PLANNING COMMISSION

October 2, 2017 at 5:15pm
City Council Chambers, 3rd Floor, 1737 Main Street, Columbia, SC 29201

Site Plan Review Case Summary
150 thru 160 Bluff Road and 1003 thru 1011 Hamrick Street, TMS#11204-02-14 thru 16, 11204-02-25 thru 29
The Orchard Phase III

Council District: 2

Proposal: Request site plan approval for the construction of a 28-unit multifamily development.

Applicant: Benjamin H. Whited, Orchard Columbia III, LLC

Proposed Use: Apartments

Staff Recommendation: Approval with staff comments.

Detail: This project entails the construction of a 28-unit multi-family development on 2.3 acres along Bluff Road and Hamrick Street. The required number of off-street parking spaces for this development is 56 (2 parking spaces per dwelling unit) whereas 91 will be provided. The applicant has worked with staff regarding the removal of grand trees and buffer yard requirements.

Should the Commission be inclined to grant approval of the site plan, staff would request that the Commission grant approval subject staff comments.

CITY REVIEWING AGENCY COMMENTS	
John Fellows, Planning	**Recommend approval with conditions:** 1. Sidewalks shall be provided along Bluff Road and Hamrick Avenue. Sidewalks shall meet City engineering standards, refer to Part 9. Sidewalk widths shall be a min of 6 feet. The furnishing zone (area for trees) shall be a minimum of 8 feet. Sidewalks shall be placed one foot from the property line. The sidewalk through the driveways shall meet SCDOT standard 720-415-00. 2. Sidewalks near building #'s 1, 13 north and 13 south, and 12 shall be extended to public side walk to allow for connectivity of those walking or biking. Both sidewalks located near Hamrick Ave shall be extended to the public sidewalk to allow for connectivity for those walking or biking. 3. A revised site plan shall be provided showing sidewalk connectivity with the development with the use of crosswalks and curb ramps to allow pedestrians to circulate through the development. 4. Encroachments from SCDOT and or the City will be required.

K. Brian Cook, Zoning Administrator	**Recommend approval.**
Johnathan Chambers, Land Development Administrator	**Recommend approval with conditions:** 1. City and State Encroachment permits will be required for work being conducted within the ROW. 2. TMS#11204-02-14 thru 16, 11204-02-25 thru 29 must be consolidated into one lot prior to the issuance of any permits. 3. Must comply with all requirements of the South Carolina Aeronautics Commission.
Jerry Thompson, Building Official	**Recommend approval with condition:** 1. Must comply with all applicable building codes.
Scott Rogers, Utilities	**Recommend approval with conditions:** 1. Any needed upgrade, extension or relocation of City utilities must be provided by the developer. 2. Any privately owned/maintained utilities or permanent structures cannot be located inside City of Columbia utility easements. 3. Water mains, sewer mains, water meters that are 4" or larger or any privately maintained utilities will not be allowed inside public right-of-ways or under sidewalks without an approved encroachment permit and written approval from the City Engineer. Coordination between the Civil Engineer, Architect and Mechanical Engineer to allow room for these utilities on the developed property is strongly encouraged. 4. If sewer flows for this project result in flows of 4,000 gallons per day or above calculations must be submitted to the City's Engineering department to determine how the proposed project will affect the City's sewer system. Depending upon the effects of the projected flows this project may or may not be approved. If required, these calculations should be submitted to the Engineering department as soon as possible.
David Brewer, Traffic Engineering	**Recommend approval.**
Kris Scott, Fire Department	**Recommend approval.**
Sara Hollar, Forestry	**Recommend approval with conditions:** 1. Any new landscaping or irrigation installed in the right of way must be approved by Forestry and Beautification for species and spacing and maintained by the adjacent property owner in a manner to not interfere with vehicular and pedestrian traffic. 2. SCDOT must approve any new landscaping installed along SCDOT roadways. 3. Any common open areas or green spaces must be maintained by the HOA or adjacent property owners.
Mike Jaspers, Stormwater	**Recommend approval with condition:** 1. Development must comply with all applicable land disturbance requirements.
Paul Pendley, Parking	**Recommend approval.**
Robert Sweatt, Street Division	**Recommend approval.**
John Hooks, Solid Waste	**Recommend approval.**
Scott Holder, Landscaping	**Recommend approval.**

City of Columbia

Orchard Columbia III, LLC

N
W E
S

Wednesday, July 12, 2017

0 95 190 380 Feet

CITY OF COLUMBIA GIS DATA DISCLAIMER

The City of Columbia GIS data represented on this map or plan is the product of compilation, as produced by others. It is provided for informational purposes only and the City of Columbia makes no representation as to its accuracy. Its use without field verification is at the sole risk of the user.

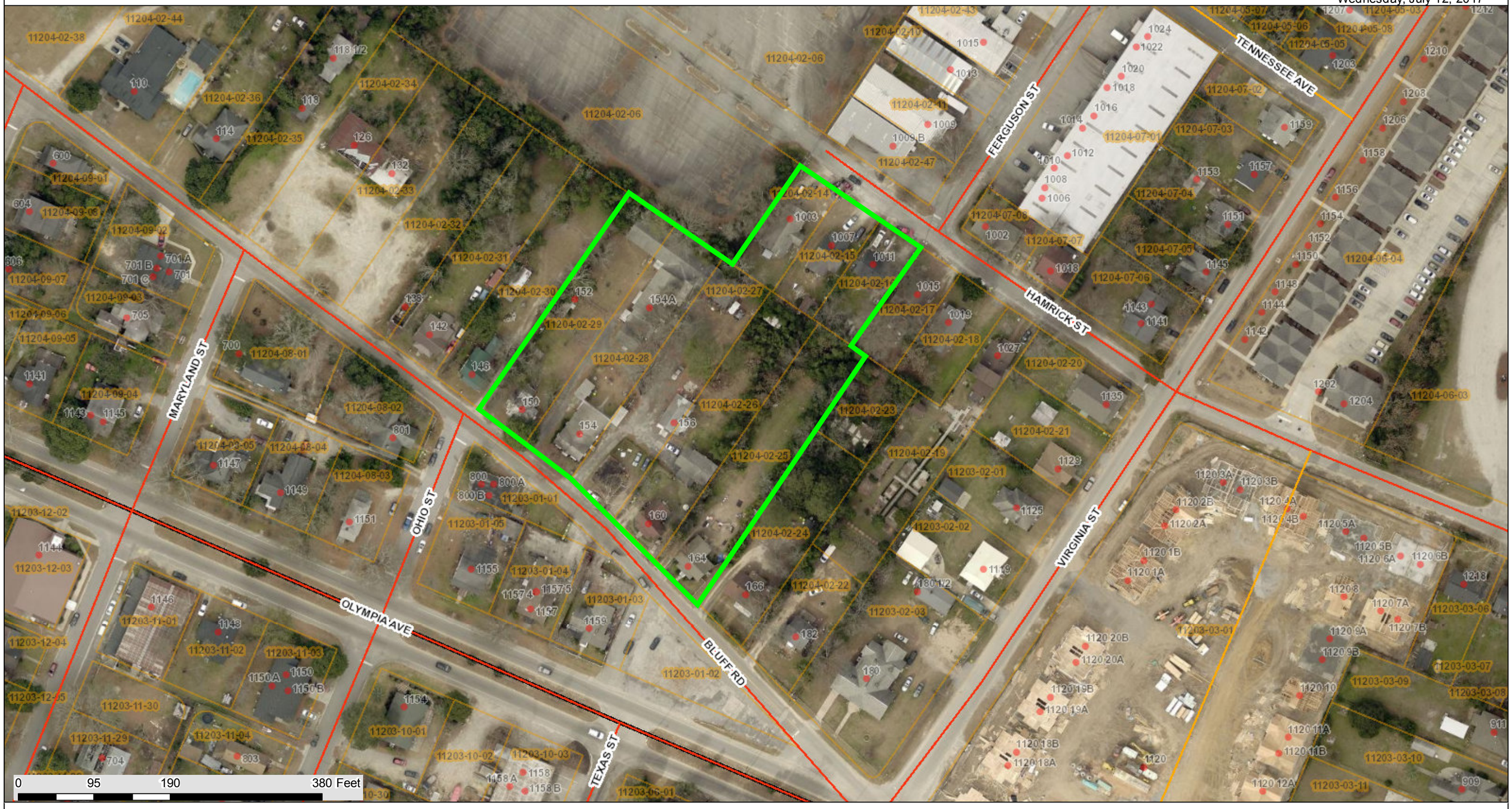
We Are Columbia

City of Columbia

Orchard Columbia III, LLC

N
W E
S

Wednesday, July 12, 2017



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RECEIVED
JUL 5 0 REC'D
DEVELOPMENT CENTER

FORM REVISED 02/10

City of Columbia
APPLICATION for
SITE PLAN/SUBDIVISION PLAT REVIEW

OFFICE USE ONLY: Date Received _____ By _____

1) APPLICANT (Please Print)

Name:	Benjamin H. Whited	Company:	Orchard Columbia III, LLC
Tel. #:	919-239-4195	Fax#:	N/A
Mobile #:	919-917-5277	E-mail:	Ben@BrookwoodCp.com

Do you own any of the property affected by this application? ☐ YES ☑ NO; If NO, provide Letter of Agency

2) THIS APPLICATION IS FOR (Check all that apply)

☐ Group/Individual Commercial Development

☑ Group Residential Development

☐ Residential Subdivision

☐ Planned Unit Development Site Review

3) PROPERTY

Address:	150,152,154,156,&160 Bluff Rd.: 1003,1007, &1011 Hamrick St		
TMS#:	11204-02-14-16 &25-29	Total Acreage:	2.3
Current Use:	residential	Proposed Use:	group residential development
Current Zoning:	RG-2		
Number of Lots and/or Units:	28- 3 bedroom units	Total Sq. Ft.	

3) DETAILED PROJECT DESCRIPTION: (Attach additional paper if you need more space)

This project will consist of the combination of existing residential lots into one parcel. It will consist of the development of 28 - 3 bedroom units and associated parking.

4) NEIGHBORHOOD CONSULTATION

Prior to the Planning Commission meeting, meet with the adjacent neighbors or neighborhood association to communicate details of the proposed project. Please note that this informational meeting is not required by ordinance, but is *strongly* encouraged. Contact information may be obtained from Zoning staff.

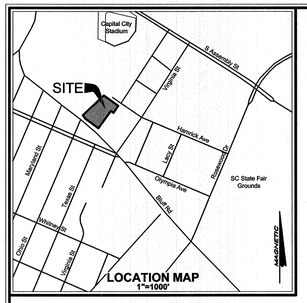
5) PLAN SUBMITTAL

Please refer to the Checklist for Site Plan Review for materials required for submittal with this application

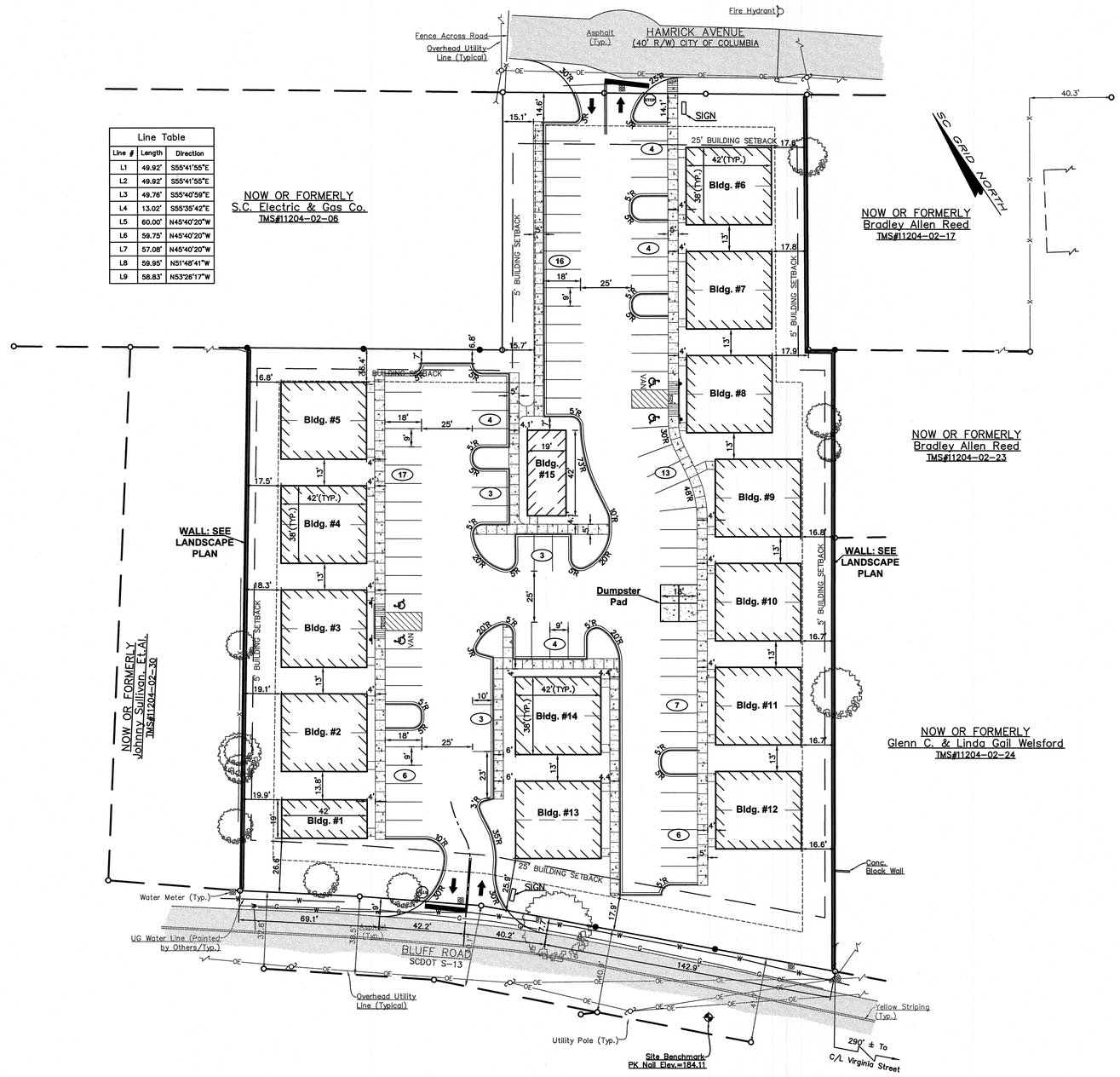
6) SIGNATURE

Applicant Signature:	By: B. Whited
Print Name:	Benjamin H. Whited
Date:	07-05-2017

PC Date: _____ Action: _____



Line Table		
Line #	Length	Direction
L1	49.92'	S55°41'55"E
L2	49.92'	S55°41'55"E
L3	49.76'	S55°40'59"E
L4	13.02'	S55°35'42"E
L5	60.00'	N45°40'20"W
L6	59.75'	N45°40'20"W
L7	57.08'	N45°40'20"W
L8	59.95'	N51°48'41"W
L9	58.83'	N53°26'17"W



0 30 60 90 120
GRAPHIC SCALE IN FEET
SCALE: 1"=30'

The Palmetto Utility Protection Service, Inc.
810 Dutch Square Blvd, Suite 320 Columbia, South Carolina 29210 (803) 939-1117
South Carolina 811 Call 811 Before you Dig
3 DAYS BEFORE DIGGING IN SOUTH CAROLINA
CALL 811
CONTRACTOR SHALL CONTACT THE UNDERGROUND LOCATORS EVERY 10 DAYS FOR AN UPDATE TO UTILITY LOCATIONS.

NOTE:
INFORMATION REGARDING THE REPUTED PRESENCE, SIZE, CHARACTER AND LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES WAS OBTAINED FROM LOCAL UTILITY COMPANIES AND AVAILABLE DRAWINGS SUPPLIED BY THE OWNER AND IS SHOWN HEREON. THERE IS NO CERTAINTY OF THE ACCURACY OF THIS INFORMATION AND IT SHALL BE CONSIDERED IN THAT LIGHT BY THOSE USING THIS DRAWING, HOWEVER, COX and DINKINS, INC. HAS NO NOTICE OR KNOWLEDGE OF ANY FACTS THAT WOULD LEAD US TO CONCLUDE THAT THE INFORMATION IS NOT ACCURATE. BUT UTILITIES AND STRUCTURES NOT SHOWN MAY BE ENCOUNTERED, THE OWNER, HIS EMPLOYEES, HIS CONSULTANTS, HIS ASSIGNS AND HIS CONTRACTORS SHALL HEREBY DISTINCTLY UNDERSTAND THAT COX and DINKINS, INC. IS NOT RESPONSIBLE FOR THE CORRECTNESS OR SUFFICIENCY OF THE UNDERGROUND INFORMATION. INFORMATION WITH RESPECT TO ABOVE GROUND MONUMENTS OF SUCH UTILITIES IS BASED UPON ACTUAL FIELD MEASUREMENTS AND OBSERVATIONS, AND IS SHOWN HEREON.

