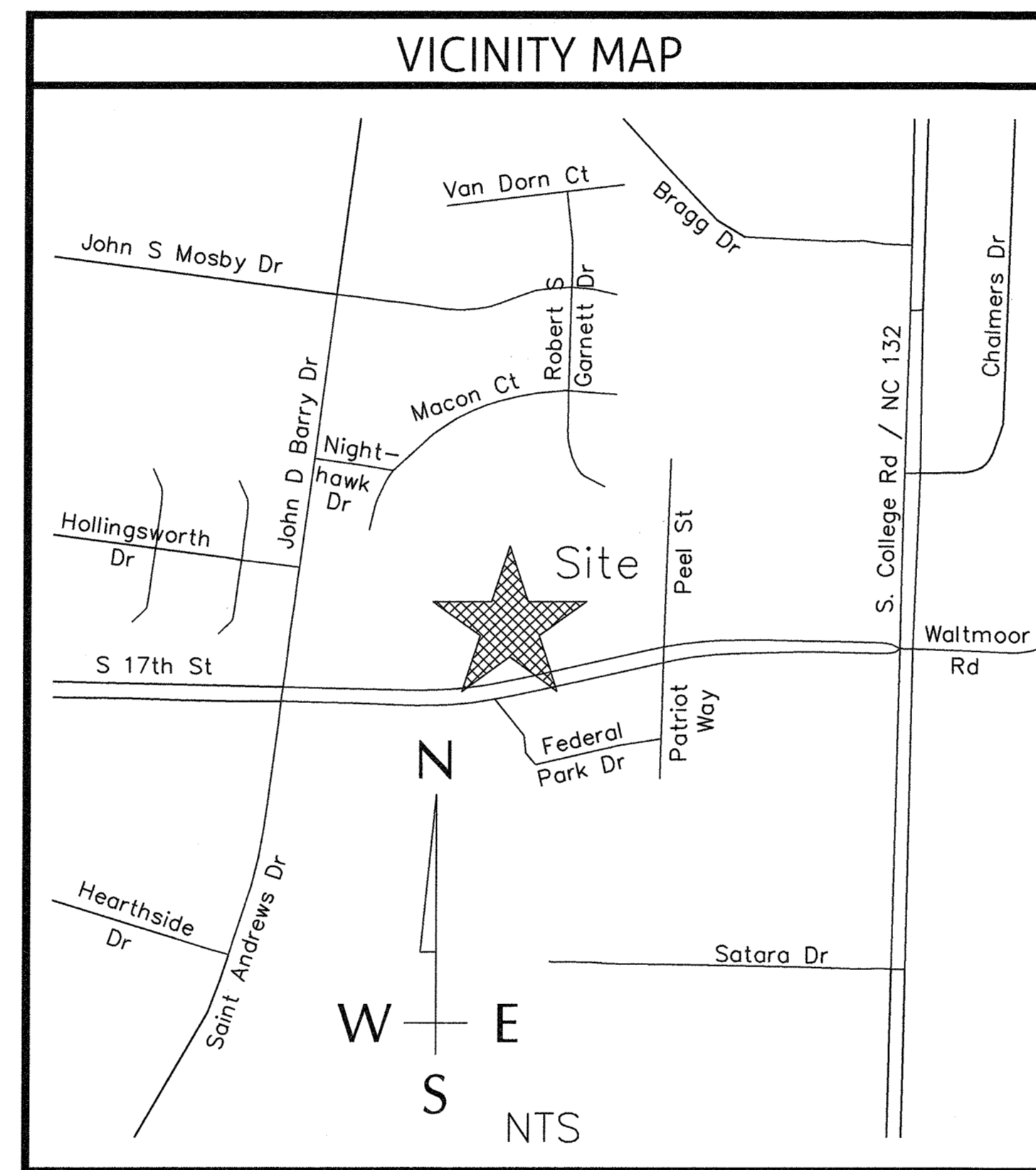


# INFRASTRUCTURE CONSTRUCTION DRAWINGS FOR ARBOR COMMONS

WILMINGTON, NC  
MARCH 2017

CONSTRUCTION PLANS  
FOR: ARBOR COMMONS  
WVF PROJECT NO.: 0861193.01

LEGEND	
LINETYPE DESCRIPTION	LINETYPE DESCRIPTION
EXISTING WATERLINE	PROPOSED UNDERGROUND ELECTRIC
PROPOSED WATERLINE	EXISTING GASLINE
EXISTING STORM DRAINAGE	PROPOSED GASLINE
PROPOSED STORM DRAINAGE	SILT FENCE
EXISTING SANITARY SEWER	TREE PROTECTION & SILT FENCE
PROPOSED SANITARY SEWER	FENCE
EXISTING FORCE MAIN	TREE PROTECTION
PROPOSED FORCE MAIN	TEMP. DIVERSION SWALE
EXISTING ELECTRIC (OVERHEAD)	RIGHT-OF-WAY
PROPOSED ELECTRIC (OVERHEAD)	EXISTING WETLANDS
EXISTING UNDERGROUND ELECTRIC	1' CONTOUR
EXISTING EASEMENT	5' CONTOUR
PROJECT BOUNDARY	PROPOSED EASEMENT



INDEX OF SHEETS	
SHEET NO.	SHEET TITLE
C-1	PROJECT NOTES
C-2	EXISTING CONDITIONS
C-3	TREE REPLACEMENT PLAN
C-4	SITE PLAN
C-5	EROSION CONTROL PLAN
C-6	UTILITY PLAN
C-7	GRADING AND STORMWATER PLAN
C-8	LANDSCAPE & LIGHTING PLAN
C-9	HOLLINGSWORTH DRIVE PLAN & PROFILE
C-10	PRIVATE INTERPARCEL ACCESS ROAD PLAN & PROFILE
C-11	PAVEMENT MARKINGS AND SIGNAGE PLAN
C-12	DRAINAGE AREA PLAN
D-1	SANITARY SEWER DETAILS
D-2	SANITARY SEWER DETAILS
D-3	SANITARY SEWER DETAILS
D-4	WATER DISTRIBUTION SYSTEM DETAILS
D-5	WATER DISTRIBUTION SYSTEM DETAILS
D-6	ROADWAY DETAILS
D-7	STORM DRAIN DETAILS
D-8	EROSION CONTROL DETAILS

SEAL REDACTED

FINAL DESIGN

STORMWATER MANAGEMENT PLAN  
APPROVED  
CITY OF WILMINGTON  
ENGINEERING DEPARTMENT  
DATE 3/25/17 PERMIT # 2017026  
SIGNED [Signature]

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 [Signature]	3/27/17
Public Utilities [Signature]	3-27-17
Traffic [Signature]	3-24-17
Fire [Signature]	3-24-17

PREPARED BY:

**WithersRavenel**  
Engineers | Planners | Surveyors  
1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 919.469.3340 | license #: C-0832 |  
www.withersravenel.com

DEVELOPER/OWNER

**LEON CAPITAL GROUP**  
5970 Fairview Road, Suite 450  
Charlotte, NC 28210  
336-327-3050  
ATTN: TODD HARRELSON

RECEIVED  
MAR 24 2017  
PLANNING DIVISION



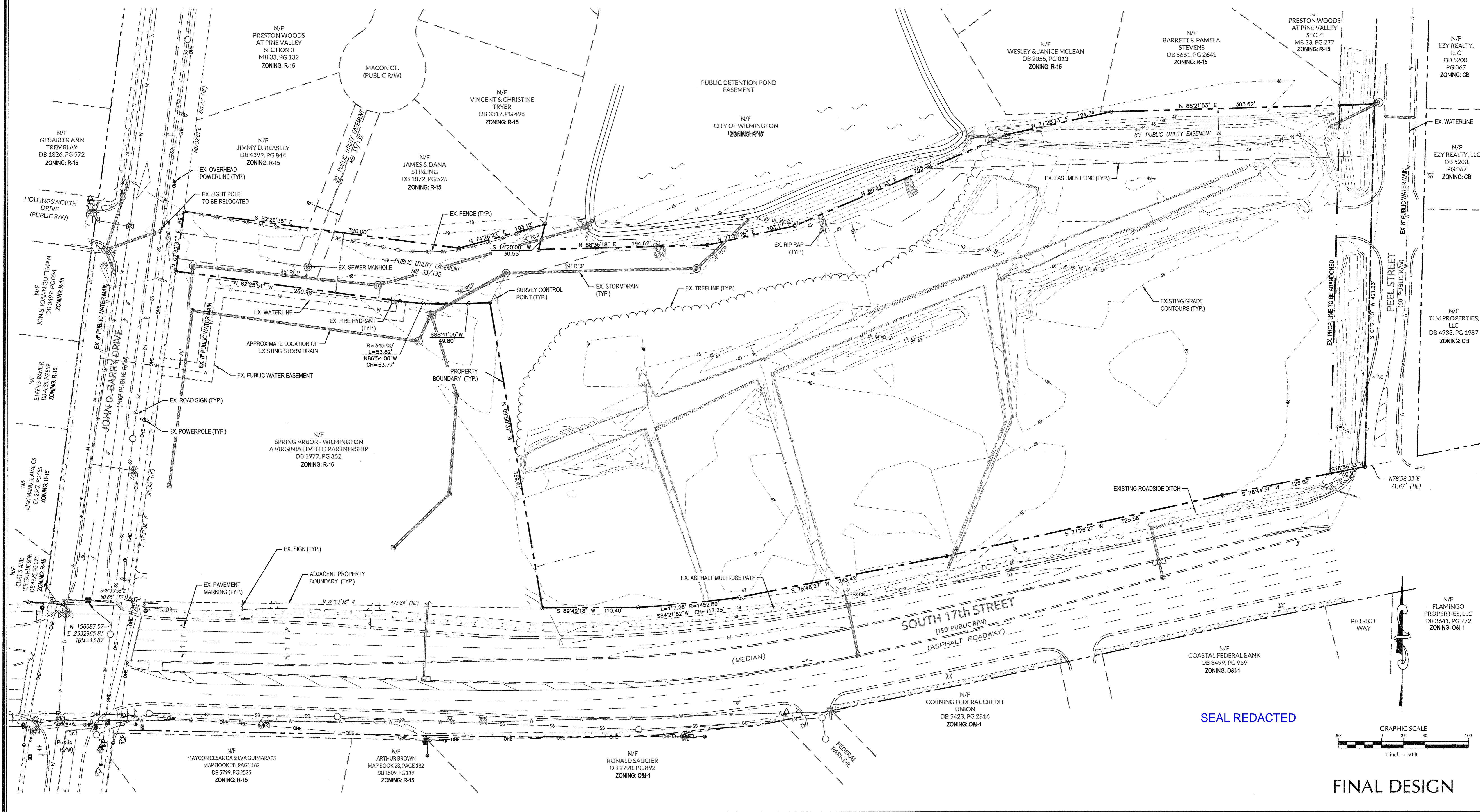
**SURVEY NOTES:**

1. THE BOUNDARY, TOPOGRAPHY AND UTILITIES SURVEY HAVE BEEN PROVIDED BY WITHERS RAVENEL. THE VERTICAL DATUM FOR THE GROUND SURVEY FOR THIS PROJECT IS NAVD 29. CONTRACTOR TO VERIFY ALL ELEVATIONS IN THE FIELD.

