

**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

BEFORE DEVELOPMENT			AFTER DEVELOPMENT				
BUILDINGS	AREA (SF)	% OF SITE	BUILDINGS (INCLUDES ROOF OVERHANGS)	EX. (SF)	PROPOSED (SF)	TOTAL (SF)	% OF SITE
BUILDINGS	5,450	1.15		0	59,296	59,296	12.46
DRIVEWAY	14,100	2.96		0	71,700	71,700	15.07
OTHER	954	0.20		0	10,836	10,836	2.28
TOTAL	20,504	4.31		0	13,628	13,628	2.86
			PARKING (CONVENTIONAL)	0	6,041	6,041	1.27
			PARKING (PERVIOUS PAVEMENT, 75% CREDIT)	0	1,336	1,336	0.28
			SIDEWALK	0	1,336	1,336	0.28
			OTHER	0	1,336	1,336	0.28
			FUTURE	0	162,837	162,837	34.22
			TOTAL	0	162,837	162,837	34.22

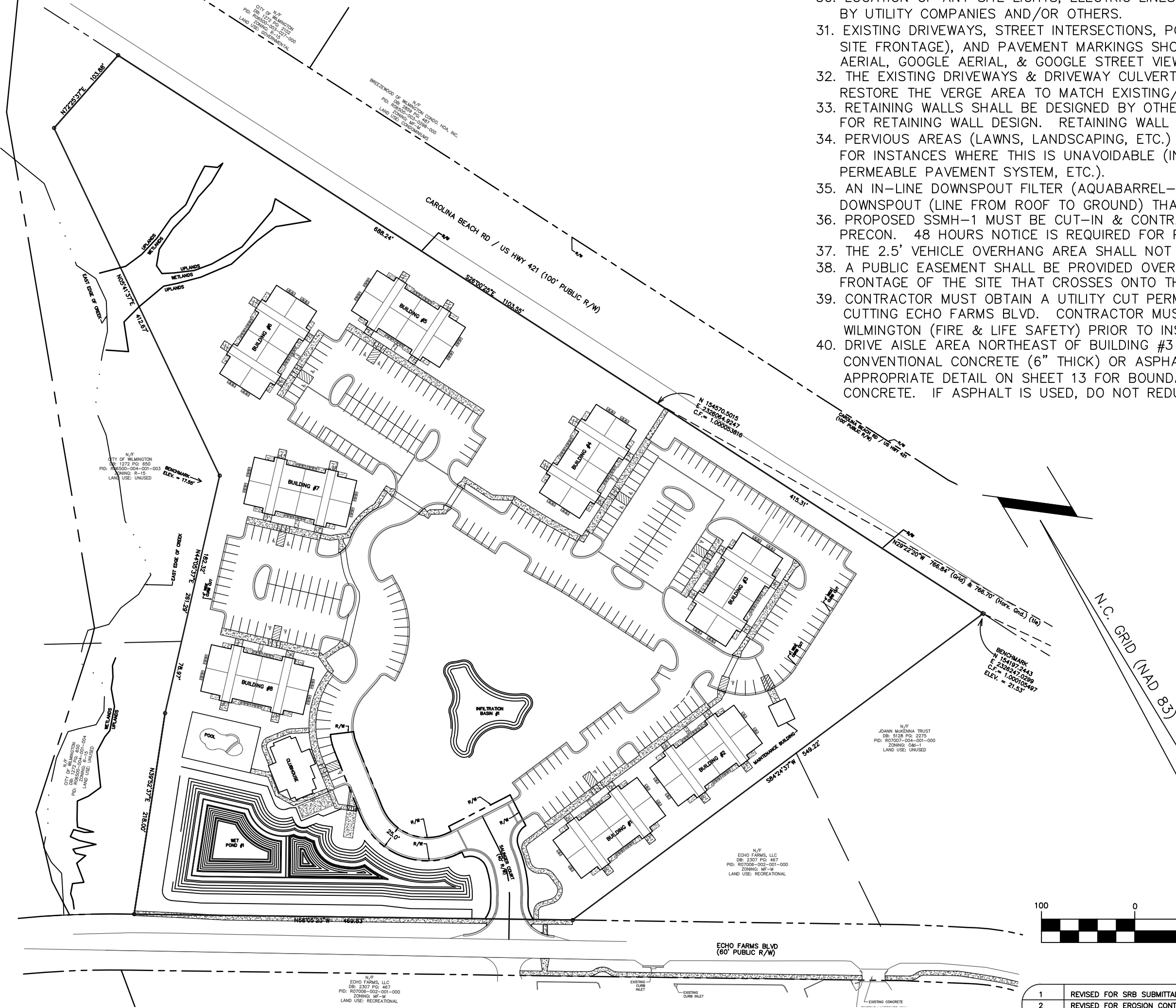
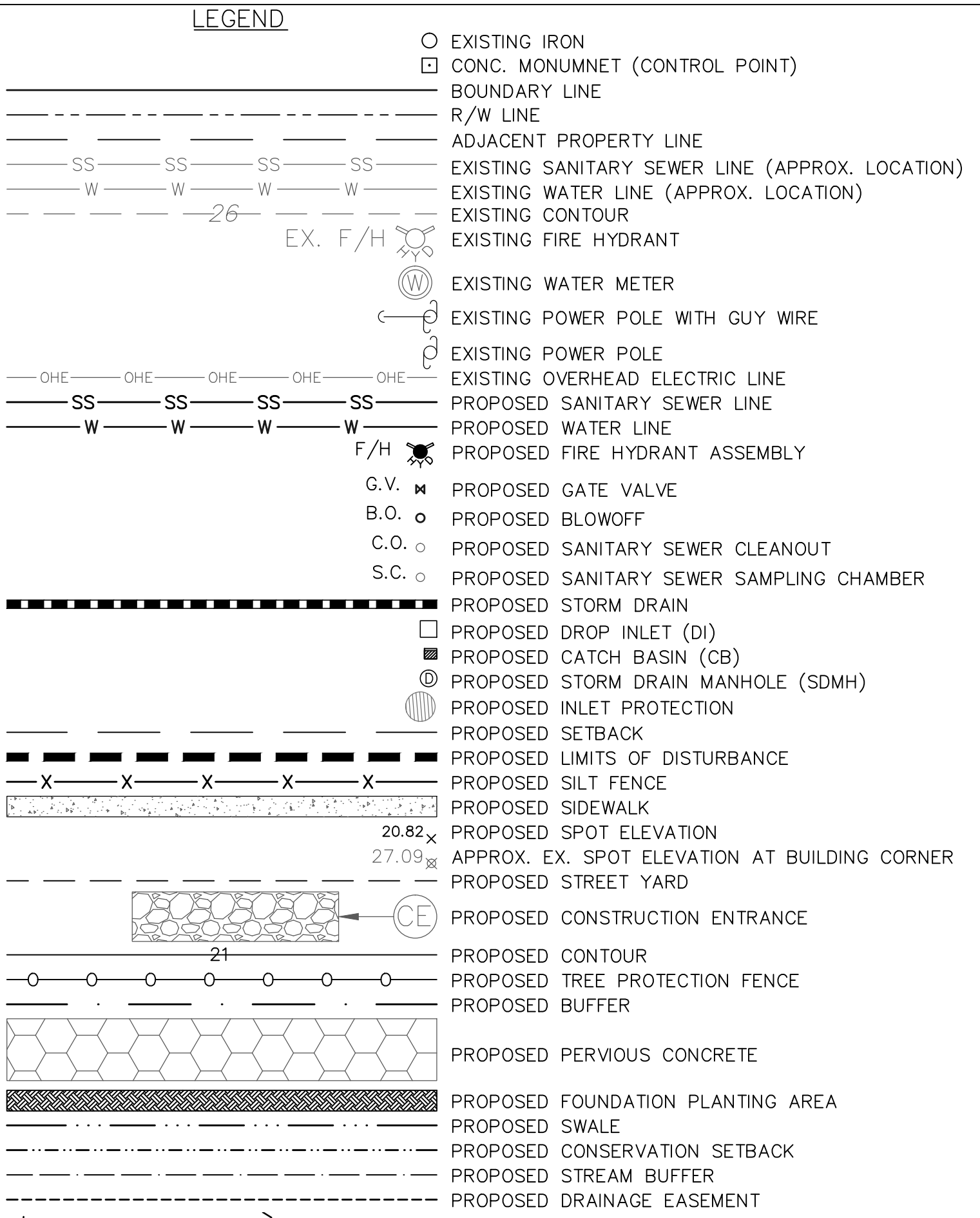
**OFF STREET PARKING CALCULATIONS (RESIDENTIAL):**  
 MIN. PARKING REQ. = 1.5 SPACES/UNIT x 184 UNITS = 276 SPACES  
 MAX. PARKING REQ. = 2.5 SPACES/UNIT x 184 UNITS = 460 SPACES  
 NUMBER OF PROPOSED PARKING SPACES = 297  
 MIN. NUMBER OF REQ. HANDICAPPED SPACES PER ADA STANDARDS FOR ACCESSIBLE DESIGN = 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 PLAN.  
 3. NO EQUIPMENT IS ALLOWED ON THE SITE UNLESS 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 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 CFPWA CROSS CONNECTION CONTROL REQUIREMENTS. WATER METER(S) CANNOT BE RELEASED UNTIL ALL REQUIREMENTS ARE MET AND THE STATE HAS GIVEN THEIR FINAL APPROVAL. CALL 332-6558 FOR INFORMATION.  
 13. IF THE CONTRACTOR DESIRES CFPWA 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 CFPWA WATER SHALL COMPLY WITH THE CFPWA CROSS CONNECTION CONTROL REGULATIONS. CALL 332-6558 FOR INFORMATION.  
 15. ANY BACKFLOW PREVENTION DEVICES REQUIRED BY CFPWA WILL NEED TO BE ON THE LIST OF APPROVED DEVICES BY USFCCCHR 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 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 LOCATED WITHIN A FEDERAL HISTORIC OR ARCHAEOLOGICAL 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 A 100-YEAR FLOOD PLAIN (PER ECS CAROLINAS, LLP).  
 10. SEE EXISTING CONDITIONS MAP & SITE PLAN FOR PRESENCE OR NON-PRESENCE OF EXISTING OR PROPOSED THROUGHFARES, 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.



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

**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 CFPWA. 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 CFPWA. 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 THROUGH THE WATER METER & 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 = 433,785 SF = 9.96 ACRES.  
 11. DISTURBED AREAS WITHIN ADJACENT RIGHTS-OF-WAY (EXCEPT FOR SWALE #1, 2, 7, & 8) & ON ADJACENT CITY OF WILMINGTON PROPERTY SHALL BE IMMEDIATELY SEEDED & STABILIZED WITH MULCH OR EROSION CONTROL MAT PRIOR TO ANY RAINFALL EVENT. SEE SWALE #1, 2, 7, & 8 DETAILS FOR SEEDING & STABILIZATION OF SWALES.  
 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 7,606 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 PIPE 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 SSM-1 MUST BE CUT-IN & CONTRACTOR MUST PROVIDE A BYPASS PLAN TO THE CFPWA 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.

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

**Approved Construction Plan**  
 Name \_\_\_\_\_ Date \_\_\_\_\_  
 Planning \_\_\_\_\_  
 Traffic \_\_\_\_\_  
 Fire \_\_\_\_\_

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

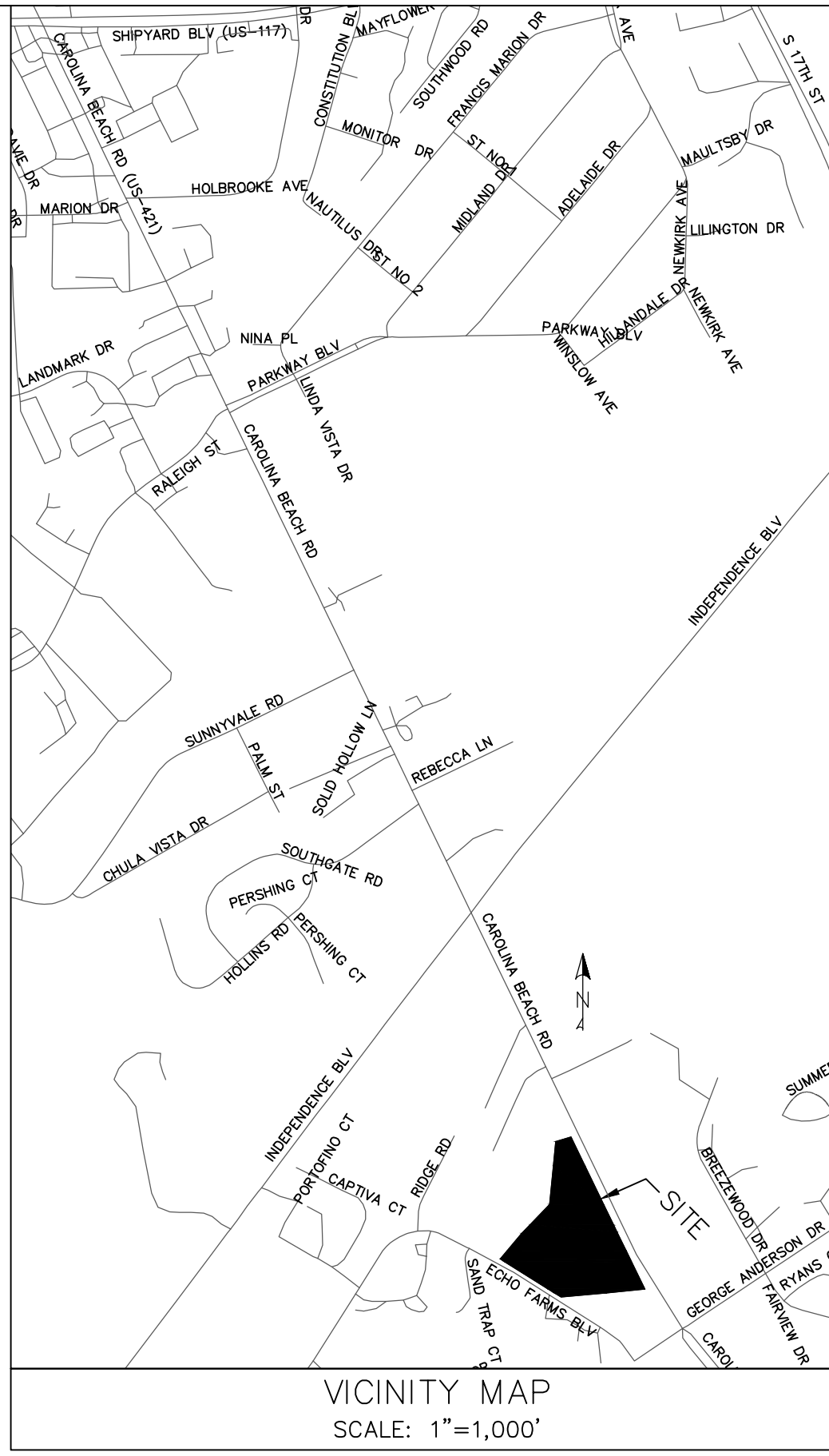
COVER SHEET  
 4010 CAROLINA BEACH ROAD  
**ARBOR TRACE APARTMENTS**  
 WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

**MALPASS ENGINEERING & SURVEYING, P.C.**  
 1134 SHIPYARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-6243  
 Fax 910-392-6203 License No. C-2320

Developer: ECHO FARM APARTMENTS, LLC  
 10 S. CAROLINA DRIVE  
 WILMINGTON, NORTH CAROLINA 28403  
 PHONE: 910-251-9030

CHECKED: JEM  
 PROJECT NO: 260  
 SHEET NO: 1  
 OF: 22

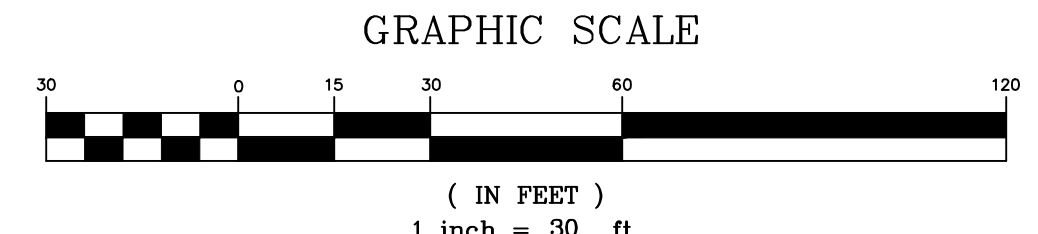
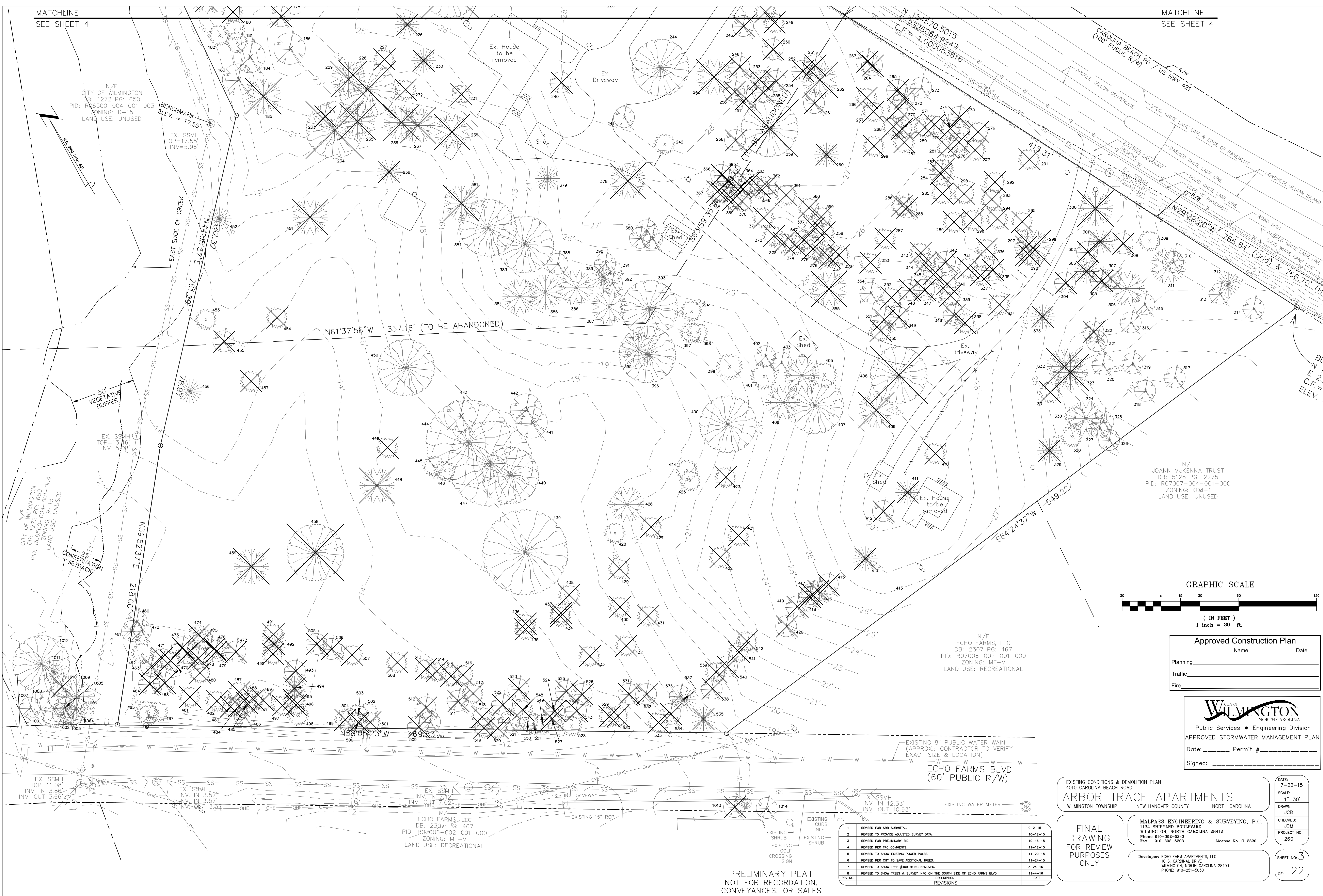


EXISTING PROTECTED TREES CHART					
NUMBER	TREE	REMOVAL	REASON FOR REMOVAL	MITIGATION REQUIRED	MITIGATION FACTOR
1	27" PINE	NO	--	--	--
2	10" TWIN OAK	NO	--	--	--
3	18" GUM	NO	--	--	--
4	17" GUM	NO	--	--	--
5	17" PINE	NO	--	--	--
6	24" POPULAR	NO	--	--	--
7	18" GUM	NO	--	--	--
8	18" GUM	NO	--	--	--
9	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	18" 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" POPULAR	NO	--	--	--
45	18" GUM	NO	--	--	--
46	19" GUM	NO	--	--	--
47	20" OAK	NO	--	--	--
48	24" PINE	NO	--	--	--
49	20" OAK	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" POPULAR	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	NO	--	--	--
78	12" PINE	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	--	--
79	11" OAK	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" POPULAR	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	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	15" PINE	NO	--	--	--
120	17" OAK	NO	--	--	--
121	21" PINE	NO	--	--	--
122	24" PINE	YES	ESSENTIAL SITE IMPROVEMENTS	1/3 (50%)	--
123	15" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	--
124	17" GUM	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	--
125	9" OAK	NO	--	--	--
126	13" 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	16" 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	14" 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	17" 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	18" 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	NO	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	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" OAK	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	18" 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" OAK	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	11" PINE	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	26" OAK	NO	--	--	--
245	8" 9" A 10" OAK (3 TREES)	NO	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	--
246	9" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	--
247	13" OAK	YES	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	--
248	15" PINE	EXEMPT	--	--	--
249	24" PINE (BELOW SPLT)	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	

MATCHLINE  
SEE SHEET 4

MATCHLINE  
SEE SHEET 4



**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

**ARBOR TRACE APARTMENTS**  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

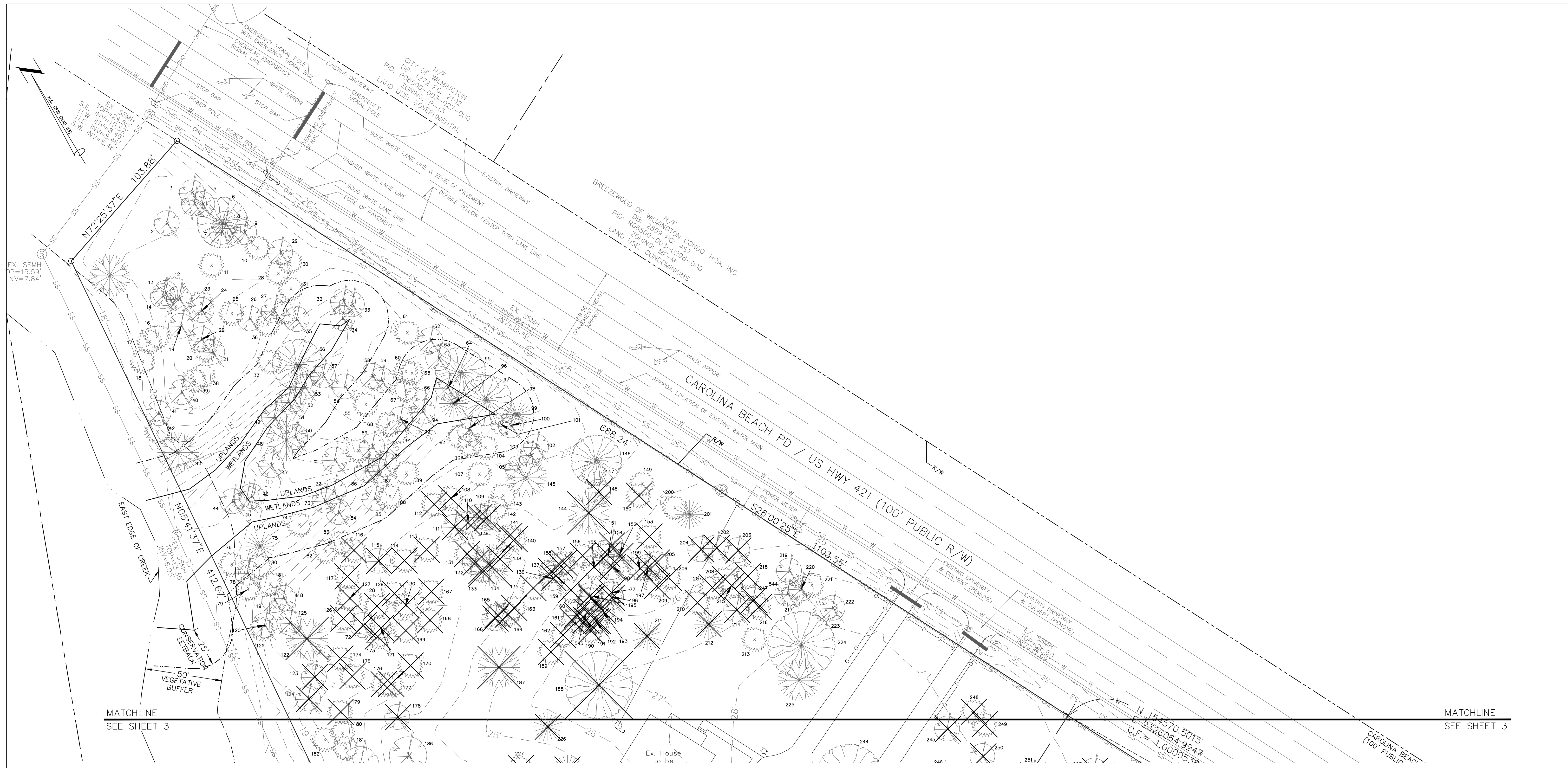
**MALPASS ENGINEERING & SURVEYING, P.C.**  
1134 SHIPYARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-6243  
Fax 910-392-5203 License No. C-2320

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: JEM  
PROJECT NO: 260  
SHEET NO: 3  
OF: 22

REV NO.	DESCRIPTION	DATE
1	REVISED FOR SBD 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 THE 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
8	REVISED TO SHOW TREES & SURVEY INFO ON THE SOUTH SIDE OF ECHO FARMS BLVD.	11-4-16

PRELIMINARY PLAT  
NOT FOR RECORDATION,  
CONVEYANCES, OR SALES



MATCHLINE  
SEE SHEET 3

MATCHLINE  
SEE SHEET 3

**Approved Construction Plan**

Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

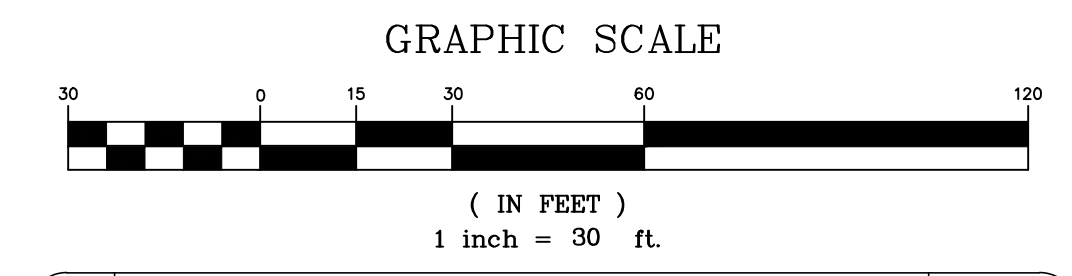
**CITY OF WILMINGTON**  
NORTH CAROLINA

Public Services • Engineering Division

**APPROVED STORMWATER MANAGEMENT PLAN**

Date: \_\_\_\_\_ Permit # \_\_\_\_\_

Signed: \_\_\_\_\_



REV. NO.	DESCRIPTION	DATE
1	REVISED FOR SRM 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

EXISTING CONDITIONS & DEMOLITION PLAN  
4010 CAROLINA BEACH ROAD  
**ARBOR TRACE 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 910-392-6343  
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: JEM  
PROJECT NO: 260

SHEET NO: 4  
OF: 22

PRELIMINARY PLAT  
NOT FOR RECORDATION,  
CONVEYANCES, OR SALES

MATCHLINE  
SEE SHEET 6

MATCHLINE  
SEE SHEET 6

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  
N47°05'37"E 261.29'  
N47°05'37"E 261.29'  
4" WIDE CURB CUT

50' VEGETATIVE BUFFER  
METLANDS UPLANDS

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'  
N39°52'37"E 218.00'

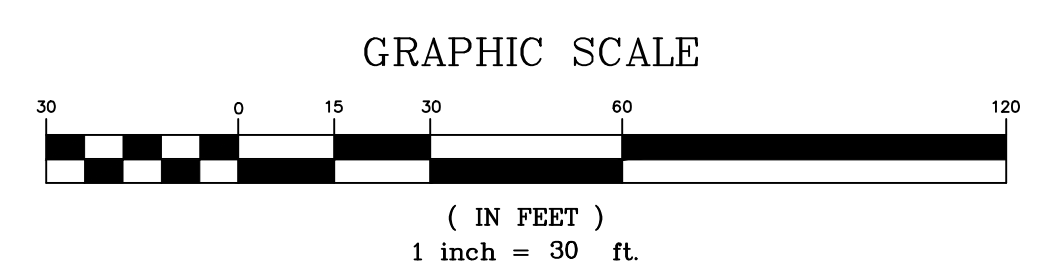
BUILDING #8  
POOL  
CLUBHOUSE

INFILTRATION BASIN #1

BUILDING #2  
MAINTENANCE BUILDING

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



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 FARMS BLVD  
(60' PUBLIC R/W)

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

PRELIMINARY PLAT  
NOT FOR RECORDATION,  
CONVEYANCES, OR SALES

REV NO.	DESCRIPTION	DATE
1	REVISED FOR SBI SUBMITTAL.	8-2-15
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 ADJ BEING REMOVED; ADJUST PARKING NORTH OF BUILDING #2, CLUBHOUSE, MAIN WALK, SIDEWALK ALONG CAROLINA BEACH RD. & WET POND #1.	8-24-16
10	REVISED TO ADJUST MAIL KIOSK & WET POND.	9-9-16
11	REVISED TO SHOW TREES & SURVEY INFO ON THE SOUTH SIDE OF ECHO FARMS BLVD.	11-4-16

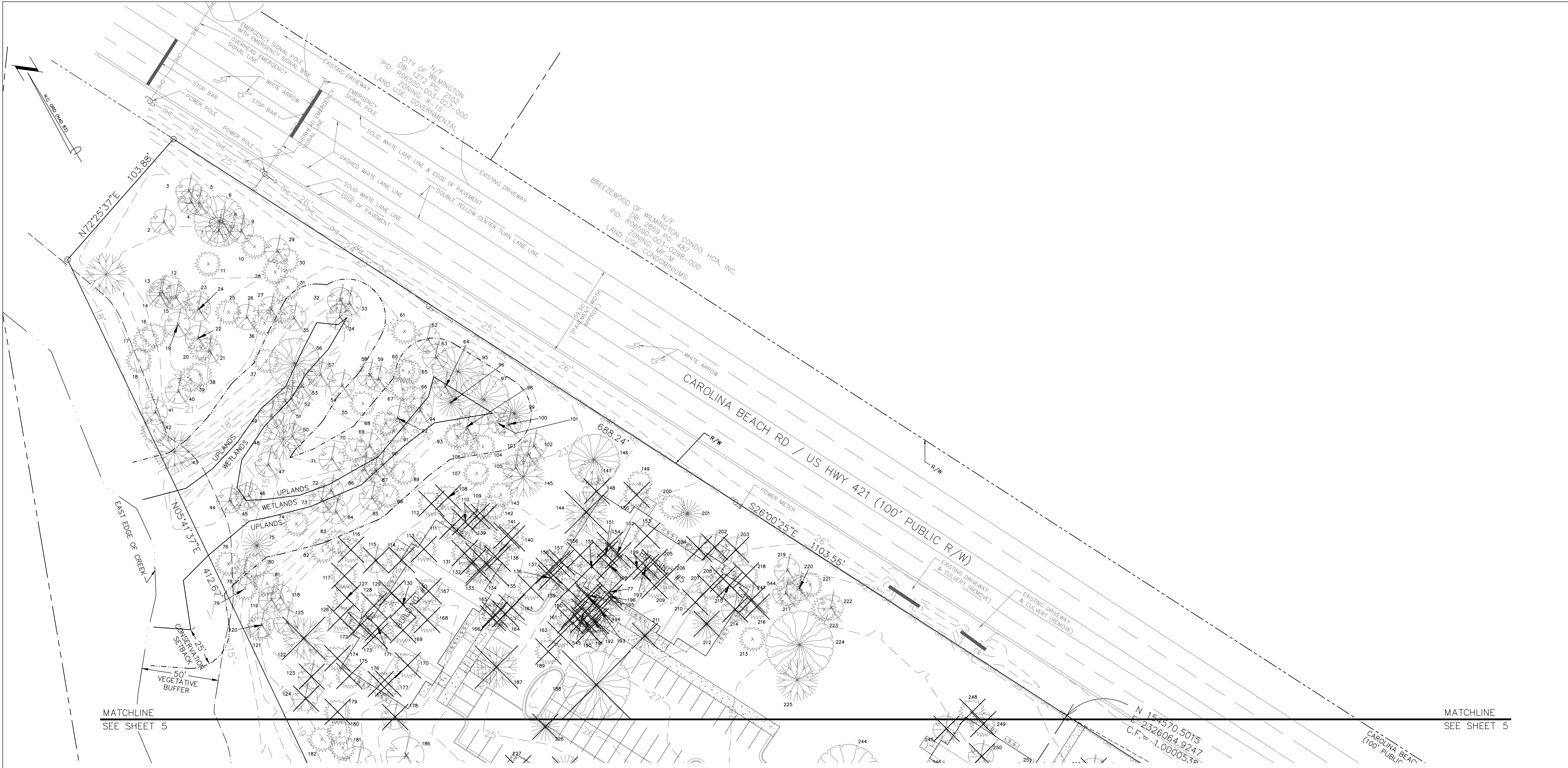
SITE INVENTORY  
4010 CAROLINA BEACH ROAD  
**ARBOR TRACE APARTMENTS**  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL  
DRAWING  
FOR REVIEW  
PURPOSES  
ONLY

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DATE: 7-22-15  
SCALE: 1"=30'  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 260  
SHEET NO: 5  
OF: 22



