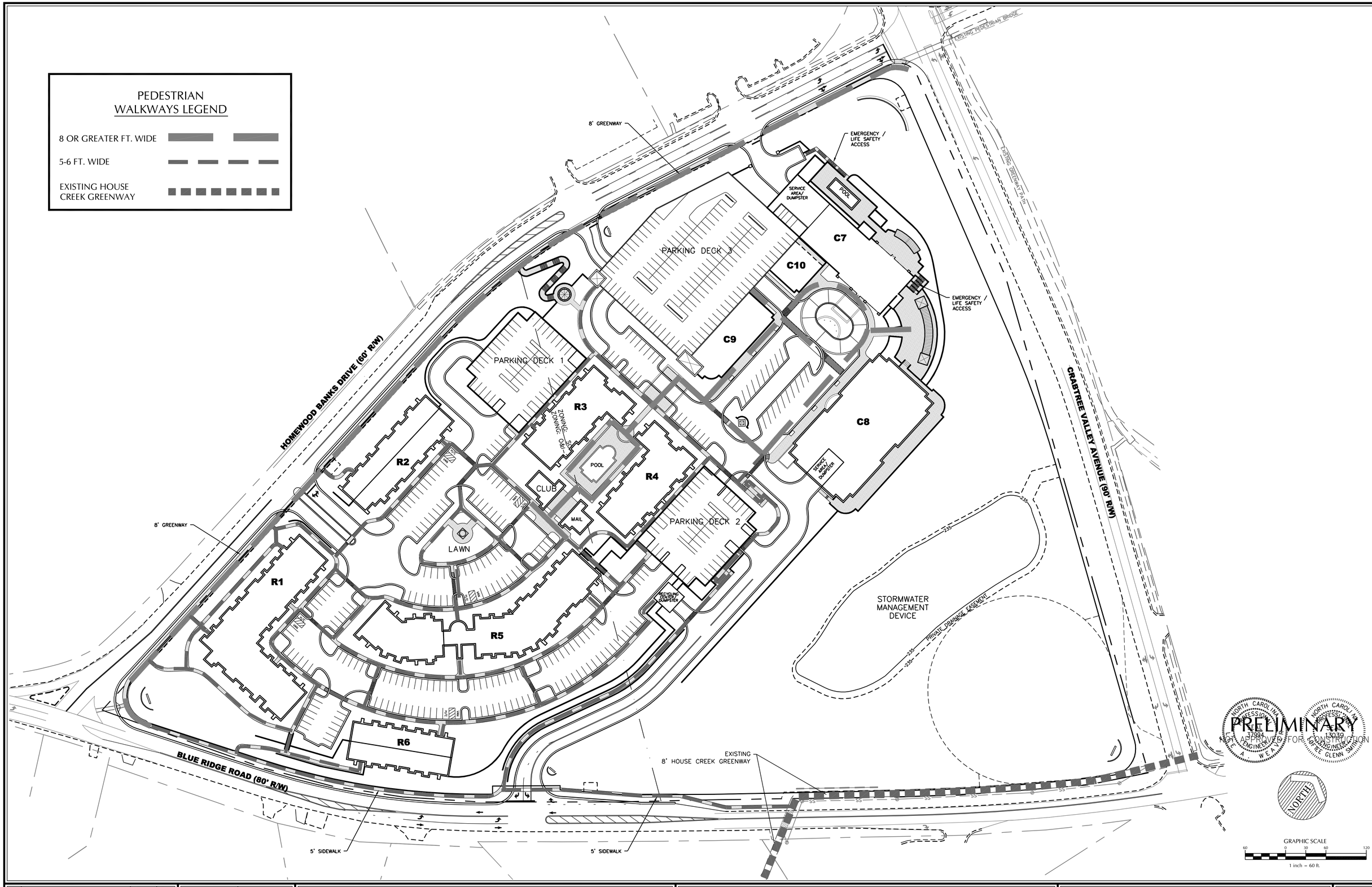
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PEDESTRIAN
WALKWAYS LEGEND

8 OR GREATER FT. WIDE

5-6 FT. WIDE

EXISTING HOUSE
CREEK GREENWAY



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1	REVISED PER 1ST COR COMMENTS	3/15/12	LAW
2	REVISED PER 2ND COR COMMENTS	4/2/12	LAW
3	REVISED PER 3RD COR COMMENTS	5/9/12	LAW
4	REVISED SITE PLAN	6/13/12	LAW

Designer W&R	Scale 1" = 60'
Drawn By	Date 02/17/12
Checked By LGS	Job No. 2110265.0

CRABTREE VILLAGE

RALEIGH WAKE COUNTY NORTH CAROLINA

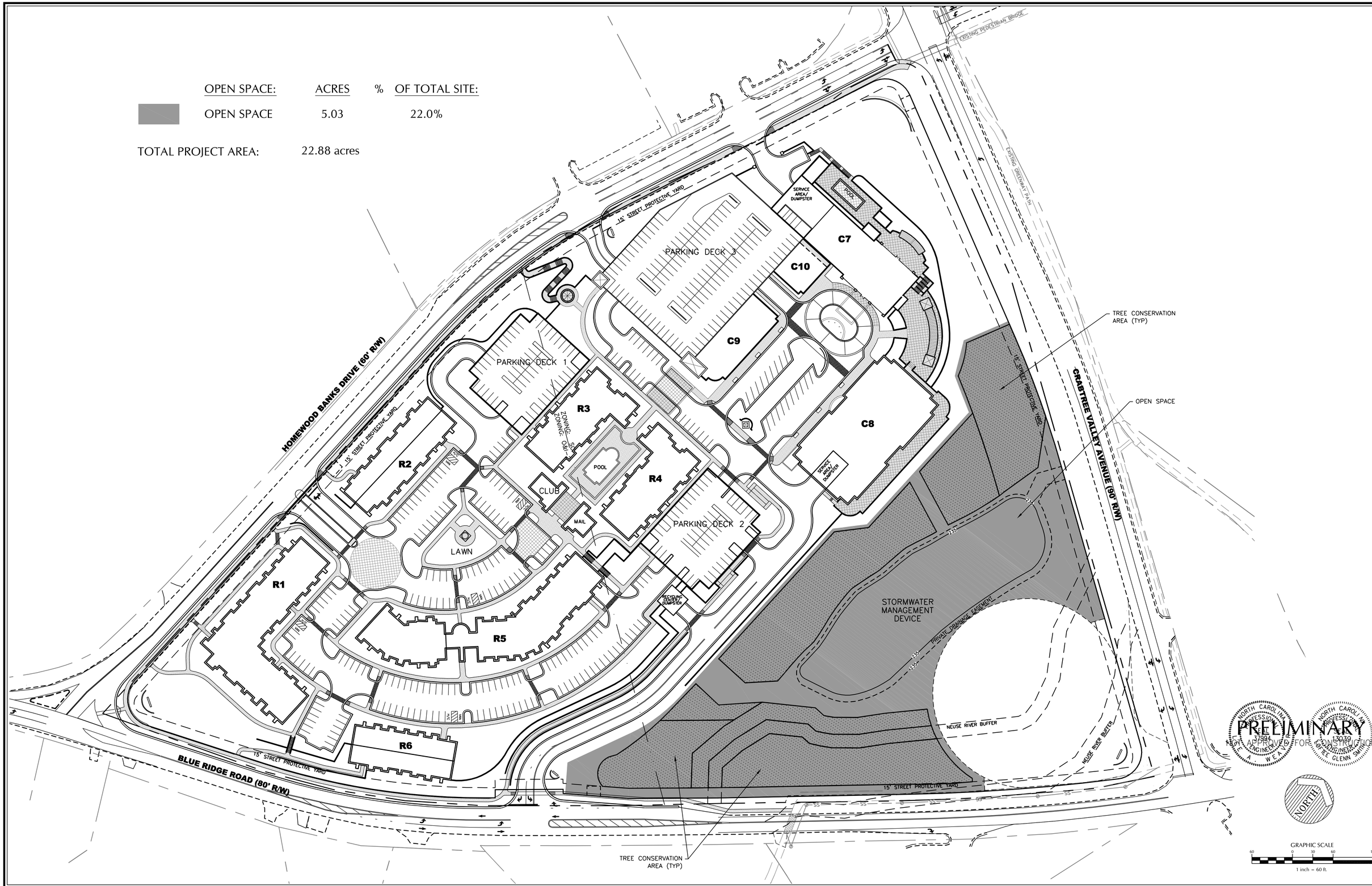
PEDESTRIAN CIRCULATION PLAN

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C 8.0

OPEN SPACE:	ACRES	%	OF TOTAL SITE:
OPEN SPACE	5.03		22.0%

TOTAL PROJECT AREA: 22.88 acres



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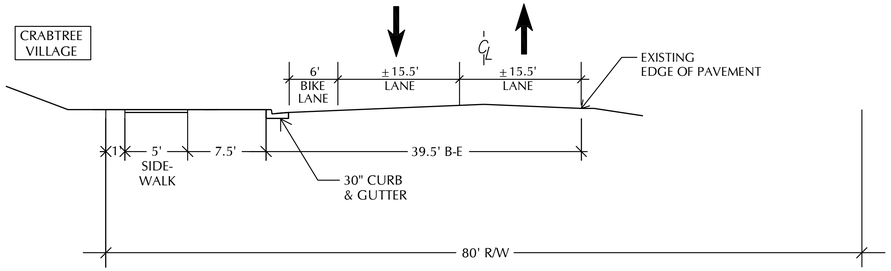
CRABTREE VILLAGE

RALEIGH WAKE COUNTY NORTH CAROLINA

OPEN SPACE PLAN

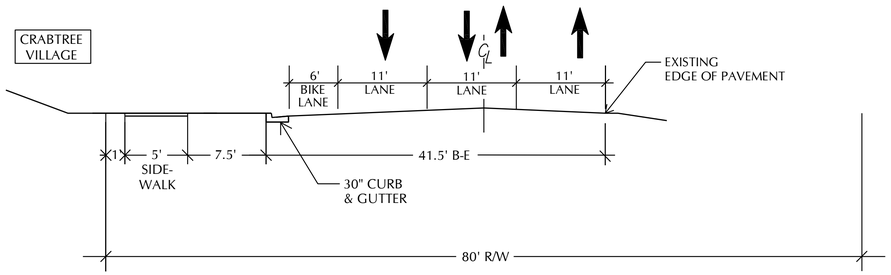
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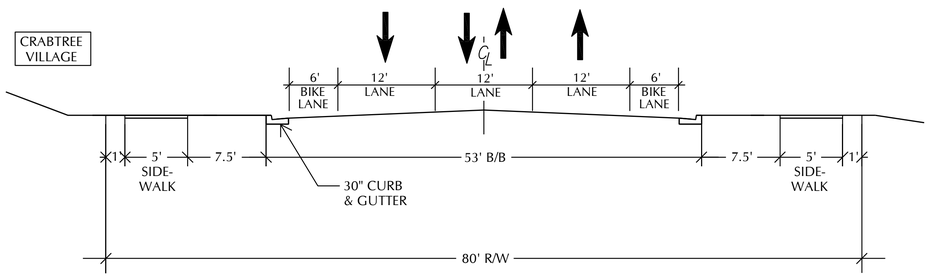
BLUE RIDGE ROAD SECTION
(MINOR THOROUGHFARE)

SECTION A - A



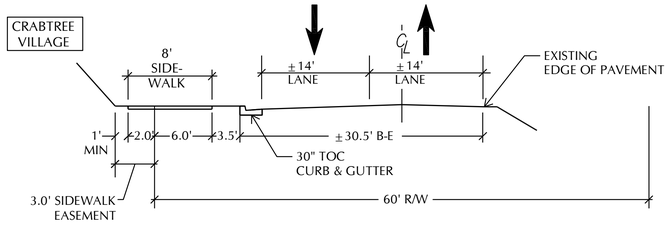
BLUE RIDGE ROAD SECTION
(MINOR THOROUGHFARE)

SECTION B - B



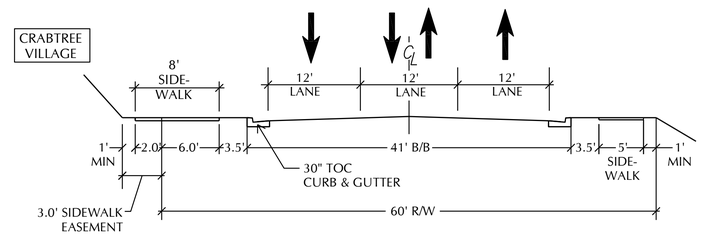
BLUE RIDGE ROAD SECTION
(MINOR THOROUGHFARE)

ULTIMATE SECTION



HOMEWOOD BANKS DRIVE SECTION
(COLLECTOR STREET SECTION)

SECTION C-C



HOMEWOOD BANKS DRIVE SECTION
(COLLECTOR STREET SECTION)

SECTION D-D
ULTIMATE SECTION

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

NOTE

1. SEE SHEET C2.0 FOR PLAN VIEW OF STREETS.
2. NO IMPROVEMENTS PROPOSED TO CRABTREE VALLEY AVENUE.

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4	REVISED SITE PLAN	6/13/12	LAW

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CRABTREE VILLAGE
RALEIGH WAKE COUNTY NORTH CAROLINA

PUBLIC R/W STREET SECTIONS

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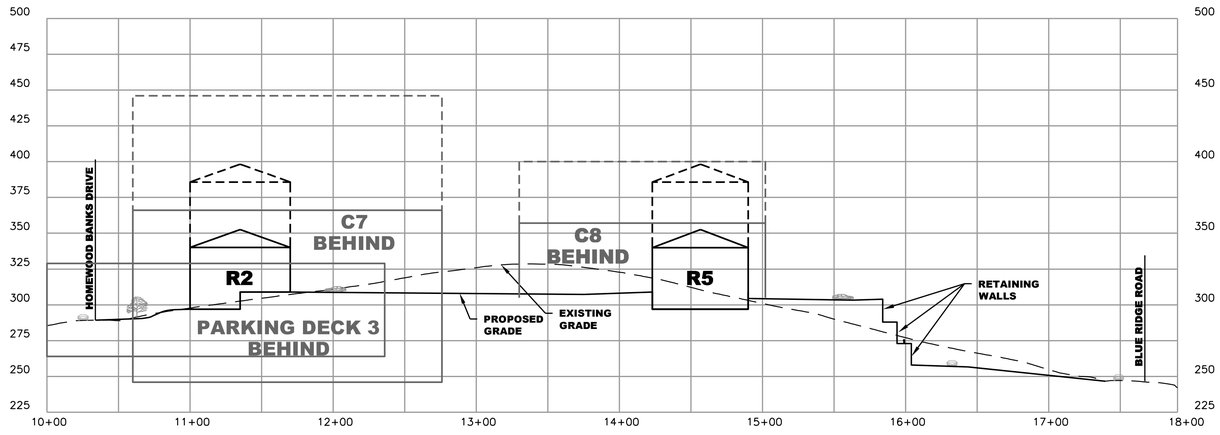
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C 10.0

SECTION A–A



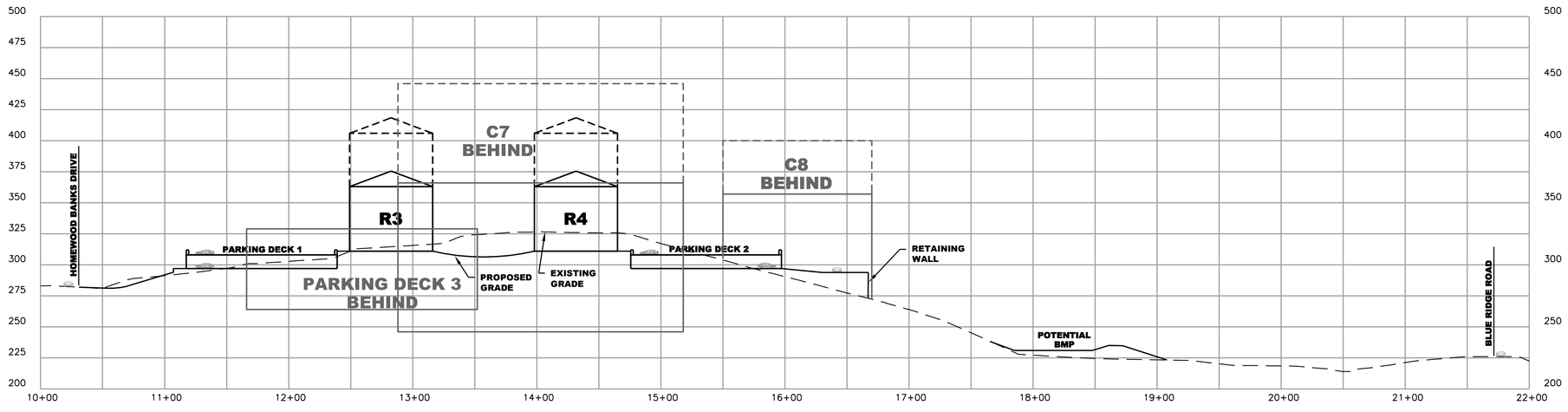
SCALE:
1" = 50' HORIZ.
1" = 50' VERT.

SECTION B–B



SCALE:
1" = 50' HORIZ.
1" = 50' VERT.

SECTION C–C



SCALE:
1" = 50' HORIZ.
1" = 50' VERT.

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CRABTREE VILLAGE

RALEIGH WAKE COUNTY NORTH CAROLINA

SITE CROSS SECTIONS

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TECHNICAL APPENDICES

Proposed Crabtree Village Mixed Use Development

Prepared for:

Pappas Properties

3525 Piedmont Center

Suite 300

Atlanta, GA 30305



Prepared by:

Stantec

801 Jones Franklin Road Suite 300
Raleigh NC 27606-3394
Ph: (919) 865-7588
Fx: (919) 851-7024
www.stantec.com

NORTH CAROLINA PROFESSIONAL SEAL 20654 ENGINEER CHRISTA A. GREENE

5/11/12

MAY 2012

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I. Executive Summary

The proposed Crabtree Village Development site is the triangular tract of land bounded by Crabtree Valley Avenue, Blue Ridge Road, and Homewood Banks Drive in Raleigh, North Carolina as illustrated in Figure 1. The proposed development could potentially consist of 525 dwelling units, 60,000 square feet of retail, and 250,000 square feet of office space. The project is scheduled for two phases. Phase 1 will consist of 315 apartment units and is anticipated to be complete by 2014. Phase 2 will consist of the additional residential units, office space, and retail land uses and is anticipated to be completed by 2016.

With the first phase, the proposed development will generate approximately 2032 trips during the average weekday with 158 trips in the AM peak hour and 191 trips in the PM peak hour.

When both phases are complete, the proposed development will generate approximately 9374 trips during the average weekday with 766 trips in the AM peak hour and 855 trips during the PM peak hour.

The City of Raleigh has three approved development plans in the vicinity of this proposed project: the Woodfield Marshall Park Apartments (SP-58-11), Woodfield Marshall Park Townhomes (S-2-12), and the Weingarten Development. Site traffic and roadway improvements for these developments are included in the traffic analyses for the proposed development.

