

GENERAL NOTES:

- CONDITIONAL PRELIMINARY PLAN APPROVAL BY CITY OF WILMINGTON SUBDIVISION REVIEW BOARD ON JULY 16, 2016.
- WATER SERVICE THROUGHOUT PROJECT IS TO BE PUBLIC. SEE SHEET WATERLINE NOTES.
- ALL UTILITIES SHALL BE UNDERGROUND.
- SEWER NOT WITHIN PUBLIC RIGHT OF WAY SHALL BE PRIVATELY PERMITTED, OWNED, AND MAINTAINED.
- CITY OF WILMINGTON TREE PRESERVATION PERMIT WILL HAVE TO BE MODIFIED FOR NEW PROJECT.
- NEEDS STATEMENT MANAGEMENT, SEWER AND WATER PERMITS ARE ACTIVE OR HAVE FINAL APPROVAL.
- NEW HANDICAP COMPLIANT CURB AND SIDEWALKS SHALL BE PROVIDED FOR NEW PROJECT.
- CITY OF WILMINGTON STORMWATER DISCHARGE PERMIT ISSUED 5/28/2015.
- THIS PROJECT COMPLIES WITH CITY OF WILMINGTON PUBLIC UTILITY AUTHORITY. EXTRA CROSS CONNECTION CONTROL REQUIREMENTS. WATER METER(S) CANNOT BE RELEASED UNTIL ALL REQUIREMENTS ARE MET AND METER HAS ISSUED THE FINAL APPROVAL. CALL 360-3910 FOR INFORMATION.
- IF THE CONTRACTOR DESIRES CEPTA WATER FOR CONSTRUCTION, HE SHALL APPLY IN ADVANCE FOR THIS SERVICE AND PROVIDE A REVISED PRESSURE TOWER SCHEDULE ON CONSTRUCTION REVIEW ON THE DEVELOPER'S SIDE OF THE WATER METER BOX.
- ALL COMMERCIAL WATER SERVICES AND ANY IRRIGATION SYSTEMS SUPPLIED BY CEPTA SHALL HAVE A BACKFLOW PREVENTION DEVICE ACCEPTABLE TO THE CEPTA AND APPROVED BY INSPECTION OR ASSE.
- TRAFFIC IMPACT STUDY IS NOT REQUIRED BY THE CITY OF WILMINGTON. ACCESS TURN LANE REQUIREMENTS HAVE BEEN WAIVED OR OTHERWISE PROVIDED IN LIEU OF CONSTRUCTION.
- ANY OPEN OR MISSING SIDEWALK PANELS, DRIVEWAY PANELS AND CURBS WILL BE REPLACED.
- ALL PAVEMENT MARKINGS IN PUBLIC RIGHT OF WAY AND FOR DRIVEWAYS ARE TO BE THERMOPLASTIC AND MEET CITY AND/OR NCOTD STANDARDS.
- ALL STORM PUBLIC DRAINAGE AND FOR DRIVEWAYS ARE TO MEET WETLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES STANDARDS.
- THERE SHALL BE A FIFTY FEET SETBACK FROM BARNARD'S CREEK.
- NO DEVELOPMENT SHALL OCCUR ON WETLANDS OR BROWN SOILS.
- WORK OF ENGINEERS NATIONWIDE PERMIT HAS BEEN ISSUED FOR SEWER WETLAND CROSSING.
- A PORTION OF THIS PROPERTY IS IN THE 100 YEAR FLOOD PLAIN.
- THE 100 YEAR FLOOD ELEVATION IS 9.0 MSL. 3-0 ELEVATION LINE SHOWN IS THE RESULT OF A LAND SURVEY.
- ALL CONSTRUCTION SHALL COMPLY WITH THE CITY OF WILMINGTON TECHNICAL STANDARDS, SUBDIVISION 118-59 (C) AND 101 APPLY TO THIS PROPERTY AND FLOODPLAIN ORDINANCES, AND FEMA GUIDELINES.
- EXISTING EROSION CONTROL MEASURES TO BE REINSTALLED IF NEEDED ALONG WITH THE INSTALLATION OF THE PROPOSED MEASURES.
- PROJECT HAS BEEN ISSUED A FINAL LETTER OF MAP AMENDMENT TO FINALE THE FULL BUILD OUT.
- THE RECREATIONAL AREAS WILL BE DEeded TO THE OWNER'S ASSOCIATION.
- TRASH COLLECTION WILL BE BY PRIVATE CONTRACT FOR DUMPSTER CONTAINING MATERIAL.
- STREET AND CURB CONSTRUCTION SHALL COMPLY WITH NOTES 3-0023 IN SECTION VII ON PAGES 6 & 7 OF THE CITY OF WILMINGTON TECHNICAL STANDARDS.
- THE CITY ENGINEER'S REVIEW OF THIS PROJECT IS LIMITED TO THE TECHNICAL ASPECTS OF THE PLAN AND CONTRACT 34-5888 FOR MORE DETAILS. IN CERTAIN CASES AN ENTIRE RESUBMITTING OF THE AREA BEING REVIEWED MAY BE REQUIRED.
- A LANDSCAPING PLAN INDICATING THE LOCATION OF REQUIRED STREET TREES SHALL BE SUBMITTED TO THE CITY OF WILMINGTON TRAFFIC ENGINEERING DIVISION AND PARKS AND RECREATION DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO THE RECORDING OF THE FINAL PLAN.
- CONTRACTOR SHALL MAINTAIN AN ALL-WEATHER ACCESS FOR EMERGENCY VEHICLES AT ALL TIMES DURING CONSTRUCTION.
- NEW HYDRANTS MUST BE BROUGHT INTO SERVICE PRIOR TO COMPLETION OF MATERIALS DELIVERED TO THE JOB SITE.
- HYDRANT MUST BE WITHIN 50' OF THE FIRE LANE AS SHOWN AS THE THICK DRIVES FOR PRACTICAL USE.
- FOR MOST BE WITHIN 10' OF THE APPROVED FIRE LANE.
- LANDSCAPING OR PARKING CANNOT BLOCK OR IMPERE THE FDC OR FIRE HYDRANTS. A 3-FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE HYDRANT.
- IN ADDITION TO THE STANDARD COMMENTS, ADDITIONAL FIRE PROTECTION AND ACCESSIBILITY REQUIREMENTS MAY BE REQUIRED DUE TO ANY SPECIAL CIRCUMSTANCES CONCERNING THE PROJECT.
- SPECIAL UNDERGROUND FIRE LINES REQUIRE A SEPARATE UNDERGROUND FIRE LINE PERMIT FROM THE WILMINGTON FIRE AND LIFE SAFETY DIVISION 910-343-0286.
- ALL ISOLATION VALVES WITHIN THE HOT BODY SHALL BE ELECTRICALLY SUPERVISED. PLEASE WORK CLOSELY WITH YOUR FIRE SPINNNELER AND ALARM INSTALLER IN REGARDS TO RUNNING WIRE FOR TAMPER SWITCH.
- NEW HYDRANTS MUST BE BROUGHT INTO SERVICE PRIOR TO COMPLETION OF MATERIALS DELIVERED TO THE JOB SITE. LANDSCAPING OR PARKING CANNOT BLOCK OR IMPERE FIRE BLOC OR INSPECTION POINT.
- A 3-FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE HYDRANT. IN ADDITION TO THE STANDARD COMMENTS, ADDITIONAL FIRE PROTECTION AND ACCESSIBILITY REQUIREMENTS MAY BE REQUIRED DUE TO SPECIAL CIRCUMSTANCES CONCERNING THE PROJECT.
- CONTRACTOR SHALL SUBMIT A RADIO SIGNAL STRENGTH STUDY THAT DEMONSTRATES THAT EXISTING EMERGENCY RESPONDER RADIO SIGNAL LEVELS MEET REQUIREMENTS OF SECTION 100-100.
- ALL PROPOSED VEGETATION WITHIN SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30' TO 10'.
- ALL PROPOSED CONTROL SIGNS AND MARKINGS OFF THE RIGHT-OF-WAY ARE TO BE MAINTAINED BY THE PROPERTY OWNER IN ACCORDANCE WITH MUTCD STANDARDS.
- ADA BARRIERS SHALL BE PER CITY ADA STANDARDS.
- MAINTENANCE REQUIRED FOR EACH PHASE POND BEFORE CO WILL BE ISSUED FOR ASSOCIATED BUILDINGS.

SITE DATA

INDEX TO SHEETS

SHEET NO.	DESCRIPTION
1.	PRELIMINARY PLAN
2.	SITE STAKING PLAN
3.	GENERAL GRADING, EROSION CONTROL, AND STORMWATER PLAN
4.	GENERAL UTILITIES PLAN
5.	TRAVEL AND SIDEWALK PLAN
6.	CITY STANDARD ROADWAY DETAILS
7.	TREE PRESERVATION PLAN
8.	LANDSCAPE PLAN
9.	LANDSCAPE DETAILS

REVISED PRELIMINARY PLAN

THE MARSHES

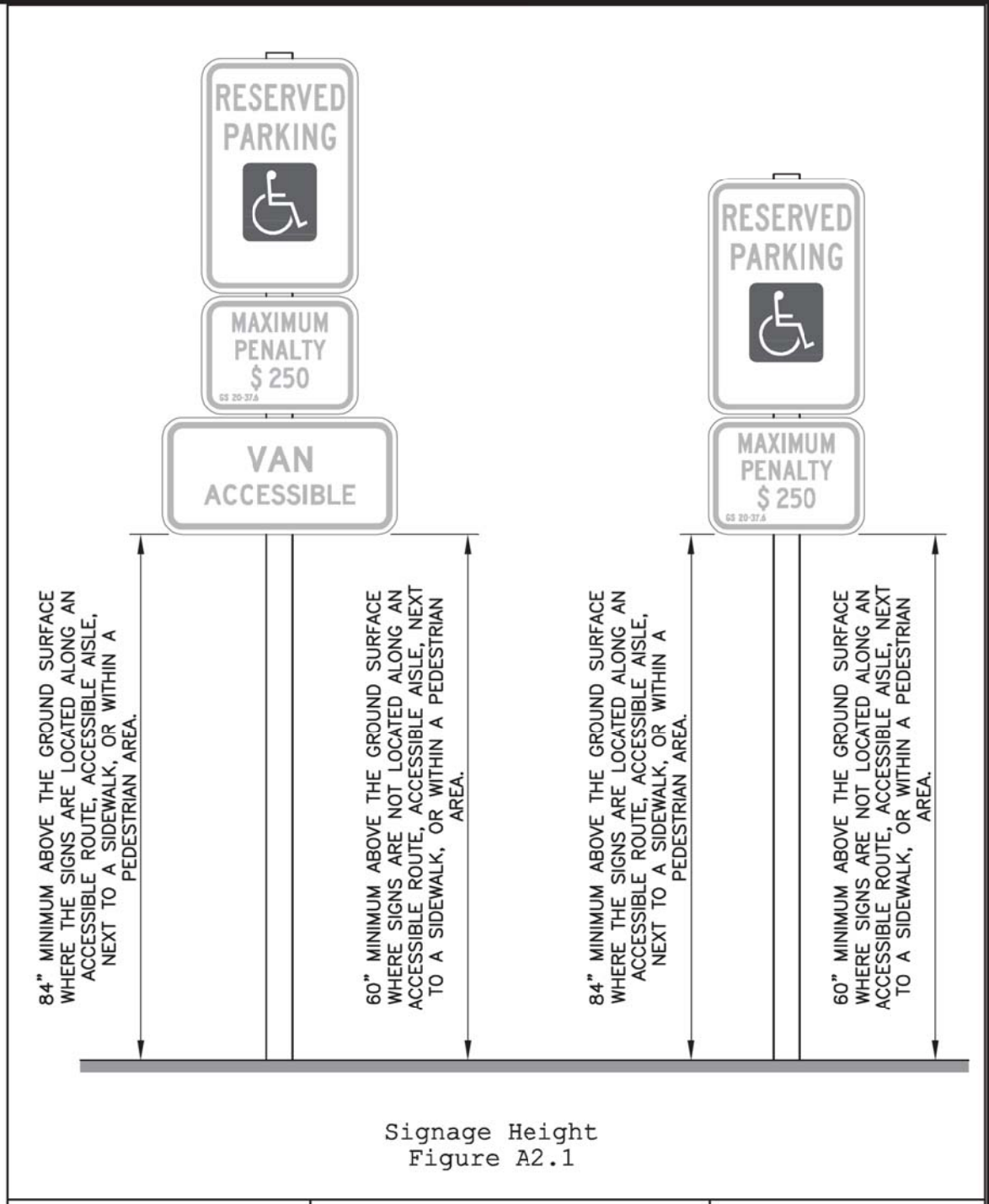
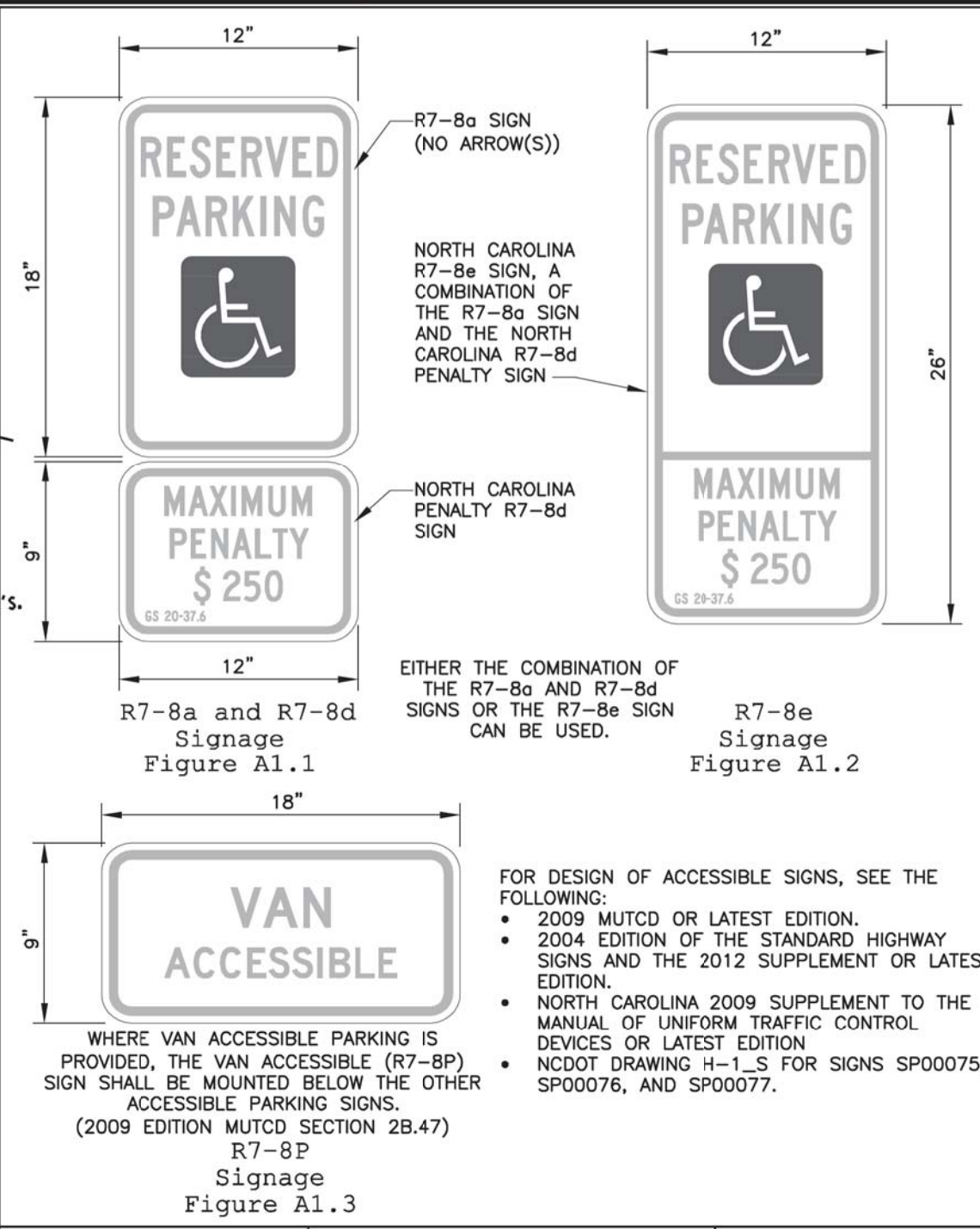
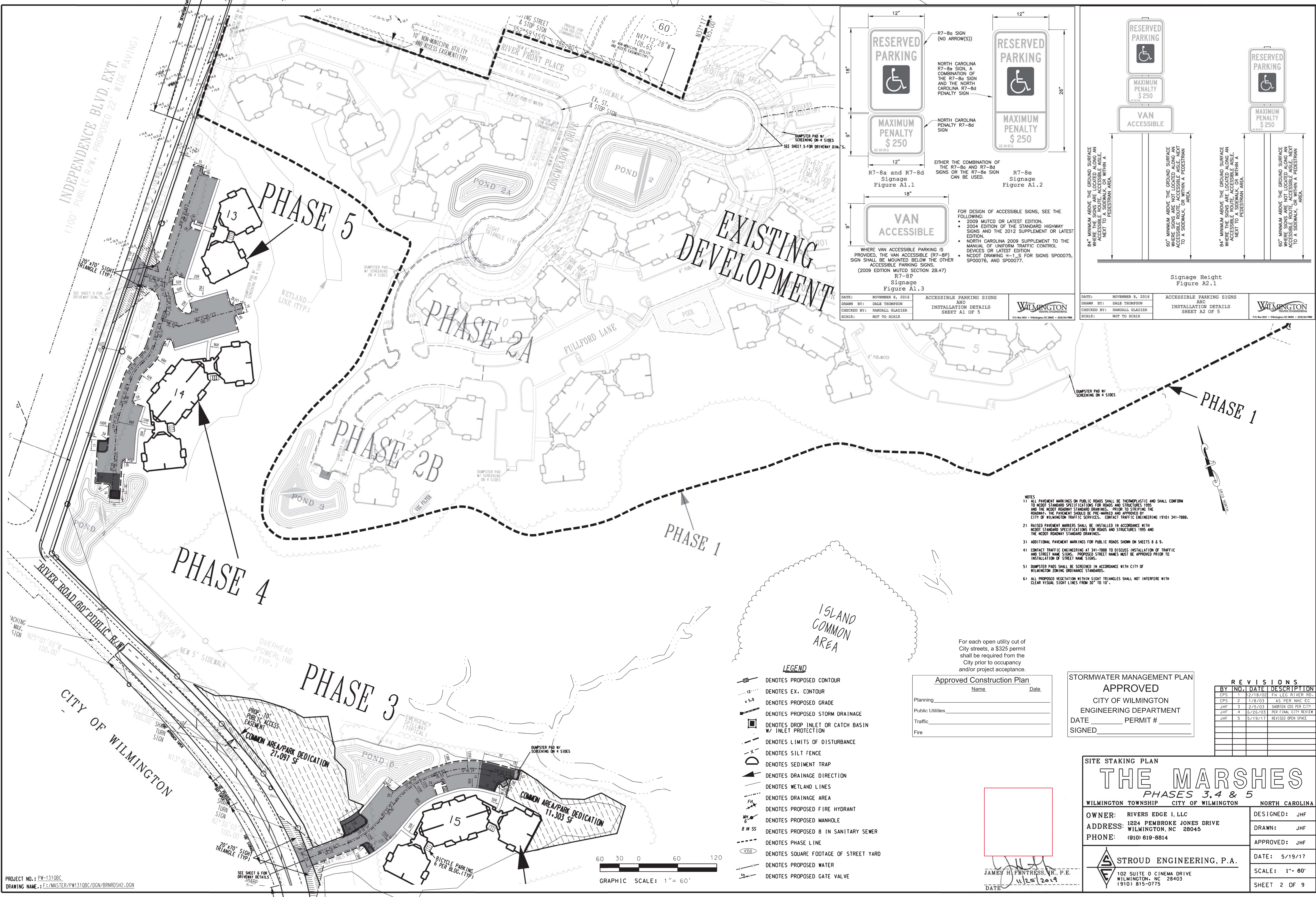
PHASES 3, 4 & 5

