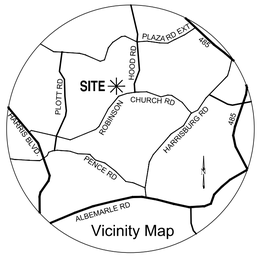
The Reserve at Canyon Hills - Phase 1

Civil Construction Documents
City of Charlotte, North Carolina



Vicinity Map

Contact Information

Developer
David Hensley
LGI Homes
3037 Sherman Drive Lancaster, SC 29720
(844) 566-3400
dhensley@lgihomes.com

Engineer
Evan C Mooney, PE
Merrick & Company
1001 Morehead Square Drive
Charlotte, NC 28203
(704) 529-6500 /office
evan.mooney@merrick.com

APPROVED FOR CONSTRUCTION
CHARLOTTE-MECKLENBURG PLANNING DEPARTMENT
By: Joshua Weaver 10-5-2016 1 of 3

CHARLOTTE.

FINAL APPROVAL

ENGINEERING PCO / DETENTION / DRAINAGE PLAN	*APPROVED* *By Brendan Smith at 1:13 pm, Oct 05, 2016*
EROSION CONTROL	*APPROVED*
URBAN FORESTRY TREE ORDINANCE	*APPROVED*
CDOT	*APPROVED*

NOTE: SCHEDULE PRE-CONSTRUCTION MEETING AT LEAST 48 HRS. PRIOR TO ANY LAND DISTURBING ACTIVITY USING THE ONLINE FORM AT http://development.charmeck.org

811 Know what's **below.** **Call** before you dig.

Q:\CHA\Projects\9033-01-Reserve at Canyon Hills\Design\CDs\Civil\9033-01 - C

PCCO SUMMARY

al Parcel ID Number(s):	10818101					
Development Type:	Single-Family					
Subject to PCCO? Y/N	Y					
If NO, why?	-- Click for Dropdown --					
Watershed:	Yadkin					
Disturbed Area (ac):	63.2					
Site Area (ac):	89.05					
	Wet Pond A	Wet Pond B	Wet Pond C	Wet Pond D	Wet Pond E	Wet Pond F
Total on-site Drainage Area (ac):	17.9	11.4	11.31	8.42	7.28	19.9
Existing Built-upon-area (SF):	0	0	0	0	0	0
Existing BUA to be removed (SF):	0	0	0	0	0	0
Existing BUA to remain (SF):	0	0	0	0	0	0
Proposed New BUA (SF):	249,512	203,599	206,919	154,046	136,360	364,074
Proposed % BUA:	32	41	42	42	43	42
Density (High / Low)	High	High	High	High	High	High
Total Post-Project BUA for site:	34%					
Development or Redevelopment?	Development					
Natural Area Required (ac):	15.58					
Natural Area provided, total (ac):	26.74					
Undisturbed Treed Natural Area Preserved (ac):	19.48					
Total stream buffer protected on-site (ac):	8.6					
Transit Station Area? Y/N	N					
Distressed Business District? Y/N	N					
Mitigation Type (if applicable)	N/A					
Natural Area mitigation? Y/N	N					
Buffer Mitigation? Y/N	N					
Total Phosphorous Mitigation? Y/N	N					

Project Information

Address: 8813 Robinson Church Road
Tax Parcel Number: 10818101
Phase 1 Area: 89.05
Zoning Classification: Current Zoning R-3
Developed as R-3 with cluster provisions only
Environmental: Yadkin SE Catawba Watershed

The Reserve at Canyon Hills - Roadway Improvement Phasing Schedule

Phase	Phase Build Year	Lots in Phase	Total Lots	Description of Improvements*	Improvement Plans Designed and Approved Deadline	Improvements Completion Deadline
1	2017	217	217	• Site Drive 4, 3, & 2 (Phase 1 & 2 entrances and frontage improvements as shown on plan sheet C900)	Plans are included in Phase 1 Construction Documents	Before the 51st lot is platted
				• Turn lane improvements at Plott Rd/Highland Ave. intersection	Before the 101st lot is platted	Before the 218th lot is platted
2	2018	173	390	None	N/A	N/A
3	2021	245	635	• Site Drive 1 (Phase 3 entrance and all remaining frontage improvements)	Before the 391st lot is platted	Before the 441st lot is platted (51st lot of Ph. 3)
				• Turn lane improvements at Harrisburg Rd. intersection	Before the 391st lot is platted	Before the 441st lot is platted (51st lot of Ph. 3)
				• Add northbound protected/permitted phase with flashing yellow arrow signal head at Harrisburg Rd. intersection	Before the 391st lot is platted	Before the 441st lot is platted (51st lot of Ph. 3)
				• Install A traffic signal at Plott Rd/Highland Ave. intersection	Before the 391st lot is platted	Before the 585th lot is platted (halfway into of Ph. 3)

* Refer to the approved Traffic Impact Study by Ramey Kemp & Associates, Inc. for detailed descriptions of improvements

Sheet Index

Scale: 1" = 200'
0 100 200 400 600 800

MERRICK® & COMPANY
1001 MOREHEAD SQUARE DRIVE, SUITE 330
CHARLOTTE, NC 28203
NC ENGINEERING FIRM P-0908 PHONE: 704.529.6500

LGI HOMES
2630 South Tryon Street
Suite 100
Charlotte, NC 28203

REVISIONS:						
REV	DESCRIPTION	DATE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	
2	Revised Per City Comments	8/24/16	CLP	RET	ECM	
1	Revised Per City Comments	7/19/16	CLP	RET	ECM	

