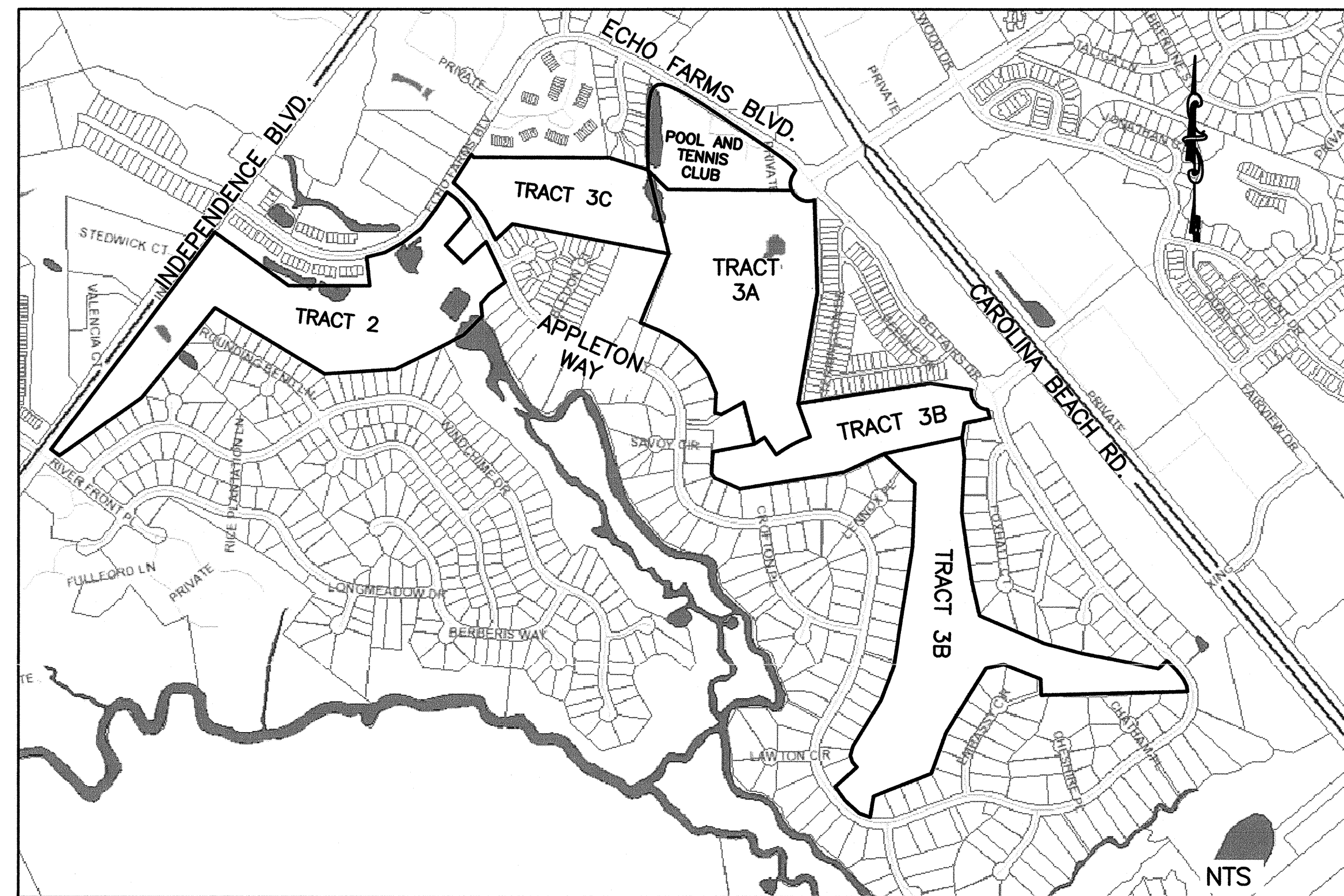


WOODLANDS AT ECHO FARMS

4114 ECHO FARMS BLVD.

WILMINGTON NC

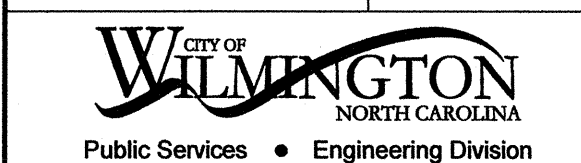


LOCATION MAP

SITE DATA TABLE OVERALL SITE	
EXISTING PARCEL ID#:	R07006-002-001-000
EXISTING MAP ID#:	312514.32.4829.000
SITE ADDRESS:	4114 ECHO FARMS BLVD. WILMINGTON, NC 28412 NEW HANOVER COUNTY
ZONING:	MF-M/O&I-1
CURRENT PROPERTY OWNER:	ECHO FARMS LLC
TRACT 3A:	BOOK 2307, PAGE 450 81.09 AC (3,532,229 SF)
TRACT 3A PROPOSED AREA OF APARTMENTS/TOWNHOMES:	25.33 AC (1,103,473 SF)
TRACT 3B PROPOSED AREA OF SINGLE FAMILY:	36.32 AC (1,582,509 SF)
POOL AND TENNIS CLUB (O&I):	7.67 AC (334,370 SF)
TRACT 3C PROPOSED FUTURE MULTIFAMILY:	11.69 AC (509,216 SF)
TRACT 2: BOOK 2307, PAGE 450	26.75 AC (1,165,280 SF)
TOTAL PROPOSED SITE AREA:	107.76 AC (4,694,828 SF)
CAMA LAND CLASSIFICATION:	URBAN/CONSERVATION AREA

SHEET INDEX	
I-1:	INVENTORY SITE PLAN
I-1.1:	INVENTORY SITE PLAN
I-1.2:	INVENTORY SITE PLAN
I-1.3:	INVENTORY SITE PLAN
I-1.4:	ZONING PLAN
B-1:	BOUNDARY AND TREE SURVEY TRACT 3A
B-2:	BOUNDARY AND TREE SURVEY TRACT 3B
B-3:	BOUNDARY AND TREE SURVEY TRACT 3B
B-4:	BOUNDARY AND TREE SURVEY TRACT 2
B-5:	BOUNDARY SURVEY TRACT 3C
C0:	OVERALL SITE PLAN
C0.1:	OVERALL SITE PLAN
C0.2:	OVERALL SITE PLAN
C0.3:	OVERALL SITE PLAN
C0.4:	OPEN SPACE PLAN
C0.5:	OPEN SPACE PLAN
C0.6:	OPEN SPACE PLAN
C1:	GRADING, DRAINAGE AND EROSION CONTROL PLAN
C1.1:	GRADING, DRAINAGE AND EROSION CONTROL PLAN
C1.2:	GRADING, DRAINAGE AND EROSION CONTROL PLAN
C1.3:	GRADING, DRAINAGE AND EROSION CONTROL PLAN
C1.4:	GRADING, DRAINAGE AND EROSION CONTROL PLAN
C1.5:	GRADING, DRAINAGE AND EROSION CONTROL PLAN
C1.6:	GRADING, DRAINAGE AND EROSION CONTROL PLAN
C2:	UTILITY PLAN
C2.1:	UTILITY PLAN
C2.2:	UTILITY PLAN
C2.3:	UTILITY PLAN
C2.4:	UTILITY PLAN
C3:	TREE PLAN
C3.1:	TREE PLAN
C3.2:	TREE PLAN
C3.3:	TREE PLAN
C3.4:	TREE PLAN
C3.5:	TREE PLAN
C3.6:	TREE PLAN
C4:	LAYOUT PLAN
C4.1:	LAYOUT PLAN
C4.2:	LAYOUT PLAN
C4.3:	LAYOUT PLAN
C4.4:	LAYOUT PLAN
C4.5:	LAYOUT PLAN
C4.6:	LAYOUT PLAN
C5:	NOTES AND DETAILS
C5.1:	NOTES AND DETAILS

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.



APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____

Signed: _____

Approved Construction Plan
Name: _____ Date: _____

Planning _____
Traffic _____
Fire _____

NC DENR PWSS WATER PERMIT #: _____
WATER CAPACITY: _____ GPD
DWO SEWER PERMIT #: _____
SEWER CAPACITY: _____ GPD
SEWER SHED # AND PLANT: _____
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

Approval of this plan establishes a zoning vested right under G.S. 160A-385.1. Unless terminated at an earlier date, the zoning vested right shall be valid until _____.

Approval of this plan, subject to the statutory requirements of G.S. 160A-385, establishes a vested right under G.S. 160A-385(b1). Unless terminated at an earlier date, the vested rights pursuant to G.S. 160A-385 shall be valid until _____.

Anticipated Phasing

It is anticipated that the development will be constructed in phases, with the following tracts included in separate phases. The sequencing of the construction of these phases has not yet been determined:
Tract 3B will be a phase;
Tract 3A will be a second phase;
Tract 2 will be a third phase; and
Tract 3C will be a fourth phase.

LANDSCAPE ARCHITECT:
MIHALY
LAND DESIGN
PLANNING+LANDSCAPE ARCHITECTURE

SURVEYOR:
MICHAEL UNDERWOOD and ASSOCIATES, PA
102 CINEMA DRIVE, SUITE A
WILMINGTON, NC 28403
PHONE: 910-815-0650
FAX: 910-815-0393
E-MAIL: muo@bizsec.com Firm License #C-0815

COVER SHEET
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

LAND OWNER/APPLICANT
ECHO FARMS, LLC
MATRIX DEVELOPMENT GROUP
CIN4000 FORSGATE DRIVE
CRANFORD, NJ 07012
732-521-2900

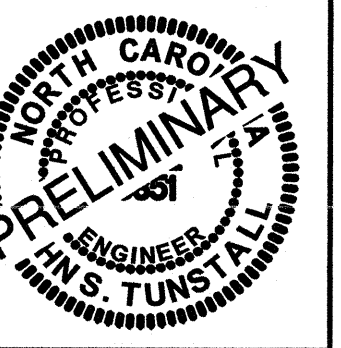
NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1429 ASH-LITTLE RIVER RD. NW
ASH, NC 28420
PHONE (910) 343-9653

License #C-3641

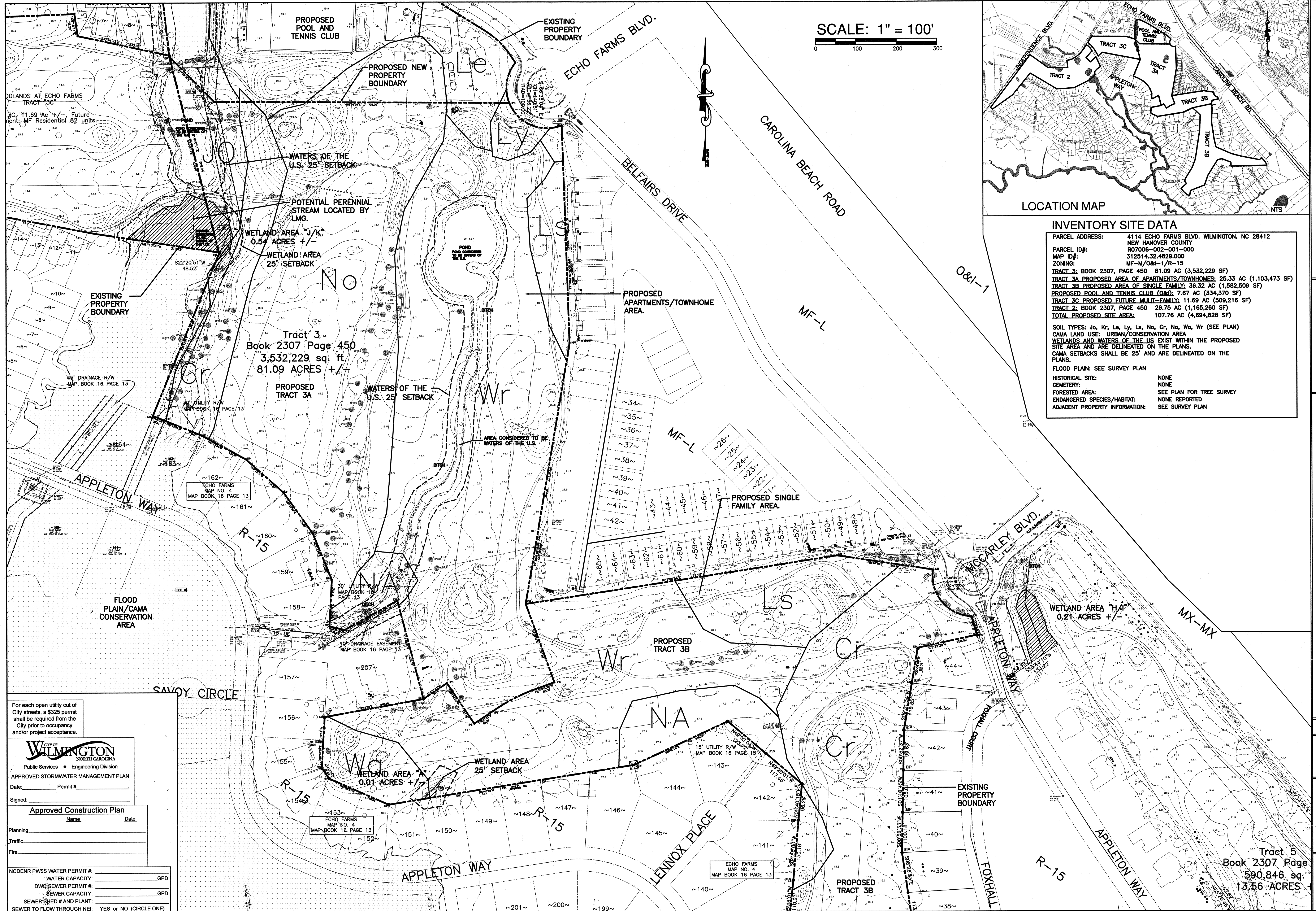
16083

DES. JST
C.D. JPN
DRWN. NKS

DATE 1/11/17



COVER SHEET

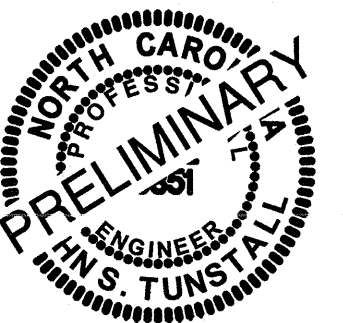


INVENTORY SITE PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANURBY, NJ 08512
 732-521-2800

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 1429 ASH-LITTLE RIVER RD. SW
 ASH, NC 28420
 PHONE (910) 343-9653
 PHONE (910) 297-5900

Licence #C-3641
 16083
 DES. JST
 O&I. JFN
 DRAWN. NKS
 DATE 1/11/17



F:\Projects\2016\16083_Woodlands at Echo Farms.dwg 16083.mxd 1/11/2017 10:15:42 AM

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

CITY OF WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

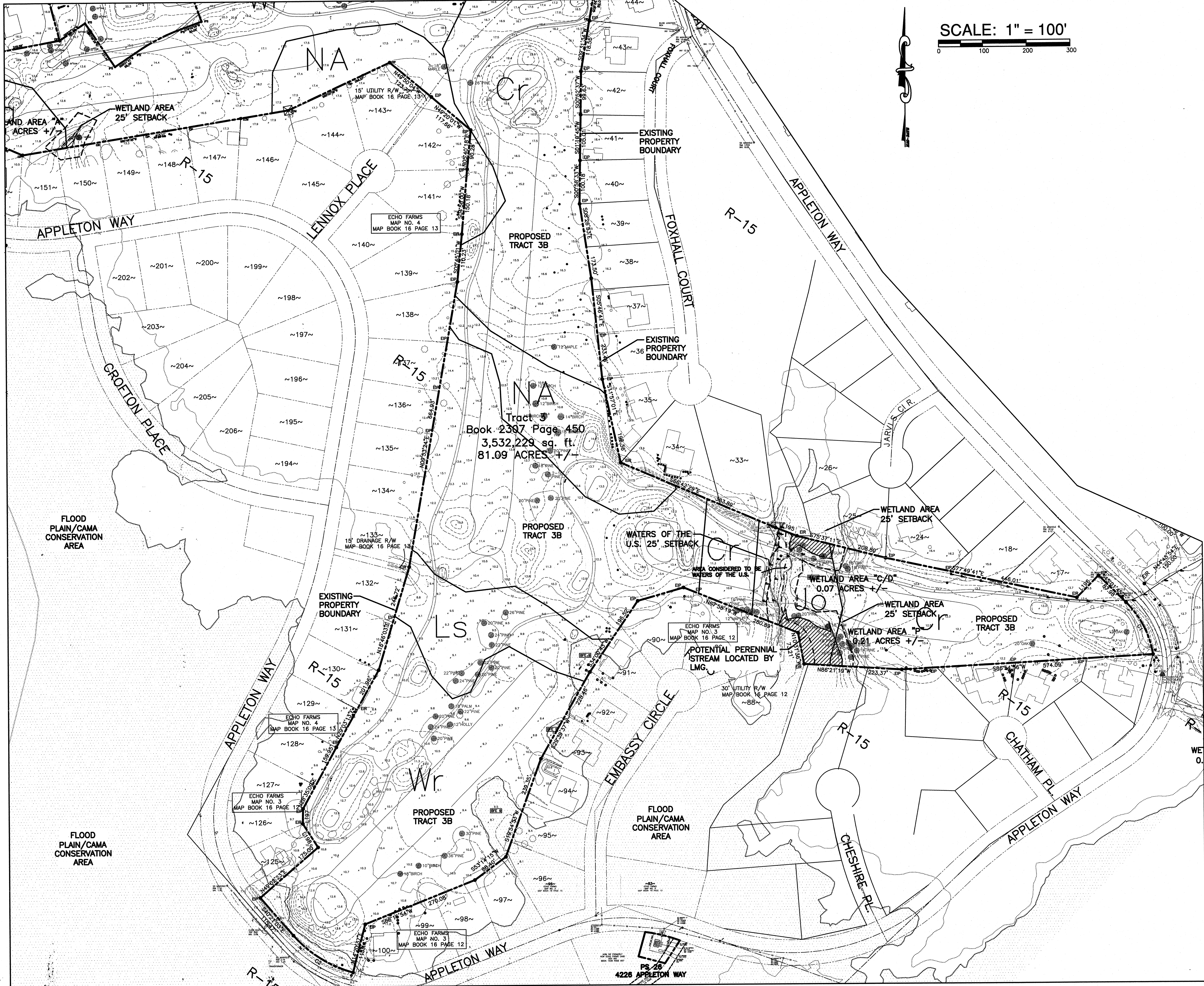
Date: _____ Permit # _____

Signed: _____

Approved Construction Plan

Name	Date
Planning	
Traffic	
Fire	

NC DENR PWSS WATER PERMIT # _____
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT # _____
 SEWER CAPACITY: _____ GPD
 SEWER HEAD # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)



SCALE: 1" = 100'



INVENTORY SITE PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

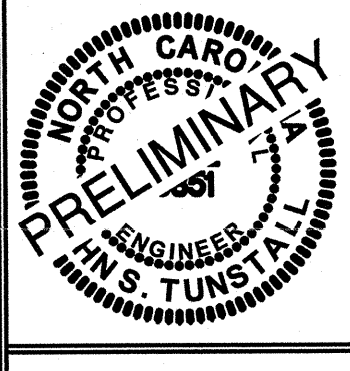
LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRYX DEVELOPMENT GROUP
 61400 FORSGATE DRIVE
 CHARLIE, NJ 00512
 732-521-2900

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 1429 ASHLITTLE RIVER RD, NW
 ASH, NC 28420
 PHONE (910) 343-9653

Licence #C-3641

16083

DES. JST
 CDR. JFN
 DRWN. NKS
 DATE 1/11/17



For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

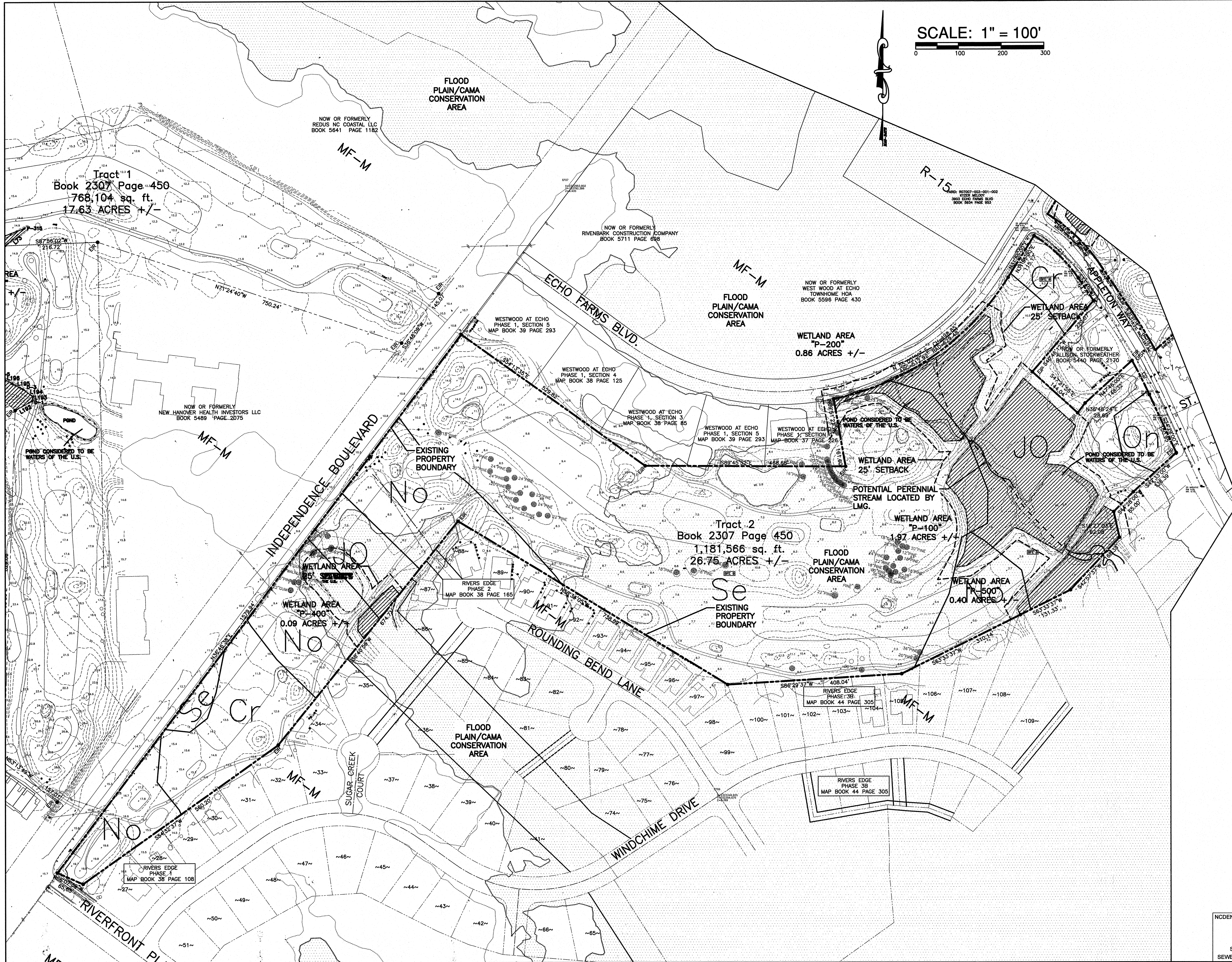
City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____

NC DENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____ GPD
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

1-1.1

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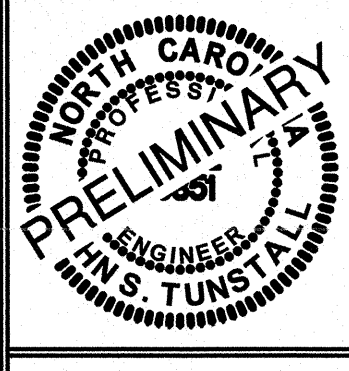
SCALE: 1" = 100'

INVENTORY SITE PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANURRY, NJ 00512
 732-521-2800

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASHLITTLE RIVER RD. NW
 WILMINGTON, NC 28401
 PHONE (910) 345-9653

License #C-3641
16083
 DES. JST
 CDD. JPN
 DRWN. NKS
 DATE 1/11/17



1-1.2

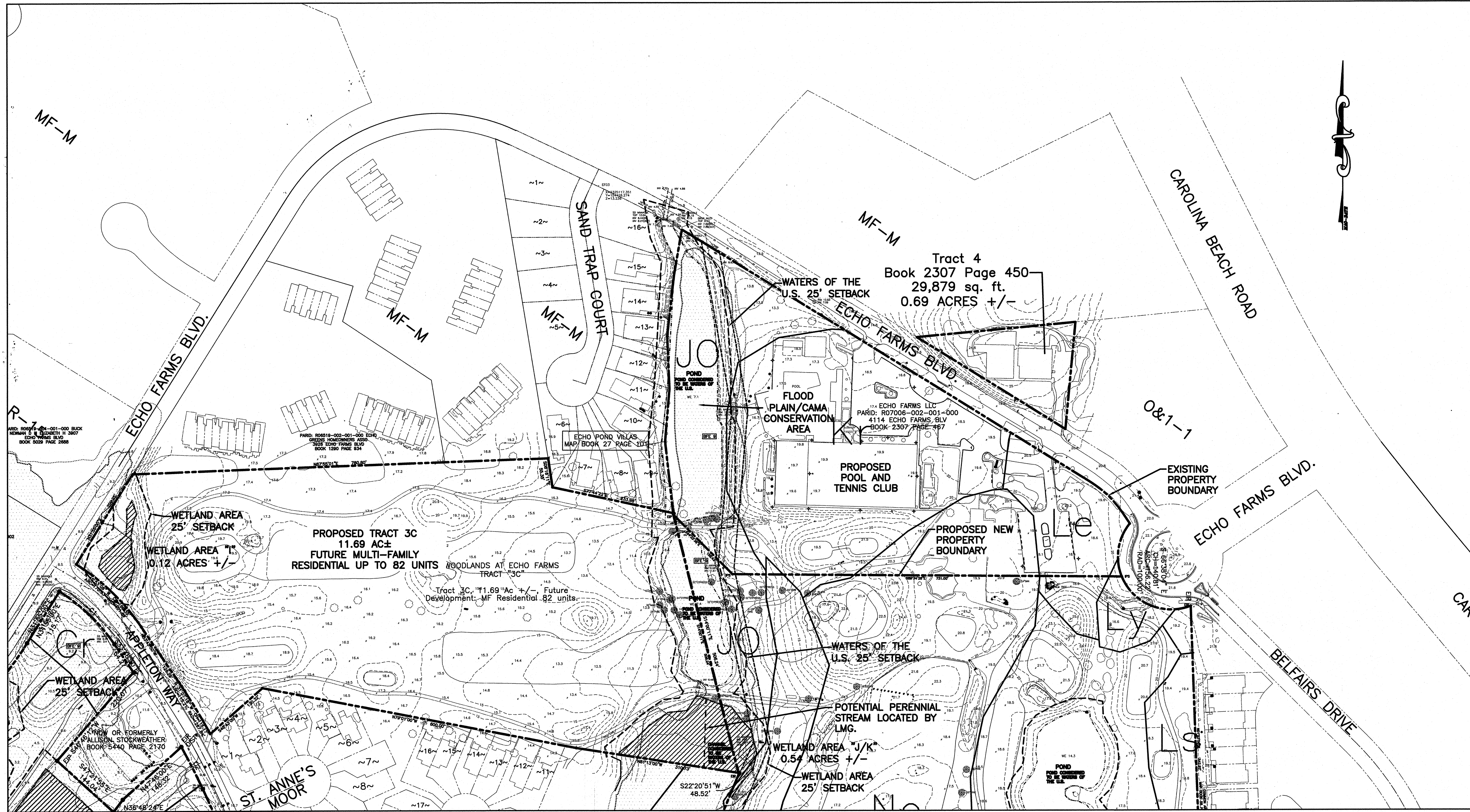
For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____

NC DENR PWSS WATER PERMIT # _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT # _____
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

I:\Projects\2016\16083 Woodlands at Echo Farms\16083 Plans\16083.master.r3.dwg, 1/11/2017 10:14:12 AM

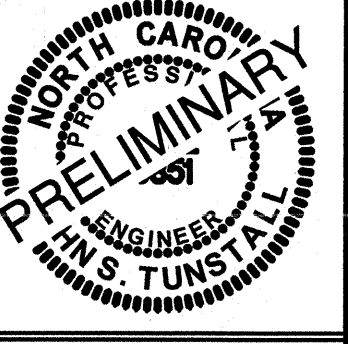


INVENTORY SITE PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFURY, NJ 08512
 732-521-2800

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASHLITTLE RIVER RD. N.W.
 WILMINGTON, NC 28401
 PHONE (910) 343-9653

License #C-3641
16083
 DES. JST
 CDR. JPN
 DRWN. NKS
 DATE 1/11/17



I-1.3

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

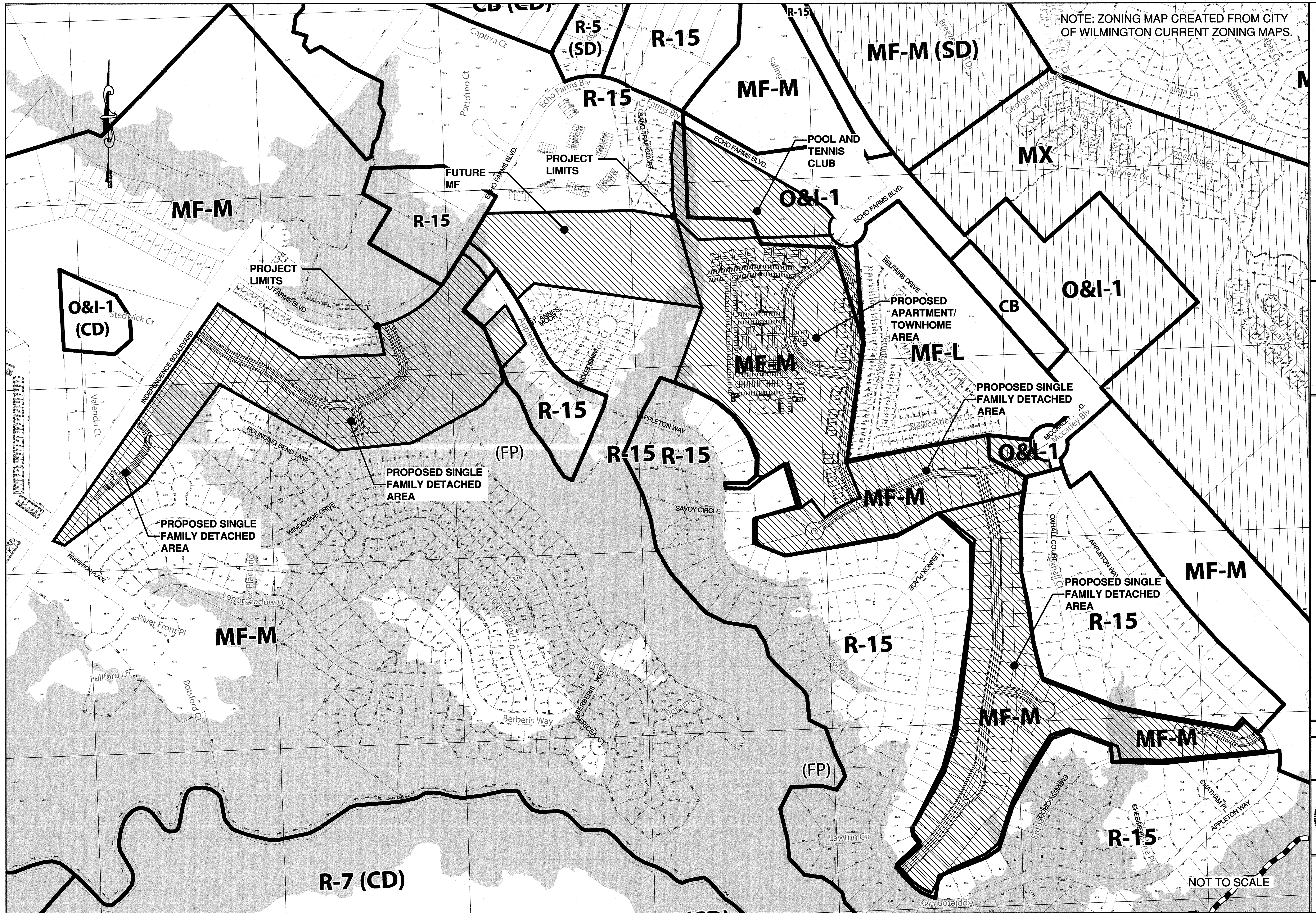
CITY OF WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____

NC DENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

SCALE: 1" = 100'





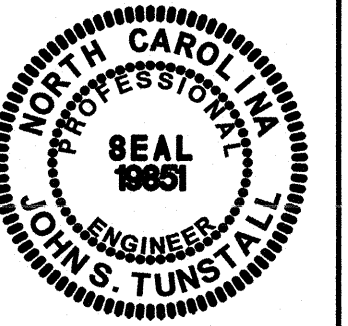
NOTE: ZONING MAP CREATED FROM CITY OF WILMINGTON CURRENT ZONING MAPS.

ZONING MAP PLAN
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

LAND OWNER/APPLICANT
ECHO FARMS LLC
MATRIX DEVELOPMENT GROUP
CN4000 FORSGATE DRIVE
CHAMBURT, N.C. 00512
732-521-2800

NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1429 ASH-LITTLE RIVER RD. NW
ASH, NC 28420
PHONE (910) 287-5900

Licence #C-3641
16083
DES. JST
CHK. JPN
DRWN. NKS
DATE 1/11/17



I-1.4

NOT TO SCALE

F:\Projects\2016\16083 Woodlands at Echo Farms\16083 Plans\16083 zoning map.r1.dwg, 1/11/2017 11:35:50 AM

FLOOD LEGEND
 FLOOD INFORMATION TAKEN FROM FLOOD INSURANCE RATE MAP, COMMUNITY PANEL 3720312500A, EFFECTIVE DATE APRIL 3, 2006.

ZONE "X" UNSHADED - AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

ZONE "X" SHADED - AREAS DETERMINED TO BE LOCATED IN A 0.2% ANNUAL CHANCE FLOOD HAZARD

AREAS DETERMINED LOCATED IN SPECIAL FLOOD HAZARD AREAS. ELEVATION DETERMINED.

