SITE DATA
PROPERTY OWNER: ECHO FARM APARTMENTS, LLC
PROJECT ADDRESS: 4010 CAROLINA BEACH ROAD
PIN NUMBER: R06500-004-001-000 & R06500-004-001-002
ZONING DISTRICT: MF-M
FLOOD AREA: THE TRACT IS NOT WITHIN ANY SPECIAL FLOOD HAZARD BOUNDARY REFERENCE NC FIRM MAP #3720312500J, EFFECTIVE APRIL 1, 2006 (PER PRELIMINARY PLAT-SITE INVENTORY BY WITHERS & RAVENEL, DATED 11/06/06)
MAXIMUM ALLOWABLE BUILDING HEIGHT (BASED ON REQUIRED SETBACK USED): 45'
MAXIMUM PROPOSED BUILDING HEIGHT (AVG. EX. GROUND ELEV. TO HALFWAY BETWEEN HIGHEST PEAK & EAVE): 43.74' (BLDG #6)
BUILDING SETBACKS, REQUIRED (DUE TO BUILDING HEIGHT): FRONT-35', REAR-29', INTERIOR SIDE-24', CORNER LOT SIDE-34'
BUILDING SETBACKS, PROPOSED (MIN.): FRONT-36.65', INTERIOR SIDE-25'
SITE AREA: 475,805 SF = 10.92 ACRES ±
MAXIMUM ALLOWABLE DENSITY: 17 UNITS/ACRE x 10.92 ACRES = 185.64 UNITS, 186 UNITS
TOTAL UNITS: 184 (ONE BEDROOM)
PROPOSED BUILDING AREA (FOOTPRINT; EXCLUDES PORCHES, PATIOS, BALCONIES, & ROOF OVERHANGS): 50,765.56 SF
MAXIMUM ALLOWABLE LOT COVERAGE: 30%
PROPOSED LOT COVERAGE: 50,765.56 / 475,805 x 100% = 10.67%
NUMBER OF PROPOSED BUILDINGS: 10
BUILDING SIZE (AREA & UNITS ARE PER BUILDING):

BUILDING	SQUARE FOOTAGE (1ST STORY)	SQUARE FOOTAGE (2ND STORY)	SQUARE FOOTAGE (3RD STORY)	NUMBER OF UNITS (1 BEDROOM)
1-2	6,034.06	6,034.06	6,034.06	20
3-8	6,034.06	6,034.06	6,034.06	24
CLUBHOUSE	2,013.08	N/A	N/A	N/A
MAINTENANCE	480.00	N/A	N/A	N/A

TOTAL AMOUNT & PERCENT OF IMPERVIOUS SURFACE AREAS ON-SITE:

BEFORE DEVELOPMENT		
	AREA (SF)	% OF SITE
BUILDINGS	5,450	1.15
DRIVEWAY	14,100	2.96
OTHER	954	0.20
TOTAL	20,504	4.31

AFTER DEVELOPMENT				
	EX. (SF)	PROPOSED (SF)	TOTAL (SF)	% OF SITE
BUILDINGS (INCLUDES ROOF OVERHANG)	0	59,296	59,296	12.46
PARKING (CONVENTIONAL)	0	71,700	71,700	15.07
PARKING (PERVIOUS PAVEMENT, 75% CREDIT)	0	10,836	10,836	2.28
SIDEWALK	0	13,628	13,628	2.86
OTHER	0	6,027	6,027	1.27
FUTURE	0	1,350	1,350	0.28
TOTAL	0	162,837	162,837	34.22

OFF STREET PARKING CALCULATIONS (RESIDENTIAL):
MIN. PARKING REQ. = 1.5 SPACES/UNIT x 184 UNITS = 276 SPACES
MAX. PARKING REQ. = 2.5 SPACES/UNIT x 184 UNITS = 460 SPACES
NUMBER OF PROPOSED PARKING SPACES = 297
MIN. NUMBER OF REQ. HANDICAPPED SPACES PER ADA STANDARDS FOR ACCESSIBLE DESIGN = 15
NUMBER OF PROPOSED HANDICAPPED SPACES = 15 SPACES
NUMBER OF REQ. BICYCLE PARKING SPACES = 20
NUMBER OF PROPOSED BICYCLE PARKING SPACES = 24
THE TRACT IS NOT WITHIN ANY SPECIAL HIGHWAY OVERLAY DISTRICT OR ANY OTHER ZONING OVERLAY DISTRICT PER THE CITY OF WILMINGTON ZONING MAPS (MAPS 3125-2 & 3125-4, DATED: MAY 8, 2015)
CAMA LAND USE CLASSIFICATION PER THE 2006 CAMA PLAN UPDATE LAND CLASSIFICATION MAP IS URBAN.

CITY OF WILMINGTON STANDARD NOTES
1. PRIOR TO ANY CLEARING, GRADING OR CONSTRUCTION ACTIVITY, TREE PROTECTION FENCING WILL BE INSTALLED AROUND PROTECTED TREES OR GROVES OF TREES & NO CONSTRUCTION WORKERS, TOOLS, MATERIALS, OR VEHICLES ARE PERMITTED WITHIN THE TREE PROTECTION FENCING.
2. NO LAND DISTURBANCE INCLUDING TREE REMOVAL IS TO OCCUR OUTSIDE THE LIMITS OF DISTURBANCE SHOWN ON THE PLANS.
3. NO EQUIPMENT IS ALLOWED ON THE SITE UNTIL ALL TREE PROTECTION FENCING AND SILT FENCING HAS BEEN INSTALLED & APPROVED.
4. PROTECTIVE TREE FENCING IS TO BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.
5. LAND CLEARING AND CONSTRUCTION CONTRACTORS SHALL RECEIVE ADEQUATE INSTRUCTION ON TREE PROTECTION REQUIREMENTS & METHODS.
6. ALL PAVEMENT MARKINGS IN PUBLIC RIGHTS-OF-WAY & FOR DRIVEWAYS ARE TO BE THERMOPLASTIC & MEET CITY AND/OR NCDOT STANDARDS.
7. 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. CONTACT TRAFFIC ENGINEERING AT 341-7888 TO DISCUSS INSTALLATION OF TRAFFIC AND STREET NAME SIGNS. PROPOSED STREET NAMES MUST BE APPROVED PRIOR TO INSTALLATION OF STREET NAME SIGNS.
8. 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.
9. CALL TRAFFIC ENGINEERING AT 341-7888 TO ENSURE THAT ALL TRAFFIC SIGNAL FACILITIES AND EQUIPMENT ARE SHOWN ON THE PLAN. CALL TRAFFIC ENGINEERING AT 341-7888 FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION IN THE RIGHT OF WAY.
10. ANY BROKEN OR MISSING SIDEWALK PANELS, DRIVEWAY APRON PANELS, OR CURB AND GUTTER SECTIONS SHALL BE REPLACED.
11. CONTACT TRAFFIC ENGINEERING AT 341-7888 TO DISCUSS STREET LIGHTING OPTIONS.
12. PROJECT SHALL COMPLY WITH CFPUA CROSS CONNECTION CONTROL REQUIREMENTS. WATER METER(S) CANNOT BE RELEASED UNTIL ALL REQUIREMENTS ARE MET AND THE STATE HAS GIVEN THEIR FINAL APPROVAL. CALL 332-6558 FOR INFORMATION.
13. IF THE CONTRACTOR DESIRES CFPUA WATER FOR CONSTRUCTION HE SHALL APPLY IN ADVANCE FOR THIS SERVICE & MUST PROVIDE A REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTION DEVICE ON THE DEVELOPER'S SIDE OF THE WATER METER BOX.
14. ANY IRRIGATION SYSTEM SUPPLIED BY CFPUA WATER SHALL COMPLY WITH THE CFPUA CROSS CONNECTION CONTROL REGULATIONS. CALL 332-6558 FOR INFORMATION.
15. ANY BACKFLOW PREVENTION DEVICES REQUIRED BY CFPUA WILL NEED TO BE ON THE LIST OF APPROVED DEVICES BY USCFCCCHR OR ASSE.
16. ALL TRAFFIC CONTROL SIGNS & MARKINGS OFF THE RIGHT-OF-WAY ARE TO BE MAINTAINED BY THE PROPERTY OWNER IN ACCORDANCE WITH MUTCD STANDARDS.
17. ALL PAVEMENT MARKINGS REGULATING TRAFFIC FLOW MUST BE THERMOPLASTIC.
18. A UTILITY CUT PERMIT IS REQUIRED FOR EACH OPEN CUT OF A CITY STREET (CONTACT 341-5888 FOR MORE DETAILS). IN CERTAIN CASES, AN ENTIRE RESURFACING OF THE AREA BEING OPEN CUT MAY BE REQUIRED.
19. TRAFFIC ENGINEERING MUST APPROVE OF PAVEMENT MARKING LAYOUT PRIOR TO ACTUAL STRIPING.
20. A LANDSCAPING PLAN INDICATING THE LOCATION OF REQUIRED STREET TREES SHALL BE SUBMITTED TO THE CITY OF WILMINGTON TRAFFIC ENGINEERING DIVISION AND PARKS AND RECREATION DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO THE RECORDING OF THE FINAL PLAT.
21. CONTACT THE NORTH CAROLINA ONE CALL CENTER PRIOR TO DOING ANY DIGGING. 1-800-632-4949.
22. ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
23. INSTALL REFLECTORS PER CITY AND NCDOT STANDARDS.

FIRE AND LIFE SAFETY NOTES
1. PARKING AND LANDSCAPING CANNOT BLOCK FIRE HYDRANTS OR FDC'S. A 3-FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE HYDRANT AND FDC.
2. FIRE HYDRANTS CANNOT BE FURTHER THAN 8' FROM THE CURB.
3. NEW HYDRANTS MUST BE BROUGHT INTO SERVICE PRIOR TO COMBUSTIBLE MATERIALS BEING DELIVERED TO THE JOB SITE.
4. ALL WEATHER ACCESS ROAD MUST BE MAINTAINED AROUND CONSTRUCTION SITE AT ALL TIMES.
5. PRIVATE UNDERGROUND FIRE LINES REQUIRE A SEPARATE UNDERGROUND FIRE LINE PERMIT FROM THE WILMINGTON FIRE & LIFE SAFETY DIVISION AT 910-343-0696.
6. A MINIMUM OF 5' SHALL SEPARATE UNDERGROUND FIRE LINES OR PRIVATE WATER MAINS FROM OTHER UNDERGROUND UTILITIES.
7. FDC'S CAN BE NO FURTHER THAN 150' FROM A FIRE HYDRANT.
8. FDC'S CAN BE NO FURTHER THAN 40' FROM FIRE DEPARTMENT VEHICLE PLACEMENT.
9. BUILDING CONSTRUCTION TYPE ACCORDING TO THE INTERNATIONAL BUILDING CODE IS V-B.
10. TAMPER SWITCHES SHALL BE INSTALLED ON ALL VALVES THAT ARE CAPABLE OF TURNING THE WATER SUPPLY OFF TO THE SPRINKLER SYSTEMS.

SITE INVENTORY NOTES
1. SOIL TYPES: Jo (JOHNSTON), Le (LEON), Ly (LYNN HAVEN), & Kr (KUREB).
2. THIS SITE IS NOT LOCATED WITHIN A CAMA AEC (PER ECS CAROLINAS, LLP).
3. A 25' CONSERVATION SETBACK IS REQUIRED FROM THE WETLANDS WHICH IS CONSIDERED SWAMP FOREST (PER ECS CAROLINAS, LLP).
4. THIS SITE IS NOT RECOGNIZED AS A LOCAL, STATE OR FEDERALLY HISTORIC OR ARCHEOLOGICAL SITE (PER ECS CAROLINAS, LLP).
5. NO CEMETERIES, BURIAL SITES, OR BURIAL GROUNDS LOCATED ON THE SITE (PER ECS CAROLINAS, LLP).
6. WETLANDS DELINEATED BY ECS CAROLINAS, LLP (SEE EXISTING CONDITIONS MAP).
7. THE PROJECT WILL NOT ADVERSELY AFFECT THREATENED OR ENDANGERED SPECIES (OPINION PER ECS CAROLINAS, LLP). ECS CAROLINAS, LLP OBSERVED SUMMER HABITAT FOR THE NORTHERN LONG-EARED BAT ON THE SITE AND RECOMMENDS ANY PROPOSED CLEARING FOR THE SITE BE CONDUCTED DURING THE WINTER MONTHS.
8. EXISTING VEGETATION HAS BEEN LOCATED AND IS LABELED (SEE EXISTING CONDITIONS MAP).
9. THE SITE IS NOT LOCATED WITHIN THE 100-YEAR FLOOD PLAIN (PER ECS CAROLINAS, LLP).
10. SEE EXISTING CONDITIONS MAP & SITE PLAN FOR PRESENCE OR NON-PRESENCE OF EXISTING OR PROPOSED THOROUGHFARES, BIKE ROUTES, PEDESTRIAN SIDEWALKS, OR TRAILS & TRANSIT FACILITIES.
11. THE TRACT IS WITHIN THE CAPE FEAR RIVER BASIN & DRAINS TO BARNARDS CREEK (C;Sw).
12. THE SITE IS CLASSIFIED AS URBAN PER THE CAMA LAND CLASSIFICATION WITH AN OFF-SITE CONSERVATION AREA LOCATED TO THE NORTHWEST OF THE SITE (PER ECS CAROLINAS, LLP).

LIST OF CONDITIONS AS APPROVED BY THE PLANNING COMMISSION ON 2/3/16
1. THE USE & DEVELOPMENT OF THE SUBJECT PROPERTY SHALL COMPLY WITH ALL REGULATIONS & REQUIREMENTS IMPOSED BY THE LAND DEVELOPMENT CODE, THE CITY OF WILMINGTON TECHNICAL STANDARDS & SPECIFICATIONS MANUAL & ANY OTHER APPLICABLE FEDERAL, STATE OR LOCAL LAW, ORDINANCE OR REGULATION, AS WELL AS ANY CONDITION STATED BELOW. IN THE EVENT OF A CONFLICT, THE MORE STRINGENT REQUIREMENT OR HIGHER STANDARD SHALL APPLY.
2. APPROVAL OF THIS PRELIMINARY PLAN DOES NOT CONSTITUTE TECHNICAL APPROVAL OF THE SITE PLAN. FINAL APPROVAL BY THE TECHNICAL REVIEW COMMITTEE & THE ISSUANCE OF ALL REQUIRED PERMITS MUST OCCUR PRIOR TO RELEASE OF THE PROJECT FOR CONSTRUCTION.
3. IF, FOR ANY REASON, ANY CONDITION FOR APPROVAL IS FOUND TO BE ILLEGAL OR INVALID OR IF THE APPLICANT SHOULD FAIL TO ACCEPT ANY CONDITION FOLLOWING APPROVAL, THE APPROVAL OF THE SITE PLAN FOR THE DISTRICT SHALL BE NULL & VOID & OF NO EFFECT & PROCEEDINGS SHALL BE INSTITUTED TO REZONE THE PROPERTY TO ITS PREVIOUS ZONING CLASSIFICATION.
4. THE USE & DEVELOPMENT OF THE SUBJECT PROPERTY SHALL BE IN ACCORDANCE WITH THE PRELIMINARY PLAN AS SUBMITTED OCTOBER 13, 2015 & APPROVED.
5. THE USE OF PINE STRAW AS GROUND COVER SHALL BE PROHIBITED WITHIN 10 FEET OF ANY PROPOSED COMBUSTIBLE EXTERIOR CONSTRUCTION.
6. ALL EXISTING & PROPOSED PUBLIC & NON-MUNICIPAL EASEMENTS SHALL BE ADDED TO THE PRELIMINARY PLAN AS NECESSARY.
7. ALL CONSTRUCTION TRAFFIC ASSOCIATED WITH THE SITE SHALL ACCESS THE SITE FROM ECHO FARMS BOULEVARD.
8. REQUIREMENTS OF THE APPROVED TRAFFIC IMPACT ANALYSIS (TIA) MUST BE COMPLETED PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
9. THE REQUIRED SIDEWALK ALONG THE CAROLINA BEACH ROAD FRONTAGE SHALL BE WAIVED & AN EQUAL AMOUNT OF SIDEWALK, BASED ON AN APPROVED COST ESTIMATE, SHALL BE PROVIDED ALONG ECHO FARMS BOULEVARD WHICH CONNECTS THE SUBJECT SITE TO THE EXISTING SIDEWALK NETWORK.

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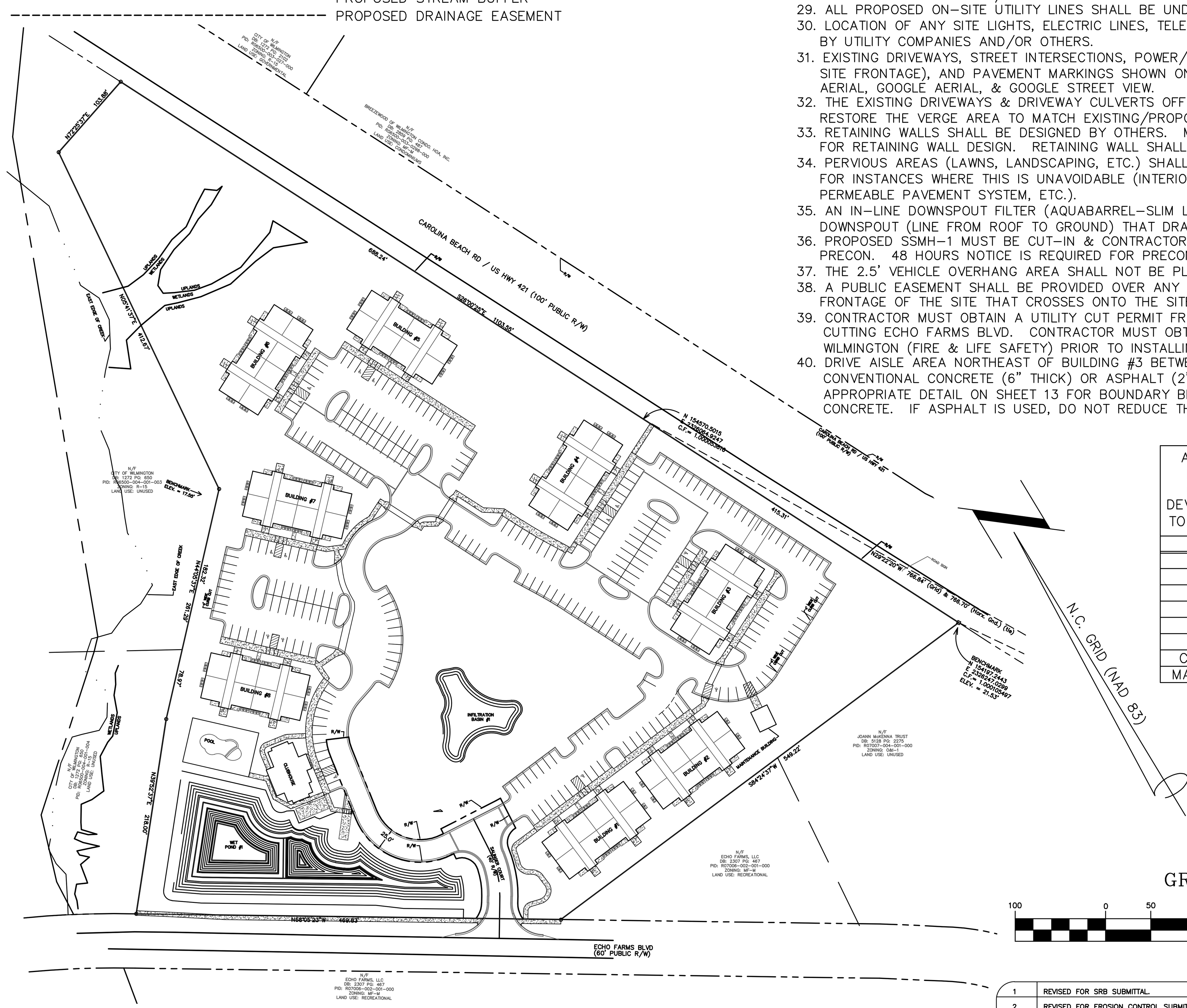
LEGEND
- EXISTING IRON
- CONC. MONUMNET (CONTROL POINT)
- BOUNDARY LINE
- R/W LINE
- ADJACENT PROPERTY LINE
- EXISTING SANITARY SEWER LINE (APPROX. LOCATION)
- EXISTING WATER LINE (APPROX. LOCATION)
- EXISTING CONTOUR
- EX. F/H — EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING POWER POLE WITH GUY WIRE
- EXISTING POWER POLE
- EXISTING OVERHEAD ELECTRIC LINE
- PROPOSED SANITARY SEWER LINE
- PROPOSED WATER LINE
- F/H — PROPOSED FIRE HYDRANT ASSEMBLY
- G.V. — PROPOSED GATE VALVE
- B.O. — PROPOSED BLOWOFF
- C.O. — PROPOSED SANITARY SEWER CLEANOUT
- S.C. — PROPOSED SANITARY SEWER SAMPLING CHAMBER
- PROPOSED STORM DRAIN
- PROPOSED DROP INLET (DI)
- PROPOSED CATCH BASIN (CB)
- PROPOSED STORM DRAIN MANHOLE (SDMH)
- PROPOSED INLET PROTECTION
- PROPOSED SETBACK
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED SILT FENCE
- PROPOSED SIDEWALK
- 20.82 — PROPOSED SPOT ELEVATION
- 27.09 — APPROX. EX. SPOT ELEVATION AT BUILDING CORNER
- PROPOSED STREET YARD
- CE — PROPOSED CONSTRUCTION ENTRANCE
- 21 — PROPOSED CONTOUR
- PROPOSED TREE PROTECTION FENCE
- PROPOSED BUFFER
- PROPOSED PERVIOUS CONCRETE
- PROPOSED FOUNDATION PLANTING AREA
- PROPOSED SWALE
- PROPOSED CONSERVATION SETBACK
- PROPOSED STREAM BUFFER
- PROPOSED DRAINAGE EASEMENT

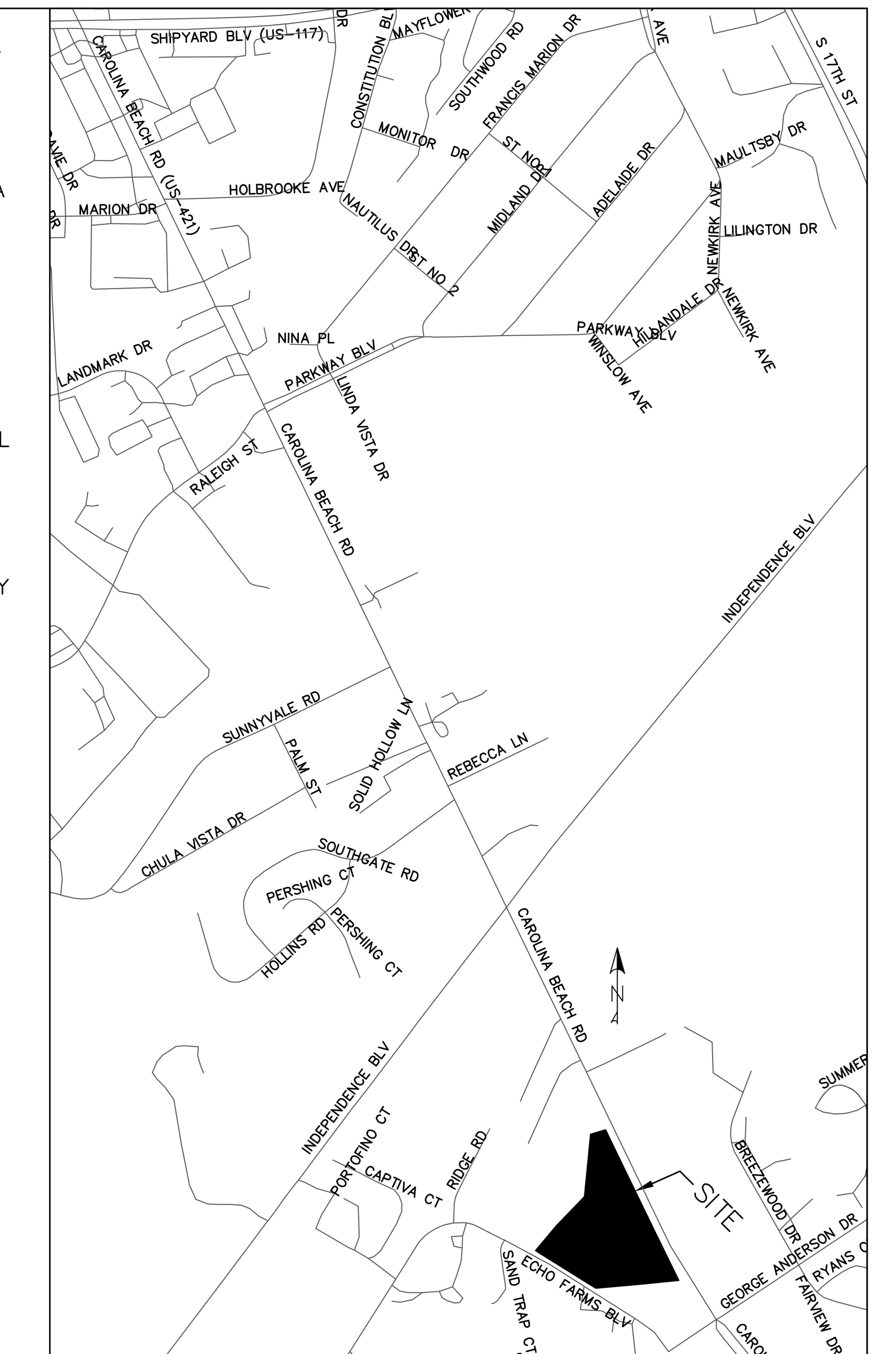


WATER & SEWER CAPACITY	
EXISTING WATER CAPACITY:	2 HOUSES x 400 GPD/HOUSE = 800 GPD
EXISTING SEWER CAPACITY:	2 HOUSES X 360 GPD/HOUSE = 720 GPD
PROPOSED WATER CAPACITY:	184 UNITS x 400 GPD/UNIT + 50 PEOPLE x 10 GPD/PERSON = 74,100 GPD
PROPOSED SEWER CAPACITY:	184 UNITS x 240 GPD/UNIT + 50 PEOPLE x 10 GPD/PERSON = 44,660 GPD

TOTAL LENGTH OF PUBLIC SANITARY SEWER MAIN = 46.32 LF
TOTAL LENGTH OF PRIVATE SANITARY SEWER MAIN = 692.07 LF
TOTAL LENGTH OF PUBLIC WATER MAIN (DOMESTIC & FIRE LINE) = 38 LF
TOTAL LENGTH OF PRIVATE WATER LINE (DOMESTIC & FIRE LINE; INCLUDING LINES TO EACH BUILDING) = 4,354 LF