DESIGN BY:	EH/CLP
DRAWN BY:	EH/CLP
CHECKED BY:	RET
APPROVED BY:	ECM
DATE:	05/20/16
DATE:	05/20/16
DATE:	05/20/16

The Reserve at Canyon Hills Ph. I
Charlotte, North Carolina

Cover Sheet

09/12/16

JOB NO.: 65119033-01
DATE: 05/20/2016
SHEET C100

Other General Notes

1. Contractor shall coordinate all curb and street grades in intersection with inspector.
2. In order to ensure proper drainage, curb shall have a minimum of 0.5% slope.
3. Sight triangles shown are the minimum required. Further requirements may be made by the City of Charlotte Department of Transportation (CDOT) or NCDOT.
4. Non-standard items (ie: pavers, irrigation systems, etc.) in the right-of-way require a Right-of-Way Encroachment Agreement with the Charlotte Department of Transportation/North Carolina Department of Transportation before installation. For City of Charlotte maintained streets, contact CDOT at (704) 336-3888.
5. In rolling and hilly terrains, sweeping of the stone base and/or application of a tack coat may be required near intersections. These requirements will be established by the Inspector and based on field conditions.
6. Any building within the 100+1 Stormwater Elevation Line is subject to the restrictions of the (City of Charlotte/Mecklenburg County) Subdivision Ordinance, Section 7.200.8.
7. Developer will provide street signs per CLDSM #50.05 (9" signs only).
8. PE Sealed shop drawings for retaining wall must be submitted to City Engineer prior to construction.
9. Prior to plat recordation, Offsite R/W and/or construction easements are required to be obtained according to the guidelines of the "Offsite R/W Acquisition Process". These needed R/W and construction limits are clearly shown on the roadway improvement plan.
10. Per Section 18-175(e) of City Code and Section 10.0 of the City's Post Construction Controls Administrative Manual, all required Natural Areas and/or Post Construction Controls easements (PCCEs) must be recorded prior to the issuance of the Certificate of Occupancy.
11. Certification and Street cut permits are required for utility cuts on City streets. Allow 7 days processing for permit. For information contact Charlotte Department of Transportation (704-336-4025) or visit http://www.charmeck.org/Departments/Transportation/Street+Maintenance/Home.htm
12. The purpose of the storm drainage easement (SDE) is to provide storm water conveyance. Buildings are not permitted in the easement area. Any other objects which impede storm water flow or system maintenance are also prohibited.
13. High-density polyethylene (HDPE) storm drainage pipe installed within existing or proposed public street right-of-way must be approved by the City's Inspector prior to any backfill being placed. Backfill material must be approved by the City Inspector prior to placement of the material within the public street right-of-way.
14. Subsurface drainage facilities may be required in the street right-of-way if deemed necessary by the inspector.
15. "As-built" drawings and plans of the storm drainage system, including designed ditches, must be submitted prior to subdivision final inspection to the City/County Engineering Department in accordance with the City/CountySubdivision Ordinance.
16. Approval of this plan is not an authorization to grade adjacent properties. When field conditions warrant off-site grading, permission must be obtained from the affected property owners.
17. The developer shall maintain each stream, creek, or backwash channel in an unobstructed state and shall remove from the channel and banks of the stream all debris, logs, timber, junk and other accumulations.
18. Prior to CO, surveyor sealed as-built drawings for underground detention systems must be provided.
19. Prior to CO, surveyor sealed as-built drawings of all water quality BMP's and detention systems must be provided.
20. Right-of-way closures longer than 30 days require a R/W Lease agreement which will include the submittal of a traffic control plan. Traffic control plans required through a lease agreement may be different from the one required during the Land Development plan review and are subject to revisions. The revised traffic control plans must be submitted as part of the lease agreement process for approval prior to start of R/W closures. Contractor shall contact CDOT at (704) 336-8348.
21. Construction staging within City R/W lasting more than 30 days requires a R/W Lease agreement. Contractor shall contact CDOT at (704) 336-8348.
22. Any work within the City's R/W that requires closure of the sidewalk or travel lane for less than 30 days requires a R/W use permit. Traffic control plans for any sidewalk or travel lane closures must be submitted as part of the R/W use permit request. Traffic control plans must be in accordance with CDOT's Work Area Traffic Control Handbook (WATCH) and must be reviewed and approved. Contractor shall contact CDOT at least 5 business days in advance of beginning of work at (704) 432-1562.
23. Any construction or use within the Future Conditions Flood Fringe Line is subject to the restrictions imposed by the Floodway Regulations of the City of Charlotte and Mecklenburg County.
24. The Developer shall contact the Charlotte Department of Transportation (Gus Jordi, 704-336-7086) to identify any conflicts with traffic signalization equipment. 60- 90 days will be required to coordinate relocation. Developer shall be responsible for all related relocation cost and/or any repair cost caused by the contractor/developer.
25. Certification and Street cut permits are required for utility cuts on City streets. Allow 7 days processing for permit. For information contact Charlotte Department of Transportation (704-336-4025) or visit http://www.charmeck.org/Departments/Transportation/Street+Maintenance/Home.htm
26. Sidewalk within the City's R/W that requires replacement as part of the development and/or street improvements should be phased in such a way as to minimize the duration of the sidewalk closure to the extent feasible. The developer should make every attempt to have sidewalk repaired and reopened for public use within 30 days of removal.
27. Estimated time to total build out for Phase 1 of Reserve of Canyon Hills is Fall of 2020.

Charlotte Storm Drainage Specifications

A. GENERAL NOTES

1. All work and materials shall conform to the latest edition of the NCDOT Standard Specifications unless otherwise specified in this manual. ALL concrete used for drainage structures shall have a minimum compressive strength of 3600 PSI at 28 days. This requirement shall be provided regardless of any lesser compressive strength specified in the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
2. Reinforced concrete pipe may be used in all storm drain applications. High Density Polyethylene Pipe (HDPE) may be substituted for pipe diameters of 48 inches or less. Culverts 60 inches in diameter or greater may be Corrugated Aluminized Metal Pipe (CAMP) or aluminum with a minimum 14 gauge metal.
3. All pipe shall be laid with the bell or groove upgrade and the joint entirely interlocking.
4. The minimum cover for all pipes is two (2) feet measured from the final surface. Special applications for less than two (2) feet of cover will be reviewed and approved by the City Engineer individually. The maximum cover for storm drainage pipes shall at a minimum comply with the requirements of the North Carolina Department of Transportation Highway Design Branch Roadway Design Manual, Part I, Section 5, and "Drainage Design". Storm pipe design that exceeds these criteria may be approved at the discretion of the City Engineer.
5. All pipes in storm drain structures shall be flush with the inside wall.
6. All storm drain structures over three (3) feet and six (6) inches in height must have steps in accordance with standard details set forth in this manual.
7. The interior surfaces of all storm drainage structures shall be pointed up and smoothed to an acceptable standard using mortar mixed to manufacturer's specifications.
8. Storm drainage piping shall be placed in a straight alignment at uniform grade. No changes in alignment shall be allowed except at catch basins, manholes, or other junctions that provide appropriate clean out access. The maximum length between access points is 300 linear feet.
9. All frames, grates, rings, covers, etc., must conform to the standards set forth in this manual.
10. All graded creek banks and slopes shall be at a maximum of two (2) feet horizontal to one (1) foot vertical (2:1) and not to exceed 10' without terracing or the slopes shall be designed by a Professional Geotechnical Engineer and approved by the City Engineer on a case **by case basis.**

B. HIGH DENSITY POLYETHYLENE PIPE (HDPE)

1. The Product used shall be corrugated exterior/smooth interior pipe (Type S), conforming to the requirements of AASHTO Specification M294 (latest edition) for Corrugated Polyethylene Pipe.
2. Bell and spigot joints shall be required on all pipes inside the right-of-way. Bells shall cover at least two full corrugations on each section of pipe. The bell and spigot joint shall have an "O" ring rubber gasket meeting ASTM F477 with the gasket factory installed, placed on the spigot end of the pipe. Pipe joints shall meet all requirements of AASHTO M294.
3. All HDPE pipe installed must be inspected and approved by the City's Inspector prior to any backfill being placed. The City inspector must be present during the backfilling operation as well.
4. Backfill material used to install HDPE pipe within the street right-of-way shall be Select Material, Class II-IV, as defined by Section 1016-3 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures. Upon submittal of written certification of material suitability by a licensed geotechnical engineer, NCDOT Class I Selec Material may be used. All backfill material shall be approved by the City inspector prior to placement of the material within the street right-of-way.
5. The minimum length of HDPE pipe permitted for use shall be four (4) feet. HDPE flared end sections are not allowed.
6. All HDPE pipe installed shall be third party certified and shall bear the Plastic Pipe Institute's (PPI) certificate sticker.