AREAS DETERMINED TO BE A REGULATORY FLOODWAY

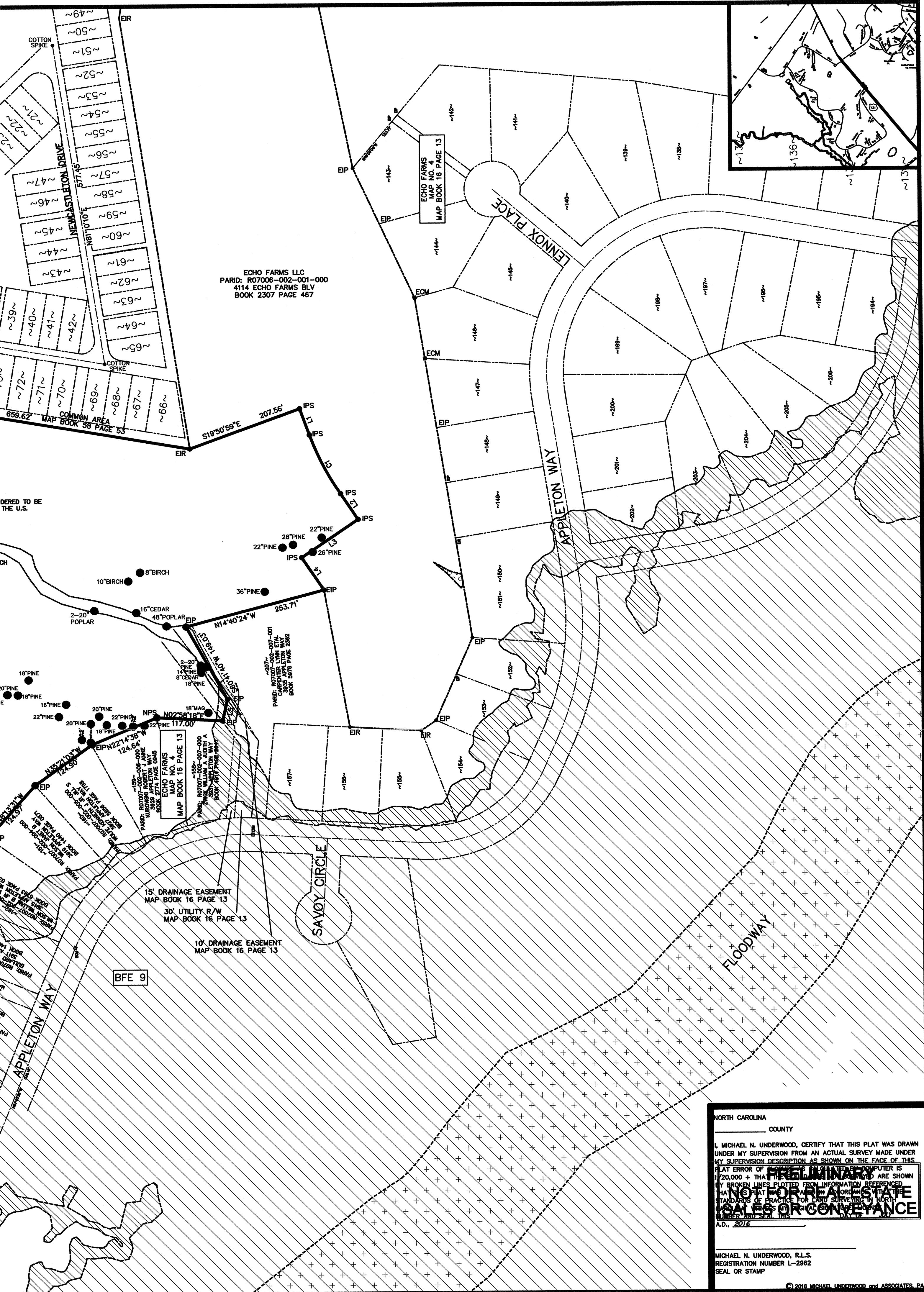
CURVE TABLE					
Curve #	Radius	Delta	Length	Chord	Tangent
C1	452.39'	150°31'19"	118.87'	118.53'	59.78'
C3	100.00'	89°30'28"	156.22'	140.81'	99.14'

LINE TABLE		
LINE	DIRECTION	DISTANCE
L1	S70°02'05"W	50.00'
L2	S56°01'31"W	55.29'
L3	N33°58'29"W	121.44'
L4	S55°57'01"W	70.11'
L5	N78°41'22"W	38.92'
L6	N67°44'18"W	29.91'

MUIRFIELD TOWNHOMES

LOT 66 MCKOWN EDWARD F RENE M 4410 TERRINGTON DR BOOK 5948 PAGE 1173 807007-003-093-000
 LOT 67 EWANG EDWARD POLAK 4408 TERRINGTON DR BOOK 5947 PAGE 0079 807007-003-094-000
 LOT 68 ROBERT L KAREN M 4402 TERRINGTON DR BOOK 5945 PAGE 1487 807007-003-095-000
 LOT 69 RECH CHARLES L ELEANOR L 4400 TERRINGTON DR BOOK 5942 PAGE 2345 807007-003-096-000
 LOT 70 SIGNATURE ECHO FARMS LTD 4344 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-097-000
 LOT 71 SIGNATURE ECHO FARMS LTD 4342 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-098-000
 LOT 72 SIGNATURE ECHO FARMS LTD 4340 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 73 ECHO FARMS TOWNHOMES NC INC 4338 TERRINGTON DR BOOK 5932 PAGE 2668 807007-003-099-000
 LOT 74 ECHO FARMS TOWNHOMES NC INC 4336 TERRINGTON DR BOOK 5932 PAGE 2658 807007-003-099-000

LOT 75 ECHO FARMS TOWNHOMES NC INC 4334 TERRINGTON DR BOOK 5932 PAGE 2658 807007-003-099-000
 LOT 76 SIGNATURE ECHO FARMS LTD 4332 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 77 SIGNATURE ECHO FARMS LTD 4330 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 78 SIGNATURE ECHO FARMS LTD 4328 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 79 SIGNATURE ECHO FARMS LTD 4326 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 80 SIGNATURE ECHO FARMS LTD 4324 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 81 SIGNATURE ECHO FARMS LTD 4322 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 82 ANDERSON LORI C 4310 TERRINGTON DR BOOK 5929 PAGE 1505 807007-003-034-000
 LOT 83 SIGNATURE ECHO FARMS LTD 4308 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 84 CHOI MICHAEL W ETAL 4304 TERRINGTON DR BOOK 5928 PAGE 2554 807007-003-099-000
 LOT 85 SIGNATURE ECHO FARMS LTD 4302 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 86 SIGNATURE ECHO FARMS LTD 4300 TERRINGTON DR BOOK 5933 PAGE 0430 807007-003-099-000
 LOT 87 SHOP MILTON ETAL 4298 TERRINGTON DR BOOK 5938 PAGE 1429 807007-003-021-000
 LOT 88 MORTITT THOMAS F DONNA D 4292 TERRINGTON DR BOOK 5928 PAGE 1910 807007-003-099-000
 LOT 89 MONTYRE BRIAN F 4294 TERRINGTON DR BOOK 5927 PAGE 2000 807007-003-099-000
 LOT 90 JONES JAMES F TAMMY C 4290 TERRINGTON DR BOOK 5928 PAGE 1554 807007-003-099-000
 LOT 91 STOUT NOVEL E JR ALICE V HALEY 4286 TERRINGTON DR BOOK 5928 PAGE 1879 807007-003-099-000
 LOT 92 MARRIAGE ANNETTE LOUISE 4284 TERRINGTON DR BOOK 5928 PAGE 0010 807007-003-099-000



ECHO POND VILLAS

LOT 9 STEPHENS ALLEN J KATHLEEN D B 3719 SAND TRAP CT BOOK 5788 PAGE 0239 807007-005-004-000

ECHO FARMS LLC PARID: R07006-002-001-000 4114 ECHO FARMS BLV BOOK 2307 PAGE 467

WOODLANDS AT ECHO FARMS TRACT "3A" 25.36 ACRES +/-

ECHO FARMS LLC PARID: R07006-002-001-000 4114 ECHO FARMS BLV BOOK 2307 PAGE 467

BOUNDARY AND TREE LOCATION SURVEY
WOODLANDS AT ECHO FARMS TRACT "3A" 25.36 ACRES +/-
 CITY OF WILMINGTON NEW HAVER COUNTY NORTH CAROLINA

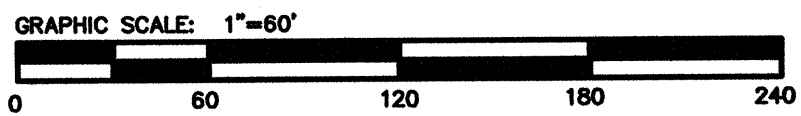
OWNER: ECHO FARMS LLC
 C/O NORRIS AND TUNSTALL CONSULTING ENGINEERS
 902 MARKET STREET
 WILMINGTON, NC 28401

MICHAEL UNDERWOOD and ASSOCIATES, PA
 102 CINEMA DRIVE, SUITE A
 WILMINGTON, NC 28403
 PHONE: 910-815-0650
 FAX: 910-815-0393
 E-MAIL: mu@bizarr.com Firm License #C-0615

SURVEYED: DC APPROVED: MNU
 DRAWN BY: TBM DATE: NOV.16
 CHECKED BY: MNU SCALE: 1"=60'

SURVEY REFERENCE
 BOOK 2307 PAGE 467

LEGEND
 ECM EXISTING CONCRETE MONUMENT
 EIP EXISTING IRON PIPE
 EIR EXISTING IRON REBAR
 IPS IRON PIPE SET
 NPS NO POINT SET
 BFE BASE FLOOD ELEVATION



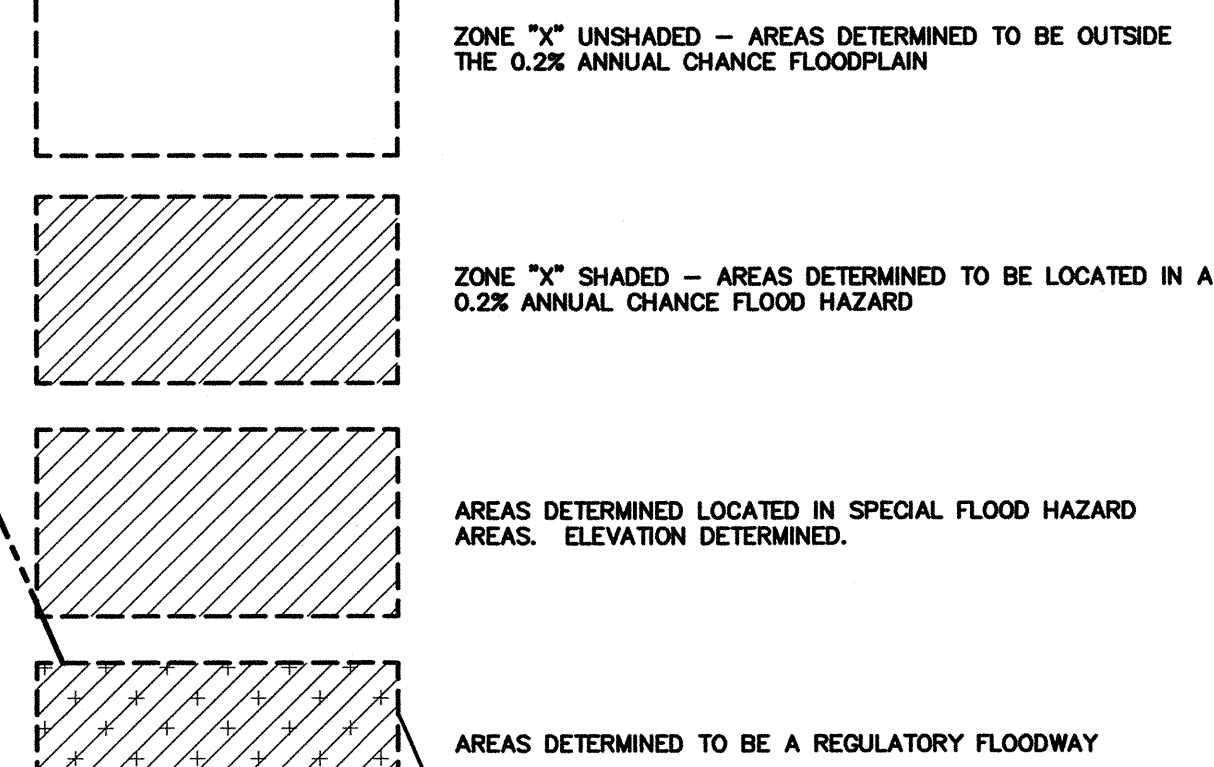
NOW OR FORMERLY
 ECHO FARMS TOWNHOMES
 MAP BOOK 24 PAGE 17
 PARID: R07007-002-049-000
 ECHO FARMS TOWNHOMES
 WIMLEDON CT
 BOOK 5531 PAGE 2432

NORTH CAROLINA COUNTY
 I, MICHAEL N. UNDERWOOD, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION DESCRIPTION AS SHOWN ON THE FACE OF THIS PLAT. ERROR OF REPRESENTATION AS SHOWN ON THE FACE OF THIS PLAT IS 1/20,000 + THAT THE INFORMATION REFERENCED HEREIN IS NOT TO BE USED FOR ANY STATE SALES OR CONVEYANCE.
 A.D. 2016

MICHAEL N. UNDERWOOD, R.L.S.
 REGISTRATION NUMBER L-2962
 SEAL OR STAMP

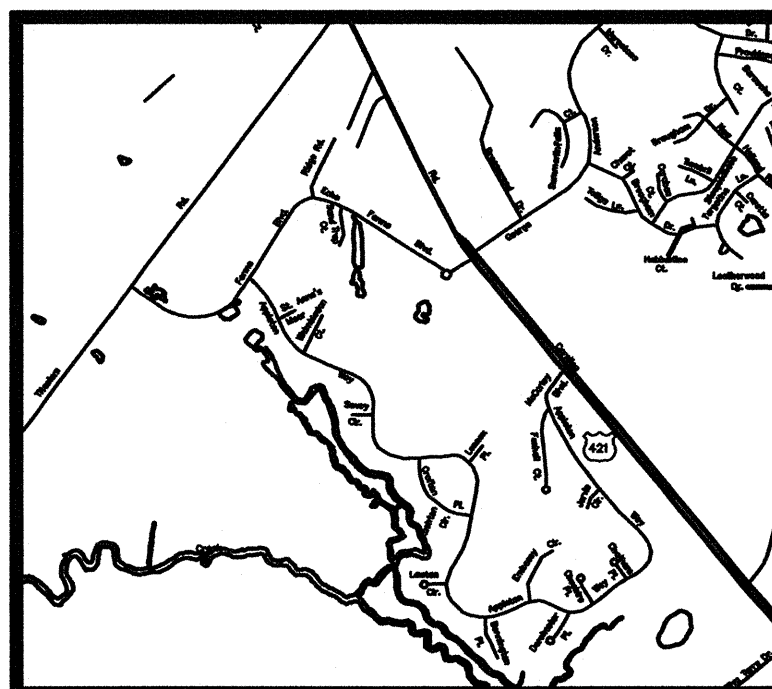
ECHO FARMS LLC
 PARID: R07006-002-001-000
 4114 ECHO FARMS BLV
 BOOK 2307 PAGE 467

FLOOD LEGEND
 FLOOD INFORMATION TAKEN FROM FLOOD
 INSURANCE RATE MAP, COMMUNITY PANEL
 3720312500J, EFFECTIVE DATE APRIL 3, 2006.

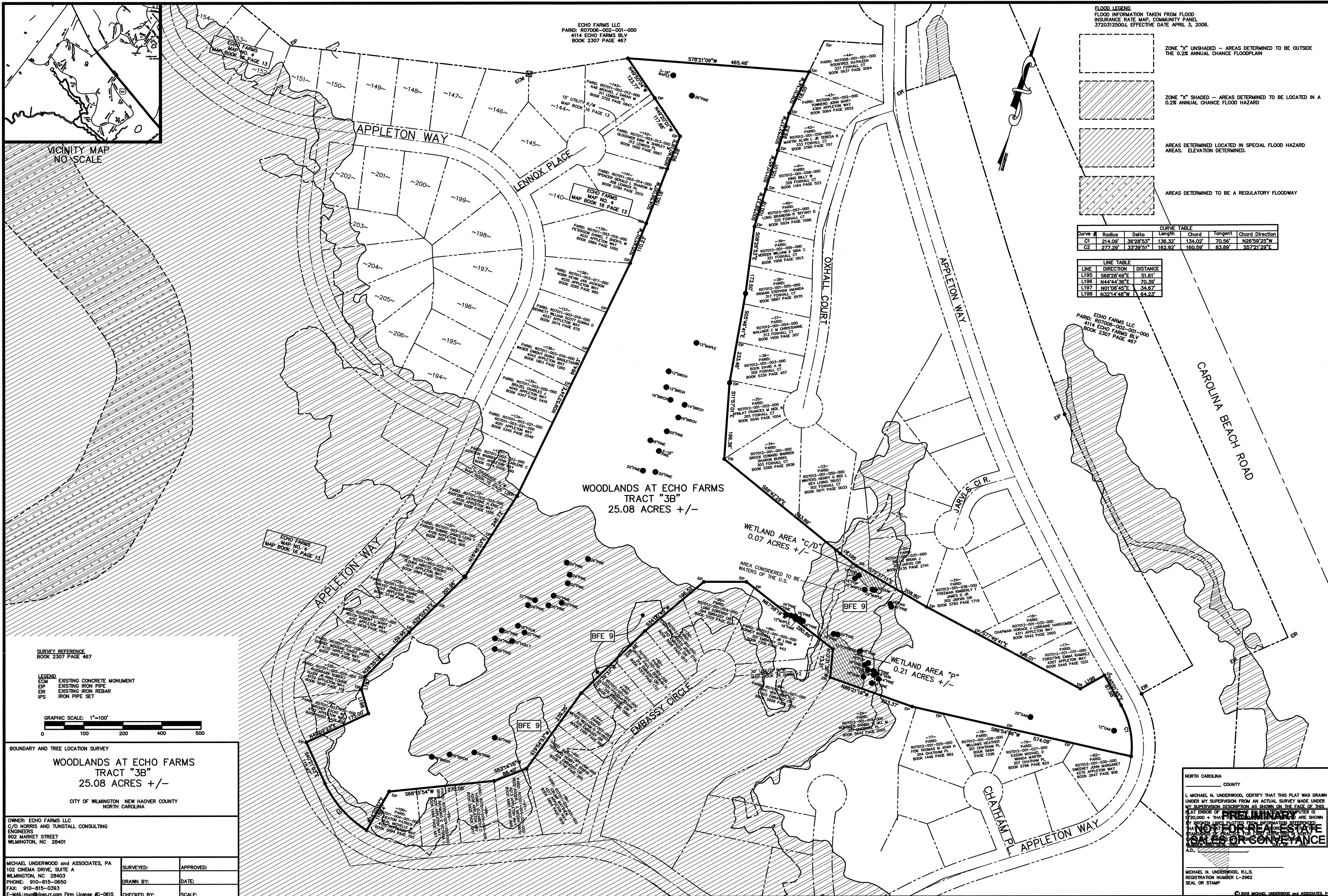


CURVE TABLE						
Curve #	Radius	Delta	Length	Chord	Tangent	Chord Direction
C1	214.09'	36°28'53"	136.32'	134.02'	70.56'	N26°59'25"W
C2	277.29'	33°39'51"	182.92'	160.59'	83.69'	S57°21'29"E

LINE TABLE		
LINE	DIRECTION	DISTANCE
L195	S88°28'49"E	51.61'
L196	N44°44'36"E	70.39'
L197	N01°08'45"E	34.67'
L198	N32°14'48"W	64.23'



VICINITY MAP
 NO SCALE



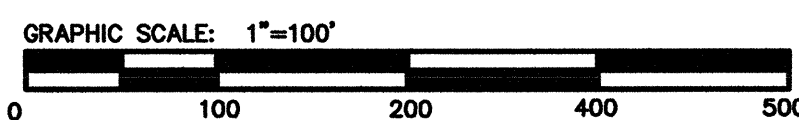
WOODLANDS AT ECHO FARMS
 TRACT "3B"
 25.08 ACRES +/-

WETLAND AREA "C/D"
 0.07 ACRES +/-

WETLAND AREA "P"
 0.21 ACRES +/-

SURVEY REFERENCE
 BOOK 2307 PAGE 467

LEGEND
 ECM EXISTING CONCRETE MONUMENT
 EIP EXISTING IRON PIPE
 EIR EXISTING IRON REBAR
 IPS IRON PIPE SET



BOUNDARY AND TREE LOCATION SURVEY

WOODLANDS AT ECHO FARMS
 TRACT "3B"
 25.08 ACRES +/-

CITY OF WILMINGTON NEW HAVEN COUNTY
 NORTH CAROLINA

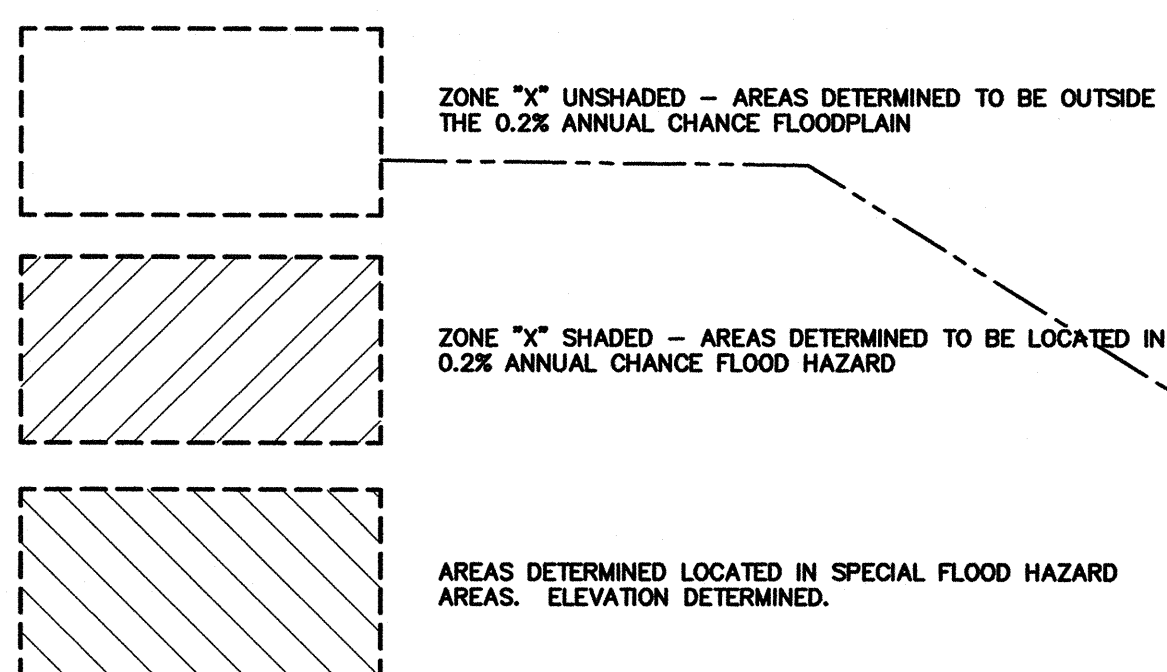
OWNER: ECHO FARMS LLC
 C/O NORRIS AND TUNSTALL CONSULTING
 ENGINEERS
 902 MARKET STREET
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MICHAEL UNDERWOOD and ASSOCIATES, PA
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 WILMINGTON, NC 28403
 PHONE: 910-815-0650
 FAX: 910-815-0393
 E-MAIL: muo@btccr.com Firm License #C-0615

SURVEYED: _____ APPROVED: _____
 DRAWN BY: _____ DATE: _____
 CHECKED BY: _____ SCALE: _____

NORTH CAROLINA COUNTY _____
 I, MICHAEL N. UNDERWOOD, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION OR DESCRIPTION AS SHOWN ON THE FACE OF THIS PLAT. THE TOTAL AREA OF THIS PLAT IS 25.08 ACRES +/- AND THE TOTAL AREA OF THE SUBJECT PROPERTY IS 25.08 ACRES +/- THAT THE TOTAL AREA OF THIS PLAT IS 25.08 ACRES +/- AND THE TOTAL AREA OF THE SUBJECT PROPERTY IS 25.08 ACRES +/-.
 MICHAEL N. UNDERWOOD, R.L.S.
 REGISTRATION NUMBER L-2962
 SEAL OR STAMP

FLOOD LEGEND:
 FLOOD INFORMATION TAKEN FROM FLOOD
 INSURANCE RATE MAP, COMMUNITY PANEL
 37203125004, EFFECTIVE DATE APRIL 3, 2006.



ZONE "X" UNSHADED - AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

ZONE "X" SHADED - AREAS DETERMINED TO BE LOCATED IN A 0.2% ANNUAL CHANCE FLOOD HAZARD

AREAS DETERMINED LOCATED IN SPECIAL FLOOD HAZARD AREAS. ELEVATION DETERMINED.

PARID: R06519-001-001-000 BUCK
 NEWMAN D III ELIZABETH H 3907
 ECHO FARMS BLVD
 BOOK 5029 PAGE 2688

PARID: R06519-002-001-000 ECHO
 GREENS HOMEOWNERS ASSO
 3925 ECHO FARMS BLVD
 BOOK 1290 PAGE 934

ECHO POND VILLAS

PARID: R07007-005-001-000
 JONES RONALD D HRS
 3725 SAND TRAP CT
 BOOK 9912 PAGE 415

PARID: R07007-005-002-000
 CAPE FEAR REGIONAL CDC
 3723 SAND TRAP CT
 BOOK 5699 PAGE 2341

PARID: R07007-005-003-000
 RHODES MICHAEL LINDA
 3721 SAND TRAP CT
 BOOK 5913 PAGE 1147

PARID: R07007-005-004-000
 STEPHENS ALLEN J KATHLEEN D B
 3719 SAND TRAP CT
 BOOK 5798 PAGE 239

ECHO POND VILLAS
 MAP BOOK 27 PAGE 101

POND

BFE 9

POND CONSIDERED TO BE WATERS OF THE U.S.

ECHO FARMS LLC
 PARID: R07006-002-001-000
 4114 ECHO FARMS BLV
 BOOK 2307 PAGE 467

PARID: R07007-003-001-002
 KYZER MELODY
 3903 ECHO FARMS BLVD
 BOOK 5934 PAGE 953

WETLAND AREA "I"
 0.12 ACRES +/-

**WOODLANDS AT ECHO FARMS
 TRACT "3C"**

Tract 3C, 11.69 Ac +/-, Future
 Development: MF Residential 82 units.

ECHO FARMS LLC
 PARID: R07006-002-001-000
 4114 ECHO FARMS BLV
 BOOK 2307 PAGE 467

BFE 9

WETLAND AREA "J"
 0.54 ACRES +/-

CHANNEL CONSIDERED TO BE WATERS OF THE U.S.

ECHO FARMS TOWNHOUSES

PARID: R07007-002-011-000
 CHERINGTON JUDITH
 301 SAINT ANNES MOOR CT
 BOOK 2710 PAGE 0700

PARID: R07007-002-012-000
 RIDLEY EUGENE MAXINE GAIL
 303 SAINT ANNES MOOR CT
 BOOK 3817 PAGE 458

PARID: R07007-002-013-000
 VITHALANI KIRTI J THERESA L
 305 SAINT ANNES MOOR CT
 BOOK 5578 PAGE 1584

PARID: R07007-002-014-000
 NELSON CHRISTINE A
 307 SAINT ANNES MOOR CT
 BOOK 5322 PAGE 2561

PARID: R07007-002-015-000
 STRUTHERS C J
 309 SAINT ANNES MOOR CT
 BOOK 1228 PAGE 1713

PARID: R07007-002-016-000
 BROPHY MARY CATHERINE HRS
 311 SAINT ANNES MOOR CT
 BOOK 9904 PAGE 2406

ECHO FARMS TOWNHOUSES

PARID: R07007-002-038-000
 MCINTYRE GENE L SUZANN B
 320 WIMBLETON CT
 BOOK 1565 PAGE 1640

PARID: R07007-002-037-000
 VINAL ELIZABETH C
 322 WIMBLETON CT
 BOOK 2889 PAGE 1206

PARID: R07007-002-036-000
 ALDEN JOANNE M JOHN C
 324 WIMBLETON CT
 BOOK 2662 PAGE 334

PARID: R07007-002-035-000
 BATUS MARY T
 323 WIMBLETON CT
 BOOK 5766 PAGE 1514

PARID: R07007-002-034-000
 ARNOLD JEAN D
 321 WIMBLETON CT
 BOOK 9911 PAGE 1614

PARID: R07007-002-033-000
 VANGRAFFELAND PETER JULIANNE TREME
 319 WIMBLETON CT
 BOOK 5335 PAGE 2347

PARID: R07007-001-013-000
 STINSON SANDRA L
 3710 APPLETON WAY
 BOOK 5975 PAGE 1938

ECHO FARMS TOWNHOUSES
 CONDO PLAT 1 PAGE 51

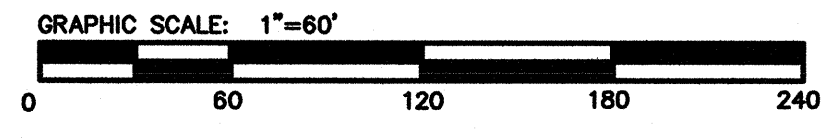
ECHO FARMS TOWNHOUSES
 MAP BOOK 24 PAGE 17

NOW OR FORMERLY
 ECHO FARMS TOWNHOUSES
 MAP BOOK 24 PAGE 17

PARID: R07007-002-049-000
 ECHO FARMS TOWNHOUSES
 WIMBLETON CT
 BOOK 5531 PAGE 2432

SURVEY REFERENCE
 BOOK 2307 PAGE 467

LEGEND
 ECM EXISTING CONCRETE MONUMENT
 EIP EXISTING IRON PIPE
 EIR EXISTING IRON REBAR
 IPS IRON PIPE SET



BOUNDARY AND TREE LOCATION SURVEY
WOODLANDS AT ECHO FARMS
TRACT "3C"
 11.69 ACRES +/-
 Tract 3C, 11.69 Ac +/-, Future
 Development: MF Residential 82 units.
 CITY OF WILMINGTON NEW HAVER COUNTY
 NORTH CAROLINA

OWNER: ECHO FARMS LLC
 C/O NORRIS AND TUNSTALL CONSULTING
 ENGINEERS
 902 MARKET STREET
 WILMINGTON, NC 28401

MICHAEL UNDERWOOD and ASSOCIATES, PA
 102 CINEMA DRIVE, SUITE A
 WILMINGTON, NC 28403
 PHONE: 910-815-0650
 FAX: 910-815-0393
 E-MAIL: muo@uzec.com Firm License #C-0615

SURVEYED: APPROVED: mmu
 DRAWN BY: tbn DATE: DEC.16
 CHECKED BY: mmu SCALE: 1"=60'

NORTH CAROLINA COUNTY
 I, MICHAEL N. UNDERWOOD, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION DESCRIPTION AS SHOWN ON THE FACE OF THIS PLAT. ERROR OF DISTANCE IN THIS PLAT IS NOT GREATER THAN 1/20,000 + THAT THE REMAINDER ARE SHOWN BY BROWN LINES PLOTTED FROM INFORMATION REFERENCED HEREON. THIS PLAT IS NOT TO BE USED FOR THE SALE OR CONVEYANCE OF ANY REAL ESTATE.
 MICHAEL N. UNDERWOOD, R.L.S.
 REGISTRATION NUMBER L-2992
 SEAL OR STAMP
 © 2016 MICHAEL UNDERWOOD and ASSOCIATES, PA

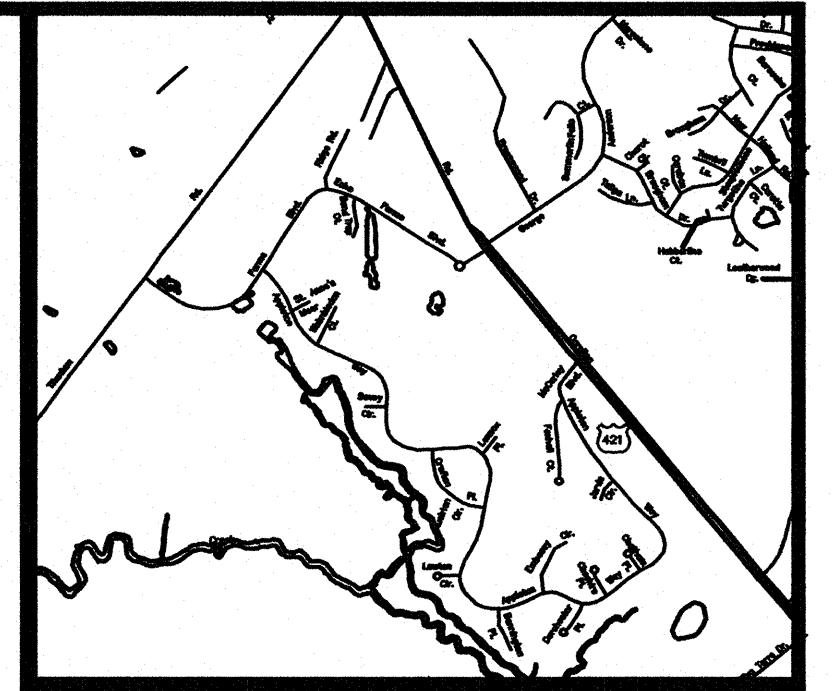
WESTWOOD AT ECHO FARMS

- ~1~ PARID: R07006-003-003-000 HILL RICHARD A DENISE P 3802 ECHO FARMS BLVD BOOK 5983 PAGE 0552
- ~2~ PARID: R07006-003-004-000 RONEY KATHLEEN 3804 ECHO FARMS BLVD BOOK 4409 PAGE 107
- ~3~ PARID: R07006-003-005-000 WATER CHRIS 3808 ECHO FARMS BLVD BOOK 5924 PAGE 1555
- ~4~ PARID: R07006-003-006-000 JACKSON BETTIE J 3808 ECHO FARMS BLVD BOOK 5901 PAGE 2500
- ~5~ PARID: R07006-003-007-000 MORSE SHELLEY I 3810 ECHO FARMS BLVD BOOK 5919 PAGE 2659
- ~6~ PARID: R07006-002-016-000 CAPPS JACK CAMERON SR JANE 3812 ECHO FARMS BLVD BOOK 5871 PAGE 1972
- ~7~ PARID: R07006-002-017-000 WILSON ALONZO V 3814 ECHO FARMS BLVD BOOK 2640 PAGE 0068
- ~8~ PARID: R07006-002-018-000 WARD DIXIE T TIMOTHY ETAL 3816 ECHO FARMS BLVD BOOK 5908 PAGE 935
- ~9~ PARID: R07006-002-019-000 WEAVER JO S 3818 ECHO FARMS BLVD BOOK 5767 PAGE 2731
- ~10~ PARID: R07006-002-020-000 JAMESON JOHN F III LORI A 3820 ECHO FARMS BLVD BOOK 5943 PAGE 630
- ~11~ PARID: R07006-002-011-000 STRAWCUTTER JOHN W 3822 ECHO FARMS BLVD BOOK 2424 PAGE 0226
- ~12~ PARID: R07006-002-012-000 COLLEY CINDY RAY 3824 ECHO FARMS BLVD BOOK 5673 PAGE 2253
- ~13~ PARID: R07006-002-013-000 DANIELS ANDREA 3826 ECHO FARMS BLVD BOOK 5998 PAGE 1509
- ~14~ PARID: R07006-002-014-000 WILKINSON LEONARD J JOHN E 3828 ECHO FARMS BLVD BOOK 5974 PAGE 1780
- ~15~ PARID: R07006-002-015-000 SIMPSON DONNA 3830 ECHO FARMS BLVD BOOK 4604 PAGE 103
- ~16~ PARID: R07006-002-016-000 HUIKO DOLORES J 3832 ECHO FARMS BLVD BOOK 5661 PAGE 0476
- ~17~ PARID: R07006-002-017-000 JAYLEN TESSA LITZ 3834 ECHO FARMS BLVD BOOK 4419 PAGE 0140
- ~18~ PARID: R07006-002-018-000 WORSLEY GERALD K 3836 ECHO FARMS BLVD BOOK 2376 PAGE 0949
- ~19~ PARID: R07006-002-019-000 HALVORSON ANDREW P 3838 ECHO FARMS BLVD BOOK 3850 PAGE 0404
- ~20~ PARID: R07006-002-020-000 CUNNINGHAM JAMES L PRISCILLA LIFE 3840 ECHO FARMS BLVD BOOK 5638 PAGE 0279
- ~21~ PARID: R07006-002-003-000 DESMOND JOHN P MILDRED 3842 ECHO FARMS BLVD BOOK 5089 PAGE 2379
- ~22~ PARID: R07006-002-004-000 MEREDIZ KRISTAN O 3844 ECHO FARMS BLVD BOOK 5808 PAGE 1787
- ~23~ PARID: R07006-002-005-000 WHITE BARBARA H 3846 ECHO FARMS BLVD BOOK 4998 PAGE 1358

NOW OR FORMERLY REDUS NC COASTAL LLC BOOK 5714 PAGE 1516

NOW OR FORMERLY NEW HANOVER HEALTH INVESTORS LLC BOOK 5489 PAGE 2075

NOW OR FORMERLY WESTWOOD AT ECHO TOWNHOME HOA BOOK 5596 PAGE 430



HIBISCUS WAY

INDEPENDENCE BOULEVARD

WOODLANDS AT ECHO FARMS TRACT "2" 26.75 ACRES +/-

WETLAND AREA "P-500" 0.40 ACRES +/-

WETLAND AREA "P-400" 0.09 ACRES +/-

SURVEY REFERENCE BOOK 2307 PAGE 467

LEGEND
 ECM EXISTING CONCRETE MONUMENT
 EIP EXISTING IRON PIPE
 EIR EXISTING IRON REBAR
 IPS IRON PIPE SET

GRAPHIC SCALE: 1"=100'

BOUNDARY AND TREE LOCATION SURVEY
WOODLANDS AT ECHO FARMS TRACT "2"
 26.75 ACRES +/-
 CITY OF WILMINGTON NEW HANOVER COUNTY NORTH CAROLINA

OWNER: ECHO FARMS LLC
 C/O NORRIS AND TUNSTALL CONSULTING ENGINEERS
 902 MARKET STREET WILMINGTON, NC 28401

SURVEYED: APPROVED:
 DRAWN BY: DATE:
 CHECKED BY: SCALE:

- ~27~ PARID: R07010-002-001-000 GRAHAM FAMILY TRUST 201 WINDCHIME DR BOOK 5974 PAGE 2005
- ~28~ PARID: R07010-002-002-000 HINES KENNETH KATHY 205 WINDCHIME DR BOOK 4287 PAGE 429
- ~29~ PARID: R07010-002-003-000 KOCH RICHARD SHERIDAN TERESA D 213 WINDCHIME DR BOOK 5427 PAGE 2600
- ~30~ PARID: R07010-002-004-000 PARK ROBERT K DORIS 217 WINDCHIME DR BOOK 5364 PAGE 2169
- ~31~ PARID: R07010-002-005-000 PARK ROBERT K DORIS 217 WINDCHIME DR BOOK 5364 PAGE 2169
- ~32~ PARID: R07010-002-006-000 VECCHIA MICHAEL A SANDRA E 221 WINDCHIME DR BOOK 2601 PAGE 530
- ~33~ PARID: R07010-002-007-000 JONES RYAN T CRYSTAL 384 SUGAR CREEK CT BOOK 5998 PAGE 1169
- ~34~ PARID: R07010-002-008-000 FULTON THOMAS G ROSA L 3800 SUGAR CREEK CT BOOK 5648 PAGE 631
- ~35~ PARID: R07010-002-009-000 NUTT WILLIAM JR MARIANNE 3808 ROUNDING BEND LN BOOK 4207 PAGE 968
- ~36~ PARID: R07010-002-010-000 DILLON FAMILY TRUST 3802 ROUNDING BEND LN BOOK 5848 PAGE 2426
- ~37~ PARID: R07010-002-011-000 JACKSON WARRIN C JANICE H 3801 ROUNDING BEND LN BOOK 5597 PAGE 2926
- ~38~ PARID: R07010-002-012-000 FERRELL LARRY B LINDA J 3833 ROUNDING BEND LN BOOK 3448 PAGE 623
- ~39~ PARID: R07010-002-013-000 WELLS CASSIE INEZ ETAL 3837 ROUNDING BEND LN BOOK 5510 PAGE 2468
- ~40~ PARID: R07010-002-014-000 HANCOCK JULIE E ETAL 305 WINDCHIME DR BOOK 2894 PAGE 139
- ~41~ PARID: R07010-002-015-000 SULLIVAN JAMES B JR SARAH E 305 WINDCHIME DR BOOK 5805 PAGE 2423
- ~42~ PARID: R07010-002-016-000 PARK ROBERT K DORIS 309 ROUNDING BEND LN BOOK 5952 PAGE 894
- ~43~ PARID: R07010-002-017-000 RUVOLO BEVERLY R 3813 ROUNDING BEND LN BOOK 9911 PAGE 2414
- ~44~ PARID: R07010-002-018-000 TAGLIAFERRO RALPH MARY ANNE 3817 ROUNDING BEND LN BOOK 4457 PAGE 506
- ~45~ PARID: R07010-002-019-000 JIANG JUN DONG HEE 3821 ROUNDING BEND LN BOOK 5921 PAGE 104
- ~46~ PARID: R07010-002-020-000 TESTA EDWARD J JUNE A 3825 ROUNDING BEND LN BOOK 4160 PAGE 841
- ~47~ PARID: R07010-002-021-000 KOVES MICHELLE L 3829 ROUNDING BEND LN BOOK 5791 PAGE 902
- ~48~ PARID: R07010-002-022-000 MALNEY STEVE LINDA 329 WINDCHIME DR BOOK 5858 PAGE 1029
- ~49~ PARID: R07010-002-023-000 MALNEY STEVE LINDA 329 WINDCHIME DR BOOK 5858 PAGE 1029
- ~50~ PARID: R07010-002-024-000 GIBSON RICHARD E DEBORAH A 337 WINDCHIME DR BOOK 4780 PAGE 694
- ~51~ PARID: R07010-002-025-000 STANKO STEVEN M 321 WINDCHIME DR BOOK 5922 PAGE 2708
- ~52~ PARID: R07010-002-026-000 FLAHERTY DOROTHY A 325 WINDCHIME DR BOOK 9912 PAGE 3012
- ~53~ PARID: R07010-002-027-000 STANKO STEVEN M 321 WINDCHIME DR BOOK 5922 PAGE 2708
- ~54~ PARID: R07010-002-028-000 MABE LARRY G SHIRLEY C 313 WINDCHIME DR BOOK 4350 PAGE 0018
- ~55~ PARID: R07010-002-029-000 BRASSARD DAVID C AMY SMITH 317 WINDCHIME DR BOOK 4512 PAGE 3012
- ~56~ PARID: R07010-002-030-000 STANKO STEVEN M 321 WINDCHIME DR BOOK 5922 PAGE 2708
- ~57~ PARID: R07010-002-031-000 MALNEY STEVE LINDA 329 WINDCHIME DR BOOK 5858 PAGE 1029
- ~58~ PARID: R07010-002-032-000 GIBSON RICHARD E DEBORAH A 337 WINDCHIME DR BOOK 4780 PAGE 694

FLOOD LEGEND
 FLOOD INFORMATION TAKEN FROM FLOOD INSURANCE RATE MAP, COMMUNITY PANEL 5720312500A, EFFECTIVE DATE APRIL 3, 2006.