MATCHLINE  
SEE SHEET 5

MATCHLINE  
SEE SHEET 5

N 15°15'10.50" E  
E 2326.064.9247  
C.F. = -1.0000538

**Approved Construction Plan**

Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

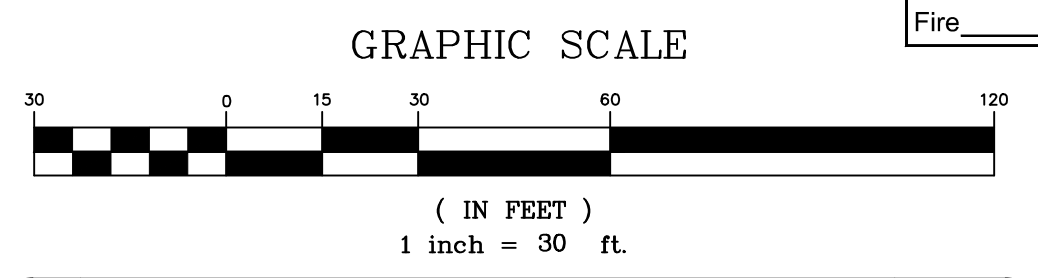
**WILMINGTON**  
NORTH CAROLINA

Public Services • Engineering Division

**APPROVED STORMWATER MANAGEMENT PLAN**

Date: \_\_\_\_\_ Permit # \_\_\_\_\_

Signed: \_\_\_\_\_



REV. NO.	DESCRIPTION	DATE
1	REVISED FOR SRI 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 THE 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

SITE INVENTORY  
4010 CAROLINA BEACH ROAD  
**ARBOR TRACE 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 910-392-5343 License No. C-2320  
Fax 910-392-5203

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: JEM  
PROJECT NO: 260

SHEET NO: 6  
OF: 22

PRELIMINARY PLAT  
NOT FOR RECORDATION,  
CONVEYANCES, OR SALES

MATCHLINE  
SEE SHEET 8

17,888 SF

MATCHLINE  
SEE SHEET 8

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 15°45'10.5015"  
2326064.9247  
C.F. = 1.000053816

CAROLINA BEACH RD / US HWY 421  
DOUBLE YELLOW CENTERLINE  
SOLID WHITE LANE LINE & EDGE OF PAVEMENT  
DASHED WHITE LANE LINE  
SOLID WHITE LANE LINE

N29°22'20"W 766.84' (Grid) & 766.70' (H)  
R/W  
ROAD SIGN  
DASHED WHITE LANE LINE  
SOLID WHITE LANE LINE

OPEN SPACE  
18,682 SF

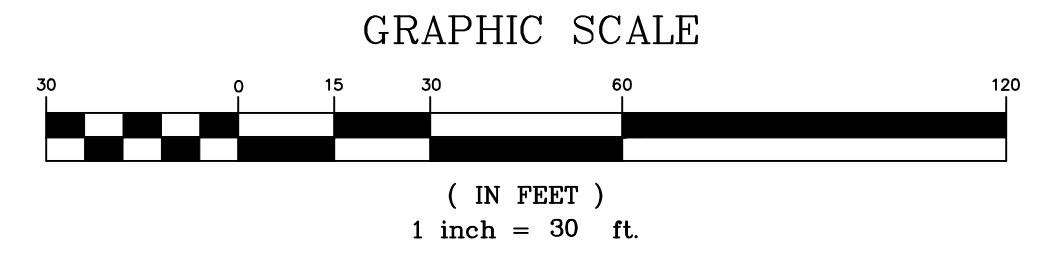
PASSIVE  
RECREATION AREA  
62,580 SF

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

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

ACTIVE  
RECREATION AREA  
6,113 SF

N39°52'37"E 218.00'  
N58°06'23"W 469.83'



Approved Construction Plan  
Name \_\_\_\_\_ Date \_\_\_\_\_  
Planning \_\_\_\_\_  
Traffic \_\_\_\_\_  
Fire \_\_\_\_\_

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

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)

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

PRELIMINARY PLAT  
NOT FOR RECORDATION,  
CONVEYANCES, OR SALES

REV. NO.	REVISIONS	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 #6.	12-14-15
7	REVISED PER CITY.	2-8-16
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
10	REVISED TO ADD SIDEWALK WITHIN ECHO FARMS BLVD R/W.	11-4-16

SITE PLAN  
4010 CAROLINA BEACH ROAD  
**ARBOR TRACE APARTMENTS**  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

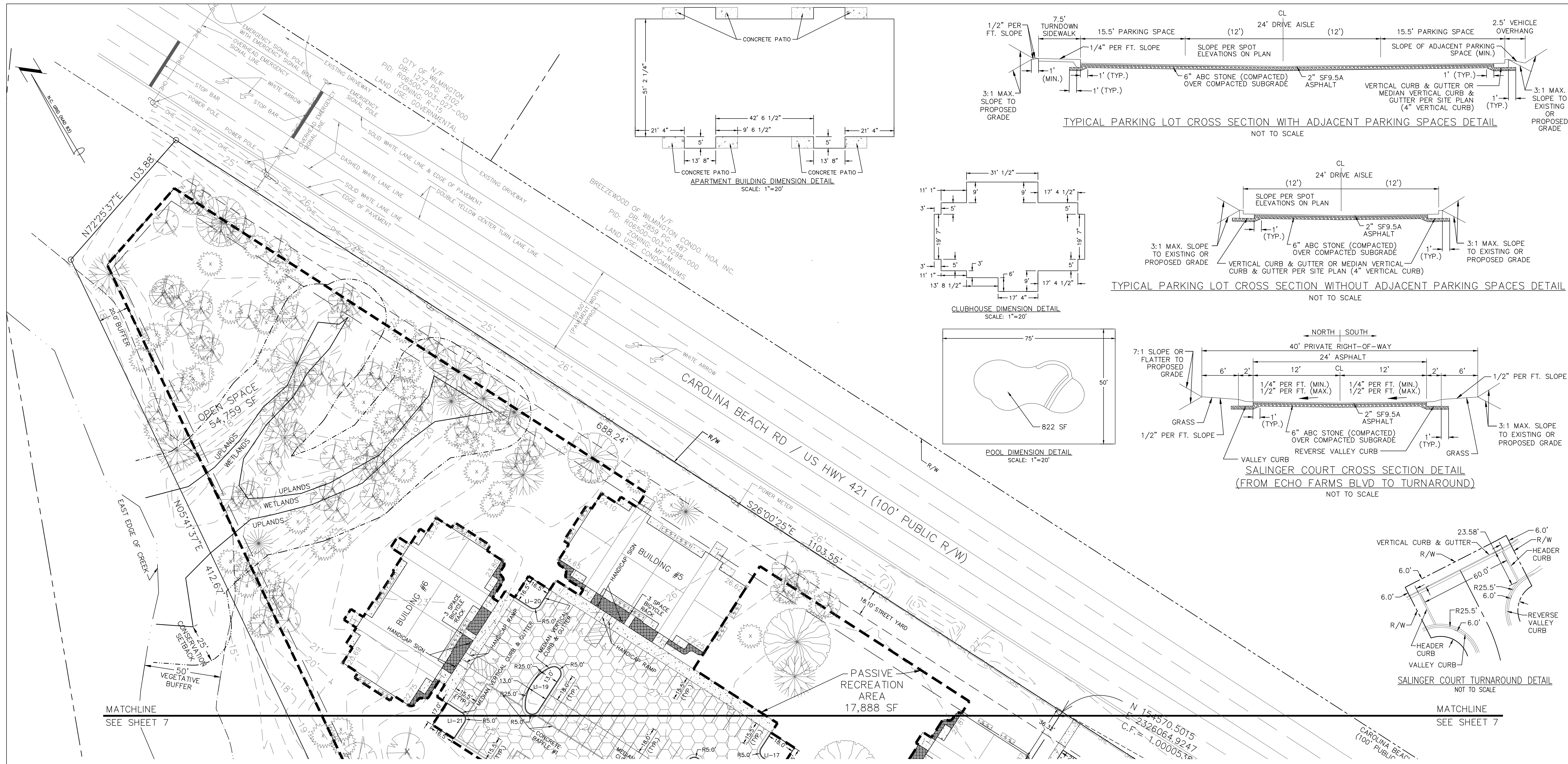
FINAL  
DRAWING  
FOR REVIEW  
PURPOSES  
ONLY

MALPASS ENGINEERING & SURVEYING, P.C.  
1134 SHIPYARD BOULEVARD  
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Phone 910-392-6243  
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: JEM  
PROJECT NO: 260

SHEET NO: 7  
OF: 22



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	267.80	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

**INTERIOR LANDSCAPING ISLANDS**

**TREES PER DISTURBED ACRE**  
9.63 AGRES \* 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 x 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')] \* 0.12 = 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')] \* 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] \* 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')] \* 0.12 = 32 SF  
PROVIDED FOUNDATION PLANTING = 33.42 SF  
\*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

**APPROVED CONSTRUCTION PLAN**

Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

Signed: \_\_\_\_\_

**GRAPHIC SCALE**  
1 inch = 30 ft.

**REVISIONS**

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 PER CITY TO SAVE ADDITIONAL TREES	11-24-15
6	REVISED TO PROVIDE SIDEWALK ALONG CAROLINA BEACH RD, STREET YARD CALC, & TREE CALC.	12-4-15
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 BUILD #2 & CLUBHOUSE	8-24-16

**APPROVED CONSTRUCTION PLAN**

Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

Signed: \_\_\_\_\_

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**APPROVED STORMWATER MANAGEMENT PLAN**

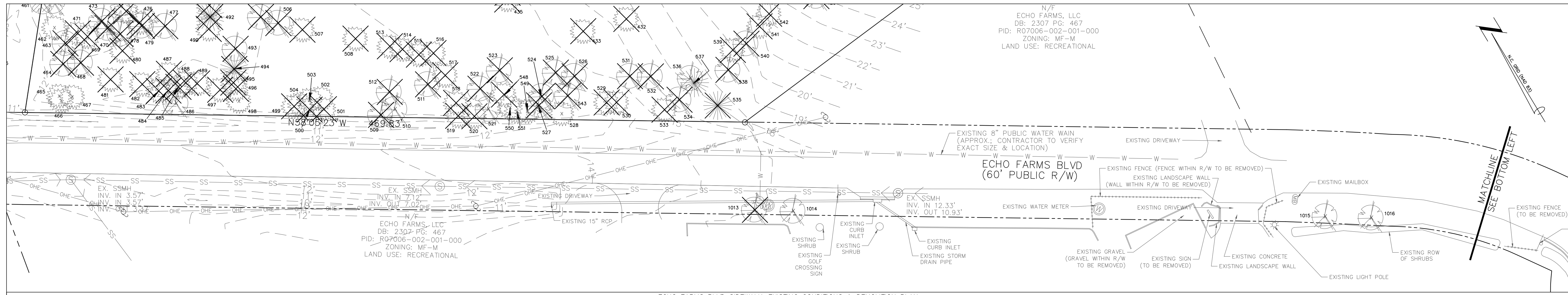
DATE: 7-22-15  
SCALE: 1"=30'  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 260  
SHEET NO: 8  
OF: 22

**ARBOR TRACE APARTMENTS**  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

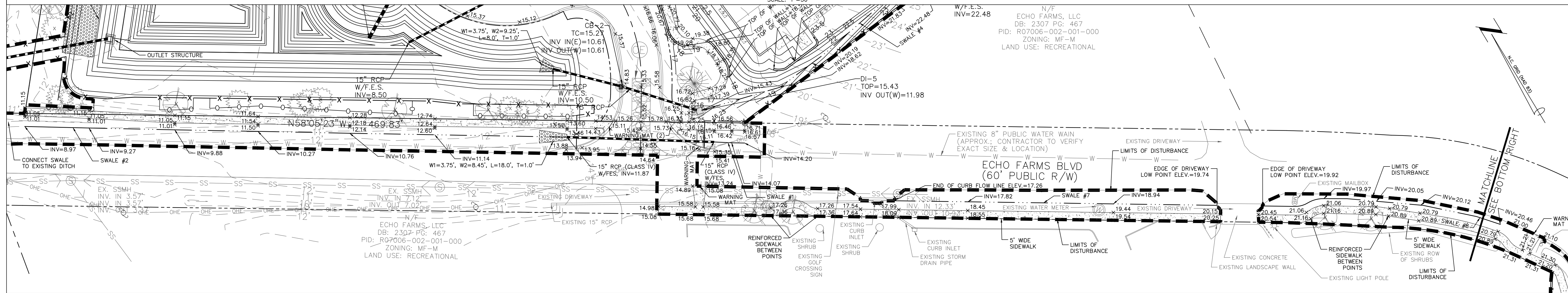
**MALPASS ENGINEERING & SURVEYING, P.C.**  
1134 SHIPYARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-6343  
Fax 910-392-6203 License No. C-2320

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

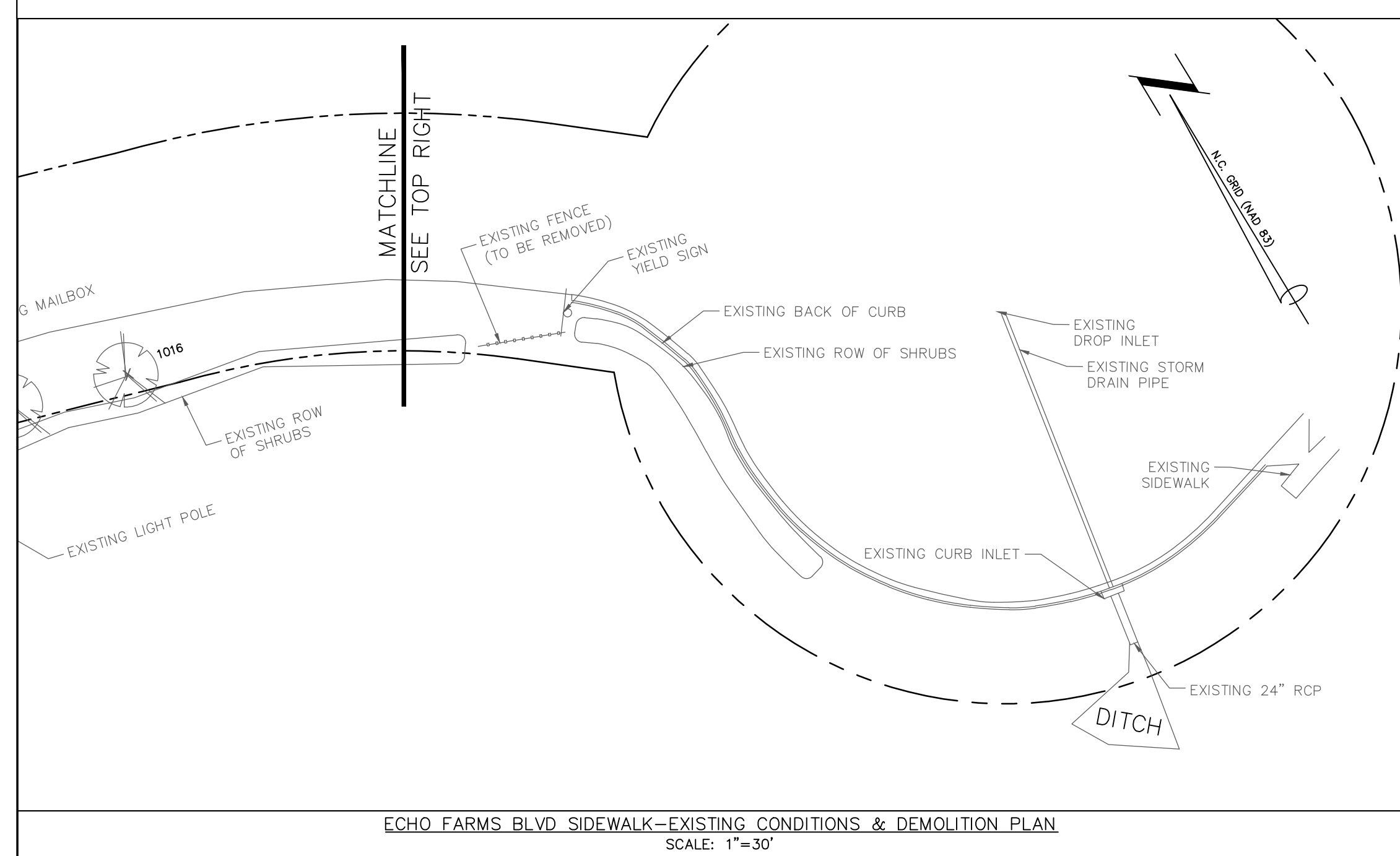




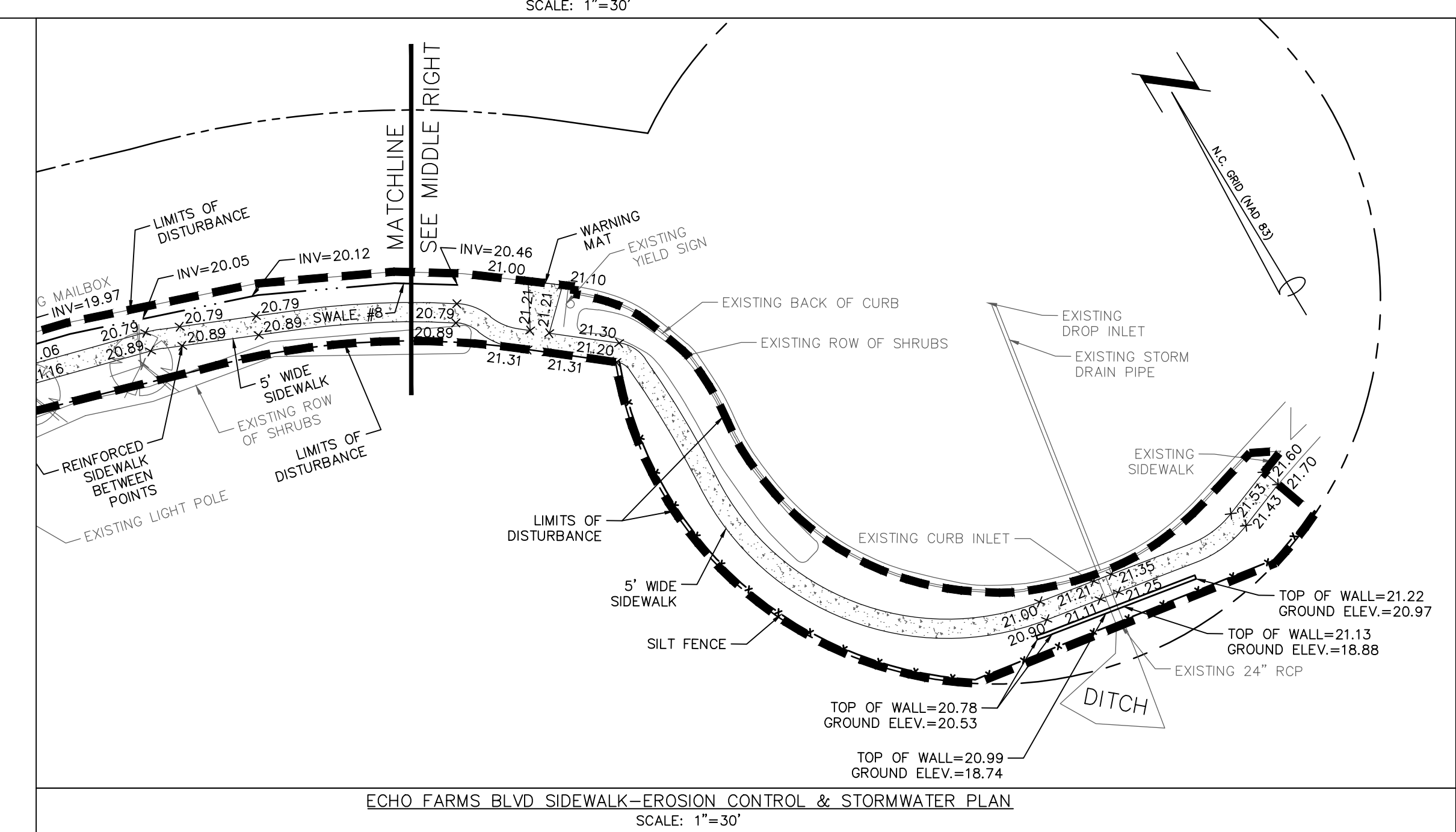
ECHO FARMS BLVD SIDEWALK-EXISTING CONDITIONS & DEMOLITION PLAN  
SCALE: 1"=30'



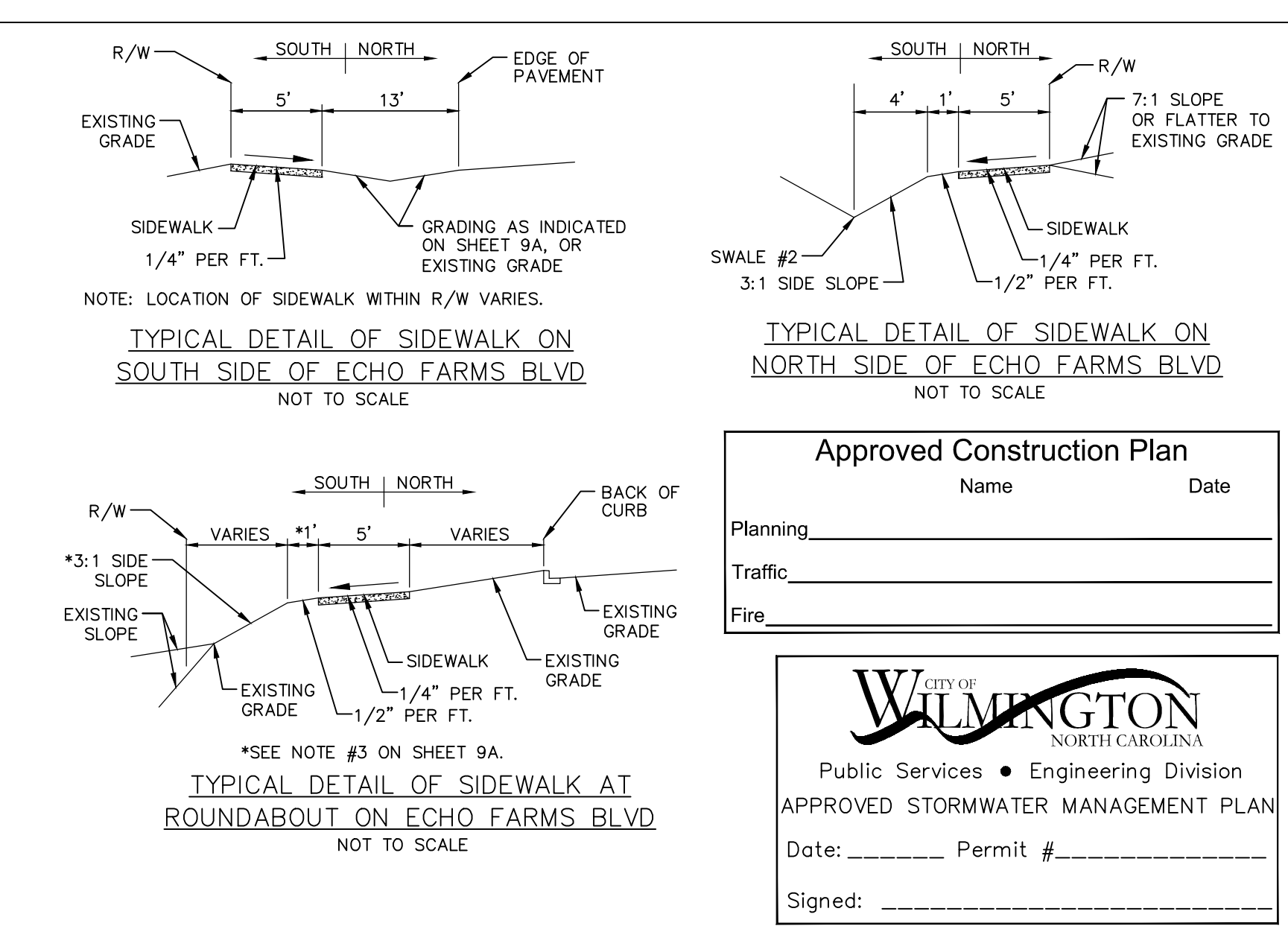
ECHO FARMS BLVD SIDEWALK-EROSION CONTROL & STORMWATER PLAN  
SCALE: 1"=30'



ECHO FARMS BLVD SIDEWALK-EXISTING CONDITIONS & DEMOLITION PLAN  
SCALE: 1"=30'

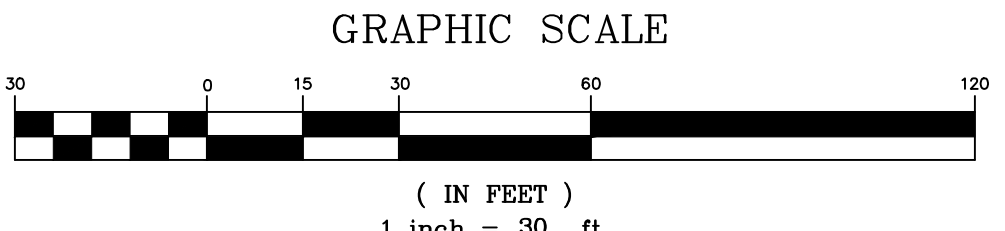


ECHO FARMS BLVD SIDEWALK-EROSION CONTROL & STORMWATER PLAN  
SCALE: 1"=30'



- NOTES FOR SIDEWALK WITHIN ECHO FARMS BLVD.
- CONTRACTOR AND/OR DEVELOPER TO COORDINATE THE REMOVAL OF THE EXISTING FENCE, SIGN, LANDSCAPE WALL, GRAVEL, & DEAD TREE WITH THE ADJACENT PROPERTY OWNER.
  - FIELD ADJUSTMENTS TO THE PROPOSED SIDEWALK GRADES ARE TO BE COORDINATED WITH & APPROVED BY THE ENGINEER & CITY INSPECTOR.
  - IF THE 3:1 SIDE SLOPE DOES NOT TIE BACK INTO THE EXISTING GRADE PRIOR TO THE END OF THE EXISTING 24" RCP AT THE ROUNDABOUT, THEN A MODULAR/KEYSTONE BLOCK RETAINING WALL WITH A FENCE SHALL BE INSTALLED AS SHOWN ON THE PLAN.
  - RETAINING WALL DESIGN BY OTHERS. MALPASS ENGINEERING & SURVEYING, P.C. IS NOT RESPONSIBLE FOR RETAINING WALL DESIGN.

PRELIMINARY PLAT  
NOT FOR RECORDATION,  
CONVEYANCES, OR SALES



REV. NO.	DESCRIPTION	REVISIONS	DATE

ECHO FARMS BLVD SIDEWALK-EX. CONDITION & EROSION CONTROL/STORMWATER PLAN

### ARBOR TRACE APARTMENTS

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

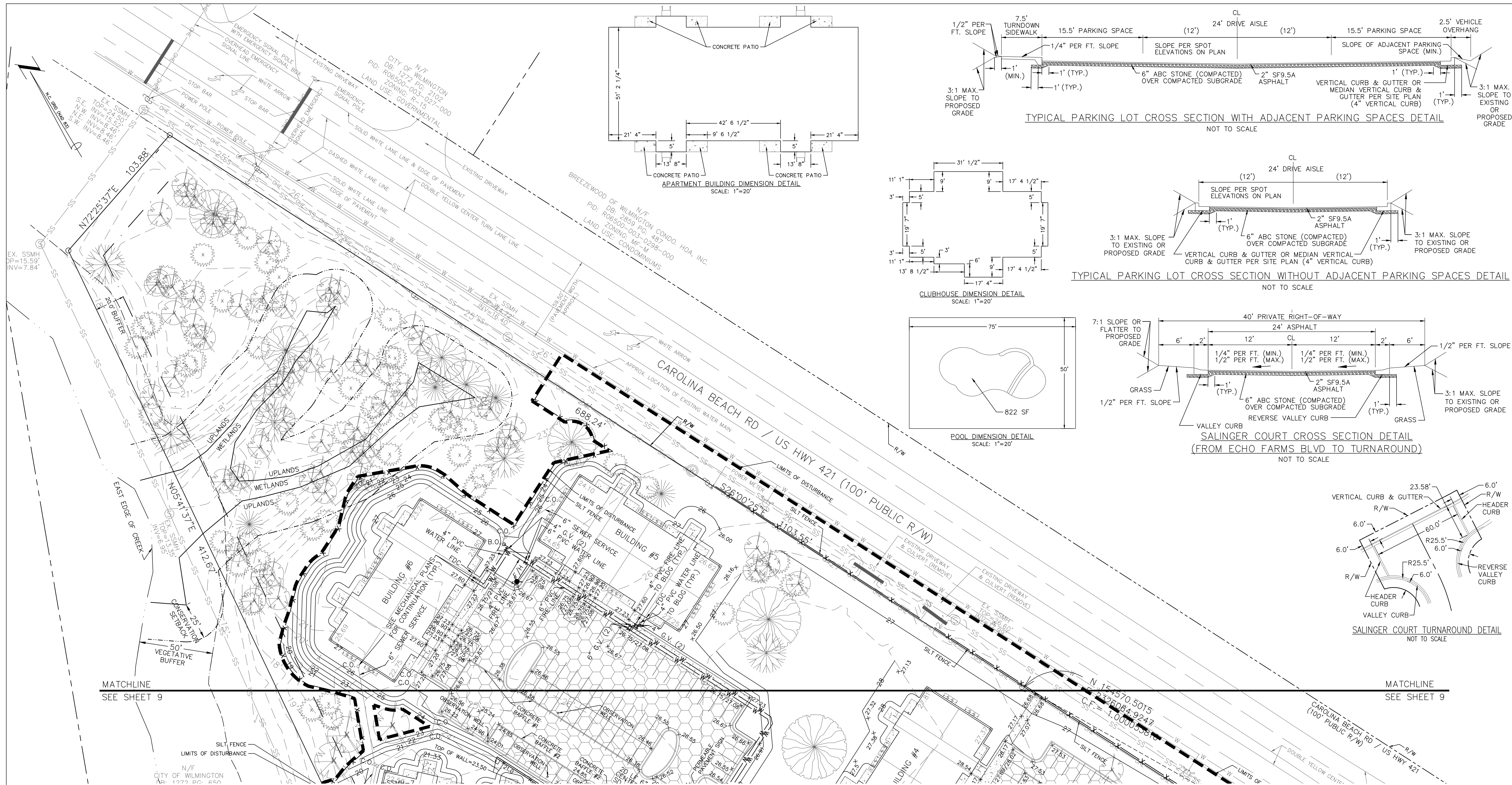
**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

DATE: 11-4-16  
SCALE: 1"=30'  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 260

Developer: ECHO FARM APARTMENTS, LLC  
4010 CAROLINA BEACH ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PHONE: 910-251-5030

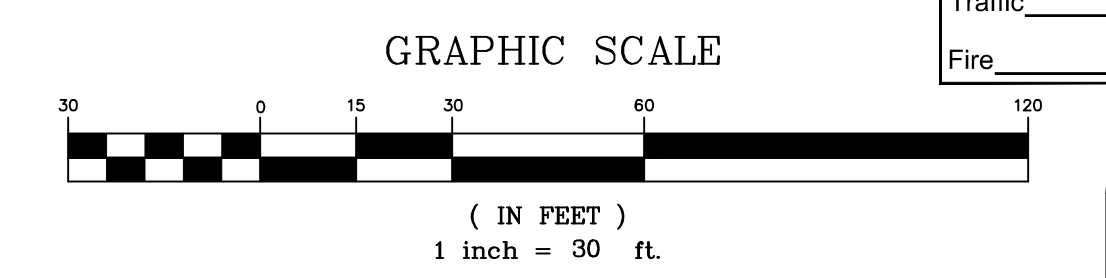
SHEET NO: 9A  
OF: 22





- 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.