C. REINFORCED CONCRETE.

1. All concrete shall be at least 3600 PSI. Prior approval shall be obtained in order to use pre-cast storm drainage structures in any street right-of-way by City Engineer.
2. Concrete pipe used within the street right-of-way shall be a minimum of Class III Reinforced Concrete Pipe, with a minimum diameter of fifteen (15) inches (eighteen (18) inches minimum on cross drain culverts within the ETJ). Installation of Class IV or higher concrete pipe shall be identified on the As-Built Plan and the City inspector shall be given documentation and notification of this information prior to construction.
3. 3. Concrete mortar joints shall be used for joining all concrete pipes. The pipe shall be clean and moist when mortar is applied. The lower portions of the bell or groove shall be filled with mortar sufficient to bring the inner surface flush and even when the next joint is fitted into place. The remainder of the joint shall then be filled with mortar and a bead or ring of mortar formed around the outside of the joint. The application of mortar may be delayed until fill is completed when the pipe is larger than thirty (30) inches.
4. Performed joint sealer, which conforms to AASHTO specification M-198 for Type B flexible plastic gaskets, may be used in lieu of the mortar joining method.

D. INSTALLATION OF REINFORCED CONCRETE AND CORRUGATED METAL PIPE.

1. All backfill shall be non-plastic in nature, free from roots, vegetative matter, waste, construction material or other objectionable material. Said material shall be capable of being compacted by mechanical means and shall have no tendency to flow or behave in a plastic manner under the tamping blows or proof rolling.
2. Materials deemed by the Engineer as unsuitable for backfill purposes shall be removed and replaced with select backfill material.
3. Backfilling of trenches shall be accomplished immediately after the pipe is laid. The fill around the pipe shall be placed in ayers not to exceed eight (8) inches, each layer shall be thoroughly compacted to 95% of the maximum density obtainable with the Standard Proctor Test (a density of 100% Standard Proctor is required for the top eight (8) inches).
4. Compaction requirements shall be attained by the use of mechanical compaction methods. Each layer of backfill shall be placed loose and thoroughly compacted in place.
5. Under no circumstances shall water be permitted to rise in un-backfilled trenches after the pipe has been placed.

Charlotte Street Specifications

A. GENERAL

1. All work and materials shall conform to the latest edition of the North Carolina Department of Transportation Standard Specifications for Roads and Structures unless otherwise specified in this manual.
2. All asphalt cuts shall be made with a saw when preparing street surfaces for patching or widening strips.
3. Paper joints shall be used to seal the ends of an asphalt pour so that future extensions can be made without causing rough joints.
4. When placing asphalt against existing surfaces, a straight edge shall be used to prevent "humping" at that location.
5. Stone shall be primed if paving is not complete within seven days following stone base approval.
6. Surfaces shall be tacked when asphalt is being placed over existing asphalt streets or adjoining concrete, storm drain and sanitary sewer structures.
7. In rolling and hilly terrains, sweeping of the stone base and/or application of a tack coat may be required near intersections. These requirements will be established by the City Inspector based on field conditions.
8. ALL concrete used for streets, curb and gutter, sidewalks and drainage structures, etc. shall have a minimum compressive strength of 3600 PSI at 28 days. This requirement shall be provided regardless of any lesser compressive strength specified in the North Carolina Department of Transportation Standard Specifications for Roads and Structures. The contractor shall prepare concrete test cylinders in accordance with Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures at the direction of the project inspector. All equipment and cylinder molds shall be furnished by the contractor. It shall be the responsibility of the contractor to protect the cylinders until such time as they are transported for testing. Testing for projects shall be performed by an independent testing lab, at no cost to the City. The contractor shall provide equipment and perform tests on concrete for a maximum slump and air content as defined in Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures. These tests shall be performed at a frequency established by the inspector. Materials failing to meet specifications shall be removed by the contractor.
9. All concrete shall be cured with 100% Resin Base, white pigmented curing compound which meets ASTM Specifications C-309, Type 1, applied at a uniform rate at one (1) gallon to 400 square feet within 24 hours of placement of the concrete.
10. All curb and gutter shall be backfilled with soil approved by the Inspector within 48 hours after construction to prevent erosion.
11. All backfill shall be non-plastic in nature, free from roots, vegetative matter, waste, construction material or other objectionable material. Said material shall be capable of being compacted by mechanical means and the material shall have no tendency to flow or behave in a plastic manner under the tamping blows or proof rolling.
12. Materials deemed by the Inspector as unsuitable for backfill purposes shall be removed and replaced with select backfill material.
13. All trenches in the street right-of-way shall be backfilled with suitable material immediately after the pipe is laid. The fill around all pipe shall be placed in layers not to exceed six (6) inches and each layer shall be compacted thoroughly.
14. Under no circumstances shall water be permitted to rise in un-backfilled trenches after the pipe has been placed.
15. Compaction requirements shall be attained by the use of mechanical compaction methods. Each six (6) inch layer of backfill shall be placed loose and thoroughly compacted into place.
16. Straight forms shall not be used for forming curb and gutter in curves.
17. All excess concrete on the front edge (lip) of gutter shall be removed when curb and gutter is poured with a machine.
18. All subgrade shall be compacted to 100% of the maximum density obtainable with the Standard Proctor Test to a depth of eight (8) inches, and a density of 95% Standard Proctor for depths greater than eight (8) inches. All tests shall be performed by developer at no cost to the City.
19. A canvas cover or other suitable cover shall be required for transporting plant mix asphalt during cool weather when the following conditions are present:
    a. Air temperature is below 60 degrees F.
    b. Length of haul from plant to job is greater than five (5) miles.
    c. Other occasions at the Inspector's discretion when a combination of factors indicates that material should be covered in order to assure proper placement temperature.
20. Concrete or asphalt shall not be placed until the air temperature measured at the location of the paving operation is at 35 degrees F and rising by 10:00 a.m. Concrete or paving operations should be suspended when the air temperature is 40 degrees F and descending. The contractor shall protect freshly placed concrete or asphalt in accordance with Sections 420 (Concrete Structures), 600 (Asphalt Bases And Pavements), and 700 (Concrete Pavements And Shoulders) of the North Carolina Department of Transportation Standard Specifications when the air temperature is at or below 35 degrees F and the concrete has not obtained an age of 72 hours.
21. The contractor shall maintain two-way traffic at all times when working within existing streets. The contractor shall place and maintain signs, danger lights, and barricades and furnish watchmen or flagmen to direct traffic in accordance with the latest edition Work Area Traffic Control Handbook (WATCH), Work in the right-of-way of State System Streets may require additional traffic control provisions.
22. The contractor shall do that which is necessary to control erosion and to prevent sedimentation damage to all adjacent properties and streams in accordance with the appropriate City of Charlotte Erosion and Sedimentation Control Ordinance.

