



May 16, 2019

Ms. Kelly Baraldi
Housing & Community Revitalization Manager
Wake County Government
Department of Affordable Housing & Community Revitalization
336 Fayetteville, Raleigh NC 27601

**Re: Sewer Connection and Easement Request
Wakefield Manor, LLC and
Wakefield Affordable Housing, LLC**

Dear Kelly,

Enclosed for your review are Mappings, Boundary Lines, Grid Coordinates and Sewer Analysis in connection with Sewer Easement Request to the Common Elements Area of Wakefield Manor, LLC and Wakefield Affordable Housing, LLC. DHIC, Inc. has been contacted by KB Home Carolinas to consider acceptance for additional sewer capacity usage from a potential new development of Townhomes at the southern location away from Wakefield Manor, LLC and Wakefield Affordable Housing, LLC, in Wake County, North Carolina.

DHIC, Inc. and its Legal Counsel have reviewed the information submitted and conclude there is **No Adverse Impact to any Real Property** of Wakefield Manor, LLC and Wakefield Affordable Housing, LLC. Moreover, the Downstream Sewer Analysis conducted by the Professional Engineering Company Withers Ravenel determined existing sewer pipe sizes to be adequately sufficient to handle current and additional service usage that are projected without exceeding capacity.

As a condition to the Sewer Easement request, it is necessary All Lienholders of Wakefield Manor, LLC and Wakefield Affordable Housing, LLC provide their consent and agree to a Subordination Agreement. The City of Raleigh ("COR") will review the Sewer Easement/ Improvements for which will be made dedicated to the COR to maintain/upkeep of sewer line maintenance. A plat will be recorded showing the sewer lines dedicated to the COR and a Sanitary Sewer Easement and Capacity Agreement will need to be signed.

DHIC, Inc. would greatly appreciate hearing back from you on consent to the Sewer Easement Access request. Should you have any questions, please do not hesitate to contact me at 919.615.3722; email rodney@dhic.org.

Sincerely,
Rodney Brown

Rodney Brown
Director of Asset Management
DHIC, Inc.

Enclosure



WithersRavenel

Our People. Your Success.

DOWNSTREAM SEWER ANALYSIS

Ponderosa Townhome Neighborhood Raleigh, NC

Prepared For:

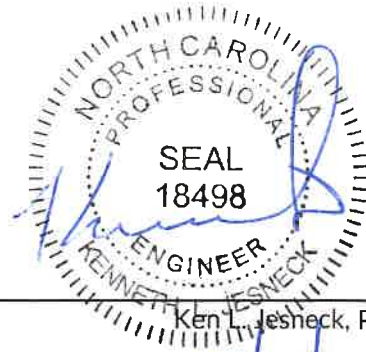
KB Home
4518 S. Miami Blvd., Suite 180
Durham, North Carolina 27703
ATTN: Grey Methven

Prepared By:

WithersRavenel
137 S. Wilmington St., Suite 200
Raleigh, NC 27601
(919) 469-3340
License No. C-0832

May 2019

WR No. 09190028



Ken L. Jesneck, PE

5/6/19

1.0 - PROJECT DESCRIPTION

WithersRavenel (WR) has completed an analysis of the capacity of portions of the existing wastewater collection system owned and operated by the City of Raleigh (City). The purpose of the analysis is to determine if the existing infrastructure has the capacity to accept flow from the proposed development and to determine what improvements are required to accept the anticipated wastewater flow from the proposed development. The Ponderosa Townhome Neighborhood is located on approximately 17 acres on Ponderosa Service Road in Raleigh, N.C. (PINs 1739476541, 1739374565, & 1739378667).

2.0 - PROJECTED WASTEWATER FLOW RATES

The analysis is based on an expected 94 residential units Ponderosa Townhomes will consist of. The project assumes all 94 units will be three-bedroom units. Based on 250gpd/bedroom for three-bedroom units, the anticipated flow average daily flow (ADF) for the project is 23,500 gpd. Using a peaking factor average ratio of 2.5, the peak flow for the project is expected to be 41 gpm. All flow will be discharged into the wastewater collection study area.