NOTE:
IT IS CONTRACTORS RESPONSIBILITY TO VERIFY THAT THEY AND THEIR SUBCONTRACTORS HAVE THE CORRECT/MOST UP-TO-DATE PLANS AVAILABLE.

SITE NOTES

1. TMS #11204-02-14-16& 25-29
2. Total area = 2.308 acres.
3. Property is zoned RG2 (General Residential).
4. Annexation process is moving forward.

BUILDING SETBACKS

Front =25 Feet
Rear =10 Feet
Side =5 Feet

BUILDING DATA

Units =28 (3 bedroom units)
Bedrooms =84
Maximum building height =40 Feet
Total square footage =47,824 sq. ft. (1,708 sq. ft./unit)
Minimum required lot area = 5,000 + 27(2,500)=72,500 sq. ft.

PARKING DATA

VEHICULAR PARKING REQUIRED
(2 parking spaces per unit)
2 x 28 units = 56 required

VEHICULAR PARKING PROVIDED

Accessible spaces	= 4
Standard spaces	=84
Total	=90 provided (3.21 spaces per unit)

(##) NUMBER OF VEHICULAR PARKING SPACES

REFERENCES:
1. BOUNDARY AND TOPOGRAPHIC MAP FOR ORCHARD COLUMBIA III, LLC BY COX AND DINKINS, INC. DATED MAY 19, 2017

NOTES:
1. THE LOCATION OF OTHER UNDERGROUND UTILITIES AND THEIR SERVICES ARE UNKNOWN. UNDERGROUND UTILITIES SHOWN WERE PAINTED BY OTHERS.
2. CONTOUR INTERVAL ELEVATIONS ARE ONE (1) FOOT, NAVD '88 DATUM.
3. REFERENCE MARK USED IS SOUTH CAROLINA GEODETIC SURVEY MONUMENT DESIGNATED "SOUTH CAROLINA POPULATION CTR", ELEVATION=312.7 (feet) (NAVD 88 DATUM), AS TAKEN FROM NGS DATA SHEET. http://www.ngs.noaa.gov/. BEARINGS REFERENCED TO SC GRID NORTH, DISTANCES ARE GROUND DISTANCES.
4. THE RIGHT-OF-WAY WIDTH OF HAMRICK AVENUE IS 40' PER REFERENCE NO. 1. OWNERSHIP AND MAINTENANCE OF HAMRICK AVENUE IS UNKNOWN. BLUFF ROAD IS LISTED AS S-13 PER THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STREET FINDER. COX AND DINKINS, INC. HAS BEEN UNABLE TO LOCATE ROADWAY PLANS TO VERIFY THE RIGHT-OF-WAY WIDTH OF THIS PORTION OF BLUFF ROAD (S-13).
5. THE PROPERTY IS LOCATED IN ZONE X PER FLOOD INSURANCE RATE MAP PANEL 45079C0094 H, LAST DATED FEBRUARY 20, 2002, BY SCALED LOCATION AND GRAPHIC PLOTTING ONLY.

COX AND DINKINS
ENGINEERS – SURVEYORS
COX AND DINKINS, INC.
724 BELTLINE BLVD.
COLUMBIA, SC 29205
803-254-0518
Fax: 803-765-0993
Email: cdinc@coxanddinkins.com

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 23105
REGISTERED PROFESSIONAL ENGINEER NO. 23105

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
COX AND DINKINS, INC. No. C00294
CERTIFICATE OF AUTHORIZATION SEAL

REVISIONS		
No.	DATE	DESCRIPTION
1	8/15/2017	ADDED DUMPSTER ENCLOSURE LOCATION.

DEVELOPER:
Orchard Columbia III, LLC
400 W. North St., Suite112
Raleigh, NC, 27603
Attention: Mr. Ben Whited, CPA
Tel: (919) 239-4195
email: ben@brookwoodcp.com

PROJECT:
ORCHARD COLUMBIA PH. 3
LOCATED NEAR COLUMBIA
RICHLAND COUNTY, SOUTH CAROLINA

SITE PLAN

TMS	11204-02-14-16,25-29
BOOK	79C-58
SF NO.	112-7/a
PROJECT NO.	1991
SHEET NO.	C1 of 10
DATE	7/31/2017

COPYRIGHT © 2017 COX and DINKINS, INC. ALL RIGHTS RESERVED.

G:\Proj\1991 Orchard Phase 3\DRAWINGS\1991 SITE.dwg, Plotted By: MYA, Plotted: Aug 25, 2017 - 11:04am

ALL RIGHTS RESERVED. THIS DRAWING AND THE DESIGN SHOWN THEREON ARE THE PROPERTY OF KENNETH B. SIMMONS ASSOCIATES. THE REPRODUCTION, COPYING, OR USE OF THIS DRAWING OR THE DESIGN THEREON, OR ANY PART THEREOF, WITHOUT THE WRITTEN CONSENT OF KENNETH B. SIMMONS ASSOCIATES IS PROHIBITED AND ANY INFRINGEMENT WILL BE SUBJECT TO LEGAL ACTION.

PLANT SCHEDULE

TREES	BOTANICAL NAME / COMMON NAME	CONT	CAL	SIZE	SPACING	QTY
	Juniperus silicicola 'Brodie' / Brodie Southern Red Cedar	-	2"Cal	8' HT. Min.		28
	Lagerstroemia x 'Muskogee' / Lavender Crape Myrtle Multi-Trunk Multi-Stem	-	2"Cal	8' HT. Min.		20
	Quercus nuttallii / Nuttall Oak	-	2"Cal	10-12' HT.	As Shown	14
	Quercus phellos / Willow Oak	-	2"Cal	10-12' HT.	As Shown	19
	Ulmus parvifolia 'Allee' / Allee Lacebark Elm	-	2"Cal	10-12' HT.		12
SHRUBS	BOTANICAL NAME / COMMON NAME	CONTAINER	SIZE	SPACING		QTY
	Buxus microphylla 'Wintergreen' / Wintergreen Boxwood	3 gal	18" HT.	AS SHOWN		41
	Ilex x 'Emily Bruner' / Emily Bruner Holly	7 gal	24" HT. MINIMUM	AS SHOWN		14
GROUND COVERS	BOTANICAL NAME / COMMON NAME	CONT	-	-	SPACING	QTY
	Cynodon dactylon '419 Hybrid' / Bermuda Grass	sod				33,835 sf

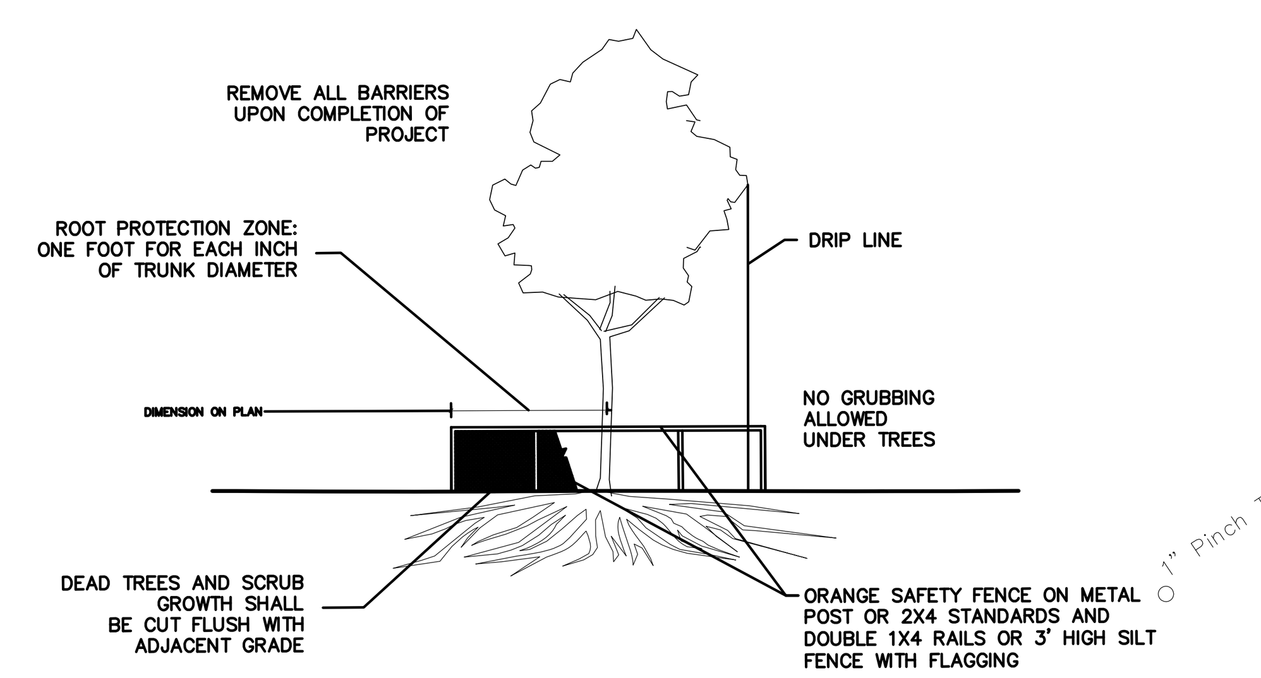
SITE DENSITY FACTOR CALS.:

Density Factor Calculation Worksheet

City of Columbia Tree Credits					
Type of Development	Commercial - 30 Units per Acre				
TOTAL SITE					
ACRES	2.3 ACRES				
REQUIRED UNITS (DFS)	69 DFS UNITS		Exempt?	☐	
TREES SAVED (EDF)					
Quantity	Tree Species	Softwood?	Tree Caliper	Units	Credits
1	Saucer Magnolia	☐	7 in	3.0	3.0
1	Sycamore	☐	42 in	57.6	57.6
1	Magnolia	☐	19 in	8.8	8.8
1	Water Oak	☐	21 in	9.6	9.6
		☐		0.0	0.0
		☐		0.0	0.0
		☐	Choose D.B.H.	0.0	0.0
		☐	Choose D.B.H.	0.0	0.0
		☐	Choose D.B.H.	0.0	0.0
		☐	Choose D.B.H.	0.0	0.0
				Total Credits	79
GRAND TREES REMOVED					
Quantity	Hardwood Tree Species	Health	Tree Caliper	Units	Credits
1	Pecan	75%	24	18.6	14.0
				0.0	0.0
				0.0	0.0
				0.0	0.0
				0.0	0.0
Quantity	Softwood Tree Species	Health	Tree Caliper	Units	Credits
		100%	Choose D.B.H.	0.0	0.0
			Choose D.B.H.	0.0	0.0
			Choose D.B.H.	0.0	0.0
			Choose D.B.H.	0.0	0.0
			Choose D.B.H.	0.0	0.0
				Total Credits	13.95
TREES PLANTED					
Quantity	Tree Species	Softwood?	Tree Caliper	Units	Credits
20	Crape Myrtle	☐	2 in	1.0	20.0
28	Brodie Juniper - Eastern Red Cedar	☑	2 in	1.0	14.0
14	Nuttall Oak	☐	2 in	1.0	14.0
19	Willow Oak	☐	2 in	1.0	19.0
12	Elm	☐	2 in	1.0	12.0
		☐	Choose Caliper	0.0	0.0
		☐	Choose Caliper	0.0	0.0
		☐	Choose Caliper	0.0	0.0
		☐	Choose Caliper	0.0	0.0
		☐	Choose Caliper	0.0	0.0
93				Total Credits	79
Required Units/Acre (DFS)	69				
Additional Units from Grand Tree Removal	13.95				
Total Required Credits (RDF)	82.95				
Existing/Saved Credits (EDF)	79.0				
Planted Credits	79.0				
Proposed Credits	158				
REMAINDER	75.1				

GENERAL NOTES:

1. ALL PLANTINGS SHALL BE MECHANICALLY IRRIGATED. ALL TREES, SHRUBS, AND GROUNDCOVER SHALL BE TRICKLE IRRIGATED. ALL LAWN AREAS SHALL HAVE FULL SPRAY IRRIGATION COVERAGE.
2. ALL TREES AND SHRUBS SHALL BE MULCHED WITH 3" PINESTRAW WITHIN TWO DAYS AFTER PLANTING. MULCH SHALL COVER THE AREA OF THE PLANTING PIT, BED, OR SAUCER AROUND EACH PLANT AS DETAILED ON SHEET L2.
3. QUANTITIES ARE SHOWN FOR INFORMATION ONLY. THE CONTRACTOR IS RESPONSIBLE FOR HIS OR HER OWN QUANTITIES. IF THERE IS A CONFLICT BETWEEN QUANTITIES AND SPACING, SPACING SHALL PREVAIL.
4. ANY AREA DISTURBED DURING CONSTRUCTION NOT COVERED BY NEW CONSTRUCTION AND OR PLANT BEDS SHALL BE PLACED IN BERMUDA SOD AT NO ADDITIONAL COST TO THE OWNER.
5. GRADING CONTOURS SHOWN FOR INFORMATION ONLY.
6. SEE ARBORIST EVALUATION REPORT DATED 8-18-2017 FOR ADDITIONAL REQUIRED MAINTENANCE AND TREE PROTECTION FOR TREES IDENTIFIED AS TO REMAIN.
7. WITHIN TEN (10) DAYS FOLLOWING ACCEPTANCE OF THE CONTRACT, THE OWNER SHALL BE NOTIFIED OF THE SOURCES OF THE MATERIALS REQUIRED. SUBSTITUTION WILL BE PERMITTED ONLY UPON SUBMISSION OF PROOF THAT PLANTS ARE NOT OBTAINABLE WITHIN FOUR HUNDRED (400) MILES OF THE SITE. IF SUBSTITUTIONS ARE NECESSARY, SUBSTITUTIONS SHALL BE OF SIMILAR TYPE, SAME SIZE, QUANTITY AND SPACING. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE LANDSCAPE ARCHITECT FOR APPROVAL, PRIOR TO INSTALLATION.



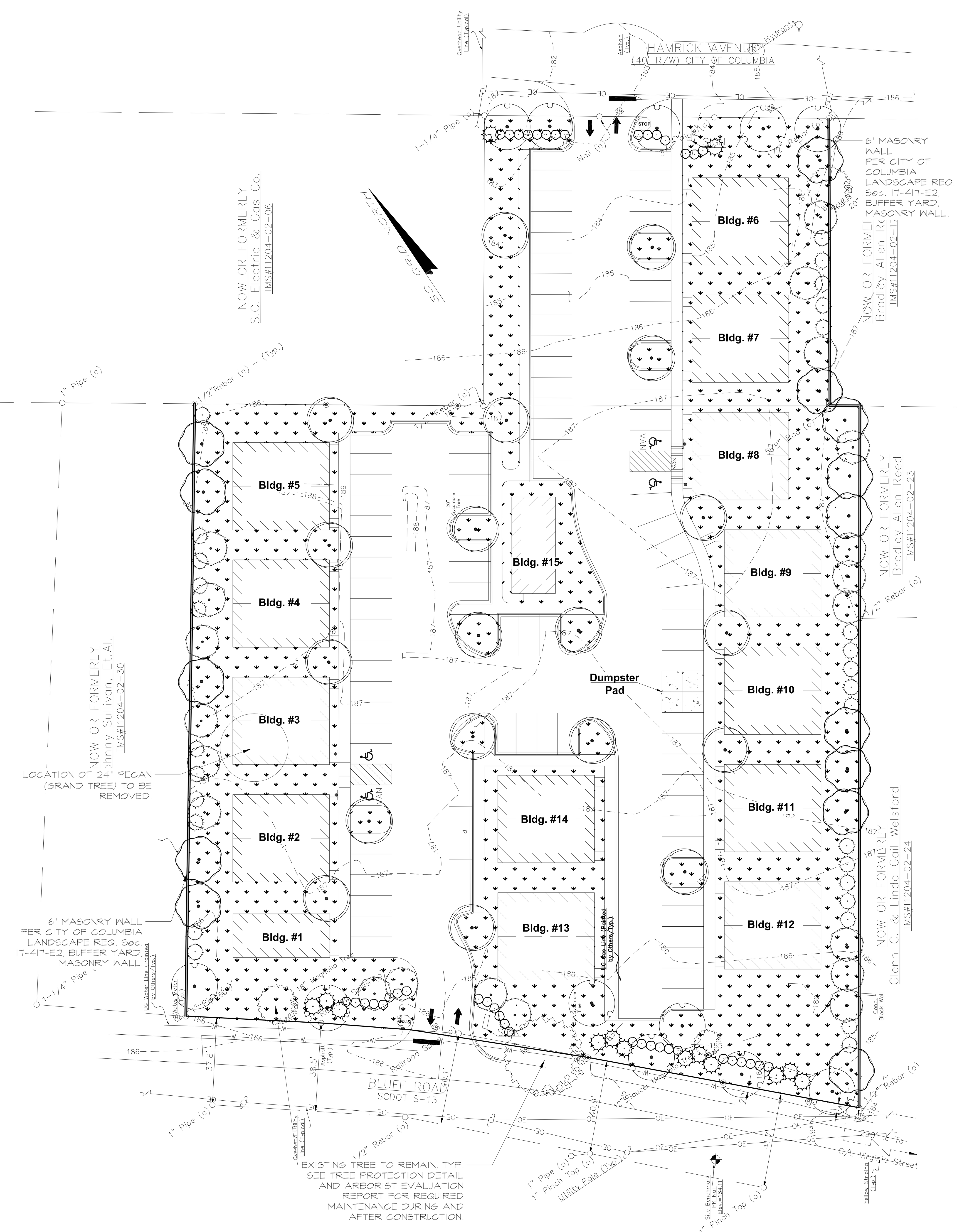
TREE PROTECTION
N.T.S

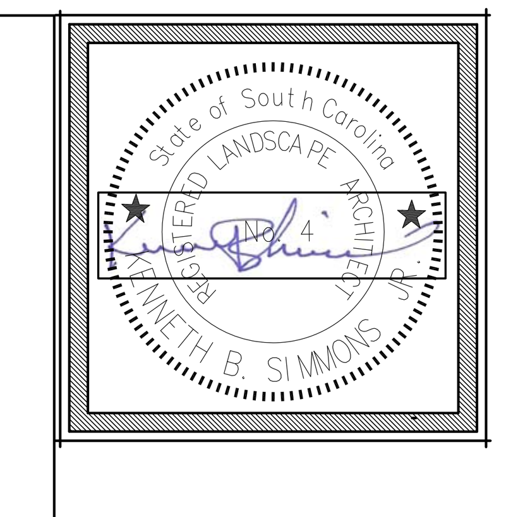
GENERAL TREE PROTECTION NOTES:

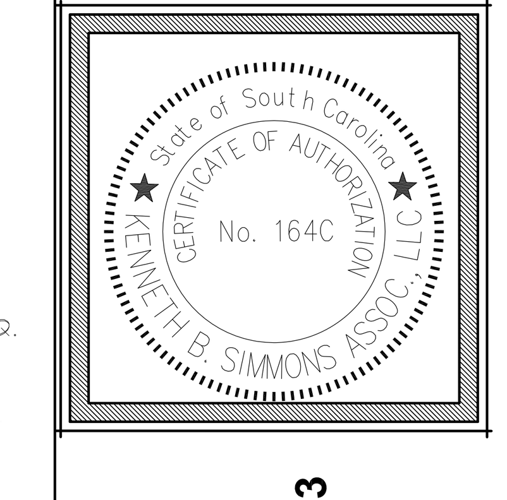
1. NO GRADING WITH IN THE TREE PROTECTION ZONE.
2. NO PARKING, MATERIAL STORAGE, BURY PITS, CONCRETE WASHOUT, BURNING OF DEBRIS, OR OTHER SIMILAR CONSTRUCTION SITE ACTIVITIES THAT COULD DISTURB OR COMPACT THE SOIL WITHIN THE TREE PROTECTION ZONE.
3. INSTALL IMPROVED TREE PROTECTION BARRIERS PRIOR TO ANY LAND DISTURBANCE OR CONSTRUCTION ACTIVITY, AND KEEP BARRIERS IN PLACE UNTIL ZONING ADMINISTRATOR OR LAND DEVELOPMENT PLANNER APPROVES THEIR REMOVAL. THESE INCLUDE:
   A. FOUR-FOOT TALL WOODEN POST AND RAIL FENCING OF 2X4 POST AND DOUBLE 1X4 RAIL.
   B. ORANGE POLYETHENE LAMINAR FENCING MOUNTED ON WOODEN POST.
4. PLACE TREE PROTECTION BARRIERS AROUND THE TREES IN A RADIUS OF NO LESS THAN ONE FOOT(1') FOR EVERY ONE INCH (1") OF TREE TRUNK DIAMETER.
5. THE CONTRACTOR SHALL ENSURE SURVIVAL OF ALL TREES TO REMAIN, THROUGHOUT THE CONSTRUCTION SEQUENCE.

TREE PROTECTION DETAIL
not to scale

PLAN







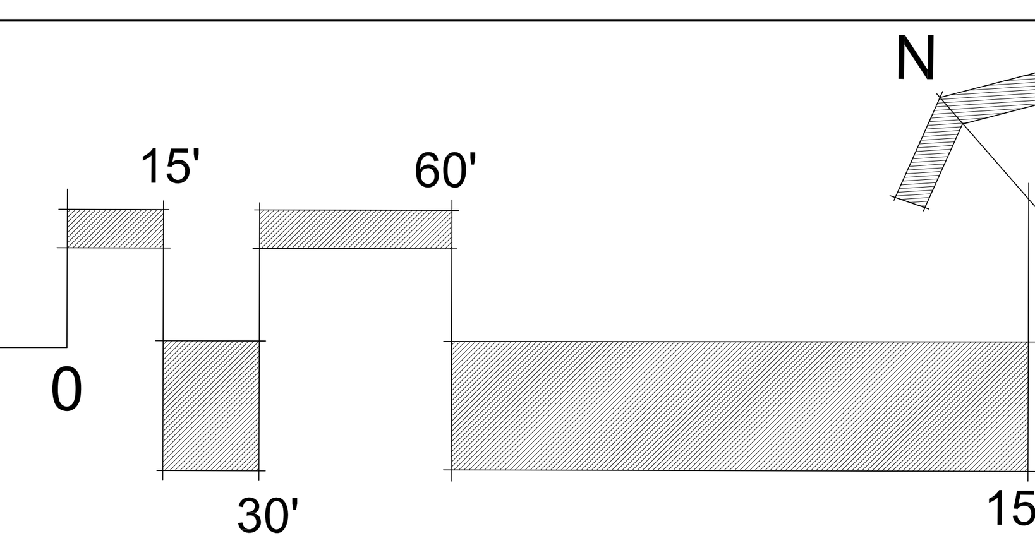
Owner: Orchard Columbia III, LLC
400 W. North St. Suite 112 Raliegh, NC, 27603
Attention: Mr. Ben Whited, CPA
Tel: (919) 239-4195
email: ben@brookwoodcp.com

Orchard Columbia PH. 3 Landscape Plan

DATE	8-22-2017
PROJ. NO.	2164
DRAWN	AMC
CHECKED	KBS
PRINTED	
REVISIONS	

Orchard Columbia PH. 3

Columbia, SC

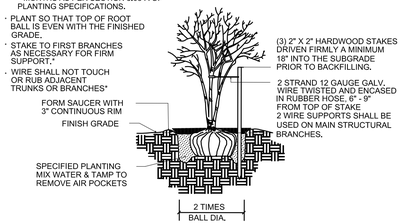


Kenneth B. Simmons Associates, LLC
landscape architecture & planning
2711 Middleburg Drive, Suite 210
Columbia, South Carolina 29204
(803) 254-3791 FAX (803) 254-3790

SHEET NO.
LS 01
OF 02

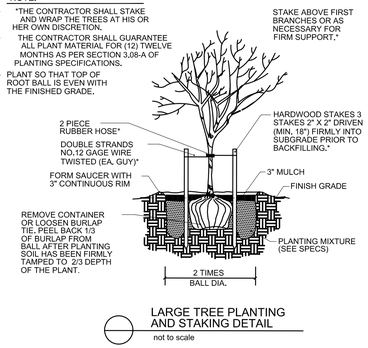
Details

NOTE:
- *THE CONTRACTOR SHALL STAKE AND WRAP THE TREES AT HIS OR HER OWN DISCRETION.
- THE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIAL FOR (12) TWELVE MONTHS AS PER SECTION 3.08-A OF PLANTING SPECIFICATIONS.
- PLANT SO THAT TOP OF ROOT BALL IS EVEN WITH THE FINISHED GRADE.
- STAKE TO FIRST BRANCHES AS NECESSARY FOR FIRM SUPPORT.*
- WIRE SHALL NOT TOUCH OR RUB ADJACENT TRUNKS OR BRANCHES*



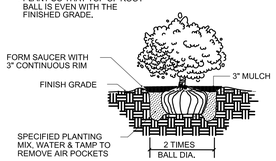
SMALL & MULTI-TRUNK TREE PLANTING & STAKING DETAIL
not to scale

NOTE:
- *THE CONTRACTOR SHALL STAKE AND WRAP THE TREES AT HIS OR HER OWN DISCRETION.
- THE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIAL FOR (12) TWELVE MONTHS AS PER SECTION 3.08-A OF PLANTING SPECIFICATIONS.
- PLANT SO THAT TOP OF ROOT BALL IS EVEN WITH THE FINISHED GRADE.



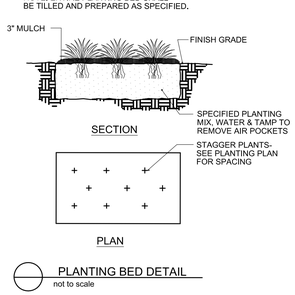
LARGE TREE PLANTING AND STAKING DETAIL
not to scale

NOTE:
- PLANT SO THAT TOP OF ROOT BALL IS EVEN WITH THE FINISHED GRADE.



SHRUB PLANTING DETAIL
not to scale

NOTE: ENTIRE PLANTING BED SHALL BE TILLED AND PREPARED AS SPECIFIED.



PLANTING BED DETAIL
not to scale

SPECIFICATIONS:

SECTION 02830-PLANTING

PART 1 - GENERAL:

1.01 - SCOPE

The Contractor shall furnish all material and labor necessary for the installation of trees and shrubs, plus maintenence, guarantee and replacement of plants.

Furnish a unit price for each plant type (installed complete) for the purpose of adding or deleting plants.

PART 2 - PRODUCTS:

2.01 - TOPSOIL

Test topsoil for pH and correct.

2.02 - TOPSOIL TO BE FURNISHED

If sufficient topsoil is not available on site, the Contractor shall furnish all topsoil required to install all work shown. Provide a soil analysis. Topsoil to have a "high" rating in each basic nutrients tested and a pH ranging from 6.0 to 6.5. Necessary additives to be incorporated to bring the soil up to standards specified.

2.03 - BASIC SLAG AND AGRICULTURAL SULPHUR

Basic slag and agricultural sulphur (for correcting the soil pH) to be standard grade.

2.04 - COW MANURE

Cow manure heat treated, weed seed free, and commercially bagged.

2.05 - COMMERCIAL FERTILIZER

Commercial fertilizer to be 16-4-8 (50% organic) formula and conform to the applicable laws. It shall be uniform in composition, and be delivered to the site in the original unopened containers.

2.06 - PEAT

Peat shall be partially decomposed vegetable matter. It shall be brown, clean, low in mineral and woody material, mildly acid and granulated or shredded.

2.07 - PINE STRAW

Pine straw baled clean, weed free. Bales to be stored off the ground.

2.08 - WATER

Use the owner's water prudently, if available. Furnish all necessary hoses and accessories for irrigation.

2.09 - PLANT MATERIALS

A. PLANTS

Plants are shown on the drawings with sizes and spacing.

B. NOMENCLATURE

The names of plants required under this Contract conform to those given in Standard Plant Names, prepared by American Joint Committee on Horticulture Nomenclature.

C. QUANTITIES

Quantities necessary to complete the planting are to be determined by the Contractor. The quantities shown on the plans are for information only.

D. QUALITY AND SIZE

Plants shall have a habit of growth that is normal for the species and free from pests, diseases, and injuries. Requirements for plants follow the standards currently recommended by the American Association of Nurserymen, Inc.

E. SUBSTITUTION

Substitution will be permitted only upon submission of proof that plants are not obtainable within four hundred (400) miles of the site.

2.10 - TYPE OF PROTECTION TO ROOTS

A. Plants designated "B&B" in the plant list are balled and burlapped.

B. Container grown plants may be substituted in lieu thereof.

2.11 - SAMPLES, TESTS, AND INSPECTIONS

A. NOTICE OF SOURCES

Within ten (10) days following acceptance of the bid, the Owner shall be notified of the sources of the materials required.

B. TOPSOIL TO BE FURNISHED

The Owner reserves the right to inspect the topsoil to be furnished.

C. PLANTS

The Contractor is responsible for all certificates of inspection that may be required by Federal, State, or other authorities.

PART 3 - EXECUTION:

3.01 - TIME OF PLANTING

The Contractor will be notified when he can start work. At the option and on the full responsibility of the Contractor, planting operations may be conducted under unreasonable conditions without additional compensation.

3.02 - SPRAYING

Plant material shall be sprayed as needed to control diseases and pest.

3.03 - PRUNING AND REPAIR

Upon completion of the work, all trees and shrubs shall be pruned only as needed. All cuts shall be made flush.

3.04 - OBSTRUCTION BELOW GROUND OR OVERHEAD

A. Where these conditions are encountered and where obstructions cannot be removed and where trees are found to be under overhead wires, other locations will be designed.

B. Removal of obstructions, relocation of construction and provision of drainage for planting shall be done only as directed. If changes in the location of the work, or if the removal of obstructions involves additional work, the Contractor shall not proceed until authorized.

3.05 - NEW PLANTING

A. LAYOUT

New planting to be located where shown on the plans.

B. PLANTING PITS

Circular pits excavated for all plants except for hedge and plants to be planted in beds. Diameter of pits for plant material two feet (2') greater than the diameter of the ball. The depth of pits for trees and shrubs shall be deep enough to accommodate the ball when the plant is set to finished grade allowing for compacted planting mixture in the bottom of the pit.

C. PERCOLATION TESTS

Subsurface drains have not been included as part of the project; therefore, the Contractor is to make such percolation tests as necessary to determine if subsurface drainage conditions are so poor as to support moisture conditions fatal to plantings. The following procedure is recommended.

1. Wait at least twenty-four (24) hours after rain and dig test pit twelve inches (12") square or twelve and one-half inches (12 1/2") in diameter to depth of bottom of plant bed, trench or pit; remove all loose soil (if standing water is visible, notify the Owner).

2. Quickly fill bottom with six inches (6") of water (approximately three and one-fourth (3 1/4) gallons).

3. Record length of time from filling until disappearance of water and divide number of minutes by six (6) to give average time of one inch (1") fall.

4. Compare one inch (1") fall time with the following table:
One inch (1") in zero to three (0-3) minutes indicates rapid absorption.
One inch (1") in three to five (3-5) minutes indicates medium absorption.
One inch (1") in five to thirty (5-30) minutes indicates slow absorption.
One inch (1") in over sixty (60) minutes indicates impervious soil.

5. If test indicates soil to be semi-impervious or impervious, notify the Owner before proceeding.

6. If the Contractor does not make tests at representative locations and file results with the Owner, or if he plants in areas shown to have poor drainage without a written release, he shall be liable for any guaranteed replacements due to subsurface water damage.

D. PLANTING MIXTURE

Soil used in planting to be topsoil mixed with one (1) part peat and one (1) part manure to five (5) parts soil. Very poor soils shall not be used.

Except for ericaceous plants, very acid or sour soil (having a pH of less than six (6)) to be thoroughly mixed with sufficient slag to produce a slightly acid reaction (a pH of six to six point five (6.0-6.5)). Soil used in planting to be thoroughly mixed with five (5) pounds of 16-4-8 (50% organic) formula commercial fertilizer per cubic yard.

E. EXCESS SOIL

Excess excavated soil from planting operations to be disposed of.

F. SETTING PLANTS

All plants planted in pits, centered, and set on compacted planting mixture to such a depth that the finished grade level at the plant after settlement will be the same as that at which the plant was grown. Wire and binding to be removed from around the trunk of the plant. Planting mixture placed and compacted carefully to avoid injury to roots. Fill the hole to finished grade and form a saucer around each plant.

G. MULCHING

All plants mulched with a three inch (3") layer of pine straw within two (2) days after planting. Mulch to cover the area of the planting pit, bed, or saucer around each plant.

3.06 - MAINTENANCE

Maintenance to begin immediately following the last operation of installation for each plant and continue in accordance with the following requirements: New planting to be protected and maintained until installation of planting is complete plus a minimum of ninety (90) days. Maintenance includes watering, weeding, cultivating, mulching, removal of dead material, reinserting plants to proper grades and restoration of the planting saucers.

3.07 - INSPECTION FOR ACCEPTANCE

A. INSPECTION

Inspection of the work of planting will be made at the conclusion of the maintenance period.

B. ACCEPTANCE

After inspection, the Contractor will be notified of acceptance of all work, exclusive of the possible replacement of plants subject to guarantee, or the requirements for completion of the work.

3.08 - PLANT GUARANTEE AND REPLACEMENT

A. GUARANTEE

Plants shall be guaranteed for one (1) year from the substantial completion of the planting and shall be alive and in satisfactory growth at the end of the guarantee period.