The following is a summary of the capacity analyses included in this Traffic Impact Analysis:

Table 1: Crabtree Village Development Level-of-Service Summary
(Delay in Seconds)

Intersection	2012 Existing		2014 No Build		2016 No Build		2014 Phase 1		2016 Phase 2	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Creedmoor Road \ Mall Entrance	A (7.3) F (83.3) EB E (77.3) WB A (4.1) NB A (7.1) SB	B (16.4) D (45.0) EB C (34.3) WB B (13.8) NB B (14.1) SB	A (7.4) F (83.3) EB E (77.2) WB A (4.1) NB A (7.3) SB	B (16.5) D (45.0) EB C (34.3) WB B (14.2) NB B (14.1) SB	A (7.5) F (83.3) EB E (77.2) WB A (4.1) NB A (7.5) SB	B (10.8) D (45.0) EB C (34.3) WB B (14.5) NB B (14.1) SB	A (7.4) F (83.3) EB E (77.5) WB A (4.1) NB A (7.3) SB	B (16.5) D (45.0) EB C (34.3) WB B (14.4) NB B (14.0) SB	A (8.6) F (83.3) EB E (78.2) WB A (4.7) NB A (8.5) SB	B (17.0) D (45.0) EB C (34.2) WB B (15.2) NB B (14.2) SB
Glenwood Avenue \ Blue Ridge Road \ Lead Mine Road	F (176.8) D (53.4) EB C (32.4) WB E (60.5) NB F (**) SB	F (133.4) D (48.7) EB F (166.7) WB F (100.5) NB F (188.1) SB	F (185.6) E (70.2) EB D (36.8) WB E (56.3) NB F (**) SB	F (166.4) D (50.1) EB F (227.1) WB F (120.1) NB F (192.3) SB	F (194.1) F (81.1) EB D (38.5) WB E (56.3) NB F (**) SB	F (174.4) D (50.8) EB F (239.5) WB F (124.2) NB F (200.1) SB	F (187.2) E (76.3) EB D (38.9) WB E (55.8) NB F (**) SB	F (171.9) D (50.8) EB F (236.5) WB F (128.2) NB F (195.0) SB	F (212.7) F (111.3) EB E (76.5) WB E (56.3) NB F (**) SB	F (190.4) D (52.0) EB F (266.0) WB F (151.6) NB F (203.1) SB
Blue Ridge Road \ Mall Entrance	A (9.7) D (38.3) EB A (2.3) NB A (7.9) SB	B (14.8) D (35.7) EB A (6.9) NB A (7.3) SB	A (9.5) D (38.3) EB A (2.4) NB A (8.7) SB	B (15.8) D (35.3) EB A (7.3) NB B (10.7) SB	A (9.6) D (38.3) EB A (2.4) NB A (8.9) SB	B (16.5) D (35.2) EB A (7.4) NB B (10.9) SB	A (9.3) D (38.3) EB A (2.4) NB A (9.0) SB	B (16.2) D (35.3) EB A (7.4) NB B (12.0) SB	B (11.8) D (38.2) EB A (2.6) NB B (12.9) SB	B (17.1) D (35.7) EB A (6.9) NB A (7.3) SB
Creedmoor Road \ Crabtree Valley Avenue	# (5.6) F (81.0) WB A (0.8) SB	# (305.2) F (**) WB C (3.9) SB	# (10.5) F (121.2) WB B (0.9) SB	# (331.0) F (**) WB C (5.9) SB	# (11.9) F (138.9) WB B (0.9) SB	# (332.4) F (**) WB D (6.3) SB	# (17.0) F (173.9) WB B (0.9) SB	# (354.5) F (**) WB D (7.1) SB	# (382.2) F (3591) WB B (1.5) SB	# (**) F (**) WB E (11.5) SB
Creedmoor Road \ Crabtree Valley Avenue	N/A	N/A	B (10.9) D (36.9) WB A (5.4) NB A (9.8) SB	C (28.1) D (52.4) WB C (29.3) NB B (16.9) SB	B (16.2) D (37.8) WB A (17.6) NB A (12.9) SB	C (27.9) D (48.3) WB C (29.6) NB B (17.6) SB	B (12.3) D (35.6) WB A (6.2) NB B (11.4) SB	C (31.0) D (52.5) WB C (33.3) NB B (19.1) SB	B (19.7) D (44.4) WB C (21.6) NB B (14.7) SB	D (36.9) D (53.4) WB D (39.0) NB C (25.2) SB
Blue Ridge Road \ Crabtree Valley Avenue	# (26.6) F (142.2) EB B (14.6) WB	# (87.3) F (410.1) EB D (26.1) WB	# (75.1) F (393.8) EB C (17.7) WB	# (**) F (**) EB F (60.0) WB	# (83.1) F (438.5) EB C (18.1) WB	# (**) F (**) EB F (72.4) WB	# (99.1) F (**) EB C (19.7) WB	# (**) F (**) EB F (126.7) WB	# (**) F (**) NB E (44.5) SB	# (**) F (**) EB F (**) WB
Blue Ridge Road \ Crabtree Valley Avenue	N/A	N/A	C (23.3) D (50.1) EB C (28.7) WB A (9.5) NB B (18.7) SB	C (24.2) D (42.6) EB C (33.7) WB B (17.9) NB B (19.7) SB	C (24.4) D (53.9) EB C (28.7) WB B (9.6) NB B (19.5) SB	D (39.6) E (69.8) EB D (50.3) WB C (33.6) NB C (29.0) SB	C (23.8) D (50.5) EB C (28.5) WB B (10.1) NB B (19.8) SB	C (26.8) D (53.6) EB C (33.6) WB C (20.1) NB B (19.1) SB	D (40.8) F (95.3) EB C (31.4) WB B (10.1) NB C (34.6) SB	D (50.0) E (78.7) EB C (33.4) WB D (49.0) NB D (37.1) SB
Homewood Banks Drive \ Crabtree Valley Avenue	# (3.3) B (12.1) NB B (11.3) SB	# (11.6) D (32.0) NB C (23.7) SB	# (3.6) B (14.6) NB B (11.9) SB	# (24.0) F (102.2) NB D (33.1) SB	# (3.6) B (14.8) NB B (12.0) SB	# (27.0) F (118.2) NB A (0.6) WB	# (4.8) C (16.7) NB B (12.2) SB	# (43.9) F (209.4) NB E (39.8) SB	# (15.6) F (57.7) NB C (18.1) SB	# (**) F (**) NB F (228.5) SB
Edwards Mill Road \ Crabtree Valley Avenue	# (2.8) B (10.6) NB A (2.8) WB	# (8.7) D (31.8) NB A (4.0) WB	# (4.7) B (13.1) NB A (3.2) WB	# (44.8) F (169.0) NB A (4.9) WB	# (4.7) B (13.3) NB A (3.2) WB	# (50.0) F (190.2) NB A (4.9) WB	# (4.6) B (13.7) NB A (2.9) WB	# (56.8) F (223.5) NB A (4.8) WB	# (5.0) B (18.3) NB A (2.8) WB	# (116.0) F (**) NB A (4.2) WB
Homewood Banks Drive \ Blue Ridge Road	# (2.5) C (24.2) SB A (4.0) EB	# (2.2) C (16.5) SB A (1.5) EB	# (3.2) D (25.1) SB A (4.1) EB	# (3.4) C (24.4) SB A (1.8) EB	# (3.2) D (25.6) SB A (4.0) EB	# (3.5) C (25.3) SB A (1.8) EB	# (3.3) D (25.5) SB A (4.1) EB	# (3.5) C (25.6) SB A (1.8) EB	# (6.2) D (45.5) SB A (4.4) EB	# (18.7) F (113.6) SB A (2.6) EB
Blue Ridge Road \ Woodfield Marshall Park Apartments Access	N/A	N/A	# (2.8) C (17.6) NB A (0.2) WB	# (2.9) E (35.3) NB A (2.1) WB	# (2.8) C (18.0) NB A (40.2) WB	# (2.3) D (34.1) NB A (9.5) WB	# (2.8) C (18.2) NB A (0.2) WB	# (2.3) E (34.6) NB A (1.0) WB	# (3.0) C (22.7) NB A (0.2) WB	# (2.7) E (48.1) NB A (0.9) WB
Blue Ridge Road \ South Site Access	N/A	N/A	N/A	N/A	N/A	N/A	# (1.3) C (19.2) SB A (0.2) EB	# (0.9) D (29.7) SB A (0.3) EB	# (2.0) D (25.2) SB A (1.2) EB	# (8.3) F (100.6) SB A (0.4) EB
Homewood Banks \ Tavern Drive \ North Site Access	# (2.9) A (9.0) EB A (1.6) NB	# (1.0) B (10.0) EB A (0.5) NB	# (2.0) A (9.3) EB A (0.9) NB	# (0.8) B (10.6) EB A (0.4) NB	# (2.0) A (9.3) EB A (0.9) NB	# (0.8) B (10.6) EB A (0.4) NB	# (1.5) A (9.6) EB A (0.5) NB	# (0.7) B (11.2) EB A (0.3) NB	# (3.3) C (16.3) EB B (11.2) WB	# (3.2) C (23.7) EB C (15.9) WB
Homewood Banks \ Suites Drive \ Northwest Site Access	# (7.4) A (9.7) EB A (7.5) NB	# (1.7) B (10.1) EB A (0.5) NB	# (7.4) A (9.7) EB A (7.5) NB	# (1.4) B (10.7) EB A (0.4) NB	# (6.0) B (10.1) EB A (6.0) NB	# (1.4) B (10.8) EB A (0.4) NB	# (5.0) B (10.5) EB A (4.5) NB	# (1.2) B (11.5) EB A (0.3) NB	# (6.0) C (15.9) EB B (11.8) WB	# (4.0) C (24.8) EB B (14.0) WB
Homewood Banks \ West Site Access	N/A	N/A	N/A	N/A	N/A	N/A	# (2.3) A (9.5) WB A (1.1) SB	# (2.0) A (9.5) WB A (2.2) SB	# (3.1) B (11.0) WB A (3.7) SB	# (3.7) B (13.2) WB A (2.2) SB

Through the analyses done as a part of this TIA, several improvements were identified for both the No Build and Build Out Scenarios.

No Build Improvements:

The following improvements are identified to address deficiencies in the transportation network that are required as a result of the background traffic and approved development projects.

- ***Crabtree Valley Avenue / Creedmoor Road*** – There have been some discussions about relocating this intersection further south as a part of the future development in the southeast quadrant of this intersection. There are no approved plans for this relocation at this time. Therefore, when appropriate MUTCD Warrants are met, provide a traffic signal at this location to allow minor street traffic to access Creedmoor Road. Due to the proximity of the Creedmoor Road / Crabtree Valley Mall Entrance intersection, the new signal will need to operate in coordination with the adjacent signals.

- ***Crabtree Valley Avenue / Blue Ridge Road*** – The **Crabtree Valley Transportation Study** was prepared by The Louis Berger Group, Inc. in March 2011. This plan provides a recommended alternative to extend Crabtree Valley Avenue to I-440. The estimated cost for this improvement is in excess of $40 Million. Due to the high cost of the preferred alternative in comparison to the size of this proposed development, this report only considered interim operations at this intersection. Therefore, when appropriate MUTCD Warrants are met, a traffic signal should be provided at this location to allow minor street traffic to access Blue Ridge Road. Due to the proximity of the Blue Ridge Road / Crabtree Valley Mall Entrance intersection, the new signal will need to operate in coordination with the adjacent signals.

- ***Glenwood Avenue / Blue Ridge Road / Lead Mine Road*** – This intersection is currently operating at an unacceptable level of service in the AM and PM peak hours. Due to the traffic volumes and existing number of travel lanes, a significant construction project will be required to improve this location to an acceptable level of service. The Crabtree Valley Transportation Study provides a recommended alternative which includes a partial grade separated intersection at an estimated cost of $52.8 Million. No short term improvements that would provide an acceptable level of service were identified at this intersection as a part of this City funded study. Due to the minimal impact of the proposed development, no additional recommendations are provided for this intersection.

Build Out Improvements:

The following improvements are identified to mitigate the additional traffic generated by the proposed development:

- ***Blue Ridge Road / South Site Access Point*** - Recommended improvements at this intersection include a southbound taper at the site access point and a northbound left turn lane that will provide full storage to the Woodfield Marshall Park Apartments turn lane. The driveway must meet or exceed all NCDOT / City of Raleigh requirements.

- ***Homewood Banks / Crabtree Tavern / North Site Access Point*** – Provide the required thoroughfare widening improving Homewood Banks Drive to a 3-lane cross-section; therefore, providing a left turn lane into the proposed development. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

- ***Homewood Banks / Homewood Suites Access / Northwest Site Access Point*** – Provide the required thoroughfare widening improving Homewood Banks Drive to a 3-lane cross-section; therefore, providing a left turn lane into the proposed development. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

- ***Homewood Banks / West Site Access Point*** –Construct half of the ultimate 3-lane cross section for Homewood Banks Drive. When the property on the west side of Homewood Banks Drive develops, a left turn lane into the site access will be provided. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

This study shows that traffic generated by the proposed development is a very small portion of the existing traffic in the study area. The Louis Berger Group, Inc. provided the **Crabtree Valley Transportation Study** for the City in March 2009 that outlined the long range transportation solutions for this area. The recommended improvements in this plan exceed $90 Million. The development of this site will not interfere with the roadway plans outlined in this study. Additionally, the proposed project reserves the area in the easternmost corner of the property for the ramp recommended in the study.

The recommended improvements for the proposed development will mitigate the traffic generated by the proposed development at the site access locations. Additional improvements due to no build conditions will need to be constructed for all intersections to operate at acceptable levels of service.

II. Introduction

The proposed Crabtree Village Development site is the triangular tract of land bounded by Crabtree Valley Avenue, Blue Ridge Road, and Homewood Banks Drive in Raleigh, North Carolina as illustrated in Figure 1. The development could ultimately consist of 525 dwelling units, 60,000 square feet of retail, and 250,000 square feet of office space. The first phase, Phase I, of the development will consist of 315 apartment units. Phase 2 will consist of the remaining residential units and the retail and office space. Phase one is anticipated to be complete by 2014 while Phase 2 is anticipated to be complete by 2016.

A site plan prepared by Withers and Ravenel is illustrated in Figure 2.

The purpose of this report is to evaluate the proposed development in terms of projected traffic conditions, evaluate the ability of the adjacent roadways to accommodate the additional traffic volumes, and to recommend transportation improvements needed to mitigate congestion that may result from the additional site traffic. This report presents trip generation, trip distribution, traffic analyses, multimodal analysis and recommendations for transportation improvements needed to meet anticipated traffic demands. This report examines the AM and PM peak hour for the 2012 Existing Conditions, 2014 No Build Conditions, 2016 No Build, 2014 Build Out, and 2016 Build Out Conditions, with and without Crabtree Village Development improvements.

Figure 1. Site Location Map

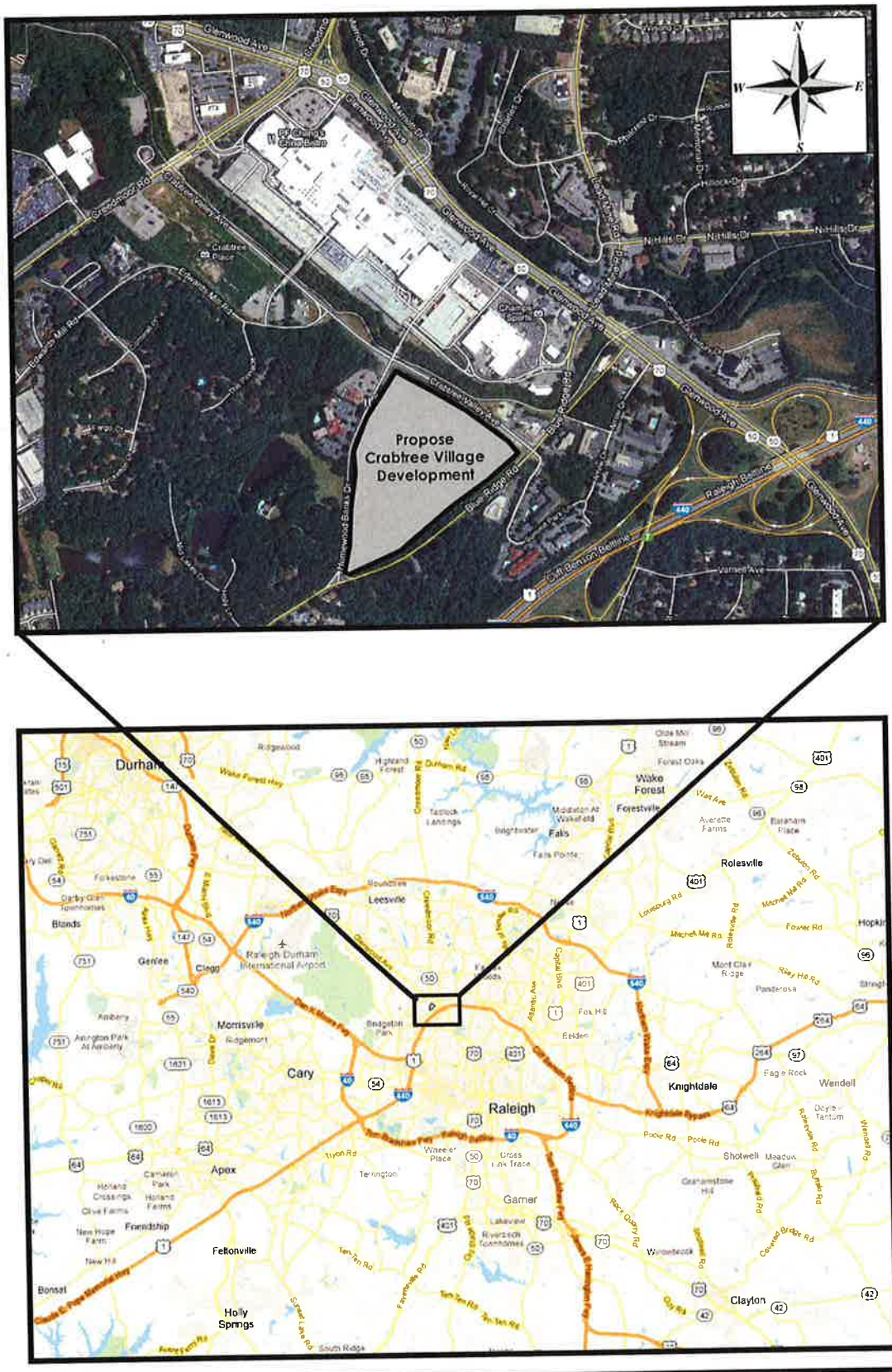
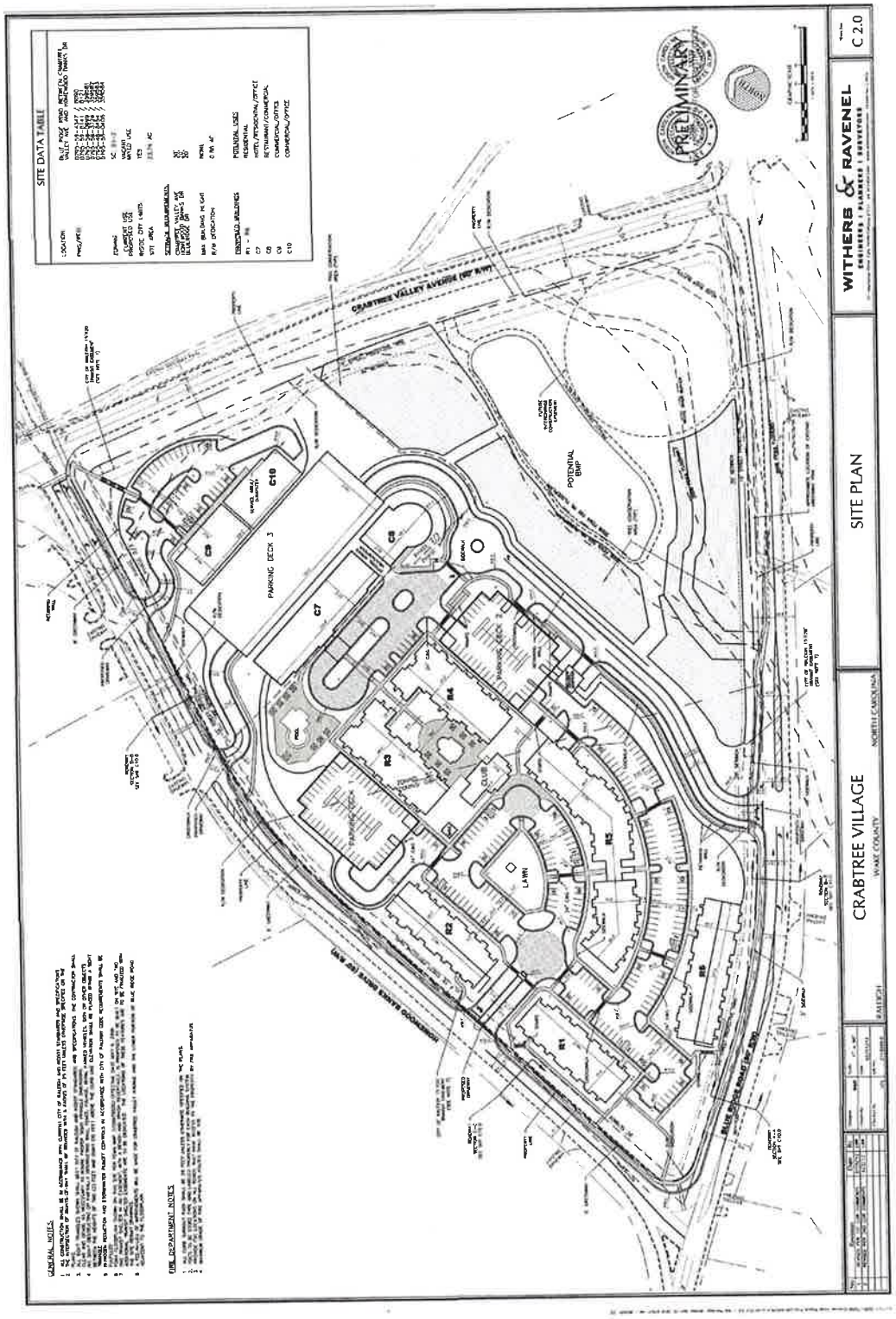