WILMINGTON TOWNSHIP CITY OF WILMINGTON NORTH CAROLINA

OWNER: RIVERS EDGE I. LLC
ADDRESS: 1224 PEMBROKE JONES DRIVE WILMINGTON, NC 28045
PHONE: (910) 619-8814

DESIGNED: JHF
DRAWN: JHF
APPROVED: JHF
DATE: 8/2/19
SCALE: 1" = 100'
SHEET 1 OF 9

STROUD ENGINEERING, P.A.
102 SUITE D CINEMA DRIVE
WILMINGTON, NC 28403
(910) 815-0775



DATE: NOVEMBER 8, 2016
 DRAWN BY: DALE THOMPSON
 CHECKED BY: RANDALL GLAZIER
 SCALE: NOT TO SCALE

DATE: NOVEMBER 8, 2016
 DRAWN BY: DALE THOMPSON
 CHECKED BY: RANDALL GLAZIER
 SCALE: NOT TO SCALE

- NOTES**
- ALL PAVEMENT MARKINGS ON PUBLIC ROADS SHALL BE THERMOPLASTIC AND SHALL CONFORM TO NCOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES 1995 AND THE NCOT ROADWAY STANDARD DRAWINGS. PRIOR TO STRIPING THE ROADWAY, THE PAVEMENT SHOULD BE PRE-MARKED AND APPROVED BY CITY OF WILMINGTON TRAFFIC SERVICES. CONTACT TRAFFIC ENGINEERING (910) 341-7888.
 - RAISED PAVEMENT MARKERS SHALL BE INSTALLED IN ACCORDANCE WITH NCOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES 1995 AND THE NCOT ROADWAY STANDARD DRAWINGS.
 - ADDITIONAL PAVEMENT MARKINGS FOR PUBLIC ROADS SHOWN ON SHEETS 8 & 9.
 - 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.
 - DUMPSTER PADS SHALL BE SCREENED IN ACCORDANCE WITH CITY OF WILMINGTON ZONING ORDINANCE STANDARDS.
 - ALL PROPOSED VEGETATION WITHIN SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30' TO 10'.

- LEGEND**
- DENOTES PROPOSED CONTOUR
 - DENOTES EX. CONTOUR
 - +5.0 DENOTES PROPOSED GRADE
 - DENOTES PROPOSED STORM DRAINAGE
 - DENOTES DROP INLET OR CATCH BASIN W/ INLET PROTECTION
 - DENOTES LIMITS OF DISTURBANCE
 - DENOTES SILT FENCE
 - DENOTES SEDIMENT TRAP
 - DENOTES DRAINAGE DIRECTION
 - DENOTES WETLAND LINES
 - DENOTES DRAINAGE AREA
 - DENOTES PROPOSED FIRE HYDRANT
 - DENOTES PROPOSED MANHOLE
 - DENOTES PROPOSED 8 IN SANITARY SEWER
 - DENOTES PHASE LINE
 - DENOTES SQUARE FOOTAGE OF STREET YARD
 - DENOTES PROPOSED WATER
 - DENOTES PROPOSED GATE VALVE

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

Approved Construction Plan

Name: _____ Date: _____

Planning: _____

Public Utilities: _____

Traffic: _____

Fire: _____

STORMWATER MANAGEMENT PLAN

APPROVED

CITY OF WILMINGTON

ENGINEERING DEPARTMENT

DATE: _____ PERMIT # _____

SIGNED: _____

BY	NO.	DATE	DESCRIPTION
CPS	1	2/18/02	PH LEG RIVER RD.
CPS	2	1/8/03	AS PER NHC EC
JHF	3	2/5/03	SHORTEN CPS PER CITY
JHF	4	6/26/03	PER FINAL CITY REVIEW
JHF	5	5/19/17	REVISED OPEN SPACE

SITE STAKING PLAN

THE MARSHES

PHASES 3, 4 & 5

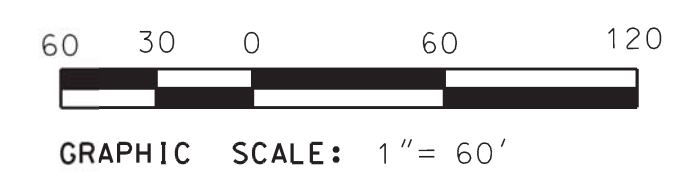
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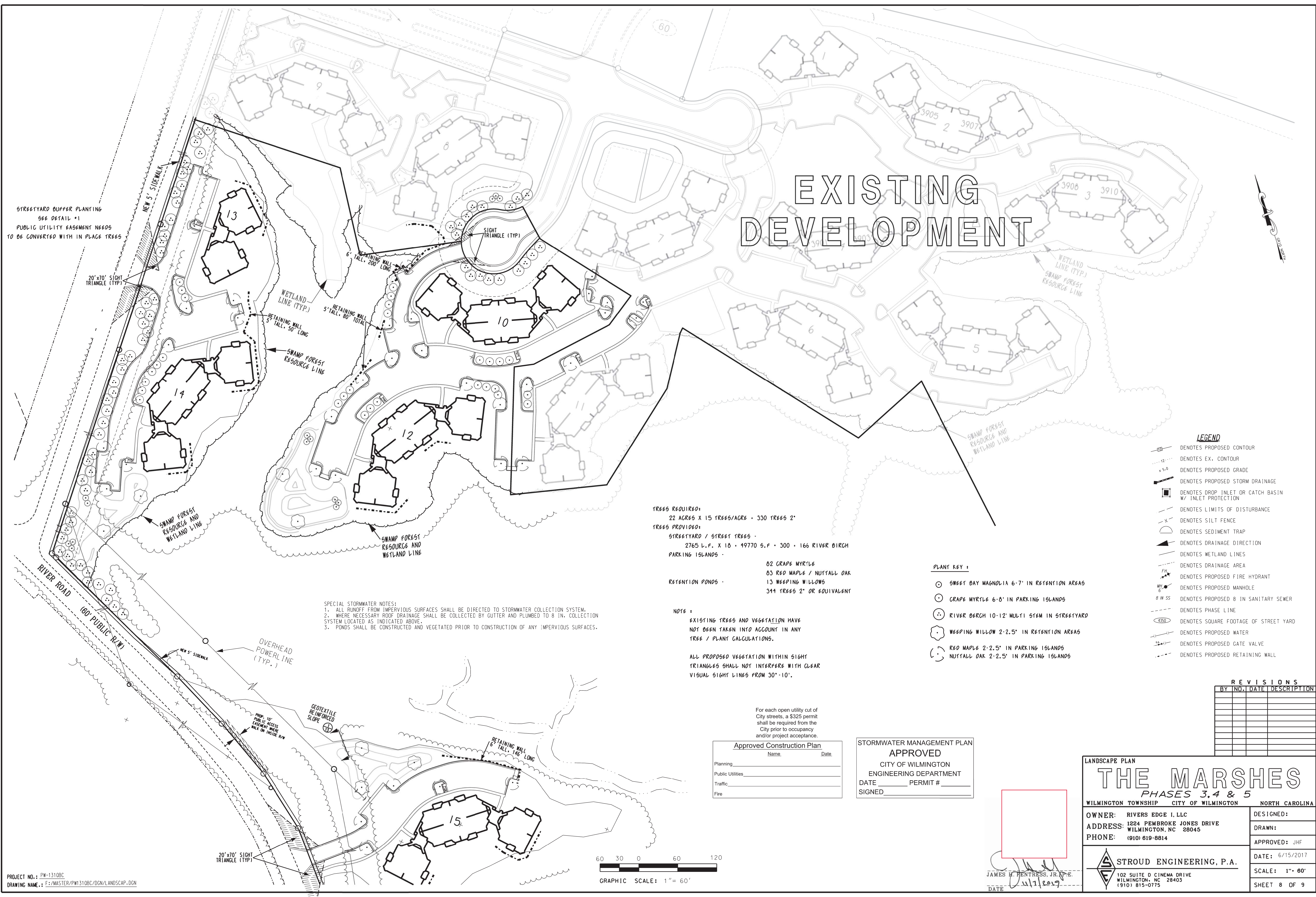
DESIGNED: JHF
 DRAWN: JHF
 APPROVED: JHF
 DATE: 5/19/17
 SCALE: 1" = 80'
 SHEET 2 OF 9

STROUD ENGINEERING, P.A.
 102 SUITE D CINEMA DRIVE WILMINGTON, NC 28403 (910) 815-0775

JAMES H. FENTRESS, R., P.E.
 DATE: 11/25/2019



EXISTING DEVELOPMENT



STREETYARD DUFFER PLANTING
SEE DETAIL #1
PUBLIC UTILITY EASEMENT NEEDS
TO BE CONVERTED WITH IN PLACE TREES

SPECIAL STORMWATER NOTES:
1. ALL RUNOFF FROM IMPERVIOUS SURFACES SHALL BE DIRECTED TO STORMWATER COLLECTION SYSTEM.
2. WHERE NECESSARY ROOF DRAINAGE SHALL BE COLLECTED BY CUTTER AND PLUMBED TO 8 IN. COLLECTION SYSTEM LOCATED AS INDICATED ABOVE.
3. PONDS SHALL BE CONSTRUCTED AND VEGETATED PRIOR TO CONSTRUCTION OF ANY IMPERVIOUS SURFACES.

TREES REQUIRED:
22 ACRES X 15 TREES/ACRE = 330 TREES 2'
TREES PROVIDED:
STREETYARD / STREET TREES -
2765 L.F. X 18 = 49770 S.F. • 300 • 166 RIVER BIRCH
PARKING ISLANDS -
02 GRAPE MYRTLE
03 RED MAPLE / NUTTALL OAK
13 WEEPING WILLOWS
RETENTION PONDS -
314 TREES 2' OR EQUIVALENT

NOTE:
EXISTING TREES AND VEGETATION HAVE NOT BEEN TAKEN INTO ACCOUNT IN ANY TREE / PLANT CALCULATIONS.
ALL PROPOSED VEGETATION WITHIN SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30'-10'.

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

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

STORMWATER MANAGEMENT PLAN APPROVED
CITY OF WILMINGTON
ENGINEERING DEPARTMENT
DATE _____ PERMIT # _____
SIGNED _____

LEGEND

- DENOTES PROPOSED CONTOUR
- DENOTES EX. CONTOUR
- + 5.0 DENOTES PROPOSED GRADE
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- DENOTES PROPOSED WATER
- DENOTES PROPOSED GATE VALVE
- DENOTES PROPOSED RETAINING WALL

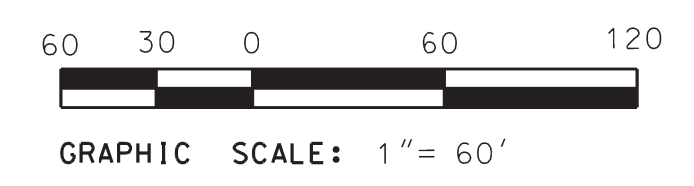
PLANT KEY:

- SWEET OAK MAGNOLIA 6-7' IN RETENTION AREAS
- GRAPE MYRTLE 6-8' IN PARKING ISLANDS
- RIVER BIRCH 10-12' MULTI STEM IN STREETYARD
- WEEPING WILLOW 2-2.5' IN RETENTION AREAS
- RED MAPLE 2-2.5' IN PARKING ISLANDS
- NUTTALL OAK 2-2.5' IN PARKING ISLANDS