PRELIMINARY PLAT
NOT FOR RECORDATION, CONVEYANCES, OR SALES

NOTES
1. BOUNDARY & TOPOGRAPHICAL SURVEY BY BATEMAN CIVIL SURVEY COMPANY, 200 N. MAIN STREET, HOLLY SPRINGS, NC 27540, PHONE: 919-577-1080.
2. ALL ELEVATIONS ARE IN FEET UNLESS OTHERWISE INDICATED.
3. ALL CITY, STATE, & FEDERAL REGULATIONS SHALL BE FOLLOWED.
4. PRIOR TO INSTALLATION OF WATER OR SANITARY SEWER MAINS CONTRACTOR SHALL NOTIFY THE ENGINEER WITH MALPASS ENGINEERING & SURVEYING, P.C. AT 910-392-5243.
5. EXISTING SANITARY SEWER MAINS ARE OWNED BY CFPUA. PROPOSED PVC SANITARY SEWER MAINS SHALL BE AWWA C900 CLASS 150 (DR-18) UNLESS OTHERWISE INDICATED. PROPOSED DIP SANITARY SEWER MAINS SHALL CONFORM TO AWWA C151 CLASS 350 AND LINED WITH PROTECTO 401.
6. EXISTING WATER MAINS ARE OWNED BY CFPUA. PROPOSED PVC WATER MAINS SHALL BE AWWA C900 CLASS 150 (DR-18) UNLESS OTHERWISE INDICATED. PROPOSED DIP WATER MAINS SHALL CONFORM TO AWWA C150 PRESSURE CLASS 350.
7. DOMESTIC WATER MAIN SHALL BE PUBLIC FROM THE EXISTING WATER MAIN IN ECHO FARMS BLVD THROUGH THE WATER METER & PRIVATE AFTER THE WATER METER. FIRE LINE SHALL BE PUBLIC FROM THE EXISTING WATER MAIN IN ECHO FARMS BLVD TO THE BACKFLOW PREVENTER & PRIVATE BEGINNING AT THE BACKFLOW PREVENTER.
8. PROPOSED SANITARY SEWER MAINS SHALL BE 8" & PROPOSED SEWER SERVICES SHALL BE 6". PROPOSED SEWER ON SITE & ON ADJACENT CITY PROPERTY SHALL BE PRIVATE, & PROPOSED SEWER WITHIN ECHO FARMS BLVD SHALL BE PUBLIC.
9. PROPOSED WATER & FIRE LINES SIZES PER PLAN. PROPOSED WATER & FIRE LINES ON SITE SHALL BE PRIVATE & PROPOSED WATER & FIRE LINES OFF-SITE SHALL BE PUBLIC.
10. LIMITS OF DISTURBANCE = 419,416 SF = 9.63 ACRES.
11. DISTURBED AREAS WITHIN ADJACENT RIGHTS-OF-WAY (EXCEPT FOR SWALES #1 & 2) & ON ADJACENT CITY OF WILMINGTON PROPERTY SHALL BE IMMEDIATELY SEEDED & STABILIZED WITH MULCH OR EXCELSIOR MAT PRIOR TO ANY RAINFALL EVENT. SEE SWALE #1 & 2 DETAILS FOR SEEDING & STABILIZATION OF SWALES #1 & 2.
12. UPON COMPLETION OF ANY PHASE OF ACTIVITY SIDE SLOPES WILL BE SEEDED/STABILIZED IN ACCORDANCE WITH GROUND STABILIZATION CHART ON SHEET 11.
13. SLOPE ON HANDICAP SPACES SHALL BE 1:50 OR FLATTER.
14. PROPOSED OFF-SITE IMPERVIOUS SURFACE AREA IS 3,438 SF.
15. TACTILE WARNING MATS ARE TO BE INSTALLED ON ALL WHEELCHAIR (HANDICAP) RAMPS.
16. ANYTHING WITHIN THE SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30"-10'.
17. ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
18. ALL DEVELOPMENT SHALL BE IN ACCORDANCE WITH THE CITY OF WILMINGTON LAND DEVELOPMENT CODE & TECHNICAL STANDARDS MANUAL, EXCEPT WHERE EXEMPTED OR VARIANCES ARE OBTAINED.
19. THE PROPOSED CURB IS 4" MEDIAN VERTICAL CURB & GUTTER, 4" VERTICAL CURB & GUTTER, VALLEY CURB, & REVERSE VALLEY CURB (SD 3-11).
20. IT IS THE APPLICANT'S/DEVELOPER'S RESPONSIBILITY TO BE COMPLIANT WITH ALL APPLICABLE ADA REQUIREMENTS.
21. ALL PLANTED & RETAINED LIVING MATERIAL REQUIRED TO MEET THE PROVISIONS OF THE CITY OF WILMINGTON LAND DEVELOPMENT CODE, SHALL BE PERPETUALLY PROTECTED & MAINTAINED TO PROFESSIONALLY ACCEPTED STANDARDS BY JOINT & SEVERAL RESPONSIBILITY OF THE OWNER, OCCUPANT, TENANT, & RESPECTIVE AGENTS OF THE PROPERTY ON WHICH THE MATERIAL IS LOCATED.
22. STORM DRAIN MANHOLES, CATCH BASINS, & DROP INLETS SHALL BE SIZED APPROPRIATELY TO ACCOMMODATE OVERSIZED PIPES AND FRAME & GRATE.
23. ALL DROP INLETS TO HAVE HEAVY DUTY 2'x3' FRAME & GRATE (GENERAL FOUNDRIES INC., ITEM #24364 OR EQUIVALENT).
24. NO PIPE JOINTS SHALL BE INSIDE ANY INTERFERENCE MANHOLE.
25. A RECORDED DRAINAGE EASEMENT SHALL BE PROVIDED FOR WET POND #1 & INFILTRATION BASIN #1 INCLUDING ACCESS TO THE NEAREST RIGHT-OF-WAY.
26. BUILDING RUNOFF SHALL BE DIRECTED TO DRAIN TO APPROPRIATE LOCATION (SEE SHEETS 13 & 14). USE DOWNSPOUT PIPING AS NECESSARY. DOWNSPOUT PIPING SHALL BE DESIGNED BY OTHERS. MAXIMUM ALLOWABLE ROOF AREA PER DOWNSPOUT PIPING DISCHARGE POINT INTO PERMEABLE PAVEMENT SYSTEM IS 1,000 SF.
27. DURING CONSTRUCTION WET POND #1 WILL SERVE AS A SEDIMENT BASIN. A FAIRCLOTH SKIMMER SHALL BE INSTALLED & CONNECTED TO THE OUTLET STRUCTURE (SEE SKIMMER DETAIL & CHART FOR SKIMMER & ORIFICE SIZE). THE FAIRCLOTH SKIMMER IS TEMPORARY. ONCE THE ENTIRE AREA DRAINING TO THE POND HAS BEEN STABILIZED THE SKIMMER SHALL BE REMOVED & THE ORIFICE PIPE (SEE POND DETAIL & CHART FOR SIZE) SHALL BE INSTALLED.
28. A MINIMUM COVER OF 2 FEET FROM TOP OF PIPE TO BOTTOM OF STONE SHALL BE PROVIDED OVER STORM DRAIN PIPE UNDER THE PARKING/DRIVE AISLES & PRIVATE STREET UNLESS CLASS IV RCP IS USED.
29. ALL PROPOSED ON-SITE UTILITY LINES SHALL BE UNDERGROUND.
30. LOCATION OF ANY SITE LIGHTS, ELECTRIC LINES, TELEPHONE LINES, AND/OR NATURAL GAS LINES TO BE DETERMINED BY UTILITY COMPANIES AND/OR OTHERS.
31. EXISTING DRIVEWAYS, STREET INTERSECTIONS, POWER/TRAFFIC SIGNAL POLES & OVERHEAD WIRES (EXCEPT ALONG SITE FRONTAGE), AND PAVEMENT MARKINGS SHOWN ON PLAN WERE TRACED/APPROXIMATED FROM NHC GIS 2010 AERIAL, GOOGLE AERIAL, & GOOGLE STREET VIEW.
32. THE EXISTING DRIVEWAYS & DRIVEWAY CULVERTS OFF CAROLINA BEACH ROAD TO THE SITE SHALL BE REMOVED. RESTORE THE VERGE AREA TO MATCH EXISTING/PROPOSED.
33. RETAINING WALLS SHALL BE DESIGNED BY OTHERS. MALPASS ENGINEERING & SURVEYING, P.C. IS NOT RESPONSIBLE FOR RETAINING WALL DESIGN. RETAINING WALL SHALL BE CONSTRUCTED OF KEYSTONE BLOCK.
34. PERVIOUS AREAS (LAWNS, LANDSCAPING, ETC.) SHALL NOT DRAIN TO THE PERMEABLE PAVEMENT SYSTEMS EXCEPT FOR INSTANCES WHERE THIS IS UNAVOIDABLE (INTERIOR PARKING LOT ISLAND, AREA BETWEEN BUILDING & PERMEABLE PAVEMENT SYSTEM, ETC.).
35. AN IN-LINE DOWNSPOUT FILTER (AQUABARREL-SLIM LINE, OR SIMILAR) MUST BE INSTALLED ON EVERY ROOF DOWNSPOUT (LINE FROM ROOF TO GROUND) THAT DRAINS TO A PERMEABLE PAVEMENT SYSTEM.
36. PROPOSED SSMH-1 MUST BE CUT-IN & CONTRACTOR MUST PROVIDE A BYPASS PLAN TO THE CFPUA PRIOR TO THE PRECON. 48 HOURS NOTICE IS REQUIRED FOR PRECON.
37. THE 2.5' VEHICLE OVERHANG AREA SHALL NOT BE PLANTED WITH SHRUBS.
38. A PUBLIC EASEMENT SHALL BE PROVIDED OVER ANY PORTION OF THE PROPOSED 5' WIDE SIDEWALK ALONG THE FRONTAGE OF THE SITE THAT CROSSES ONTO THE SITE.
39. CONTRACTOR MUST OBTAIN A UTILITY CUT PERMIT FROM THE CITY OF WILMINGTON (ENGINEERING) PRIOR TO OPEN CUTTING ECHO FARMS BLVD. CONTRACTOR MUST OBTAIN AN UNDERGROUND FIRE LINE PERMIT FROM THE CITY OF WILMINGTON (FIRE & LIFE SAFETY) PRIOR TO INSTALLING THE FIRE LINE.
40. DRIVE AISLE AREA NORTHEAST OF BUILDING #3 BETWEEN PERMEABLE PAVEMENTS SYSTEMS SHALL BE EITHER CONVENTIONAL CONCRETE (6" THICK) OR ASPHALT (2" SF9.5A ASPHALT OVER 6" COMPACTED ABC STONE). USE APPROPRIATE DETAIL ON SHEET 13 FOR BOUNDARY BETWEEN ASPHALT/CONVENTION CONCRETE & PERVIOUS CONCRETE. IF ASPHALT IS USED, DO NOT REDUCE THE PERVIOUS CONCRETE AREAS TO PROVIDE CONCRETE CURB.



VICINITY MAP
SCALE: 1"=1,000'

SHEET INDEX	
1	COVER SHEET
2	EXISTING PROTECTED TREES CHART
3	EXISTING CONDITIONS & DEMOLITION PLAN
4	EXISTING CONDITIONS & DEMOLITION PLAN
5	SITE INVENTORY
6	SITE INVENTORY
7	SITE PLAN
8	SITE PLAN
9	EROSION CONTROL, STORMWATER, & UTILITY PLAN
10	EROSION CONTROL, STORMWATER, & UTILITY PLAN
11	EROSION CONTROL & STORMWATER DETAIL SHEET
12	EROSION CONTROL & STORMWATER DETAIL SHEET
13	STORMWATER DETAIL SHEET
14	DRAINAGE AREA MAP
15	DETAIL SHEET
16	DETAIL SHEET
17	PLAN PROFILE
18	SANITARY SEWER DETAIL SHEET
19	SANITARY SEWER DETAIL SHEET
20	SANITARY SEWER DETAIL SHEET
21	WATER DETAIL SHEET
22	WATER DETAIL SHEET
L-1	TREE MITIGATION PLAN
L-2	TREE MITIGATION PLAN

APPROXIMATE FINISHED FLOOR ELEVATION (CONTRACTOR TO CONSULT WITH ARCHITECT & DEVELOPER REGARDING FFE PRIOR TO CONSTRUCTING BUILDING PAD)	
BUILDING	FFE (FEET)
1	23.96
2	27.30
3-4	28.67
5-6	27.73
7	21.79
8	17.43
CLUBHOUSE	16.58
MAINTENANCE	28.28

NOTE WELL
DEVELOPER TO PROVIDE SIDEWALK ALONG ECHO FARMS BLVD, IN ADDITION TO PROPOSED FRONTAGE SIDEWALK, IN LIEU OF PROVIDING FRONTAGE SIDEWALK ALONG CAROLINA BEACH ROAD PER PLANNING COMMISSION CONDITIONAL APPROVAL.

OPEN SPACE
TOP OF STORMWATER POND AREA = 21932, SF
REQUIRED OPEN SPACE = 0.35 * (475,805 - 21,932) = 158,856 SF = 3.65 ACRES
PROVIDED OPEN SPACE (INCLUDES ACTIVE & PASSIVE RECREATION AREA) = 160,022 SF = 3.67 ACRES
REQUIRED ACTIVE OR PASSIVE RECREATION AREA = 0.5 * 158,856 = 79,428 SF = 1.82 ACRES
PROVIDED ACTIVE RECREATION AREA = 6,113 SF = 0.14 ACRES
PROVIDED PASSIVE RECREATION AREA = 80,468 SF = 1.85 ACRES
PROVIDED TOTAL RECREATION AREA = 86,581 SF = 1.99 ACRES

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 Construction Plan
Name Date
Planning________________
Traffic________________
Fire________________

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

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

REV NO.	DESCRIPTION	DATE
1	REVISED FOR SRB SUBMITTAL.	9-2-15
2	REVISED FOR EROSION CONTROL SUBMITTAL.	10-1-15
3	REVISED TO SHOW PRIVATE STREET.	10-12-15
4	REVISED FOR PRELIMINARY BID.	10-16-15
5	REVISED FOR SUBMITTAL.	10-23-15
6	REVISED PER EROSION CONTROL COMMENTS.	11-3-15
7	REVISED PER TRC COMMENTS.	11-19-15
8	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11-24-15
9	REVISED TO ADJUST NOTES #9-12 & 26, PROVIDE SIDEWALK ALONG CAROLINA BEACH RD, & ADD FINISHED FLOOR ELEVATION CHART.	12-14-15
10	REVISED PER CITY.	2-9-16
11	REVISED PER CITY.	2-18-16
12	REVISED TO ADJUST PARKING NORTH OF BUILDING #2, CLUBHOUSE, MAIL KIOSK, SIDEWALK AROUND CLUBHOUSE, & SITE DATA TABLE.	8-24-16
13	REVISED TO ADJUST IMPERVIOUS AREAS IN SITE DATA TABLE, MAIL KIOSK & WET POND.	9-9-16

REVISIONS

COVER SHEET
4010 CAROLINA BEACH ROAD
ECHO FARM APARTMENTS
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
Fax 910-392-5203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

DATE: 7-22-15
SCALE: 1"=100'
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260

SHEET NO: 1
OF: 22

EXISTING PROTECTED TREES CHART

NUMBER	TREE	REMOVAL	REASON FOR REMOVAL	MITIGATION REQUIRED	MITIGATION FACTOR
1	27" PINE	NO	–	–	–
2	10" TWIN OAK	NO	–	–	–
3	18" GUM	NO	–	–	–
4	15" GUM	NO	–	–	–
5	17" GUM	NO	–	–	–
6	24" POPLAR	NO	–	–	–
7	16" GUM	NO	–	–	–
8	18" GUM	NO	–	–	–
9	14" GUM	NO	–	–	–
10	16" PINE	NO	–	–	–
11	13" PINE	NO	–	–	–
12	21" PINE	NO	–	–	–
13	12" OAK	NO	–	–	–
14	12" OAK	NO	–	–	–
15	10" OAK	NO	–	–	–
16	14" PINE	NO	–	–	–
17	14" PINE	NO	–	–	–
18	20" PINE	NO	–	–	–
19	13" OAK	NO	–	–	–
20	12" PINE	NO	–	–	–
21	11" GUM	NO	–	–	–
22	9" OAK	NO	–	–	–
23	17" PINE	NO	–	–	–
24	10" OAK	NO	–	–	–
25	15" PINE	NO	–	–	–
26	11" OAK	NO	–	–	–
27	14" OAK	NO	–	–	–
28	18" PINE	NO	–	–	–
29	15" GUM	NO	–	–	–
30	18" PINE	NO	–	–	–
31	22" PINE	NO	–	–	–
32	19" GUM	NO	–	–	–
33	17" GUM	NO	–	–	–
34	12" GUM	NO	–	–	–
35	14" OAK	NO	–	–	–
36	14" PINE	NO	–	–	–
37	15" PINE	NO	–	–	–
38	13" PINE	NO	–	–	–
39	16" PINE	NO	–	–	–
40	11" OAK	NO	–	–	–
41	12" OAK	NO	–	–	–
42	19" PINE	NO	–	–	–
43	24" PINE	NO	–	–	–
44	14" POPLAR	NO	–	–	–
45	12" GUM	NO	–	–	–
46	19" GUM	NO	–	–	–
47	20" OAK	NO	–	–	–
48	24" PINE	NO	–	–	–
49	12" GUM	NO	–	–	–
50	10" OAK	NO	–	–	–
51	10" GUM	NO	–	–	–
52	10" GUM	NO	–	–	–
53	14" GUM	NO	–	–	–
54	18" OAK	NO	–	–	–
55	18" PINE	NO	–	–	–
56	29" POPLAR	NO	–	–	–
57	8" OAK	NO	–	–	–
58	8" GUM	NO	–	–	–
59	8" OAK	NO	–	–	–
60	19" PINE	NO	–	–	–
61	19" PINE	NO	–	–	–
62	16" GUM	NO	–	–	–
63	18" GUM	NO	–	–	–
64	20" OAK	NO	–	–	–
65	20" PINE	NO	–	–	–
66	14" PINE	NO	–	–	–
67	13" PINE	NO	–	–	–
68	19" PINE	NO	–	–	–
69	14" OAK	NO	–	–	–
70	20" PINE	NO	–	–	–
71	9" OAK	NO	–	–	–
72	11" OAK	NO	–	–	–
73	9" OAK	NO	–	–	–
74	16" PINE	NO	–	–	–
75	8" DOGWOOD	NO	–	–	–
76	17" PINE	NO	–	–	–
77	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
78	11" OAK	NO	–	–	–
79	19" PINE	NO	–	–	–
80	20" PINE	NO	–	–	–
81	21" PINE	NO	–	–	–
82	15" PINE	NO	–	–	–
83	14" PINE	NO	–	–	–
84	10"–9" TWIN OAK	NO	–	–	–
85	9" OAK	NO	–	–	–
86	15" PINE	NO	–	–	–
87	9" OAK	NO	–	–	–
88	15" PINE	NO	–	–	–
89	17" PINE	NO	–	–	–
90	15" GUM	NO	–	–	–
91	21" PINE	NO	–	–	–
92	7" OAK	NO	–	–	–
93	16" PINE	NO	–	–	–
94	10" GUM	NO	–	–	–
95	32" OAK	NO	–	–	–
96	12" MAGNOLIA	NO	–	–	–
97	36" POPLAR	NO	–	–	–
98	12" OAK	NO	–	–	–
99	10" MAGNOLIA	NO	–	–	–
100	8" MAPLE	NO	–	–	–
101	7" MAGNOLIA	NO	–	–	–
102	16" OAK	NO	–	–	–
103	14" GUM	NO	–	–	–
104	20" PINE	NO	–	–	–
105	8" OAK	NO	–	–	–
106	17" PINE	NO	–	–	–
107	12" PINE	NO	–	–	–
108	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
109	11" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
110	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
111	13" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
112	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
113	19" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
114	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
115	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
116	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
117	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
118	9" OAK	NO	–	–	–
119	11" OAK	NO	–	–	–
120	17" OAK	NO	–	–	–
121	21" PINE	NO	–	–	–
122	24" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
123	15" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
124	17" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
125	9" OAK	NO	–	–	–
126	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
127	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
128	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
129	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
130	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
131	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
132	14" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
133	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
134	24" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
135	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
136	10" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
137	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
138	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
139	9" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
140	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
141	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
142	18" PINE	NO	–	–	–
143	16" PINE	NO	–	–	–
144	26" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
145	24" PINE	NO	–	–	–
146	28" OAK	NO	–	–	–
147	18" PINE	NO	–	–	–
148	16" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
149	17" PINE	NO	–	–	–
150	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
151	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
152	13" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
153	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
154	11" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
155	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
156	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
157	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
158	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
159	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
160	14" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
161	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
162	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
163	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
164	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
165	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
166	15" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
167	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
168	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–

EXISTING PROTECTED TREES CHART

NUMBER	TREE	REMOVAL	REASON FOR REMOVAL	MITIGATION REQUIRED	MITIGATION FACTOR
169	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
170	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
171	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
172	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
173	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
174	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
175	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
176	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
177	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
178	19" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
179	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
180	14" PINE	NO	–	–	–
181	16" PINE	NO	–	–	–
182	14" PINE	NO	–	–	–
183	8" OAK	NO	–	–	–
184	22" OAK	NO	–	–	–
185	24" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
186	19" OAK	NO	–	–	–
187	25" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
188	33" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
189	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
190	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
191	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
192	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
193	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
194	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
195	10" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
196	10" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
197	10" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
198	12" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
199	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
200	21" PINE	NO	–	–	–
201	26" MAGNOLIA	NO	–	–	–
202	14" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
203	11" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
204	12" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
205	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
206	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
207	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
208	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
209	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
210	21" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
211	10" DOGWOOD	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
212	25" MAGNOLIA	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
213	19" PINE	NO	–	–	–
214	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
215	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
216	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
217	14" PINE	NO	–	–	–
218	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
219	11" OAK	NO	–	–	–
220	12" OAK	NO	–	–	–
221	14" PINE	NO	–	–	–
222	14" OAK	NO	–	–	–
223	17" PINE	NO	–	–	–
224	25"–9" TWIN OAK	NO	–	–	–
225	32" PINE	NO	–	–	–
226	19" MAGNOLIA	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
227	19" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
228	29" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
229	29" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
230	16" CHERRY	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (75%)
231	5" CHINABERRY	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
232	21" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
233	12" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
234	34" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
235	25" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
236	29" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
237	25" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
238	9" TALLOW	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
239	25" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
240	19" BIRCH	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
241	20" OAK	NO	–	–	–
242	20" PINE	NO	–	–	–
243	30" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
244	36" OAK	NO	–	–	–
245	8",9",& 10" OAK (3 TREES)	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
246	9" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
247	13" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
248	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
249	24" PINE (BELOW SPLIT)	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
250	15" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
251	12" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
252	13" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
253	6" HOLLY	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
254	13" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
255	16" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
256	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
257	9" MAPLE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
258	14" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
259	26" LIVE OAK	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
260	8" MAGNOLIA	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
261	20" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
262	30" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
263	11" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
264	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
265	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
266	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
267	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
268	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
269	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
270	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
271	19" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
272	9" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
273	9" OAK	NO	–	–	–
274	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
275	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
276	21" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
277	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
278	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
279	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
280	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
281	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
282	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
283	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
284	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
285	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
286	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
287	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
288	10" MAPLE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
289	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
290	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
291	22" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
292	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
293	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
294	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
295	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
296	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
297	12" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
298	21" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
299	24" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
300	27" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
301	9" CATALPA	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (25%)
302	10" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
303	10" CATALPA	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (25%)
304	10" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
305	13" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
306	31" PINE	NO	–	–	–
307	22" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
308	14" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
309	14" PINE	NO	–	–	–
310	17" MAPLE	NO	–	–	–
311	32" PINE	NO	–	–	–
312	22" MAGNOLIA	NO	–	–	–
313	22" GUM	NO	–	–	–
314	16" GUM	NO	–	–	–
315	11" GUM	NO	–	–	–
316	15"–5" TWIN GUM	NO	–	–	–
317	12" YELLOW POPLAR	NO	–	–	–
318	9"–7" TWIN YELLOW POPLAR	NO	–	–	–
319	12" GUM	NO	–	–	–
320	9" POPLAR	NO	–	–	–
321	16"–8" TWIN GUM	NO	–	–	–
322	19" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
323	24" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
324	24" PINE	NO	–	–	–
325	14" GUM	NO	–	–	–
326	14" GUM	NO	–	–	–
327	15" GUM	NO	–	–	–
328	18" PINE	NO	–	–	–
329	13" HACKBERRY	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (75%)
330	12" PINE	NO	–	–	–
331	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
332	27" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
333	9" TALLOW	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (50%)
334	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
335	12" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–

EXISTING PROTECTED TREES CHART

NUMBER	TREE	REMOVAL	REASON FOR REMOVAL	MITIGATION REQUIRED	MITIGATION FACTOR
336	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
337	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
338	21" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
339	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
340	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
341	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
342	9" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
343	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
344	23" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
345	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
346	21" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
347	16" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
348	10" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
349	19" WILLOW	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
350	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
351	12" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
352	19" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
353	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
354	10" OAK	NO	–	–	–
355	24" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
356	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
357	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
358	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
359	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
360	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
361	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
362	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
363	16" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
364	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
365	15" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
366	18" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
367	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
368	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
369	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
370	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
371	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
372	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
373	21" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
374	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
375	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
376	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
377	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
378	27" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
379	8" TALLOW	NO	–	–	–
380	12"–11"–17"–10" MAPLE CLUSTER (4 TREES)	NO	–	–	–
381	28" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
382	24" LIVE OAK	NO	–	–	–
383	50" OAK	NO	–	–	–
384	27" PINE	NO	–	–	–
385	27" PINE	NO	–	–	–
386	25" PINE	NO	–	–	–
387	24" PINE	NO	–	–	–
388	17" OAK	NO	–	–	–
389	11" CHERRY	NO	–	–	–
390	19" MAPLE	NO	–	–	–
391	19" PINE	NO	–	–	–
392	17" OAK	NO	–	–	–
393	24" OAK	NO	–	–	–
394	22" OAK	NO	–	–	–
395	24" PINE	NO	–	–	–
396	50" OAK	NO	–	–	–
397	18" PINE	NO	–	–	–
398	16" PINE	NO	–	–	–
399	21" PINE	NO	–	–	–
400	32" OAK	NO	–	–	–
401	19" PINE	NO	–	–	–
402	20" OAK	NO	–	–	–
403	19" GUM	NO	–	–	–
404	24" PINE	NO	–	–	–
405	22" PINE	NO	–	–	–
406	38" PINE	NO	–	–	–
407	36" OAK	NO	–	–	–
408	36" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
409	48" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (50%)
410	12" CEDAR	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
411	12" TALLOW	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
412	13" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
413	22" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
414	15" MAGNOLIA	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
415	16" BIRCH	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
416	14" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
417	11" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
418	11" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
419	18" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
420	21" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
421	19" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
422	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
423	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
424	16"–11"–12" SPLIT PINE	NO	–	–	–
425	14" PINE	NO	–	–	–
426	30" PINE	NO	–	–	–
427	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
428	13" PINE	NO	–	–	–
429	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
430	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
431	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
432	19" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
433	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
434	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
435	21" PINE (BELOW SPLIT)	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
436	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
437	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
438	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
439	48" LIVE OAK	NO	–	–	–
440	27" LIVE OAK	NO	–	–	–
441	21" OAK	NO	–	–	–
442	21" OAK	NO	–	–	–
443	17" OAK	NO	–	–	–
444	24" OAK	NO	–	–	–
445	23" PINE	NO	–	–	–
446	22" PINE	NO	–	–	–
447	52" OAK	NO	–	–	–
448	26" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
449	23" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	–	–
450	36" OAK	NO	–	–	–
451	27" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
452	20" MAGNOLIA	NO	–	–	–
453	15" PINE	NO	–	–	–
454	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
455	20" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
456	13"–13" TWIN HOLLY	NO	–	–	–
457	14" & 15" PINE (2 TREES)	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
458	24" MAPLE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
459	24" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
460	16" OAK	NO	–	–	–
461	20" GUM	NO	–	–	–
462	20" PINE	NO	–	–	–
463	12" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
464	14" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
465	18" PINE	NO	–	–	–
466	16" PINE	NO	–	–	–
467	14" PINE	NO	–	–	–
468	12" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
469	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
470	14" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
471	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
472	17" OAK	NO	–	–	–
473	11" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
474	7" MAGNOLIA	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
475	17" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
476	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
477	16" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
478	16" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
479	21" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
480	20" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
481	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
482	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
483	11" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
484	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
485	10" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
486	11" OAK	NO	–	–	–
487	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
488	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–

EXISTING PROTECTED TREES CHART

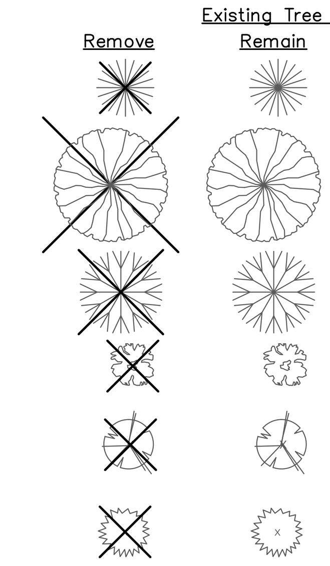
NUMBER	TREE	REMOVAL	REASON FOR REMOVAL	MITIGATION REQUIRED	MITIGATION FACTOR
489	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
490	23" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
491	11" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
492	8" MAGNOLIA	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
493	18" MAPLE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
494	8" MAGNOLIA	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
495	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
496	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
497	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
498	19" PINE	NO	–	–	–
499	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
500	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
501	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
502	20" PINE	NO	–	–	–
503	12" PINE	NO	–	–	–
504	14" PINE	NO	–	–	–
505	17" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
506	26" OAK (BELOW SPLIT)	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
507	16" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
508	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
509	8" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
510	11" MAPLE	NO	–	–	–
511	16" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
512	10" MAPLE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
513	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
514	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
515	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
516	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
517	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
518	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
519	16" PINE	YES	ESSENTIAL SITE IMIPROVEMENTS	EXEMPT	–
520	12" PINE	YES	ESSENTIAL SITE IMIPROVEMENTS	EXEMPT	–
521	10" MAPLE	NO	–	–	–
522	13" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
523	10" & 10" GUM (2 TREES)	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
524	10" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
525	11" OAK	NO	–	–	–
526	15" OAK	NO	–	–	–
527	16" YELLOW POPLAR	YES	ESSENTIAL SITE IMIPROVEMENTS	EXEMPT	–
528	21" PINE	NO	–	–	–
529	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
530	14" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
531	20" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
532	12" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
533	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
534	8" HARDWOOD	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
535	10" BLACK CHERRY	YES	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (50%)
536	16" OAK	NO	–	–	–
537	10" BLACK CHERRY	NO	–	–	–
538	12" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
539	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
540	8" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
541	11" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
542	15" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
543	12" MAPLE	NO	–	–	–
544	10" OAK	NO	–	–	–
545	18" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
546	12" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
547	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
548	13" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
549	13" PINE	NO	–	–	–
550	12" PINE	NO	–	–	–
551	15" PINE	NO	–	–	–

EXISTING PROTECTED TREES CHART – OFF-SITE ALONG/NEAR PROPOSED WET POND #1 OUTFALL PIPE

NUMBER	TREE	REMOVAL	REASON FOR REMOVAL	MITIGATION REQUIRED	MITIGATION FACTOR
1001	20" PINE	NO	–	–	–
1002	8" MAPLE	NO	–	–	–
1003	12" PINE	NO	–	–	–
1004	22" PINE	NO	–	–	–
1005	8" GUM	NO	–	–	–
1006	9" GUM	NO	–	–	–
1007	16" MAPLE	NO	–	–	–
1008	13" YELLOW POPLAR	NO	–	–	–
1009	24" PINE	NO	–	–	–
1010	16" HARDWOOD	NO	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	–
1011	11" MAGNOLIA	NO	–	–	–
1012	33" OAK	NO	–	–	–

Existing Tree Legend

Remove — Remain



– Existing Significant Flowering Trees
– Existing Significant Hardwood & Non-Pine Conifer Trees
– Existing Significant Pine Trees
– Existing Regulated Flowering Trees
– Existing Regulated Hardwood & Non-Pine Conifer Trees
– Existing Regulated Pine Trees

TREE MITIGATION
TOTAL PINE TREE DBH = 543"
REQUIRED # OF PINE PLUGS = [(1 / 3) * 0.5 * 495] + [(2 / 3) * 0.5 * 48]
= 99 PLUGS
*SEE LANDSCAPE PLAN FOR PROVIDED PINE PLUGS (LONG LEAF PINE)

TOTAL 100% MITIGATION TREE DBH = 227"
TOTAL 75% MITIGATION TREE DBH = 29"
TOTAL 50% MITIGATION TREE DBH = 19"
TOTAL 25% MITIGATION TREE DBH = 19"
REQUIRED # OF REPLACEMENT TREES (100% MITIGATION) = (2 / 3 * 1.0 * 227)
= 151 TREES
REQUIRED # OF REPLACEMENT TREES (75% MITIGATION) = (2 / 3 * 0.75 * 29)
= 15 TREES
REQUIRED # OF REPLACEMENT TREES (50% MITIGATION) = (2 / 3 * 0.5 * 19)
= 6 TREES
REQUIRED # OF REPLACEMENT TREES (25% MITIGATION) = (2 / 3 * 0.25 * 19)
= 3 TREES
*SEE LANDSCAPE PLAN FOR PROVIDED REPLACEMENT TREES

