PROGRESS PLOT DATE: 08-01-2022

# KNIGHTDALE - CREEKVIEW CROSSING

# MASTER PLAN

## TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

ST. MATTHEWS TOWNSHIP

ZMA - 5 - 21

**SITE INFORMATION:**

| | | |
|---|---|---|
| LOCATION: | 4325 OLD FAISON RD | |
| COUNTY: | WAKE | |
| PARENT PIN: | 1744711175, 1744910921, 1744619718, 1744920445, 1744811114, 1744713798. | |
| CURRENT ZONING: | RT | |
| PROPOSED ZONING: | PD - GR3 | |
| ACREAGE: | 102.06 AC | |
| LAND CLASS: | RESIDENTIAL | |
| MINIMUM BUILDING SETBACKS: | SINGLE FAMILY | TOWNHOME |
| FRONT YARD: | 10' | 20' |
| SIDE YARD: | 20% LOT WIDTH | 0' (10' BETWEEN BUILDINGS ) |
| REAR YARD: | 25' | 15' |
| CORNER YARD: | 10' | N/A |

LOT ACREAGE:

| | |
|---|---|
| TOTAL NUMBER PROPOSED LOTS: | 283 |
| PROPOSED DENSITY: | 2.77 DU/AC |
| MINIMUM ALLOWED LOT SIZE: | 2,000 SF |
| MINIMUM PROPOSED LOT SIZE: | 2,000 SF |
| MAXIMUM PROPOSED LOT SIZE: | 15,115 SF (LOT 59) |
| AVERAGE PROPOSED LOT SIZE: | 3,676 SF |
| MINIMUM ALLOWABLE LOT WIDTH: | 20' |
| MINIMUM PROPOSED LOT WIDTH: | 20' |

LOT TYPE BREAKDOWN:

| | |
|---|---|
| TOWNHOMES (20'X100'): | 35 UNITS |
| 3 STORY TOWNHOMES (20'X100'): | 27 UNITS |
| SINGLE FAMILY (30'X110'): | 81 UNITS |
| SINGLE FAMILY (60'X120'): | 44 UNITS |
| SINGLE FAMILY (70'X120'): | 24 UNITS |
| BUILDING (70'X135'): | 72 UNITS |

OPEN SPACE BREAKDOWN:

| | |
|---|---|
| PROPERTY BOUNDARY: | 4,445,645 SF (102.06 AC) |
| REQUIRED OPEN SPACE : | 322,344 SF (7.4 AC) |
| IMPROVED OPEN SPACE REQUIRED : | 80,586 SF (1.85 AC) |
| PROVIDED OPEN SPACE: | 2,713,860 SF (62.30 AC) |
| PASSIVE OPEN SPACE PROVIDED : | 165,972 SF (3.81 AC) |
| ACTIVE OPEN SPACE PROVIDED : | 216,753 SF (4.98 AC) |
| PARK: | 60,710 SF (1.39 AC) |
| PARK WITH BENCHES: | 27,185 SF (0.62 AC) |
| PARK WITH FIRE PIT: | 78,077 SF (1.79 AC) |
| PLAYGROUND: | 17,058 SF (0.39 AC) |
| POOL AREA: | 25,000 SF (0.57 AC) |
| TRAILS: | 72,810 SF (1.67 AC) |
| GREENWAY: | 68,630 SF (1.58 AC) |
| BOCCE: | 33,255 SF (0.76 AC) |
| PRESERVED OPEN SPACE: | 2,331,135 SF (53.52 AC) |
| TREE COVERAGE: | 2,331,135 SF (53.52 AC) |

IMPERVIOUS AREAS:

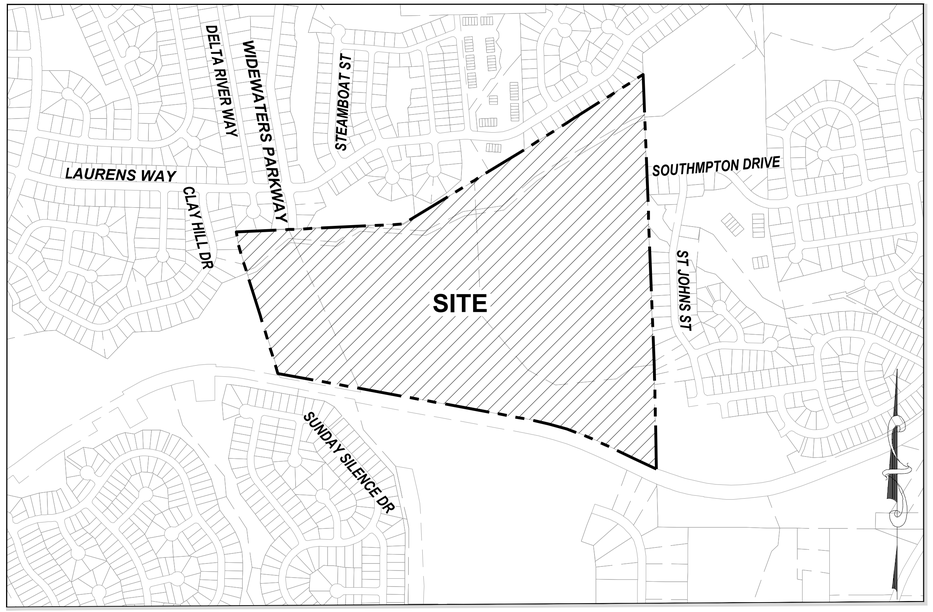
| | |
|---|---|
| PARKING PROVIDED: | 147 |
| ROADWAYS / PARKING: | 352,377 SF (8.09 AC) |
| SIDEWALKS: | 88,946 SF (2.04 AC) |
| 20' LOTS (1,400 SF/UNIT): (AVG) | 86,800 SF (1.99 AC) |
| 30' LOTS (1,500 SF/UNIT): (AVG) | 121,500 SF (2.79 AC) |
| 60' LOTS (2,100 SF/UNIT): (AVG) | 92,400 SF (2.12 AC) |
| 70' LOTS (2,100 SF/UNIT): (AVG) | 50,400 SF (1.16 AC) |
| BUILDING UNIT (7,800 SF/12 UNITS): (AVG) | 46,800 SF (1.07 AC) |
| TOTAL ON-SITE IMPERVIOUS AREA: | 839,223 SF (19.27 AC) |
| TOTAL ON-SITE IMPERVIOUS PERCENT: | 18.88% |

UTILITY DEMANDS:

| | |
|---|---|
| SEWAGE USAGE: | 70,750 GPD<br>250 GPD / RESIDENTIAL UNIT X 283 UNITS |
| WATER USAGE: | 70,750 GPD<br>250 GPD / RESIDENTIAL UNIT X 283 UNITS |

STREET TYPE SUMMARY:

| | |
|---|---|
| 54' ROW SECTION: | 5,670 LF |
| 64' ROW SECTION: | 3,717 LF |
| CONNECTIVITY INDEX: | 1.52 |




**VICINITY MAP**

1" =500'

**OWNER:**

ELLIS DEVELOPMENTS NC, LLC
C/O STRONG ROCK DEVELOPMENT COMPANY
8362 SIX FORKS RD.
SUITE 104 RALEIGH, NC 27615
919-770-4174 (P)
CONTACT: JOSH LAMBERT
josh@strongrockdev.com

**SURVEYOR:**

TAYLOR LAND CONSULTANTS
5448 APEX PEAKWAY
APEX, NC 27502
919-801-1104 (O)
919-337-7998 (M)
CONTACT: JEREMY TAYLOR, PLS
jeremy@taylorlc.com

**ENVIRONMENTAL:**

SAGE ECOLOGICAL SERVICES
3707 SWIFT DRIVE
RALEIGH, NORTH CAROLINA, 27606
919-559-1537
CONTACT: SEAN CLARK
sclark@sageecological.com

**CIVIL ENGINEERING:**

STRONG ROCK ENGINEERING GROUP, PLLC
PO BOX 55992
RALEIGH, NC 27624
COMPANY LICENSE #: P-2166
CONTACT: JOSH LAMBERT, PE
984.200.1932 (O)
josh@strongrockgroup.com

| SHEET INDEX | |
|---|---|
| C-0.0 | COVER SHEET |
| C-1.0 | OVERALL EXISTING CONDITIONS |
| C-1.1 | DETAILED EXISTING CONDITIONS |
| C-1.2 | DETAILED EXISTING CONDITIONS |
| C-2.0 | OVERALL SITE PLAN |
| C-2.1 | DETAILED SITE PLAN |
| C-2.2 | DETAILED SITE PLAN |
| C-2.3 | DETAILED SITE PLAN |
| C-2.4 | DETAILED SITE PLAN |
| C-2.5 | OPEN SPACE PLAN |
| C-2.6 | SITE AND STREET DETAILS |
| C-3.0 | OVERALL UTILITY PLAN |
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| C-3.4 | DETAILED UTILITY PLAN |
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| C-4.2 | DETAILED STORMWATER PLAN |
| C-4.3 | DETAILED STORMWATER PLAN |
| C-4.4 | DETAILED STORMWATER PLAN |
| C-5.0 | OVERALL LANDSCAPE PLAN |
| C-5.1 | DETAILED LANDSCAPE PLAN |
| C-5.2 | DETAILED LANDSCAPE PLAN |
| C-6.0 | OVERALL LIGHTING PLAN |
| C-6.1 | DETAILED LIGHTNG PLAN |
| C-6.2 | DETAILED LIGHTING PLAN |
| C-7.0 | OVERALL SIGNS AND MARKINGS PLAN |
| C-7.1 | DETAILED SIGNS AND MARKINGS PLAN |
| C-7.2 | DETAILED SIGNS AND MARKINGS PLAN |
| E-1.0 | HODGE RD AND LYNNWOOD IMPROVEMENTS PLAN |
| E-2.0 | WIDEWATERS PARKWAY & LAURENS WAY IMPROVEMENTS PLAN |
| E-3.0 | CARRINGTON DRIVE & SMITHFIELD ROAD IMPROVEMENTS PLAN |

Know what's below. Call before you dig.

| PUBLIC INFRASTRUCTURE QUANTITIES TABLE | | |
|---|---|---|
| SEWER: | | |
| MANHOLES | 57 | EA |
| 8" PUBLIC SANITARY SEWER | 8,191 | LF |
| SEWER SERVICES | 283 | EA |
| WATER: | | |
| 8" PUBLIC WATERMAIN | 9,374 | LF |
| WATER SERVICES | 283 | EA |
| FIRE HYDRANT ASSEMBLIES | 29 | EA |
| 8" GATE VALVES | 28 | EA |
| 8" X 8" TEES | 8 | EA |
| 8" X 8" CROSS | 1 | EA |
| 8" BLOW OFF ASSEMBLIES | 5 | EA |
| CONCRETE/ASPHALT: | | |
| PUBLIC STREETS | 9,387 | LF |
| PRIVATE ALLEYS | 6,102 | LF |
| PUBLIC 5' SIDEWALK | 17,789 | LF |
| 30" CURB & GUTTER | 18,020 | LF |
| GREENWAY | 4,014 | LF |
| SITE DATA: | | |
| NUMBER OF LOTS | 283 (UNITS) | |
| GPD USAGE WATER | 70,750 | |
| GPD USAGE SEWER | 70,750 | |
| CALCULATION FOR GPD WATER (PER UNIT) | 250 | |
| CALCULATION FOR GPD SEWER (PER UNIT) | 250 | |

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT


STRONG ROCK ENGINEERING GROUP
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM


| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA
***MASTER PLAN***
**COVER SHEET**

DRAWING SHEET
**C-0.0**

**01 OF 33**

PROGRESS PLOT DATE: 08-01-2022

## GENERAL NOTES:

1. BOUNDARY TAKEN FROM THE SURVEY PREPARED BY TAYLOR LAND CONSULTANTS.
2. TOPOGRAPHIC INFORMATION TAKEN FROM THE SURVEY PREPARED BY TRIANGLE AERIAL SURVEYS LLP.
3. WETLAND AND STREAM DELINEATION BY SAGE ECOLOGICAL SERVICES, INC.
4. THE SUBJECT PROPERTY IS LOCATED IN ZONE X AE IN ACCORDANCE WITH FIRM MAP #3720174400J, EFFECTIVE ON MAY 2, 2006.

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

SEAL

STRONGROCK ENGINEERING GROUP

STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM

| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**OVERALL EXISTING CONDITIONS**

DRAWING SHEET

**C-1.0**

**02 OF 33**

GRAPHIC SCALE

150 0 75 150 300 600

( IN FEET )
1 inch = 150 ft.

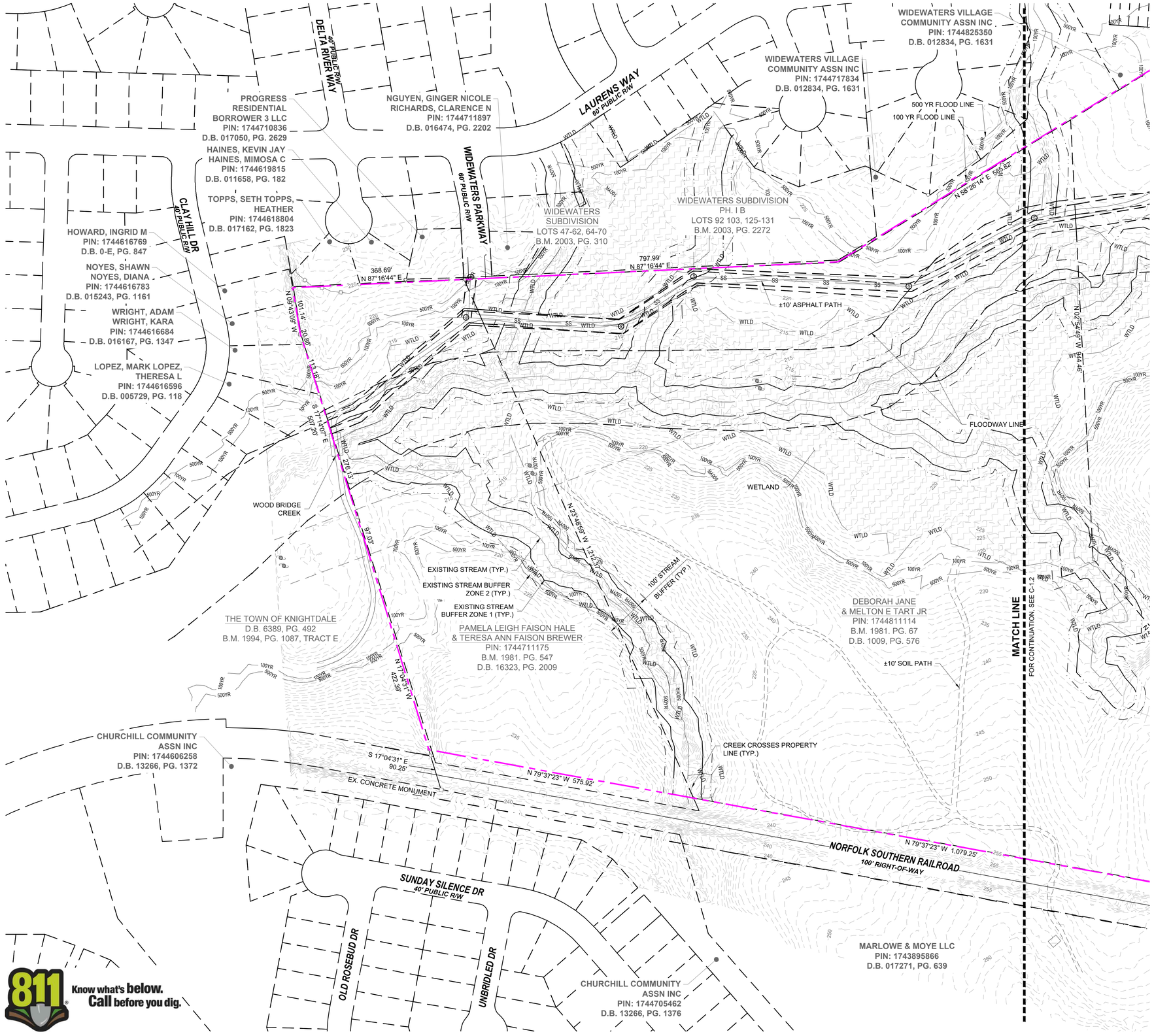
## LEGEND:

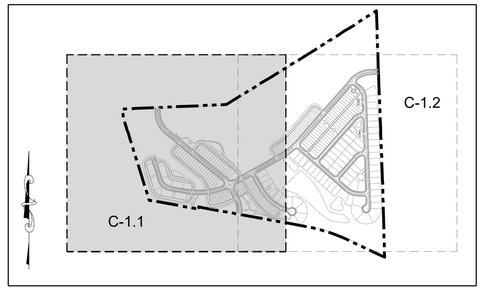
- MASTER PLAN BOUNDARY
- EXISTING ADJOINER PROPERTY LINE
- 1' CONTOUR
- EXISTING TREE LINE
- EXISTING BUFFER
- EXISTING STREAM
- EXISTING STREAM BUFFER - ZONE 2
- EXISTING STREAM BUFFER - ZONE 1
- EXISTING POND
- EXISTING CART PATH
- EXISTING ROW LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WELL
- EXISTING SANITARY SEWER MANHOLE
- EXISTING WETLAND

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | RADIUS | LENGTH | CHORD | BEARING |
| C1 | 3699.59' | 176.51' | 176.49' | N 64°48'33" W |
| C2 | 2064.68' | 395.00' | 394.40' | N 73°48'45" W |

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

PROGRESS PLOT DATE: 08-01-2022




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-1.0 FOR LEGEND

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT


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| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED EXISTING CONDITIONS**

DRAWING SHEET

**C-1.1**

**03 OF 33**

PROGRESS PLOT DATE: 08-01-2022

WIDEWATERS VILLAGE COMMUNITY ASSN INC
PIN: 1744825350
D.B. 012834, PG. 1631

THE TOWN OF KNIGHTDALE
D.B. 8095, PG. 1115
PIN: 1754-02-0595

SOUTHAMPTON DRIVE
60' PUBLIC R/W

LARSON, JOHN D JR
EVERETT, TINA M
PIN: 1744926142
D.B. 016560, PG. 2110

TOWNE, CHARLTON C
TOWNE, ANNA M
PIN: 1744927033
D.B. 016921, PG. 349

LEWIS LANDING COMMUNITY ASSOC INC
PIN: 1744916876
D.B. 009210, PG. 2584

UWANDJI, KISASE JEAN
PIN: 1744916782
D.B. 11144, PG. 750

JONES, LITISHA M
PIN: 1744916682
D.B. 010713, PG.02088

MURPHY, JENNIFER
MURPHY, ERIC
PIN: 1744916584
D.B. 15030, PG. 644

HALL, BRUCE R II
PIN: 1744916497
D.B.017450, PG. 01256

RABON, PHILIP A
RABON, NICHOLE N
PIN: 1744916399
D.B.013291, PG. 2092

THOMPSON, HANNAH
PIN: 1744916392
D.B.016110, PG. 182

CROSBY, NEAL
PIN: 1744916294
D.B. 016666, PG. 1950

SUITE, TYLER M SUITE, DANIELLE B
PIN: 1744917106
D.B. 015658, PG. 2335

TORTOLA PL
50' PUBLIC R/W

CARIBBEAN CT'
50' PUBLIC R/W

JERNIGAN, JOAN H
PIN: 1744917018
D.B. 010437, PG. 2060

ROBINSON, RENEE
PIN: 1744917020
D.B. 015150, PG. 2453

STEVENS, JAMES E
STEVENS, SHANNAN COLLEEN
PIN: 1744907962
D.B. 011366, PG. 2542

PATTERSON, STEPHANIE KRISTINE
PIN: 1744907962
D.B. 015057, PG. 1772

LARA-CUBAS, MARLON YUNIOR ELIAS, LESLIE C
PIN: 1744907789
D.B. 016543, PG. 1012

N/F
BROOKEFIELD STATION DEVELOPMENT, LLC
B.M. 1997, PG. 1014, TRACT 2B
D.B. 11783, PG. 1

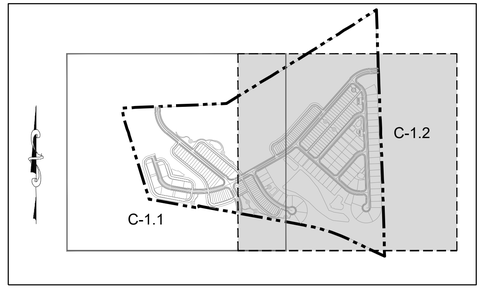
PAMELA LEIGH FAISON HALE
& TERESA ANN FAISON BREWER
PIN: 1744910921
B.M. 1981. PG. 547
D.B. 16323, PG. 2009

DEBORAH JANE
& MELTON E TART JR
PIN: 1744811114
B.M. 1981. PG. 67
D.B. 1009, PG. 576

MARLOWE & MOYE LLC
PIN: 1743895866
D.B. 017271, PG. 639

500 YR FLOOD LINE
100 YR FLOOD LINE
FLOODWAY LINE
WETLAND
EXISTING STREAM
EXISTING STREAM BUFFER ZONE 2
EXISTING STREAM BUFFER ZONE 1
100' STREAM BUFFER (TYP.)
±10' ASPHALT PATH
±10' SOIL PATH
EX. POND
MATCH LINE
FOR CONTINUATION, SEE C-1.1
NORFOLK SOUTHERN RAILROAD
100' RIGHT-OF-WAY
ST JOHNS ST
60' PUBLIC R/W

N 59°26'14" E 405.66'
N 59°26'14" E 585.82'
N 20°52'49" W 514.49'
N 70°17'09" W 500.00'
S 84°17'29" W 397.39'
S 82°30'31" W 151.43'
S 54°56'08" W 140.31'
N 61°23'36" W 223.17'
S 01°01'51" E 727.62'
S 02°12'28" E 1,320.49'
N 79°37'23" W 1,079.25'
N 79°17'36" W 136.79'
N 66°30'17" W 140.62'
N 66°33'05" W 228.49'




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-1.0 FOR LEGEND

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

STRONGROCK
ENGINEERING GROUP
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM

| STRONG ROCK PROJECT | | | |
|---|---|---|---|
| DATE | | | |
| SCALE | AS SHOWN | DESIGNED BY | JWL |
| | | DRAWN BY | JWL |
| | | CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED EXISTING CONDITIONS**

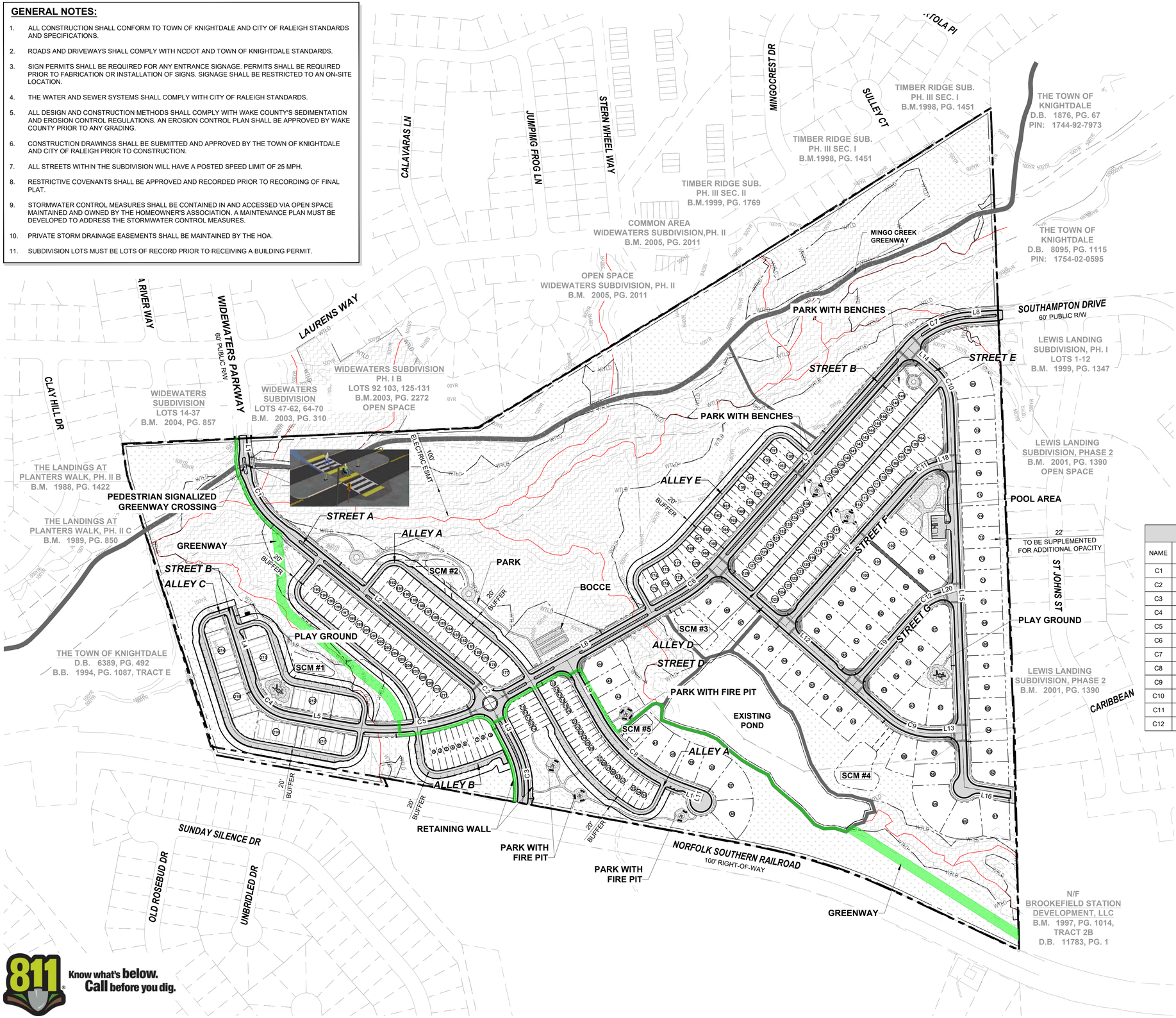
DRAWING SHEET
**C-1.2**

**04 OF 33**

PROGRESS PLOT DATE: 08-01-2022

## GENERAL NOTES:

1. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF KNIGHTDALE AND CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. ROADS AND DRIVEWAYS SHALL COMPLY WITH NCDOT AND TOWN OF KNIGHTDALE STANDARDS.
3. SIGN PERMITS SHALL BE REQUIRED FOR ANY ENTRANCE SIGNAGE. PERMITS SHALL BE REQUIRED PRIOR TO FABRICATION OR INSTALLATION OF SIGNS. SIGNAGE SHALL BE RESTRICTED TO AN ON-SITE LOCATION.
4. THE WATER AND SEWER SYSTEMS SHALL COMPLY WITH CITY OF RALEIGH STANDARDS.
5. ALL DESIGN AND CONSTRUCTION METHODS SHALL COMPLY WITH WAKE COUNTY'S SEDIMENTATION AND EROSION CONTROL REGULATIONS. AN EROSION CONTROL PLAN SHALL BE APPROVED BY WAKE COUNTY PRIOR TO ANY GRADING.
6. CONSTRUCTION DRAWINGS SHALL BE SUBMITTED AND APPROVED BY THE TOWN OF KNIGHTDALE AND CITY OF RALEIGH PRIOR TO CONSTRUCTION.
7. ALL STREETS WITHIN THE SUBDIVISION WILL HAVE A POSTED SPEED LIMIT OF 25 MPH.
8. RESTRICTIVE COVENANTS SHALL BE APPROVED AND RECORDED PRIOR TO RECORDING OF FINAL PLAT.
9. STORMWATER CONTROL MEASURES SHALL BE CONTAINED IN AND ACCESSED VIA OPEN SPACE MAINTAINED AND OWNED BY THE HOMEOWNER'S ASSOCIATION. A MAINTENANCE PLAN MUST BE DEVELOPED TO ADDRESS THE STORMWATER CONTROL MEASURES.
10. PRIVATE STORM DRAINAGE EASEMENTS SHALL BE MAINTAINED BY THE HOA.
11. SUBDIVISION LOTS MUST BE LOTS OF RECORD PRIOR TO RECEIVING A BUILDING PERMIT.




## LEGEND:

- EXISTING PROPERTY LINE
- STREET LIGHT
- SIGN
- WHEELCHAIR RAMP
- ROADWAY CENTER LINE
- PROPOSED PROPERTY LINE
- STANDARD CURB & GUTTER
- DRAINAGE EASEMENT
- CONCRETE SIDEWALK
- ASPHALT PAVEMENT
- OPEN SPACE
- ACTIVE OPEN SPACE
- WETLAND

### LINE TABLE

| NAME | ROADWAY | LENGTH | DIRECTION | BEGIN STATION | END STATION |
|---|---|---|---|---|---|
| L1 | STREET A | 62.93' | S3°24'42"E | 10+00.00 | 10+62.93 |
| L2 | STREET A | 809.00' | S50°47'35"E | 13+11.02 | 21+20.02 |
| L3 | STREET A | 144.51' | S27°27'08"E | 22+42.23 | 23+86.74 |
| L4 | STREET B | 261.92' | S17°27'00"E | 10+00.00 | 12+61.92 |
| L5 | STREET B | 184.74' | S79°37'23"E | 14+24.69 | 16+09.42 |
| L6 | STREET B | 675.48' | N60°30'31"E | 21+31.31 | 28+06.79 |
| L7 | STREET B | 947.62' | N41°20'11"E | 29+74.10 | 39+21.71 |
| L8 | STREET B | 92.19' | N85°43'42"E | 41+54.15 | 42+46.34 |
| L9 | STREET C | 216.84' | S29°29'29"E | 10+00.00 | 12+16.84 |
| L10 | STREET C | 80.98' | S69°57'50"E | 15+69.68 | 16+50.66 |
| L11 | STREET C | 23.00' | S20°02'10"W | 16+50.66 | 16+73.66 |
| L12 | STREET D | 746.63' | S48°39'49"E | 10+00.00 | 17+46.63 |
| L13 | STREET D | 85.20' | N87°50'51"E | 19+17.41 | 20+02.61 |
| L14 | STREET E | 114.13' | S48°39'49"E | 10+00.00 | 11+14.13 |
| L15 | STREET E | 1254.21' | S2°09'09"E | 12+35.90 | 24+90.11 |
| L16 | STREET E | 152.27' | S80°51'26"E | 24+90.11 | 26+42.38 |
| L17 | STREET F | 639.76' | N41°20'11"E | 10+00.00 | 16+39.76 |
| L18 | STREET F | 56.44' | N72°50'51"E | 17+22.26 | 17+78.69 |
| L19 | STREET G | 329.83' | N41°20'11"E | 10+00.00 | 13+29.83 |
| L20 | STREET G | 56.44' | N72°50'51"E | 14+12.33 | 14+68.76 |

### CURVE TABLE

| NAME | ROADWAY | RADIUS | ARC LENGTH | CHORD LENGTH | CHORD DIRECTION | BEGIN STATION | END STATION |
|---|---|---|---|---|---|---|---|
| C1 | STREET A | 300.00' | 248.09' | 241.08' | S27°06'09"E | 10+62.93 | 13+11.02 |
| C2 | STREET A | 300.00' | 122.21' | 121.37' | S39°07'22"E | 21+20.02 | 22+42.23 |
| C3 | STREET A | 300.00' | 188.25' | 185.18' | S9°28'32"E | 23+86.74 | 25+74.99 |
| C4 | STREET B | 150.00' | 162.77' | 154.90' | S48°32'11"E | 12+61.92 | 14+24.69 |
| C5 | STREET B | 750.00' | 521.88' | 511.41' | N80°26'34"E | 16+09.42 | 21+31.30 |
| C6 | STREET B | 500.00' | 167.31' | 166.53' | N50°55'21"E | 28+06.79 | 29+74.09 |
| C7 | STREET B | 300.00' | 232.44' | 226.67' | N63°31'56"E | 39+21.71 | 41+54.15 |
| C8 | STREET C | 500.00' | 352.84' | 345.56' | S49°42'27"E | 12+16.84 | 15+69.67 |
| C9 | STREET D | 225.00' | 170.78' | 166.71' | S70°24'29"E | 17+46.63 | 19+17.41 |
| C10 | STREET E | 150.00' | 121.77' | 118.45' | S25°24'29"E | 11+14.13 | 12+35.89 |
| C11 | STREET F | 150.00' | 82.50' | 81.46' | N57°05'31"E | 16+39.76 | 17+22.25 |
| C12 | STREET G | 150.00' | 82.50' | 81.46' | N57°05'31"E | 13+29.83 | 14+12.32 |

### USPS NOTE

CLUSTER MAILBOXES TO BE LOCATED WITHIN NEIGHBORHOOD OPEN SPACE. KIOSK LOCATION SHALL BE APPROVED BY USPS PRIOR TO SUBDIVISION APPROVAL. IF TEMPORARY LOCATIONS ARE REQUIRED, APPROVAL OF LOCATIONS SHALL BE RECEIVED FROM USPS. MAIL KIOSK WILL HAVE ADA COMPLIANT RAMPS AND PARKING SPACES.