Approved Construction Plan	
Name	Date
Planning	3/22/17
Public Utilities	NA
Traffic	W-5200-3-2717
Fire	Holt/Bjell 3-24-17

STORMWATER MANAGEMENT PLAN	
APPROVED	
CITY OF WILMINGTON	
ENGINEERING DEPARTMENT	
DATE	3/21/17 PERMIT # 2017006
SIGNED	[Signature]

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



No.	Revision	Date	By
1	REVISED PER COW SRB	5-24-16	JSB
2	REVISED PER CITY OF WILMINGTON COMMENTS	10-17-16	JSB
3	ADDED CALLOUT FOR EX. SIGNS PER COW COMMENTS	2-6-17	JSB

**ARBOR COMMONS**  
 Wilmington, New Hanover County, North Carolina  
 Designer: JSB, Scale: 1"=50'  
 Drawn By: JSB, Date: 3/24/16  
 Checked By: JSB, Job No.: 03061193.01

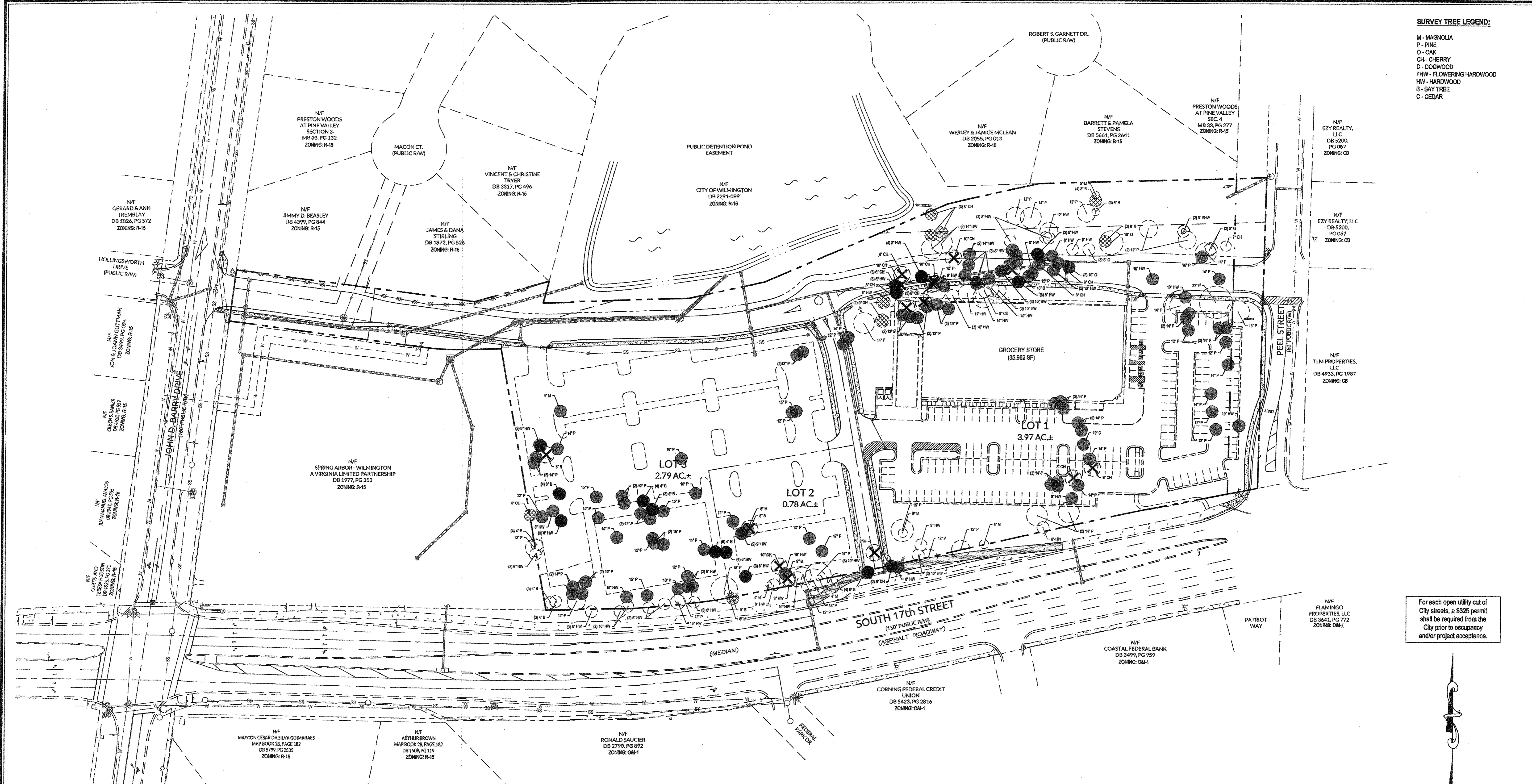
**EXISTING CONDITIONS**

**WithersRavenel**  
 Engineers | Planners | Surveyors  
 1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | T: 910.256.9277 | license #: C-0832 | www.withersravenel.com  
 Sheet No. **C-2**

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**SURVEY TREE LEGEND:**

- M - MAGNOLIA
- P - PINE
- O - OAK
- CH - CHERRY
- D - DOGWOOD
- FHW - FLOWERING HARDWOOD
- HW - HARDWOOD
- B - BAY TREE
- C - CEDAR



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

**MITIGATION CALCULATIONS:**

**LOT 1 & PROPOSED ROADWAY:**  
 EX. REGULATED TREES TO BE REMOVED  
 HARDWOOD TREES > 8" DBH (7)  
 ALL CONIFER TREES > 12" DBH (3)  
 ALL DOGWOODS, MAGNOLIAS, OTHER ORNAMENTAL FLOWERING TREES & AMERICAN HOLLIES > 4" DBH (7)  
 TOTAL TREES TO BE REMOVED: 17  
 (3) x (75% OF TYPE OF TREE) / 3: 6  
 (3) x (50% OF TYPE OF TREE) / 3: 3  
 (7) x (100% OF TYPE OF TREE) / 3: 8  
**19 REGULATED REPLACEMENT TREES REQUIRED**  
 EX. SIGNIFICANT TREES TO BE REMOVED  
 HARDWOOD, LONG LEAF PINE, POCCOSIN (PND) PINE, BLACK PINE & NON-PINE CONIFER TREES > 24" DBH (0)  
 ALL OTHER PINES > 32" DBH (0)  
 DOGWOODS, MAGNOLIAS, AMERICAN HOLLIES & OTHER ORNAMENTAL FLOWERING TREES > 8" DBH (12)  
 TOTAL TREES TO BE REMOVED: 12  
 (12) x (2 x 100% OF TYPE OF TREE) / 3: 8  
**8 SIGNIFICANT REPLACEMENT TREES REQUIRED**

**MITIGATION CALCULATIONS:**

**LOT 2:**  
 EX. REGULATED TREES TO BE REMOVED  
 HARDWOOD TREES > 8" DBH (15)  
 ALL CONIFER TREES > 12" DBH (3)  
 ALL DOGWOODS, MAGNOLIAS, OTHER ORNAMENTAL FLOWERING TREES & AMERICAN HOLLIES > 4" DBH (1)  
 TOTAL TREES TO BE REMOVED: 19  
 (13) x (75% OF TYPE OF TREE) / 3: 4  
 (3) x (50% OF TYPE OF TREE) / 3: 1  
 (1) x (100% OF TYPE OF TREE) / 3: 1  
**6 REGULATED REPLACEMENT TREES REQUIRED**  
 EX. SIGNIFICANT TREES TO BE REMOVED  
 HARDWOOD, LONG LEAF PINE, POCCOSIN (PND) PINE, BLACK PINE & NON-PINE CONIFER TREES > 24" DBH (0)  
 ALL OTHER PINES > 32" DBH (0)  
 DOGWOODS, MAGNOLIAS, AMERICAN HOLLIES & OTHER ORNAMENTAL FLOWERING TREES > 8" DBH (3)  
 TOTAL TREES TO BE REMOVED: 3  
 (3) x (2 x 100% OF TYPE OF TREE) / 3: 2  
**2 SIGNIFICANT REPLACEMENT TREES REQUIRED**

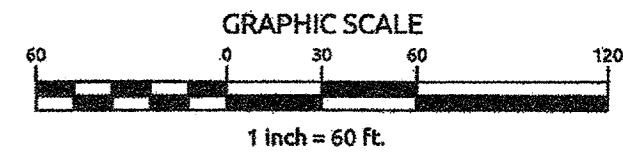
**MITIGATION CALCULATIONS:**

**LOT 3:**  
 EX. REGULATED TREES TO BE REMOVED  
 HARDWOOD TREES > 8" DBH (7)  
 ALL CONIFER TREES > 12" DBH (2)  
 ALL DOGWOODS, MAGNOLIAS, OTHER ORNAMENTAL FLOWERING TREES & AMERICAN HOLLIES > 4" DBH (18)  
 TOTAL TREES TO BE REMOVED: 27  
 (7) x (75% OF TYPE OF TREE) / 3: 2  
 (2) x (50% OF TYPE OF TREE) / 3: 1  
 (18) x (100% OF TYPE OF TREE) / 3: 6  
**13 REGULATED REPLACEMENT TREES REQUIRED**  
 EX. SIGNIFICANT TREES TO BE REMOVED  
 HARDWOOD, LONG LEAF PINE, POCCOSIN (PND) PINE, BLACK PINE & NON-PINE CONIFER TREES > 24" DBH (0)  
 ALL OTHER PINES > 32" DBH (0)  
 DOGWOODS, MAGNOLIAS, AMERICAN HOLLIES & OTHER ORNAMENTAL FLOWERING TREES > 8" DBH (1)  
 TOTAL TREES TO BE REMOVED: 1  
 (1) x (2 x 100% OF TYPE OF TREE) / 3: 1  
**1 SIGNIFICANT REPLACEMENT TREES REQUIRED**