B. GRADING

1. Proposed street rights-of-way shall be graded to their full width for ditch type streets and a minimum of eight (8) feet behind the curb for curb and gutter sections.
2. Fill embankments shall be formed of suitable material placed in successive layers not to exceed more than six (6) inches in depth for the full width of the cross-section, including the width of the slope area. No stumps, trees, brush, rubbish or other unsuitable materials or substances shall be placed in the embankment. Each successive six (6) inch layer shall be thoroughly compacted by the sheepsfoot tamping roller, 10-ton power roller, pneumatic-tired roller, or other methods approved by the City Engineer. Embankments over and around all pipe culverts shall be of select material, placed and thoroughly tamped and compacted as directed by the City Engineer or his representative.

C. ROADWAY BASE

1. All roadways shall be constructed with a base course as described on the appropriate Charlotte Land Development Standard Detail Drawing.
2. The material for stone base course shall conform to the requirements of Section 1010, Aggregate for Non-Asphalt Flexible Type Base, and Section 520, Aggregate Base course of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
3. The stone base shall be compacted to 100% of the maximum density obtainable with the Modified Proctor Test (AASHTOT180) by rolling with ring or tamping roller or with a pneumatic tired roller with a minimum weight of ten tons. When completed, the base course shall be smooth, hard, dense, unyielding and well bonded.
4. A bituminous concrete base course, as specified on the Standard Detail Drawing may be substituted in lieu of a stone base course.
5. Asphalt base course will only be allowed within widening strips less than five (5) feet in width.

D. ROADWAY INTERMEDIATE AND SURFACE COURSE

1. All public roadways shall be constructed with an intermediate and surface course as described on the appropriate City of Charlotte Land Development Standard Detail Drawing.
2. Plant mixed asphalt shall conform in all respects to Section 610 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
3. The final (1) one inch lift of asphalt surface course for Residential Subdivision Streets shall be withheld until a minimum of (75%) Seventy-Five Percent of the Development is occupied (occupied means a certificate of occupancy has been issued) or at least (1) one year has lapsed from the application of the intermediate course layer (All documentation to be provided by the developer and approved by the City Inspector). All known base failures shall be repaired prior to application of the final one inch lift of asphalt surface course.
4. The City inspector shall be given a (24) twenty-four hour notification to inspect the intermediate course deficiencies. All deficiency repairs are to be monitored by a City Inspector and accepted prior to application of final layer.
5. City inspectors shall be notified prior to using recycled plant mixes.
6. Failure to meet the above requirements may result in the delay or prevention of street acceptance by the City of Charlotte or NCDOT.

E. SIDEWALKS AND DRIVEWAYS

1. Sidewalks shall be constructed of not less than 3600 P.S.I. concrete and shall be four (4) inches thick, constructed on an adequately graded base, except where a sidewalk crosses a driveway it shall be six (6) inches thick. Subgrade shall be compacted to 95% of the maximum density obtainable with the Standard Proctor Test. The surface of the sidewalk shall be steel trowel and light broom finished and cured with an acceptable curing compound. Tooled joints shall be provided at intervals of not less than five (5) feet and expansion joints at intervals of not more than forty-five (45) feet. The sidewalk shall have a desired lateral slope of 1.5% (2.00% maximum).
2. Planting strip adjacent to sidewalk shall be graded to ¼ inch per foot (min.) up to 1 ¼ inch per foot (max.), except where excessive natural grades make this requirement impractical. In such cases, the City Engineer may authorize a suitable grade.
3. Sidewalk widths shall be a minimum of five (5) feet unless otherwise specified. A 5' x 5' sidewalk is required at least every 200' as required by ADA for a passing zone unless otherwise provided by residential driveways, intersecting sidewalk, etc.
4. Approval of sidewalk construction plans must be obtained as part of the plan review process. Except in unusual circumstances, sidewalk must be located a minimum of (4) four feet from the back of the curb or at the back of the right-of-way. A recorded public sidewalk easement is required for all sidewalk located outside public right-of-way; the width shall be equal to the distance from the right-of-way line to the back of the sidewalk plus two feet or to the face of building, whichever is less. The sidewalk easement must be recorded with the Mecklenburg County Register of Deeds prior to issuance of a certificate of occupancy for the corresponding building(s).
5. Running slope of all accessible ramps shall be 7.5% (8.33% maximum). Accessible ramps are required where sidewalks intersect curbing at any street intersection and at Type III driveway connections.
6. For City projects only: On CLDS# 10.24A/B/C, 10.25(A/B/C/D only), and 10.27A/B, the curb and gutter across the front of the driveway shall be measured and paid for separately under Curb and Gutter (either 2'-0" valley gutter, vertical curb, or standard 2'-6" curb and gutter as specified on the details). The curb and gutter is to be measured per linear foot along the surface of the top of the curb. The concrete driveway apron is to be measured per square yard.
7. Refer to the WATCH Manual, MUTCD (latest edition), and the Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) for construction zone pedestrian routes and signalization and controls for actuators. Curb ramps shall be designed and constructed in accordance with the American Disability Act.
8. Contractor and/or design engineer is responsible for notifying the City when installing sidewalk adjacent to street grades that exceed 5%

Water Quality Basin Construction Specifications

A. Earthwork

1. The foundation area shall be cleared of trees, logs, stumps, roots, boulders, sod and unsuitable soil. If needed to establish vegetation, the topsoil shall be stockpiled and spread on the completed dam and spillways. The foundation area shall be thoroughly scarified before placement of the fill material.
2. Existing stream channels in the foundation area shall be sloped no steeper than a ratio of one horizontal to one vertical. They shall be depeened and widened as necessary to remove all stones, gravel, sand, stumps, roots, and other objectionable material and to accommodate compaction equipment. Foundation areas shall be kept free of standing water when fill is placed on them. The borrow areas shall be cleared of stumps, roots and unsuitable soil. The water quality basin shall be cleared and all stumps removed.
3. Before filling operations begin, the geotechnical engineer will take representative samples of each proposed fill material and test them to determine the compaction and classification characteristics (proctor test). Only those materials as approved by the geotechnical engineer will be used as fill on the dam. Generally sm or sc classification soils will be acceptable. Compacted earth fills shall be constructed to the elevations, lines, grades and cross sections indicated on the plans.
4. After stripping of foundations and removal of weak or unsuitable materials has been completed, and before start of material placement, compacted earth shall be used to fill all stump holes, minor excavations and depressions for cavities inside the earth fill limits.
5. Fill shall be placed in horizontal layers of not more than (9") loose depth. As soon as feasible after starting construction of a fill. The central portion therof shall be built and maintained slightly higher than the sides to allow free drainage to the side slopes.
6. Each layer of fill shall be compacted by rolling with compaction equipment which is best suited for the types of soil encountered. Fill adjacent to pipe conduit and antiseep collars shall be compacted by hand. Each layer of fill shall be compacted to not less than 95% maximum dry density (standard proctor) at optimum moisture content. Wetting or drying of the material and manipulation to secure uniform moisture content throughout each layer shall be required. Density tests will be performed at a frequency as specified by the geotechnical engineer. As a minimum, tests will be performed on every third lift or every 1000 cubic yards whichever comes first. Also density test will be performed whenever fill material characteristics change.