GRAPHIC SCALE

150 0 75 150 300 600

( IN FEET )
1 inch = 150 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

STRONGROCK ENGINEERING GROUP

STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM

| STRONG ROCK PROJECT | | |
|---|---|---|
| | DATE | |
| | SCALE | AS SHOWN |
| | DESIGNED BY | JWL |
| | DRAWN BY | JWL |
| | CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**OVERALL SITE PLAN**

DRAWING SHEET
**C-2.0**

**05 OF 33**

PROGRESS PLOT DATE: 08-01-2022

**LEGEND:**

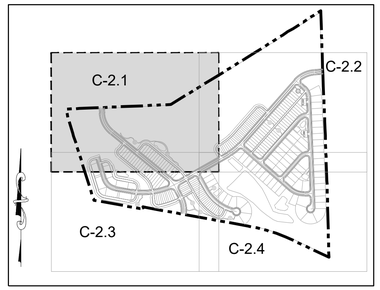
SEE SHEET C-2.0 FOR LEGEND, LINE AND CURVE TABLES

GRAPHIC SCALE

60 0 30 60 120 240

( IN FEET )

1 inch = 60 ft.




SITE KEY PLAN

LAURENS WAY

WIDEWATERS PARKWAY
60' PUBLIC R/W

WIDEWATERS SUBDIVISION
LOTS 14-37
B.M. 2004, PG. 857

WIDEWATERS SUBDIVISION
LOTS 47-62, 64-70
B.M. 2003, PG. 310

WIDEWATERS SUBDIVISION
PH. I B
LOTS 92 103, 125-131
B.M. 2003, PG. 2272

THE LANDINGS AT PLANTERS WALK, PH. II B
B.M. 1988, PG. 1422

THE LANDINGS AT PLANTERS WALK, PH. II C
B.M. 1989, PG. 850

PEDESTRIAN SIGNALIZED GREENWAY CROSSING

STREET A (64' PUBLIC ROW)

STREET B (54' PRIVATE ROW)

STREET B (64' PUBLIC ROW)

ALLEY A (20' PRIVATE ROW)

ALLEY B (20' PRIVATE ROW)

ALLEY C (20' PRIVATE ROW)

ALLEY E (20' PRIVATE ROW)

PARK

BOCCE

SCM #1

SCM #2

DUMPSTER LOCATION

10' GREENWAY EASEMENT

30' GREENWAY EASEMENT

100' ELECTRIC ESMT

20' ACCESS AND MAINTENANCE EASEMENT

20' BUFFER

MATCH LINE
FOR CONTINUATION, SEE C-2.3

MATCH LINE
FOR CONTINUATION, SEE C-2.2

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

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| | |
|---|---|
| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED SITE PLAN**

DRAWING SHEET

**C-2.1**

**06 OF 33**

PROGRESS PLOT DATE: 08-01-2022

**LEGEND:**

SEE SHEET C-2.0 FOR LEGEND, LINE AND CURVE TABLES

OPEN SPACE
WIDEWATERS SUBDIVISION, PH. II
B.M. 2005, PG. 2011

SOUTHAMPTON DRIVE
60' PUBLIC R/W

LEWIS LANDING
SUBDIVISION, PH. I
LOTS 1-12
B.M. 1999, PG. 1347

PARK WITH BENCHES

ALLEY D
(20' PRIVATE ROW)

STREET B
(64' PUBLIC ROW)

PARK WITH BENCHES

ALLEY E
(20' PRIVATE ROW)

MATCH LINE
FOR CONTINUATION SEE C-2.1

SCM #3

MATCH LINE
FOR CONTINUATION, SEE C-2.4

STREET D
(54' PUBLIC ROW)

20' ACCESS AND MAINTENANCE EASEMENT

20' BUFFER

22' TO BE SUPPLEMENTED FOR ADDITIONAL OPACITY

22' BUFFER

POOL AREA

STREET F
(54' PUBLIC ROW)

STREET E
(54' PUBLIC ROW)

STREET G
(54' PUBLIC ROW)

ST JOHNS ST

4 BICYCLE PARKING SPACES

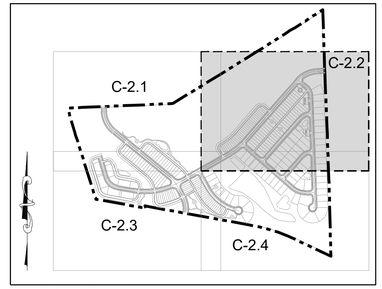
TRAIL

MAIL KIOSK WITH OVERHEAD SHELTER 5' BEYOND FOOTPRINT

LEWIS LANDING
SUBDIVISION, PHASE 2
B.M. 2001, PG. 1390
OPEN SPACE

25'X25' SIGHT TRIANGLE (TYP.)

**SITE KEY PLAN**




GRAPHIC SCALE
60 0 30 60 120 240
( IN FEET )
1 inch = 60 ft.

Know what's below. Call before you dig.

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

SEAL


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| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED SITE PLAN**

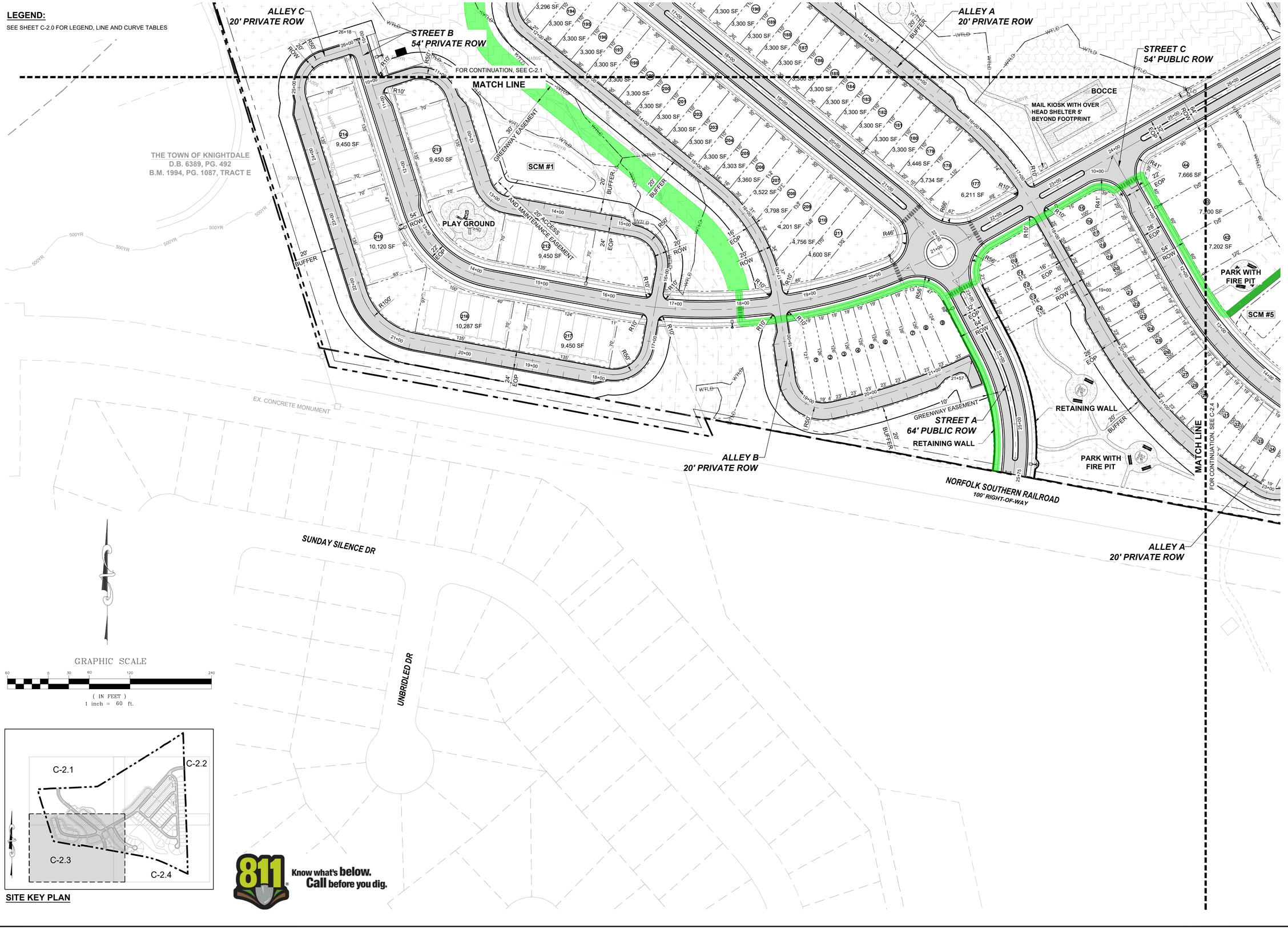
DRAWING SHEET
**C-2.2**

**07 OF 33**

PROGRESS PLOT DATE: 08-01-2022

**LEGEND:**

SEE SHEET C-2.0 FOR LEGEND, LINE AND CURVE TABLES




GRAPHIC SCALE

60 0 30 60 120 240

( IN FEET )
1 inch = 60 ft.




SITE KEY PLAN

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT


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6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM


| | |
|---|---|
| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

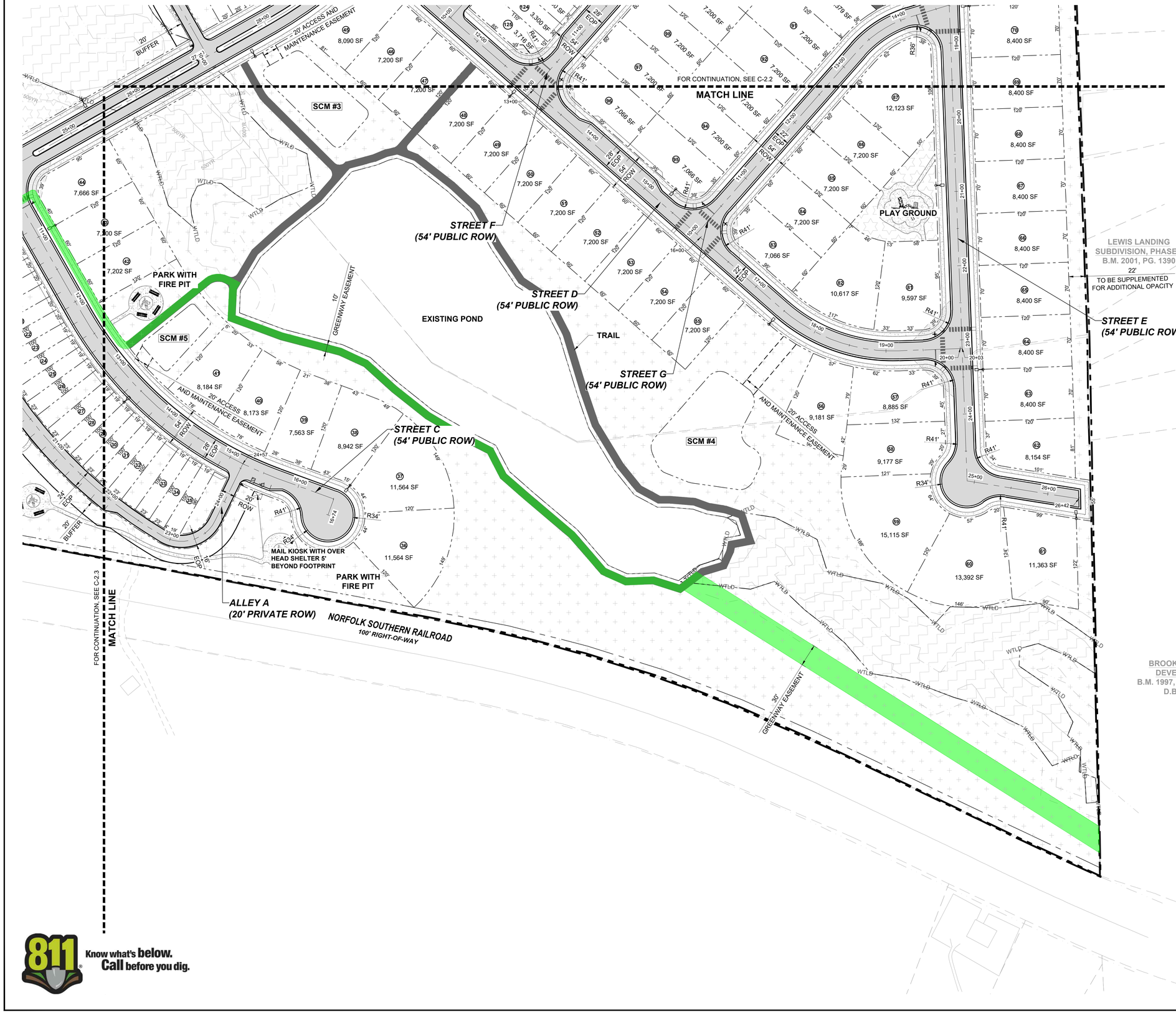
**DETAILED SITE PLAN**

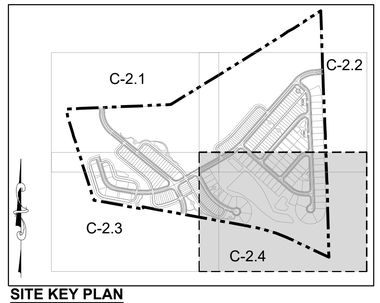
DRAWING SHEET

**C-2.3**

**08 OF 33**

PROGRESS PLOT DATE: 08-01-2022




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-2.0 FOR LEGEND, LINE AND CURVE TABLES

GRAPHIC SCALE

60 0 30 60 120 240

( IN FEET )
1 inch = 60 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

SEAL


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| STRONG ROCK PROJECT | | | |
|---|---|---|---|
| | DATE | | |
| | SCALE | AS SHOWN | |
| | DESIGNED BY | JWL | |
| | DRAWN BY | JWL | |
| | CHECKED BY | JWL | |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED SITE PLAN**

DRAWING SHEET

**C-2.4**

**09 OF 33**

PROGRESS PLOT DATE: 08-01-2022

**LEGEND:**

- EXISTING PROPERTY LINE
- ROADWAY CENTER LINE
- PROPOSED PROPERTY LINE
- PASSIVE AND PRESERVED OPEN SPACE
- ACTIVE OPEN SPACE
- PRESERVED OPEN SPACE
- WETLANDS

| | AREA |
|---|---|
| ACTIVE OPEN SPACE | 216,753 SF (4.98 AC) |
| PASSIVE OPEN SPACE | 165,972 SF(3.81 AC) |
| PRESERVED OPEN SPACE | 2,331,135 SF (53.52 AC) |
| TOTAL | 2,713,860 (62.30) |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |


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| | |
|---|---|
| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**OPEN SPACE PLAN**

DRAWING SHEET

**C-2.5**

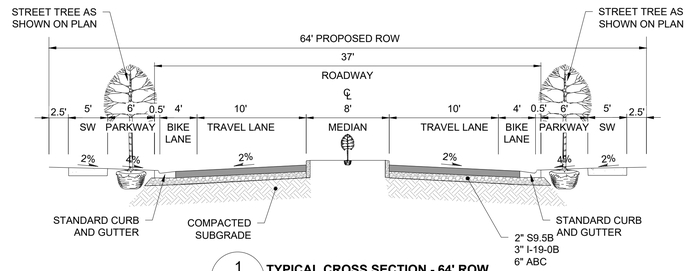
**10 OF 33**

GRAPHIC SCALE

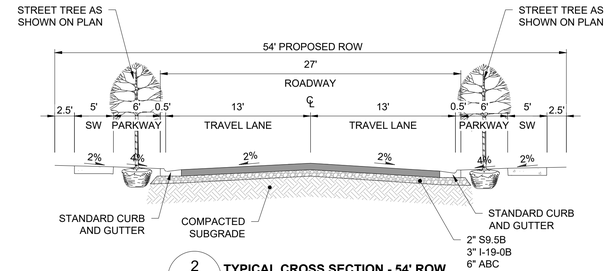
150 0 75 150 300 600

( IN FEET )
1 inch = 150 ft.

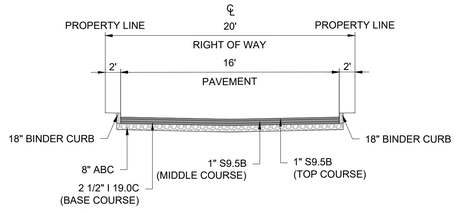
811 Know what's below. Call before you dig.



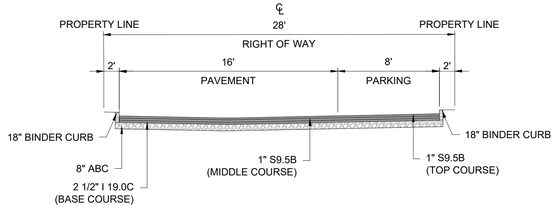

1 C-2.6 **TYPICAL CROSS SECTION - 64' ROW**
SCALE: NTS



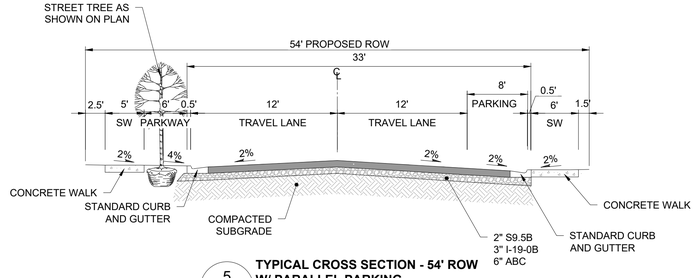

2 C-2.6 **TYPICAL CROSS SECTION - 54' ROW**
SCALE: NTS




3 C-2.6 **TYPICAL CROSS SECTION - 20' REAR ALLEY**
SCALE: NTS




4 C-2.6 **TYPICAL CROSS SECTION - 28' REAR ALLEY W/ PARALLEL PARKING**
SCALE: NTS




5 C-2.6 **TYPICAL CROSS SECTION - 54' ROW W/ PARALLEL PARKING**
SCALE: NTS

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

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| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

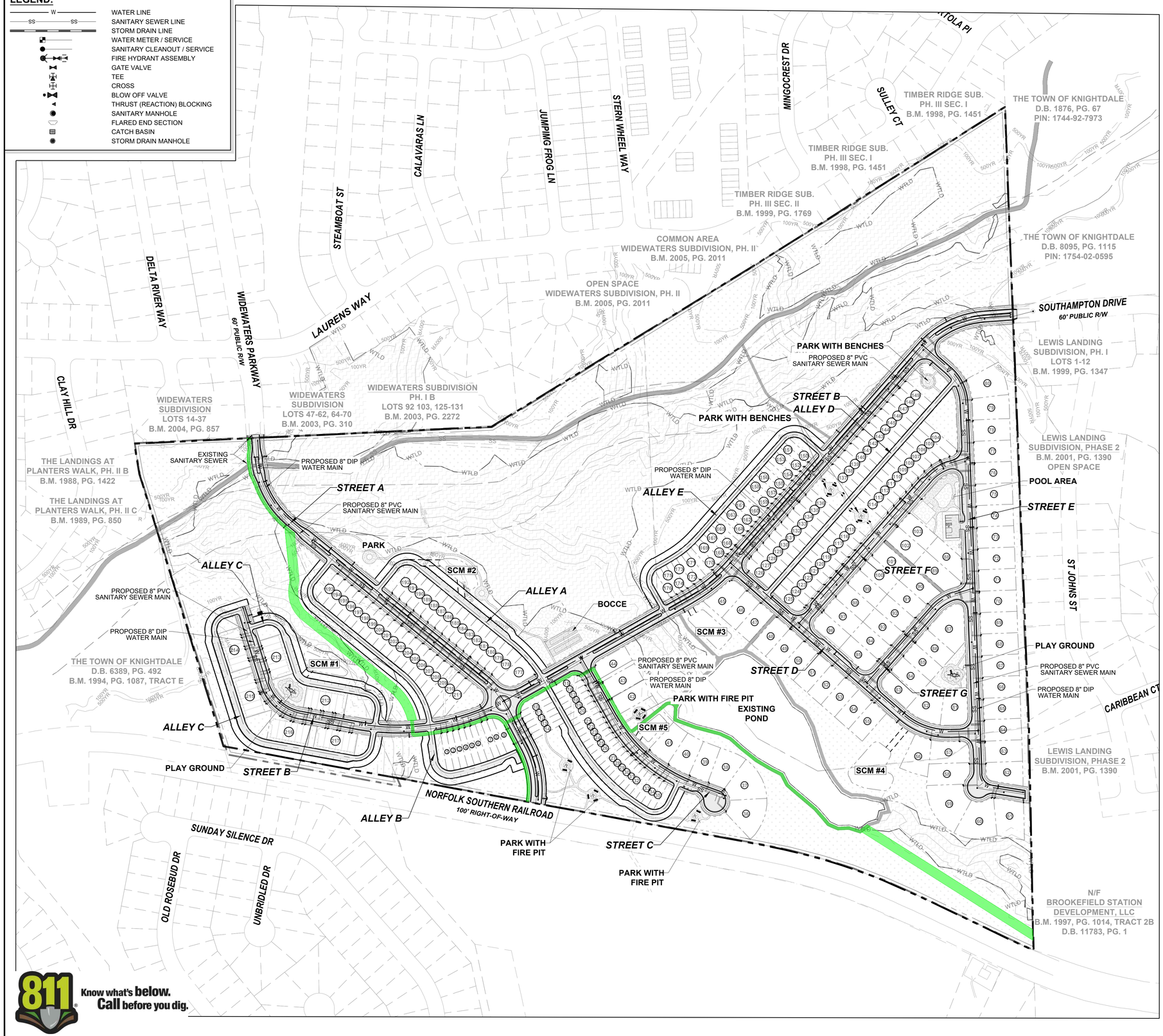
**SITE AND STREET DETAILS**

DRAWING SHEET
**C-2.6**

PROGRESS PLOT DATE: 08-01-2022

## LEGEND:

- WATER LINE
- SANITARY SEWER LINE
- STORM DRAIN LINE
- WATER METER / SERVICE
- SANITARY CLEANOUT / SERVICE
- FIRE HYDRANT ASSEMBLY
- GATE VALVE
- TEE
- CROSS
- BLOW OFF VALVE
- THRUST (REACTION) BLOCKING
- SANITARY MANHOLE
- FLARED END SECTION
- CATCH BASIN
- STORM DRAIN MANHOLE




## UTILITY NOTES:

1. ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS (REFERENCE: CORPUD HANDBOOK, CURRENT EDITION)
2. UTILITY SEPARATION REQUIREMENTS:
   - A. A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.
   - B. WHEN INSTALLING WATER &/OR SEWER MAINS, THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'. IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS, THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER & MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.
   - C. WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS.
   - D. 5.0' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER & STORM SEWER FACILITIES, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
   - E. MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS; MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS & A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER CORPUD DETAILS W-41 & S-49).
   - F. ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN. VERTICAL SEPARATION REQUIRED.
3. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
4. DEVELOPER SHALL PROVIDE 30 DAYS ADVANCE WRITTEN NOTICE TO OWNER FOR ANY WORK REQUIRED WITHIN AN EXISTING CITY OF RALEIGH UTILITY EASEMENT TRAVERSING PRIVATE PROPERTY.
5. CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
6. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCEMAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
7. IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
8. INSTALL 3/4" COPPER* WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT. NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW & PRESSURE.
9. INSTALL 4" PVC* SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM.
10. PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
11. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE &/OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND &/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION.
12. NCDOT/RAILROAD ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION.
13. GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT STEPHEN CALVERLEY AT (919) 996-2334 OR STEPHEN.CALVERLEY@RALEIGHNC.GOV FOR MORE INFORMATION.
14. CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. A CERTIFICATE OF COMPLIANCE SHALL ALSO BE OBTAINED FOR EACH DEVICE PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT JOANIE HARTLEY AT (919) 996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION.

GRAPHIC SCALE

150 0 75 150 300 400

( IN FEET )
1 inch = 150 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT


STRONGROCK
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6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM


| STRONG ROCK PROJECT | | |
|---|---|---|
| | DATE | |
| | SCALE | AS SHOWN |
| | DESIGNED BY | JWL |
| | DRAWN BY | JWL |
| | CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**OVERALL UTILITY PLAN**

DRAWING SHEET
**C-3.0**

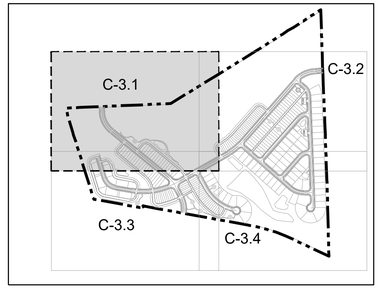
**12 OF 33**

PROGRESS PLOT DATE: 08-01-2022

GRAPHIC SCALE

60 0 30 60 120 240

( IN FEET )
1 inch = 60 ft.




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-3.0 FOR LEGEND

LAURENS WAY

WIDEWATERS PARKWAY
60' PUBLIC R/W

WIDEWATERS SUBDIVISION
LOTS 14-37
B.M. 2004, PG. 857

WIDEWATERS SUBDIVISION
LOTS 47-62, 64-70
B.M. 2003, PG. 310

WIDEWATERS SUBDIVISION
PH. I B
LOTS 92 103, 125-131
B.M. 2003, PG. 2272

THE LANDINGS AT
PLANTERS WALK, PH. II B
B.M. 1988, PG. 1422

THE LANDINGS AT
PLANTERS WALK, PH. II C
B.M. 1989, PG. 850

BLOW OFF ASSEMBLY
EX SSMH #101

68 LF 8" PVC @ 0.5% MIN.

SSMH #57

84 LF 8" PVC @ 0.5% MIN.

FHA

SSMH #56

84 LF 8" PVC @ 0.5% MIN.

SSMH #55

8" DIP W/L

85 LF 8" PVC @ 0.5% MIN.

STREET A
(64' PUBLIC ROW)

SSMH #54

FHA

PARK

211 LF 8" PVC @ 0.5% MIN.

SSMH #53

200 LF 8" PVC @ 0.5% MIN.

8" DIP W/L

ALLEY A
(20' PRIVATE ROW)

SCM #2

STREET B
(54' PRIVATE ROW)

ALLEY C
(20' PRIVATE ROW)

BLOW OFF ASSEMBLY

SSMH #41

FHA

8" DIP W/L

WATER METER
(TYP.)

SSMH #52

ALLEY B
(20' PRIVATE ROW)

MATCH LINE
FOR CONTINUATION, SEE C-3.3

ALLEY C
(20' PRIVATE ROW)

200 LF 8" PVC @ 0.5% MIN.

SANITARY LATERAL
(TYP.)

SSMH #51

ELECTRIC ESMT

MATCH LINE
FOR CONTINUATION, SEE C-3.2

FHA

8" DIP W/L

STREET B
(64' PUBLIC ROW)

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036225 JOSHUA W. LAMBERT

SEAL

STRONGROCK ENGINEERING GROUP

STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM

| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED UTILITY PLAN**

DRAWING
SHEET

**C-3.1**

**13 OF 33**

PROGRESS PLOT DATE: 08-01-2022

**LEGEND:**

SEE SHEET C-3.0 FOR LEGEND

OPEN SPACE
WIDEWATERS SUBDIVISION, PH. II
B.M. 2005, PG. 2011

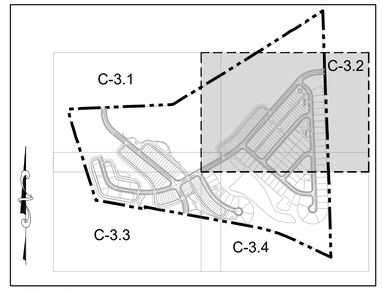
SOUTHAMPTON DRIVE
60' PUBLIC R/W

BLOW OFF ASSEMBLY
85 LF 8" PVC @ 0.5% MIN.
EX SSMH #102
76 LF 8" PVC @ 0.5% MIN.
SSMH #31
SSMH #30
112 LF 8" PVC @ 0.5% MIN.
SSMH #29
FHA
8"x8"x8" TEE
(3) 8" VALVE
SSMH #28
116 LF 8" PVC @ 0.5% MIN.
106 LF 8" PVC @ 0.5% MIN.
8" DIP W/L
SSMH #14
171 LF 8" PVC @ 0.5% MIN.
59 LF 8" PVC @ 0.5% MIN.
SANITARY LATERAL (TYP.)
PARK WITH BENCHES
SSMH #27
SSMH #13
59 LF 8" PVC @ 0.5% MIN.
WATER METER (TYP.)
SSMH #12
FHA
204 LF 18" PVC @ 0.5% MIN.
8" DIP W/L
FHA
191 LF 8" PVC @ 0.5% MIN.
STREET B
(64' PUBLIC ROW)
SSMH #26
ALLEY D
(20' PRIVATE ROW)
74 LF 8" PVC @ 0.5% MIN.
8"x8"x8" TEE
(3) 8" VALVE
SSMH #11
188 LF 18" PVC @ 0.5% MIN.
57 LF 8" PVC @ 0.5% MIN.
SSMH #10
SSMH #9
STREET E
(54' PUBLIC ROW)
8" DIP W/L
ALLEY E
(20' PRIVATE ROW)
FHA
SSMH #25
FHA
175 LF 8" PVC @ 0.5% MIN.
8" DIP W/L
POOL AREA
298 LF 8" PVC @ 0.5% MIN.
195 LF 8" PVC @ 0.5% MIN.
PARK WITH BENCHES
SSMH #24
FHA
SSMH #8
SSMH #18
STREET F
(54' PUBLIC ROW)
SSMH #7
8"x8"x8" TEE
(3) 8" VALVE
SSMH #23
FHA
210 LF 8" PVC @ 0.5% MIN.
FHA
8" DIP W/L
160 LF 18" PVC @ 0.5% MIN.
8"x8"x8" TEE
(3) 8" VALVE
94 LF 8" PVC @ 0.5% MIN.
SSMH #22
SSMH #19
292 LF 8" PVC @ 0.5% MIN.
FHA
8" DIP W/L
137 LF 8" PVC @ 0.5% MIN.
185 LF 18" PVC @ 0.5% MIN.
STREET G
(54' PUBLIC ROW)
SSMH #16
FHA
SSMH #21
295 LF 8" PVC @ 0.5% MIN.
MATCH LINE
FOR CONTINUATION, SEE C-3.4
MATCH LINE
FOR CONTINUATION, SEE C-3.1
SCM #3
STREET D
(54' PUBLIC ROW)
FHA
338 LF 18" PVC @ 0.5% MIN.
8"x8"x8" TEE
(3) 8" VALVE
SSMH #20
SSMH #6
FHA
294 LF 8" PVC @ 0.5% MIN.