REVISIONS

BY	NO.	DATE	DESCRIPTION

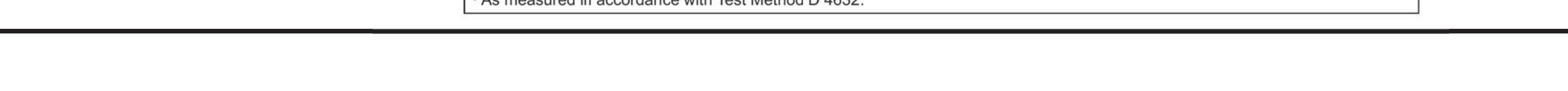
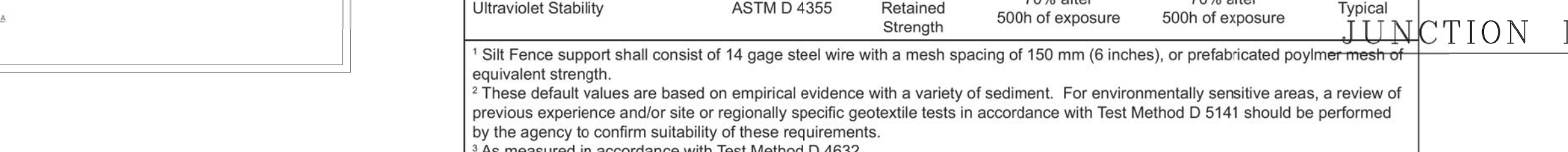
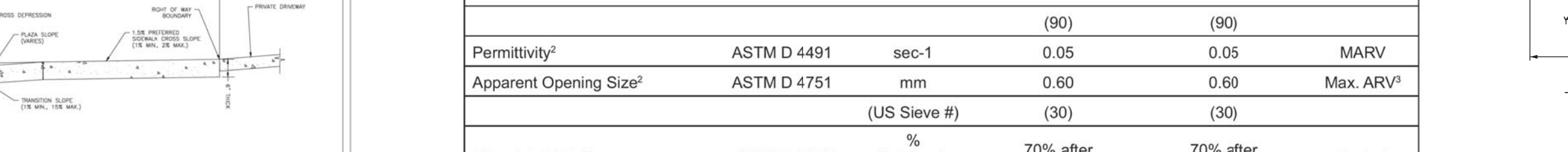
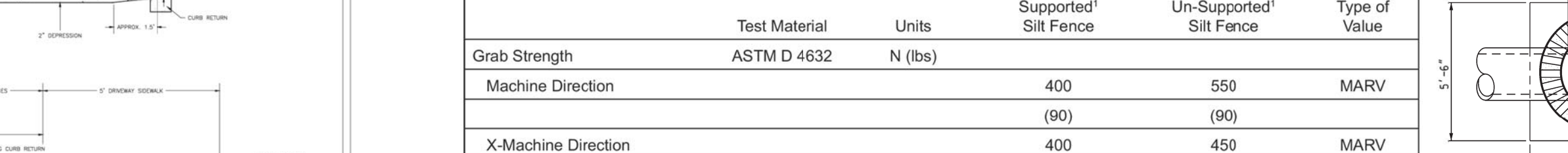
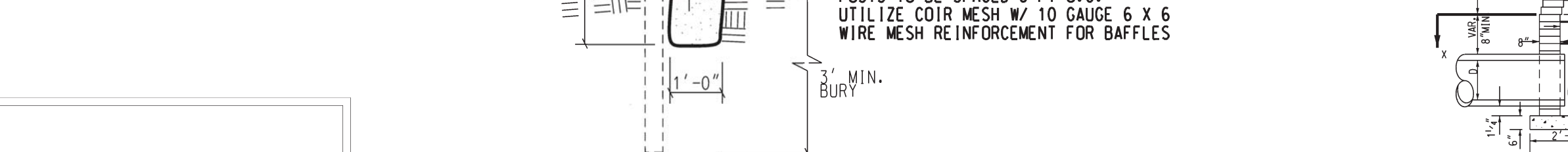
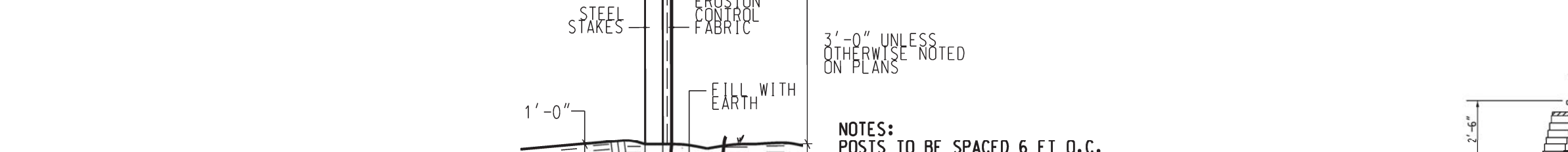
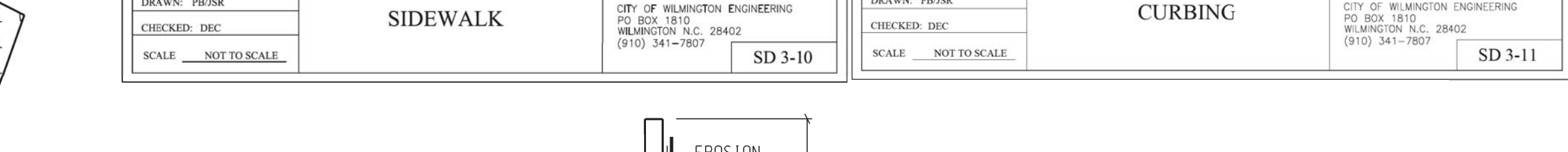
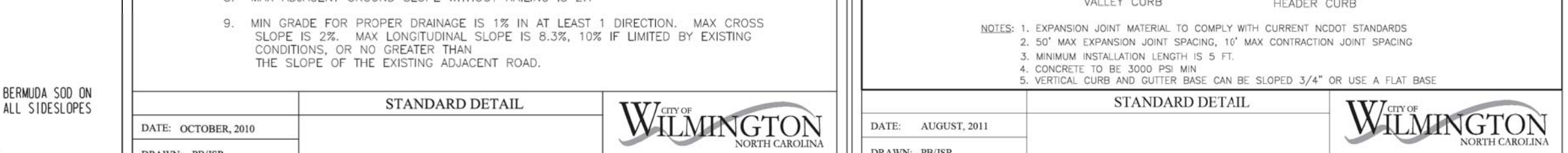
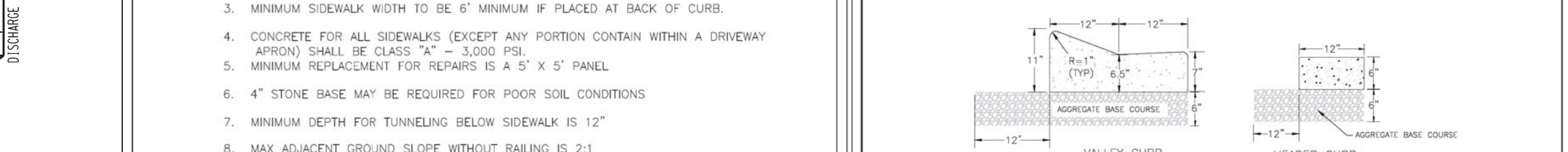
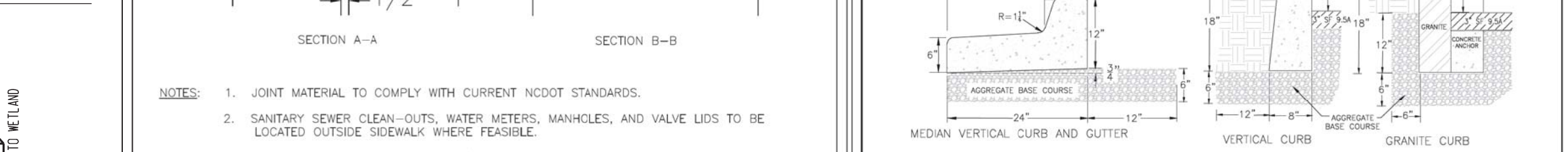
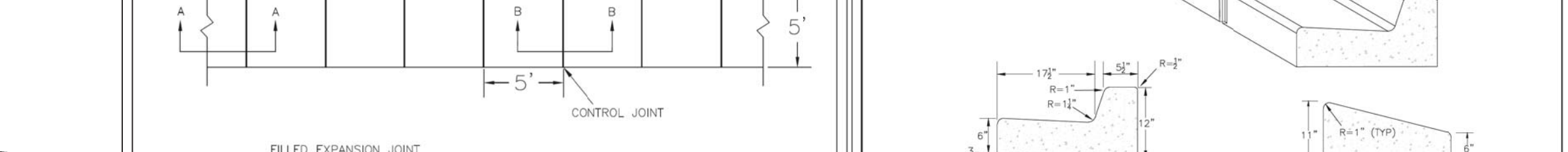
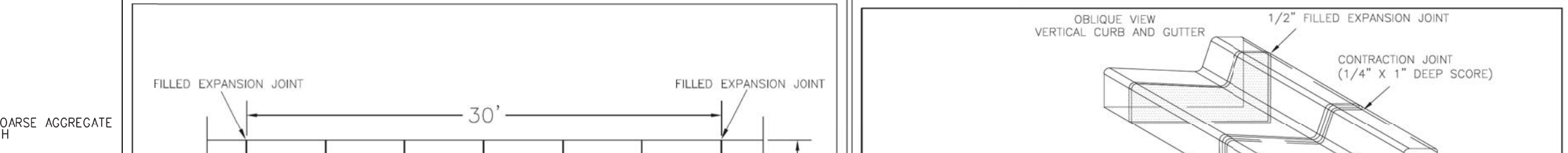
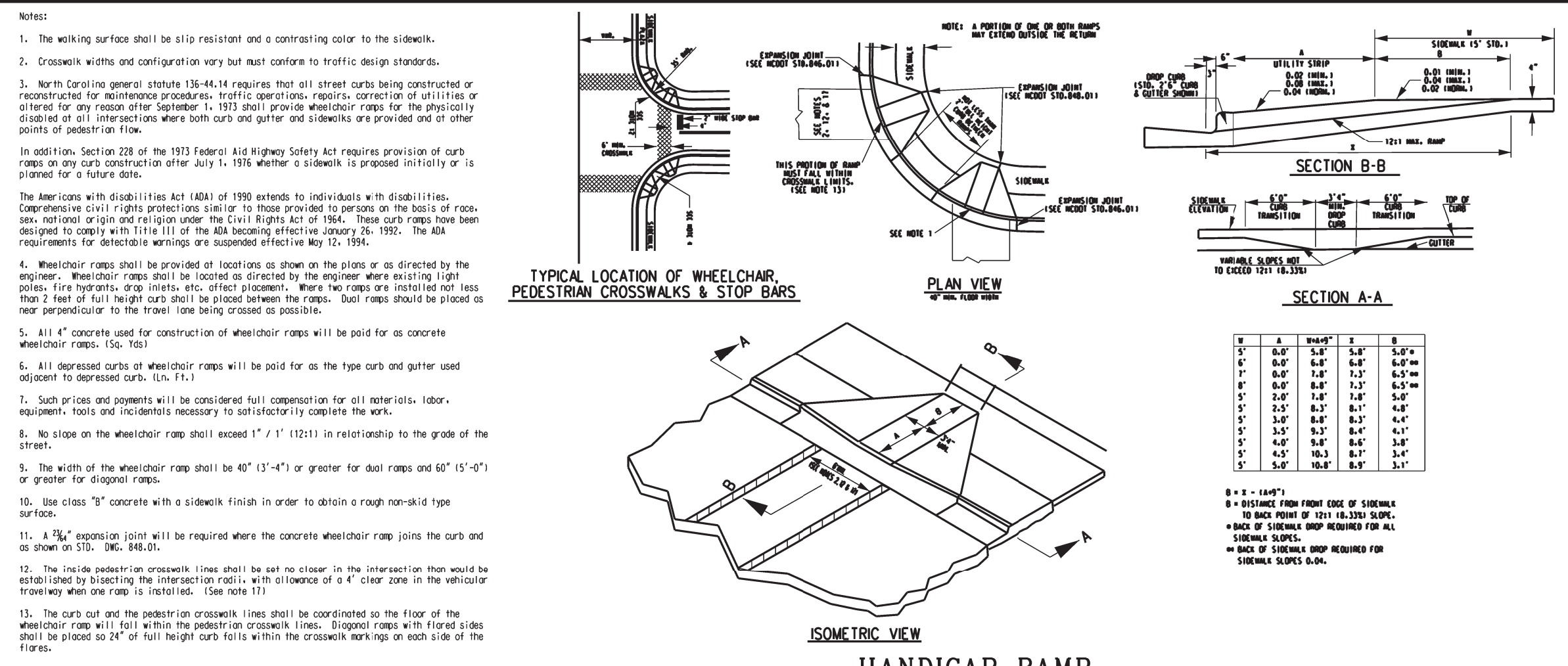
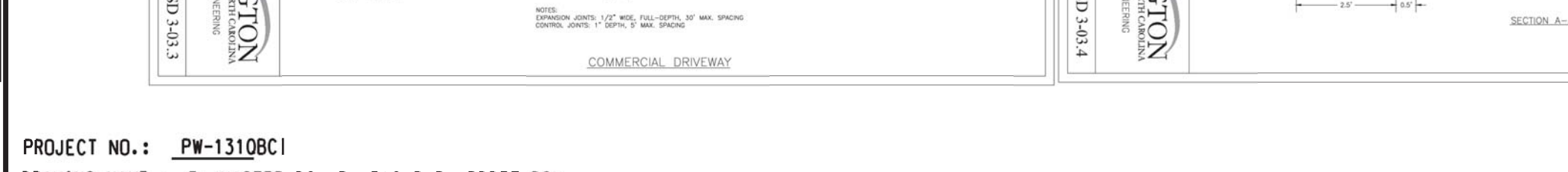
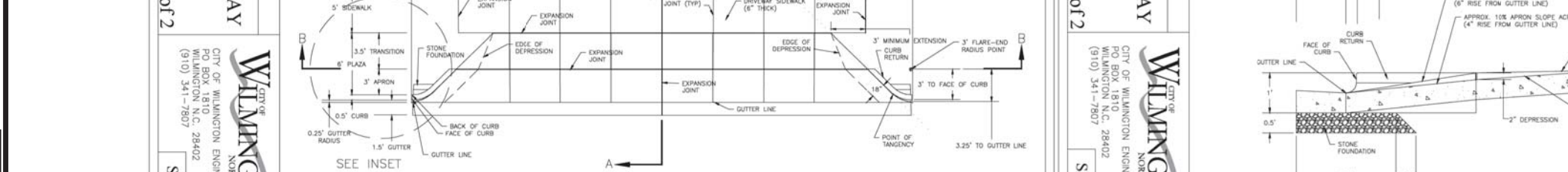
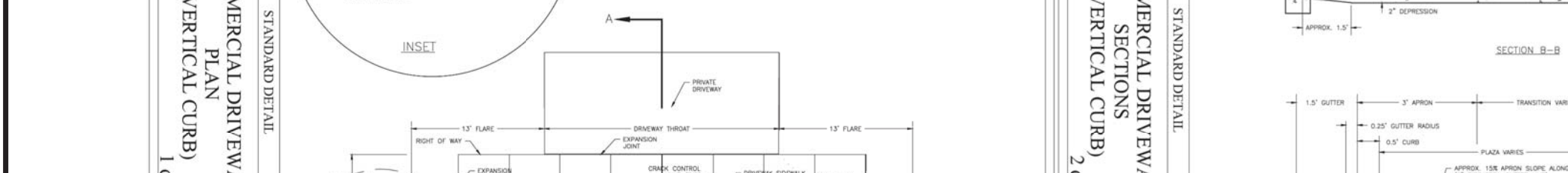
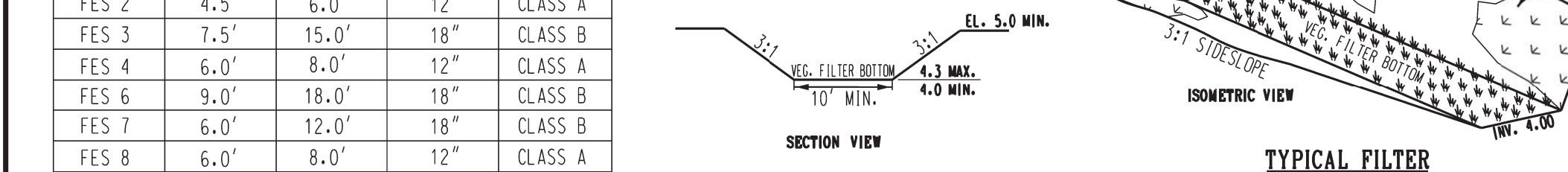
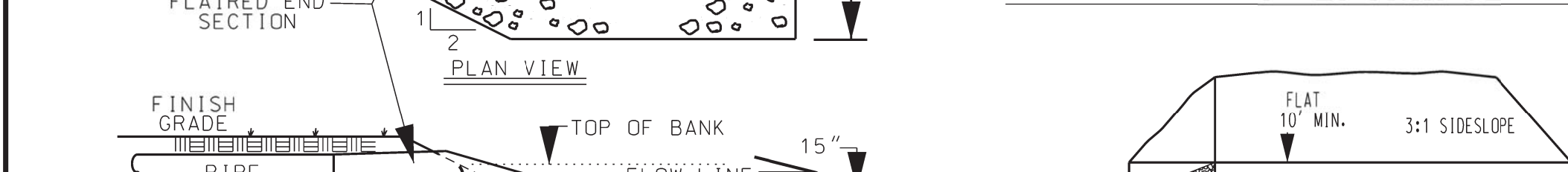
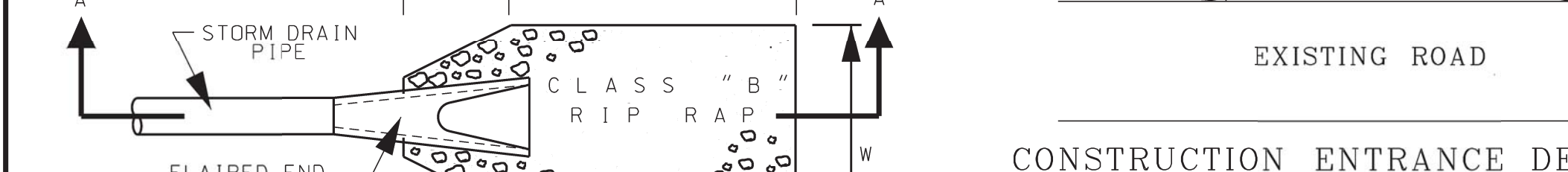
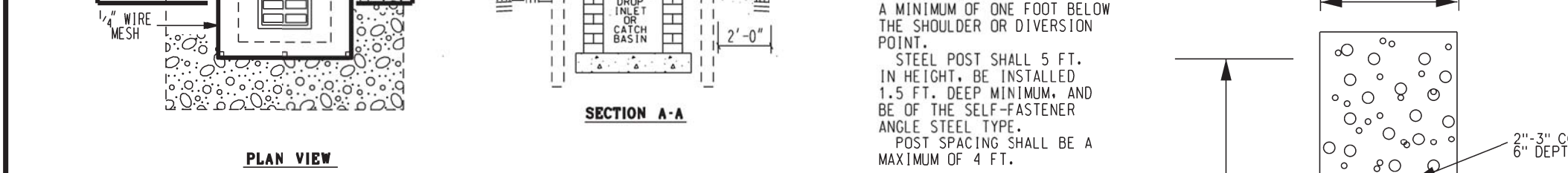
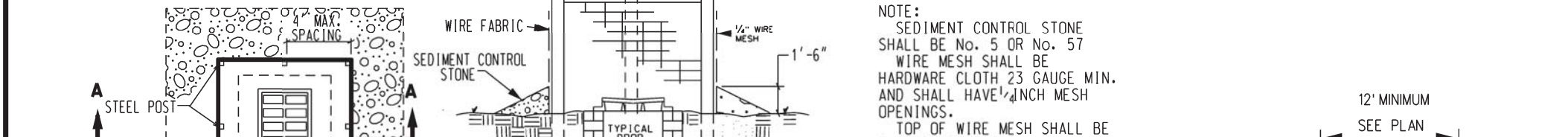
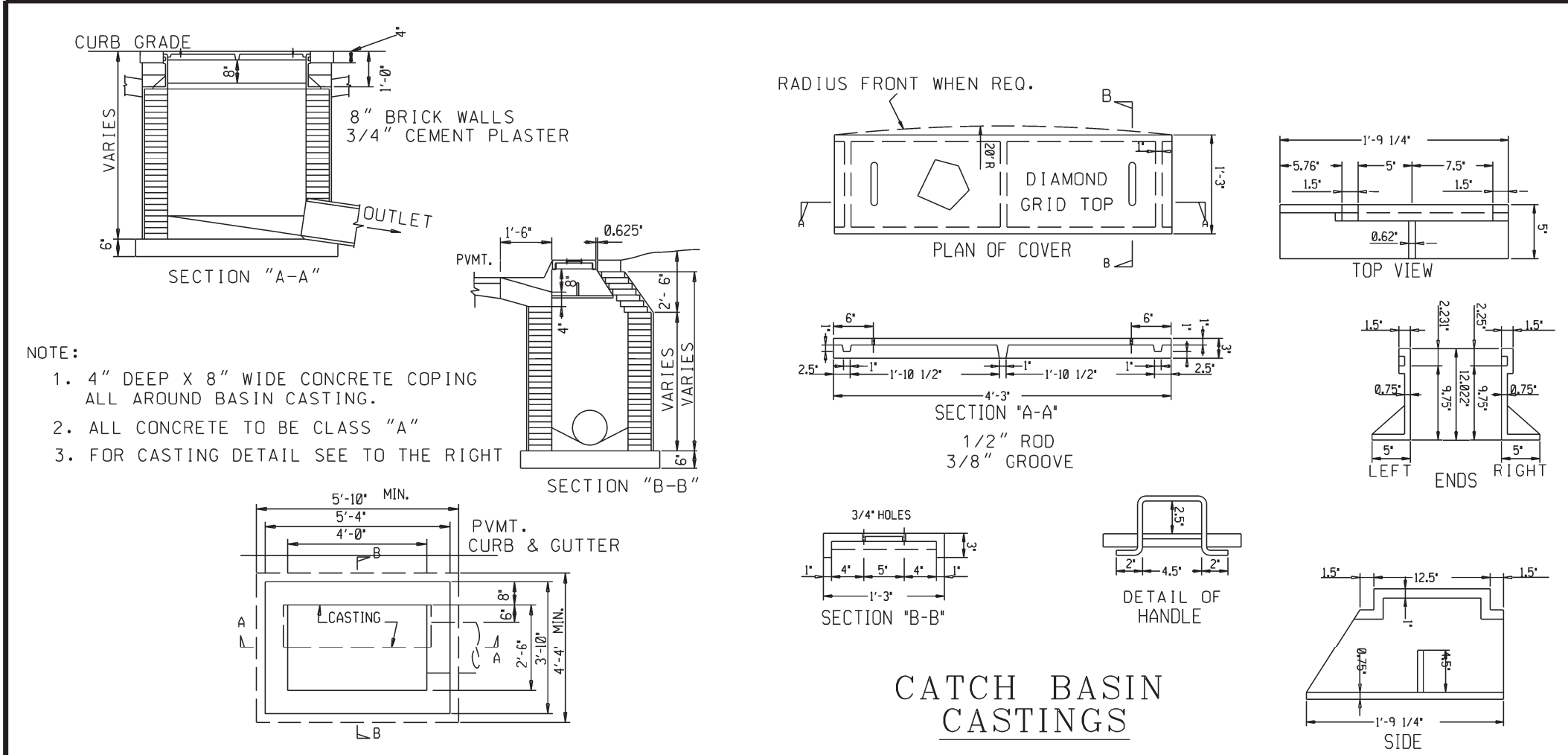
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DRAWING NAME: F:/MASTER/PW1310BC/DCN/LANDSCAP.DGN