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

PRELIMINARY PLAT  
NOT FOR RECORDATION,  
CONVEYANCES, OR SALES

**Approved Construction Plan**

Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

**WILMINGTON**  
NORTH CAROLINA

Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_

Signed: \_\_\_\_\_

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

**ARBOR TRACE APARTMENTS**

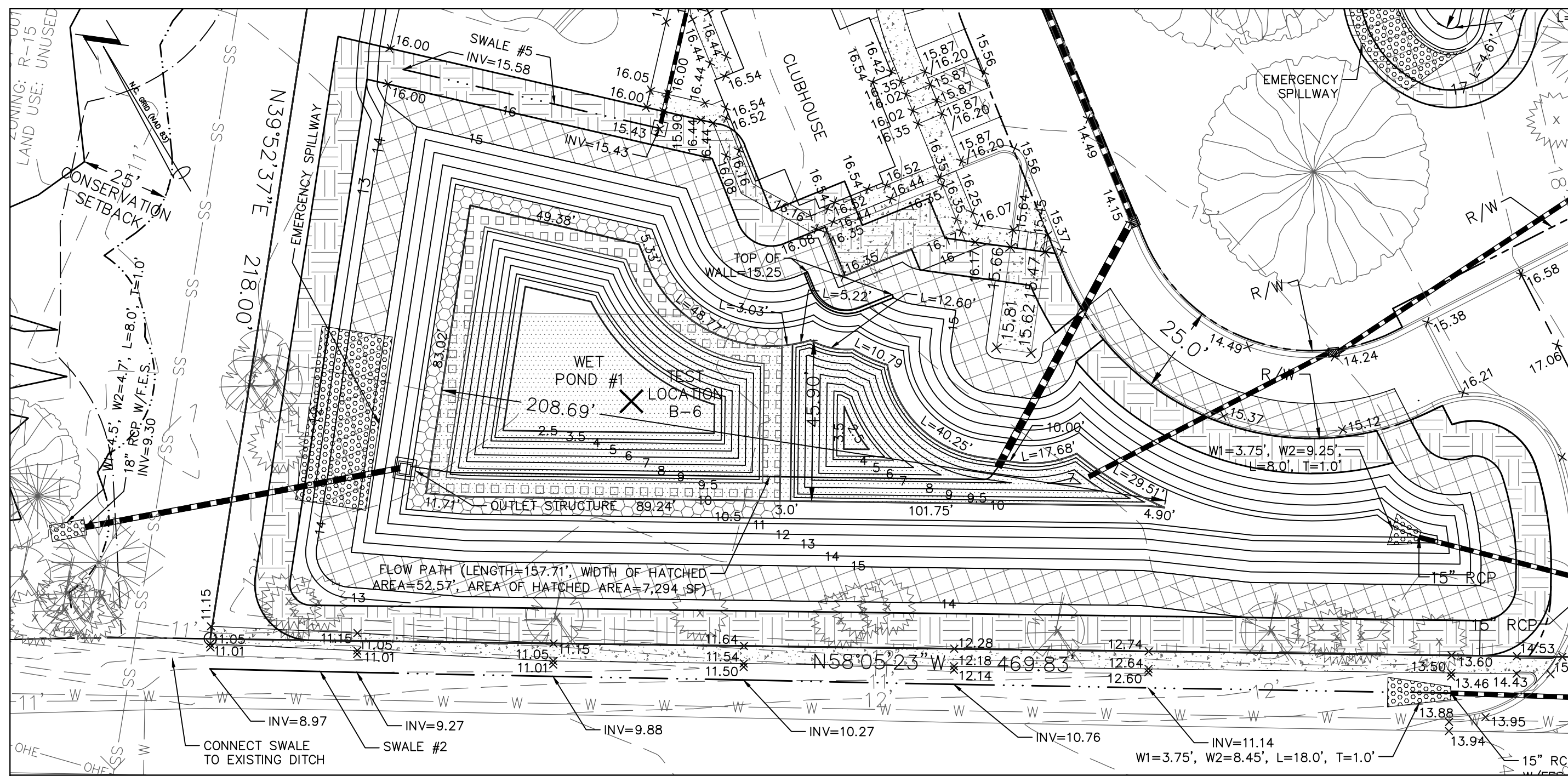
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

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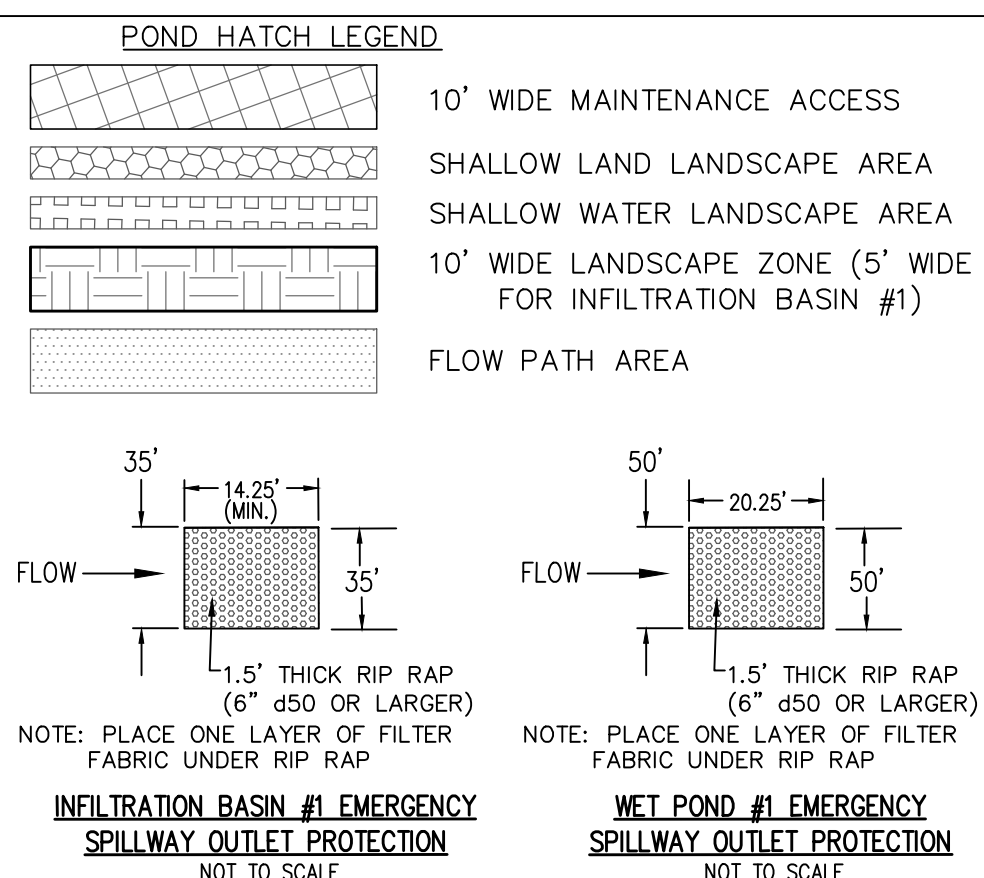
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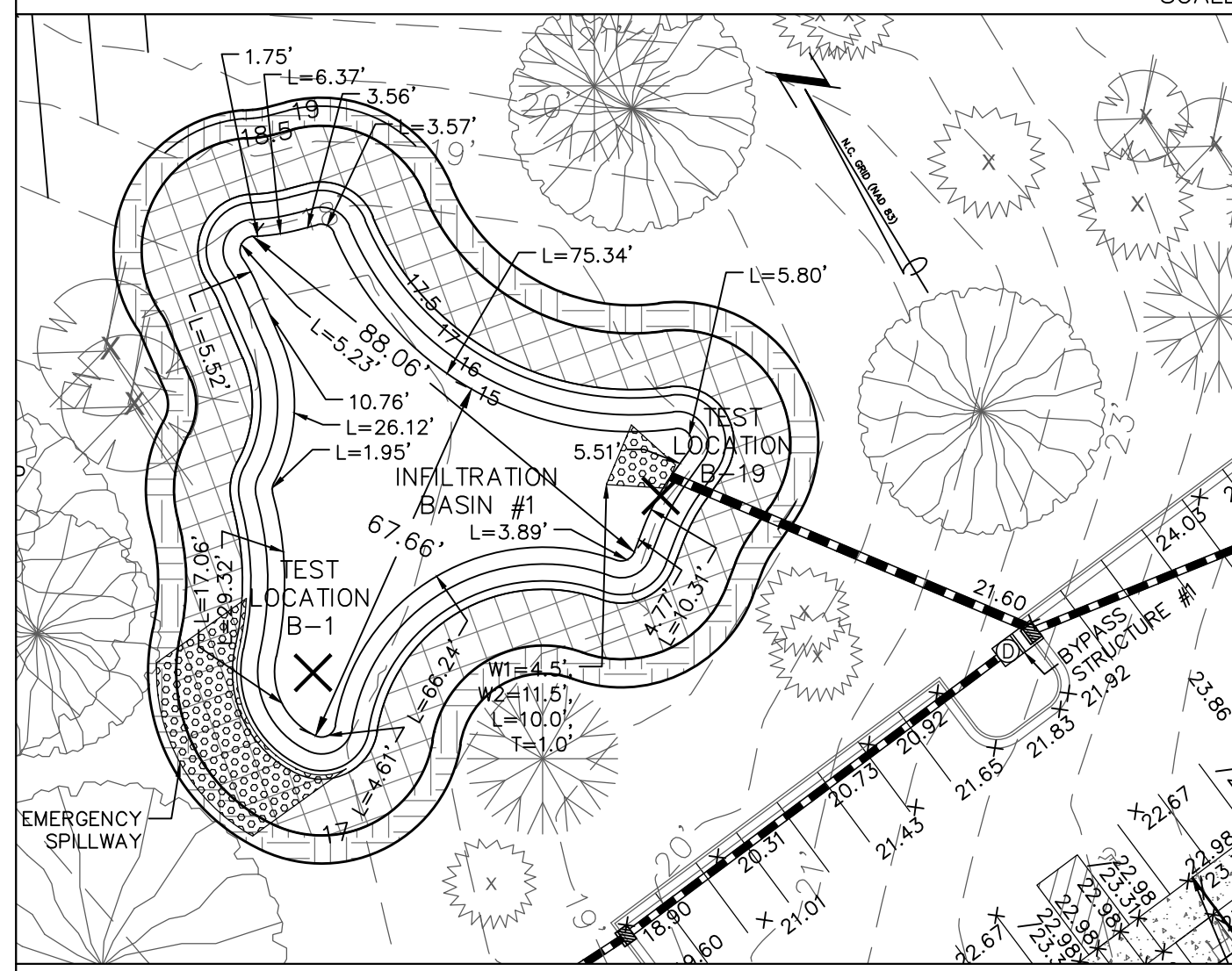


WET POND #1 DETAIL  
SCALE: 1"=30'

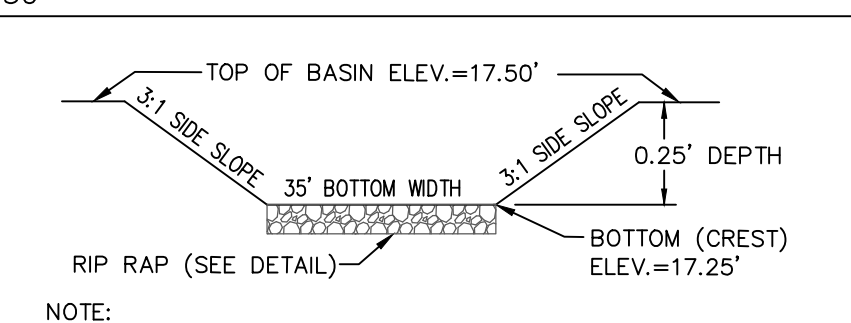


INFILTRATION BASIN #1 EMERGENCY SPILLWAY OUTLET PROTECTION NOT TO SCALE

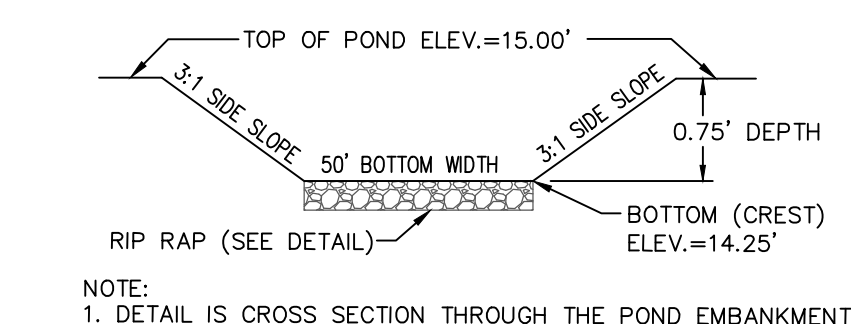
WET POND #1 EMERGENCY SPILLWAY OUTLET PROTECTION NOT TO SCALE



INFILTRATION BASIN #1 DETAIL  
SCALE: 1"=30'



INFILTRATION BASIN #1 EMERGENCY SPILLWAY CROSS SECTION DETAIL NOT TO SCALE



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

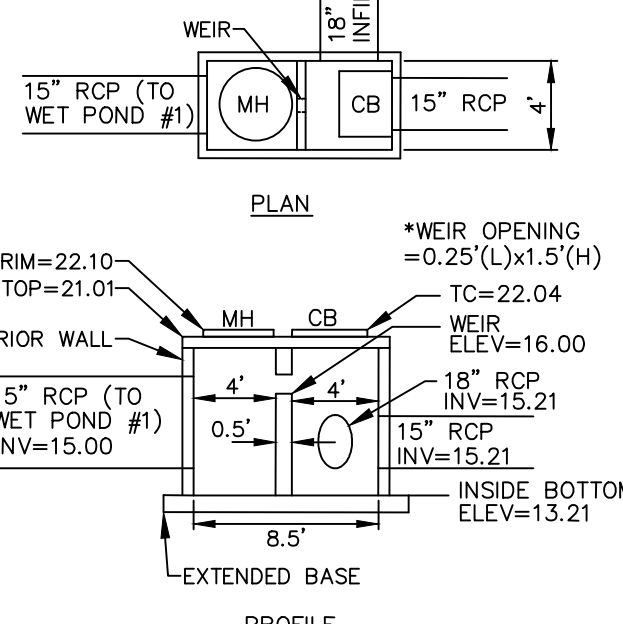
\* INFORMATION PROVIDED BY BATEMAN CIVIL SURVEY COMPANY, PC.  
\*\* INFORMATION PROVIDED BY EGS CAROLINAS, LLP.  
\*\*\* CALCULATED BASED ON INFORMATION PROVIDED BY OTHERS

WET POND #1

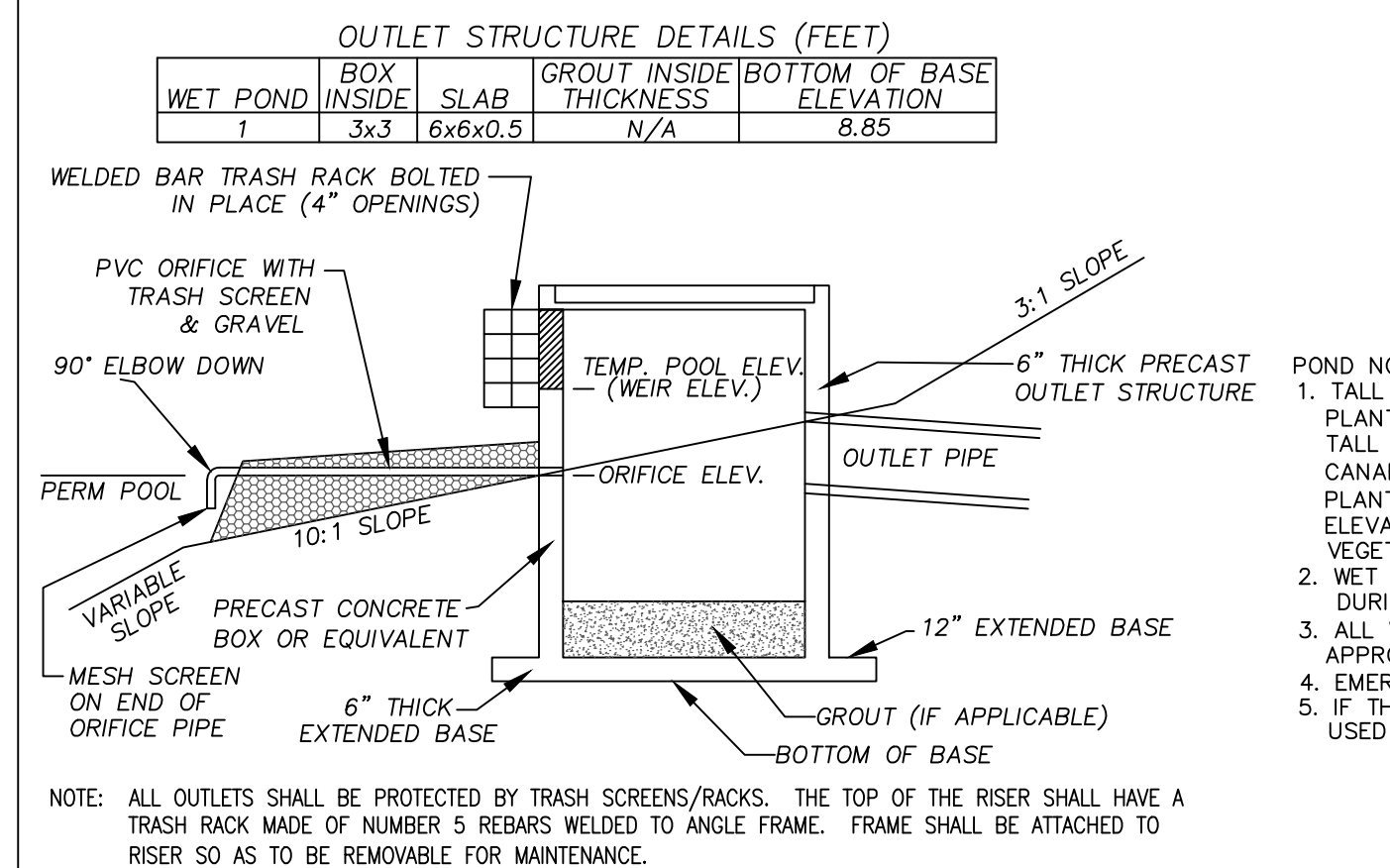
ELEV. (FT)	AREA (SQ. FT.)	INCREMENTAL VOLUME (CU. FT.)	CUMULATIVE VOLUME (CU. FT.)
10.00	8,686	0	0
10.50	11,762	5,112	5,112
11.00	12,827	6,147	11,259
12.00	15,022	13,925	25,184
13.00	17,262	16,142	41,326
14.00	19,559	18,411	59,737
15.00	21,927	20,743	80,480

INFILTRATION BASIN #1

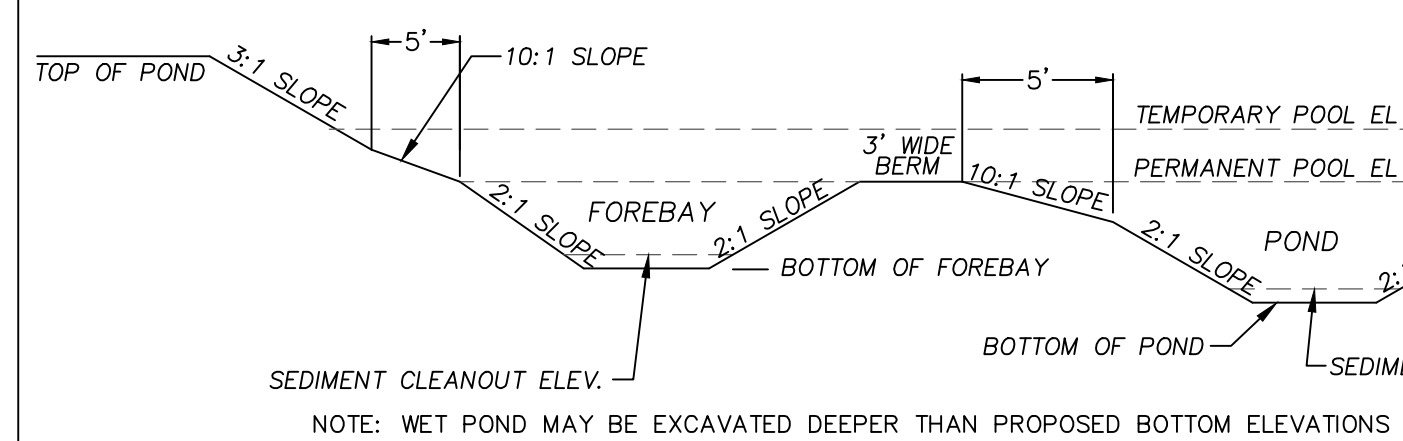
ELEV. (FT)	AREA (SQ. FT.)	INCREMENTAL VOLUME (CU. FT.)	CUMULATIVE VOLUME (CU. FT.)
15.00	2,925	0	0
15.50	3,364	1,572	1,572
16.00	3,817	1,795	3,367
16.50	4,283	2,025	5,392
17.00	4,764	2,262	7,654
17.50	5,260	2,506	10,160



BYPASS STRUCTURE #1 DETAIL NOT TO SCALE



OUTLET STRUCTURE DETAIL NOT TO SCALE

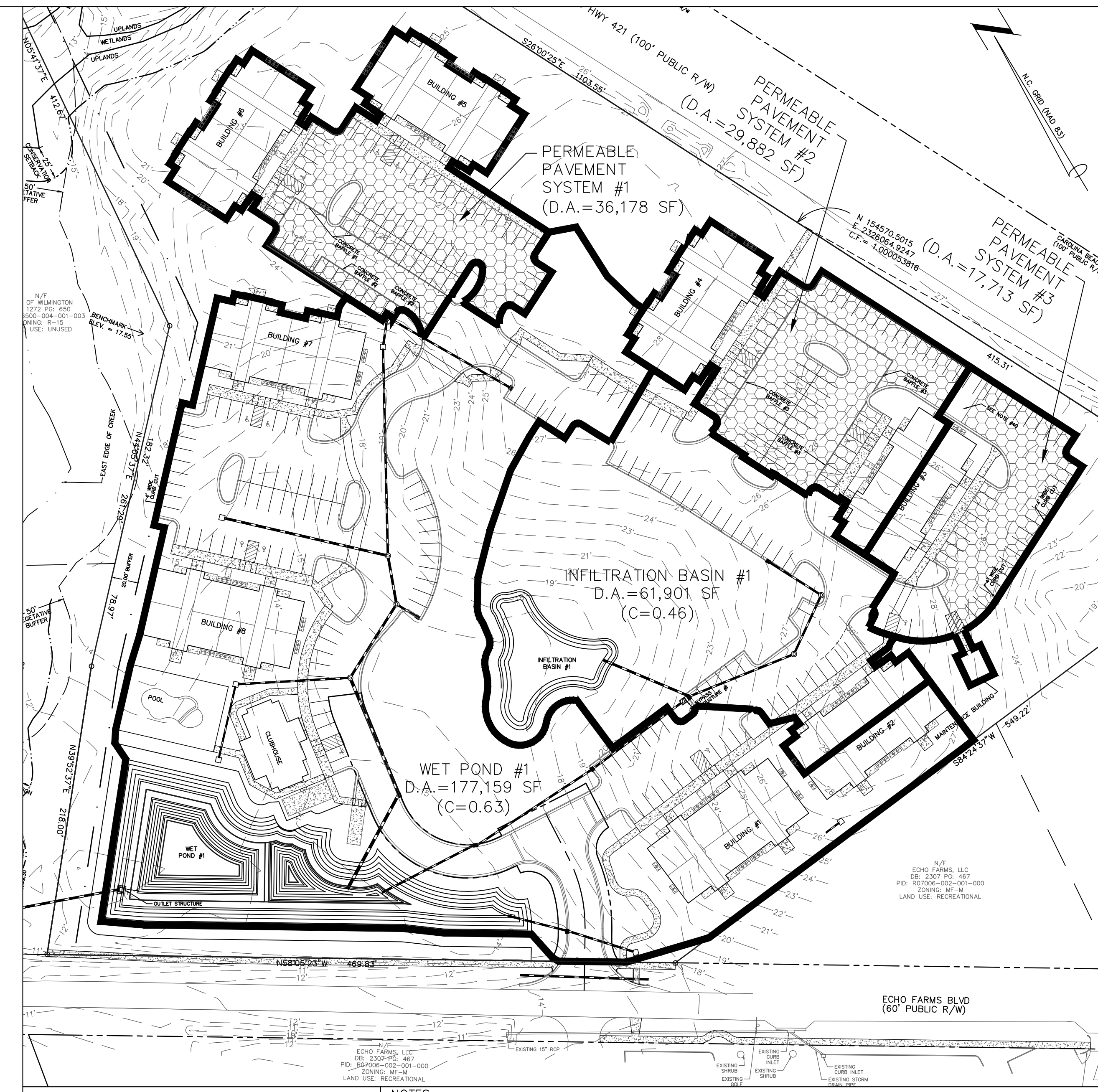


WET POND #1-FOREBAY & POND SECTION DETAIL NOT TO SCALE

- POND NOTES:
- 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).
  - WET POND #1 SHALL BE USED AS A SEDIMENT BASIN WITH A FAIRLOTH SKIMMER ORIFICE DURING CONSTRUCTION. IT SHALL BE CLEANED OUT PRIOR TO USE AS A WET POND.
  - ALL WATER THAT DRAINS OFF IMPERVIOUS SURFACES SHALL BE DIRECTED INTO THE APPROPRIATE STORMWATER SYSTEM (SEE DRAINAGE AREA MAPS).
  - EMERGENCY SPILLWAY & ENERGY DISSIPATOR TO HAVE FILTER FABRIC UNDERLAYMENT.
  - IF THE POND NEEDS TO BE DRAINED FOR MAINTENANCE OR AN EMERGENCY A PUMP SHALL BE USED TO DRAIN IT.

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.

WET POND	TOP POND	PERM. POND	TEMP. POND	VEGETATED SHELF	FOREBAY TOP	FOREBAY BOTTOM	POND TOP	POND BOTTOM	SEDIMENT CLEANOUT EL.	SEDIMENT CLEANOUT EL.	OUTLET STRUCTURE ELEVATIONS	EMERGENCY SPILLWAY	IMPERVIOUS AREAS	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 @ 11.20	N/A	1.5' @ 10.00	18" RCP @ 9.85	50' @ 14.25	30,819	65,872	8,092	5,157	1,336	111,276



BMP DRAINAGE AREA MAP  
SCALE: 1"=60'

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

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 subcordatus (Sweetflag), Alisma subcordatum (Water plantain), Hydrocotyle quadrivalvis (Waterpocket), Iris virginica (Blue flag iris), Auropus effusus var. pygmaeus (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 toberamontani (Soft stem bulrush), Schoenoplectus americanus (Three-square bulrush), Scirpus operinus (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 (Hobbledehoy rosemallow), Kosteletzkya virginica (Seashore Mallow), Lobelia cardinalis (Cardinal flower), Lobelia elongata (longleaf lobelia), Lobelia siphilitica (Great blue Lobelia), Rhynchospora colorata (Starrush whitetop), Soocharum 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.

Approved Construction Plan

Name \_\_\_\_\_ Date \_\_\_\_\_

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

ARBOR TRACE APARTMENTS  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DATE: 10-11-15  
SCALE: VARIES  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 260

MALPASS ENGINEERING & SURVEYING, P.C.  
1134 SHIPYARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-6243  
Fax 910-392-5203 License No. C-2320