ZONE "X" UNSHADED - AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

ZONE "X" SHADED - AREAS DETERMINED TO BE LOCATED IN A 0.2% ANNUAL CHANCE FLOOD HAZARD

AREAS DETERMINED LOCATED IN SPECIAL FLOOD HAZARD AREAS. ELEVATION DETERMINED.

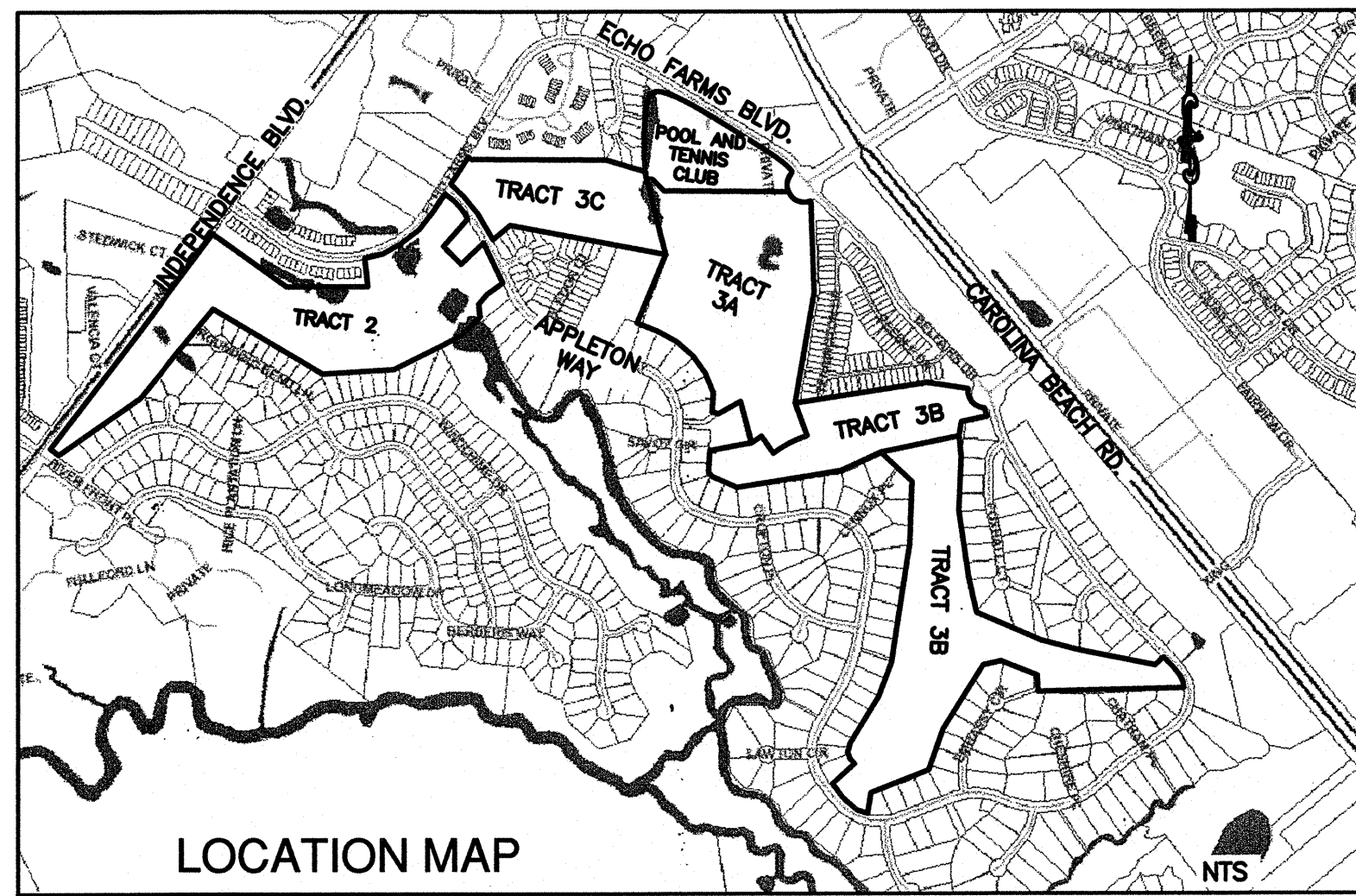
NORTH CAROLINA COUNTY

I, MICHAEL N. UNDERWOOD, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION DESCRIPTION AS SHOWN ON THE FACE OF THIS PLAT ERROR OF $\pm 20.000'$ THAT THE DISTANCES SHOWN BY BROKEN LINES PLOTTED FROM INFORMATION REFERENCED STANDARDS OF PRACTICE FOR THE SURVEYING PROFESSION IN NORTH CAROLINA, 2008, ARE:

NO GUARANTEE FOR REAL ESTATE PURPOSES OR CONVEYANCE

MICHAEL N. UNDERWOOD, R.L.S.
 REGISTRATION NUMBER L-2962
 SEAL OR STAMP

© 2015 MICHAEL UNDERWOOD and ASSOCIATES, PA



SITE DATA TABLE TRACT 3A

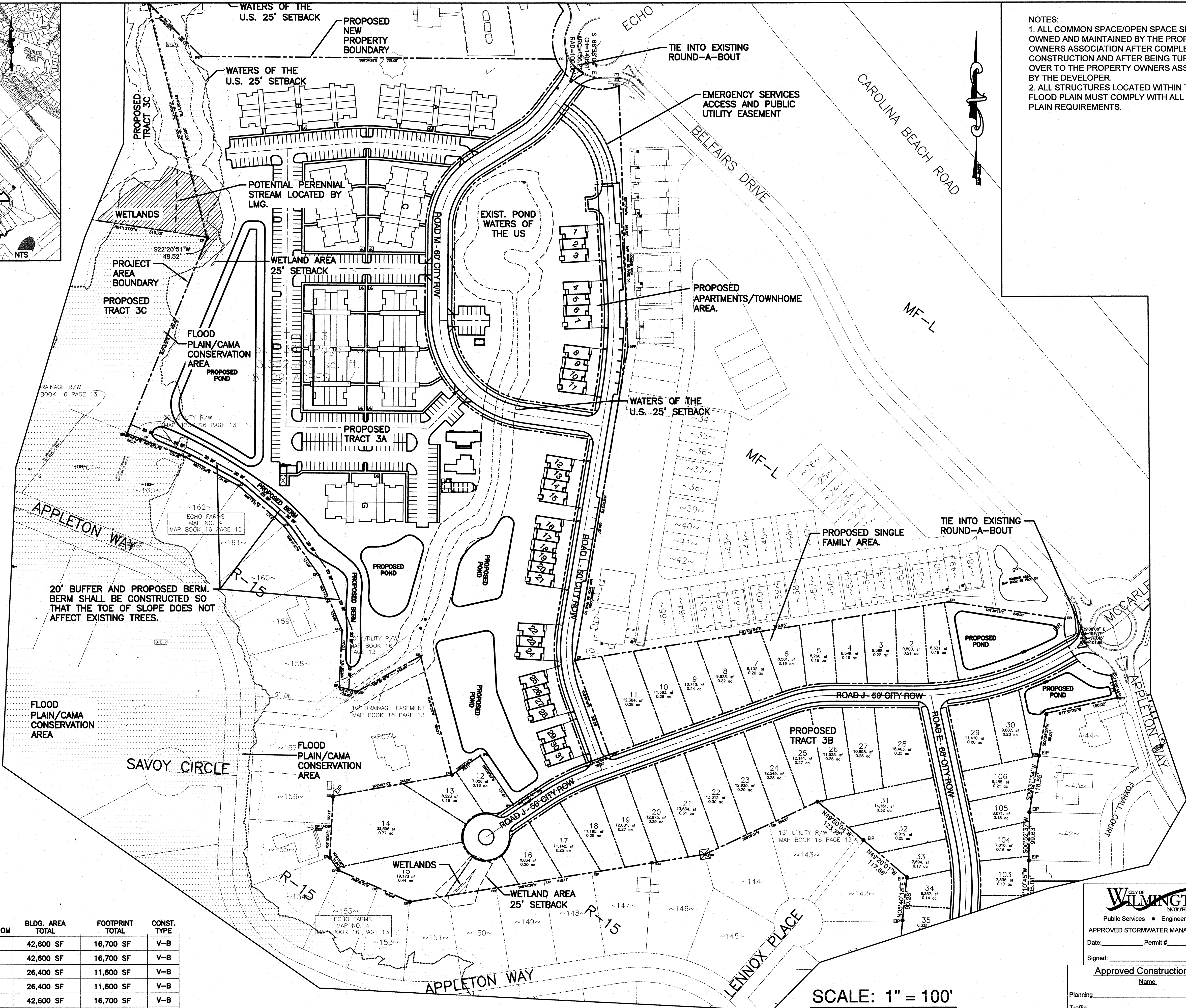
TRACT 3A PROPOSED AREA OF APARTMENTS/TOWNHOMES: 25.33 AC (1,103,473 SF)
ZONE: MF-M
CAMA LAND CLASSIFICATION: URBAN/CONSERVATION AREA
REQUIRED SETBACKS:
 MF: F=35' R=25' SI=20 SC=30
 ATT/DET/DU/TR/Q: F=15' R=15' SI=5 SC=10
PROPOSED SETBACKS: PROVIDED AS PER CODE
BUILDING SEPARATION: 16' MIN. REQUIRED AND PROVIDED
REQUIRED LOT COVERAGE:
 MF: 30%
 ATT/DET/DU/TR/Q: 50%
PROPOSED LOT COVERAGE:
 MF AND TOWNHOMES: 13.00%
REQUIRED BUILDING HEIGHT: 35'-96' WITH ADDITIONAL YARD REQUIREMENTS.
MAXIMUM ALLOWED DENSITY: 17 UNITS/ACRE
 FOR AREAS LOCATED WITHIN A CAMA CONSERVATION AREA THE MAXIMUM ALLOWED DENSITY IS 2.5 UNITS/ACRE.
DENSITY TRACT 3A:
 247 UNITS (216 APARTMENTS, 31 TOWNHOMES)
 MAXIMUM ALLOWED UNITS @ 17 UNITS/ACRE = 431 UNITS
 PROPOSED DENSITY 9.75 UNITS/ACRE = 247 UNITS
PARKING REQUIREMENT RESIDENTIAL:
 MAX: 2.5 PER UNIT
 MIN: 0-1 BEDROOM 1.5; 2 BEDROOM 2; 3 OR MORE BEDROOMS 2.25
 APARTMENTS: 120 (1) BEDROOM, 96 (2) BEDROOM
 PARKING REQUIREMENT MF APARTMENTS: MAX. 540/MIN. 372
 PARKING PROVIDED MF APARTMENTS: 390
 HC PARKING REQUIREMENT MF APARTMENTS: 8
 HC PARKING PROVIDED MF APARTMENTS: 16
 BICYCLE PARKING REQUIREMENT MF APARTMENTS: 20
 BICYCLE PARKING PROVIDED MF APARTMENTS: 20 MIN.
TOWNHOMES: 31 (3) BEDROOM
 PARKING REQUIREMENT TOWNHOMES: MAX. 2.5/MIN. 2.25 PER UNIT
 PARKING PROVIDED TOWNHOMES: 78 MAX./70 MIN.
 PARKING PROVIDED TOWNHOMES: 82 TOTAL (20 ON STREET)
OPEN SPACE REQUIREMENT TRACT 3A MF: 35% OF TRACT AREA MINUS PONDS, MARSH, ETC. 17.5% ACTIVE/PASSIVE; 17.5% ACTIVE/PASSIVE/OPEN; AS PER ARTICLE 17.02.4.73 - 177.02.4.73 X 35 = 324,124± SF / 7.44± AC REQUIRED AREA AVAILABLE: 10.98 AC (3.92 ACTIVE)
STREETYARD FOR NON SINGLE FAMILY: 12 MULTIPLIER
FOUNDATION PLANTINGS MULTIFAMILY APARTMENTS: 12% FACE OF BUILDING X LENGTH
INTERIOR LANDSCAPING MULTIFAMILY APARTMENTS: 20% CANOPY COVER
SOLID WASTE DISPOSAL:
 MF: DUMPSTER
 TOWN HOMES: HAND CART
WATER AND SEWER CAPACITY:
 MF: 240 G.P.D. PER UNIT = 51,840 G.P.D.
 TOWN HOMES: 360 G.P.D. PER UNIT = 11,160 G.P.D.
ADJACENT PROPERTY INFORMATION: SEE SURVEY PLAN

IMPERVIOUS AREA

TRACT 3A IMPERVIOUS AREA MF AND TOWNHOMES:	
BUILDINGS:	140,500 SF
SIDEWALK:	35,344 SF
ASPHALT/CONC./C&G:	257,816 SF
TOTAL:	371,581 SF TOTAL
PERCENT IMP.:	40.00%

MULTI-FAMILY APARTMENTS									
BUILDING	# ON SITE	STORIES	HEIGHT	UNITS	1 BEDROOM	2 BEDROOM	BLDG. AREA TOTAL	FOOTPRINT TOTAL	CONST. TYPE
A	1	3	35'	36			42,600 SF	16,700 SF	V-B
B	1	3	35'	36			42,600 SF	16,700 SF	V-B
C	1	3	35'	24			26,400 SF	11,600 SF	V-B
D	1	3	35'	24			26,400 SF	11,600 SF	V-B
E	1	3	35'	36			42,600 SF	16,700 SF	V-B
F	1	3	35'	36			42,600 SF	16,700 SF	V-B
G	1	3	35'	24			26,400 SF	11,600 SF	V-B
MAIL KIOSK	1	1	16'±				300 SF	300 SF	
POOL HOUSE	1	1	16'±				1,200 SF	1,200 SF	
CLUB HOUSE	1	1	18'±				1,700 SF	1,700 SF	
TOTAL	10			216	120	96	252,800 SF	104,800 SF	

TOWNHOMES									
BUILDING	# ON SITE	STORIES	HEIGHT	UNITS	BEDROOMS/UNIT	FOOTPRINT BUILDING	FOOTPRINT TOTAL	BLDG. AREA TOTAL	
3 UNIT	3	2	26'±	9	3 (27)	3,500 SF	10,500 SF	10,500 SF	
4 UNIT	4	2	26'±	16	3 (48)	4,600 SF	18,400 SF	18,400 SF	
6 UNIT	1	2	26'±	6	3 (18)	6,800 SF	6,800 SF	6,800 SF	
TOTAL	8			31	93	14,900 SF	35,700 SF	35,700 SF	



NOTES:
 1. ALL COMMON SPACE/OPEN SPACE SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNERS ASSOCIATION AFTER COMPLETION OF CONSTRUCTION AND AFTER BEING TURNED OVER TO THE PROPERTY OWNERS ASSOCIATION BY THE DEVELOPER.
 2. ALL STRUCTURES LOCATED WITHIN THE FLOOD PLAIN MUST COMPLY WITH ALL FLOOD PLAIN REQUIREMENTS.

SCALE: 1" = 100'

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NCDENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWG SEWER PERMIT #: _____ GPD
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

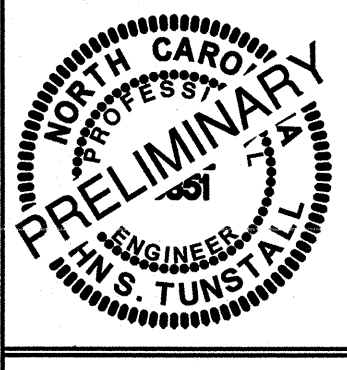
OVERALL SITE PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANBURY, NJ 00512
 732-521-2900

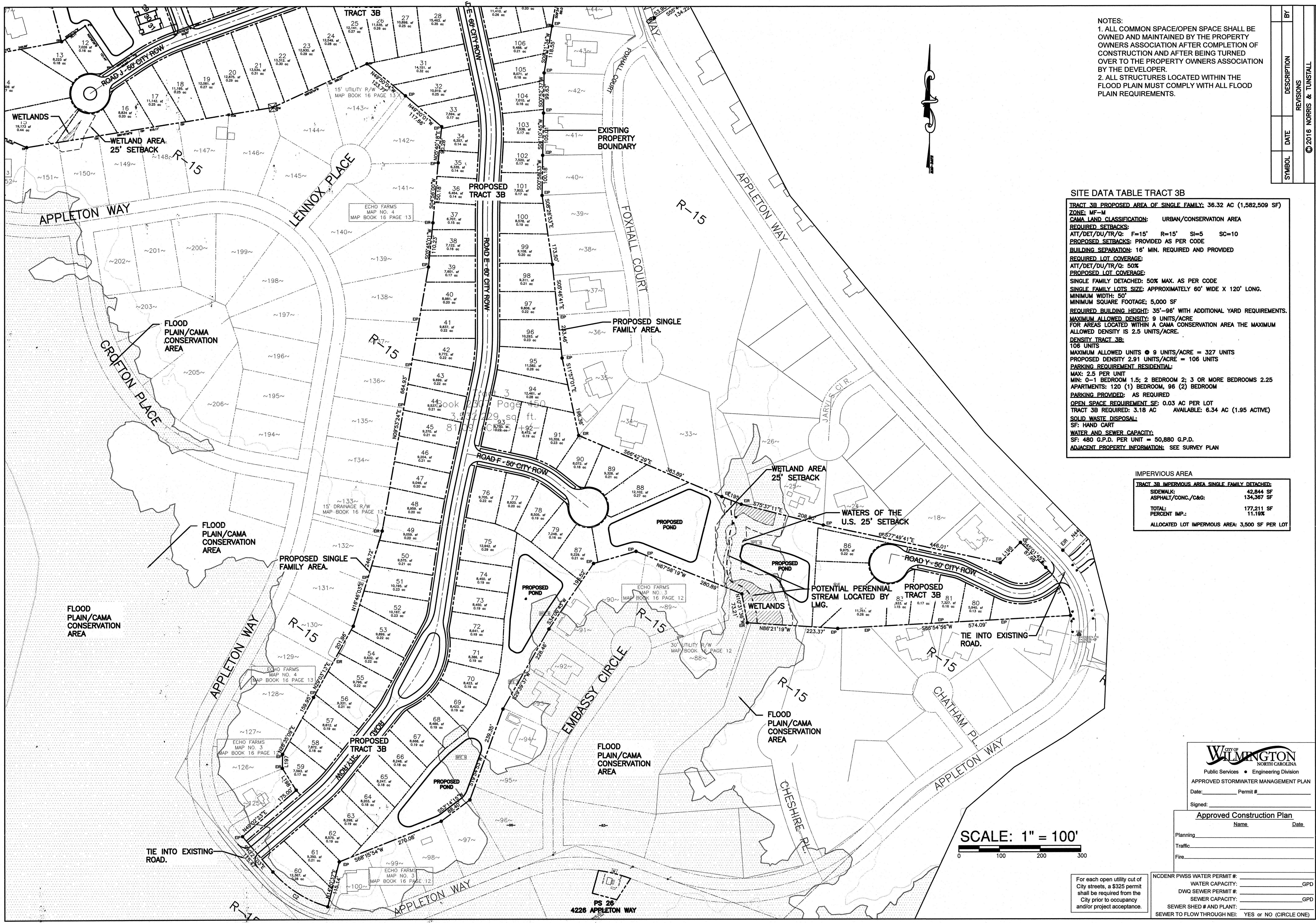
NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASHLITTLE RIVER RD, NW
 WILMINGTON, NC 28401
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-9653
 PHONE (910) 287-5900

Licence #C-3641
16083

DES: JST
 CDR: JFN
 DRWL: NKS
 DATE: 1/11/17



CO



NOTES:
 1. ALL COMMON SPACE/OPEN SPACE SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNERS ASSOCIATION AFTER COMPLETION OF CONSTRUCTION AND AFTER BEING TURNED OVER TO THE PROPERTY OWNERS ASSOCIATION BY THE DEVELOPER.
 2. ALL STRUCTURES LOCATED WITHIN THE FLOOD PLAIN MUST COMPLY WITH ALL FLOOD PLAIN REQUIREMENTS.

SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

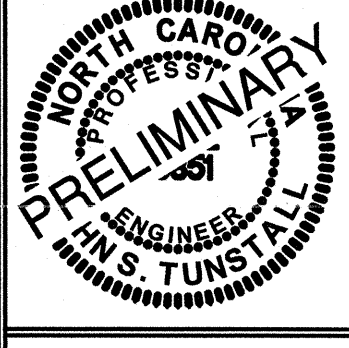
OVERALL SITE PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFURY, NJ 08512
 732-521-2800

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASHLITTLE RIVER RD. NW
 WILMINGTON, NC 28401
 PHONE (910) 344-9653

License #C-3641
16083

DES. JST
 CD. JFN
 DRWL. NKS
 DATE 1/11/17



C0.1

SITE DATA TABLE TRACT 3B

TRACT 3B PROPOSED AREA OF SINGLE FAMILY: 36.32 AC (1,582,509 SF)	
ZONE: MF-M	CAMA LAND CLASSIFICATION: URBAN/CONSERVATION AREA
REQUIRED SETBACKS: ATI/DET/DU/TR/Q: F=15' R=15' SI=5 SC=10 PROPOSED SETBACKS: PROVIDED AS PER CODE	
BUILDING SEPARATION: 16' MIN. REQUIRED AND PROVIDED	
REQUIRED LOT COVERAGE: ATI/DET/DU/TR/Q: 50% PROPOSED LOT COVERAGE:	
SINGLE FAMILY DETACHED: 50% MAX. AS PER CODE	
SINGLE FAMILY LOTS SIZE: APPROXIMATELY 60' WIDE X 120' LONG.	
MINIMUM WIDTH: 50'	
MINIMUM SQUARE FOOTAGE: 5,000 SF	
REQUIRED BUILDING HEIGHT: 35'-96" WITH ADDITIONAL YARD REQUIREMENTS.	
MAXIMUM ALLOWED DENSITY: 9 UNITS/ACRE FOR AREAS LOCATED WITHIN A CAMA CONSERVATION AREA THE MAXIMUM ALLOWED DENSITY IS 2.5 UNITS/ACRE.	
DENSITY TRACT 3B: 106 UNITS	
MAXIMUM ALLOWED UNITS: 9 UNITS/ACRE = 327 UNITS	
PROPOSED DENSITY: 2.91 UNITS/ACRE = 106 UNITS	
PARKING REQUIREMENT RESIDENTIAL: MAX: 2.5 PER UNIT MIN: 0-1 BEDROOM 1.5; 2 BEDROOM 2; 3 OR MORE BEDROOMS 2.25	
APARTMENTS: 120 (1) BEDROOM, 96 (2) BEDROOM	
PARKING PROVIDED: AS REQUIRED	
OPEN SPACE REQUIREMENT SF: 0.03 AC PER LOT	
TRACT 3B REQUIRED: 3.18 AC AVAILABLE: 6.34 AC (1.95 ACTIVE)	
SOLID WASTE DISPOSAL: SF: HAND CART	
WATER AND SEWER CAPACITY: SF: 480 G.P.D. PER UNIT = 50,880 G.P.D.	
ADJACENT PROPERTY INFORMATION: SEE SURVEY PLAN	

IMPERVIOUS AREA

TRACT 3B IMPERVIOUS AREA SINGLE FAMILY DETACHED:	
SIDEWALK:	42,844 SF
ASPHALT/CONC./C&G:	134,387 SF
TOTAL:	177,231 SF
PERCENT IMP.:	11.18%
ALLOCATED LOT IMPERVIOUS AREA: 3,500 SF PER LOT	

SCALE: 1" = 100'

For each open utility cut of City streets, a \$325 meter shall be required from the City prior to occupancy and/or project acceptance.

NODENR PWSS WATER PERMIT #:	_____	GPD
WATER CAPACITY:	_____	GPD
DWQ SEWER PERMIT #:	_____	GPD
SEWER CAPACITY:	_____	GPD
SEWER SHED # AND PLANT:	_____	
SEWER TO FLOW THROUGH NEI:	YES OR NO (CIRCLE ONE)	

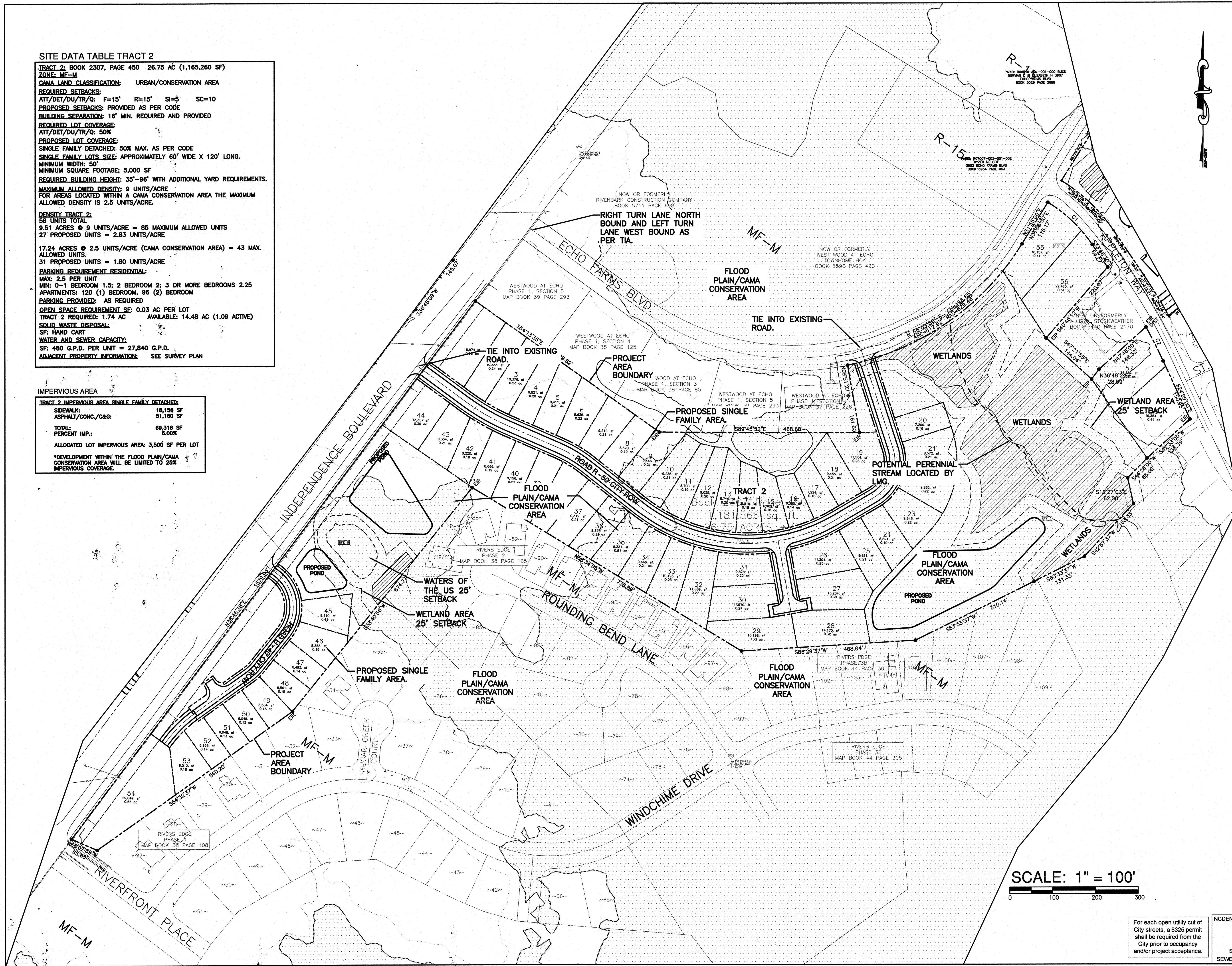
SITE DATA TABLE TRACT 2

TRACT 2: BOOK 2307, PAGE 450 26.75 AC (1,165,280 SF)
 ZONE: MF-M
 CAMA LAND CLASSIFICATION: URBAN/CONSERVATION AREA
 REQUIRED SETBACKS:
 ATT/DET/DU/TR/Q: F=15' R=15' SI=5' SC=10
 PROPOSED SETBACKS: PROVIDED AS PER CODE
 BUILDING SEPARATION: 16' MIN. REQUIRED AND PROVIDED
 REQUIRED LOT COVERAGE:
 ATT/DET/DU/TR/Q: 50%
 PROPOSED LOT COVERAGE:
 SINGLE FAMILY DETACHED: 50% MAX. AS PER CODE
 SINGLE FAMILY LOTS SIZE: APPROXIMATELY 60' WIDE X 120' LONG.
 MINIMUM WIDTH: 50'
 MINIMUM SQUARE FOOTAGE: 5,000 SF
 REQUIRED BUILDING HEIGHT: 35'-96' WITH ADDITIONAL YARD REQUIREMENTS.
 MAXIMUM ALLOWED DENSITY: 9 UNITS/ACRE
 FOR AREAS LOCATED WITHIN A CAMA CONSERVATION AREA THE MAXIMUM ALLOWED DENSITY IS 2.5 UNITS/ACRE.
 DENSITY TRACT 2:
 58 UNITS TOTAL
 9.51 ACRES @ 9 UNITS/ACRE = 85 MAXIMUM ALLOWED UNITS
 27 PROPOSED UNITS = 2.83 UNITS/ACRE
 17.24 ACRES @ 2.5 UNITS/ACRE (CAMA CONSERVATION AREA) = 43 MAX. ALLOWED UNITS.
 31 PROPOSED UNITS = 1.80 UNITS/ACRE
 PARKING REQUIREMENT RESIDENTIAL:
 MAX: 2.5 PER UNIT
 MIN: 0-1 BEDROOM 1.5; 2 BEDROOM 2; 3 OR MORE BEDROOMS 2.25
 APARTMENTS: 120 (1) BEDROOM, 96 (2) BEDROOM
 PARKING PROVIDED: AS REQUIRED
 OPEN SPACE REQUIREMENT SE: 0.03 AC PER LOT
 TRACT 2 REQUIRED: 1.74 AC AVAILABLE: 14.48 AC (1.09 ACTIVE)
 SOLID WASTE DISPOSAL:
 SF: HAND CART
 WATER AND SEWER CAPACITY:
 SF: 480 G.P.D. PER UNIT = 27,840 G.P.D.
 ADJACENT PROPERTY INFORMATION: SEE SURVEY PLAN

IMPERVIOUS AREA

TRACT 2 IMPERVIOUS AREA SINGLE FAMILY DETACHED:	
SIDEWALK:	18,156 SF
ASPHALT/CONC./C&G:	51,190 SF
TOTAL:	69,346 SF
PERCENT IMP.:	6.00%
ALLOCATED LOT IMPERVIOUS AREA:	3,500 SF PER LOT

*DEVELOPMENT WITHIN THE FLOOD PLAIN/CAMA CONSERVATION AREA WILL BE LIMITED TO 25% IMPERVIOUS COVERAGE.