Figure 2. Site Plan



III. Inventory of traffic Conditions

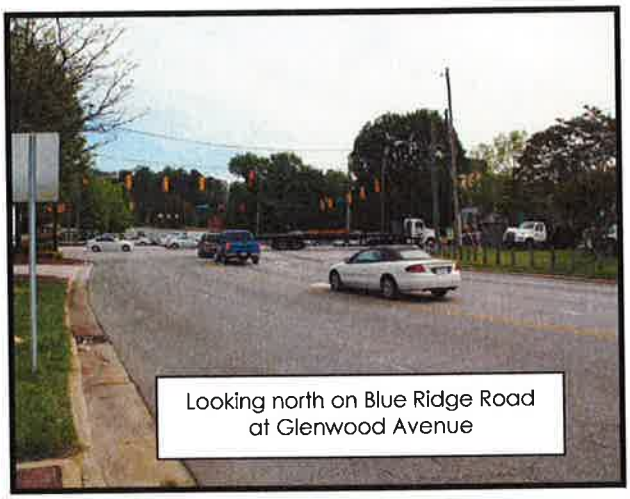
A. Study Area

The City of Raleigh requested that the following intersections be analyzed to determine the associated impacts from the proposed development:

- Glenwood Avenue \Blue Ridge Road \ Lead Mine Road (Signalized)
- Blue Ridge Road \ Mall Entrance (Signalized)
- Blue Ridge Road \ Crabtree Valley Avenue (Unsignalized)
- Blue Ridge Road \ Homewood Banks Drive (Unsignalized)
- Crabtree Valley Avenue \ Homewood Banks Drive (Unsignalized)
- Edwards Mill Road \ Crabtree Valley Avenue (Unsignalized)
- Creedmoor Road \ Crabtree Valley Avenue (Signalized)
- Creedmoor Road \ Mall Entrance (Signalized)
- Blue Ridge Road \ Woodfield Marshall Park Apartment Access Point (Unsignalized)

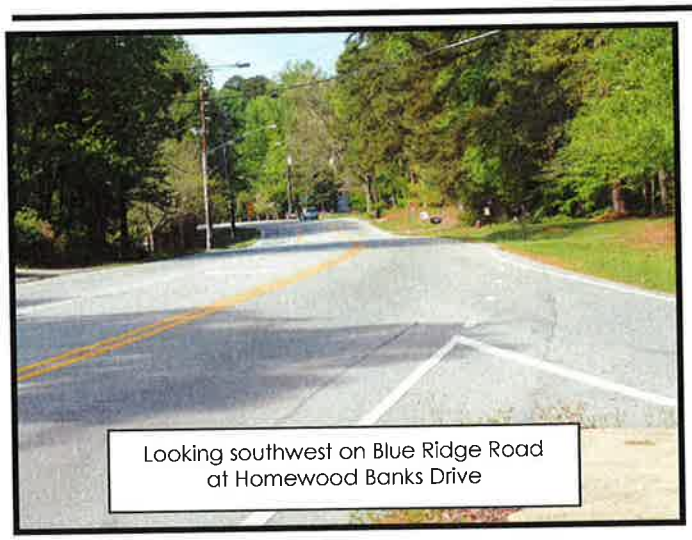
B. Existing Conditions

Blue Ridge Road (SR 1670) is a two-lane minor thoroughfare located on the southeast side of the proposed development. North of Crabtree Valley Avenue, Blue Ridge Road widens to a multi-lane cross section in the vicinity of Crabtree Valley Mall. Blue Ridge Road serves as a north-south connector between Duraleigh Road and Glenwood Avenue. The 2009 Average Daily Traffic (ADT) as reported by NCDOT on Blue Ridge Road is approximately 7,200 Vehicles Per Day (VPD)[1] near the proposed development. Further north, near Glenwood Avenue, the ADT is 10,000 vpd. The speed limit in the area of the proposed development is 35 mph. The section of Blue



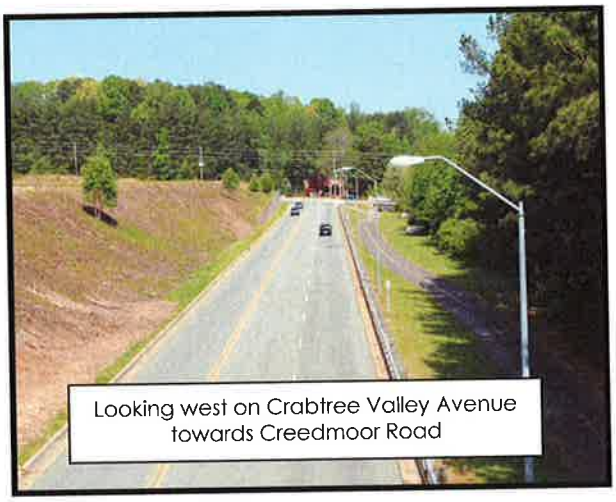
Looking north on Blue Ridge Road at Glenwood Avenue

Stantec

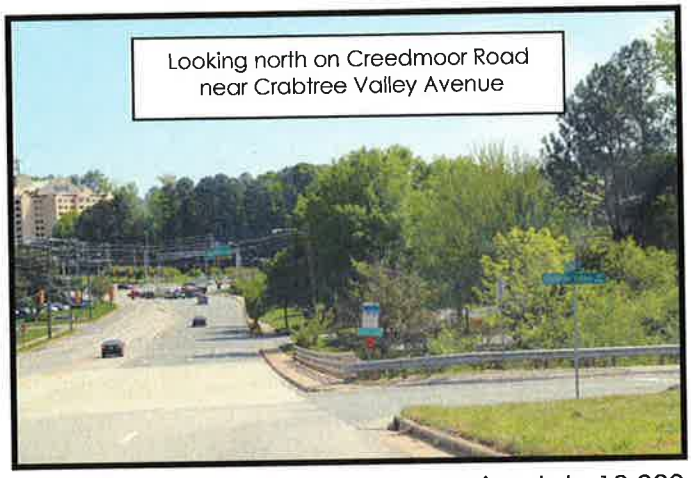

Looking southwest on Blue Ridge Road at Homewood Banks Drive

Ridge Road just south of the proposed development has a suggested speed limit of 25 mph through a curvy section. The land uses in this area vary from commercial near Glenwood Avenue to primarily residential to the south.

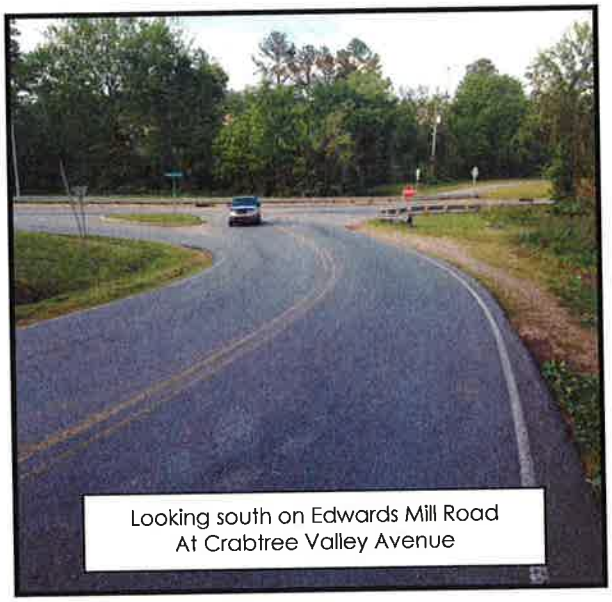
Crabtree Valley Avenue varies from a two-lane to a three-lane curb and gutter section between Creedmoor Road and Blue Ridge Road. Crabtree Valley Avenue is classified as a Major Thoroughfare in the 2030 Raleigh Comprehensive Plan. According to the NCDOT, the ADT for Crabtree Valley Avenue is approximately 4000 vpd. The posted speed limit in this area is 35 mph. The land uses in this area are primarily commercial and undeveloped land.


Looking west on Crabtree Valley Avenue towards Creedmoor Road

Creedmoor Road (SR 3009) is a five-lane secondary arterial located northwest of the proposed development. The area along Creedmoor Road is primarily commercial development. The posted speed limit on this roadway is 45 mph. The 2009 Average Daily Traffic (ADT) as reported by NCDOT on Creedmoor Road is approximately 18,000 Vehicles Per Day (VPD)[1].


Looking north on Creedmoor Road near Crabtree Valley Avenue

Edwards Mill Road is a two lane collector street where it intersects with Crabtree Valley Avenue to Parklake Avenue. It provides access to a bridge over Crabtree Valley Avenue which is a direct connection to Crabtree Valley Mall. West of Parklake Avenue, Edwards Mill Road becomes five-lane secondary arterial with curb and gutter that provides access between Interstate 40 and the Crabtree Valley Mall Area. There is no reported ADT for Edwards Mill Road between Crabtree Valley Avenue and Parklake Avenue.


Looking south on Edwards Mill Road At Crabtree Valley Avenue

Glenwood Avenue (US 70) is a multilane principal arterial that serves as an east-west connector between downtown Raleigh and the City of Durham. Glenwood Avenue intersects with Interstate 440 and Creedmoor Road in the vicinity of the proposed development. The 2009 ADT just east of Blue Ridge Road is 68,000 VPD[1]. The land uses in this area are primarily commercial. The posted speed limit on this roadway is 45 mph.



Looking west on Glenwood Avenue at Blue Ridge Road

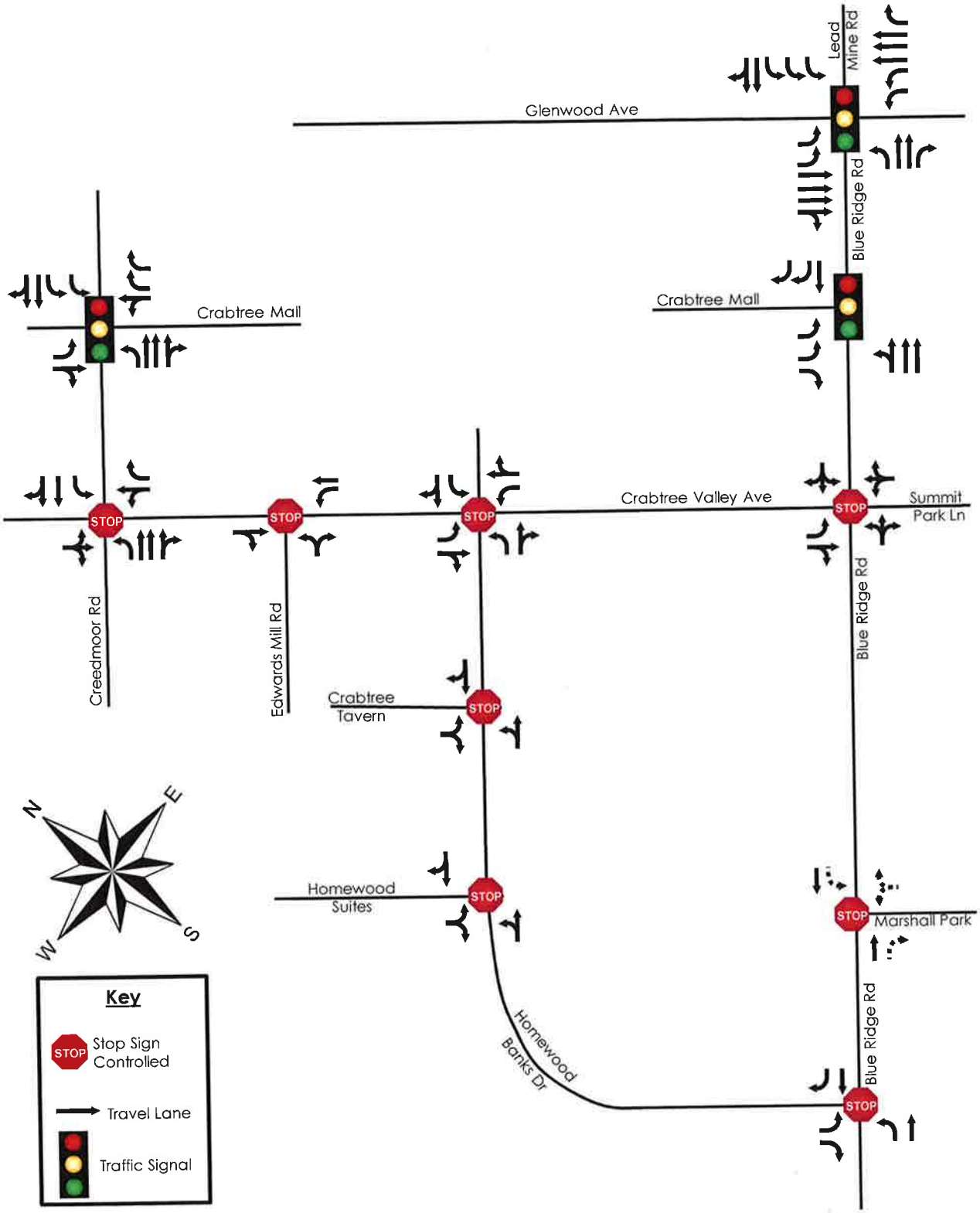


Looking north on Homewood Banks Drive near Blue Ridge Road

Homewood Banks Drive (SR 1669) is a two-lane collector street west of the proposed development. Homewood Banks Drive provides a connection between Crabtree Valley Avenue and Blue Ridge Road. There is currently a hotel and a restaurant on the northwest side of Homewood Banks Drive, otherwise, a significant portion of the land is currently undeveloped. The 2009 ADT as reported by the North Carolina Department of Transportation (NCDOT) is approximately 1,500 VPD[1] near the proposed development. The speed limit on Homewood Banks Drive is 35 mph.

The existing lane configurations and traffic control for this area are shown on Figure 3.

Figure 3. Existing Lane Configurations & Traffic Controls



C. Crash Statistics

The North Carolina Department of Transportation (NCDOT) Safety Planning Group provided a Strip Analysis Report from the NCDOT Traffic Engineering Accident Analysis System (TEAAS) for Crabtree Valley Avenue from Creedmoor Road to Blue Ridge Road which details crashes occurring between March 1, 2001 and February 29, 2012. Additionally, NCDOT TEAAS Intersection Analysis Reports were provided for the following intersections:

- Blue Ridge Road at Homewood Banks Road (3/1/2009 – 2/29/2012)
- Crabtree Valley Avenue at Blue Ridge Road (3/1/2009 – 2/29/2012)
- Blue Ridge Road at Crabtree Valley Mall Entrance (3/1/2009 – 2/29/2012)

Crabtree Valley Avenue

Along the 0.58 mile section of Crabtree Valley Avenue between Creedmoor Road and Blue Ridge Road, there were 67 reported crashes within the study period. The majority of the crashes were "angle" crashes (40), "left turn, different roadways" crashes (9) or "left turn, same roadway" crashes (9). No fatalities occurred along this section of roadway during the study period. Approximately 70% of all crashes were property damage only crashes. Table 2 details the locations of the most frequent crash sites.

Table 2 : Study Area Crash Statistics
Crabtree Valley Avenue (Creedmoor Road to Blue Ridge Road)
NCDOT Traffic Engineering Accident Analysis System
March 1, 2009 to February 29, 2012

Location	Total # of Crashes
Crabtree Valley Avenue / Blue Ridge Road (Unsignalized)	11
Crabtree Valley Avenue / Homewood Banks Drive (Unsignalized)	23
Crabtree Valley Avenue / Edwards Mill (Unsignalized)	7
Crabtree Valley Avenue / Creedmoor Road (Unsignalized)	25

This table indicates that about a third of all the crashes on the analyzed section of roadway occurred in the vicinity of the intersection of Crabtree Valley Road at Homewood Banks Drive and about a third occurred at the intersection of Crabtree Valley Avenue at Creedmoor Road.

Overall, this section of roadway has a severity index of 3.21. According to the NCDOT Division of Mobility and Safety's **Traffic Engineering Accident Analysis System (TEAAS) Training Manual**[2], a severity index of 8.4 or higher indicates that the area is likely to have more serious crashes. This section of roadway has a crash rate of 2635 crashes per 100 million vehicle miles. According to information provided by the NCDOT Division of Mobility and Safety Traffic Safety Systems Management Unit, the 2008 – 2010 statewide crash rate for urban two-lane roadways is 233 crashes per 100 million vehicle miles. (A copy of the statewide average crash rates is located in the Appendix.) Therefore, these statistics indicate that while the crash rate is approximately 11 times the Statewide average, the types of crashes on this roadway are not extremely severe.

A majority of the crashes were angle crashes occurring at unsignalized intersections. According to the FHWA Safety Program, "the major crash type at stop-controlled intersections is a right angle crash involving a vehicle entering the intersection from the stop approach and a vehicle on the through approach. In these crashes, most of the vehicles on the stop approach stop or at least slow down to under 10 mph before pulling out. However, many drivers involved in these crashes make poor decisions regarding the available safe gaps between vehicles on the through road. Inattentive or distracted drivers, speeding, and physical limitations of the intersection contribute to future crash potential."[3] The lower speeds contribute to less severe crashes.

All the intersections along Crabtree Valley Avenue are currently unsignalized. Turning movement volumes are high along many of the minor movements. Potential mitigation measures could include traffic

calming measures, additional turning lanes, roundabouts, ensuring appropriate sight distance is provided, and implementing turn restrictions[4]. Ultimately, due to traffic volumes at some intersections along this roadway, signalization may be required.

Blue Ridge Road & Homewood Banks Road

At the Blue Ridge Road and Homewood Banks Road intersection, there were 5 reported crashes between March 1, 2009 and February 29, 2012. During this time, there was three rear end, slow or stop, one animal and one left turn, same roadway crash at this location. Although no fatalities occurred at this location, there were two Class C injuries.