LEWIS LANDING
SUBDIVISION, PH. I
LOTS 1-12
B.M. 1999, PG. 1347

LEWIS LANDING
SUBDIVISION, PHASE 2
B.M. 2001, PG. 1390
OPEN SPACE

ST JOHNS ST




SITE KEY PLAN

GRAPHIC SCALE
60 0 30 60 120 240
( IN FEET )
1 inch = 60 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036225 JOSHUA W. LAMBERT

SEAL

STRONGROCK
ENGINEERING GROUP
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM

| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED UTILITY PLAN**

DRAWING
SHEET

**C-3.2**

**14 OF 33**

PROGRESS PLOT DATE: 08-01-2022

**LEGEND:**

SEE SHEET C-3.0 FOR LEGEND

BLOW OFF ASSEMBLY

SSMH #41

FHA

FOR CONTINUATION, SEE C-3.1

MATCH LINE

STREET B
(54' PRIVATE ROW)

THE TOWN OF KNIGHTDALE
D.B. 6389, PG. 492
B.M. 1994, PG. 1087, TRACT E

239 LF 8" PVC @ 0.5% MIN.

SCM #1

ALLEY C
(20' PRIVATE ROW)

PLAY GROUND

SSMH #42

8" DIP W/L

FHA

54 LF 8" PVC @ 0.5% MIN.

SSMH #43

53 LF 8" PVC @ 0.5% MIN.

SSMH #44

267 LF 8" PVC @ 0.5% MIN

SANITARY LATERAL (TYP.)

WATER METER (TYP.)

SSMH #45

108 LF 8" PVC @ 0.5% MIN

SSMH #46

106 LF 8" PVC @ 0.5% MIN.

SSMH #47

116 LF 8" PVC @ 0.5% MIN.

SSMH #48

52 LF 8" PVC @ 0.5% MIN

SSMH #40

108 LF 8" PVC @ 0.5% MIN

SSMH #39

SSMH #52

200 LF 8" PVC @ 0.5% MIN

SSMH #51

8" DIP W/L

FHA

STREET A
(64' PUBLIC ROW)

242 LF 8" PVC @ 0.5% MIN

68 LF 8" PVC @ 0.5% MIN

SSMH #50

72 LF 8" PVC @ 0.5% MIN

SSMH #49

ALLEY A
(20' PRIVATE ROW)

BOCCE

8"x8"x8" TEE
(3) 8" VALVE

SSMH #37

233 LF 8" PVC @ 0.5% MIN

SSMH #38

92 LF 8" PVC @ 0.5% MIN

8"x8" CROSS
(4) VALVE

264 LF 8" PVC @ 0.5% MIN.

STREET B
(64' PUBLIC ROW)

PARK WITH FIRE PIT

STREET C
(54' PUBLIC ROW)

SCM #5

SSMH #36

SSMH #35

86 LF 8" PVC @ 0.5% MIN.

ALLEY B
(20' PRIVATE ROW)

EX. CONCRETE MONUMENT

NORFOLK SOUTHERN RAILROAD
100' RIGHT-OF-WAY

MATCH LINE
FOR CONTINUATION, SEE C-3.4

SUNDAY SILENCE DR

UNBRIDLED DR

GRAPHIC SCALE

60 0 30 60 120 240

( IN FEET )
1 inch = 60 ft.

SITE KEY PLAN

C-3.1 C-3.2 C-3.3 C-3.4

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036225 JOSHUA W. LAMBERT

SEAL

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| | |
|---|---|
| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

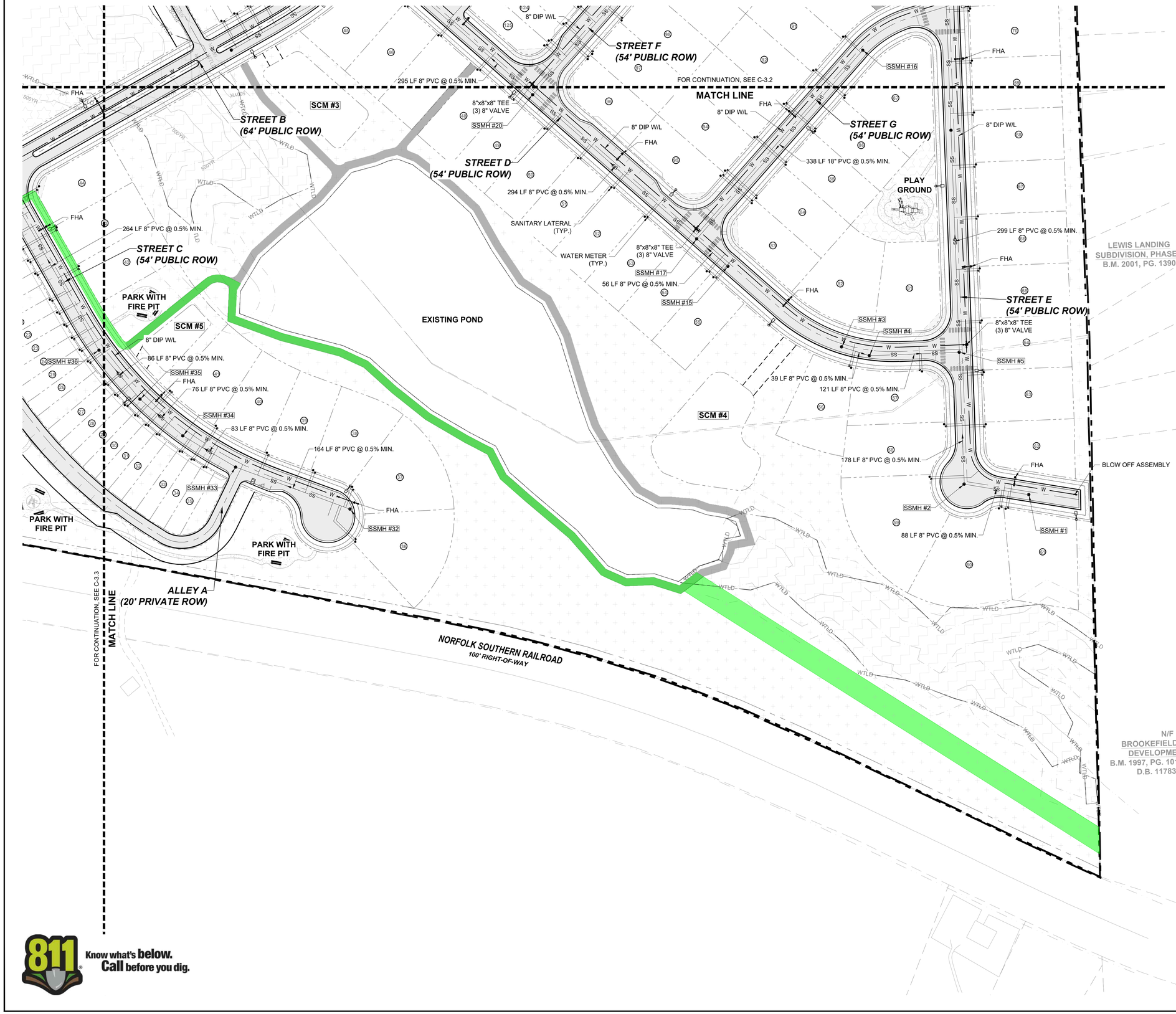
**DETAILED UTILITY PLAN**

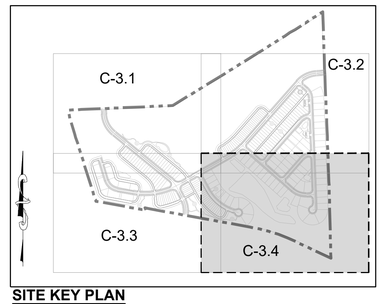
DRAWING
SHEET

**C-3.3**

**15 OF 33**

PROGRESS PLOT DATE: 08-01-2022




SITE KEY PLAN

**LEGEND:**

SEE SHEET C-3.0 FOR LEGEND

GRAPHIC SCALE

60 0 30 60 120 240

( IN FEET )
1 inch = 60 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

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| | | | |
|---|---|---|---|
| STRONG ROCK PROJECT | | | |
| | DATE | | |
| | SCALE | AS SHOWN | |
| | DESIGNED BY | JWL | |
| | DRAWN BY | JWL | |
| | CHECKED BY | JWL | |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED UTILITY PLAN**

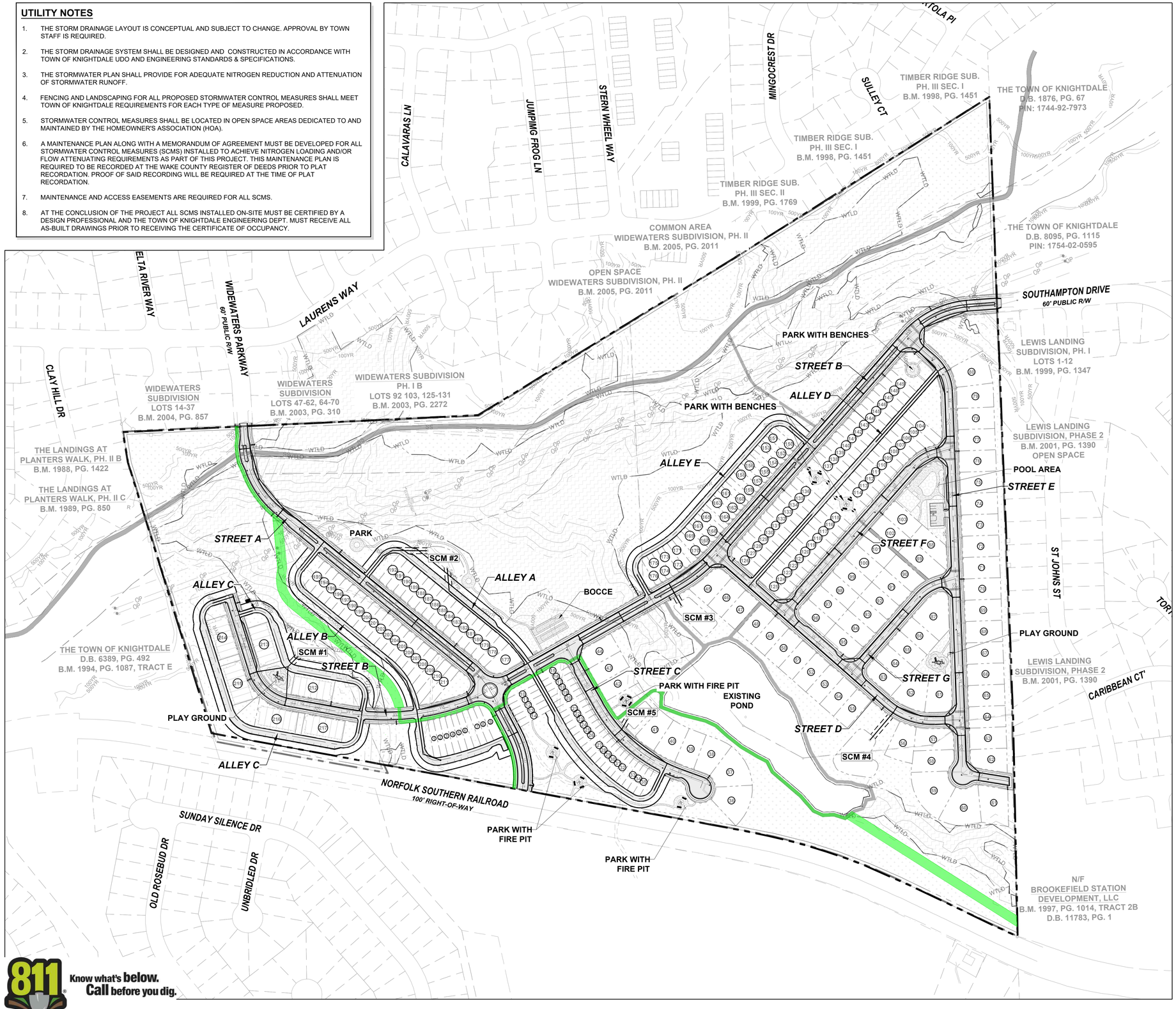
DRAWING SHEET
**C-3.4**

**16 OF 33**

PROGRESS PLOT DATE: 08-01-2022

## UTILITY NOTES

1. THE STORM DRAINAGE LAYOUT IS CONCEPTUAL AND SUBJECT TO CHANGE. APPROVAL BY TOWN STAFF IS REQUIRED.
2. THE STORM DRAINAGE SYSTEM SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH TOWN OF KNIGHTDALE UDO AND ENGINEERING STANDARDS & SPECIFICATIONS.
3. THE STORMWATER PLAN SHALL PROVIDE FOR ADEQUATE NITROGEN REDUCTION AND ATTENUATION OF STORMWATER RUNOFF.
4. FENCING AND LANDSCAPING FOR ALL PROPOSED STORMWATER CONTROL MEASURES SHALL MEET TOWN OF KNIGHTDALE REQUIREMENTS FOR EACH TYPE OF MEASURE PROPOSED.
5. STORMWATER CONTROL MEASURES SHALL BE LOCATED IN OPEN SPACE AREAS DEDICATED TO AND MAINTAINED BY THE HOMEOWNER'S ASSOCIATION (HOA).
6. A MAINTENANCE PLAN ALONG WITH A MEMORANDUM OF AGREEMENT MUST BE DEVELOPED FOR ALL STORMWATER CONTROL MEASURES (SCMS) INSTALLED TO ACHIEVE NITROGEN LOADING AND/OR FLOW ATTENUATING REQUIREMENTS AS PART OF THIS PROJECT. THIS MAINTENANCE PLAN IS REQUIRED TO BE RECORDED AT THE WAKE COUNTY REGISTER OF DEEDS PRIOR TO PLAT RECORDATION. PROOF OF SAID RECORDING WILL BE REQUIRED AT THE TIME OF PLAT RECORDATION.
7. MAINTENANCE AND ACCESS EASEMENTS ARE REQUIRED FOR ALL SCMS.
8. AT THE CONCLUSION OF THE PROJECT ALL SCMS INSTALLED ON-SITE MUST BE CERTIFIED BY A DESIGN PROFESSIONAL AND THE TOWN OF KNIGHTDALE ENGINEERING DEPT. MUST RECEIVE ALL AS-BUILT DRAWINGS PRIOR TO RECEIVING THE CERTIFICATE OF OCCUPANCY.




## LEGEND:

- WATER LINE
- SANITARY SEWER LINE
- STORM DRAIN LINE
- WATER METER / SERVICE
- SANITARY CLEANOUT / SERVICE
- FIRE HYDRANT ASSEMBLY
- GATE VALVE
- TEE
- CROSS
- BLOW OFF VALVE
- THRUST (REACTION) BLOCKING
- SANITARY MANHOLE
- FLARED END SECTION
- CATCH BASIN
- STORM DRAIN MANHOLE

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, CITY OF RALEIGH AND NCDOT STANDARDS, SPECIFICATIONS, AND DETAILS.

GRAPHIC SCALE

150 0 75 150 300 600

( IN FEET )
1 inch = 150 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT


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6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM


| STRONG ROCK PROJECT | | |
|---|---|---|
| | DATE | |
| | SCALE | AS SHOWN |
| | DESIGNED BY | JWL |
| | DRAWN BY | JWL |
| | CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**OVERALL STORMWATER PLAN**

DRAWING SHEET

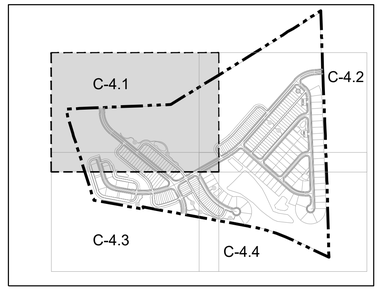
**C-4.0**

PROGRESS PLOT DATE: 08-01-2022

GRAPHIC SCALE

60 0 30 60 120 240

( IN FEET )
1 inch = 60 ft.




**SITE KEY PLAN**

**LEGEND:**
SEE SHEET C-4.0 FOR LEGEND

LAURENS WAY

WIDEWATERS PARKWAY
60' PUBLIC R/W

WIDEWATERS SUBDIVISION
LOTS 14-37
B.M. 2004, PG. 857

WIDEWATERS SUBDIVISION
LOTS 47-62, 64-70
B.M. 2003, PG. 310

WIDEWATERS SUBDIVISION
PH. I B
LOTS 92 103, 125-131
B.M. 2003, PG. 2272

THE LANDINGS AT PLANTERS WALK, PH. II B
B.M. 1988, PG. 1422

THE LANDINGS AT PLANTERS WALK, PH. II C
B.M. 1989, PG. 850

35 LF 15" RCP
CB #97
CB #96
107 LF 15" RCP
CB #98
127 LF 15" RCP
CB #100
172 LF 15" RCP
CB #99
25 LF 15" RCP
35 LF 18" RCP
CB #101
DI #419
112 LF 18" RCP
FES #304
38 LF 18" RCP
DI #418
178 LF 18" RCP
DI #417
85 LF 15" RCP
DI #416
STREET A
(64' PUBLIC ROW)
PARK
SCM #2
FES #303
75 LF 18" RCP
85 LF 18" RCP
DI #438
DI #415
ALLEY A
(20' PRIVATE ROW)
248 LF 18" RCP
STREET B
(64' PUBLIC ROW)
CB #95
35 LF 18" RCP
220 LF 18" RCP
CB #94
35 LF 18" RCP
CB #93
230 LF 15" RCP
CB #83
25 LF 15" RCP
DI #431
44 LF 15" RCP
DI #430
63 LF 15" RCP
DI #433
STREET B
(54' PRIVATE ROW)
DI #432
45 LF 15" RCP
195 LF 15" RCP
ALLEY C
(20' PRIVATE ROW)
ALLEY C
(20' PRIVATE ROW)
ALLEY B
(20' PRIVATE ROW)
BOCCE
DI #414
189 LF 15" RCP
103 LF 18" RCP
153 LF 15" RCP
CB #75
CB #74
CB #73
CB #72
35 LF 15" RCP
35 LF 15" RCP
ELECTRIC ESMT
100'

MATCH LINE
FOR CONTINUATION, SEE C-4.2

MATCH LINE
FOR CONTINUATION, SEE C-4.3

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

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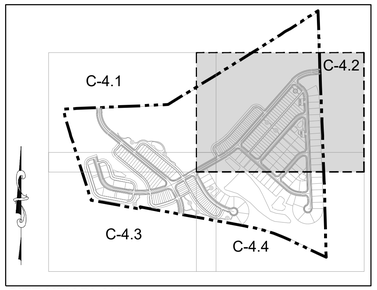

| | |
|---|---|
| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

# *MASTER PLAN*
# DETAILED STORMWATER PLAN

DRAWING SHEET
**C-4.1**

PROGRESS PLOT DATE: 08-01-2022




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-4.0 FOR LEGEND

**MATCH LINE**
FOR CONTINUATION, SEE C-4.1

**MATCH LINE**
FOR CONTINUATION, SEE C-4.4

***SOUTHAMPTON DRIVE***
***60' PUBLIC R/W***

***STREET B***
***(64' PUBLIC ROW)***

***ALLEY D***
***(20' PRIVATE ROW)***

***ALLEY E***
***(20' PRIVATE ROW)***

***STREET E***
***(54' PUBLIC ROW)***

***STREET F***
***(54' PUBLIC ROW)***

***STREET G***
***(54' PUBLIC ROW)***

***STREET D***
***(54' PUBLIC ROW)***

**PARK WITH BENCHES**

**POOL AREA**

**SCM #3**

**ST JOHNS ST**

LEWIS LANDING
SUBDIVISION, PH. I
LOTS 1-12
B.M. 1999, PG. 1347

LEWIS LANDING
SUBDIVISION, PHASE 2
B.M. 2001, PG. 1390
OPEN SPACE

CB #28
35 LF 15" RCP
CB #30
35 LF 15" RCP
CB #29
150 LF 15" RCP
CB #31
62 LF 15" RCP
60 LF 18" RCP
35 LF 18" RCP
CB #35
CB #32
25 LF 18" RCP
26 LF 15" RCP
CB #27
184 LF 18" RCP
CB #34
CB #33
90 LF 18" RCP
78 LF 15" RCP
CB #37
241 LF 15" RCP
DI #401
CB #26
CB #36
35 LF 15" RCP
307 LF 15" RCP
139 LF 18" RCP
DI #403
75 LF 15" RCP
25 LF 15" RCP
CB #24
CB #25
DI #402
DI #404
52 LF 18" RCP
CB #23
27 LF 15" RCP
80 LF 15" RCP
48 LF 15" RCP
CB #38
35 LF 18" RCP
229 LF 18" RCP
CB #22
CB #21
CB #18
CB #40
35 LF 15" RCP
CB #19
138 LF 15" RCP
128 LF 15" RCP
25 LF 15" RCP
CB #16
CB #39
190 LF 18" RCP
CB #20
31 LF 15" RCP
CB #17
DI #405
CB #42
31 LF 15" RCP
198 LF 15" RCP
35 LF 15" RCP
96 LF 18" RCP
35 LF 18" RCP
CB #53
CB #41
289 LF 15" RCP
CB #62
136 LF 24" RCP
CB #54
CB #15
CB #63
77 LF 15" RCP
52 LF 15" RCP
CB #14
27 LF 15" RCP
DI #407
CB #61
53 LF 18" RCP
25 LF 15" RCP
DI #406
CB #56
CB #12
25 LF 15" RCP
CB #11
CB #60
97 LF 18" RCP
75 LF 15" RCP
CB #64
CB #57
56 LF 15" RCP
218 LF 15" RCP
DI #408
CB #59
49 LF 30" RCP
25 LF 15" RCP
CB #44
CB #13
48 LF 15" RCP
FES #306
95 LF 18" RCP
CB #74
CB #55
35 LF 24" RCP
153 LF 15" RCP
CB #58
25 LF 15" RCP
CB #51
25 LF 15" RCP
35 LF 15" RCP
CB #73
104 LF 15" RCP
215 LF 15" RCP
CB #43
25 LF 15" RCP
CB #52

GRAPHIC SCALE
60 0 30 60 120 240
( IN FEET )
1 inch = 60 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT


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| STRONG ROCK PROJECT | | |
|---|---|---|
| | DATE | |
| | SCALE | AS SHOWN |
| | DESIGNED BY | JWL |
| | DRAWN BY | JWL |
| | CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED STORMWATER PLAN**

DRAWING / SHEET
**C-4.2**

**19 OF 33**

PROGRESS PLOT DATE: 08-01-2022

**LEGEND:**

SEE SHEET C-4.0 FOR LEGEND

THE TOWN OF KNIGHTDALE
D.B. 6389, PG. 492
B.M. 1994, PG. 1087, TRACT E

FOR CONTINUATION, SEE C-4.1

MATCH LINE

ALLEY A (20' PRIVATE ROW)

ALLEY B (20' PRIVATE ROW)

ALLEY C (20' PRIVATE ROW)

STREET A (64' PUBLIC ROW)

STREET B (64' PUBLIC ROW)

STREET B (54' PRIVATE ROW)

SCM #1

SCM #5

PLAY GROUND

BOCCE

PARK WITH FIRE PIT

NORFOLK SOUTHERN RAILROAD
100' RIGHT-OF-WAY

SUNDAY SILENCE DR

UNBRIDLED DR

GRAPHIC SCALE
60 0 30 60 120 240
( IN FEET )
1 inch = 60 ft.

SITE KEY PLAN
C-4.1
C-4.2
C-4.3
C-4.4

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

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| | |
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| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

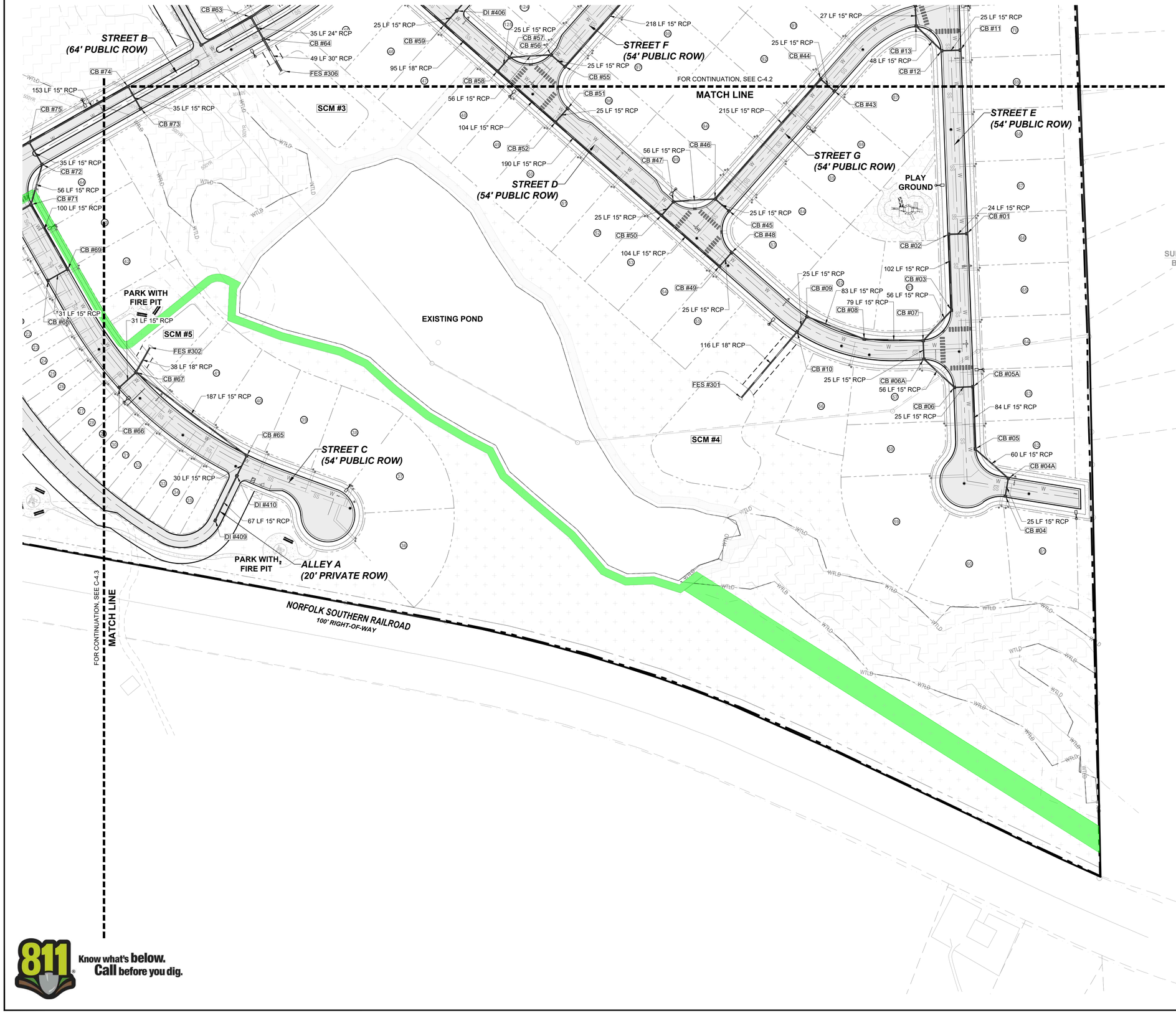
***MASTER PLAN***

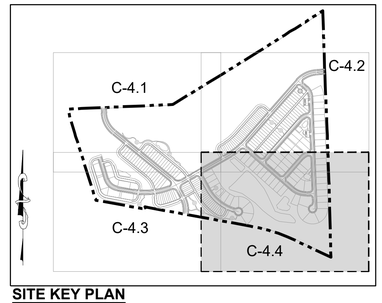
**DETAILED STORMWATER PLAN**

DRAWING SHEET
**C-4.3**

**20 OF 33**

PROGRESS PLOT DATE: 08-01-2022




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-4.0 FOR LEGEND

GRAPHIC SCALE

60 0 30 60 120 240

( IN FEET )
1 inch = 60 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

SEAL


STRONGROCK
ENGINEERING GROUP
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 | JOSH@STRONGROCKENGINEERING.COM


| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED STORMWATER PLAN**

DRAWING SHEET

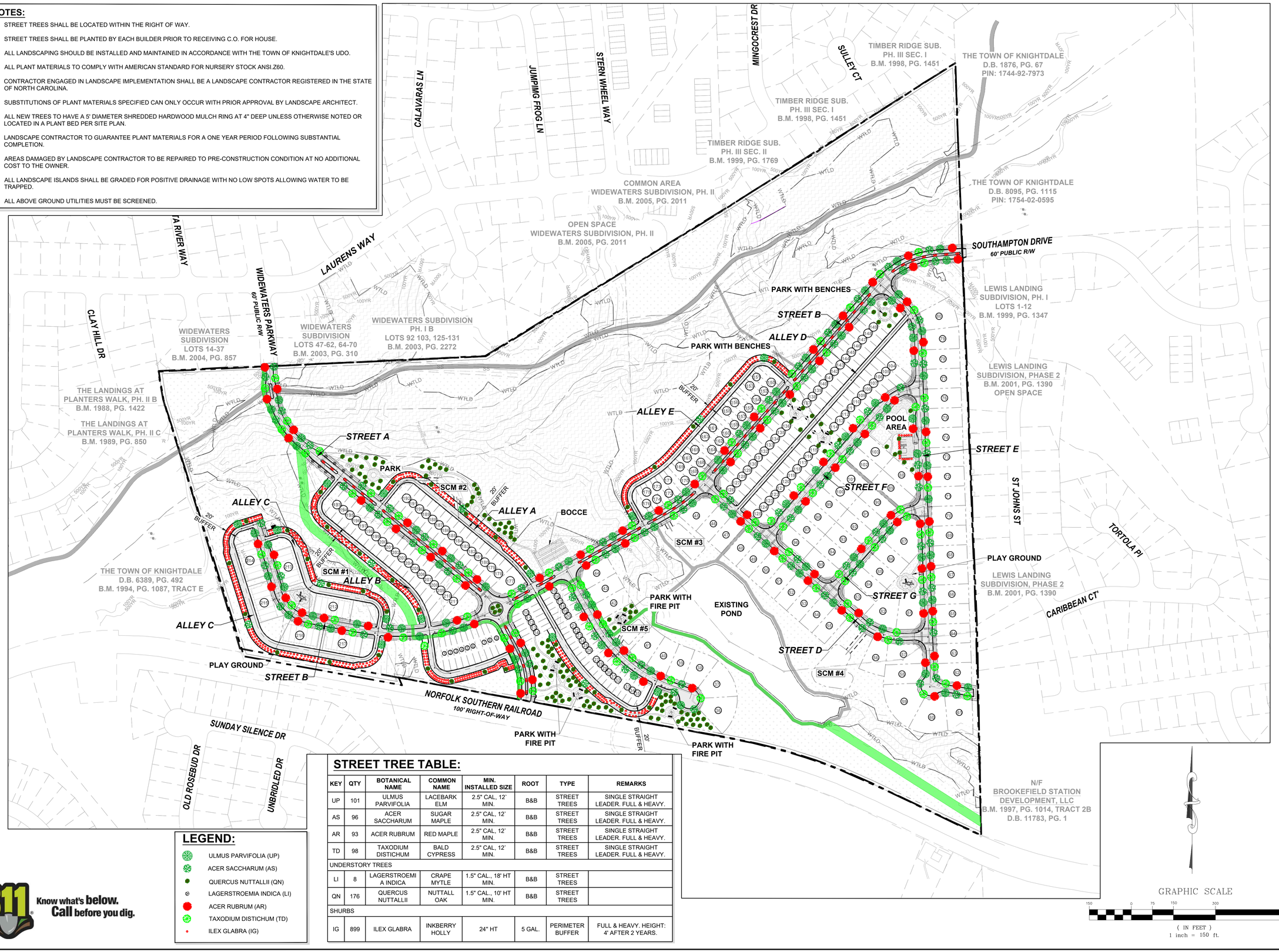
**C-4.4**

**21 OF 33**

PROGRESS PLOT DATE: 08-01-2022

## NOTES:

1. STREET TREES SHALL BE LOCATED WITHIN THE RIGHT OF WAY.
2. STREET TREES SHALL BE PLANTED BY EACH BUILDER PRIOR TO RECEIVING C.O. FOR HOUSE.
3. ALL LANDSCAPING SHOULD BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE TOWN OF KNIGHTDALE'S UDO.
4. ALL PLANT MATERIALS TO COMPLY WITH AMERICAN STANDARD FOR NURSERY STOCK ANSI.Z60.
5. CONTRACTOR ENGAGED IN LANDSCAPE IMPLEMENTATION SHALL BE A LANDSCAPE CONTRACTOR REGISTERED IN THE STATE OF NORTH CAROLINA.
6. SUBSTITUTIONS OF PLANT MATERIALS SPECIFIED CAN ONLY OCCUR WITH PRIOR APPROVAL BY LANDSCAPE ARCHITECT.
7. ALL NEW TREES TO HAVE A 5' DIAMETER SHREDDED HARDWOOD MULCH RING AT 4" DEEP UNLESS OTHERWISE NOTED OR LOCATED IN A PLANT BED PER SITE PLAN.
8. LANDSCAPE CONTRACTOR TO GUARANTEE PLANT MATERIALS FOR A ONE YEAR PERIOD FOLLOWING SUBSTANTIAL COMPLETION.
9. AREAS DAMAGED BY LANDSCAPE CONTRACTOR TO BE REPAIRED TO PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
10. ALL LANDSCAPE ISLANDS SHALL BE GRADED FOR POSITIVE DRAINAGE WITH NO LOW SPOTS ALLOWING WATER TO BE TRAPPED.
11. ALL ABOVE GROUND UTILITIES MUST BE SCREENED.