SCALE: 1" = 100'



SYMBOL	DATE	DESCRIPTION	BY
		REVISIONS	

OVERALL SITE PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

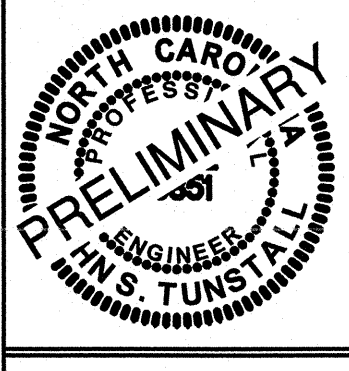
LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANURRY, NJ 08512
 732-521-2900

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASHLITTLE RIVER RD, NW
 WILMINGTON, NC 28401
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-5653

Licence #C-3641

16083

DES: JST
 CD: JPN
 DRWL: NKS
 DATE: 1/11/17



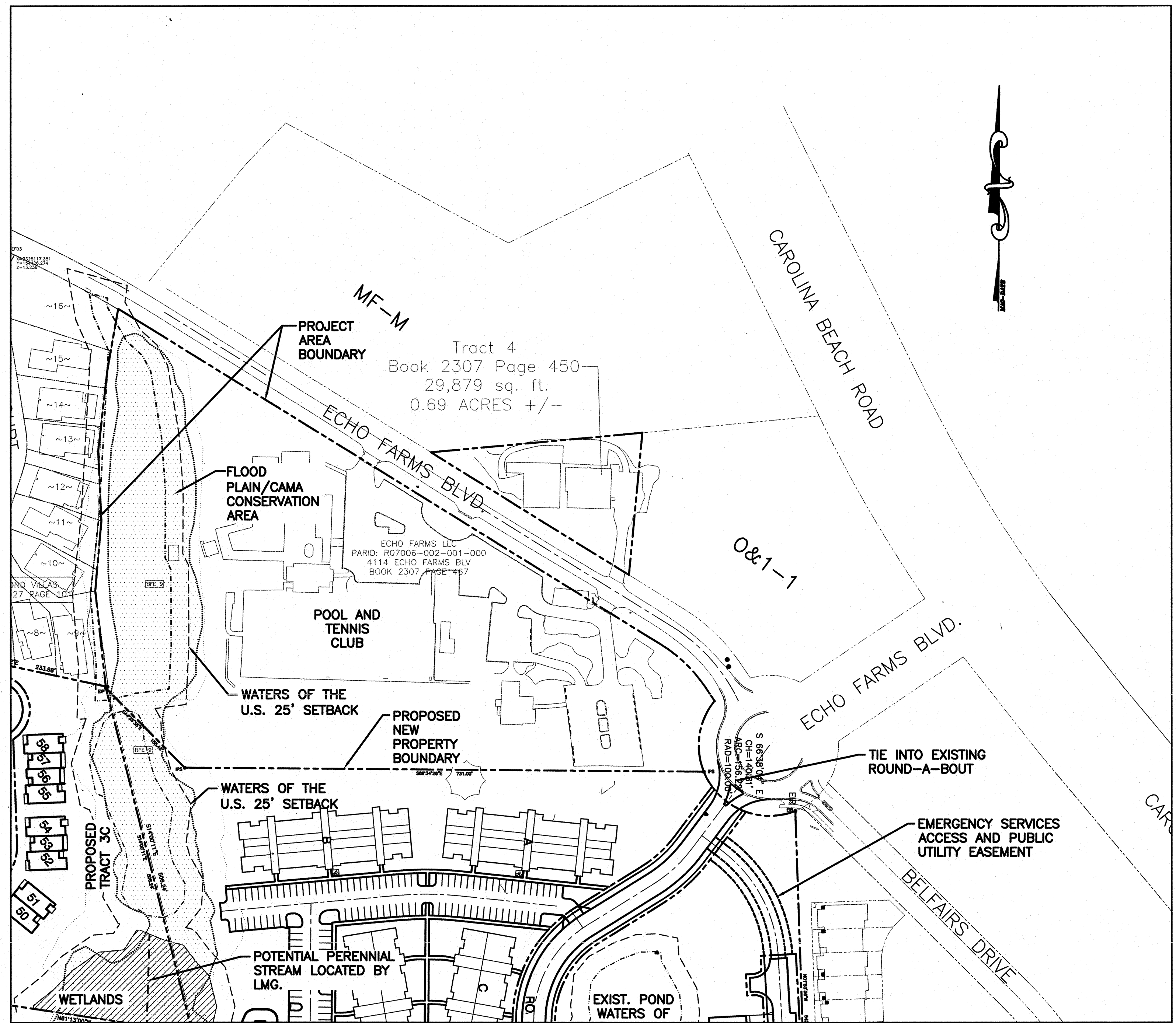
City of **WILMINGTON**
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

Approved Construction Plan
 Name: _____ Date: _____
 Planning: _____
 Traffic: _____
 Fire: _____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NODENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____ GPD
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

C0.2



SCALE: 1" = 100'

0 100 200 300

SITE DATA TABLE TRACT POOL AND TENNIS CLUB

POOL AND TENNIS CLUB (O&I):	7.67 AC (334,370 SF)
ZONE:	O&I
CAMA LAND CLASSIFICATION:	URBAN/CONSERVATION AREA
REQUIRED SETBACKS:	F=20' R=25' SI=20 SC=20
PROPOSED SETBACKS:	PROVIDED AS PER CODE
REQUIRED LOT COVERAGE:	35% MAX.
PROPOSED LOT COVERAGE:	PROVIDED AS PER CODE
REQUIRED BUILDING HEIGHT:	45'-75' WITH ADDITIONAL YARD REQUIREMENTS.
PARKING REQUIREMENT RECREATION FACILITY PRIVATE:	1/200 MAX. 1/400 MIN.
STREET/YARD FOR O&I:	18 MULTIPLIER
FOUNDATION PLANTINGS:	12% FACE OF BUILDING X LENGTH
INTERIOR LANDSCAPING:	PERCENTAGE BY AMOUNT OF IMPERVIOUS SURFACE
SOLID WASTE DISPOSAL:	HAND CART
WATER AND SEWER CAPACITY:	
ADJACENT PROPERTY INFORMATION:	SEE SURVEY PLAN

IMPERVIOUS AREA

POOL AND TENNIS CLUB IMPERVIOUS AREA AMENITIES:	
TOTAL EXISTING:	121,613 SF
PERCENT IMP.:	36.37%

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

City of WILMINGTON NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
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Approved Construction Plan
Name _____ Date _____
Planning _____
Traffic _____
Fire _____

NODENR PWSS WATER PERMIT #: _____ GPD
WATER CAPACITY: _____ GPD
DWQ SEWER PERMIT #: _____
SEWER CAPACITY: _____ GPD
SEWER SHED # AND PLANT: _____
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

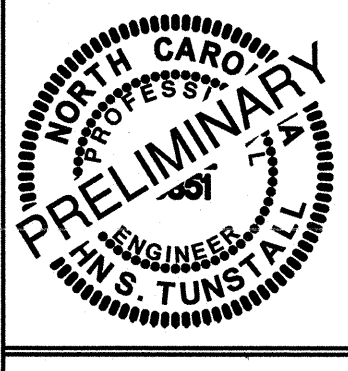
OVERALL SITE PLAN
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

LAND OWNER/APPLICANT
ECHO FARMS, LLC
MATRIX DEVELOPMENT GROUP
CN4000 FORSGATE DRIVE
CHAMBURY, NJ 00512
732-521-2800

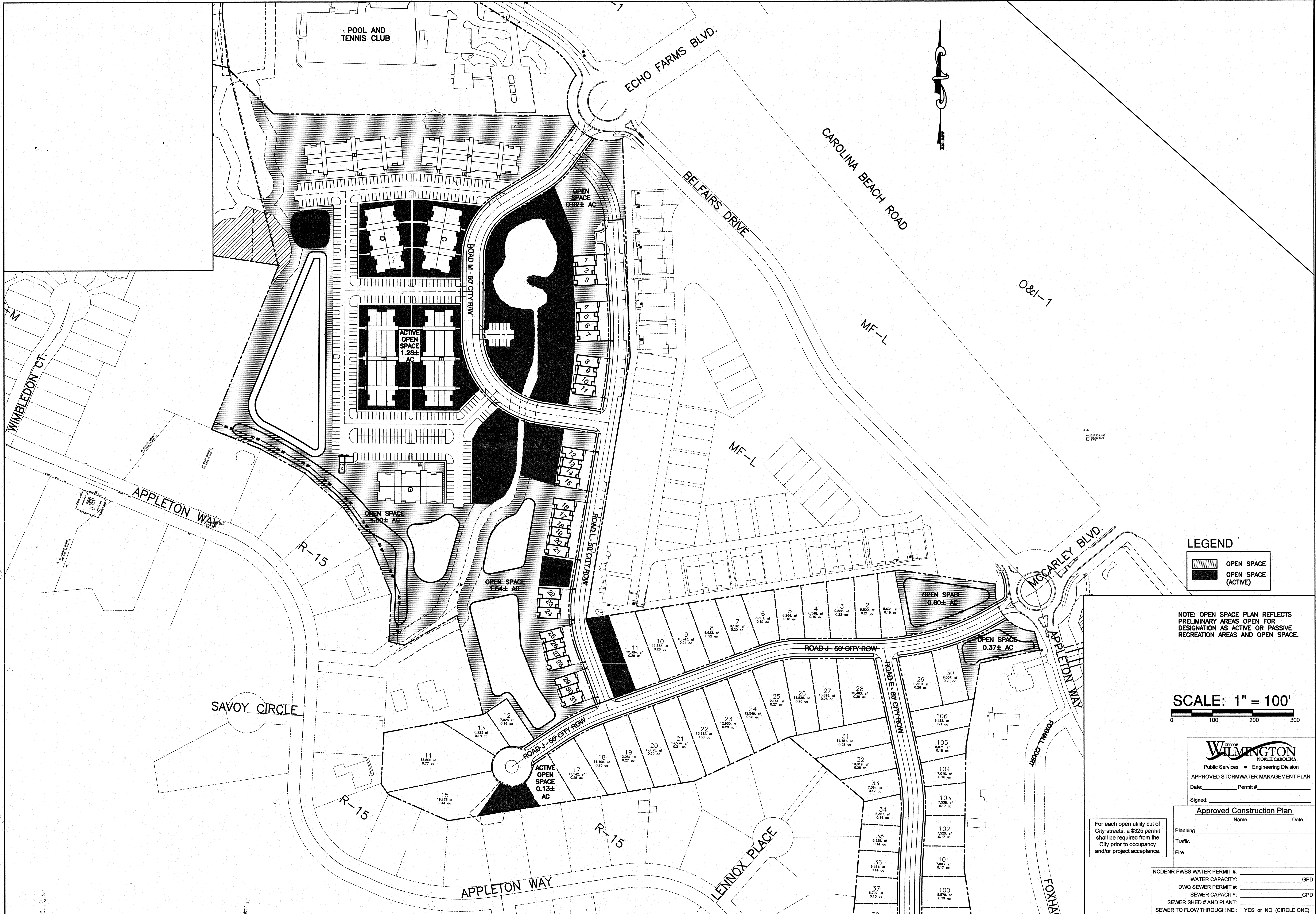
NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
902 MARKET STREET
WILMINGTON, NC 28401
PHONE (910) 343-9653
1429 ASHLITTLE RIVER RD, NW
WILMINGTON, NC 28420
PHONE (910) 287-5900

Licence #C-3641
16083

DES.	JST
OP.	JPN
DRWN.	NKS
DATE	1/11/17



C0.3



POOL AND TENNIS CLUB

ECHO FARMS BLVD.

CAROLINA BEACH ROAD

BELAIRS DRIVE

O&I-1

MF-L

MF-L

APPLETON WAY

R-15

OPEN SPACE 1.54± AC

OPEN SPACE 0.60± AC

OPEN SPACE 0.37± AC

SAVOY CIRCLE

R-15

ACTIVE OPEN SPACE 0.13± AC

R-15

LENNOX PLACE

APPLETON WAY

MOCARLEY BLVD.

APPLETON WAY

FOXHA

LEGEND

- OPEN SPACE
- OPEN SPACE (ACTIVE)

NOTE: OPEN SPACE PLAN REFLECTS PRELIMINARY AREAS OPEN FOR DESIGNATION AS ACTIVE OR PASSIVE RECREATION AREAS AND OPEN SPACE.

SCALE: 1" = 100'

City of WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____

Signed: _____
Approved Construction Plan
Name _____ Date _____

Planning _____
Traffic _____
Fire _____

NCDENR PWSS WATER PERMIT #: _____ GPD
WATER CAPACITY: _____ GPD
DWQ SEWER PERMIT #: _____
SEWER CAPACITY: _____ GPD
SEWER SHED # AND PLANT: _____
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

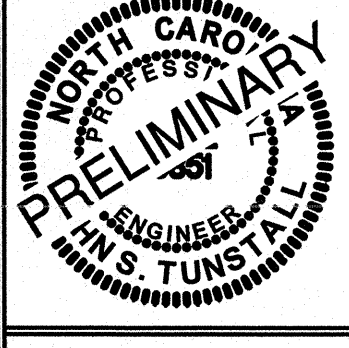
OPEN SPACE PLAN
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

LAND OWNER/APPLICANT
ECHO FARMS, LLC
MATRIX DEVELOPMENT GROUP
CN4000 FORSGATE DRIVE
CHANURRY, NJ 08512
732-521-2900

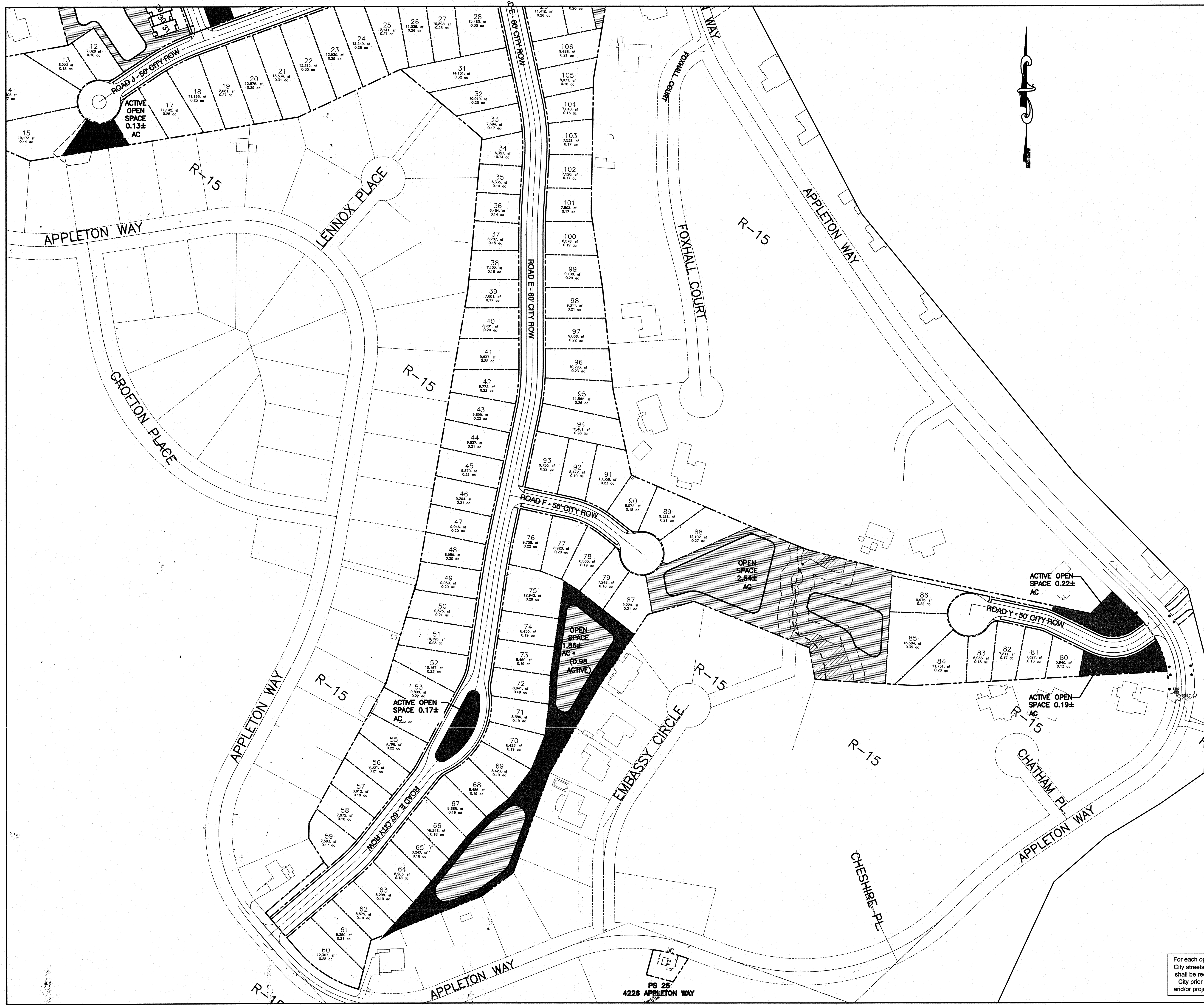
NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1429 ASH-LITTLE RIVER RD. NW
WILMINGTON, NC 28420
PHONE (910) 287-5900

Licence #C-3641
16083

DES. JST
CDR. JFN
DRWN. NKS
DATE 1/11/17



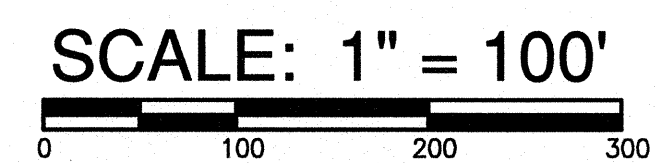
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LEGEND

- OPEN SPACE
- OPEN SPACE (ACTIVE)

NOTE: OPEN SPACE PLAN REFLECTS PRELIMINARY AREAS OPEN FOR DESIGNATION AS ACTIVE OR PASSIVE RECREATION AREAS AND OPEN SPACE.



City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____

Signed: _____
 Approved Construction Plan
 Name _____ Date _____

Planning	_____
Traffic	_____
Fire	_____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NC DENR PWSS WATER PERMIT #:	_____	_____	_____	_____	_____	_____
WATER CAPACITY:	_____	_____	_____	_____	_____	_____
DWQ SEWER PERMIT #:	_____	_____	_____	_____	_____	_____
SEWER CAPACITY:	_____	_____	_____	_____	_____	_____
SEWER SHED # AND PLANT:	_____	_____	_____	_____	_____	_____
SEWER TO FLOW THROUGH NEI:	YES	or	NO	(CIRCLE ONE)		

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFORD, NJ 07012
 732-521-2800

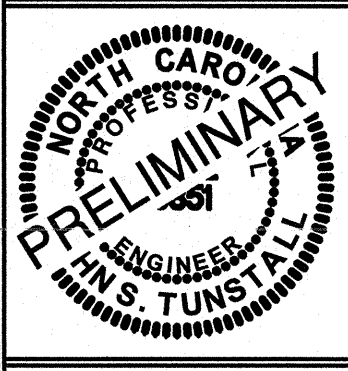
OPEN SPACE PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASH LITTLE RIVER RD. NW
 WILMINGTON, NC 28420
 PHONE (910) 267-5900

Licence #C-3641

16083

DES. JST
 C.D. JPN
 DRWL. NKS
 DATE 1/11/17



C0.5



LEGEND

- OPEN SPACE
- OPEN SPACE (ACTIVE)

NOTE: OPEN SPACE PLAN REFLECTS PRELIMINARY AREAS OPEN FOR DESIGNATION AS ACTIVE OR PASSIVE RECREATION AREAS AND OPEN SPACE.

SCALE: 1" = 100'

WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____

Signed: _____

Approved Construction Plan

Name _____ Date _____

Planning _____

Traffic _____

Fire _____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NCDENR PWSS WATER PERMIT #: _____ GPD

WATER CAPACITY: _____ GPD

DWQ SEWER PERMIT #: _____

SEWER CAPACITY: _____ GPD

SEWER SHED # AND PLANT: _____

SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

OPEN SPACE PLAN
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

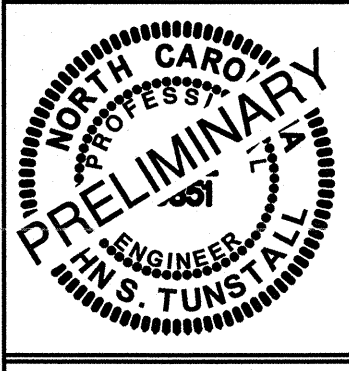
LAND OWNER/APPLICANT
ECHO FARMS, LLC
MATRIX DEVELOPMENT GROUP
CN4000 FORSGATE DRIVE
CRANFORD, NJ 08512
732-521-2800

NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1429 ASHLITTLE RIVER RD. NW
WILMINGTON, NC 28401
PHONE (910) 344-9653

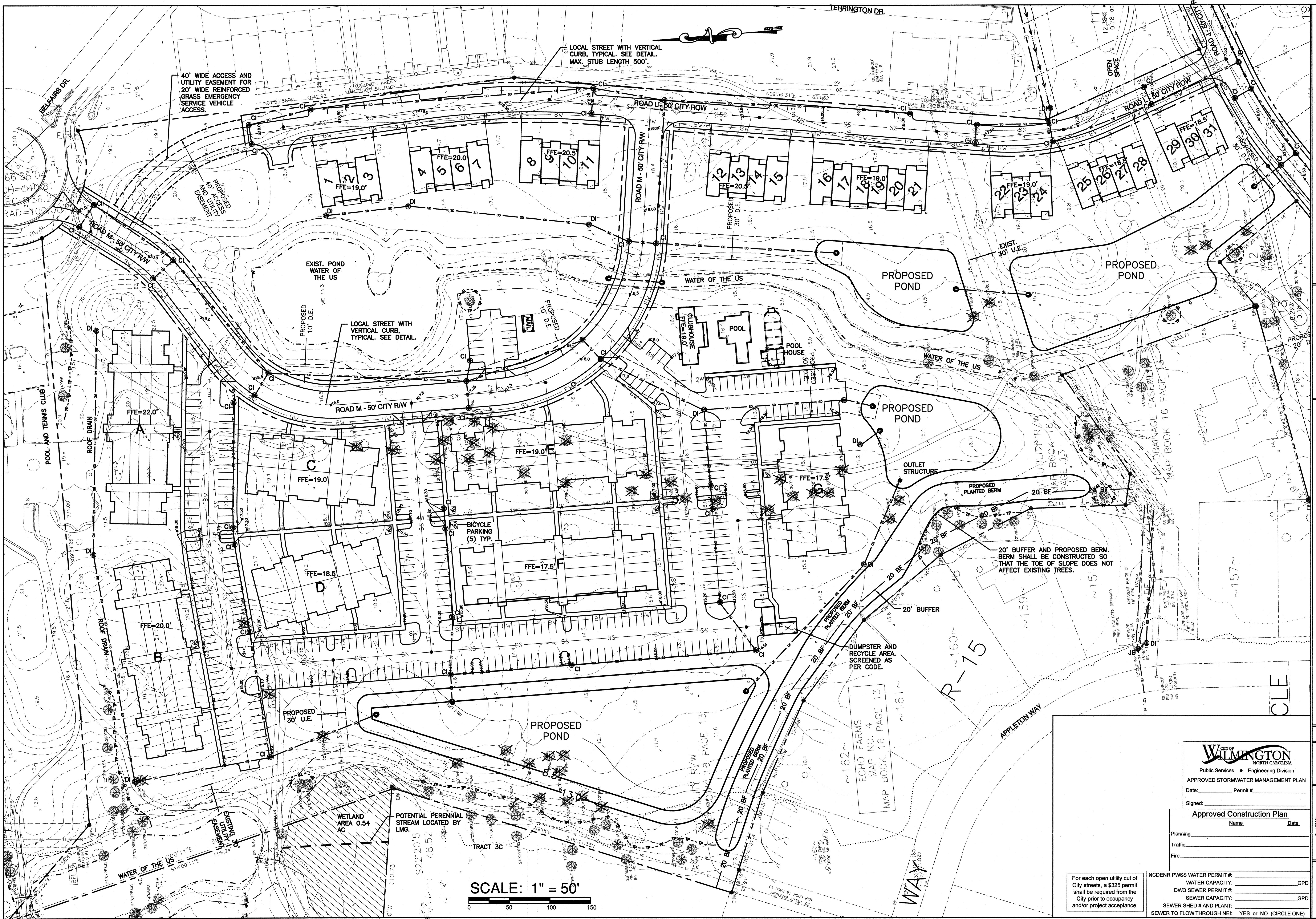
16083

DES. JUST
D.B. JFN
DRAW. NKS

DATE 1/11/17



C0.6



GRADING, DRAINAGE AND EROSION CONTROL PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFURY, NJ 08512
 732-521-2800

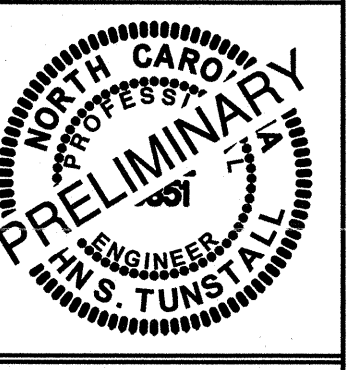
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 CONSULTING ENGINEERS P.C.
 1429 ASH-LITTLE RIVER RD. NW
 WILMINGTON, NC 28401
 PHONE (910) 343-9653

Licence #C-3641

16083

DESIGNER: JST
 DRAWN: JFN
 NKS

DATE: 1/11/17



C1

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____

Signed: _____
Approved Construction Plan
 Name: _____ Date: _____

Planning: _____
 Traffic: _____
 Fire: _____

NC DENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

SCALE: 1" = 50'
 0 50 100 150

NC DENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____
 DWQ SEWER PERMIT #: _____ GPD
 SEWER CAPACITY: _____
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

Approved Construction Plan
 Name: _____ Date: _____

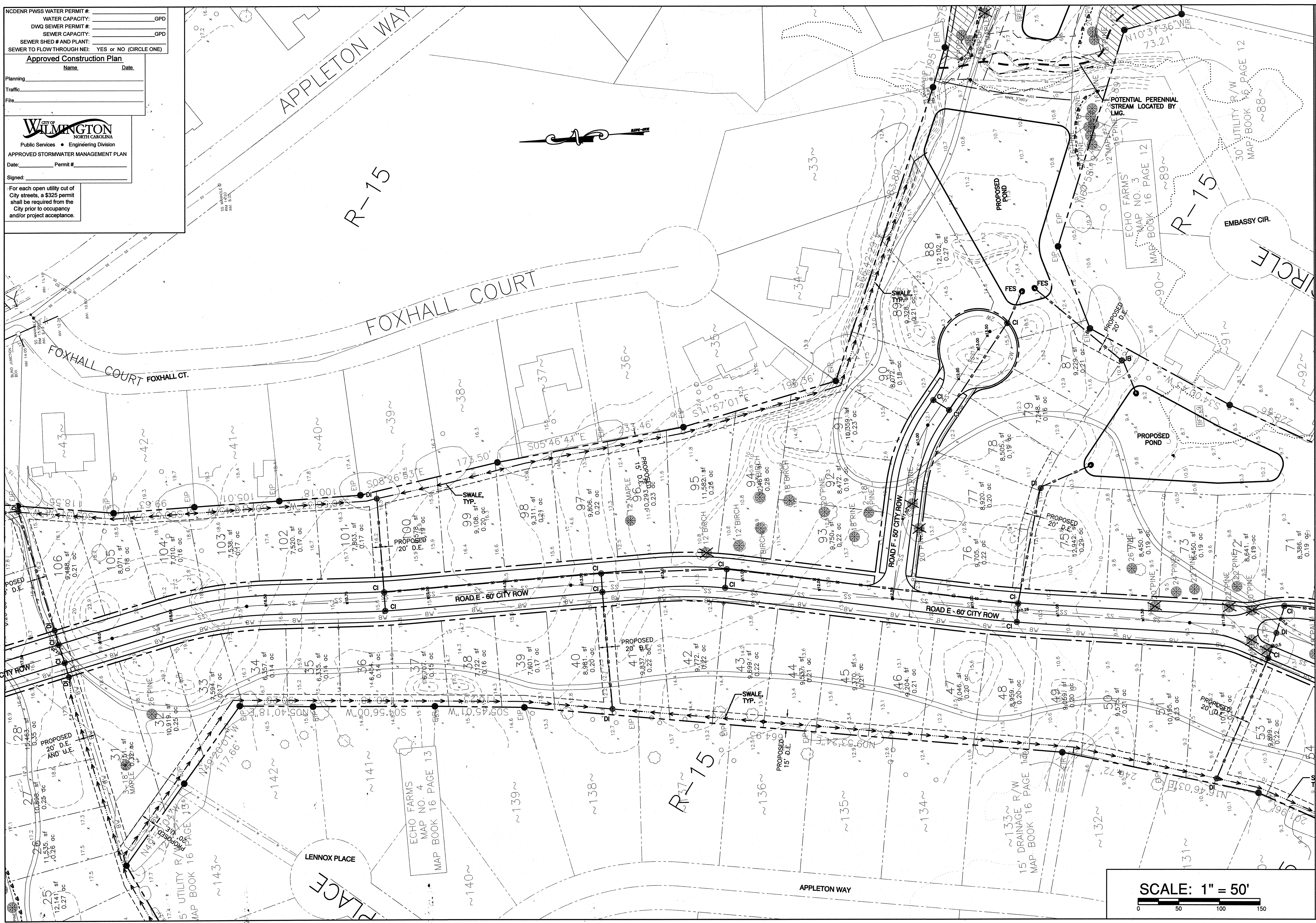
Planning: _____
 Traffic: _____
 File: _____

CITY OF WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit #: _____

Signed: _____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

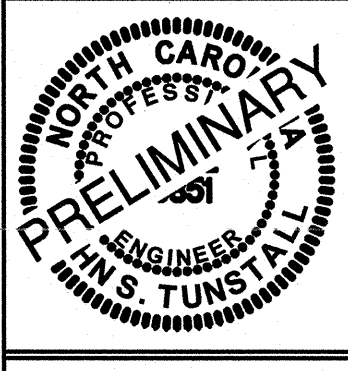


LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANURBY, NJ 00512
 732-521-2800

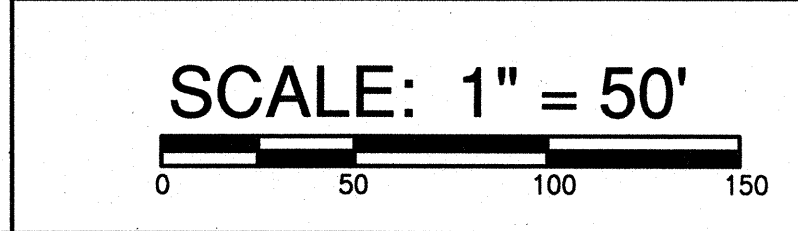
GRADING, DRAINAGE AND EROSION CONTROL PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 344-9653

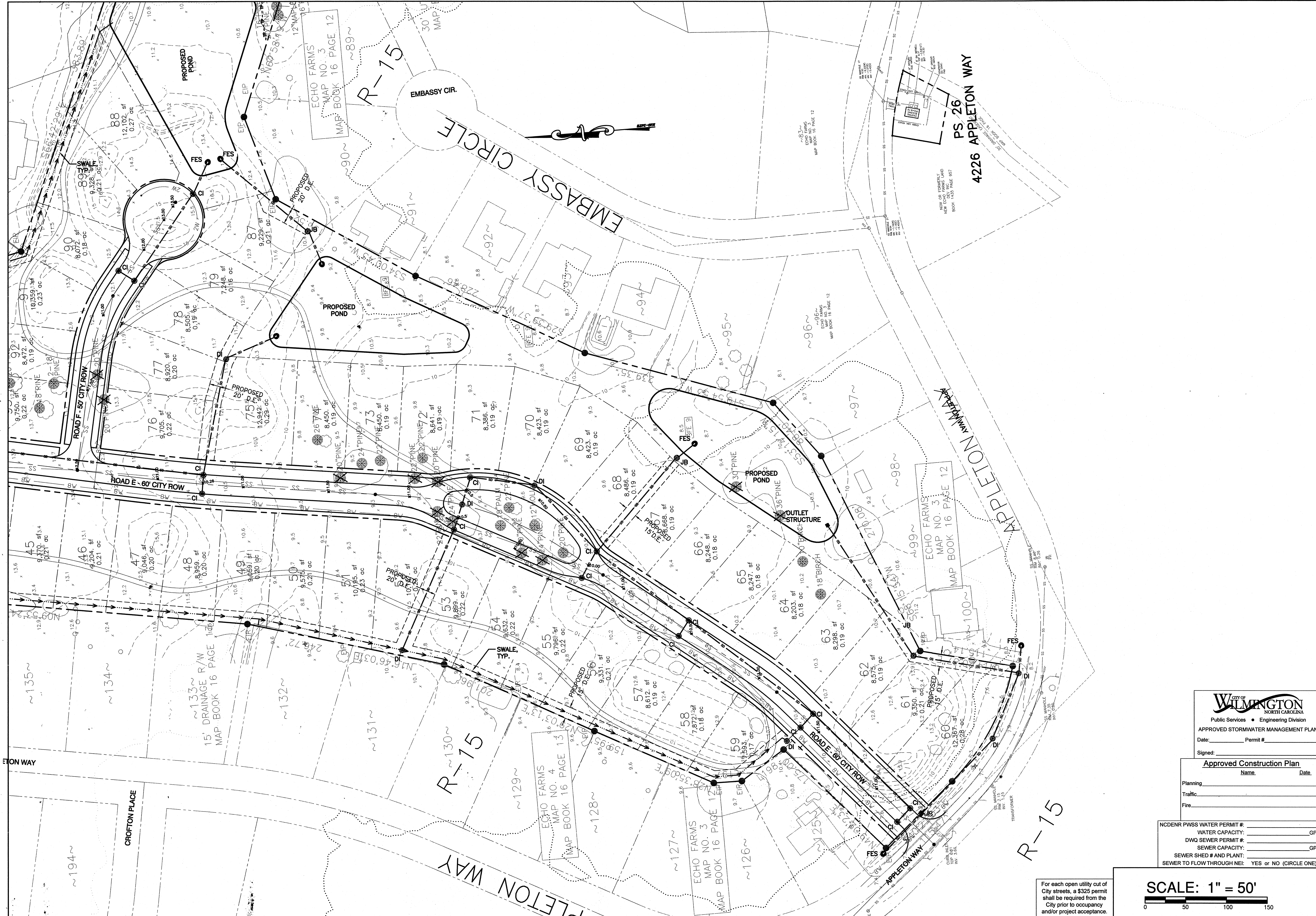
Licence #C-3641
 16083
 DR: JST
 BB: JFN
 BRW: NKS
 DATE: 1/11/17



C1.2



F:\Projects\2016\16083 Woodlands at Echo Farms\16083 Plans\16083.mxd, 1/11/2017 10:20:11 AM



For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

SCALE: 1" = 50'
 0 50 100 150

City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____

Signed: _____

Approved Construction Plan
 Name _____ Date _____

Planning _____
 Traffic _____
 Fire _____

NCDENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____ GPD
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NE: YES OR NO (CIRCLE ONE)

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFURY, NJ 08512
 732-521-2800

GRADING, DRAINAGE AND EROSION CONTROL PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 903 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 344-9653
 1429 ASHLITTLE RIVER RD. SWY
 WILMINGTON, NC 28420
 PHONE (910) 267-5900

Licence #C-3641

16083

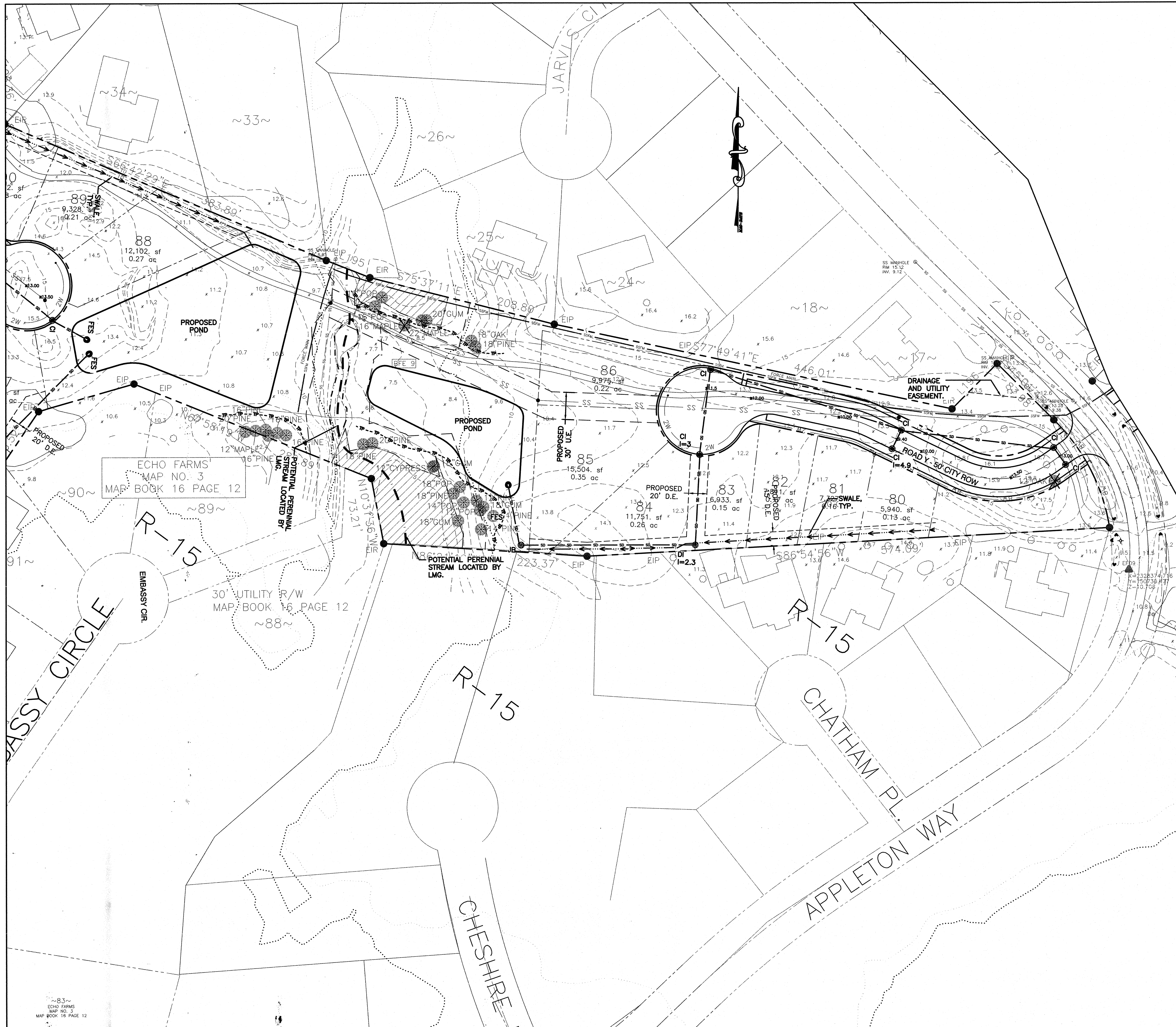
DES: JST
 DB: JFN
 DRWL: NKS

DATE: 1/11/17

PRELIMINARY

ENGINEER
 N. S. TUNSTALL

C1.3



GRADING, DRAINAGE AND EROSION CONTROL PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFURY, NJ 08512
 732-521-2800

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 903 MARKET STREET
 WILMINGTON, NC 28401
 1429 ASHLITTLE RIVER RD. NW
 WILMINGTON, NC 28420
 PHONE (910) 344-9653
 PHONE (910) 267-5900

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

Approved Construction Plan
 Name _____ Date _____

Planning _____
 Traffic _____
 Fire _____

NCDENR PWSS WATER PERMIT #: _____
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

SCALE: 1" = 50'
 0 50 100 150

License #C-3641
16083
 DES JST
 DR. JFN
 DRWL. NKS
 DATE 1/11/17
PRELIMINARY
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 N. S. TUNSTALL

C1.4

MF-M

NOW OR FORMER
WEST WOOD AT ECHO
TOWNHOME HOA
BOOK 5596 PAGE 430

WESTWOOD AT ECHO
PHASE 1, SECTION 5
MAP BOOK 39 PAGE 293

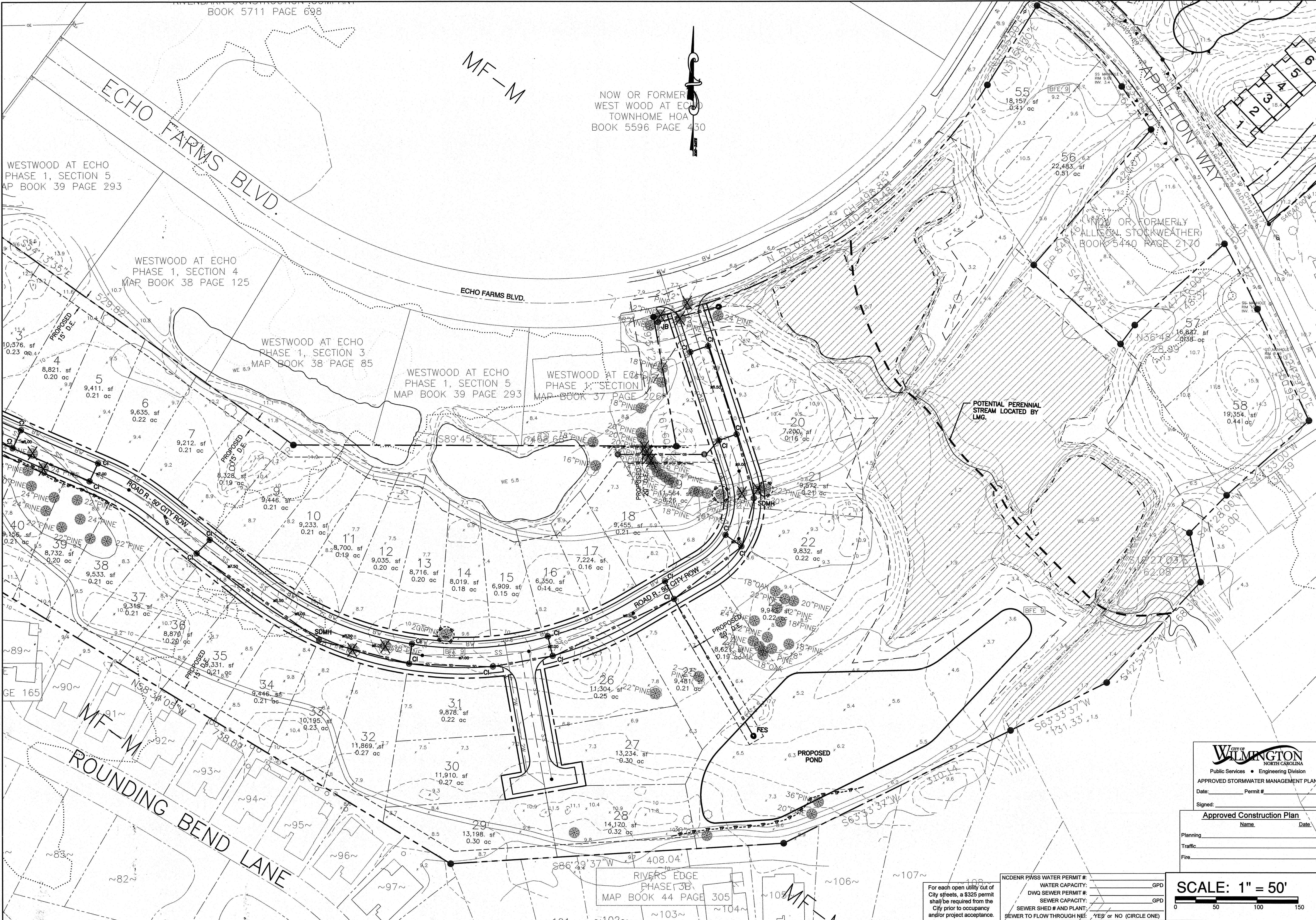
WESTWOOD AT ECHO
PHASE 1, SECTION 4
MAP BOOK 38 PAGE 125