Approved Construction Plan
Name Date
Planning____________________
Traffic____________________
Fire____________________

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

EXISTING PROTECTED TREES CHART
4010 CAROLINA BEACH ROAD
ECHO FARM APARTMENTS
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DATE: 11–17–15
SCALE: N.T.S.
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910–392–5243
Fax 910–392–5203
License No. C–2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910–251–5030

SHEET NO: 2 OF: 22

REV NO.	DESCRIPTION	DATE
1	REVISED TO ADD OFF–SITE TREES TO CHART.	11–20–15
2	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11–24–15
3	REVISED TO REMOVE TREE #409 & ADJUST TREE MITIGATION CALCULATIONS.	8–24–16
4	REVISED TO ADJUST MITIGATION FACTOR FOR TREE #409 & ADJUST TREE MITIGATION CALCULATIONS.	9–2–16

REVISIONS

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MATCHLINE
SEE SHEET 4

MATCHLINE
SEE SHEET 4

N/F
CITY OF WILMINGTON
DB: 1272 PG: 650
PID: R06500-004-001-003
ZONING: R-15
LAND USE: UNUSED

BENCHMARK
ELEV. = 17.55'

EX. SSMH
TOP=17.55'
INV=5.96'

H.C. 989 (NAD 83)

EAST EDGE OF CREEK

N44°53'37"E 219.29'

N61°37'56"W 357.16' (TO BE ABANDONED)

50' VEGETATIVE BUFFER

EX. SSMH
TOP=13.46'
INV=5.38'

N/F
CITY OF WILMINGTON
DB: 1272 PG: 650
PID: R06500-004-001-004
ZONING: R-15
LAND USE: UNUSED

25' CONSERVATION SETBACK

N39°52'37"E 218.00'

N32°05'23"W 469.83'

Ex. House to be removed

Ex. Driveway

Ex. Shed

(TO BE ABANDONED)

S65°59'35"W

N 154570.5015
E 2326084.9247
C.F. = 1.000053816

CAROLINA BEACH RD / US HWY 421
(100' PUBLIC R/W)

R/W

DOUBLE YELLOW CENTERLINE

SOLID WHITE LANE LINE & EDGE OF PAVEMENT

DASHED WHITE LANE LINE

CONCRETE MEDIAN ISLAND

EXISTING DRIVEWAY (REMOVE)

SOLID WHITE LANE LINE

EDGE OF PAVEMENT

ROAD SIGN

DASHED WHITE LANE LINE

SOLID WHITE LANE LINE

413.31'

N29°22'20"W 766.84' (Grid) & 766.70' (H

BE
N 1
E 23
C.F. =
ELEV. =

N/F
JOANN McKENNA TRUST
DB: 5128 PG: 2275
PID: R07007-004-001-000
ZONING: O&I-1
LAND USE: UNUSED

S84°24'37"W 549.22'

N/F
ECHO FARMS, LLC
DB: 2307 PG: 467
PID: R07006-002-001-000
ZONING: MF-M
LAND USE: RECREATIONAL

ECHO FARMS BLVD
(60' PUBLIC R/W)

EXISTING 8" PUBLIC WATER WAIN
(APPROX.; CONTRACTOR TO VERIFY
EXACT SIZE & LOCATION)

EX. SSMH
TOP=11.08'
INV. IN 3.86'
INV. OUT 3.66'

EX. SSMH
INV. IN 3.57'
INV. IN 3.57'
INV. OUT 3.52'

EX. SSMH
INV. IN 7.12'
INV. OUT 7.02'

EXISTING DRIVEWAY

EX. SSMH
INV. IN 12.33'
INV. OUT 10.93'

N/F
ECHO FARMS, LLC
DB: 2307 PG: 467
PID: R07006-002-001-000
ZONING: MF-M
LAND USE: RECREATIONAL

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

Approved Construction Plan		
	Name	Date
Planning		
Traffic		
Fire		

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

EXISTING CONDITIONS & DEMOLITION PLAN
4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DATE:	7-22-15
SCALE:	1"=30'
DRAWN:	JCB
CHECKED:	JBM
PROJECT NO:	260

REV NO.	DESCRIPTION	DATE
1	REVISED FOR SRB SUBMITTAL.	9-2-15
2	REVISED TO PROVIDE ADJUSTED SURVEY DATA.	10-12-15
3	REVISED FOR PRELIMINARY BID.	10-16-15
4	REVISED PER TRC COMMENTS.	11-12-15
5	REVISED TO SHOW EXISTING POWER POLES.	11-20-15
6	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11-24-15
7	REVISED TO SHOW TREE #409 BEING REMOVED.	8-24-16

REVISIONS

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
Fax 910-392-5203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

SHEET NO: 3
OF: 22

PRELIMINARY PLAT
NOT FOR RECORDATION,
CONVEYANCES, OR SALES

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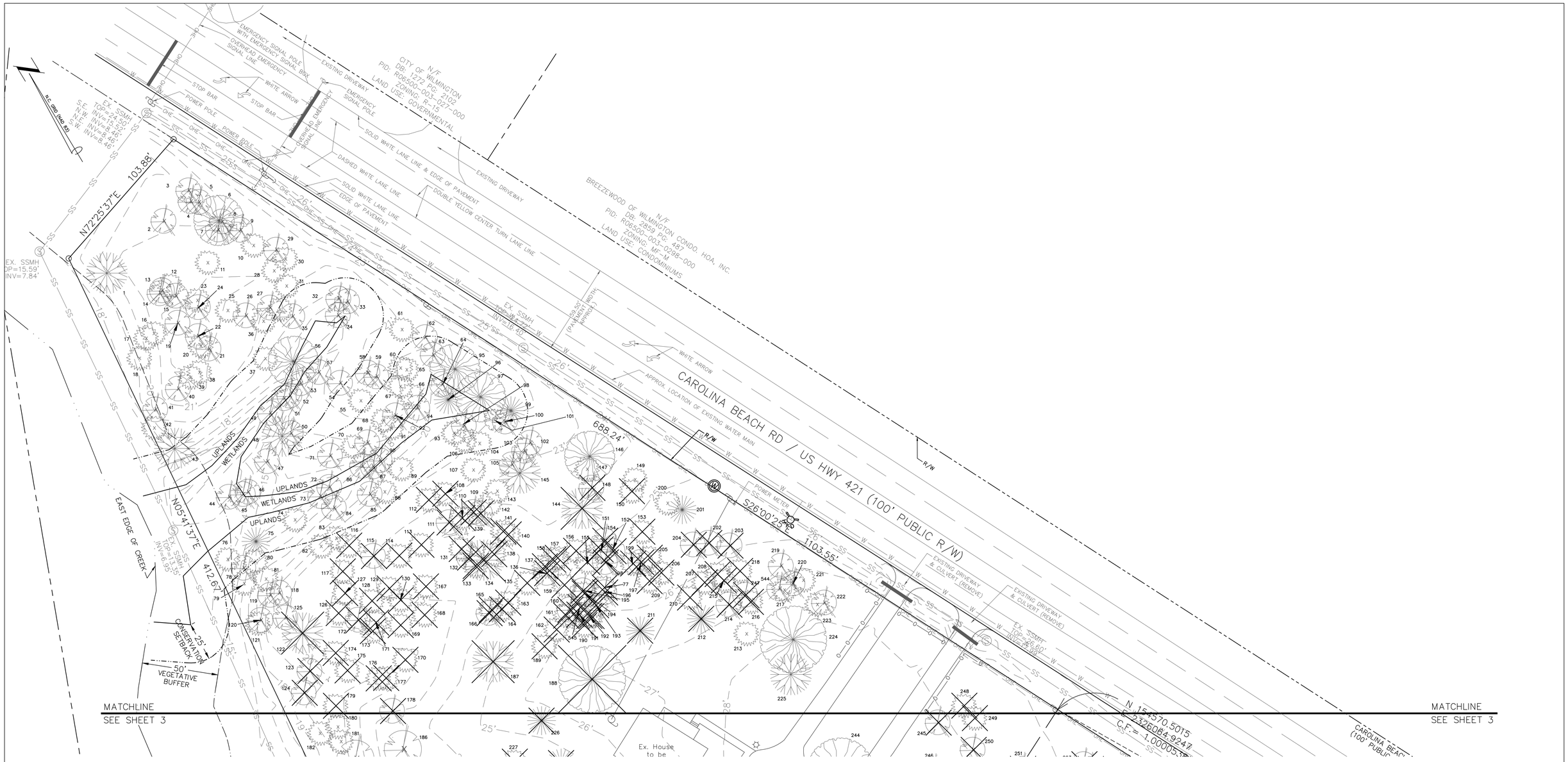

Approved Construction Plan

	Name	Date
Planning		
Traffic		
Fire		

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

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

REV NO.	DESCRIPTION	DATE
1	REVISED FOR SRB SUBMITTAL.	9-2-15
2	REVISED TO PROVIDE ADJUSTED SURVEY DATA.	10-12-15
3	REVISED FOR PRELIMINARY BID.	10-16-15
4	REVISED PER TRC COMMENTS.	11-12-15
5	REVISED TO SHOW EXISTING POWER POLES.	11-20-15
6	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11-24-15

REVISIONS

PRELIMINARY PLAT
NOT FOR RECORDATION,
CONVEYANCES, OR SALES

EXISTING CONDITIONS & DEMOLITION PLAN
4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
Fax 910-392-5203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

DATE: 7-22-15
SCALE: 1"=30'
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260
SHEET NO: 4
OF: 22

G:\AutoCAD\2015\260\Echo Farms Apartments(11-19-15).dwg

MATCHLINE
SEE SHEET 6

MATCHLINE
SEE SHEET 6

N 154570.5015
E 2326064.9247
C.F.= 1.000053816

CAROLINA BEACH RD / US HWY 421
(100' PUBLIC R/W)

N/F
CITY OF WILMINGTON
DB: 1272 PG: 650
PID: R06500-004-001-003
ZONING: R-15
LAND USE: UNUSED

BENCHMARK
ELEV. = 17.55'

N.C. GRID (NAD 83)

EAST EDGE OF CREEK

N44°53'57"E 291.29'

N39°52'37"E 218.00'

N32°05'23"W 469.83'

S84°24'37"W 549.22'

N29°22'20"W 766.84' (Grid) & 766.70' (Hz

413.31'

BUILDING #1

BUILDING #2

BUILDING #3

BUILDING #4

BUILDING #8

POOL

CLUBHOUSE

MAINTENANCE BUILDING

INFILTRATION BASIN #1

WET POND #1

50' VEGETATIVE BUFFER

WETLANDS
UPLANDS

25' CONSERVATION SETBACK

4' WIDE CURB CUT

46'x46' SIGHT TRIANGLE

DOUBLE YELLOW CENTERLINE

SOLID WHITE LANE LINE & EDGE OF PAVEMENT

DASHED WHITE LANE LINE

SOLID WHITE LANE LINE

EDGE OF PAVEMENT

CONCRETE MEDIAN ISLAND

ROAD SIGN

EXISTING DRIVEWAY (REMOVE)

N/F
JOANN McKENNA TRUST
DB: 5128 PG: 2275
PID: R07007-004-001-000
ZONING: O&I-1
LAND USE: UNUSED

N/F
ECHO FARMS, LLC
DB: 2307 PG: 467
PID: R07006-002-001-000
ZONING: MF-M
LAND USE: RECREATIONAL

ECHO FARMS BLVD
(60' PUBLIC R/W)

EXISTING DRIVEWAY

N/F
ECHO FARMS, LLC
DB: 2307 PG: 467
PID: R07006-002-001-000
ZONING: MF-M
LAND USE: RECREATIONAL

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

Approved Construction Plan		
	Name	Date
Planning		
Traffic		
Fire		

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

PRELIMINARY PLAT
NOT FOR RECORDATION,
CONVEYANCES, OR SALES

REV NO.	DESCRIPTION	DATE
1	REVISED FOR SRB SUBMITTAL.	9-2-15
2	REVISED TO SHOW PRIVATE STREET.	10-12-15
3	REVISED FOR PRELIMINARY BID.	10-16-15
4	REVISED PER TRC COMMENTS.	11-17-15
5	REVISED TO SHOW EXISTING OFF-SITE TREES ALONG/NEAR WET POND #1 OUTFALL PIPE.	11-20-15
6	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11-24-15
7	REVISED TO PROVIDE SIDEWALK ALONG CAROLINA BEACH RD.	12-14-15
8	REVISED PER CITY.	2-9-16
9	REVISED TO SHOW TREE #409 BEING REMOVED, ADJUST PARKING NORTH OF BUILDING #2, CLUBHOUSE, MAIL KIOSK, SIDEWALK AROUND CLUBHOUSE, & WET POND #1.	8-24-16
10	REVISED TO ADJUST MAIL KIOSK & WET POND.	9-9-16

REVISIONS

SITE INVENTORY
4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DATE: 7-22-15
SCALE: 1"=30'
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
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WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
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Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

SHEET NO: 5
OF: 22

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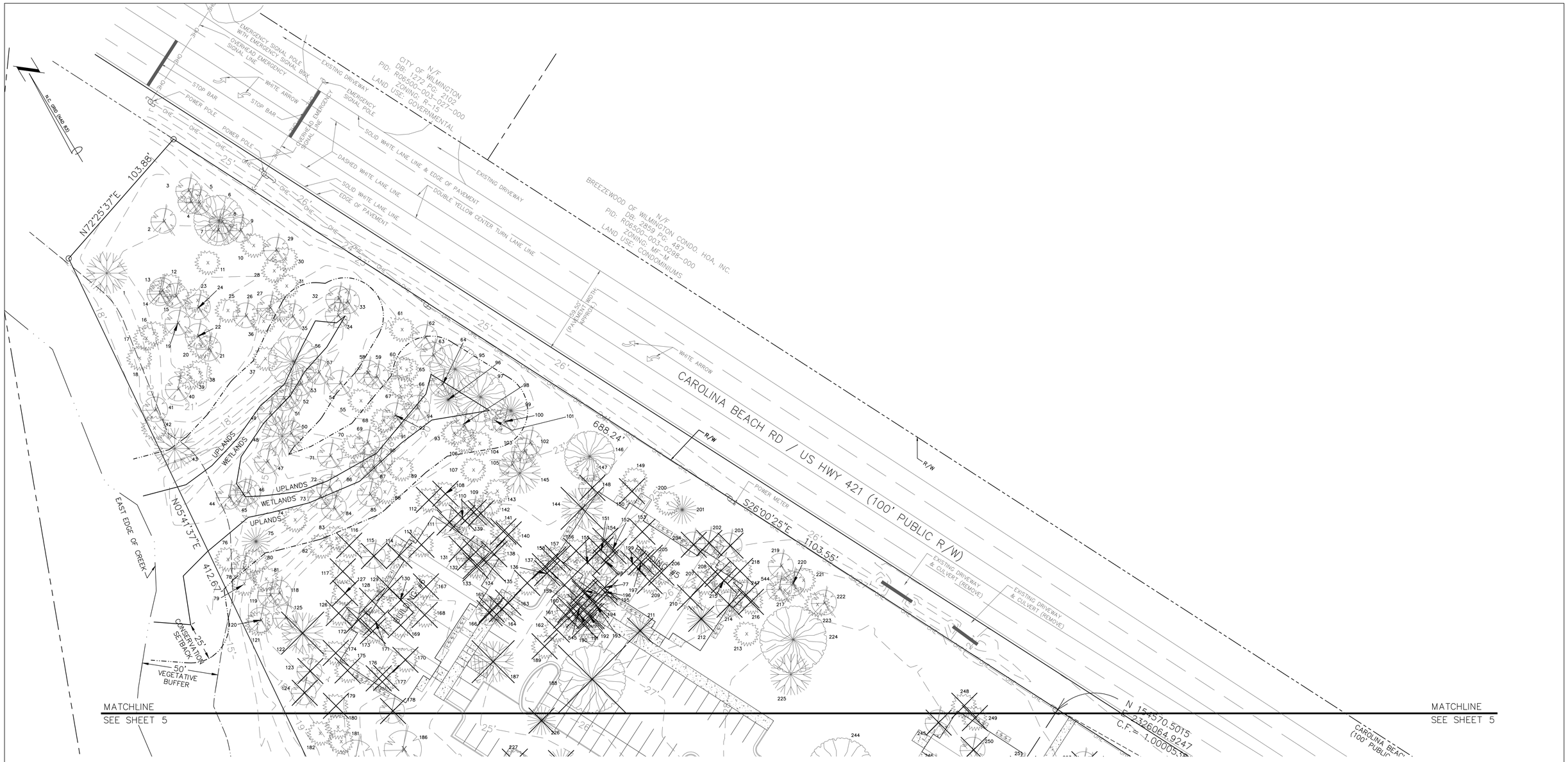

Approved Construction Plan

	Name	Date
Planning		
Traffic		
Fire		

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

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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4	REVISED PER TRC COMMENTS.	11-17-15
5	REVISED TO SHOW EXISTING POWER POLES.	11-20-15
6	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11-24-15
7	REVISED TO PROVIDE SIDEWALK ALONG CAROLINA BEACH RD.	12-14-15
8	REVISED PER CITY.	2-9-16

REVISIONS

PRELIMINARY PLAT
NOT FOR RECORDATION, CONVEYANCES, OR SALES

SITE INVENTORY
4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

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PHONE: 910-251-5030

DATE: 7-22-15
SCALE: 1"=30'
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260
SHEET NO: 6
OF: 22

G:\AutoCAD\2015\260\Echo Farms Apartments(2-4-16).dwg

MATCHLINE
SEE SHEET 8

MATCHLINE
SEE SHEET 8

17,888 SF

N 15,570.5015
E 2326064.9247
C.F. = 1.000053816

CAROLINA BEACH RD / US HWY 421
(100' PUBLIC R/W)

N/F
CITY OF WILMINGTON
DB: 1272 PG: 650
PID: R06500-004-001-003
ZONING: R-15
LAND USE: UNUSED

BENCHMARK
ELEV. = 17.55'

EAST EDGE OF CREEK

N44°05'37"E 282.32'

N39°52'37"E 261.29'

N39°52'37"E 218.00'

N58°05'23"W 469.83'

S84°24'37"W 549.22'

N29°22'20"W 766.84' (Grid) & 766.70' (H

415.31'

BUILDING #1
BUILDING #2
BUILDING #3
BUILDING #4
BUILDING #7
BUILDING #8

MAINTENANCE BUILDING

OPEN SPACE
18,682 SF

PASSIVE
RECREATION AREA
62,580 SF

ACTIVE
RECREATION
AREA
6,113 SF

POOL

CLUBHOUSE

WET
POND #1

INFILTRATION
BASIN #1

PRIVATE DRAINAGE EASEMENT

20' PRIVATE DRAINAGE EASEMENT

20' PRIVATE UTILITY EASEMENT

50' VEGETATIVE BUFFER

20.00' BUFFER

25' CONSERVATION SETBACK

WETLANDS
UPLANDS

SIDEWALK EASEMENT (PUBLIC)

PROPOSED 5' WIDE SIDEWALK

9.00' STREET YARD

10.00' STREET YARD

18.0' STREET YARD

24.00' SETBACK

35.00' SETBACK

ECHO FARMS BLVD
(60' PUBLIC R/W)

SKLINGER COURT
(40' R/W)

19.35' (PAVEMENT WIDTH)

46'x46' SIGHT TRIANGLE

EXISTING DRIVEWAY

N/F
ECHO FARMS, LLC
DB: 2307 PG: 467
PID: R07006-002-001-000
ZONING: MF-M
LAND USE: RECREATIONAL

N/F
JOANN McKENNA TRUST
DB: 5128 PG: 2275
PID: R07007-004-001-000
ZONING: O&I-1
LAND USE: UNUSED

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ECHO FARMS, LLC
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PID: R07006-002-001-000
ZONING: MF-M
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GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

Approved Construction Plan

	Name	Date
Planning		
Traffic		
Fire		

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

SITE PLAN
4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DATE: 7-22-15
SCALE: 1"=30'
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260

REV NO.	DESCRIPTION	DATE
1	REVISED FOR SRB SUBMITTAL.	9-2-15
2	REVISED TO SHOW PRIVATE STREET.	10-12-15
3	REVISED FOR PRELIMINARY BID.	10-16-15
4	REVISED PER TRC COMMENTS.	11-12-15
5	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11-24-15
6	REVISED TO PROVIDE SIDEWALK ALONG CAROLINA BEACH RD & CURB CUT NORTH OF BUILDING #8.	12-14-15
7	REVISED PER CITY.	2-9-16
8	REVISED TO ADJUST PARKING NORTH OF BUILDING #2, CLUBHOUSE, MAIL KIOSK, SIDEWALK AROUND CLUBHOUSE, WET POND #1, FOUNDATION PLANTING AREA IN FRONT OF BLDG #2 & CLUBHOUSE, LANDSCAPE ISLANDS NORTH OF BLDG #2, & RECREATION AREA.	8-24-16
9	REVISED TO ADJUST MAIL KIOSK & WET POND.	9-9-16

REVISIONS

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
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Developer: ECHO FARM APARTMENTS, LLC
10 S. CAROLINA DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

SHEET NO: 7
OF: 22

PRELIMINARY PLAT
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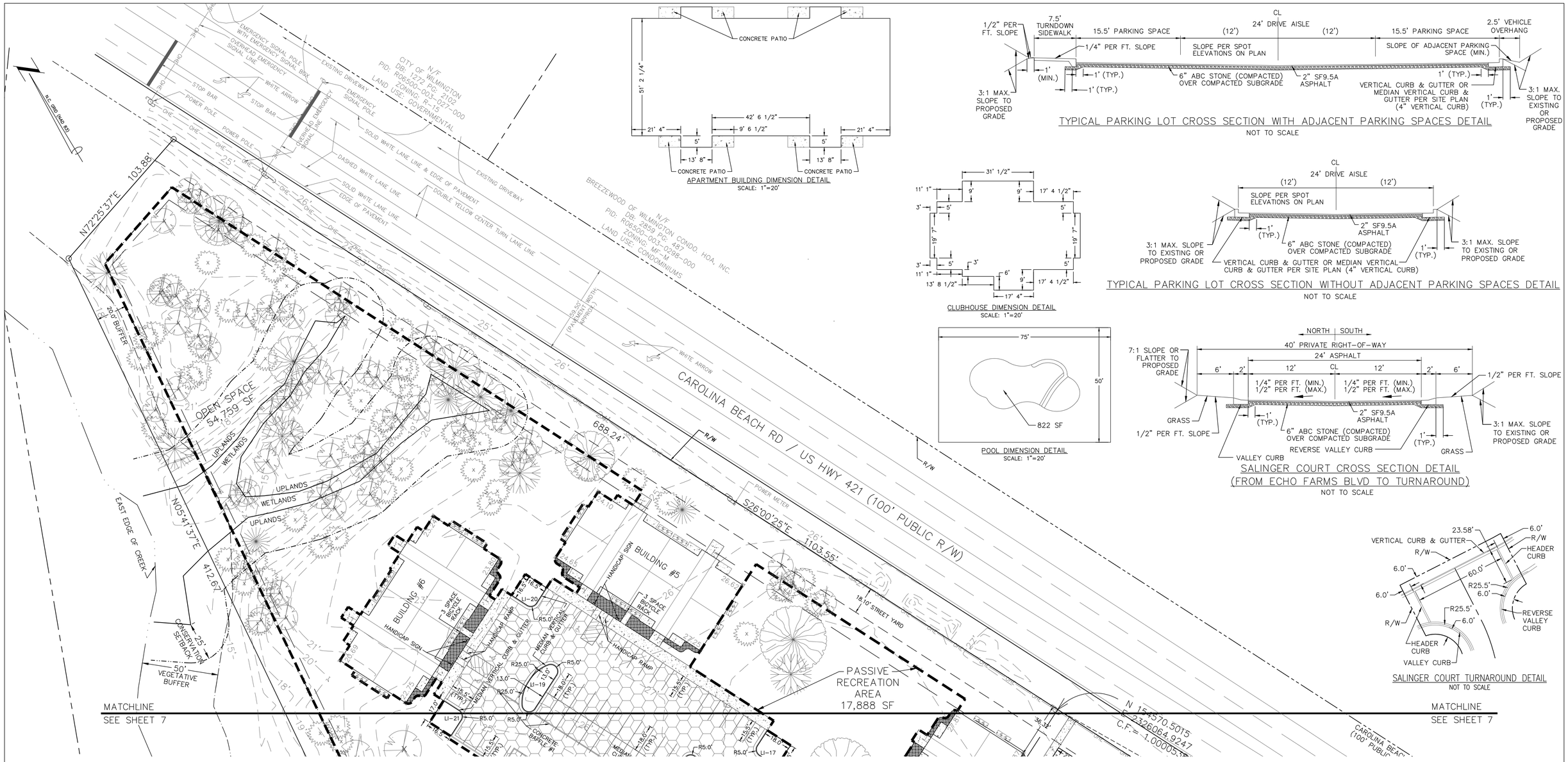
G:\AutoCAD\2015\260\Echo Farms Apartments(7-27-16).dwg



INTERIOR LANDSCAPING ISLANDS			
LANDSCAPE ISLAND	TOTAL AREA (SF)	IMPERVIOUS AREA (SF)	PERCENT IMPERVIOUS
LI-1	224.80	0	0
LI-2	288.80	0	0
LI-3	223.15	0	0
LI-4	456.81	0	0
LI-5	248.52	0	0
LI-6	281.12	0	0
LI-7	282.65	0	0
LI-8	339.15	0	0
LI-9	287.15	0	0
LI-10	378.84	0	0
LI-11	378.84	0	0
LI-12	355.84	0	0
LI-13	491.09	0	0
LI-14	609.04	0	0
LI-15	229.69	0	0
LI-16	283.78	0	0
LI-17	292.65	0	0
LI-18	378.84	0	0
LI-19	378.84	0	0
LI-20	267.90	0	0
LI-21	276.15	0	0
LI-22	397.14	0	0
LI-23	367.99	0	0
LI-24	378.84	0	0
LI-25	378.84	0	0
LI-26	276.15	0	0
LI-27	276.15	0	0
LI-28	1,171.14	147.53	12.60
LI-29	278.99	0	0
LI-30	224.31	0	0
LI-31	223.15	0	0
LI-32	217.52	0	0
LI-33	436.55	0	0
LI-34	223.15	0	0
LI-35	288.80	0	0
LI-36	216.67	0	0

TREES PER DISTURBED ACRE
9.63 ACRES * 15 = 144.45, 144 TREES REQUIRED
*SEE LANDSCAPING PLAN FOR PROVIDED TREES

STREET YARD–CAROLINA BEACH ROAD (PRIMARY FRONTAGE)
STREET FRONTAGE = 1,103.55 FT
REQUIRED STREET YARD = 18 * 1,103.55 = 19,863.90 SF
PROVIDED STREET YARD = 19,937.57 SF
IMPERVIOUS AREA = 90.51 SF
PERCENT IMPERVIOUS = 90.51 / 19,937.57 * 100% = 0.46%
REQUIRED PLANTING = 19,937.57 / 600 = 33.23 , 33 CANOPY TREES (OR 3 UNDERSTORY TREES PER 1 CANOPY TREE)
33.23 * 6 = 199.38 , 199 SHRUBS
*SEE LANDSCAPING PLAN FOR PROVIDED TREES & SHRUBS

STREET YARD–ECHO FARMS BLVD (SECONDARY FRONTAGE)
STREET FRONTAGE = 469.83 – 37.53 = 432.30 FT
REQUIRED STREET YARD = 18 * 432.30 / 2 = 3,890.70 SF
PROVIDED STREET YARD = 3,461.82 + 578.81 = 4,040.63 SF
IMPERVIOUS AREA = 233.20 SF
PERCENT IMPERVIOUS = 233.20 / 4,040.63 * 100% = 5.78%
REQUIRED PLANTING = 4,040.63 / 600 = 6.74 , 7 CANOPY TREES (OR 3 UNDERSTORY TREES PER 1 CANOPY TREE)
6.74 * 6 = 40.44 , 40 SHRUBS
*SEE LANDSCAPING PLAN FOR PROVIDED TREES & SHRUBS

INTERIOR SHADING
PARKING FACILITY AREA [PARKING LOT AREA TO BACK OF CURB (OR BACK OF SIDEWALK ADJACENT TO PARKING SPACES) MINUS LANDSCAPE ISLANDS PLUS PRIVATE STREET (INCLUDING PORTION WITHIN ECHO FARMS BLVD R/W)]
= 125,139 SF
REQUIRED INTERIOR SHADING (IS) = 0.2 * 125,139 = 25,028 SF
*SEE LANDSCAPING PLAN FOR PROVIDED INTERIOR SHADING & TREES

FOUNDATION PLANTING–FRONT OR REAR OF BUILDINGS #1–8 (PER FRONT OR REAR OF BUILDING ADJACENT TO PARKING/DRIVE AISLE)
REQUIRED FOUNDATION PLANTING = [(30.73' x 112.54') + (0.5 x 10.62' x 31.86') + (0.5 x 10.62' x 31.86')] x 0.12 = 455.61 SF
PROVIDED FOUNDATION PLANTING (BUILDINGS #1–8) = 508.48 SF
*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

FOUNDATION PLANTING–SIDE OF BUILDINGS #1, 2, 3, 4, 7, & 8 (PER SIDE OF BUILDING ADJACENT TO PARKING/DRIVE AISLE)
REQUIRED FOUNDATION PLANTING = [(31.44' x 51.19') + (0.5 x 12.63' x 50.53')] x 0.12 = 231.43 SF
PROVIDED FOUNDATION PLANTING (BUILDINGS #1 & 2) = 262.12 SF
PROVIDED FOUNDATION PLANTING (BUILDINGS #3 & 4) = 236.31 SF
PROVIDED FOUNDATION PLANTING (BUILDING #7) = 267.45 SF
PROVIDED FOUNDATION PLANTING (BUILDING #8) = 280.41 SF

*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

FOUNDATION PLANTING–FRONT OF CLUBHOUSE
REQUIRED FOUNDATION PLANTING = [(8.98' x 14.09') + (11.31' x 31.05') + (8.98' x 20.38') + (13.81' x 4.61' x 0.5) + 87.47 SF] x 0.12 = 93.61 SF
PROVIDED FOUNDATION PLANTING = 169.32 SF
*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