Overall, this intersection has a severity index of 2.48. According to the NCDOT Division of Mobility and Safety's **Traffic Engineering Accident Analysis System (TEAAS) Training Manual[2]**, a severity index of 8.4 or higher indicates that the area is likely to have more serious crashes.

With no significant number of crashes and no pattern of a certain crash type, no specific countermeasures are recommended at this location.

Crabtree Valley Avenue at Blue Ridge Road

At the Crabtree Valley Avenue and Blue Ridge Road intersection, there were 17 reported crashes between March 1, 2009 and February 29, 2012. During this time, there were eight angle, one backing up, two left turn, same roadway, one ran off road – right, three rear end, slow or stop, one right turn, same roadway and one sideswipe, same direction crashes at this location. Although no fatalities occurred at this location, there were seven Class C injuries.

Overall, this intersection has a severity index of 4.05. According to the NCDOT Division of Mobility and Safety's **Traffic Engineering Accident Analysis System (TEAAS) Training Manual[2]**, a severity index of 8.4 or higher indicates that the area is likely to have more serious crashes.

Of the 17 crashes that occurred at this intersection, nearly half were angle crashes. As part of this TIA, a traffic signal is recommended at this location. This will provide an effective countermeasure to help reduce the number of angle crashes at this intersection.

Blue Ridge Road at Crabtree Valley Mall Entrance

At the Blue Ridge Road and Crabtree Valley Mall Entrance, there were 17 reported crashes between March 1, 2009 and February 29, 2012. During this time, there were six angle, three left turn, different roadways, two left turn, same roadway, one rear end, slow or stop, and five sideswipe, same direction crashes at this location. Although no fatalities occurred at this location, there were seven Class C injuries.

Overall, this intersection has a severity index of 2.31. According to the NCDOT Division of Mobility and Safety's **Traffic Engineering Accident Analysis System (TEAAS) Training Manual**[2], a severity index of 8.4 or higher indicates that the area is likely to have more serious crashes.

Although the crashes are not severe, some low cost countermeasures that could decrease the frequency of crashes include reducing the speed limit, ensuring that there is appropriate sight distance, verifying that adequate clearance is provided on the signals, adjusting the signal timing, and providing advance warning signs.[6]

D. Projected Roadway Improvements

There are no known transportation projects planned in the immediate vicinity of this development that will be constructed prior to the Build Out year.

E. Planned Roadway Improvements

There is one improvement planned in the project area that will be constructed as a part of the Woodfield Marshall Park Apartments Development (SP-58-12). A southbound left turn lane with 125 feet of storage and a northbound right turn lane with 125 feet of storage will be constructed on Blue Ridge Road at the development site entrance. This improvement is considered to be in place for all future year scenarios.

F. Public Transportation

The Capital Area Transit (CAT) System provides the primary bus service for the City of Raleigh. Blue Ridge Road is served by Route 16 (Oberlin) and Crabtree Valley Avenue is served by Routes 4 (Rex Hospital), 16 (Oberlin), and 23c (Millbrook). These buses operate six days a week and pass through the project area every 30 to 60 minutes depending on the time of day and day of the week. Additionally, there is a park & ride area and a transfer point located on the south side of Crabtree Valley Mall.

IV. Traffic Generation

The amount of traffic generated by a new development is a function of the size and type of the development. Once the proposed land use data for the site are known, the number of trips generated by the development can be estimated. Trip generation data for this report was determined in accordance with the procedures outlined in the Institute of Transportation Engineers (ITE) report entitled ***Trip Generation (7th Edition)***[6]. Trip generation estimates were developed in terms of vehicle trips per average weekday and AM and PM peak hours.

Traffic impact is determined by estimating the total number of daily vehicle trips, as well as the number of peak hour vehicle trips. It should be recognized that a percentage of these trips are "captured" trips while others are "new" trips.

"Captured" trips are trips that occur internally and therefore reduce the overall amount of trips generated for a site. Areas with multiple uses (office, retail, or residential) have the potential for internally captured trips throughout the day, during the midday, and the afternoon. Generally, internally captured trips are not considered for the morning peak hour. The internal capture percentages estimated by ITE Methodology for the daily trips and PM peak hour trips are listed in the trip generation table.

"Pass-by" trips refer to present motorists who pass the site that will probably patronize the development; thus, the driveway volumes at the development are different from the total added to the adjacent street system. Facilities such as retail establishments, fast food restaurants, banks, service stations, and convenience stores attract motorists from the passing stream of traffic. Based on guidelines set forth by the NCDOT Congestion Management Unit, this study assumes that 34% of the PM peak hour shopping center traffic will be pass-by trips, and that none of the AM peak hour traffic will be pass-by trips. Pass by trips are deducted after the reduction for the internally captured trips.

To provide a conservative analysis, no reduction was taken for transit use.
The following table summarize the estimated traffic generation for the proposed development.

Table 3: ITE Trip Generation
Proposed Crabtree Village Development – Phase I

Land Use (code)	Daily	AM	AM IN	AM OUT	PM	PM IN	PM OUT
315 Apartments (220)	**2032**	**158**	32	126	**191**	124	67
Total New Trips	**2032**	**158**	**32**	**126**	**191**	**124**	**67**

Table 4: ITE Trip Generation
Proposed Crabtree Village Development – Full Build Out

Land Use (code)	Daily	AM	AM IN	AM OUT	PM	PM IN	PM OUT
60,000 sf retail (820)	**4872**	**114**	70	44	**451**	221	230
525 Apartments (220)	**3305**	**261**	52	209	**306**	199	107
250,000 sf General Office Building (710)	**2701**	**391**	344	47	**359**	61	298
Sub Total Trips	**10,878**	**766**	**466**	**300**	**1116**	**481**	**635**
Internal Capture: 12% Daily, 11% PM	**-1368**				**-126**	-63	-63
Total Trips	**9510**		**466**	**300**	**990**	**418**	**572**
Pass-By trips (34% PM)	**-136**				**-136**	-67	-69
Total New Trips	**9374**	**766**	**466**	**300**	**855**	**351**	**503**

Table 3 indicates the first phase of the development will generate approximately 2032 trips during the average weekday with 158 trips in the AM peak hour and 191 trips in the PM peak hour.

Table 4 indicates that full build out of the proposed site will generate approximately 9374 trips during the average weekday with 766 trips in the AM peak hour and 855 trips during the PM peak hour.

V. Traffic Distribution

In order to properly determine the impact of the traffic generated by the proposed development, it is necessary to determine the distribution of traffic to and from the site. These percentages were developed based on existing traffic volume's directional distributions. The following distributions were used for the Crabtree Village Development Traffic Impact Analysis, for the AM and PM peak hours:

15% to/from the north on Creedmoor Road
12% to/from the south on Creedmoor Road
20% to/from the east on Glenwood Ave
10% to/from the west on Glenwood Ave
10% to/from the north on Lead Mine Road
20% to/from the south on Blue Ridge Road
5% to/from the south on Edwards Mill Road
6% to/from the Crabtree Mall Entrances (2% to/from the signalized intersection on Creedmoor Road, 2% to/from the signalized intersection on Blue Ridge Road and 2% to/from the intersection adjacent Homewood Banks Drive).
2% to/from the east on Summit Park Lane.

Because the site layout allows for internal access from all the land uses to all site access points, the new trips were assigned to the access points equally for the purpose of these analyses. The site trip distributions used for the Phase I and Phase II Traffic Impact Analyses are illustrated in Figures 4 and 5.

Figure 4. Phase I Site Trip Distribution

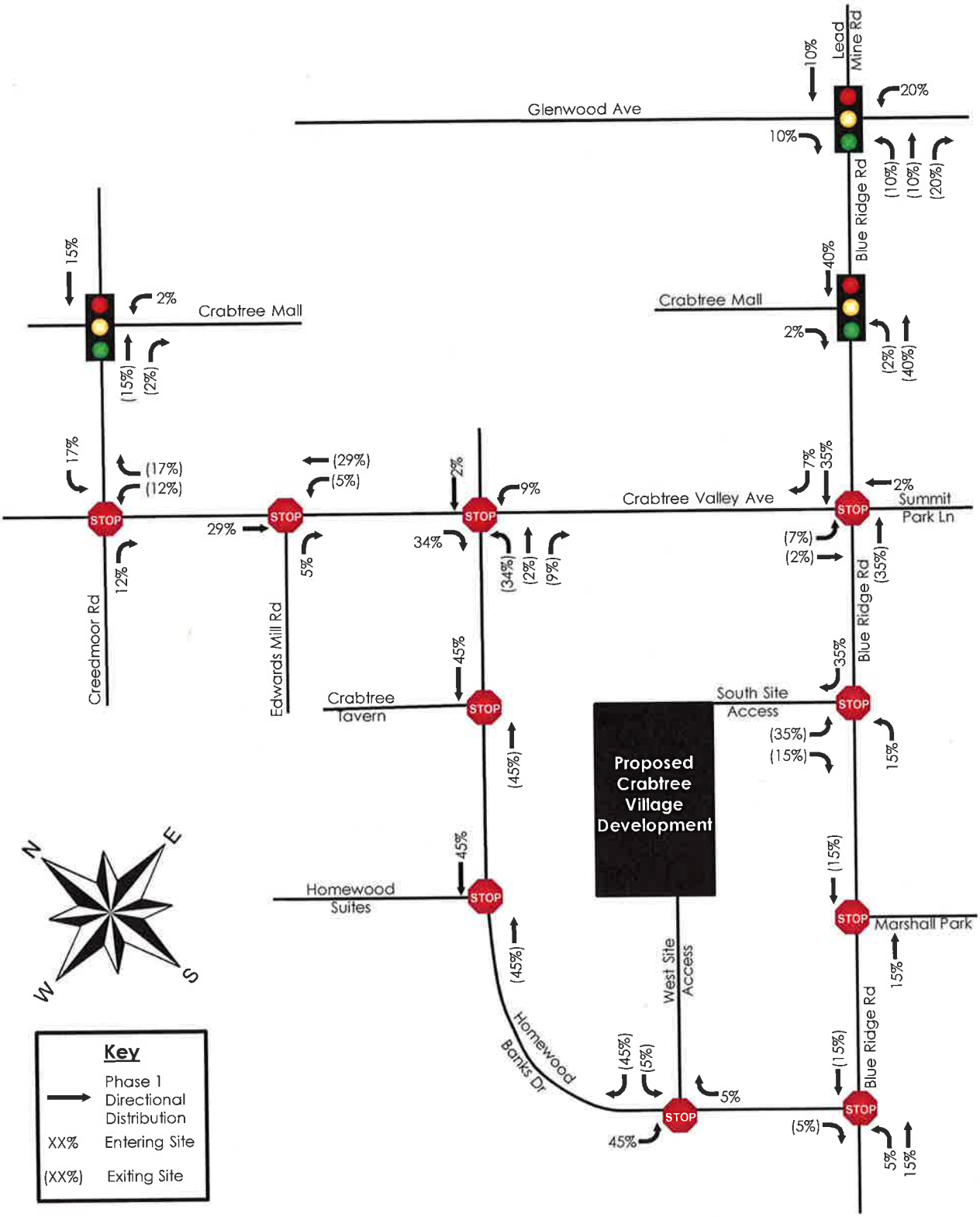
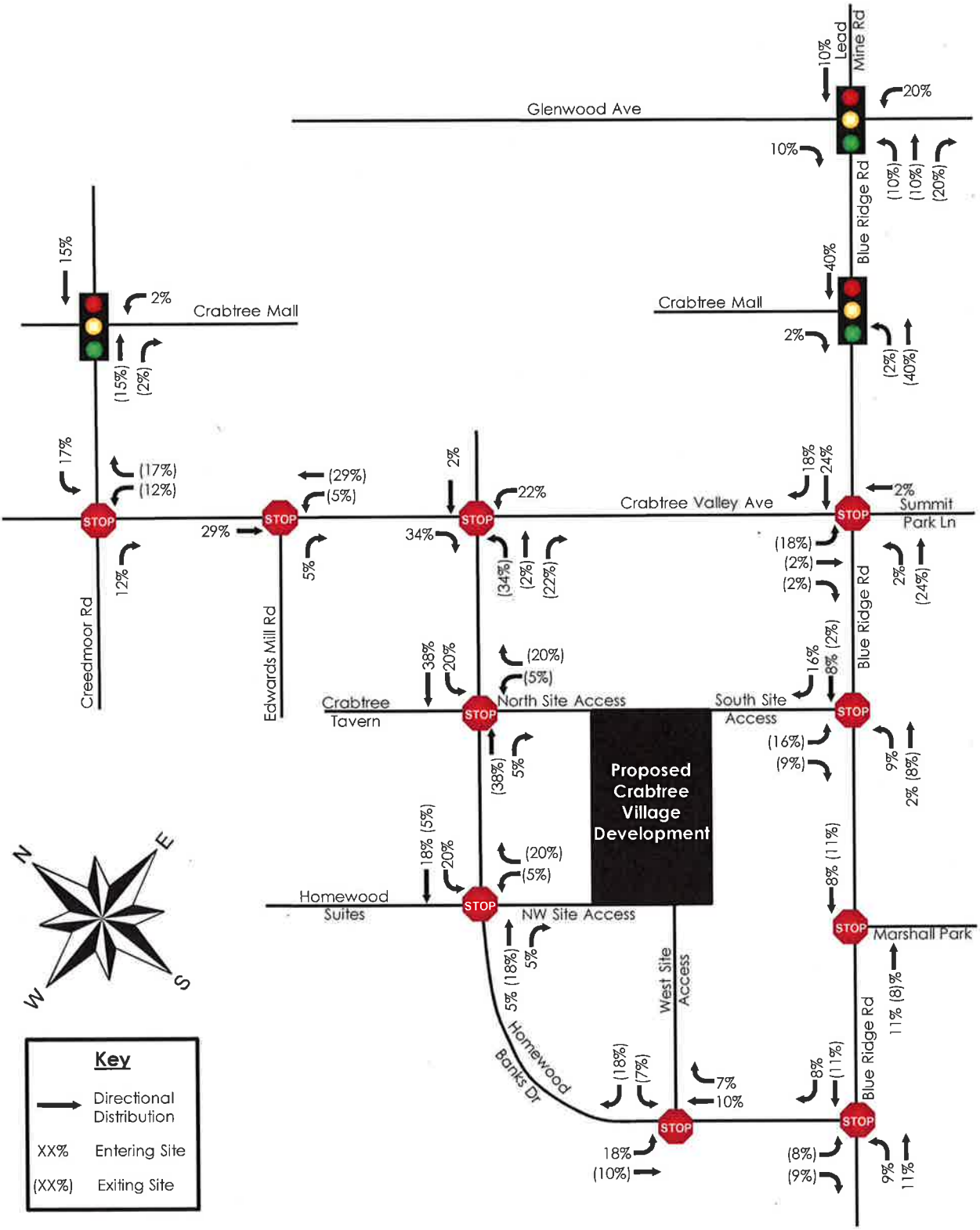


Figure 5. Full Build Out Site Trip Distribution



VI. Projected Traffic Volumes

A. Existing Traffic

AM (7-9 am) and PM (4-6 pm) traffic counts were provided by the City of Raleigh for the following locations:

- Glenwood Avenue / Blue Ridge Road (July 7 and August 13, 2009)
- Crabtree Mall / Blue Ridge Road (July 6 and August 24, 2010)
- Crabtree Mall / Creedmoor Road (April 29 and May 10, 2010)

In addition, the City of Raleigh provided 2009 Synchro files that contained AM and PM peak hour traffic volumes at the following additional study area intersections:

- Crabtree Valley Avenue / Creedmoor Road
- Crabtree Valley Avenue / Edwards Mill Road
- Crabtree Valley Avenue / Homewood Banks Drive
- Crabtree Valley Avenue / Blue Ridge Road
- Blue Ridge Road / Crabtree Valley Avenue

The existing turning movement volumes generated by the Homewood Suites and Crabtree Tavern at the driveways on Homewood Banks Drive were estimated using the ITE Trip Generation, 8th Edition, rates and equations with the number of rooms and square footage as the independent variable and assigned based on existing traffic patterns and the roadway network.

The previous intersection turning movement counts were increased by a growth rate of 1.0% compounded annually for 1, 2, or 3 years to approximate the existing traffic volumes. These turning movement volumes were then used to calculate the existing traffic volumes at the intersection of Homewood Banks Drive and Blue Ridge Road. Raw count data for these locations is included in the Appendix. The 2012 AM and PM (balanced) Peak Hour Traffic Volumes are illustrated on Figure 6.

B. Historical Traffic Growth

Historical growth traffic is the increase in traffic volumes due to usage increases and non-specific growth throughout the area. Due to recent economic conditions, there has been very little change in traffic volumes in the study area for the past few years. Therefore, the growth rate for background traffic is assumed to be 1.0%, compounded annually. Approved development trips were included separately to calculate the future traffic growth for this area.

C. Approved Development Traffic

Approved development traffic is traffic generated by specific approved, but not yet constructed, projects within the vicinity of the subject project. According to the City of Raleigh, there are three approved developments in the project area. Located on Blue Ridge Road east and west (respectively) of Homewood Banks Drive, SP-58-12 / Woodfield Marshall Park Apartments will consist of a maximum of 360 apartments and S-2-12 / Woodfield Marshall Park Townhomes will consist of 24 townhome lots. The new trips expected at the study intersections were calculated using the ITE Trip Generation, 8th Edition, rates and equations and assigned based on the previously approved directional distributions provided in the 2006 Traffic Impact Analysis Report for this site. The third approved mixed-use development is located on Edwards Mill Road and the numbers of expected new trips generated at the study intersections was provided by by the City of Raleigh. Traffic generated by the three approved developments is illustrated on Figures 7A, 7B, 7C, and 7D.

D. Total Traffic

To obtain total 2014 Phase 1 and 2016 Phase 2 (Build Out) traffic volumes, the distributed site and pass-by trips were added to the 2014 and 2016 No Build traffic volumes, respectively. The AM and PM peak-hour turning movements for the studied site access drives and intersections were then calculated and analyzed for the Build Out years. The 2014 Phase 1 and 2016 Phase 2 traffic volumes for the study intersections are illustrated on Figures 8A, 8B, 8C and 8D.