JAMES H. PENTRESS, JR. P.E.
DATE: 7/1/2017

LANDSCAPE PLAN
THE MARSHES
PHASES 3, 4 & 5
WILMINGTON TOWNSHIP CITY OF WILMINGTON NORTH CAROLINA
OWNER: RIVERS EDGE I, LLC
ADDRESS: 1224 PEMBROKE JONES DRIVE WILMINGTON, NC 28045
PHONE: (910) 619-8814
DESIGNED: _____
DRAWN: _____
APPROVED: JHF
DATE: 6/15/2017
SCALE: 1" = 80'
SHEET 8 OF 9

STROUD ENGINEERING, P.A.
102 SUITE D CINEMA DRIVE WILMINGTON, NC 28403 (910) 815-0775



PERMANENT SEEDING TABLE 1

Seeding Dates	Recommended Planting	Rate (lb/ac)
Feb. 15 - Apr. 1	Tall Fescue Mixture	see table 2
Apr. 1 - Nov. 1	Hybrid Bermudagrass	see table 2
Apr. 1 - Jul. 15	Common Bermudagrass	see table 2
Mar. 1 - Jul. 1	Centipedeagrass	see table 2

PERMANENT SEEDING TABLE 2a-LOW MAINTENANCE MIXTURES

Site Description	Recommended Planting	Rate (lb/ac)
Well to poorly drained soils	Tall Fescue Mixture	80
	Pensacola Bahiagrass	50
	Kobe Lespedeza	40
Dry to well drained soils	Pensacola Bahiagrass	50
	Common Bermudagrass	30
	Kobe Lespedeza	10
	German Millet	10
Swales	Common Bermudagrass	40-80

PERMANENT SEEDING TABLE 2b-HIGH MAINTENANCE MIXTURES

Site Description	Recommended Planting	Rate (lb/ac)
Well to poorly drained soils	Tall Fescue Mixture	200
	Rye Grain	25
Dry to well drained soils	Hybrid Bermudagrass	50
Well drained sandy loam to sand, loams.	Centipedeagrass	10-20

TEMPORARY SEEDING TABLE

Seeding Dates	Recommended Planting	Rate (lb/ac)
Dec. 1 - Apr. 15	Kobe Lespedeza with Rye Grain	50
Apr. 15 - Aug. 15	Rye Grain	120
Aug. 15 - Dec. 1	Rye Grain	120

CONSTRUCTION SEQUENCE PHASE 1

- INSTALL SEDIMENT CONTROL MEASURES.
- CLEAR AND GRADE AREA OF POND AND SWALES.
- CLEAR & GRUB REMAINDER OF SITE.
- INSTALL UNDERGROUND UTILITIES IN PHASE 1 AND MULTIFAMILY.
- CONSTRUCT BUILDINGS.
- INSTALL CURB, GUTTER AND PAVE.
- PROVIDE 100% VEGETATIVE COVER OF ALL DISTURBED SOILS.

EROSION & SEDIMENT CONTROL MAINTENANCE PLAN

- All erosion and sediment control measures will be checked for stability and operation following every runoff-producing rainfall, but in no case, less than once every week and within 24 hours of every half inch rainfall.
- All points of egress will have construction entrances that will be periodically top-dressed with an additional 2 inches of #4 stone to maintain proper depth. They will be maintained in a condition to prevent mud or sediment from leaving the site. Immediately remove objectionable material spilled, washed or tracked onto the construction entrance or roadways.
- Sediment will be removed from hardware cloth and gravel inlet protection, block and gravel inlet protection, rock doughnut inlet protection and rock pipe inlet protection when the designed storage capacity has been half filled with sediment. Rock will be cleaned or replaced when the sediment pool no longer drains as designed. Debris will be removed from the rock and hardware cloth to allow proper drainage. Side stacks will be emptied once a week and after every rain event. Sediment will be removed from around wattles, beaver dams, dandy socks and socks once a week and after every rain event.
- Diversion ditches will be cleaned out immediately to remove sediment or obstructions from the flow area. The diversion ditches will also be repaired. Swales must be temporarily stabilized within 21 calendar days of cause of any phase of activity associated with a swale.
- Sediment will be removed from behind the sediment fence when it becomes half filled. The sediment fence will be repaired as necessary to maintain a barrier. Stakes must be steel. Stake spacing will be 8 feet max., with the use of extra strength fabric, without wire backing. Stake spacing will be 6 feet max., with the use of extra strength fabric, without wire backing. If rock filters are designed at low points in the sediment fence the rock will be repaired or replaced if it becomes half full of sediment, no longer drains as designed or is damaged.
- Sediment will be removed from sediment traps when the designed storage capacity has been half filled with sediment. The rock will be cleaned or replaced when the sediment pool no longer drains or when the rock is dislodged. Baffles will be repaired or replaced if they collapse, tear, decompose or become ineffective. They will be replaced promptly. Sediment will be removed when deposits reach half the height of the 1" baffle.
- Sediment will be removed from the sediment basin when the design storage capacity has been half filled with sediment. Rock will be cleaned or replaced when the sediment pool no longer drains or when the rock is dislodged. Baffles will be repaired or replaced if they collapse, tear, decompose or become ineffective. They will be replaced promptly. Sediment will be removed from baffles when deposits reach half the height of the 1" baffle. Floating skimmers will be inspected weekly and will be kept clean.
- All seeded areas will be fertilized, reseeded as necessary and mulched according to specifications in the vegetative plan to maintain a vigorous, dense vegetative cover. All slopes will be stabilized within 21 calendar days. All other areas will be stabilized within 15 working days.
- Flocculants will be used to address turbidity issues. The pumps, tanks, hoses and injection systems will be checked for problems or turbid discharges daily.