FOUNDATION PLANTING–FRONT OF MAINTENANCE BUILDING
REQUIRED FOUNDATION PLANTING = [(10.00' x 20.00') + (0.5 x 6.67' x 20.00')] x 0.12 = 32 SF
PROVIDED FOUNDATION PLANTING = 33.42 SF
*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

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1	REVISED FOR SRB SUBMITTAL.	9–2–15
2	REVISED TO PROVIDE ADJUSTED SURVEY DATA.	10–12–15
3	REVISED FOR PRELIMINARY BID.	10–16–15
4	REVISED PER TRC COMMENTS.	11–12–15
5	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11–24–15
6	REVISED TO PROVIDE SIDEWALK ALONG CAROLINA BEACH RD, STREET YARD CALC, & TREE CALC.	12–14–15
7	REVISED PER CITY.	2–9–16
8	REVISED TO CORRECT IMPERVIOUS AREA IN STREET YARD ALONG CAROLINA BEACH ROAD.	2–15–16
9	REVISED TO ADJUST CLUBHOUSE DIMENSION DETAIL, INTERIOR LANDSCAPING ISLANDS CHART, INTERIOR SHADING CALCULATIONS, & FOUNDATION PLANTING CALCULATIONS FOR BLDG #2 & CLUBHOUSE.	8–24–16

REVISIONS

PRELIMINARY PLAT
NOT FOR RECORDATION, CONVEYANCES, OR SALES

Approved Construction Plan

	Name	Date
Planning		
Traffic		
Fire		

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

SITE PLAN
4010 CAROLINA BEACH ROAD
ECHO FARM APARTMENTS
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY

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PHONE: 910-251-5030

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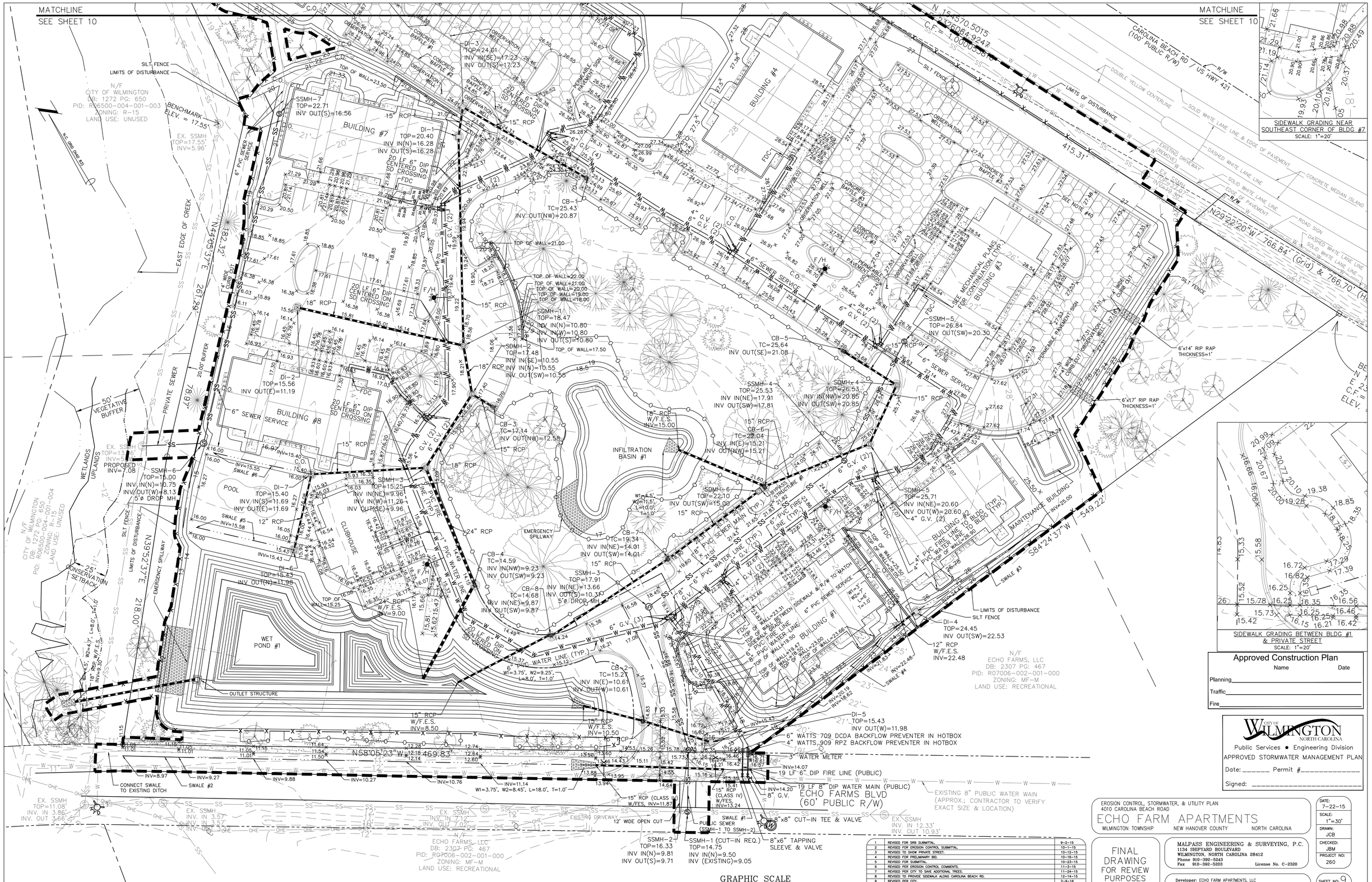
MATCHLINE
SEE SHEET 10

MATCHLINE
SEE SHEET 10



PRELIMINARY PLAT
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REV NO.	DESCRIPTION	DATE
	REVISIONS	
1	REVISED FOR SRB SUBMITTAL.	9–2–15
2	REVISED FOR EROSION CONTROL SUBMITTAL.	10–1–15
3	REVISED TO SHOW PRIVATE STREET.	10–12–15
4	REVISED FOR PRELIMINARY BID.	10–16–15
5	REVISED FOR SUBMITTAL.	10–23–15
6	REVISED PER EROSION CONTROL COMMENTS.	11–3–15
7	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11–24–15
8	REVISED TO PROVIDE SIDEWALK ALONG CAROLINA BEACH RD.	12–14–15
9	REVISED PER CITY.	2–9–16
10	REVISED PER CFPUA TO ADJUST SEWER INVERTS & LABEL AS PUBLIC OR PRIVATE.	3–15–16
11	REVISED PER CFPUA TO CHANGE BACKFLOW PREVENTER ON FIRE LINE.	4–29–16
12	REVISED TO ADJUST PARKING NORTH OF BUILDING #2, CLUBHOUSE, MAIL KIOSK, SIDEWALK AROUND CLUBHOUSE, & WET POND #1.	8–24–16
13	REVISED TO ADJUST MAIL KIOSK & WET POND.	9–9–16

Approved Construction Plan

	Name	Date
Planning		
Traffic		
Fire		

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

EROSION CONTROL, STORMWATER, & UTILITY PLAN
4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY

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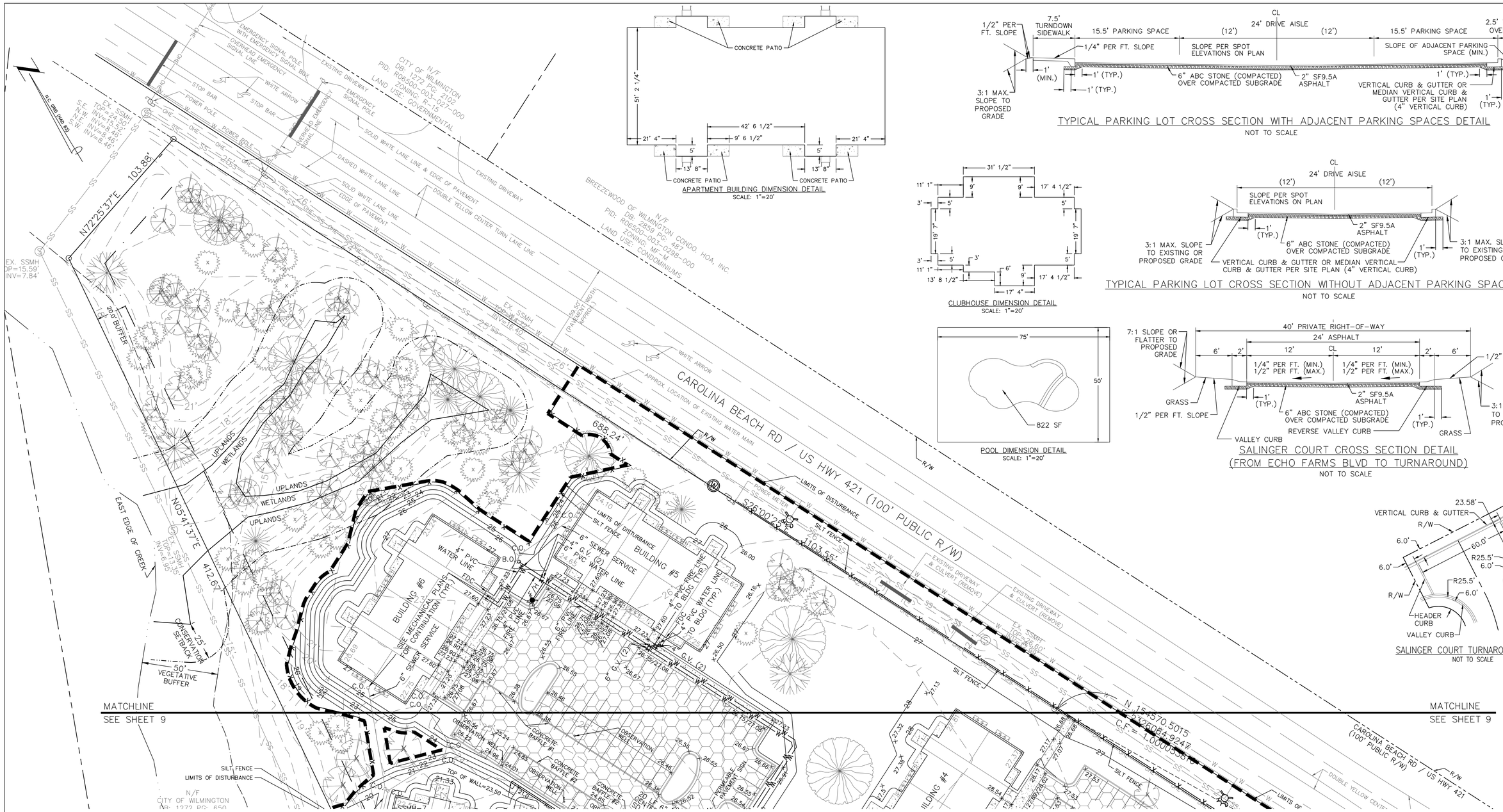


UTILITY SEPARATION NOTES

1. WATER MAINS SHALL HAVE A MINIMUM COVER OF 3'.
2. SANITARY SEWER MAINS SHALL HAVE A MINIMUM COVER OF 3' OR D.I.P. SHALL BE USED.
3. HORIZONTAL SEPARATION BETWEEN WATER AND SANITARY SEWER SHALL BE 10' BETWEEN EDGE OF PIPES.
4. VERTICAL SEPARATION BETWEEN WATER AND SANITARY SEWER:
   WATER OVER SANITARY SEWER: >18" BETWEEN PIPES OR USE D.I.P. (ON BOTH) 10' ON EITHER SIDE OF CROSSING.
   SANITARY SEWER OVER WATER: USE D.I.P. (ON BOTH) 10' ON EITHER SIDE OF CROSSING.
5. HORIZONTAL SEPARATION BETWEEN STORM SEWER & SANITARY SEWER SHALL BE 5' BETWEEN EDGE OF PIPES.
6. A 24" VERTICAL SEPARATION BETWEEN PIPES SHALL BE PROVIDED BETWEEN STORM SEWER AND SANITARY SEWER. WHERE SEPARATION IS LESS THAN 24" & SANITARY IS OVER STORM USE D.I.P. ON SANITARY SEWER 10' ON EITHER SIDE OF CROSSING. WHERE SEPARATION IS LESS THAN 12" & STORM IS OVER SANITARY BRIDGING IS REQUIRED (SEE SANITARY SEWER DETAIL). WHERE SEPARATION IS 12"–24" & STORM IS OVER SANITARY BRIDGING OR D.I.P. ON SANITARY SEWER 10' ON EITHER SIDE OF CROSSING.
7. HORIZONTAL SEPARATION BETWEEN WATER AND STORM SEWER SHALL BE 5' BETWEEN EDGE OF PIPES.
8. VERTICAL SEPARATION BETWEEN WATER AND STORM SEWER:
   WATER OVER STORM SEWER: >18" BETWEEN PIPES OR USE D.I.P. ON WATER 10' ON EITHER SIDE OF CROSSING.
   STORM SEWER OVER WATER: USE D.I.P. ON WATER 10' ON EITHER SIDE OF CROSSING.
9. ALL SANITARY SEWER MANHOLES WITH A DROP OF 30" OR GREATER SHALL HAVE AN INSIDE DIAMETER OF 5' WITH AN INSIDE DROP STRUCTURE.
10. GRAVITY SANITARY SEWER WITHIN 50' OF WETLANDS SHALL BE D.I.P. AND MEET WATER MAIN MATERIALS, TESTING METHODS AND ACCEPTABILITY STANDARDS {15A NCAC 18C}.
11. SANITARY SEWER MANHOLES MUST BE GREATER THAN 50' FROM WETLANDS, AS MEASURED TO THE CLOSEST OUTSIDE EDGE.

Approved Construction Plan

	Name	Date
Planning		
Traffic		
Fire		

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

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

REV NO.	DESCRIPTION	DATE
1	REVISED FOR SRB SUBMITTAL.	9–2–15
2	REVISED FOR EROSION CONTROL SUBMITTAL.	10–1–15
3	REVISED TO PROVIDE ADJUSTED SURVEY DATA.	10–12–15
4	REVISED FOR PRELIMINARY BID.	10–16–15
5	REVISED FOR SUBMITTAL.	10–23–15
6	REVISED PER EROSION CONTROL COMMENTS.	11–3–15
7	REVISED PER CITY TO SAVE ADDITIONAL TREES.	11–24–15
8	REVISED TO PROVIDE SIDEWALK ALONG CAROLINA BEACH RD.	12–14–15
9	REVISED PER CITY.	2–9–16
10	REVISED TO ADJUST CLUBHOUSE DIMENSION DETAIL.	8–24–16

REVISIONS

PRELIMINARY PLAT
NOT FOR RECORDATION, CONVEYANCES, OR SALES

EROSION CONTROL, STORMWATER, & UTILITY PLAN
4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
Fax 910-392-5203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

DATE: 7-22-15
SCALE: 1"=30'
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260
SHEET NO: 10
OF: 22

G:\AutoCAD\2015\260\Echo Farms Apartments(7-27-16).dwg

Permanent Seeding
Specifications #6.11 – Specifications
(Specifications are as per the "Erosion and Sediment Control Planning and Design Manual" of the state of North Carolina)
Table 6.11p – Seeding No. 1CP for: Well–to Poorly Drained soils with Good Moisture Retention; Low Maintenance
Seeding mixture

Species	Rate (lb/acre)
Tall fescue	80
Pensacola Bahiagrass	50
Sericea lespedeza	30
Kobe lespedeza	10

Seeding Notes
1. From Sept. 1 – Mar. 1, use unscarified sericea seed
2. On poorly drained sites omit sericea and increase Kobe to 30 lb/acre.
3. Where a neat appearance is desired, omit sericea and increase Kobe to 40 lb/acre.

Nurse plants
Between Apr. 15 & Aug. 15, add 10 lb/acre German millet or 15 lb/acre Sudangrass. Prior to May 1 or after Aug. 15, add 25 lb/acre rye (grain).

Seeding dates

	Best	Possible
Early spring:	Feb. 15 – Mar. 20	Feb. 15 – Apr. 30
Fall:	Sept. 1 – Sept. 30	Sept. 1 – Oct. 31

Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000–5,000 lb/acre ground agricultural limestone (use the lower rate on sandy soils) and 1,000 lb/acre 10–10–10 fertilizer.
Mulch – Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor straw by tacking with asphalt, netting, or roving or by crimping with a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – If growth is less than fully adequate, refertilize in the second year, according to soil tests or topdress with 500 lb/acre 10–10–10 fertilizer. Mow as needed when sericea is omitted from the mixture. Reseed, fertilize, and mulch damaged areas immediately.

Table 6.11q – Seeding No. 2CP for: Well–to Poorly Drained soils with Good Moisture Retention; High Maintenance
Seeding mixture

Species	Rate (lb/acre)
Tall fescue (blend of two or three improved varieties)	200
Rye (grain)	25

Seeding dates
Best: Sept. 15 – Oct. 15
Possible: Sept. 1 – Oct. 31 or Feb. 15 – Apr. 30

Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000–5,000 lb/acre ground agricultural limestone (use the lower rate on sandy soils) and 1,000 lb/acre 10–10–10 fertilizer.
Mulch – Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor straw by tacking with asphalt, netting, or roving or by crimping with a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – Fertilize according to soil tests or apply 40 lb/acre nitrogen in Jan. or Feb., 40 lb in Sept., and 40 lb in Nov., from a 12–4–8 , 16–4–8, or similar turf fertilizer. Avoid fertilizer applications during warm weather, as this inceases stand losses to disease. Reseed, fertilize, and mulch damaged areas immediately. Mow to a height of 2.5–3.5 inches as needed.

Table 6.11r – Seeding No. 3CP for: Dry Sands to Sandy Loams; High Maintenance, Fine Turf
Seeding mixture

Species	Rate (bu/1,000 ft^2)
Tifway or Tifway II hybrid Bermudagrass	Minimum: 3 Rapid cover: 10

Seeding Notes
1. Sprig or sod (Practice 6.12, Sodding). Moisture is essential during initial establishment. Sod must be kept well watered for 2–3 weeks, but can be planted earlier or later than sprigs.
2. Common Bermuda can be seeded or sprigged but does not produce a high–quality turf. It is also less cold tolerant than the hybrids, more weed prone, and a pest in flower beds and specimen plantings.

Planting dates
Apr. – July

Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10–10–10 fertilizer, or 50 lb/acre nitrogen from turf–type slow–release fertilizer. Add 25–50 lb/acre nitrogen at 2– to 3–week intervals through midsummer.
Sprigging – Plant sprigs in furrows with a tractor–drawn transplanter, or broadcast by hand.
Furrows should be 4–6 inches deep and 2 ft apart. Place sprigs about 2 ft apart in the row with one end at or above ground level (Figure 6.11d).
Broadcast at rates shown above, and press sprigs into the top 1/2–2 inches of soil with a disk set straight so that sprigs are not brought back toward the surface.
Mulch – Do not mulch.
Maintenance – Water as needed and mow to 3/4– to 1–inch height. Topdress with 40 lb/acre nitrogen in Apr., 50 lb in May, 50 lb in June, 30 lb in July, and 25–50 lb in Aug.

Table 6.11s – Seeding No. 4CP for: Well–Drained Sandy Loams to Dry Sands, Coastal Plain and Eastern Edge of Piedmont; Low–to Medium–Care Lawns
Seeding mixture

Species	Rate
Centipedegrass	10–20 lb/acre (seed) or 33 bu/acre (sprigs)

Seeding dates
Mar. – June
(Sprigging can be done through July where water is available for irrigation.)

Soil amendments – Apply lime and fertilizer according to soil tests, or apply 300 lb/acre 10–10–10.
Sprigging – Plant sprigs in furrows with a tractor–drawn transplanter, or broadcast by hand.
Furrows should be 4–6 in ches deep and 2 ft apart. Place sprigs about 2 ft apart in the row with one end at or above ground level (Figure 6.11d)
Broadcast at rates shwon above, and press sprigs into the top 1/2–2 inches of soil with a disk set straight so that sprigs are not brought back toward the surface.
Mulch – Do not mulch.
Maintenance – Fertilize very sparingly – 20 lb/acre nitrogen in spring with no phosphorus. Centipedegrass cannot tolerate high pH or excess fertilizer.

Table 6.11t – Seeding No. 5CP for: Well–Drained Sandy Loams to Dry Sands; Low Maintenance
Seeding mixture

Species	Rate (lb/acre)
Pensacola Bahiagrass	50
Sericea lespedeza	30
Common Bermudagrass	10
German millet	10

Seeding Notes
1. Where a neat appearance is desired, omit sericea.
2. Use common Bermuda only on isolated sites where it cannot become a pest. Bermudagrass may be replaced with 5 lb/acre centipedegrass.

Seeding dates
Apr. 1 – July 15

Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10–10–10 fertilizer.
Mulch – Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor by tacking with asphalt, roving, or netting or by crimping with a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch ancoring tool.
Maintenance – Refertilize the following Apr. with 50 lb/acre nitrogen. Repeat as growth requires. May be mowed only once a year. Where a neat appearance is desired, omit sericea and mow as often as need.

Table 6.11v – Seeding No. 7CP for: Grass–lined Channels; Coastal Plain, Lower Piedmont, and Dry Soils in the Central Piedmont
Seeding mixture

Species	Rate (lb/acre)
Common Bermudagrass	40–80 (1–2 lb/1,000 ft^2)

Seeding dates
Coastal Plain: Apr. – July
Piedmont: Apr. 15 – June 30

Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10–10–10 fertilizer.
Mulch – Use jute, excelsior matting, or other effective channel lining material to cover the bottom of channels and ditches. The lining should extend above the highest calculated depth of flow. On channel side slopes above this height, and in drainages not requiring temporary linings, apply 4,000 lb/acre grain straw and anchor straw by stapling netting over the top.
Mulch and anchoring materials must not be allowed to wash down slopes where they can clog drainage devices.
Maintenance – A minimum of 3 weeks is required for establishment. Inspect and repair mulch frequently. Refertilize the following Apr. with 50 lb/acre nitrogen.

Refer to Appendix 8.02 for botanical names.

Temporary Seeding
Specifications #6.10 – Specifications
(Specifications are as per the "Erosion and Sediment Control Planning and Design Manual" of the state of North Carolina)
Table 6.10a – Temporary Seeding Recommendations for Late Winter and Early Spring
Seeding Mixture

Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

Seeding dates
Mountains – Above 2500 ft: Feb. 15–May 15
Below 2500 ft: Feb. 1–May 1
Piedmont – Jan. 1–May 1
Coastal Plain – Dec. 1–Apr. 15

Soil amendments – Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10–10–10 fertilizer.
Mulch – Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10b Temporary seeding Recommendations for Summer
Seeding mixture

Species	Rate (lb/acre)
German millet	40

In the Piedmont and Mountains, a small–stemmed Sudangrass may be substituted at a rate of 50 lb/acre.

Seeding dates
Mountains – May 15–Aug. 15
Piedmont – May 1–Aug. 15
Coastal Plain – Apr. 15–Aug. 15

Soil amendments – Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10–10–10 fertilizer.
Mulch – Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10c Temporary Seeding Recommendations for Fall
Seeding mixture

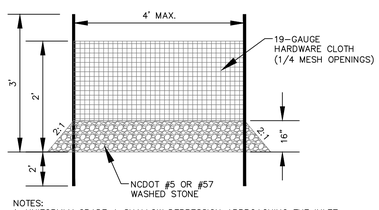
Species	Rate (lb/acre)
Rye (grain)	120

Seeding dates
Mountions – Aug. 15–Dec. 30
Coastal Plain and Piedmont – Aug. 15–Dec. 30

Soil amendments – Follow soil tests or apply 2,000 lb/acre ground agricultural limestone and 1,000 lb/acre 10–10–10 fertilizer.
Mulch – Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

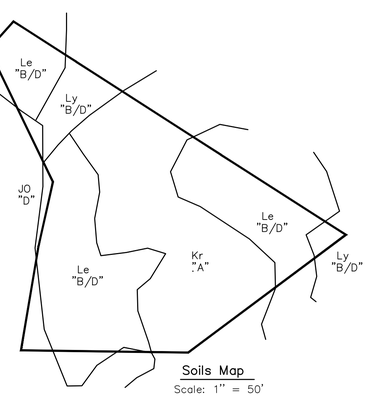
GROUND STABILIZATION		
SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10 FEET OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)

*NEW HANOVER COUNTY LAND QUALITY SEEDING DEADLINES: 21 CALENDAR DAYS FOR ALL SLOPES & 15 WORKING DAYS FOR ALL OTHER AREAS.
**THE SHORTER STABILIZATION TIME FRAME BETWEEN THE ABOVE CHART AND THE NEW HANOVER COUNTY LAND QUALITY SEEDING DEADLINES, FOR THE RESPECTIVE AREAS, SHALL BE FOLLOWED.

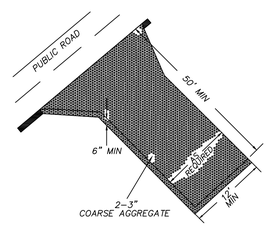


NOTES:
1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
2. DRIVE 5–FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2–FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.

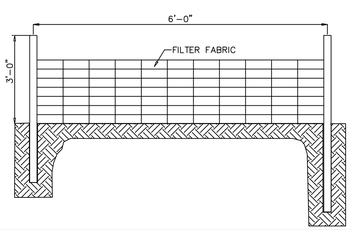
HARDWARE CLOTH & GRAVEL INLET PROTECTION DETAIL
NOT TO SCALE



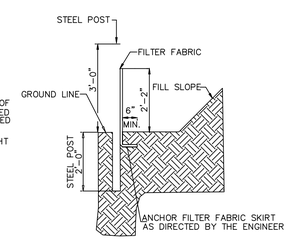
Soils Map
Scale: 1" = 50'



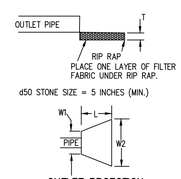
TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT
NOT TO SCALE



NOTES:
1. FILTER FABRIC SHALL BE A MINIMUM OF 36" IN WIDTH AND SHALL BE FASTENED ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER
2. STEEL POST SHALL BE 5' 0" IN HEIGHT AND BE OF SELF FASTENER ANGLE STEEL TYPE

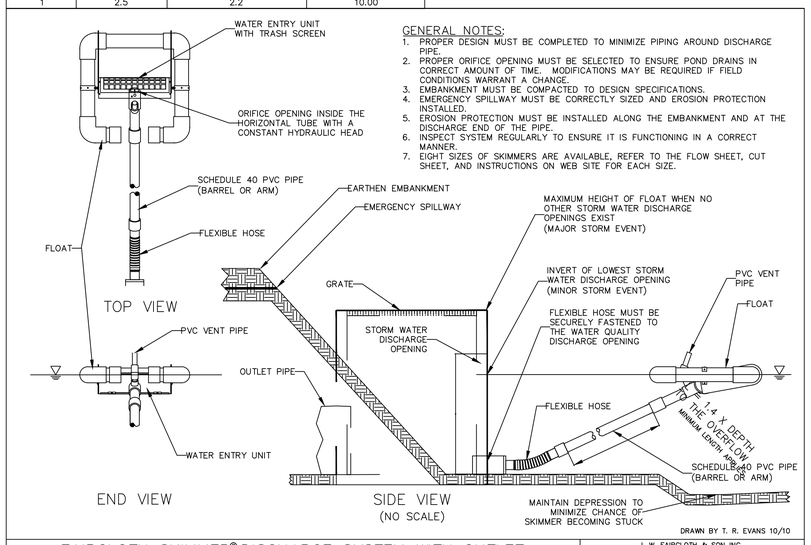


GUIDELINES FOR TEMPORARY SILT FENCE DETAIL
NOT TO SCALE



OUTLET PROECTION
NOT TO SCALE

FAIRCLOTH SKIMMER			
WET POND	SKIMMER (INCHES)	ORIFICE DIAMETER (INCHES)	ORIFICE INVERT (FEET)
1	2.5	2.2	10.00



GENERAL NOTES:
1. PROPER DESIGN MUST BE COMPLETED TO MINIMIZE PIPING AROUND DISCHARGE PIPE.
2. PROPER ORIFICE OPENING MUST BE SELECTED TO ENSURE POND DRAINS IN CORRECT AMOUNT OF TIME. MODIFICATIONS MAY BE REQUIRED IF FIELD CONDITIONS WARRANT A CHANGE.
3. EMBANKMENT MUST BE COMPACTED TO DESIGN SPECIFICATIONS.
4. EMERGENCY SPILLWAY MUST BE CORRECTLY SIZED AND EROSION PROTECTION INSTALLED.
5. EROSION PROTECTION MUST BE INSTALLED ALONG THE EMBANKMENT AND AT THE DISCHARGE END OF THE PIPE.
6. INSPECT SYSTEM REGULARLY TO ENSURE IT IS FUNCTIONING IN A CORRECT MANNER.
7. EIGHT SIZES OF SKIMMERS ARE AVAILABLE, REFER TO THE FLOW SHEET, CUT SHEET, AND INSTRUCTIONS ON WEB SITE FOR EACH SIZE.

FAIRCLOTH SKIMMER® DISCHARGE SYSTEM WITH OUTLET STRUCTURE

DRAWN BY T. R. EVANS 10/10

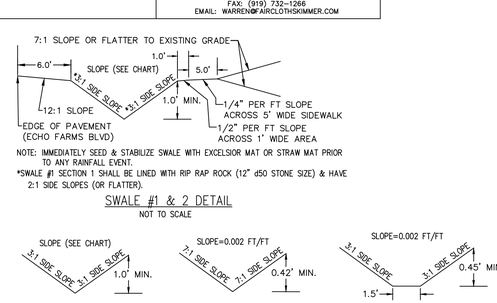
J. W. FAIRCLOTH & SON INC.
WWW.FAIRCLOTHSKIMMER.COM
TELEPHONE: (919) 732–1244
FAX: (919) 732–1266
EMAIL: WARREN@FAIRCLOTHSKIMMER.COM

SWALE #1			
SECTION	DOWNSTREAM INVERT (FT)	UPSTREAM INVERT (FT)	SLOPE (FT/FT)
1	12.98	13.81	0.072
2	13.81	14.20	0.0153

SWALE #2			
SECTION	DOWNSTREAM INVERT (FT)	UPSTREAM INVERT (FT)	SLOPE (FT/FT)
1	8.97	9.27	0.0071
2	9.27	9.88	0.0108
3	9.88	10.27	0.0072
4	10.27	10.76	0.0082
5	10.76	11.14	0.0068
6	11.14	11.87	0.0084

SWALE #3			
SECTION	DOWNSTREAM INVERT (FT)	UPSTREAM INVERT (FT)	SLOPE (FT/FT)
1	24.45	25.00	0.0051

SWALE #4			
SECTION	DOWNSTREAM INVERT (FT)	UPSTREAM INVERT (FT)	SLOPE (FT/FT)
1	15.43	20.19	0.0600
2	20.19	22.48	0.0253



NOTE: IMMEDIATELY SEED & STABILIZE SWALE WITH EXCELSIOR MAT OR STRAW MAT PRIOR TO ANY RAINFALL EVENT.
*SWALE #1 SECTION 1 SHALL BE LINED WITH RIP RAP ROCK (12" d50 STONE SIZE) & HAVE 2:1 SIDE SLOPES (OR FLATTER).