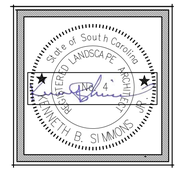
B. REPLACEMENT

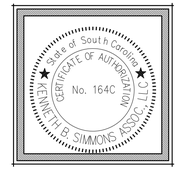
At the end of the guarantee period an inspection will be made. Any plant that is dead or not in satisfactory growth shall be removed. These and any plants missing, due to the Contractor's negligence, shall be replaced.

C. MATERIALS AND OPERATION

All replacements shall be plants of the same kind and size as specified. They shall be furnished and planted as specified under New Planting. The cost of such replacements shall be by the Contractor.

END OF SECTION





Owner: Orchard Columbia III, LLC
400 W. North St. Suite 112 Raliegh, NC, 27603
Attention: Mr. Ben Whited, CPA
Tel: (919) 239-4195
email: ben@brookwoodcp.com

Orchard Columbia PH. 3
Details and Specifications

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DATE 8/22/2017
PROJ. NO. 2163
DRAWN AMC
CHECKED KBS
PRINTED
REVISIONS

Orchard Columbia PH. 3

Columbia, SC

Kenneth B. Simmons Associates, LLC
landscape architecture & planning
2711 Middleburg Drive, Suite 210
Columbia, South Carolina 29204
(803) 254-3791 FAX (803) 254-3790

SHEET NO.
LS 02
OF 02

1 SOUTH ELEVATION

1/4" = 1'-0"

2 EAST ELEVATION

1/4" = 1'-0"

KEYED NOTES

01 STONE VENEER BASE BY CONTRACTOR
02 5" EXPOSURE HARDIEPLANK SMOOTH LAP SIDING
03 4' X 8' SMOOTH HARDIE PANELW/ 2.5" BATTENS 12" O.C.
04 3.5" HARDIETRIM
05 PORCH COLUMN, REF. TYPICAL DETAILS
06 PORCH RAILING, REF. TYPICAL DETAILS
07 ROOF BRACKET, REF. TYPICAL DETAILS
08 CLASS 'A' ASPHALT SHINGLES
09 2x PAINTED RAFTER TAILS
10 GUTTERS & DOWNSPOUT BY CONTRACTOR
11 BARN STYLE SCONCE BY OWNER / CONTRACTOR
12 TYPICAL DOOR & WINDOW CASING: 3.5" SMOOTH HEAD, VERTS, & SILL, ALL HARDIETRIM
13 CONCRETE STAIR BY CONTRACTOR
14 LOUVRED GABLE END VENT

3 NORTH ELEVATION

1/4" = 1'-0"

4 WEST ELEVATION

1/4" = 1'-0"

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PROJECT:
COLUMBIA DUPLEX
COLUMBIA, SOUTH CAROLINA

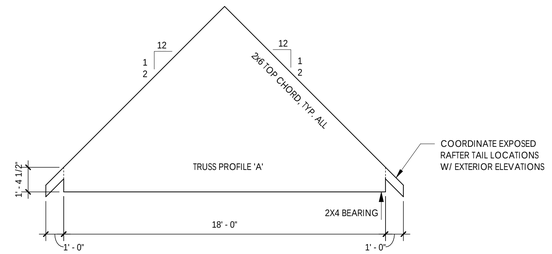
TITLE:
ELEV

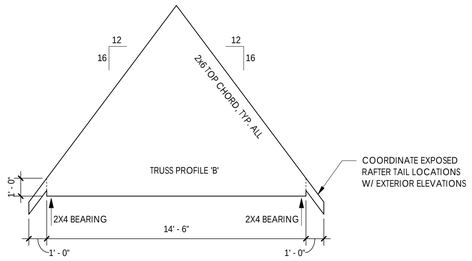
A2.0

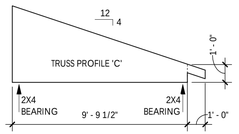
DATE:
02/19/2016

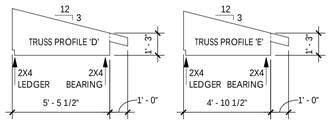
ISSUE:
CONSTRUCTION

REVISED:
06/17/2016



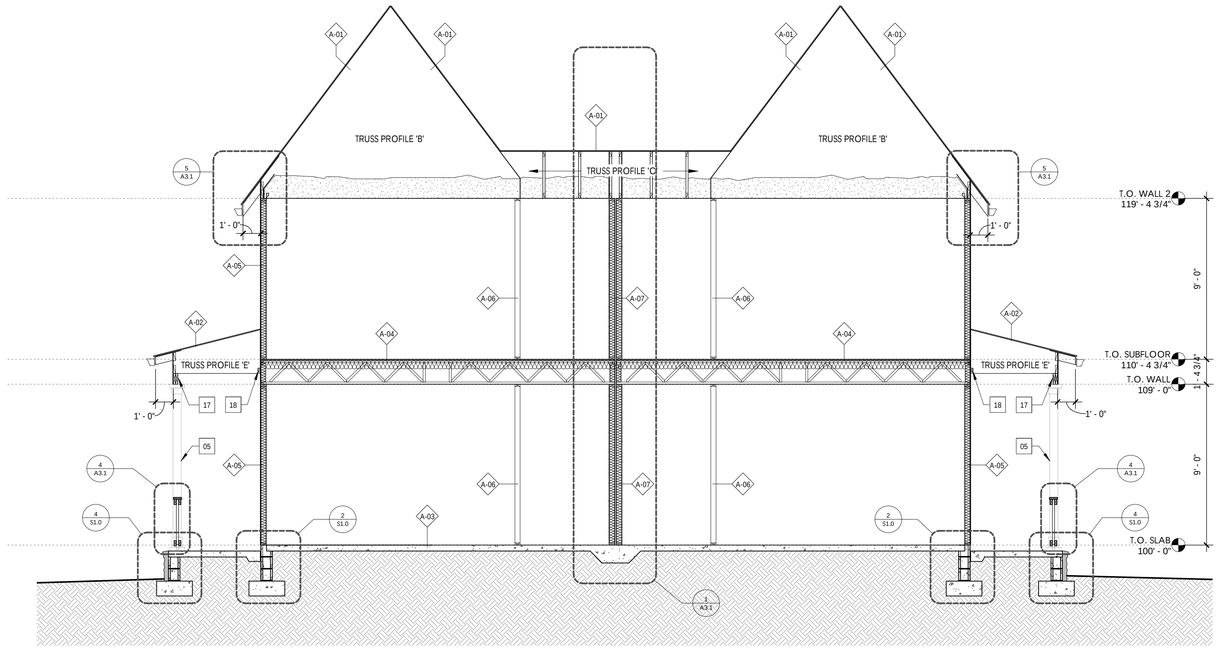




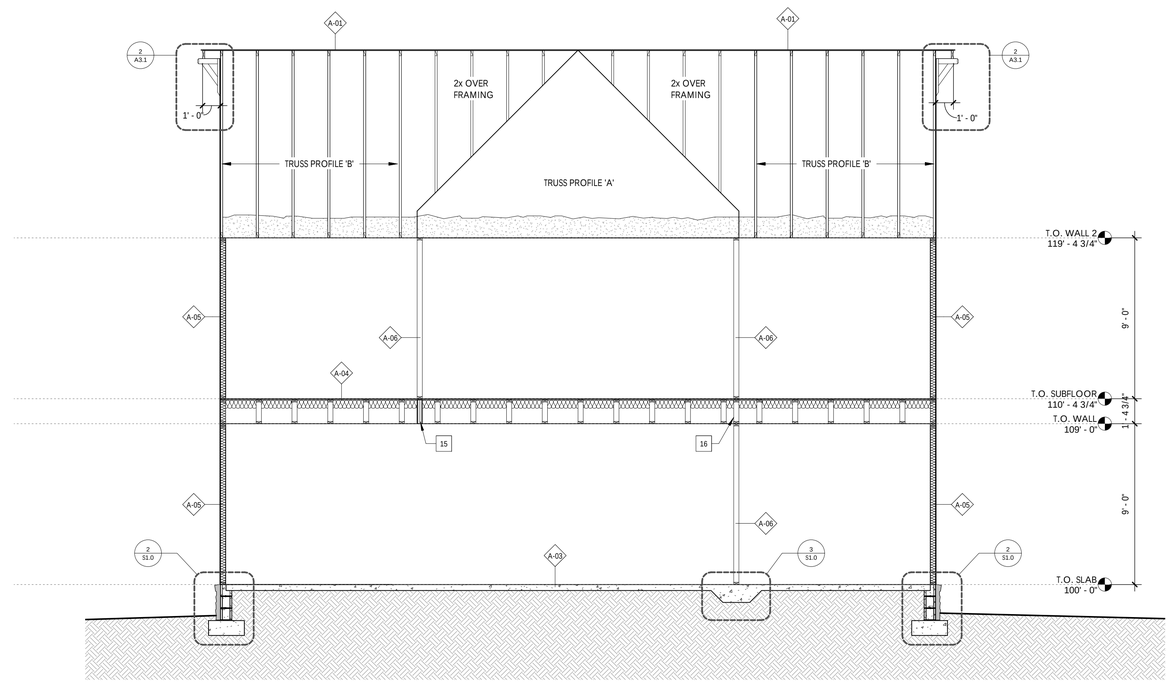


FRAMING DIAGRAMS & TRUSS PROFILES ARE FOR INFORMATION ONLY, FINAL CONFIGURATION AND ENGINEERING BY TRUSS MANUFACTURER

3 TRUSS PROFILES
1/4" = 1'-0"



1 Section 1
1/4" = 1'-0"



2 Section 2
1/4" = 1'-0"

ASSEMBLIES

A-01 TYP. ROOF: CLASS 'A' ASPHALT SHINGLES, 15# FELT UNDERLAYMENT, 7/16" SPAN RATED OSB, PRE-ENGINEERED WOOD TRUSSES @ 24" O.C., 12" BLOW-IN INSULATION OR MIN. REQ'D BY CODE, 5/8" GYP. BOARD

A-02 TYP. PORCH ROOF: CLASS 'A' ASPHALT SHINGLES, 15# FELT UNDERLAYMENT, 7/16" SPAN RATED OSB, PRE-ENGINEERED WOOD TRUSSES @ 24" O.C., SMOOTH VENTED HARDIESOFFIT PANEL

A-03 TYP. MAIN FLOOR: 4" CONCRETE SLAB W/ 6X6" W.W.M., 6 MIL VAPOR BARRIER, OVER 95% COMPACTED FILL OR UNDISTURBED SOIL

A-04 TYP. UPPER FLOOR: FINISH FLOOR TBD, 3/4" T&G OSB DECKING, 16" OWW JOIST @ 24" O.C. UNLESS OTHERWISE NOTED, R-19 SOUND BATT INSULATION, 5/8" GYP. BD.

A-05 EXTERIOR WALL: HARDIE FIBER CEMENT SIDING PER ELEV, TYVEK BUILDING WRAP OR EQUIV, 7/16" OSB SHEATHING, R-13 KRAFT FACED BATT INSULATION, 2X4 FRAMING @ 16" O.C., 1/2" GYP. BOARD

A-06 INTERIOR WALL: 1/2" GYP. BOARD BOTH SIDES, 2X4 FRAMING @ 24" O.C., SOUND BATT INSUL.

A-07 AREA SEP. WALL-1 HR: 5/8" TYPE 'X' GYP. BOARD, 2X4 FRAMING @ 16" O.C., SOUND BATT INSUL., 1" AIR GAP, TYPE 'X' GYP. BOARD

KEYED NOTES

05 PORCH COLUMN, REF. TYPICAL DETAILS

15 LVL OR FLOOR TRUSS TO CARRY BEARING WALL ABOVE BY TRUSS MFR

16 PACK SOLID IN FLOOR FOR BEARING WALL ABOVE

17 (2) TRTD 2X8, CASED & PAINTED

18 TRTD 2X4 LEDGER

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PROJECT:
COLUMBIA DUPLEX
COLUMBIA, SOUTH CAROLINA

TITLE:
SECTION

A3.0

DATE:
02/19/2016

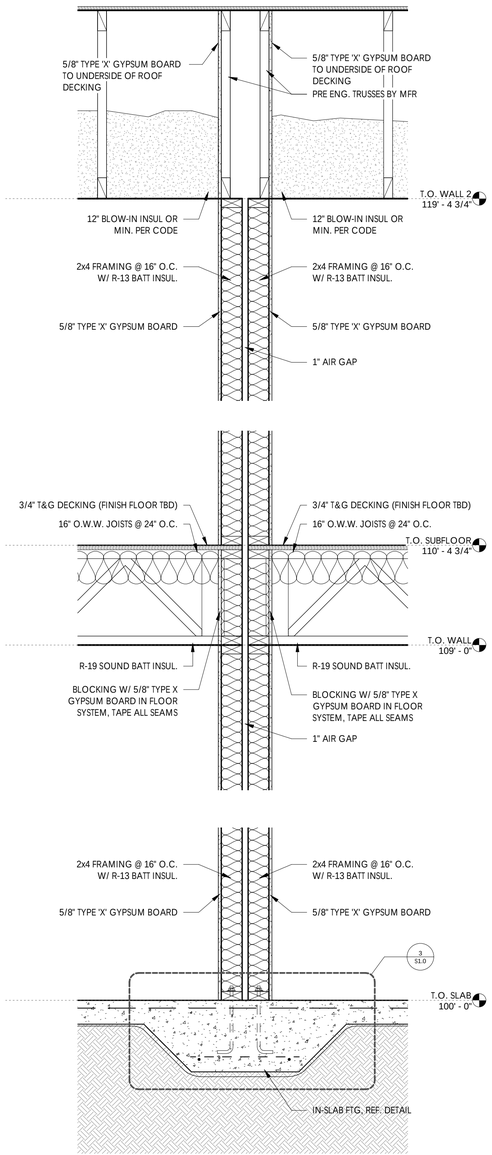
ISSUE:
CONSTRUCTION

REVISED:

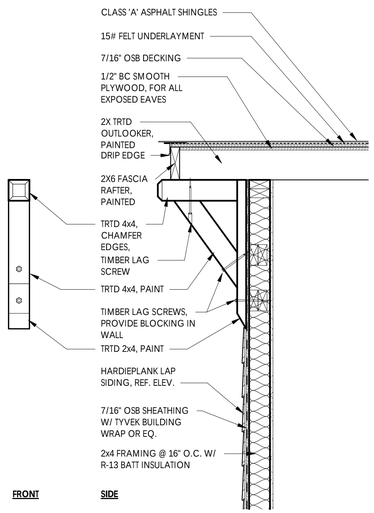
U341 / UL263
1-HOUR FIRE RATED WALL ASSEMBLY

FIRE SEPARATION WALL SHALL BE CONTINUOUS FROM SLAB TO ROOF SHEATHING & TIGHT AGAINST ALL EXTERIOR WALLS.

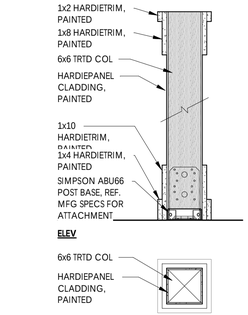
PENETRATIONS SHALL COMPLY WITH IRC SECTION R302.