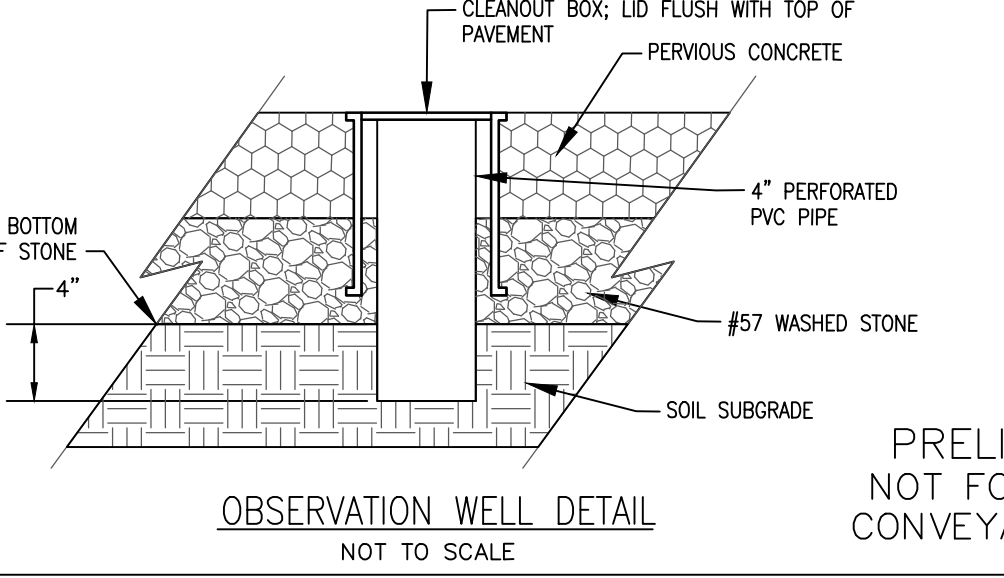
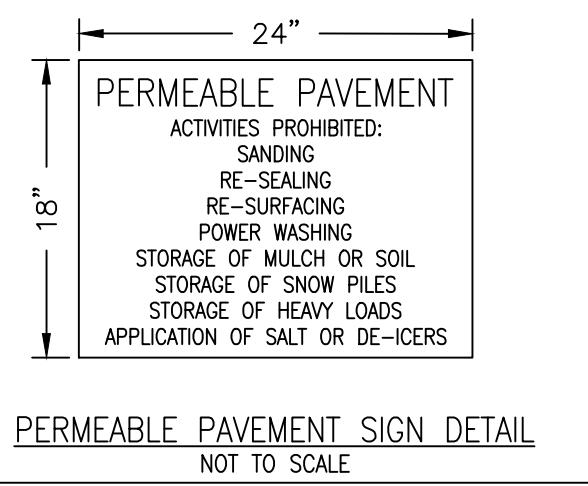
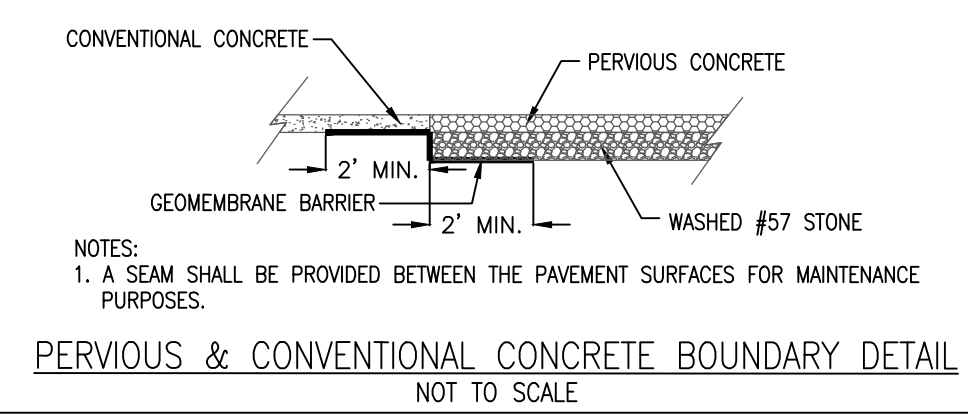
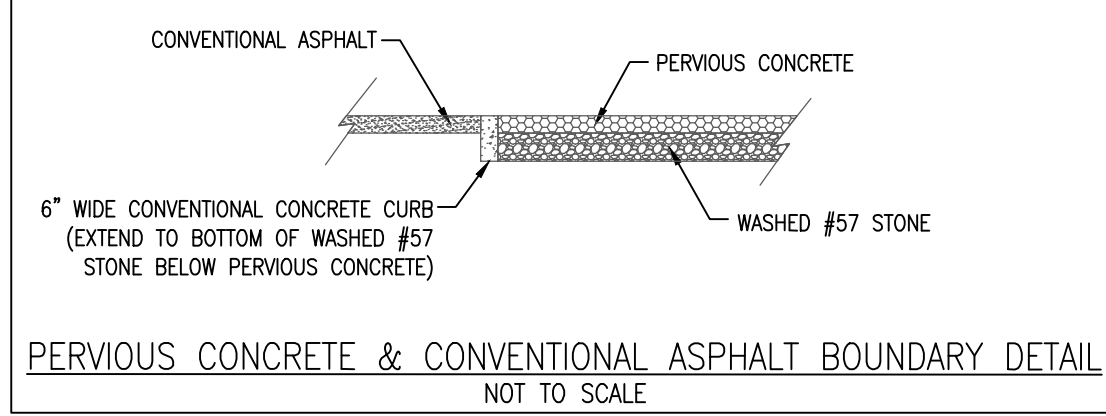
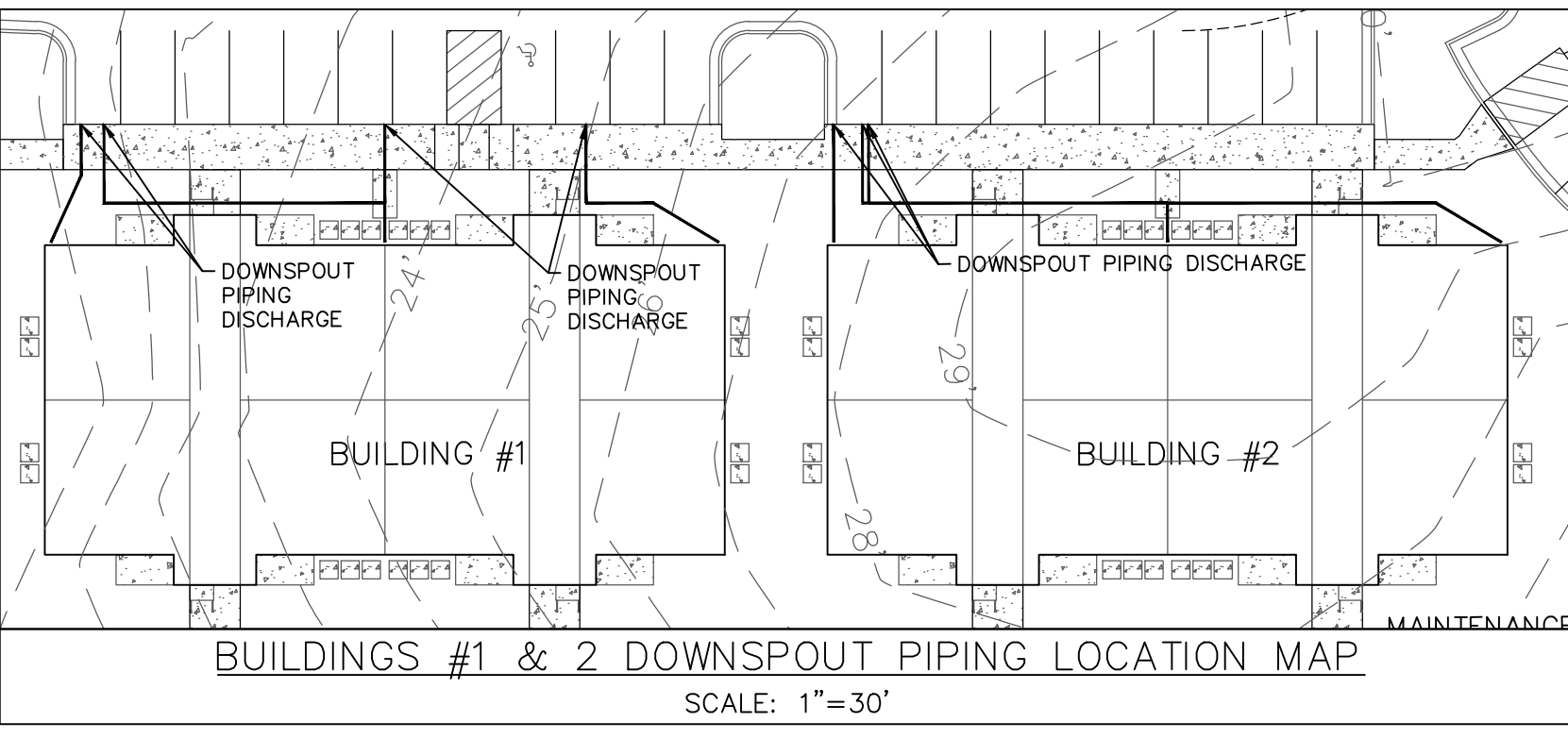
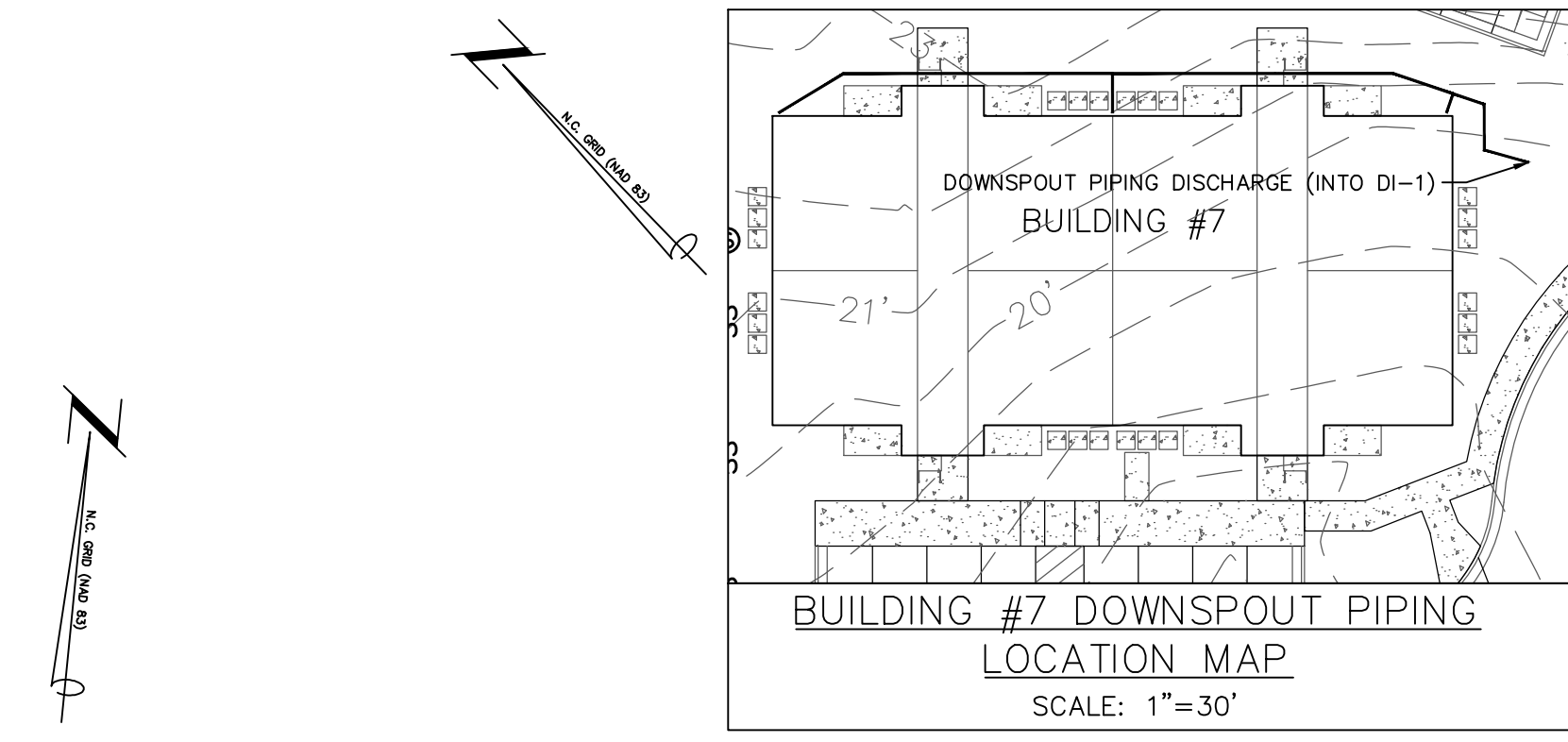
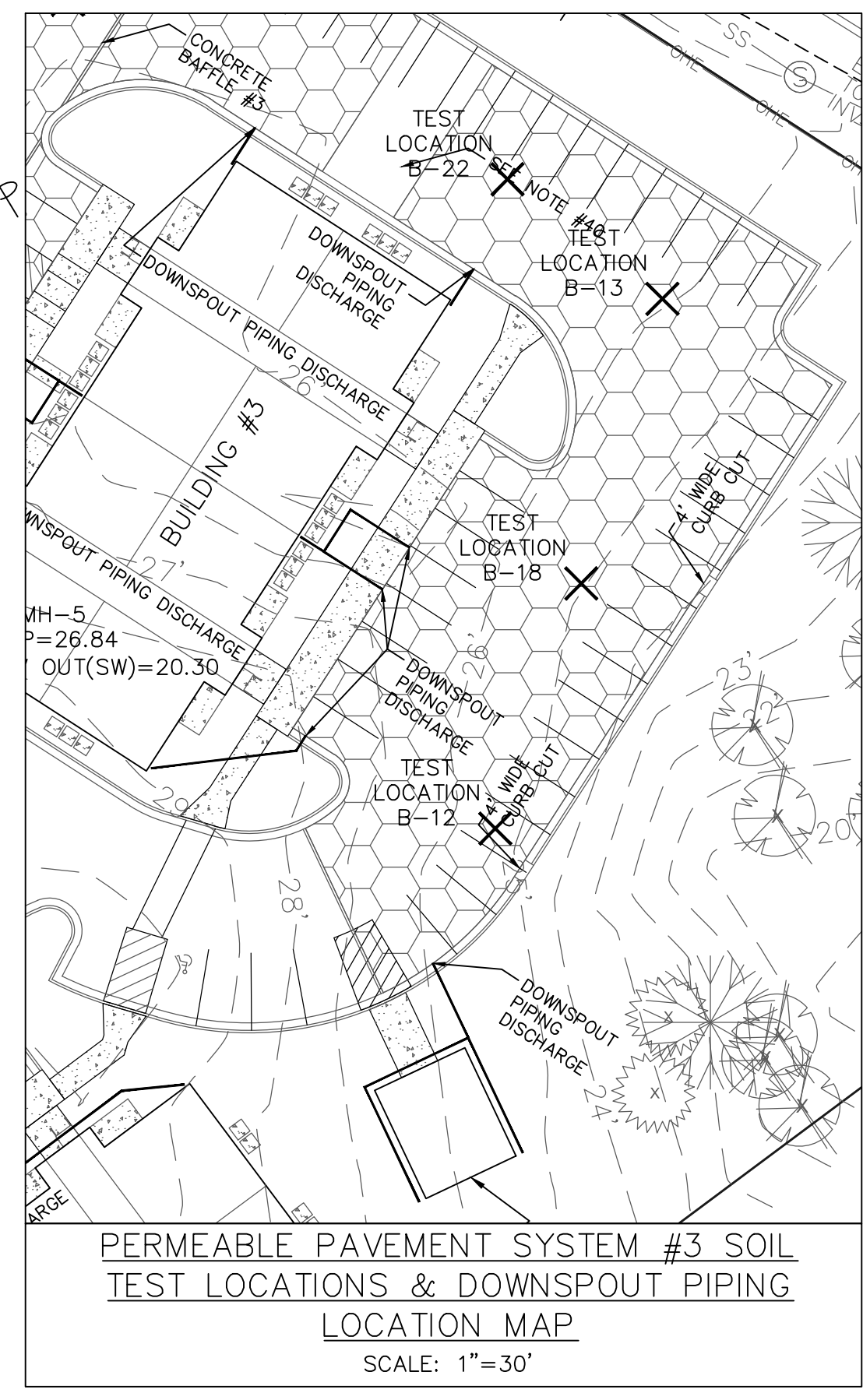
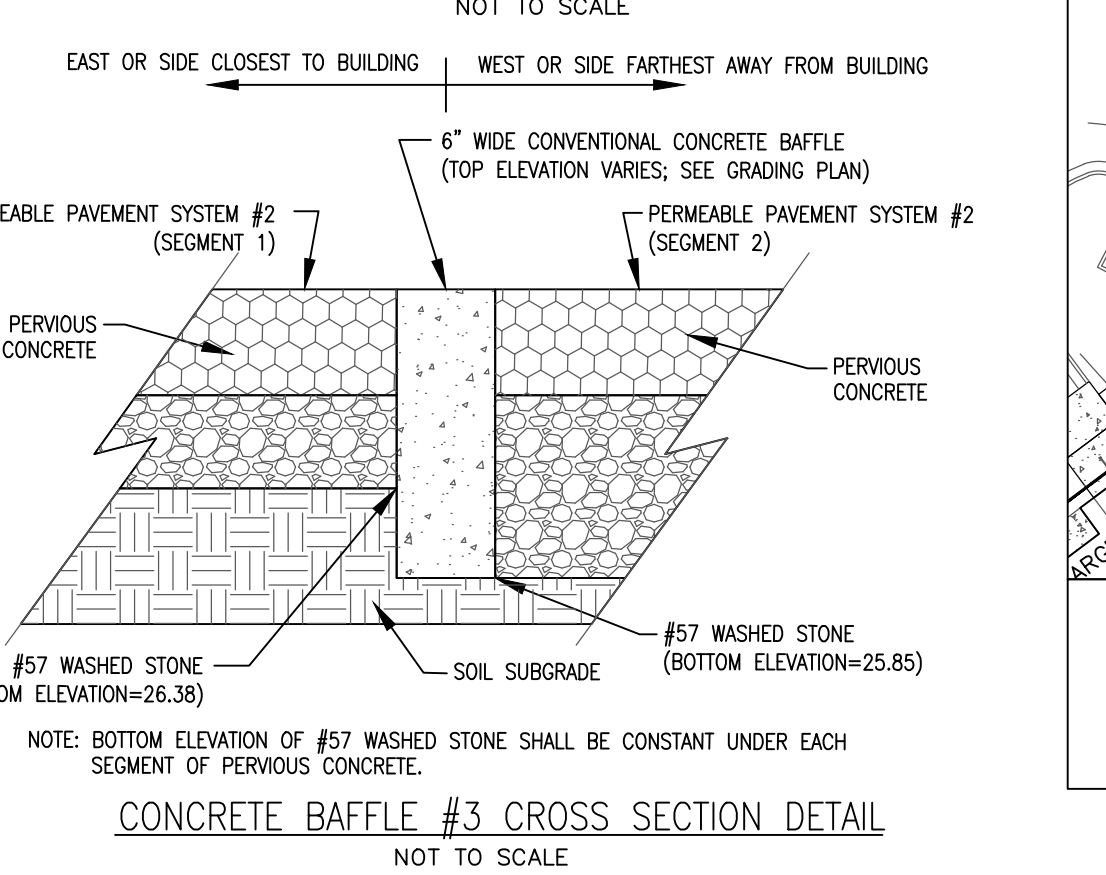
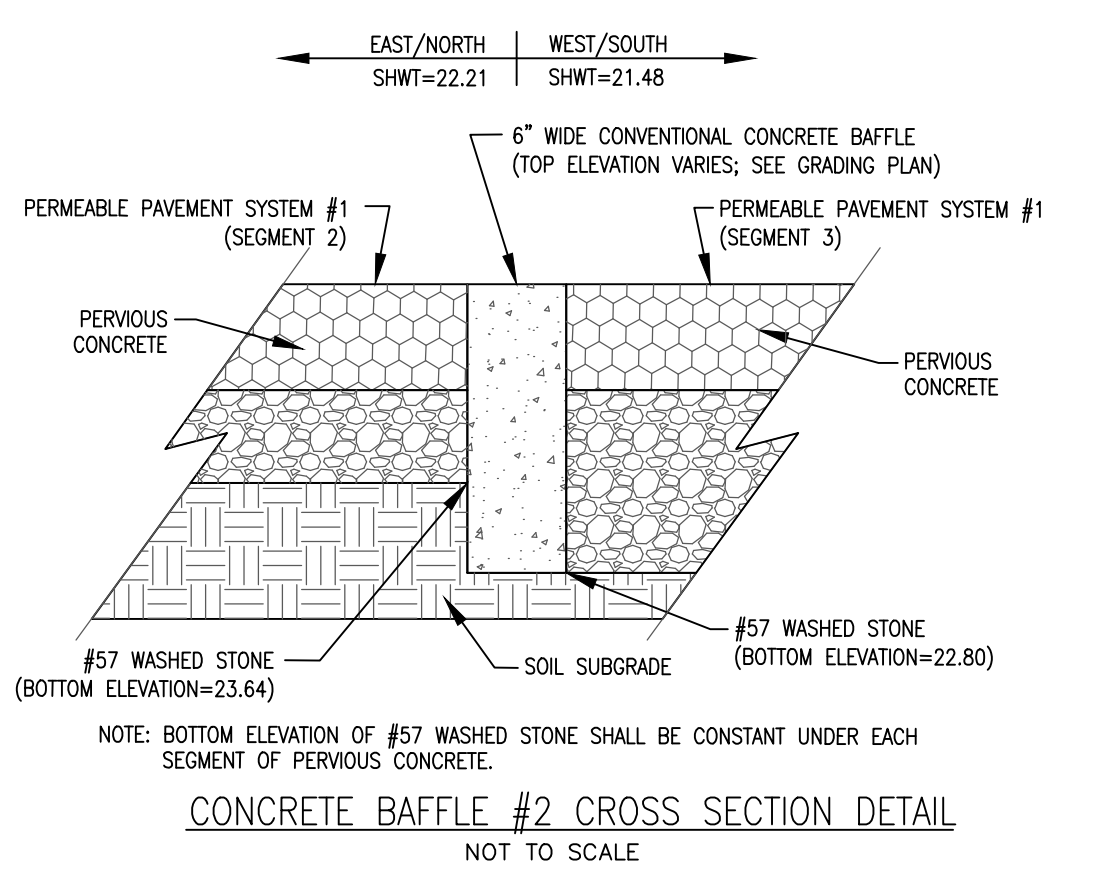
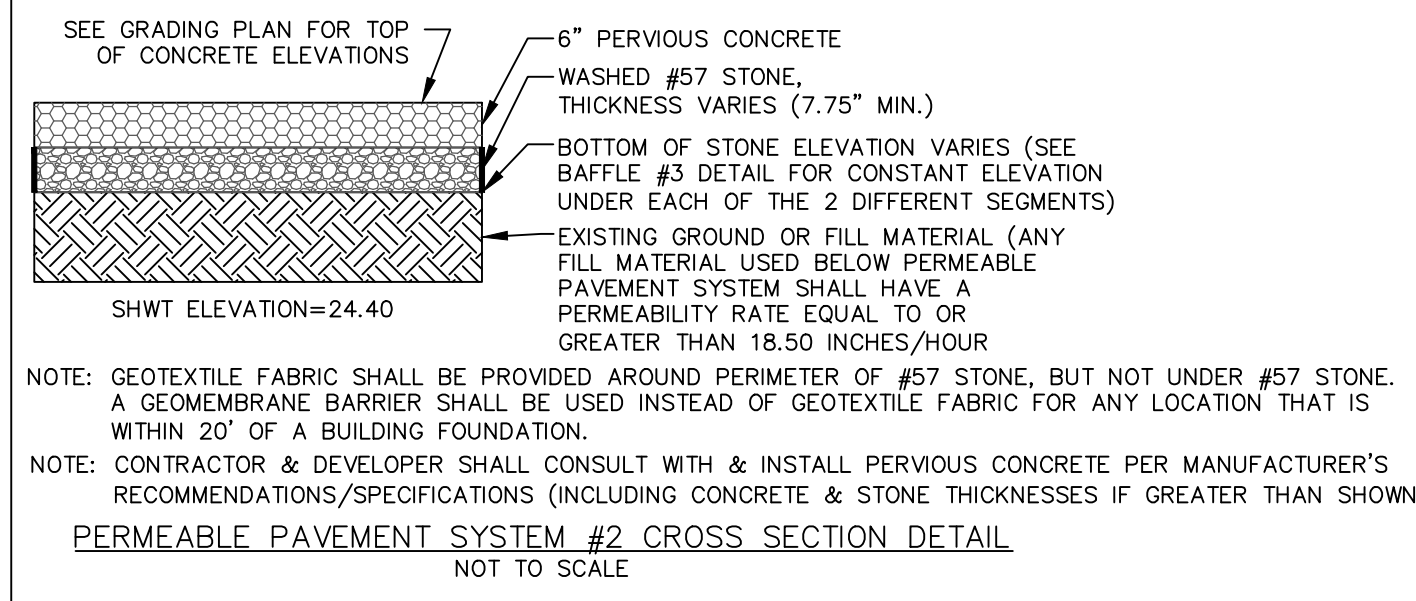
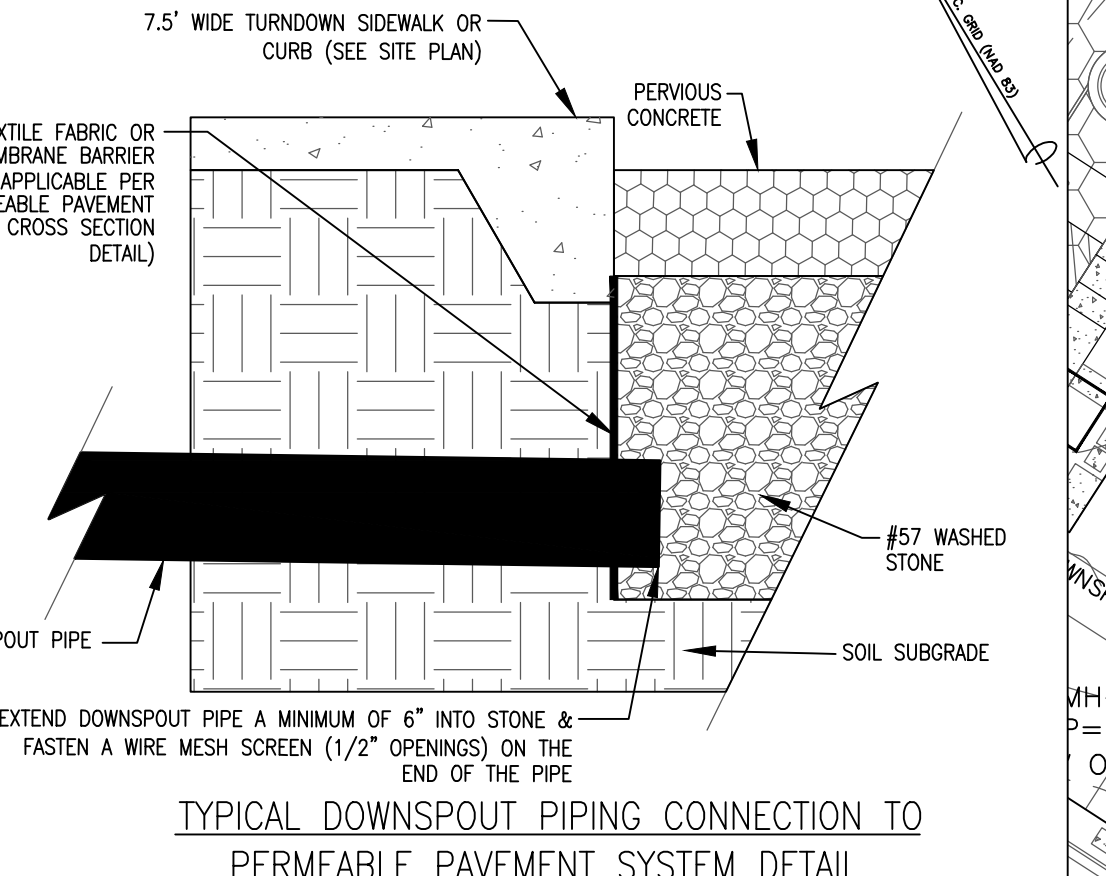
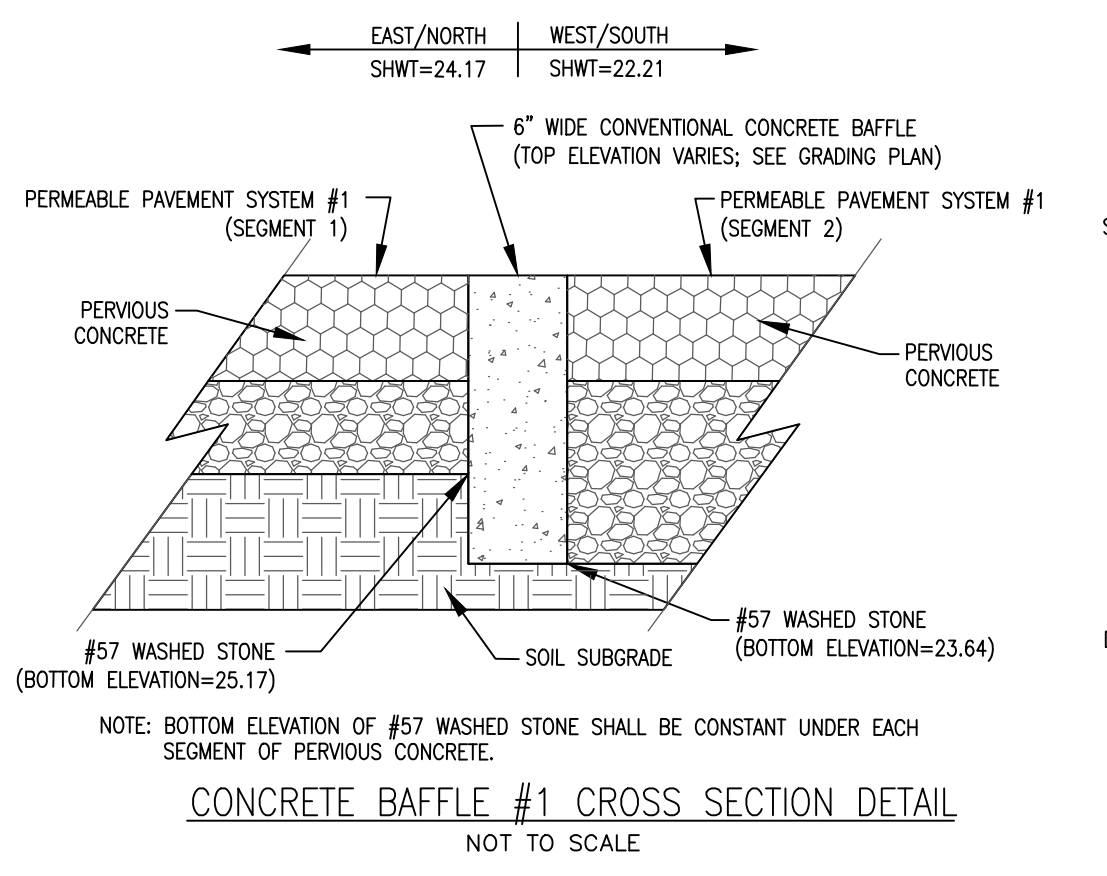
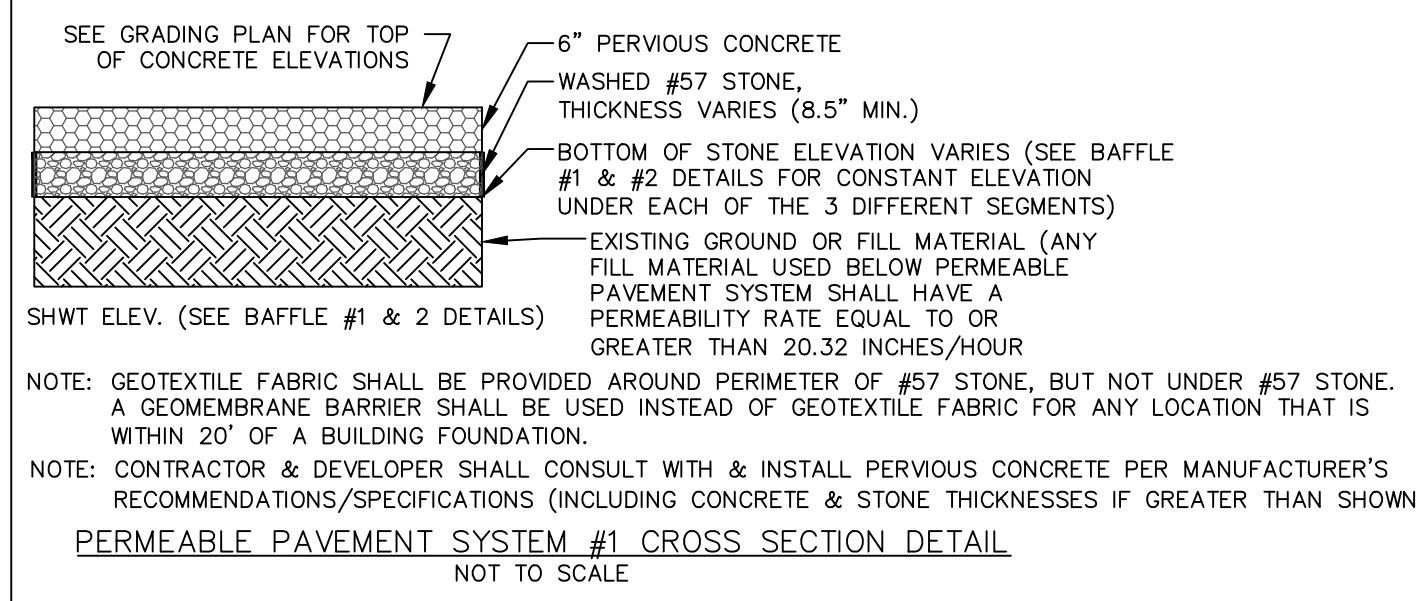
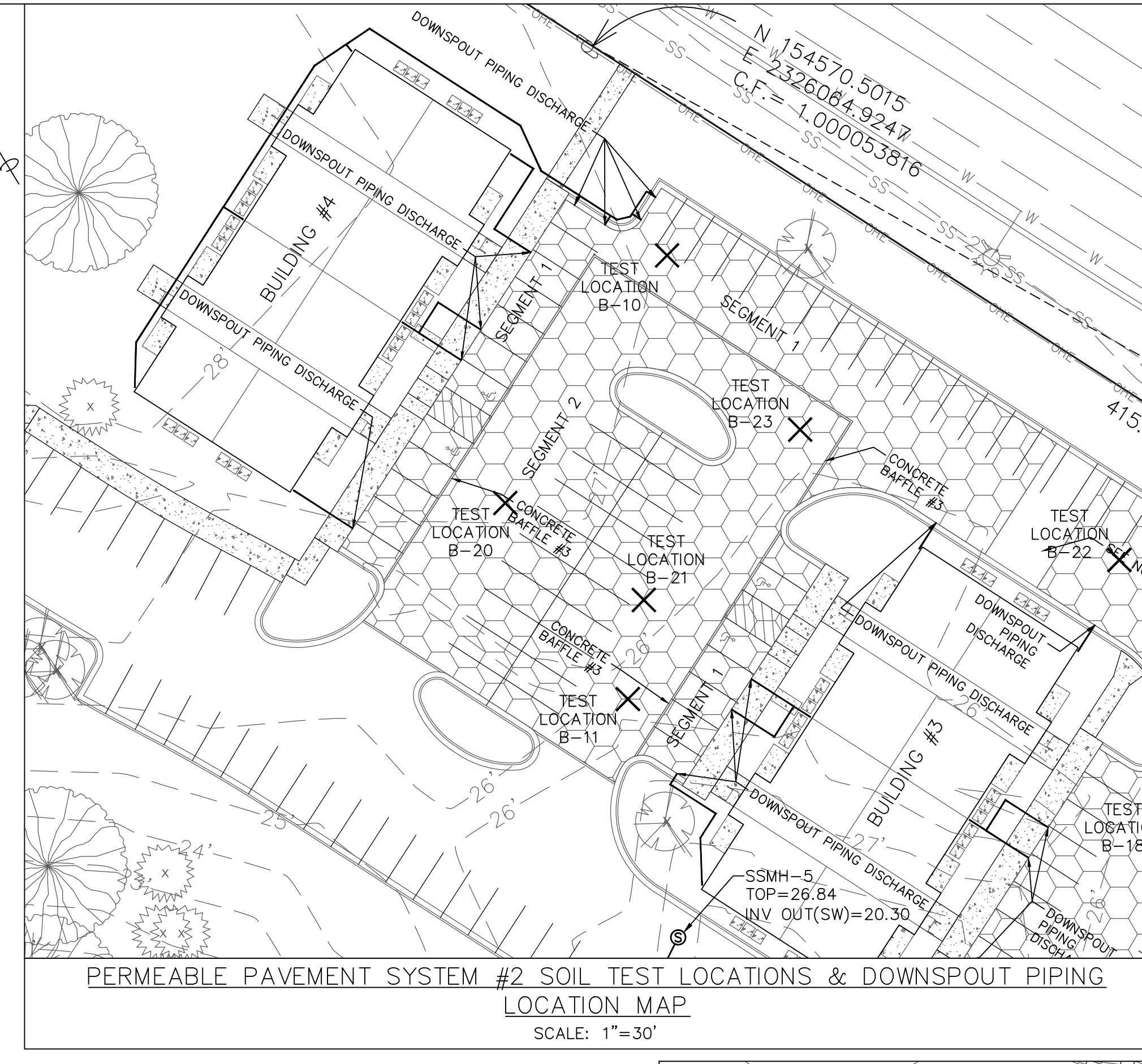
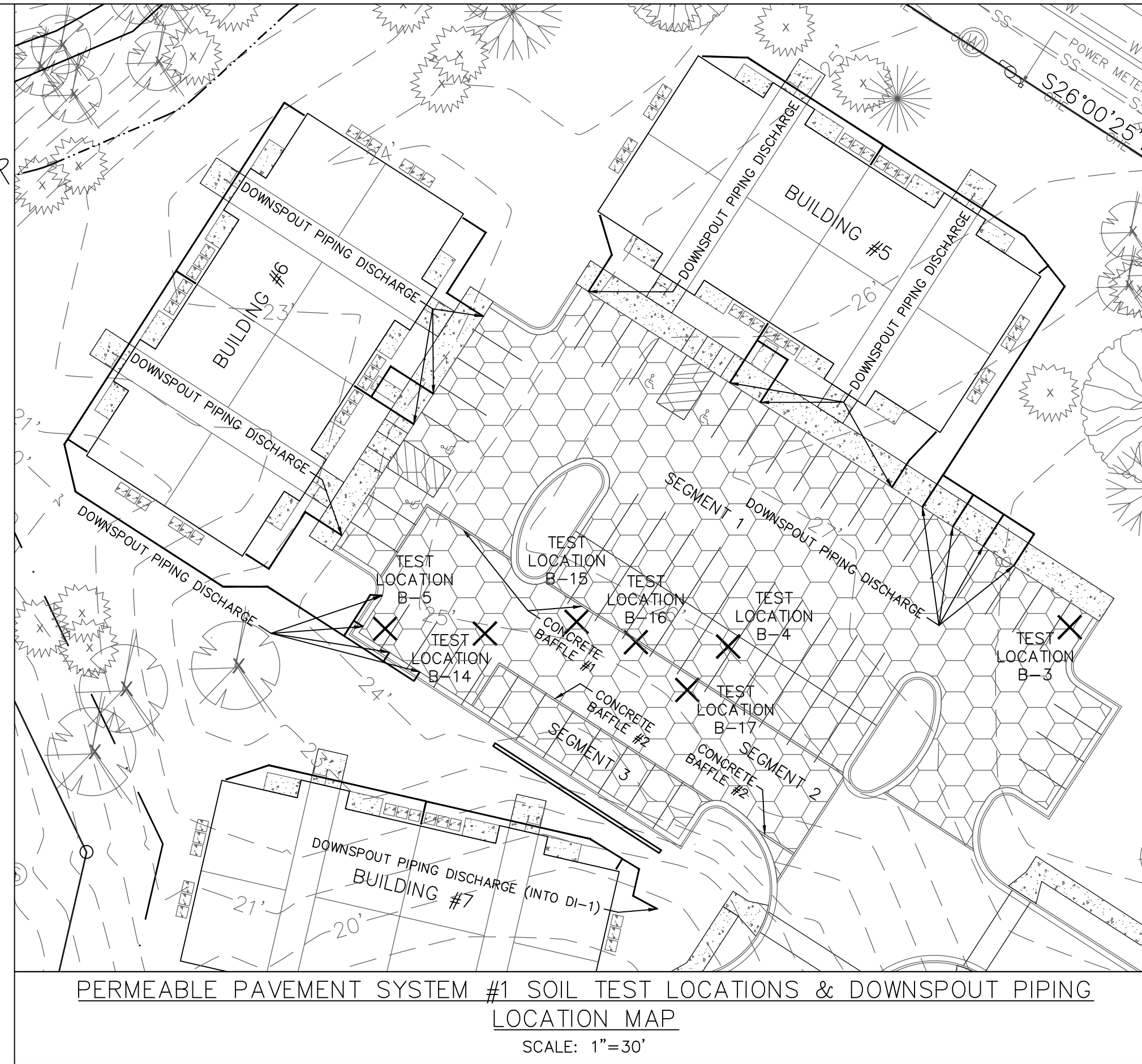
Developer: ECHO FARM APARTMENTS, LLC  
10 S. CARDINAL DRIVE  
WILMINGTON, NORTH CAROLINA 28403  
PHONE: 910-251-5030

FINAL DRAWING FOR REVIEW PURPOSES ONLY

SHEET NO: 12  
OF: 22

PRELIMINARY PLAN  
NOT FOR RECORDATION,  
CONVEYANCES, OR SALES

- CONSTRUCTION SEQUENCE FOR INSTALLATION OF PERMEABLE PAVEMENT (NC DENR STORMWATER BMP MANUAL CHAPTER 18)**
- 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.
  - EXCAVATE PERMEABLE PAVEMENT AREAS & 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 SHOULD 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.
  - 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.
  - PLACE GEOTEXTILES AND GEOMEMBRANE (IF APPLICABLE)
    - FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR THE APPROPRIATE OVERLAP BETWEEN ROLLS OF MATERIAL. SECURE THE MATERIAL TO EXCAVATION WALLS IF IT DOES NOT MOVE OR WRINKLE WHEN PLACING AGGREGATE.
  - PLACE OBSERVATION WELL(S)
    - PLACE OBSERVATION WELL(S) ACCORDING TO THE PLAN AND VERIFY THAT THE ELEVATIONS ARE CORRECT.
  - PLACE & COMPACT AGGREGATE BASE
    - INSPECT ALL AGGREGATE 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, CHECK FOR ANY ACCUMULATION OF SEDIMENTS ON THE FINISHED SOIL SUBGRADE.
    - IF THE EXPOSED SUBGRADE HAS BEEN SUBJECTED TO RAINFALL BEFORE PLACEMENT 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 SUBGRADE. BE CAREFUL NOT TO DAMAGE THE OBSERVATION WELLS DURING COMPACTION.
    - FOLLOW COMPACTION RECOMMENDATIONS 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.
  - 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.
  - 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.
  - 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:
      - ROUTING CONSTRUCTION ACCESS THROUGH OTHER PORTIONS OF THE SITE SO THAT NO CONSTRUCTION TRAFFIC PASSES THROUGH THE PERMEABLE PAVEMENT SITE (INSTALL BARRIERS/FENCES AS NEEDED).
      - 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.
      - SCHEDULE STREET SWEEPING DURING AND AFTER CONSTRUCTION TO PREVENT SEDIMENT FROM ACCUMULATING ON THE PAVEMENT.