3.0 - EXISTING WASTEWATER COLLECTION SYSTEM FLOWS

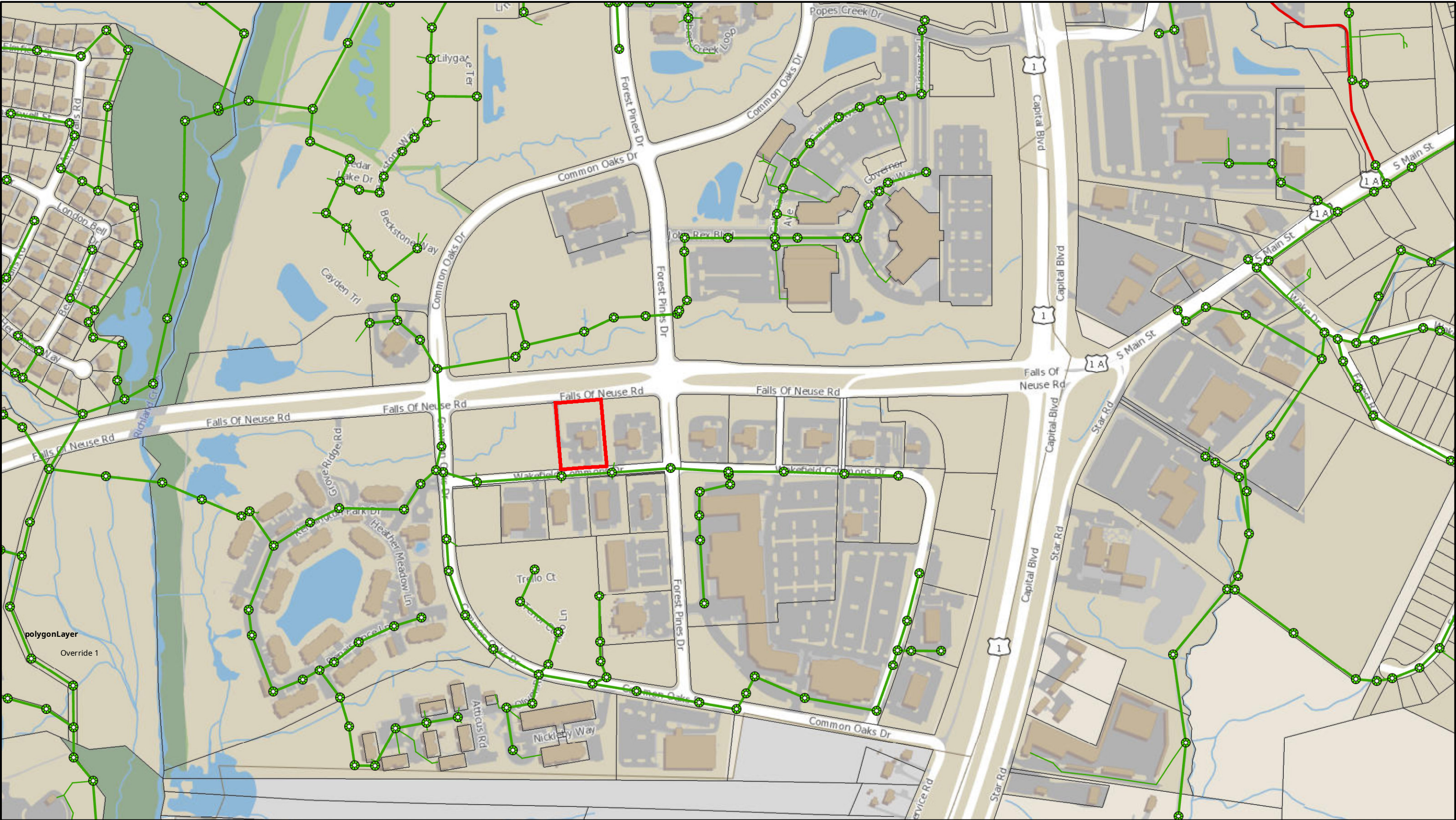
The wastewater collection in the area South of Falls of Neuse Road along Common Oaks Drive is comprised of 12" and 8" gravity sewer from Falls of Neuse Road down to the connection point at Nickleby Way. Commercial, retail and residential units discharge to the wastewater collection system.