## LEGEND:

- ULMUS PARVIFOLIA (UP)
- ACER SACCHARUM (AS)
- QUERCUS NUTTALLII (QN)
- LAGERSTROEMIA INDICA (LI)
- ACER RUBRUM (AR)
- TAXODIUM DISTICHUM (TD)
- ILEX GLABRA (IG)

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

## STREET TREE TABLE:

| KEY | QTY | BOTANICAL NAME | COMMON NAME | MIN. INSTALLED SIZE | ROOT | TYPE | REMARKS |
|---|---|---|---|---|---|---|---|
| UP | 101 | ULMUS PARVIFOLIA | LACEBARK ELM | 2.5" CAL, 12' MIN. | B&B | STREET TREES | SINGLE STRAIGHT LEADER. FULL & HEAVY. |
| AS | 96 | ACER SACCHARUM | SUGAR MAPLE | 2.5" CAL, 12' MIN. | B&B | STREET TREES | SINGLE STRAIGHT LEADER. FULL & HEAVY. |
| AR | 93 | ACER RUBRUM | RED MAPLE | 2.5" CAL, 12' MIN. | B&B | STREET TREES | SINGLE STRAIGHT LEADER. FULL & HEAVY. |
| TD | 98 | TAXODIUM DISTICHUM | BALD CYPRESS | 2.5" CAL, 12' MIN. | B&B | STREET TREES | SINGLE STRAIGHT LEADER. FULL & HEAVY. |
| UNDERSTORY TREES | | | | | | | |
| LI | 8 | LAGERSTROEMIA INDICA | CRAPE MYTLE | 1.5" CAL., 18' HT MIN. | B&B | STREET TREES | |
| QN | 176 | QUERCUS NUTTALLII | NUTTALL OAK | 1.5" CAL., 10' HT MIN. | B&B | STREET TREES | |
| SHURBS | | | | | | | |
| IG | 899 | ILEX GLABRA | INKBERRY HOLLY | 24" HT | 5 GAL. | PERIMETER BUFFER | FULL & HEAVY. HEIGHT: 4' AFTER 2 YEARS. |

| No. | REVISIONS | DATE | BY |
|---|---|---|---|

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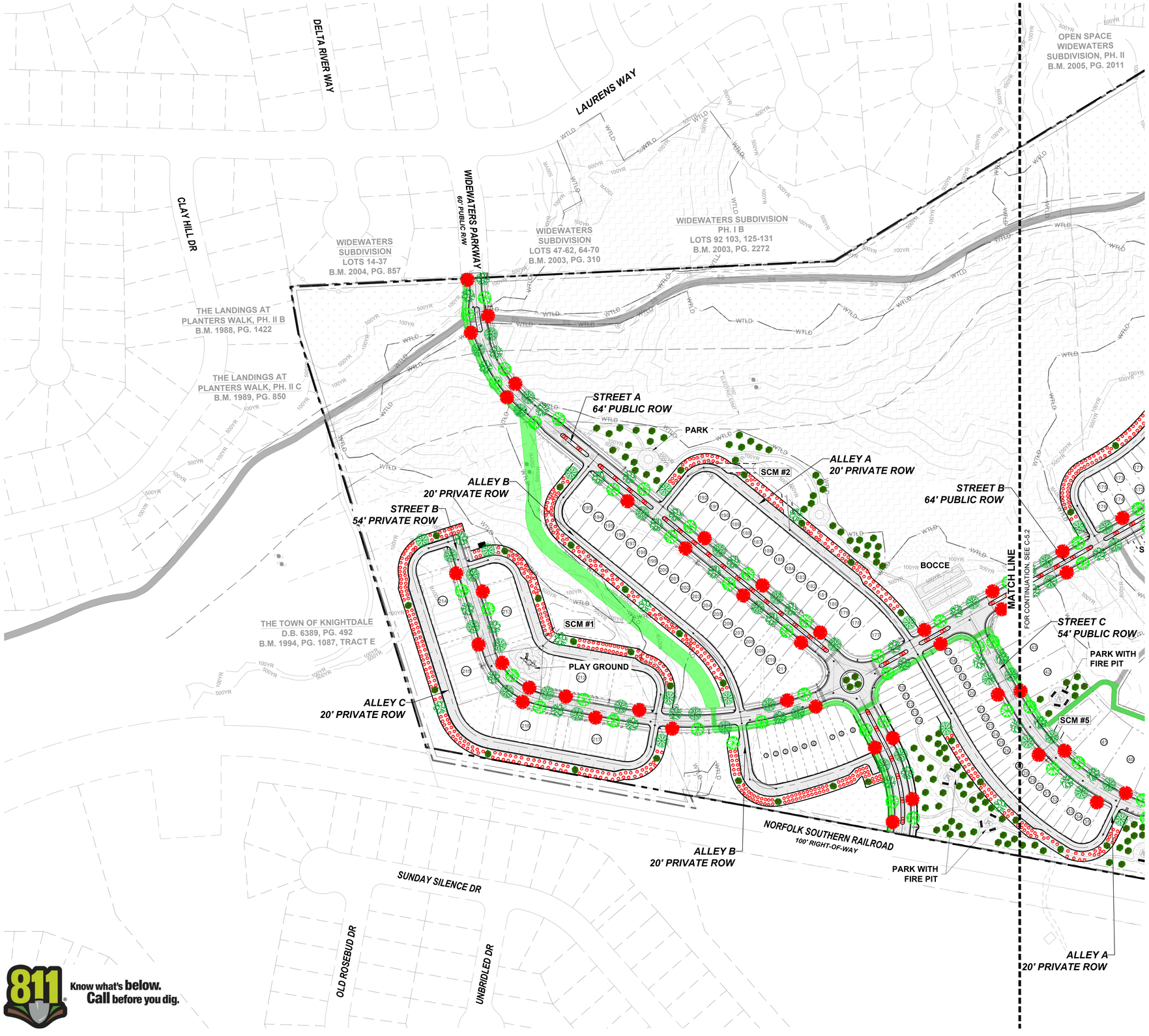
| STRONG ROCK PROJECT | | | |
|---|---|---|---|
| DATE | | DESIGNED BY | JWL |
| SCALE | AS SHOWN | DRAWN BY | JWL |
| | | CHECKED BY | JWL |

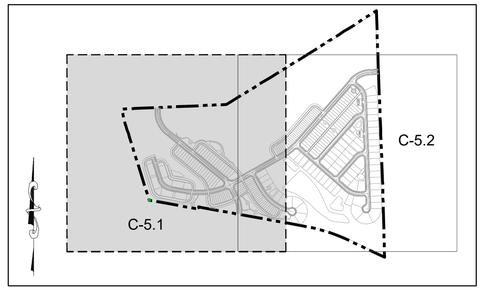
KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

# MASTER PLAN
# OVERALL LANDSCAPE PLAN

DRAWING SHEET
C-5.0

PROGRESS PLOT DATE: 08-01-2022




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-5.0 FOR LEGEND

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

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

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| STRONG ROCK PROJECT | |
|---|---|
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KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED LANDSCAPE PLAN**

DRAWING SHEET

**C-5.1**

**23 OF 33**

PROGRESS PLOT DATE: 08-01-2022

OPEN SPACE
WIDEWATERS SUBDIVISION, PH. II
B.M. 2005, PG. 2011

SOUTHAMPTON DRIVE
60' PUBLIC R/W

STREET B
64' PUBLIC ROW
PARK WITH BENCHES

ALLEY D
20' PRIVATE ROW

LEWIS LANDING
SUBDIVISION, PH. I
LOTS 1-12
B.M. 1999, PG. 1347

PARK WITH BENCHES

LEWIS LANDING
SUBDIVISION, PHASE 2
B.M. 2001, PG. 1390
OPEN SPACE

ALLEY E
20' PRIVATE ROW

POOL AREA

ST JOHNS ST

TORTOLA PL

MATCH LINE
FOR CONTINUATION, SEE C-5.1

BOCCE

SCM #3

PLAY GROUND

STREET C
54' PUBLIC ROW

PARK WITH
FIRE PIT

STREET F
54' PUBLIC ROW

STREET D
54' PUBLIC ROW

LEWIS LANDING
SUBDIVISION, PHASE 2
B.M. 2001, PG. 1390

CARIBBEAN CT'

EXISTING POND

SCM #5

STREET G
54' PUBLIC ROW

ALLEY A
20' PRIVATE ROW

SCM #4

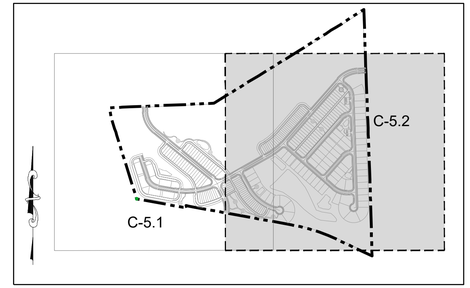
PARK WITH
FIRE PIT

STREET E
54' PUBLIC ROW

NORFOLK SOUTHERN RAILROAD
100' RIGHT-OF-WAY

N/F
BROOKEFIELD STATION
DEVELOPMENT, LLC
B.M. 1997, PG. 1014, TRACT 2B
D.B. 11783, PG. 1

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




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-5.0 FOR LEGEND

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA
PROFESSIONAL
SEAL
036225
ENGINEER
JOSHUA W. LAMBERT
SEAL


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| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
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| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED LANDSCAPE PLAN**

DRAWING SHEET
**C-5.2**

PROGRESS PLOT DATE: 08-01-2022

**LEGEND:**

LED STREET LIGHTS (7,000 LUMENS LED 75 ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30

**NOTE:**

1. ALL FIXTURES SHALL BE "FULL CUTOFF" OR BE FULLY SHIELDED. MAXIMUM POLE HEIGHT SHALL BE 37'.
2. FIBERGLASS POLES ARE REQUIRED -MINIMUM INITIAL DELIVERED LUMEN LEVELS-4,8000 LUMES -BUG RATING: B1, U1, G2.

DELTA RIVER WAY
STEAMBOAT ST
CALAVARAS LN
JUMPING FROG LN
STERN WHEEL WAY
MINGOCREST DR
SULLEY CT
TOLA PL
CLAY HILL DR
WIDEWATERS PARKWAY
60' PUBLIC R/W
LAURENS WAY
SOUTHAMPTON DRIVE
60' PUBLIC R/W
ST JOHNS ST
CARIBBEAN CT
OLD ROSEBUD DR
UNBRIDLED DR
SUNDAY SILENCE DR

TIMBER RIDGE SUB. PH. III SEC. I B.M. 1998, PG. 1451
TIMBER RIDGE SUB. PH. III SEC. I B.M. 1998, PG. 1451
TIMBER RIDGE SUB. PH. III SEC. II B.M. 1999, PG. 1769
COMMON AREA WIDEWATERS SUBDIVISION, PH. II B.M. 2005, PG. 2011
OPEN SPACE WIDEWATERS SUBDIVISION, PH. II B.M. 2005, PG. 2011
THE TOWN OF KNIGHTDALE D.B. 1876, PG. 67 PIN: 1744-92-7973
THE TOWN OF KNIGHTDALE D.B. 8095, PG. 1115 PIN: 1754-02-0595
WIDEWATERS SUBDIVISION LOTS 14-37 B.M. 2004, PG. 857
WIDEWATERS SUBDIVISION LOTS 47-62, 64-70 B.M. 2003, PG. 310
WIDEWATERS SUBDIVISION PH. I B LOTS 92 103, 125-131 B.M. 2003, PG. 2272
THE LANDINGS AT PLANTERS WALK, PH. II B B.M. 1988, PG. 1422
THE LANDINGS AT PLANTERS WALK, PH. II C B.M. 1989, PG. 850
THE TOWN OF KNIGHTDALE D.B. 6389, PG. 492 B.M. 1994, PG. 1087, TRACT E
LEWIS LANDING SUBDIVISION, PH. I LOTS 1-12 B.M. 1999, PG. 1347
LEWIS LANDING SUBDIVISION, PHASE 2 B.M. 2001, PG. 1390 OPEN SPACE
LEWIS LANDING SUBDIVISION, PHASE 2 B.M. 2001, PG. 1390
N/F BROOKEFIELD STATION DEVELOPMENT, LLC B.M. 1997, PG. 1014, TRACT 2B D.B. 11783, PG. 1
NORFOLK SOUTHERN RAILROAD 100' RIGHT-OF-WAY

PARK WITH BENCHES
PARK WITH BENCHES
STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
ALLEY A
ALLEY B
ALLEY C
ALLEY D
ALLEY E
PARK
PARK WITH FIRE PIT
PARK WITH FIRE PIT
PARK WITH FIRE PIT
EXISTING POND
BOCCE
POOL AREA
PLAY GROUND
PLAY GROUND
SCM #1
SCM #2
SCM #3
SCM #4
SCM #5

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

GRAPHIC SCALE
150 0 75 150 300 600
( IN FEET )
1 inch = 150 ft.

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT


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| | |
|---|---|
| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
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KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

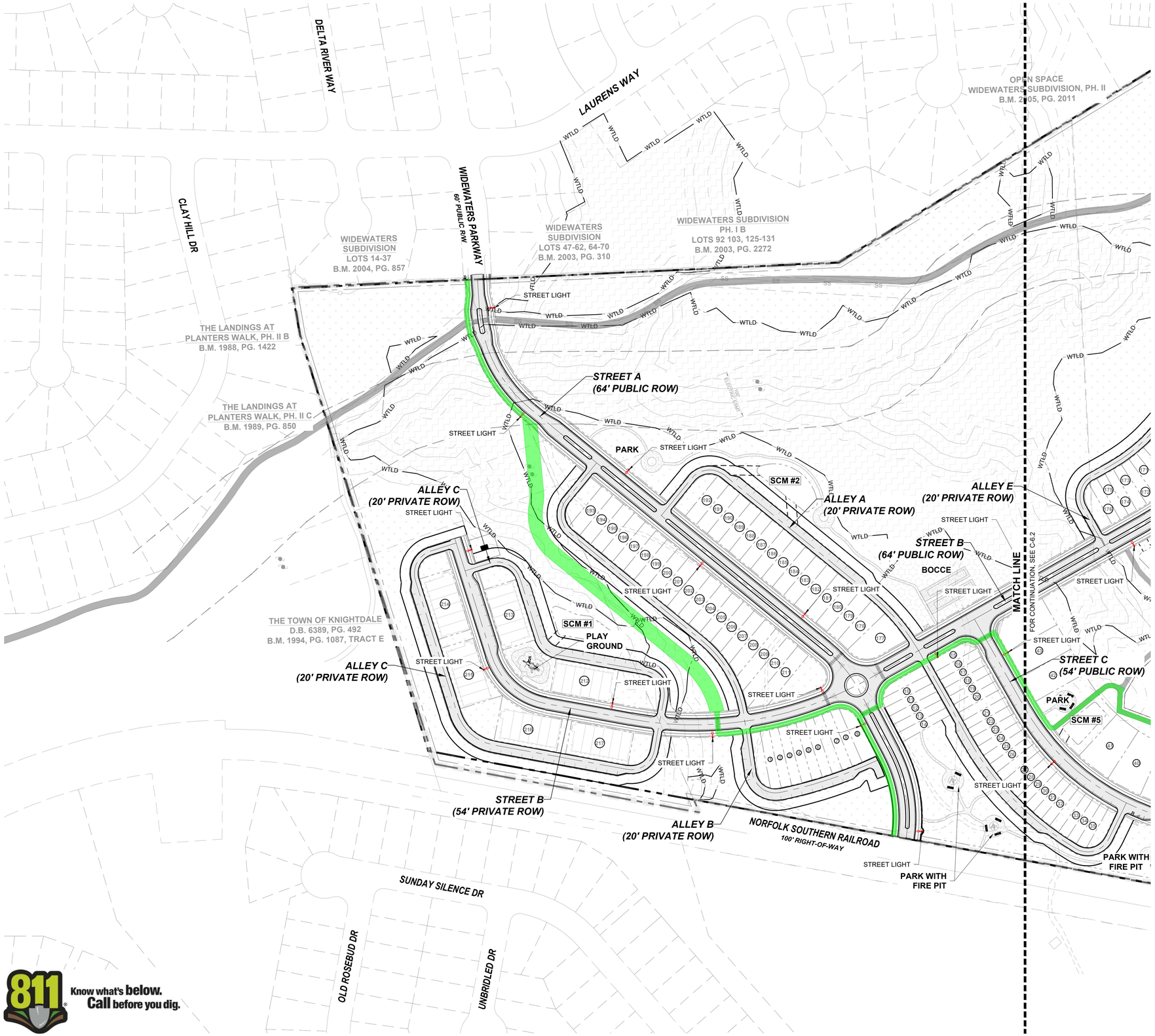
***MASTER PLAN***

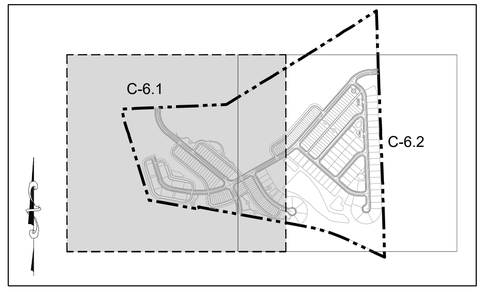
**OVERALL LIGHTING PLAN**

DRAWING SHEET
**C-6.0**

**25 OF 33**

PROGRESS PLOT DATE: 08-01-2022




**SITE KEY PLAN**

**LEGEND:**

SEE SHEET C-6.0 FOR LEGEND

**LEGEND:**

LED STREET LIGHTS (7,000 LUMENS LED 75 ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

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

| No. | REVISIONS | DATE | BY |
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|---|---|
| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED LIGHTNG PLAN**

DRAWING SHEET

**C-6.1**

**26 OF 33**

PROGRESS PLOT DATE: 08-01-2022

COMMON AREA
WIDEWATERS SUBDIVISION, PH. II
B.M. 2005, PG. 2011

OPEN SPACE
WIDEWATERS SUBDIVISION, PH. II
B.M. 2005, PG. 2011

SOUTHAMPTON DRIVE
60' PUBLIC R/W

LEWIS LANDING
SUBDIVISION, PH. I
LOTS 1-12
B.M. 1999, PG. 1347

LEWIS LANDING
SUBDIVISION, PHASE 2
B.M. 2001, PG. 1390
OPEN SPACE

LEWIS LANDING
SUBDIVISION, PHASE 2
B.M. 2001, PG. 1390

N/F
BROOKEFIELD STATION
DEVELOPMENT, LLC
B.M. 1997, PG. 1014, TRACT 2B
D.B. 11783, PG. 1

STREET B
(64' PUBLIC ROW)

ALLEY D
(20' PRIVATE ROW)

ALLEY E
(20' PRIVATE ROW)

STREET F
(54' PUBLIC ROW)

STREET G
(54' PUBLIC ROW)

STREET E
(54' PUBLIC ROW)

STREET D
(54' PUBLIC ROW)

STREET C
(54' PUBLIC ROW)

ALLEY A
(20' PRIVATE ROW)

ST JOHNS ST

TORTOLA PL

CARIBBEAN CT

MATCH LINE
FOR CONTINUATION, SEE C-6.1

PARK WITH BENCHES

POOL AREA

PARK WITH BENCHES

PLAY GROUND

BOCCE

PARK WITH FIRE PIT

PARK WITH FIRE PIT

PARK WITH FIRE PIT

PARK WITH FIRE PIT

EXISTING POND

SCM #3

SCM #4

SCM #5

STREET LIGHT

WTLD

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

C-6.1

C-6.2

## SITE KEY PLAN

## LEGEND:

SEE SHEET C-6.0 FOR LEGEND

### LEGEND:

LED STREET LIGHTS (7,000 LUMENS LED 75 ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

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| STRONG ROCK PROJECT | |
|---|---|
| DATE | |
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| DRAWN BY | JWL |
| CHECKED BY | JWL |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

***MASTER PLAN***

**DETAILED LIGHTING PLAN**

DRAWING SHEET

**C-6.2**

**27 OF 33**

PROGRESS PLOT DATE: 08-01-2022

## SIGN LEGEND:

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

| SIGN | MUTCD STD. | SIZE |
|---|---|---|
| STOP | R1-1 3 | 30"X30" |
| 25 MPH | R2-1 | 24"X30" |
| ROAD CLOSED | R11-2 | 48"X30" |
| STREET NAME | D3-1 | VARIES"X12" |
| PEDESTRIAN CROSSING | W11-2 | 30" |
| PEDESTRIAN CROSSING | W16-7P | 30" |
| YIELD SIGN | R1-2 | 30"x30"x30" |

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT SIGN DEEP X 12-IN DIA. CONCRETE FOOTING. MUTCD STD. SIZE KNIGHTDALE AND/OR NCDOT PRIOR TO SIGN INSTALLATION.

3. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY THE TOWN OF KNIGHTDALE AND/OR NCDOT PRIOR TO SIGN INSTALLATION.

4. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE TOWN OF KNIGHTDALE, NCDOT STANDARDS AND SPECIFCATIONS.

5. THE TOWN OF KNIGHTDALE REQUIRES ALL REGULATORY PAVEMENT MARKINGS TO BE HI-VIS THERMOPLASTIC, EXCEPT FOR PARKING SPACE STRIPING WHICH MAY BE WHITE PAINT, PER STREET NAME D3-1 VARIES"X12" DETAIL 4.06.

## LEGEND:

STOP SIGN

STREET SIGN

STEAMBOAT ST
CALAVARAS LN
JUMPING FROG LN
STERN WHEEL WAY
MINGOCREST DR
SULLEY CT
TIMBER RIDGE SUB. PH. III SEC. I B.M. 1998, PG. 1451
THE TOWN OF KNIGHTDALE D.B. 1876, PG. 67 PIN: 1744-92-7973
TIMBER RIDGE SUB. PH. III SEC. I B.M. 1998, PG. 1451
TIMBER RIDGE SUB. PH. III SEC. II B.M. 1999, PG. 1769
COMMON AREA WIDEWATERS SUBDIVISION, PH. II B.M. 2005, PG. 2011
OPEN SPACE WIDEWATERS SUBDIVISION, PH. II B.M. 2005, PG. 2011
THE TOWN OF KNIGHTDALE D.B. 8095, PG. 1115 PIN: 1754-02-0595
LAURENS WAY
WIDEWATERS PARKWAY 60' PUBLIC R/W
SOUTHAMPTON DRIVE 60' PUBLIC R/W
CROSSWALK (TYP.)
STREET SIGN (TYP.)
PARK WITH BENCHES
STOP SIGN (TYP.)
STOP BAR (TYP.)
LEWIS LANDING SUBDIVISION, PH. I LOTS 1-12 B.M. 1999, PG. 1347
CLAY HILL DR
WIDEWATERS SUBDIVISION LOTS 14-37 B.M. 2004, PG. 857
WIDEWATERS SUBDIVISION LOTS 47-62, 64-70 B.M. 2003, PG. 310
WIDEWATERS SUBDIVISION PH. I B LOTS 92 103, 125-131 B.M. 2003, PG. 2272
ALLEY D
STREET B
LEWIS LANDING SUBDIVISION, PHASE 2 B.M. 2001, PG. 1390 OPEN SPACE
POOL AREA
THE LANDINGS AT PLANTERS WALK, PH. II B B.M. 1988, PG. 1422
THE LANDINGS AT PLANTERS WALK, PH. II C B.M. 1989, PG. 850
STREET A
ALLEY E
STREET E
STREET F
ST JOHNS ST
TORTOLA PL
PARK
SCM #2
ALLEY A
BOCCE
ALLEY C
SCM #3
PLAY GROUND
STREET C
STREET G
LEWIS LANDING SUBDIVISION, PHASE 2 B.M. 2001, PG. 1390
CARIBBEAN CT
THE TOWN OF KNIGHTDALE D.B. 6389, PG. 492 B.M. 1994, PG. 1087, TRACT E
SCM #1
PLAY GROUND
PARK WITH FIRE PIT
EXISTING POND
SCM #5
ALLEY C
STREET D
SCM #4
STREET B
NORFOLK SOUTHERN RAILROAD 100' RIGHT-OF-WAY
ALLEY B
PARK WITH FIRE PIT
PARK WITH FIRE PIT
SUNDAY SILENCE DR
OLD ROSEBUD DR
UNBRIDLED DR
N/F BROOKEFIELD STATION DEVELOPMENT, LLC B.M. 1997, PG. 1014, TRACT 2B D.B. 11783, PG. 1

GRAPHIC SCALE
150 0 75 150 300 600
( IN FEET )
1 inch = 150 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036225 JOSHUA W. LAMBERT


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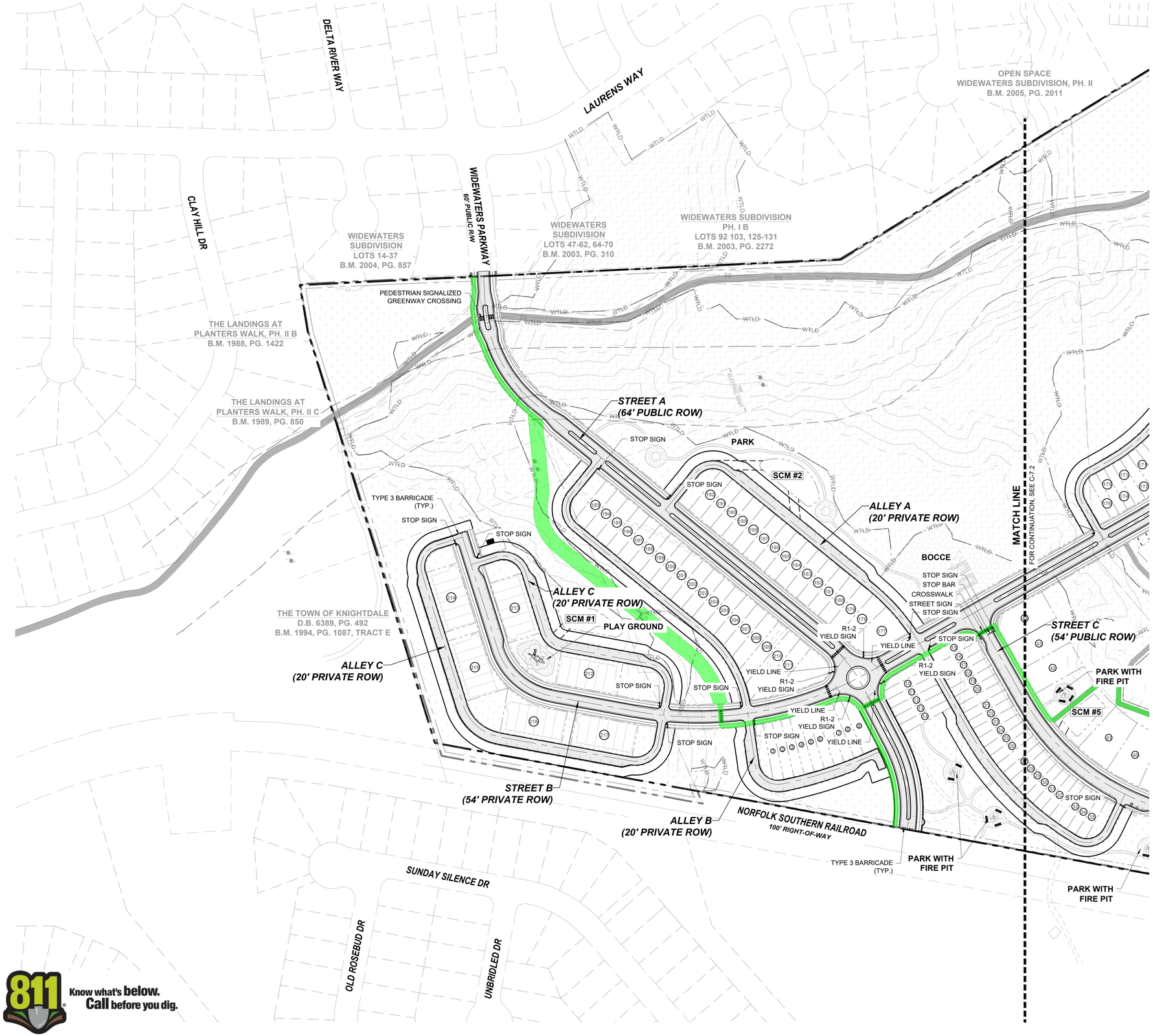

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| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

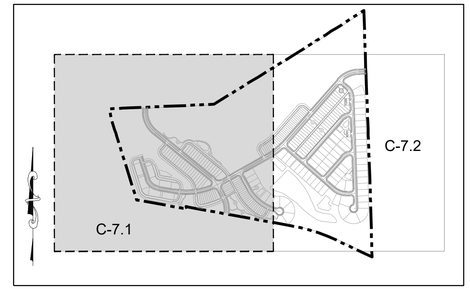
KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

# *MASTER PLAN*
# OVERALL SIGNS AND MARKINGS PLAN

DRAWING SHEET
C-7.0

PROGRESS PLOT DATE: 08-01-2022




## SITE KEY PLAN

## SIGN LEGEND:

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

| SIGN | MUTCD STD. | SIZE |
|---|---|---|
| STOP | R1-1 3 | 30"X30" |
| 25 MPH | R2-1 | 24"X30" |
| ROAD CLOSED | R11-2 | 48"X30" |
| STREET NAME | D3-1 | VARIES"X12" |
| PEDESTRIAN CROSSING | W11-2 | 30" |
| PEDESTRIAN CROSSING | W16-7P | 30" |
| YIELD SIGN | R1-2 | 30"x30"x30" |

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT SIGN DEEP X 12-IN DIA. CONCRETE FOOTING. MUTCD STD. SIZE KNIGHTDALE AND/OR NCDOT PRIOR TO SIGN INSTALLATION.
3. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY THE TOWN OF KNIGHTDALE AND/OR NCDOT PRIOR TO SIGN INSTALLATION.
4. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE TOWN OF KNIGHTDALE, NCDOT STANDARDS AND SPECIFCATIONS.
5. THE TOWN OF KNIGHTDALE REQUIRES ALL REGULATORY PAVEMENT MARKINGS TO BE HI-VIS THERMOPLASTIC, EXCEPT FOR PARKING SPACE STRIPING WHICH MAY BE WHITE PAINT, PER STREET NAME D3-1 VARIES"X12" DETAIL 4.06.