**TREE QUANTITY LEGEND:**

- EX. REGULATED TREES TO BE SAVED (00)
- ⊗ EX. SIGNIFICANT TREES TO BE SAVED (14)
- EX. REGULATED TREES TO BE REMOVED (140)
- ⊗ EX. SIGNIFICANT TREES TO BE REMOVED (16)

**STORMWATER MANAGEMENT PLAN APPROVED**  
 CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE 3/23/17 PERMIT # 2017006  
 SIGNED [Signature]



SEAL REDACTED

**Approved Construction Plan**

Name	Date
Planning	3/27/17
Public Utilities	NA
Traffic	3-27-17
Fire	3-24-17

No.	Revision	Date	By
1	REVISED PER CITY SIS	3-24-16	MEM
2	REVISED PER CLIENT COMMENTS	11-16-16	MEM
3	REVISED PER COW	12-08-16	MEM

Designer	W&R	Scale	NOTED
Drawn By	JSB	Date	3/24/16
Checked By	JJW	Job No.	03081193.01

**ARBOR COMMONS**  
 New Hanover County  
 Wilmington, North Carolina

**TREE REPLACEMENT PLAN**

**WithersRavenel**  
 Engineers | Planners | Surveyors  
 1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com

Sheet No.  
**C-3**

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**SITE INVENTORY NOTES:**

- THIS PROPERTY IS NOT IMPACTED BY ANY AEC.
- THERE ARE NO CONSERVATION OVERLAY BOUNDARIES AFFECTING THIS PROPERTY.
- THIS SITE IS NOT IMPACTED BY ANY RECOGNIZED HISTORIC OR ARCHEOLOGICAL SIGNIFICANCE.
- NO CEMETERIES WERE EVIDENCE ON THE SITE.
- THERE IS NO EVIDENCE OF JURISDICTIONAL WETLANDS ON THE SITE.
- THERE IS NO EVIDENCE OF ENDANGERED SPECIES OR HABITAT ISSUES ON THE SITE.
- THE SITE DRAINAGE FLOWS INTO THE BARNARDS CREEK WATERSHED WITHIN THE CAPE FEAR RIVER BASIN. CLASS C-SW WATERS.

**GENERAL NOTES:**

- NEW HANOVER COUNTY PARCEL NOS:  
313510.37.9059 (807 JOHN D. BARRY DR.)  
313510.36.8767 (4301 S. 17TH ST.) P/O  
313510.06.47.7974 (3534 S. COLLEGE DR.)
- ZONING DISTRICT: CB (CD)  
SETBACKS - 20' STREET  
20' CORNER SIDE  
20' INTERIOR SIDE TO RESIDENTIAL  
(+1:1 PER HGT > 20')  
25' REAR TO RESIDENTIAL  
(+1:1 PER HGT > 20')
- CAMA LAND CLASSIFICATION: URBAN

**DEVELOPMENT NOTES:**

- ALL DEVELOPMENT SHALL BE IN ACCORDANCE WITH THE CITY OF WILMINGTON LAND DEVELOPMENT CODE.
- PROJECT SHALL COMPLY WITH ALL FEDERAL, STATE & NEW HANOVER COUNTY REGULATIONS.

**DEVELOPMENT DATA:**

TOTAL TRACT AREA: 10.59 AC.±  
 NEW PUBLIC R/W - 1.75 AC.±  
 BUFFERYARDS - 1.30 AC.±  
 DEVELOPMENT LOT - 7.54 AC.±

ONSITE IMPERVIOUS SURFACES (DRAINS TO POND):  
 EX. PUBLIC P.V.M.T. - 1,500 S.F.  
 PUBLIC & PRIVATE STREET P.V.M.T. - 45,264 S.F.  
 PUBLIC & PRIVATE SIDEWALKS - 7,474 S.F.

OFFSITE IMPERVIOUS SURFACES (DRAINS TO POND):  
 EX. 17TH STREET PAVEMENT & PATH - 9,333 S.F.

FUTURE LOT DEVELOPMENT:  
 LOT 1 - 133,540 S.F.  
 LOT 2 - 33,000 S.F.  
 LOT 3 - 108,000 S.F.  
 TOTAL - 272,540 S.F.

TOTAL - 336,111 S.F.

\*EXISTING WATER QUALITY PERMIT ALLOWANCE = 336,111 S.F.\*

ONSITE IMPERVIOUS SURFACES (DOES NOT DRAIN TO POND):  
 PUBLIC STREET P.V.M.T. - 8,253 S.F.  
 PUBLIC SIDEWALKS - 1,080 S.F.

OFFSITE IMPERVIOUS SURFACES (DOES NOT DRAIN TO POND):  
 PUBLIC STREET P.V.M.T. - 3,800 S.F.  
 PUBLIC SIDEWALKS - 1,225 S.F.

**Approved Construction Plan**

Name: \_\_\_\_\_ Date: 3/24/17

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

Public Utilities: \_\_\_\_\_

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

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

**STORMWATER MANAGEMENT PLAN**

**APPROVED**

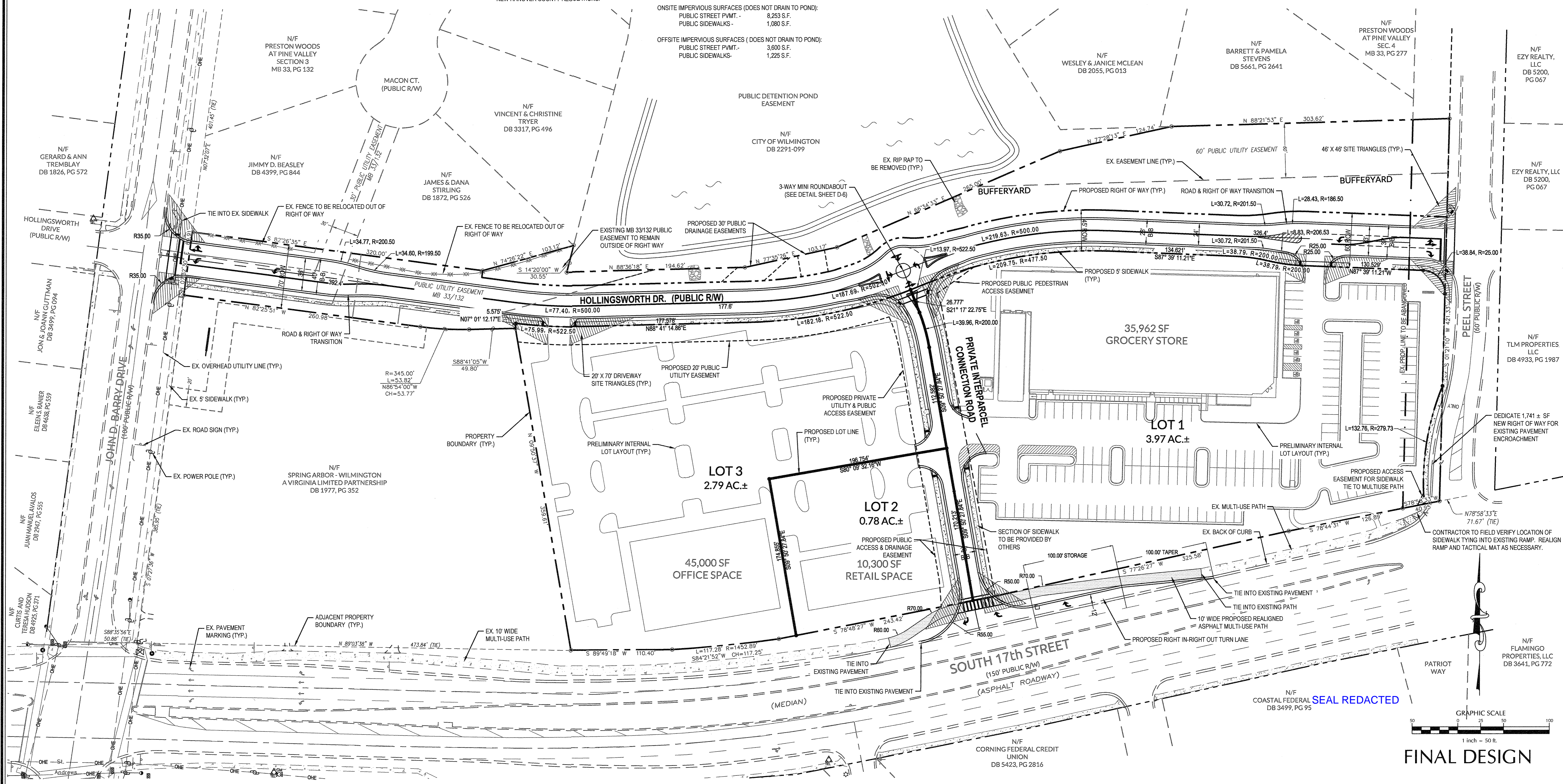
CITY OF WILMINGTON

ENGINEERING DEPARTMENT

DATE 3/23/17 PERMIT # 2017006

SIGNED: \_\_\_\_\_

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



No.	Revision	Date	By	Designer	Scale
1	REVISED PER COW SRB	5-24-16	JSB	JSB	1"=50'
2	ADDED UTILITY EASEMENT PER CPFLIA REVIEW	8-24-16	JSB		
3	REVISED NCECMR & PER CITY OF WILMINGTON COMMENTS	10-28-16	JSB		
4	REVISED PER CLIENT COMMENTS	11-16-16	JSB		
5	REVISED PER COW COMMENTS (TRAFFIC CIRCLE, ETC.)	3-21-17	JSB		

**ARBOR COMMONS**

Wilmington New Hanover County North Carolina

**SITE PLAN**

Scale 1"=50'  
 Date 3/24/16  
 Job No. 03061193.01

**WithersRavenel**

Engineers | Planners | Surveyors

1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com

Sheet No. **C-4**

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**EROSION CONTROL NOTES:**

1. PROPOSED DISTURBED AREA: 10.12 ACRES
2. SOILS TYPE: LE (LEON SAND), MU (MURVILLE FINE SAND) AND RM (RIMINI SAND).
3. THERE IS NO EVIDENCE OF JURISDICTIONAL WETLANDS ON THE SITE.
4. THERE IS NO EVIDENCE OF ENDANGERED SPECIES OR HABITAT ISSUES ON THE SITE.
5. THE SITE DRAINAGE FLOWS INTO THE BARNARDS CREEK WATERSHED WITHIN THE CAPE FEAR RIVER BASIN. CLASS C:SW WATERS.