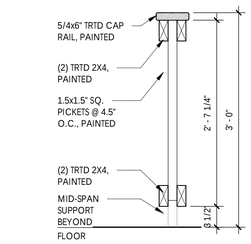
1 1 HR RATED WALL
1" = 1'-0"



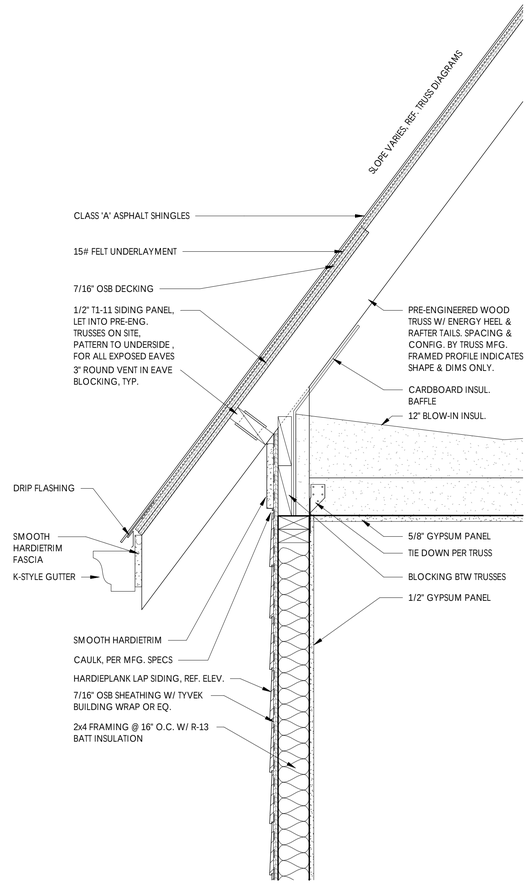
2 ROOF BRACKET
1" = 1'-0"



3 PORCH COLUMN
1" = 1'-0"



4 PORCH RAIL
1" = 1'-0"



5 EAVE - EXPOSED RAFTER TAILS
1 1/2" = 1'-0"

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PROJECT:
COLUMBIA DUPLEX
COLUMBIA, SOUTH CAROLINA

TITLE:
TYPICAL DETAILS

A3.1

DATE:
02/19/2016

ISSUE:
CONSTRUCTION

REVISED:

DendroDiagnostics, Inc.
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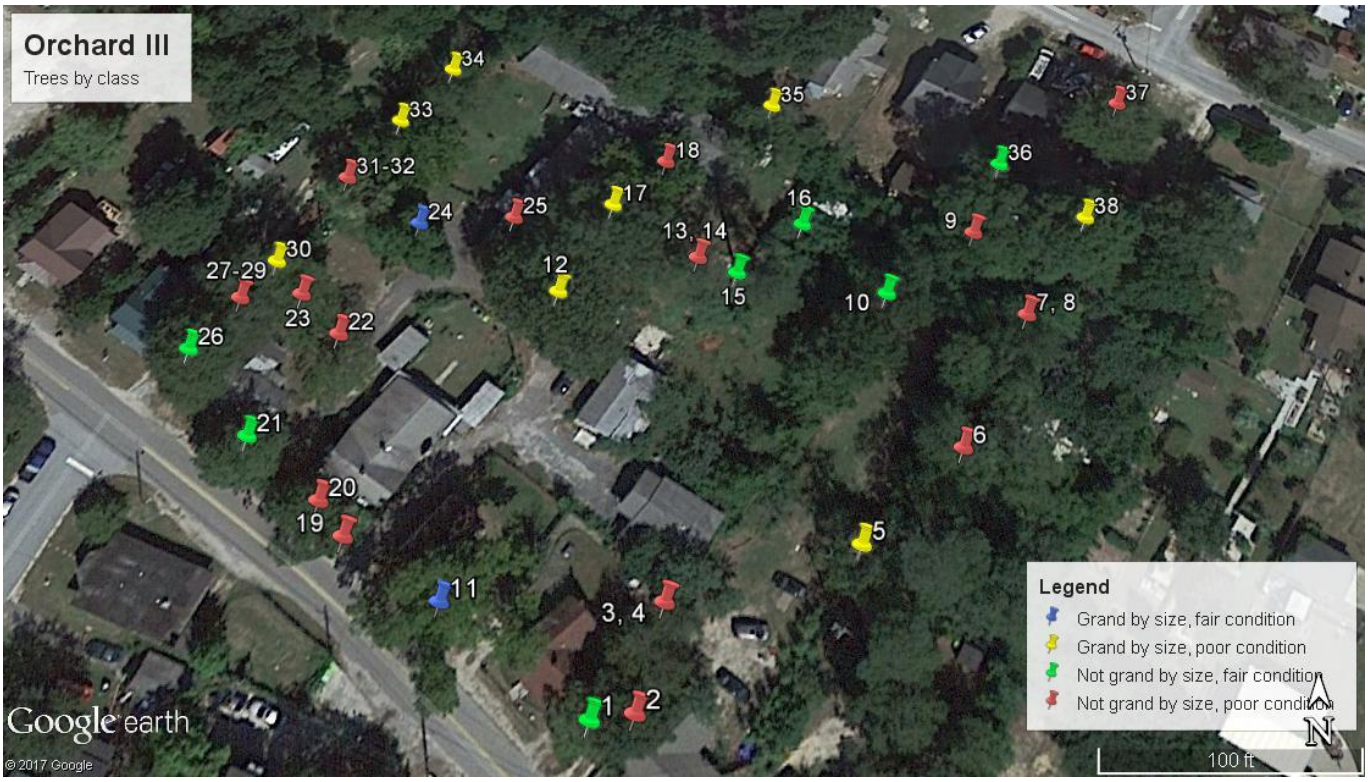
www.dendrodiagnostics.com

Evaluation
Of the Trees
On a Site in the Olympia Area;
Proposed for Development as - The Orchard Phase III
Columbia, S.C.
August 3 – August 18, 2017



Evaluation by DendroDiagnostics, Inc.
Andrew J. Boone, CF
Wilt C. Boone, Arborist Technician

Table of Contents

Executive Summary

DendroDiagnostics performed an evaluation of the trees on the site of a proposed development, The Orchard phase III, located between Bluff Road and Hamrick Avenue. This buildings on this site consisted of 9 old houses and an abandoned school. Thirty-seven trees larger than 4 inches in diameter were scattered between the residences. These were examined in detail for size and condition. The prime consideration was to determine which trees were protected under Columbia's tree ordinance. Certain large trees and some smaller individuals were potential candidates for protection during construction. The larger trees (diameter greater than 24 inches for hardwoods) could have been grand trees under City code, if they were found to be in fair or better condition.

Of those 37 trees, we found that 28 that were smaller than 24 inches in diameter. As such they were not grand trees. Twenty-one of those smaller trees were in poor condition and we recommend that they be cut before site development. The other 7 of the 28 smaller trees were in fair condition and could be retained, at your discretion, for tree density credit.

Nine trees on the site were larger than 24 inches, and as such, were potential grand trees. However, when they were evaluated, we found that 7 of those were in poor condition, and therefore were not grand trees. They can be removed with City permission without incurring mitigation requirements.

Two trees, a pecan and a sycamore, were larger than 24 inches in diameter and in fair condition. Those trees are grand trees under City code and must be protected during construction if they are to be retained.

In order to cut either tree, permission from the City Zoning Director is required. If either is cut, it must be mitigated by planting an equivalent diameter of new trees or preserving smaller trees on the site that are in fair or better condition. This mitigation is in addition to a required tree density factor for the site of 30 units per acre. Depending on your parking layout, there may be tree planting required there also. There are additional requirements for establishing landscaping, but those are beyond the scope of this report.

This document constitutes a tree evaluation and protection plan that should meet the requirements of the City of Columbia. Andrew Boone, who performed this evaluation, is a Certified Arborist and a Registered Forester in South Carolina.

You will need to submit this report to the City of Columbia along with requests for tree removal. They should give you written permission to follow these recommendations. Do not cut any trees before receiving that written permission.

Introduction

On 1 August 2017, DendroDiagnostics was contacted by Mr. Andrew Cheatham with KBSA Landscape Architecture and Planning. Drew was working with Cox and Dinkins, Inc., and others, to develop a site located on Bluff Road in the Olympia area. The working name for this development was The Orchard Phase III. Another nearby site had already been developed as the Orchard. Drew advised us that he needed a bid on an evaluation of the existing trees on this site and a tree protection plan for the property. We made a proposition and our bid was accepted. This document was prepared to meet those requirements of the City.

The tract was actually 8 parcels that together measured approximately 2.3 acres in size. They were designated #R11204-02-(25-29) and #R11204-02- (14-16). The area was currently in residential homes, some of which were no longer occupied. The surrounding parcels were zoned as either residential, multi-family, high density or neighborhood commercial properties.

This site was bounded on the west and east by residential tracts, to the north by Hamrick Avenue and to the south by Bluff Road.

Historical imagery of the site was viewed in Google Earth and on the Richland Online website. The earliest imagery available there was taken in 1939. Although of marginal quality, it showed that the site appeared to already have the current houses located on it, but not the school building. One tree currently on the site was visible in the 1939 photography (the large sycamore at 156 Bluff Road). The 1959 imagery was of even worse quality, but the school building behind 154 Bluff road was present. The first color imagery was taken in 2000 and showed the site substantially as it is currently.

On 9, 11 and 16 August 2017, we traveled to the property to conduct a detailed evaluation of the trees located there. The trees were examined in detail. They were measured for diameter at breast height (DBH) with a logger's tape and their height was measured with a laser clinometer, or estimated. Their spread was estimated by pacing to the edges of their dripline. Pine age was measured with an increment borer, or estimated (for hardwoods) based on known species growth rates. Tree location was recorded using a Global Positioning System. Each tree was marked with flagging tape, on which its number and DBH were noted with a sharpie marker.

The tree's buttress roots and trunks were visually checked for physical defects. These possible defects included presence of cankers, wood decay or other stem diseases. If there was a possibility of internal tree decay in the lower eight feet of the trunk, that area was tapped with a mallet for aural decay detection (a hollow sound). The extent of the decay was confirmed by drilling with a long thin drill bit. If a tree was leaning, the direction and degree of lean was measured with a digital level and recorded.

Above about eight feet on the trunk, all evaluation was done by visual inspection. In this inspection, we looked for structural problems like cracks, included bark, presence of fungal fruiting bodies, open areas of decay, weeping from bacterial infection or insect attacks, codominant stems, sprout branches, excessively long limbs and other defects.

Branches, twigs and foliage were visually evaluated for structure, color and presence of any insects or diseases. Any dieback in the crown (an indication of root or vascular disorder) was logged on the data sheets.

After conducting our evaluation we determined that further work was needed to assess the condition of 1 tree on the site. That required use of an instrument which our company did not possess (a Resistograph^{tm}). We subcontracted that examination to a local Tree service that had that device. With it we measured the extent of internal decay in that tree of concern.

Nine trees on the property were large enough to be a possible grand trees. We gave special attention to the evaluation of those individuals. An additional potentially grand tree was located on a neighbor's property at 1015 Hamrick Avenue. It was inspected, since if it was indeed a grand tree, there would have been protection requirements for its root area on the Orchard tract. All trees were assessed for condition, since smaller trees in fair or better condition may be retained to meet City tree density factor requirements.

Tree Data

As we evaluated each tree, we completed a data sheet detailing our findings. These were used for standardization, for preparing a summary of conditions and the final report. The completed data sheets will be retained in our office. A considerable number of images of the trees and site were taken with a digital camera, for use in this report.

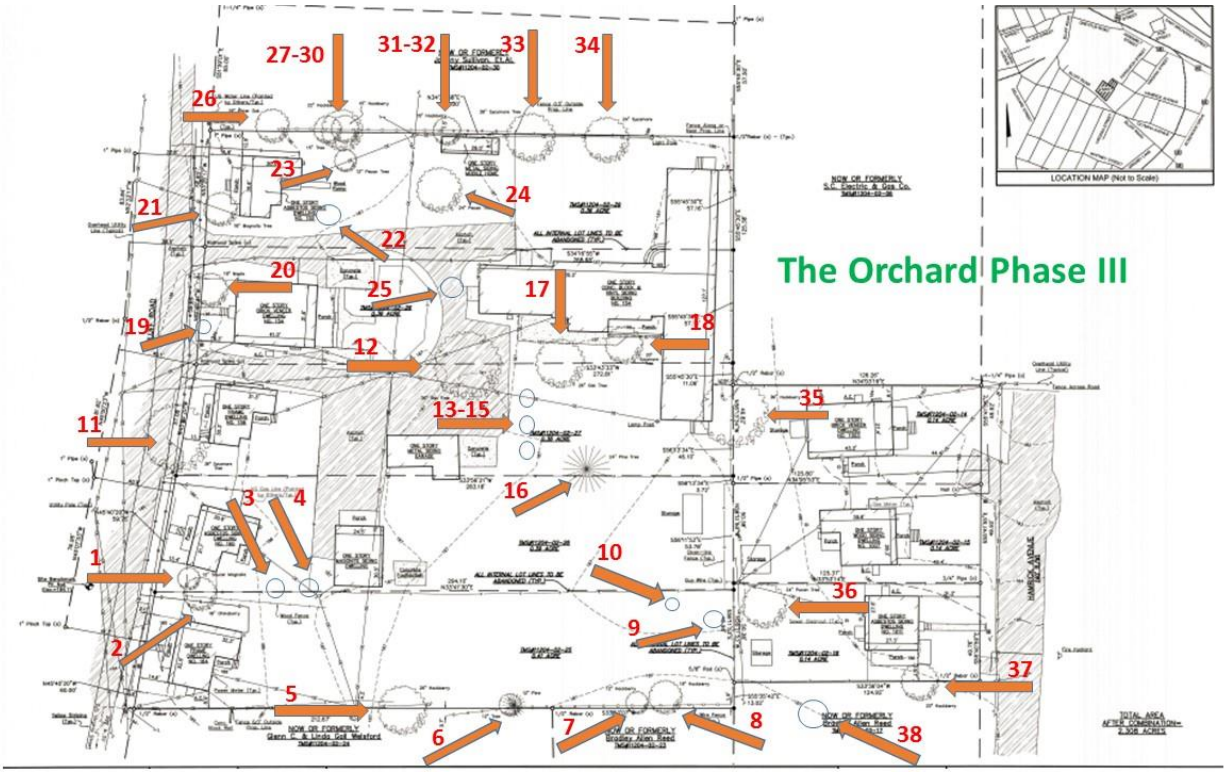
The majority of trees on this site were located on property lines of the individual tracts. A few had likely been planted as yard trees and these were located in the interior of the various lots.

We noted that all the sugarberry trees and many of the others on these tracts had thinning foliage, dieback and decay that indicated they were declining. Much of that was because of past soil disturbances and compaction. The trees had received little care beyond pruning an occasional limb interfering with a structure.

Many trees covered in this report are recommended for removal, but no trees should be cut prior to your receiving written approval for such actions by the City. One company I worked with had (before my time with them) received verbal authorization to cut some trees and they proceeded with removals.

Unfortunately, the city (Greenville) cited them for not waiting for written approval and they were forced to pay several hundred thousand dollars in fines and mitigation fees.

Below is a map of the site showing the locations of trees examined in this evaluation:



Tree #: 1

Species: Saucer Magnolia (*Magnolia X soulangeana*)

DBH: 7 x 7 x 7 inches (triple stem)

Height: 40 feet

Spread: 24 X 36 feet

Approx. age: 40+ years

Location: Latitude: 33.97962 Longitude: -81.02882

Condition: Fair- (30% condition rating). Not a grand tree by size; could be retained for density credit.

Description: This tree was located near the eastern corner of the residence at 160 Bluff Road. It had girdling roots, mechanical damage to its roots and soil compaction over them. It was codominant (2 tops) at 3 feet with included bark present between 0 and 3 feet up its trunks. Several dead branches and decaying branch stubs were located in its crown. Some sprouts were present that were several years old. Foliage was somewhat chlorotic (yellowing).

Action needed: This tree is currently in marginally fair condition. It could be retained for tree density credits, depending on its location in final site plans. However, it is not a grand tree by size and could normally be cut without mitigation. It appears to be partially in a 25 foot

building setback along Bluff Road. Because of this, the City may question its removal and if so, you could require it to be protected during construction.

Tree #: 2
Species: Chinaberry (*Melia azedarack*)
DBH: 8 x 15 inches
Height: 50 feet
Spread: 30 x 40 feet
Approx. age: 50+ years
Location: Latitude: 33.97962 Longitude: -81.02882 (same as tree #1)
Condition: Poor (20% condition rating). Not a grand tree by size or condition.
Description: This tree was located 8 feet east of tree #1. It had mechanical damage to its roots as well as presence of girdling roots at its base. It was codominant from 0-2 feet up its trunk and again at 14-16 feet up with included bark in both locations. There was basal decay present which had eroded the area above the buttress roots. There were 7 dead limbs >2 inches in diameter in its crown and it was visibly thinning.
Action needed: Although Chinaberry is in the mahogany family, it is generally considered a trash tree because it drops copious amounts of its drupe-like fruit. It is generally a short-lived species and this individual is near the end of its life. It is located to the interior of the setback line, so it has no protected status. You should request permission from Columbia to remove it prior to site development. It poses a moderate risk of trunk or limb breakage due to the brash nature of its wood. Since it is not a grand or protected tree, no mitigation should be requires on its removal.

Tree #: 3
Species: Sugarberry (*Celtis laevigata*)
DBH: 8 X 6 X 4 inches
Height: 40 feet
Spread: not estimated
Approx. age: 40 years
Location: Latitude: 33.97984 Longitude: -81.02881
Condition: Poor, dying (0% condition rating); Not a grand tree by size or condition.
Description: This tree was located in the backyard of 160 Huger Street. It was growing on a fence line, where the seed from which it sprouted had been deposited by a passing bird. It had been attacked by *Agrilus macer*, a Buprestid insect borer. Those insects were in process of girdling the sugarberry by their feeding and gallery construction.
Action needed: A dying tree can have no condition rating. Sugarberry is being killed across its range by a complex of insects and diseases. The Buprestid attacking this one has been seen in sugarberries in South Carolina and Georgia. Once they attack a tree, no known treatment can stop it. You should be able to cut this tree with City permission.