The wastewater collection system was surveyed to determine the slope of each line segment. A spreadsheet was developed to determine the capacity of each sewer segment and its corresponding percent flow of capacity. The data is present in attached table (Appendix A).

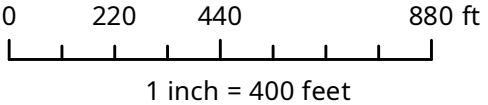
4.0 - CONCLUSIONS AND RECOMMENDATIONS

Based on the results from the analysis table, none of the sewer segments exceed 50% capacity with the existing flow. Upon entering the proposed flow from the Ponderosa Townhomes, none of the pipe segments have risen above the 50% flow capacity of the pipes. In all cases the pipe sizes are adequate in handling the existing and proposed flows.

APPENDIX A



Sewer Study Area



Disclaimer
iMaps makes every effort to produce and publish the most current and accurate information possible. However, the maps are produced for information purposes, and are **NOT** surveys. No warranties, expressed or implied, are provided for the data therein, its use, or its interpretation.

Ponderosa Downstream Sewer Analysis



Ponderosa Sewer Analysis

Flow (Half or Full)

=

Θ =

n/nfull =

full

6.2832

1

Minimum Slopes per

Diameter of Pipe

(in)

6

8

10

12

14

15

16

18

21

24

27

30

36

Minimum Slope

(feet per 100 feet)

0.6

0.4

0.28

0.22

0.17

0.15

0.14

0.12

0.1

0.08

0.07

0.06

0.05

Proposed Flow

Type

1 bed

2 bed

3 bed

Quantity (ea)

94

Flow Rate (gal/day)

240

250

Total =

Total Flow (gal/day)

23,500

23,500

Proposed Flow (GPM)