## LEGEND:

SEE SHEET C-7.0 FOR LEGEND

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

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

| No. | REVISIONS | DATE | BY |
|---|---|---|---|
| | | | |

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036225 JOSHUA W. LAMBERT

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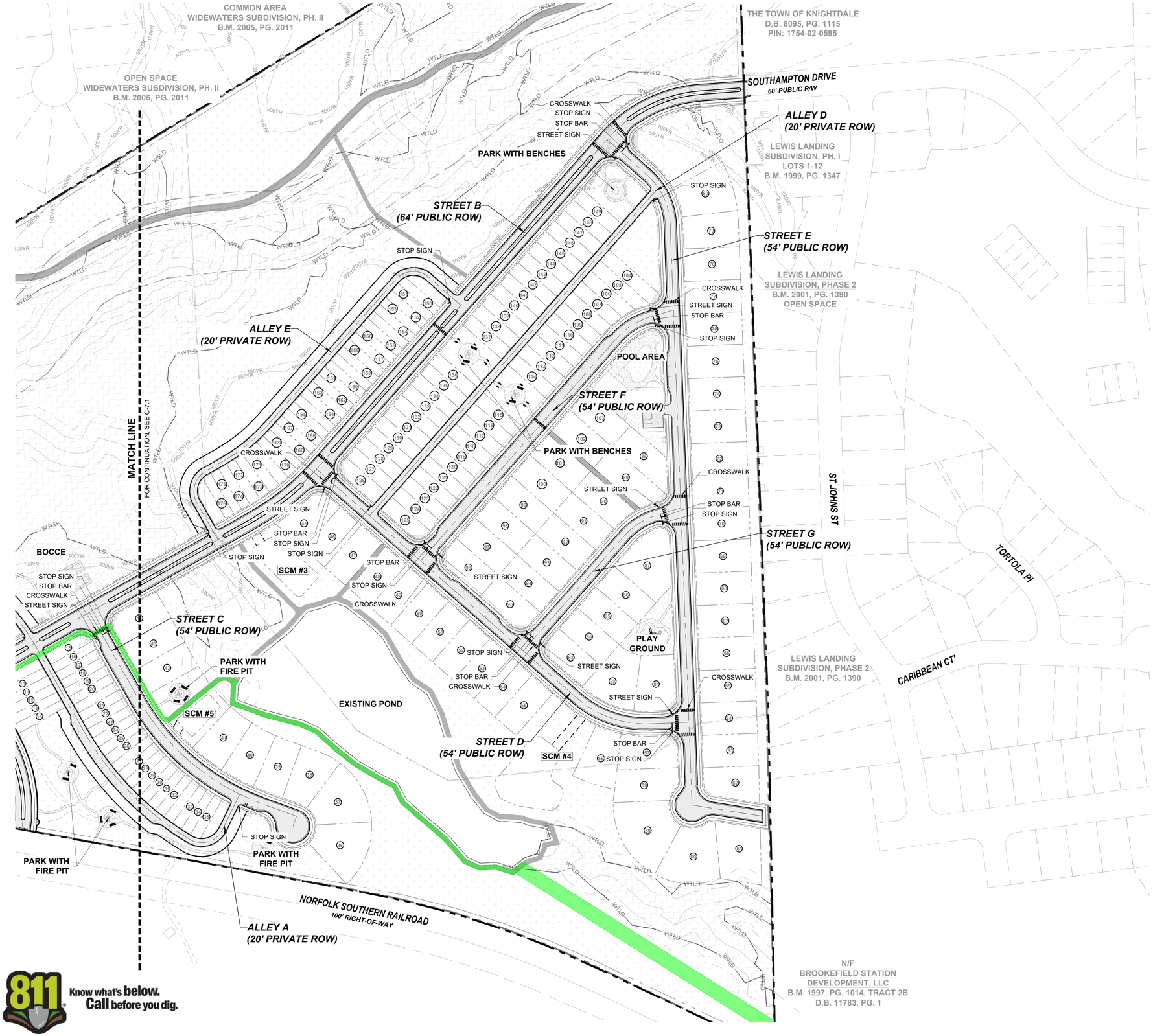
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|---|---|
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |

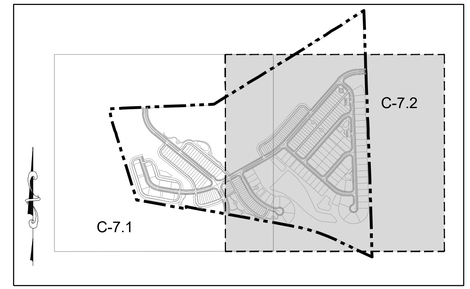
KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

# *MASTER PLAN*
# DETAILED SIGNS AND MARKINGS PLAN

DRAWING SHEET
C-7.1

PROGRESS PLOT DATE: 08-01-2022




## SITE KEY PLAN

## SIGN LEGEND:

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

| SIGN | MUTCD STD. | SIZE |
|---|---|---|
| STOP | R1-1 3 | 30"X30" |
| 25 MPH | R2-1 | 24"X30" |
| ROAD CLOSED | R11-2 | 48"X30" |
| STREET NAME | D3-1 | VARIES"X12" |
| PEDESTRIAN CROSSING | W11-2 | 30" |
| PEDESTRIAN CROSSING | W16-7P | 30" |
| YIELD SIGN | R1-2 | 30"x30"x30" |

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT SIGN DEEP X 12-IN DIA. CONCRETE FOOTING. MUTCD STD. SIZE KNIGHTDALE AND/OR NCDOT PRIOR TO SIGN INSTALLATION.
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4. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE TOWN OF KNIGHTDALE, NCDOT STANDARDS AND SPECIFCATIONS.
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## LEGEND:

SEE SHEET C-7.0 FOR LEGEND

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

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

| No. | REVISIONS | DATE | BY |
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NORTH CAROLINA PROFESSIONAL SEAL 036225 ENGINEER JOSHUA W. LAMBERT

SEAL


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| STRONG ROCK PROJECT | | | |
|---|---|---|---|
| | DATE | | |
| | SCALE | AS SHOWN | |
| | DESIGNED BY | JWL | |
| | DRAWN BY | JWL | |
| | CHECKED BY | JWL | |

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA

# *MASTER PLAN*
# DETAILED SIGNS AND MARKINGS PLAN

DRAWING SHEET
C-7.2

30 OF 33




GRAPHIC SCALE
( IN FEET )
1 inch = 50 ft.

PROGRESS PLOT DATE: 08-01-2022

| | | | | | |
|---|---|---|---|---|---|
| 31 OF 33 | DRAWING SHEET E-1.0 | KNIGHTDALE - CREEKVIEW CROSSING<br>TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA<br>***MASTER PLAN***<br>**HODGE RD AND LYNNWOOD IMPROVEMENTS PLAN** | STRONG ROCK PROJECT<br>DATE<br>SCALE AS SHOWN<br>DESIGNED BY JWL<br>DRAWN BY JWL<br>CHECKED BY JWL | **STRONGROCK**<br>ENGINEERING GROUP<br>STRONG ROCK ENGINEERING GROUP, PLLC \| COMPANY LICENSE # P-2166<br>6801 FALLS OF NEUSE RD. SUITE 108 RALEIGH, NC 27615 \| JOSH@STRONGROCKENGINEERING.COM | SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040725 JOSHUA W. LAMBERT |

| No. | REVISIONS | DATE | BY |
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GRAPHIC SCALE
( IN FEET )
1 inch = 50 ft.
0
25
50
100
200

PROGRESS PLOT DATE: 08-01-2022

32 OF 33

DRAWING SHEET
E-2.0

KNIGHTDALE - CREEKVIEW CROSSING
TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA
***MASTER PLAN***
**WIDEWATERS PARKWAY & LAURENS WAY IMPROVEMENTS PLAN**

| | |
|---|---|
| STRONG ROCK PROJECT | |
| DATE | |
| SCALE | AS SHOWN |
| DESIGNED BY | JWL |
| DRAWN BY | JWL |
| CHECKED BY | JWL |


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SEAL:
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040225 JOSHUA W. LAMBERT

| No. | REVISIONS | DATE | BY |
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GRAPHIC SCALE
( IN FEET )
1 inch = 50 ft.

PROGRESS PLOT DATE: 08-01-2022

| | | | |
|---|---|---|---|
| 33 OF 33 | DRAWING SHEET E-3.0 | KNIGHTDALE - CREEKVIEW CROSSING<br>TOWN OF KIGHTDALE, WAKE COUNTY, NORTH CAROLINA<br>***MASTER PLAN***<br>**CARRINGTON DRIVE & SMITHFIELD ROAD IMPROVEMENTS PLAN** | STRONG ROCK PROJECT<br>DATE<br>SCALE AS SHOWN<br>DESIGNED BY JWL<br>DRAWN BY JWL<br>CHECKED BY JWL |


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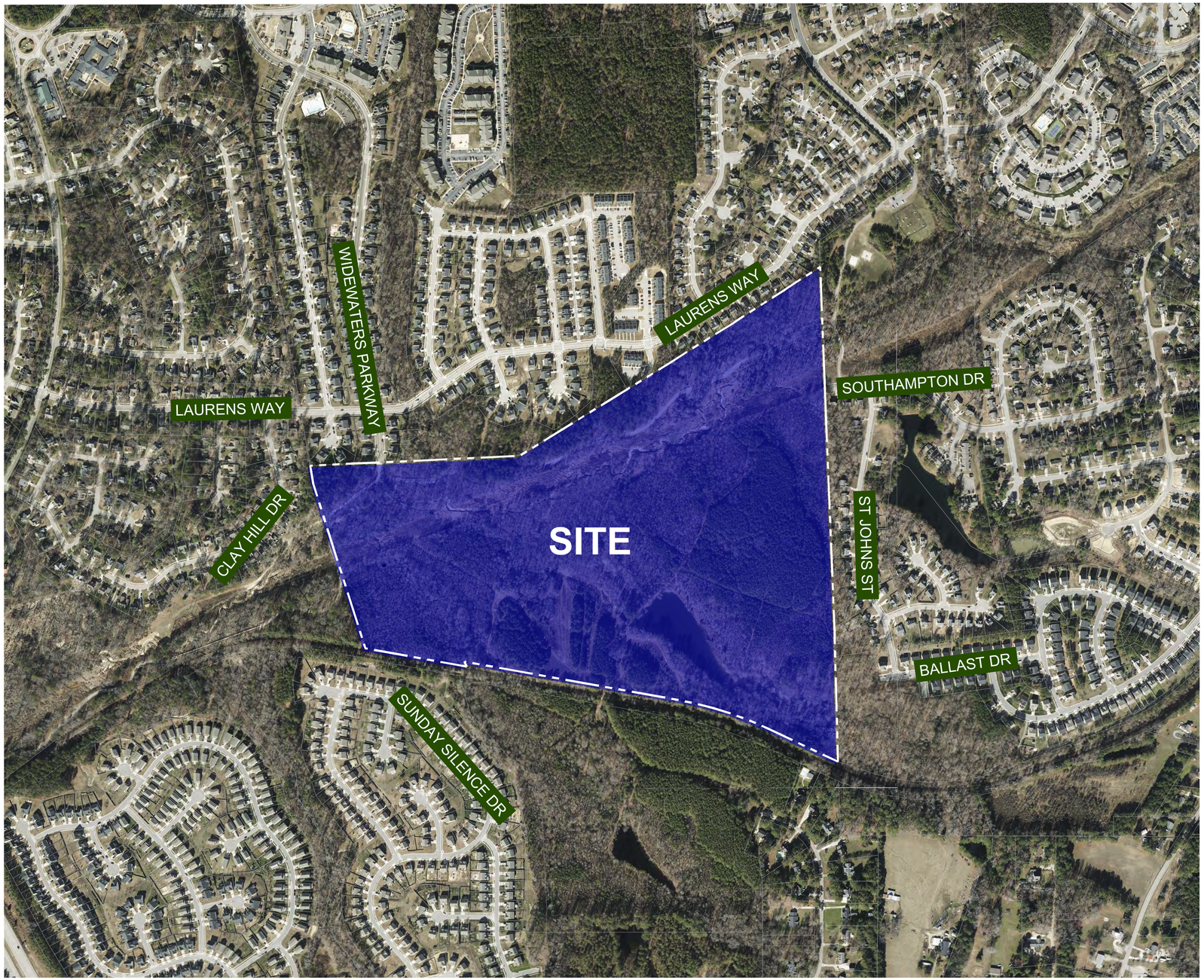

SEAL:
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049225 JOSHUA W. LAMBERT

| No. | REVISIONS | DATE | BY |
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# CREEKVIEW CROSSING PUD
ZMA-5-21

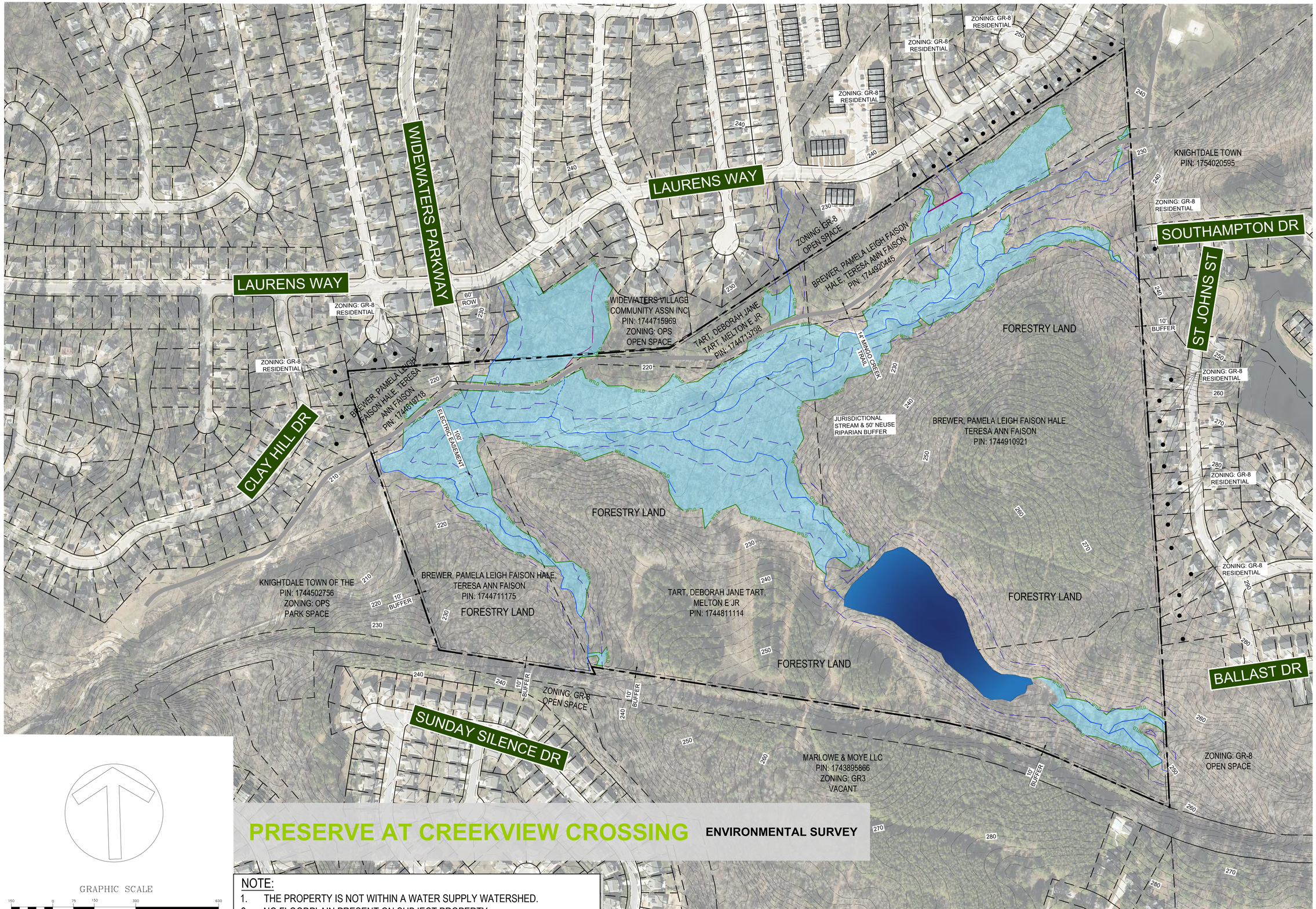
CREEKVIEW CROSSING PUD




| SITE DATA TABLE | |
|---|---|
| CIVIL ENGINEERING: | STRONG ROCK ENGINEERING GROUP, PLLC PO BOX 55992<br>RALEIGH, NC 27624<br>COMPANY LICENSE #: P-2166<br>CONTACT: JOSH LAMBERT, PE<br>984.200.1932 (O)<br>JOSH@STRONGROCKGROUP.COM |
| OWNER: | ELLIS DEVELOPMENTS NC, LLC<br>C/O STRONG ROCK DEVELOPMENT COMPANY<br>8362 SIX FORKS RD.<br>SUITE 104RALEIGH, NC 27615<br>919-770-4174 (P)<br>CONTACT: JOSH LAMBERT<br>JOSH@STRONGROCKDEV.COM |
| TAX ID: | 1744711175, 1744910921, 1744619718, 1744920445, 1744811114, 1744713798 |
| DEED REFERENCE | DB. 16323 PG. 2009 |
| TOWNSHIP: | KNIGHTDALE |
| ZONING: | RT |
| CURRENT USE: | SINGLE FAMILY/ WOODED LAND |
| PROPOSED USE: | RESIDENTIAL |
| PROPOSED ZONING: | PD - GR3 |
| TOTAL PROJECT AREA: | 102.06 AC |
| PROPOSED DENSITY: | 2.77 DU/AC |
| RIVER BASIN: | NEUSE |

| | |
|---|---|
| FRONT LOAD SINGLE FAMILY LOT STANDARDS: | MINIMUM LOT SIZE: 8,400 SF<br>LOT WIDTH: 70'<br>FRONT SETBACK: 10'<br>SIDE SETBACK: 5'<br>CORNER SETBACK: 10'<br>REAR SETBACK: 25' |
| FRONT LOAD SINGLE FAMILY LOT STANDARDS: | MINIMUM LOT SIZE: 7,200 SF<br>LOT WIDTH: 60'<br>FRONT SETBACK: 10'<br>SIDE SETBACK: 5'<br>CORNER SETBACK: 10'<br>REAR SETBACK: 25' |
| REAR LOAD SINGLE FAMILY LOT STANDARDS: | MINIMUM LOT SIZE: 3,300 SF<br>LOT WIDTH: 30'<br>FRONT SETBACK: 35'<br>SIDE SETBACK: 3'<br>CORNER SETBACK: 10'<br>REAR SETBACK: 25' |
| REAR LOAD TOWNHOME LOT STANDARDS: | MINIMUM LOT SIZE: 2,000 SF<br>LOT WIDTH: 20'<br>FRONT SETBACK: 10'<br>SIDE SETBACK: N/A<br>CORNER SETBACK: 10'<br>REAR SETBACK: 15'<br>BUILDING SEPARATION: 10' |

SITE LOCATION




# PRESERVE AT CREEKVIEW CROSSING

**ENVIRONMENTAL SURVEY**

GRAPHIC SCALE

150 0 75 150 300 600

( IN FEET )
1 inch = 150 ft.

NOTE:

1. THE PROPERTY IS NOT WITHIN A WATER SUPPLY WATERSHED.
2. NO FLOODPLAIN PRESENT ON SUBJECT PROPERTY.
3. WETLANDS HAVE BEEN FIELD LOCATED.

EXISTING CONDITIONS AND ENVIRONMENTAL SURVEY

# COMMUNITY VISION

KNIGHTDALENEXT 2035 COMPREHENSIVE PLAN. THE CREEKVIEW CROSSING PROJECT IS A MIXED-USE RESIDENTIAL DEVELOPMENT DESIGNED TO AMPLIFY THE AESTHETIC OF THE COMMUNITY WHILE PROVIDING CRITICAL IMPROVEMENTS TO THE BENEFIT OF ALL KNIGHTDALE RESIDENTS. THIS PROJECT WILL FEATURE 283 UNITS, OVER SIX PRODUCT TYPES. THE MAIN ENTRANCE ROADS WILL FEATURE ALLEY-LOADED UNITS WHICH WILL ENHANCE THE SAFETY AND CURB APPEAL OF THE DEVELOPMENT'S MOST TRAVELED ROADWAYS. FRONT-LOADED UNITS WILL BE PRESENT ON SIDE AND SECONDARY STREETS TO MATCH THE SUBURBAN CHARACTER OF NEIGHBORING COMMUNITIES. BY PROVIDING MULTIPLE PRODUCT TYPES AND PRICE POINTS, CREEKVIEW CROSSING WILL ALLOW FAMILIES AND NEW RESIDENTS, AT VARYING INCOMES, AND STAGES TO LIVE HARMONIOUSLY AND CALL KNIGHTDALE HOME.

OPEN SPACE IS THE MARQUEE FEATURE THAT WILL SET THIS DEVELOPMENT APART FROM OTHERS. THE NATURAL FEATURES INCLUDE THE MINGO CREEK AND AN EXISTING POND. WITH 59.8% OF THE SITE BEING DEDICATED FOR OPEN SPACE, THERE WILL BE AMPLE OPPORTUNITIES TO MEET EVERYONE'S RECREATIONAL NEEDS. AMENITIES WILL INCLUDE A CLUBHOUSE, POOL, PARK, BOCCE COURT, PLAYGROUND AND MORE. CREEKVIEW CROSSING WILL ALSO FEATURE AN EXTENSION OF THE GREENWAY NETWORK TO BENEFIT ALL KNIGHTDALE RESIDENTS. THE END RESULT WILL BE A VISUALLY APPEALING, WALKABLE NEIGHBORHOOD THAT WILL ENHANCE THE SENSE OF PLACE AND SERVE AS A MODEL FOR FUTURE DEVELOPMENTS.

ACCOMPANYING THE RESIDENTIAL DEVELOPMENT WILL BE CRITICAL TRANSPORTATION IMPROVEMENTS. AS AN INFILL SITE, CREEKVIEW CROSSING WILL BE PROVIDING A KEY EXTENSION OF WIDEWATERS PKWY TOWARDS THE EVENTUAL GOAL OF A CONNECTION TO OLD FAISON ROAD. THE DESIGN OF THIS EXTENSION LEAVES AMPLE SPACE FOR A FUTURE RAILROAD CROSSING AND ALIGNMENT IS CONSISTENT WITH FUTURE PLANS AND DEVELOPMENTS. IN ADDITION, THE SOUTHAMPTON DRIVE EXTENSION WILL PROVIDE A NEW CONNECTION FOR NEIGHBORING RESIDENTS TO ACCESS RT. 64 OR SMITHFIELD ROAD. BOTH OF THESE EXTENSIONS WILL INCREASE CONNECTIVITY BETWEEN INDIVIDUAL COMMUNITIES AND KNIGHTDALE AS A WHOLE.

# COMPREHENSIVE PLAN CONSISTENCY STATEMENT

1. **NATURAL ENVIRONMENT -** Creekview Crossing contains a variety of existing natural features. The principle in KnightdaleNext cites the need for residents to experience the natural environment (KNP p. 14). This proposal contains multiple extensions of the greenway network as well as connections into the existing greenway. In addition to the preservation area around the Mingo Creek, this development will also preserve the existing pond on the property and highlight that feature with an internal trail that runs along the perimeter

2. **INFILL DEVELOPMENT -** This project borders between two existing residential subdivisions and is currently under utilized based on the Mixed Use designation in the Growth and Conservation Map (KNP p. 49) and Widewaters extension shown in the Street Network Map (KNP p. 81). The Comprehensive Plan aims to “promote infill development” (KNP p. 15). This project is in compliance with this guiding principle based on the designations and maps provided in KnightdaleNext.

3. **TRANSPORTATION -** The Creekview Crossing project will feature sidewalks, greenway extensions, an internal trail network, creation of two new extensions into existing stubs, and will be providing the first link in the Widewaters Parkway extension. Residents within the community and the general public will have multiple transportation options to safely and efficiently access or pass through the property whether it be via car, bike, or on foot. The inclusive transportation options meet the guiding principle to emphasize quality infrastructure improvements and multiple forms of transportation (KNP p. 15).

4. **COMMUNITY DESIGN -** Creekview Crossing will provide and enhance the sense of place within Knightdale. Unlike traditional sprawl, this mixed use project will feature a variety of passive and active open space amenities, multiple unit types, natural features, and two median-divided boulevard entrances that will enhance the streetscape and curb appeal of this community. These design attributes align with KnightdaleNext and the overall identity the Town is striving for.

5. **GREAT NEIGHBORHOODS AND EXPANDED HOME CHOICES -** According to KnightdaleNext, the principal attribute of this guiding value revolves around housing opportunity. Creekview Crossing provides six different unit types, well over the recommended two. With this amount of variety, there will be a range of price points to allow families at varying stages of life to find accommodations that meet their needs now and into the future. The community's nearly 60% open space will set it apart and promote a vibrant and fulfilling lifestyle that residents will come to love.

# CREEKVIEW CROSSING - KNIGHTDALE UDO CONSISTENCY

1. **MODIFICATION FOR SINGLE FAMILY DETACHED LOT WIDTH** - Table 3.4 Bulk and Dimensional Standards require street-loaded units and alley-loaded units to maintain lot widths of 80' and 30'respectively. This development is proposing 70’ & 60' for street-loaded units. This proposed reduction is made to appease the recommendations in KnightdaleNext to provide expanded home choices as well as unique community design and compact development patterns. The space savings from these reductions can be found through the inclusion of the clubhouse and pool, playground, dog park, greenway, and preservation of the natural pond and wetlands**.**

2. **MODIFICATION TO INCLUSION OF MULTI-FAMILY DWELLINGS -** Section 5.2.A.1 and 5.2.A.2 state that multi-family dwellings must be located in a growth activity center or priority investment area while also including a mixture of non-residential uses. Creekview Crossing proposes a multi-family dwelling housing type located in the southwestern portion of the project. The inclusion of multi-family dwellings is intended to further Knightdale's desire for a creating great neighborhoods through a mixture of housing types by further aiding in meeting the recent housing demand for the "missing middle" housing product in Knightdale and surround areas. Due to its proposed location in the middle of a suburban pattern of established subdivisions, non-residential uses are not contemplated for this dwelling type.

3. **MODIFICATION TO DRIVEWAY LENGTH FOR REAR-LOADED TOWNHOUSE AND REAR-LOADED SINGLE FAMILY** - Table 3.4 Bulk and Dimensional Standards require all units within GR3 to maintain a minimum driveway length of 35'. In an effort to incorporate the “public realm” the applicant is requesting to reduce this requirement to 25' for rear-loaded townhomes and 25' for rear-loaded single family. The reduction will still accommodate adequate parking throughout the development, especially in denser areas of the project, and meanwhile promote pedestrian movement within the community. The applicant is proposing an extensive streetscape to encourage the aforementioned movement and beautify the community as a whole.

4. **MODIFICATION TO 64' ROW REQUIREMENT -** The north-south collector road is shown to decrease in size to 54' from its connection with Widewaters Parkway until the road traverses the wetlands in the northern portion of the site. The road then widens to 64'. The reason for this request is to minimize as much as possible impacts to wetlands in this area.