**Approved Construction Plan**

Name: \_\_\_\_\_ Date: 3/27/17

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

Public Utilities: \_\_\_\_\_

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

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

**STORMWATER MANAGEMENT PLAN**

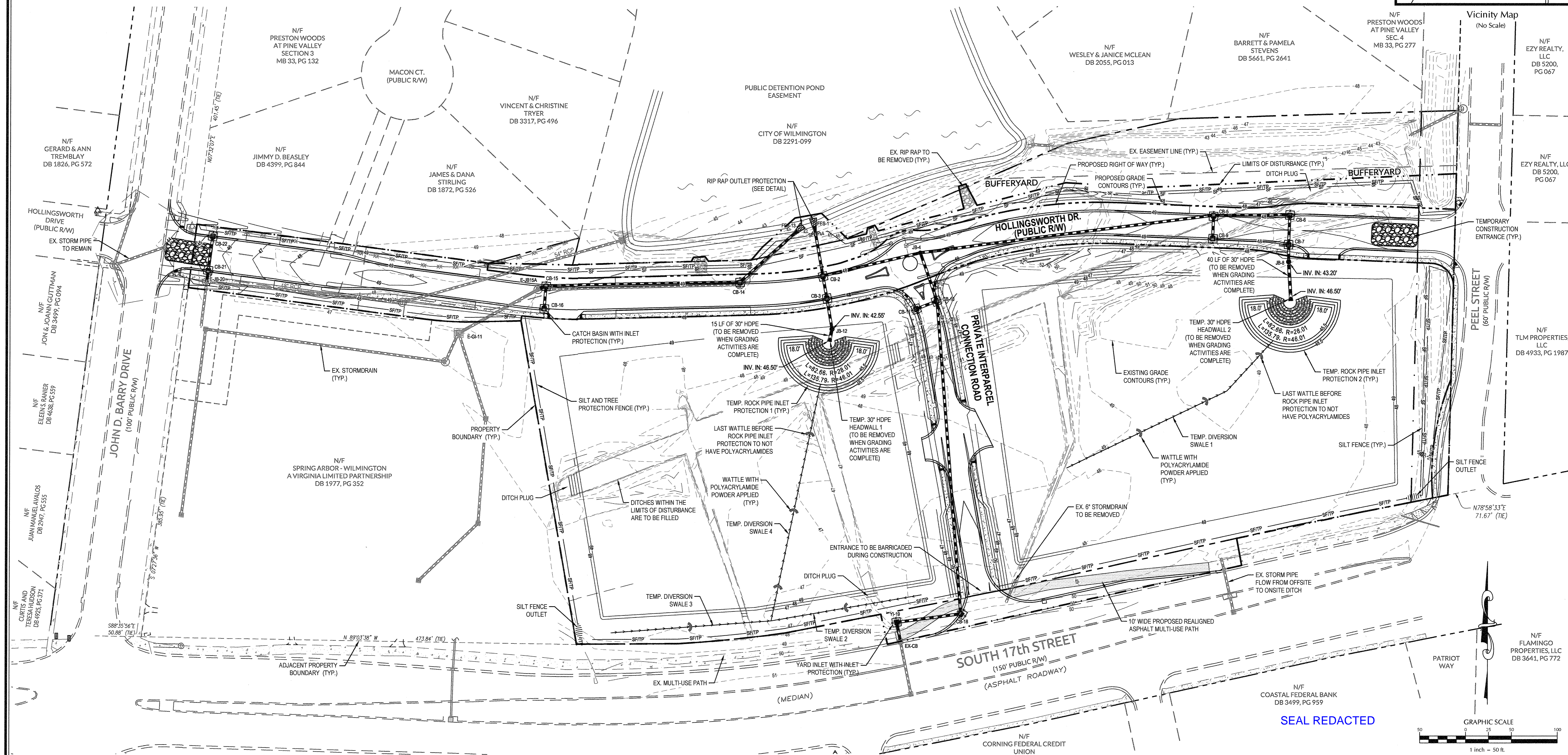
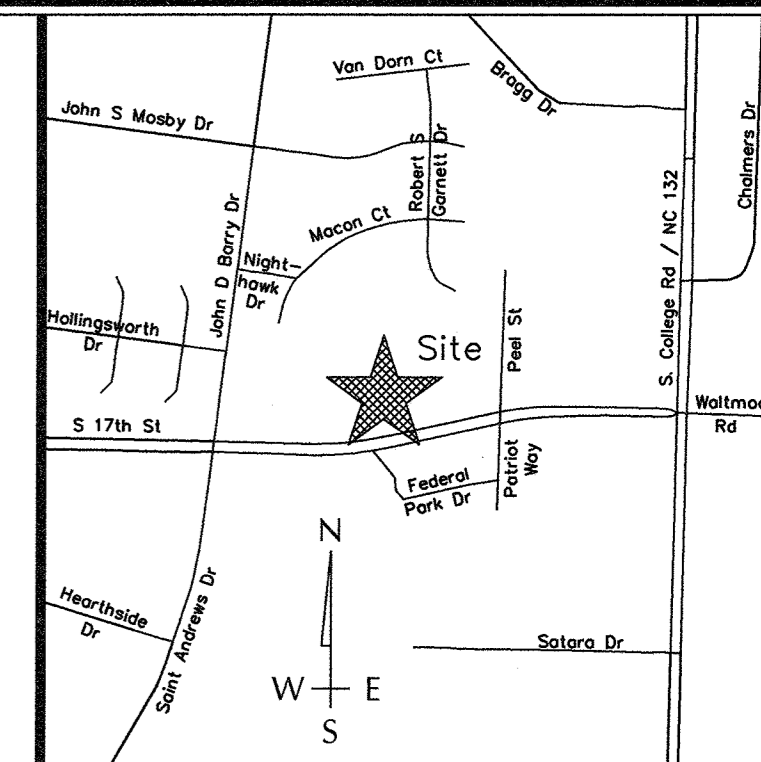
**APPROVED**

CITY OF WILMINGTON  
ENGINEERING DEPARTMENT

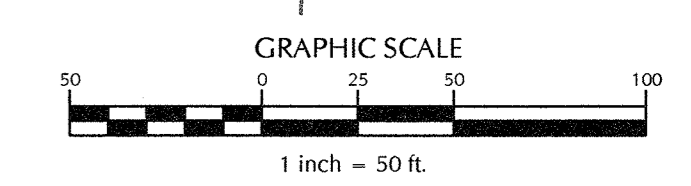
DATE 3/25/17 PERMIT # 2017006

SIGNED: \_\_\_\_\_

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



SEAL REDACTED



**FINAL DESIGN**

No.	Revision	Date	By	Designer	Scale
1	REVISED PER NHC EC & CITY SW COMMENTS	10-28-16	JSB	JSB	1"=50'
2	REVISED PER CLIENT COMMENTS	11-16-16	JSB		
3	REVISED PER NHC EC COMMENTS	11-21-16	JSB		

**ARBOR COMMONS**

New Hanover County North Carolina

Wilmington

**EROSION CONTROL PLAN**

**WithersRavenel**  
Engineers | Planners | Surveyors

1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | T: 910.256.9277 | License #: C-0832 | www.withersravenel.com

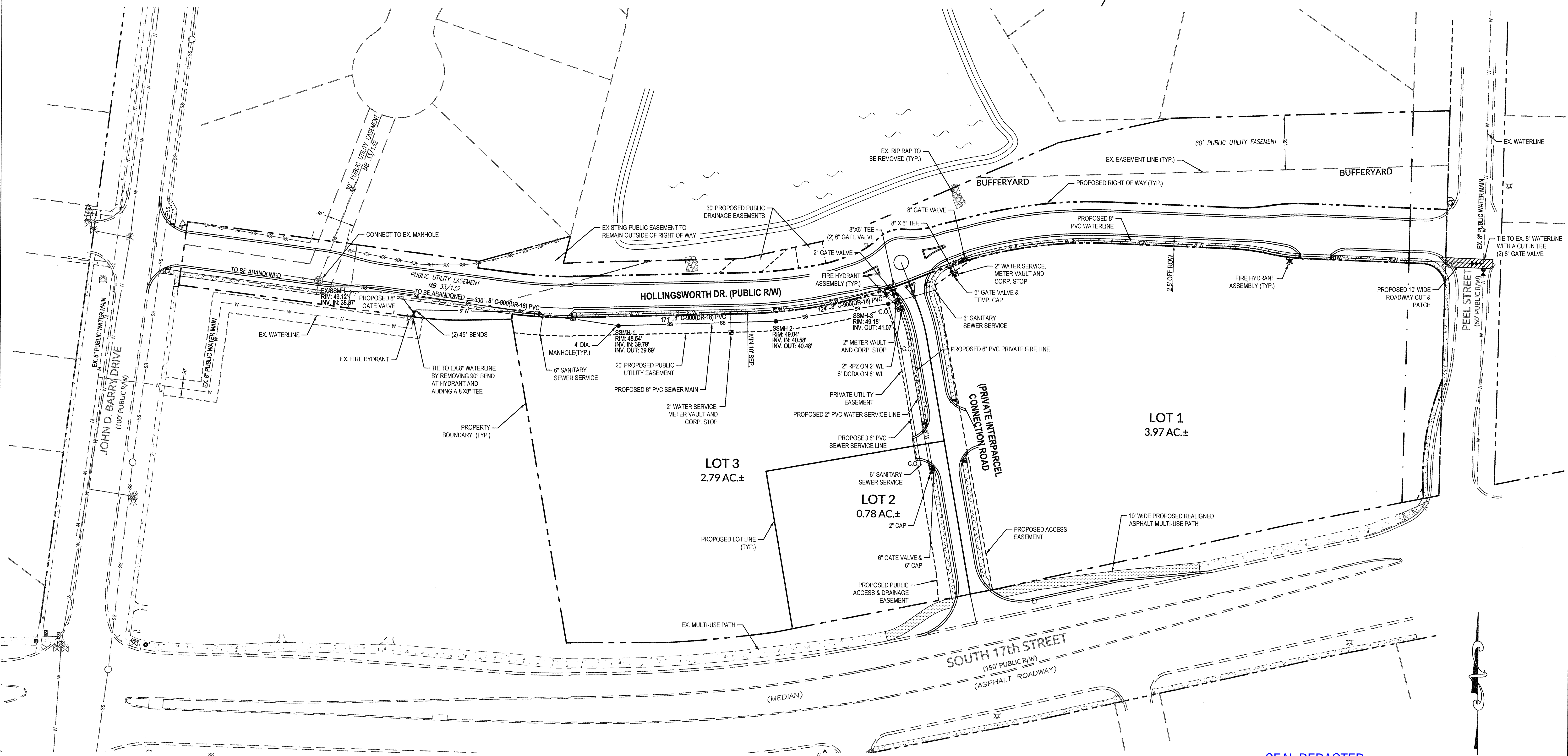
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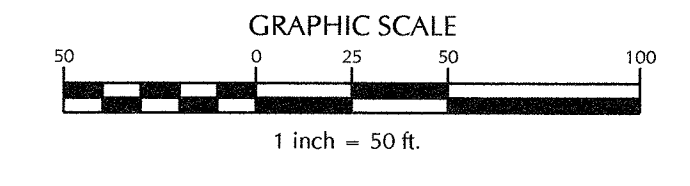
Approved Construction Plan  
 Name: [Signature] Date: 3/21/17  
 Planning: [Signature] 3-27-17  
 Traffic: [Signature] 3-24-17  
 Fire: [Signature] 3-24-17