B. Outlet device

1. Outlet device components are to fabricated as shown on the plans.
2. Contractor to submit designed shop drawings to the civil engineer for approval prior to construction to the outlet device. Shop drawings should include precast box design, trach rack, grated cover, aluminum steps, and all drain/orifice piping required.

C. Concrete

1. All concrete shall conform to the standard specifications for ready mixed Concrete, ASTM C 94. An air-entraining admixture shall be added. The concrete shall be proportioned to meet the following requirements:

Compressive strength:	Minimum 3600 psi
Water-cement ratio:	0.40 - 0.50
Slump:	Minimum 3", maximum 5"
Air content:	Minimum 5%, maximum 8%
Coarse aggregate:	1" - 1 1/2"

D. Grassing

1. Grass all areas disturbed by construction per specification of erosion control detail sheet.

E. Planting

1. Wetland plantings shall be added as required by Charlotte-Mecklenburg BMP design manual. Planting shall be based on availability of plants listed in table on Sheet C410.

Water Quality Basin Operation & Maintenance Plan

A. Inspect monthly, or after every runoff-producing rainfall event, whichever comes first:

1. Remove debris from the trash rack.
2. Check and clear the orifice of any obstructions. If a pump is used as a draw down mechanism, check for pump operation.
3. Check the pond side slopes, remove trash, repair eroded areas before the next rainfall event.
4. If the pond is operated with a vegetated filter, check the filter for sediment accumulation, erosion and proper orientation of the flow spreader mechanism. Repair as necessary.

B. Quarterly

1. Inspect the collection system (ie: catch basins, piping, grassed swales) for proper functioning. Clear accumulated trash from basin grates, basin bottoms, and check piping for obstructions.
2. Check pond inlet pipes for undercutting, replace riprap, and repair broken pipes.
3. Reseed grassed swales, including the vegetated filter if applicable. Twice a year as necessary. Repair eroded areas immediately.

C. Every six months

1. Remove accumulated sediment from the bottom of the outlet structure.
2. Check the pond depth at various points in the pond. If depth is reduced to 75% of original design depth, sediment will be removed to at least original design depth.

D. As needed (general)

1. Mow the side slopes, not including normally submerged vegetated shelf, according to the season. Maximum grass height will be 6",
3. The orifice is designed to draw down the temporary pool in 4 days. If draw down is not accomplished in that time, the system may be clogged. The source of clogging must be found and eliminated.
4. All components of the storm water system must be kept in good working order.
5. Upon completion of the pond and project development, Charlotte-Mecklenburg Schools will be the resonsible party for operation and maintenance.

MERRICK & COMPANY
10211 MORSEFIELD SQUARE DRIVE, SUITE 530
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NC ENGINEERING FIRM F-0908 PHONE: 704.529.6500

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Suite 200
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REVISIONS:								
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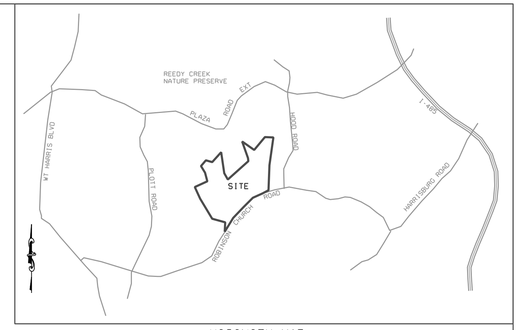
DESIGN BY:	EH/DJP	05/20/16
DRAWN BY:	EH/DJP	05/20/16
CHECKED BY:	RET	05/20/16
APPROVED BY:	ECM	05/20/16

The Reserve at Canyon Hills Ph. I
Charlotte, North Carolina

General Notes & Specifications

09/12/16

JOB NO: 65119033-01
DATE: 05/20/2016
SHEET C101



VICINITY MAP

I. ROBERT F. AKERS, JR.. A PROFESSIONAL LAND SURVEYOR IN NORTH CAROLINA. CERTIFY THAT THIS PROJECT WAS COMPLETED UNDER MY SUPERVISION FROM AN ACTUAL PHOTOGRAMMETRIC SURVEY MADE UNDER MY SUPERVISION; THAT THIS PHOTOGRAMMETRIC SURVEY WAS PERFORMED TO MEET FEDERAL GEOGRAPHIC DATA COMMITTEE (FGDC) STANDARDS FOR A FINAL MAP SCALE OF 1" = 50' AND A CONTOUR INTERVAL OF ONE FOOT USING IMAGERY WITH A NOMINAL SCALE OF 1" = 330' ; THAT THE IMAGERY WAS OBTAINED ON MARCH 10, 2008 AND THE PHOTOGRAMMETRIC SURVEY WAS COMPLETED ON MAY 17, 2016; THAT CONTOURS SHOWN AS BROKEN LINES MAY NOT MEET FGDC STANDARDS DUE TO OBSCURRED GROUND AND THAT ALL COORDINATES AND ELEVATIONS SHOWN ARE BASED ON NORTH CAROLINA GRID COORDINATES, AS SUPPLIED BY MERRICK & COMPANY.