WESTWOOD AT ECHO
PHASE 1, SECTION 3
MAP BOOK 38 PAGE 85

WESTWOOD AT ECHO
PHASE 1, SECTION 5
MAP BOOK 39 PAGE 293

WESTWOOD AT ECHO
PHASE 1, SECTION 1
MAP BOOK 37 PAGE 226

NOW OR FORMERLY
PALLISON STOCKWEATHER
BOOK 5440 PAGE 2170



GRADING, DRAINAGE AND EROSION CONTROL PLAN
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

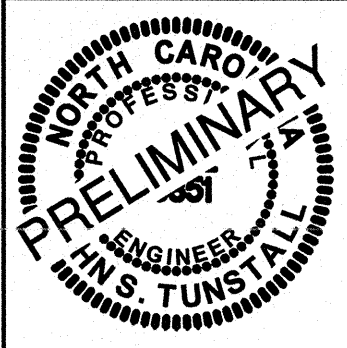
LAND OWNER/APPLICANT
ECHO FARMS, LLC
MATRIX DEVELOPMENT GROUP
CN4000 FORSGATE DRIVE
CHAMBURY, NJ 00512
732-521-2800

NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1429 ASHLITTLE RIVER RD. NW
WILMINGTON, NC 28401
PHONE (910) 344-9653

License #C-3641
16083
DES. JST
C.D. JPN
DRAW. NKS
DATE 1/11/17

City of
WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
Signed: _____

Approved Construction Plan
Name _____ Date _____
Planning _____
Traffic _____
Fire _____



For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NC DENR PWSS WATER PERMIT #	_____	GPD
WATER CAPACITY:	_____	GPD
DWQ SEWER PERMIT #	_____	GPD
SEWER CAPACITY:	_____	GPD
SEWER SHED # AND PLANT:	_____	
SEWER TO FLOW THROUGH NEI:	YES or NO (CIRCLE ONE)	

SCALE: 1" = 50'
0 50 100 150

C1.5



NCDENR PWSS WATER PERMIT # _____ GPD
 WATER CAPACITY: _____ GPD
 DWG SEWER PERMIT # _____ GPD
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

Approved Construction Plan
 Name _____ Date _____

Planning _____
 Traffic _____
 Fire _____

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

GRADING, DRAINAGE AND EROSION CONTROL PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANBURY, NJ 08512
 732-521-2900

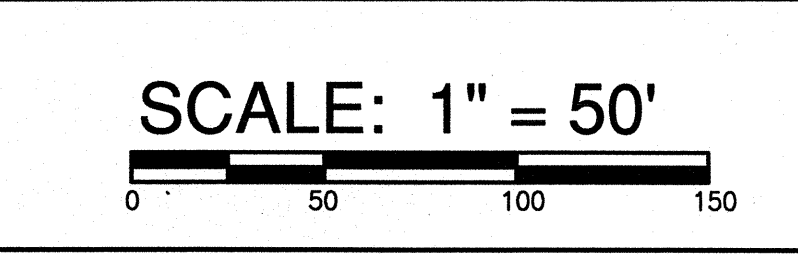
NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-9653

1429 ASHLITTLE RIVER RD, NW
 ASH, NC 28420
 PHONE (910) 287-5900

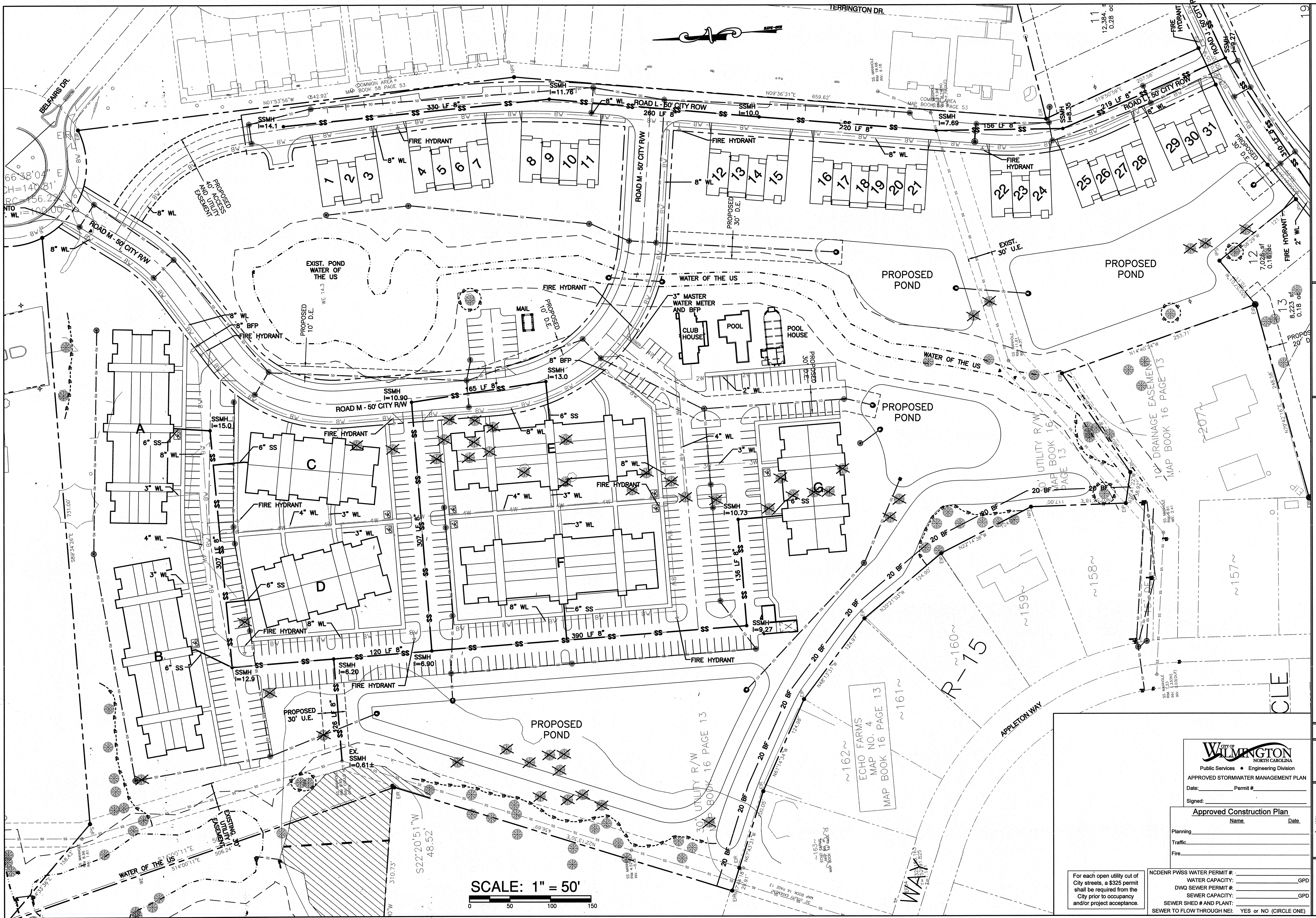
Licence #C-3641
16083
 DES. JST
 C.D. JPN
 DRWL. NKS
 DATE 1/11/17

PRELIMINARY
 NORTH CAROLINA
 PROFESSIONAL ENGINEERS
 IN S. TUNSTALL

C1.6



\\Projects\2016\16083 Woodlands at Echo Farms\16083 Plans\16083.mxd, 1/11/2017 10:21:47 AM



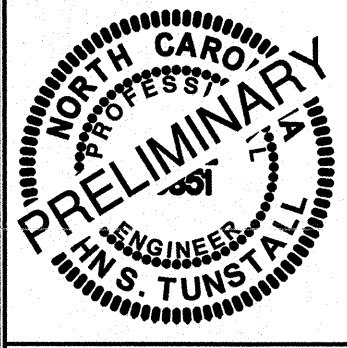
SCALE: 1" = 50'

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NCDENR PWSS WATER PERMIT #: _____ GPD
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City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____



C2

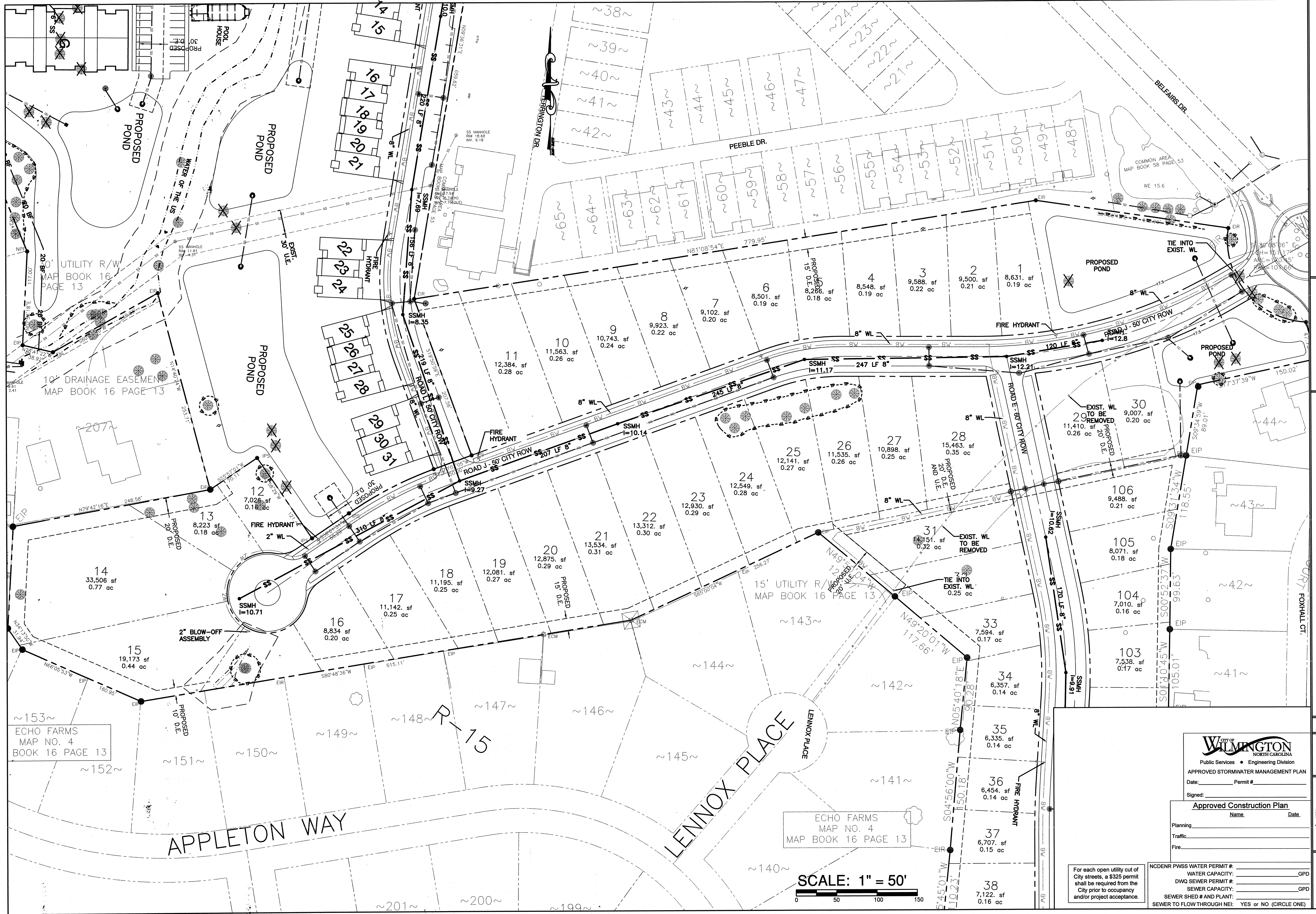
UTILITY PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANBURY, NJ 08512
 732-521-2900

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASH-LITTLE RIVER RD. NW
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 PHONE (910) 343-9653
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Licence #C-3641
16083
 DES. JST
 CDR. JPN
 DRWN. NKS
 DATE 1/11/17

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UTILITY PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CH4000 FORSGATE DRIVE
 CRANFORD, NJ 08012
 732-521-2900

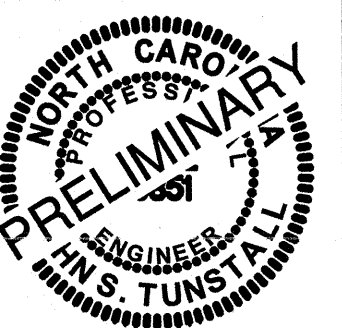
NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASH-LITTLE RIVER RD. NW
 ASH, NC 28420
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-9653
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Licence #C-3641

16083

DES. JST
 C.D. JPN
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DATE 1/11/17



City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: Permit #
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 Name _____ Date _____

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 Traffic _____
 Fire _____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

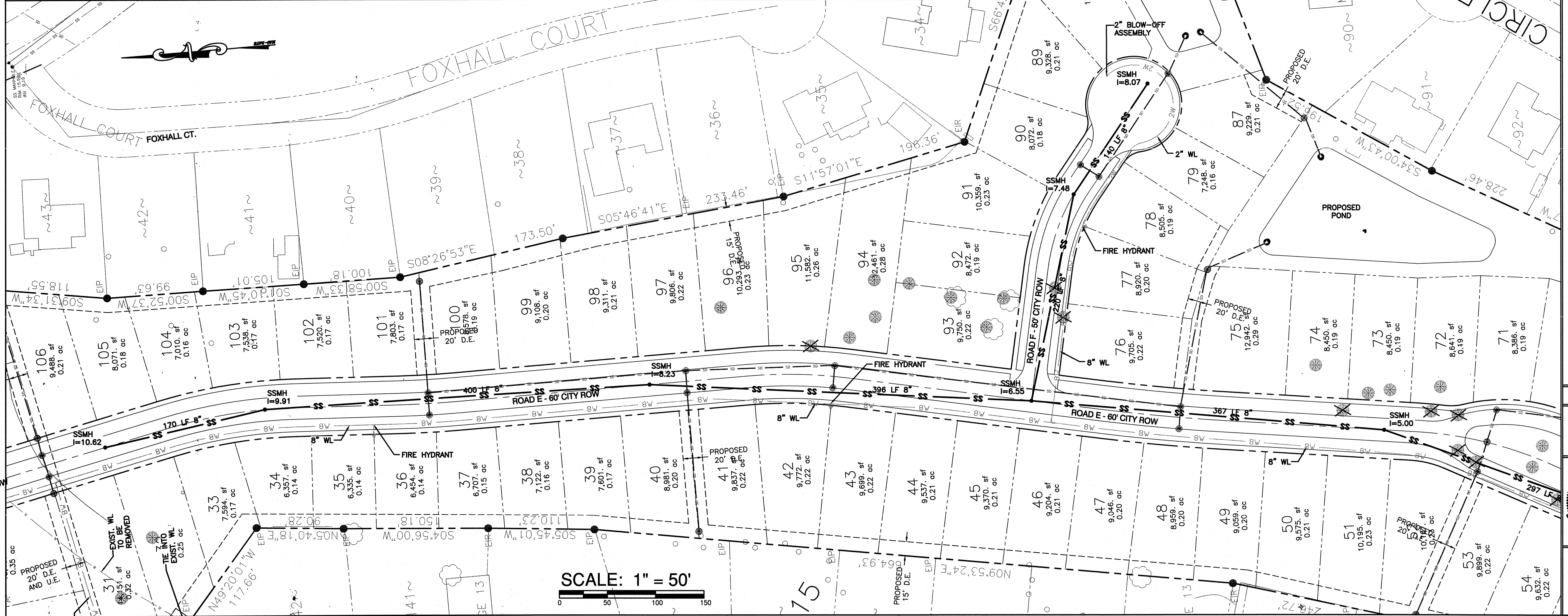
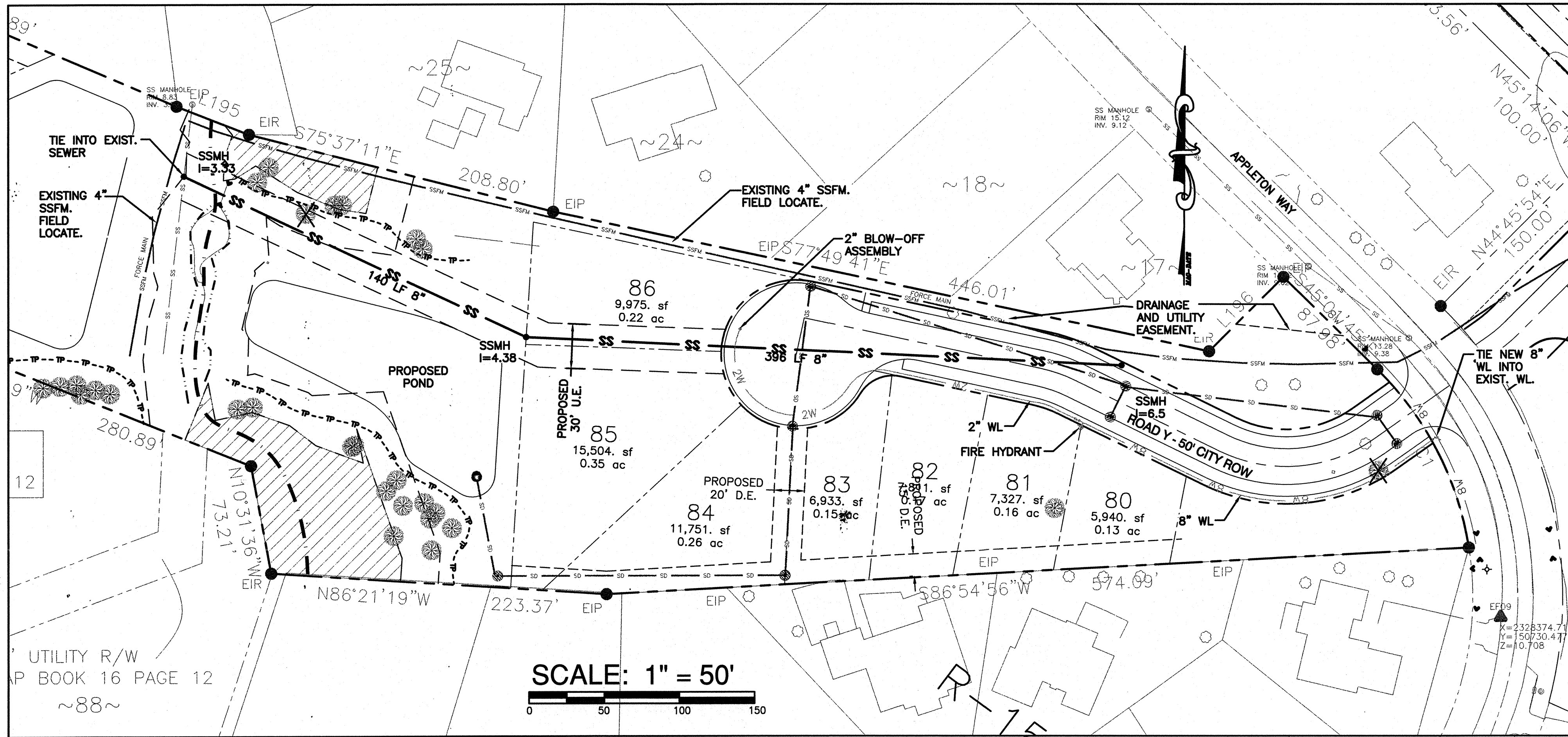
NC DENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____ GPD
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

ECHO FARMS
 MAP NO. 4
 MAP BOOK 16 PAGE 13

SCALE: 1" = 50'
 0 50 100 150

ECHO FARMS
 MAP NO. 4
 BOOK 16 PAGE 13

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For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

City of WILMINGTON
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
Signed: _____

Approved Construction Plan	
Name	Date
Planning	
Traffic	
Fire	

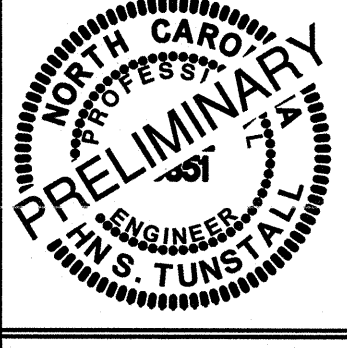
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WATER CAPACITY:	GPD
DWG SEWER PERMIT #:	
SEWER CAPACITY:	GPD
SEWER SHED # AND PLANT:	
SEWER TO FLOW THROUGH NEI:	YES or NO (CIRCLE ONE)

UTILITY PLAN
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

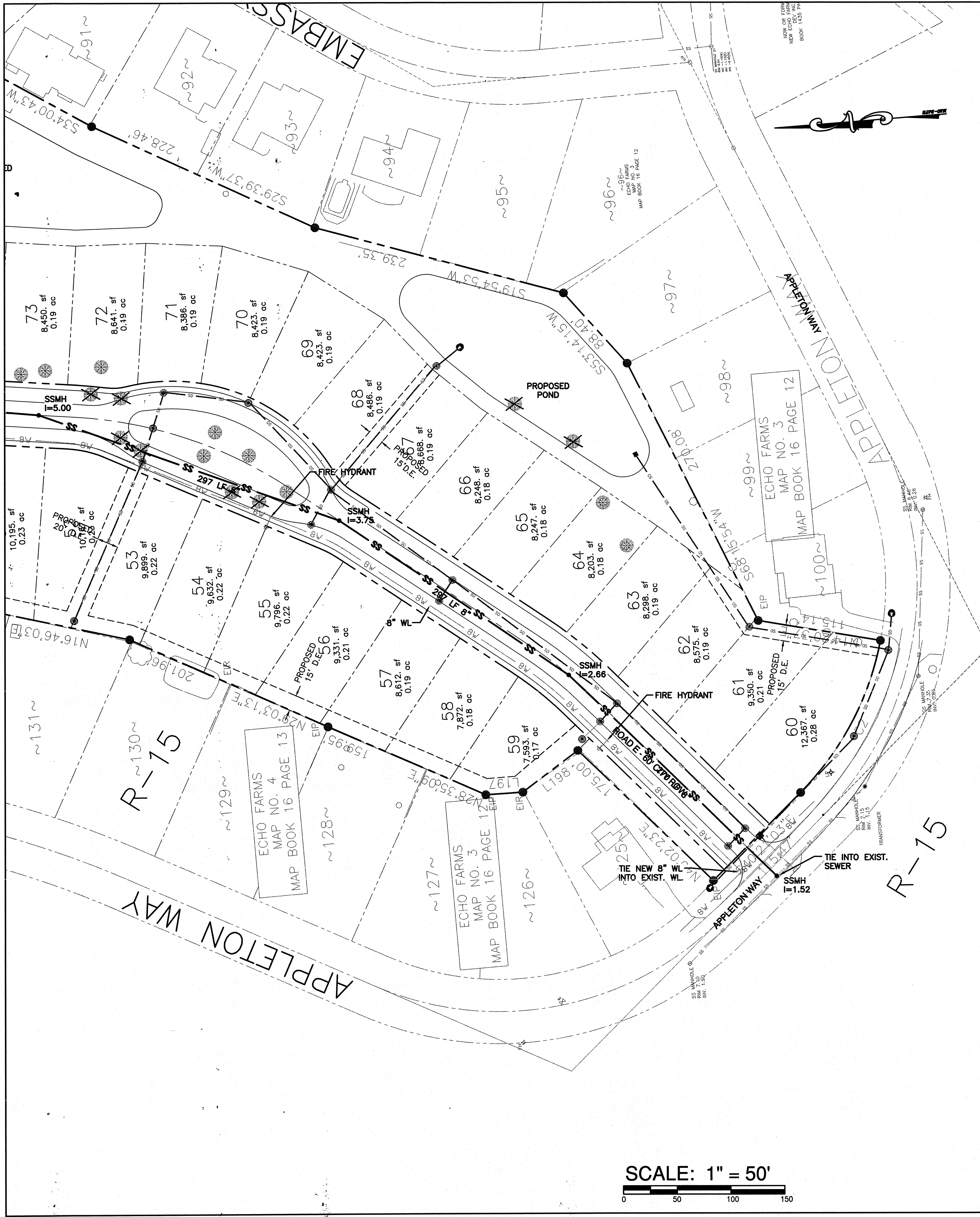
LAND OWNER/APPLICANT
ECHO FARMS, LLC
MATRIX DEVELOPMENT GROUP
6N4000 FORSGATE DRIVE
CHAMBURY, NJ 08512
732-521-2900

NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1429 ASH-LITTLE RIVER RD. NW
WILMINGTON, NC 28401
PHONE (910) 345-9653

Licence #C-3641
16083
DES: JST
CB: JFN
DWG: NKS
DATE: 1/11/17



C2.2



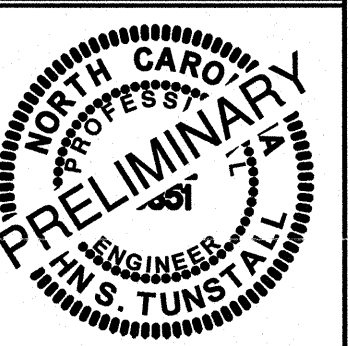
SCALE: 1" = 50'

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City of WILMINGTON
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 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____

Signed: _____
 Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____



C2.3

16083

DES JST
 DRWN JFN
 NKS

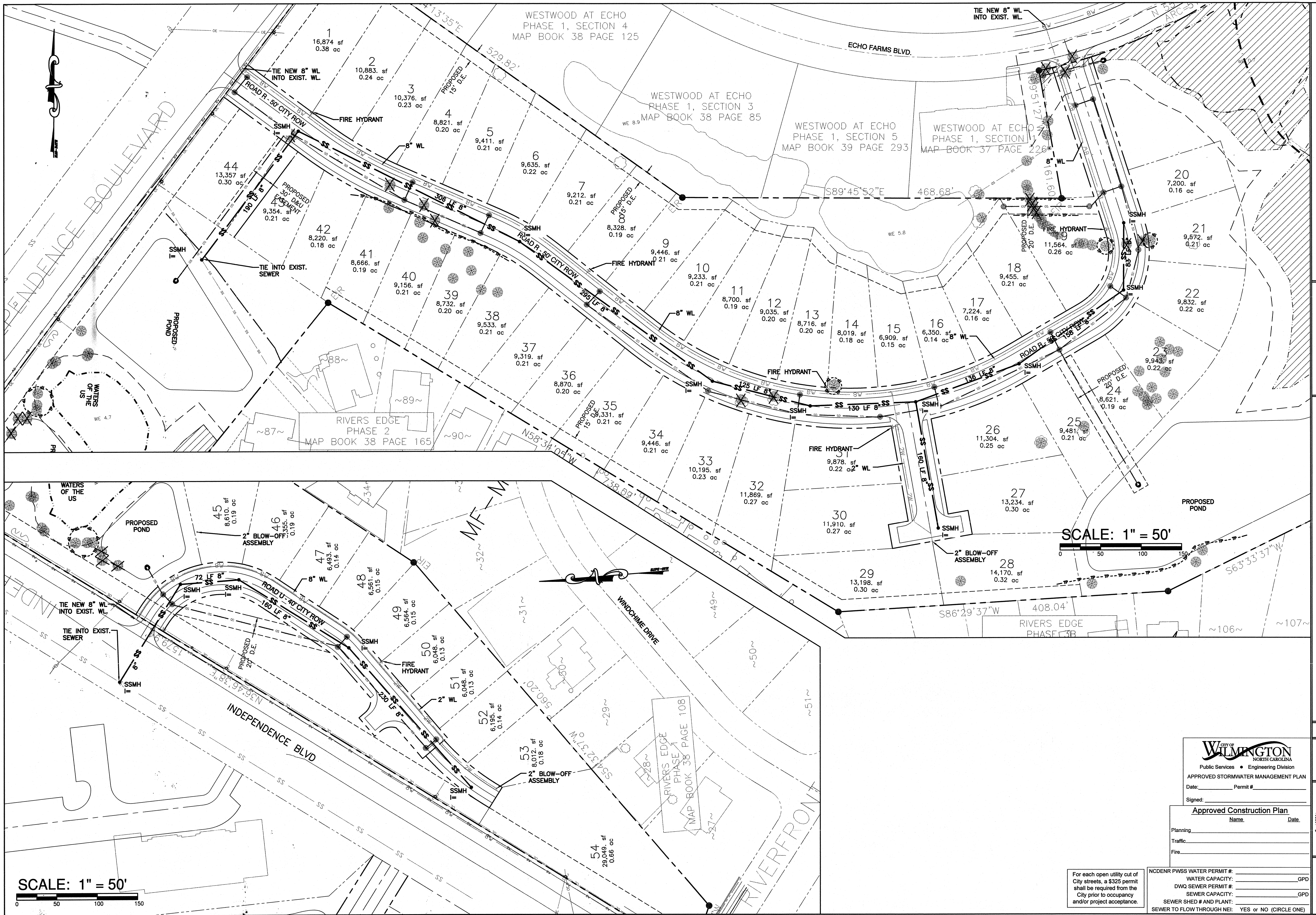
DATE 1/11/17

License #C-3641

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-5653
 1429 ASHLITTLE RIVER RD, NW
 WILMINGTON, NC 28420
 PHONE (910) 287-5900

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANBURY, NJ 00812
 732-521-2900

UTILITY PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY



WESTWOOD AT ECHO
PHASE 1, SECTION 4
MAP BOOK 38 PAGE 125

WESTWOOD AT ECHO
PHASE 1, SECTION 3
MAP BOOK 38 PAGE 85

WESTWOOD AT ECHO
PHASE 1, SECTION 5
MAP BOOK 39 PAGE 293

WESTWOOD AT ECHO
PHASE 1, SECTION 1
MAP BOOK 37 PAGE 226

RIVERS EDGE
PHASE 2
MAP BOOK 38 PAGE 165

RIVERS EDGE
PHASE 1
MAP BOOK 38 PAGE 108

RIVERS EDGE
PHASE 3B

SCALE: 1" = 50'

SCALE: 1" = 50'

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

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City of WILMINGTON
 Public Services • Engineering Division
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UTILITY PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANBURY, NJ 08512
 732-521-2800

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASH-LITTLE RIVER RD. NW
 WILMINGTON, NC 28401
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-9653
 PHONE (910) 287-5900

Licence #C-3641
 16083

DES JST
 DRN JFN
 NKS

DATE 1/11/17
 NORTH CAROLINA
 PRELIMINARY
 ENGINEER
 NORRIS & TUNSTALL

C2.4

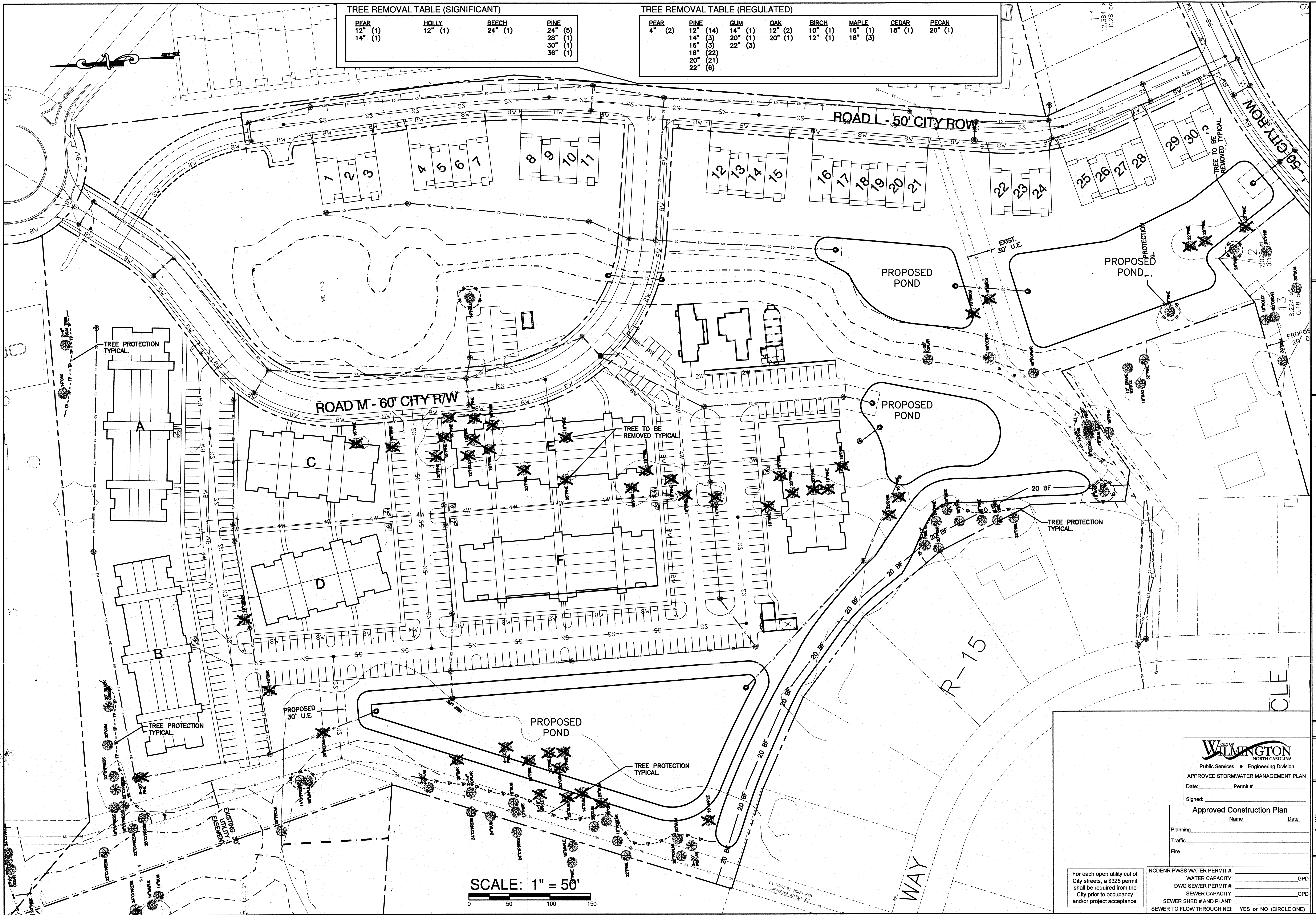
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TREE REMOVAL TABLE (SIGNIFICANT)

PEAR	HOLLY	BEECH	PINE
12" (1)	12" (1)	24" (1)	24" (5)
14" (1)			28" (1)
			30" (1)
			36" (1)

TREE REMOVAL TABLE (REGULATED)

PEAR	PINE	GUM	OAK	BIRCH	MAPLE	CEDAR	PECAN
4" (2)	12" (14)	14" (1)	12" (2)	10" (1)	16" (1)	18" (1)	20" (1)
	14" (3)	20" (1)	20" (1)	12" (1)	18" (3)		
	16" (3)	22" (3)					
	18" (22)						
	20" (21)						
	22" (6)						



SCALE: 1" = 50'

0 50 100 150

TREE PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

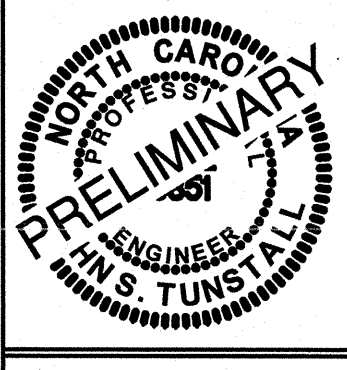
LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANURRY, NJ 08512
 732-521-2800

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASHLITTLE RIVER RD. NW
 WILMINGTON, NC 28401
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-9653

Licence #C-3641
16083
 DES: JST
 CB: JFN
 DRWN: NKS
 DATE: 1/11/17

City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____

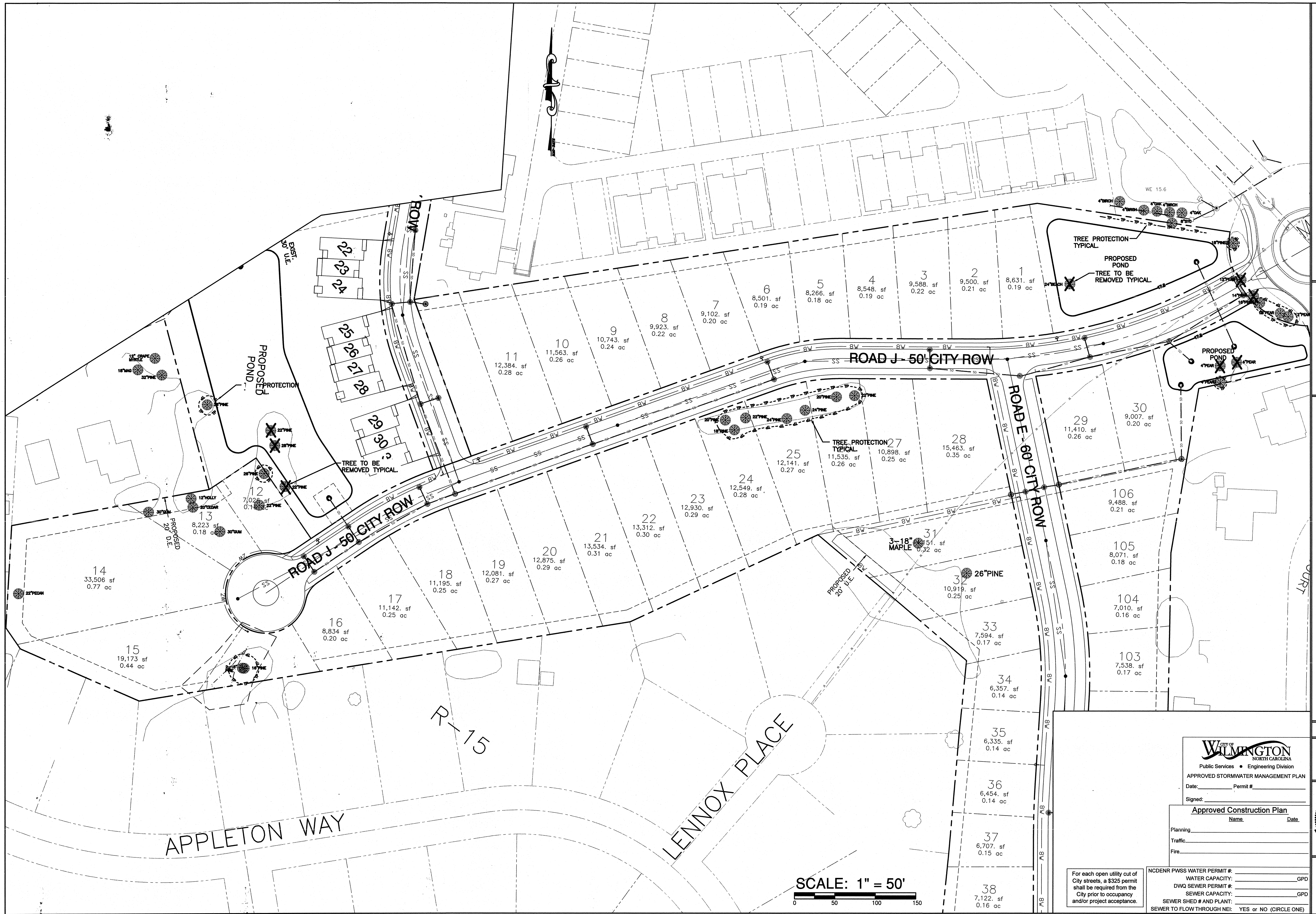
Signed: _____
Approved Construction Plan
 Name: _____ Date: _____
 Planning: _____
 Traffic: _____
 Fire: _____