Tree #: 4

Species: Sugarberry (*Celtis laevigata*)
DBH: 8 X 7 inches
Height: 38 feet
Spread: not measured
Approx. age: 40 years
Location: Latitude: 33.97984 Longitude: -81.02881 (same as #3)
Condition: Poor, dying (0% condition rating). Not a grand tree by size or condition.
Description: This tree was growing about 8 feet east of tree #3. It had also been attacked by *Agrilus macer* borers (egg masses were seen) and was dying. It was in the same fence line as #3. Its trunk was leaning at 10 degrees to the south. Its crown had an 80% transparency rating (80% light, 20% leaves). The foliage was yellowing and quite thin.
Action needed: This tree poses a moderate risk of trunk failure because of the lean and the decay that will quickly colonize the wood after tree death. It can be removed (with written permission) without requiring any mitigation. It cannot be retained for density credit since it is dying.

Tree #: 5

Species: Sugarberry (*Celtis laevigata*)
DBH: 29 inches
Height: 65 feet
Spread: 66 X 60 feet (estimated)
Approx. age: 80+ years
Location: Latitude: 33.97995 Longitude: -81.02851
Condition: Poor (0% condition rating). A grand tree by size, but not by condition.
Description: This tree was growing on the eastern property line of the tract at 164 Bluff Road. It was enmeshed in a stand of bamboo and vines. A beehive was located 10 feet to its east, on the adjacent landowner's tract. This sugarberry was also being attacked by *Agrilus macer* beetles. However, it was in terrible shape prior to that attack. It had numerous large dead limbs (>6 inches) that had died years earlier. The transparency of its crown was 80% and what foliage it had was chlorotic (yellowing).
Action needed: This tree is dying and poses a substantial risk of limb droppage. Although it is potentially a grand tree by size, it will not live another year and therefore does not merit grand tree status. It should be removed with written permission from the City, prior to any site work. Since it is not in fair or better condition, mitigation should not be required.

Tree #: 6

Species: Carolina Laurel-Cherry (*Prunus caroliniana)*
DBH: 12 inches
Height: 40 feet
Spread: 30 X 30 feet (estimated)
Approx. age: 40+ years
Location: Latitude: 33.98086 Longitude: -81.02850
Condition: Poor (10% condition rating). Not a grand tree by size

Description: This was another volunteer tree planted by a passing bird. There were many of these along the fences, but this was the only one marked as a tree on the tree survey. It was in extremely poor condition since it had been a double stemmed tree and one of its tops was now dead and rotting. The remaining trunk had significant decay and an open cavity at a height of 6 feet. Transparency of this tree was estimated at 50%, but it was covered in ivy and that foliage accounted for a good deal of the light blockage.

Action needed: Carolina Laurel-Cherry is a tree that will continue to stay alive long after most others would die. This is apparently because it lives on its current production of energy by its evergreen leaves, whereas most other trees depend partly on stored starches for energy. I have seen individuals over 100 years old whose trunks are disintegrating, but a few live branches keep them alive. This individual will be in a developed area where constant branch droppage will pose a risk. This tree normally would be protected (if it was in better health), since it is in a building setback. However, it can be removed with City permission, because it is not in fair or better condition.

Tree #: 7

Species: Sugarberry (*Celtis laevigata*)
DBH: 5 inches
Height: 8 feet
Spread: 8 X 8 feet
Approx. age: 40+
Location: Latitude: 33.98011 Longitude: -81.02824
Condition: Poor, dying (0% condition rating). Not a grand tree by size.

Description: This Sugarberry was a sorry subject that had recently suffered trunk breakage. The remainder of the tree was now under attack by *Agrilus macer* and dying fast. It was next to tree #8, which had overtopped it some time ago.

Action needed: This tree is dying. It will not be alive at the end of this summer. As such, it should be removed prior to beginning construction. It is in a setback buffer, but has no value for retention. It should be removed (with written permission).

Tree #: 8

Species: Sugarberry (*Celtis laevigata*)
DBH: 18 inches
Height: 40 feet
Spread: 40 X 36 feet
Approx. age: 40+ years
Location: Latitude: 33.98011 Longitude: -81.02824 (same as tree #7)
Condition: Poor, dying (0% condition rating). Not a grand tree by size.

Description: This tree was another growing on a fence line. Its trunk had a 12 degree lean to the west and its transparency was 70%. It too was under attack by *Agrilus macer*, with egg masses seen in large numbers on its trunk. Its crown had begun to thin and what foliage was present was chlorotic and thinning.

Action needed: This sugarberry was ensconced in a thicket of bamboo and vines. It was located near the back property line of the residence at 164 Bluff Road. This tree is within the setback, but

there is no good reason to retain it, as it will be dead soon. You should apply for written permission to remove it.

Tree #: 9
Species: Winged elm (*Ulmus alata*)
DBH: 13 inches
Height: 45 feet
Spread: 20 X 20 feet
Approx. age: 40 years
Location: Latitude: 33.98035 Longitude: -81.02825
Condition: Poor (15% condition rating). Not a grand tree by size or condition.
Description: This tree was not recorded on the tree survey, but we included it because we were already in the bamboo thicket where it was growing. It had a double trunk above DBH and the tops of both were dead. It had a transparency of 50% and a trunk lean of 11 degrees to the south.
Action needed: This tree is losing the competition battle to the bamboo around it. It is outside the setback buffer and as such is not a protected tree. It can be cut without mitigation and should be removed before or during site preparation. You should include it in your request for tree removal.

Tree #: 10
Species: Chinaberry (*Melia azedarack*)
DBH: 15 inches
Height: 50 feet
Spread: 25 X 30 feet
Approx. age: 40 years
Location: Latitude: 33.98017 Longitude: -81.02846
Condition: Fair- (45% condition rating). Not a grand tree by size but possibly suitable for retention.
Description: This tree was at the back northwest corner of the lot at 164 Bluff Road. It was not included in the tree survey. However, it was in about as good a condition as a Chinaberry can be (for its age). It was codominant at 7 feet with 2 trunks. Several dead limbs were present in its top along with 2 hangers. Its transparency was 50 percent. It was also in the bamboo thicket.
Action needed: This tree is outside the setback buffer and not large enough to achieve grand status. It could be retained for tree density credit, if it is located in a suitable area. If that is not the case, it could be removed without mitigation since it is not protected. If you decide to remove it, you should include it with the list of trees for which you are requesting to cut.

Tree #: 11
Species: Sycamore (*Platanus occidentalis*)
DBH: 42 inches
Height: 50 feet
Spread: 72 x 60 feet
Approx. age: 90+ years

Location: Latitude: 33.97987 Longitude: -81.02901
Condition: Fair- (30% condition rating). A grand tree by size and condition, at least for a few years.
Description: This tree was growing adjacent to Bluff Road. It was the only currently living tree on the site which was visible in the 1939 aerial imagery. It has had a hard life, but still has some vitality remaining. Its base is 6 feet from the pavement of Bluff Road. It had filled the available site with its roots, some of which were girdling others. The presence of houses and road prevented its roots from expanding as they normally would have. Many roots were above the ground and most had some mechanical damage. Its trunk was codominant at 9 feet with 4 tops arising from that point. One of the tops was dead along with some large branches. The leaves were infected with bacterial leaf scorch and some were smaller than usual (especially high in the crown). Someone had nailed a mailbox to its trunk.
Action needed: This tree is within the Bluff Road buffer and building setback. It is barely in fair condition, but is a grand tree and does merit protection. It will need some work to bring it back into reasonable condition. It should be pruned for dead wood removal. Some limbs towards the site could be removed at that time, if they will interfere with buildings or traffic. It has a limited root area since the tree's roots are constrained by existing hardscapes. Since its roots do not extend very far, the normal 42 foot radius root protection zone could be reduced (there is no reason to protect a root zone where there are no roots). The tree's trunks will need to be cabled to reduce stress to the crotch and thereby the chance of trunk failure. Up to 4 inches of sand could be added to cover surface roots (no clay) and the root area then could be mulched with organic mulch. Other tree protection as cited in City Code should be followed (see section on tree protection).

Tree #: 12
Species: Willow Oak (*Quercus phellos)*
DBH: 38 inches
Height: 65 feet
Spread: 48 x 60 feet
Approx. age: 80 years
Location: Latitude: 33.98025 Longitude: -81.02882
Condition: Poor (10% condition rating). A grand tree by size, but not by condition; a high risk tree.
Description: This oak was located behind the residence at 154 Bluff Road. At first glance, I thought it was a beautiful tree. Unfortunately, when we approached closer, we saw a huge conk of *Inonotus dryadeus* at its base, as well as lesser problems. It was encircled by pavement which it had broken as it grew. Unfortunately, that macadam had caused considerable root injury that allowed the decay fungus to enter the oak. Above the conk, there was an area of sunken tissue that extended from 0-12 feet on the trunk. The branches had a high aspect (lots of branches coming from a small space on the trunk). The tree was a wolf tree and had retained its extremely large and long lower limbs. Three limbs larger in diameter than 4 inches were dead in the crown. Another dead limb had broken and was hanging in the top. Foliage high in the crown was thinning from poor water translocation.
Action needed: This tree is problematic since the root decay is impossible to quantify. However, the presence of a large *Inonotus* conk does demonstrate an extensive infection. That infection cannot be treated or remediated. Since root disease often results in unpredictable windthrow (uprooting), this tree will not be suitable for retention on the site. Risk in trees

is related to both the defect and the occupancy rate of the site. In a park, the area under this tree could be roped off to keep the public out of the danger area. That is not possible in a developed area, since the liability of personal or structural damage is too high to accept. Because of its condition, this is not a grand tree and therefore is not protected under Code. You should apply to remove it because of the risk it poses. Await written approval before cutting it.

Tree #: 13

Species: Loblolly Pine (*Pinus taeda*)
DBH: 16 inches
Height: 70 feet
Spread: 11 X 18 feet
Approx. age: 50+ years
Location: Latitude: 33.98032 Longitude: -81.02866
Condition: Poor (10% condition rating). Not a grand tree by diameter; a high risk of trunk failure.
Description: This tree was one of a group of 4 pines near the willow oak just described. It had 2 Fusiform Rust cankers on its trunk. The lower of these had girdled ¾^{ths} the circumference of the trunk. That canker extended from the ground to 9 feet in height on the trunk. Another smaller rust canker was 30 feet up the trunk. The top held 10 dead limbs larger than 4 inches in diameter. The tree had a small top and a low live crown ratio.
Action needed: This pine was not included on the trees survey. However, it is in such poor shape as to be a potential hazard for trunk failure during even a moderate wind. Such risk is not acceptable in a developed area and this individual should be removed before it falls on someone. I still advise seeking written approval for removing this or any tree when developing a site to avoid running afoul of local authority.

Tree #: 14

Species: Loblolly Pine (*Pinus taeda*)
DBH: 14 inches
Height: 75 feet
Spread: 24 X 12 feet
Approx. age: 50+ years
Location: Latitude: 33.98030 Longitude: -81.02869
Condition: Fair- (30% condition rating). Not a grand tree by size.
Description: This tree was located 10 feet to the east of tree #13. It was in slightly better shape, but still had numerous condition issues facing it. It had some low trunk decay, as evidenced by its basal swelling. The tree had slick bark, which indicated its growth rate had slowed. The trunk had a 12 degree lean to the east. Termite tubes were noted running up the outside of its trunk, in the bark crevices. Ten dead limbs were present in the crown and the live crown ratio was low (20%). Foliage was thinning, especially high in the crown.
Action needed: This tree is just barely in the fair category and has no chance of improving over time. It is not grand by size or condition. Moreover, it lacks the qualities that would recommend it for retention to meet required tree density credit. Its decay will worsen and it will eventually be more of a risk than can be tolerated. The best course would be to apply to remove it now.

Tree #: 15

Species: Loblolly Pine (*Pinus taeda*)
DBH: 18 inches
Height: 75 feet
Spread: 30 X 24 feet
Approx. age: 60+ years
Location: Latitude: 33.98089 Longitude: -81.02872
Condition: Fair (40% condition rating); not a grand tree by size, but could be retained.
Description: This tree's trunk was located 10 feet to the east of tree #14. It had not been included in the tree survey of the site. It had a slight basal swelling that could have been tension wood or wound response tissue. Its trunk had a dogleg at 40 feet (a crook in the stem) that was a weak point where an old top had died in the past. The crown was one-sided with its live crown to the south of its trunk.
Action needed: This tree is not a grand tree but could be retained for tree density credit because it is in fair or better condition. However, it is not in a protected area of the site and could be removed if it does not fit into development plans. If you wish to remove it, you should add it to the list of tree that you are requesting to remove.

Tree #: 16

Species: Loblolly Pine (*Pinus taeda*)
DBH: 25 inches
Height: 75 feet
Spread: 40 X 30 feet
Approx. age: 80+ years
Location: Latitude: 33.98031 Longitude: -81.02865
Condition: Fair (50% condition rating). Not a grand tree by size, but suitable for retention.
Description: This tree will be just south of building #16 as shown on a construction diagram. It was the best pine growing on the tract. Its base had no abnormal swelling, unlike the other pines. The bark was slick, indicating advanced age and slow growth. Sap was dripping onto the lower trunk from somewhere high on the tree, but we could not determine the source of that minor leakage. The crown held 11 dead limbs or stubs that were >2 inches in diameter. Most of the crown was to the east of the trunk.
Action needed: This tree could be retained to partially meet the required density factor. It is not grand (30 inches DBH is the minimum for conifers) or protected, so that would not be mandatory. It appears to be in an area planned for grass around a building, but a sidewalk may be too close to avoid damaging the root plate. In general, I do not recommend retaining pines near buildings unless their root area can be protected at a rate of 1 foot of ground radius to 1 inch of DBH. If you decide to remove it, you can add it to the list of trees for which you are requesting removal.

Tree #: 17

Species: Water Oak (*Quercus nigra*)
DBH: 29 inches
Height: 65 feet
Spread: 80 X 60 feet (estimated)
Approx. age: 80+ years
Location: Latitude: 33.98034 Longitude: -81.02877
Condition: Poor (20% condition rating). A grand tree by size, but not by condition.
Description: This tree was near the foundation of the old schoolhouse at 154 Bluff Road. Its roots had suffered from extreme compaction and mechanical damage. The basal swelling was not symmetrical. Drilling with a Resistograph[tm] found pockets of decay throughout its base. The lower trunk had a low cavity located 1 foot high on its north side. It was codominant at 19 feet. There were multiple cavities on the trunk at old limb scars and on the limbs high in the crown. Dead limbs and sprout growth were numerous throughout the crown. A large hanger was present waiting to fall on someone. There were very few nodes on limbs to provide opportunity for crown reduction pruning and some stubs were already present from old poor pruning. Leaf size was below average for the species and the crown transparency was 40%.
Action needed: Although this tree is grand by size, it poses a moderate risk of unexpected root failure. Since it is less than 15 feet to a currently present hardscape that must be demolished, it would be extremely difficult to protect sufficient roots to assure tree survival. The tree is a wolf, or a tree that grew up by itself with no neighbors to compete with it for branch space. It has extremely long limbs that could not be shortened without making stub cuts, which are prohibited by the City. Water oaks of this age often drop green branches in a phenomenon known as sudden summer limb drop. Because of the known habits of this species and the risk this particular tree poses, I do not recommend that it be retained.

Tree #: 18

Species: Sycamore (*Platanus occidentalis*)
DBH: 21 inches
Height: 65 feet
Spread: 50 X 40 feet (estimated)
Approx. age: 60+ years
Location: Latitude: 33.98042 Longitude: -81.02876
Condition: Poor (20% condition rating). Not grand tree by size, and not suitable for retention.
Description: This tree was even closer to the hardscape of the old school building than tree #17. Its base was only 2 feet from a paved porch. There was extreme soil compaction and root damage through its entire root zone. The trunk appeared to be sound but had extreme taper that indicated a restricted underground area for its roots or a subsoil hardpan. There was decay present at the locations of old branch stubs, and some limbs were dying. Limbs were excessively long, without nodes for pruning opportunities. Foliage was thinning and stunted in size, especially high in the crown. It was infected with bacterial leaf scorch.
Action needed: Since this sycamore is not grand, protected or in fair or better condition, it would be wise to remove it prior to construction. It poses some risk of uprooting that will worsen if it is retained so close to a building that must be demolished. The species does well along

streets, but not so well in the interior of tracts to be developed. It is prone to infestation by sucking insects whose excretions are high in sugar. That results in growth of sooty mold on anything underneath the sycamore. You should add this tree to the list for which you desire written permission to remove.

Tree #: 19

Species: Ginkgo (*Ginkgo biloba*)
DBH: 7 inches
Height: 22 feet
Spread: 12 X 12 feet
Approx. age: 25+ years
Location: Latitude: 33.97998 Longitude: -81.0291
Condition: Poor (10% condition rating). Not a grand tree by size.
Description: This was tree was in the setback area along Bluff Road. It had been overlooked in the tree survey. My first thought was that it would be a nice, medium sized tree to retain there. Unfortunately, when we looked at its back side, there was a cavity extending from the ground to a height of 7 feet on its trunk. A conk of *Poria sp*. was fruiting on the edge of the cavity. The trunk was codominant at about 12 feet and had a good deal of sweep present. The limbs appeared wispy with foliage only on primary branches and sprouts. Ginkgo is usually a tree with moderate transparency, but on this individual it was 60 percent.
Action needed: This is a species that I often recommend for use as an urban tree. However, care must be taken to obtain only male individuals because of the pungent aroma emitted by the female Ginkgo during the fall of the year. This genus is extremely primitive and has only one species. This individual will suffer stem breakage, probably during a wind event because of its weakened state. Although not a grand tree, this one has tentative protected status because of its location. Unfortunately, I must recommend that it be removed because of its condition. That should not require mitigation since it is not in fair or better condition.