STORMWATER MANAGEMENT PLAN  
**APPROVED**  
 CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE 3/25/17 PERMIT # 2017006  
 SIGNED [Signature]

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



SEAL REDACTED



FINAL DESIGN

No.	Revision	Date	By	Designer	Scale
1	REVISED PER CCW SRG	5-24-16	JSB	JSB	1"=50'
2	RELOCATED SEWER MAIN & ADDED UTILITY EASEMENT PER CPFA REVIEW	10-28-16	JSB		
3	REVISED PER CLIENT & CPFA COMMENTS	11-28-16	JSB		

Drawn By: JSB Date: 3/24/16  
 Checked By: JSB Job No.: 03061193.01

**ARBOR COMMONS**  
 Wilmington New Hanover County North Carolina

**UTILITY PLAN**

**WithersRavenel**  
 Engineers | Planners | Surveyors  
 1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com

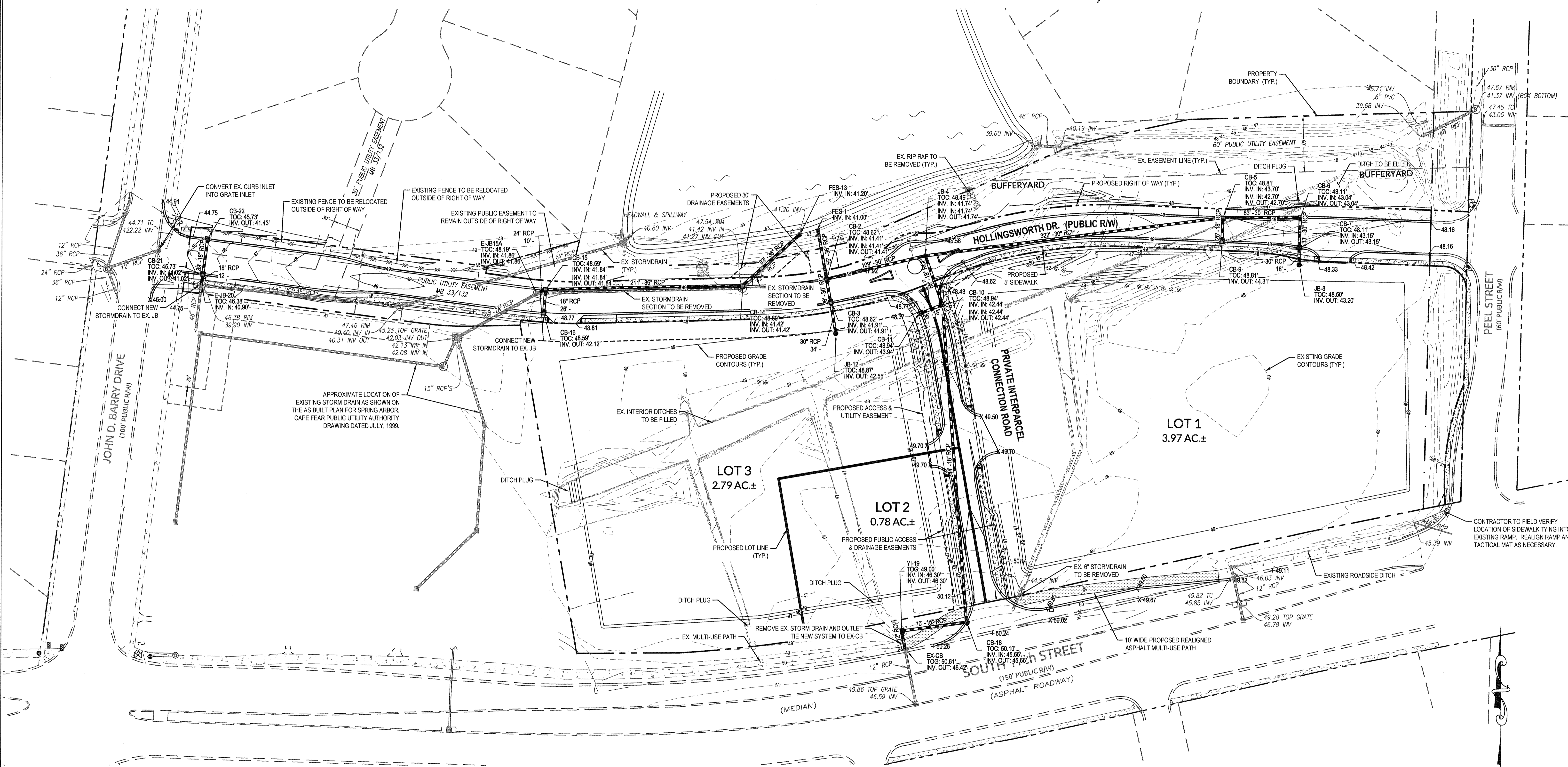
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**C-6**

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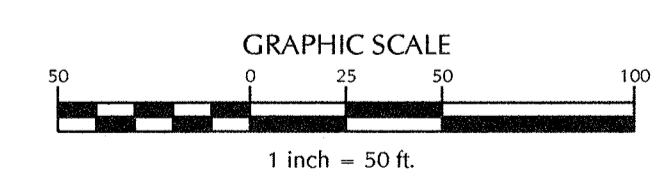
Approved Construction Plan  
 Name: [Signature] Date: 3/24/17  
 Planning: [Signature] NA  
 Public Utilities: [Signature] 3-27-17  
 Traffic: [Signature] 3-24-17  
 Fire: [Signature] 3-24-17

STORMWATER MANAGEMENT PLAN  
**APPROVED**  
 CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE 3/23/17 PERMIT # 2017006  
 SIGNED [Signature]

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



SEAL REDACTED



FINAL DESIGN

No.	Revision	Date	By	Designer	Scale
1	REVISED PER COW SRB	5-24-16	JSB	JSB	1"=50'
2	REVISED PER NHC EC & CITY OF WILMINGTON COMMENTS	10-28-16	JSB		
3	REVISED PER CLIENT COMMENTS	11-16-16	JSB		
4	REVISED TRAFFIC CIRCLE & TURN LANE PER COW COMMENTS	2-28-17	JSB		