16.32

Peaking Factor

2.5

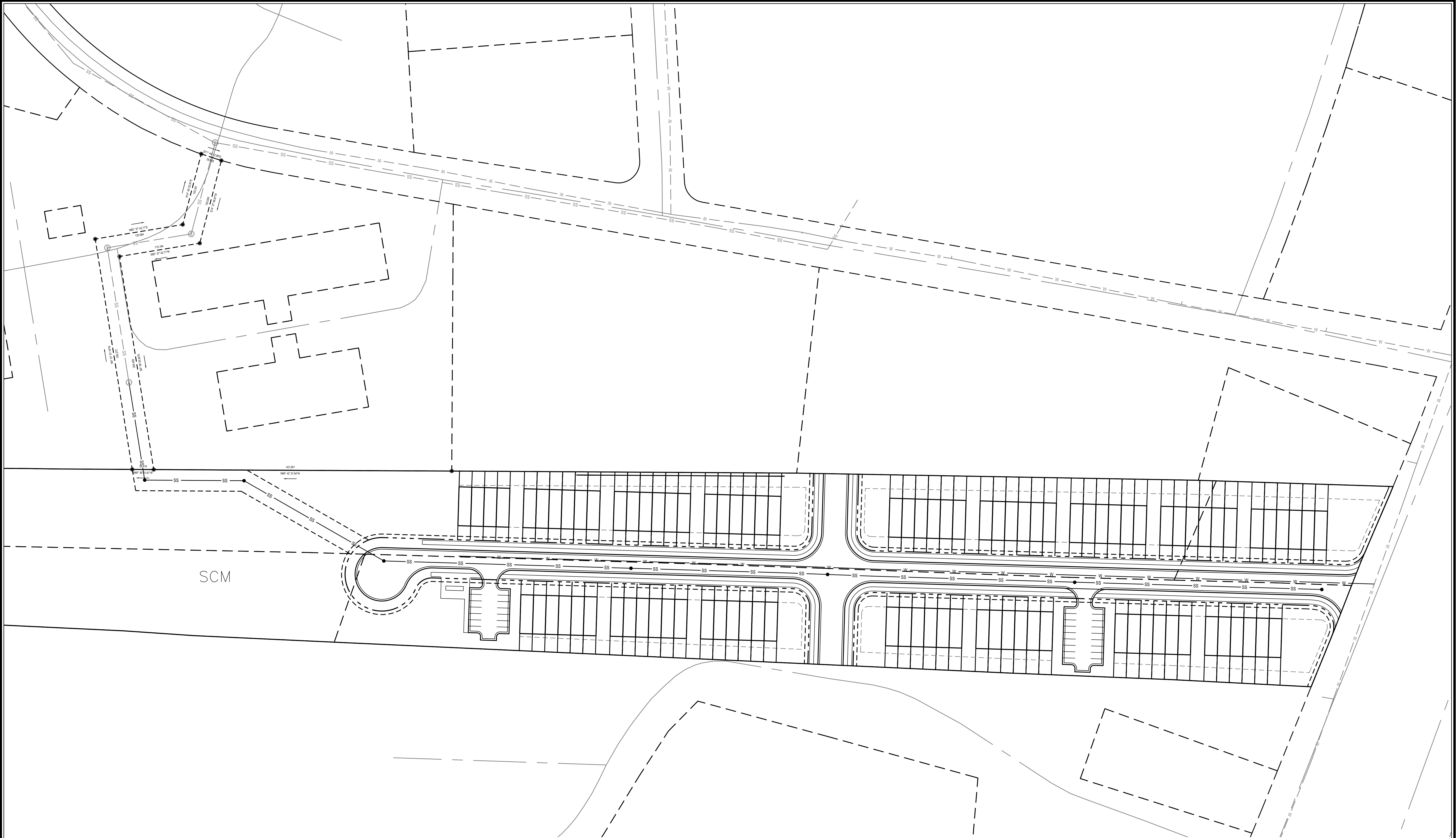
Proposed Peak Flow (GPM)