# COMMUNITY MASTER PLAN

## SITE DATA:

| | |
|---|---|
| TOTAL AREA: | 102.06 AC |
| PARENT PIN: | 1744711175, 1744910921, 1744619718 1744920445, 1744811114, 1744713798 |
| PROPOSED ZONING: | PD-GR3 |
| RESIDENTIAL UNITS: | 283 |
| -TWO STORY TOWNHOMES | 35 |
| -THREE STORY TOWNHOMES | 27 |
| -SINGLE FAMILY (30' x 120') | 81 |
| -SINGLE FAMILY (60' x 120') | 44 |
| -SINGLE FAMILY (70' x 120') | 24 |
| -BUILDING | 72 |
| OPEN SPACE REQUIRED | 7.40 AC |
| ACTIVE OPEN SPACE REQUIRED | 1.85 AC |
| OPEN SPACE PROVIDED | 62.30 AC |
| ACTIVE OPEN SPACE PROVIDED | 4.98 AC |
| CONNECTIVITY RATIO | 1.52 |

## LEGEND

- 30' x 110' S/F LOT
- 60' x 120' S/F LOT
- 70' x 120' S/F LOT
- 20' x 100' TOWNHOME LOT (2- STORY)
- 20' x 100' TOWNHOME LOT (3- STORY)
- 135' x 70' BUILDING

1. PARK
2. POCKET PARK
3. PARK WITH BENCHES
4. POOL AND CLUBHOUSE
5. PLAYGROUND
6. GREENWAYS
7. STORMWATER MANAGEMENT
8. ELECTRIC EASEMENT
9. WETLANDS
10. AREAS WITH TRAILS

## TREE COVERAGE REQUIREMENT

9,730 LF X 20 LF = 194,600 SQ FT REQUIRED (4.68 ACRES)

NRB AREA: 1,080,334 SQ FT (24.80 ACRES)

TREE COVERAGE PROVIDED: 2,331,135 SQ FT (53.52 ACRES)

## WATER ALLOCATION POINTS

| | |
|---|---|
| BASE POINTS | |
| MAJOR SUBDIVISION | 15 POINTS |
| BONUS POINTS | |
| FOUNTAIN WITHIN BMP | 4 POINTS |
| STORMWATER - BIORETENTION | 5 POINTS |
| 4 ON STREET PUBLIC PARKING | 4 POINTS |
| RESIDENTIAL ARCHITECTURAL STANDARDS | 15 POINTS |
| 2300' PRIVATE GREENWAY | 2 POINTS |
| RESORT STYLE POOL - 2,500 SQ FT | 2 POINTS |
| DECK/PATIO (2,000 SQ FT) | 2 POINTS |
| CLUBHOUSE | 2 POINTS |
| IPEMA CERTIFIED PLAYGROUND EQUIPMENT | 4 POINTS |
| | |
| TOTAL POINTS | 55 POINTS |

LAURENS WAY

WIDEWATERS PARKWAY

SOUTHAMPTON DR

ST JOHNS ST

CLAY HILL DR

BALLAST DR

SUNDAY SILENCE DR

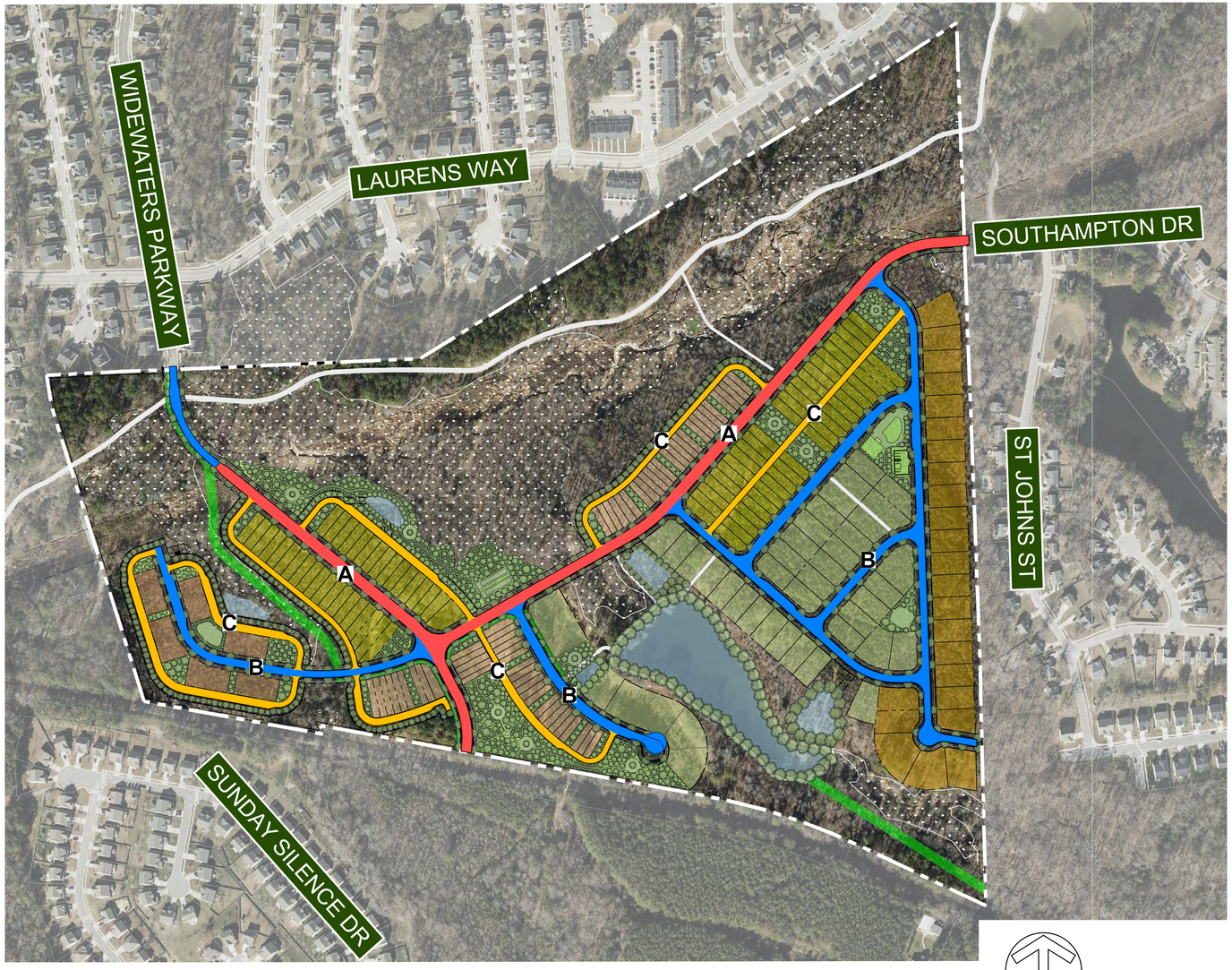
GRAPHIC SCALE

150 0 75 150 300 600

( IN FEET )

1 inch = 150 ft.

# STREET SECTIONS

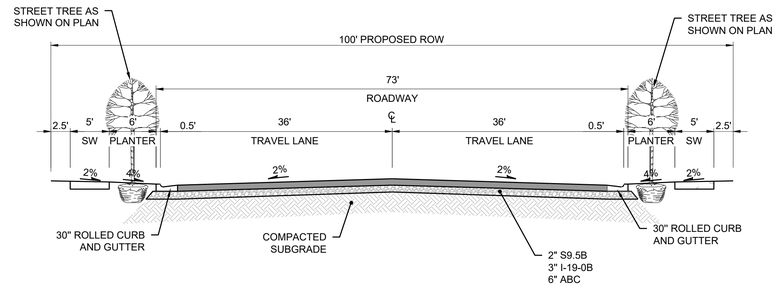



GRAPHIC SCALE

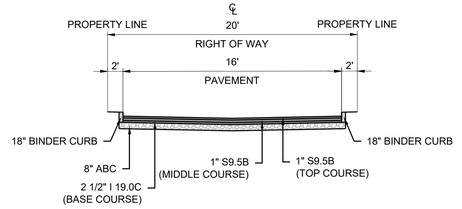
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( IN FEET )
1 inch = 200 ft.

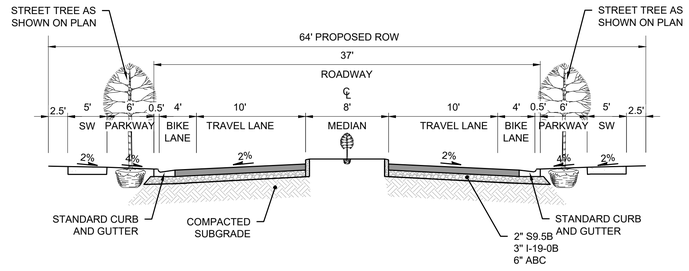
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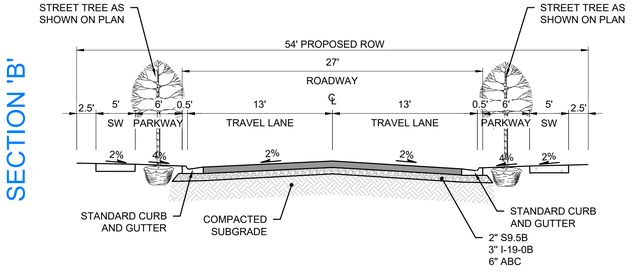

## SECTION 'C' TYP. INTERIOR RESIDENTIAL ALLEY




## SECTION 'A'




## SECTION 'B'



# COMMUNITY AMENITIES

KEYNOTES:

1. PARK
2. POCKET PARK
3. PARK WITH BENCHES
4. POOL AND CLUBHOUSE
5. PLAY GROUND
6. GREENWAYS
7. POND

LAURENS WAY

WIDEWATERS PARKWAY

LAURENS WAY

SOUTHAMPTON DR

CLAY HILL DR

ST JOHNS ST

BALLAST DR

GRAPHIC SCALE

150 0 75 150 300 600

( IN FEET )
1 inch = 150 ft.

KEYNOTES:

1. PARK
2. POCKET PARK
3. PARK WITH BENCHES
4. POOL AND CLUBHOUSE
5. PLAY GROUND
6. GREENWAYS
7. POND

GRAPHIC SCALE

150 0 75 150 300 600

( IN FEET )
1 inch = 150 ft.

# PRESERVED OPEN SPACE

# COMMUNITY AMENITIES

## PARK



## POOL AND CLUBHOUSE



## BOCCE COURT



## WALKING TRAIL



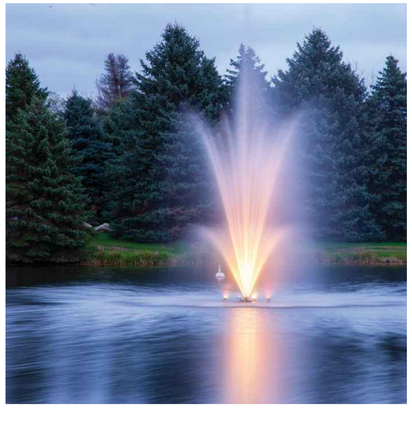
## POCKET PARK



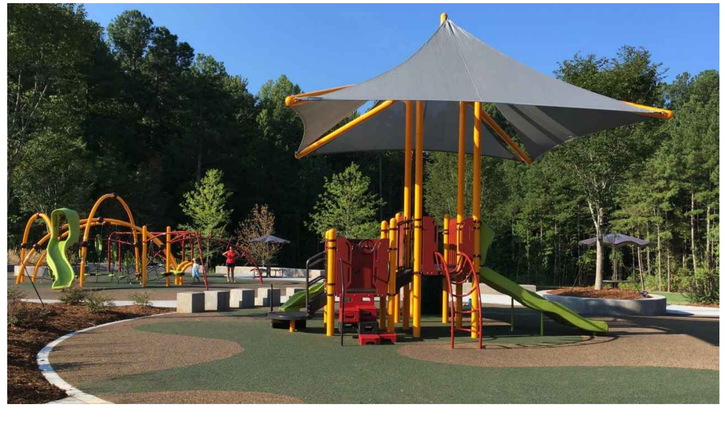
## PARK WITH BENCHES



## FOUNTAIN WITH A LIGHT



## PLAY GROUND



# TOWNHOMES - 20' x 100' LOTS (2-STORY)







RESIDENTIAL PRODUCT

# TOWNHOMES - 20' x 100' LOTS (3-STORY)






RESIDENTIAL PRODUCT

# FRONT LOADED SINGLE FAMILY





















RESIDENTIAL PRODUCT

# REAR LOADED SINGLE FAMILY











RESIDENTIAL PRODUCT

# MUTIL-FAMILY BUILDINGS





RESIDENTIAL PRODUCT

# ARCHITECTURAL STANDARDS

1. TOWNHOMES SHALL BE TWO-STORY HOMES AND THREE STORY HOMES WITH A MINIMUM WIDTH OF 20' WIDE AND HAVE A MINIMUM HEATED AREA OF 1,400 SQUARE FEET, THREE-STORY TOWNHOMES WILL COMPRISE AT LEAST 30% OF PRODUCT MIX.
2. NEO TRADITIONAL SINGLE FAMILY DETACHED HOMES SHALL BE REAR LOADED TWO-STORY HOMES BUILT ON LOTS LESS THAN 60 FEET WIDE WITH A MINIMUM HEATED AREA OF 1,500 SQUARE FEET.
3. SINGLE FAMILY RANCH DETACHED HOMES SHALL BE BUILT ON LOTS AT LEAST 60 FEET WIDE WITH A MINIMUM HEATED AREA OF 1,480 SQUARE FEET, AND NO MORE THAN 25% OF THE RANCH HOMES MAY BE LESS THAN 1,500 SQUARE FEET.
4. TRADITIONAL SINGLE FAMILY DETACHED HOMES SHALL BE TWO-STORY HOMES BUILT ON LOTS AT LEAST 60 FEET WIDE WITH A MINIMUM HEATED AREA OF 2,100 SQUARE FEET.
5. ALL HOMES WILL EITHER CONSIST OF A SINGLE MATERIAL OF BRICK OR STONE OR WILL HAVE A COMBINATION OF 2 OR MORE OF THE FOLLOWING MATERIALS ON THE FRONT FAÇADE (NOT INCLUDING FOUNDATIONS): STONE, BRICK, LAP SIDING, FIBER CEMENT SIDING, SHAKES, OR BOARD AND BATTEN SIDING, WITH SIDE AND REAR FACADES OF FIBER CEMENT SIDING. WHEN 2 MATERIALS ARE USED, THE MATERIALS SHALL BE DIFFERENT BUT COMPLIMENTARY COLORS. VINYL MAY ONLY BE USED OF SOFFITS, FASCIA, AND CORNER BOUNDS.
6. ALL SINGLE FAMILY DETACHED HOMES WILL HAVE FRONT PORCHES WITH A MINIMUM DEPTH OF 5 FEET. TOWNHOMES WILL HAVE RECESSED FRONT PORCHES WITH A MINIMUM DEPTH OF 5 FEET AND/OR BALCONIES.
7. ALL TRADITIONAL SINGLE FAMILY DETACHED HOMES WILL HAVE A REAR PATIO OR DECKS A MINIMUM OF 10' X 10'. ALL SINGLE FAMILY RANCH DETACHED HOMES WILL HAVE A MINIMUM 6' X 10' COVERED PATIO.
8. MAIN ROOF PITCHES (EXCLUDING PORCHES) FRONTING THE STREET WILL BE AT LEAST 7:12, WITH THE EXCEPTION OF RANCH HOMES IN WHICH 6:12 SHALL BE ALLOWED.
9. FOR EVERY 30 FEET (OR FRACTION) OF CONTINUOUS SIDE ELEVATION (CALCULATED ON A PER FLOOR BASIS), THERE SHALL BE ONE WINDOW OR DOOR ADDED TO THE SIDE ELEVATIONS. ANY SIDING BREAK ON THE SIDE OF THE HOME, SUCH AS A FI REPLACE, SIDE PORCH, OR WALL OFFSETS MAY BE USED AS AN ALTERNATE TO WINDOWS.
10. THERE SHALL BE A MINIMUM 12 INCH OVERHANG ON EVERY GABLE END FOR EVERY HOME.
11. GARAGES ON ALL NEO TRADITIONAL SINGLE FAMILY DETACHED HOMES AND TOWNHOMES SHALL BE ALLEY FED.
12. ALL FRONT LOADED GARAGE DOORS SHALL HAVE GLASS WINDOWS, CARRIAGE - STYLE AND HARDWARE.
13. ALL SINGLE FAMILY DETACHED HOMES SHALL BE RAISED FROM THE FINISHED GRADE A MINIMUM OF 18” AND SHALL HAVE STEM WALL OR RAISED SLAB FOUNDATIONS THAT SHALL BE COVERED ON ALL SIDES WITH BRICK OR STONE. AREAS UNDER PORCHES MAY BE ENCLOSED WITH LATTICE.
14. ALL SINGLE FAMILY ATTACHED HOMES SHALL BE RAISED FROM THE FINISHED GRADE A MINIMUM OF 12” AND SHALL HAVE STEM WALL OR RAISED SLAB FOUNDATIONS THAT SHALL BE COVERED ON ALL SIDES WITH BRICK OR STONE. AREAS UNDER PORCHES MAY BE ENCLOSED WITH LATTICE.
15. ANY SINGLE FAMILY HOMES WITH A CRAWL SPACE SHALL BE WRAPPED IN BRICK, OR STONE ON ALL SIDES AND 18" EXPOSED FOUNDATION.
16. FOR FRONT LOAD SINGLE FAMILY DETACHED HOMES, NO MORE THAN 10% CAN HAVE GARAGE DOORS THAT EXCEED 45% OF THE OVERALL WIDTH OF THE HOUSE, AND IN NO CASES CAN THE GARAGE DOOR EXCEED 48% OF THE OVERALL WIDTH OF THE HOUSE. SPLIT BAY DOORS SHALL BE AN OPTION.
17. ALL HOMES SHALL HAVE FRONT DOOR GLASS INSERTS.
18. 18 GARAGES FOR LOTS THAT ARE AT LEAST 60 FEET WIDE WILL NOT PROTRUDE MORE THAN SIX (6) FEET FROM THE FRONT PORCH OR STOOP AND ALL GARAGE DOORS SHALL HAVE WINDOW INSERTS AND HARDWARE.
19. THE COMMUNITY SHALL INCLUDE HOMES WITH MORE THAN ELEVATION TYPE.
20. AT LEAST 50% OF THE SINGLE FAMILY DETACHED HOMES WILL HAVE FRONT PORCHES THAT EXTEND THE WIDTH OF THE FRONT ELEVATION OF THE HOME EXCLUSIVE OF THE GARAGE.

April 2022




# CREEKVIEW CROSSING RESIDENTIAL

## Traffic Impact Analysis

LOCATED IN KNIGHTDALE, NC

### Prepared for:

Ellis Developments Group
6801 Falls of Neuse Road, #108
Raleigh, North Carolina 27615

### Prepared by:

Exult Engineering, PC
P.O. Box 99277
Raleigh, NC 27624

EXULT ENGINEERING

This document entitled Creekview Crossing Residential Traffic Impact Analysis was prepared by Exult Engineering, PC for the account of Ellis Developments Group. The material in it reflects Exult Engineering's best judgement in light of the information available to them at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Exult Engineering, PC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Creekview Crossing Residential Traffic Impact Analysis

Prepared by: _____ (sign)

Date: 4-21-2022

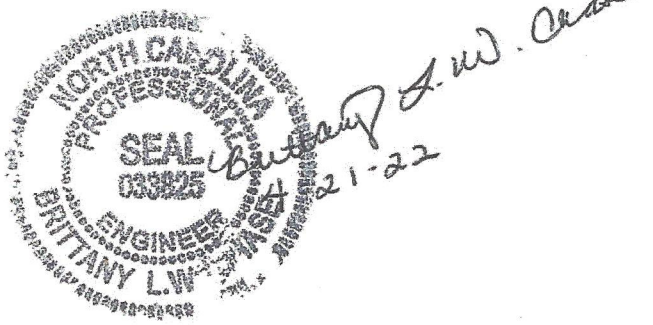
**Lisa Lundeen, PE**

Reviewed by: _____ (sign)

Date: 4-21-22

**Brittany Chase, PE**

EXULT ENGINEERING



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## EXECUTIVE SUMMARY

The proposed 89.5-acre site is located south of Laurens Way, west of St. Johns Street in Knightdale, North Carolina. The property is currently zoned as Rural Transition. The proposed development consists of 151 single family residential units, 68 residential townhome units, and 72 multifamily apartment units. The proposed site is to be developed within four years by the year 2026 and does require rezoning. The proposed development will be accessed by cross-connectivity to Widewaters Parkway and Southampton Drive. The purpose of this Traffic Impact Analysis (TIA) is to analyze the potential traffic impacts of the proposed development on the surrounding roadway network and to identify any roadway improvements necessary to mitigate the impact of the project traffic.

A TIA Scoping MOU was prepared and submitted to the Town of Knightdale and the North Carolina Department of Transportation (NCDOT). The Scoping MOU and subsequent correspondence regarding the scope of the TIA is included in the Appendix of this report. The *NCDOT Congestion Management Capacity Analysis Guidelines* were referenced to perform this traffic study.

As determined by the Town of Knightdale and NCDOT, the study area includes:

1. Widewaters Parkway at Laurens Way
2. Widewaters Parkway at Flatrock Park Drive (roundabout)
3. Widewaters Parkway at Knightdale Boulevard
4. Laurens Way at Lynnwood Road
5. Lynnwood Road at Hodge Road
6. Smithfield Road at Carrington Drive
7. First Avenue/Bethlehem Road at Crosstie Street

The proposed development is expected to generate 2,242 daily trips, 160 AM peak hour trips (42 entering, 118 exiting), and 213 PM peak hour trips (132 entering, 81 exiting).

Based on coordination with the Town, a 3% annual growth rate was applied to the existing traffic volumes to determine 2026 no-build traffic volumes. Approved developments are developments in the area of the proposed site that have been approved but not yet constructed. The traffic from these approved developments is expected to contribute to the no-build traffic volumes projected for the study intersections. According to the Town and NCDOT, there are no approved developments to consider in the future year analysis.

To determine the traffic impacts of the proposed development, capacity analyses were performed at the study intersections under the following scenarios:

- Existing (2022) Traffic Conditions
- No-Build (2026) Traffic Conditions
- Buildout (2026) Traffic Conditions
- Buildout (2026) Traffic Conditions with Recommended Improvements

NCDOT and the Town have indicated there are no roadway improvements committed to by others to include in the future analysis for the study intersections.

Due to existing pedestrian safety concerns, the following pedestrian improvements are recommended to be constructed **by others**:

*Widewaters Parkway at Laurens Way:*

- Re-stripe the crosswalk on the north leg of Widewaters Parkway, preferably to a 10-foot wide high-visibility crosswalk.
- Relocate the existing stop bars on the east and west leg approaches of Laurens Way such that the minimum distance between the stop bar and crosswalk is four (4) feet.

Based on the capacity analysis presented herein, the following roadway improvements are recommended to be completed **by the developer** to accommodate buildout site traffic volumes:

*Hodge Road at Lynnwood Road:*

- Construct a northbound right-turn lane on Hodge Road to provide 50 feet of full-width storage and appropriate taper.

*Carrington Drive at Smithfield Road:*

- Stripe the existing eastbound approach of Carrington Drive to provide an exclusive left-turn lane and an exclusive right-turn lane.

The following roadway improvements are required to be constructed **by the developer** within the proposed site:

- Construct the extension of Widewaters Parkway to provide a Future Town-Maintained Collector Street in accordance with the Town's *Street Network Plan*.
- Construct the extension of Southampton Drive to provide a Future Town-Maintained Collector Street in accordance with the Town's *Street Network Plan*.

## INTRODUCTION

The proposed 89.5-acre site is located south of Laurens Way, west of St. Johns Street in Knightdale, North Carolina, as shown on Figure 1. The property is currently zoned as Rural Transition. The proposed development consists of 151 single family residential units, 68 residential townhome units, and 72 multifamily apartment units. The property does require rezoning to accommodate the proposed site. As shown on Figure 2, the proposed development will be accessed by cross-connectivity to Widewaters Parkway and Southampton Drive. The proposed site is to be developed within four years by the year 2026

The purpose of this TIA is to analyze the potential traffic impacts of the proposed development on the surrounding roadway network and to identify any roadway improvements necessary to mitigate the impact of the project traffic. This study includes the analysis of the following traffic scenarios:

- Existing (2022) Traffic Conditions
- No-Build (2026) Traffic Conditions
- Buildout (2026) Traffic Conditions
- Buildout (2026) Traffic Conditions with Recommended Improvements

Based on coordination with the Town, a 3% annual growth rate was applied to the existing traffic volumes to determine 2026 no-build traffic volumes. Approved developments are developments in the area of the proposed site that have been approved but not yet constructed. The traffic from these approved developments is expected to contribute to the no-build traffic volumes projected for the study intersections. According to the Town and NCDOT, there are no approved developments to consider in the future year analysis.

# Creekview Crossing Residential TIA

## Vicinity Map

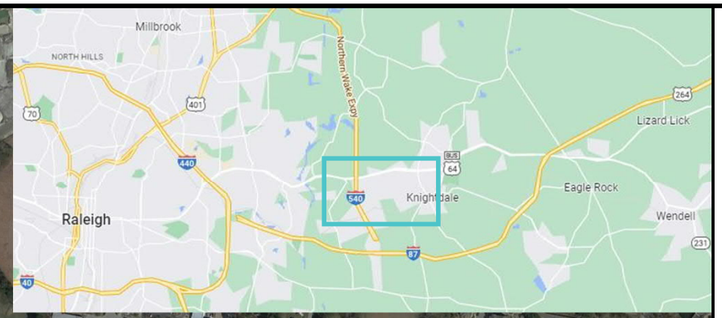
*Wake County, NCDOT Division 5*

LEGEND

(#) Intersection #

Figure 1

EXULT ENGINEERING




Knightdale Blvd

Flatrock Park Dr

Widewaters Pkwy

Laurens Way

Hodge Rd

Lynnwood Rd

SITE

Smithfield Rd

Carrington Dr

First Ave

Crosstie St

Bethlehem Rd

1 2 3 4 5 6 7

# Creekview Crossing Residential TIA

## Proposed Site Plan

Prepared by Strong Rock

*Wake County, NCDOT Division 5*

**Figure 2**

EXULT ENGINEERING

**LEGEND:**

OPEN SPACE

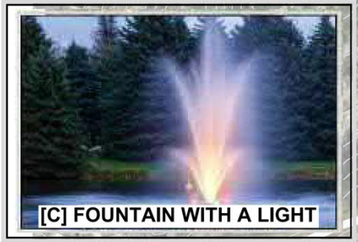
POND

ROAD













DELTA RIVER WAY
WIDEWATERS PARKWAY
STEAMBOAT ST
CALAVARAS LN
JUMPING FROG LN
STERN WHEEL WAY
LAURENS WAY
CLAY HILL DR
SUNDAY SILENCE DR
MINGO CREEK
MINGO CREEK GREENWAY
JURISDICTIONAL STREAM & 50' NEUSE RIPARIAN BUFFER
EDUCATIONAL SIGNAGE AND BENCHES
POCKET PARK WITH BENCHES
OPEN SPACE
RRFB CROSSWALK
10' GREENWAY EASEMENT
30' GREENWAY EASEMENT
ELECTRIC EASEMENT
PARK WITH FIRE PIT
PARK, BOCCE BALL & MAIL KIOSK
STORMWATER POND
EXISTING POND
STORM WATER CONTROL MEASURE #1
BEGIN PRIVATE STREET
20' TYPE B BUFFER
10' BUFFER
5' LANDSCAPING EASEMENT (TYP.)
8' TRAIL
12' TRAILS
54' ROW
22' EOP
A
B
C
D
E
F
G

GRAPHIC SCALE

150 0 75 150 300 600

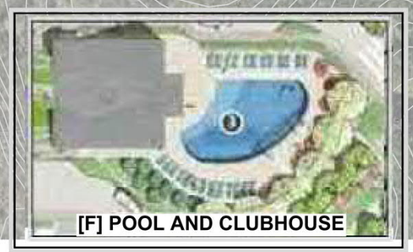
( IN FEET )

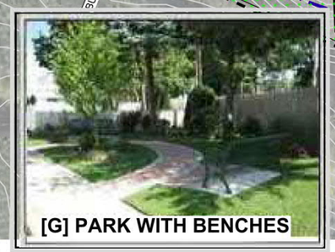
1 inch = 150 ft.

**PRELIMINARY SKETCH "D"**

| | | | | |
|---|---|---|---|---|
| 3 STORY TOWNHOMES | 20' x 100' | LOTS | 21 | UNITS (7%) |
| TOWNHOMES | 20' x 100' | LOTS | 47 | UNITS (16%) |
| SINGLE FAMILY | 30' x 110' | LOTS | 78 | UNITS (27%) |
| SINGLE FAMILY | 60' x 120' | LOTS | 52 | UNITS (18%) |
| SINGLE FAMILY | 70' x 120' | LOTS | 21 | UNITS (7%) |
| BUILDING | 135' x 70' | LOTS | 72 | UNITS (25%) |
| | | | 291 | UNITS |



## EXISTING CONDITIONS

The proposed 89.5-acre site is located south of Laurens Way, west of St. Johns Street in Knightdale, North Carolina. The property is currently zoned as Rural Transition. Per the Town and NCDOT, the study area for the proposed development includes the following intersections:

1. Widewaters Parkway at Laurens Way
2. Widewaters Parkway at Flatrock Park Drive (roundabout)
3. Widewaters Parkway at Knightdale Boulevard
4. Laurens Way at Lynnwood Road
5. Lynnwood Road at Hodge Road
6. Smithfield Road at Carrington Drive
7. First Avenue/Bethlehem Road at Crosstie Street

A site visit was performed on Wednesday, March 16, 2022 to observe existing field conditions, such as lane geometry, posted speed limits, and traffic operations. Figure 3 shows the Existing Lane Geometry at the above existing study intersections.

Peak-hour turning movement traffic counts were performed at the existing study intersections during the AM (7:00 – 9:00) and PM (4:00 – 6:00) peak periods on Tuesday, March 15, 2022 and on Wednesday, March 30, 2022. Traffic count data is included in the Appendix of this report. Any traffic count imbalances between study intersections were justified due to the number of access points and land uses located between study intersections. Figure 4 shows the 2022 AM and PM Peak Hour Existing Traffic Volumes for the study intersections.

Widewaters Parkway is currently a 2-lane undivided roadway with a posted speed limit of 25 miles per hour (mph) in the project vicinity. Widewaters Parkway is classified as an Existing Town-Maintained Collector on the Town of Knightdale's *Street Network Plan* and a Main Street on the Town's *Functional Classification Plan*. Assuming the PM peak hour traffic volume accounts for approximately 10% of the daily traffic volume, Widewaters Parkway has an estimated 2022 ADT volume of 2,550 vehicles per day.

Laurens Way is currently a 2-lane undivided roadway with a posted speed limit of 25 miles per hour (mph) in the project vicinity. Laurens Way is classified as an Existing Town-Maintained Collector on the Town of Knightdale's *Street Network Plan* and a Main Street on the Town's *Functional Classification Plan.* Assuming the PM peak hour traffic volume accounts for approximately 10% of the daily traffic volume, Laurens Way has an estimated 2022 ADT volume of 1,920 vehicles per day.

Flatrock Park Drive is currently a 2-lane undivided roadway with a posted speed limit of 25 miles per hour (mph) in the project vicinity. Flatrock Park Drive is classified as an Existing Town-Maintained Collector on Town of Knightdale's *Street Network Plan* and a Main Street on the Town's *Functional Classification Plan.* Assuming the PM peak hour traffic volume accounts for approximately 10% of the daily traffic volume, Flatrock Park Drive has an estimated 2022 ADT volume of 1,960-3,880 vehicles per day.

Knightdale Boulevard (U.S. 64 Business) is currently a 6-lane roadway with a posted speed limit of 45 miles per hour (mph) in the project vicinity. Knightdale Boulevard is classified as an Existing State-Maintained Arterial on Town of Knightdale's *Street Network Plan* and a Six-Lane Boulevard on the Town's *Functional Classification Plan.* Knightdale Boulevard has a 2019 average annual daily traffic (AADT) volume of 38,500 vehicles per day on the *NCDOT Interactive Traffic Volume Map*.

Lynnwood Road is currently a 2-lane undivided roadway with a posted speed limit of 25 miles per hour (mph) in the project vicinity. Lynnwood Road is classified as an Existing Town-Maintained Collector on Town of Knightdale's *Street Network Plan* and an Avenue on the Town's *Functional Classification Plan.* Assuming the PM peak hour traffic volume accounts for approximately 10% of the daily traffic volume, Lynnwood Road has an estimated 2022 ADT volume of 2,520 vehicles per day.