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

**Approved Construction Plan**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

City of Wilmington  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN

Date: \_\_\_\_\_ Permit # \_\_\_\_\_

Signed: \_\_\_\_\_

STORMWATER DETAIL SHEET  
4010 CAROLINA BEACH ROAD  
**ARBOR TRACE APARTMENTS**  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

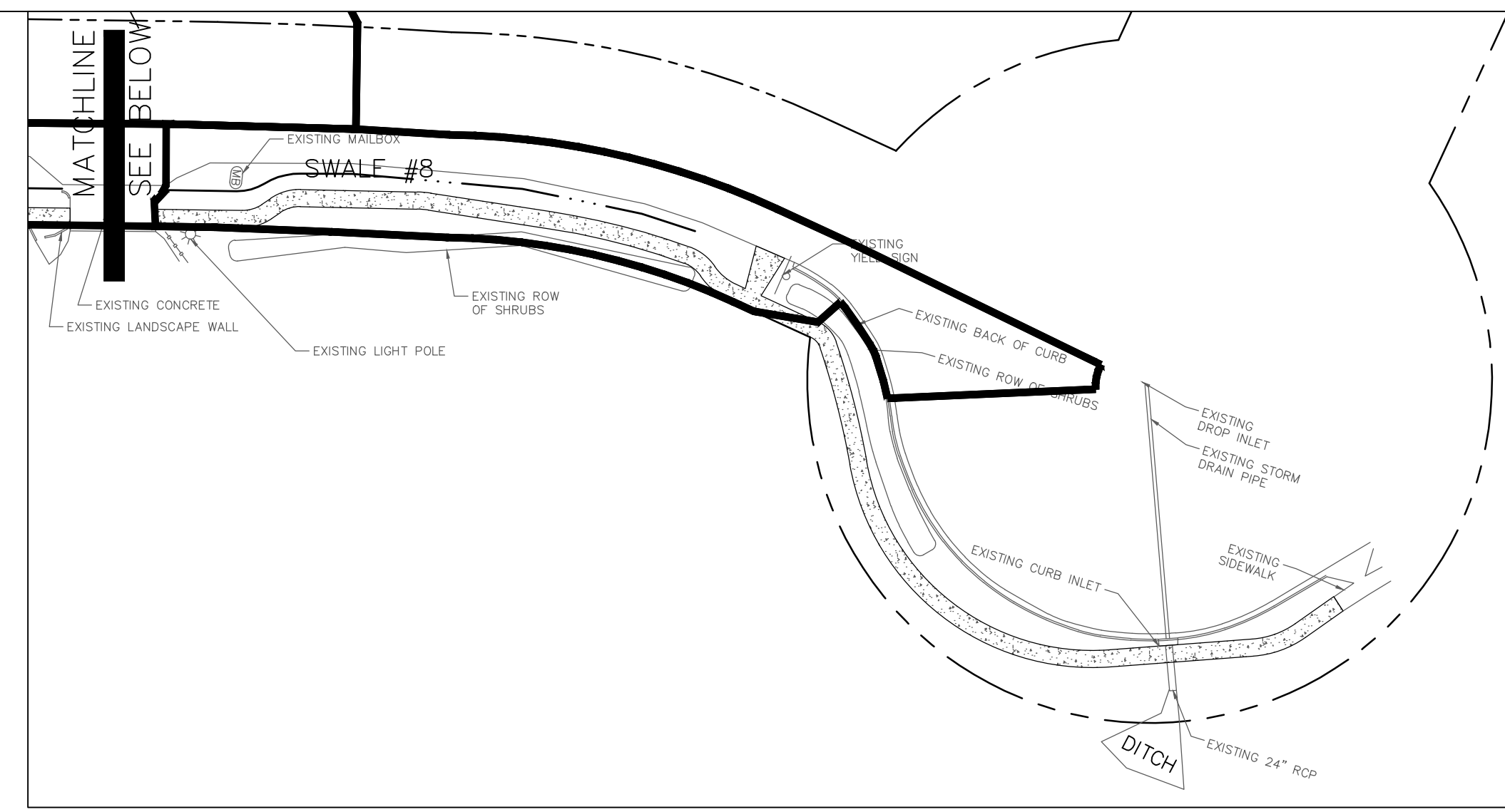
DATE: 10-1-15  
SCALE: VARIES  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 260

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

MALPASS ENGINEERING & SURVEYING, P.C.  
1134 SHIPYARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-6243  
Fax 910-392-6203 License No. C-2380

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

SHEET NO: 13  
OF: 22



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

INLET & SWALE 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
***SWALE #7	0.35
SWALE #8	0.18

\*DI-5 D.A. INCLUDES DI-4 D.A.  
 \*\*SWALE #2 D.A. INCLUDES SWALE #1 D.A.  
 \*\*\*SWALE #7 D.A. INCLUDES SWALE #8 D.A.

Pipe Table—Driveway Culvert

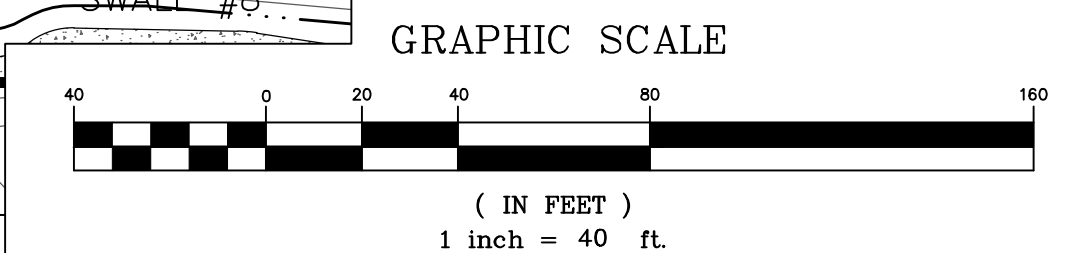
From	To	Size (in)	Length (ft)	Slope (%)	D.S. Invert (ft)	U.S. Invert (ft)
Upstream	Downstream	15 (Class IV)	96	1.43	11.87	13.24

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



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 WALK AND WET POND.	9-9-16
5	REVISED TO ADD SIDEWALK ON SOUTH SIDE OF ECHO FARMS BLVD R/W & ADD SWALE #7 & 8 TO DRAINAGE AREA CHART.	11-4-16

DRAINAGE AREA MAP—INLETS & SWALES  
 SCALE: 1"=40'

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 # \_\_\_\_\_

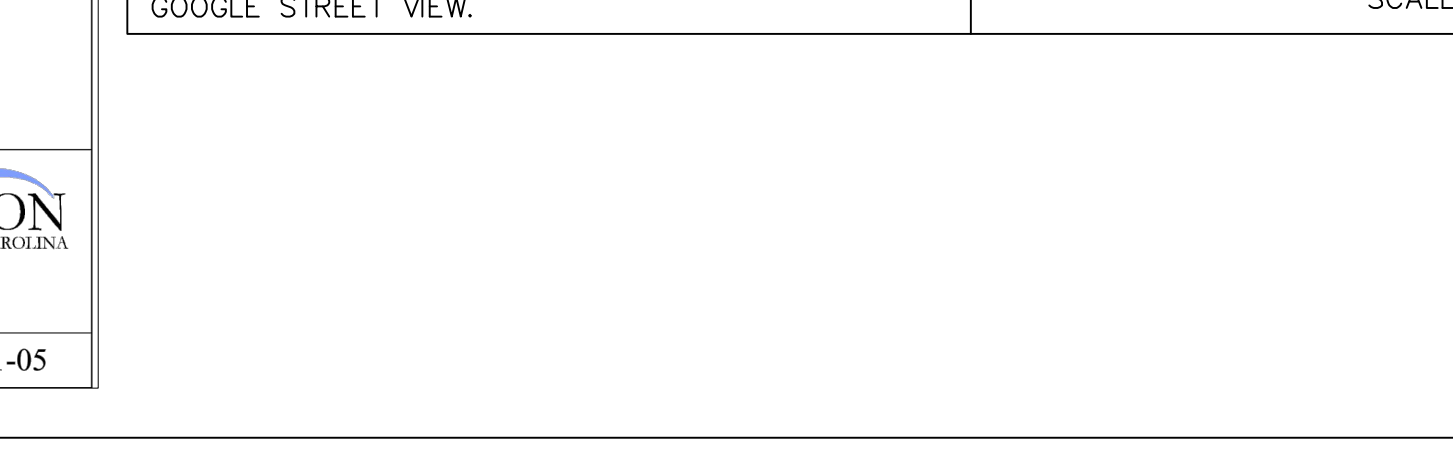
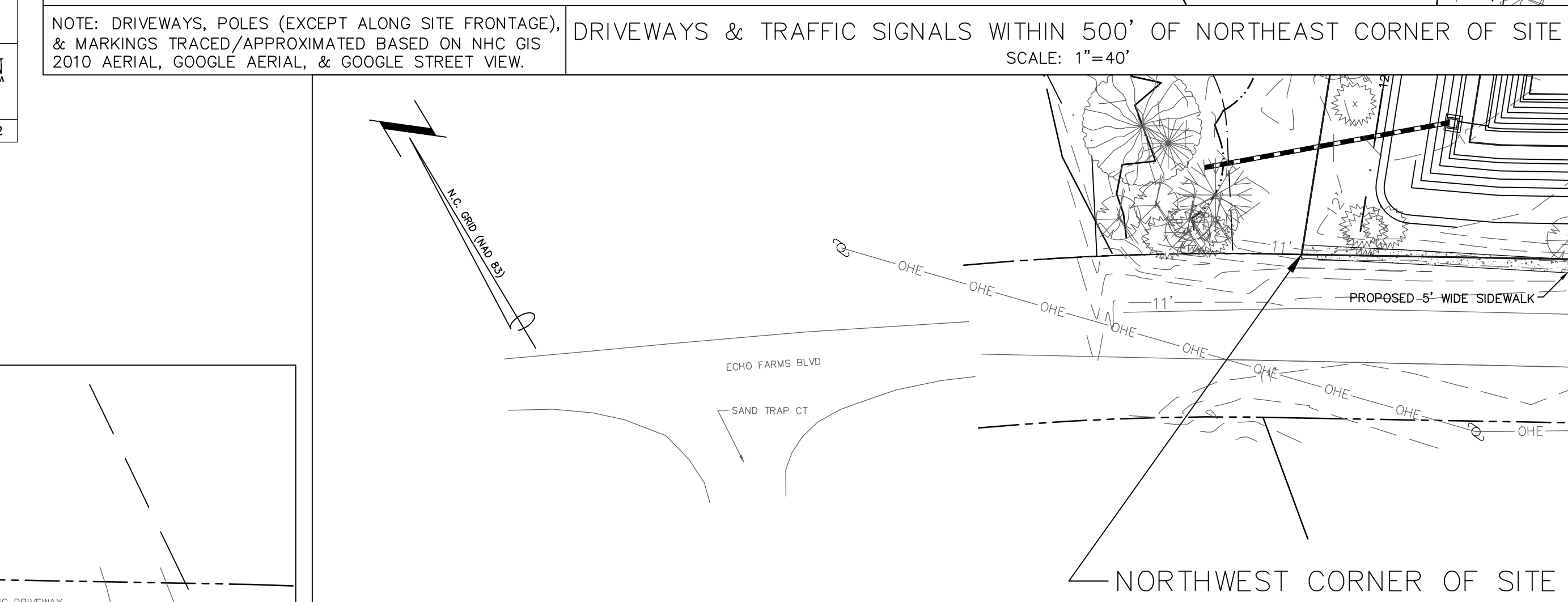
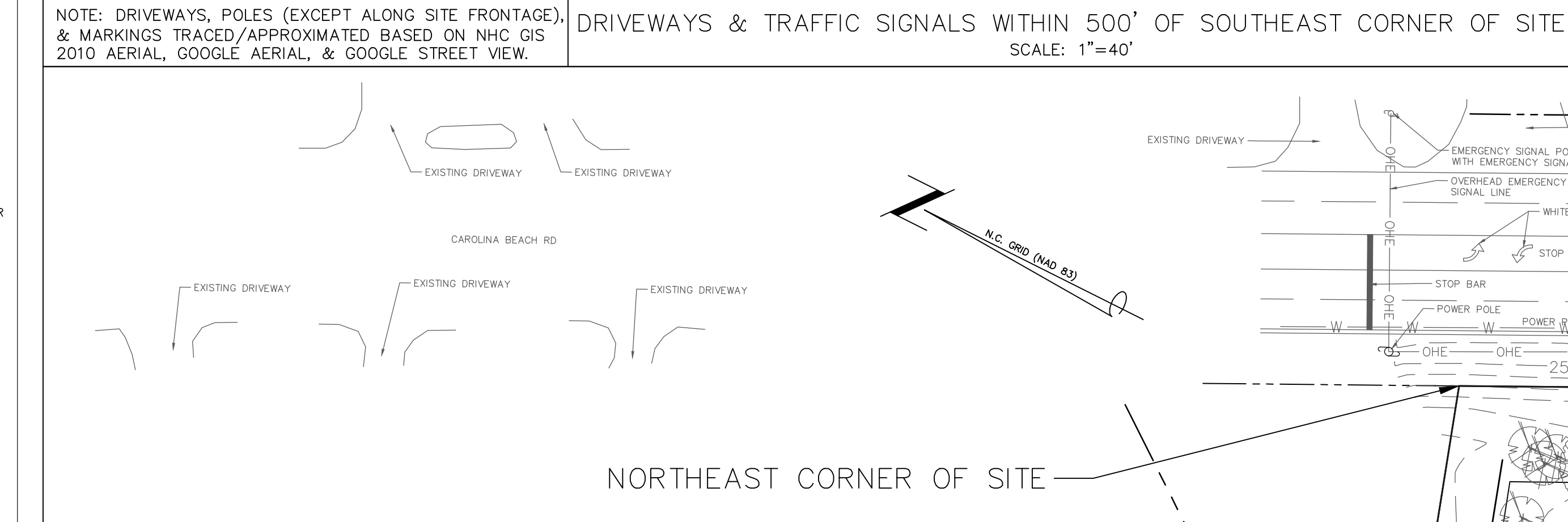
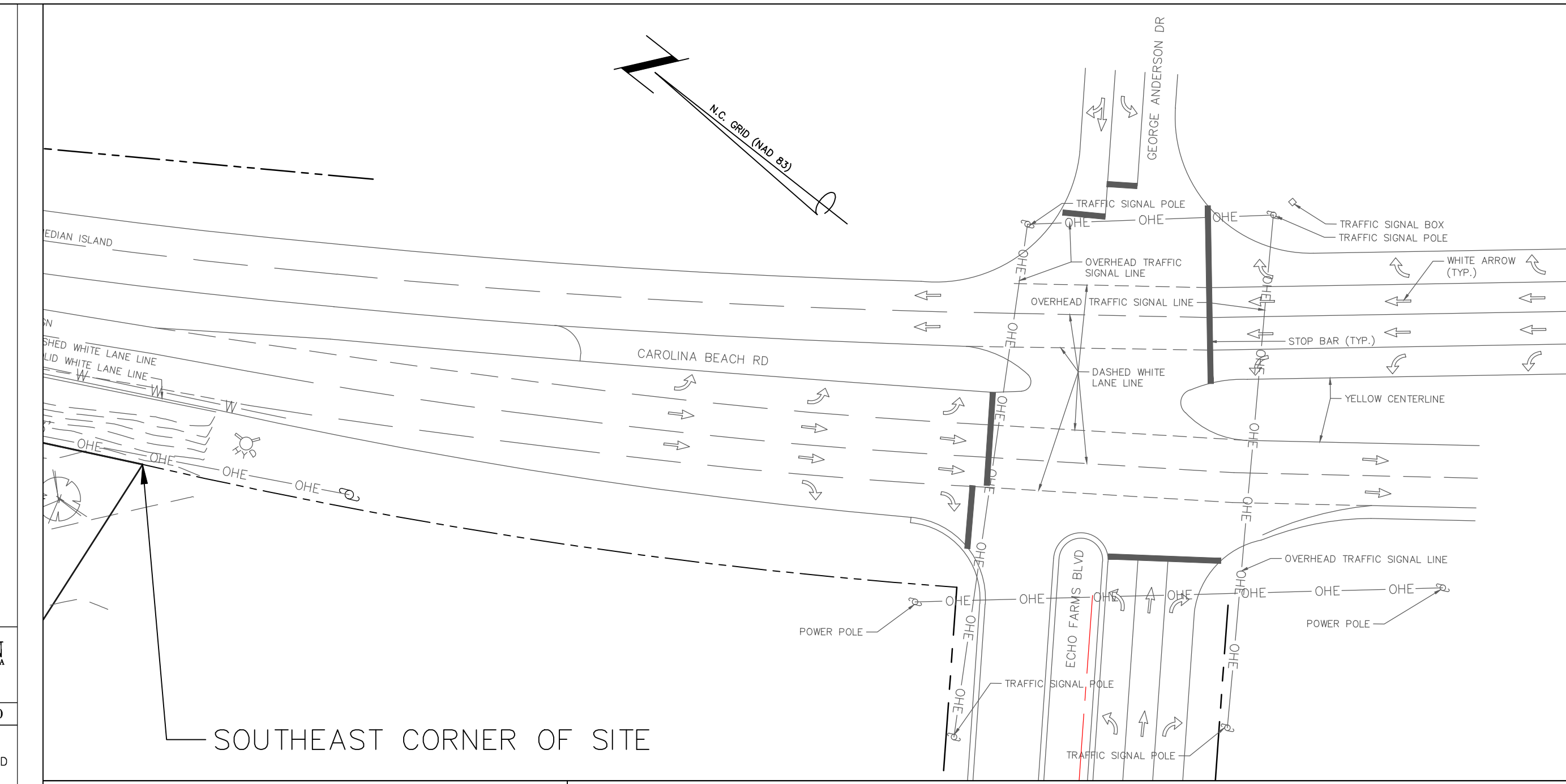
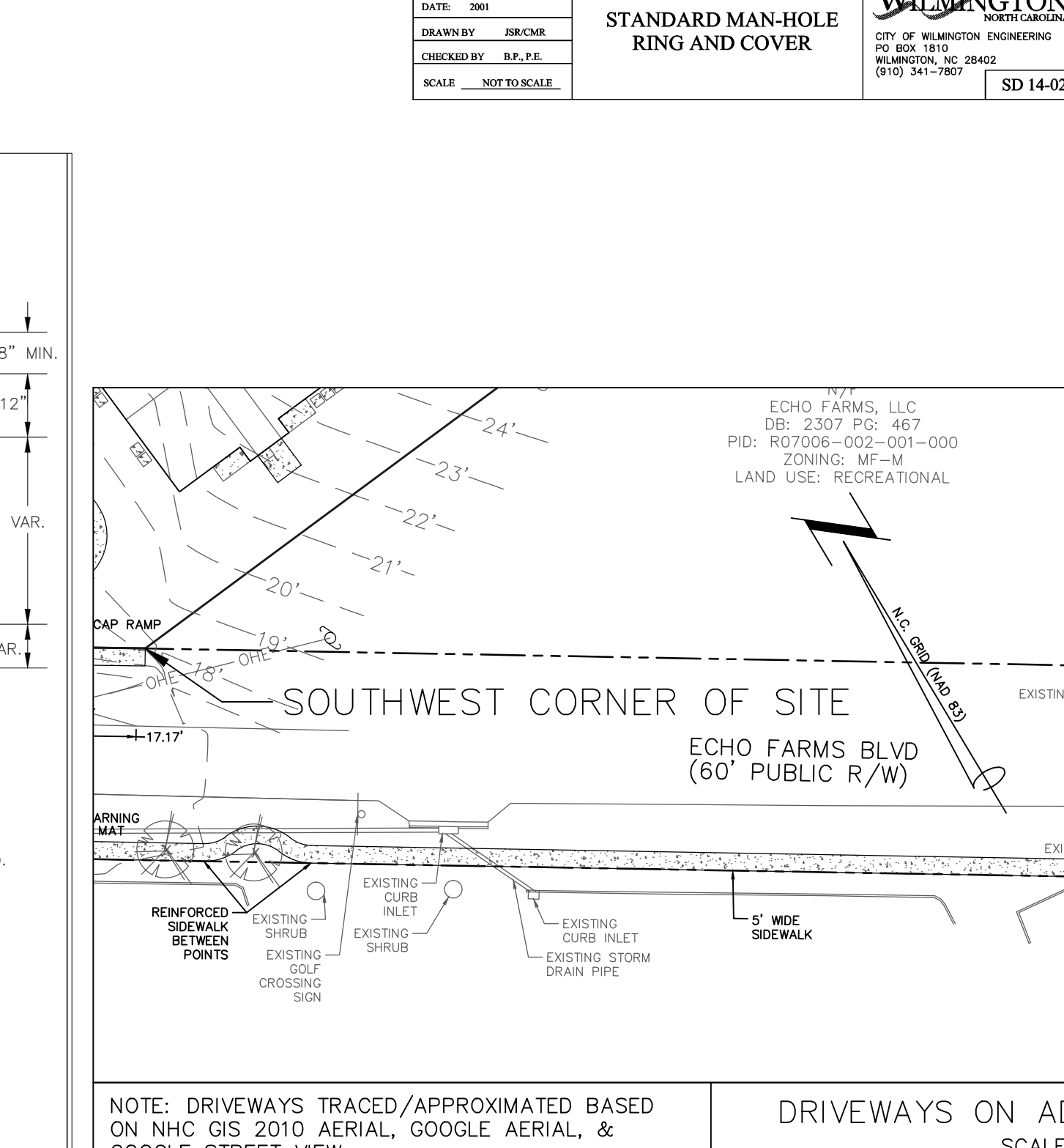
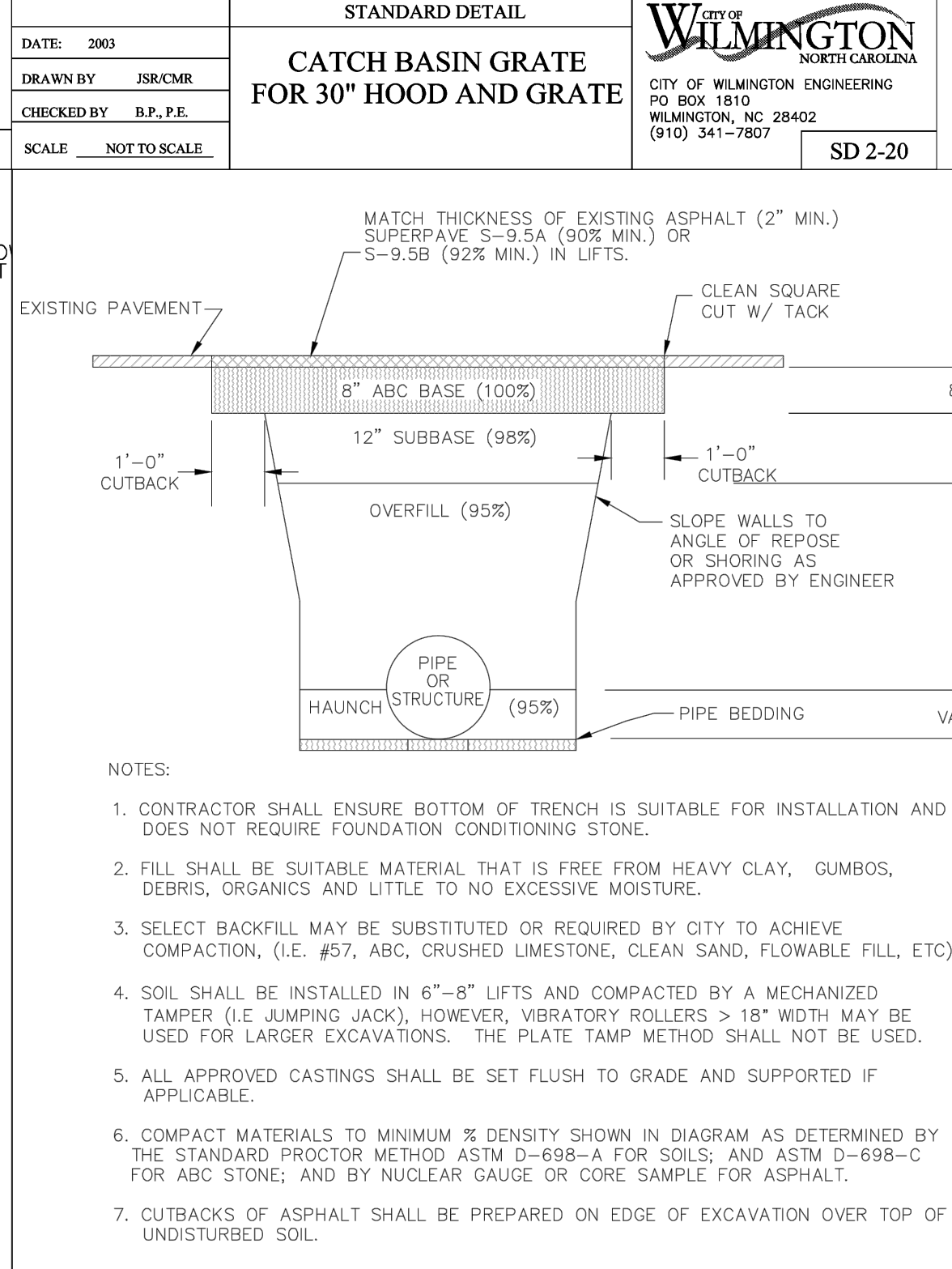
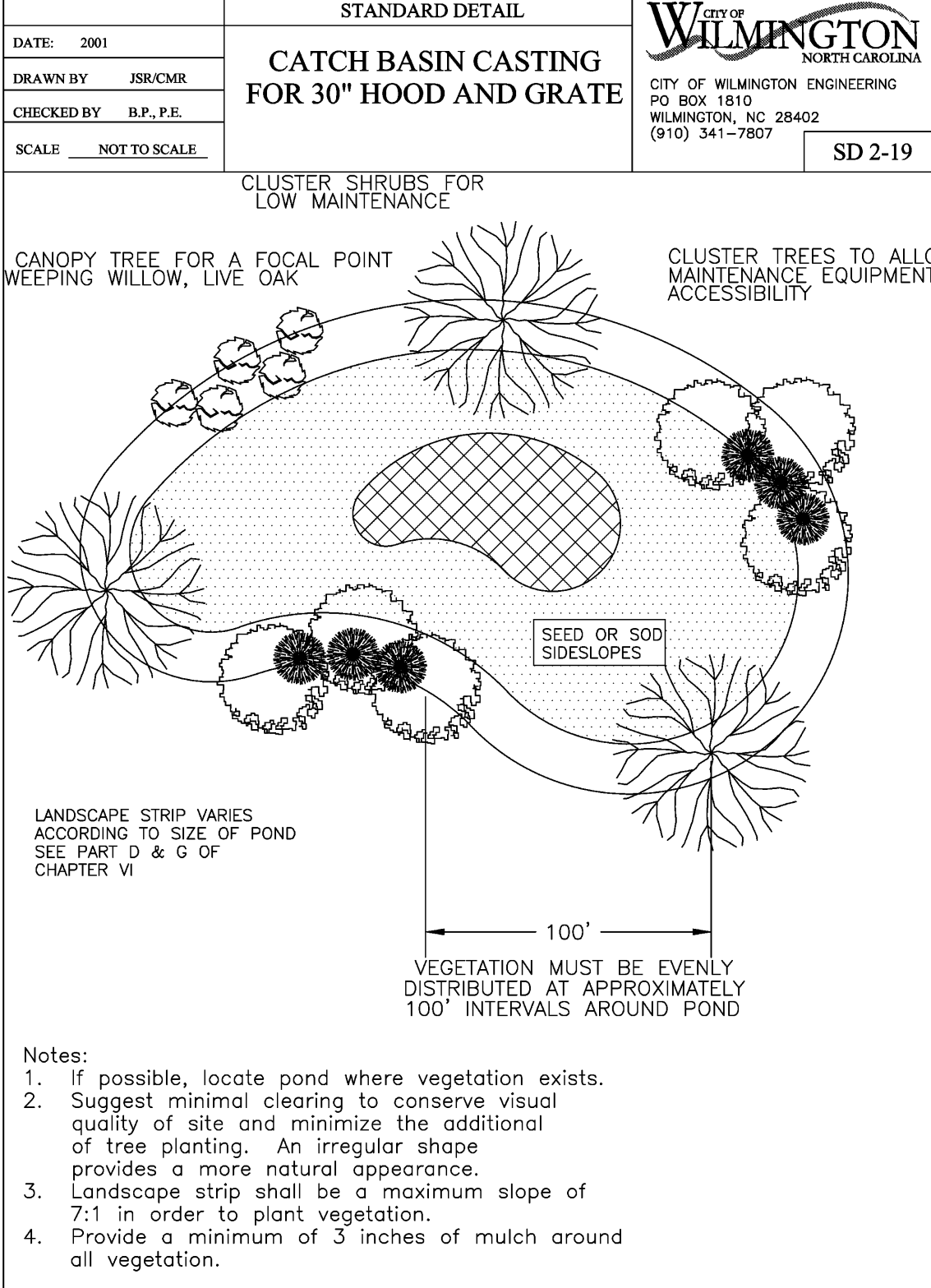
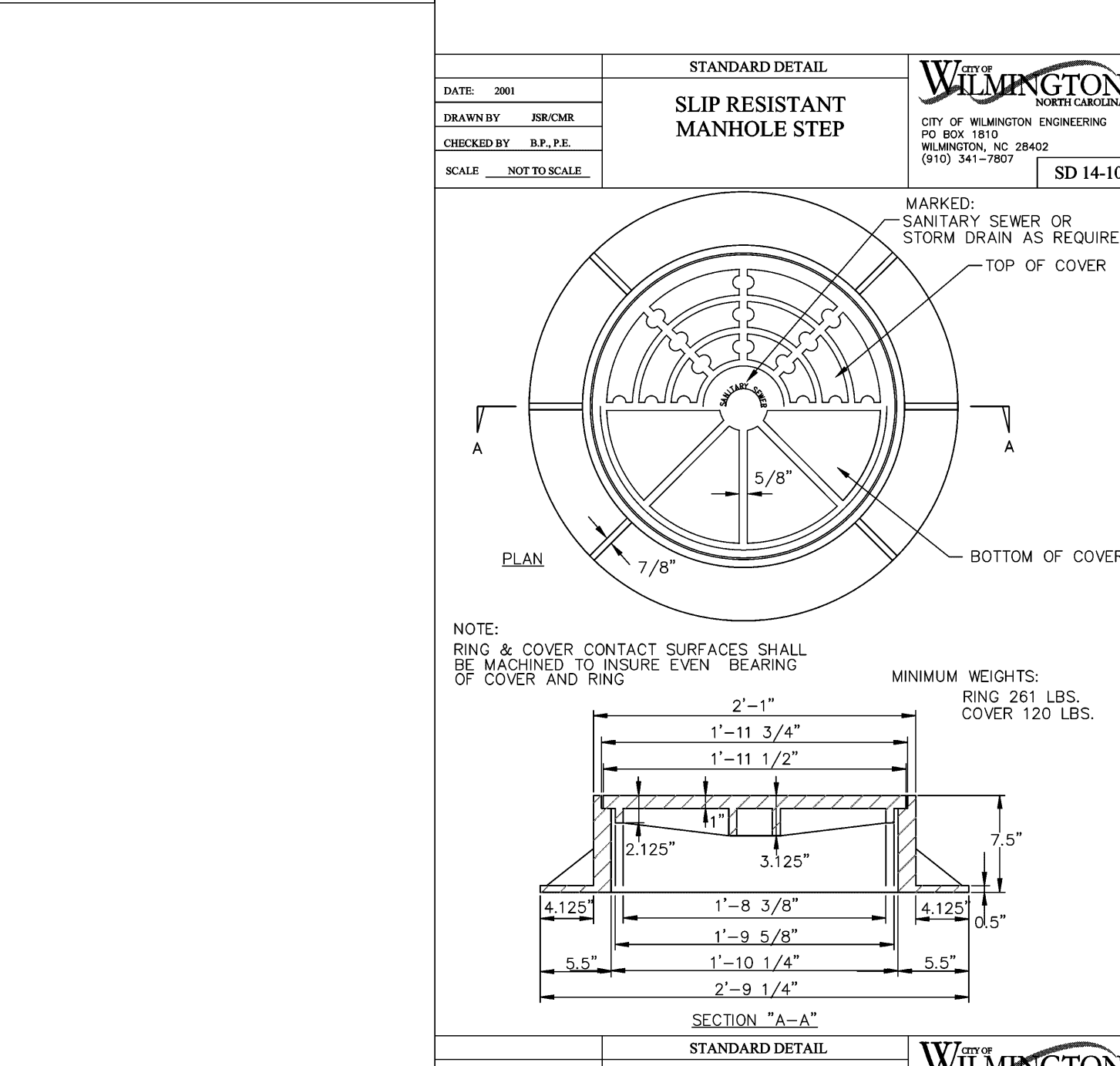
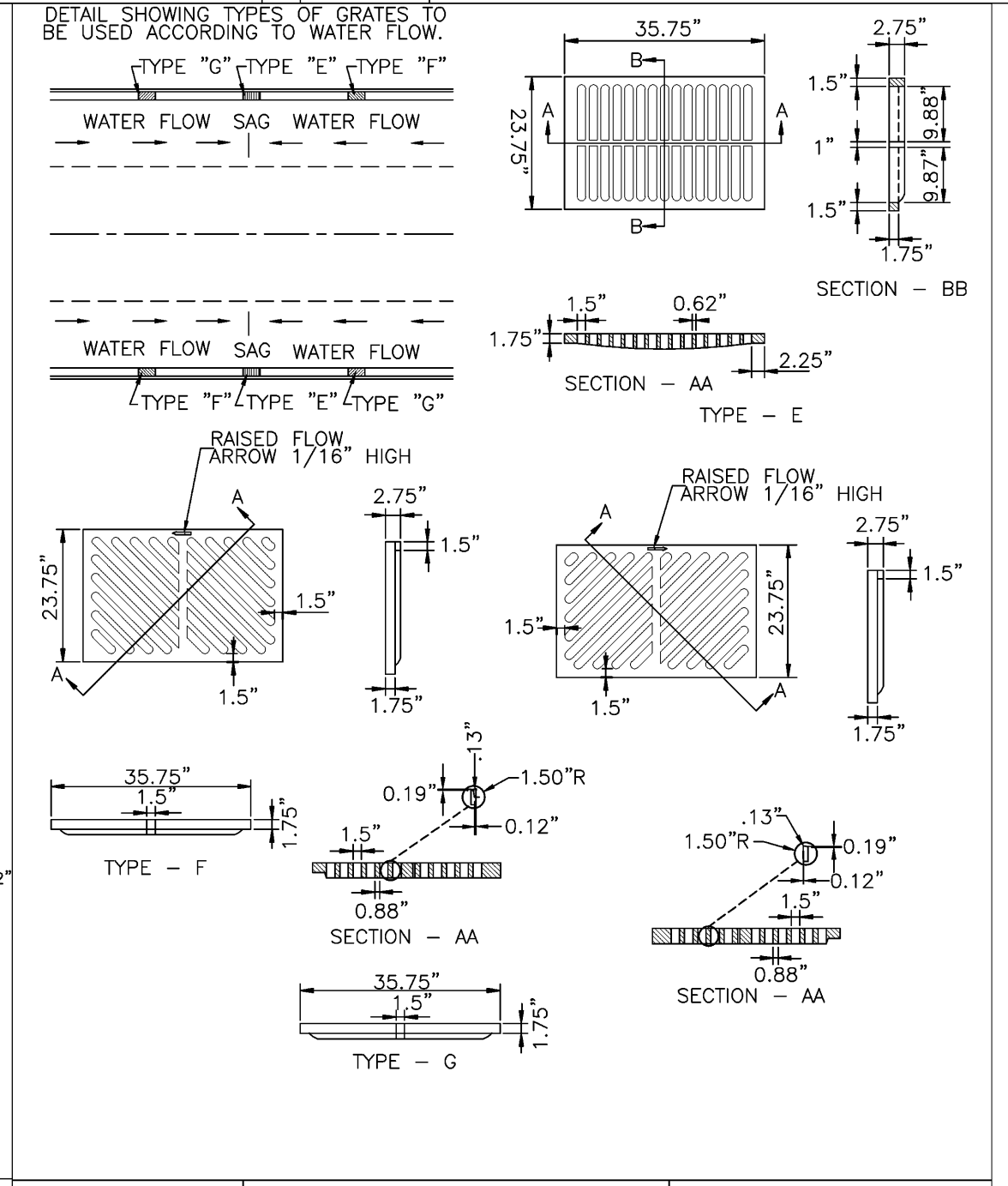
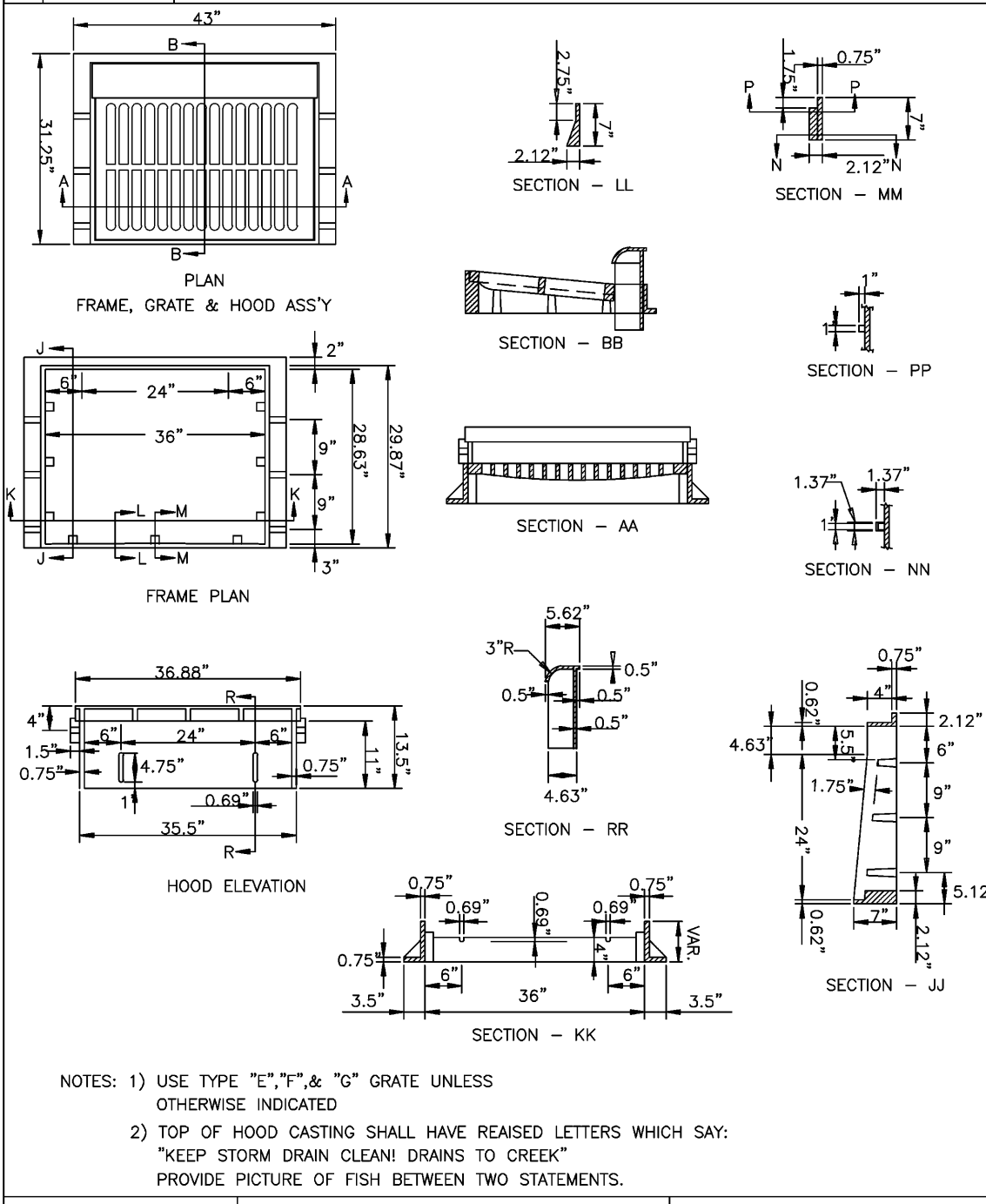
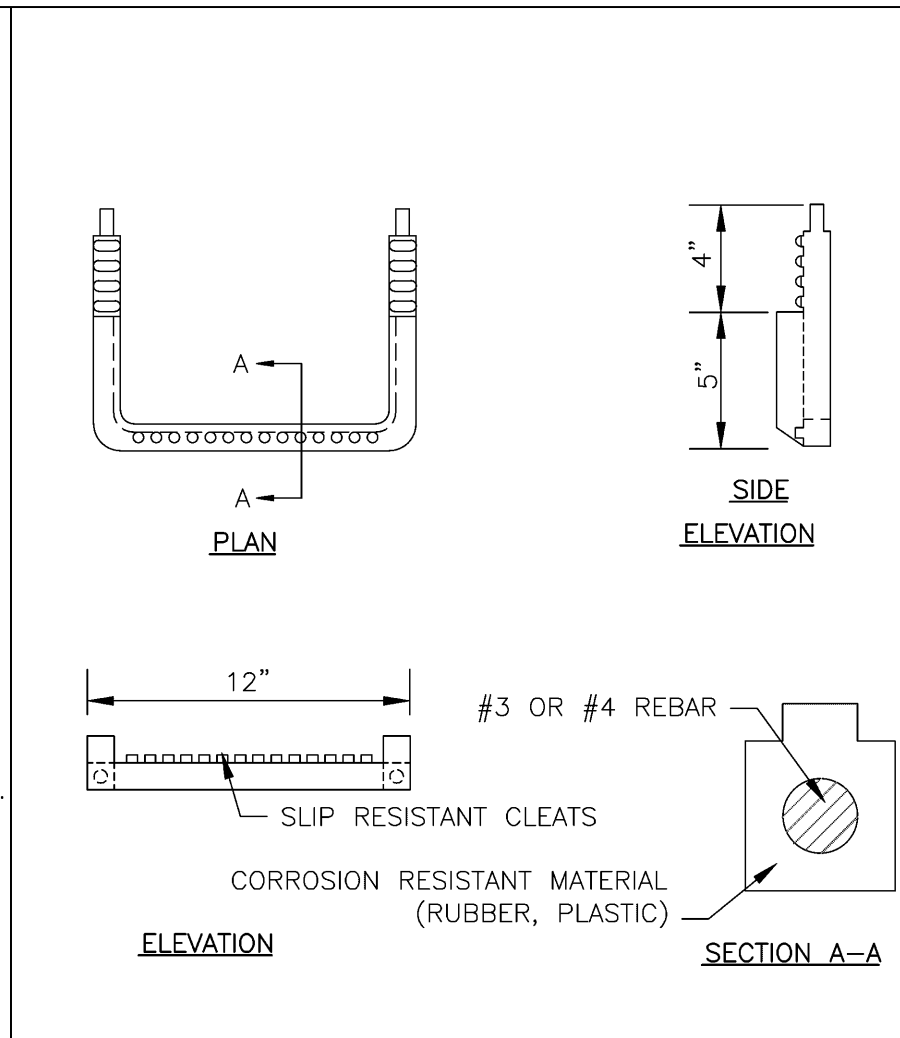
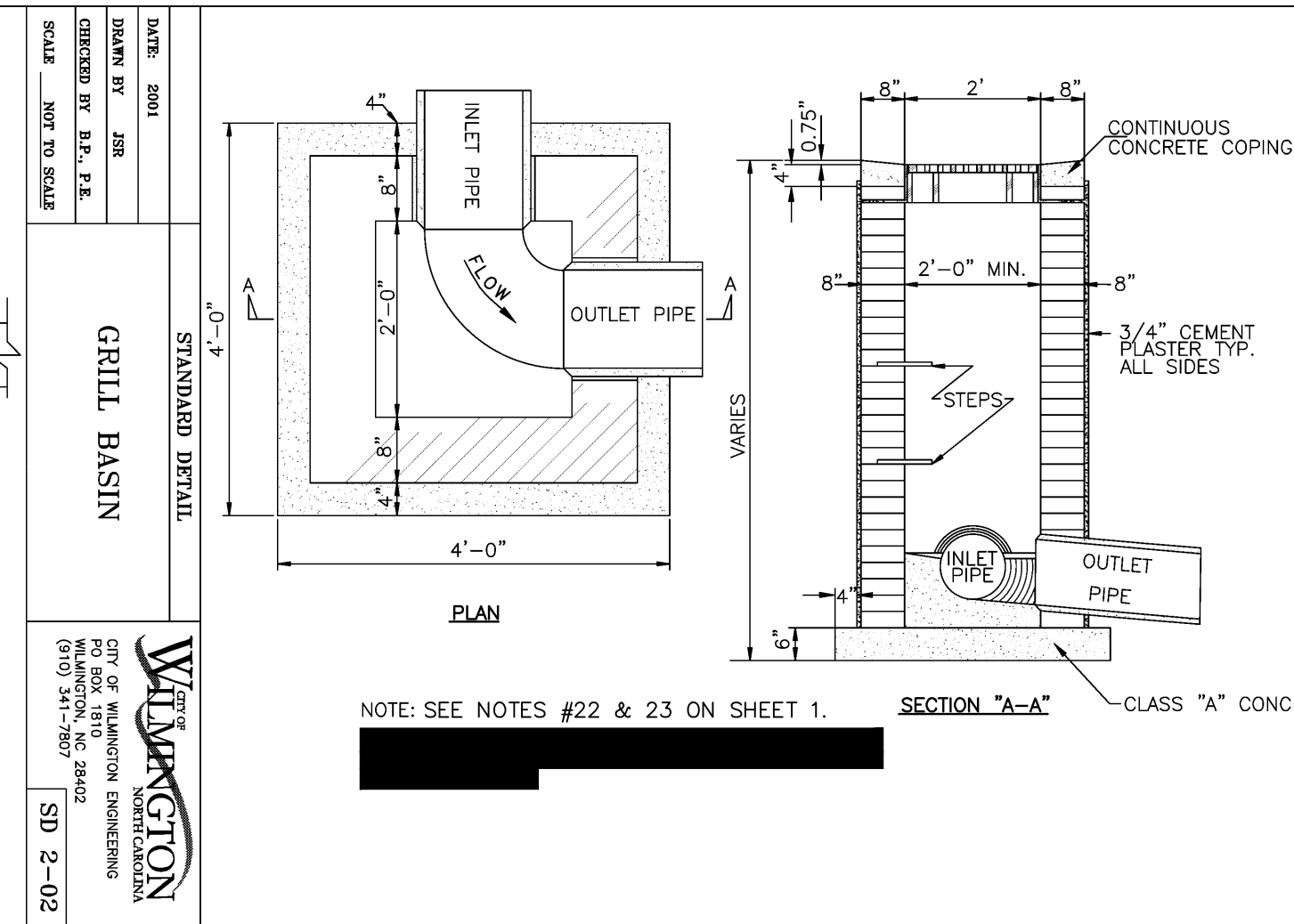
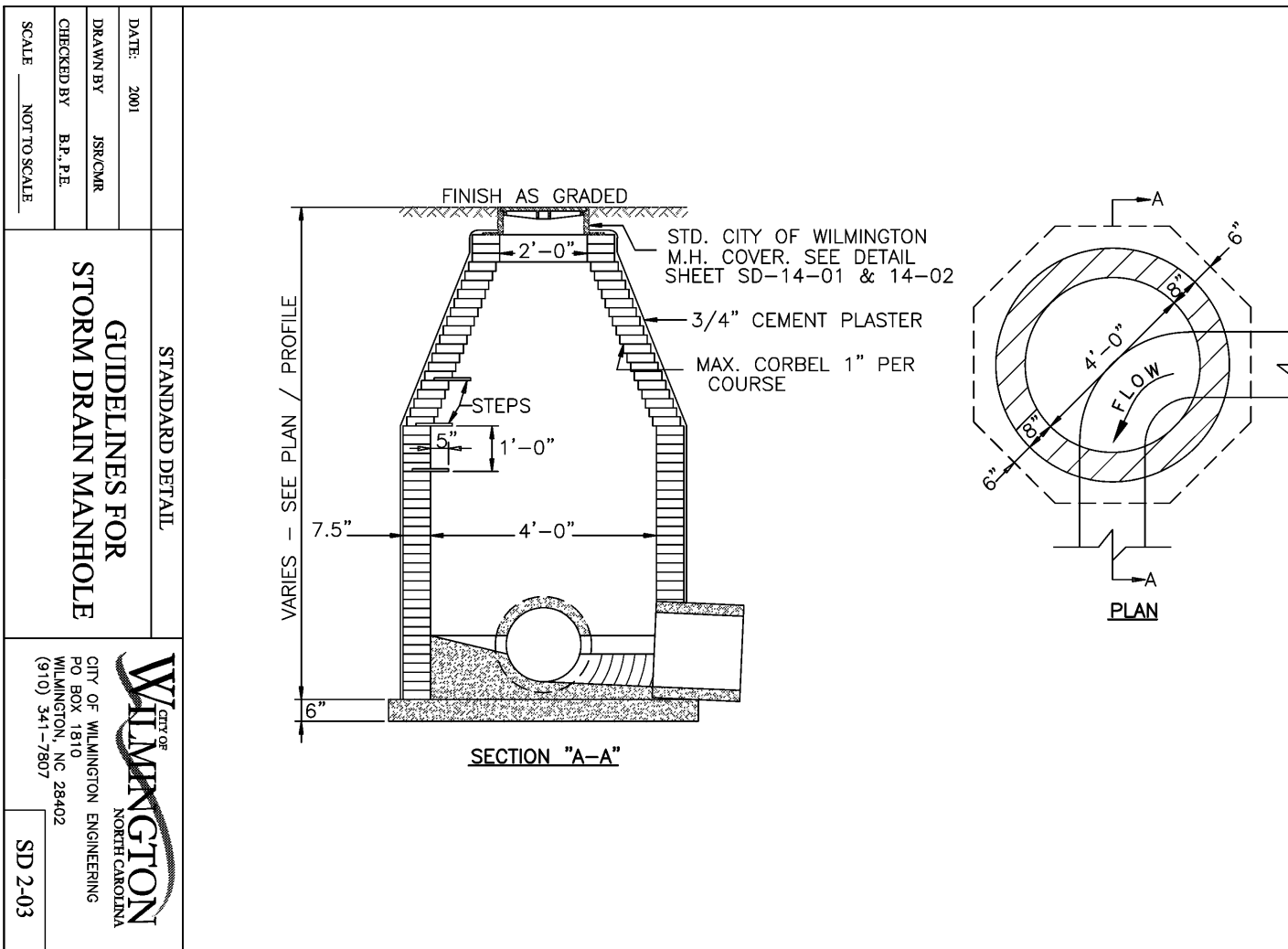
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DRAINAGE AREA MAP  
 4010 CAROLINA BEACH ROAD  
**ARBOR TRACE APARTMENTS**  
 WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