ROBERT F. AKERS, JR. PLS L-2965

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR ROBERT F. AKERS, JR. NO. 2965

NORTH CAROLINA AVIOIMAGE MAPPING SERVICES, INC. NO. F-0810 CORPORATE LICENSE

TOPOGRAPHIC SURVEY

FOR

MERRICK & COMPANY

MECKLENBURG COUNTY TAX PARCEL 10818101

OWNED BY LIMITED PARTNERSHIP FARM PROPERTIES

CONTROL SURVEY BY MERRICK & COMPANY. BASED ON NCGS VIRTUAL REFERENCE STATION
ALL DATA NAD 83-2011 GRID COORDINATES - NAVD88 VERTICAL.
TOPOGRAPHIC MAPPING BY AVIOIMAGE MAPPING SERVICES, INC.
SCALE: 1" = 200' - PROJECT # AJ16020 - DATE: MAY 17, 2016

SCALE 1" = 200'

200 0 200 400 600

CONTOUR INTERVAL = 1 FT

AVIOIMAGE MAPPING SERVICES, INC.
4455 MORRIS PARK DRIVE - SUITE B
CHARLOTTE, NC 28227
PH: 704-573-7080 - E-MAIL: BOB@AVIOIMAGE.COM

Summary of Land

Reserve at Canyon Hills Phase 1 Gross Site Area:	89.05ac
Reserve at Canyon Hills Phase 1 Denuded Area:	63.2ac
Area in Future Phases	177.70ac
Total Number of Lots in Phase 1:	217
Proposed Density:	2.44 d.u./ac

Site Notes

1. Parcel #10818101:
   - Current Zoning: R-3
   - Developed as: R-3 (Cluster) (Cluster Provisions of the Zoning Ordinance Only)
   - Minimum Lot Area: 8,000 sq.ft.
   - Minimum Lot Width: 60 ft
   - Maximum Height: 40 ft
   - Maximum Density: 3.0 DU/ac

2. Proposed Setbacks:
   - Front (Garage): 20 ft
   - Front (House): 17 ft
   - Side Yard: 5 ft
   - Side Yard (Corner): 10 ft
   - Rear Yard: 30 ft

3. Tree Save Calculations:
   - Phase 1 Site Area: 89.05 ac
   - Ex Duke Power R/W: 0.83 ac
   - Ex S.S. Easement: 0.33 ac
   - Ex Pond: 1.49 ac
   - Net Site Area: 86.40 ac
   - Tree Save Area Required: 8.64 ac (10%)
   - Tree Save Area in COS: 11.95 ac (13.8%)
   - Tree Save Area Provided: 11.95 ac (13.8%)

4. Natural Area Calculations:
   - Phase 1 Site Area: 89.05 ac
   - Total Impervious Area: 30.18 ac
   - BUA: 34%
   - Planting Strip Area: 3.99 ac
   - Planting Strip Natural Credit: 2.99 ac
   - Ex R/W & SS Easement: 1.16 ac
   - Ex R/W & SS Easement Credit: 0.29 ac
   - Tree Save Area: 11.95 ac
   - Undisturbed Natural Area: 1.27 ac
   - Revegetated Natural Area: 2.71 ac
   - Natural Area Required: 15.58 ac (17.5%)
   - Natural Area Provided: 19.21 ac (21.6%)

5. Common Open Space Calculations:
   - Phase 1 Site Area: 89.05 ac
   - Common Open Space Required: 8.91 ac (10.0%)
   - Common Open Space Provided: 27.32 ac (30.7%)

6. Watershed Calculations:
   - Watershed: Yadkin SE Catawba
   - Total Impervious Area: 30.18 ac
   - BUA: 34%
   - Development Option: High-Density
   - Max Impervious Area per Lot: 3,489 sf

Legend

- Proposed R/W
- Property Line
- Proposed Lot Lines
- Proposed Edge of Pavement
- Proposed Tree Line
- PCO Buffer
- Existing DOT Maintenance R/W
- Proposed Treesave/ Undisturbed Natural Area in Common Open Space
- Surveyed Wetlands
- Revegetated Natural Area
- FEMA 100-yr Floodplain
- 100+1 Stormwater Elevation Line
- Construction Phase Line

Scale: 1" = 150'

0 75 150 300 450 600

N

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CHECKED BY: RET 05/20/16
APPROVED BY: ECM 05/20/16

The Reserve at Canyon Hills Ph. I
Charlotte, North Carolina

Overall Site Plan

09/12/16

JOB NO: 65119033-01
DATE: 05/20/2016
SHEET C201

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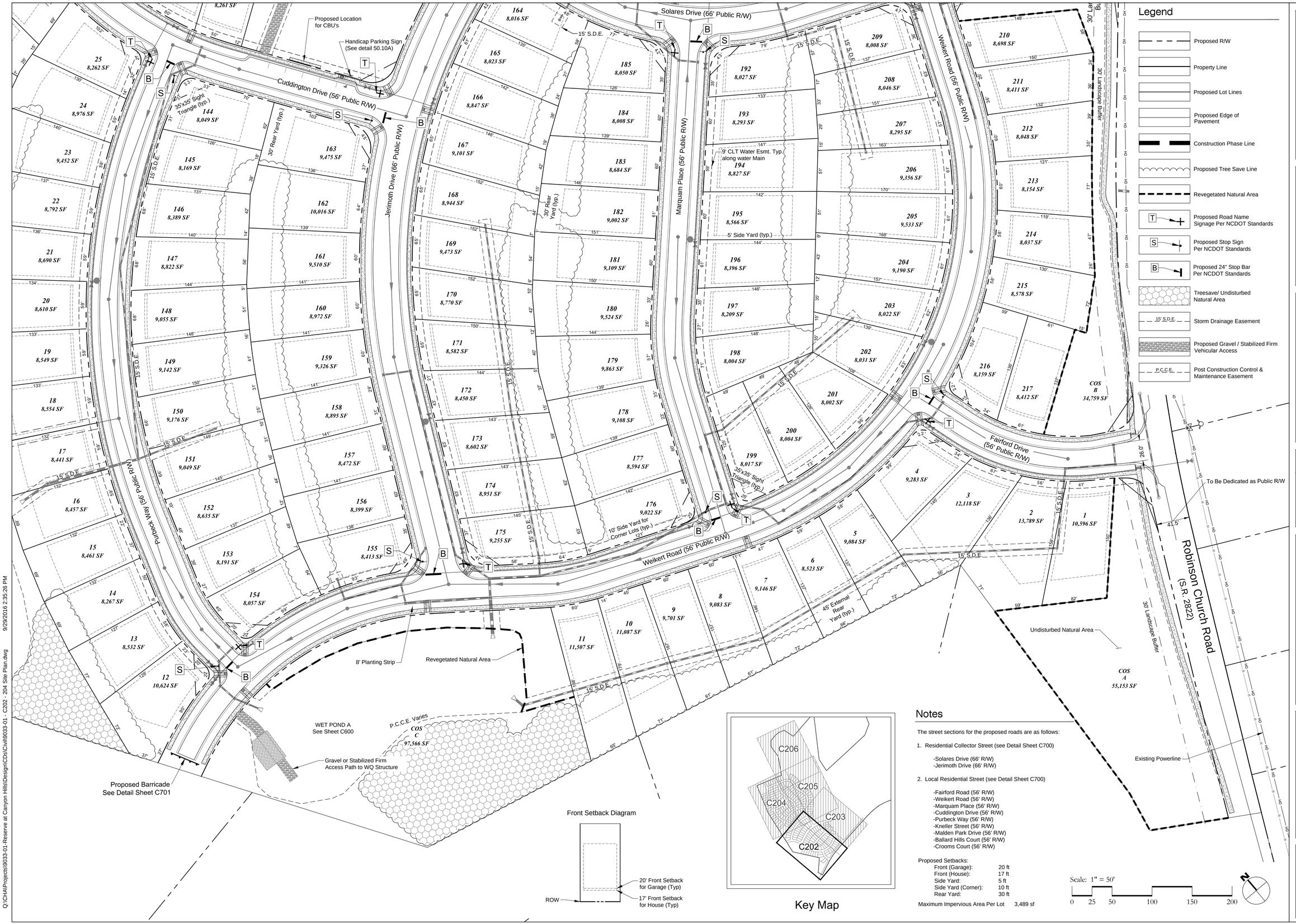