For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NC DENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____ GPD
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

C3



TREE PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFURY, NJ 08512
 732-521-2500

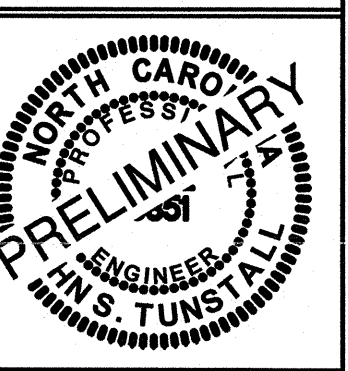
NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASH-LITTLE RIVER RD. NW
 WILMINGTON, NC 28420
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-9653
 PHONE (910) 267-5900

Licence #C-3641

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DES	JUST
CB	JFN
DRWL	NKS

DATE 1/11/17



C3.1

CITY OF WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
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Approved Construction Plan
 Name _____ Date _____
 Planning _____
 Traffic _____
 Fire _____

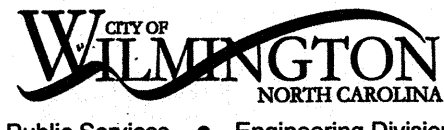
For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NCDENR PWSS WATER PERMIT #: _____
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____
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 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

SCALE: 1" = 50'
 0 50 100 150

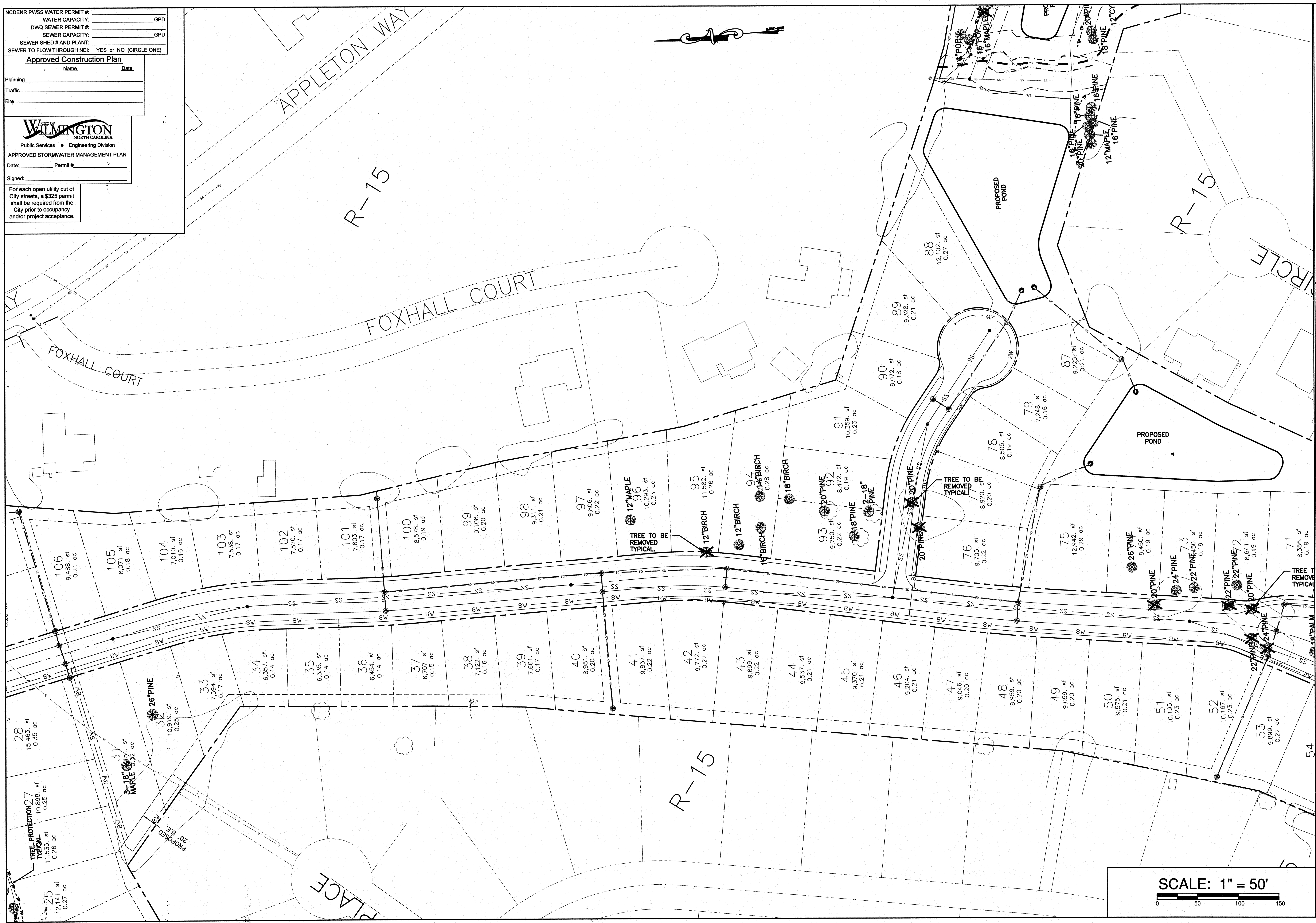
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Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
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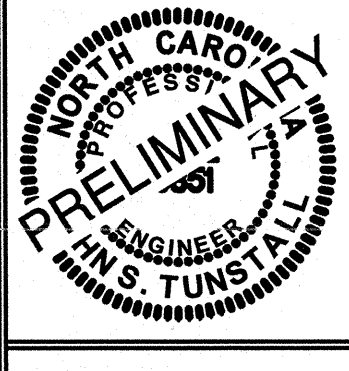


TREE PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CH4400 FORSGATE DRIVE
 CRANFORD, NJ 07012
 732-521-2900

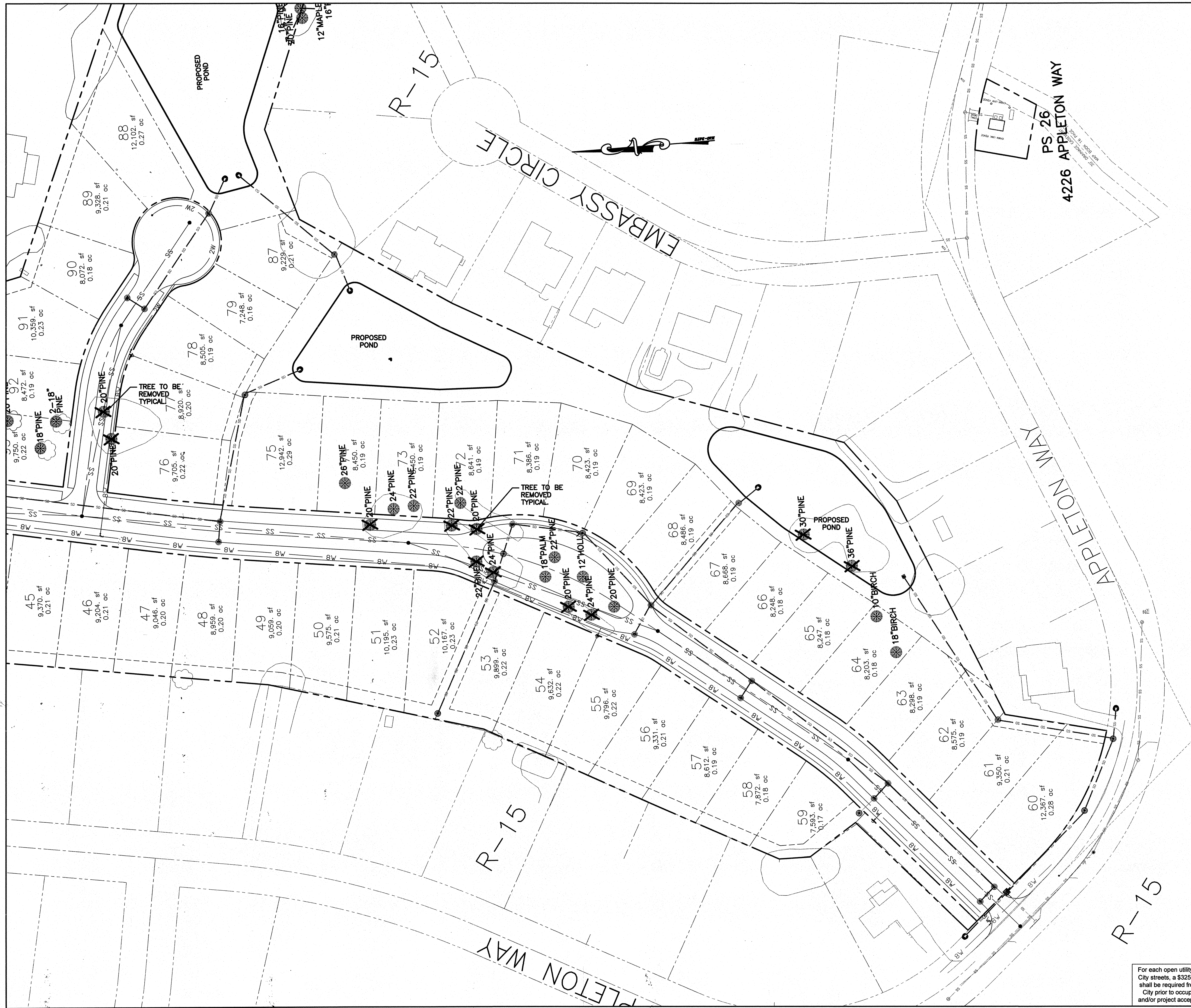
NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-9653
 1429 ASHLITTLE RIVER RD, NW
 ASH, NC 28420
 PHONE (910) 287-5900

Licence #C-3641
16083
 DR JST
 DR JFN
 DR NKS
 DATE 1/11/17



C3.2

SCALE: 1" = 50'
 0 50 100 150



For each open utility out of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

SCALE: 1" = 50'
 0 50 100 150

City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
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Approved Construction Plan
 Name _____ Date _____

Planning _____
 Traffic _____
 Fire _____

NC DENR PWSS WATER PERMIT #: _____
 WATER CAPACITY: _____ GPD
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TREE PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANBURY, NJ 00512
 732-521-2800

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 CONSULTING ENGINEERS P.C.
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 WILMINGTON, NC 28401
 PHONE (910) 343-9653

1429 ASH-LITTLE RIVER RD. NW
 ASH, NC 28620
 PHONE (910) 287-5900

Licence #C-3641

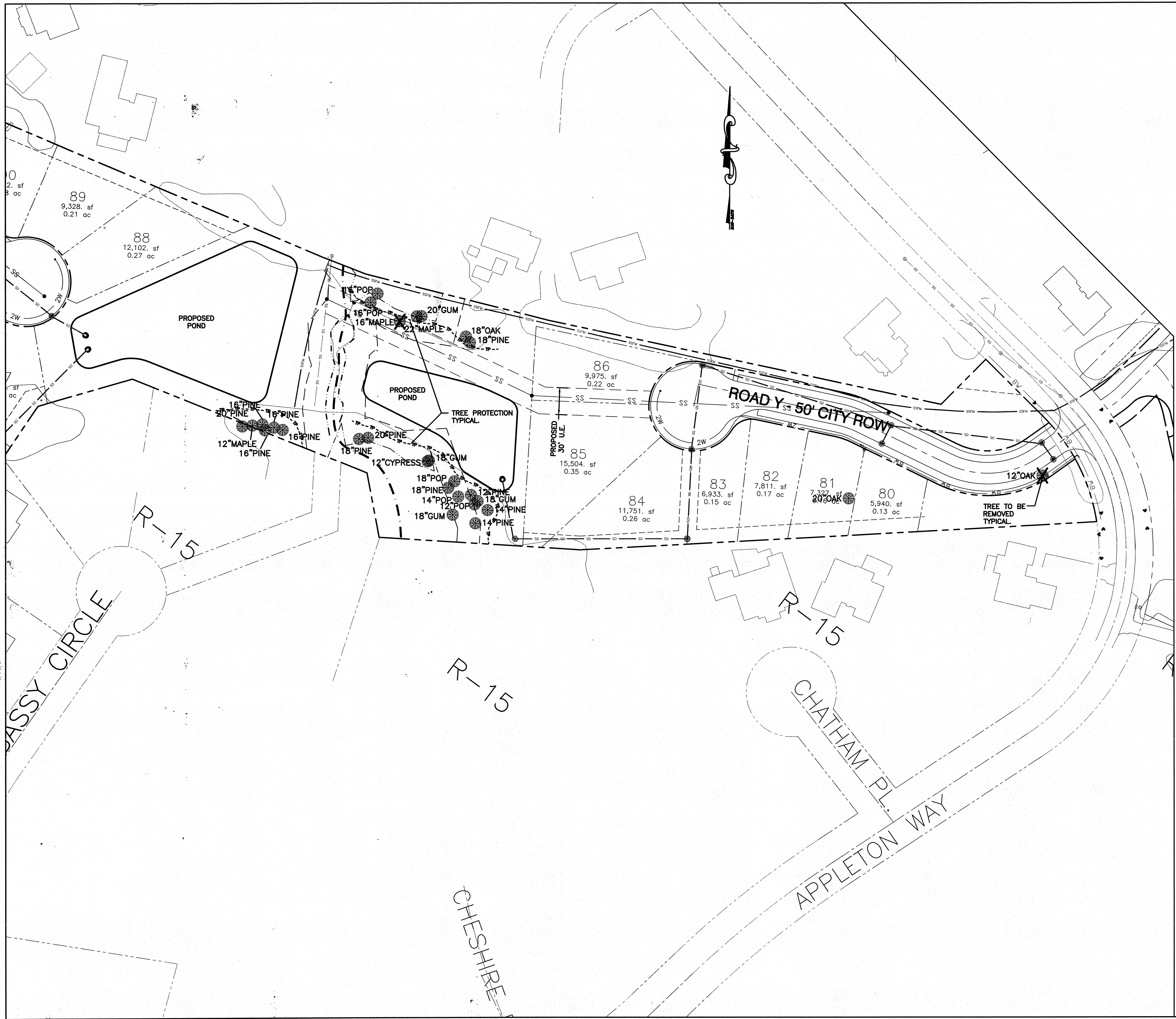
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DES. JST
 CDR. JFN
 DRWN. NKS

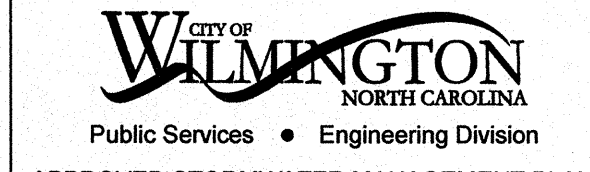
DATE 1/11/17

PRELIMINARY
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 IN S. TUNSTALL

C3.3



For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.



APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____

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Approved Construction Plan
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Planning _____
Traffic _____
Fire _____

NCDENR PWSS WATER PERMIT #: _____
WATER CAPACITY: _____ GPD
DWQ SEWER PERMIT #: _____
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SEWER SHED # AND PLANT: _____
SEWER TO FLOW THROUGH NET: YES or NO (CIRCLE ONE)

SCALE: 1" = 50'
0 50 100 150

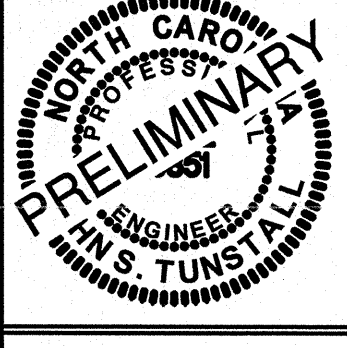
TREE PLAN
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

LAND OWNER/APPLICANT
ECHO FARMS, LLC
MATRIX DEVELOPMENT GROUP
CN4000 FORSGATE DRIVE
CHAMBURY, NJ 00812
732-521-2900

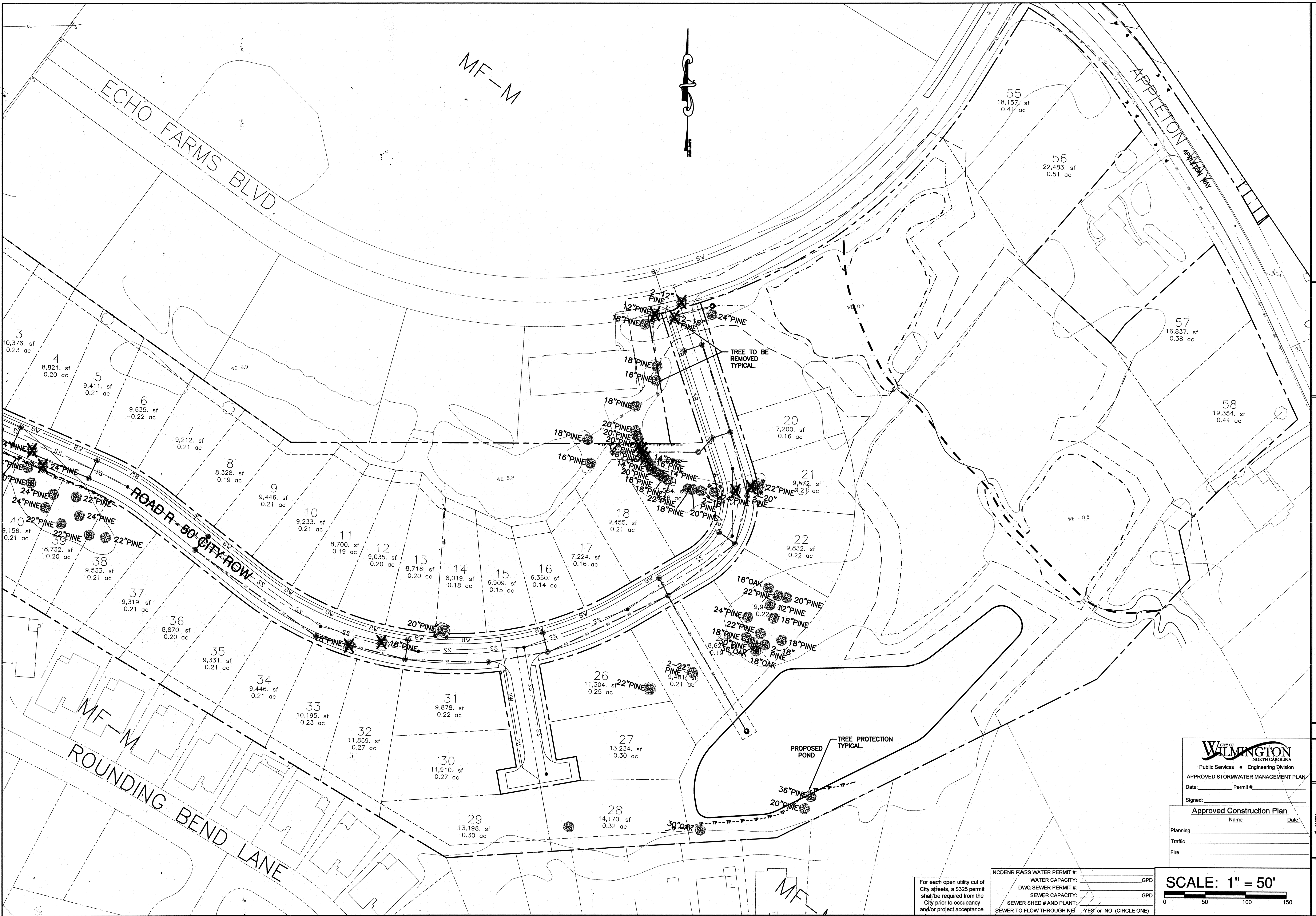
NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1429 ASHLITTLE RIVER RD, NW
WILMINGTON, NC 28401
PHONE (910) 343-9653

License #C-3641
16083

DES JST
COP JPN
DRWL NKS
DATE 1/11/17



C3.4



MF-M



TREE PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

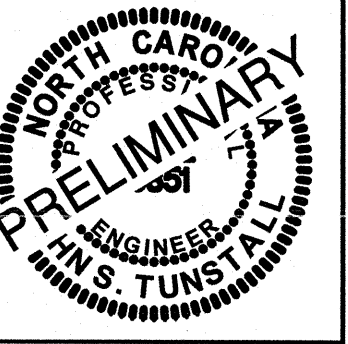
LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFURY, NJ 08512
 732-521-2800

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 1429 ASHLITTLE RIVER RD. NW
 WILMINGTON, NC 28420
 903 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 343-9653
 PHONE (910) 267-5900

Licence #C-3641

16083

DES: JST
 CB: JFN
 DRWL: NKS
 DATE: 1/11/17



C3.5

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

Approved Construction Plan
 Name: _____ Date: _____
 Planning: _____
 Traffic: _____
 Fire: _____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NC DENR PWSS WATER PERMIT #: _____ GPD
 WATER CAPACITY: _____ GPD
 DWQ SEWER PERMIT #: _____ GPD
 SEWER CAPACITY: _____ GPD
 SEWER SHED # AND PLANT: _____
 SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

SCALE: 1" = 50'
 0 50 100 150

F:\Projects\2016\16083 Woodlands at Echo Farms\16083 Plans\dwg\16083.msterr3.dwg, 1/11/2017 10:26:48 AM



NCDENR PWSS WATER PERMIT #: _____ GPD
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TREE PLAN
WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

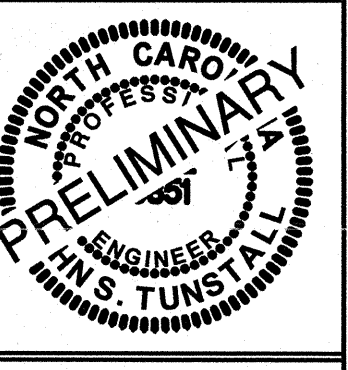
LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CRANFORD, NJ 07012
 732-521-2900

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 PHONE (910) 344-9653
 1429 ASHLITTLE RIVER RD. NW
 WILMINGTON, NC 28420
 PHONE (910) 287-5900

Licence #C-3641

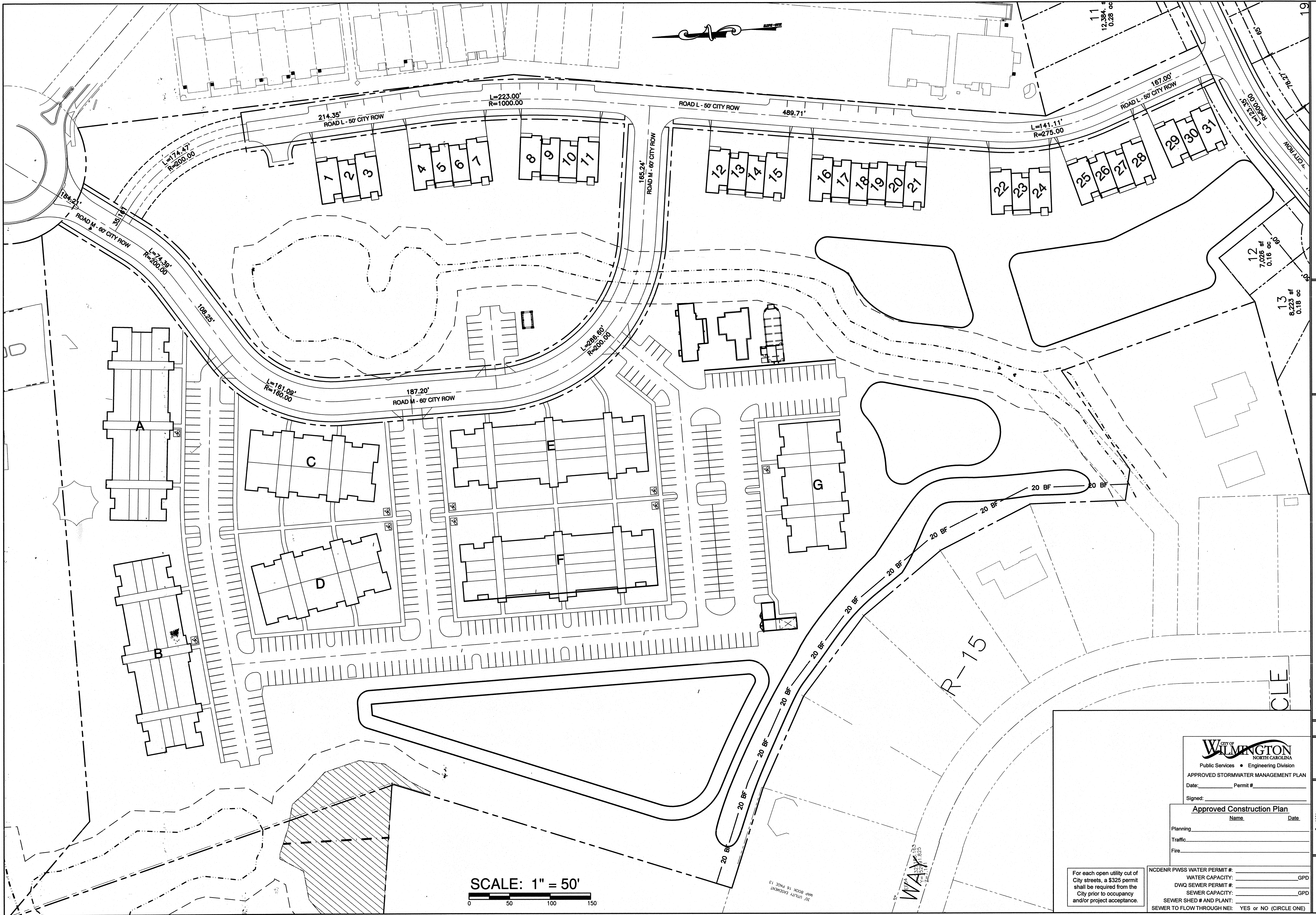
16083

DR. JST
 BR. JFN
 DR. NKS
 DATE 1/11/17



C3.6

SCALE: 1" = 50'
 0 50 100 150



LAYOUT PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

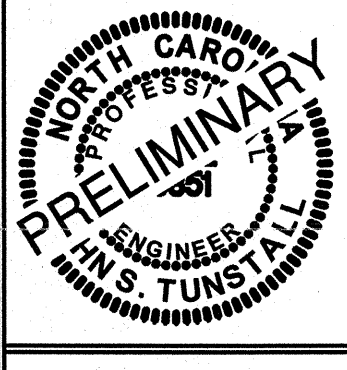
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16083

DES.	JST
CDR.	JFN
DRWN.	NKS
DATE	1/11/17



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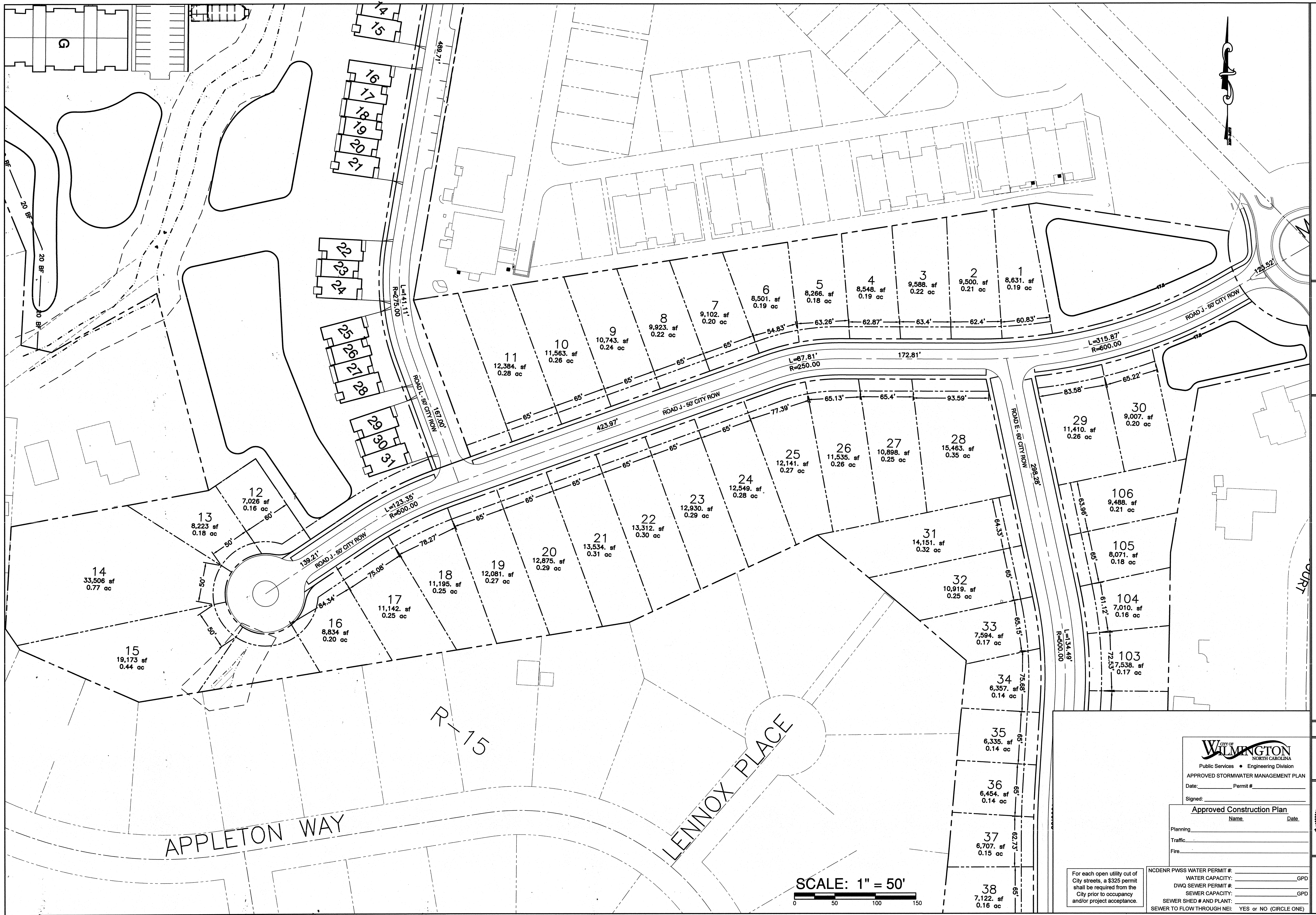
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 SEWER CAPACITY: _____ GPD
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 SEWER TO FLOW THROUGH NEI: YES OR NO (CIRCLE ONE)

C4

SCALE: 1" = 50'
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 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

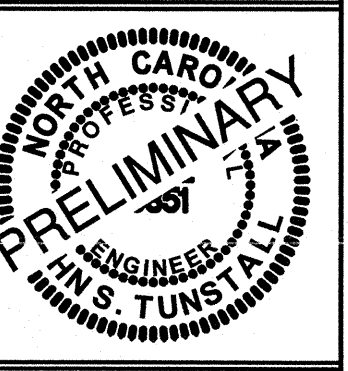
LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANBURY, NJ 00512
 732-521-2900

NORRIS & TUNSTALL
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 1429 ASHLITTLE RIVER RD, NW
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 910 MARKET STREET
 WILMINGTON, NC 28401
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16083

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APP	JPN
DRWL	NKS
DATE	1/11/17



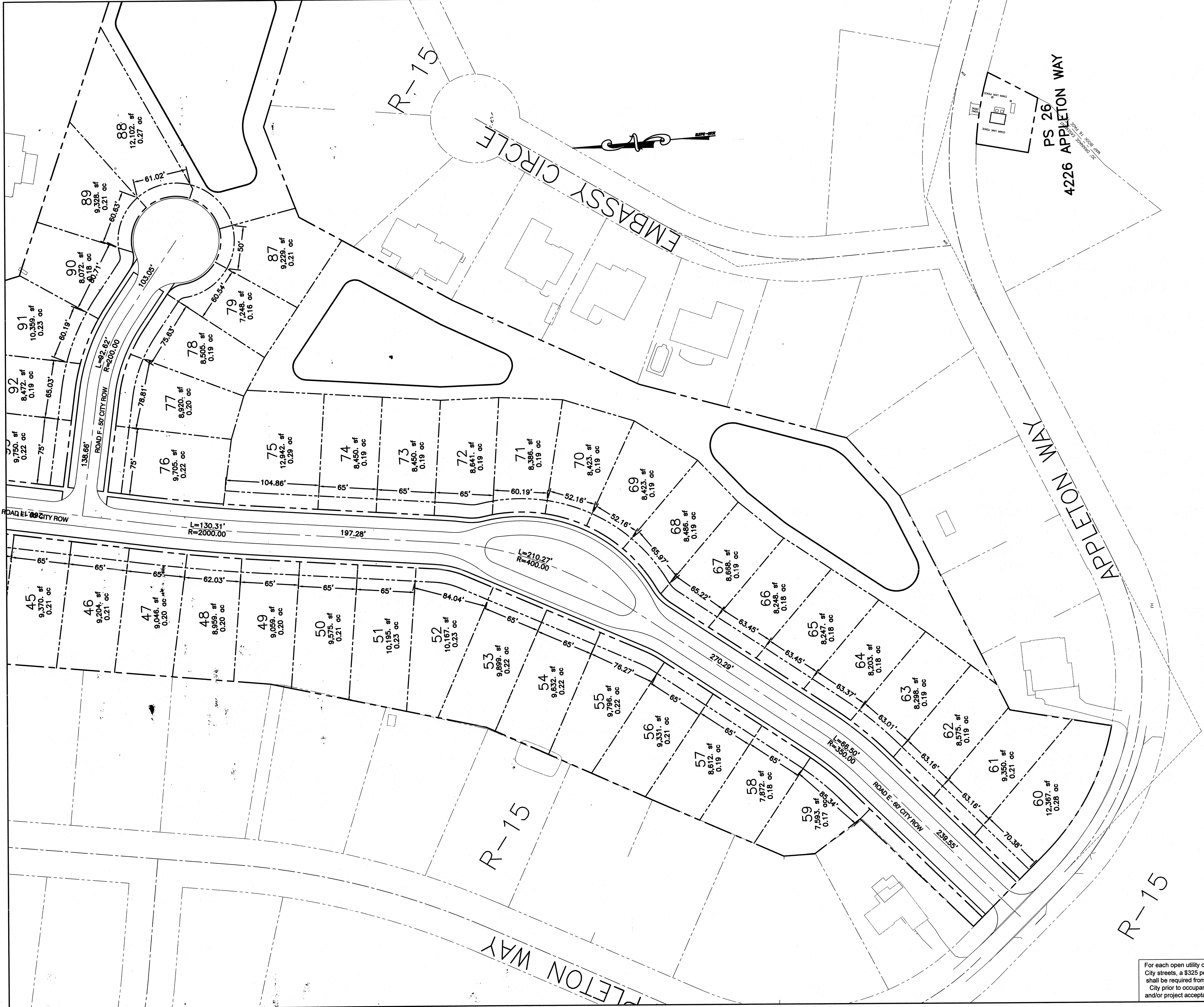
City of WILMINGTON
 NORTH CAROLINA
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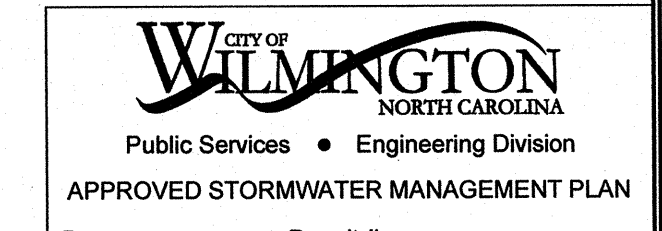
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C4.1



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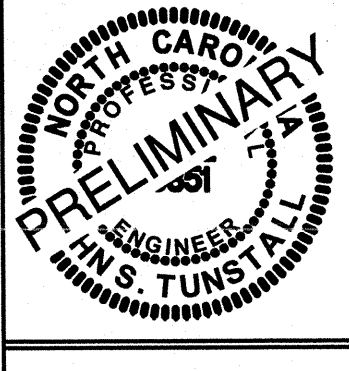
LAYOUT PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 10400 FORSGATE DRIVE
 CRANFORD, NJ 07012
 732-521-2900