40.80

Pipe Section Number	Start	End	Estimated Flow (GPM)	Proposed Peak Flow (GPM)	Cumulative Flow (GPM)	Diameter (in)	Material	Length (ft)	Change in Elevation (ft)	Slope (S)	Roughness Coefficient (n)	Flow Area (ft^2) at Full	Hydraulic Radius (ft) for Full	Wetted Perimeter (ft) for Full	Flow (cfs)	Flow (gal/s)	Flow (gpm)	Max Pipe Storage Capacity (gpm)	Observed % of Flow Capacity	Observed Size
1	SSMH #1	SSMH #2		40.80	136.29	16	Polyvinyl Chloride	250.8	0.89	0.35	0.013	1.40	0.33	4.19	4.58	34.28	2057.04	2057	7%	Pipe size adequate
2	SSMH #2	SSMH #3		40.80	136.29	16	Polyvinyl Chloride	248.25	0.15	0.06	0.013	1.40	0.33	4.19	1.89	14.15	848.82	848	16%	Pipe size adequate
3	SSMH #3	SSMH #5		40.80	136.29	16	Polyvinyl Chloride	384.06	0.59	0.15	0.013	1.40	0.33	4.19	3.02	22.56	1353.44	1353	10%	Pipe size adequate
4	SSMH #5	SSMH #6	2.08	42.88	136.29	16	Polyvinyl Chloride	42.09	0.75	1.78	0.013	1.40	0.33	4.19	10.27	76.82	4609.50	4609	3%	Pipe size adequate
5	SSMH #6	SSMH #7	2.08	42.88	134.21	16	Polyvinyl Chloride	184.28	0.15	0.08	0.013	1.40	0.33	4.19	2.20	16.42	985.19	985	14%	Pipe size adequate
6	SSMH #7	SSMH #8	14.08	54.88	132.13	8	Polyvinyl Chloride	188.34	2.31	1.23	0.013	0.35	0.17	2.09	1.34	10.04	602.28	602	22%	Pipe size adequate
7	SSMH #8	SSMH #9	14.17	54.97	118.05	8	Polyvinyl Chloride	128.06	2.70	2.11	0.013	0.35	0.17	2.09	1.76	13.16	789.66	789	15%	Pipe size adequate
8	SSMH #9	SSMH #10	4.58	45.38	58.50	8	Polyvinyl Chloride	285.98	0.15	0.50	0.013	0.35	0.17	2.09	0.86	6.41	384.55	384	15%	Pipe size adequate
9	SSMH #10	SSMH #11	2.5	43.30	99.30	8	Polyvinyl Chloride	133.35	9.68	7.26	0.013	0.35	0.17	2.09	3.26	24.42	1465.23	1465	7%	Pipe size adequate
10	SSMH #11	SSMH #12		40.80	96.80	8	Polyvinyl Chloride	90.99	0.49	0.54	0.013	0.35	0.17	2.09	0.89	6.65	399.09	399	24%	Pipe size adequate
11	SSMH #12	SSMH #13	27.15	67.95	96.80	8	Polyvinyl Chloride	31.21	1.16	3.72	0.013	0.35	0.17	2.09	2.34	17.47	1048.45	1048	9%	Pipe size adequate
12	SSMH #13	SSMH #14	19.75	60.55	69.65	8	Polyvinyl Chloride	296.33	6.15	2.08	0.013	0.35	0.17	2.09	1.75	13.06	783.46	783	9%	Pipe size adequate
13	SSMH #14	SSMH #15		40.80	49.90	8	Polyvinyl Chloride	137.75	4.78	3.47	0.013	0.35	0.17	2.09	2.26	16.88	1013.06	1013	5%	Pipe size adequate
14	SSMH #15	SSMH #16		40.80	49.90	8	Polyvinyl Chloride	211.17	3.63	1.72	0.013	0.35	0.17	2.09	1.59	11.88	713.02	713	7%	Pipe size adequate
15	SSMH #16	SSMH #17		40.80	49.90	8	Polyvinyl Chloride	192.54	1.27	0.66	0.013	0.35	0.17	2.09	0.98	7.36	441.68	441	11%	Pipe size adequate
16	SSMH #17	SSMH #18		40.80	49.90	8	Polyvinyl Chloride	230.12	10.06	4.37	0.013	0.35	0.17	2.09	2.53	18.95	1137.07	1137	4%	Pipe size adequate
17	SSMH #18	SSMH #19	6.6	47.40	49.90	8	Polyvinyl Chloride	126.28	7.72	6.11	0.013	0.35	0.17	2.09	3.00	22.41	1344.64	1344	4%	Pipe size adequate
18	SSMH #19	SSMH #20		40.80	43.30	8	Polyvinyl Chloride	112.99	2.37	2.10	0.013	0.35	0.17	2.09	1.75	13.13	787.63	787	6%	Pipe size adequate
19	SSMH #20	SSMH #21	2.5	43.30	43.30	8	Polyvinyl Chloride	188.44	13.35	7.08	0.013	0.35	0.17	2.09	3.23	24.13	1447.50	1447	3%	Pipe size adequate