SWALE #1 & 2 DETAIL
NOT TO SCALE

SWALE #3 & 4 DETAIL
NOT TO SCALE

SWALE #5 DETAIL
NOT TO SCALE

SWALE #6 DETAIL
NOT TO SCALE

MAINTENANCE PLAN
1. ALL EROSION CONTROL MEASURES WILL BE CHECKED EVERY 7 DAYS OR AFTER EACH RAIN PRODUCING ½ INCHES OR MORE WHICH EVER COMES FIRST.
2. SEDIMENT WILL BE REMOVED FROM BEHIND SILT FENCES WHERE SEDIMENT IS 0.5 FEET DEEP AND REPAIR FABRIC IF TORN, LEAKING OR FAILING.
3. ALL POINTS OF EGRESS WILL HAVE CONSTRUCTION ENTRANCES THAT WILL BE PERIODICALLY TOP–DRESSED WITH AN ADDITIONAL 2 INCHES OF #4 STONE TO MAINTAIN PROPER DEPTH. THEY WILL BE MAINTAINED IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE SITE. IMMEDIATELY REMOVE OBJECTIONABLE MATERIAL SPILLED, WASHED, OR TRACKED ONTO THE CONSTRUCTION ENTRANCE OR ROADWAYS.
4. CHECK SEDIMENT BASINS AFTER PERIODS OF SIGNIFICANT RUNOFF. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT ACCUMULATES TO ONE–HALF THE DESIGN DEPTH. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA. GRAVEL WILL BE CLEANED OR REPLACED WHEN THE SEDIMENT POOL NO LONGER DRAINS PROPERLY OR IF THE ROCK IS DISLODGED.
5. INSPECT TEMPORARY SEDIMENT TRAPS AFTER EACH SIGNIFICANT RAINFALL. REMOVE SEDIMENT AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE–HALF THE DESIGN DEPTH OF THE TRAP. PLACE THE SEDIMENT THAT IS REMOVED IN THE DESIGNED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL FACING. CHECK THE STRUCTURE FOR DAMAGE FROM EROSION OR PIPING. PERIODICALLY CHECK THE DEPTH OF THE SPILLWAY TO ENSURE IT IS A MINIMUM OF 1.5 FT BELOW THE LOW POINT OF THE EMBANKMENT. IMMEDIATELY FILL ANY SETTLEMENT OF THE EMBAKMENT TO SLIGHTLY ABOVE GRADE. ANY RIPRAP DISPLACED FROM THE SPILLWAY MUST BE REPLACED IMMEDIATELY. AFTER ALL SEDIMENT–PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS AND STABILIZE PROPERLY.
6. INSPECT RIPRAP OUTLET STRUCTURES AFTER HEAVY RAINS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.
7. RIP RAP SHOULD BE INSPECTED PERIODICALLY FOR SCOUR OR DISLODGED STONES. CONTROL OF WEED AND BRUSH GROWTH MAY BE NEEDED IN SOME LOCATIONS.
8. ROCK DAM: CHECK SEDIMENT AFTER EACH RAINFALL. REMOVE SEDIMENT AND RESTORE ORIGINAL VOLUME WHEN SEDIMENT ACCUMULATES TO ABOUT ONE–HALF THE DESIGN VOLUME.
CHECK THE STRUCTURE FOR EROSION, PIPING, AND ROCK DISPLACEMENT AFTER EACH SIGNIFICANT RAINSTORM AND REPAIR IMMEDIATELY.
9. INSPECT ALL MULCHES PERIODICALLY AND AFTER RAINSTORMS TO CHECK FOR RILL EROSION, DISLOCATION, OR FAILURE. WHERE EROSION IS OBSERVED, APPLY ADDITIONAL MULCH. IF WASHOUT OCCURS, REPAIR THE SLOPE GRADE, RESEED, AND REINSTALL MULCH. CONTINUE INSPECTIONS UNTIL VEGETATION IS FIRMLY ESTABLISHED.
10. INSPECT CHECK DAMS AND CHANNELS FOR DAMAGE AFTER EACH RUNOFF EVENT. ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, INSTALL A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL. REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE CHECK DAM, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.
11. INSPECT BAFFLES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY. BE SURE TO MAINTAIN ACCESS TO THE BAFFLES. SHOULD THE FABRIC OF A BAFFLE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY. REMOVE SEDIMENT DEPOSITS WHEN IT REACHES HALF FULL TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE BAFFLES. TAKE CARE TO AVOID DAMAGING THE BAFFLES DURING CLEANOUT. SEDIMENT DEPTH SHOULD NEVER EXCEED HALF THE DESIGNED STORAGE DEPTH. AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED, REMOVE ALL BAFFLE MATERIALS AND UNSTABLE SEDIMENT DEPOSITS, BRING THE AREA TO GRADE, AND STABILIZE IT.
12. INSPECT INLETS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (½ INCH OR GREATER) RAINFALL EVENT. SEDIMENT WILL BE REMOVED FROM HARDWARE CLOTH AND GRAVEL INLET PROTECTION, BLOCK AND GRAVEL INLET PROTECTION, ROCK DOUGHNUT INLET PROTECTION AND ROCK PIPE INLET PROTECTION WHEN THE DESIGNED STORAGE CAPACITY HAS BEEN HALF FILLED WITH SEDIMENT. ROCK WILL BE CLEANED OR REPLACED WHEN THE SEDIMENT POOL NO LONGER DRAINS AS DESIGNED. DEBRIS WILL BE REMOVED FROM THE ROCK AND HARDWARE CLOTH TO ALLOW PROPER DRAINAGE. TAKE CARE NOT TO DAMAGE OR UNDERCUT THE WIRE MESH DURING SEDIMENT REMOVAL. SILT SACKS WILL BE EMPTIED ONCE A WEEK AND AFTER EVERY RAIN EVENT. SEDIMENT WILL BE REMOVED FROM AROUND BEAVER DAMS, DANDY SACKS AND SOCKS ONCE A WEEK AND AFTER EVERY RAIN EVENT.
13. INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY RAINFALL. IMMEDIATELY REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR THE DIVERSION RIDGE. CAREFULLY CHECK OUTLETS AND MAKE TIMELY REPAIRS AS NEEDED. WHEN THE AREA PROTECTED IS PERMANENTLY STABILIZED, REMOVE THE RIDGE AND THE CHANNEL TO BLEND WITH THE NATURAL GROUND LEVEL AND APPROPRIATELY STABILIZE IT.
14. INSPECT SKIMMER SEDIMENT BASINS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (ONE–HALF INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT ACCUMULATES TO ONE–HALF THE HEIGHT OF THE FIRST BAFFLE. PULL THE SKIMMER TO ONE SIDE SO THAT THE SEDIMENT UNDERNEATH IT CAN BE EXCAVATED. EXCAVATE THE SEDIMENT FROM THE ENTIRE BASIN, NOT JUST AROUND THE SKIMMER OR THE FIRST CELL. MAKE SURE VEGETATION GROWING IN THE BOTTOM OF THE BASIN DOES NOT HOLD DOWN THE SKIMMER. REPAIR THE BAFFLES IF THEY ARE DAMAGED. RE–ANCHOR THE BAFFLES IF WATER IS FLOWING UNDERNEATH OR AROUND THEM. IF THE SKIMMER IS CLOGGED WITH TRASH AND THERE IS WATER IN THE BASIN, USUALLY JERKING ON THE ROPE WILL MAKE THE SKIMMER BOB UP AND DOWN AND DISLODGE THE DEBRIS AND RESTORE FLOW. IF THIS DOES NOT WORK, PULL THE SKIMMER OVER TO THE SIDE OF THE BASIN AND REMOVE THE DEBRIS. ALSO CHECK THE ORIFICE INSIDE THE SKIMMER TO SEE IF IT IS CLOGGED; IF SO REMOVE THE DEBRIS. IF THE SKIMMER ARM OR BARREL PIPE IS CLOGGED, THE ORIFICE CAN BE REMOVED AND THE OBSTRUCTION CLEARED WITH A PLUMBER'S SNAKE OR BY FLUSHING WITH WATER. BE SURE AND REPLACE THE ORIFICE BEFORE REPOSITIONING THE SKIMMER. CHECK THE FABRIC LINED SPILLWAY FOR DAMAGE AND MAKE ANY REQUIRED REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE SKIMMER AND POOL AREAS. FREEZING WEATHER CAN RESULT IN ICE FORMING IN THE BASIN. SOME SPECIAL PRECAUTIONS SHOULD BE TAKEN IN THE WINTER TO PREVENT THE SKIMMER FROM PLUGGING WITH ICE.
15. ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDED AS NECESSARY, AND MULCHED ACCORDING TO SPECIFICATIONS IN THE VEGETATIVE PLAN TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER. SEE GROUND STABILIZATION CHART FOR STABILIZATION TIME FRAME.

Approved Construction Plan
Name Date
Planning
Traffic
Fire

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

EROSION CONTROL & STORMWATER DETAIL SHEET
4010 CAROLINA BEACH ROAD
ECHO FARM APARTMENTS
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DATE:	10–1–15
SCALE:	N.T.S.
DRAWN:	JCB
CHECKED:	JBM
PROJECT NO:	260

REV NO.	DESCRIPTION	DATE
1	REVISED FOR PRELIMINARY BID.	10–16–15
2	REVISED FOR SUBMITTAL.	10–23–15
3	REVISED PER EROSION CONTROL COMMENTS.	11–3–15
4	REVISED TO ADD SWALE DETAIL.	12–14–15
5	REVISED PER CITY.	2–9–16

REVISIONS

FINAL DRAWING FOR REVIEW PURPOSES ONLY

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SHEET NO: 11
OF: 22

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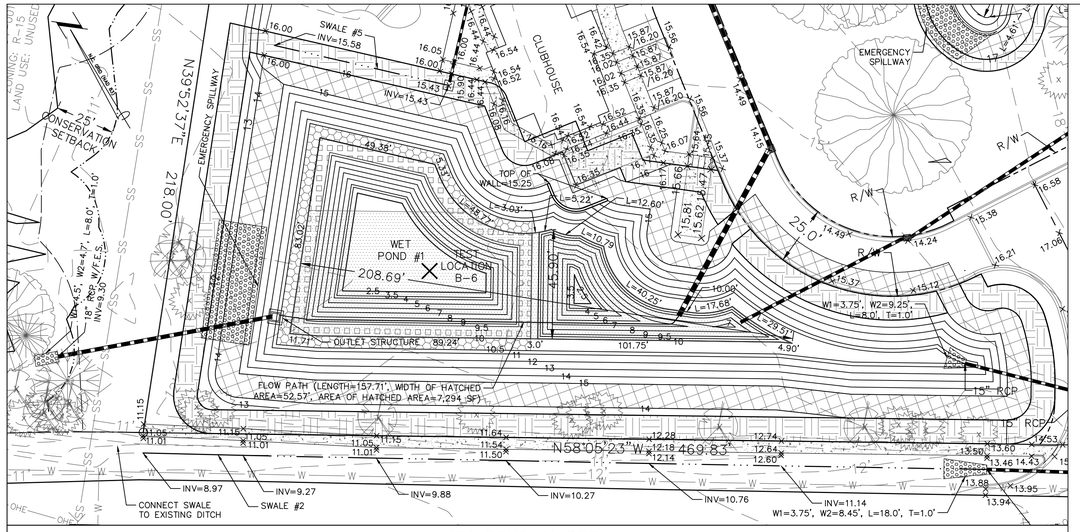
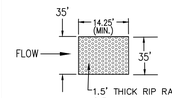


WET POND #1 DETAIL

SCALE: 1"=30'

POND HATCH LEGEND

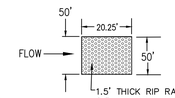
- 10' WIDE MAINTENANCE ACCESS
- SHALLOW LAND LANDSCAPE AREA
- SHALLOW WATER LANDSCAPE AREA
- 10' WIDE LANDSCAPE ZONE (5' WIDE FOR INFILTRATION BASIN #1)
- FLOW PATH AREA



NOTE: PLACE ONE LAYER OF FILTER FABRIC UNDER RIP RAP

INFILTRATION BASIN #1 EMERGENCY SPILLWAY OUTLET PROTECTION

NOT TO SCALE



NOTE: PLACE ONE LAYER OF FILTER FABRIC UNDER RIP RAP

WET POND #1 EMERGENCY SPILLWAY OUTLET PROTECTION

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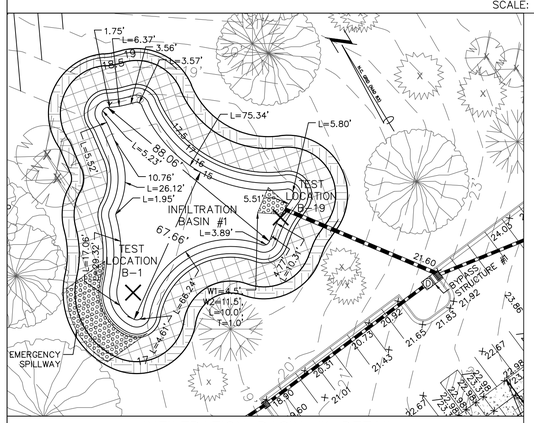
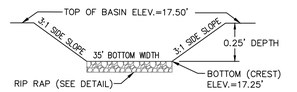


INFILTRATION BASIN #1 DETAIL

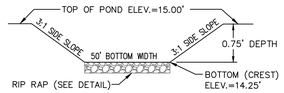
SCALE: 1"=30'



NOTE:
1. DETAIL IS CROSS SECTION THROUGH THE BASIN EMBANKMENT.
2. INSTALL A ROW OF SACRETE BAGS ACROSS ENTIRE WIDTH OF SPILLWAY WITH TOP OF BAG AT ELEVATION=17.25' TO ENSURE RUNOFF CANNOT EXIT THE BASIN UNTIL THE STAGE REACHES ELEVATION=17.25'.

INFILTRATION BASIN #1 EMERGENCY SPILLWAY CROSS SECTION DETAIL

NOT TO SCALE



NOTE:
1. DETAIL IS CROSS SECTION THROUGH THE POND EMBANKMENT.

WET POND #1 EMERGENCY SPILLWAY CROSS SECTION DETAIL

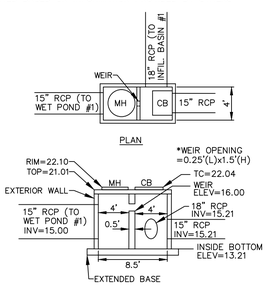
NOT TO SCALE

SEASONAL HIGH WATER TABLE RESULTS				
TEST LOCATION ID	EXISTING GROUND ELEVATION (FEET)*	SHWT (INCHES BELOW GROUND SURFACE)**	SHWT ELEVATION (FEET)***
B-1	16.60	48	12.60
B-2	20.96	38	17.80
B-3	27.98	60	22.98
B-4	26.17	36	23.17
B-5	24.67	66	19.17
B-6	12.47	10	11.64
B-7	14.50	30	12.00
B-8	14.79	36	11.79
B-9	18.18	60	13.18
B-10	27.03	48	23.03
B-11	25.73	16	24.40
B-12	25.47	18	23.97
B-13	26.32	36	23.32
B-14	25.48	48	21.48
B-15	25.71	42	22.21
B-16	25.48	42	21.98
B-17	24.73	42	21.23
B-18	25.57	44	21.91
B-19	17.76	66	12.26
B-20	27.02	52	22.69
B-21	27.05	50	22.89
B-22	26.29	38	23.13
B-23	26.30	42	22.80

* INFORMATION PROVIDED BY BATEMAN CIVIL SURVEY COMPANY, PC.
** INFORMATION PROVIDED BY ECS CAROLINAS, LLP.
*** CALCULATED BASED ON INFORMATION PROVIDED BY OTHERS

WET POND #1			
ELEV. (FT)	AREA (SQ. FT.)	INCREMENTAL VOLUME (CU. FT.)	CUMULATIVE VOLUME (CU. FT.)
10.00	8,686	0	0
10.50	11,762	5,112	5,112
11.00	12,827	6,147	11,259
12.00	15,022	13,925	25,184
13.00	17,262	16,142	41,326
14.00	19,559	18,411	59,737
15.00	21,927	20,743	80,480

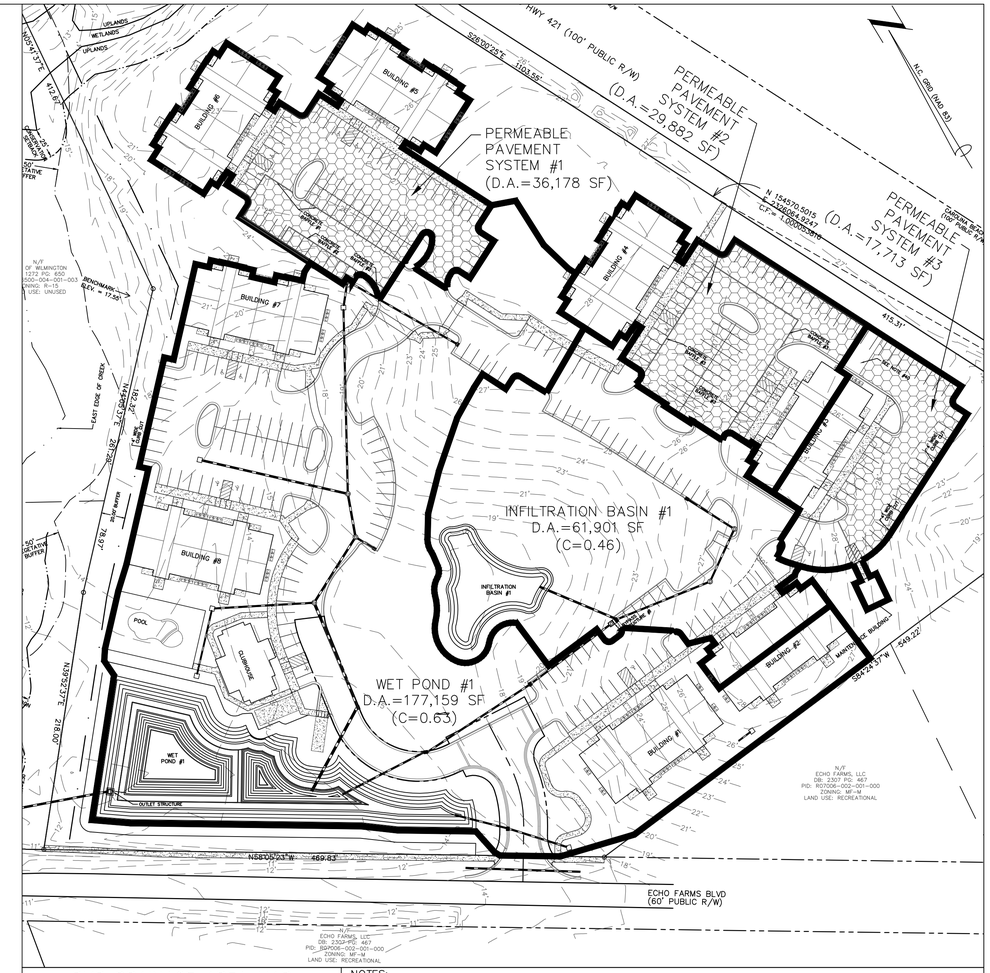
INFILTRATION BASIN #1			
ELEV. (FT)	AREA (SQ. FT.)	INCREMENTAL VOLUME (CU. FT.)	CUMULATIVE VOLUME (CU. FT.)
15.00	2,925	0	0
15.50	3,364	1,572	1,572
16.00	3,817	1,795	3,367
16.50	4,283	2,025	5,392
17.00	4,764	2,262	7,654
17.50	5,260	2,506	10,160



NOTE: LENGTH & WIDTH DIMENSIONS SHOWN ARE INSIDE OF THE STRUCTURE. EXTERIOR WALLS & TOP OF STRUCTURE TO BE MIN. OF 0.5' THICK. BASE OF STRUCTURE TO BE MIN. OF 0.5' THICK & EXTEND MIN. OF 0.5' BEYOND OUTSIDE WALL OF STRUCTURE.

BYPASS STRUCTURE #1 DETAIL

NOT TO SCALE



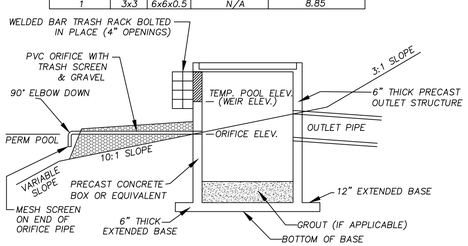
BMP DRAINAGE AREA MAP

SCALE: 1"=60'

NOTES:
1. D.A. OF PERMEABLE PAVEMENT SYSTEMS EXCLUDE ANY PERVIOUS AREA SHOWN WITHIN D.A. BOUNDARY.
2. D.A. OF WET POND #1 EXCLUDES D.A. OF INFILTRATION BASIN #1.

OUTLET STRUCTURE DETAILS (FEET)

WET POND	BOX INSIDE	SLAB	GROUT INSIDE THICKNESS	BOTTOM OF BASE ELEVATION
1	3x3	6x6x0.5	N/A	8.85

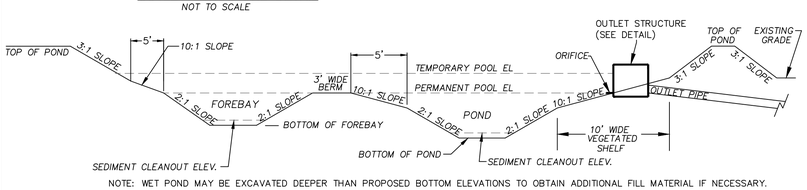


NOTE: ALL OUTLETS SHALL BE PROTECTED BY TRASH SCREENS/RACKS. THE TOP OF THE RISER SHALL HAVE A TRASH RACK MADE OF NUMBER 5 REBARS WELDED TO ANGLE FRAME. FRAME SHALL BE ATTACHED TO RISER SO AS TO BE REMOVABLE FOR MAINTENANCE.

OUTLET STRUCTURE DETAIL

NOT TO SCALE

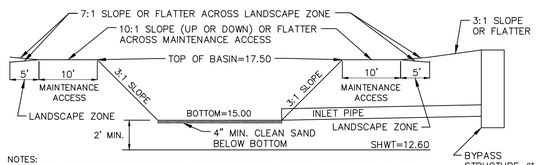
POND NOTES:
1. TALL FESCUE, BERMUDA GRASS, PENSACOLA BAHIAGRASS, OR REED CANARY GRASS SHALL BE PLANTED ON SLOPES OF WET POND #1 ABOVE ELEVATION=10.50'. TALL FESCUE, BERMUDA GRASS, PENSACOLA BAHIAGRASS, REED CANARY GRASS, OR ANY SHALLOW LAND PLANT VARIETIES FROM THE VEGETATIVE SHELF PLANT SCHEDULE SHALL BE PLANTED AROUND THE FOREBAY IN WET POND #1 FROM ELEVATION=10.00' TO 10.50'. SEE VEGETATIVE SHELF PLANT SCHEDULE FOR PLANTING OF VEGETATIVE SHELF (HATCHED AREA).
2. WET POND #1 SHALL BE USED AS A SEDIMENT BASIN WITH A FAIRCLOTH SKIMMER ORIFICE DURING CONSTRUCTION. IT SHALL BE CLEANED OUT PRIOR TO USE AS A WET POND.
3. ALL WATER THAT DRAINS OFF IMPERVIOUS SURFACES SHALL BE DIRECTED INTO THE APPROPRIATE STORMWATER SYSTEM (SEE DRAINAGE AREA MAPS).
4. EMERGENCY SPILLWAY & ENERGY DISSIPATOR TO HAVE FILTER FABRIC UNDERLAYMENT.
5. IF THE POND NEEDS TO BE DRAINED FOR MAINTENANCE OR AN EMERGENCY A PUMP SHALL BE USED TO DRAIN IT.



NOTE: WET POND MAY BE EXCAVATED DEEPER THAN PROPOSED BOTTOM ELEVATIONS TO OBTAIN ADDITIONAL FILL MATERIAL IF NECESSARY.

WET POND #1–FOREBAY & POND SECTION DETAIL

NOT TO SCALE



NOTES:
1. ANY FILL MATERIAL USED TO OBTAIN INFILTRATION BASIN BOTTOM ELEVATION SHALL BE CLEAN SAND (BEACH QUALITY) WITH A PERMEABILITY RATE EQUAL TO OR GREATER THAN 13.0 INCHES/HOUR.

INFILTRATION BASIN #1–CROSS SECTION DETAIL

NOT TO SCALE

VEGETATIVE SHELF PLANT SCHEDULE						
LOCATION	PLANT VARIETIES BOTANICAL NAME (COMMON NAME)	SPACING	SIZE	HATCHED SHELF AREA (SF)	PLANTINGS REQUIRED (MIN. 50 PER 200 SF)	PLANTINGS PROVIDED (MIN. 50 PER 200 SF)
*SHALLOW WATER (VEGETATIVE SHELF BELOW PERMANENT POOL ELEVATION; ELEV.=9.50' TO ELEV.=10.00')	Acorus subcordatum (Sweetflag), Alisma subcordatum (Water plantain), Hydrolea quadrivalvis (Waterpod), Iris virginica (Blue flag iris), Juncus effusus var. pylaei or solutus (Soft rush), Ludwigia spp. (Primrose willow), Peltandra virginica (Arrow arum), Pontederia cordata (Pickerelweed), Sagittaria latifolia (Duck Potato), Sagittaria lancifolia (Bulltongue), Saururus cernuus (Lizard's tail), Schoenoplectus tabernaemontani (Soft stem bulrush), Schoenoplectus americanus (Three-square bulrush), Scirpus cyperinus (Woolgrass), Zizaniopsis miliacea (Giant cutgrass)	2' O.C. STAGGERED	5–6" PLUG	1,554.90	389	389
**SHALLOW LAND (VEGETATIVE SHELF ABOVE PERMANENT POOL ELEVATION; ELEV.=10.00' TO ELEV.=10.50')	Asclepias incarnata (Swamp Milkweed), Carex tenera (Quill sedge), Chelone glabra (White Turtlehead), Eupatoriadelphus dubius (Dwarf Joe Pye Weed), Eupatoriadelphus fistulosus (Joe Pye Weed), Eupatoriadelphus maculatus (Spotted trumpetweed), Hibiscus coccineus (Scarlet rose mallow), Hibiscus laevis (Halberdleaf rosemallow), Kosteletzkya virginica (Seashore Mallow), Lobelia cardinalis (Cardinal flower), Lobelia elongaa (longleaf lobelia), Lobelia siphilitica (Great blue Lobelia), Rhynchospora colorata (Starrush whitetop), Saccharum baldwinii (Narrow plumegrass)	2' O.C. STAGGERED	5–6" PLUG	1,490.12	373	373

*AT LEAST 3 DIFFERENT SHALLOW WATER PLANT VARIETIES MUST BE PLANTED.
**AT LEAST 3 DIFFERENT SHALLOW LAND PLANT VARIETIES MUST BE PLANTED.