Figure 6. 2012 Existing AM & PM Peak Hour Traffic Volumes

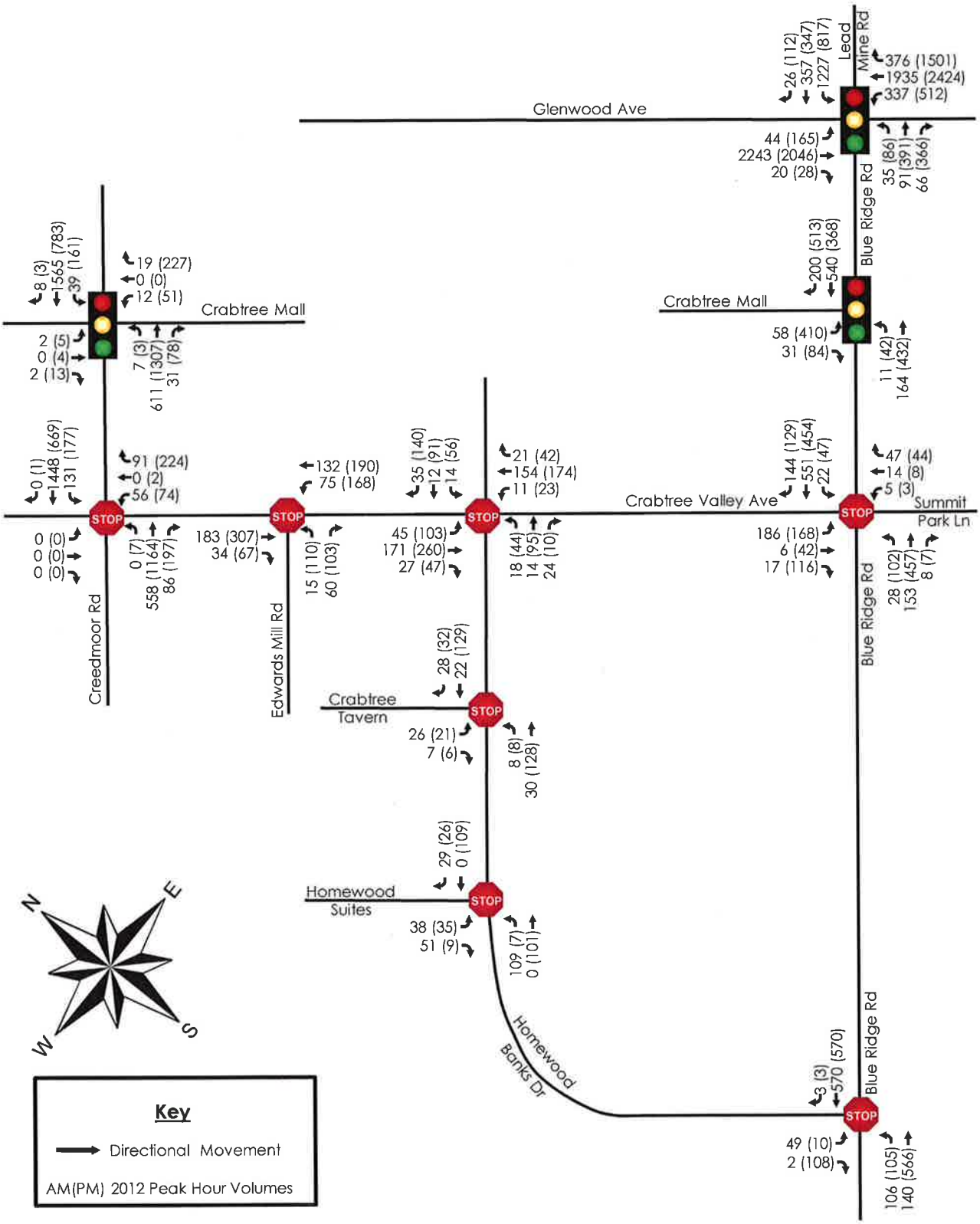


Figure 7A. 2014 AM No Build Peak Hour Traffic Volumes

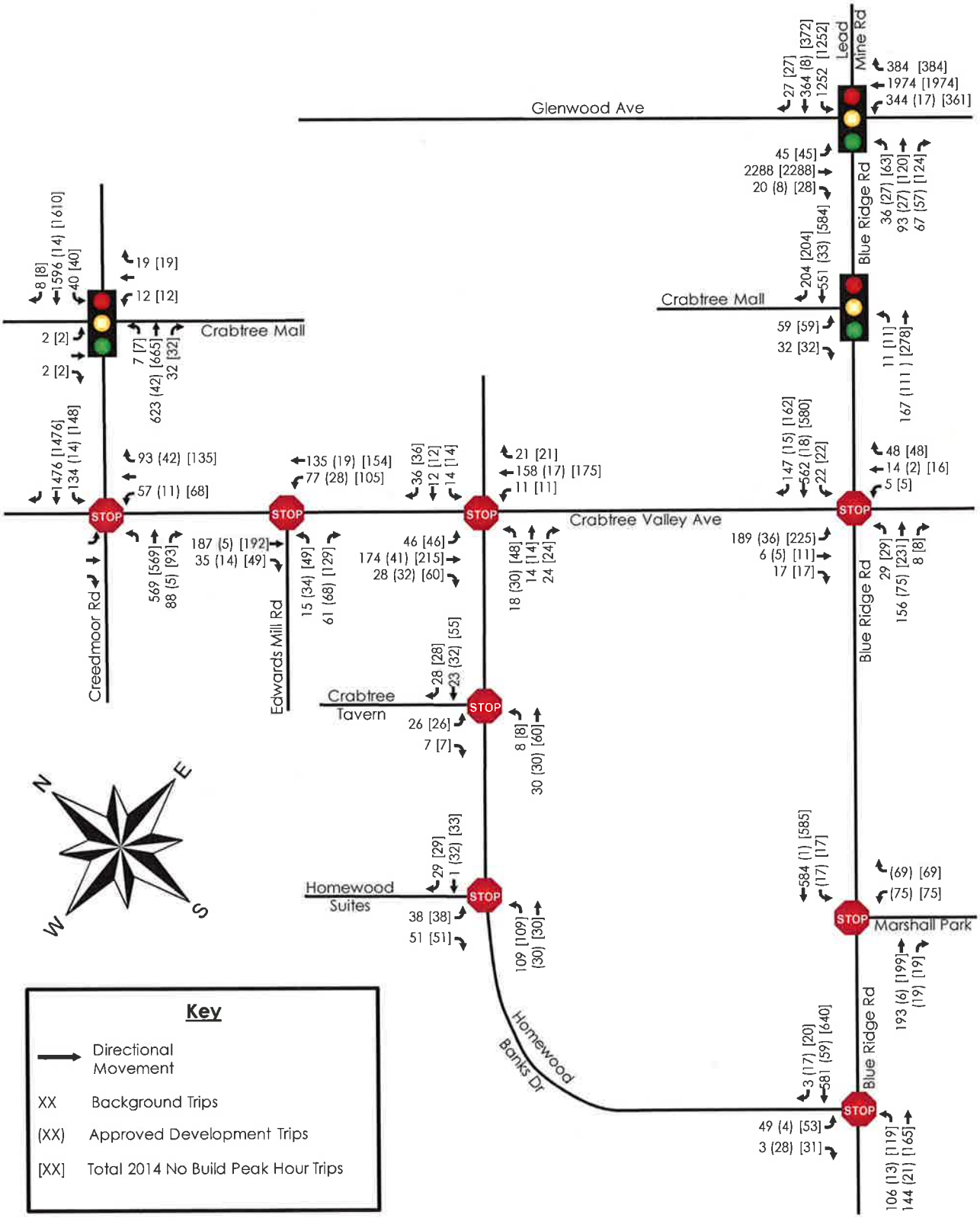


Figure 7A. 2014 PM No Build Peak Hour Traffic Volumes

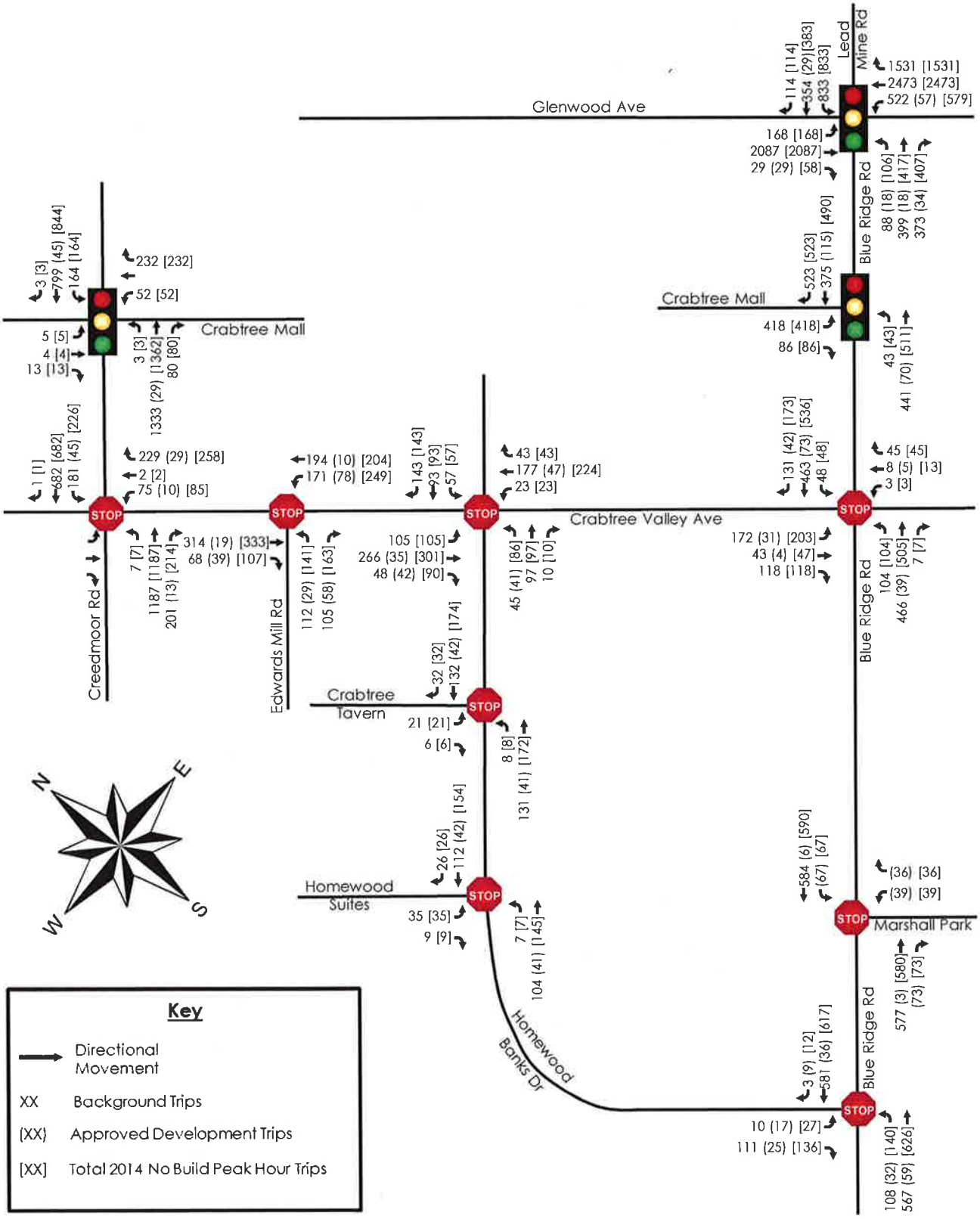


Figure 7C. 2016 AM No Build Peak Hour Traffic Volumes

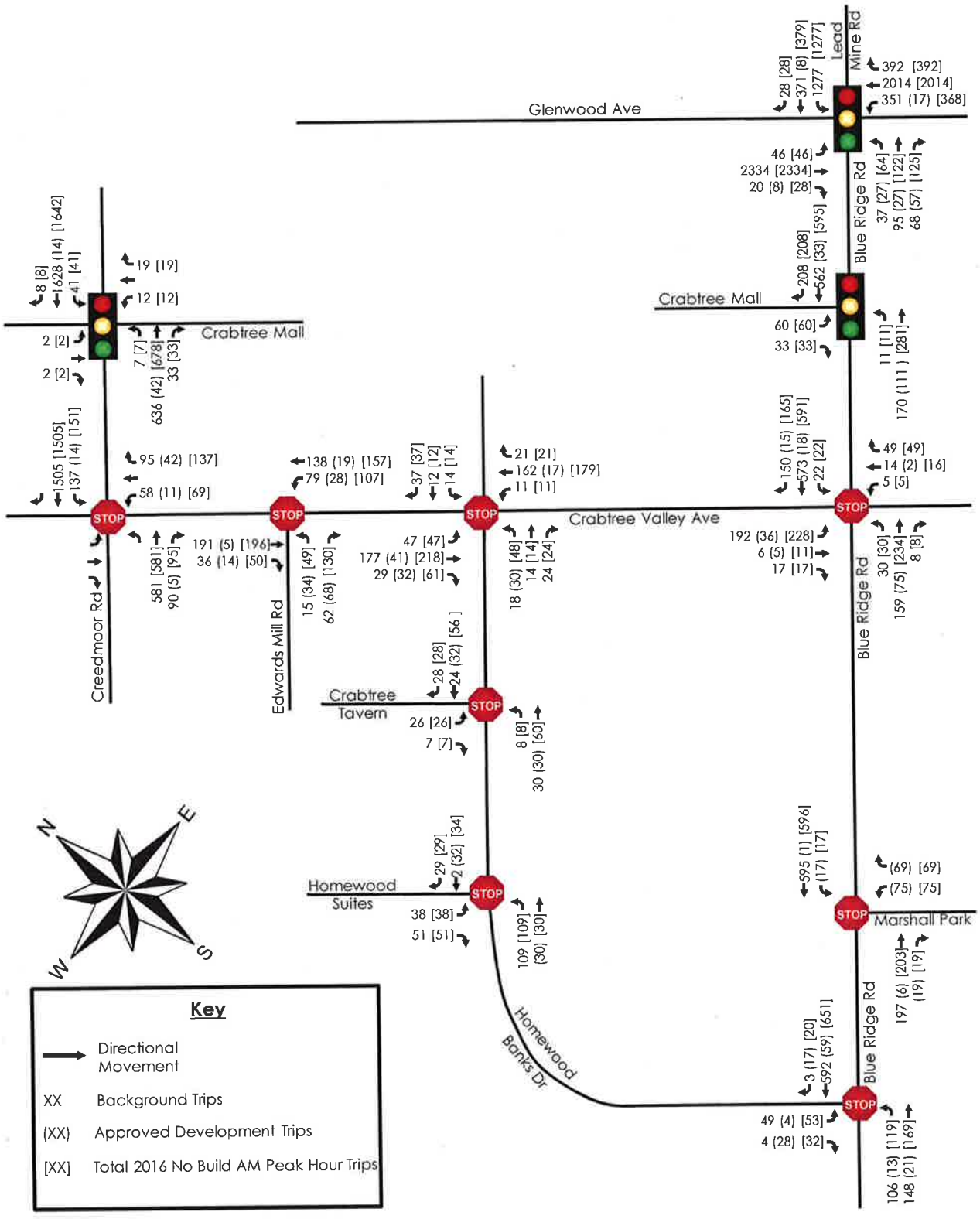


Figure 7D. 2016 PM No Build Peak Hour Traffic Volumes

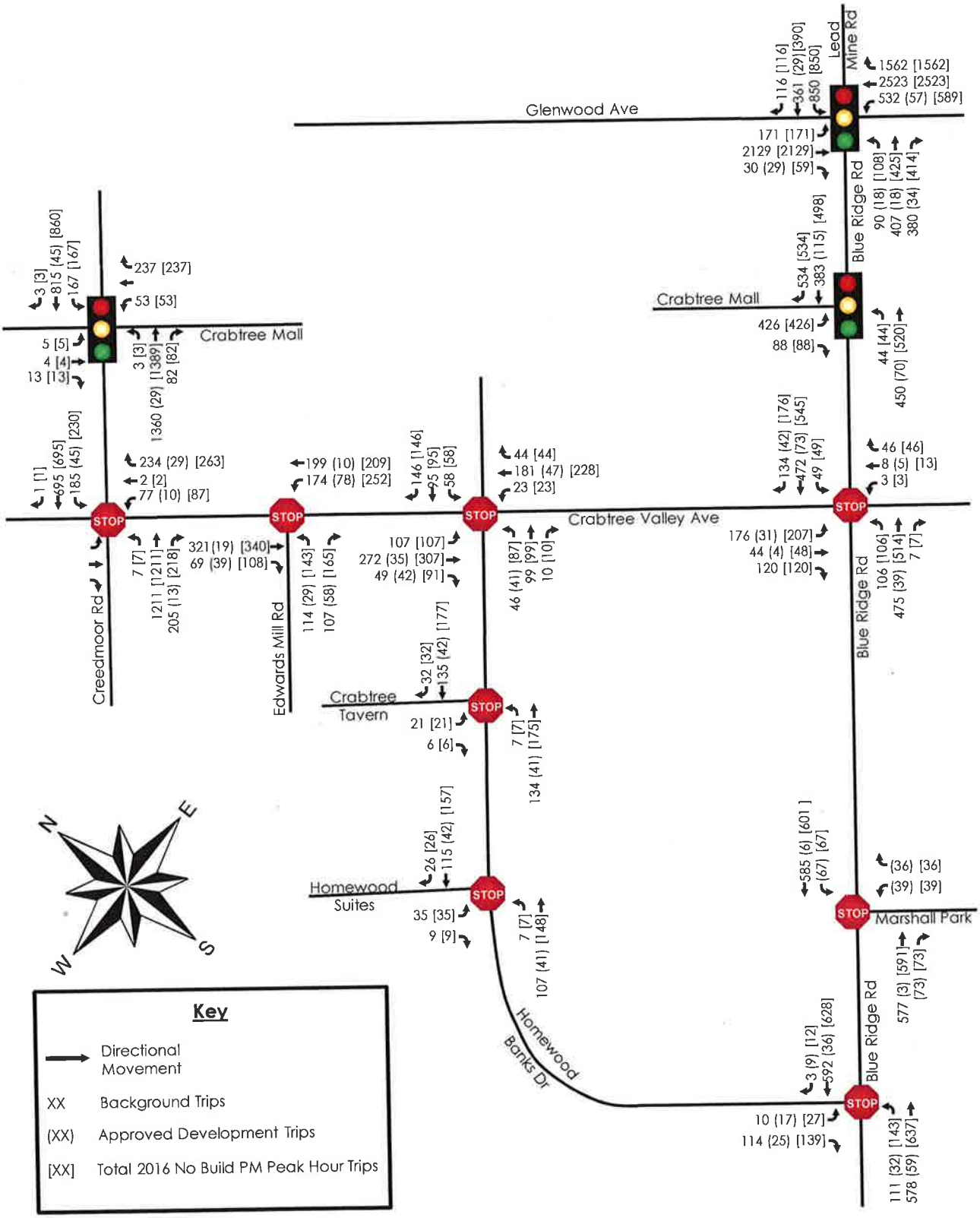


Figure 8A. 2014 AM Build Out Peak Hour Traffic Volumes

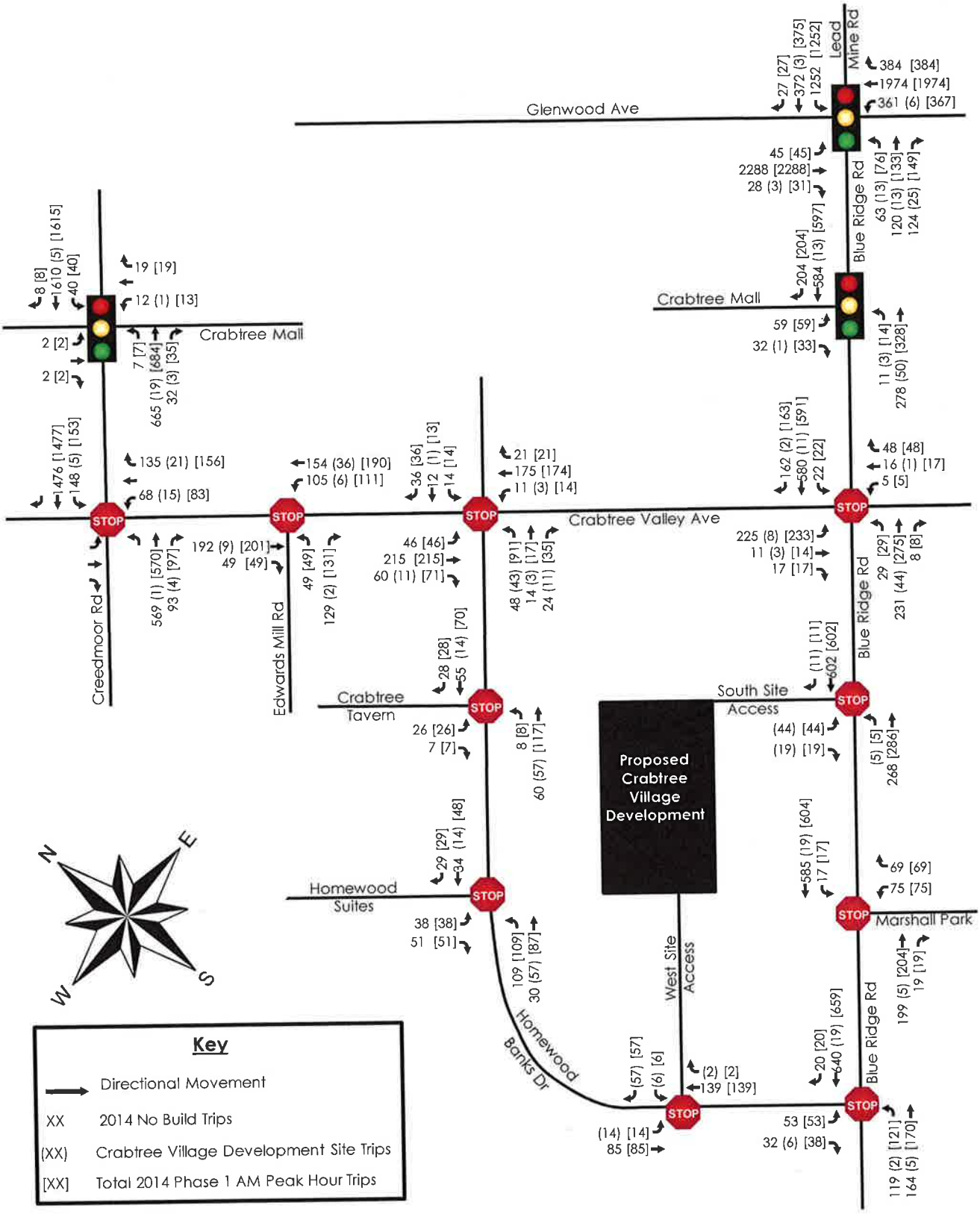


Figure 8B. 2014 PM Build Out Peak Hour Traffic Volumes

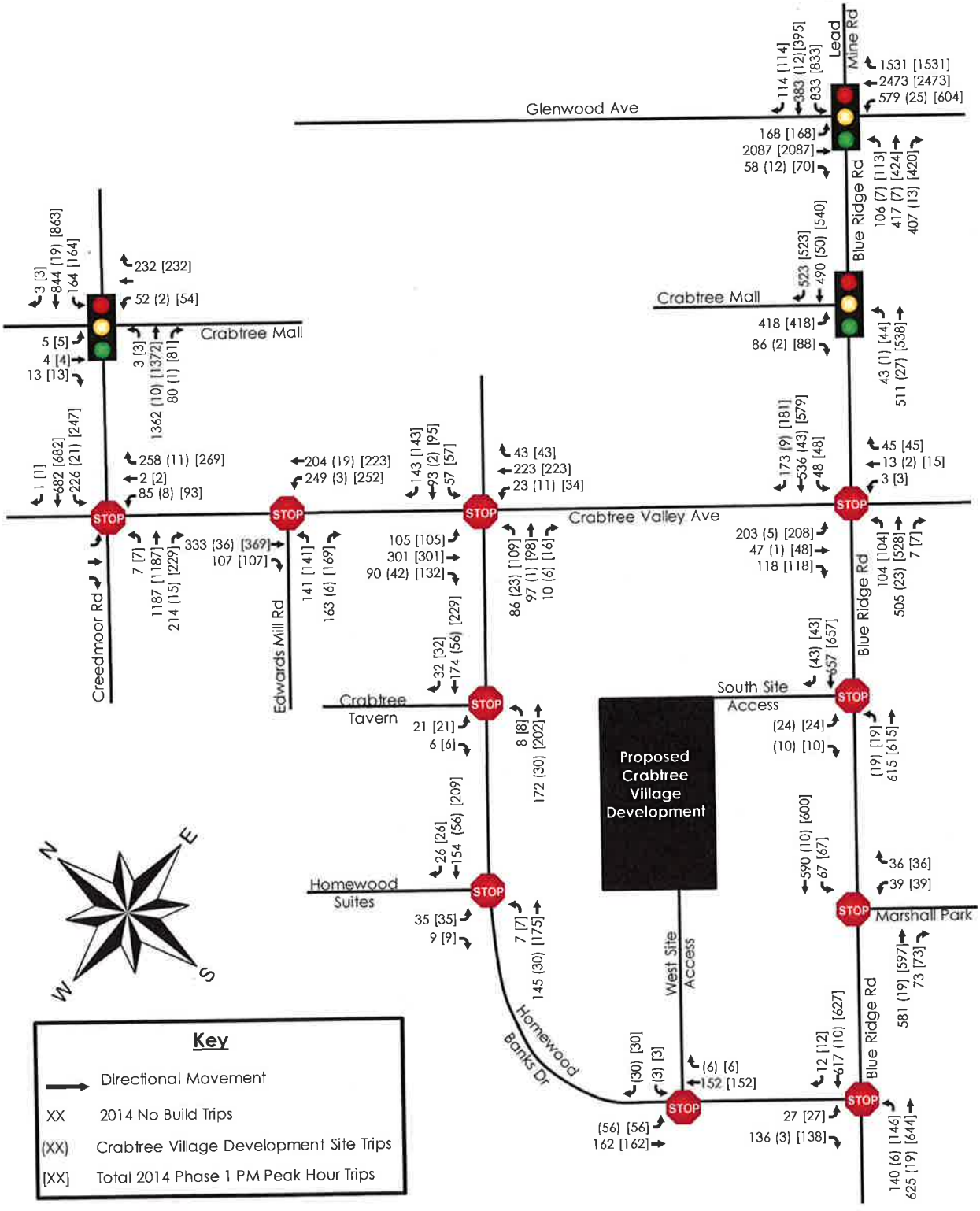


Figure 8C. 2016 AM Build Out Peak Hour Traffic Volumes

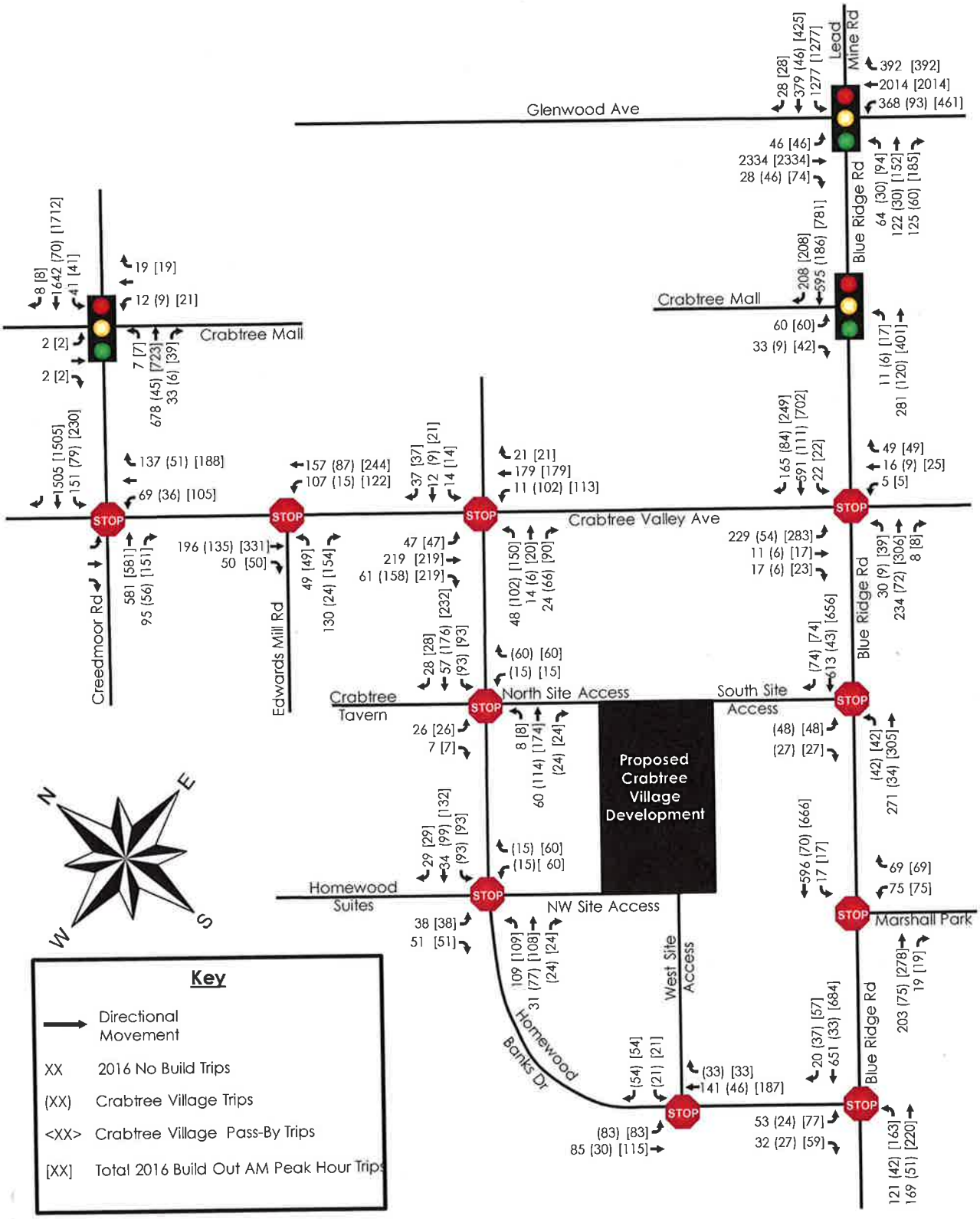
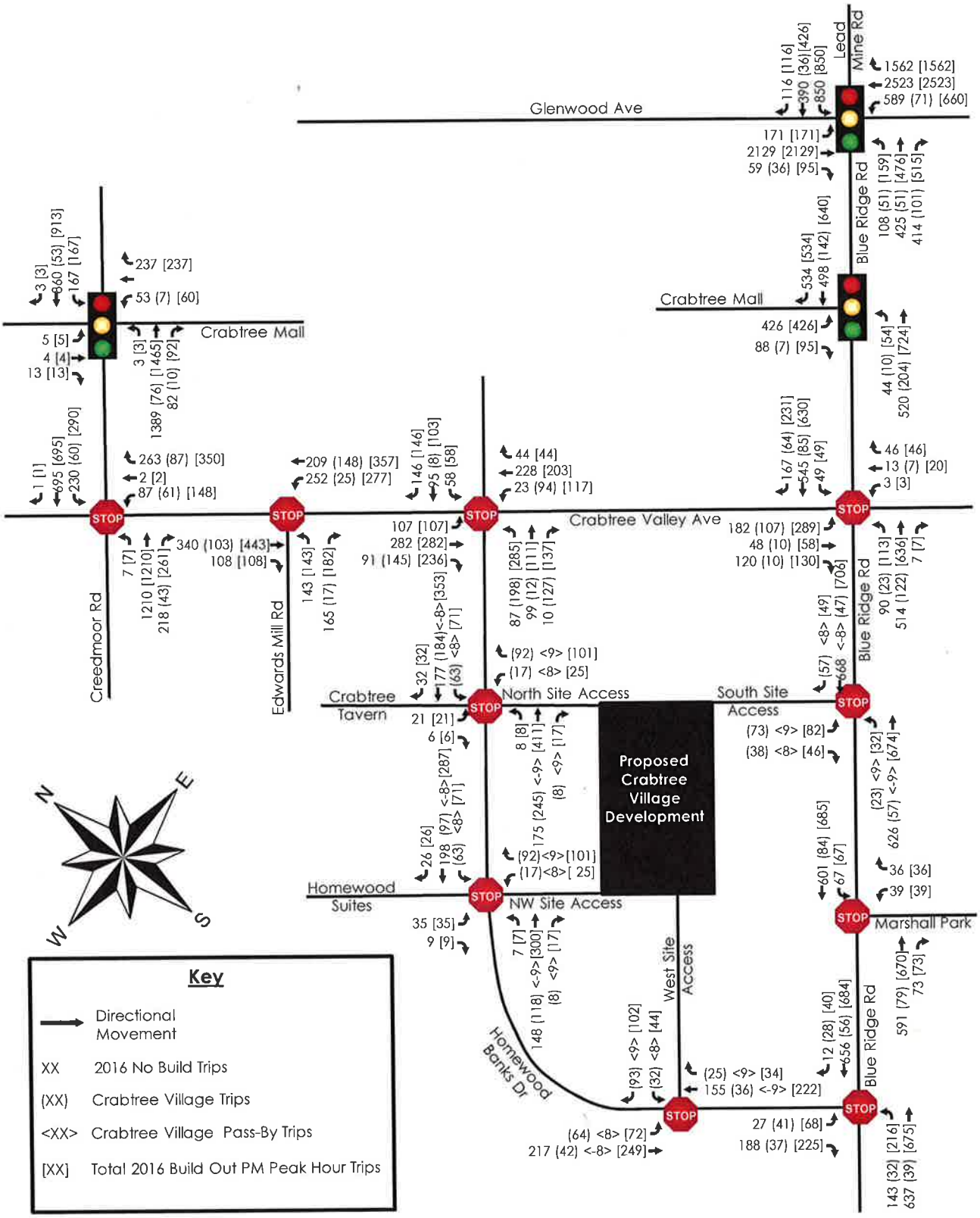


Figure 8D. 2016 PM Build Out Peak Hour Traffic Volumes



VII. Site Access

According to the Conceptual Site Plan, primary access to the site is provided via four (4) proposed driveways. The North Site Access is on Homewood Banks across from the existing Crabtree Tavern Driveway, and is proposed as a full movement access. The Northwest Site Access is on Homewood Banks across from the existing Homewood Suites Driveway, and is proposed as a full movement access. The West Site Access is on Homewood Banks Drive, approximately 360 feet north of the intersection of Blue Ridge Road and Homewood Banks Drive, and is proposed as a full movement access. The South Site Access is on Blue Ridge Road, approximately 1150 feet south of the intersection of Blue Ridge Road and Crabtree Valley Avenue, and is proposed as a full movement access. The proposed development will have no direct access to Crabtree Valley Avenue.

With Phase I of the development, the West Site Access on Homewood Banks Drive and the South Site Access on Blue Ridge Road will be constructed. The other two driveways will be constructed with Phase 2.

VIII. Traffic Analysis

Capacity analyses were performed for the roadway network in the project study area. The traffic analysis program Synchro© Version 8 was used to analyze all intersections according to methods put forth by the Transportation Research Board's ***Highway Capacity Manual (HCM)***[7]. The Highway Capacity Manual defines capacity as "the maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform section of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions, usually expressed as vehicles per lane per hour."

Level-of-service (LOS) is a term used to describe different traffic conditions and is defined as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists/ or passengers." LOS varies from Level A, representing free flow, to Level F where traffic breakdown conditions are evident.

Traffic conditions with LOS of E or F are deemed unacceptable and represent significant travel delay, increased accident potential, and inefficient motor vehicle operation. At an unsignalized intersection, the primary traffic on the main roadway is virtually uninterrupted. Therefore, the overall delay for the intersection is usually less than what is calculated for the minor street movements. The overall intersection delay and the delay for the intersection's minor street(s) are reported in the summary tables of this report. Generally, LOS D is acceptable for signalized intersections in suburban areas during peak periods. With the current method of reporting LOS for unsignalized intersections, it is not uncommon for some of the minor street movements to be operating at a LOS F during peak hour conditions.

Tables 5 and 6 present the criteria of each LOS as indicated in the ***Highway Capacity Manual***[7].

Table 5: Level-of-Service Criteria
Signalized Intersections

Level-of-Service	Stopped Delay per Vehicle (sec)
A	≤ 10.0
B	>10.0 and ≤ 20.0
C	>20.0 and ≤ 35.0
D	>35.0 and ≤ 55.0
E	>55.0 and ≤ 80.0
F	>80.0

Table 6: Level-of-Service Criteria
Unsignalized Intersections

Level-of-Service	Stopped Delay per Vehicle (sec)
A	≤ 10.0
B	>10.0 and ≤ 15
C	>15 and ≤ 25
D	>25 and ≤ 35
E	>35 and ≤ 50
F	>50

Capacity Analyses were performed for the following intersections defined within the study area for 2012 Existing, 2014 No Build, 2016 No Build, 2014 Build Out and 2016 Build Out conditions. All future year scenarios were evaluated with existing geometry and the desired geometry discussed in the three background developments.