Legend

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- P.C.C.E. — Post Construction Control & Maintenance Easement

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   - -Weikert Road (56' R/W)
   - -Marquam Place (56' R/W)
   - -Cuddington Drive (56' R/W)
   - -Purbeck Way (56' R/W)
   - -Kneller Street (56' R/W)
   - -Malden Park Drive (56' R/W)
   - -Ballard Hills Court (56' R/W)
   - -Crooms Court (56' R/W)

Proposed Setbacks:

Front (Garage):	20 ft
Front (House):	17 ft
Side Yard:	5 ft
Side Yard (Corner):	10 ft
Rear Yard:	30 ft

Maximum Impervious Area Per Lot 3,489 sf

Scale: 1" = 50'

0 25 50 100 150 200

N

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CHARLOTTE, NC 28203
N.C. ENGINEERING FIRM # C-0928 PHONE: 704.329.6500

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The Reserve at Canyon Hills Ph. I

Charlotte, North Carolina

Site Plan

09/12/16

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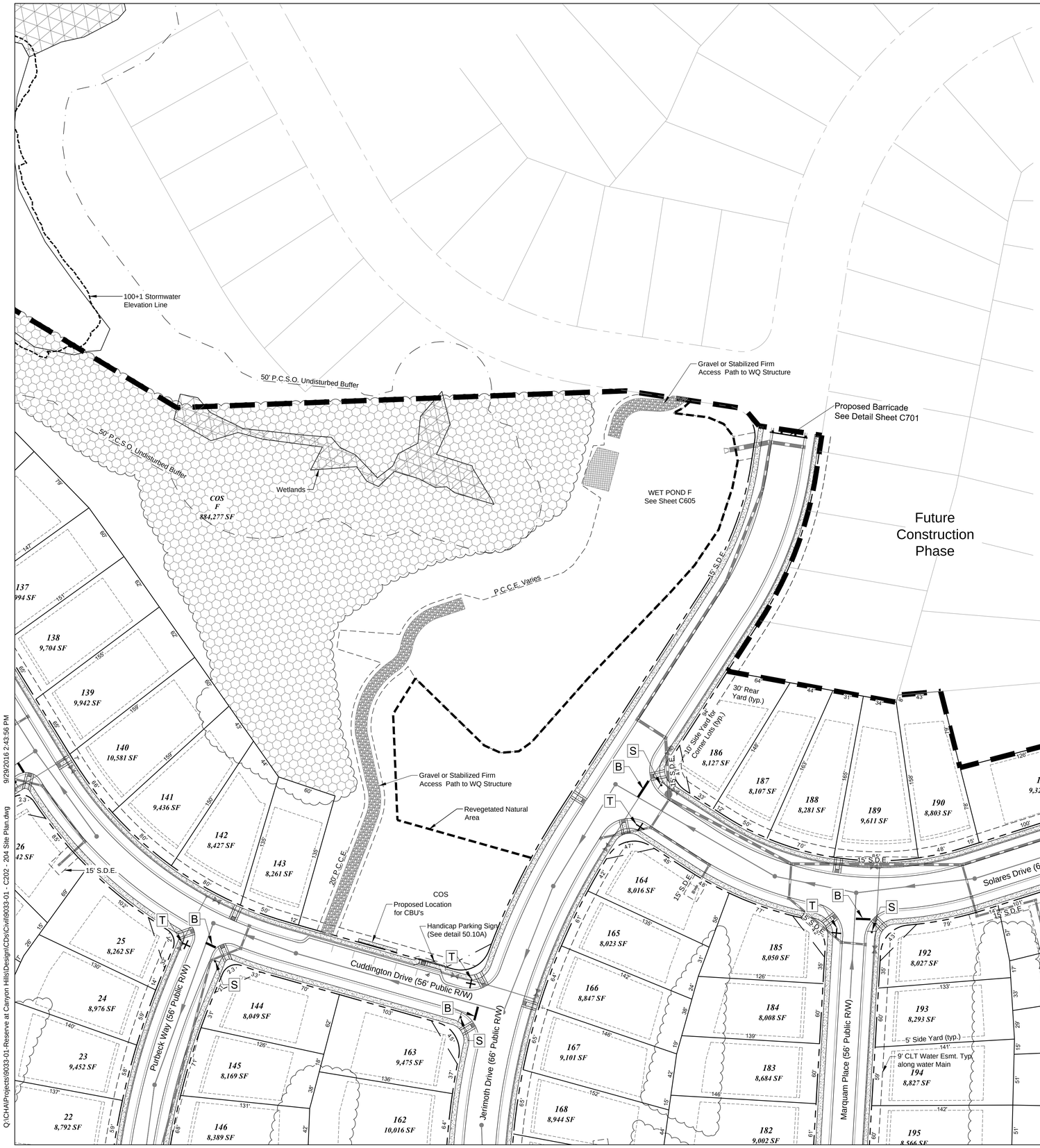
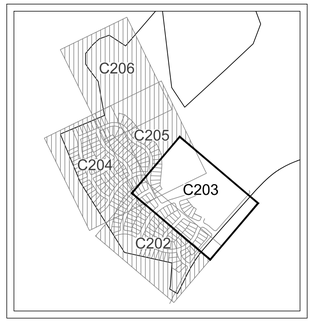
SHEET C202





Key Map

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The Reserve at Canyon Hills Ph. I
Charlotte, North Carolina

Site Plan

09/12/16

JOB NO: 6511903300-01
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SHEET C203

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Legend

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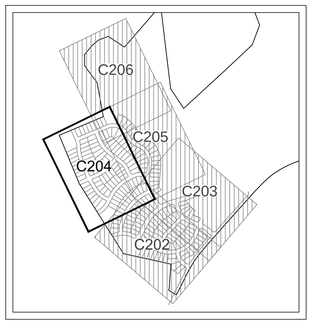
0 25 50 100 150 200



Key Map

MERRICK & COMPANY
1001 YORKSHEAD SQUARE DRIVE, SUITE 530
CHARLOTTE, NC 28203
N.C. ENGINEERING FIRM # C-0928
PHONE: (704) 329-6500

LGI HOMES
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05/20/16	05/20/16	05/20/16	05/20/16