Drawn By	Date	Checked By	Job No.
JSB	3/24/16	JJW	03061193.01

**ARBOR COMMONS**  
 New Hanover County  
 North Carolina

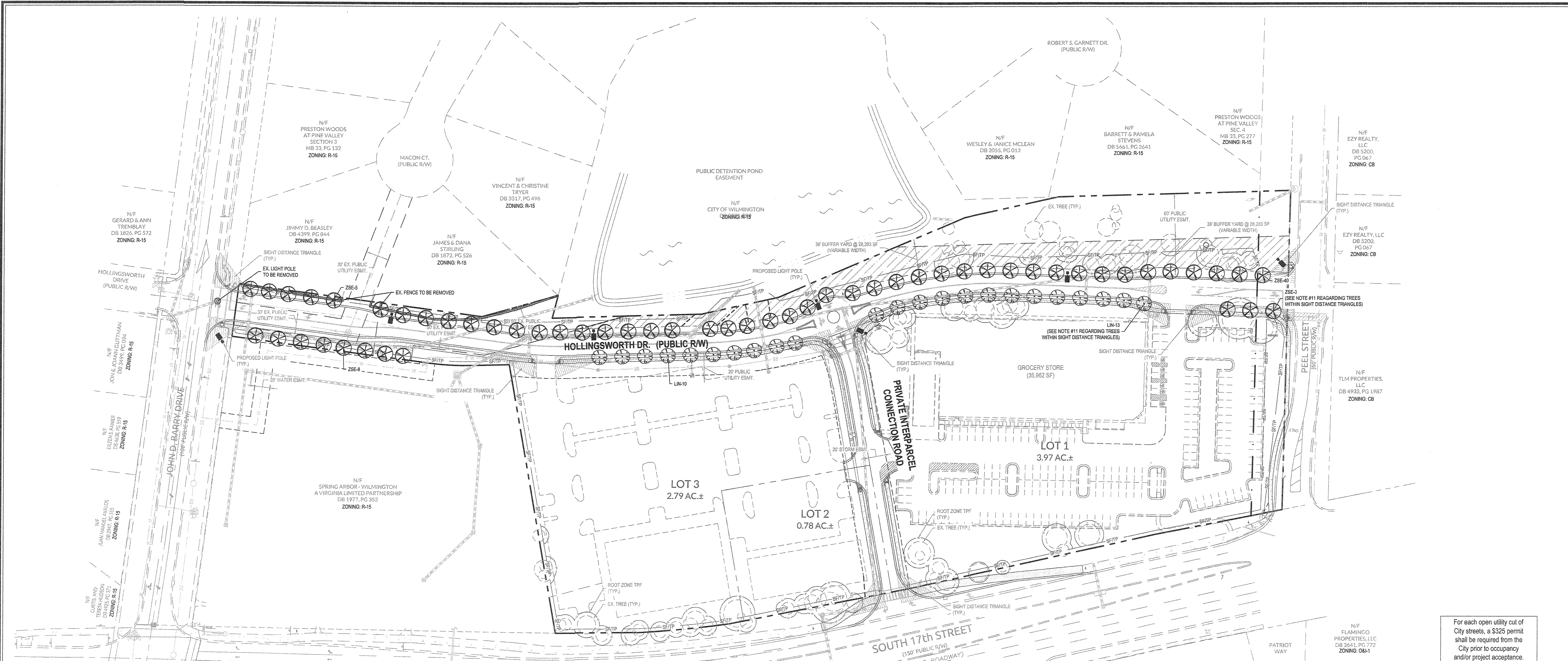
**GRADING AND STORMWATER PLAN**

**WithersRavenel**  
 Engineers | Planners | Surveyors  
 1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com

Sheet No.  
**C-7**

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- LANDSCAPE NOTES:**
- ALL PLANTS SHALL MEET OR EXCEED THE MINIMUM STANDARDS SET FORTH IN "THE AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
  - ALL AREAS DISTURBED AND NOT SPECIFIED AS MULCHED PLANTING BEDS WILL BE GRASSED. LAWN AREAS MAY BE ESTABLISHED WITH EITHER SOD OR SEED AT THE CONTRACTOR'S DISCRETION. HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FULL STAND OF GRASS AT THE TIME OF COMPLETION.
  - CONTRACTOR SHALL USE WHATEVER METHOD OF TREE STAKING HE DEEMS FIT. HOWEVER, HE WILL BE HELD LIABLE FOR ANY DAMAGES CAUSED TO TREES BY IMPROPER STAKING METHODS (OR ABSENCE OF STAKING) AND IS RESPONSIBLE FOR UPRIGHTING AND REPLANTING TREES WHICH ARE BLOWN OVER.
  - CONTRACTOR SHALL WARRANTY ALL TREES AND SHRUBS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK OF THE LANDSCAPE PLAN.
  - IF DISCREPANCIES OR AVAILABILITIES ARE FOUND IN THE PLANT SPECIES AND/OR MIN. SIZES REQ'D., CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT. SUBSTITUTIONS MAY BE MADE WITH AUTHORIZATION AS LONG AS THE PLANTS FOLLOW THE INTENDED FORM AND FUNCTION.
  - THE DEVELOPER SHALL NOTIFY LANDSCAPE DESIGNER PRIOR TO INSTALLATION TO ENSURE PROPER TREE SELECTION & SPACING.
  - EACH TREE SHALL BE A MINIMUM OF 2" CALIPER AS MEASURED FROM THE DIAMETER AT BREAST HEIGHT (DBH).
  - TREES WITHIN THE SAME BLOCKS SHALL BE THE SAME SPECIES.
  - ALL PLANTINGS SHALL BE CURBED OR OTHERWISE PHYSICALLY PROTECTED FROM VEHICULAR TRAFFIC.
  - THE OWNER IS RESPONSIBLE FOR MAINTAINING ALL REQUIRED PLANT MATERIAL AND PLANTING AREAS IN GOOD HEALTH AND APPEARANCE. ANY DEAD, UNHEALTHY OR MISSING PLANTS MUST BE REPLACED WITHIN 60 DAYS WITH VEGETATION WHICH CONFORMS TO THE INITIAL PLANTING RATES AND STANDARDS.
  - NO PLANTINGS OVER 30' IN HEIGHT SHALL BE ALLOWED IN VISION CLEARANCE. EXISTING TREES IN THE SIGHT DISTANCE TRIANGLE SHOULD BE LIMBED UP TO ACCOMMODATE THE CODE REGARDING SIGHT DISTANCE TRIANGLES. ALL PROPOSED VEGETATION WITHIN SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30' TO 10'.
  - PRIOR TO ANY CLEARING, GRADING, OR CONSTRUCTION ACTIVITY, TREE PROTECTION FENCING WILL BE INSTALLED AROUND PROTECTED TREES OR GROVES OF TREES AND NO CONSTRUCTION WORKERS, TOOLS, MATERIALS, OR VEHICLES ARE PERMITTED WITHIN THE TREE PROTECTION FENCING.
  - A LANDSCAPING PLAN INDICATING THE LOCATION OF REQUIRED STREET TREES SHALL BE SUBMITTED TO THE CITY OF WILMINGTON TRAFFIC ENGINEERING DIVISION AND PARKS AND RECREATION DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO THE RECORDING OF THE FINAL PLAT. (SD 15-14 COPV TECH STDS)
  - THERE IS NO CONSERVATION RESOURCES ASSOCIATED WITH THE PARCELS INCLUDING ANY RARE OR ENDANGERED SPECIES IN ACCORDANCE WITH THE NC WILDLIFE RESOURCES COMMISSION.
  - THE CRITICAL ROOT ZONE (CRZ) SHALL BE PROTECTED DURING CONSTRUCTION BY APPROVED TREE PROTECTION FENCING AND PRACTICES. TREE PROTECTIVE FENCING SHALL BE SHOWN ON SITE PLANS AND GRADING PLANS AROUND EACH TREE. CLUSTER OF TREES, AT PERIMETER OF TREE-SAVE AREAS, AND AT LIMITS OF DISTURBANCE. NO EQUIPMENT IS ALLOWED ON THE SITE UNTIL ALL TREE PROTECTION FENCING AND SILT FENCING HAS BEEN INSTALLED AND APPROVED. TREE PROTECTIVE FENCING SHALL REMAIN IN PLACE THROUGH COMPLETION OF CONSTRUCTION ACTIVITIES.
  - IF THE ENTIRE CRZ CANNOT BE PRESERVED, THE DISTURBED AREA SHALL EXTEND NO CLOSER TO THE PROTECTED TREE TRUNK THAN ONE HALF (1/2) THE RADIUS OF THE CRZ. IN NO CASE CAN MORE THAN 40% OF THE CRZ BE DISTURBED.

PLANT TYPE	QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
CANOPY TREES	59	ZSE	Zakova serrata	Japanese Zelkova	B&B	2 1/2" MIN.	8' MIN.	STREET TREE (30' O.C.)
UNDERSTORY TREES	23	LN	Lagerstroemia indica 'Natchez' (STD)	Single Stem Natchez Crape Myrtle	B&B	2" MIN.	8' MIN.	STREET TREE (30' O.C.)

**TREE PROTECTION NOTES:**

- TO PRESERVE EXISTING TREES SPECIFIED ON THE REQUIRED LANDSCAPE PLAN TO REMAIN ON THE SITE AS A FUNCTION OF FULFILLING PURPOSES OF THIS SECTION, THE CRITICAL ROOT ZONE SHALL BE PROTECTED BY PROPER INSTALLATION OF BARRICADES AND SIGNAGE FROM VEHICULAR MOVEMENT, MATERIAL STORAGE, COMPACTING, GRADING, EXCAVATING, AND OTHER DEVELOPMENT RELATED ACTIVITIES DURING CONSTRUCTION AND IN THE FINAL LANDSCAPE DESIGN.
- THE CRITICAL ROOT ZONE (CRZ) SHALL BE PROTECTED DURING CONSTRUCTION BY APPROVED TREE PROTECTION FENCING AND PRACTICES. TREE PROTECTIVE FENCING SHALL BE SHOWN ON SITE PLANS AND GRADING PLANS AROUND EACH TREE. CLUSTER OF TREES, AT PERIMETER OF TREE-SAVE AREAS, AND AT LIMITS OF DISTURBANCE. NO EQUIPMENT IS ALLOWED ON THE SITE UNTIL ALL TREE PROTECTION FENCING AND SILT FENCING HAS BEEN INSTALLED AND APPROVED. TREE PROTECTIVE FENCING SHALL REMAIN IN PLACE THROUGH COMPLETION OF CONSTRUCTION ACTIVITIES.
- IF THE ENTIRE CRZ CANNOT BE PRESERVED, THE DISTURBED AREA SHALL EXTEND NO CLOSER TO THE PROTECTED TREE TRUNK THAN ONE HALF (1/2) THE RADIUS OF THE CRZ. IN NO CASE CAN MORE THAN FORTY (40) PERCENT OF THE CRZ BE DISTURBED.
- DISTURBANCE OF THE CRZ WILL ONLY BE ALLOWED ON ONE (1) SIDE OF THE RETAINED TREE AND ONLY WITH PRIOR APPROVAL BY THE APPROPRIATE REVIEWING AGENCY.
- PRIOR TO GRADING, TREE ROOTS SHALL BE PRUNED USING APPROPRIATE ARBORICULTURE PRUNING TOOLS AND PRACTICES.
- DISTURBANCE OTHER THAN THAT ALLOWED ON THE APPROVED PLAN, INCLUDING INCORRECTLY PLACED TREE PROTECTION FENCING OR IMPROPER ROOT PRUNING CONSTITUTES NEGLIGENCE AND WILL REQUIRE THE OWNER TO POST AN IRREVOCABLE LETTER OF CREDIT OR OTHER MEANS OF FINANCIAL ASSURANCE APPROVED BY THE REVIEWING AGENCY FOR THREE (3) YEARS TO PROVIDE FOR MITIGATION OF THE TREE PER SECTION 18-460 TO BE RELEASED IF DETERMINED BY THE REVIEWING AGENCY THAT THE TREE IS NOT AT RISK OF DYING DUE TO THE DISTURBANCE.
- ANY PERSON WHO IS RESPONSIBLE FOR FAILING TO PROPERLY INSTALL OR MAINTAIN PROTECTION MEASURES PURSUANT TO THIS ARTICLE SHALL BE SUBJECT TO A FINE OF FIVE HUNDRED DOLLARS (\$500.00) PER DAY AND A STOP WORK ORDER SHALL BE PLACED ON THE PROJECT. THE OWNER OF THE PROPERTY SHALL ALSO BE A JOINTLY AND SEVERALLY RESPONSIBLE PARTY IF THE IMPROPER PRACTICES ARE CONDUCTED BY AN EMPLOYEE, AGENT, OR OTHER PERSON UNDER THE CONTROL, EMPLOY, OR DIRECTION OF THE PROPERTY OWNER.
- IF A TREE REQUIRED TO BE PROTECTED IS DESTROYED, SUBSTANTIALLY DAMAGED, OR DIES AS A RESULT OF NEGLIGENCE OR FAILURE TO COMPLY WITH THE REQUIREMENTS OF THIS SECTION ON THE PART OF ANY PROPERTY OWNER AND/OR AGENT OF THE OWNER, WITHIN THREE (3) YEARS AFTER COMPLETION OF CONSTRUCTION, THEN REPLACEMENT TREES OF A SIMILAR SPECIES SHALL BE PLANTED ON THE SITE PURSUANT TO SECTION 18-460 OF THE CITY OF WILMINGTON ORDINANCE.

**CRITICAL ROOT ZONE (CRZ)**  
The CRZ is the area around the root system of a tree that is essential for its health and survival. It is defined by the extent of the root system and is protected by a barrier of tree protection fencing.

**TREE PROTECTION FENCING**  
Tree protection fencing shall be installed around the CRZ of each tree to be protected. The fencing shall be made of heavy-duty plastic or metal and shall be supported by posts. The spacing between posts shall be no more than 6 feet.