COASTAL PLAIN SITE STABILIZATION SCHEDULE

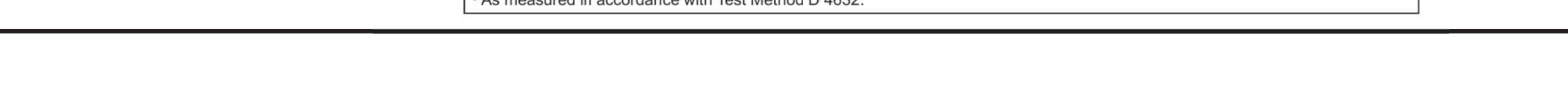
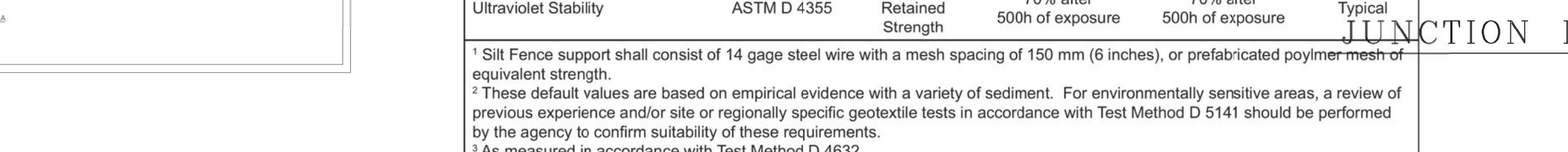
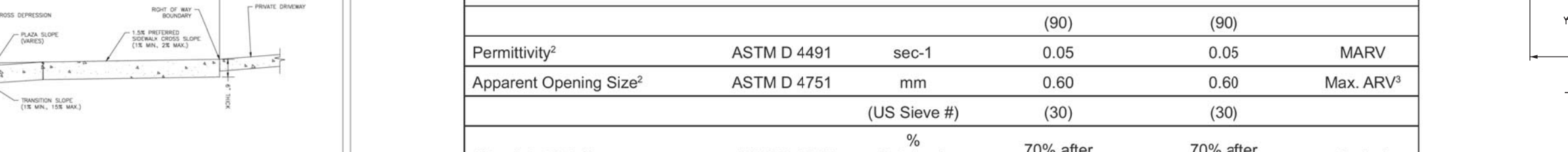
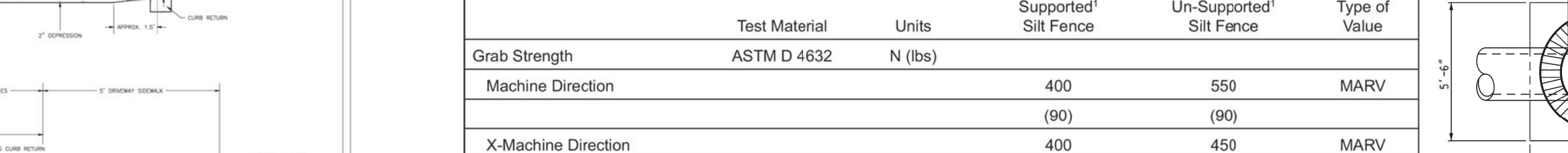
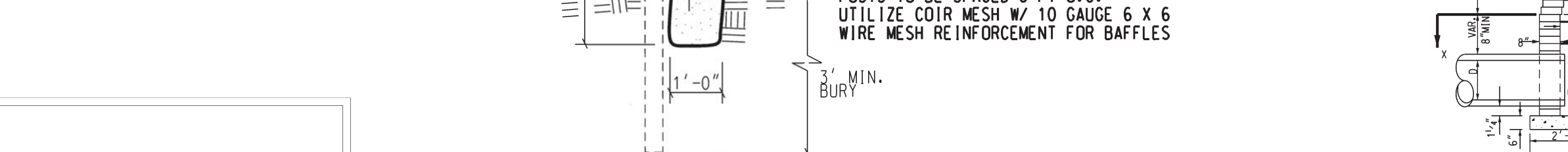
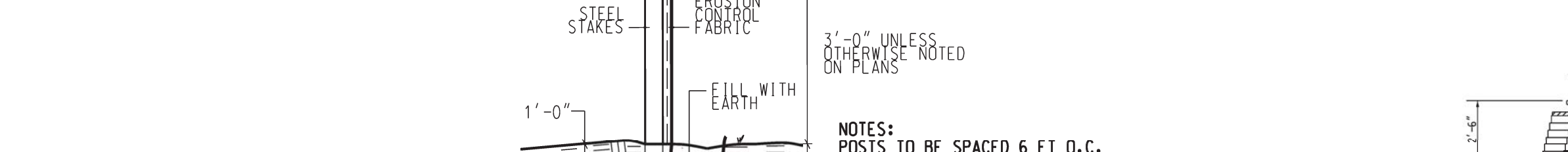
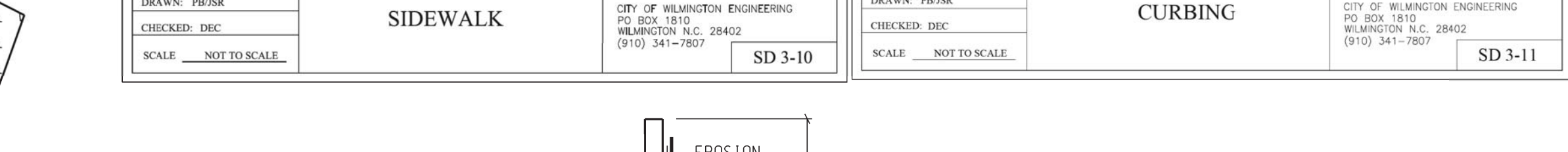
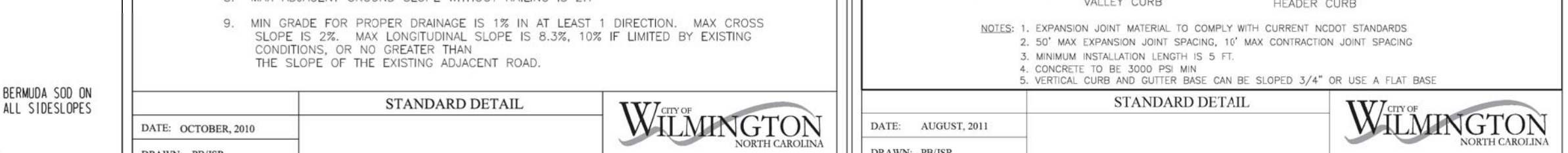
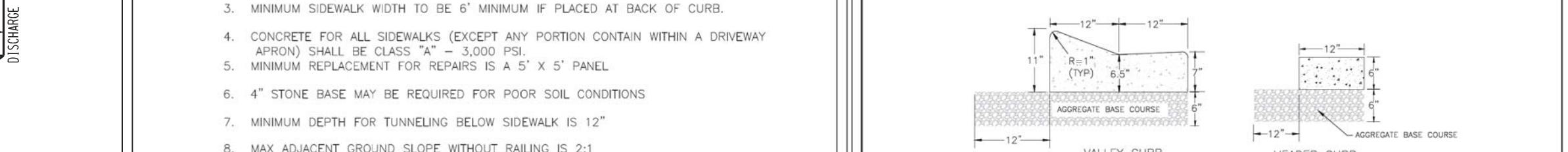
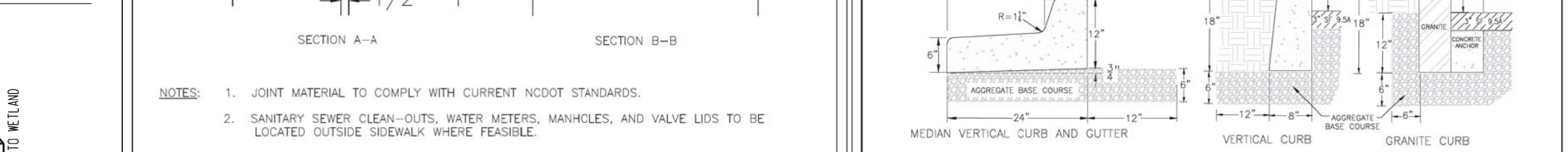
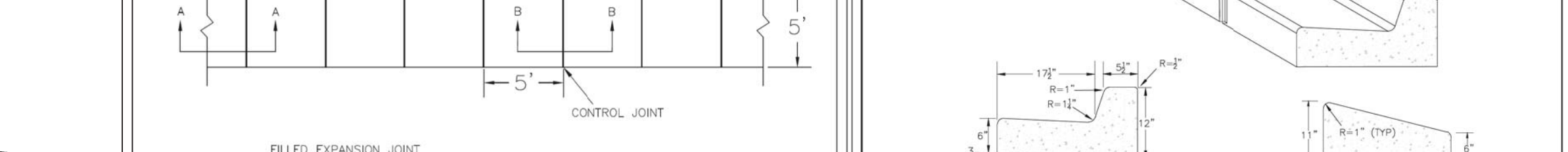
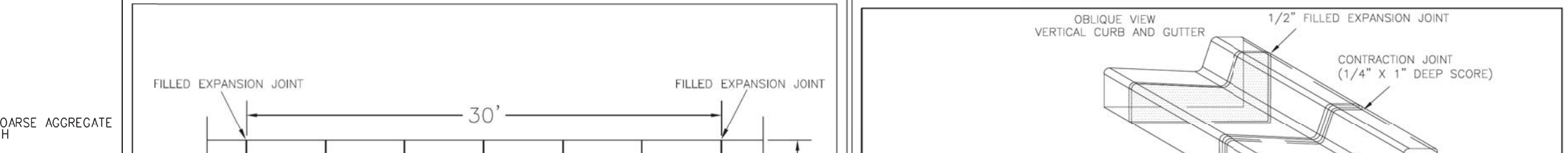
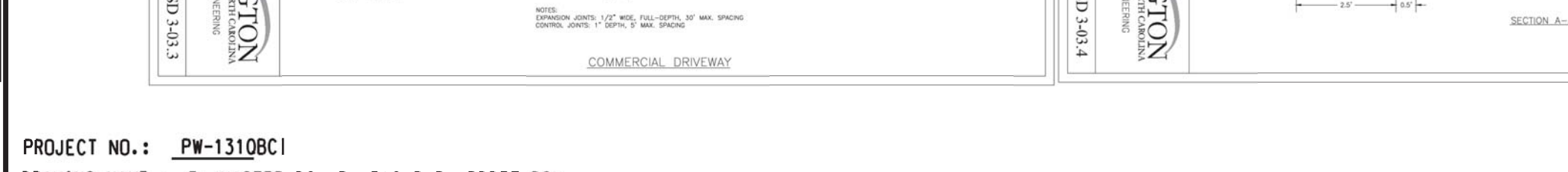
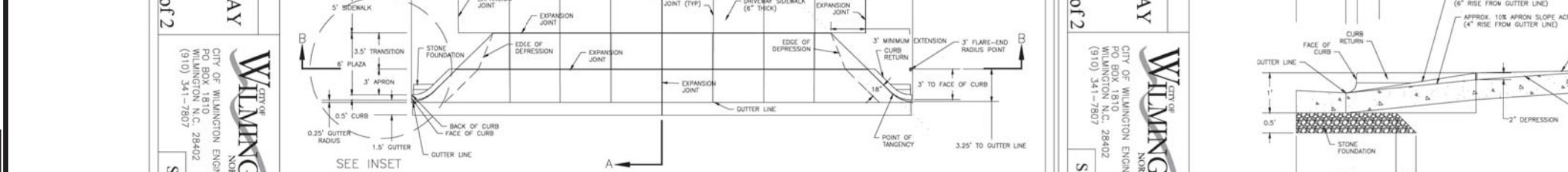
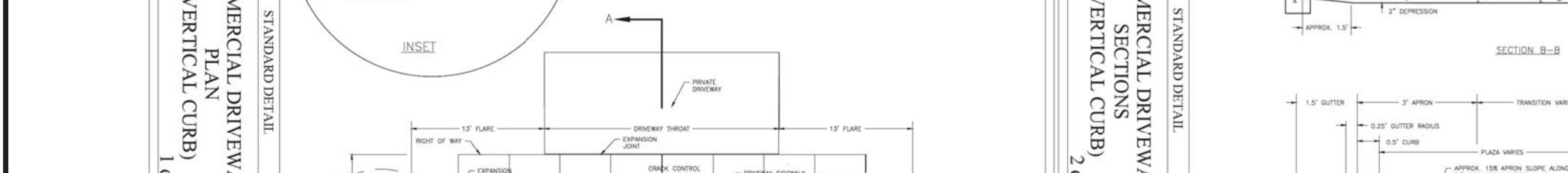
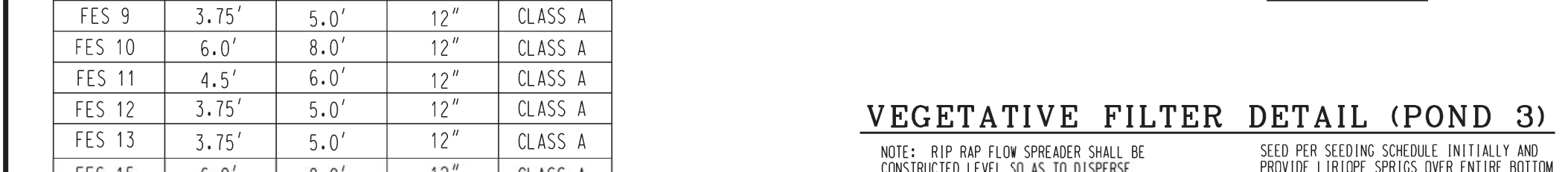
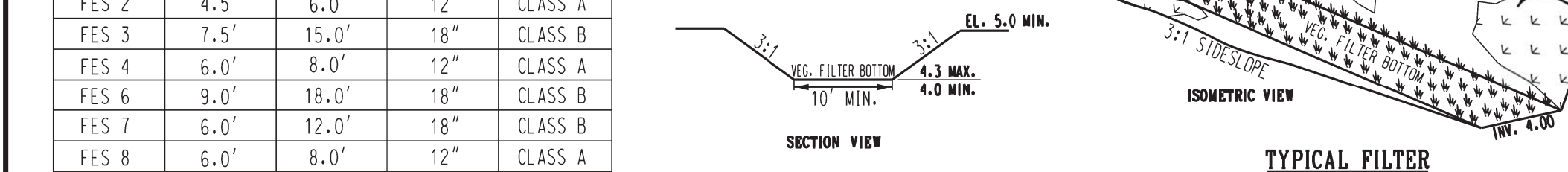
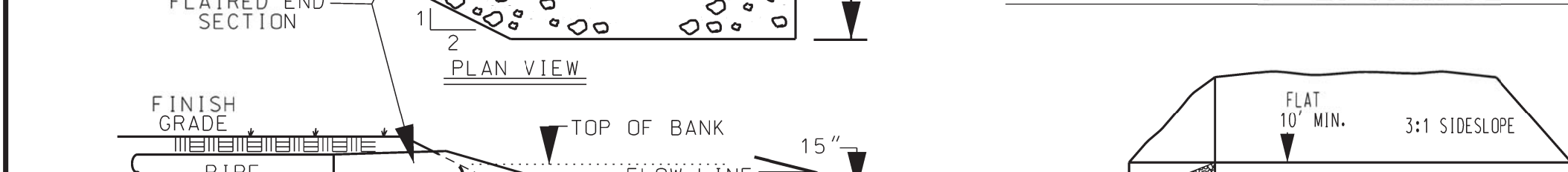
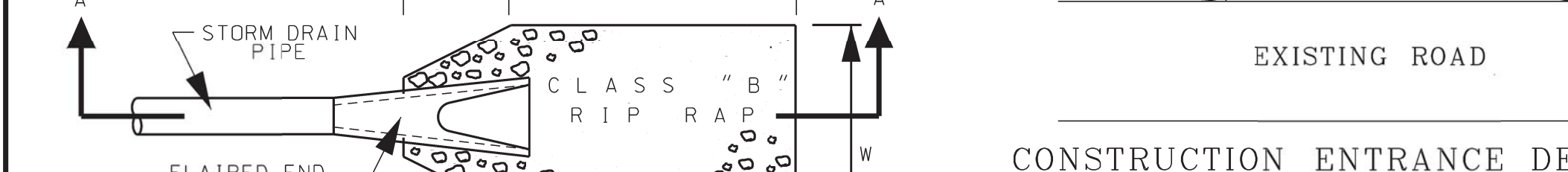
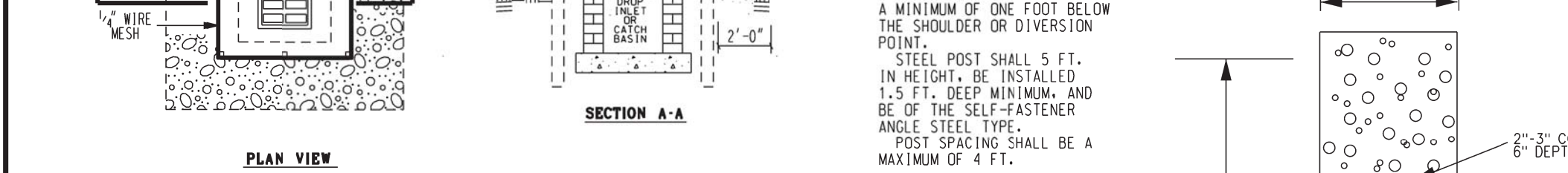
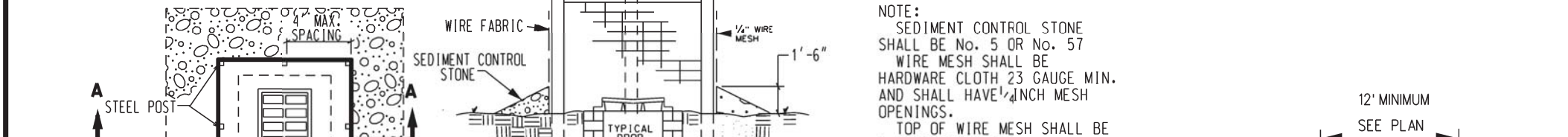
- Fertilize and lime per recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.
- Incorporate lime/fertilizer 4-6 inches.
- Roller strip slopes by tracked machinery.
- Select species based on season. Refer to tables.
- Broadcast seeds evenly and cover by raking or dragging a chain. Firm soil by rolling.
- Apply straw mulch at a rate 1-2 tons per acre. Anchor straw by racking with asphalt, netting, or a mulch anchoring tool.
- A disk with blades set nearly straight can be used as a mulch anchoring tool.
- Re-fertilize if growth is not fully adequate. Reseed, re-fertilize and mulch immediately following erosion or other damage.

SOD INSTALLATION

- Fertilize and lime per recommendations of soil tests or apply 100 lb/1,000 sf ground agricultural limestone and 25 lb/1,000 sf fertilizer. In the fall, use 10-10-10. In the spring, use 5-10-10.
- Incorporate lime/fertilizer 4-6 inches.
- Roll or harrow to achieve a smooth final grade.
- Roll to achieve a smooth, firm surface on which to lay the sod.
- Lightly rake and irrigate top layer of soil just prior to installation.
- Lay sod in a staggered, brick-like pattern with the longest dimension perpendicular to the slope. Avoid gaps. Use a knife to fit irregular shapes.
- Roll sod lightly after installation to ensure good soil to soil contact.
- Irrigate initially to wet soil to a depth of 4". Keep soil moist for 2-3 weeks thereafter or until sod has taken root.

For seeding outside of recommended dates and/or for temporary stabilization, refer to temporary seeding table.

For highly erosive areas or as directed by an engineer, sod shall be provided.



PERMANENT SEEDING TABLE 1

Seeding Dates	Recommended Planting	Rate (lb/ac)
Feb. 15 - Apr. 1	Tall Fescue Mixture	see table 2
Apr. 1 - Nov. 1	Hybrid Bermudagrass	see table 2
Apr. 1 - Jul. 15	Common Bermudagrass	see table 2
Mar. 1 - Jul. 1	Centipedeagrass	see table 2

PERMANENT SEEDING TABLE 2a-LOW MAINTENANCE MIXTURES

Site Description	Recommended Planting	Rate (lb/ac)
Well to poorly drained soils	Tall Fescue Mixture	80
	Pensacola Bahiagrass	50
	Kobe Lespedeza	40
Dry to well drained soils	Pensacola Bahiagrass	50
	Common Bermudagrass	30
	Kobe Lespedeza	10
	German Millet	10
Swales	Common Bermudagrass	40-80

PERMANENT SEEDING TABLE 2b-HIGH MAINTENANCE MIXTURES

Site Description	Recommended Planting	Rate (lb/ac)
Well to poorly drained soils	Tall Fescue Mixture	200
	Rye Grain	25
Dry to well drained soils	Hybrid Bermudagrass	50
Well drained sandy loam to sand, loams.	Centipedeagrass	10-20

TEMPORARY SEEDING TABLE

Seeding Dates	Recommended Planting	Rate (lb/ac)
Dec. 1 - Apr. 15	Kobe Lespedeza with Rye Grain	50
Apr. 15 - Aug. 15	Rye Grain	120
Aug. 15 - Dec. 1	Rye Grain	120

CONSTRUCTION SEQUENCE PHASE 1

- INSTALL SEDIMENT CONTROL MEASURES.
- CLEAR AND GRADE AREA OF POND AND SWALES.
- CLEAR & GRUB REMAINDER OF SITE.
- INSTALL UNDERGROUND UTILITIES IN PHASE 1 AND MULTIFAMILY.
- CONSTRUCT BUILDINGS.
- INSTALL CURB, GUTTER AND PAVE.
- PROVIDE 100% VEGETATIVE COVER OF ALL DISTURBED SOILS.

EROSION & SEDIMENT CONTROL MAINTENANCE PLAN

- All erosion and sediment control measures will be checked for stability and operation following every runoff-producing rainfall, but in no case, less than once every week and within 24 hours of every half inch rainfall.
- All points of egress will have construction entrances that will be periodically top-dressed with an additional 2 inches of #4 stone to maintain proper depth. They will be maintained in a condition to prevent mud or sediment from leaving the site. Immediately remove objectionable material spilled, washed or tracked onto the construction entrance or roadways.
- Sediment will be removed from hardware cloth and gravel inlet protection, block and gravel inlet protection, rock doughnut inlet protection and rock pipe inlet protection when the designed storage capacity has been half filled with sediment. Rock will be cleaned or replaced when the sediment pool no longer drains as designed. Debris will be removed from the rock and hardware cloth to allow proper drainage. Side stacks will be emptied once a week and after every rain event. Sediment will be removed from around wattles, beaver dams, dandy socks and socks once a week and after every rain event.
- Diversion ditches will be cleaned out immediately to remove sediment or obstructions from the flow area. The diversion ditches will also be repaired. Swales must be temporarily stabilized within 21 calendar days of cause of any phase of activity associated with a swale.
- Sediment will be removed from behind the sediment fence when it becomes half filled. The sediment fence will be repaired as necessary to maintain a barrier. Stakes must be steel. Stake spacing will be 8 feet max., with the use of extra strength fabric, without wire backing. Stake spacing will be 6 feet max., with the use of extra strength fabric, without wire backing. If rock filters are designed at low points in the sediment fence the rock will be repaired or replaced if it becomes half full of sediment, no longer drains as designed or is damaged.
- Sediment will be removed from sediment traps when the designed storage capacity has been half filled with sediment. The rock will be cleaned or replaced when the sediment pool no longer drains or when the rock is dislodged. Baffles will be repaired or replaced if they collapse, tear, decompose or become ineffective. They will be replaced promptly. Sediment will be removed when deposits reach half the height of the 1" baffle.
- Sediment will be removed from the sediment basin when the design storage capacity has been half filled with sediment. Rock will be cleaned or replaced when the sediment pool no longer drains or when the rock is dislodged. Baffles will be repaired or replaced if they collapse, tear, decompose or become ineffective. They will be replaced promptly. Sediment will be removed from baffles when deposits reach half the height of the 1" baffle. Floating skimmers will be inspected weekly and will be kept clean.
- All seeded areas will be fertilized, reseeded as necessary and mulched according to specifications in the vegetative plan to maintain a vigorous, dense vegetative cover. All slopes will be stabilized within 21 calendar days. All other areas will be stabilized within 15 working days.
- Flocculants will be used to address turbidity issues. The pumps, tanks, hoses and injection systems will be checked for problems or turbid discharges daily.