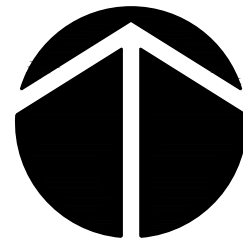
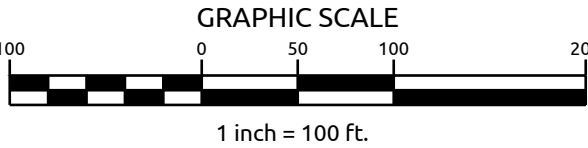


137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com



UTILITY NOTES:
- ALL WATERLINES SHOWN ON PLAN ARE 8"
- ALL SEWERLINES SHOWN ON PLAN ARE 8"
- ALL SEWER MANHOLES ARE 4' IN DIAMETER

PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION



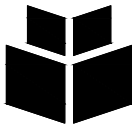
No.	Revision	Date	By

Designer	CT	Scale	1" = 60'
Drawn By	DB	Date	03/12/19
Checked By	CT	Job No.	09190028

PONDEROSA
WAKE COUNTY

NC

SITE EXHIBIT



WithersRavenel
Engineers | Planners | Surveyors

115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

Sheet No.
EX-S

THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS.

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	199.38'	605.00'	18°52'57"	S 61°22'29" E	198.48'
C2	30.03'	605.00'	2°50'39"	S 72°08'57" E	30.03'

WAKEFIELD HILLS CONDOS
DEED BOOK 11693 PAGE 757

WAKEFIELD HILLS CONDOS
DEED BOOK 11693 PAGE 757

WAKEFIELD AFFORDABLE HOUSING LLC
UN9 BM 2007-430A1

WAKEFIELD HILLS CONDOS
DEED BOOK 11693 PAGE 757

WAKEFIELD AFFORDABLE
HOUSING LLC
UN10 BM 2007-430A1

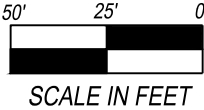
N.C.G.S.
"CHAPPELL"
NAD 83 (NSRS2007)
N.C. GRID COORDS.
N=799,626.92
E=2,136,571.19
C.G.F.: 0.99993423

N:797711.8631
E:2134053.0905

TIE TO THE COMMON CORNER OF
NEW TREAT 24 WAKEFIELD COMMERCIAL
WAKEFIELD COMMONS
S 89°39'56" E 411.62'

LEGEND
IPF-IRON PIPE FOUND
EASEMENT
BOUNDARY LINE
BOUNDARY LINE NOT SURVEYED

CITY OF RALEIGH SANITARY
SEWER EASEMENT



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SCALE: 1"=50'

DATE: 3-31-19

**EXHIBIT MAP OF
WAKEFIELD HILLS CONDOS
PROPERTY**

WithersRavenel

Engineers | Planners | Surveyors

Wakefield Hills Condo Property

30' City of Raleigh Sanitary Sewer Easement

Beginning at a point on the common property line with James Baxter Adams Ponderosa 10813, LCC, said point being the following call from NCGS Survey Monument "CHAPPELL", said monument having NC grid coordinates of (NAD 83 – 2007) of N=799,626.92, E=2,136,571.19, said call is South 52°44'51" West 3163.93 feet to the point of beginning, thence from said beginning point along the common property line of James Baxter Adams Ponderosa 10813, North 89°36'05" West 30.43 feet to a point, thence leaving common property line North 09°15'42" West 327.83 feet to a point, thence North 78°23'10" East 118.18 feet to a point, thence North 15°18'02" East 101.81 feet to a point on the right of way of Common Oaks Drive, thence with said right of way of Common Oaks Drive (Variable Width Public R/W) along a curve to the left having an arc distance of 30.03 feet, a radius of 605.00 feet and chord bearing and distance of South 72°08'57" East 30.03 feet to a point, thence leaving said right of way South 15°18'02" West 118.89 feet to a point, thence South 78°23'10" West 107.80 feet to a point, thence South 09°15'42" East 304.14 feet to a point and place of beginning containing 0.371 acres more or less.