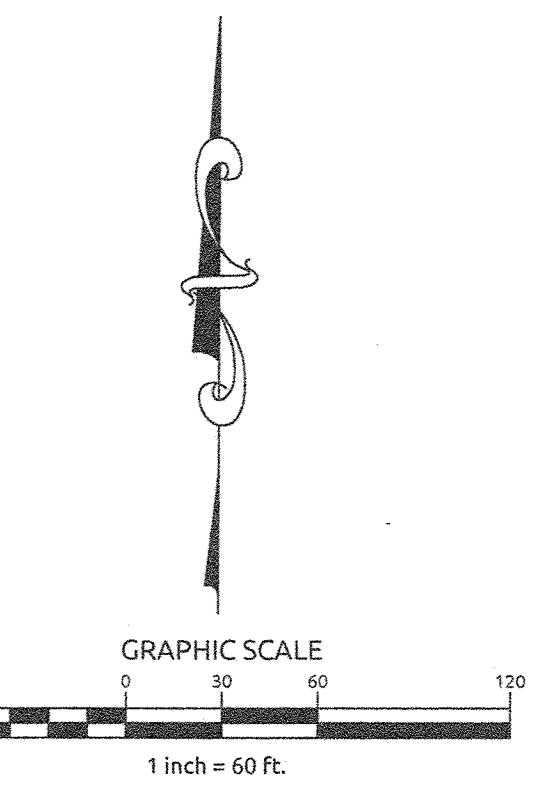
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WILMINGTON  
CITY OF WILMINGTON ENGINEERING  
DATE 01-11-17  
SD 15-69

**STANDARD DETAIL**  
WILMINGTON  
CITY OF WILMINGTON ENGINEERING  
DATE 01-11-17  
SD 15-69

**STORMWATER MANAGEMENT PLAN**  
**APPROVED**  
CITY OF WILMINGTON  
ENGINEERING DEPARTMENT  
DATE 3/25/17 PERMIT # 2017006  
SIGNED [Signature]

**Approved Construction Plan**  
Name [Signature] Date 3/27/17  
Public Utilities [Signature]  
Traffic [Signature] 3-27-17  
Fire [Signature] 3-24-17

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



No.	Revision	Date	By
1	REVISED PER COW S&B	5-24-16	MEM
2	REVISED PER CLIENT COMMENTS	11-16-16	MEM
3	REVISED PER COW	12-09-16	MEM

**ARBOR COMMONS**  
New Hanover County  
North Carolina

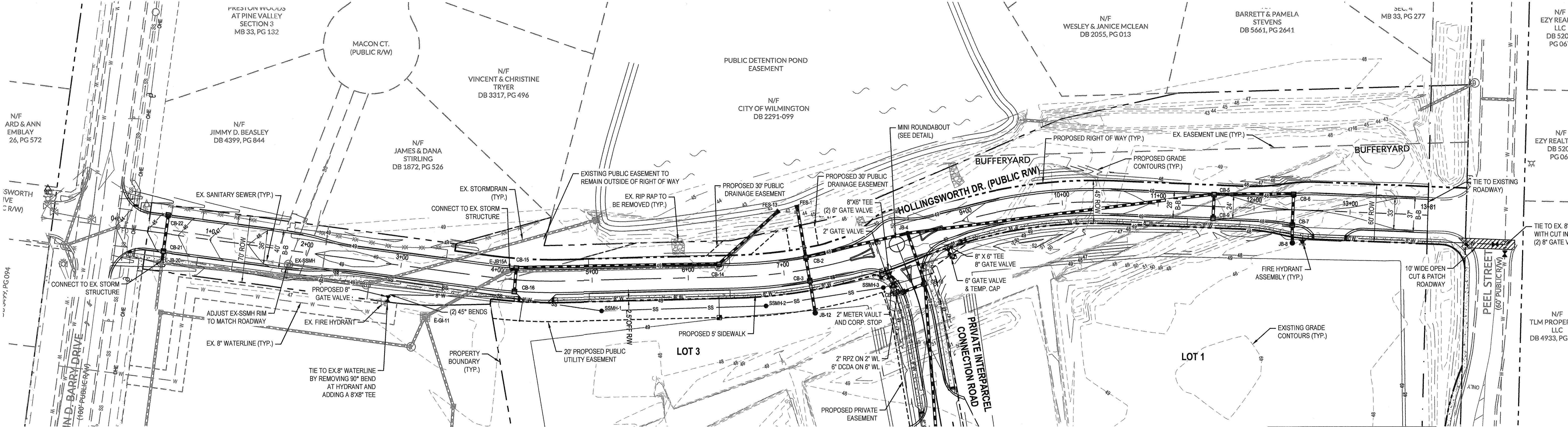
Designer: W&R Scale: NOTED  
Drawn By: JSB Date: 3/24/16  
Checked By: JJW Job No.: 03061193.01

**LANDSCAPE & LIGHTING PLAN**

**WithersRavenel**  
Engineers | Planners | Surveyors  
1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com

Sheet No. **C-8**

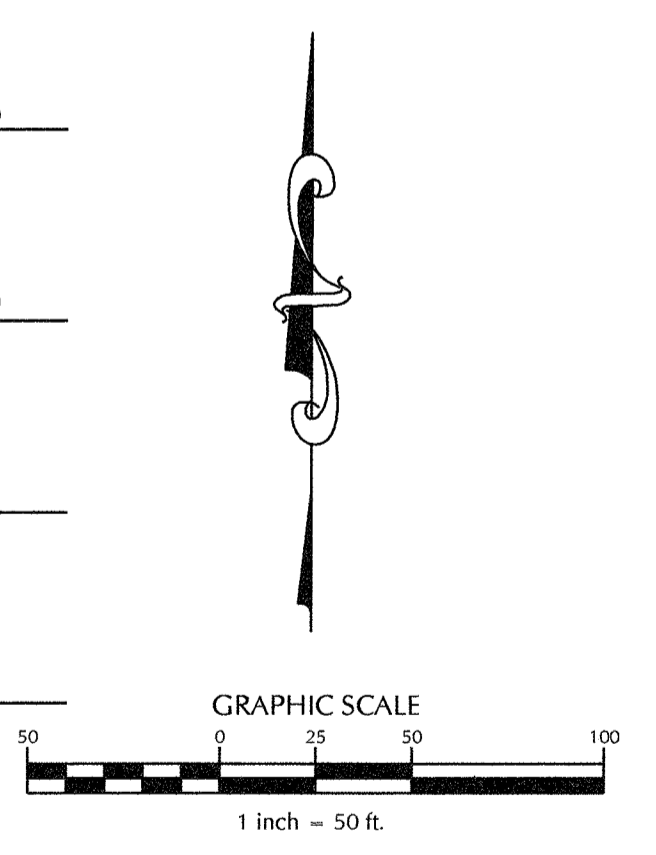
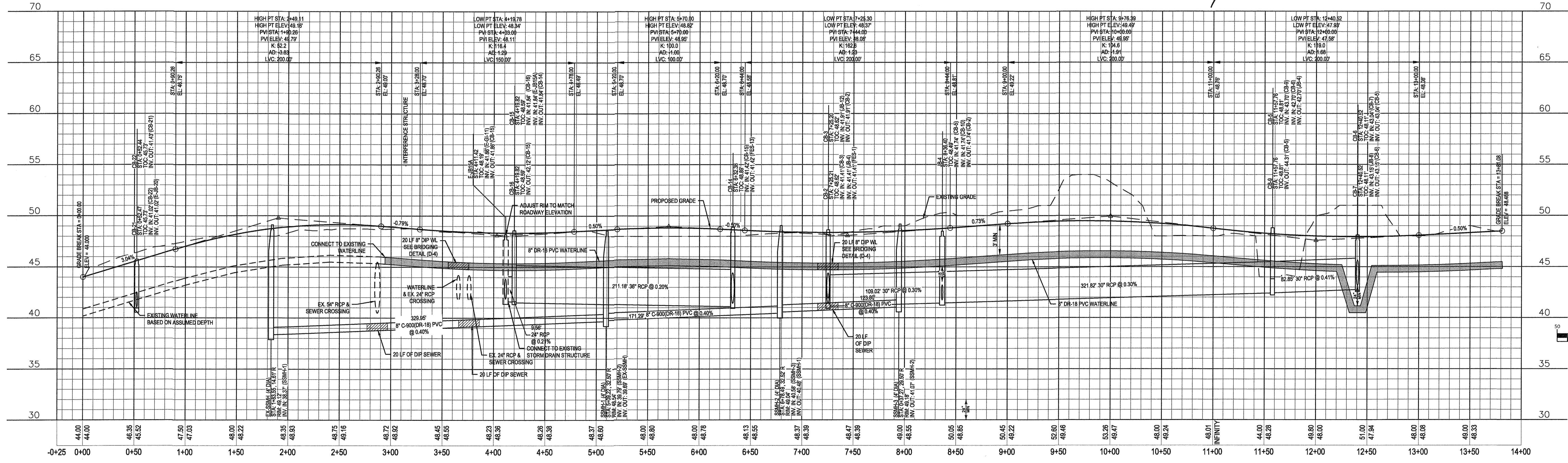
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Approved Construction Plan  
 Name: [Signature]  
 Date: 3/23/17  
 Planning: [Signature]  
 Public Utilities: [Signature]  
 Traffic: [Signature] 3-27-17  
 Fire: [Signature] 7-27-17

STORMWATER MANAGEMENT PLAN  
**APPROVED**  
 CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE 3/23/17 PERMIT # 2017026  
 SIGNED [Signature]