COASTAL PLAIN SITE STABILIZATION SCHEDULE

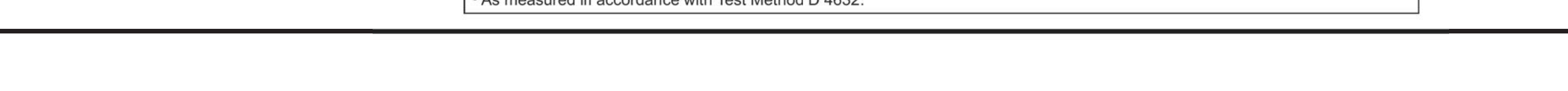
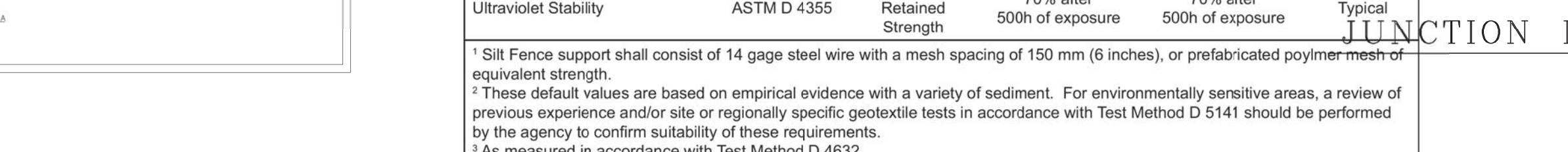
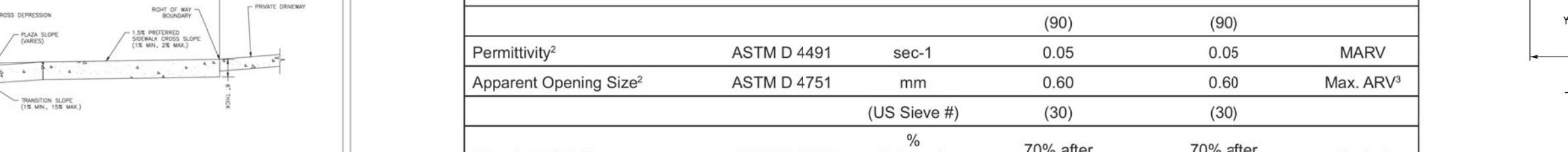
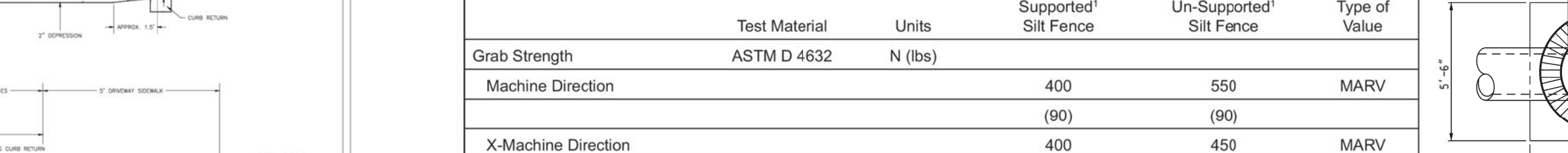
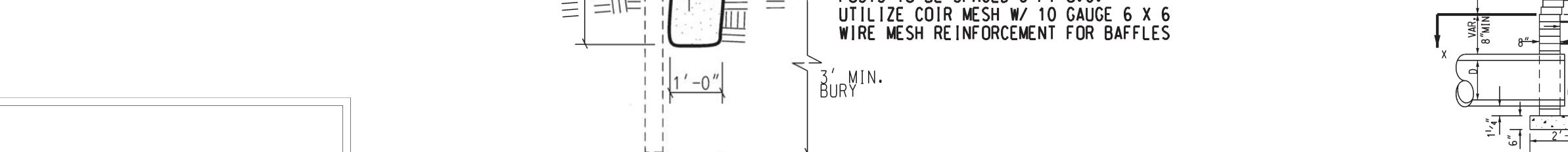
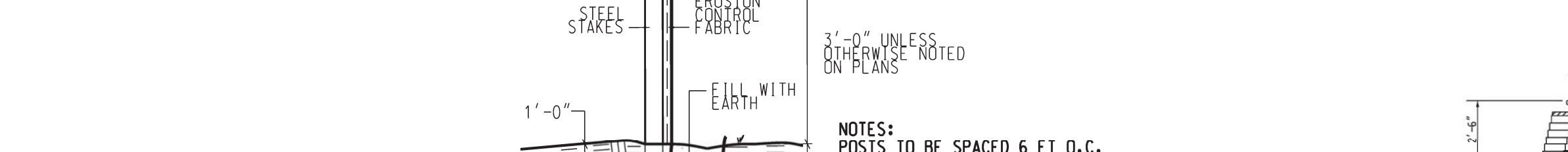
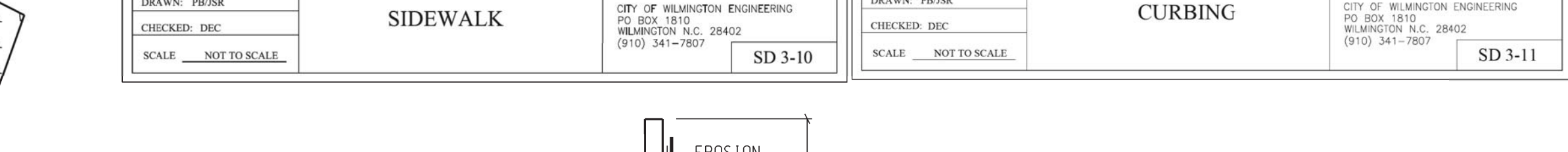
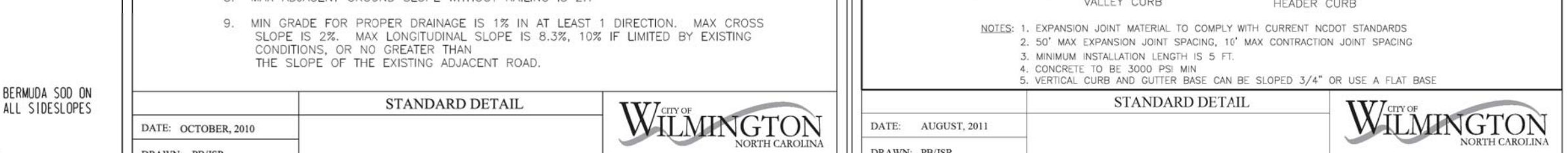
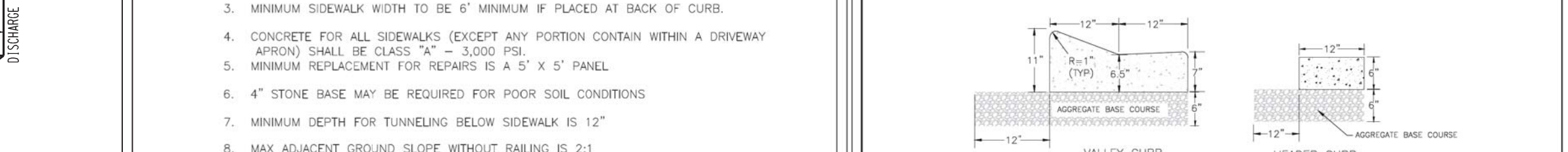
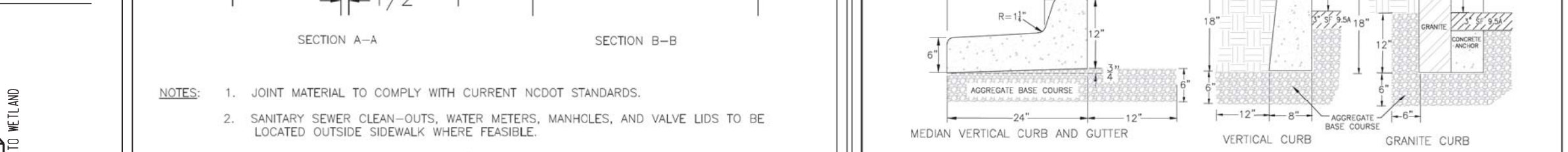
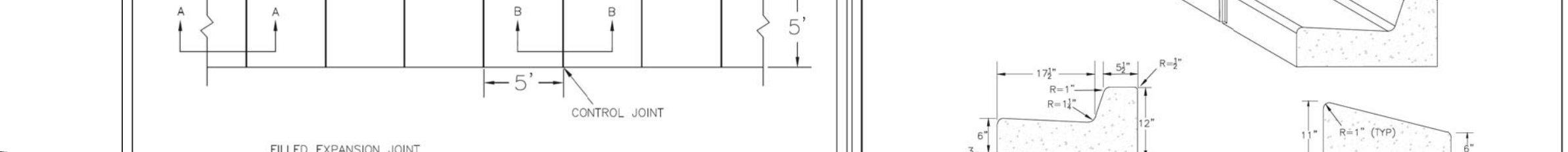
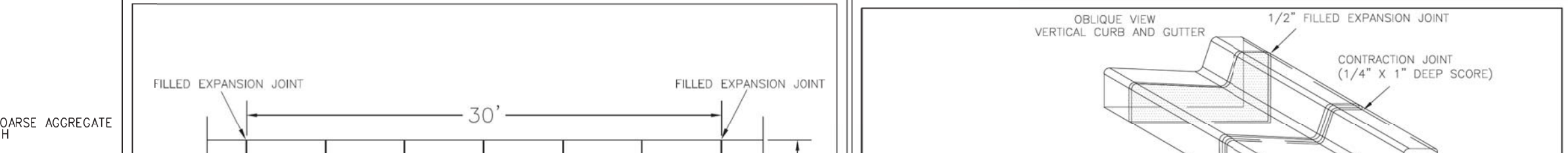
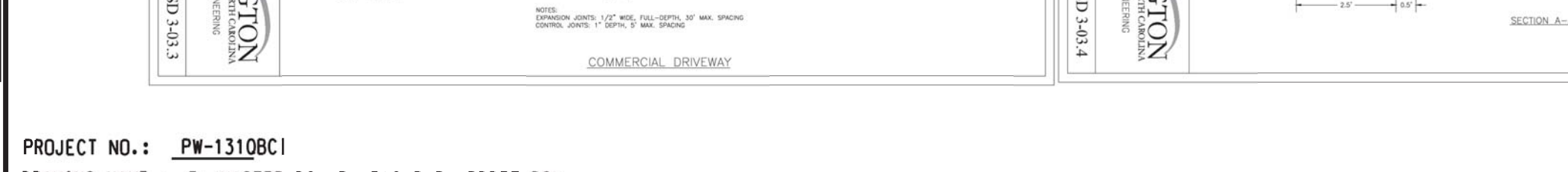
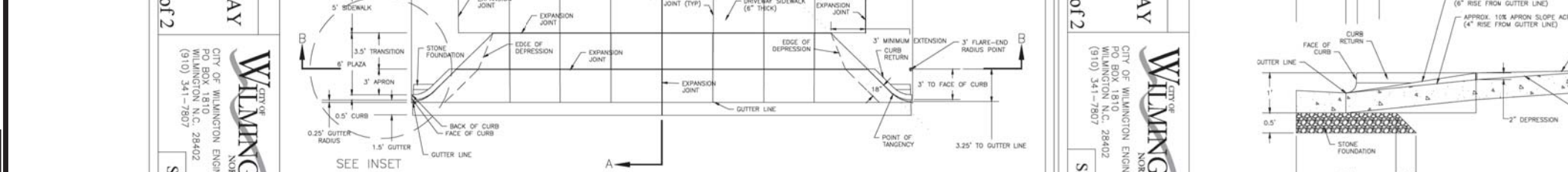
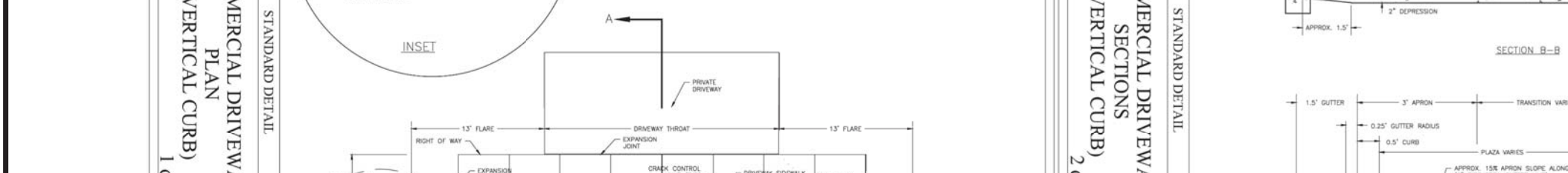
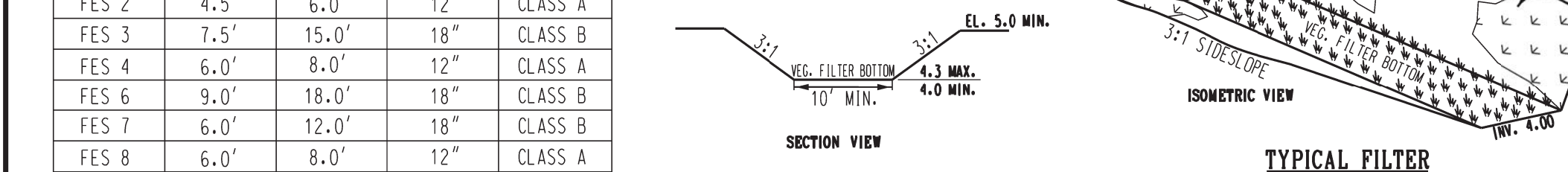
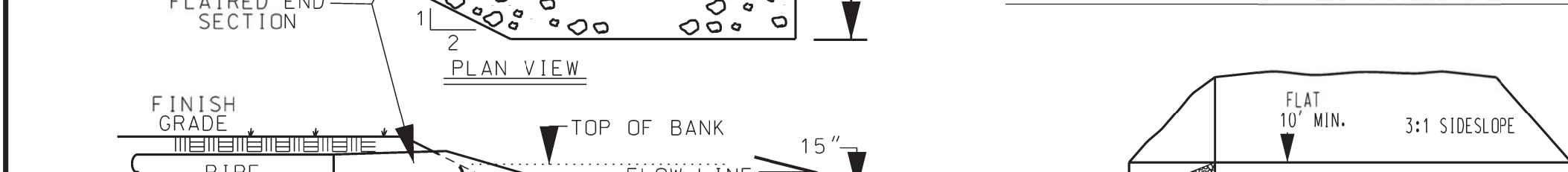
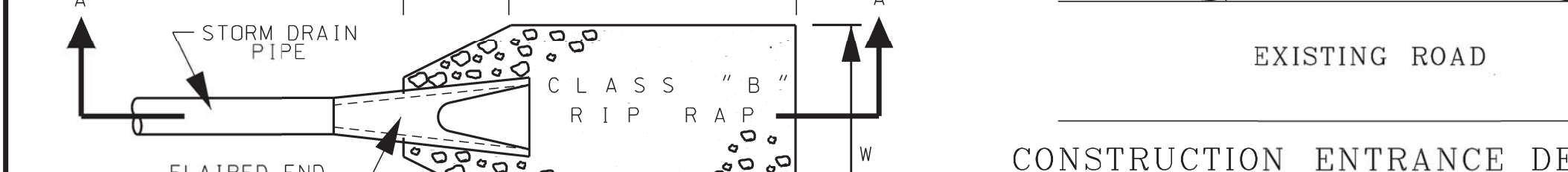
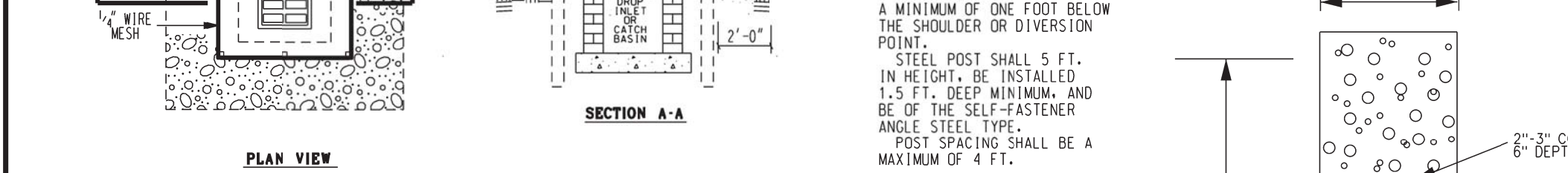
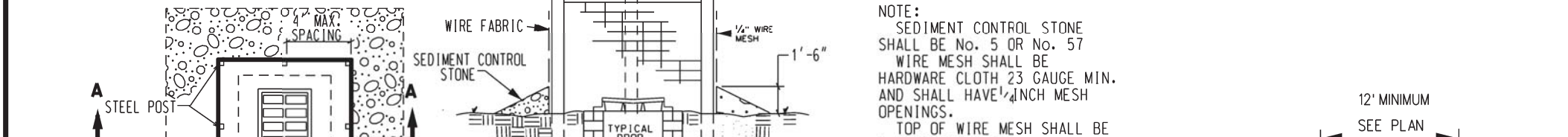
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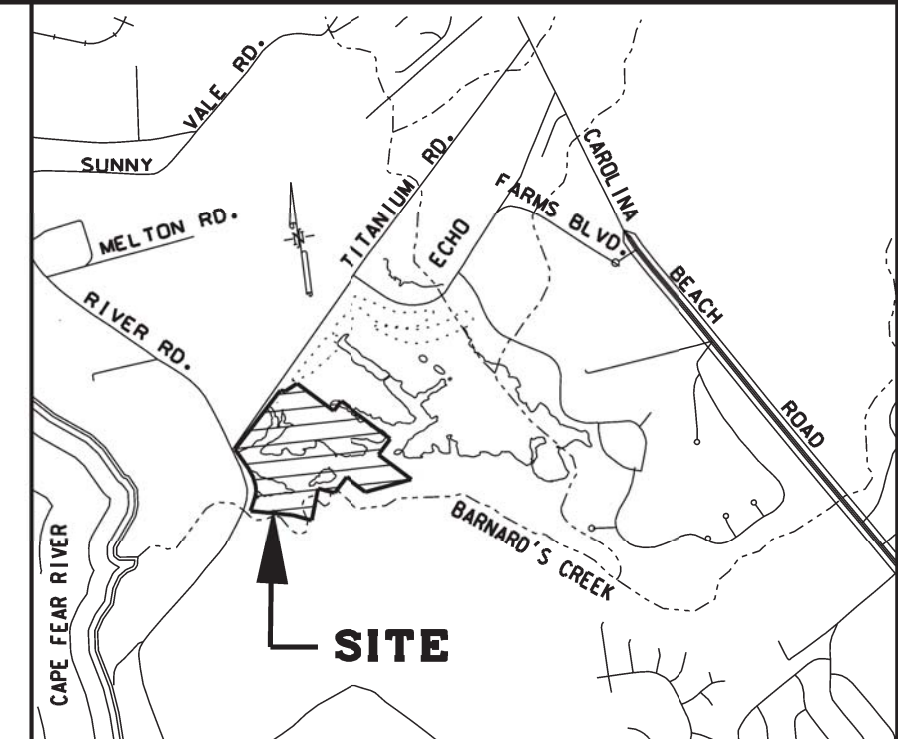
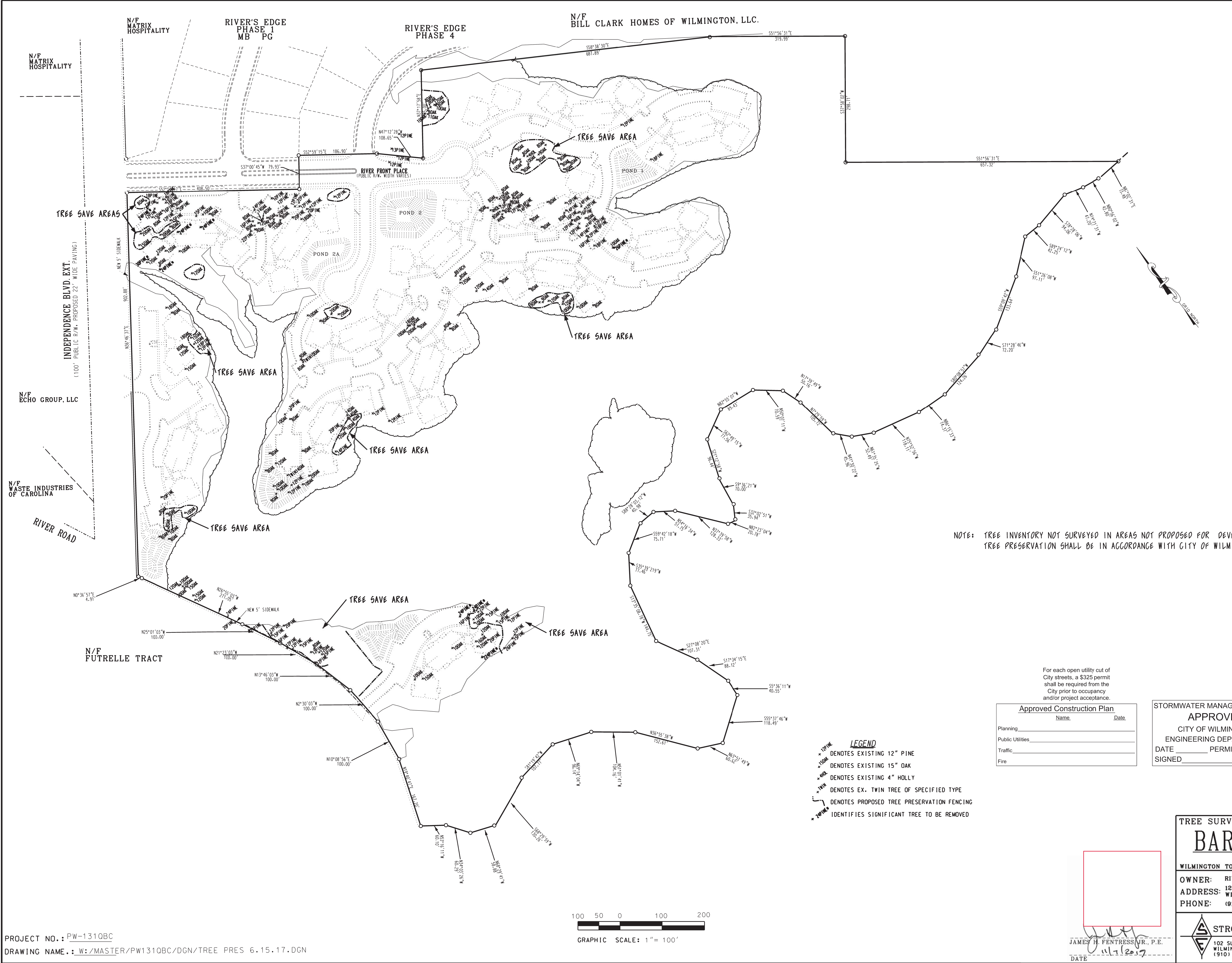
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- All seeded areas will be fertilized, re