- Glenwood Avenue \Blue Ridge Road \ Lead Mine Road (Signalized)
- Blue Ridge Road \ Mall Entrance (Signalized)
- Blue Ridge Road \ Crabtree Valley Avenue (Unsignalized)
- Blue Ridge Road \ Homewood Banks (Unsignalized)
- Crabtree Valley Avenue \ Homewood Banks (Unsignalized)
- Edwards Mill Road \ Crabtree Valley Avenue (Unsignalized)
- Creedmoor Road \ Crabtree Valley Avenue (Unsignalized)
- Creedmoor Road \ Mall Entrance (Signalized)
- Blue Ridge Road \ Woodfield Marshall Park Apartments Access Point (Unsignalized)
- Blue Ridge Road \ South Site Access Point (Unsignalized)
- Homewood Banks Drive \ North Site Access Point (Unsignalized)
- Homewood Banks Drive \ Northwest Site Access Point (Unsignalized)
- Homewood Banks Drive \ West Site Access Point (Unsignalized)

Existing signal timings provided by the City of Raleigh for each peak hour period were used to analyze the study area intersections. As required by the City, all signal timings and offsets were kept constant for each scenario.

All capacity analyses are included in the Appendix and are briefly summarized in the following sub-sections:

A. Glenwood Avenue \Blue Ridge Road \ Lead Mine Road (Signalized)

Analyses indicate that the Glenwood Avenue \Blue Ridge Road \ Lead Mine Road intersection currently operates at an overall LOS F during the AM and PM peak hours. The intersection is expected to continue to operate at LOS F during the AM and PM peak hours of the 2014 No Build, 2016 No Build, 2014 Build Out and 2016 Build Out scenarios.

The addition of Phase I of the proposed development will have a minimal impact on the operations of the intersection. The overall delay is expected to increase by 1.6 seconds per vehicle during the AM peak hour. During the PM peak hour, the overall delay is actually expected to decrease by 8 seconds per vehicle. In over saturated traffic conditions, sometimes increasing the number of turning movements with minimal delay can reduce the total overall intersection average delay per vehicle. The additional site traffic increases the total traffic at the intersection by 0.90% during the AM peak hour and 0.83% during the PM peak hour with the addition of Phase I traffic.

With full build out of the proposed development, the overall delay is expected to increase by 18.6 seconds per vehicle during the AM peak hour and 16.0 seconds per vehicle in the PM peak hour. This is assuming that there will be no changes in the signal timing from what is currently in place at this intersection. The additional site traffic increases the total traffic at the intersection by 4.25% during the AM peak hour and 3.71% during the PM peak hour with the addition of the full build out development traffic.

The ***Crabtree Valley Transportation Study*** prepared by The Louis Berger Group, Inc. provides a recommended alternative for this intersection which includes a partial grade separated intersection at an estimated cost of $52.8 Million. No short term improvements that would provide an acceptable level of service were identified at this intersection as a part of this City funded study. Due to the minimal impact of the proposed development, no additional recommendations are provided for this intersection.

Table 7 summarizes the LOS and average delay per vehicle at the Glenwood Avenue \Blue Ridge Road \ Lead Mine Road intersection.

Table 7:
Glenwood Avenue \Blue Ridge Road \ Lead Mine Road
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	F (176.8) D (53.4) EB C (32.4) WB E (60.5) NB F (**) SB	F (133.4) D (48.7) EB F (166.7) WB F (100.5) NB F (188.1) SB
2014 No Build	F (185.6) E (70.2) EB D (36.8) WB E (56.3) NB F (**) SB	F (166.4) D (50.1) EB F (227.1) WB F (120.1) NB F (192.3) SB
2016 No Build	F (194.1) F (81.1) EB D (38.5) WB E (56.3) NB F (**) SB	F (174.4) D (50.8) EB F (239.5) WB F (124.2) NB F (200.1) SB
2014 Build Out	F (187.2) E (76.3) EB D (38.9) WB E (55.8) NB F (**) SB	F (171.9) D (50.8) EB F (236.5) WB F (128.2) NB F (195.0) SB
2016 Build Out	F (212.7) F (111.3) EB E (76.5) WB E (56.3) NB F (**) SB	F (190.4) D (52.0) EB F (266.0) WB F (151.6) NB F (203.1) SB

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development.