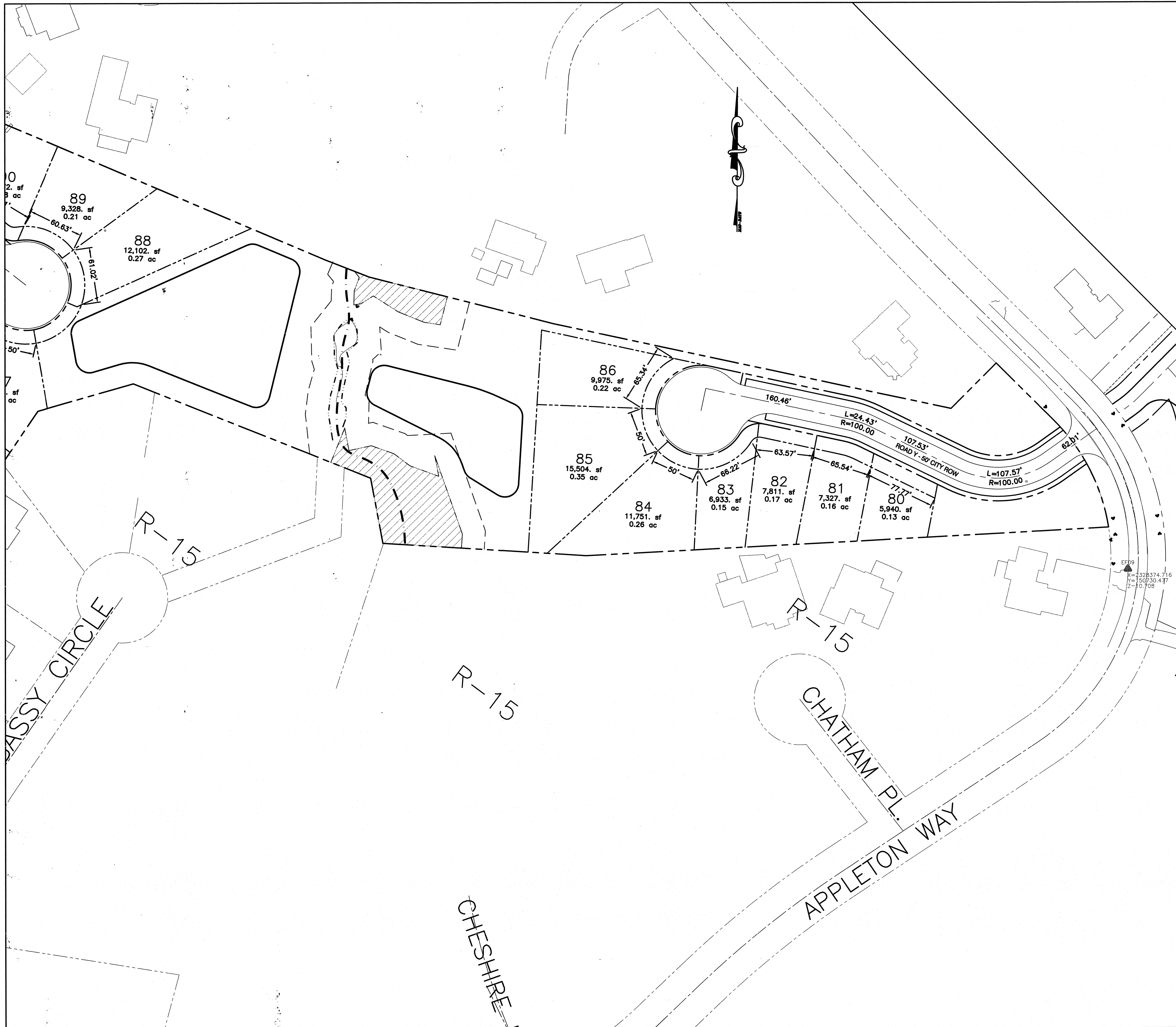
NORRIS & TUNSTALL
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 902 MARKET STREET
 WILMINGTON, NC 28401
 1429 ASHLITTLE RIVER RD., NW
 ASH, NC 28420
 PHONE (910) 343-9653

City of Wilmington
 License #C-3641


16083
 DES. JUST
 C.D. JPN
 DRWN. NKS
 DATE 1/11/17



C4.3

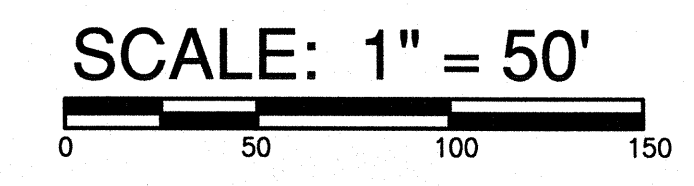


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 Public Services • Engineering Division
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Approved Construction Plan
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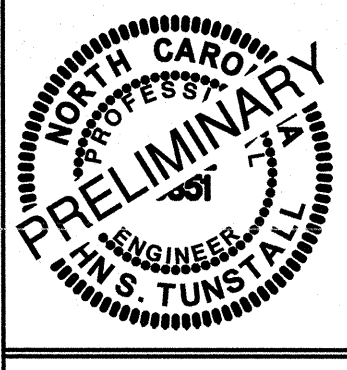


LAYOUT PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

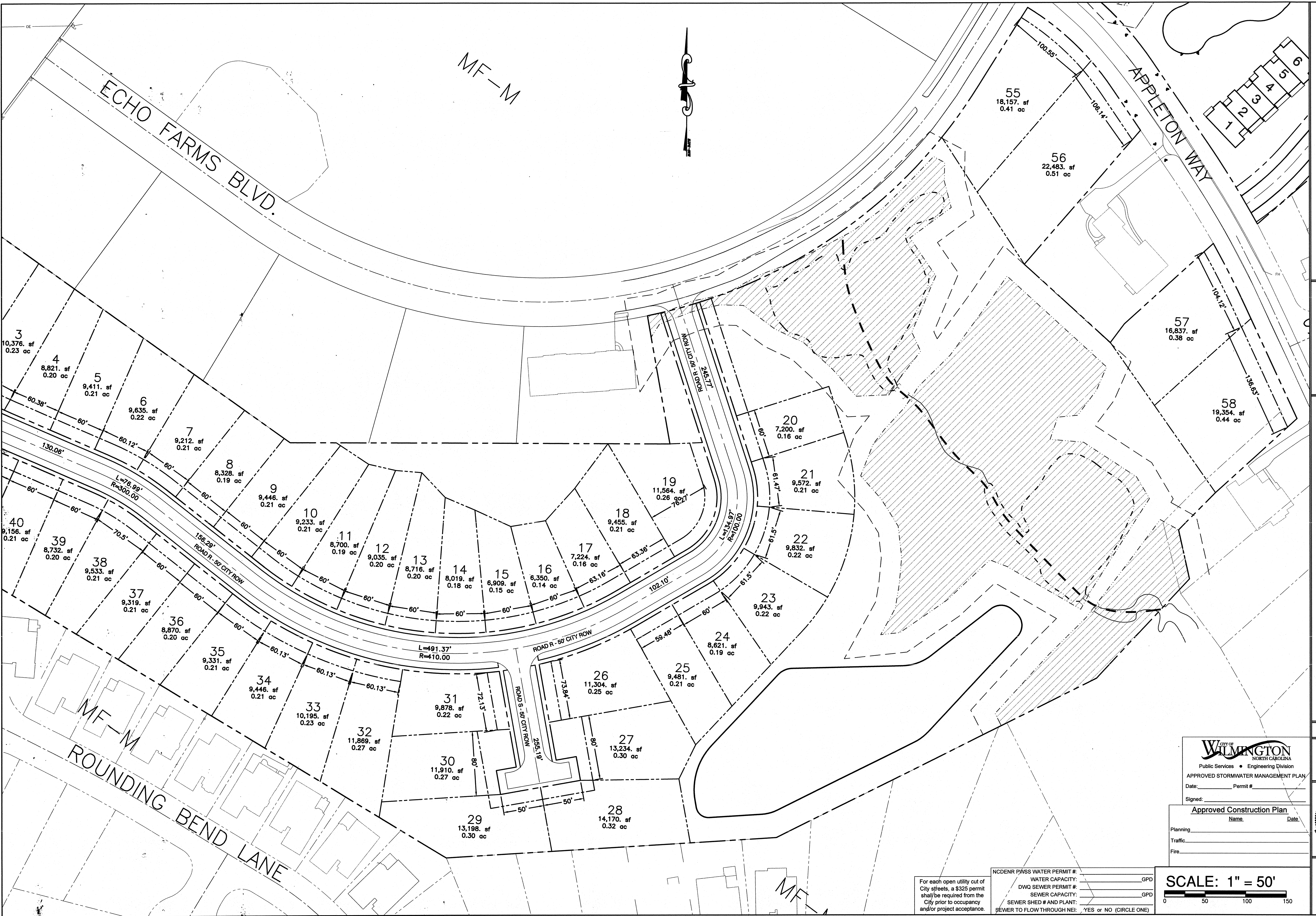
LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
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 CHANBURY, NJ 00512
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Licence #C-3641
16083
 DES. JST
 C.D. JPN
 DRWN. NKS
 DATE 1/11/17



C4.4



LAYOUT PLAN
 WOODLANDS AT ECHO FARMS
 4114 ECHO FARMS BLVD.
 WILMINGTON, NC 28412
 NEW HANOVER COUNTY

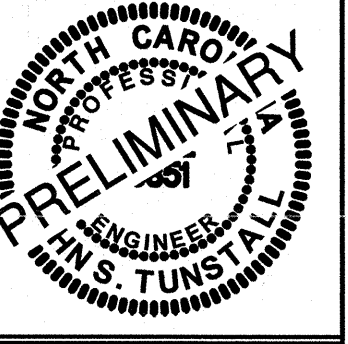
LAND OWNER/APPLICANT
 ECHO FARMS, LLC
 MATRIX DEVELOPMENT GROUP
 CN4000 FORSGATE DRIVE
 CHANURBY, NJ 00812
 732-521-2900

NORRIS & TUNSTALL
 CONSULTING ENGINEERS P.C.
 902 MARKET STREET
 WILMINGTON, NC 28401
 910.343.9653
 1429 ASHLITTLE RIVER RD, NW
 WILMINGTON, NC 28420
 PHONE (910) 287-5900

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16083

DES	JST
CDR	JFN
DRWN	NKS
DATE	1/11/17



City of WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
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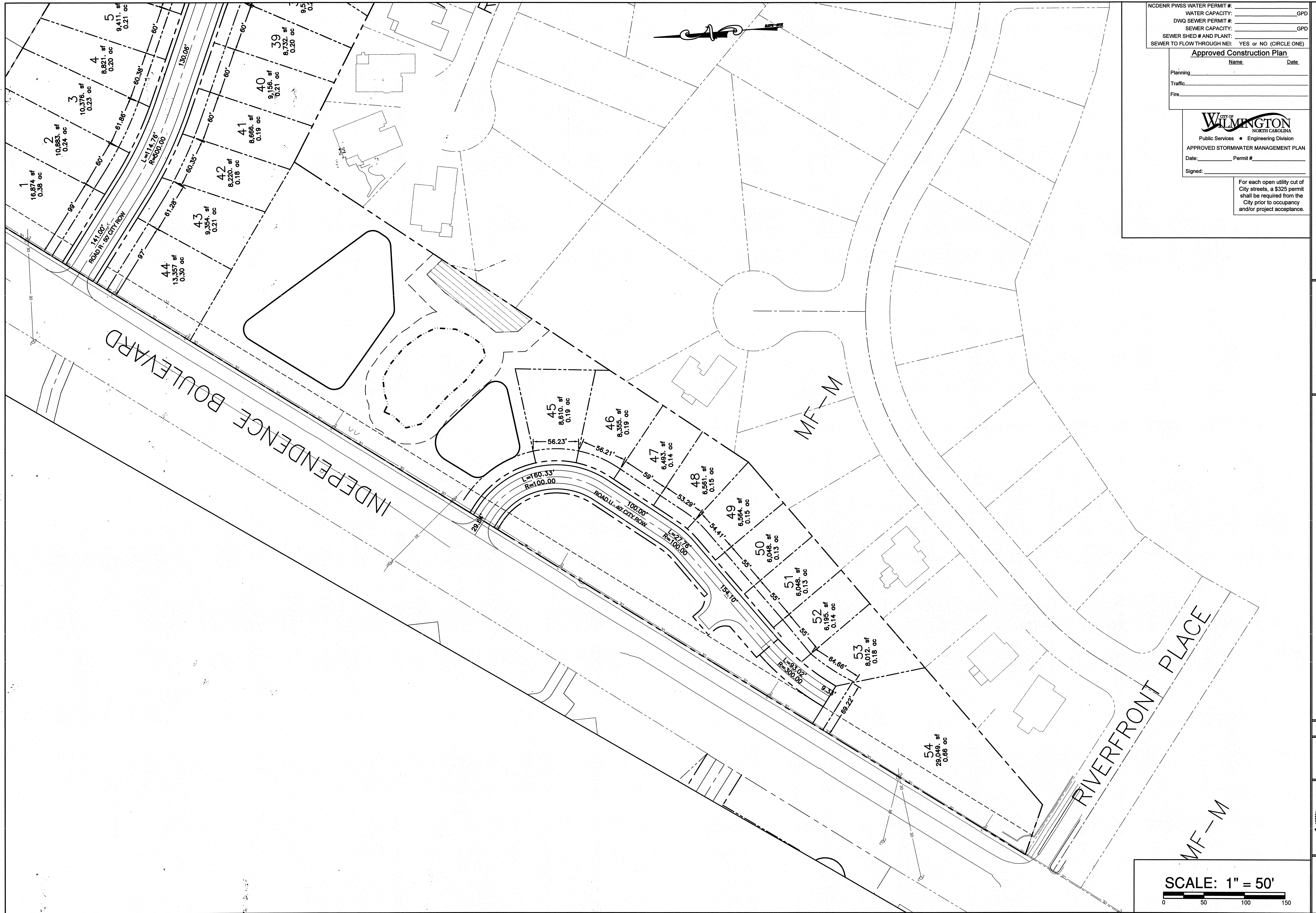
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SCALE: 1" = 50'
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C4.5



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CITY OF WILMINGTON
 NORTH CAROLINA
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LAND OWNER/APPLICANT
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 4040 FORSGATE DRIVE
 CRANFORD, NJ 07012
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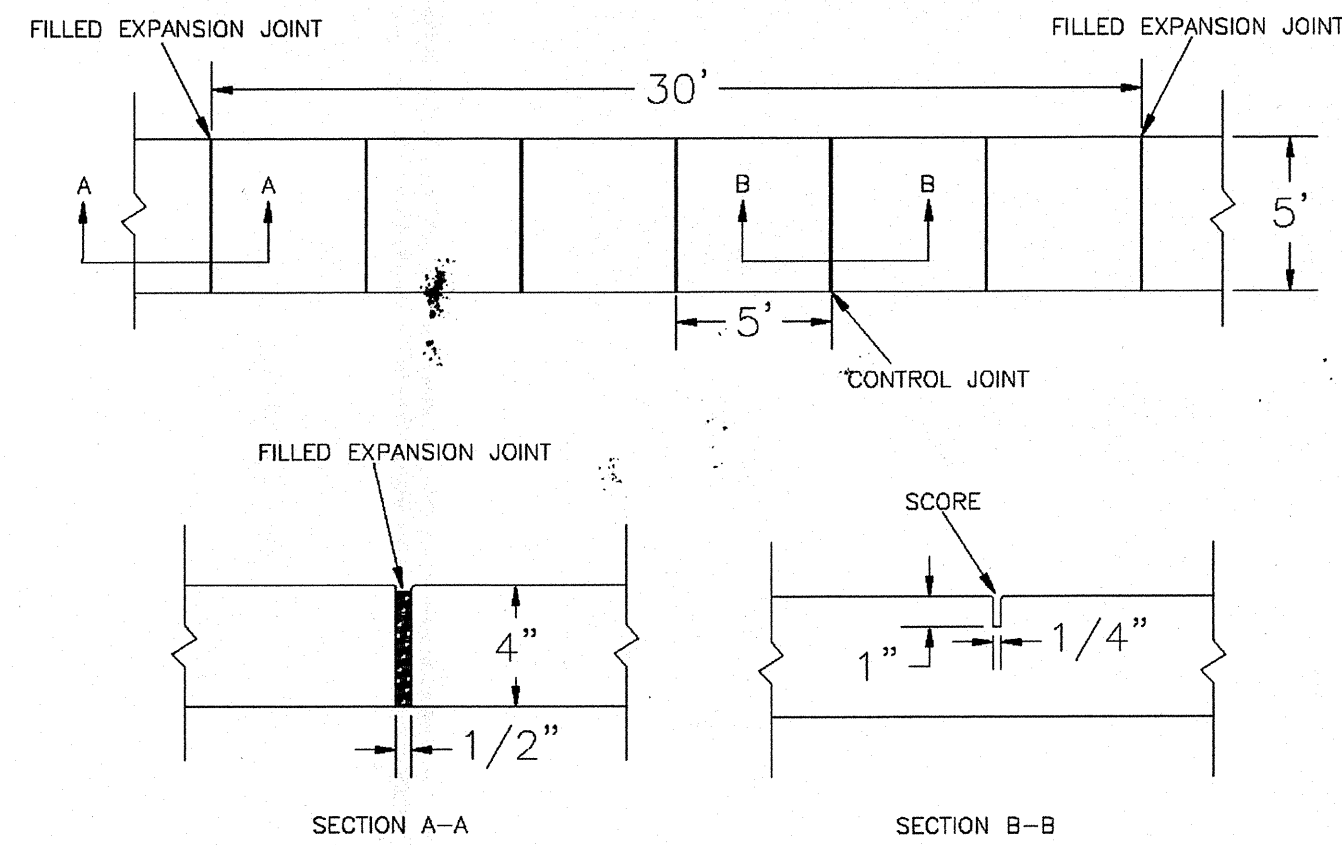
1429 ASHLITTLE RIVER RD. NW
 WILMINGTON, NC 28420
 PHONE (910) 267-5900

Licence #C-3641
 16083
 DR: JST
 BR: JFN
 CK: KKS
 DATE: 1/11/17



C4.6

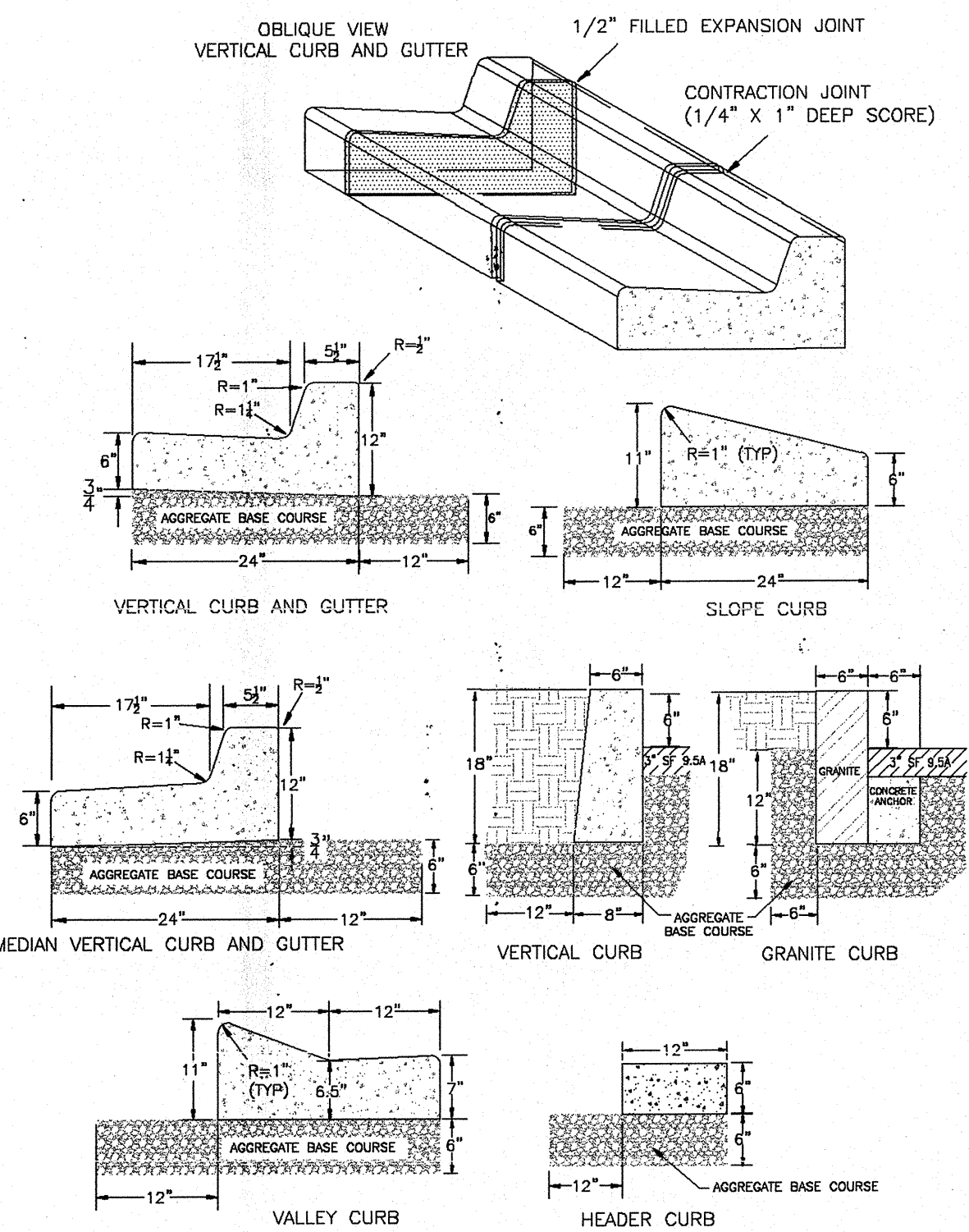
SCALE: 1" = 50'
 0 50 100 150



- NOTES:
1. JOINT MATERIAL TO COMPLY WITH CURRENT NCDOT STANDARDS.
 2. SANITARY SEWER CLEAN-OUTS, WATER METERS, MANHOLES, AND VALVE LIDS TO BE LOCATED OUTSIDE SIDEWALK WHERE FEASIBLE.
 3. MINIMUM SIDEWALK WIDTH TO BE 6' MINIMUM IF PLACED AT BACK OF CURB.
 4. CONCRETE FOR ALL SIDEWALKS (EXCEPT ANY PORTION CONTAIN WITHIN A DRIVEWAY APRON) SHALL BE CLASS "A" - 3,000 PSI.
 5. MINIMUM REPLACEMENT FOR REPAIRS IS A 5' X 5' PANEL.
 6. 4" STONE BASE MAY BE REQUIRED FOR POOR SOIL CONDITIONS.
 7. MINIMUM DEPTH FOR TUNNELING BELOW SIDEWALK IS 12"
 8. MAX ADJACENT GROUND SLOPE WITHOUT RAILING IS 2:1
 9. MIN GRADE FOR PROPER DRAINAGE IS 1% IN AT LEAST 1 DIRECTION. MAX CROSS SLOPE IS 2%. MAX LONGITUDINAL SLOPE IS 8.3%, 10% IF LIMITED BY EXISTING CONDITIONS, OR NO GREATER THAN THE SLOPE OF THE EXISTING ADJACENT ROAD.

NOT TO SCALE

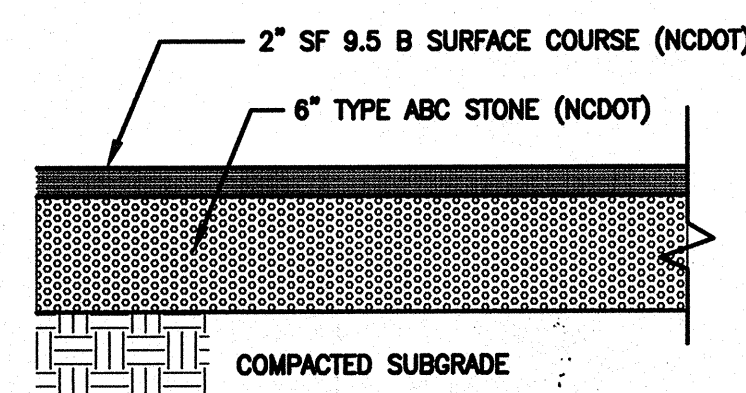
C.O.W. STANDARD SIDEWALK DETAIL



- NOTES:
1. EXPANSION JOINT MATERIAL TO COMPLY WITH CURRENT NCDOT STANDARDS
 2. 50' MAX EXPANSION JOINT SPACING, 10' MAX CONTRACTION JOINT SPACING
 3. MINIMUM INSTALLATION LENGTH IS 5 FT.
 4. CONCRETE TO BE 3000 PSI MIN
 5. VERTICAL CURB AND GUTTER BASE CAN BE SLOPED 3/4" OR USE A FLAT BASE

NOT TO SCALE

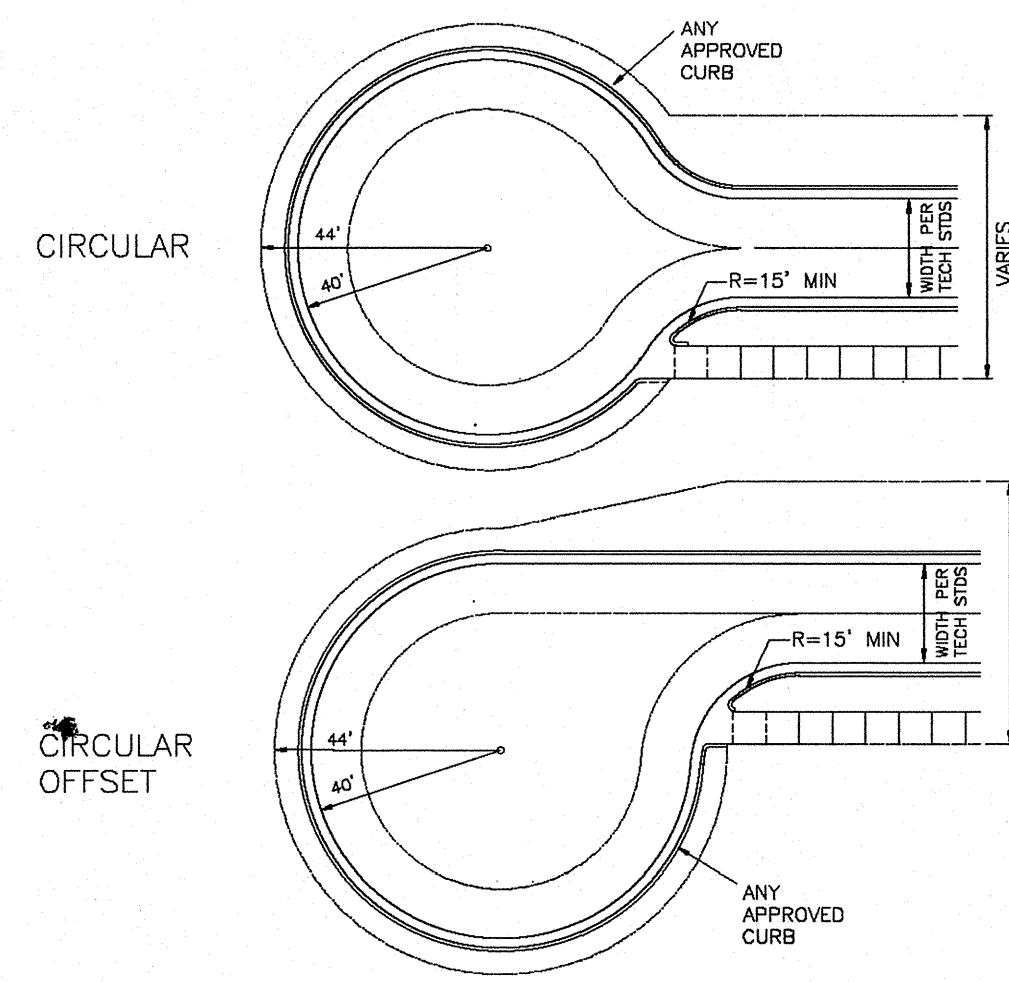
C.O.W. STANDARD CURBING DETAIL



NOTE: PAVEMENT SECTION MAY VARY DEPENDING UPON FIELD CONDITIONS. CONTRACTOR SHALL COORDINATE w/OWNER & GEOTECHNICAL ENGINEER TO DETERMINE ACTUAL PAVEMENT SECTION.

ASPHALT PAVEMENT SECTION

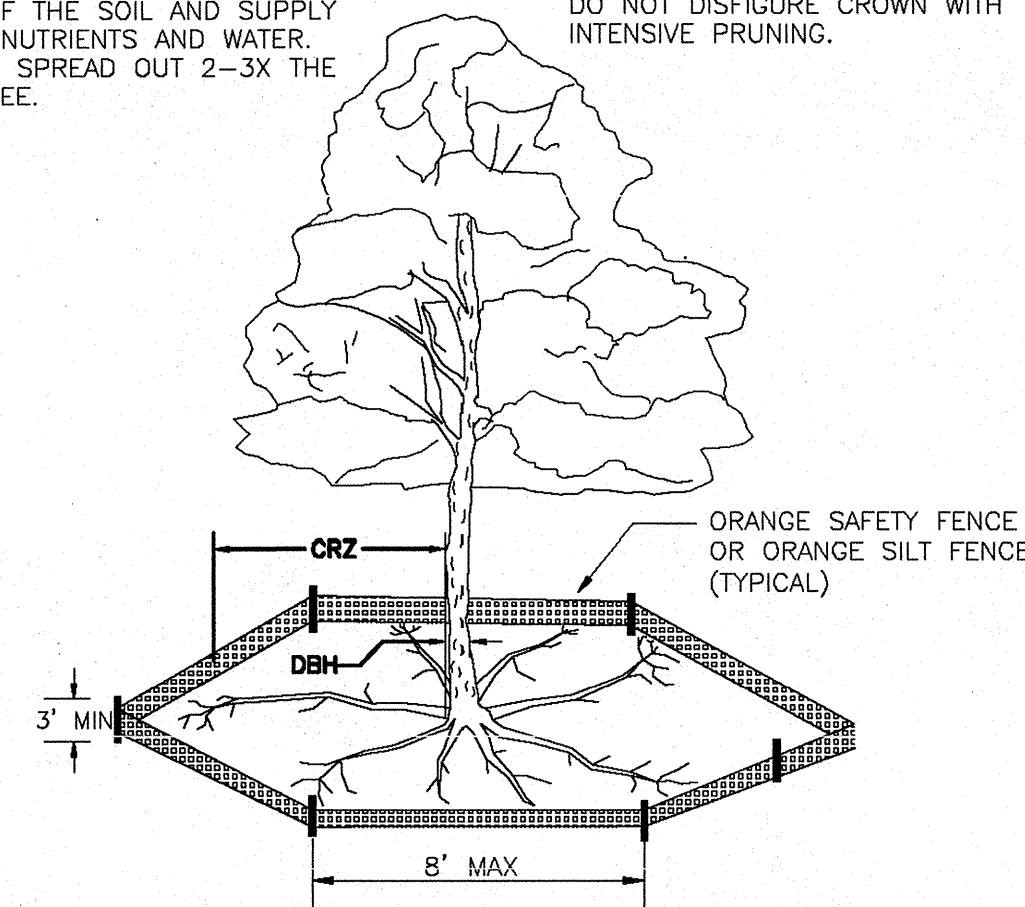
NOT TO SCALE



C.O.W. RESIDENTIAL CUL-DE-SAC DETAIL

- NOTE: THE CRITICAL ROOT ZONE (CRZ) OF A TREE IS WHERE THE MAJORITY OF A TREE'S ROOTS LAY. 85% OF MOST TREE ROOTS ARE FOUND IN THE TOP 24\"/>

NOTE: CROWN OF THE TREE IS NEEDED FOR LEAF GROWTH TO PRODUCE OXYGEN, FILTER THE AIR, REDUCE WIND AND SOFTEN NOISE. DO NOT DISFIGURE CROWN WITH INTENSIVE PRUNING.



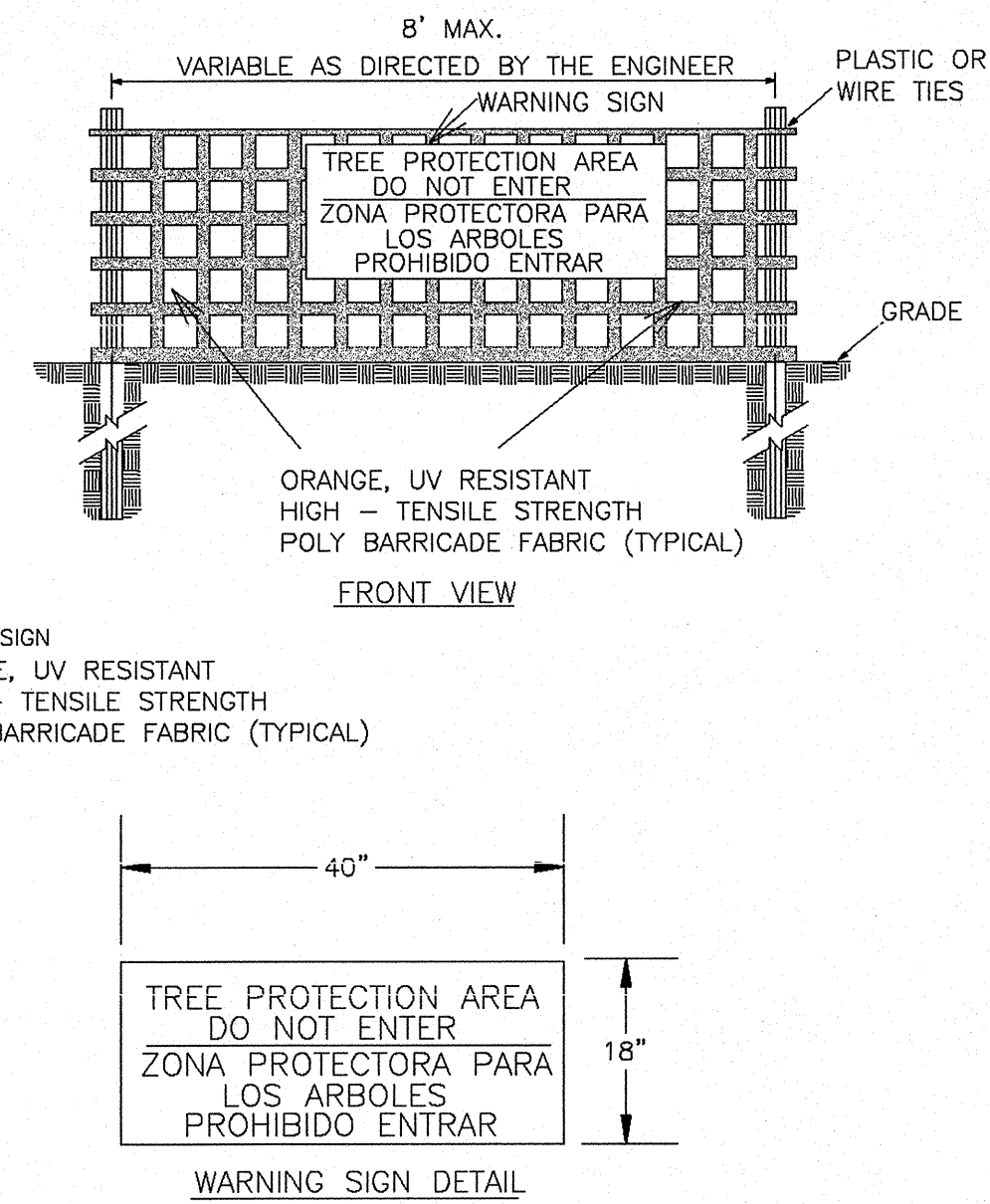
- NOTES:
1. PROTECT CRITICAL ROOT ZONE (CRZ) OF TREES PRIOR TO CONSTRUCTION. CLEARLY MARK THE TREES AND ERECT A PROTECTIVE BARRIER AT THE CRZ. BARRIER SHALL BE MAINTAINED UNTIL CONSTRUCTION IS COMPLETE.
 2. CRZ RADIUS IS 1 FT PER INCH OF TREE DIAMETER AT BREAST HEIGHT (DBH).
 3. IF CONSTRUCTION OCCURS WITHIN THE CRZ, AT LEAST 12\"/>

C.O.W. TREE PROTECTION DETAIL

NOTES:

1. THE TREE PROTECTION FENCING SHALL NOT BE VIOLATED FOR THE ENTIRE DURATION OF THE PROJECT WITHOUT APPROVAL FROM URBAN FORESTRY STAFF.
2. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL. LETTERS TO BE 3\"/>

C.O.W. TREE PROTECTION DETAIL



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C.O.W. TREE PROTECTION DETAIL

CITY OF WILMINGTON STANDARD NOTES

1. CONTACT THE NORTH CAROLINA ONE CALL CENTER PRIOR TO DOING ANY DIGGING AT 1-800-632-4949.
2. PRIOR TO ANY CLEARING, GRADING OR CONSTRUCTION ACTIVITY, TREE PROTECTION FENCING WILL BE INSTALLED AROUND PROTECTED TREES OR GROVES OF TREES AND NO CONSTRUCTION WORKERS, TOOLS, MATERIALS, OR VEHICLES ARE PERMITTED WITHIN THE TREE PROTECTION FENCING.
3. ALL PAVEMENT MARKINGS IN PUBLIC RIGHTS-OF-WAY AND FOR DRIVEWAYS ARE TO BE THERMOPLASTIC AND MEET CITY AND/OR NCDOT STANDARDS.
4. ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
5. INSTALL REFLECTORS PER CITY AND NCDOT STANDARDS. TRAFFIC ENGINEERING MUST APPROVE OF PAVEMENT MARKING LAYOUT PRIOR TO ACTUAL STRIPING.
6. ALL TRAFFIC CONTROL SIGNS AND MARKINGS OFF THE RIGHT-OF-WAY ARE TO BE MAINTAINED BY THE PROPERTY OWNER IN ACCORDANCE WITH MUTCD STANDARDS.
7. TRAFFIC CONTROL DEVICES (INCLUDING SIGNS AND PAVEMENT MARKINGS) IN AREAS OPEN TO PUBLIC TRAFFIC ARE TO MEET MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) STANDARDS.
8. IT SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER TO ERECT OFFICIAL STREET NAME SIGNS AT ALL INTERSECTIONS ASSOCIATED WITH THE SUBDIVISION IN ACCORDANCE WITH THE TECHNICAL STANDARDS AND SPECIFICATIONS MANUAL. THE SUBDIVIDER MAY ACQUIRE AND ERECT OFFICIAL STREET NAME SIGNS OR MAY CHOOSE TO CONTRACT WITH THE CITY TO INSTALL THE STREET SIGNS AND THE SUBDIVIDER SHALL PAY THE COST OF SUCH INSTALLATION. CONTACT TRAFFIC ENGINEERING AT 341-7888 TO DISCUSS INSTALLATION OF TRAFFIC AND STREET NAME SIGNS. POSTED STREET NAMES MUST BE APPROVED PRIOR TO INSTALLATION OF STREET NAME SIGNS.
9. CONTACT TRAFFIC ENGINEERING AT 341-7888 FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION IN THE RIGHT-OF-WAY.
10. A UTILITY CUT PERMIT IS REQUIRED FOR EACH OPEN CUT OF A CITY STREET. CONTACT 341-5886 FOR MORE DETAILS. IN CERTAIN CASES AN ENTIRE RESURFACING OF THE AREA BEING OPEN CUT MAY BE REQUIRED.
11. ANY BROKEN OR MISSING SIDEWALK PANELS, DRIVEWAY PANELS, AND CURBING WILL BE REPLACED.
12. CONTACT KAREN DIXON AT 341-7888 TO DISCUSS STREET LIGHTING OPTIONS.
13. PROJECT SHALL COMPLY WITH CFPWA CROSS CONNECTION CONTROL REQUIREMENTS. WATER METER(S) CANNOT BE RELEASED UNTIL ALL REQUIREMENTS ARE MET AND THE STATE HAS GIVEN THEIR FINAL APPROVAL. CALL 343-3910 FOR INFORMATION.
14. IF THE CONTRACTOR DESIRES CFPWA WATER FOR CONSTRUCTION HE SHALL APPLY IN ADVANCE FOR THIS SERVICE AND MUST PROVIDE A REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTION DEVICE ON THE DEVELOPER'S SIDE OF THE WATER METER BOX.
15. ANY IRRIGATION SYSTEM SUPPLIED BY CFPWA WATER SHALL COMPLY WITH CFPWA CROSS CONNECTION CONTROL REGULATIONS. CALL 332-6558 FOR INFORMATION.
16. ANY BACKFLOW PREVENTION DEVICES REQUIRED BY CFPWA WILL NEED TO BE ON THE LIST OF APPROVED DEVICES BY USCFCOCHR OR ASSE.
17. WHEN PVC WATER MAINS AND/OR POLYETHYLENE SERVICES ARE PROPOSED, THE PIPES ARE TO BE MARKED WITH NO. 10 INSULATED SINGLE STRAND COPPER WIRE INSTALLED THE ENTIRE LENGTH AND SECURED TO ALL VALVES. THIS WIRE IS TO BE ACCESSIBLE AT ALL FIRE HYDRANTS AND WATER METER BOXES TO AID IN FUTURE LOCATION OF FACILITIES.
18. THE NUMBER AND SPACING OF DRIVEWAYS FOR ALL INTERCONNECTED SITES WILL BE DETERMINED BY THE COMBINED FRONTAGE OF THE INTERCONNECTED PROPERTIES.
19. UNDERGROUND FIRE LINE MUST BE PERMITTED AND INSPECTED BY THE WILMINGTON FIRE DEPARTMENT FROM THE PUBLIC ROW TO THE BUILDING. CONTACT THE WILMINGTON FIRE DEPARTMENT DIVISION OF FIRE AND LIFE SAFETY AT 910-343-0696 FOR ADDITIONAL INFORMATION.
20. A LANDSCAPE PLAN INDICATING THE LOCATION OF REQUIRED STREET TREES SHALL BE SUBMITTED TO THE CITY OF WILMINGTON TRAFFIC ENGINEER DIVISION AND PARKS AND RECREATION DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO THE RECORDING OF THE FINAL PLAN.