WET POND	TOP POND	PERM. POOL	TEMP. POOL	VEGETATED SHELF	FOREBAY BOTTOM	POND BOTTOM	SEDIMENT CLEANOUT EL FOREBAY	SEDIMENT CLEANOUT EL MAIN POND	OUTLET STRUCTURE ELEVATIONS TOP	WIER(bottom)	WIER(top)	ORIFICE	OUTLET	EMERGENCY SPILLWAY	IMPERVIOUS AREAS (SQUARE FEET) BUILDINGS	PARKING	SIDEWALKS	OTHER	FUTURE	TOTAL
1	15.00	10.00	11.20	9.50–10.50	2.50	2.50	3.50	3.50	13.75	0.5'Hx1.75'L@11.20	N/A	1.5"ø @ 10.00	18"ø RCP @ 9.85	50' @ 14.25	30,819	65,872	8,092	5,143	1,350	111,276

Approved Construction Plan

Name Date

Planning_____

Traffic_____

Fire_____

CITY OF WILMINGTON NORTH CAROLINA

Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit #_____

Signed: _____

EROSION CONTROL & STORMWATER DETAIL SHEET

4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

REV NO.	DESCRIPTION	DATE
1	REVISED FOR PRELIMINARY BID.	10–16–15
2	REVISED FOR SUBMITTAL.	10–23–15
3	REVISED TO ADD DETAILS.	11–3–15
4	REVISED PER TRC COMMENTS.	12–14–15
5	REVISED PER CITY.	2–9–16
6	REVISED TO ADJUST CLUBHOUSE, MAIL KIOSK, SIDEWALK AROUND CLUBHOUSE, WET POND #1, WET POND #1 OUTLET STRUCTURE, VOLUME CHART, IMPERVIOUS AREAS IN CHART, AND MAINTENANCE & LANDSCAPE ZONE BETWEEN WET POND #1 & CLUBHOUSE.	8–24–16
7	REVISED TO ADJUST MAIL KIOSK, WET POND #1, WET POND #1 OUTLET STRUCTURE, VOLUME CHART, IMPERVIOUS AREAS IN CHART, AND MAINTENANCE & LANDSCAPE ZONE BETWEEN WET POND #1 & CLUBHOUSE.	9–9–16

REVISIONS

FINAL DRAWING FOR REVIEW PURPOSES ONLY

PRELIMINARY PLAT
NOT FOR RECORDATION, CONVEYANCES, OR SALES

MALPASS ENGINEERING & SURVEYING, P.C.
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Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

DATE: 10–1–15
SCALE: VARIES
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260
SHEET NO: 12 OF: 22

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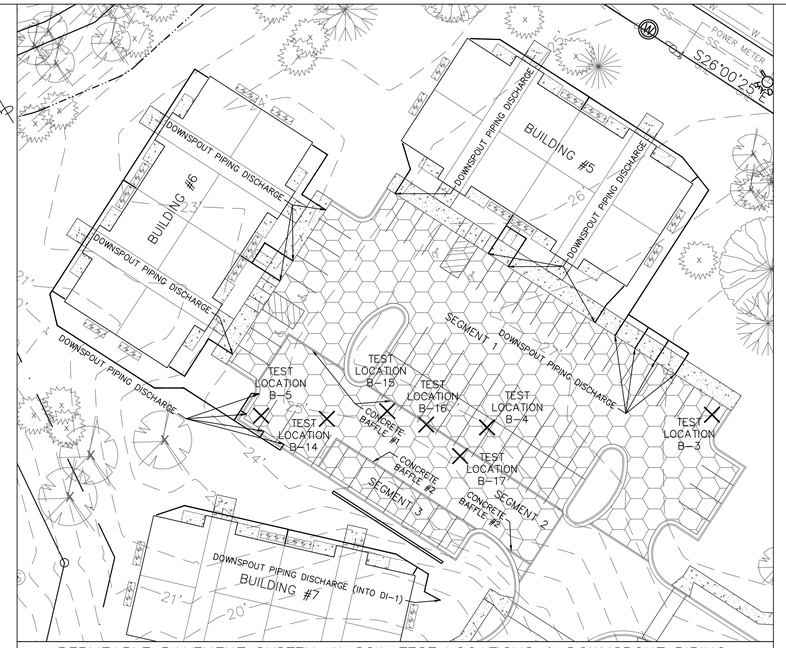
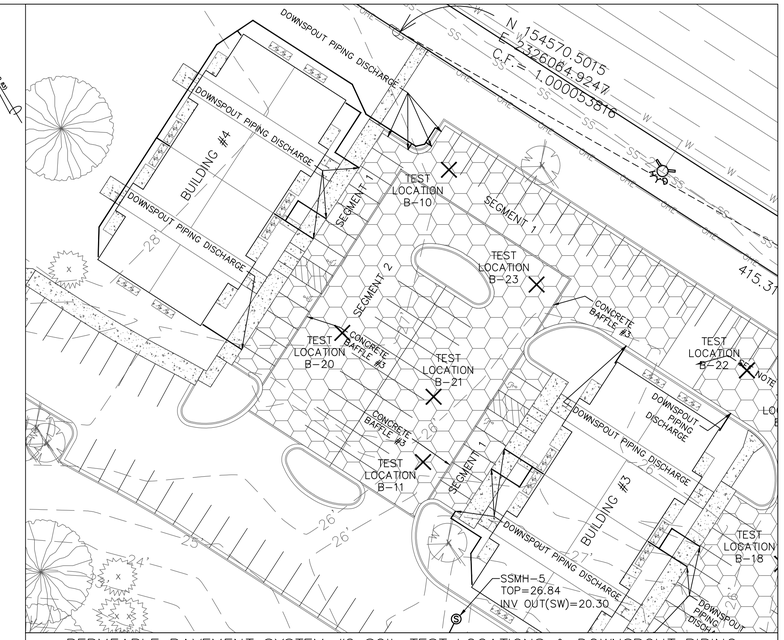
CONSTRUCTION SEQUENCE FOR INSTALLATION OF PERMEABLE PAVEMENT (NCDENR STORMWATER BMP MANUAL CHAPTER 18)

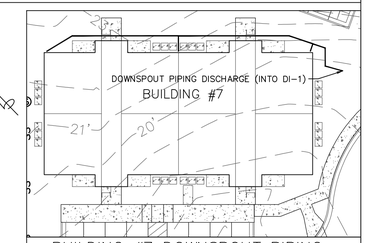
1. ENSURE ACCEPTABLE CONDITIONS FOR CONSTRUCTION
   - PERVIOUS SURFACES MUST BE GRADED TO DRAIN AWAY FROM THE PERMEABLE PAVEMENT, EXCEPT WHERE THIS IS UNAVOIDABLE, SUCH AS PARKING LOT ISLANDS, AND AREA BETWEEN BUILDINGS & PARKING LOT.
   - IMPERVIOUS AREAS THAT WILL DRAIN TO THE PERMEABLE PAVEMENT ARE COMPLETED.
   - AREAS ADJACENT TO THE PERMEABLE PAVEMENT ARE STABILIZED (VEGETATION, MULCH, STRAW, FIBER BLANKETS, ETC.) IN ORDER TO PREVENT EROSION & POSSIBLE CONTAMINATION WITH SEDIMENTS.
   - CONSTRUCTION ACCESS TO OTHER PORTIONS OF THE SITE IS ESTABLISHED SO THAT NO CONSTRUCTION TRAFFIC PASSES THROUGH THE PERMEABLE PAVEMENT SITE DURING INSTALLATION. INSTALL BARRIERS/FENCES AS NEEDED.
   - WEATHER FORECAST CALLS FOR A WINDOW OF DRY WEATHER TO PREVENT EXCESS COMPACTION OR SMEARING OF THE SOIL SUBGRADE WHILE IT IS EXPOSED.
   - ALL PERMEABLE PAVEMENT AREAS ARE CLEARLY MARKED ON THE SITE.
2. EXCAVATE PERMEABLE PAVEMENT AREA & PREPARE SUBGRADE SURFACE
   - EXCAVATE IN DRY SUBGRADE CONDITIONS & AVOID EXCAVATING IMMEDIATELY AFTER STORMS WITHOUT A SUFFICIENT DRYING PERIOD.
   - DO NOT ALLOW EQUIPMENT TO CROSS THE PAVEMENT AREA AFTER EXCAVATION HAS BEGUN.
   - OPERATE EXCAVATION EQUIPMENT FROM OUTSIDE THE EXCAVATION AREA OR FROM UNEXCAVATED PORTIONS OF THE AREA USING AN EXCAVATION STAGING PLAN.
   - USE EQUIPMENT WITH TRACKS RATHER THAN TIRES TO MINIMIZE SOIL COMPACTION WHEN EQUIPMENT ON THE SUBGRADE SURFACE IS UNAVOIDABLE.
   - DIG THE FINAL 9 TO 12 INCHES BY USING THE TEETH OF THE EXCAVATOR BUCKET TO LOOSEN SOIL & DO NOT SMEAR THE SUBGRADE SOIL SURFACE. FINAL GRADING OR SMOOTHING OF SUBGRADE SHOULD BE DONE BY HAND IF POSSIBLE.
   - THE FINAL SUBGRADE SLOPE SHALL NOT EXCEED 0.5%. THE FINAL SUBGRADE SHALL BE SURVEYED BEFORE PROCEEDING WITH INSTALLATION.
   - MINIMIZE THE TIME BETWEEN EXCAVATION AND PLACEMENT OF THE AGGREGATE.
   - AFTER THE SUBGRADE SLOPE IS VERIFIED, SCARIFY THE SOIL SUBGRADE SURFACE TO MAINTAIN THE SOILS PRE-DISTURBANCE INFILTRATION RATE.
   - TO SCARIFY THE PAVEMENT, USE THE EXCAVATOR BUCKET'S TEETH TO RAKE THE SURFACE OF THE SUBGRADE.
3. TEST THE SUBGRADE SOIL INFILTRATION RATE (INFILTRATION SYSTEMS ONLY)
   - IMMEDIATELY AFTER EXCAVATION & BEFORE THE AGGREGATE IS PLACED, CONDUCT A DIRECT MEASUREMENT OF THE SOIL'S INFILTRATION RATE. INFILTRATION TESTING SHALL BE PERFORMED BY AN APPROPRIATELY-QUALIFIED PROFESSIONAL.
   - RESULTS OF THE INFILTRATION TESTING SHALL BE PROVIDED TO THE ENGINEER.
   - IF THE SOIL TEST SHOWS INFILTRATION RATE(S) THAT ARE LOWER THAN THE RATE(S) USED IN THE DESIGN, THEN ADDITIONAL SCARIFICATION, RIPPING, OR TRENCHING OF THE SOIL WILL BE NEEDED.
   - CONTRACTOR SHALL CONTACT & RECEIVE APPROVAL FROM ENGINEER OF RECORD TO CONTINUE INSTALLATION OF PERMEABLE PAVEMENT.
4. PLACE GEOTEXTILES AND GEOMEMRANE (IF APPLICABLE)
   - FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR THE APPROPRIATE OVERLAP BETWEEN ROLLS OF MATERIAL. SECURE THE MATERIAL TO ENSURE IT DOES NOT MOVE OR WRINKLE WHEN PLACING AGGREGATE.
5. PLACE OBSERVATION WELL(S)
   - PLACE OBSERVATION WELL(S) ACCORDING TO THE PLAN AND VERIFY THAT THE ELEVATIONS ARE CORRECT.
6. PLACE & COMPACT AGGREGATE BASE
   - INSPECT ALL AGGREGATES TO ENSURE THEY ARE CLEAN, FREE OF FINES, AND CONFORM TO THE PLANS.
   - IF AGGREGATE DELIVERED TO THE SITE CANNOT BE IMMEDIATELY PLACED INTO THE EXCAVATION, THEY SHOULD BE STOCKPILED ON AN IMPERVIOUS SURFACE, GEOTEXTILE, OR ON AN IMPERVIOUS MATERIAL TO KEEP THE AGGREGATE FREE OF SEDIMENT.
   - IF AGGREGATE BECOMES CONTAMINATED WITH SEDIMENT, THEN IT SHALL BE REPLACED WITH CLEAN AGGREGATE.
   - BEFORE PLACING THE AGGREGATE BASE, REMOVE ANY ACCUMULATION OF SEDIMENTS ON THE FINISHED SOIL SUBGRADE.
   - IF THE EXPOSED SUBGRADE HAS BEEN SUBJECTED TO RAINFALL BEFORE PLACMENT OF THE AGGREGATE, THEN THE SUBGRADE SURFACE MUST BE SCARIFIED TO BREAK UP THE RESULTING SURFACE CRUST.
   - SLOPES & ELEVATIONS SHALL BE CHECKED ON THE SOIL SUBGRADE AND THE FINISHED ELEVATION OF BASE (AFTER COMPACTION) OR BEDDING MATERIALS TO ASSURE THEY CONFORM TO THE PLANS AND SPECIFICATIONS.
   - THE AGGREGATE SHALL BE SPREAD (NOT DUMPED) BY A FRONT-END LOADER OR FROM DUMP TRUCKS DEPOSITING FROM NEAR THE EDGE OF THE EXCAVATED AREA OR DIRECTLY ON DEPOSITED AGGREGATE PILES. MOISTEN AND SPREAD THE WASHED STONE WITHOUT DRIVING ON THE SOIL SUBGRADE. BE CAREFUL NOT TO DAMAGE THE OBSERVATION WELLS DURING COMPACTION.
   - FOLLOW COMPACTION RECOMMENTDATIONS BY THE PERMEABLE PAVEMENT MANUFACTURER OR THAT FROM INDUSTRY GUIDELINES.
   - BE SURE THAT CORNERS, AREAS AROUND UTILITY STRUCTURES AND OBSERVATION WELLS, & TRANSITION AREAS TO OTHER PAVEMENTS ARE ADEQUATELY COMPACTED.
   - DO NOT CRUSH AGGREGATES DURING COMPACTION.
7. INSTALL CURB RESTRAINTS AND PAVEMENT BARRIERS
   - EDGE RESTRAINTS AND BARRIERS BETWEEN PERMEABLE IMPERVIOUS PAVEMENT SHALL BE INSTALLED PER THE PLAN. BEFORE MOVING ON TO CONSTRUCTION STEP 8, BE CERTAIN THE DESIGN AND INSTALLATION ARE CONSISTENT.
8. INSTALL PAVEMENT COURSE
   - PERVIOUS CONCRETE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST VERSION OF ACI 522.1 SPECIFICATION FOR PERVIOUS CONCRETE.
   - INSTALLATION OF THE PERVIOUS CONCRETE MAY BE ACCOMPLISHED USING EITHER THE ONE-STEP OR THE TWO-STEP METHOD.
9. PROTECT THE PAVEMENT THROUGH PROJECT COMPLETION
   - IF IT IS NOT POSSIBLE TO INSTALL THE PERMEABLE PAVEMENT AT THE END OF THE SITE CONSTRUCTION TIMELINE, THEN PROTECT THE PAVEMENT UNTIL PROJECT COMPLETION. THIS SHALL BE DONE BY:
     - A) ROUTING CONSTRUCTION ACCESS THROUGH OTHER PORTIONS OF THE SITE SO THAT NO CONSTRUCTION TRAFFTIC PASSES THROUGH THE PERMEABLE PAVEMENT SITE (INSTALL BARRIERS/FENCES AS NEEDED).
     - B) IF THIS IS NOT POSSIBLE, PROTECT THE PAVEMENT PER THE CONSTRUCTION DOCUMENTS. PROTECTION TECHNIQUES THAT MAY BE USED INCLUDE MATS, PLASTIC SHEETING, BARRIERS TO LIMIT ACCESS, OR MOVING THE STABILIZED CONSTRUCTION ENTRANCE.
     - C) SCHEDULE STREET SWEEPING DURING AND AFTER CONSTRUCTION TO PREVENT SEDIMENT FROM ACCUMULATING ON THE PAVEMENT.



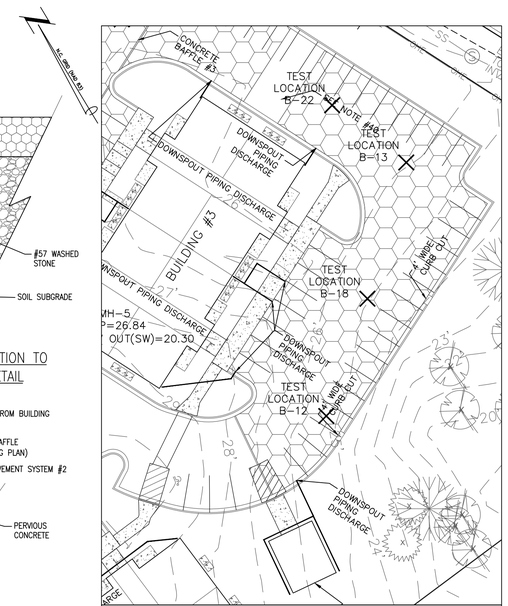
PERMEABLE PAVEMENT SYSTEM #1 SOIL TEST LOCATIONS & DOWNSPOUT PIPING LOCATION MAP
SCALE: 1"=30'



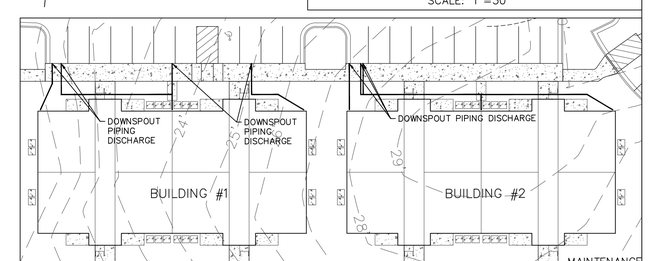
PERMEABLE PAVEMENT SYSTEM #2 SOIL TEST LOCATIONS & DOWNSPOUT PIPING LOCATION MAP
SCALE: 1"=30'



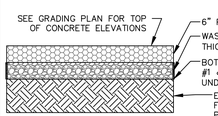
BUILDING #7 DOWNSPOUT PIPING LOCATION MAP
SCALE: 1"=30'



PERMEABLE PAVEMENT SYSTEM #3 SOIL TEST LOCATIONS & DOWNSPOUT PIPING LOCATION MAP
SCALE: 1"=30'



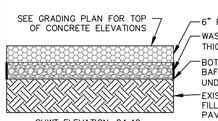
BUILDINGS #1 & 2 DOWNSPOUT PIPING LOCATION MAP
SCALE: 1"=30'



NOTE: GEOTEXTILE FABRIC SHALL BE PROVIDED AROUND PERIMETER OF #57 STONE, BUT NOT UNDER #57 STONE. A GEOMEMBRANE BARRIER SHALL BE USED INSTEAD OF GEOTEXTILE FABRIC FOR ANY LOCATION THAT IS WITHIN 20' OF A BUILDING FOUNDATION.

NOTE: CONTRACTOR & DEVELOPER SHALL CONSULT WITH & INSTALL PERVIOUS CONCRETE PER MANUFACTURER'S RECOMMENDATIONS/SPECIFICATIONS (INCLUDING CONCRETE & STONE THICKNESSES IF GREATER THAN SHOWN).

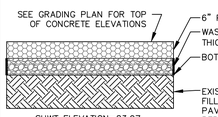
PERMEABLE PAVEMENT SYSTEM #1 CROSS SECTION DETAIL
NOT TO SCALE



NOTE: GEOTEXTILE FABRIC SHALL BE PROVIDED AROUND PERIMETER OF #57 STONE, BUT NOT UNDER #57 STONE. A GEOMEMBRANE BARRIER SHALL BE USED INSTEAD OF GEOTEXTILE FABRIC FOR ANY LOCATION THAT IS WITHIN 20' OF A BUILDING FOUNDATION.

NOTE: CONTRACTOR & DEVELOPER SHALL CONSULT WITH & INSTALL PERVIOUS CONCRETE PER MANUFACTURER'S RECOMMENDATIONS/SPECIFICATIONS (INCLUDING CONCRETE & STONE THICKNESSES IF GREATER THAN SHOWN).

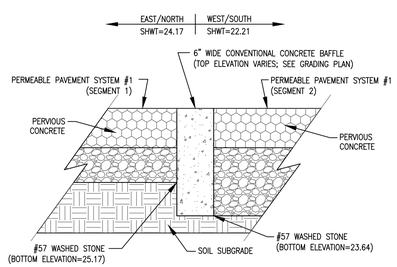
PERMEABLE PAVEMENT SYSTEM #2 CROSS SECTION DETAIL
NOT TO SCALE



NOTE: GEOTEXTILE FABRIC SHALL BE PROVIDED AROUND PERIMETER OF #57 STONE, BUT NOT UNDER #57 STONE. A GEOMEMBRANE BARRIER SHALL BE USED INSTEAD OF GEOTEXTILE FABRIC FOR ANY LOCATION THAT IS WITHIN 20' OF A BUILDING FOUNDATION.

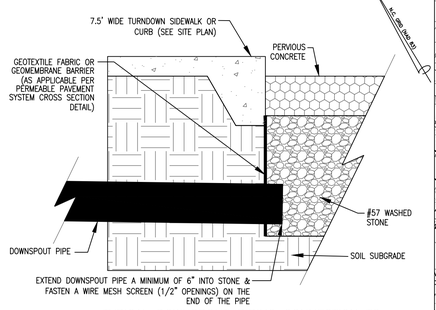
NOTE: CONTRACTOR & DEVELOPER SHALL CONSULT WITH & INSTALL PERVIOUS CONCRETE PER MANUFACTURER'S RECOMMENDATIONS/SPECIFICATIONS (INCLUDING CONCRETE & STONE THICKNESSES IF GREATER THAN SHOWN).

PERMEABLE PAVEMENT SYSTEM #3 CROSS SECTION DETAIL
NOT TO SCALE

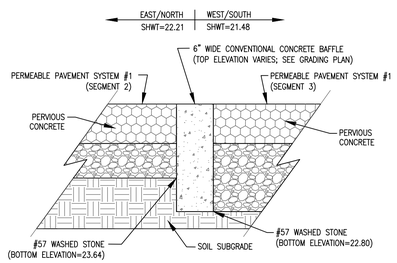


NOTE: BOTTOM ELEVATION OF #57 WASHED STONE SHALL BE CONSTANT UNDER EACH SEGMENT OF PERVIOUS CONCRETE.

CONCRETE BAFFLE #1 CROSS SECTION DETAIL
NOT TO SCALE

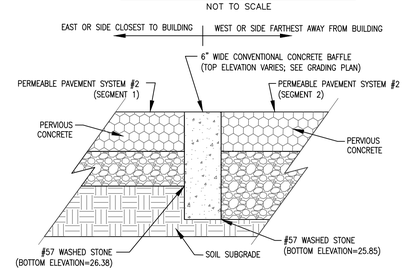


TYPICAL DOWNSPOUT PIPING CONNECTION TO PERMEABLE PAVEMENT SYSTEM DETAIL
NOT TO SCALE



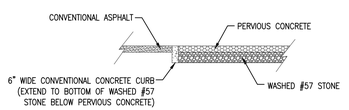
NOTE: BOTTOM ELEVATION OF #57 WASHED STONE SHALL BE CONSTANT UNDER EACH SEGMENT OF PERVIOUS CONCRETE.

CONCRETE BAFFLE #2 CROSS SECTION DETAIL
NOT TO SCALE

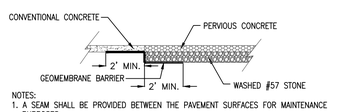


NOTE: BOTTOM ELEVATION OF #57 WASHED STONE SHALL BE CONSTANT UNDER EACH SEGMENT OF PERVIOUS CONCRETE.

CONCRETE BAFFLE #3 CROSS SECTION DETAIL
NOT TO SCALE

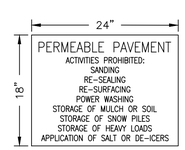


PERVIOUS CONCRETE & CONVENTIONAL ASPHALT BOUNDARY DETAIL
NOT TO SCALE

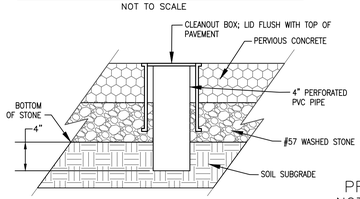


NOTES:
1. A SEAM SHALL BE PROVIDED BETWEEN THE PAVEMENT SURFACES FOR MAINTENANCE PURPOSES.

PERVIOUS & CONVENTIONAL CONCRETE BOUNDARY DETAIL
NOT TO SCALE



PERMEABLE PAVEMENT SIGN DETAIL
NOT TO SCALE



OBSERVATION WELL DETAIL
NOT TO SCALE

PRELIMINARY PLAT
NOT FOR RECORDATION, CONVEYANCES, OR SALES

REV NO.	DESCRIPTION	DATE
1	REVISED FOR PRELIMINARY BID.	10-16-15
2	REVISED FOR SUBMITTAL.	10-23-15
3	REVISED TO ADJUST DETAILS.	11-16-15
4	REVISED TO ADD DETAILS.	11-24-15
5	REVISED TO ADD DETAIL.	12-14-15
6	REVISED PER CITY.	2-9-16
7	REVISED TO ADJUST PARKING NORTH OF BUILDING #2.	8-24-16

REVISIONS

FINAL DRAWING FOR REVIEW PURPOSES ONLY

Approved Construction Plan
Name Date
Planning
Traffic
Fire

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

STORMWATER DETAIL SHEET
4010 CAROLINA BEACH ROAD
ECHO FARM APARTMENTS
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
Fax 910-392-5203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

DATE: 10-1-15
SCALE: VARIES
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260
SHEET NO: 13
OF: 22

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DRAINAGE AREA MAP-INLETS

SCALE: 1"=40'

INLET DRAINAGE AREA CHART	
INLET	DRAINAGE AREA (ACRES)
CB-1	0.20
CB-2	0.18
CB-3	0.42
CB-4	0.78
CB-5	0.28
CB-6	0.29
CB-7	0.19
CB-8	0.24
DI-1	0.13
DI-2	0.66
DI-3	0.01
DI-4 & SWALE #3	0.16
*DI-5 & SWALE #4	0.36
DI-6 & SWALE #5	0.09
DI-7	0.23
SWALE #1	1.21
**SWALE #2	1.71
SWALE #6	0.119

*DI-5 D.A. INCLUDES DI-4 D.A.
**SWALE #2 D.A. INCLUDES SWALE #1 D.A.

Pipe Table -System #1						
From	To	Size	Length	Slope	D.S. Invert	U.S. Invert
CB-8	Pond	15	78	1.78%	8.50	9.87
CB-7	CB-8	15	103	4.05%	9.87	14.01
SDMH-6	CB-7	15	81	1.19%	14.01	15.00

Pipe Table-System #2						
From	To	Size	Length	Slope	D.S. Invert	U.S. Invert
CB-4	Pond	24	78	0.29%	9.00	9.23
SDMH-3	CB-4	24	92	0.78%	9.23	9.96
SDMH-2	SDMH-3	18	62	0.91%	9.96	10.55
SDMH-1	SDMH-2	18	34	0.68%	10.55	10.80
DI-2	SDMH-1	18	125	0.31%	10.80	11.19
DI-7	SDMH-3	15	83	0.50%	11.26	11.69
DI-6	DI-7	12	56	0.50%	11.69	11.98
CB-3	SDMH-2	15	16	11.95%	10.55	12.58
DI-1	SDMH-1	15	154	3.51%	10.80	16.28
DI-3	DI-1	15	20	4.25%	16.28	17.23
CB-1	DI-3	15	104	3.46%	17.23	20.87

Pipe Table -System #3						
From	To	Size	Length	Slope	D.S. Invert	U.S. Invert
CB-6	Pond	18	69	0.31%	15.00	15.21
SDMH-5	CB-6	15	81	6.43%	15.21	20.60
SDMH-4	SDMH-5	15	46	0.51%	20.60	20.85
CB-5	SDMH-4	15	44	0.50%	20.85	21.08

Pipe Table -System #4						
From	To	Size	Length	Slope	D.S. Invert	U.S. Invert
CB-2	Pond	15	46	0.23%	10.50	10.61
DI-5	CB-2	15	50	2.62%	10.61	11.98

Pipe Table -System #5						
From	To	Size	Length	Slope	D.S. Invert	U.S. Invert
DI-4	Swale	12	13	0.36%	22.48	22.53

Pipe Table-Driveway Culvert						
From	To	Size (in)	Length (ft)	Slope (%)	D.S. Invert (ft)	U.S. Invert (ft)
Upstream	Downstream	15 (Class IV)	96	1.43	11.87	13.24

Pipe Table -Wet Pond #1 Outfall						
From	To	Size (in)	Length (ft)	Slope (%)	D.S. Invert (ft)	U.S. Invert (ft)
Pond	Downstream	18	92	0.60	9.30	9.85

Pipe Table -Culvert Downstream of Swale #7						
From	To	Size (in)	Length (ft)	Slope (%)	D.S. Invert (ft)	U.S. Invert (ft)
Swale #7	Downstream	15	21	2.20	22.70	23.16

Approved Construction Plan

Name Date

Planning_____

Traffic_____

Fire_____

CITY OF WILMINGTON NORTH CAROLINA

Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit #_____

Signed: _____

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

REV NO.	DESCRIPTION	DATE
1	REVISED TO ADD SWALE #7 DRAINAGE AREA & PIPE CHART.	12-14-15
2	REVISED PER CITY.	2-9-16
3	REVISED TO ADJUST PARKING NORTH OF BUILDING #2 & INLET DRAINAGE AREAS AT CLUBHOUSE.	8-24-16
4	REVISED TO ADJUST MAIL KIOSK AND WET POND.	9-9-16

REVISIONS

PRELIMINARY PLAT
NOT FOR RECORDATION,
CONVEYANCES, OR SALES

DRAINAGE AREA MAP
4010 CAROLINA BEACH ROAD

ECHO FARM APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
Fax 910-392-5203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

DATE: 11-24-15
SCALE: 1"=40'
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260

SHEET NO: 14
OF: 22

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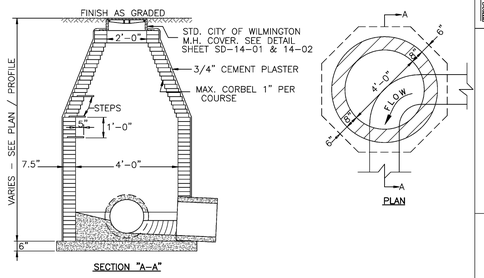


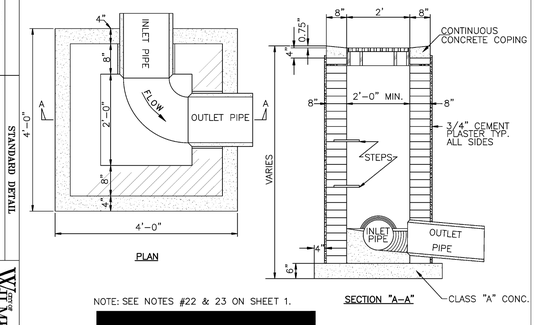
STANDARD DETAIL

GUIDELINES FOR STORM DRAIN MANHOLE

DATE: 2001
DRAWN BY JSR/CMR
CHECKED BY B.P., P.E.
SCALE NOT TO SCALE

CITY OF WILMINGTON ENGINEERING
WILMINGTON, NC 28402
(910) 341-7807

SD 2-03



NOTE: SEE NOTES #22 & 23 ON SHEET 1.