PROJECT NO. : PW-1310BC
CITY OF WILMINGTON TREE PRESERVATION PLAN



VICINITY MAP

N.T.S.

TOTAL AREA	57.11 AC.
AREA IN BARNARD'S CREEK RUN	+/- 2 AC.
AREA FOR DENSITY CALCULATION	55.11 AC.
TOTAL NUMBER OF REGULATED DECIDUOUS TREES	87
TOTAL NUMBER OF REGULATED CONIFEROUS TREES	142
TOTAL NUMBER OF REGULATED FLOWERING TREES	5
TOTAL NUMBER OF TREES ON PROPERTY	234
TOTAL NUMBER OF SIGNIFICANT TREES (24" DIA.)	12
TOTAL NUMBER OF REGULATED TREES REMOVED	163
TOTAL NUMBER OF SIGNIFICANT TREES REMOVED	71
TOTAL NUMBER OF SIGNIFICANT TREES SAVED	8
MITIGATION REQUIREMENT	400 IN.
MINIMUM 3" REPLACEMENT TREES	133

TREE DATA

NOTE: TREE INVENTORY NOT SURVEYED IN AREAS NOT PROPOSED FOR DEVELOPMENT.
TREE PRESERVATION SHALL BE IN ACCORDANCE WITH CITY OF WILMINGTON SPECIFICATIONS

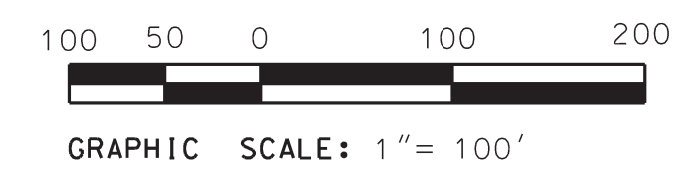
For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.

Approved Construction Plan	
Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

STORMWATER MANAGEMENT PLAN APPROVED	
CITY OF WILMINGTON	
ENGINEERING DEPARTMENT	
DATE	PERMIT #
SIGNED	

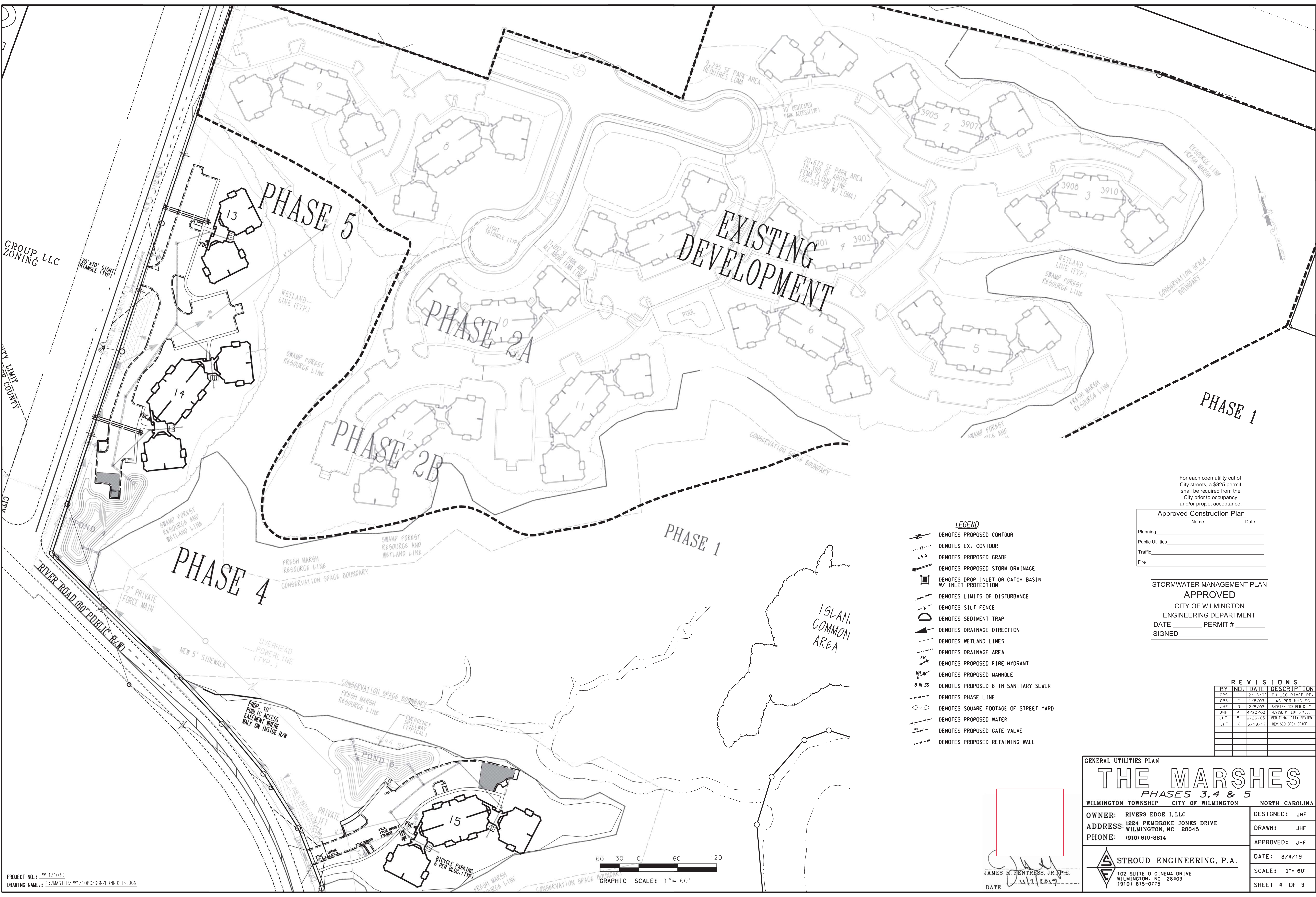
REVISIONS			
BY	NO.	DATE	DESCRIPTION
JHF	1	2/20/03	PER CITY

- LEGEND**
- + 12PINE DENOTES EXISTING 12" PINE
 - + 15OAK DENOTES EXISTING 15" OAK
 - + 4HOLLY DENOTES EXISTING 4" HOLLY
 - + TWIN DENOTES EX. TWIN TREE OF SPECIFIED TYPE
 - DENOTES PROPOSED TREE PRESERVATION FENCING
 - + 24PINE IDENTIFIES SIGNIFICANT TREE TO BE REMOVED

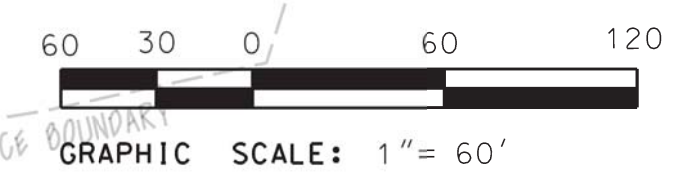


JAMES H. FENTRESS, P.E.
 DATE: 1/17/2019

TREE SURVEY		
BARNARD'S LANDING		
AT ECHO FARMS		
WILMINGTON TOWNSHIP	CITY OF WILMINGTON	NORTH CAROLINA
OWNER: RIVERS EDGE I, LLC	DESIGNED: JHF	
ADDRESS: 1224 PEMBROKE JONES DRIVE	DRAWN: JHF	
WILMINGTON, NC 28045	APPROVED: JHF	
PHONE: (910) 619-8814	DATE: 7/11/02	
STROUD ENGINEERING, P.A.		SCALE: 1" = 100'
102 SUITE D CINEMA DRIVE		SHEET 7 OF 9
WILMINGTON, NC 28403		
(910) 815-0775		



PROJECT NO.: PW-1310BC
 DRAWING NAME: F:/MASTER/PW1310BC/DCN/BRNRSH3.DGN



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

Approved Construction Plan

Name: _____ Date: _____

Planning: _____

Public Utilities: _____

Traffic: _____

Fire: _____

STORMWATER MANAGEMENT PLAN APPROVED

CITY OF WILMINGTON
 ENGINEERING DEPARTMENT

DATE: _____ PERMIT #: _____

SIGNED: _____

- LEGEND**
- DENOTES PROPOSED CONTOUR
 - DENOTES EX. CONTOUR
 - DENOTES PROPOSED GRADE
 - DENOTES PROPOSED STORM DRAINAGE
 - DENOTES DROP INLET OR CATCH BASIN W/ INLET PROTECTION
 - DENOTES LIMITS OF DISTURBANCE
 - DENOTES SILT FENCE
 - DENOTES SEDIMENT TRAP
 - DENOTES DRAINAGE DIRECTION
 - DENOTES WETLAND LINES
 - DENOTES DRAINAGE AREA
 - DENOTES PROPOSED FIRE HYDRANT
 - DENOTES PROPOSED MANHOLE
 - DENOTES PROPOSED 8 IN SANITARY SEWER
 - DENOTES PHASE LINE
 - DENOTES SQUARE FOOTAGE OF STREET YARD
 - DENOTES PROPOSED WATER
 - DENOTES PROPOSED GATE VALVE
 - DENOTES PROPOSED RETAINING WALL

REVISIONS

BY	NO.	DATE	DESCRIPTION
CPS	1	12/18/02	FH LEG RIVER RD.
CPS	2	1/8/03	AS PER NHC EC
JHF	3	2/5/03	SHORTEN CDS PER CITY
JHF	4	4/23/03	REVISE PL LOT GRADERS
JHF	5	6/28/03	PER FINAL CITY REVIEW
JHF	6	5/19/11	REVISED OPEN SPACE