SITE WORK NOTES:

1. THE CONTRACTOR SHALL VISIT THE SITE TO BECOME FAMILIAR WITH FIELD CONSTRUCTION CONDITIONS.
2. CONTRACTOR SHALL COORDINATE WORK WITHIN NCDOT AND LOCAL RIGHT OF WAYS WITH PROPER AUTHORITIES AND SHALL MEET ANY REQUIREMENTS AS TO TRAFFIC CONTROL AND CONNECTION TO EXISTING STREETS.
3. CLEARING AND GRUBBING: REMOVE ALL TREES AS REQUIRED UNLESS OTHERWISE NOTED TO REMAIN, STUMPS, ROOTS, SHRUBBERY, ASPHALT, CONCRETE, STRUCTURES, BURIED UTILITIES, STORAGE TANKS, ETC. WITHIN LIMITS OF CONSTRUCTION.
4. STRIPPING: BEFORE EXCAVATING OR FILLING, REMOVE ALL TOPSOIL, WOOD, LEAVES, AND ANY OTHER UNSUITABLE MATERIAL.
5. MUCKING: REMOVE ANY SOFT, ORGANIC SILT MATERIALS AND EXISTING BURIED CONSTRUCTION DEBRIS AS REQUIRED AND FILL TO SUBGRADE ELEVATIONS WITH A CLEAN SELECT-FILL COMPACTED AS SPECIFIED.
6. DISPOSAL: CLEARED, GRUBBED, STRIPPED OR EXCAVATED SPOIL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE CODES.
7. BORROW MATERIAL: THE CONTRACTOR SHALL FURNISH BORROW MATERIAL REQUIRED FROM OFF SITE AND OBTAIN ALL REQUIRED PERMITS ASSOCIATED WITH BORROW OPERATIONS.
8. FILL AND COMPACTION: SEE SPECIFICATIONS.
9. LAYOUT: THE CONTRACTOR SHALL PROVIDE ALL LAYOUT REQUIRED TO CONSTRUCT HIS WORK.
10. THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OF EXISTING UTILITIES DURING CONSTRUCTION.
11. EXISTING BOUNDARY AND TOPOGRAPHIC INFORMATION FROM SURVEY BY MICHAEL UNDERWOOD AND ASSOCIATES, PA AND PROVIDED BY OWNER.
12. THE CONTRACTOR SHALL VERIFY DIMENSIONS AT JOBSITE.
13. THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF RELOCATION OR DISCONNECTION OF ALL EXISTING UTILITIES WITH APPLICABLE AGENCIES AND AUTHORITIES.
14. ALL PAVEMENT AND BASE MATERIALS AND WORKMANSHIP SHALL CONFORM TO NCDOT STANDARDS.
15. WATER AND SEWER SERVICES SHALL BE INSTALLED TO MEET LOCAL AND STATE PLUMBING CODES. METER AND TAPS SHALL MEET ALL LOCAL REQUIREMENTS.
16. ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE.
17. SEE SOILS REPORT FOR ADDITIONAL REQUIREMENTS.
18. CONTRACTOR SHALL NOTE THAT EARTHWORK QUANTITIES ARE HIS RESPONSIBILITY. PLANS DO NOT REPRESENT A BALANCED EARTHWORK CONDITION.
19. REINF. CONC. PIPE SHALL BE CLASS III W/RUBBER GASKETED JOINT OR "RAM NECK". INSTALL PER MANUFACTURER'S REQUIREMENTS.
20. USE WHITE LANE MARKING PAINT FOR ALL PAVEMENT MARKINGS. PAINT SHALL BE A CHLORINATED RUBBER ALKYL, FS TT-P-115, TYPE III, FACTORY MIXED, QUICK DRYING, NON-BLEEDING.
21. REFER TO THE PLUMBING DRAWINGS FOR LOCATION AND INVERTS OF NEW WASTE, WATER AND ROOF DRAIN LINES.

UTILITY NOTES FOR FIRE HYDRANTS

1. FIRE HYDRANTS MUST BE WITHIN 150' OF THE FIRE DEPARTMENT CONNECTION.
2. THE FIRE DEPARTMENT CONNECTION MUST BE WITHIN 40' OF FIRE APPARATUS PLACEMENT.
3. LANDSCAPING AND PARKING CANNOT BLOCK OR IMPEDE THE FIRE DEPARTMENT CONNECTIONS OR FIRE HYDRANTS. A 3' CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE FIRE HYDRANT CONNECTION AND THE FIRE HYDRANT.
4. FIRE HYDRANTS MUST BE LOCATED WITHIN 6' OF THE CURB.
5. NEW HYDRANTS MUST BE AVAILABLE FOR USE PRIOR TO CONSTRUCTION OF THE BUILDINGS.
6. NEW HYDRANTS MUST BE BROUGHT INTO SERVICE PRIOR TO COMBUSTIBLE MATERIALS BEING DELIVERED TO THE JOB SITE.
7. THE CONTRACTOR SHALL MAINTAIN AN ALL WEATHER ACCESS FOR EMERGENCY VEHICLES AT ALL TIMES DURING CONSTRUCTION.
8. TEMPORARY STREET SIGNS SHALL BE INSTALLED AT EACH STREET INTERSECTION WHEN CONSTRUCTION OF NEW ROADWAYS ALLOWS PASSAGE BY VEHICLES.
9. UNDERGROUND FIRE LINE AND PRIVATE WATER MAINS MUST BE PERMITTED AND INSPECTED BY THE WILMINGTON FIRE DEPARTMENT FROM THE PUBLIC RIGHT-OF-WAY TO THE BUILDING. CONTACT THE WILMINGTON FIRE DEPARTMENT DIVISION OF FIRE AND LIFE SAFETY AT 910-343-0696 FOR ADDITIONAL INFORMATION.
10. A MINIMUM OF 5' SHALL SEPARATE UNDERGROUND FIRE LINES OR PRIVATE WATER MAINS FROM OTHER UNDERGROUND UTILITIES.
11. HYDRANTS SHALL BE OF SUFFICIENT NUMBERS TO ACCOMMODATE BASE FIRE FLOW REQUIREMENTS OF THE STRUCTURE.
12. BUILDING CONSTRUCTION TYPE: APARTMENTS V-B

NOTES AND DETAILS
WOODLANDS AT ECHO FARMS
4114 ECHO FARMS BLVD.
WILMINGTON, NC 28412
NEW HANOVER COUNTY

LAND OWNER/APPLICANT
ECHO FARMS, LLC
MATRIX DEVELOPMENT GROUP
64000 FORSGATE DRIVE
CHANDLER, NJ 08512
732-521-2900

NORRIS & TUNSTALL
CONSULTING ENGINEERS P.C.
1429 ASH-LITTLE RIVER RD. NW
WILMINGTON, NC 28401
PHONE (910) 287-5900

Licence #C-3641

16083

DES. JST
CIB. JPN
DRAW. NKS

DATE 1/11/17



C5

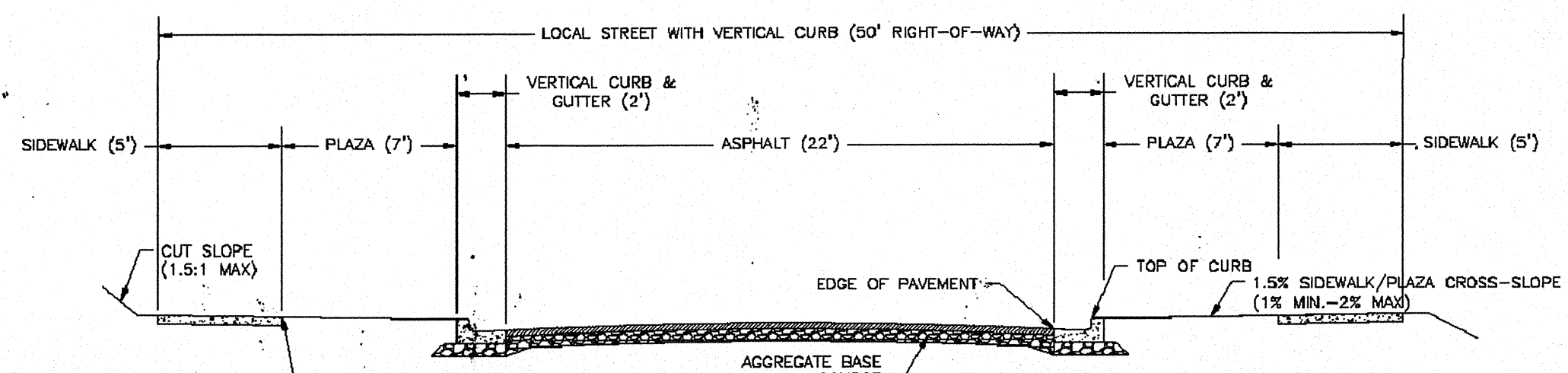
Approved Construction Plan

Name _____ Date _____
Planning _____
Traffic _____
Fire _____

City of WILMINGTON
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
Signed: _____

For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

NCDENR PWSS WATER PERMIT #: _____
WATER CAPACITY: _____ GPD
DWQ SEWER PERMIT #: _____
SEWER CAPACITY: _____ GPD
SEWER SHED # AND PLANT: _____
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

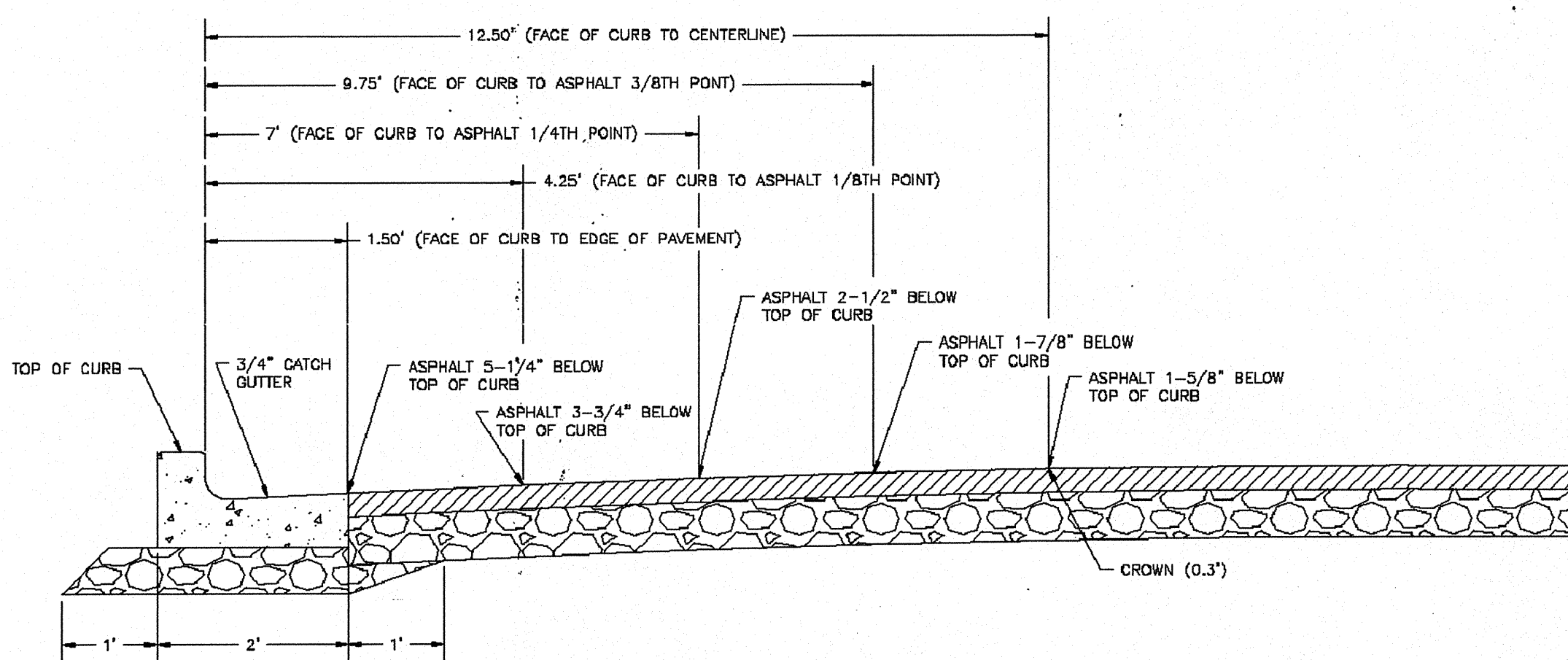


FRONT EDGE OF SIDEWALK APPROX. 1-3/8" ABOVE TOP OF CURB (PREFERRED)

NOTE:
A 10' NON-MUNICIPAL UTILITY EASEMENT SHALL EXIST ALONG ALL PUBLIC RIGHTS-OF-WAY.

NOTES:
LOCAL STREETS SERVE A MAXIMUM OF 50 RESIDENTIAL DWELLING UNITS

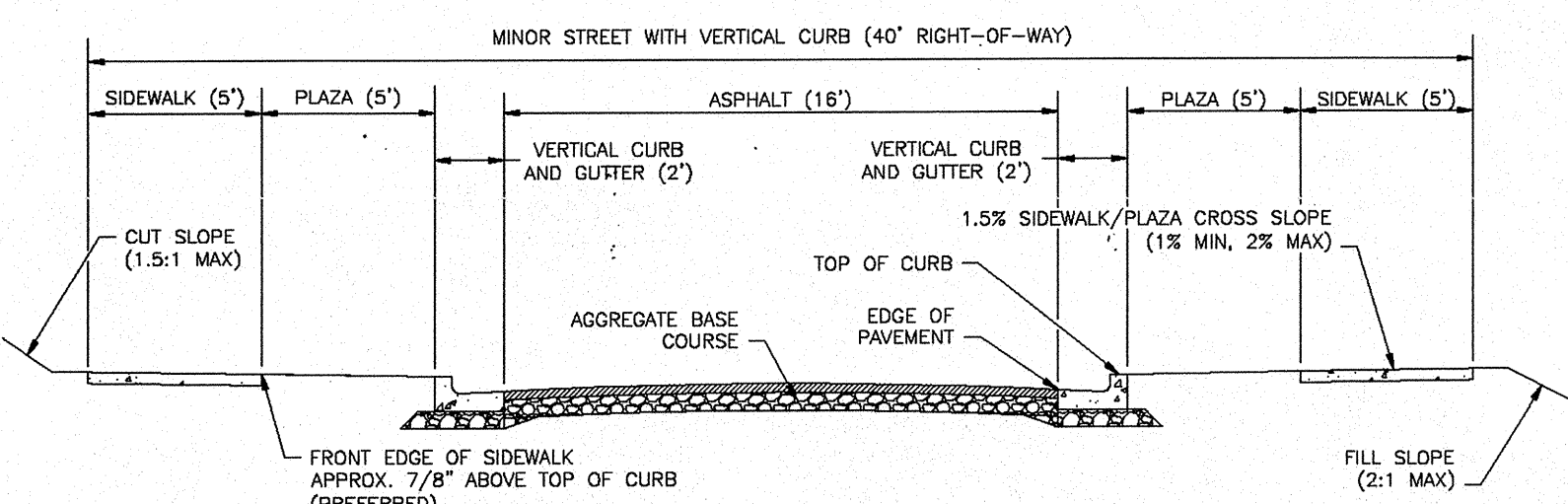
LOCAL STREET WITH VERTICAL CURB SECTION



LOCAL STREET WITH VERTICAL CURB CROWN

NOT TO SCALE

C.O.W. LOCAL STREET WITH VERTICAL CURB DETAIL

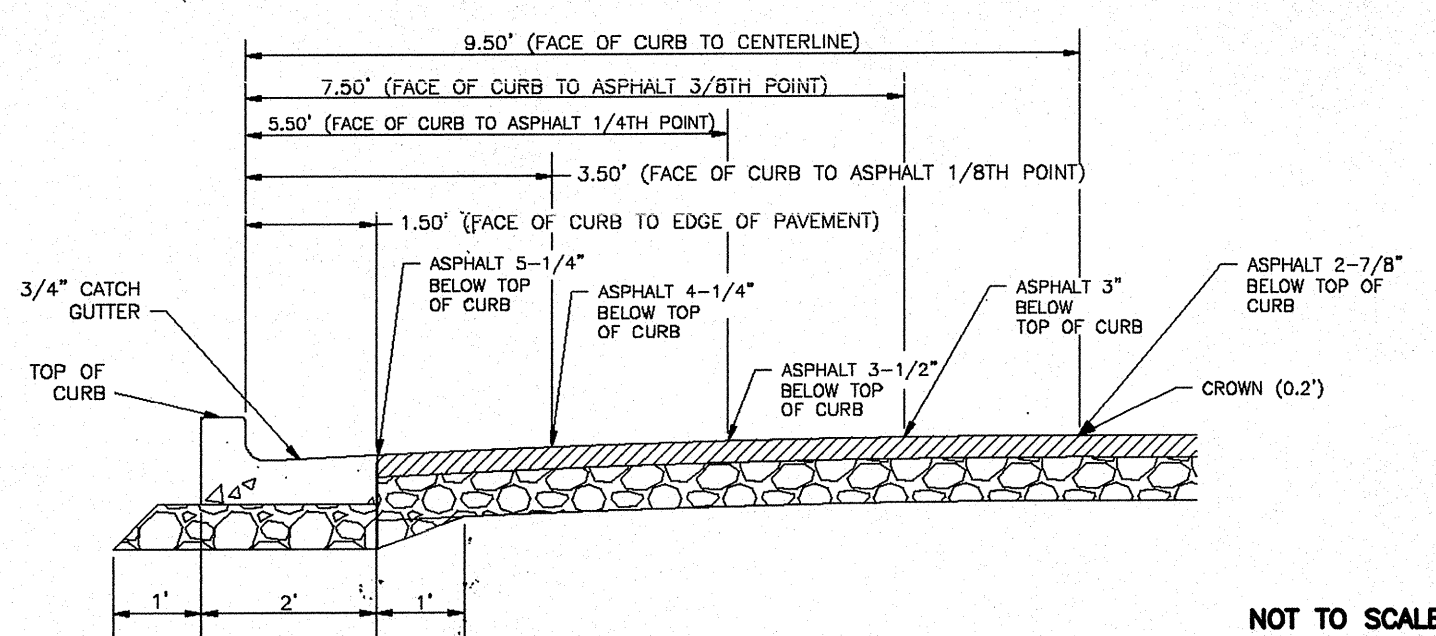


FRONT EDGE OF SIDEWALK APPROX. 7/8" ABOVE TOP OF CURB (PREFERRED)

FILL SLOPE (2:1 MAX)

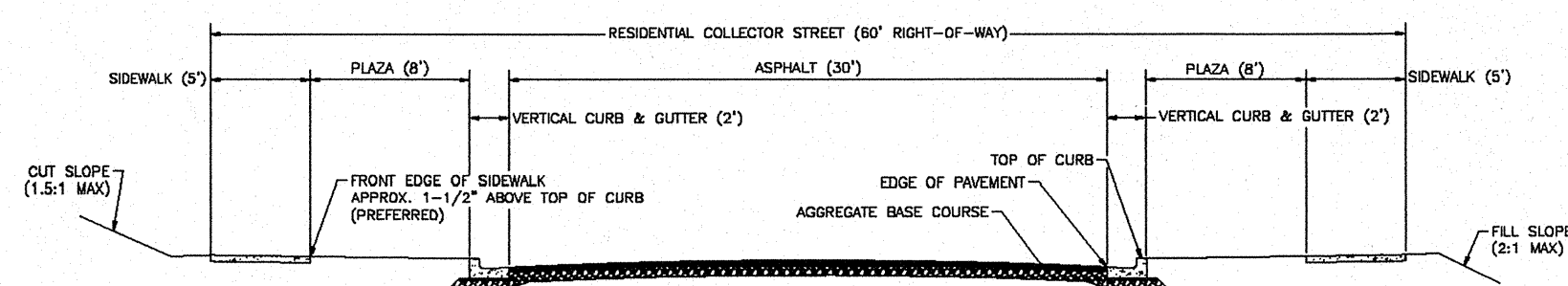
NOTE:
MINOR STREETS SERVE A MAXIMUM OF 15 RESIDENTIAL DWELLING UNITS

MINOR STREET WITH VERTICAL CURB (SECTION)

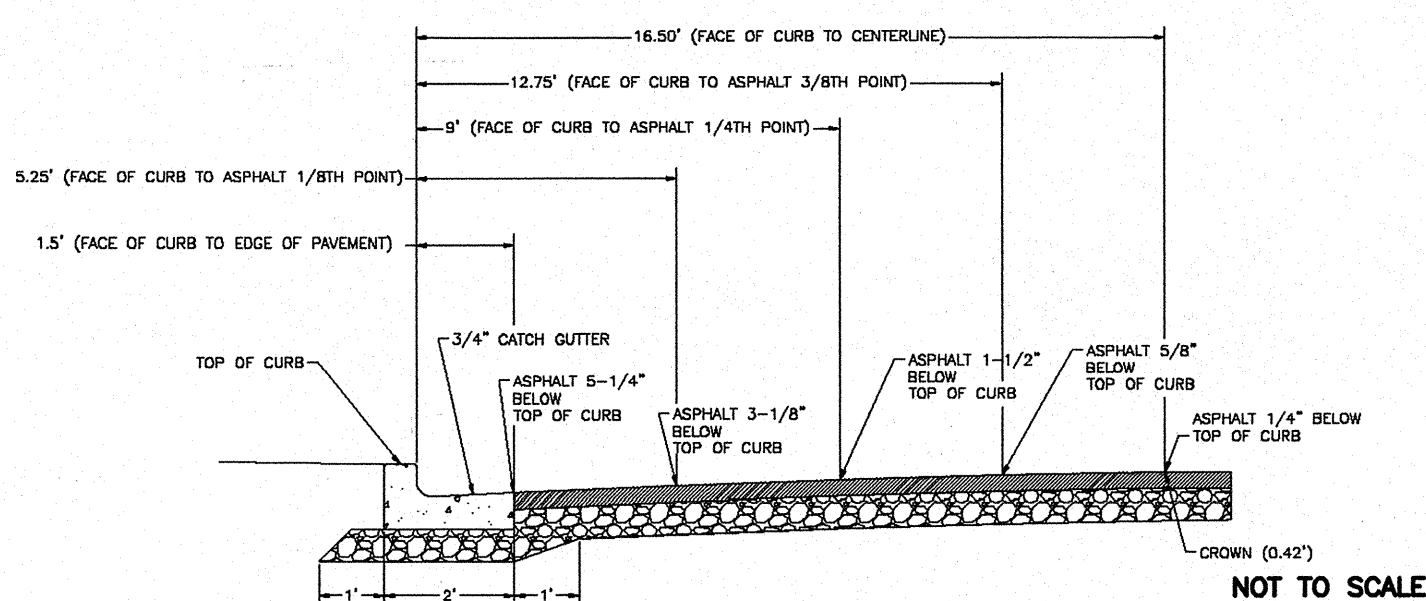


NOT TO SCALE

C.O.W. MINOR STREET WITH VERTICAL CURB DETAIL

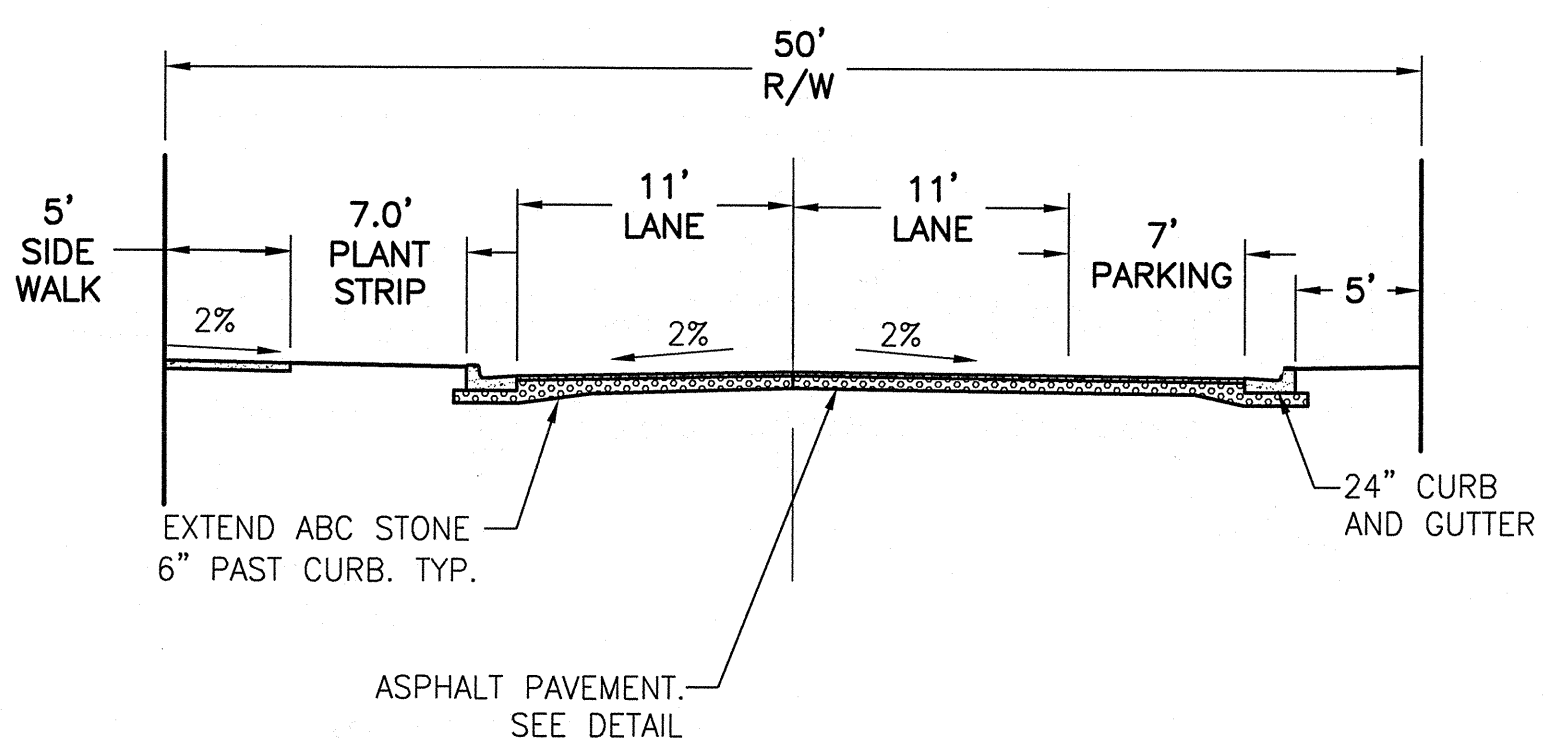


RESIDENTIAL COLLECTOR STREET SECTION



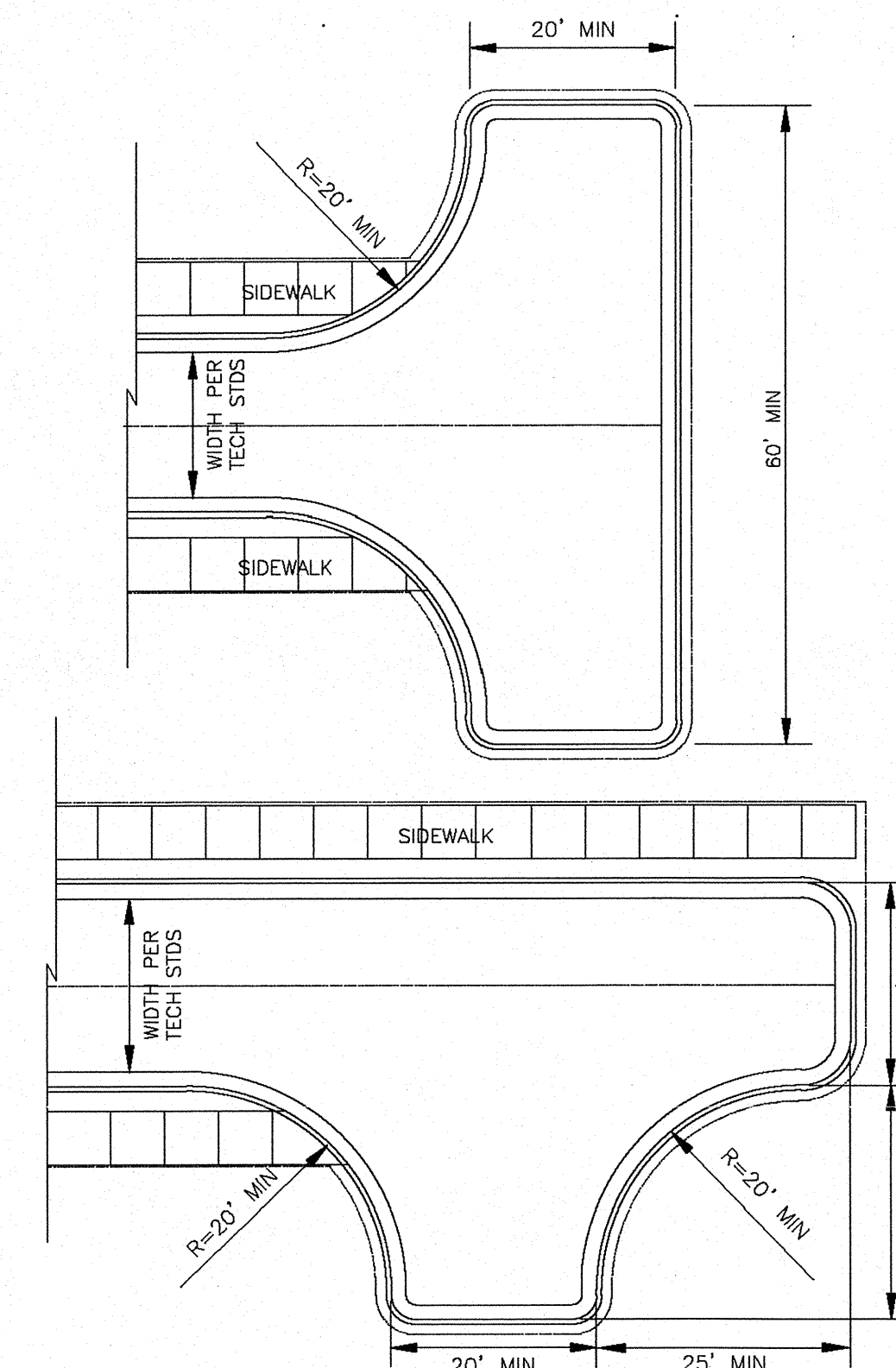
NOT TO SCALE

C.O.W. RESIDENTIAL COLLECTOR STREET WITH VERTICAL CURB DETAIL

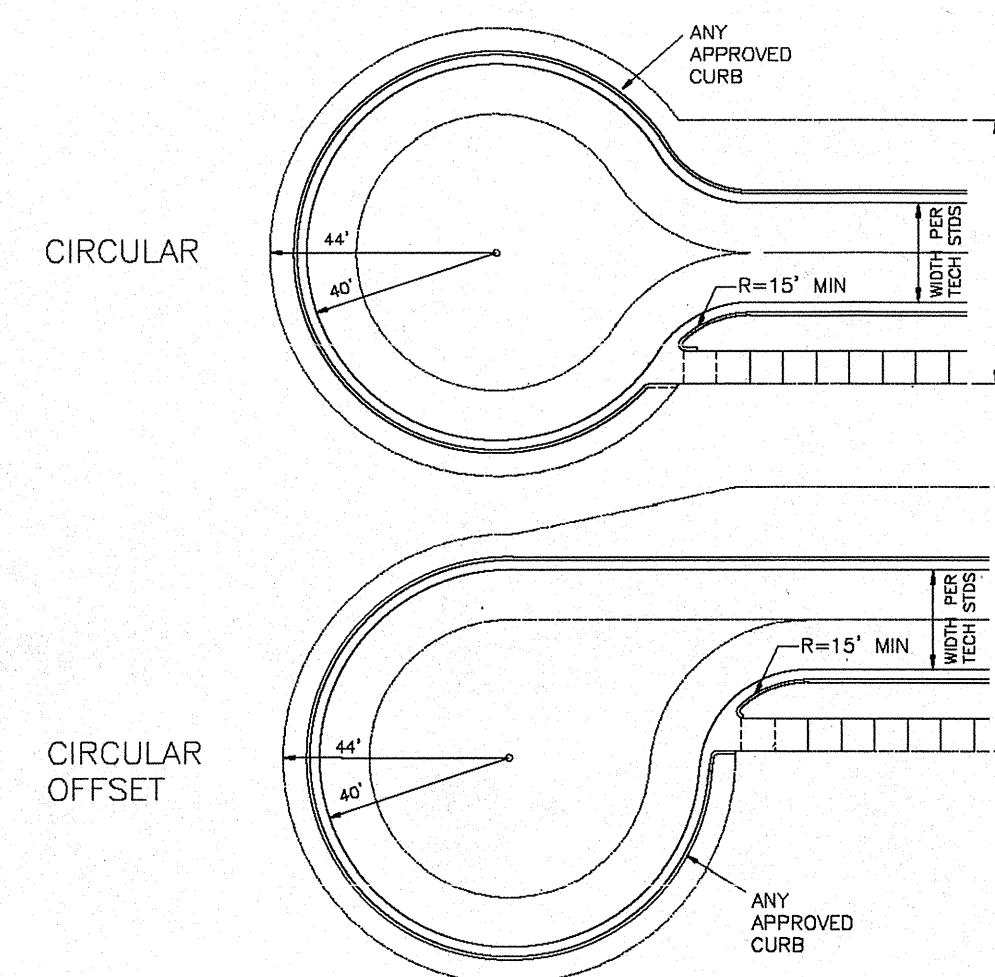


ROAD L WITH ON STREET PARKING SECTION

NTS



C.O.W. TURNAROUNDS DETAIL



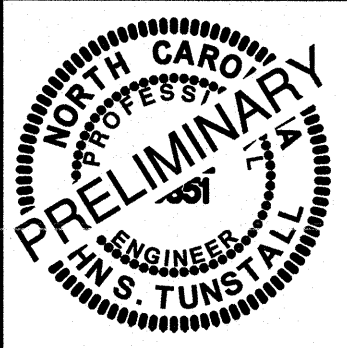
C.O.W. CUL-DE-SAC DETAIL

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C5.1

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