The Reserve at Canyon Hills Ph. I

Charlotte, North Carolina

Site Plan

09/12/16

JOB NO: 65119033-01

DATE: 05/20/2016

SHEET C204

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Legend

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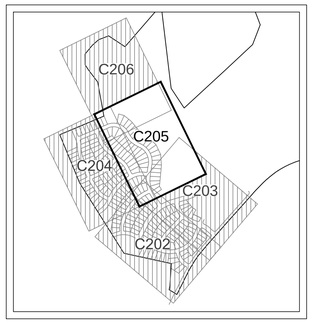

Key Map

Scale: 1" = 50'

0 25 50 100 150 200

Future Construction Phase

Phase 2
Phase 1

Existing Pond

100+1 Stormwater Elevation Line

100' P.C.S.O. Undisturbed Buffer

50' P.C.S.O. Undisturbed Buffer

Wetland Area

Top of Bank

STA: 11+65.61 100+1 WSEL: 674.29

STA: 12+65.61 100+1 WSEL: 675.1

STA: 13+65.61 100+1 WSEL: 676.08

Gravel or Stabilized Firm Access Path to WQ Structure

WET POND E See Sheet C604

WET POND D See Sheet C603

Revegetated Natural Area

20' S.S. Easement

P.C.C.E. Varies

Cuddington Drive (56' Public R/W)

Malden Park Drive (56' Public R/W)

Kneller Street (56' Public R/W)

Purbeck Way (56' Public R/W)

30' Rear Yard (typ.)

10' Side Yard for 8' Corner Lots (typ.)

5' Side Yard (typ.)

9' CLT Water Esmt. Typ. along water Main

15' S.D.E.

20' P.C.C.E.

COS F 884,277 SF

98	8,400 SF	114	9,302 SF	26	8,142 SF
97	8,400 SF	115	9,597 SF	27	8,106 SF
126	11,103 SF	116	10,057 SF	28	8,149 SF
127	10,584 SF	117	10,608 SF	29	8,415 SF
128	9,461 SF	118	10,068 SF	30	
129	8,884 SF	119	10,592 SF	25	8,262 SF
130	8,263 SF	120	9,731 SF	24	8,976 SF
131	9,460 SF	121	10,114 SF	23	9,452 SF
132	9,901 SF	122	10,500 SF	22	8,792 SF
133	9,905 SF	123	10,803 SF	144	8,049 SF
134	9,989 SF	56	8,156 SF	145	8,169 SF
135	9,989 SF	55	8,171 SF	146	8,389 SF
136	9,711 SF	54	8,075 SF	147	8,322 SF
137	8,994 SF	100	8,745 SF	101	8,772 SF
138	9,704 SF	102	11,373 SF	103	13,650 SF
139	9,942 SF	104	9,869 SF	105	9,339 SF
140	10,581 SF	106	8,639 SF	107	9,166 SF
141	9,436 SF	108	9,237 SF	109	10,306 SF
142	8,427 SF	110	11,922 SF	111	12,620 SF
143	8,261 SF	112	10,938 SF	113	9,783 SF

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The Reserve at Canyon Hills Ph. I

Charlotte, North Carolina

Site Plan

09/12/16

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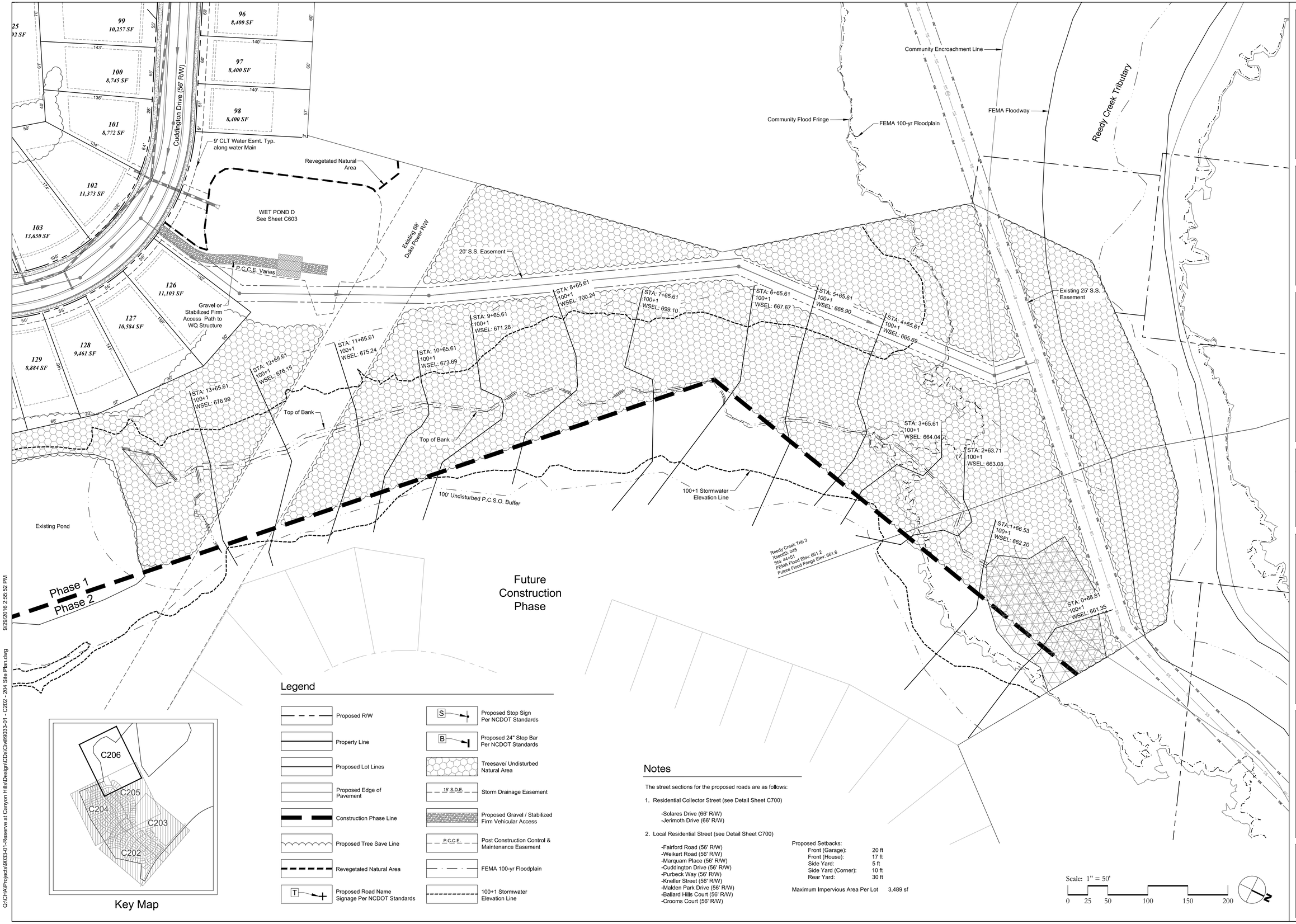

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The Reserve at Canyon Hills Ph. I

Charlotte, North Carolina

Site Plan

09/12/16

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