GENERAL UTILITIES PLAN

THE MARSHES

PHASES 3, 4 & 5

WILMINGTON TOWNSHIP CITY OF WILMINGTON NORTH CAROLINA

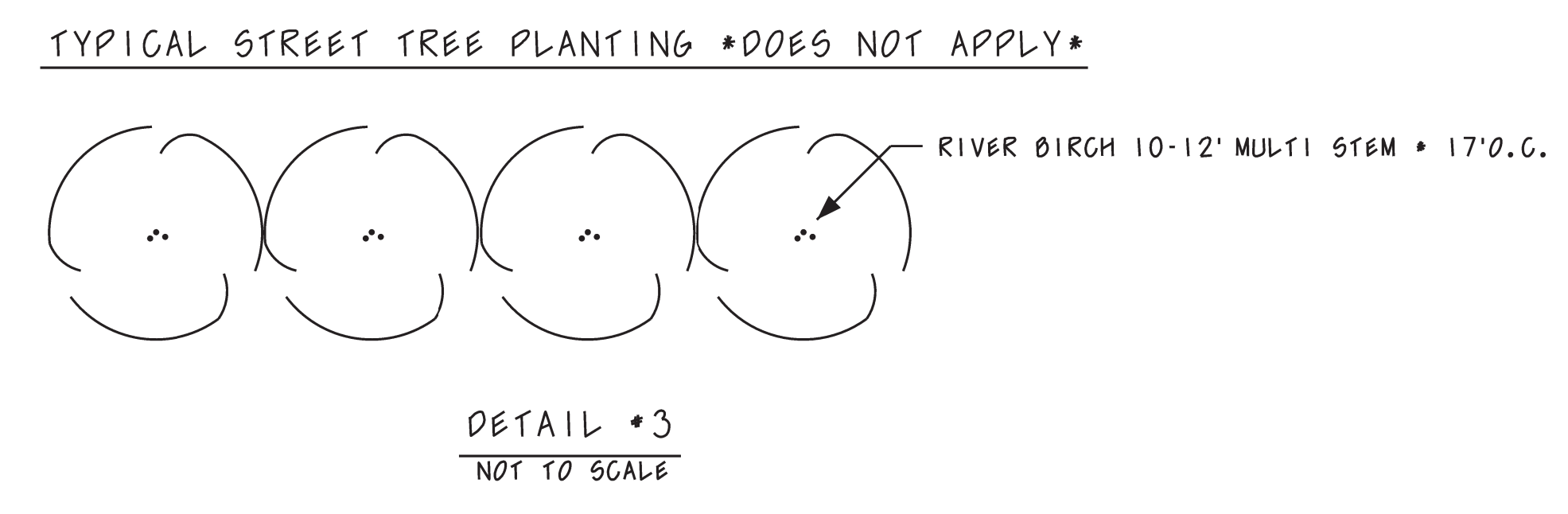
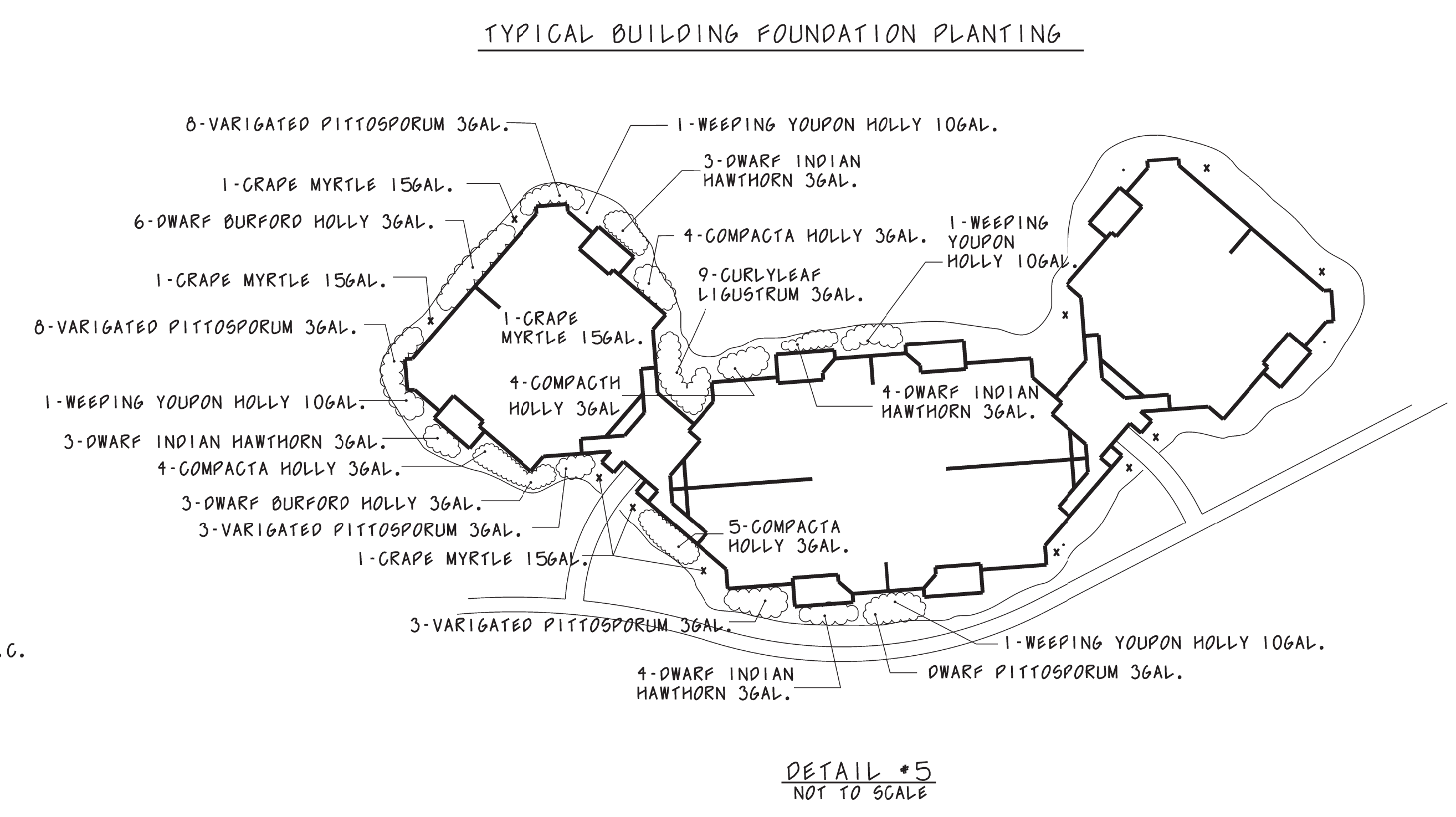
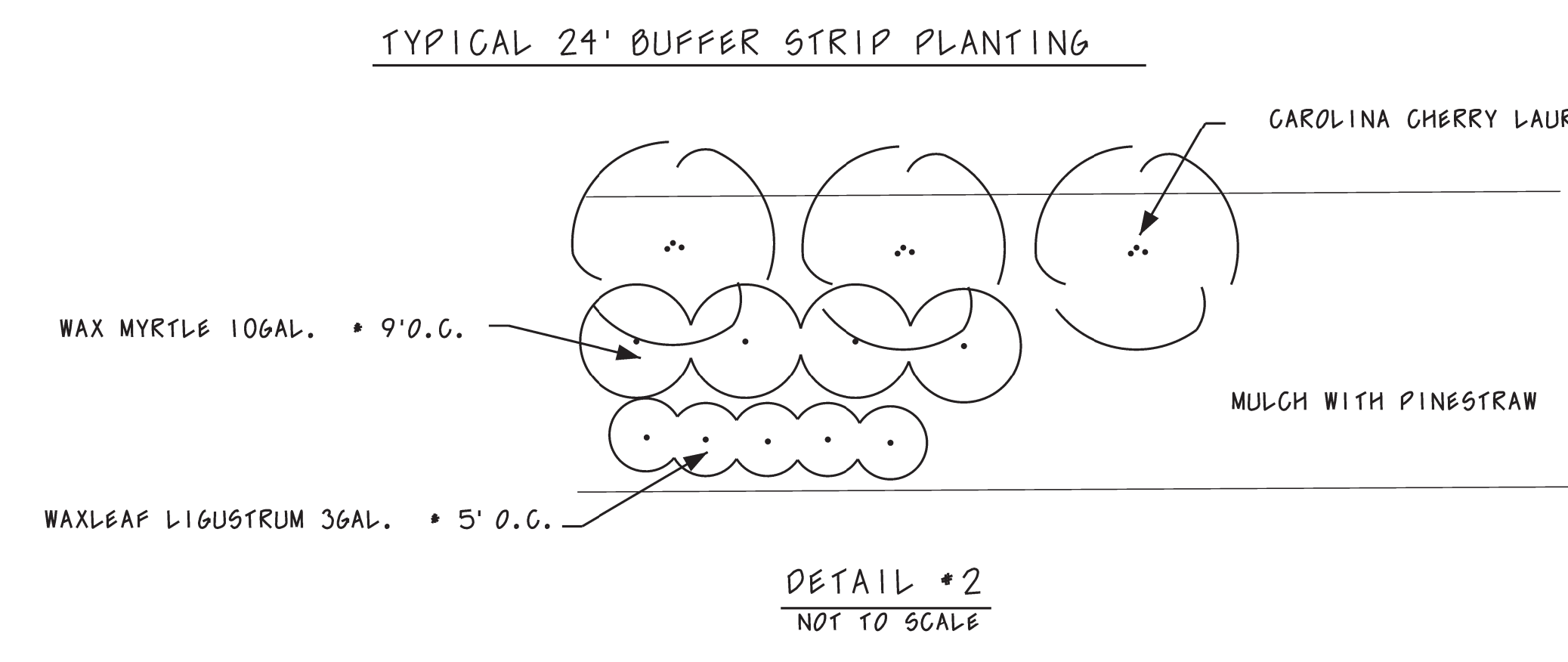
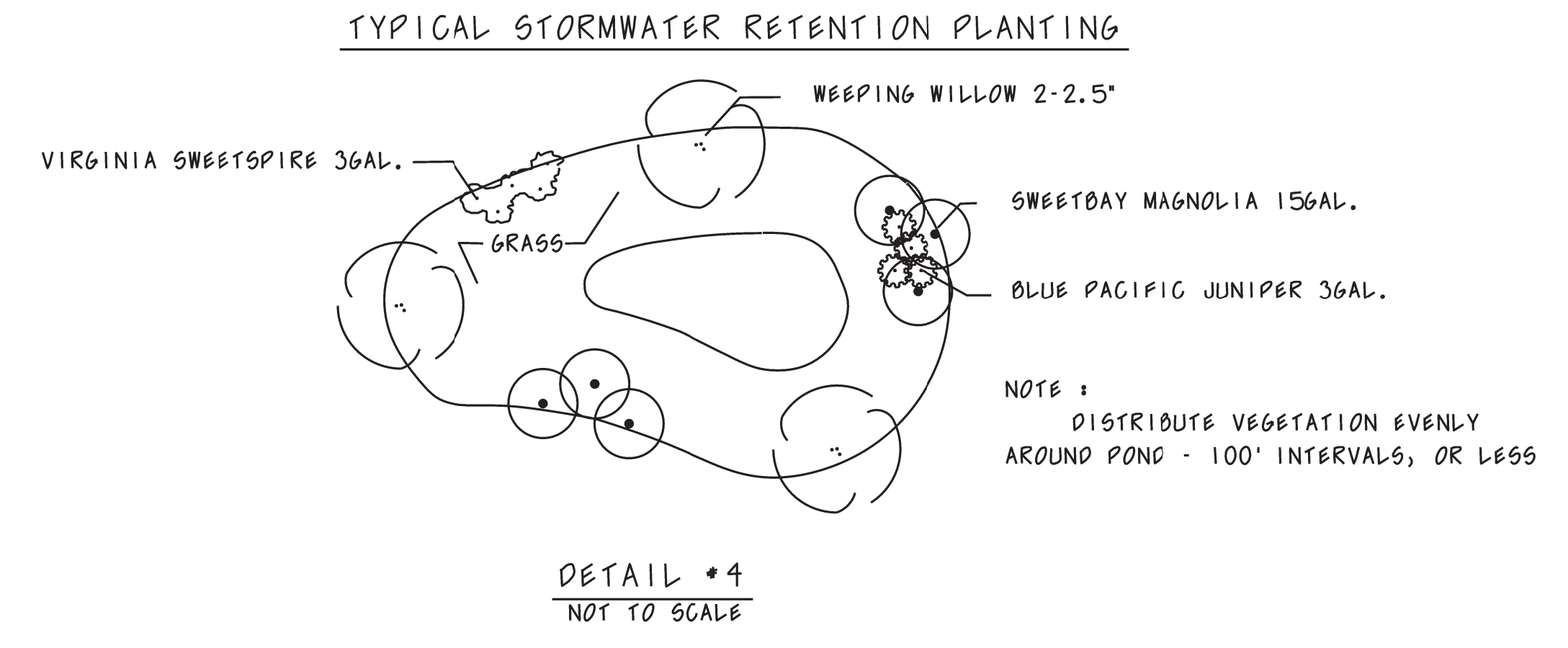
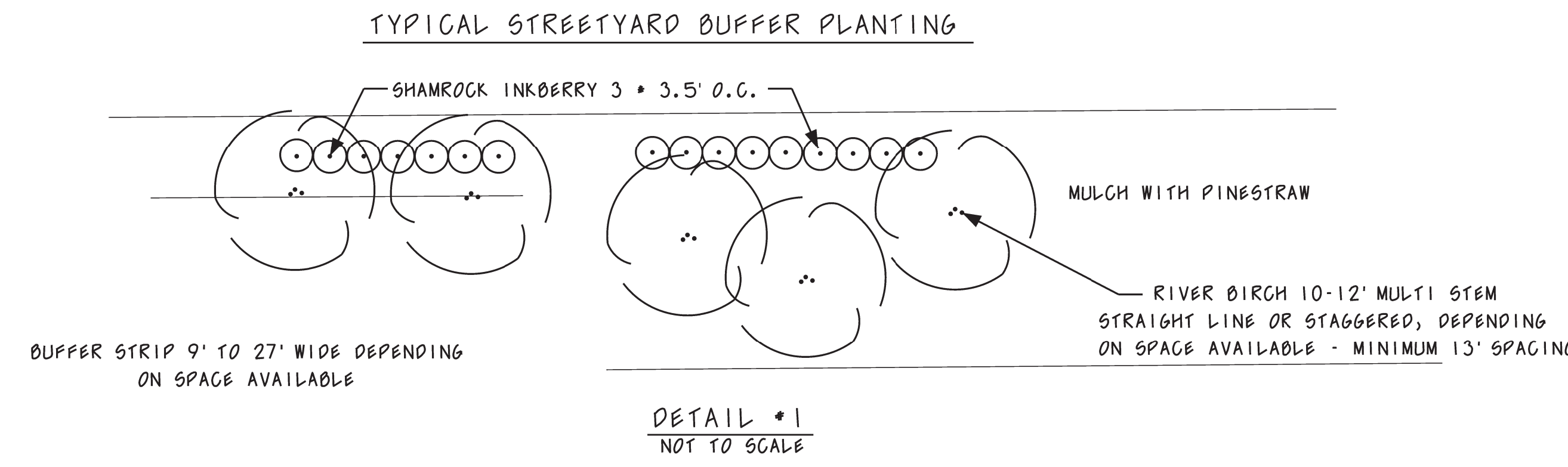
OWNER: RIVERS EDGE I, LLC
 ADDRESS: 1224 PEMBROKE JONES DRIVE WILMINGTON, NC 28045
 PHONE: (910) 619-8814

DESIGNED: JHF
 DRAWN: JHF
 APPROVED: JHF

DATE: 8/4/19
 SCALE: 1" = 80'

STROUD ENGINEERING, P.A.
 102 SUITE D CINEMA DRIVE WILMINGTON, NC 28403 (910) 815-0775

JAMES H. HENTRESS, JR. P.E.
 DATE: 8/11/2019



REVISIONS			
BY	NO.	DATE	DESCRIPTION

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

Approved Construction Plan

Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

STORMWATER MANAGEMENT PLAN APPROVED

CITY OF WILMINGTON
ENGINEERING DEPARTMENT

DATE _____ PERMIT # _____
SIGNED _____

JAMES H. FENTRESS, P.E.
DATE 6/15/2017

LANDSCAPE PLAN - PLANTING DETAILS

THE MARSHES

PHASES 3, 4 & 5

WILMINGTON TOWNSHIP CITY OF WILMINGTON NORTH CAROLINA

OWNER: RIVERS EDGE I. LLC
ADDRESS: 1224 PEMBROKE JONES DRIVE WILMINGTON, NC 28045
PHONE: (910) 819-8814

DESIGNED: TLL
DRAWN: TLL
APPROVED: JHF
DATE: 6/15/2017
SCALE:
SHEET 9 OF 9

STROUD ENGINEERING, P.A.
102 SUITE D CINEMA DRIVE WILMINGTON, NC 28403 (910) 815-0775