[redacted]

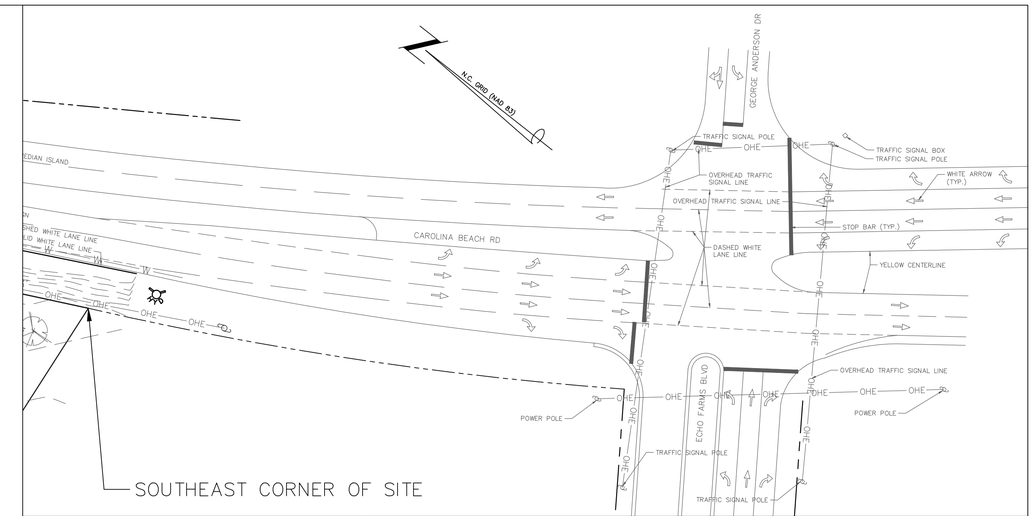
STANDARD DETAIL

GRILL BASIN

DATE: 2001
DRAWN BY JSR
CHECKED BY B.P., P.E.
SCALE NOT TO SCALE

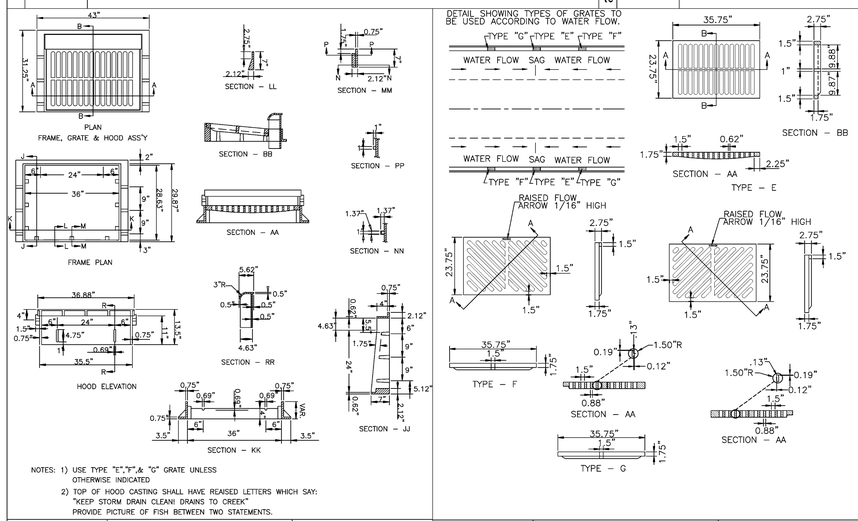
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807

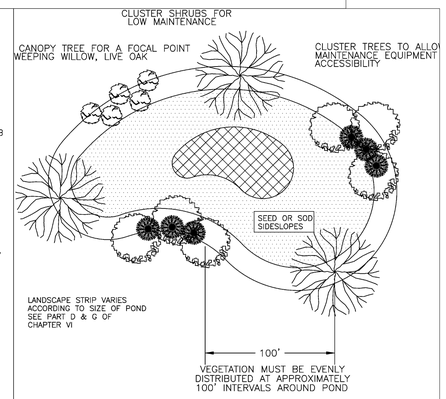
SD 2-02



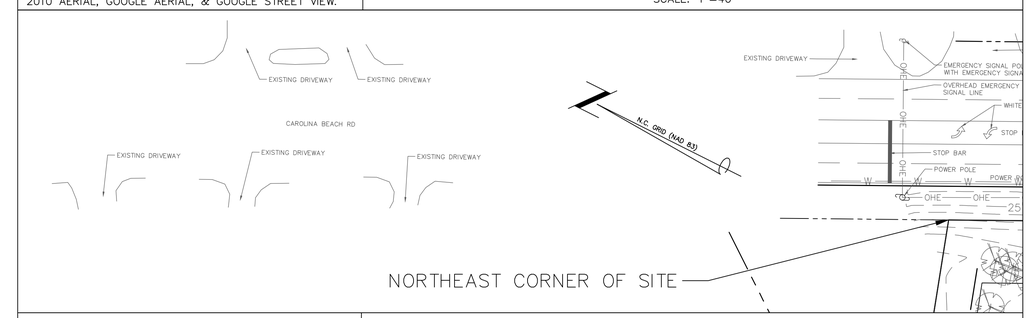
NOTE: DRIVEWAYS, POLES (EXCEPT ALONG SITE FRONTAGE), & MARKINGS TRACED/APPROXIMATED BASED ON NHC GIS 2010 AERIAL, GOOGLE AERIAL, & GOOGLE STREET VIEW.

DRIVEWAYS & TRAFFIC SIGNALS WITHIN 500' OF SOUTHEAST CORNER OF SITE
SCALE: 1"=40'





Notes:
1. If possible, locate pond where vegetation exists.
2. Suggest minimal clearing to conserve visual quality of site and minimize the additional of tree planting. An irregular shape provides a more natural appearance.
3. Landscape strip shall be a maximum slope of 7:1 in order to plant vegetation.
4. Provide a minimum of 3 inches of mulch around all vegetation.



NOTE: DRIVEWAYS, POLES (EXCEPT ALONG SITE FRONTAGE), & MARKINGS TRACED/APPROXIMATED BASED ON NHC GIS 2010 AERIAL, GOOGLE AERIAL, & GOOGLE STREET VIEW.

DRIVEWAYS & TRAFFIC SIGNALS WITHIN 500' OF NORTHEAST CORNER OF SITE
SCALE: 1"=40'

STANDARD DETAIL

CATCH BASIN CASTING FOR 30" HOOD AND GRATE

DATE: 2001
DRAWN BY JSR/CMR
CHECKED BY B.P., P.E.
SCALE NOT TO SCALE

CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807

SD 2-19

STANDARD DETAIL

CATCH BASIN GRATE FOR 30" HOOD AND GRATE

DATE: 2003
DRAWN BY JSR/CMR
CHECKED BY B.P., P.E.
SCALE NOT TO SCALE

CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807

SD 2-20

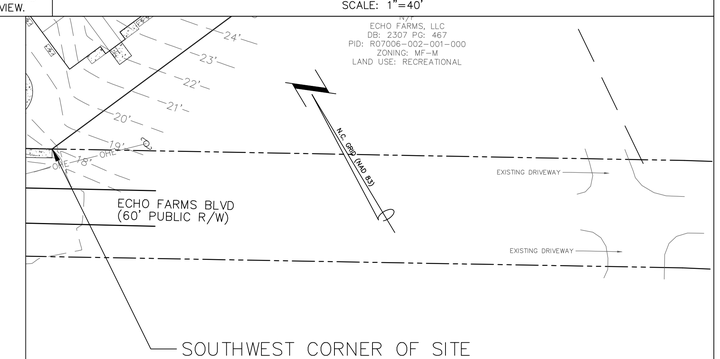
STANDARD DETAIL

TYPICAL STORM WATER FACILITY LANDSCAPING PLAN

DATE: JULY 2003
DRAWN BY JSR
CHECKED BY B.P., P.E.
SCALE NOT TO SCALE

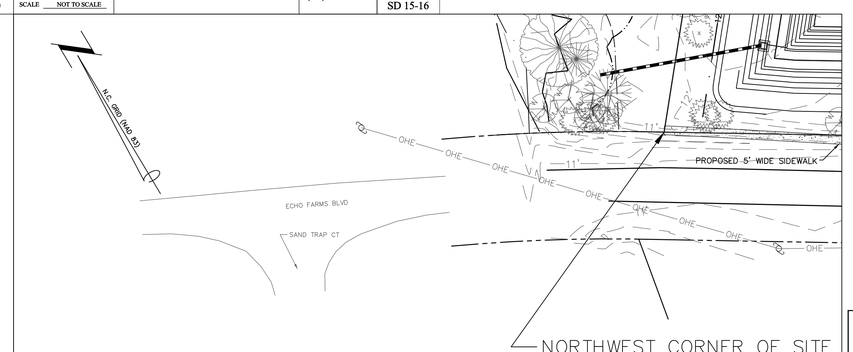
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807

SD 15-16



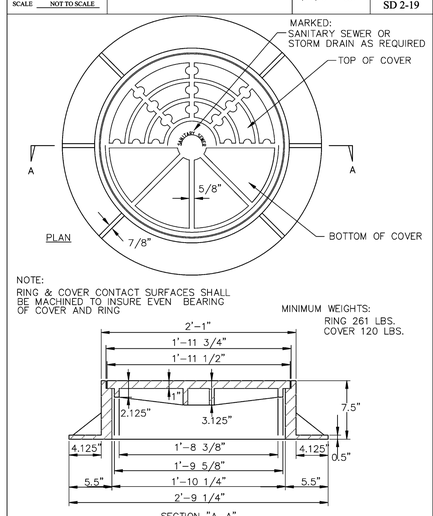
NOTE: DRIVEWAYS TRACED/APPROXIMATED BASED ON NHC GIS 2010 AERIAL, GOOGLE AERIAL, & GOOGLE STREET VIEW.

DRIVEWAYS ON ADJACENT PROPERTY
SCALE: 1"=40'



NOTE: DRIVEWAYS TRACED/APPROXIMATED BASED ON NHC GIS 2010 AERIAL, GOOGLE AERIAL, & GOOGLE STREE VIEW.

DRIVEWAYS WITHIN 250' OF NORTHWEST CORNER OF SITE
SCALE: 1"=40'



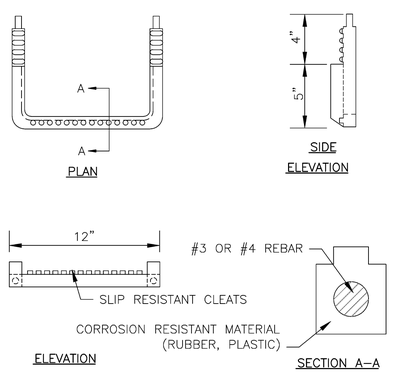
STANDARD DETAIL

STANDARD MAN-HOLE RING AND COVER

DATE: 2001
DRAWN BY JSR/CMR
CHECKED BY B.P., P.E.
SCALE NOT TO SCALE

CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807

SD 14-02



STANDARD DETAIL

SLIP RESISTANT MANHOLE STEP

DATE: 2001
DRAWN BY JSR/CMR
CHECKED BY B.P., P.E.
SCALE NOT TO SCALE

CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807

SD 14-10

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

Approved Construction Plan

	Name	Date
Planning		
Traffic		
Fire		

DETAIL SHEET
4010 CAROLINA BEACH ROAD
ECHO FARM APARTMENTS
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DATE: 11-24-15
SCALE: N.T.S.
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260

FINAL DRAWING FOR REVIEW PURPOSES ONLY

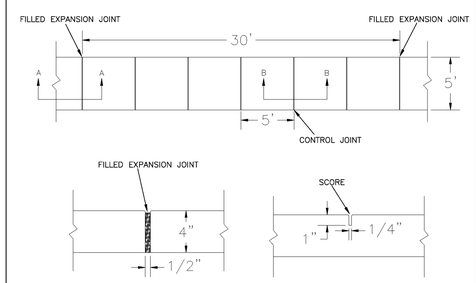
MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
Fax 910-392-5203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

SHEET NO: 15
OF: 22

REV NO.	DESCRIPTION	DATE
	REVISIONS	

G:\AutoCAD\2015\260\Echo Farms Apartments(11-19-15).dwg



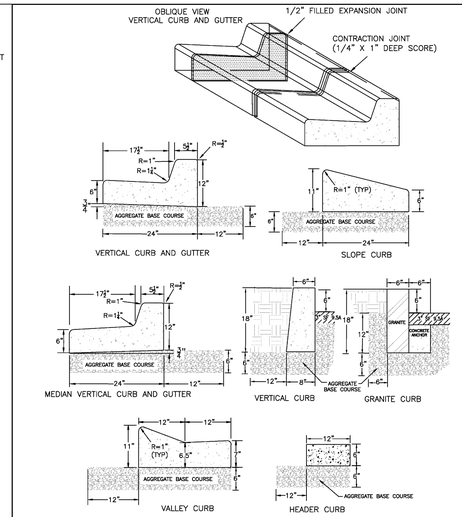
NOTES:

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.

DATE: OCTOBER, 2010	STANDARD DETAIL
DRAWN: PB/JSR	SIDEWALK
CHECKED: DEC	
SCALE NOT TO SCALE	

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON N.C. 28402
(910) 341–7807

SD 3-10

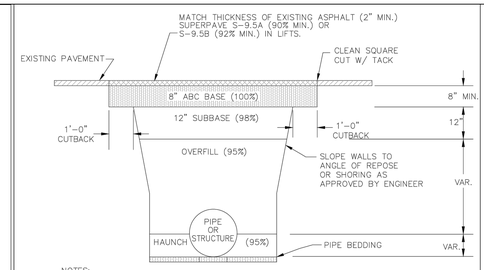


NOTES:
1. EXPANSION JOINT MATERIAL TO COMPLY WITH CURRENT NCDOT STANDARDS
2. 50' MAX EXPANSION JOINT SPACING, 10' MAX CONTRACTION JOINT SPACING
3. MINIMUM INSTALLATION LENGTH IS 5 FT.
4. CONCRETE TO BE 3000 PSI MIN
5. VERTICAL CURB AND GUTTER BASE CAN BE SLOPED 3/4" OR USE A FLAT BASE

DATE: AUGUST, 2011	STANDARD DETAIL
DRAWN: PB/JSR	CURBING
CHECKED: DEC	
SCALE NOT TO SCALE	

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON N.C. 28402
(910) 341–7807

SD 3-11



NOTES:

1. CONTRACTOR SHALL ENSURE BOTTOM OF TRENCH IS SUITABLE FOR INSTALLATION AND DOES NOT REQUIRE FOUNDATION CONDITIONING STONE.
2. FILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBOS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.
3. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC).
4. SOIL SHALL BE INSTALLED IN 6"–8" LIFTS AND COMPACTED BY A MECHANIZED TAMPER (I.E JUMPING JACK), HOWEVER, VIBRATORY ROLLERS > 18" WIDTH MAY BE USED FOR LARGER EXCAVATIONS. THE PLATE TAMP METHOD SHALL NOT BE USED.
5. ALL APPROVED CASTINGS SHALL BE SET FLUSH TO GRADE AND SUPPORTED IF APPLICABLE.
6. COMPACT MATERIALS TO MINIMUM % DENSITY SHOWN IN DIAGRAM AS DETERMINED BY THE STANDARD PROCTOR METHOD ASTM D–698–A FOR SOILS; AND ASTM D–698–C FOR ABC STONE; AND BY NUCLEAR GAUGE OR CORE SAMPLE FOR ASPHALT.
7. CUTBACKS OF ASPHALT SHALL BE PREPARED ON EDGE OF EXCAVATION OVER TOP OF UNDISTURBED SOIL.

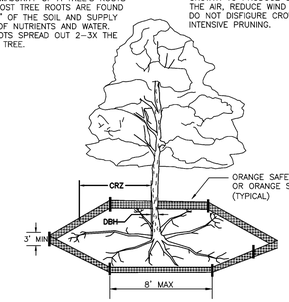
DATE: MAY, 2013	STANDARD DETAIL
DRAWN BY JSR	PAVEMENT REPAIRS–UTILITY CUTS
CHECKED BY D.E.C., P.E.	
SCALE NOT TO SCALE	

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING OFFICE
212 OPERATIONS CENTER DRIVE
WILMINGTON N.C. 28412
(910) 341–7807

SD 1-05

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" OF THE SOIL AND SUPPLY THE MAJORITY OF NUTRIENTS AND WATER. GENERALLY, ROOTS SPREAD OUT 2–3X THE HEIGHT OF THE TREE.

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.

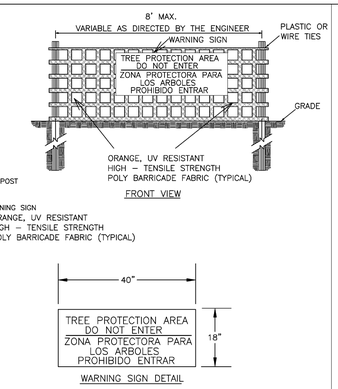


NOTES:
1. PROTECT CRITICAL ROOT ZONE (CRZ) OF TREES PRIOR TO CONSTRUCTION. CLEARLY MARK THE TREES AND ERECT A PROTECTIVE BARRIER AT THE CRZ. BARRIER SHALL BE MAINTAINED UNTIL CONSTRUCTION IS COMPLETE.
2. CRZ RADIUS IS 1 FT PER INCH OF TREE DIAMETER AT BREAST HEIGHT (DBH).
3. IF CONSTRUCTION OCCURS WITHIN THE CRZ, AT LEAST 12" OF MULCH AND/OR LOGGING MATTS SHALL BE PLACED WHERE MACHINERY MANEUVERS TO REDUCE SOIL COMPACTION IN THIS ZONE.
4. WHERE SIDEWALKS AND PATHWAYS PASS WITHIN CRZ, EXTRA CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE ROOTS. ALTERNATE CONSTRUCTION METHODS, SUCH AS A REINFORCED SIDEWALK, SHALL BE IMPLEMENTED AS NECESSARY.
5. FOR ALL TREES, CUTTING OF LARGE STRUCTURAL ROOTS LOCATED NEAR THE BASE OF THE TRUNK IS PROHIBITED. DO NOT COMPACT SOIL BENEATH TREES. NO VEHICLE SHALL BE ALLOWED TO PARK UNDER TREES. NO MATERIALS OR EQUIPMENT SHALL BE STORED BENEATH TREES. DAMAGING THE BARK WITH LAWNMOWERS, CONSTRUCTION EQUIPMENT, OR ANYTHING ELSE IS PROHIBITED. CONTRACTOR SHALL REPAIR DAMAGE TO TREES.
6. FAILING TO INSTALL OR MAINTAIN PROTECTION MEASURES SHALL RESULT IN A STOP WORK ORDER AND FINE OF $500/DAY. DISTURBANCE OTHER THAN THAT ALLOWED ON THE APPROVED PLAN WILL REQUIRE OWNER TO POST A LETTER OF CREDIT FOR 3 YRS FOR TREE MITIGATION.

DATE: JAN, 2015	STANDARD DETAIL
DRAWN BY JSR	TREE PROTECTION DURING CONSTRUCTION
CHECKED BY RDG, P.E.	
SCALE NOT TO SCALE	SHEET 1 of 2

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341–7807

SD 15-09

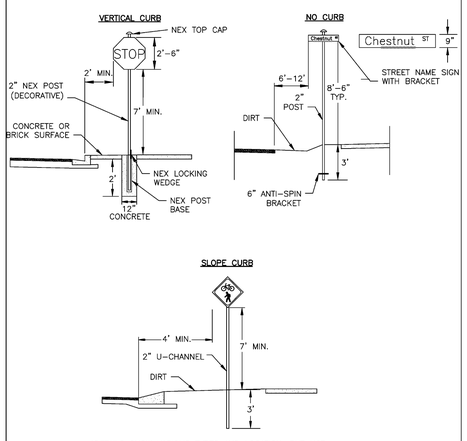


NOTES:
1. THE TREE PROTECTION FENCING SHALL NOT BE VIOLATED FOR THE ENTIRE DURATION OF THE PROJECT WITHOUT APPROVAL FROM URBAN FORESTRY STAFF.
2. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL. LETTERS TO BE 3" HIGH, MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
3. SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER. FOR TREE PROTECTION AREAS LESS THAN 100' IN PERIMETER, PROVIDE NO LESS THAN TWO SIGNS PER PROTECTION AREA.
4. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC. MAINTAIN TREE PROTECTION FENCE AND SIGNS THROUGHOUT DURATION OF PROJECT.
5. TREE PROTECTION FENCING AND SIGNAGE SHALL BE REMOVED AFTER CONSTRUCTION.
6. ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OF WILMINGTON, BASED ON ACTUAL FIELD CONDITIONS.

DATE: JAN, 2015	STANDARD DETAIL
DRAWN BY JSR	TREE PROTECTION DURING CONSTRUCTION
CHECKED BY RDG, P.E.	
SCALE NOT TO SCALE	SHEET 2 of 2

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341–7807

SD 15-09



*DETAILS SHOW VARIOUS TYPES AND LOCATION, BUT NOT ALL COMBINATIONS.

SIGNS

1. All signs shall meet the requirements of MUTCD and City Traffic Engineering in effect at the time of construction.
2. All Traffic Control Signs including multi-use paths shall be fabricated with 0.080 inch aluminum blanks using high intensity prismatic reflective sheeting Type IV or better. STOP signs shall be a minimum of 30"x30".
3. SPECIAL DESIGNATION signs by location and type shall adhere to City of Wilmington signage plan (ie. downtown, historic, cross-city trail, parks, riverfront, scenic by-way, parking, etc.) and all associated policies.
4. POST MOUNTED STREET NAME SIGNS shall be fabricated with 9" extruded aluminum street name sign blanks using a standard cut-out. Minimum sign length is 18" long and increasing in 6" increments to 54" maximum as dictated by the number of letters in the name. The color scheme shall be white letters on a green background without a border. Generally, in the downtown and historic areas or as designated in the City of Wilmington signage plan the background shall be blue and contain a topper.
5. Decorative sign posts shall consist of the NEX sign support system, 2" octagonal tube, 14 gauge, powder coated glossy black and include cap, post, base and wedge.
6. All other sign posts shall be u-channel posts made of galvanized steel with 8' posts 2lbs/ft or 12' posts 3lbs/ft. Galvanized NEX post may be substituted with approval from the City Signs and Markings Engineer.
7. OVERHEAD STREET NAME SIGNS shall be fabricated with 0.080 inch aluminum flat sign blanks 18" in height using a standard cut-out. Sign length will be dictated by the number of letters in the name. For mast-arm type traffic signal supports and other overhead support systems refer to the design plans for maximum sign length.
8. All sign lettering, colors and fonts shall adhere to the MUTCD in effect at the time of construction. Florescent Yellow-Green shall be used on signs, in place of Yellow, when listed as an optional color in the MUTCD. Generally, the font will be FHWA series fonts (Highway Gothic.) Other font types require prior City Signs and Markings Engineer approval .

LOCATION

9. Sign locations depend on the edge of road condition. Generally, signs shall be a minimum 2' from face of a vertical curb, 4' from front of slope face curb, and 6' from edge of pavement without curb. Signs shall not be located more than 12' from any of these locations.
10. Sign posts installed in dirt shall be buried a minimum of 36". Octagonal posts shall utilize an anti-spin device, 6" in length minimum. Sign posts installed in concrete or brick shall utilize a base cast in concrete 24" x 12" diameter.
11. Street name signs shall be installed 8'-6" from the ground to the bottom of the sign. Street name signs co-located with STOP signs shall be installed above the STOP sign. A 6" space shall be maintained between the STOP sign and a Street name sign that is parallel to the STOP sign face. All other signs should be mounted per MUTCD guidelines for Urban Areas.

DATE: NOVEMBER, 2011	STANDARD DETAIL
DRAWN BY JSR	STREET SIGNS AND LOCATION
CHECKED BY BDR, P.E.	
SCALE NOT TO SCALE	SHEET 1 of 2

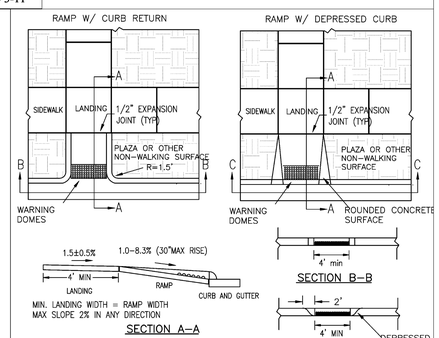
CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341–7807

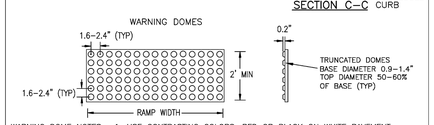
SD 15-03

DATE: NOVEMBER, 2011	STANDARD DETAIL
DRAWN BY JSR	STREET SIGNS AND LOCATION
CHECKED BY BDR, P.E.	
SCALE NOT TO SCALE	SHEET 2 of 2

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341–7807

SD 15-03



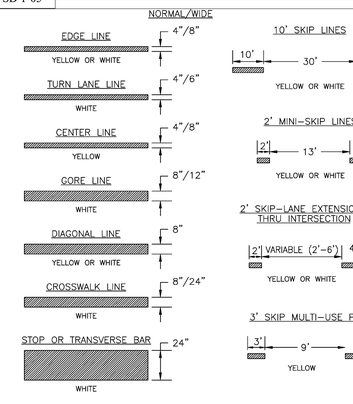


WARNING DOME NOTES:
1. USE CONTRASTING COLORS, RED OR BLACK ON WHITE PAVEMENT.
2. USE CAST IN PLACE PAVERS FOR NEW CONSTRUCTION.
3. RUBBER MATS ARE PERMITTED FOR RETROFITS.
4. LANDING AND RAMP WIDTH MAY BE REDUCED TO 3' WHERE SPACE IS LIMITED AND DESIGN IS APPROVED BY THE CITY ENGINEER.

DATE: DECEMBER, 2010	STANDARD DETAIL
DRAWN: PB/JSR	PERPENDICULAR CURB RAMP ADJACENT TO PLAZA
CHECKED: DEC	
SCALE NOT TO SCALE	

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON N.C. 28402
(910) 341–7807

SD3-08



1–PAVEMENT MARKINGS AND SYMBOLS SHALL BE DESIGNED PER MUTCD WITH APPROVAL FROM CITY TRAFFIC ENGINEERING, AND INSTALLED IN ACCORDANCE WITH NCDOT DIVISION 12 SPECIFICATIONS.

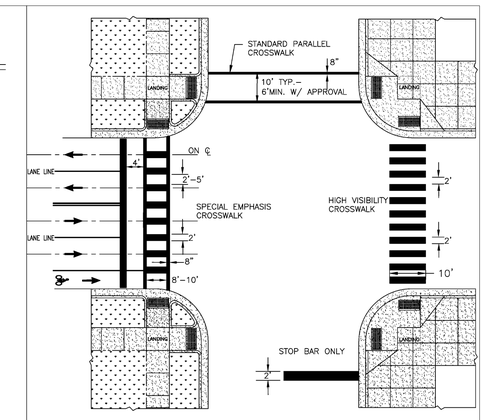
2–GENERALLY, PERMANENT MARKINGS WILL BE UNIFORM AND SMOOTH AND WILL CONSIST OF 120MIL OF THERMOPLASTIC FOR ALL LINES AND SYMBOLS; TEMPORARY MARKINGS SHALL CONSISTS OF 15 MIL PAINT, EVERY 6 MONTHS.

3–DURING APPLICATION THE EXISTING PAVEMENT SHALL NOT SHOW SIGNS OF MOISTURE AND BE CLEAN, FREE OF DIRT AND OIL, ETC. THERMOPLASTIC SHALL ONLY BE INSTALLED WHERE PAVEMENT IS 50° F AND RISING. PAINT SHALL ONLY BE INSTALLED WHERE PAVEMENT IS 40° F AND RISING.

DATE: DECEMBER, 2011	STANDARD DETAIL
DRAWN BY JSR	PAVEMENT MARKINGS LINE TYPES
CHECKED BY BDR, P.E.	
SCALE NOT TO SCALE	

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341–7807

SD 11-01



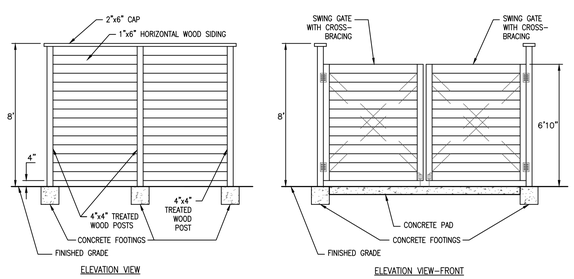
1–TYPICAL CROSSWALK DIMENSIONS ARE PROVIDED FOR REFERENCE. ALL APPLICATIONS SHALL CONSIDER PEDESTRIAN, BICYCLE AND TRAFFIC CONDITIONS AND ARE SUBJECT TO ADA GUIDELINES AND MATERIAL SPECIFICATIONS. LAYOUTS SHALL BE DIRECTED BY THE ENGINEER.

2–GENERALLY, STANDARD PARALLEL CROSSWALKS TO BE USED AT SIGNALIZED INTERSECTIONS OR WHERE CROSSWALK TRAFFIC OR CONFLICT POINTS ARE AVERAGE. SPECIAL EMPHASIS CROSSWALKS AND HIGH VISIBILITY CROSSWALKS ARE NEEDED AT BUSY SIGNALIZED INTERSECTIONS AND WHERE BICYCLE AND PEDESTRIAN TRAFFIC REQUIRES INCREASED VISIBILITY.

DATE: FEBRUARY, 2012	STANDARD DETAIL
DRAWN BY JSR	CROSSWALK PAVEMENT MARKINGS
CHECKED BY BDR, P.E.	
SCALE NOT TO SCALE	

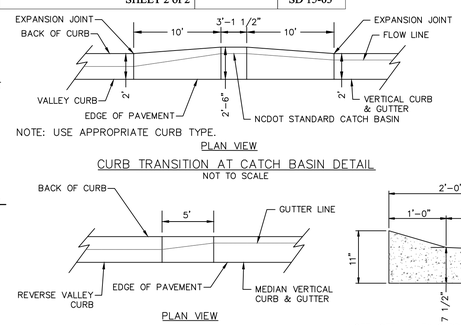
CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341–7807

SD 11-11



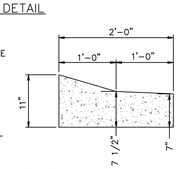
NOTES:
1. CONCRETE FOOTINGS FOR THE FENCE & GATE POSTS, AND POST LOCATIONS/SPACING PER OTHERS.
2. IF STRUCTURAL DESIGN IS REQUIRED FOR TRASH COMPACTOR FENCE & GATE, THEN DEVELOPER SHALL CONSULT WITH A STRUCTURAL ENGINEER.
3. MALPASS ENGINEERING & SURVEYING, P.C. IS NOT RESPONSIBLE FOR STRUCTURAL INTEGRITY OF TRASH COMPACTOR FENCE, GATE OR PAD.