Hodge Road is currently a 2-lane undivided roadway with a posted speed limit of 45 miles per hour (mph) in the project vicinity. Hodge Road is classified as an Existing State-Maintained Arterial on Town of Knightdale's *Street Network Plan.* Hodge Road is designated as a Boulevard south of Lynnwood Road and an Avenue north of Lynnwood Road on the Town's *Functional Classification Plan.* Hodge Road has a 2020 average annual daily traffic (AADT) volume of 8,000 vehicles per day on the *NCDOT Interactive Traffic Volume Map*.

Smithfield Road is currently a 2-lane undivided roadway with a posted speed limit of 35 miles per hour (mph) in the project vicinity. Smithfield Road is classified as an Existing State-Maintained Arterial on Town of Knightdale's *Street Network Plan.* Smithfield Road is classified as an Urban Avenue north of Carrington Drive and a Main Street south of Carrington Drive on the Town's *Functional Classification Plan*. Smithfield Road has a 2019 average annual daily traffic (AADT) volume of 12,500 vehicles per day on the *NCDOT Interactive Traffic Volume Map*.

Carrington Drive is currently a 2-lane undivided roadway with a posted speed limit of 25 miles per hour (mph) in the project vicinity. Carrington Drive is classified as a local road on the *NCDOT Functional Class Map.* Assuming the PM peak hour traffic volume accounts for approximately 10% of the daily traffic volume, Carrington Drive has an estimated 2022 ADT volume of 1,570 vehicles per day.

Crosstie Street is currently a 2-lane undivided roadway with a posted speed limit of 25 miles per hour (mph) in the project vicinity. Crosstie Street is classified as a local road on the *NCDOT Functional Class Map* and a Main Street on the Town's *Functional Classification Plan.* Assuming the PM peak hour traffic volume accounts for approximately 10% of the daily traffic volume, Crosstie Street has an estimated 2022 ADT volume of 1,210 vehicles per day.

First Avenue/Bethlehem Road is currently a 2-lane undivided roadway with a posted speed limit of 45 miles per hour (mph) in the project vicinity. First Avenue/Bethlehem Road is classified as an Existing State-Maintained Arterial on Town of Knightdale's *Street Network Plan* and an Avenue on the Town's *Functional Classification Plan.* First Avenue/Bethlehem Road has a 2019 average annual daily traffic (AADT) volume of 9,100vehicles per day on the *NCDOT Interactive Traffic Volume Map*.

# Creekview Crossing Residential TIA

## Existing Lane Geometry

LEGEND

Stop Control
Approach Lane
Speed Limit
Departure Lane
Signal Control
XX' Intersection Spacing

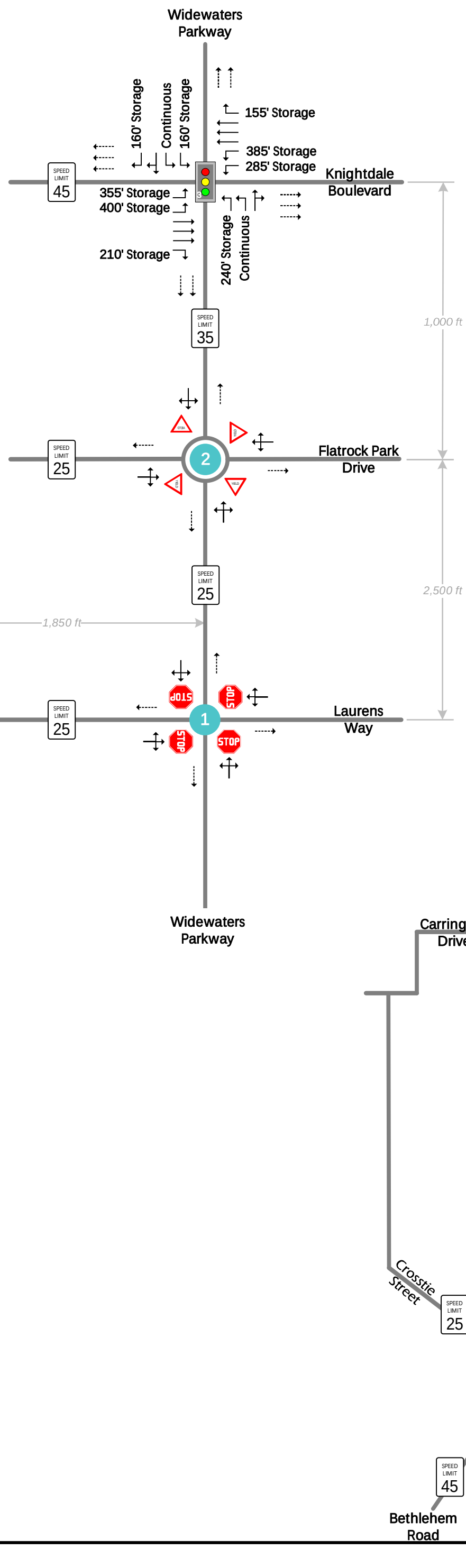
XX' - FULL STORAGE LENGTH

- Not a Study Intersection

*Wake County, NCDOT Division 5*

**Figure 3**

EXULT ENGINEERING



# Creekview Crossing Residential TIA

## Existing 2022 AM and PM Traffic Volumes

LEGEND

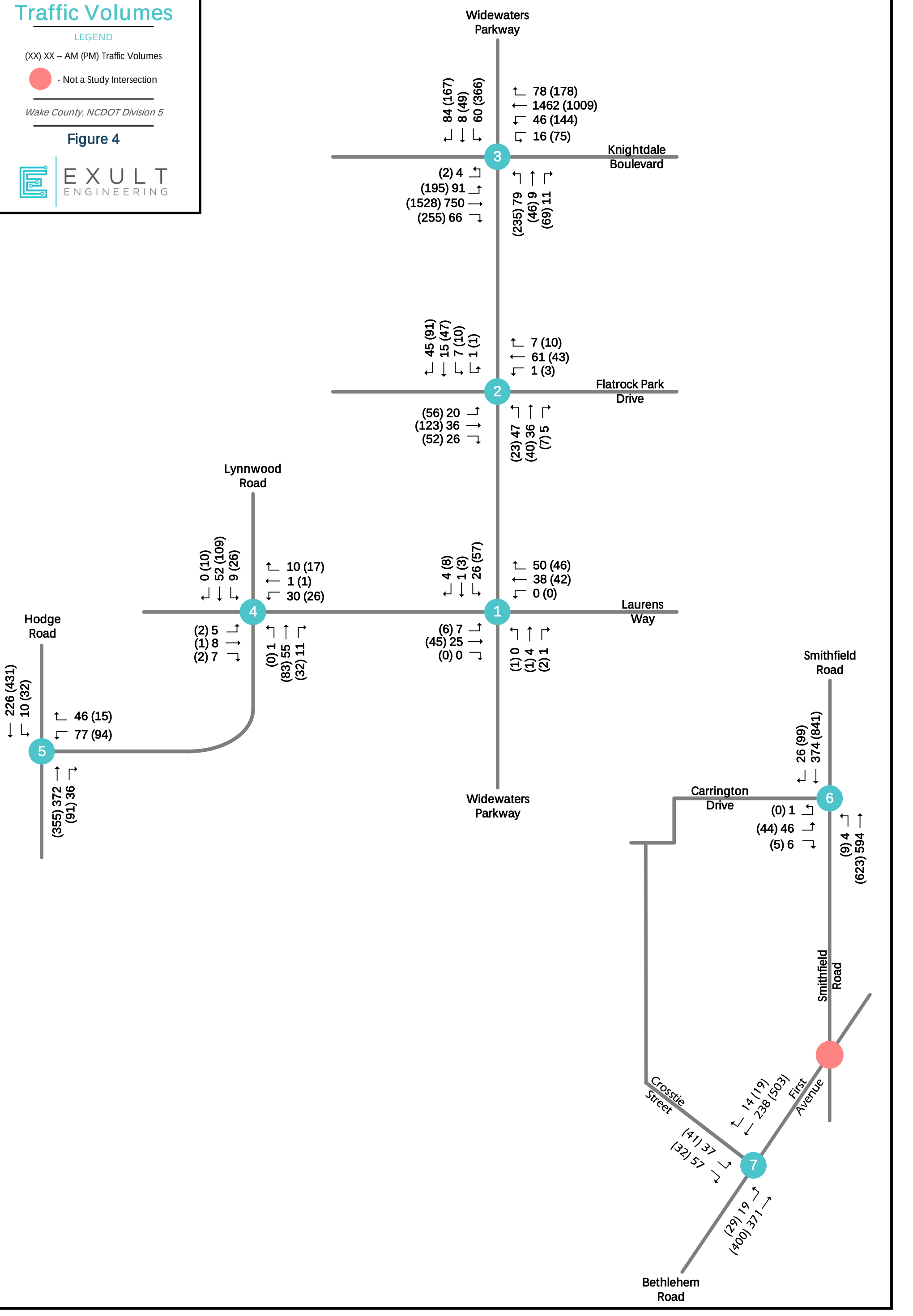
(XX) XX – AM (PM) Traffic Volumes

- Not a Study Intersection

*Wake County, NCDOT Division 5*

**Figure 4**

EXULT ENGINEERING



## FUTURE CONDITIONS

The proposed site is to be developed within four years by the year 2026. The projected 2026 no-build traffic volumes consist of existing 2022 traffic volumes plus no-build growth. As required by the Town, an annual 3% growth rate was applied to determine 2026 no-build traffic volumes.

Approved developments are developments in the area of the proposed site that have been approved but not yet constructed. The traffic from these approved developments is expected to contribute to the no-build traffic volumes projected for the study intersections. According to the Town and NCDOT, there are no approved developments to consider in the future year analysis.

The projected no-build traffic volumes at the study intersections are shown in Figure 5 (2026 AM Peak Hour No-Build Traffic Volumes) and Figure 6 (2026 PM Peak Hour No-Build Traffic Volumes). Traffic volume calculations are also included in the Appendix of this report.

According to NCDOT and the Town, there are no roadway improvements committed to by others to include in the future year analysis.

# Creekview Crossing Residential TIA

## 2026 AM Peak Hour No-Build Traffic

LEGEND

XX – Existing Traffic
(XX) – 2026 No-Build Traffic Due to Growth Rate
[XX] – 2026 Total No-Build Traffic

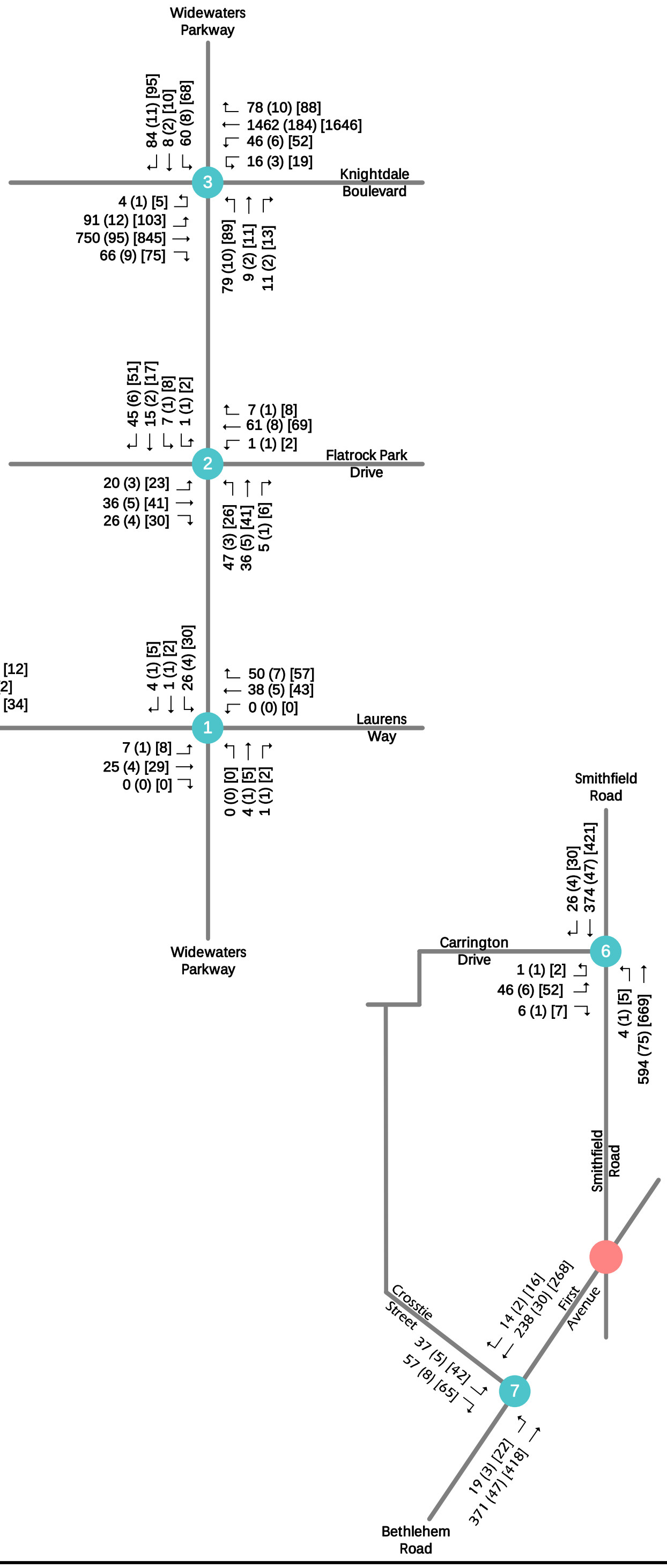
XX + (XX) = [XX]

- Not a Study Intersection

*Wake County, NCDOT Division 5*

**Figure 5**

EXULT ENGINEERING



# Creekview Crossing Residential TIA

## 2026 PM Peak Hour No-Build Traffic

LEGEND

XX – Existing Traffic
(XX) – 2026 No-Build Traffic Due to Growth Rate
[XX] – 2026 Total No-Build Traffic

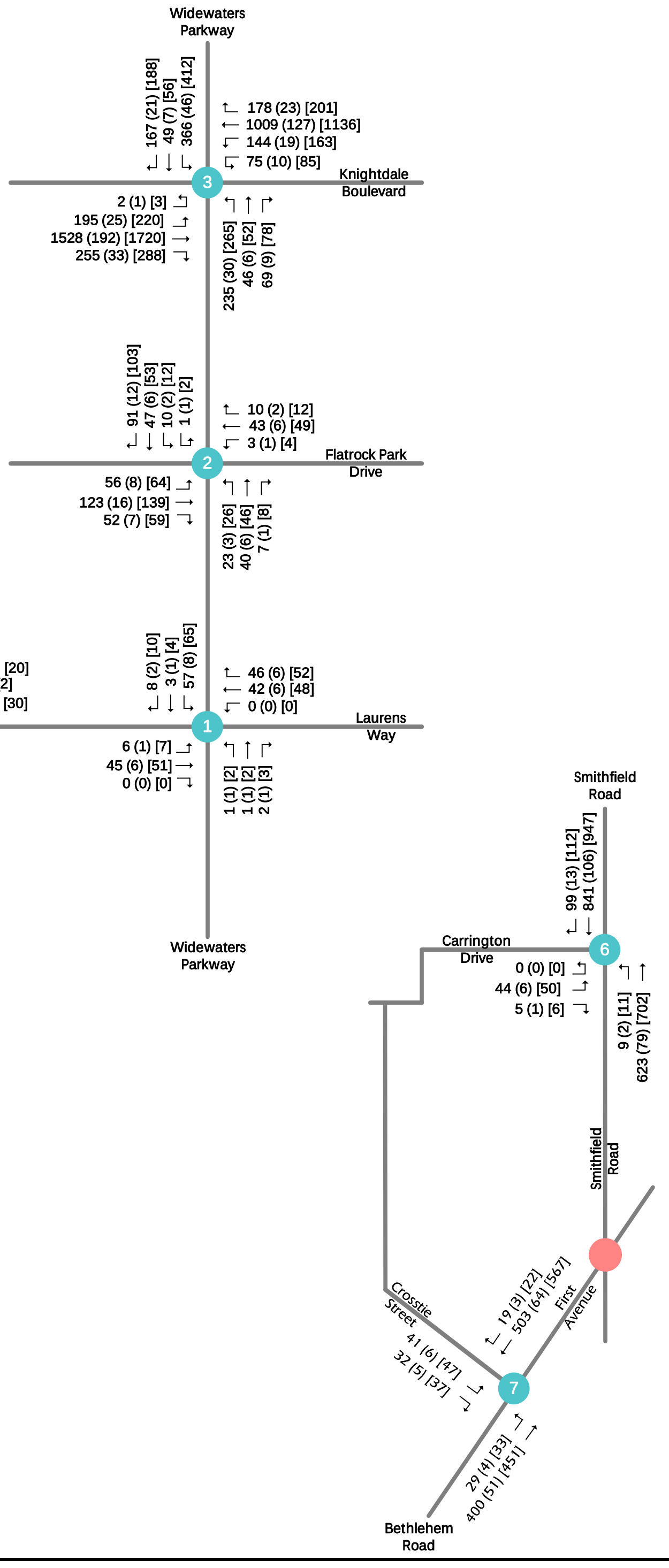
XX + (XX) = [XX]

- Not a Study Intersection

*Wake County, NCDOT Division 5*

**Figure 6**

EXULT ENGINEERING



## PROPOSED SITE

The proposed 89.5-acre site is located south of Laurens Way, west of St. Johns Street in Knightdale, North Carolina. The property is currently zoned as Rural Transition. The proposed development consists of 151 single family residential units, 68 residential townhome units, and 72 multifamily apartment units. The proposed site is to be developed within four years by the year 2026 and does require rezoning. The proposed development will be accessed by cross-connectivity to Widewaters Parkway and Southampton Drive.

Table 1 shows the projected trip generation for the proposed development. The trip generation was based on rates published in the most recent edition of the Institute of Transportation Engineer's *Trip Generation Manual* (11th Edition). The NCDOT Congestion Management Rates vs. Equations spreadsheet was used for guidance. The proposed development is expected to generate 2,242 daily trips, 160 AM peak hour trips (42 entering, 118 exiting), and 213 PM peak hour trips (132 entering, 81 exiting).

**Table 1: Trip Generation**

| Land Use | | | Daily | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Enter | Exit | Total | Enter | Exit |
| 210: Single Family Detached Housing | 151 | d.u. | 1,476 | 109 | 28 | 81 | 147 | 93 | 54 |
| 215: Single Family Attached Housing | 68 | d.u. | 468 | 30 | 9 | 21 | 37 | 21 | 16 |
| 221: Multifamily Housing (Mid-Rise) | 72 | d.u. | 298 | 21 | 5 | 16 | 29 | 18 | 11 |
| **Total** | | | 2,242 | 160 | 42 | 118 | 213 | 132 | 81 |

References: *Trip Generation Manual*, 11th Edition, Institute of Transportation Engineers, September 2021

Based on the existing traffic patterns and surrounding opportunities to access retail and office developments, the proposed trip distribution for the site is as follows:

- 25% to/from the west on Knightdale Boulevard
- 12% to/from the east on Knightdale Boulevard
- 5% to/from the north on Widewaters Parkway
- 10% to/from the west on Flatrock Park Drive
- 2% to/from the east on Flatrock Park Drive
- 3% to/from the east on Laurens Way
- 5% to/from the north on Lynnwood Road
- 10% to/from the north on Hodge Road
- 10% to/from the south on Hodge Road
- 3% to/from the north on Smithfield Road
- 5% to/from the south on Smithfield Road
- 2% to/from the east on First Avenue
- 8% to/from the west on Bethlehem Road

The trip generation methodology and site distributions were previously approved by the Town. Figure 7 shows the Site Traffic Distribution and Assignment at each of the study intersections. The trip assignment

was applied to the trips generated for the proposed development to determine the projected AM and PM peak hour site traffic. The projected AM and PM peak hour site traffic volumes were added to the 2026 no-build traffic volumes to determine the buildout traffic volumes at the study intersections. The projected buildout traffic volumes at the study intersections are shown in Figure 8 (2026 AM Peak Hour Buildout Traffic Volumes) and Figure 9 (2026 PM Peak Hour Buildout Traffic Volumes).

In accordance with the Town's *Street Network Plan*, the proposed site plan incorporates the future extensions of Widewaters Parkway and Southampton Drive through the development. While this interconnectivity will allow for new travel patterns, background traffic volumes were not reassigned throughout the roadway network. Given the surrounding land uses and opportunities to access major thoroughfares, the potential future directional shift in background traffic volumes is expected to counterbalance the impact of the opposing directional shift in traffic.

# Creekview Crossing Residential TIA

## Site Traffic Distribution & Assignment

LEGEND

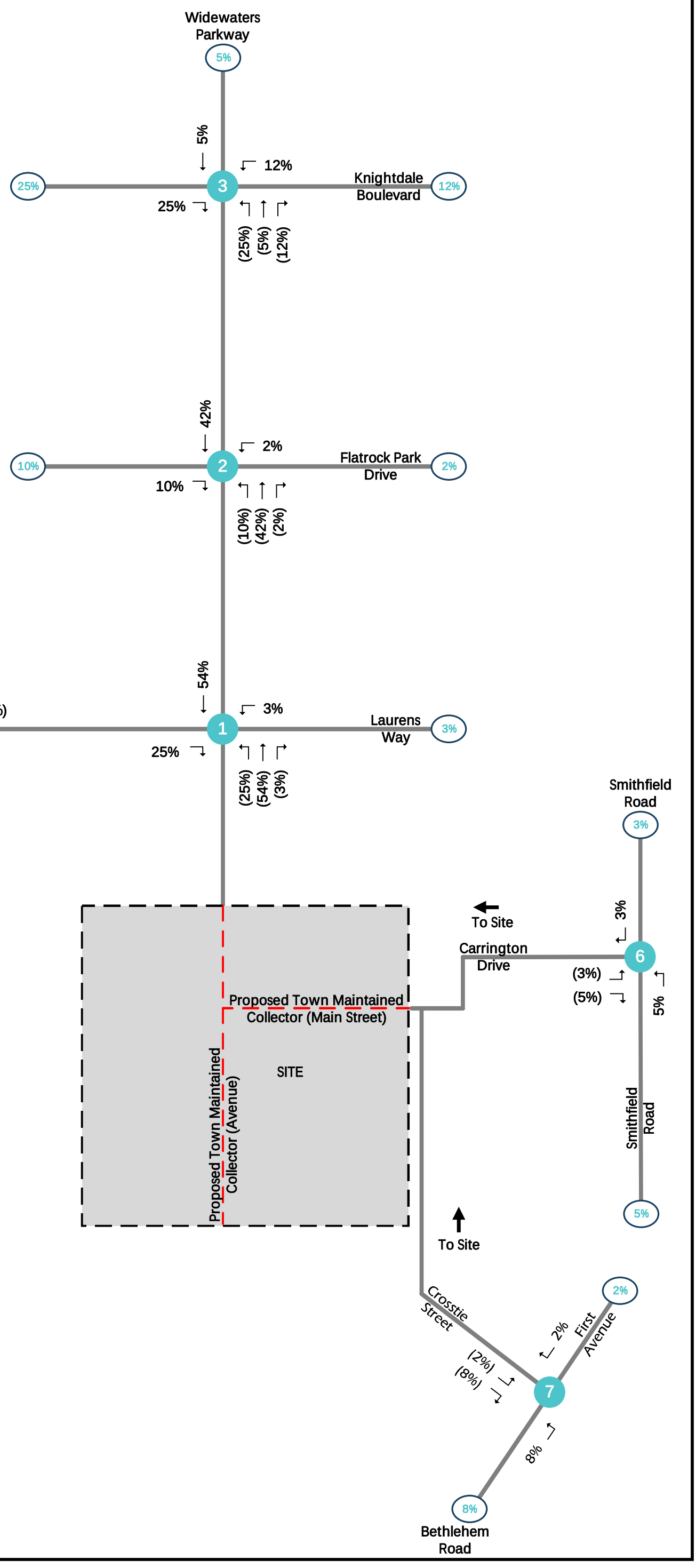
(XX%) – Outbound Site Traffic
XX% – Inbound Site Traffic

XX% – Overall Distribution

*Wake County, NCDOT Division 5*

**Figure 7**

EXULT ENGINEERING



# Creekview Crossing Residential TIA

## 2026 AM Peak Hour Buildout Traffic

LEGEND

XX – No-Build Traffic
(XX) – 2026 Total Project Traffic
[XX] – 2026 Total Buildout Traffic

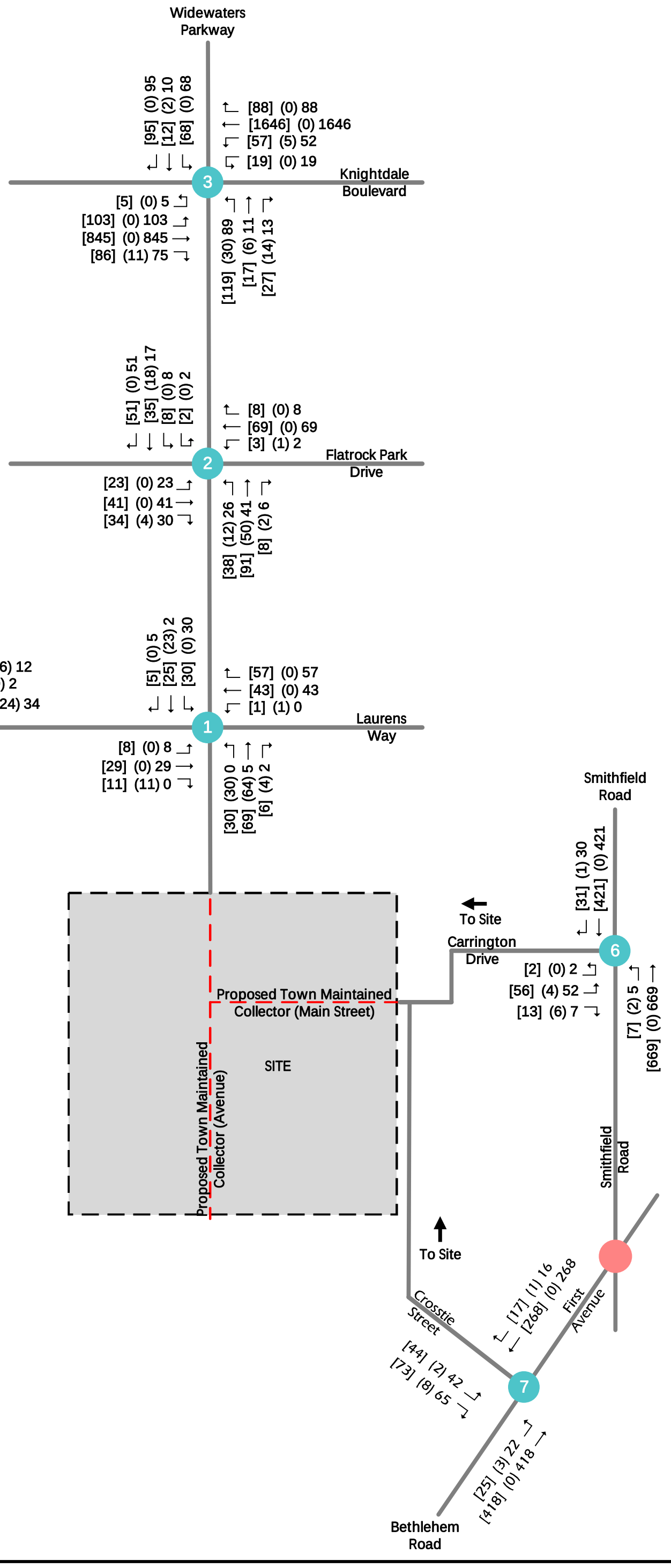
XX + (XX) = [XX]

- Not a Study Intersection

*Wake County, NCDOT Division 5*

**Figure 8**

EXULT ENGINEERING



# Creekview Crossing Residential TIA

## 2026 PM Peak Hour Buildout Traffic

LEGEND

XX – No-Build Traffic
(XX) – 2026 Total Project Traffic
[XX] – 2026 Total Buildout Traffic

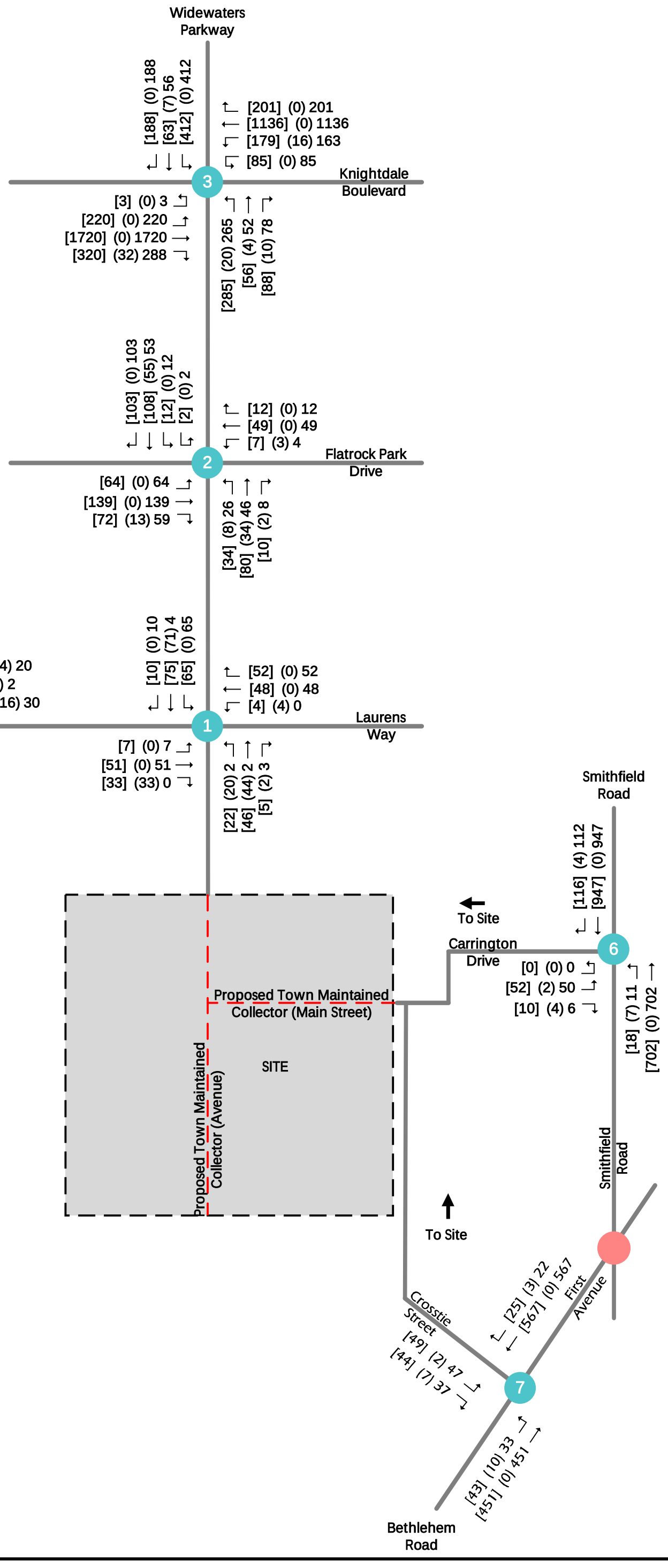
XX + (XX) = [XX]

- Not a Study Intersection

*Wake County, NCDOT Division 5*

**Figure 9**

EXULT ENGINEERING



## CAPACITY ANALYSIS

The intersections identified within the study area were analyzed under 2022 existing, 2026 no-build, and 2026 buildout conditions to identify the potential traffic impact of the proposed development on the roadway network. Necessary roadway improvements to mitigate the anticipated impact of the proposed site traffic were recommended based on the level-of-service (LOS) analysis results.