B. Blue Ridge Road \ Mall Entrance (Signalized)

Analyses indicate that the Blue Ridge Road \ Mall Entrance intersection currently operates at an overall LOS A during the AM peak hour and LOS B during the PM peak hour. The intersection is expected to continue to operate at the same LOS for each of the peak hours for all future year scenarios. The addition of the proposed development will have a minimal impact on the operations of the intersection. During all studied peak periods, the development is expected to add no more than 2.2 seconds of delay to the overall intersection.

Table 8 summarizes the LOS and average delay per vehicle at the Blue Ridge Road \ Mall Entrance intersection.

Table 8:
Blue Ridge Road \ Mall Entrance
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	A (9.7) D (38.3) EB A (2.3) NB A (7.9) SB	B (14.8) D (35.7) EB A (6.9) NB A (7.3) SB
2014 No Build	A (9.5) D (38.3) EB A (2.4) NB A (8.7) SB	B (15.8) D (35.3) EB A (7.3) NB B (10.7) SB
2016 No Build	A (9.6) D (38.3) EB A (2.4) NB A (8.9) SB	B (16.5) D (35.2) EB A (7.4) NB B (10.9) SB
2014 Build Out	A (9.3) D (38.3) EB A (2.4) NB A (9.0) SB	B (16.2) D (35.3) EB A (7.4) NB B (12.0) SB
2016 Build Out	B (11.8) D (38.2) EB A (2.6) NB B (12.9) SB	B (17.1) D (35.7) EB A (6.9) NB A (7.3) SB

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development.

C. Blue Ridge Road \ Crabtree Valley Avenue (Unsignalized)

Analyses indicate that the Blue Ridge Road \ Crabtree Valley Avenue intersection currently operates with unacceptable levels of service on the eastbound approach during the AM and PM peak hours. The delay on this approach is expected to increase dramatically, even without the proposed development. Although a detailed signal warrant analysis has not been performed, it is likely that this location will meet warrants for signalization in the future with just the predicted background growth.

With the addition of a traffic signal, the intersection is expected to operate at an overall LOS D or better during the AM and PM peak hours of the 2014 No Build, 2016 No Build, 2014 Build Out and 2016 Build Out scenarios. Due to the proximity of the Blue Ridge Road / Crabtree Valley Mall entrance traffic signal, these two locations will need to be tied into the same system to ensure they will work properly together.

The additional traffic generated by Phase 1 of the proposed development will add less than 3 seconds of overall delay during both of the peak periods. The additional traffic generated by the full Build Out of the site will add approximately 16 seconds average vehicle delay in the AM peak hour and 10 seconds in the PM peak hour.

Table 9 summarizes the LOS and average delay per vehicle for the Blue Ridge Road \ Crabtree Valley Avenue intersection.

Table 9:
Blue Ridge Road \ Crabtree Valley Avenue
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	# (26.6) F (142.2) EB B (14.6) WB	# (87.3) F (410.1) EB D (26.1) WB
2014 No Build • Unsignalized	# (75.1) F (393.8) EB C (17.7) WB	# (**) F (**) EB F (60.0) WB
• Signalized	C (23.3) D (50.1) EB C (28.7) WB A (9.5) NB B (18.7) SB	C (24.2) D (42.6) EB C (33.7) WB B (17.9) NB B (19.7) SB
2016 No Build • Unsignalized	# (83.1) F (438.5) EB C (18.1) WB	# (**) F (**) EB F (72.4) WB
• Signalized	C (24.4) D (53.9) EB C (28.7) WB B (9.6) NB B (19.5) SB	D (39.6) E (69.8) EB D (50.3) WB C (33.6) NB C (29.0) SB
2014 Build Out • Unsignalized	# (99.1) F (**) EB C (19.7) WB	# (**) F (**) EB F (126.7) WB
• Signalized	C (23.8) D (50.5) EB C (28.5) WB B (10.1) NB B (19.8) SB	C (26.8) D (53.6) EB C (33.6) WB C (20.1) NB B (19.1) SB
2016 Build Out • Unsignalized	# (**) F (**) NB E (44.5) SB	# (**) F (**) EB F (**) WB
• Signalized	D (40.8) F (95.3) EB C (31.4) WB B (10.1) NB C (34.6) SB	D (50.0) E (78.7) EB C (33.4) WB D (49.0) NB D (37.1) SB

 # No letter value calculated by Synchro, only an overall intersection delay
*** Delay exceeds reasonable amount of delay by Synchro*

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development; however installation of a traffic signal would be expected to provide adequate intersection LOS for existing and future conditions.

D. Blue Ridge Road \ Homewood Banks Drive (Unsignalized)

Analyses indicate that the Blue Ridge Road \ Homewood Banks Drive intersection currently operates with less than 3 seconds per vehicle overall delay in the AM and PM peak hours. There is minimal change for the No Build Scenarios. For the 2014 Build Out analysis, the overall delay is expected to be less than 4 seconds per vehicle. Blue Ridge Road is expected to continue to operate at LOS A. Although the Homewood Banks Drive left-turning movement will have difficulty finding gaps during the PM peak hour by 2016 because of the increased through volumes on Blue Ridge Road, these drivers may use alternate routes through the development or other existing routes to travel northeast on Blue Ridge Road from the area.

Table 10 summarizes the LOS and average delay per vehicle for the Blue Ridge Road \ Homewood Banks Drive intersection.

Table 10:
Blue Ridge Road \ Homewood Banks Drive
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	# (2.5) C (24.2) SB A (4.0) EB	# (2.2) C (16.5) SB A (1.5) EB
2014 No Build	# (3.2) D (25.1) SB A (4.1) EB	# (3.4) C (24.4) SB A (1.8) EB
2016 No Build	# (3.2) D (25.6) SB A (4.0) EB	# (3.5) C (25.3) SB A (1.8) EB
2014 Build Out	# (3.3) D (25.5) SB A (4.1) EB	# (3.5) C (25.6) SB A (1.8) EB
2016 Build Out	# (6.2) D (45.5) SB A (4.4) EB	# (18.7) F (113.6) SB A (2.6) EB

 # No letter value calculated by Synchro, only an overall intersection delay

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development.

E. Crabtree Valley Avenue \ Homewood Banks (Unsignalized)

Analyses indicate that the Crabtree Valley Avenue approaches to the intersection with Homewood Banks Drive will continue to operate at LOS A during the AM and PM peak hours, while the stop controlled left-turning vehicles on the northbound and southbound approaches will experience increased delays during the AM and PM peak hours of the 2014 No Build, 2016 No Build, 2014 Phase 1 and 2016 Build Out scenarios. The addition of the traffic generated by Phase 1 of the proposed development will add 1.2 seconds of overall average vehicle delay during the AM peak hour and less than 20 seconds of overall average vehicle delay during the PM peak hour.

It is not uncommon for minor unsignalized movements to operate at an unacceptable LOS during peak periods when there are high traffic volumes on the mainline. This delay will be experienced primarily during the afternoon peak hour. Installation of a traffic signal at this intersection would be expected to provide adequate overall intersection LOS for all studied scenarios, but the expected hourly volumes would probably not meet the minimum MUTCD volume requirements to warrant consideration of a traffic signal. Installation of stop signs on the Crabtree Valley Avenues to create all-way stop control would also allow the northbound and southbound vehicles access to the roadway, but would probably cause unacceptable delays and queuing on Crabtree Valley Avenue. Installation of modern design roundabout would also be likely to provide adequate operations at this intersection; however this should be considered in conjunction with the planned widening of Crabtree Valley Avenue and would probably require additional right-of-way acquisition. Detailed engineering studies are required to determine the applicability of either of these intersection control solutions.

Table 11 summarizes the LOS and average delay per vehicle at the Crabtree Valley Avenue \ Homewood Banks intersection.

Table 11:
Crabtree Valley Avenue \ Homewood Banks
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	# (3.3) B (12.1) NB B (11.3) SB	# (11.6) D (32.0) NB C (23.7) SB
2014 No Build	# (3.6) B (14.6) NB B (11.9) SB	# (24.0) F (102.2) NB D (33.1) SB
2016 No Build	# (3.6) B (14.8) NB B (12.0) SB	# (27.0) F (118.2) NB A (0.6) WB
2014 Build Out	# (4.8) C (16.7) NB B (12.2) SB	# (43.9) F (209.4) NB E (39.8) SB
2016 Build Out	# (15.6) F (57.7) NB C (18.1) SB	# (**) F (**) NB F (228.5) SB

 # No letter value calculated by Synchro, only an overall intersection delay
*** Delay exceeds reasonable amount of delay by Synchro*

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development.

F. Edwards Mill Road \ Crabtree Valley Avenue (Unsignalized)

Analyses indicate that the Edwards Mill Road \ Crabtree Valley Avenue intersection currently operates with minimal overall delay in the AM and PM peak hours. The northbound approach operates at LOS D or better. The Crabtree Valley Avenue approaches to the intersection with Edwards Mill Road will continue to operate at LOS A during the AM and PM peak hours, while the stop controlled left-turning vehicles on the northbound approach will experience increased delays during the AM and PM peak hours of the 2014 No Build, 2016 No Build, 2014 Phase 1 and 2016 Build Out scenarios. The additional traffic expected from Phase 1 of the development is expected to contribute less than 8% more trips in the AM peak hour and 6% in the PM peak hour to the No Build volumes at this intersection.

It is not uncommon for a minor unsignalized movement to operate at an unacceptable LOS during peak periods when there are high traffic volumes on the mainline. This delay will be experienced primarily during the afternoon peak hour. Installation of a traffic signal at this intersection would be expected to provide adequate overall intersection LOS for all studied scenarios, but the expected hourly volumes would probably not meet the minimum MUTCD volume requirements to warrant consideration of a traffic signal. Installation of stop signs on the Crabtree Valley Avenues to create all-way stop control would also allow the northbound and southbound vehicles access to the roadway, but would probably cause unacceptable delays and queuing on Crabtree Valley Avenue. Installation of modern design roundabout would also be likely to provide adequate operations at this intersection; however this should be considered in conjunction with the planned widening of Crabtree Valley Avenue and would probably require additional right-of-way acquisition. Detailed engineering studies are required to determine the applicability of either of these intersection control solutions.

Table 12 summarizes the LOS and average delay per vehicle at the Edwards Mill Road \ Crabtree Valley Avenue intersection.

Table 12:
Edwards Mill Road \ Crabtree Valley Avenue
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	# (2.8) B (10.6) NB A (2.8) WB	# (8.7) D (31.8) NB A (4.0) WB
2014 No Build	# (4.7) B (13.1) NB A (3.2) WB	# (44.8) F (169.0) NB A (4.9) WB
2016 No Build	# (4.7) B (13.3) NB A (3.2) WB	# (50.0) F (190.2) NB A (4.9) WB
2014 Build Out	# (4.6) B (13.7) NB A (2.9) WB	# (56.8) F (223.5) NB A (4.8) WB
2016 Build Out	# (5.0) B (18.3) NB A (2.8) WB	# (116.0) F (**) NB A (4.2) WB

 # No letter value calculated by Synchro, only an overall intersection delay
*** Delay exceeds reasonable amount of delay by Synchro*

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development.

G. Creedmoor Road \ Crabtree Valley Avenue (Unsignalized)

Analyses indicate that the Creedmoor Road \ Crabtree Valley Avenue intersection currently operates with unacceptable levels of service on the westbound approach during the AM and PM peak hours. The delay on this approach is expected to increase dramatically, even without the proposed development. Although a detailed signal warrant analysis has not been performed, it is likely that this location will meet warrants for signalization in the future with just the predicted background growth.

With the addition of a traffic signal, the intersection is expected to operate at an overall LOS D or better during the AM and PM peak hours of the 2014 No Build, 2016 No Build, 2014 Build Out and 2016 Build Out scenarios. Due to the proximity of the Creedmoor Road / Crabtree Valley Mall entrance traffic signal; these two locations will need to be tied into the same system to ensure they will work properly together.

The additional traffic generated by Phase 1 and the full Build Out of the proposed development will add less than 3 seconds of overall delay during both of the peak periods. The traffic generated by Phase 1 will add approximately 2% to the traffic peak hour volumes at the intersection and less than 10% for the full Build Out.

Table 13 summarizes the LOS and average delay per vehicle at the Creedmoor Road \ Crabtree Valley Avenue intersection.

Table 13:
Creedmoor Road \ Crabtree Valley Avenue
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	# (5.6) F (81.0) WB A (0.8) SB	# (305.2) F (**) WB C (3.9) SB
2014 No Build • Unsignalized	# (10.5) F (121.2) WB B (0.9) SB	# (331.0) F (**) WB C (5.9) SB
• Signalized	B (10.9) D (36.9) WB A (5.4) NB A (9.8) SB	C (28.1) D (52.4) WB C (29.3) NB B (16.9) SB
2016 No Build • Unsignalized	# (11.9) F (138.9) WB B (0.9) SB	# (332.4) F (**) WB D (6.3) SB
• Signalized	B (16.2) D (37.8) WB A (17.6) NB A (12.9) SB	C (27.9) D (48.3) WB C (29.6) NB B (17.6) SB
2014 Build Out • Unsignalized	# (17.0) F (173.9) WB B (0.9) SB	# (354.5) F (**) WB D (7.1) SB
• Signalized	B (12.3) D (35.6) WB A (6.2) NB B (11.4) SB	C (31.0) D (52.5) WB C (33.3) NB B (19.1) SB
2016 Build Out • Unsignalized	# (382.2) F (3591) WB B (1.5) SB	# (**) F (**) WB E (11.5) SB
• Signalized	B (19.7) D (44.4) WB C (21.6) NB B (14.7) SB	D (36.9) D (53.4) WB D (39.0) NB C (25.2) SB

 # No letter value calculated by Synchro, only an overall intersection delay
*** Delay exceeds reasonable amount of delay by Synchro*

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development; however installation of a traffic signal would be expected to provide adequate intersection LOS for existing and future conditions.

H. Creedmoor Road \ Mall Entrance (Signalized)

Analyses indicate that the Creedmoor Road \ Mall Entrance intersection currently operates at an overall LOS A or B during the AM and PM peak hours. The intersection is expected to continue to operate at LOS A or B during the AM and PM peak hours of the 2014 No Build, 2016 No Build, 2014 Build Out and 2016 Build Out scenarios. The addition of the proposed development will add less than 7 seconds of overall average vehicle delay during each of the peak periods for full Build Out.

Table 14 summarizes the LOS and average delay per vehicle at the Creedmoor Road \ Mall Entrance intersection.

Table 14:
Creedmoor Road \ Mall Entrance
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	A (7.3) F (83.3) EB E (77.3) WB A (4.1) NB A (7.1) SB	B (16.4) D (45.0) EB C (34.3) WB B (13.8) NB B (14.1) SB
2014 No Build	A (7.4) F (83.3) EB E (77.2) WB A (4.1) NB A (7.3) SB	B (16.5) D (45.0) EB C (34.3) WB B (14.2) NB B (14.1) SB
2016 No Build	A (7.5) F (83.3) EB E (77.2) WB A (4.1) NB A (7.5) SB	B (10.8) D (45.0) EB C (34.3) WB B (14.5) NB B (14.1) SB
2014 Build Out	A (7.4) F (83.3) EB E (77.5) WB A (4.1) NB A (7.3) SB	B (16.5) D (45.0) EB C (34.3) WB B (14.4) NB B (14.0) SB
2016 Build Out	A (8.6) F (83.3) EB E (78.2) WB A (4.7) NB A (8.5) SB	B (17.0) D (45.0) EB C (34.2) WB B (15.2) NB B (14.2) SB

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development.

I. Blue Ridge Road \ South Site Access Point (Unsignalized)

Analyses indicate that Blue Ridge Road at the South Site Access Point intersection is expected to operate with minimal overall delays to the primary through traffic on the mainline. After the Phase I Build Out, the driveway exiting the development is expected to operate at LOS C in the AM peak hour and LOS D during the PM peak hour. For the full build out in 2016, the driveway exiting the development is expected to operate at LOS D during the AM peak hour and LOS F during the PM peak hour. It is not uncommon for a minor unsignalized movement to operate at an unacceptable LOS during peak periods when there are high traffic volumes on the mainline. Additionally, due to the interconnectivity throughout the site, traffic exiting the site will have other options to exit the development that are experiencing less delay.

Table 15 summarizes the LOS and average delay per vehicle at the Blue Ridge Road \ South Site Access Point intersection.

Table 15:
Blue Ridge Road \ South Site Access Point
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2014 Build Out	# (1.3) C (19.2) SB A (0.2) EB	# (0.9) D (29.7) SB A (0.3) EB
2016 Build Out	# (2.0) D (25.2) SB A (1.2) EB	# (8.3) F (100.6) SB A (0.4) EB

 # No letter value calculated by Synchro, only an overall intersection delay

Recommended improvements at this intersection include a southbound taper at the site access point and a northbound left turn lane that will provide full storage to the Woodfield Marshall Park Apartments turn lane. The driveway must meet or exceed all NCDOT / City of Raleigh requirements.

J. Blue Ridge Road \ Woodfield Marshall Park Apartments Access Point (Unsignalized)

Analyses indicate that Blue Ridge Road at the Woodfield Marshall Park Apartments Access Point intersection is expected to continue to operate at LOS A during the AM and PM peak hours of the 2014 No Build and Phase 1 and 2016 No Build and Build Out scenarios. The LOS for the side street approach is expected to be LOS C in the AM peak hour and D or E in the PM peak hour for all scenarios studied.

Table 16 summarizes the LOS and average delay per vehicle at Blue Ridge Road \ Woodfield Marshall Park Apartments Access Point intersection.

Table 16:
Blue Ridge Road \ Woodfield Marshall Park Apartments Access Point
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2014 No Build	# (2.8) C (17.6) NB A (0.2) WB	# (2.9) E (35.3) NB A (2.1) WB
2016 No Build	# (2.8) C (18.0) NB A (40.2) WB	# (2.3) D (34.1) NB A (9.5) WB
2014 Build Out	# (2.8) C (18.2) NB A (0.2) WB	# (2.3) E (34.6) NB A (1.0) WB
2016 Build Out	# (3.0) C (22.7) NB A (0.2) WB	# (2.7) E (48.1) NB A (0.9) WB

 # No letter value calculated by Synchro, only an overall intersection delay

There are no recommendations for improvements at this intersection as a result of the additional traffic generated by the proposed development.

K. Homewood Banks Drive \ Crabtree Tavern \ North Site Access Point (Unsignalized)

Analyses indicate that the Homewood Banks Drive \ North Site Access Point intersection currently operates and is expected to continue to operate in 2014 and 2016, with or without the project traffic, LOS C or better during the AM and PM peak hours on all approaches.

Table 17 summarizes the LOS and average delay per vehicle at the Homewood Banks Drive \ North Site Access Point intersection.