MALPASS ENGINEERING & SURVEYING, P.C.  
 1134 SHIPYARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-5243  
 Fax 910-392-5203 License No. C-2820

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: JEM  
 PROJECT NO: 260  
 SHEET NO: 14  
 OF: 22



**Approved Construction Plan**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Planning: \_\_\_\_\_

Traffic: \_\_\_\_\_

Fire: \_\_\_\_\_

City of Wilmington  
 Public Services • Engineering Division  
**APPROVED STORMWATER MANAGEMENT PLAN**  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_

**ARBOR TRACE APARTMENTS**  
 WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

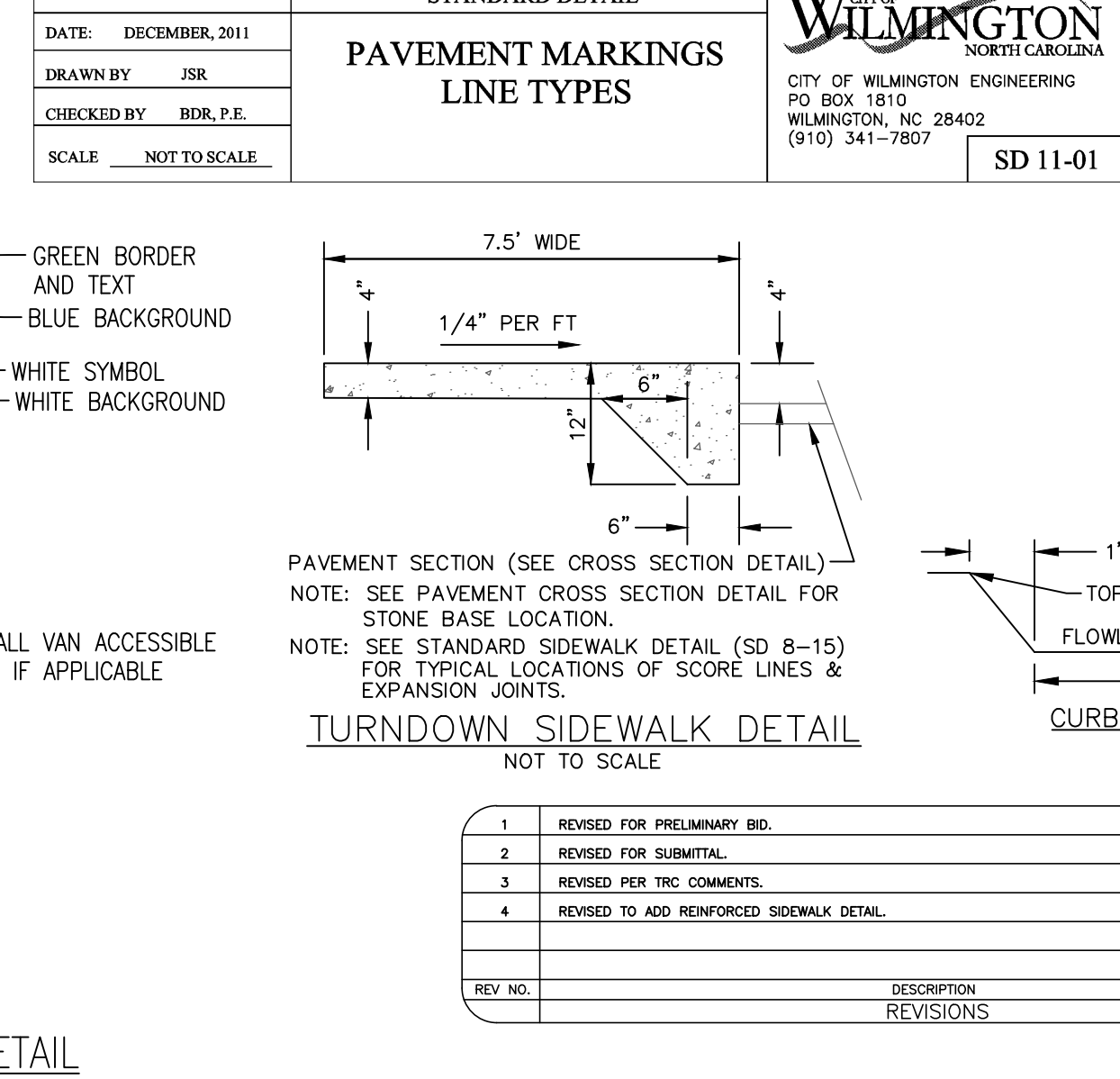
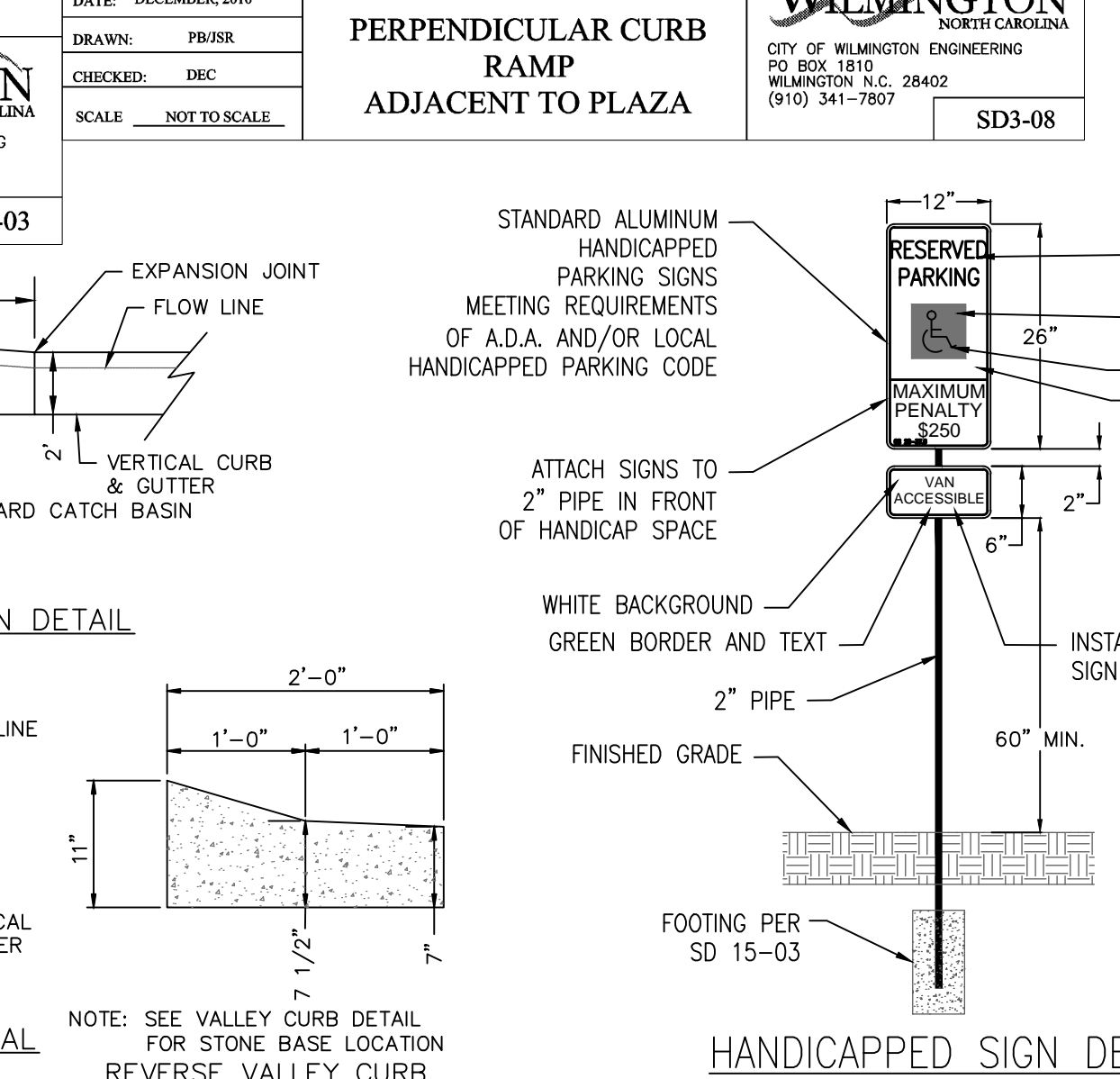
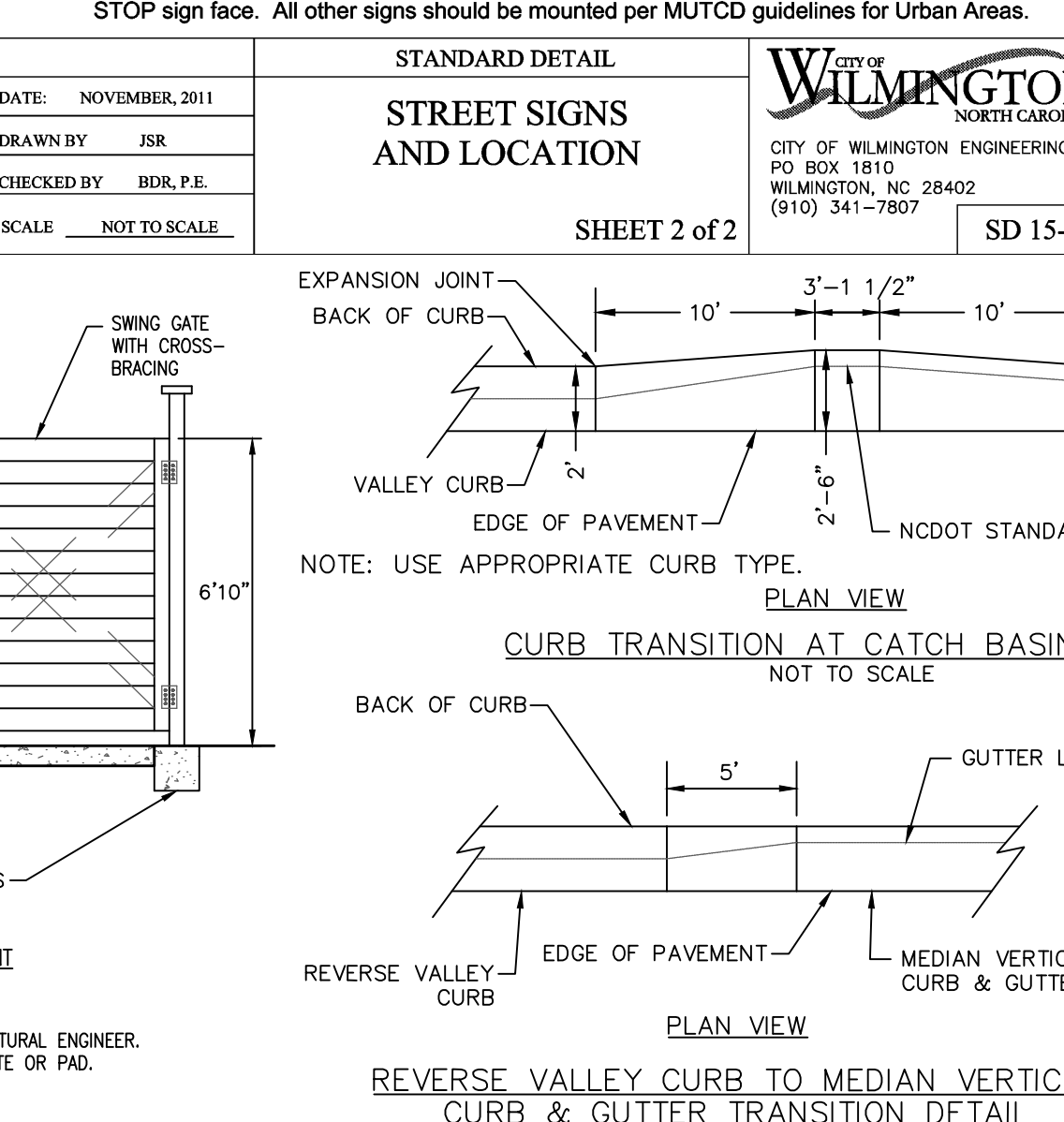
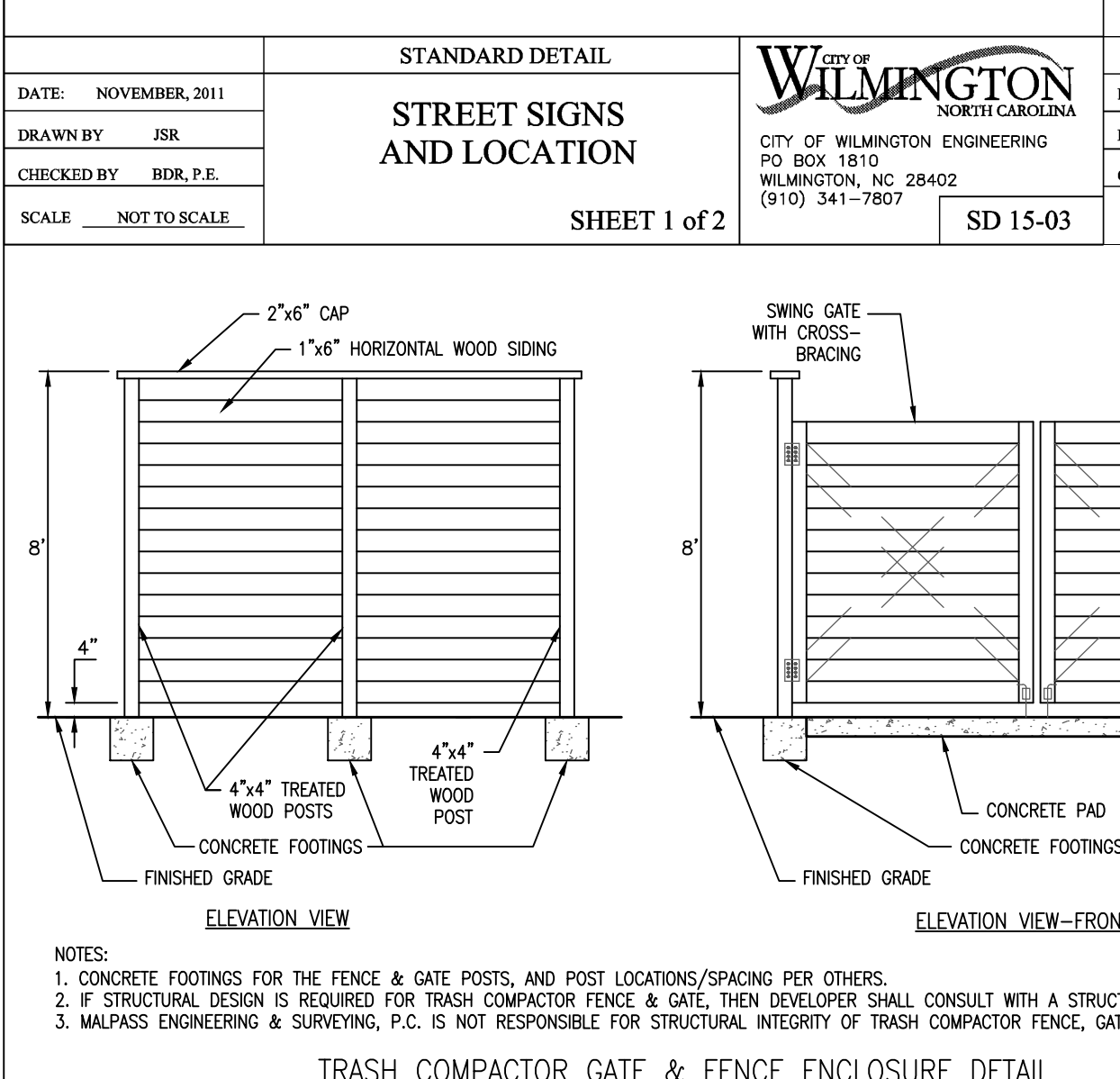
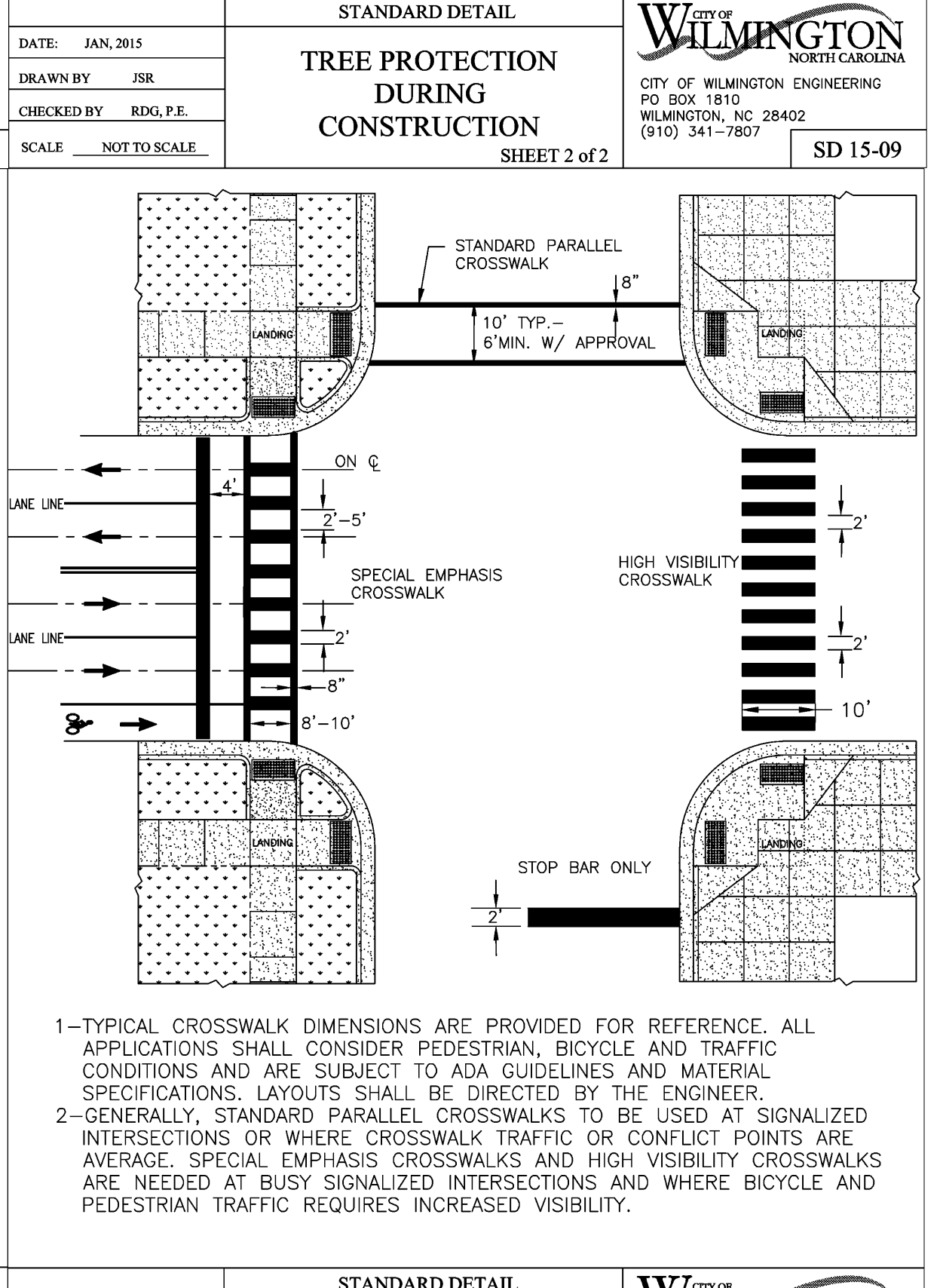
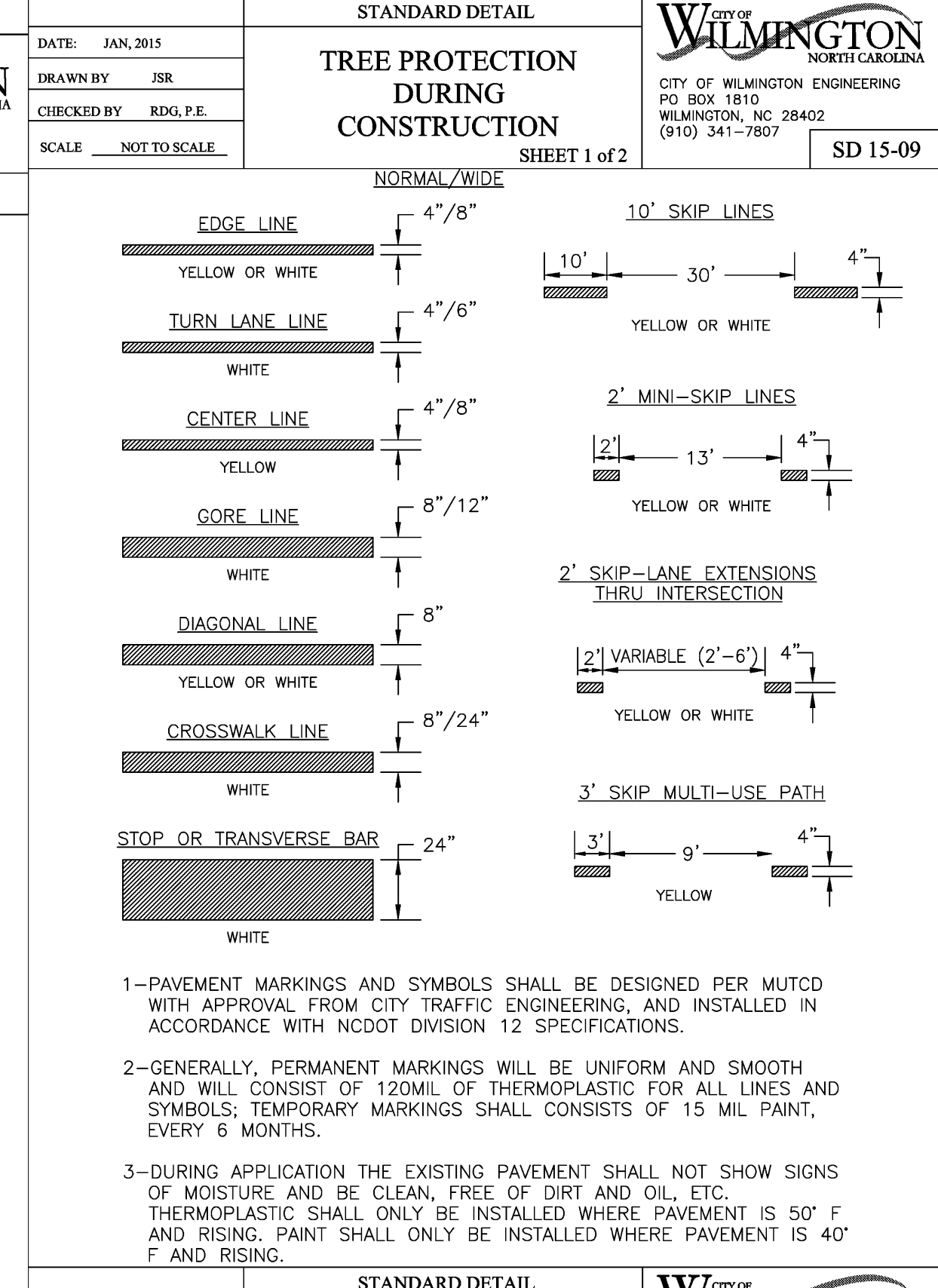
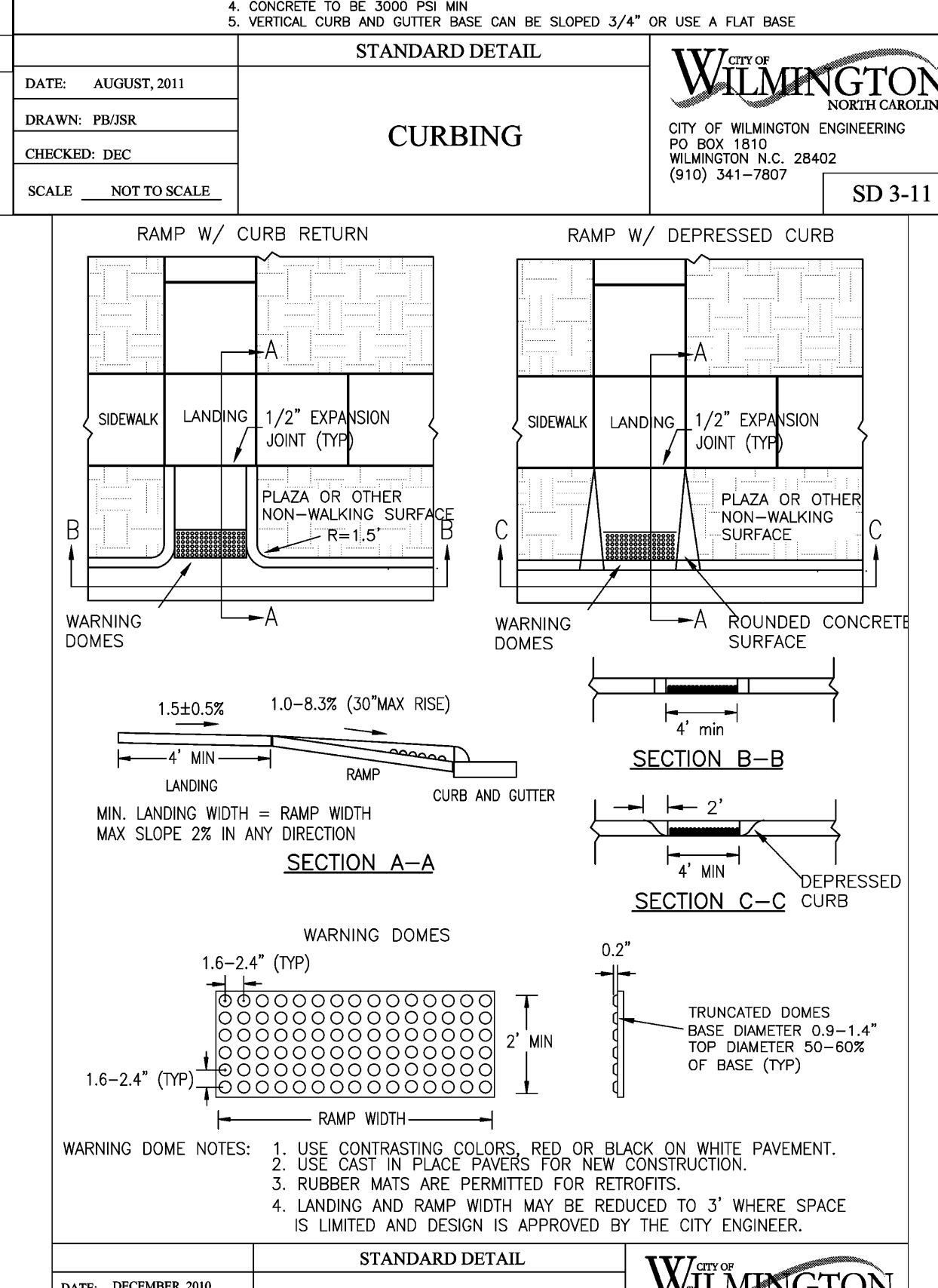
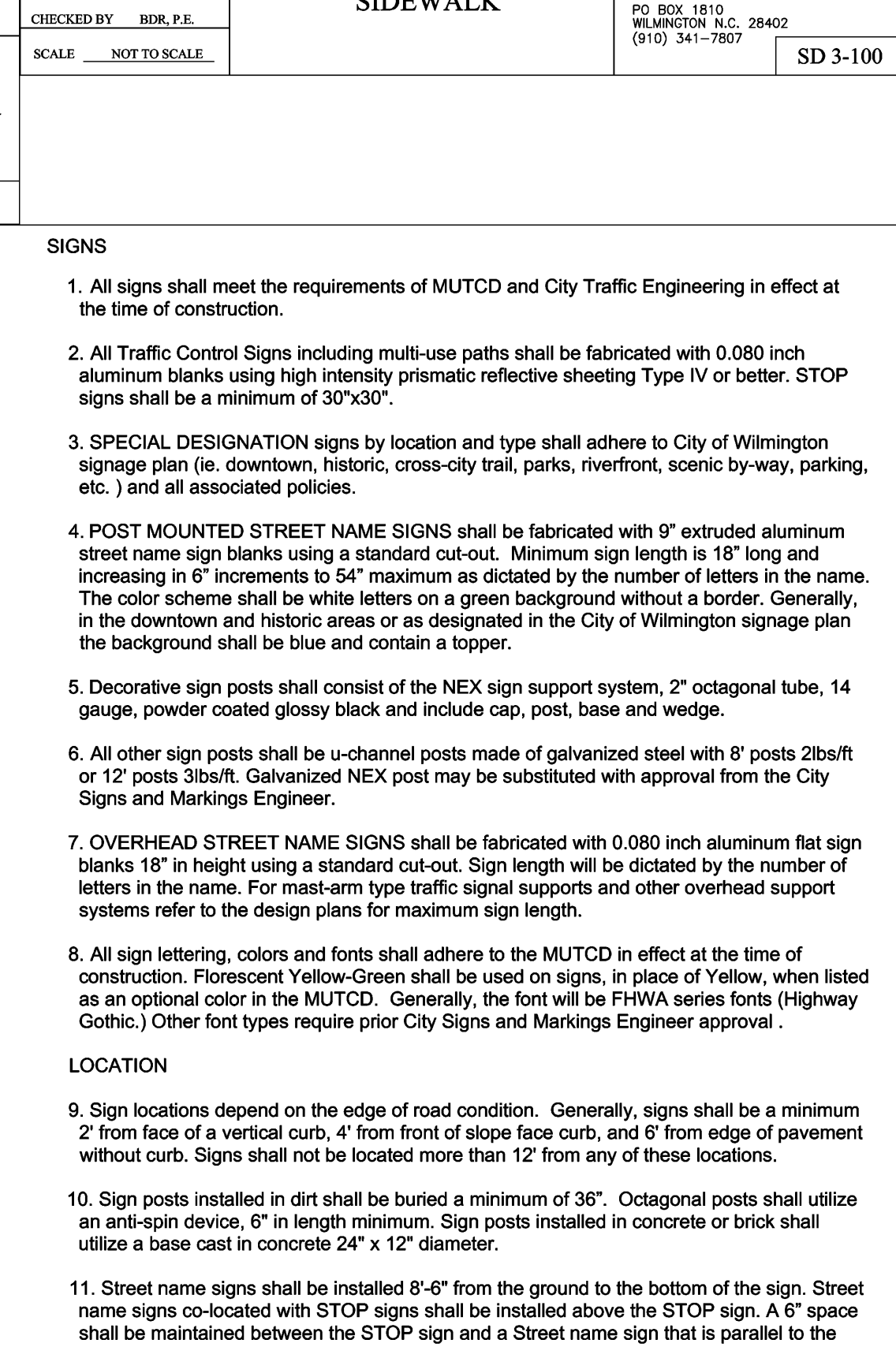
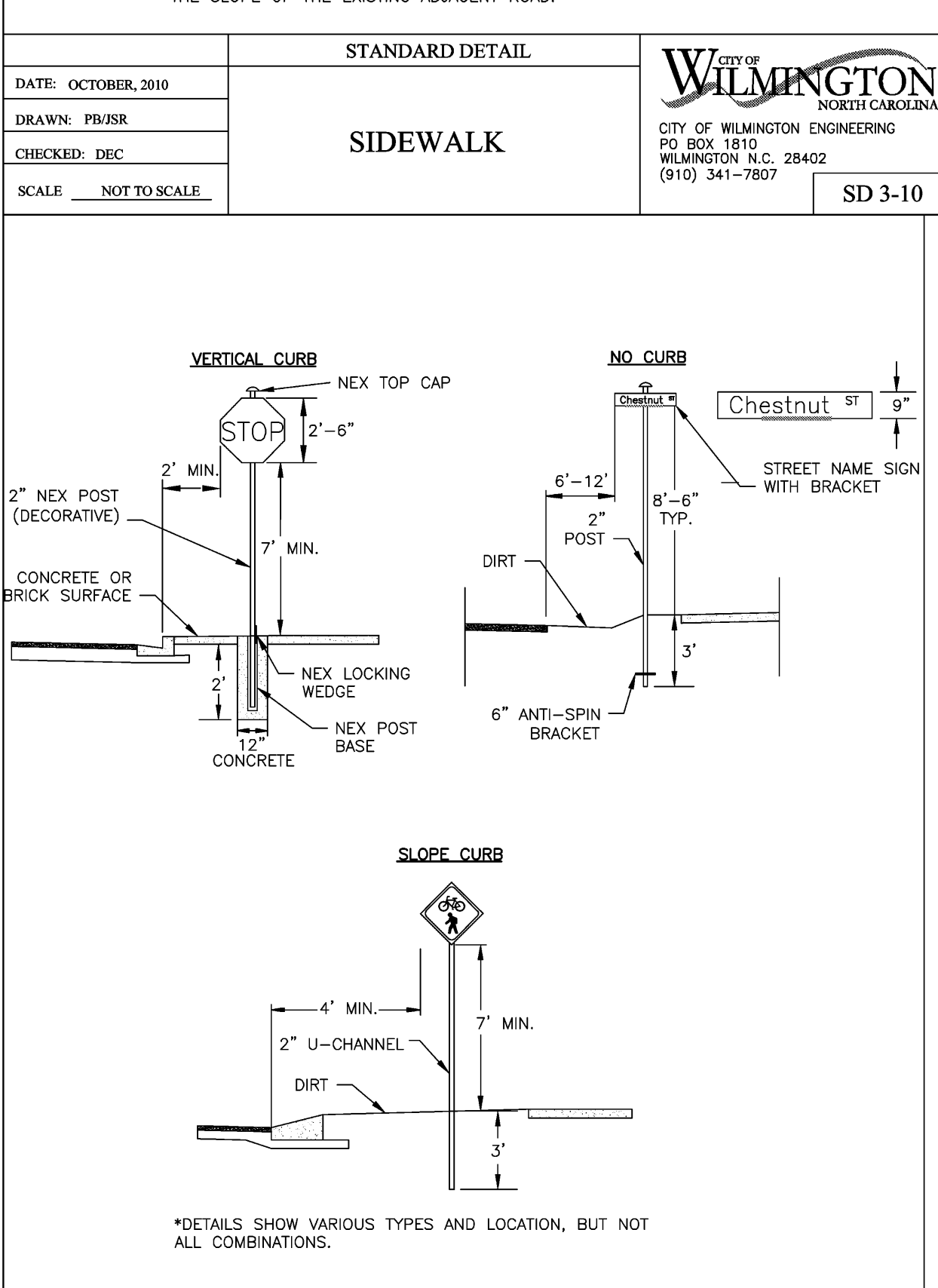
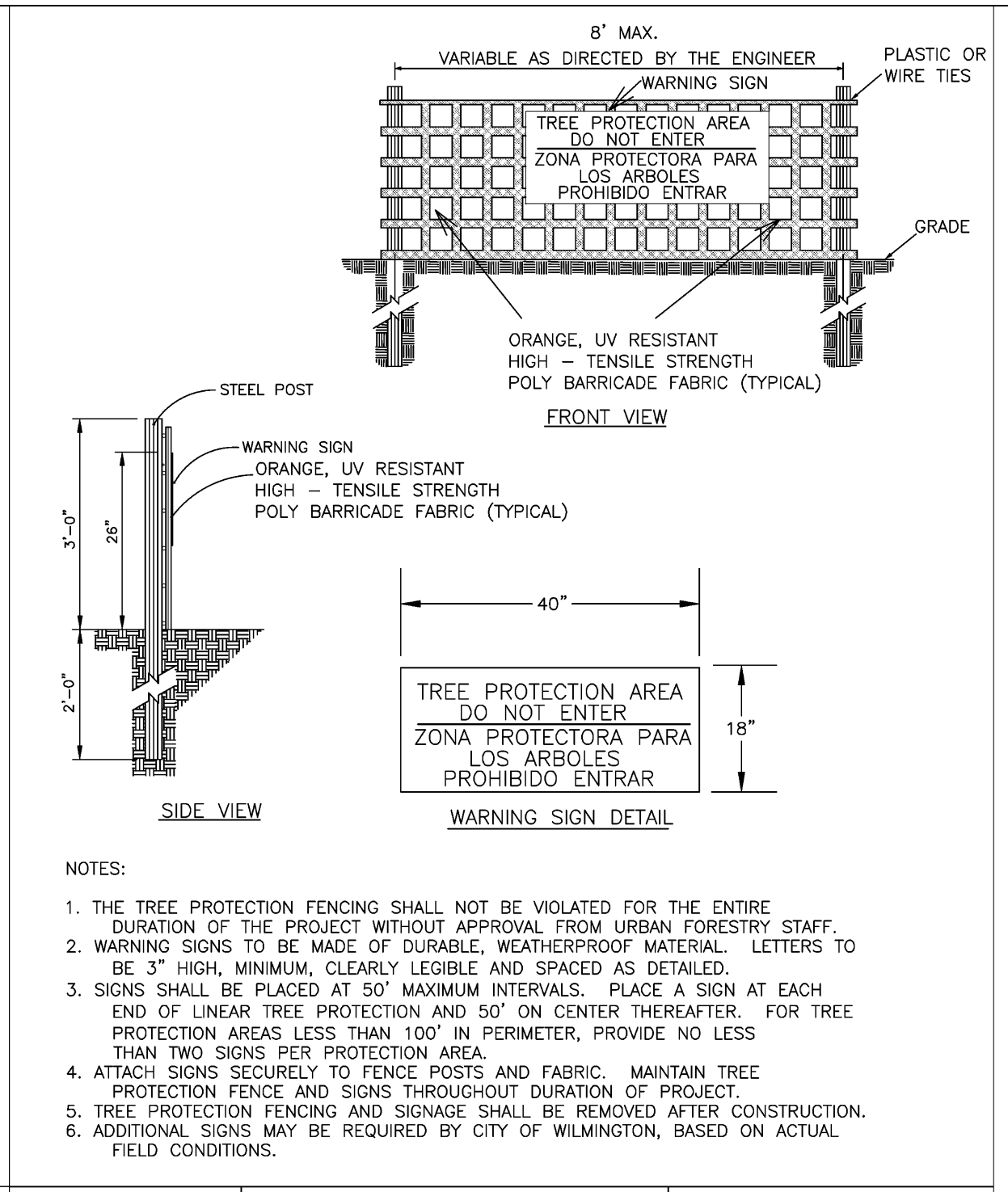
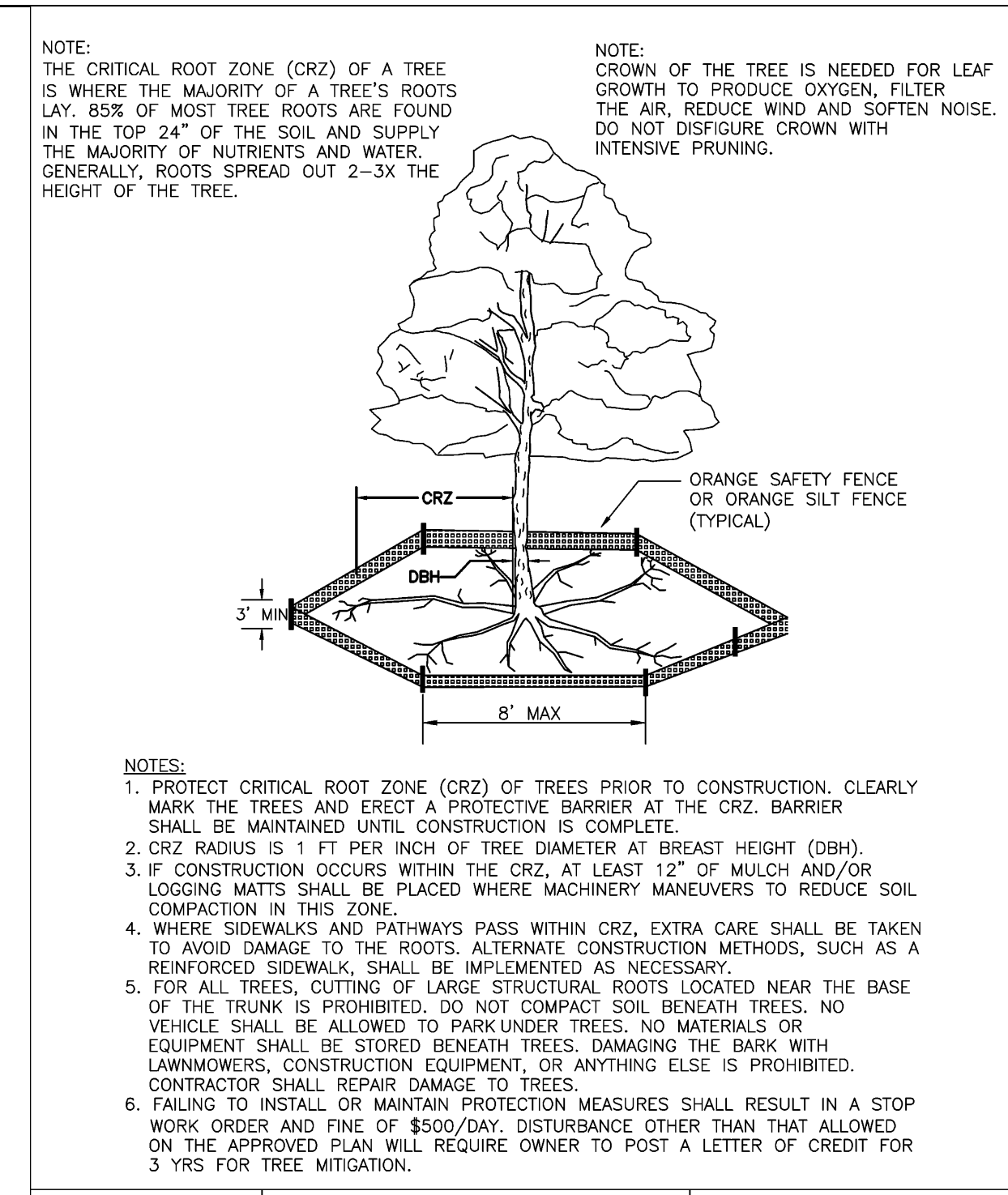
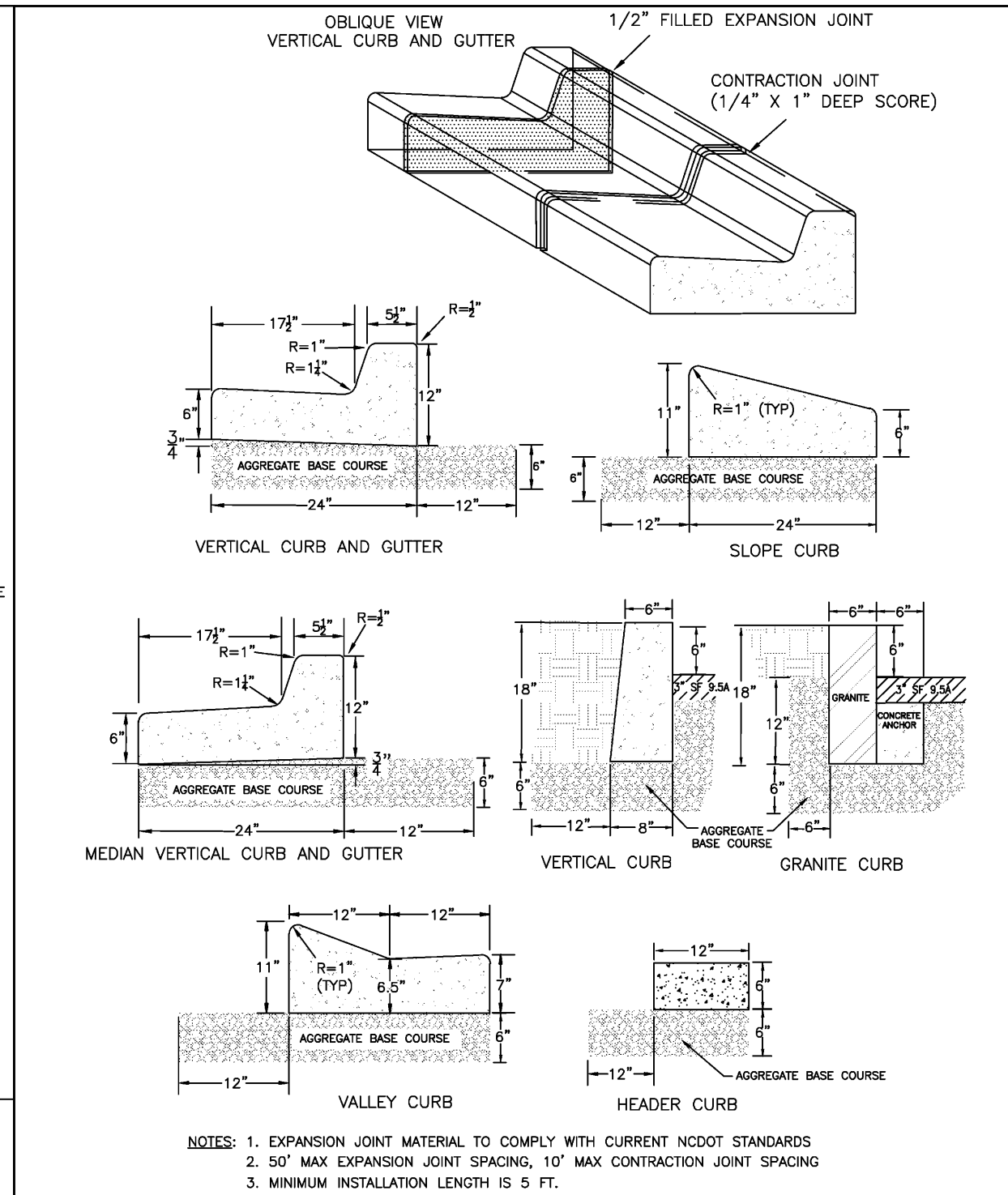
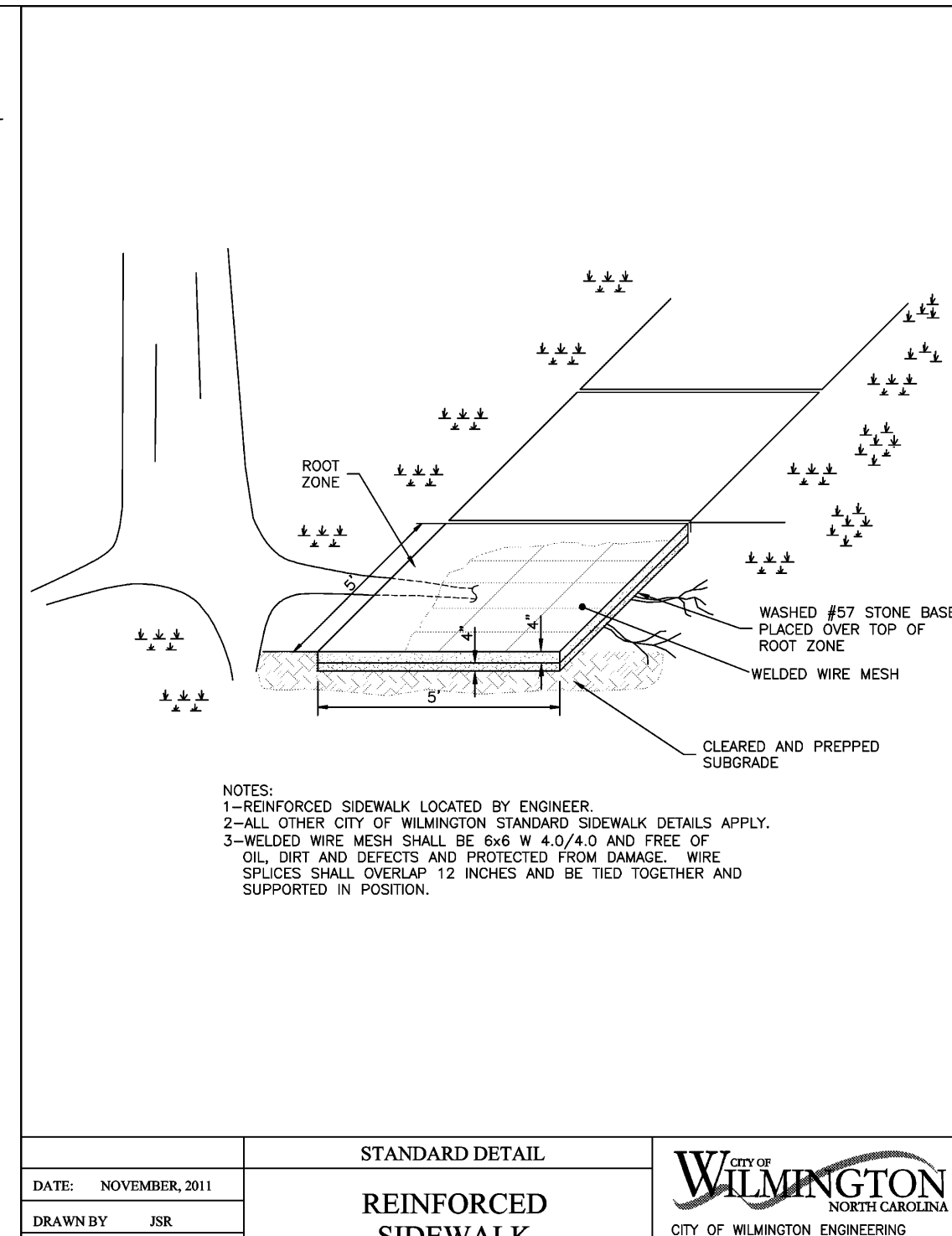
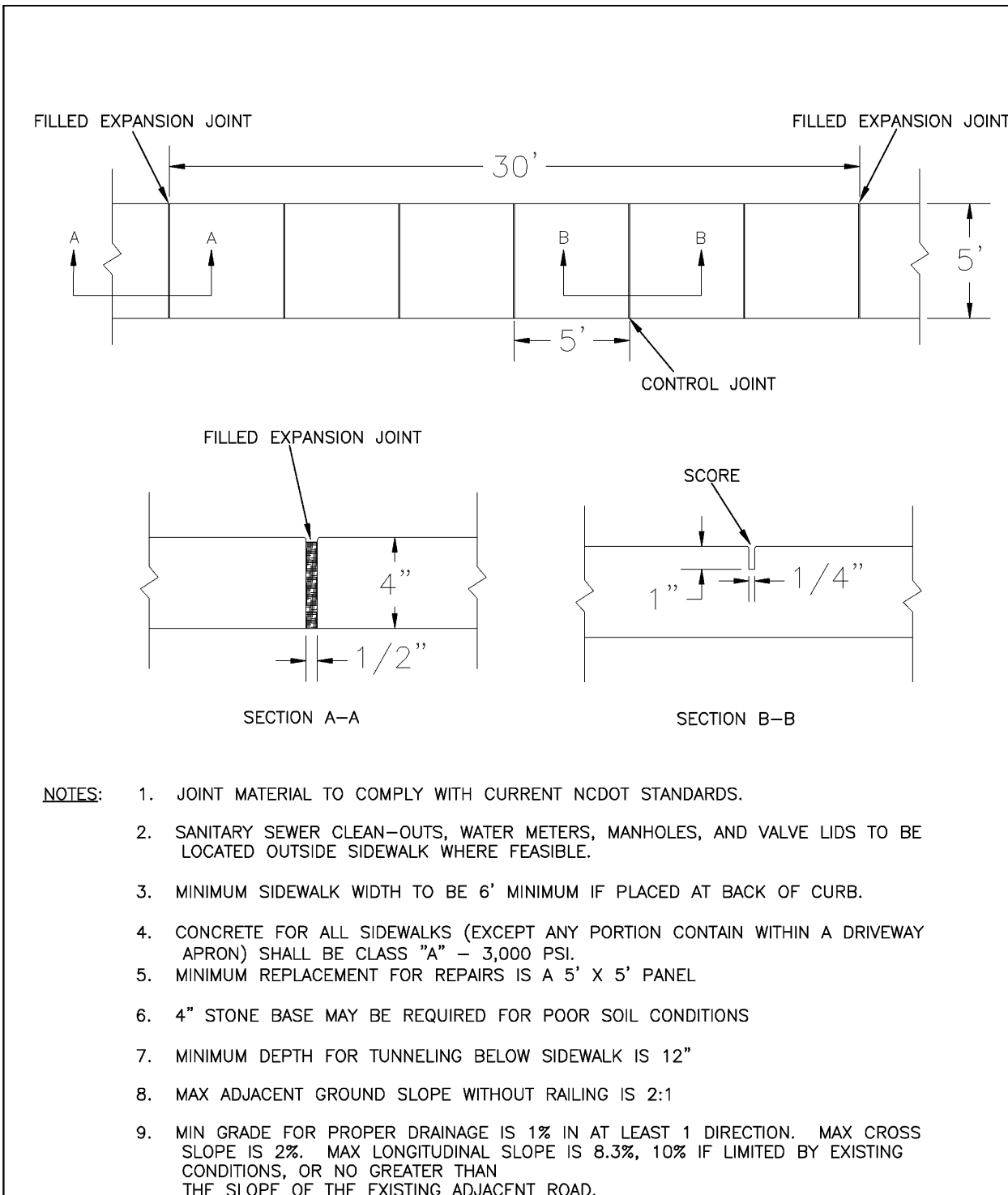
**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