Tree #: 20

Species: Red maple (*Acer rubrum*)
DBH: 22 inches
Height: 45 feet
Spread: 30 X 40 feet
Approx. age: 50+ years
Location: Latitude: 33.97993 Longitude: -81.02927
Condition: Poor (20% condition rating). Not a grand tree by size or suitable for retention.
Description: This tree was growing beside tree #19 in front of the residence at 154 Bluff Road. It was also in the building setback located there. Unfortunately, it had experienced much hardship during its life. It had multiple girdling roots and was in an area with insufficient root space. Swelling was present at its base, which indicated the presence of internal decay. It had 3 trunks above 5 feet. Another stem that could have been a trunk or a large lower limb growing towards the house had been pruned away, leaving an open wound. The trunk closest to Bluff Road was hollow from 10 -18 feet and had an open cavity in the lower portion of the hollow. A second top had swelling consistent with wound wood growing over decay. There was considerable tip dieback towards the road and sprouts were present

throughout the crown. Sapsuckers had fed on the trunks and limbs so much that it did not appear to have typical maple bark.

Action needed: Although this maple might have been protected because of its location, its condition precludes retention. Two of the trunks are decayed and will fail at some point, possibly dropping onto a trafficked area or walkway. If those tops are pruned away, the remainder of the tree would be extremely unsightly. Because of this risk, I recommend that this tree be removed. You can plant another tree nearby that will be in much better shape (although I do not usually recommend planting red maples because of species characteristics).

Tree #: 21

Species: Southern Magnolia (*Magnolia grandiflora)*
DBH: 19 inches
Height: 40 feet
Spread: 42 X 45 feet
Approx. age: 60+ years
Location: Latitude: 33.98019 Longitude: -81.02932
Condition: Fair- (30% condition rating). Not a grand tree by size, but marginally suitable for retention.
Description: This tree was the last of the trees in front of houses in the southwest corner of the site. It was not perfect by a long shot, but does have potential to possibly live for another decade. There was mechanical damage and decay in its surface roots. They had likely grown so shallow because of an underground obstruction. The trunk was codominant with some included bark, but otherwise appeared healthy. Lower branches had been pruned away in the past to raise the crown. A powerline ran through its top. Leaves were moderately infested with false oleander scales.

Action needed: This tree is barely in fair shape, but is in the building setback and will likely be considered to be protected. It can be retained with some judicious pruning to shape its crown. The scale insects should be controlled. This tree would count towards your required tree density for the site. If you decide to cut it, mitigation would be needed. I recommend retaining it for those credits.

Tree #: 22

Species: Black Walnut (*Juglans nigra*)
DBH: 21 inches
Height: 35 feet
Spread: 48 X 48 feet
Approx. age: 60+ years
Location: Latitude: 33.98022 Longitude: -81.02920
Condition: Poor (15% condition rating). Not a grand tree by size, or suitable for retention.
Description: This tree was located behind the house at 150 Bluff Road. It was omitted on the tree survey. It was declining with a transparency rate of 90 percent. The trunk was codominant at 6 feet with included bark and decay below the crotch. There was a wire embedded in the trunk, which was girdling it. Most of its limbs were dead, with perennial *Nectria* cankers present on several branches that were still alive. The foliage was being shed prematurely.

Action needed: This tree is currently in poor condition. It has no redeeming features that would qualify it for protection. You can apply to the City remove it, along with the rest of the trees to be cut. No mitigation should be required.

Tree #: 23
Species: Black Walnut (*Juglans nigra*)
DBH: 14 inches
Height: 32 feet
Spread: 30 x 42 feet
Approx. age: 50+ years
Location: Latitude: 33.98028 Longitude: -81.02924
Condition: Poor (10% condition rating). Not a grand tree by size or suitable for retention.
Description: This tree was located near the property line on the west side of the tract. In fact, it was outside the 5 foot the building setback, but within the 20 foot space between the planned buildings and the property line. Its trunk was leaning at 9 degrees to the east. A *Nectria* canker at 15 feet up its trunk was girdling 50% of the stem. This tree was being suppressed by a nearby sugarberry, which had limited its height growth. It was defoliating from an infestation of lacewings.
Action needed: This walnut is in worse condition than the one previously evaluated (#22). It will suffer trunk breakage when the canker weakens it sufficiently to break in a wind. Because of that canker, I cannot recommend this tree for retention. It is not a protected or grand tree, so its removal should cause no mitigation consequences. I recommend that you ask Columbia for written permission to remove it.

Tree #: 24
Species: Pecan (*Carya illinoinensis*)
DBH: 24 inches
Height: 60 feet
Spread: 48 X 42
Approx. age: 60+ years
Location: Latitude: 33.98037 Longitude: -81.02910
Condition: Fair+ (60% condition rating); A grand tree by size and condition.
Description: This tree was located in the backyard of 150 Huger Street. It was growing in the center of that yard, near an abandoned trailer. Its trunk was codominant at DBH, with the tops growing away from each other. The lean of those stems was 17 and 20 percent. Several small decay pockets were detected by drilling, but none extended more than 2 inches into the trunk. It had long, drooping limbs that came to within 4 feet of the ground. Its foliage and fruit was infected with bacterial scab.
Action needed: This was by far the best tree we evaluated on the site. It was just barely large enough to be significant when measured at DBH. Its trunks were 14 and 17 inches in diameter, so even if it forked at a lower point than DBH, the sum of its stem's diameters would have made it a grand tree. As a grand tree it must be protected or mitigated (if removed). Since it is in the middle of a lot, it is unlikely that you will be able to design around it. In fact, it is completely under building #3 on proposed plans. If this tree is retained, you would be required to protect it. That would include fencing around its critical root zone, which

extends out from the trunk for 24 feet in all directions. That would take a considerable divot from your project.

Tree #: 25

Species: Crape Myrtle (*Lagerstroemia sp.*)
DBH: 8 inches
Height: 25 feet
Spread: 16 X 16 feet
Approx. age: 40 years
Location: Latitude: 33.98036 Longitude: -81.02903
Condition: Poor (20% condition rating). Not a grand tree by size or suitable for retention.
Description: This tree was growing about 2 feet in front of the old school house. It was another tree missed by the tree survey. At first glance, it appeared to be in fair condition, but closer inspection found that its stem was almost completely girdled by an unknown species of canker. It had root sprouts, which indicated other stress. That stress was likely due to soil compaction and lack of care. Its transparency rate was 50 percent. It had been topped at several times in the past, which had destroyed its natural form.
Action needed: This tree is not a grand or protected individual. It is deteriorating rather quickly and would be unlikely to survive for long if it was retained. You can add it to your list of trees to be cut before commencing site work. There should be no mitigation required for its removal.

Tree #: 26

Species: Water Oak (*Quercus nigra*)
DBH: 21 inches
Height: 55 feet
Spread: 66 X 50 feet (estimated)
Approx. age: 60+ years
Location: Latitude: 33.98027 Longitude: -81.02940
Condition: Fair (35% condition rating). Not a grand tree by size but suitable for retention.
Description: This tree was growing on the western property line near the house at 150 Bluff Road. It may have been partially or entirely on the neighboring tract since it was across the fence that was assumed to designate the property line. Its trunk had high taper, but no serious defects were seen on it. However, its condition was downgraded because of its crown condition. It had dieback, dead limbs and heavy sprouts throughout. The foliage was thinning high in the crown. These defects were likely caused by deficiencies in its root system.
Action needed: This tree is located in the building setback on the western property line. As such, it is a protected tree, if it is on your side of that line. If it is on the neighboring residential tract, it does not fall into commercial zoning regulations and has no protection through Columbia Zoning requirements. However, you should protect enough of its root area so as not to kill it. Killing a neighbor's tree could potentially get you a trip to court.

Tree #: 27

Species: Water Oak (*Quercus nigra*)
DBH: 10 inches
Height: 50 feet
Spread: 15 X 15 feet
Approx. age: 40+ years
Location: Latitude: 33.98024 Longitude: -81.02938
Condition: Poor (15% condition rating). Not a grand tree by size, and not suitable for retention.
Description: This was another volunteer tree that grew from the acorn of a nearby larger water oak. It was growing in the fence just north of tree #26. Its trunk had basal swelling indicative of internal decay. There were several open cavities in the trunk and obvious decay. The transparency of the top was 60%, and that was mostly from leaves born on sprout branches.
Action needed: This oak is neither grand nor protected because of its condition and size. It is apparently on your tract and could be cut without mitigation. If you do keep it, you will get no tree density credits, since it is in poor condition. I would add it to the list of trees recommended for removal.

Tree #: 28

Species: Sugarberry (*Celtis laevigata*)
DBH: 19 inches
Height: 65 feet
Spread: 30 X 30 feet
Approx. age: 60+
Location: Latitude: 33.98027 Longitude: -81.02930
Condition: Poor, dying (5% condition rating). Not a grand tree by size.
Description: This Sugarberry was another being attacked by *Agrilus macer*. That attack was just beginning since we saw only a few egg masses. However, other trees like this rarely survive more than a year after being attacked. This tree may have been on the adjacent landowner since it was on the other side of the fence thought to mark the property line. There were lots of dead branches and stubs already visible. The foliage was chlorotic and thinning, which predicted untimely tree death.
Action needed: This tree is dying. It will likely not be alive next spring. It is not grand by size or protected by condition. When it dies, you can use this evaluation as proof that you did not kill it with your construction. If it is indeed on your neighbor, you cannot cut it without their permission or a court order. When it dies it will be a threat to both your buildings and the neighbor's house.

Tree #: 29

Species: Sugarberry (*Celtis laevigata*)
DBH: 20 inches
Height: 60 feet
Spread: 30 X 36 feet
Approx. age: 60+ years

Location: Latitude: 33.98027 Longitude: -81.02930 (same as tree for #28)
Condition: Poor, dying (5% condition rating). Not a grand tree by size or suitable for retention.
Description: This tree was growing in a group of 3 on the western property line. It was also in a fence, but on the Orchard side of it. It had egg masses of *Agrilus macer* scattered on its trunk that indicated that it had only recently been attacked. It had a large cavity in its trunk at 8 feet up its length. Its transparency was 80 percent.
Action needed: This sugarberry is a low value tree which is dying. It had 2 houses in range of its fall once it dies. Since this tree is apparently on your side of the property line, you can add it to the list of trees which you are requesting to remove. No mitigation should be needed.

Tree #: 30
Species: Sugarberry (*Celtis laevigata*)
DBH: 21 X 6 inches (double stem)
Height: 55 feet
Spread: 35 X 40 feet
Approx. age: 40 years
Location: Latitude: 33.98027 Longitude: -81.029305
Condition: Poor, dying (5% condition rating). A grand tree by size but not condition.
Description: This tree was the last in its group on the property line. Its trunk was actually on the neighbor's side of the fence. It had extensive decay in both stems with numerous open cavities. The 2 stems had fused at 3 points and decay was obvious there also. Its transparency rate was 80% and it was holding dead leaves. However, none of that really mattered as it had been attacked by *Agrilus macer* beetles. The attack was in its early stages, but his tree does not have a significant life expectancy.
Action needed: This tree is beginning to die from the beetle attack and previous stresses. Sugarberry apparently cannot be considered any longer for retention as an urban tree in this area because of the species die-off. Since its condition is so poor, it is not a grand tree and can be removed with permission, without triggering mitigation requirements.

Tree #: 31, 32
Species: Tree-of-Heaven (*Ailanthus altissima*)
DBH: Two trees side by side; 18 inches and 12 inches
Height: 50 feet
Spread: 24 X 18 feet, 18 X 12 feet
Approx. age: 50 years
Location: Latitude: 33.98035 Longitude: -81.02923
Condition: Poor, invasive species (0% condition rating). Not a grand tree by size.
Description: These trees were located in the back yard of the residence at 150 Bluff Road, behind an abandoned trailer on the property line. On the tree survey, they were shown as a single hackberry, but that was not correct. They were 2 individual trees that had grown very close to each other. Their trunks were embedded in the fence, but most of their tops were on Orchard property. They were in generally poor condition with advanced trunk decay and multiple dead branches. The foliage in their tops was thinning. Each trunk had a 10 degree lean away from the adjacent tree.

Action needed: These trees are line trees and cannot be cut without permission of both owners. However, they are an invasive species whose seeds colonize open areas and choke out native trees. In addition to that quality, they are so decayed that they will pose a risk of trunk breakage before long. Since they are invasive, they have no condition value. They could be cut if you and your neighbor can agree to remove them. Removing them should not precipitate any mitigation issues.

Tree #: 33

Species: Sycamore (*Platanus occidentalis*)
DBH: 26 inches
Height: 50 feet
Spread: 50 x 50 feet
Approx. age: 60+ years
Location: Latitude: 33.98043 Longitude: -81.02901
Condition: Poor (10% condition rating). A grand tree by size but not condition; risk of trunk failure.
Description: This tree was growing 25 feet north of the pair of Ailanthus trees and on the same fence line. This tree was entirely on Orchard property, if the fence was the property line at that point. The trunk forked into 2 tops just above DBH. One side had an open cavity with decay between 8 and 9 feet above the ground. That cavity was so extensive as to create a weak point on the stem where it will eventually break. Another larger cavity was on the other stem at a height of 15 – 20 feet. Branches were extremely long and bending towards the ground. The tree was thinning and beginning to decline.
Action needed: This tree is close enough to planned buildings that it will hit one of them when it fails. This is not a matter of if it fails, but rather of when. It may stand for 5 years, or it could break tomorrow. There are no arboricultural techniques that will strengthen a rotting trunk. In years past, cavities were filled with concrete, but we discovered that that would not flex in the wind and accelerated trunk failure. A tree does not heal wounds. A healthy tree grows bark over them and forms a chemical barrier in its tissue to seal off decay. However, sycamore as a species does that poorly and this one is already stressed. Since it is on your side of the property line and not a grand or protected tree, it can be removed with no mitigation. As with all others to be cut, wait for written permission before removing them. Large fines can be levied for unauthorized tree removal.

Tree #: 34

Species: Black Cherry (*Prunus serotina)*
DBH: 28 inches
Height: 55 feet
Spread: 50 x 50 feet (estimated)
Approx. age: 60 years
Location: Latitude: 33.98056 Longitude: -81.02903
Condition: Poor (20% condition rating). A grand tree by size, but not by condition.
Description: This cherry was basically a large weed growing along the property line fence. Its trunk was entirely on Orchard property. It had decay in the trunk about 6 feet above the ground that had colonized an old wound where an additional top had been removed some years ago. Boring dust from insect infestation was seen on the vines around its base. Those vines

totally enshrouded it and prevented us from examining most of its trunk. There were multiple dead limbs and sprouts, which indicated that it was not in good health. The top was also quite thin with a transparency rate of 80 percent.

.Action needed: Black cherry makes a nice tree in the mountains, but rarely do we find a good specimen of the species around Columbia. This tree is an example of that observation. Cherry wood is very brittle and will easily break, especially when its branches grow long (as this one has done). You would be better served by removing this one and replanting another species, if a tree is desired at that location. Since it is declining and not in fair or better condition, you should be able to remove it without mitigation, with City approval.

Tree #: 35

Species: Sugarberry (*Celtis laevigata*)
DBH: 22 X 17 inches
Height: 60 feet
Spread: 60 X 50 feet (estimated)
Approx. age: 80+ years
Location: Latitude: 33.98057 Longitude: -81.02854
Condition: Poor, declining (15% condition rating). A grand tree by diameter, but not condition.
Description: This tree was growing behind the residence at 1003 Hamrick Avenue. It had been a beautiful tree 30 years ago, but was now suffering from a multitude of ailments. It had trunk decay where it had enveloped a metal fence a long time ago. Decay was also detected in its buttress roots. It was covered with so much English Ivy that it was being choked. Its trunk was codominant at 1.5 and 10 feet above the ground. Large (>10 inch diameter) branches were dead and rotting in the crown. Decay conks were seen on green limbs. The foliage was yellowing, of small size and thinning in the upper crown. A few egg masses of *Agrilus macer* were seen on upper limbs, but it had not yet been mass attached by the beetles. Its foliage was infested by Asian Woolly Aphid.

Action needed: This sugarberry may live another year, but it is doubtful if it will last much longer than that. Once the beetles hit a sugarberry, others sense the tree's stress and follow suit. The dead branches are a current risk factor. If no more die, the dead ones could be removed by pruning. However, it is our experience that once a tree declines to the point of this one, it rarely recovers. There is no point in putting time and money into retaining this tree when it has no future. You should apply to remove it and do so once you have that approval.