TRASH COMPACTOR GATE & FENCE ENCLOSURE DETAIL
NOT TO SCALE

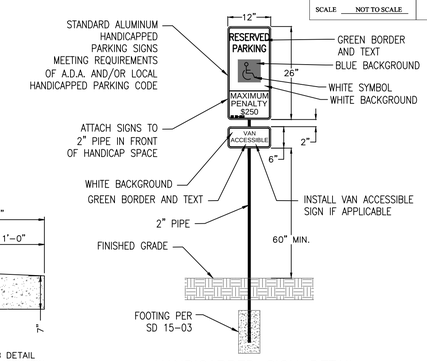


CURB TRANSITION AT CATCH BASIN DETAIL
NOT TO SCALE

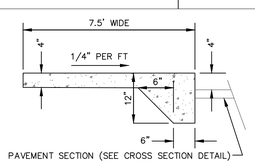
REVERSE VALLEY CURB TO MEDIAN VERTICAL CURB & GUTTER TRANSITION DETAIL
NOT TO SCALE



NOTE: SEE VALLEY CURB DETAIL FOR STONE BASE LOCATION
REVERSE VALLEY CURB
NOT TO SCALE

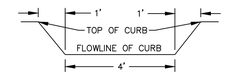


HANDICAPPED SIGN DETAIL
NOT TO SCALE



PAVEMENT SECTION (SEE CROSS SECTION DETAIL)
NOTE: SEE PAVEMENT CROSS SECTION DETAIL FOR STONE BASE LOCATION.
NOTE: SEE STANDARD SIDEWALK DETAIL (SD 8–15) FOR TYPICAL LOCATIONS OF SCORE LINES & EXPANSION JOINTS.

TURNDOWN SIDEWALK DETAIL
NOT TO SCALE



CURB CUT DETAIL
N.T.S.

REV NO.	DESCRIPTION	DATE
1	REVISED FOR PRELIMINARY BID.	10–16–15
2	REVISED FOR SUBMITTAL.	10–23–15
3	REVISED PER TRC COMMENTS.	11–24–15

REVISIONS

Approved Construction Plan

Name	Date
Planning	
Traffic	
Fire	

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

DETAIL SHEET
4010 CAROLINA BEACH ROAD
ECHO FARM APARTMENTS
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910–392–5243
Fax 910–392–5203 License No. C–2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910–251–5030

DATE: 10–1–15
SCALE: N.T.S.
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260
SHEET NO: 16
OF: 22

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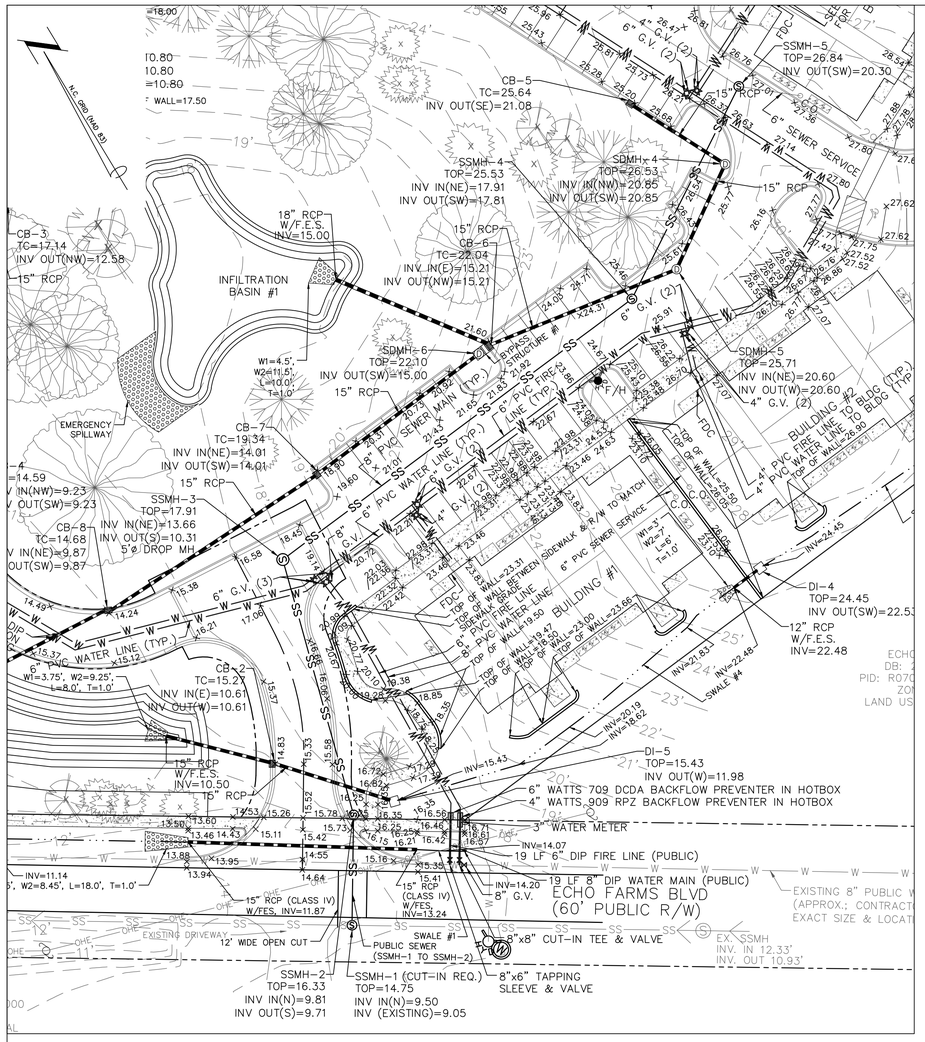
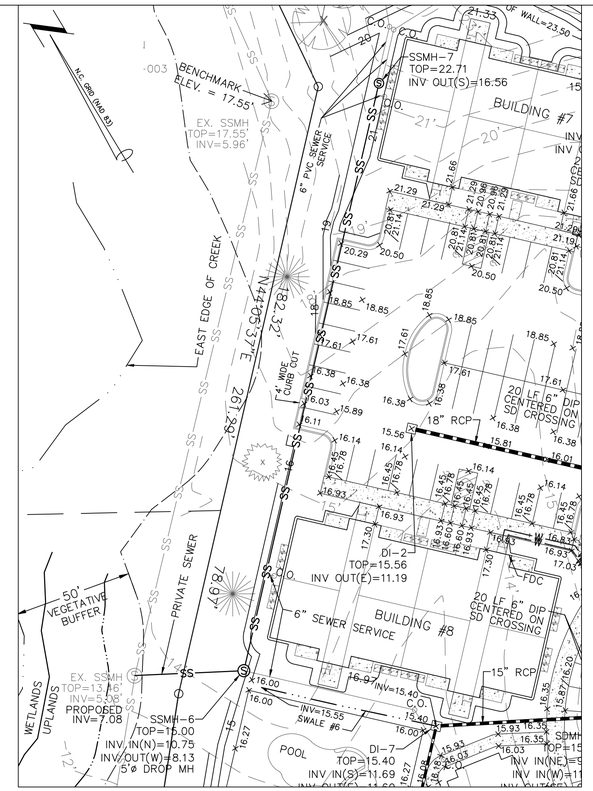
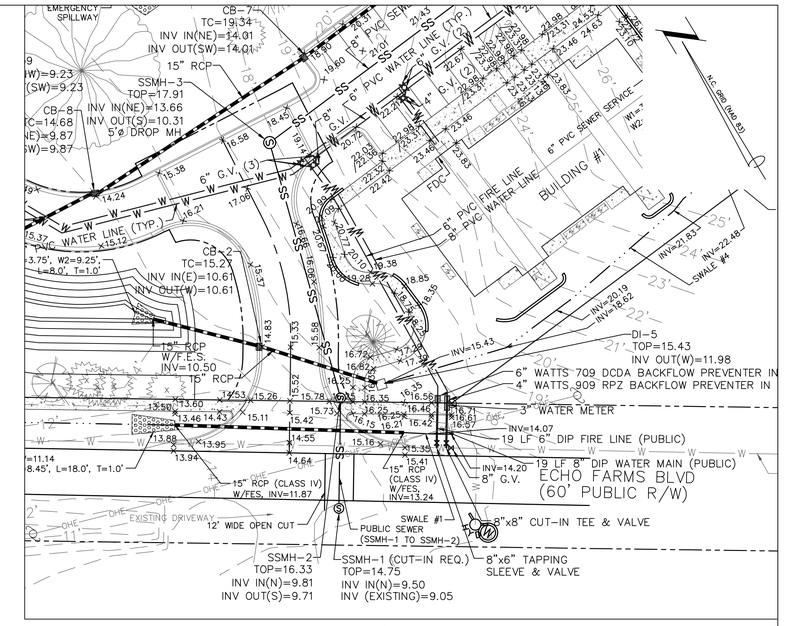


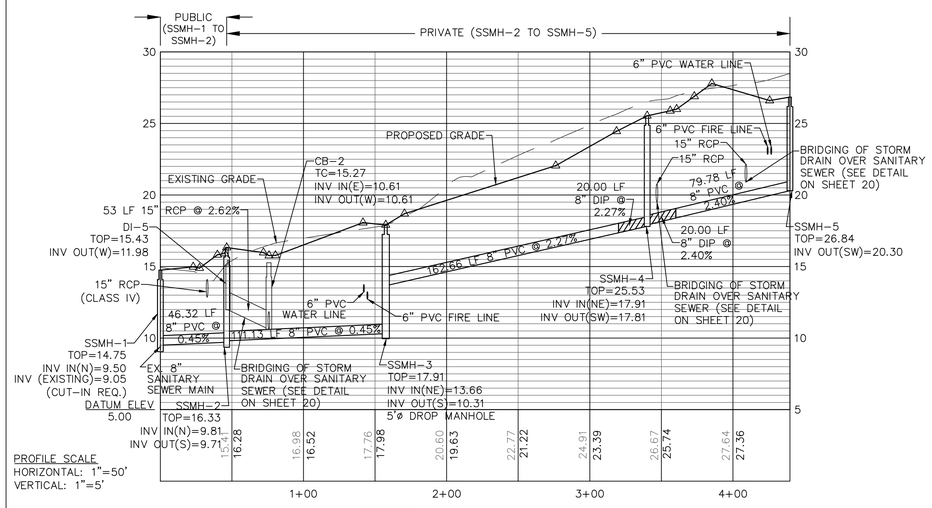
PLAN VIEW SCALE: 1"=30'



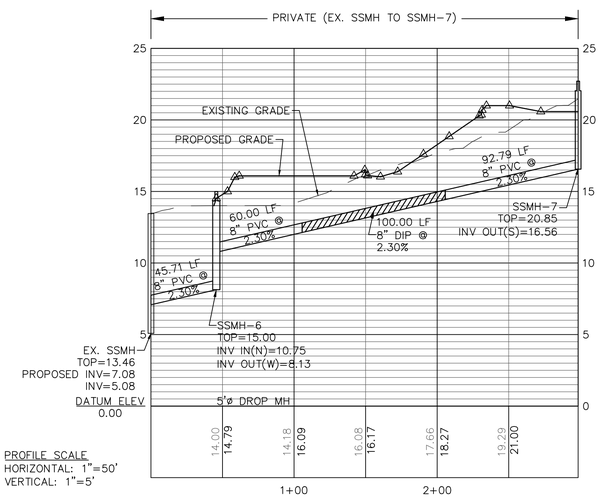
PLAN VIEW SCALE: 1"=30'



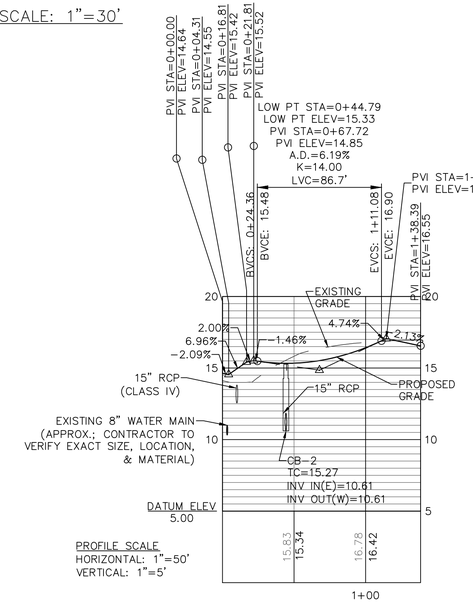
PLAN VIEW SCALE: 1"=30'



SEWER
(STATIONED ALONG CENTERLINE OF SEWER)



SEWER
(STATIONED ALONG CENTERLINE OF SEWER)



SALINGER COURT

Approved Construction Plan	
	Name / Date
Planning	
Traffic	
Fire	

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

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

REV NO.	DESCRIPTION	DATE
1	REVISED PER CITY.	2-9-16
2	REVISED PER CFPUA TO ADJUST SEWER INVERTS & LABEL AS PUBLIC OR PRIVATE.	3-15-16
3	REVISED PER CFPUA TO CHANGE BACKFLOW PREVENTER ON FIRE LINE.	4-29-16
4	REVISED TO ADJUST PARKING NORTH OF BUILDING #2.	8-24-16

REVISIONS

FINAL DRAWING FOR REVIEW PURPOSES ONLY

PLAN PROFILE
4010 CAROLINA BEACH ROAD
ECHO FARM APARTMENTS
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

MALPASS ENGINEERING & SURVEYING, P.C.
1134 SHIPYARD BOULEVARD
WILMINGTON, NORTH CAROLINA 28412
Phone 910-392-5243
Fax 910-392-5203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

DATE: 12-14-15
SCALE: VARIES
DRAWN: JCB
CHECKED: JBM
PROJECT NO: 260
SHEET NO: 17 OF: 22

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MATCHLINE
SEE SHEET L-2

L-2

N/F
CITY OF WILMINGTON
DB: 1272 PG: 650
PID: R06500-004-001-003
ZONING: R-15
LAND USE: UNUSED

N/F
CITY OF WILMINGTON
DB: 1272 PG: 650
PID: R06500-004-001-004
ZONING: R-15
LAND USE: UNUSED

N/F
JOANN McKENNA TRUST
DB: 5128 PG: 2275
PID: R07007-004-001-000
ZONING: O&I-1
LAND USE: UNUSED

N/F
ECHO FARMS, LLC
DB: 2307 PG: 467
PID: R07006-002-001-000
ZONING: MF-M
LAND USE: RECREATIONAL

N/F
ECHO FARMS, LLC
DB: 2307 PG: 467
PID: R07006-002-001-000
ZONING: MF-M
LAND USE: RECREATIONAL

CAROLINA BEACH RD / US HWY 421
(100' PUBLIC R/W)

ECHO FARMS BLVD
(60' PUBLIC R/W)

BUILDING #7
BUILDING #8
BUILDING #4
BUILDING #3
BUILDING #2
BUILDING #1
CLUBHOUSE
MAINTENANCE BUILDING
POOL
WET POND #1
INFILTRATION BASIN #1
PRIVATE DRAINAGE EASEMENT
SIDEWALK EASEMENT (PUBLIC)
CONCRETE BAFFLE #1
CONCRETE BAFFLE #2
CONCRETE BAFFLE #3
EAST EDGE OF CREEK
WETLANDS
UPLANDS
50' VEGETATIVE BUFFER
25' BUFFER
25' CONSERVATION SETBACK
20' PRIVATE DRAINAGE EASEMENT
NATURAL AREA
Lawn
SEE NOTE #10
ROAD SIGN
R/W
9.00' STREET YARD
46'x46' SIGHT TRIANGLE

Myrica cerifera
Pinus palustris
Feijoa sellowiana
Callistemon citrinus
Camellia sasanqua
Illicium floridanum
Gardenia jasminoides
Prunus yedoensis
Quercus virginiana
Ilex vomitoria
Ilex vomitoria(existing hedge)
Rhododendron indicum
Trachelospermum asiaticum
Sabal minor
Pennisetum Karley rose
Sabal palmetto
Cycas revoluta
Buta capitata
Eragrositis chloromelas
Salix babylonica
Juniperus virginiana
Rosa meijocho
Liriope muscari

TREE MITIGATION PLANTINGS

SYMBOL	QTY	BOTANICAL NAME / COMMON NAME	CALIPER
	9	DIOSPYROS VIRGINIANA / COMMON PERSIMMON	2" (MIN.)
	166	ILEX VOMITORIA / YAUPON HOLLY	2" (MIN.)
	99	PINUS PALUSTRIS / LONGLEAF PINE	PLUGS

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

Approved Construction Plan

	Name	Date
Planning		
Traffic		
Fire		

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

ECHO FARM APARTMENTS

4010 CAROLINA BEACH ROAD
WILMINGTON TOWNSHIP
NEW HANOVER COUNTY
NORTH CAROLINA

DATE: 2-18-2016
SCALE: 1"=30'
DRAWN BY: DDC
REVISION DATE: 2-23-2016 8-23-2016 9-12-2016

LAND-DESIGN SOUTH

LAND-DESIGN SOUTH
Landscape Architect-Asla
105 B CORAL DRIVE
WRIGHTSVILLE BEACH,N.C.28480
910 550 8788

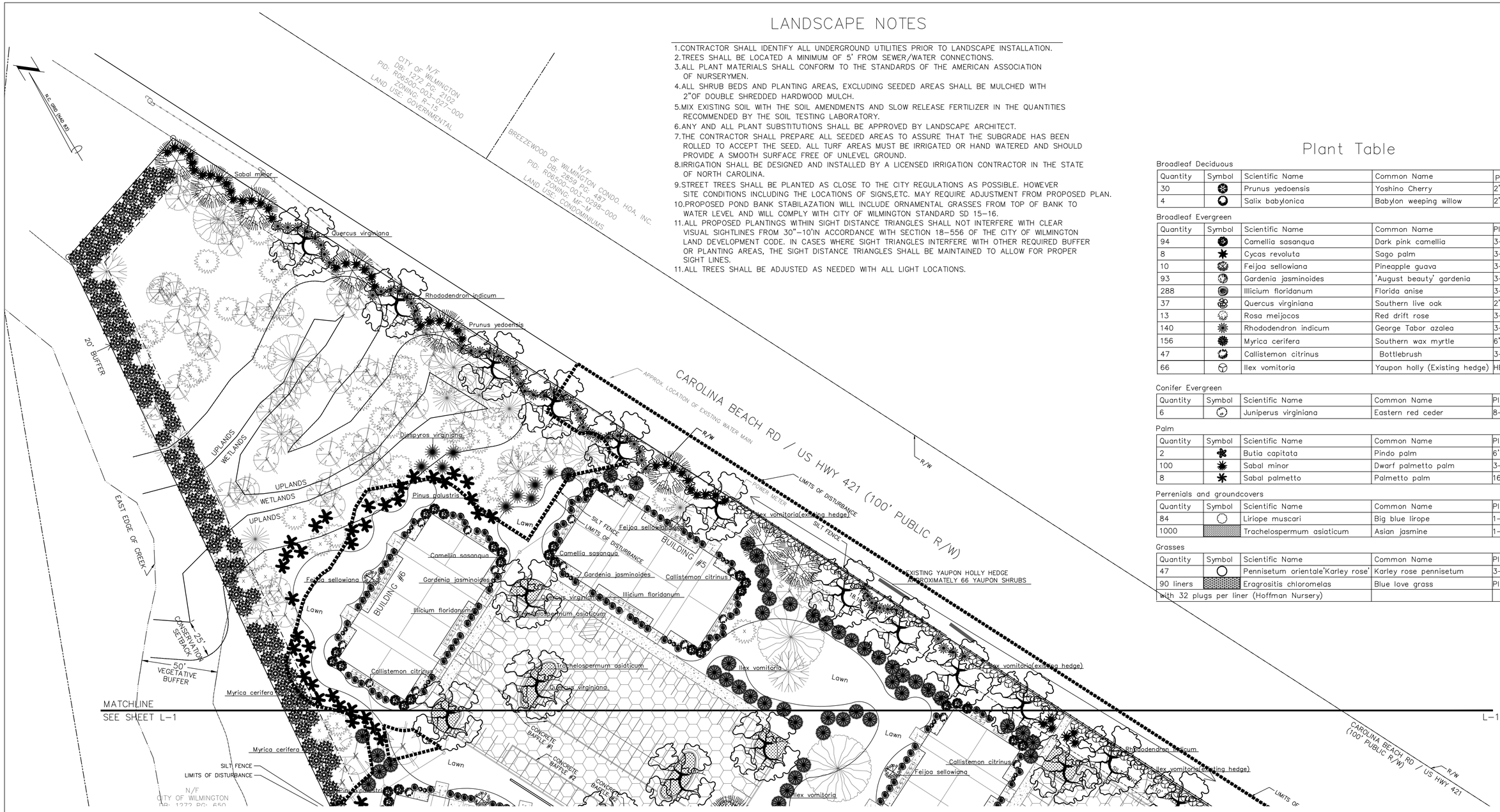
LANDSCAPE PLAN

Developer: ECHO FARM APARTMENTS, LLC
10 S. CARDINAL DRIVE
WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

SHEET NO: L-1

LANDSCAPE NOTES

1. CONTRACTOR SHALL IDENTIFY ALL UNDERGROUND UTILITIES PRIOR TO LANDSCAPE INSTALLATION.
2. TREES SHALL BE LOCATED A MINIMUM OF 5' FROM SEWER/WATER CONNECTIONS.
3. ALL PLANT MATERIALS SHALL CONFORM TO THE STANDARDS OF THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL SHRUB BEDS AND PLANTING AREAS, EXCLUDING SEEDED AREAS SHALL BE MULCHED WITH 2"OF DOUBLE SHREDDED HARDWOOD MULCH.
5. MIX EXISTING SOIL WITH THE SOIL AMENDMENTS AND SLOW RELEASE FERTILIZER IN THE QUANTITIES RECOMMENDED BY THE SOIL TESTING LABORATORY.
6. ANY AND ALL PLANT SUBSTITUTIONS SHALL BE APPROVED BY LANDSCAPE ARCHITECT.
7. THE CONTRACTOR SHALL PREPARE ALL SEEDED AREAS TO ASSURE THAT THE SUBGRADE HAS BEEN ROLLED TO ACCEPT THE SEED. ALL TURF AREAS MUST BE IRRIGATED OR HAND WATERED AND SHOULD PROVIDE A SMOOTH SURFACE FREE OF UNLEVEL GROUND.
8. IRRIGATION SHALL BE DESIGNED AND INSTALLED BY A LICENSED IRRIGATION CONTRACTOR IN THE STATE OF NORTH CAROLINA.
9. STREET TREES SHALL BE PLANTED AS CLOSE TO THE CITY REGULATIONS AS POSSIBLE. HOWEVER SITE CONDITIONS INCLUDING THE LOCATIONS OF SIGNS,ETC. MAY REQUIRE ADJUSTMENT FROM PROPOSED PLAN.
10. PROPOSED POND BANK STABILAZATION WILL INCLUDE ORNAMENTAL GRASSES FROM TOP OF BANK TO WATER LEVEL AND WILL COMPLY WITH CITY OF WILMINGTON STANDARD SD 15-16.
11. ALL PROPOSED PLANTINGS WITHIN SIGHT DISTANCE TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHTLINES FROM 30"-10'IN ACCORDANCE WITH SECTION 18-556 OF THE CITY OF WILMINGTON LAND DEVELOPMENT CODE. IN CASES WHERE SIGHT TRIANGLES INTERFERE WITH OTHER REQUIRED BUFFER OR PLANTING AREAS, THE SIGHT DISTANCE TRIANGLES SHALL BE MAINTAINED TO ALLOW FOR PROPER SIGHT LINES.
11. ALL TREES SHALL BE ADJUSTED AS NEEDED WITH ALL LIGHT LOCATIONS.



Plant Table

Broadleaf Deciduous

Quantity	Symbol	Scientific Name	Common Name	Planting Size
30		Prunus yedoensis	Yoshino Cherry	2"cal
4		Salix babylonica	Babylon weeping willow	2"cal

Broadleaf Evergreen

Quantity	Symbol	Scientific Name	Common Name	Planting Size
94		Camellia sasanqua	Dark pink camellia	3-gal
8		Cycas revoluta	Sago palm	3-gal
10		Feijoa sellowiana	Pineapple guava	3-gal
93		Gardenia jasminoides	'August beauty' gardenia	3-gal
288		Illicium floridanum	Florida anise	3-gal
37		Quercus virginiana	Southern live oak	2"cal
13		Rosa meijocos	Red drift rose	3-gal
140		Rhododendron indicum	George Tabor azalea	3-gal
156		Myrica cerifera	Southern wax myrtle	6'
47		Callistemon citrinus	Bottlebrush	3-gal
66		Ilex vomitoria	Yaupon holly (Existing hedge)	HEDGE

Conifer Evergreen

Quantity	Symbol	Scientific Name	Common Name	Planting Size
6		Juniperus virginiana	Eastern red ceder	8-10'

Palm

Quantity	Symbol	Scientific Name	Common Name	Planting Size
2		Butia capitata	Pindo palm	6'booted
100		Sabal minor	Dwarf palmetto palm	3-gal
8		Sabal palmetto	Palmetto palm	16'booted

Perrenials and groundcovers

Quantity	Symbol	Scientific Name	Common Name	Planting Size
84		Liriope muscari	Big blue lirope	1-gal
1000		Trachelospermum asiaticum	Asian jasmine	1-gal

Grasses

Quantity	Symbol	Scientific Name	Common Name	Planting Size
47		Pennisetum orientale'Karley rose'	Karley rose pennisetum	3-gal
90 liners		Eragrositis chloromelas	Blue love grass	Plugs
with 32 plugs per liner (Hoffman Nursery)				

LANDSCAPE CALCULATIONS:

TREES PER DISTURBED ACRE
9.63 ACRES X 15 = 144.45, 144 TREES REQUIRED

STREET YARD -CAROLINA BEACH ROAD (PRIMARY FRONTAGE)
STREET FRONTAGE = 1,103.55 FT
REQUIRED STREETYARD = 18 X 1,103.55 = 19,863.90 SF
PROVIDED STREETYARD = 19,937.57 SF
IMPERVIOUS AREA = 90.51 SF
PERCENT IMPERVIOUS = 90.51/19,937.57 X 100% = 0.46%
REQUIRED PLANTING = 90.51/600 = 33.23 ,33 CANOPY TREES
(OR 3 UNDERSTORY TREES PER I CANOPY TREE)
33.23 X 6 = 199.38 , 199 SHRUBS
PROVIDED PLANTING = 30 TREES & 3 EXISITNG TREES TO REMAIN = 33 TREES
306 SHRUBS

STREETYARD - ECHO FARMS BLVD (SECONDARY FRONTAGE)
STREET FRONTAGE = 469.83 - 37.53 = 432.30 FT
REQUIRED STREETYARD = 18 X 432.30/2 = 3890.70 SF
PROVIDED STREETYARD = 3,461.82 + 578.81 = 4,040.63 SF
IMPERVIOUS AREA = 233.20
PERCENT IMPERVIOUS = 233.20/4,040.63 X 100% = 5.78%
REQUIRED PLANTING = 4,040.63/600 = 6.74 , 7 CANOPY TREES (OR 3 UNDERSTORY TREES PER I CANOPY TREE)
6.74 X 6 = 40.44 , 40 SHRUBS
PROVIDED PLANTING = 8 TREES & 8 EXISTING TREES TO REMAIN= 16 TREES
53 SHRUBS

INTERIOR SHADING
PARKING FACILITY AREA [PARKING LOT AREA TO BACK OF CURB (OR BACK OF SIDEWALK ADJACENT TO PARKING SPACES) MINUS LANDSCAPE ISLANDS PLUS PRIVATE STREET(INCLUDING PORTION WITHIN ECHO FARMS BLVD ROW.] = 124,085 SF
REQUIRED INTERIOR SHADING (IS) = 0.2 X 124,085 = 24,817 SF
PROVIDED INTERIOR SHADING (IS) = 17 LIVE OAKS @ 707=12,019
15 YOSHINO CHERRY @ 707 = 10,605
4 EXISTING HARDWOODS @ 707 =2,828
TOTAL (IS)= 25,452SF

LANDSCAPE CALCULATIONS:

FOUNDATION PLANTING-FRONT OR REAR OF BUILDINGS #1-8 (PER FRONT OR REAR OF BUILDING ADJACENT TO PARKING /DRIVE AISLE)
REQUIRED FOUNDATION PLANTING = [30.73' X 112.54')+(0.5 X 10.62'X 31.86') +(0.5 X 10.62' X 31.86')] X 0.12 = 455.61 SF
PROVIDED FOUNDATION PLANTING (BUILDINGS #1 & 3-8) = 508.48 SF
PROVIDED FOUNDATION PLANTING (BUILDING #2)= 560.10 SF

FOUNDATION PLANTING SIDE OF BUILDINGS #1,2,3,4,7,&8 (PER SIDE OF BUILDING ADJACENT TO PARKING/DRIVE AISLE)
REQUIRED FOUNDATION PLANTING =[(31.44' X 51.19') +(0.5 X 12.63' X 50.53') X 0.12 = 231.43 SF
PROVIDED FOUNDATION PLANTINGS (BUILDINGS #1 & 2) = 262.12 SF
PROVIDED FOUNDATION PLANTINGS (BUILDINGS #3 & 4) = 236.31 SF
PROVIDED FOUNDATION PLANTINGS (BUILDING #7)=267.45 SF
PROVIDED FOUNDATION PLANTINGS (BUILDING #8) =280.41 SF

FOUNDATION PLANTING -FRONT OF CLUBHOUSE
REQUIRED FOUNDATION PLANTING = [(8.98' X 14.09')+(11.31 X 31.43') +(8.98' X 19.98')+(13.81' X 4.61' X 0.5)+87.47 SF] X 0.12 = 93.69 SF
PROVIDED FOUNDATION PLANTING = 169.84 SF

FOUNDATION PLANTING -FRONT OF MAINTENANCE BUILDING
REQUIRED FOUNDATION PLANTING = [(10.00' X 20.00')+(0.5' X 6.67' X 20.00')] X 0.12 = 32 SF
PROVIDED FOUNDATION PLANTING = 33.42 SF

Approved Construction Plan

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Traffic		
Fire		

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Signed: _____

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(IN FEET)
1 inch = 30 ft.

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4010 CAROLINA BEACH ROAD
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NORTH CAROLINA

LAND-DESIGN SOUTH

LAND-DESIGN SOUTH
LANDSCAPE ARCHITECT-ASLA
105 B CORAL DRIVE
WRIGHTSVILLE BEACH,N.C.28480
910 550 8788

LANDSCAPE PLAN

Developer: ECHO FARM APARTMENTS, LLC
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WILMINGTON, NORTH CAROLINA 28403
PHONE: 910-251-5030

DATE: 2-18-2016
SCALE: 1"=30'
DRAWN BY: DDC
REVISION DATE: 2-23-2016 8-23-2016 9-12-2016

SHEET NO: L-2