Table 17:
Homewood Banks Drive \ Crabtree Tavern \ North Site Access Point
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	# (2.9) A (9.0) EB A (1.6) NB	# (1.0) B (10.0) EB A (0.5) NB
2014 No Build	# (2.0) A (9.3) EB A (0.9) NB	# (0.8) B (10.6) EB A (0.4) NB
2016 No Build	# (2.0) A (9.3) EB A (0.9) NB	# (0.8) B (10.6) EB A (0.4) NB
2014 Build Out	# (1.5) A (9.6) EB A (0.5) NB	# (0.7) B (11.2) EB A (0.3) NB
2016 Build Out	# (3.3) C (16.3) EB B (11.2) WB	# (3.2) C (23.7) EB C (15.9) WB

 # No letter value calculated by Synchro, only an overall intersection delay

With the required thoroughfare widening, Homewood Banks Drive will have a 3-lane cross-section, providing a left turn lane into the proposed development. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

L. Homewood Banks Drive \ Homewood Suites Access \ Northwest Site Access Point (Unsignalized)

Analyses indicate that the Homewood Banks Drive \ Homewood Suites Access \ Northwest Site Access Point intersection currently operates and is expected to continue to operate in 2014 and 2016, with or without the project traffic, LOS C or better during the AM and PM peak hours on all approaches

Table 18 summarizes the LOS and average delay per vehicle at Homewood Banks Drive \ Homewood Suites Access \ Northwest Site Access Point intersection.

Table 18:
Homewood Banks Drive \ Northwest Site Access Point
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2012 Existing	# (7.4) A (9.7) EB A (7.5) NB	# (1.7) B (10.1) EB A (0.5) NB
2014 No Build	# (7.4) A (9.7) EB A (7.5) NB	# (1.4) B (10.7) EB A (0.4) NB
2016 No Build	# (6.0) B (10.1) EB A (6.0) NB	# (1.4) B (10.8) EB A (0.4) NB
2014 Build Out	# (5.0) B (10.5) EB A (4.5) NB	# (1.2) B (11.5) EB A (0.3) NB
2016 Build Out	# (6.0) C (15.9) EB B (11.8) WB	# (4.0) C (24.8) EB B (14.0) WB

 # No letter value calculated by Synchro, only an overall intersection delay

With the required thoroughfare widening, Homewood Banks Drive will have a 3-lane cross-section, providing a left turn lane into the proposed development. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

M. Homewood Banks Drive \ West Site Access Point (Unsignalized)

Analyses indicate that Homewood Banks Drive at the West Site Access Point intersection is expected to continue to operate at LOS A during the AM and PM peak hours of the 2014 Phase 1 and 2016 Build Out scenarios. The LOS for the side street approach is expected to be LOS A or B for all scenarios.

Table 19 summarizes the LOS and average delay per vehicle at the Homewood Banks Drive \ West Site Access Point intersection.

Table 19:
Homewood Banks Drive \ West Site Access Point
Level-of-Service (Delay in Seconds)

Condition	AM Peak LOS (Delay in sec.)	PM Peak LOS (Delay in sec.)
2014 Build Out	# (2.3) A (9.5) WB A (1.1) SB	# (2.0) A (9.5) WB A (2.2) SB
2016 Build Out	# (3.1) B (11.0) WB A (3.7) SB	# (3.7) B (13.2) WB A (2.2) SB

 # No letter value calculated by Synchro, only an overall intersection delay

The developer will be required to construct half of the ultimate 3-lane cross section for Homewood Banks Drive. When the property on the west side of Homewood Banks Drive develops, a left turn lane into the site access will be provided. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

IX. SimTraffic Observations

SimTraffic models were run for the 2014 No Build, 2016 No Build, 2014 Build Out, and 2016 Build Out scenarios to observe the predicted traffic operations throughout the study area during each of the peak hours. Based on the results of the SimTraffic Analyses, excessive delays are predicted along Crabtree Valley Avenue during the afternoon peak hour as a result of all intersections being unsignalized. The most excessive queue is caused by the westbound traffic not being able to exit onto Creedmoor Avenue. This traffic is predicted to potentially back up the entire length of Crabtree Valley Avenue. Therefore, long queues are also predicted along Crabtree Valley Avenue at Edwards Mill Road and Homewood Banks Drive. Assuming that traffic signals are installed at the Blue Ridge Road and Creedmoor Road intersections with Crabtree Valley Avenue, the queues along Crabtree Valley Avenue will be significantly reduced while the signals will operate at acceptable levels of service.

Additionally, the SimTraffic models indicate that the available storage area between the Crabtree Village Development Blue Ridge Road Access and the Woodfield Marshall Park Apartments Blue Ridge Road Access is sufficient to accommodate the left turning traffic. There is approximately 365 feet between the two driveways and the worst case queues were predicted to be less than 300 feet combined (55 feet for Marshall Farms and 237 feet for Crabtree Village).

X. Multimodal Analysis

According to the 2030 Comprehensive Plan, the City of Raleigh is now classifying and analyzing roadways based on not only vehicle capacity and function, but also the capacity and function of other modes of transportation, such as pedestrians, bicyclists, and transit services. Through this added level of transportation planning evaluation, the City's goal is to ensure that all new roadway projects and major reconstruction projects within the City of Raleigh will provide appropriate and adequate right-of-way for safe and convenient movement for all users, including bicyclists, pedestrians, transit riders, and motorists.

ARTPLAN 2009 Conceptual Planning Analysis software is used in this study to evaluate pedestrian, bicycle, and bus levels-of-service within the proposed study area. ARTPLAN was developed by the Florida Department of Transportation (FDOT) to quantitatively evaluate these multimodal components. This application was developed based on the 2000 Highway Capacity Manual (HCM) methodologies for automobiles and further expanded to account for the entire multimodal system. ARTPLAN evaluates a network's multimodal components based on a variety of existing conditions, including, but not limited to ...

- Signal Timing Data (cycle lengths, g/C ratios, etc.)
- Roadway Conditions (number of lanes, turning lane storage lengths, median widths, speed limits, etc.)
- Traffic Volumes (peak hour turning movement, AADT, etc.)
- Existing Multimodal Facilities (sidewalks, bicycle lanes, bus stops, barriers between pedestrians and motorists, etc.)
- Existing Multimodal Operations (transit schedules, etc.)

Similar to capacity analysis results, as outlined in the HCM and described earlier in this report, multimodal analysis provides quantitative output in the form of a level-of-service (LOS) grade. As comparable to the results in capacity analyses, the multimodal analysis levels-of-service can vary from a Level A, being most desirable and conducive to all modes of transportation, to a Level F, being least desirable

and most dangerous for pedestrians, bicyclists, and/or transit users. Tables 20 and 21 below indicate what LOS corresponds with the ARTPLAN score for bicycle and pedestrian analysis, and bus frequency for transit analysis.

TABLE 20:
Bicycle & Pedestrian Level-of-Service Criteria
(based on FDOT LOS Standards)

Level-of-Service	ARTPLAN Score
A	***≤ 1.5***
B	***>1.5 and ≤2.5***
C	***>2.5 and ≤3.5***
D	***>3.5 and ≤4.5***
E	***>4.5 and ≤5.5***
F	***> 5.5***

TABLE 21:
Bus Level-of-Service Criteria
(based on the Transit Capacity and Quality of Service Manual)

Level-of-Service	Adjusted Bus Frequency (Buses/Hr)
A	***≥ 5***
B	***<5 and ≥4***
C	***<4 and ≥3***
D	***<3 and ≥2***
E	***<2 and ≥1***
F	***< 1***

For this project, traffic signals were assumed to be in place at all three intersections surrounding the proposed development. In some cases, the actual calculated values for the g/C ratio or % turns exceeded what was acceptable or allowed for this program. In some cases, the maximum allowable values were used.

The multimodal analysis results for the existing PM peak hour conditions are outlined in Table 22.

TABLE 22: Multimodal Level-of-Service Summary
Crabtree Village Development
Existing PM Conditions

Primary Road	Section From	Section To	Bicycle LOS		Pedestrian LOS		Bus LOS	
			ARTPLAN Score	Level-of-Service	ARTPLAN Score	Level-of-Service	Adjusted Bus Freq.	Level-of-Service
Blue Ridge Road	**Crabtree Valley Avenue**	**Homewood Banks Drive**	**4.21**	**D**	**4.16**	**D**	**4.73**	**B**
Crabtree Valley Avenue	**Blue Ridge Road**	**Homewood Banks Drive**	**3.95**	**D**	**2.68**	**C**	**7.35**	**A**
Homewood Banks Drive	**Crabtree Valley Avenue**	**Blue Ridge Road**	**2.81**	**C**	**3.48**	**C**	**0.0**	**F**

Blue Ridge Road currently has a portion of a greenways path on a segment along the west side of the roadway. Additionally, this road is serviced by one bus route. ARTPLAN 2009 estimates that Blue Ridge Road from Crabtree Valley Avenue to Homewood Banks Drive, under existing PM peak hour conditions, operates at a LOS D for bicyclists and pedestrians and LOS B for transit riders.

Crabtree Valley Avenue currently has a sidewalk / Crabtree Creek Trail along the northern side of the roadway. Additionally, this road is serviced by two bus routes. ARTPLAN 2009 estimates that Ridge Road from Crabtree Valley Avenue from Blue Ridge Road to Homewood Banks Drive, under existing PM peak hour conditions, operates at a LOS D for bicyclists, LOS C for pedestrians, and LOS A for transit riders.

Homewood Banks Drive currently has a sidewalk on the west side of the roadway from Crabtree Valley Avenue along the frontage of the existing businesses. Additionally, this road is not serviced by any bus routes. ARTPLAN 2009 estimates that Homewood Banks Drive from Blue Ridge Road to Crabtree Valley Avenue, under existing PM peak hour conditions, operates at a LOS C for bicyclists and pedestrians and LOS F for transit riders.

Multimodal analysis was also performed for the future PM peak conditions. A summary of the future year results along the study area roadways is shown in Table 23.

TABLE 23: *Multimodal Level-of-Service Summary*
Crabtree Village Development
Future PM Conditions

Primary Road	Section From	Section To	Bicycle LOS		Pedestrian LOS		Bus LOS	
			ARTPLAN Score	Level-of-Service	ARTPLAN Score	Level-of-Service	Adjusted Bus Freq.	Level-of-Service
Blue Ridge Road	**Crabtree Valley Avenue**	**Homewood Banks Drive**	**4.21**	**D**	**2.93**	**C**	**4.96**	**B**
Crabtree Valley Avenue	**Blue Ridge Road**	**Homewood Banks Drive**	**3.95**	**D**	**2.68**	**C**	**7.35**	**A**
Homewood Banks Drive	**Crabtree Valley Avenue**	**Blue Ridge Road**	**2.25**	**C**	**2.26**	**B**	**0.0**	**F**

The planned improvements with the proposed development consist of constructing sidewalk on the remaining portion on the east side of Blue Ridge Road and constructing sidewalk along the entire frontage on the east side of Homewood Banks Drive. The developer has indicated that three transit easements, with one covered, could be provided. At this time, the exact locations of these transit stops have not been identified. No new bus service on Homewood Banks Drive was assumed as part of this analysis.

Multimodal analysis using ARTPLAN 2009 estimates shows that with the planned improvements, the pedestrian LOS will be improved to a C on Blue Ridge Road and a B on Homewood Banks Road. All other multimodal levels of service stay the same.

The multimodal levels-of-service as defined in the proposed Crabtree Village Development study area are considered acceptable for existing and future year conditions. Construction of the proposed site is not expected to result in any significant multimodal impacts within the proposed study area.

XI. Recommendations

Through the analyses done as a part of this TIA, several improvements were identified for both the No Build and Build Out Scenarios.

No Build Improvements:

The following improvements are identified to address deficiencies in the transportation network that are required as a result of the background traffic and approved development projects.

- **Crabtree Valley Avenue / Creedmoor Road** – There have been some discussions about relocating this intersection further south as a part of the future development in the southeast quadrant of this intersection. There are no approved plans for this relocation at this time. Therefore, when appropriate MUTCD Warrants are met, provide a traffic signal at this location to allow minor street traffic to access Creedmoor Road. Due to the proximity of the Creedmoor Road / Crabtree Valley Mall Entrance intersection, the new signal will need to operate in coordination with the adjacent signals.

- **Crabtree Valley Avenue / Blue Ridge Road** – The ***Crabtree Valley Transportation Study*** was prepared by The Louis Berger Group, Inc. in March 2011. This plan provides a recommended alternative to extend Crabtree Valley Avenue to I-440. The estimated cost for this improvement is in excess of $40 Million. Due to the high cost of the preferred alternative in comparison to the size of this proposed development, this report only considered interim operations at this intersection. Therefore, when appropriate MUTCD Warrants are met, a traffic signal should be provided at this location to allow minor street traffic to access Blue Ridge Road. Due to the proximity of the Blue Ridge Road / Crabtree Valley Mall Entrance intersection, the new signal will need to operate in coordination with the adjacent signals.

- **Glenwood Avenue / Blue Ridge Road / Lead Mine Road** – This intersection is currently operating at an unacceptable level of service in the AM and PM peak hours. Due to the traffic volumes and existing number of travel lanes, a significant construction project will be required to improve this location to an acceptable level of service. The ***Crabtree Valley Transportation Study*** provides a recommended alternative which includes a partial grade separated intersection at an estimated cost of $52.8 Million. No short term improvements that would provide an acceptable level of service were identified at this intersection as a part of this City funded study. Due to the minimal impact of the proposed development, no additional recommendations are provided for this intersection.

Build Out Improvements:

The following improvements are identified to mitigate the additional traffic generated by the proposed development:

- **Blue Ridge Road / South Site Access Point** - Recommended improvements at this intersection include a southbound taper at the site access point and a northbound left turn lane that will provide full storage to the Woodfield Marshall Park Apartments turn lane. The driveway must meet or exceed all NCDOT / City of Raleigh requirements.

- **Homewood Banks / Crabtree Tavern / North Site Access Point** – Provide the required thoroughfare widening improving Homewood Banks Drive to a 3-lane cross-section; therefore, providing a left turn lane into the proposed development. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

- **Homewood Banks / Homewood Suites Access / Northwest Site Access Point** – Provide the required thoroughfare widening improving Homewood Banks Drive to a 3-lane cross-section; therefore, providing a left turn lane into the proposed development. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

- **Homewood Banks / West Site Access Point** –Construct half of the ultimate 3-lane cross section for Homewood Banks Drive. When the property on the west side of Homewood Banks Drive develops, a left turn lane into the site access will be provided. The driveway must be constructed to meet or exceed all NCDOT / City of Raleigh requirements.

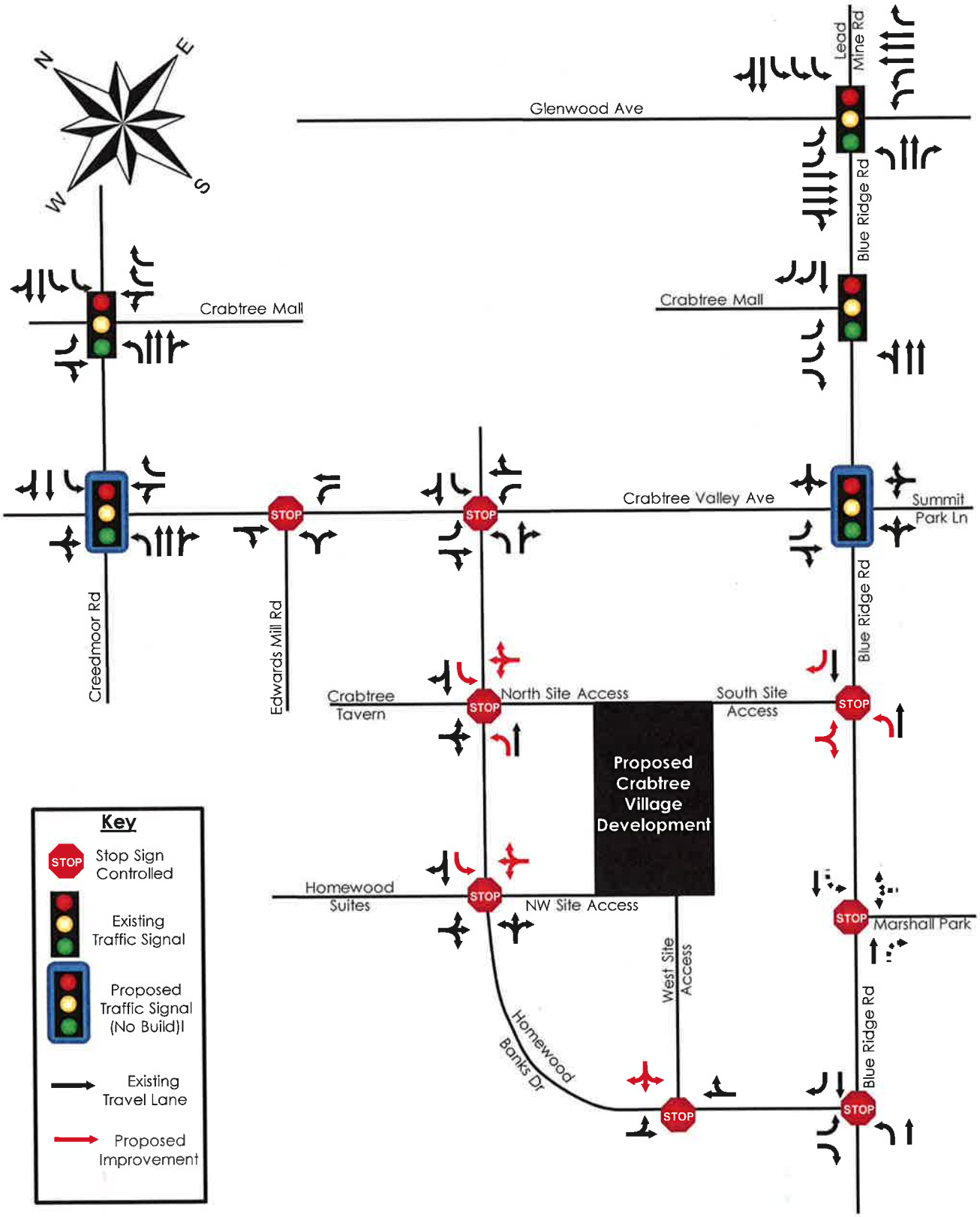
A summary of the recommended lane configurations and traffic controls are illustrated in Figure 9.

XII. Conclusions

This study shows that traffic generated by the proposed development is a very small portion of the existing traffic in the study area. The Louis Berger Group, Inc. provided the **Crabtree Valley Transportation Study** for the City in March 2009 that outlined the long range transportation solutions for this area. The recommended improvements in this plan exceed $90 Million. The development of this site will not interfere with the roadway plans outlined in this study. Additionally, the proposed project reserves the area in the easternmost corner of the property for the ramp recommended in the study.

The recommended improvements for the proposed development will mitigate the traffic generated by the proposed development at the site access locations. Additional improvements due to no build conditions will need to be constructed for all intersections to operate at acceptable levels of service.

Figure 9. Recommended Lane Configurations and Traffic Controls



XIII. References

[1]***2009 NCDOT Average Daily Traffic Volumes***, Raleigh Urban Area Mapping, http://www.ncdot.org/travel/statemapping/trafficvolumemaps/ (Raleigh, Sheet 6)

[2]***Traffic Engineering Accident Analysis System (TEAAS) Training Manual,*** NCDOT Traffic Engineering & Safety Systems Branch, February 2007, Page 14-2.

[3] http://safety.fhwa.dot.gov/intersection/resources/fhwasa09020/chap_2.cfm

[4] http://safety.fhwa.dot.gov/intersection/unsignalized/presentations/nchrp500_v5/

[5].http://www.vdot.virginia.gov/business/resources/HSIP/HSIP%20General%20Crash%20Pattern%20and%20Countermeasures.pdf

[6]***Trip Generation (7th Edition),*** Institute of Transportation Engineers (ITE), 2008.

[7]***Highway Capacity Manual***, Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 1998.

APPENDIX

- General Project Info
- Traffic Counts
- Trip Generation Information
- Signal Timing Information
- Multimodal Analysis Output (ARTPLAN)
- Area Plans
- Crash Data
- Synchro Files & Output
- SimTraffic Output