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

DATE: 11-24-15  
 SCALE: N.T.S.  
 DRAWN: JCB  
 CHECKED: JEM  
 PROJECT NO: 260  
 SHEET NO: 15  
 OF: 22

REV NO.	DESCRIPTION	DATE
1	REVISED TO ADD SIDEWALK ON SOUTH SIDE OF ECHO FARMS BLVD R/W & ADD PAVEMENT REPAIRS - UTILITY CUTS DETAIL FROM SHEET 16.	11-4-15





**Approved Construction Plan**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Planning \_\_\_\_\_  
Traffic \_\_\_\_\_  
Fire \_\_\_\_\_

Signed: \_\_\_\_\_

**ARBOR TRACE APARTMENTS**  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DETAIL SHEET  
4010 CAROLINA BEACH ROAD  
WILMINGTON, NORTH CAROLINA 28412

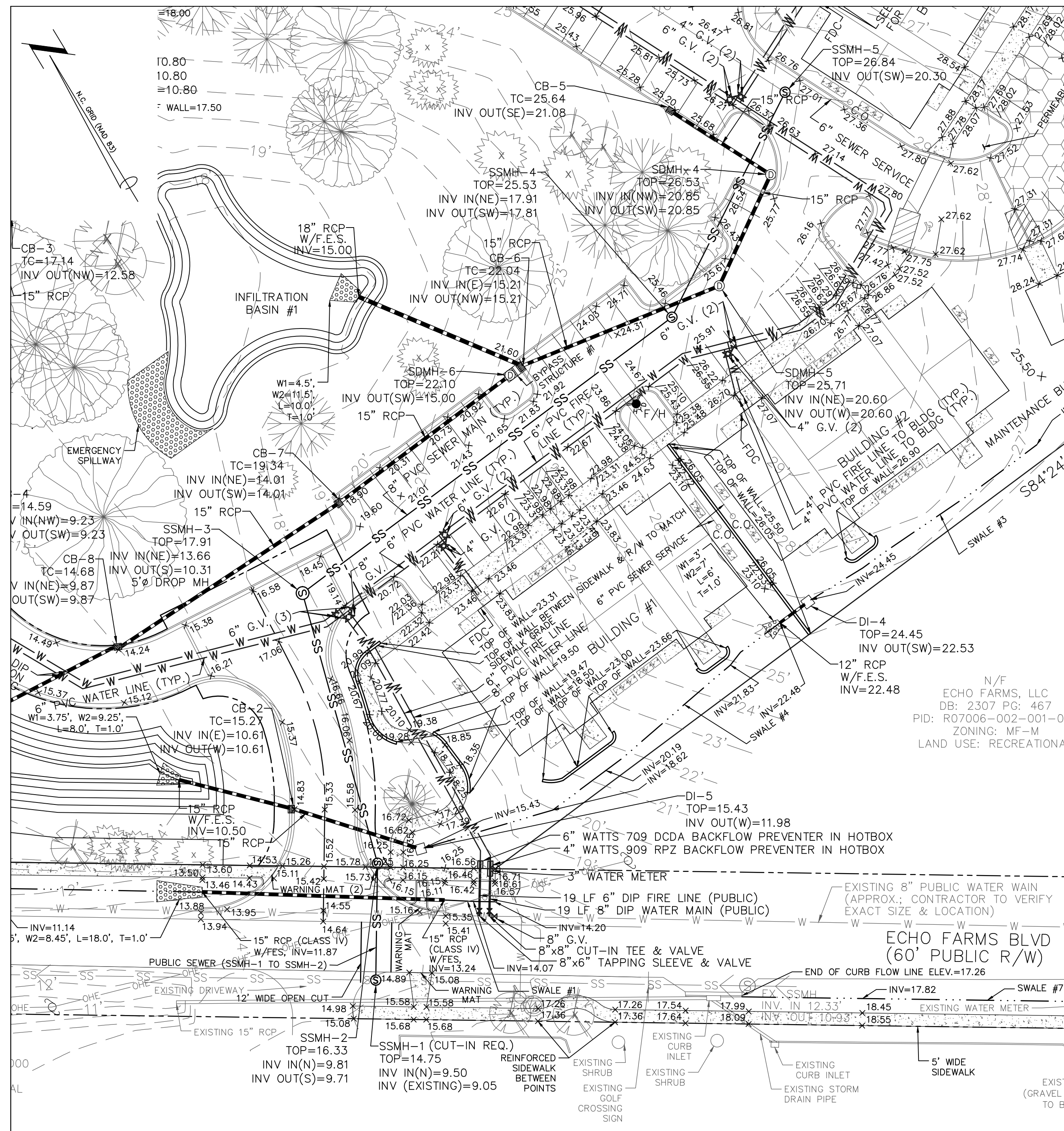
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SCALE: N.T.S.  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 260

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

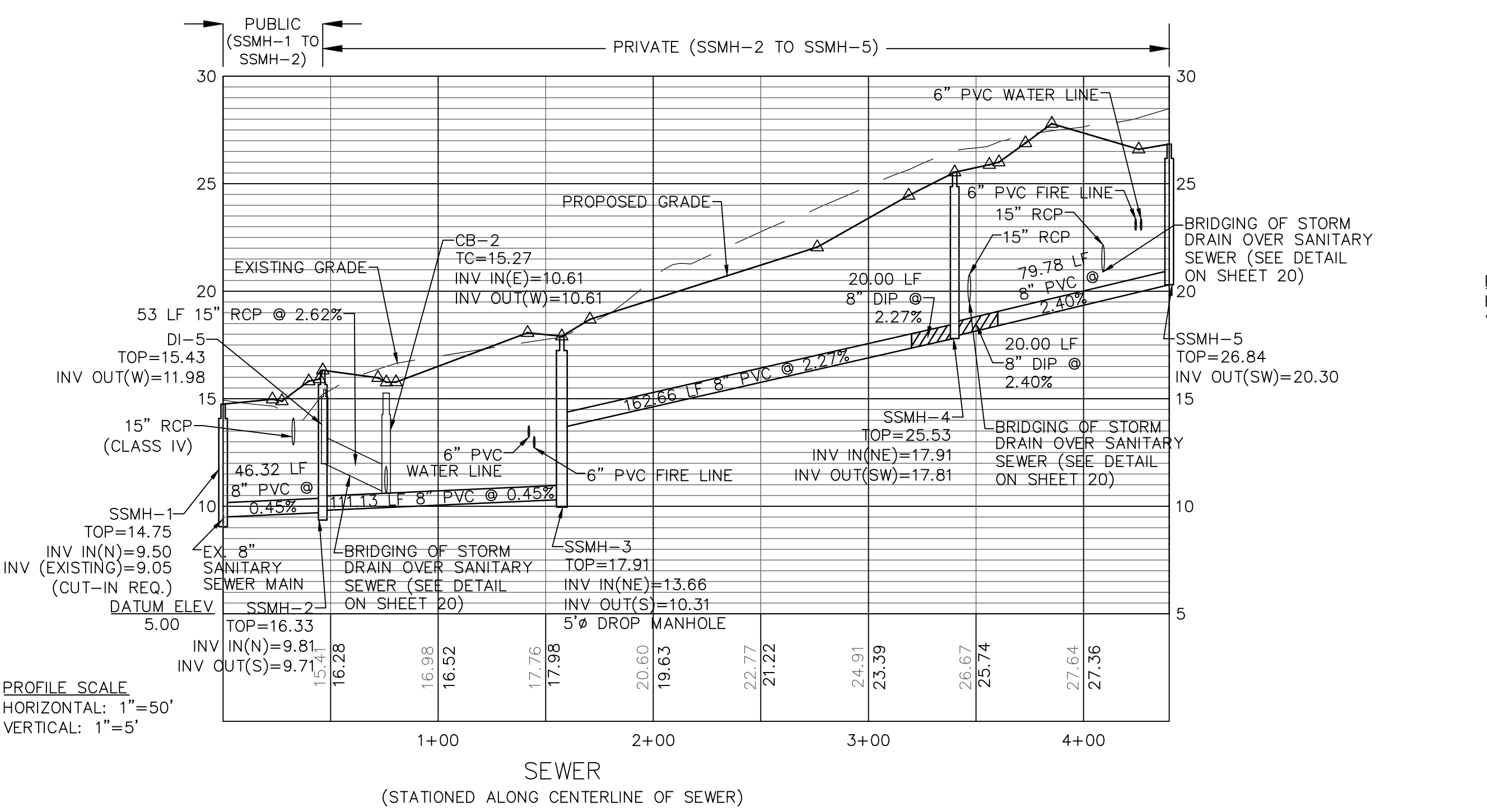
MALPASS ENGINEERING & SURVEYING, P.C.  
1134 SHIPYARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-6243  
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10 S. CARDINAL DRIVE  
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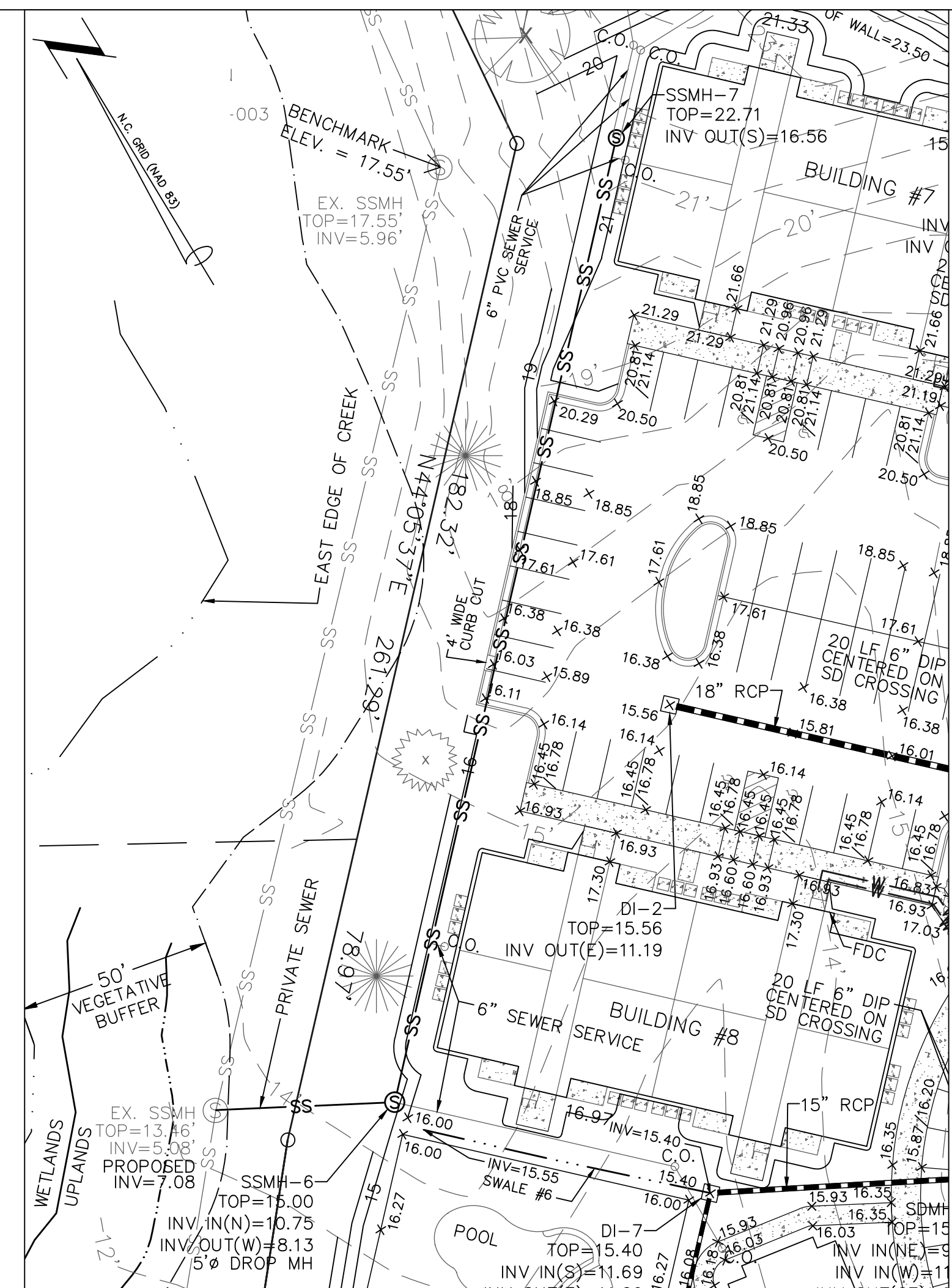
SHEET NO: 16  
OF: 22



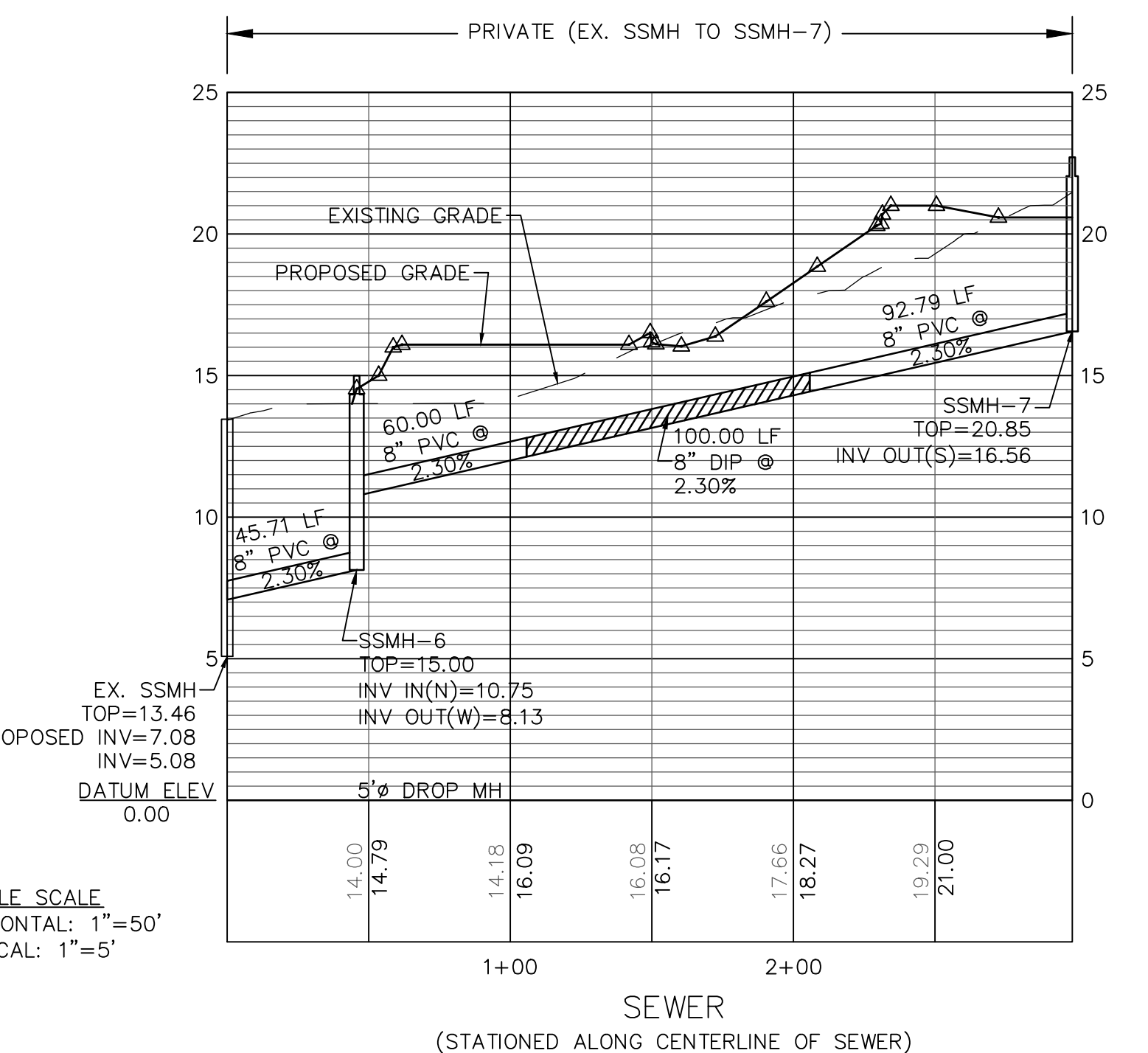
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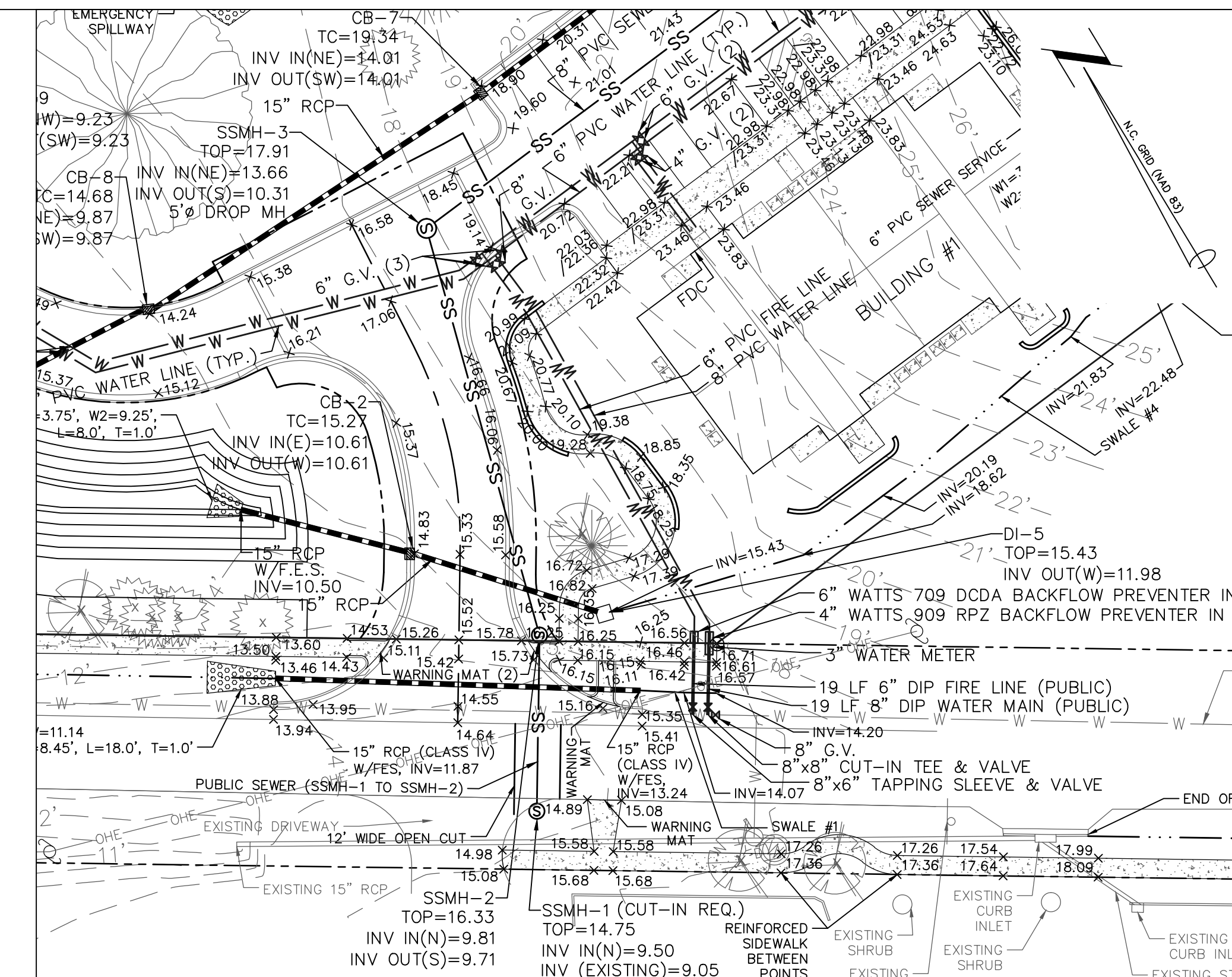
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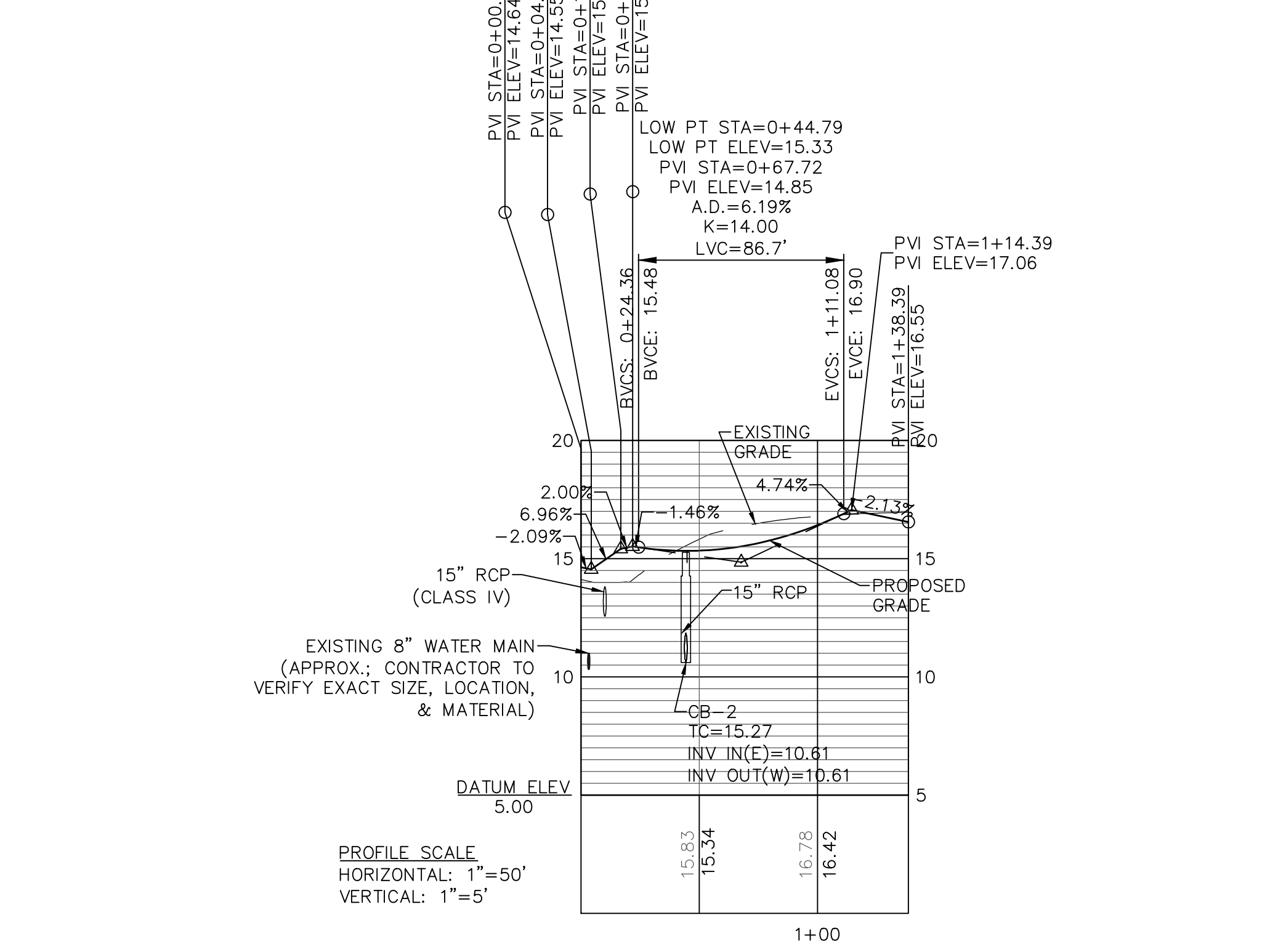
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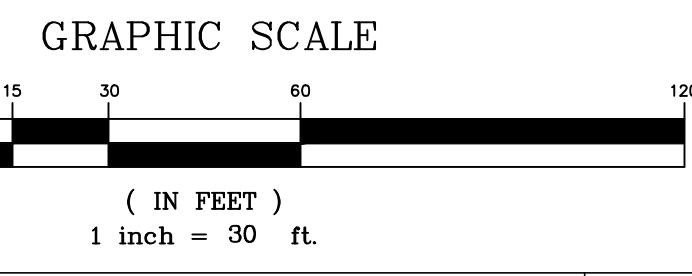
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VERTICAL: 1"=5'



PLAN VIEW SCALE: 1"=30'



PROFILE SCALE  
HORIZONTAL: 1"=50'  
VERTICAL: 1"=5'



REV NO.	DESCRIPTION	DATE
1	REVISED PER CITY.	2-9-16
2	REVISED PER CITY TO ADJUST SEWER INVERTS & LABEL AS PUBLIC OR PRIVATE.	3-15-16
3	REVISED PER CITY TO CHANGE BACKFLOW PREVENTER ON FIRE LINE.	4-29-16
4	REVISED TO ADJUST PARKING NORTH OF BUILDING #2.	8-24-16
5	REVISED TO ADD SIDEWALK ON SOUTH SIDE OF ECHO FARMS BLVD R/W.	11-4-16

Approved Construction Plan

Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

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

PLAN PROFILE  
4010 CAROLINA BEACH ROAD  
**ARBOR TRACE APARTMENTS**  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

MALPASS ENGINEERING & SURVEYING, P.C.  
1134 SHIPYARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-6343  
Fax 910-392-6203 License No. C-2320

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

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



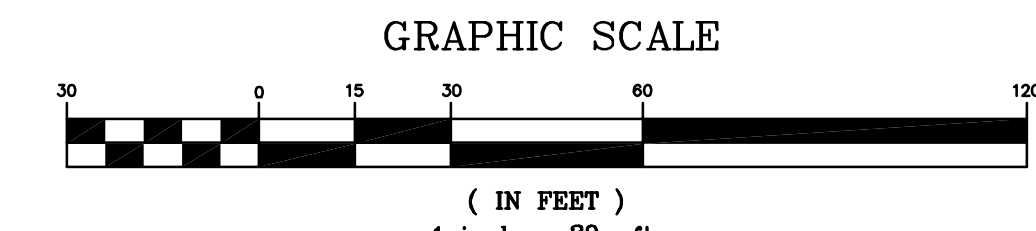
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ZONING: R-15  
LAND USE: UNUSED

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

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

N/F  
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DB: 2307 PG: 467  
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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



**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

**Approved Construction Plan**

Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

**APPROVED STORMWATER MANAGEMENT PLAN**

Date: \_\_\_\_\_ Permit # \_\_\_\_\_

Signed: \_\_\_\_\_

**ARBOR TRACE 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  
9-23-2016

LAND-DESIGN SOUTH  
Landscape Architect-Asst  
105 B CORAL DRIVE  
WRIGHTSVILLE BEACH, N.C. 28480  
910 560 8788

LANDSCAPE PLAN

Developer: ARBOR TRACE 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 STABILIZATION 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
33		<i>Prunus yedoensis</i>	Yoshino Cherry	2" cal
4		<i>Salix babylonica</i>	Babylon weeping willow	2" cal

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

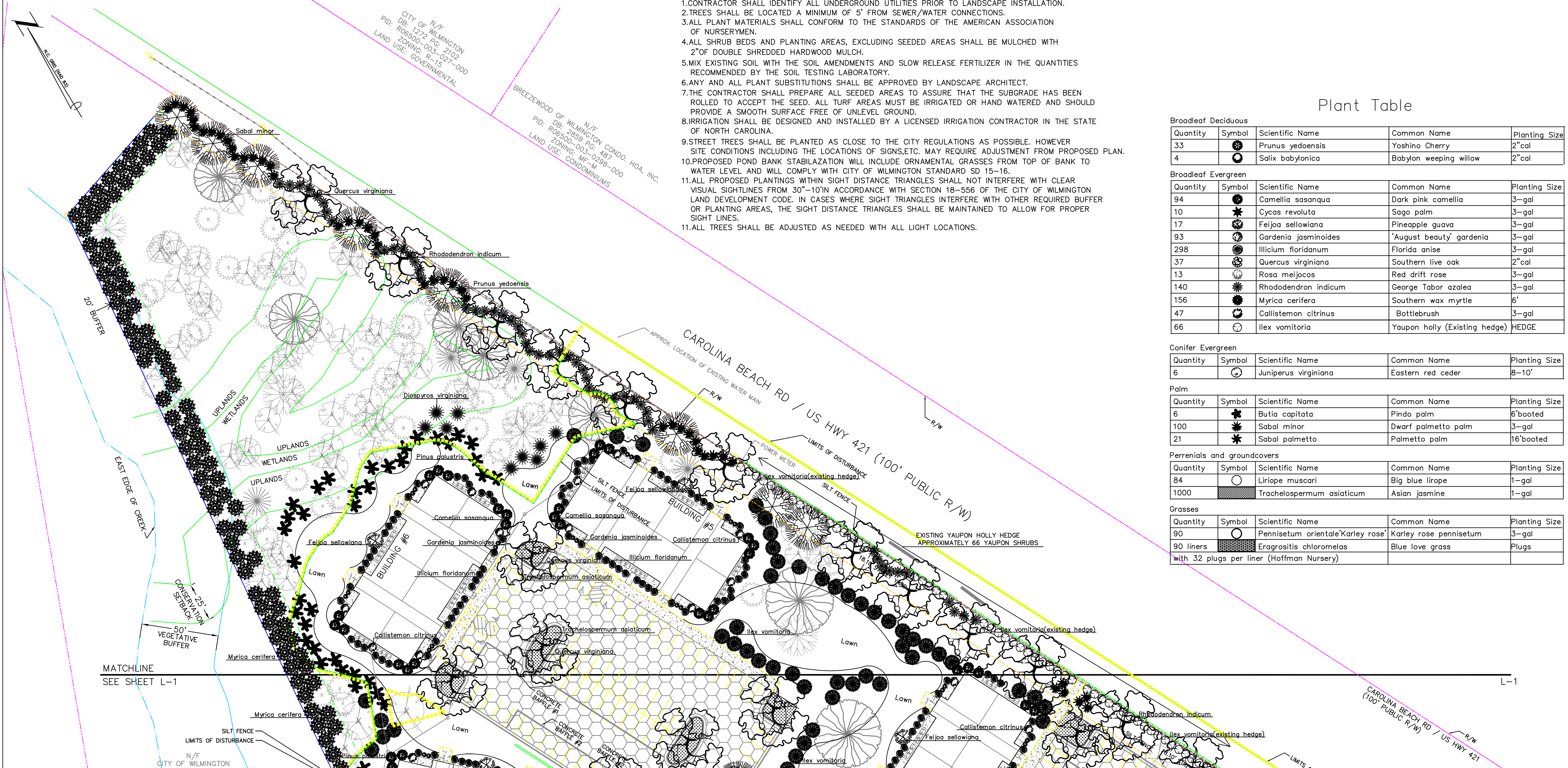
Conifer Evergreen				
Quantity	Symbol	Scientific Name	Common Name	Planting Size
6		<i>Juniperus virginiana</i>	Eastern red cedar	8-10'

Palm				
Quantity	Symbol	Scientific Name	Common Name	Planting Size
6		<i>Butia capitata</i>	Pindo palm	6'booted
100		<i>Sabal minor</i>	Dwarf palmetto palm	3-gal
21		<i>Sabal palmetto</i>	Palmetto palm	16'booted

Perennials and groundcovers				
Quantity	Symbol	Scientific Name	Common Name	Planting Size
84		<i>Liriope muscari</i>	Big blue lirope	1-gal
1000		<i>Trachelospermum asiaticum</i>	Asian jasmine	1-gal

Grasses				
Quantity	Symbol	Scientific Name	Common Name	Planting Size
90		<i>Pennisetum orientale</i>	'Karley rose' Karley rose pennisetum	3-gal
90 liners		<i>Eragrostis chloromelas</i>	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 1 CANOPY TREE)  
 33.23 X 6 = 199.38, 199 SHRUBS  
 PROVIDED PLANTING = 30 TREES & 3 EXISTING TREES TO REMAIN = 33 TREES  
 306 SHRUBS

**STREETYARD - ECHO FARMS BLVD (SECONDARY FRONTAGE)**  
 STREET FRONTAGE = 469.83 - 37.33 = 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 1 CANOPY TREE)  
 6.74 X 6 = 40.44, 40 SHRUBS  
 PROVIDED PLANTING = 8 TREES & 8 EXISTING TREES TO REMAIN = 16 TREES  
 53 SHRUBS

**LANDSCAPE CALCULATIONS:**

**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) = 25,452 SF

**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

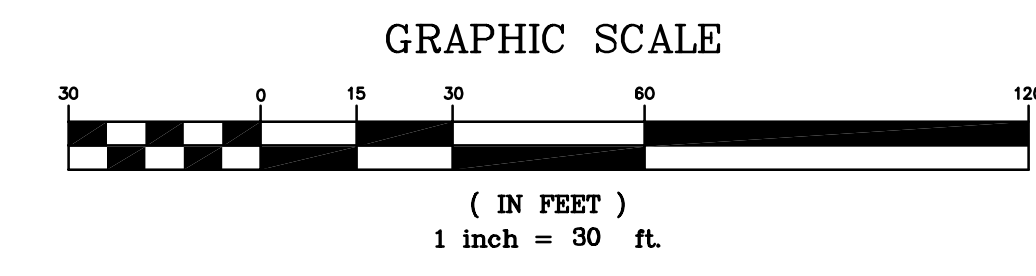
Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

Public Services • Engineering Division  
 APPROVED STORMWATER MANAGEMENT PLAN  
 Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
 Signed: \_\_\_\_\_



**ARBOR TRACE APARTMENTS**

4010 CAROLINA BEACH ROAD  
 WILMINGTON TOWNSHIP  
 NEW HANOVER COUNTY  
 NORTH CAROLINA

LAND-DESIGN SOUTH  
 LANDSCAPE ARCHITECT-ASLA  
 105 B CORAL DRIVE  
 WRIGHTSVILLE BEACH, N.C. 28480  
 910 560 8788

LANDSCAPE PLAN

Developer: ARBOR TRACE APARTMENTS, LLC  
 10 S. CARDINAL DRIVE  
 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  
 9-23-2016

SHEET NO: L-2