Tree #: 36

Species: Pecan (*Carya illinoinensis*)
DBH: 23 inches
Height: 65 feet
Spread: 54 X 48 feet
Approx. age: 70+ years
Location: Latitude: 33.98044 Longitude: -81.02826
Condition: Fair- (35% condition rating); not a grand tree by size, but could be retained.
Description: This tree's trunk was measured at 24 inches DBH on the tree survey. However, when we cut the ivy vines around it at DBH and re-measured it, it was really 23 inches in diameter. It had a number of problems that reduced its condition rating. There were several

suspicious swellings on its trunk and it was somewhat misshapen (it appeared flat on two sides, rather than being cylindrical and symmetrical). A great deal of English Ivy had grown up the trunk and onto some lower limbs. There were at least 6 dead branch stubs where branches had been pruned or broken away. Decay was present in some of those. Limbs were long and drooping, with some close to the ground. Many sprouts of various ages were present, which indicated past stress. Foliage was stunted and thinning high in its crown.

Action needed: This tree is not a grand tree but could be retained for tree density credit because it is in fair or better condition. However, according to the construction diagram, that would require relocating a planned building. Since the tree does not have grand or protected status, it could be cut without mitigation, with City approval.

Tree #: 37

Species: Sugarberry (*Celtis laevigata*)
DBH: 20 inches
Height: 65 feet
Spread: 60 X 60 feet
Approx. age: 50+ years
Location: Latitude: 33.98058 Longitude: -81.02795
Condition: Poor (20% condition rating). Not a grand tree by size.
Description: This tree was located beside a wooden fence at the residence to the east of 1011 Hamrick Avenue. Its trunk was not on Orchard property, but it did have limbs on the Orchard side of the fence. Its trunk had turned black from sooty mold growing on excretions of aphids feeding on its leaves. It was coated in ivy, which prevented us from evaluating its trunk. It had long limbs that were mostly over the owner's house. Foliage was yellowing, but only one egg mass of *Agrilus macer* was seen on the bark of limbs not covered in ivy.

Action needed: This tree is not on Orchard property, so you cannot remove it without the owner's permission (which I suspect would be unlikely). However, limbs over the property line can usually be pruned by you if they interfere with your activities (as long as the tree is not killed). It is always better to get permission from the owner before pruning a tree since he can raise a stink and hire a lawyer. I suspect that this will be a moot point soon, as area sugarberries are rapidly dying. Once dead, it will be a risk and someone will have to remove it or face their own liabilities.

Tree #: 38

Species: Willow Oak (*Quercus phellos)*
DBH: 35 inches
Height: 70 feet
Spread: 70 X 70 feet
Approx. age: 80+ years
Location: Latitude: 33.98037 Longitude: -81.02808
Condition: Poor (20% condition rating). A grand tree by size, but not by condition
Description: This tree was not located on the Orchard tract. It was in the back yard of the residence to the east of 1011 Hamrick Avenue. We evaluated it because of its proximity to your land. If it had been a grand tree, you could have been required to protect the portion of its critical

root zone on your side of the property line. The major problems with this tree were in its structure. It was codominant at 12 feet with 3 tops arising from that fork. There was considerable included bark associated with the fork and decay had eroded integrity of the trunk. In various places in the crown, grafting had occurred between limbs and tops. We also saw 2 locations of open decay on the lower trunk, peeking out of the ivy that covered it.

Action needed: This would have been a nice tree if it had received some correctional pruning 40 years ago. Unfortunately, that has not happened. The tree's defects are eventually going to fail and the trunk will fracture into pieces. Stem fracturing is what normally happens when a tree has this much included bark. At this time, few limbs cross your property line and those are small and inconsequential. If they become an issue, you can prune the ones crossing your property line as discussed above.

Conclusions and Recommendations

Zoning Code as it Affects Tree Removal and Mitigation

The Zoning Code of the City of Columbia (Division 13: Section 17-411 – 170-833) describes regulations concerning tree protection and replacement. Prior to obtaining a Building Permit, they must approve your landscaping plan (Sec. 17-412). The landscape plan should include a tree survey, tree inventory and tree protection plans (you now have all of those). In general, all trees in fair or better condition in protected zones are considered protected and cannot be damaged or cut without a permit (sec. 17-421). Protected zones are defined as portions of a property required by Code to be in open space (Sec. 17-55. Definitions). These would include street protective yards and buffer transition yards.

Grand trees are considered especially valuable and carry their own set of regulations. A grand tree is a tree in fair or better condition that is: a large hardwood 24 inches in diameter or larger, a conifer 30 inches in diameter or larger, or a small maturing hardwood (like a Dogwood) that is 10 inches in diameter or larger (Sec. 17-55, Definitions, Grand Tree). There are 9 such trees on your site that meet the minimum diameter criterion. However, only two are in fair or better condition.

Trees to be protected are normally identified on your plans as such. If any trees are retained, you would need to establish a tree protection zone around them. For an individual tree, that zone is considered to extend one foot in radius for each inch of diameter of the protected tree (Sec. 17-421.c.). For example, a 10 inch tree would have a protected zone 10 feet in radius from its base. On your site this would normally apply to a sycamore (#11), a pecan (tree #24) and any of the smaller trees that you wish to retain (as long as they are in fair or better condition). Tree #11 is growing in an area that constrains its roots. As such there should be no need to protect the entire 42 foot root zone that would normally be protected. There seems no point in protecting areas with no roots. The protection area for that tree would be the existing front yard of the residence at 156 Bluff Road. That is bounded on 2 sides by driveways, one side by the residence, and on the other side by the road.

There are requirements in City Code for protection of any retained trees. Before you begin any construction activities, the protected trees should have a barrier installed around them (Sec. 17-421.e.2).

Acceptable fencing includes 4 foot high wooden or orange laminate designs held in place by wooded posts, or any fencing method approved by the zoning administrator (Sec. 17-421.e.2.d).

This tree protection zone (as defined above) is considered off limits to any construction activities. No material storage, parking, concrete washouts, debris burning, trenching or soil disturbance is allowed inside that area (Sec. 17-421.e.2.b). If utility installation is required there, they may be bored in at a 25 inch depth (Sec. 17-421.e.2.c).

The City should give you a written permit for tree removals once they have approved your landscape plan. No trees of any condition or size should before you have written permission.

If you decide to remove the pecan listed above (#24), you will need permission from the City Zoning Administrator. Mitigation of grand or protected tree removal is by tree replacement or payment into the City of Columbia Landscape and Tree Fund (Sec. 17-422.f). In general, trees can be replaced by replanting a density factor equal to what was removed. This is in addition to a density factor of 30 units/ acre that is required for most sites (Sec. 17-422.a.1). That density factor can be met by preserving sufficient, small healthy trees or planting new ones. Those areas to be undisturbed include buffer yards and street protective yards. Additional requirements apply to vehicular surface areas (17-414).

Trees to be replanted should be at least 2 inches in caliper and 10 feet tall (Sec. 17-415.b.1). That section also includes requirements for shrubs, mulching and additional tree specifications. The code contains a table equating density factor to diameter, by tree size. You will likely need to plant some trees of the minimum size to meet the requirements for the tree density factor of your site. There is a list of acceptable tree species in the attached Tree Ordinance. I recommend that you plant Overcup, White, Post, or Nuttall Oaks. I would avoid planting Bradford pears, river birch, Leyland cypress and red maple. Depending on how extensive your parking area is, you may be required to plant trees there also. The other requirements for landscaping in the ordinance that are beyond the scope of this evaluation and tree protection document.

There are penalties prescribed for unauthorized cutting of trees in Columbia. The fine can be up to $500.00/ violation, issuance of a stop work order or modification of your permit (Sec. 17-816.b).

The City of Columbia has an Administrative Guide that is intended as an addendum and explanation of the Tree Ordinance. A copy of that is attached as an appendix to this document. A copy of Columbia's "Request for Tree Removal" form is also attached.

Summary of Findings Regarding the Trees and Site Evaluated

In order to understand how defects and diseases affect urban trees, it is important to comprehend the basics of tree biology. Small roots, called root hairs, absorb water and nutrients from the soil. This mixture is then transported back to the tree through conductive roots. Those roots also partially fulfill the task of holding the tree upright. Larger roots, called the root plate, extend radially from the trunk for several feet (about 9 feet for a 20 inch DBH tree). That root plate bears the lion's share of the task of supporting the weight of the trunk. The water and nutrients absorbed and translocated through the root system move upwards in a tree through small tubes in the wood called xylem. The xylem forks into the

main limbs, through smaller branches and twigs until reaching the leaves. The leaves are the energy creators in a tree and use chlorophyll, water and sunlight to produce sugars in a process called photosynthesis. Sugars produced in this manner are then transported back down the trunk through a layer of tissue just underneath the bark, known as the phloem. Those sugars are used as energy to power growth of the tree, with any excess being stored for later usage.

When evaluating urban trees, it is important to look both at the tree's health and its structure. Health is a measure of how efficient a tree is doing the activities mentioned in the above paragraph. A healthy tree produces sugars by photosynthesis in the leaves and then translocates them to other parts of the tree where they are used for growth or stored for later use. If all these parts are functioning well, the tree is deemed to be healthy. Only a few of your trees are healthy.

A tree can appear to be fairly healthy (at least to an untrained observer), but can have structural defects that predispose it to trunk breakage or other types of catastrophic failure (thereby causing risk to people or buildings near them). For instance, one of the most common trunk defects occurs when a tree has multiple stems. At the point where the stems fork, their bark can be trapped between them as they grow in diameter. This condition, called included bark, prevents the wood of the stems from forming a tight attachment to each other. As time passes, the weight of tissue above the defect will mount, increasing stress on that joint. Eventually, one side will break off and fall. Most of the hardwoods on your site have that defect.

Various insect and disease pests can invade a tree where they feed on the sugars produced by the tree or on tissues created by its respiration. The most serious of these pests can kill trees outright, but many slowly degenerate the tree's tissue. Among the second group are the fungi that cause root rot and wood decay. They infect a tree by means of airborne spores that land on an area of the tree that has been injured in some manner. They germinate there and grow into the tree's tissue. These organisms grow quite slowly, but over time they will erode the strength of the wood or the roots. As the trunk or roots lose strength, it is more difficult for them to support the weight of the trunk and crown above them. As long as the tree is living, the weight of the trunk will increase over the years. At the same time the rot fungi are weakening the trunk (and/ or the roots) until a storm (or eventually just gravity) causes the tree to fail and fall. Many of your trees have that defect.

One insect of particular concern to your trees (the sugarberries) is a beetle, *Agrilus macer*. We have found this insect attacking and killing those trees in South Carolina and Georgia. There may be other insects and diseases involved in the mass death of sugarberry, but none have been found consistently in dying trees. It appears that sugarberry in this area will no longer be a species that we can expect to survive much longer.

Soil compaction, root infection and subsequent loss causes symptoms that appear in the tops of affected trees. As the roots die, the top of that tree will die back and dead limbs will be observed in the tree's crown. This condition is generally called a decline spiral, since root death leads to top death. Top death means that less foliage is available to produce sugars, so there will be less energy for new root growth. This reduction in energy is utilized by opportunistic insects and diseases that would not ordinarily be vigorous enough to attack a healthy tree. As these insects and diseases destroy additional tissue, the decline can hasten until all stored energy is exhausted and tree death occurs. This is affecting many of the

trees discussed in this evaluation. It would be much easier to remove those trees now than after construction is completed.

When trees are hit by powerful storms, their limbs are often broken and branch stubs remain. This and other stresses (like drought or root loss) stimulate small, latent buds under the bark to grow, forming sprout branches. A normal branch has an attachment to the center of the stem so that each year when the tree grows larger the limb is more strongly held to the trunk or larger limb where it originated. However, sprout limbs have a less strong connection to the tree (since the sprouts originate directly under the bark) and will break off more easily as they increase in size and weight. When they fall, they can hit the ground (or anything under the tree) like spears. All the hardwoods on your site have sprouts to some degree.

Lean of a tree's trunk is yet another defect that predisposes it to failure. A tree will grow towards light, and that can often be what causes it to lean. Unfortunately, with the passage of time the center of gravity of a leaning tree moves farther away from its base and increases the likelihood of stem breakage or uprooting. A more insidious form of lean occurs when a tree suffers root or soil failure. In this situation, soil will often mound on the side of the tree away from its lean. When this happens, no arboricultural treatments will prevent the eventual uprooting and fall of the tree. Lean is a significant issue with several trees on your tract.

A tree falling in the forest poses little risk to people because it is unlikely to hit anyone when it fails. In order for the tree to constitute a potential risk, it must have a defect that makes it more likely to fail plus a target that can be damaged by such failure. Thus, a defective tree located around people or buildings becomes a risk since its failure could cause personal injury or property destruction. Presently, there is not extensive human activity on this site, so the danger of personal damage is not extreme (few targets). Once large numbers of people and their property are present, the number of targets (and potential liability from a tree accident) will increase. This could be a major liability, especially if a person is injured by tree failure (for example: from uprooting, trunk breakage or falling branches).

In general, I do not recommend retaining large trees during construction if they will be within ten feet of a building. This also applies to planting of trees that will grow to a height of more than fifteen feet. Some trees that stay small when mature (like Japanese maple or palms) can be planted a bit closer than that, but will eventually need pruning to keep branches off of nearby structures. The roots also need space, and damaging the roots near the base of a tree (root plate) will destabilize it and could lead to root failure and uprooting.

Any trees retained on the site, or new ones you plant will need protection, even after construction. Too often, I see contractors or homeowners spend time and money on tree protection during the building process, but ignore damage that happens later. Installation of underground utilities and irrigation requires ditching on the site and can destroy root systems. Most roots are in the upper six inches of the soil and any ditching machine cuts deeper than that. Tilling or disking the soil in root areas for grass installation always destroys feeder roots and should be avoided. Addition of fill materials over roots can suffocate them. The root zone of retained trees should be mulched and grass only planted in areas where no tree roots are located. If irrigation must be installed or soil compaction lessened, use of an air spade or similar tool can loosen or trench the soil without cutting roots.

Disclaimer

All tree evaluations were performed from ground level with only visible and accessible portions of trees being checked. All recommendations were made in good faith backed by scientific arboriculture and forestry. However, DendroDiagnostics, Inc. makes no warranty, either implied or specific, as to the actual chance of survival or failure of your trees. All trees pose some degree of risk. Those risks fall into several general categories; these include branch failure, trunk failure and root failure (uprooting). There is also a risk of shallow roots tripping pedestrians. Some degree of risk is inherent in having any trees in close proximity to people or structures. Although this risk can be minimized by proper arboricultural maintenance, it cannot be entirely mitigated without removing all trees and their roots on the site. Healthy trees carry a slight risk of failure, but even healthy trees can be compromised by high winds or other extreme weather.

The City of Columbia is not obligated to accept my findings, but they always have in the past.

Certificate of Evaluation Statement

I certify that all of the statements in this evaluation are true, complete, and correct to the best of my knowledge and belief, and that they are made in good faith.

Report by:

Andrew J. Boone, CF
ISA Certified Arborist SO-0669A; Tree Risk Assessment Qualified
SAF Certified Forester # 2730
S.C. Registered Forester # 716
S.C. Commercial Pesticide Applicator # C-0014974
U.S. Forest Service Certified Forest Entomologist and Pathologist

Figure 1: Tree Evaluation Form

DendroDiagnostics, Inc.
1901 Martin Road • Chapin, SC 29036
Phone: (803) 730-2930
www.dendrodiagnostics.com

Tree Evaluation Form

Date: _____ **Page:** _____ **Tree #:** _____

Owner: Orchard/ Olympia

Species: _____ **Free to grow?** _____
DBH: _____ **Height:** _____ **CRZ (radius):** _____
Root Plate Diameter: _____ **Spread:** _____
Targets: _____
_____ **Transparency:** _____
Grid: 33.9_____**-81.02**_____ **Lean:**_____ **Direction:** _____
Soil Type: _____ **Drainage:** _____ **Age:**_____

Condition: _____ **Risk:** _____

Roots: (Planting depth, girdling root, injury, obstructions, I&D, other): {2-8} _____

_____

_____

Trunk: (Sound bark and wood, cavities, cracks, conks, decay, COD, included bark): {2-8}

_____

_____

Branches: (Dieback, attachment, dead limbs, aspect, sprouts, wound closure, I&D): {2-8}

_____

_____

Twigs and Leaves: (color, distribution, size, wilting, thinning, I&D): {1-4 each, (8 total)}:_____

_____

History: (known disturbances, nearby tree failures): _____

_____

Short Term Needs: _____

_____

Long Term Needs: _____

_____

Roots, Trunk, Scaffold branches get 1-4 pts for structure and 1-4 for health. Small branches and foliage and buds get 1-4 pts for health only (32 maximum)