The proposed site is to be developed within five years by the year 2026. This study includes the analysis of the following traffic scenarios:

- Existing (2022) Traffic Conditions
- No-build (2026) Traffic Conditions
- Buildout (2026) Traffic Conditions
- Buildout (2026) Traffic Conditions with Recommended Improvements

LOS is a qualitative measurement of traffic operations that is a measure of delay time. The Transportation Research Board's *Highway Capacity Manual* (HCM) defines six levels of service for intersections with LOS "A" representing the best operating condition and LOS "F" representing the worst. The following table summarizes the criteria for signalized intersections and stop-controlled intersections.

**Table 2: Highway Capacity Manual (LOS and Delay)**

| Signalized Intersection | | Stop-Controlled Intersection | |
|---|---|---|---|
| Level-of-Service (LOS) | Average Control Delay (Seconds per Vehicles) | Level-of-Service (LOS) | Average Control Delay (Seconds per Vehicle) |
| A | ≤ 10.0 | A | ≤ 10.0 |
| B | > 10.0 and ≤ 20.0 | B | > 10.0 and ≤ 15.0 |
| C | > 20.0 and ≤ 35.0 | C | > 15.0 and ≤ 25.0 |
| D | > 35.0 and ≤ 55.0 | D | > 25.0 and ≤ 35.0 |
| E | > 55.0 and ≤ 80.0 | E | > 35.0 and ≤ 50.0 |
| F | > 80.0 | F | > 50.0 |

Version 10.3 of Synchro Professional software was used to determine the LOS, delay, and expected queue length at the signalized and unsignalized intersections. SimTraffic was also used to determine the maximum queue length experienced at the study intersections. This software is based on the analysis procedures defined in the HCM. For unsignalized intersections, Synchro reports were created using the HCM 6$^{th}$ Edition option for unsignalized intersections. Queue lengths for the turn lanes are shown in the summary tables. Detailed Synchro and SimTraffic reports are included in the Appendix of this report.

LOS for a two-way stop-controlled (TWSC) intersection is determined by the control delay and is defined for the minor approaches. Control delay includes initial deceleration delay, queue move-up time, stopped

delay, and final acceleration delay. With respect to field measurements, this summation of control delay is defined as the total time elapsed from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. Capacity analysis results between LOS A and LOS C for the minor street stop-controlled approaches are assumed to represent short delays. Results between LOS D and LOS E for the minor street stop-controlled approaches are assumed to represent moderate delays, and LOS F for the minor street stop-controlled approaches is assumed to represent long delays. It is typical for minor street stop-controlled approaches and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. However, the majority of the traffic moving through the intersection experiences little or no delay on the major street approaches.

Capacity Analysis Inputs

The *NCDOT Congestion Management Capacity Analysis Guidelines* were referenced to perform this traffic study. The following inputs were used for all intersections:

- Peak Hour Factor (PHF) was based on existing count data by intersection for existing scenarios. For no-build and buildout scenarios, a PHF of 0.90 was used.
- Heavy vehicle (HV%) percentages were based on existing count data by intersection for existing scenarios. To remain conservative, the heavy vehicle percentage was set to 2% for no-build and buildout scenarios.
- Right-turns on red were not permitted in any scenario, unless otherwise justified in the intersection summary section.
- For allowable movements where zero (0) volumes are projected, a value of four (4) was used in the Synchro capacity analysis model.

For unsignalized intersections, queue length for HCM from Synchro is given in terms of number of vehicles. To convert to queue length in feet, an estimated 25'/vehicle was applied.

As recommended in the *NCDOT Congestion Management Capacity Analysis Guidelines*, SIDRA 9 software was utilized for the roundabout analysis. Three Measurements of Effectiveness (MOEs) are typically used to estimate the performance of a roundabout design: degree of saturation, delay, and queue length. Each measure provides a distinct perspective on roundabout's operation under specific traffic and geometric conditions.

- *Degree of saturation* is the ratio of the demand at the roundabout entry to the capacity of the entry and provides a direct assessment of the sufficiency of a given design. The degree of saturation for an entry lane should be less than 0.85 for satisfactory operation. When the degree of saturation exceeds this range, the operation of the roundabout can deteriorate rapidly, particularly over short periods of time. With deterioration in operation, queues form and delay begins to increase exponentially.
- *Delay* is a standard parameter identified in the Highway Capacity Manual (HCM) used to measure the performance of an intersection. The HCM identifies delay attributable to the control device. This control delay is the time that a driver spends queuing and then waiting for an acceptable gap in the circulating flow while at the front of the queue. For roundabouts, this delay represents the time for a single vehicle on any approach spends yielding to traffic before entering the circulating roadway. This is not indicative of the cumulative delay experienced by vehicles on an approach waiting to advance to the roundabout yield point.

- *Queue Length* is a key factor when assessing the adequacy of the geometric design of the roundabout approaches. Queue length provides a means for comparing roundabout performance with other intersection control types (i.e. stop control, traffic signal) and can be greatly affected by the degree of saturation of an approach. Queue length is typically shown in feet or vehicles lengths. A standard passenger car has a queue length of 25 feet, which represents the distance between the front bumpers of two stacked vehicles.

The following subsections summarize the LOS and queue length results for the capacity analysis under 2022 existing, 2026 no-build, and 2026 buildout traffic scenarios as well as recommended improvements for each study intersection.

Widewaters Parkway at Laurens Way

Widewaters Parkway at Laurens Way is currently an unsignalized intersection. All approaches operate under stop control.

The capacity analysis results for the intersection are summarized in Table 3 below. The intersection of Widewaters Parkway at Laurens Way currently operates with short delays for all approaches during the AM and PM peak hours.

The intersection is expected to continue to operate with short delays for all approaches under no-build and buildout conditions during the AM and PM peak hours. As shown in Table 3, the addition of traffic from the proposed development is expected to have minimal impact on the operation of the intersection of Widewaters Parkway at Laurens Way. Therefore, no roadway improvements are recommended to accommodate project traffic at the intersection.




**Westbound Approach of Widewaters Parkway at Laurens Way**

**Table 3: Level-of-Service: Widewaters Parkway at Laurens Way (Unsignalized)**

| Condition | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) |
| 2022 Existing | EB – A (7.3)<br>WB – A (7.2)<br>NB – A (7.3)<br>SB – A (7.5) | No Turn Lanes | EB – A (7.5)<br>WB – A (7.4)<br>NB – A (7.1)<br>SB – A (7.8) | No Turn Lanes |
| 2026 No-Build | EB – A (7.4)<br>WB – A (7.3)<br>NB – A (7.3)<br>SB – A (7.6) | No Turn Lanes | EB – A (7.6)<br>WB – A (7.5)<br>NB– A (7.3)<br>SB – A (7.9) | No Turn Lanes |
| 2026 Buildout | EB – A (7.7)<br>WB – A (7.7)<br>NB – A (8.1)<br>SB – A (7.9) | No Turn Lanes | EB – A (8.1)<br>WB – A (8.1)<br>NB – A (8.2)<br>SB – A (8.8) | No Turn Lanes |

*Pedestrian Enhancements*

Per conversations with the Town, pedestrian safety enhancements at this intersection are of particular importance to Town Council. Pedestrian count data was collected during the AM and PM peak hours. The maximum number of pedestrians observed in a one-hour time period at this intersection was 17 pedestrians. The north leg of Widewaters Parkway experienced the highest pedestrian volume crossing demand.



**Pedestrian Crossing on North Leg of Widewaters Parkway at Laurens Way**

During the site visit at this intersection, it was noted that the existing crosswalk on the north leg of Widewaters Parkway is faded and not visible. The stop bars located on the east and west legs of Laurens Way are placed approximately two (2) feet from the crosswalks at the nearest points. The minimum separation distance for stop bars from crosswalks recommended by NCDOT is four (4) feet. Additional photos of the pedestrian accommodations at the intersection are included in the Appendix.

To enhance pedestrian safety at this intersection, the following improvements are recommended to be completed by others:

- Re-stripe the crosswalk on the north leg of Widewaters Parkway, preferably to a 10-foot wide high-visibility crosswalk.
- Relocate the existing stop bars on the east and west leg approaches of Laurens Way such that the minimum distance between the stop bar and crosswalk is four (4) feet.

Widewaters Parkway at Flatrock Park Drive

Widewaters Parkway at Flatrock Park Drive is currently a roundabout intersection. Each approach operates under yield control.



**Westbound Approach of Widewaters Parkway at Flatrock Park Drive**

The capacity analysis results for the intersection are summarized in Table 4 below. The intersection of Widewaters Parkway at Flatrock Park Drive currently operates with short delays for all approaches during the AM and PM peak hours. The intersection is expected to continue to operate with short delays for all approaches under no-build and buildout conditions during the AM and PM peak hours. As shown in Table 4, the addition of traffic from the proposed development is expected to have minimal impact on the operation of the intersection of Widewaters Parkway at Flatrock Park Drive. Therefore, no roadway improvements are recommended to accommodate project traffic at the intersection.

**Table 4: Level-of-Service: Widewaters Parkway at Flatrock Park Drive (Roundabout)**

| Condition | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|
| | LOS, Delay (sec/veh) | v/c | Turn Lane SIDRA 95% Queue Length (feet) | LOS, Delay (sec/veh) | v/c | Turn Lane SIDRA 95% Queue Length (feet) |
| 2021 Existing | Overall – A (3.4)<br>EB – A (3.3)<br>WB – A (3.5)<br>NB – A (3.5)<br>SB – A (3.5) | Overall – 0.075<br>EB – 0.067<br>WB – 0.061<br>NB – 0.075<br>SB – 0.061 | EB – 7.4'<br>WB – 6.6'<br>NB – 8.3'<br>SB – 6.6' | Overall – A (4.3)<br>EB – A (4.7)<br>WB – A (3.5)<br>NB – A (4.0)<br>SB – A (4.0) | Overall – 0.211<br>EB – 0.211<br>WB – 0.055<br>NB – 0.074<br>SB – 0.137 | EB – 27'<br>WB – 5.9'<br>NB – 8'<br>SB – 16.2' |
| 2026 No-Build | Overall – A (3.6)<br>EB – A (3.4)<br>WB – A (3.7)<br>NB – A (3.6)<br>SB – A (3.7) | Overall – 0.089<br>EB – 0.080<br>WB – 0.074<br>NB – 0.089<br>SB – 0.074 | EB – 9'<br>WB – 8.1'<br>NB – 10'<br>SB – 8.1' | Overall – A (4.5)<br>EB – A (4.9)<br>WB – A (3.6)<br>NB – A (4.2)<br>SB – A (4.2) | Overall – 0.234<br>EB – 0.234<br>WB – 0.063<br>NB – 0.084<br>SB – 0.152 | EB – 30.6'<br>WB – 6.7'<br>NB – 9.1'<br>SB – 18.2' |
| 2026 Buildout | Overall – A (3.9)<br>EB – A (3.5)<br>WB – A (4.0)<br>NB – A (4.1)<br>SB – A (3.9) | Overall – 0.147<br>EB – 0.085<br>WB – 0.081<br>NB – 0.147<br>SB – 0.092 | EB – 9.6'<br>WB – 8.8'<br>NB – 17.5'<br>SB – 10.2' | Overall – A (4.9)<br>EB – A (5.5)<br>WB – A (3.9)<br>NB – A (4.6)<br>SB – A (4.7) | Overall – 0.262<br>EB – 0.262<br>WB – 0.069<br>NB – 0.131<br>SB – 0.205 | EB – 34.4'<br>WB – 7.4'<br>NB – 14.6'<br>SB –25.8' |

Widewaters Parkway at Knightdale Boulevard (U.S. 64 Business)



**Northbound Approach of Widewaters Parkway at Knightdale Boulevard (U.S. 64 Business)**

Widewaters Parkway at Knightdale Boulevard (U.S. 64 Business) is currently a signalized intersection. Existing signal plans and timing charts obtained from NCDOT were used for the 2022 analysis scenarios (minimum initial, maximum green, yellow and red time). The signal plan is included in the Appendix of this report. For future no-build and buildout scenarios, the following input values were used in accordance with NCDOT Congestion Management guidelines:

- Cycle lengths for future scenarios remained consistent with existing cycle lengths as long as minimum recommendations were met. Splits were optimized for future year scenarios.
- Left-turn treatment for exclusive left-turn lanes was set to protected only.
- For future year scenarios, minimum initial for the major street through movements was set to 12 seconds, minimum initial for major street left-turns and minor street was set to 7 seconds, lost time was set to 5 seconds, yellow time was set to 5 seconds, and red time was set to 2 seconds in future scenarios.
- Default values for vehicle extension and minimum gap were used.
- The southbound right-turn overlap was not able to be modeled in Synchro due to the conflicting protected eastbound u-turn movement. Therefore, right-turns on red were permitted for the southbound approach only under all analysis scenarios.

It is important to note that in order to most appropriately model how the intersection operates today, pedestrian phases were not included in the peak hour capacity analysis scenarios due to the minimal amount of pedestrians observed at the intersection.

Table 5 summarizes the capacity analysis results for the signalized intersection of Widewaters Parkway at Knightdale Boulevard (U.S. 64 Business) under 2022 existing, 2026 no-build, and 2026 buildout scenarios. As shown in Table 5 below, the intersection of Widewaters Parkway at Knightdale Boulevard (U.S. 64 Business) currently operates at LOS C during the AM peak hour and LOS D during the PM peak hours. The intersection is expected to continue to operate at LOS C during the AM peak hour and LOS D during the PM peak hour under the 2026 no-build and buildout conditions. The site traffic has minimal impact on the operation at the intersection of Widewaters Parkway at Knightdale Boulevard (U.S. 64 Business) and the intersection is projected to operate at an acceptable LOS.

According to the Town's *Unified Development Ordinance*, mitigation should be considered if the addition of site traffic degrades the projected level-of-service at the intersection. According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways (*July 2003), mitigation improvements should be identified if the total average delay at the intersection or individual approaches increases by 25% or more with the addition of the proposed development site trips. The LOS

is not expected to be impacted with the development of the proposed site and the total average delay at the intersection and individual approaches under buildout conditions increases by less than 25% when compared to no-build conditions. Therefore, no roadway improvements are recommended to accommodate project traffic at the intersection.

**Table 5: Level-of-Service: Widewaters Parkway at Knightdale Boulevard (US 64 Business) (Signalized)**

| Condition | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) |
| 2022 Existing | Overall – B (18.1)<br>EB – B (15.7)<br>WB – B (16.5)<br>NB – D (53.5)<br>SB – C (26.8) | EBU/L – 63'/107'<br>EBR – 32'/67'<br>WBU/L – 46'/88'<br>WBR – 20'/149'<br>NBL – 55'/118'<br>SBL – 45'/122'<br>SBR – -'/46' | Overall – D (35.8)<br>EB – C (31.5)<br>WB – C (29.3)<br>NB – E (59.6)<br>SB – D (52.1) | EBU/L – 129'/190'<br>EBR – 77'/ 147'<br>WBU/L – 141'/163'<br>WBR – 55'/127'<br>NBL – 151'/196'<br>SBL – 230'/285'<br>SBR – 26'/220' |
| 2026 No-Build | Overall – C (20.1)<br>EB – B (16.5)<br>WB – B (19.3)<br>NB – D (53.2)<br>SB – C (27.7) | EBU/L – 74'/127'<br>EBR – 38'/73'<br>WBU/L – 54'/87'<br>WBR – 24'/68'<br>NBL – 64'/119'<br>SBL – 53'/106'<br>SBR – -'/94' | Overall – D (40.0)<br>EB – D (36.4)<br>WB – C (33.1)<br>NB – E (62.7)<br>SB – E (55.1) | EBU/L – 159'/195'<br>EBR – 107'/273'<br>WBU/L – 179'/192'<br>WBR – 62'/208'<br>NBL – 180'/211'<br>SBL – 270'/284'<br>SBR – 54'/211' |
| 2026 Buildout | Overall – C (21.0)<br>EB – B (16.5)<br>WB – B (19.7)<br>NB – D (54.5)<br>SB – C (29.1) | EBU/L – 74'/119'<br>EBR – 40'/95'<br>WBU/L – 57'/84'<br>WBR – 24'/69'<br>NBL – 80'/115'<br>SBL – 53'/93'<br>SBR – -'/58' | Overall – D (40.9)<br>EB – D (37.2)<br>WB – C (33.6)<br>NB – E (65.0)<br>SB – E (55.7) | EBU/L – 159'/183'<br>EBR – 122'/353'<br>WBU/L – 186'/242'<br>WBR – 62'/201'<br>NBL –194'/217'<br>SBL – 270'/286'<br>SBR – 57'/212' |

Laurens Way at Lynnwood Road

Laurens Way at Lynnwood Road is currently an unsignalized intersection. Each approach operates under stop control.




**Southbound Approach of Laurens Way at Lynnwood Road**

The capacity analysis results for the intersection are summarized in Table 6 below. The intersection of Laurens Way at Lynnwood Road currently operates with short delays for all approaches during the AM and PM peak hours. The intersection is expected to continue to operate with short delays for all approaches under no-build and buildout conditions during the AM and PM peak hours. As shown in Table 6, the addition of traffic from the proposed development is expected to have minimal impact on the operation of the intersection of Laurens Way at Lynnwood Road. Therefore, no roadway improvements are recommended to accommodate project traffic at the intersection.

**Table 6: Level-of-Service: Laurens Way at Lynnwood Road (Unsignalized)**

| Condition | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) |
| 2022 Existing | EB – A (7.3)<br>WB – A (7.6)<br>NBL – A (8.0)<br>NBT/R – A (7.9)<br>SBL – A (8.1)<br>SBT/R – A (7.9) | NBL – 0'/10'<br>SBL – 0'/31' | EB – A (7.5)<br>WB – A (7.8)<br>NBL – A (8.0)<br>NBT/R – A (8.1)<br>SBL – A (8.2)<br>SBT/R – A (8.3) | NBL – 0'/27'<br>SBL – 3'/39' |
| 2026 No-Build | EB – A (7.4)<br>WB – A (7.7)<br>NBL – A (8.0)<br>NBT/R – A (7.9)<br>SBL – A (8.1)<br>SBT/R – A (7.9) | NBL – 0'/27'<br>SBL – 3'/31' | EB – A (7.7)<br>WB – A (8.0)<br>NBL – A (8.1)<br>NBT/R – A (8.4)<br>SBL – A (8.3)<br>SBT/R – A (8.6) | NBL – 0'/27'<br>SBL – 5'/55' |
| 2026 Buildout | EB – A (7.5)<br>WB – A (7.9)<br>NBL – A (8.1)<br>NBT/R – A (8.0)<br>SBL – A (8.2)<br>SBT/R – A (8.0) | NBL – 0'/22'<br>SBL – 3'/40' | EB – A (7.8)<br>WB – A (8.3)<br>NBL – A (8.2)<br>NBT/R – A (8.7)<br>SBL – A (8.5)<br>SBT/R – A (8.8) | NBL – 0'/26'<br>SBL – 5'/44' |

Lynnwood Road at Hodge Road

Lynnwood Road at Hodge Road is currently an unsignalized intersection. The westbound minor street approach (Lynnwood Road) operates under stop control, and the northbound and southbound major street approaches (Hodge Road) are free-flow.

The capacity analysis results for the intersection are summarized in Table 7 below. The intersection of Lynnwood Road at Hodge Road currently operates with short delays during the AM peak hour and moderate delays during the PM peak hour for the minor street approach (Lynnwood Road).




**Westbound Approach of Lynnwood Road at Hodge Road**

The intersection is expected to continue to operate with short delays during the AM peak hour and moderate delays during the PM peak hour for the minor street approach under no-build conditions. The intersection is expected to continue to operate with short delays for the minor street approach during the AM peak hour under buildout conditions. The intersection is expected to operate with long delays during the PM peak hour under buildout conditions. It is typical for stop-controlled approaches to experience long delays during peak hours while the major street free-flow approaches experience little to no delay.

According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways (*July 2003), mitigation improvements should be identified if the total average delay at the intersection or individual approaches increases by 25% or more with the addition of the proposed development site trips. The projected delay for the westbound minor street approach under buildout conditions increases by 25% when compared to no-build conditions.

The following improvement is recommended by the developer to mitigate the impact of the proposed development:

- Construct a northbound right-turn lane on Hodge Road to provide 50 feet of full-width storage and appropriate taper.

However, it is important to note that there are existing conditions that may prohibit the construction of the recommended northbound right-turn lane. In particular, there are existing utilities (pole and boxes) located on the southeast quadrant of the intersection and cross pipes under each roadway that would need to be extended. Based on our preliminary review, an easement would need to be obtained from the adjacent property owner to relocate the utilities an appropriate distance from the widened roadway. In addition, temporary or permanent drainage easements may be required for the pipe extensions. Due to the right-of-way constraints, the improvement may not be feasible for the intersection. If the adjacent

property owner does not agree to the easements and the improvement is not constructed, the intersection will still operate with reasonable delay and queueing.

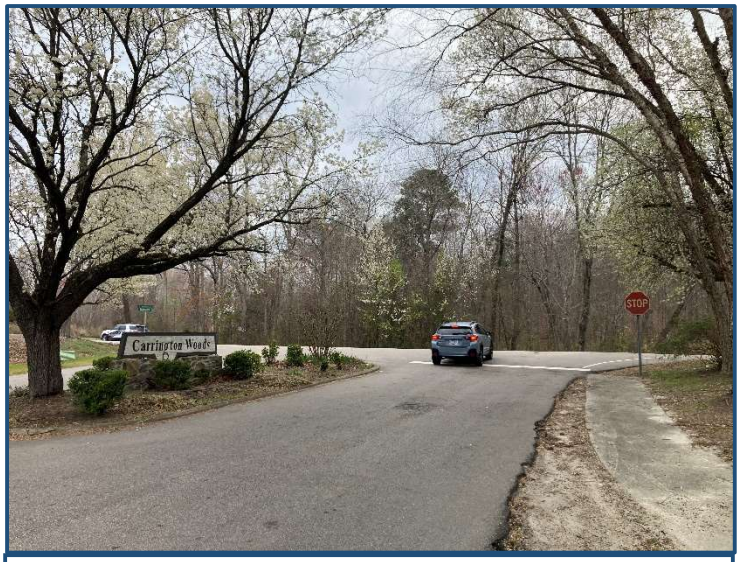
**Table 7: Level-of-Service: Lynwood Road at Hodge Road (Unsignalized)**

| Condition | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) |
| 2022 Existing | WB – C (17.3)<br>SBL – A (8.4) | No Turn Lanes | WB – D (27.2)<br>SBL – A (8.5) | No Turn Lanes |
| 2026 No-Build | WB – C (18.9)<br>SBL – A (8.5) | No Turn Lanes | WB – E (39.9)<br>SBL – A (8.7) | No Turn Lanes |
| 2026 Buildout | WB – C (20.7)<br>SBL – A (8.5) | No Turn Lanes | WB – F (50.0)<br>SBL – A (8.8) | No Turn Lanes |
| 2026 Buildout with Improvements | WB – C (19.9)<br>SBL – A (8.5) | NBR – -'/-' | WB – E (41.5)<br>SBL – A (8.8) | NBR – -'/12' |

Carrington Drive at Smithfield Road

Carrington Drive at Smithfield Road is currently an unsignalized intersection. The eastbound minor street approach (Carrington Drive) operates under stop control, and the northbound and southbound main street approaches (Smithfield Road) are free-flow.

The capacity analysis results for the intersection are summarized in Table 8 below. The intersection of Carrington Drive at Smithfield Road currently operates with short delays during the AM peak hour and moderate delays during the PM peak hour for the minor street approach (Carrington Drive).




**Eastbound Approach of Carrington Drive at Smithfield**

The intersection is expected to operate with moderate delays for the minor street approach during the AM peak hour under no-build and buildout conditions. The intersection is expected to operate with long delays for the minor street approach during the PM peak hour under no-build and buildout conditions. While the intersection is expected to experience long delays for the eastbound minor street approach of Carrington Drive under future conditions, it is typical for stop-controlled approaches to experience long delays during peak hours while the major street free-flow approaches experience little to no delay.

The addition of traffic from the proposed development is expected to have minimal impact on the operation of the intersection of Carrington Drive at Smithfield Road. According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways (*July 2003), mitigation improvements should be identified if the total average delay at the intersection or individual approaches increases by 25% or more with the addition of the proposed development site trips. The LOS is not expected to be impacted with the development of the proposed site and the total average delay at the intersection and individual approaches under buildout conditions increases by less than 25% when compared to no-build conditions.

Based on the Federal Highway Administration *Manual on Uniform Traffic Control Devices* (2009), the projected buildout peak hour traffic volumes do not meet the Peak Hour Signal Warrant for considering the installation of a traffic signal to improve operation. The existing turn lanes on the northbound and southbound approaches of Smithfield Road and wide egress lane for the eastbound approach of Carrington Drive provide increased capacity at the intersection.

In order to best utilize the available pavement on the eastbound approach, the following roadway improvement is recommended to accommodate project traffic at the intersection:

- Stripe the existing eastbound approach of Carrington Drive to provide an exclusive left-turn lane and an exclusive right-turn lane.

**Table 8: Level-of-Service: Carrington Drive at Smithfield Road (Unsignalized)**

| Condition | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) |
| 2022 Existing | EB – C (21.9)<br>NBL – A (8.2) | NBL – 0'/18' | EB – E (49.3)<br>NBL – B (10.2) | NBL – 0'/31'<br>SBR - -'/4' |
| 2026 No-Build | EB – D (29.1)<br>NBL – A (8.4) | NBL – 0'/25' | EB – F (116.9)<br>NBL – B (11.2) | NBL – 3'/31'<br>SBR - -'/9' |
| 2026 Buildout | EB – D (29.4)<br>NBL – A (8.4) | NBL – 0'/25' | EB – F (132.8)<br>NBL – B (11.3) | NBL – 3'/31'<br>SBR - -'/18' |
| 2026 Buildout with Improvements | EB – D (28.0)<br>NBL – A (8.4) | EBL – 33'/77'<br>EBR – 3'/39'<br>NBL – 0'/18' | EB – F (117.7)<br>NBL – B (11.3) | EBL – 93'/184'<br>EBR – 3'/107'<br>NBL – 3'/35'<br>SBR - -'/18' |

It is important to note that traffic currently utilizing the intersection of Carrington Drive and Smithfield Road may instead travel to the north and west via the interconnectivity provided through the proposed site and therefore decrease the delay experienced at this intersection. As shown in the analysis results for the study intersections to the north and west, there is available capacity to accommodate this potential shift in traffic.

Based on the *Guidelines for NCDOT Project-Level Traffic Forecasting Procedures* (June 2002), the capacity for a two-lane suburban roadway is approximately 10,500 - 12,500 vehicles per day (vpd). Assuming the PM peak hour traffic accounts for approximately 10% of the daily traffic volumes, the total demand for Carrington Drive under 2026 project buildout conditions is 1,960 vpd, which is well below the capacity of the roadway. The existing traffic controls (i.e., stop-controlled intersections) in place within the subdivision are expected to support the proposed development site traffic volumes.

Crosstie Street at Bethlehem Road/First Avenue

Crosstie Street at Bethlehem Road/First Avenue is currently an unsignalized intersection. The eastbound minor street approach (Crosstie Street) operates under stop control, and the northbound and southbound major street approaches (Bethlehem Road/First Avenue) are free-flow.




**Eastbound Approach of Crosstie Street at Bethlehem Road/First Avenue Road**

The capacity analysis results for the intersection are summarized in Table 9 below. The intersection of Crosstie Street at Bethlehem Road/First Avenue currently operates with short delays for the minor street approach (Crosstie Street) during both the AM and PM peak hours. The intersection is expected to continue to operate with short delays for the minor street approach during the AM peak hour under no-build and buildout conditions. The intersection is expected to operate with moderate delays for the minor street approach during the PM peak hour under no-build and buildout conditions. It is typical for stop-controlled approaches to experience moderate or long delays during peak hours while the major street free-flow approaches experience little to no delay.

As shown in Table 9, the addition of traffic from the proposed development is expected to have minimal impact on the operation of the intersection of Crosstie Street at Bethlehem Road/First Avenue. According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways (*July 2003), mitigation improvements should be identified if the total average delay at the intersection or individual approaches increases by 25% or more with the addition of the proposed development site trips. The LOS is not expected to be impacted with the development of the proposed site and the total average delay at the intersection and individual approaches under buildout conditions increases by less than 25% when compared to no-build conditions. Therefore, no roadway improvements are recommended to accommodate project traffic at the intersection.

**Table 9: Level-of-Service: Crosstie Street at Bethlehem Road/First Avenue (Unsignalized)**

| Condition | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) | LOS and Delay (sec/veh) | Turn Lane Synchro 95% Queue Length/SimTraffic Max Queue Length (feet) |
| 2022 Existing | EB – B (12.8)<br>NBL – A (7.8) | NBL – 0'/34' | EB – C (18.6)<br>NBL – A (8.6) | NBL – 3'/34' |
| 2026 No-Build | EB – B (14.4)<br>NBL – A (8.0) | NBL – 3'/30' | EB – D (26.4)<br>NBL – A (9.0) | NBL – 3'/39' |
| 2026 Buildout | EB – B (14.6)<br>NBL – A (8.0) | NBL – 3'/48' | EB – D (28.0)<br>NBL – A (9.1) | NBL – 5'/42' |

## RECOMMENDATIONS

The recommended lane geometry is shown on Figure 10.

Due to existing pedestrian safety concerns, the following pedestrian improvements are recommended to be constructed **by others**:

*Widewaters Parkway at Laurens Way:*

- Re-stripe the crosswalk on the north leg of Widewaters Parkway, preferably to a 10-foot wide high-visibility crosswalk.
- Relocate the existing stop bars on the east and west leg approaches of Laurens Way such that the minimum distance between the stop bar and crosswalk is four (4) feet.

Based on the capacity analysis presented herein, the following roadway improvements are recommended to be completed **by the developer** to accommodate buildout site traffic volumes:

*Hodge Road at Lynnwood Road:*

- Construct a northbound right-turn lane on Hodge Road to provide 50 feet of full-width storage and appropriate taper.

*Carrington Drive at Smithfield Road:*

- Stripe the existing eastbound approach of Carrington Drive to provide an exclusive left-turn lane and an exclusive right-turn lane.

The following roadway improvements are required to be constructed **by the developer** within the proposed site:

- Construct the extension of Widewaters Parkway to provide a Future Town-Maintained Collector Street in accordance with the Town's *Street Network Plan*.
- Construct the extension of Southampton Drive to provide a Future Town-Maintained Collector Street in accordance with the Town's *Street Network Plan*.

# Creekview Crossing Residential TIA

## Recommended Lane Geometry

LEGEND

- Stop Control
- Speed Limit XX
- Existing Signal
- Existing Approach Lane
- Departure Lane
- Recommended Improvements by Developer
- XX Recommended Pedestrian Improvements by Others
- XX' Intersection Spacing
- XX' - FULL STORAGE LENGTH
- - Not a Study Intersection

*Wake County, NCDOT Division 5*

**Figure 10**

EXULT ENGINEERING