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



SEAL REDACTED

FINAL DESIGN

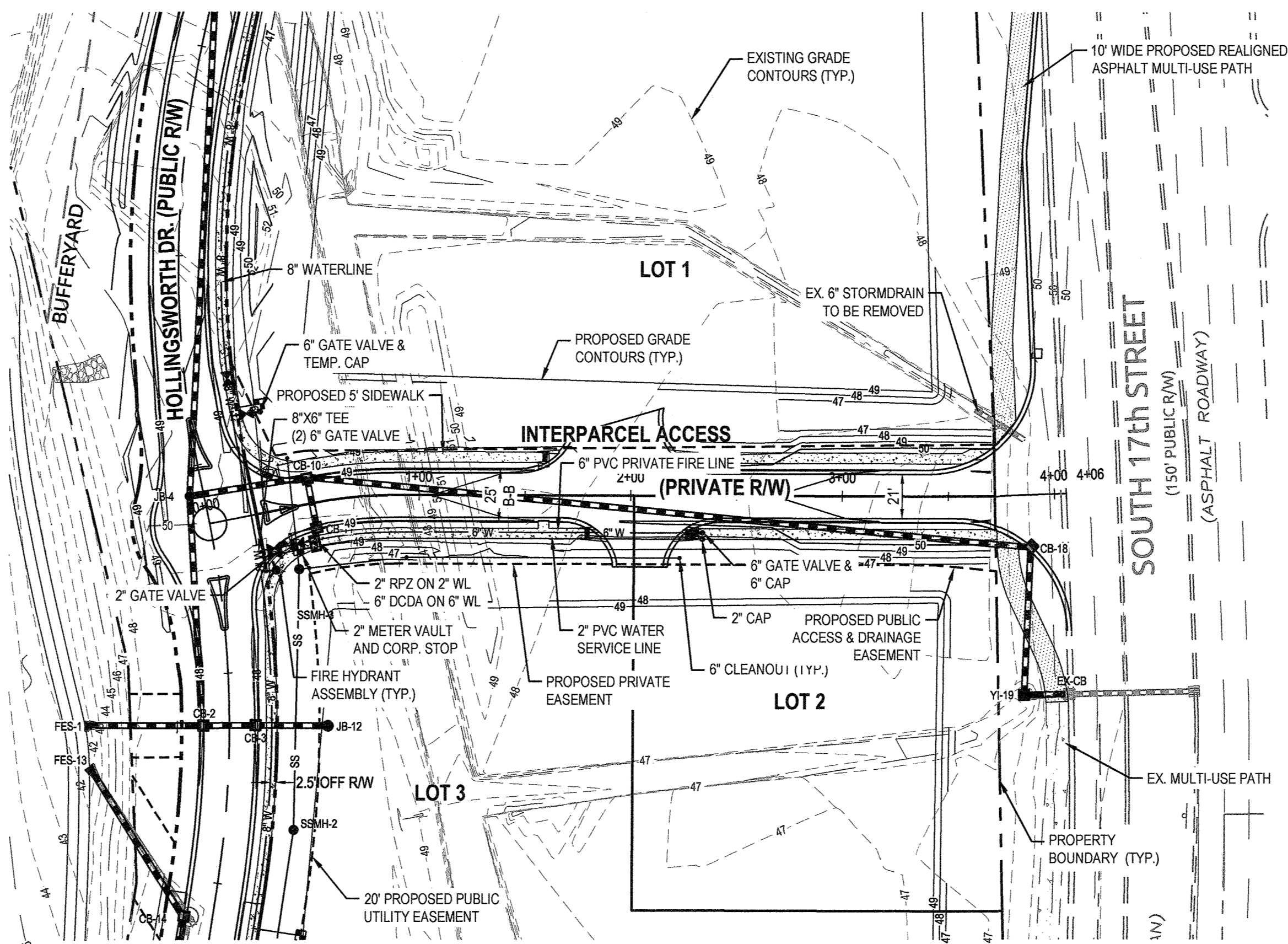
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1	REVISED PER COW SRB	5-24-16	JSB	JSB	1"=50'
2	RELOCATED SEWERMAN & ADDED UTILITY EASEMENT PER COW REVIEW	8-24-16	JSB	JSB	
3	REVISED ROADWAY ELEVATIONS & STORM DRAIN SYSTEM	10-28-16	JSB	JSB	
4	REVISED PER CLIENT & COW COMMENTS	11-28-16	JSB	JSB	

**ARBOR COMMONS**  
 Wilmington, New Hanover County, North Carolina

**HOLLINGSWORTH DRIVE PLAN & PROFILE**

**WithersRavenel**  
 Engineers | Planners | Surveyors  
 1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com

Sheet No.  
**C-9**



**Approved Construction Plan**

Name: *[Signature]* Date: 3/24/17

Planning: *[Signature]*

Public Utilities: *[Signature]*

Traffic: *[Signature]* 3-27-17

Fire: *[Signature]* 7-24-17

**STORMWATER MANAGEMENT PLAN**

**APPROVED**

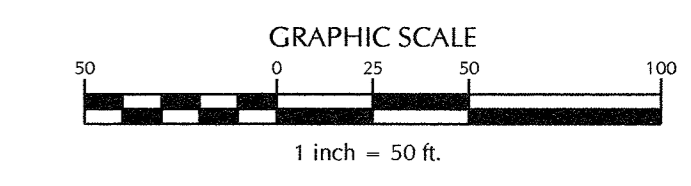
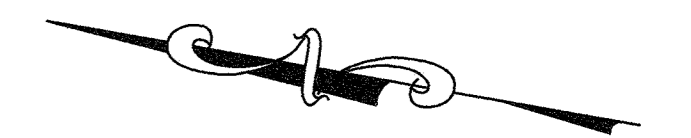
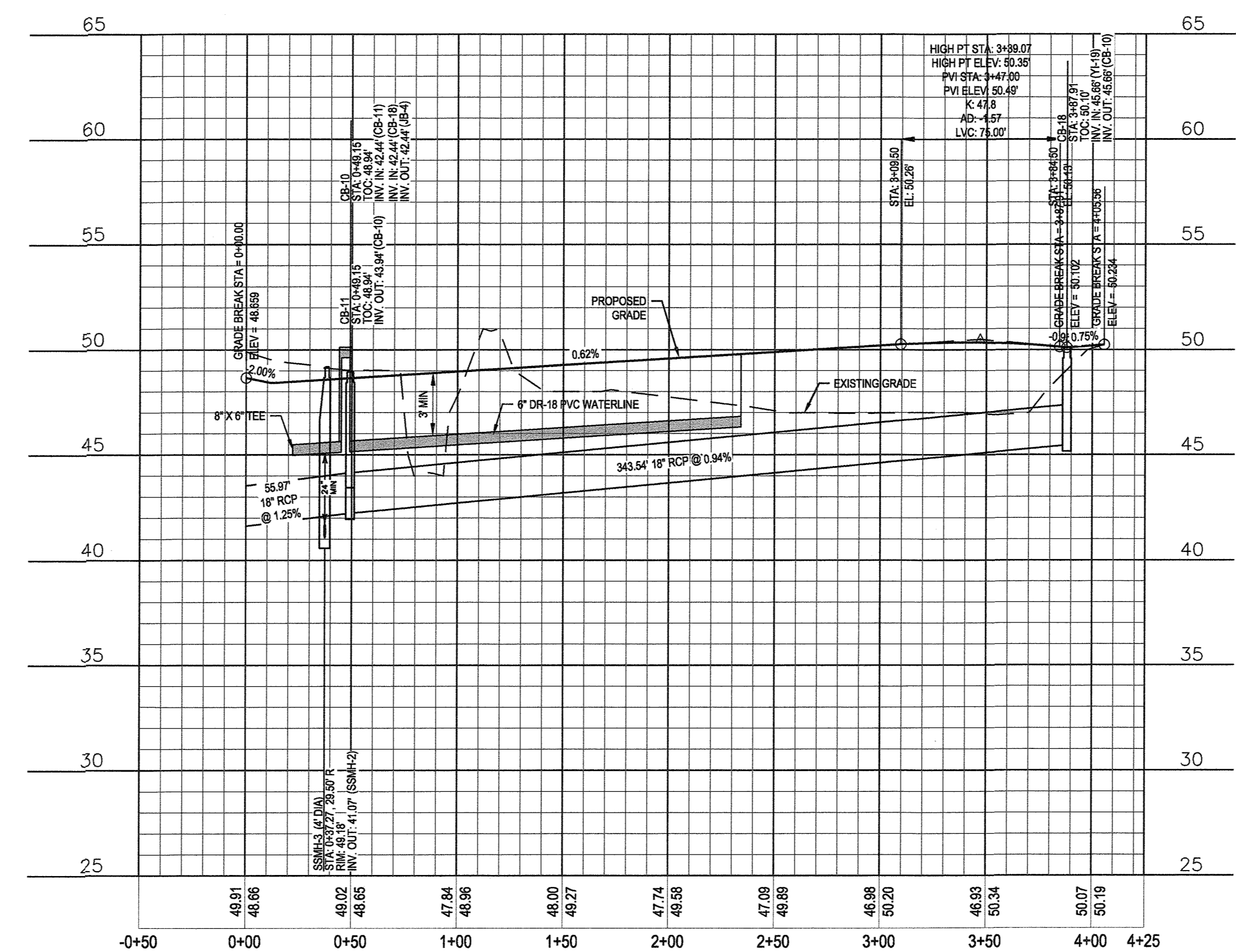
CITY OF WILMINGTON

ENGINEERING DEPARTMENT

DATE 3/23/17 PERMIT # 2017026

SIGNED *[Signature]*

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



SEAL REDACTED

**FINAL DESIGN**

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2	RELOCATED SEWERMAIN & ADDED UTILITY EASEMENT PER CPWA REVIEW	8-24-16	JSB		
3	REVISED STORM DRAIN SYSTEM & GRADE ELEVATIONS	10-28-16	JSB		
4	REVISED PER CLIENT & CPWA COMMENTS	11-28-16	JSB		
5	REVISED ROAD GRADES & MOVED DR-18 TO OS-18 PER COW COMMENTS	2-28-17	JSB		

Drawn By: JSB Date: 3/24/16  
Checked By: JWB Job No.: 03061193.01  
JWW 03061193.01

**ARBOR COMMONS**

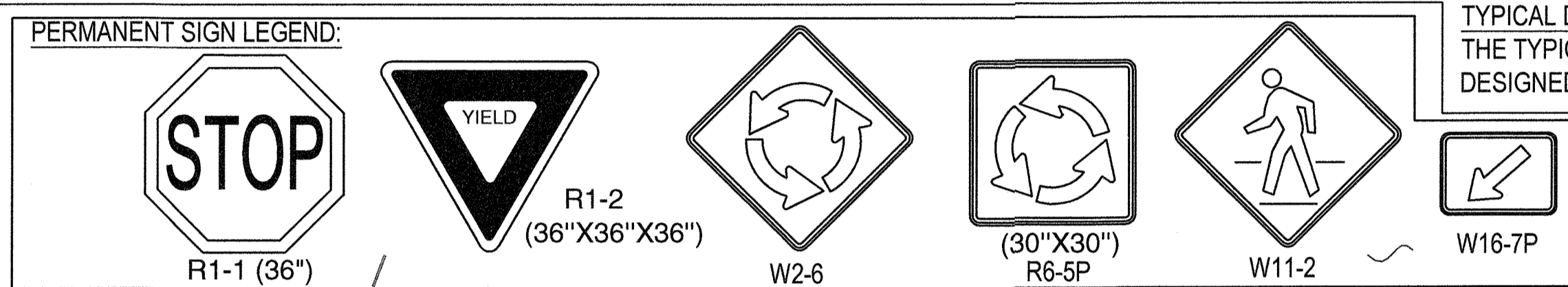
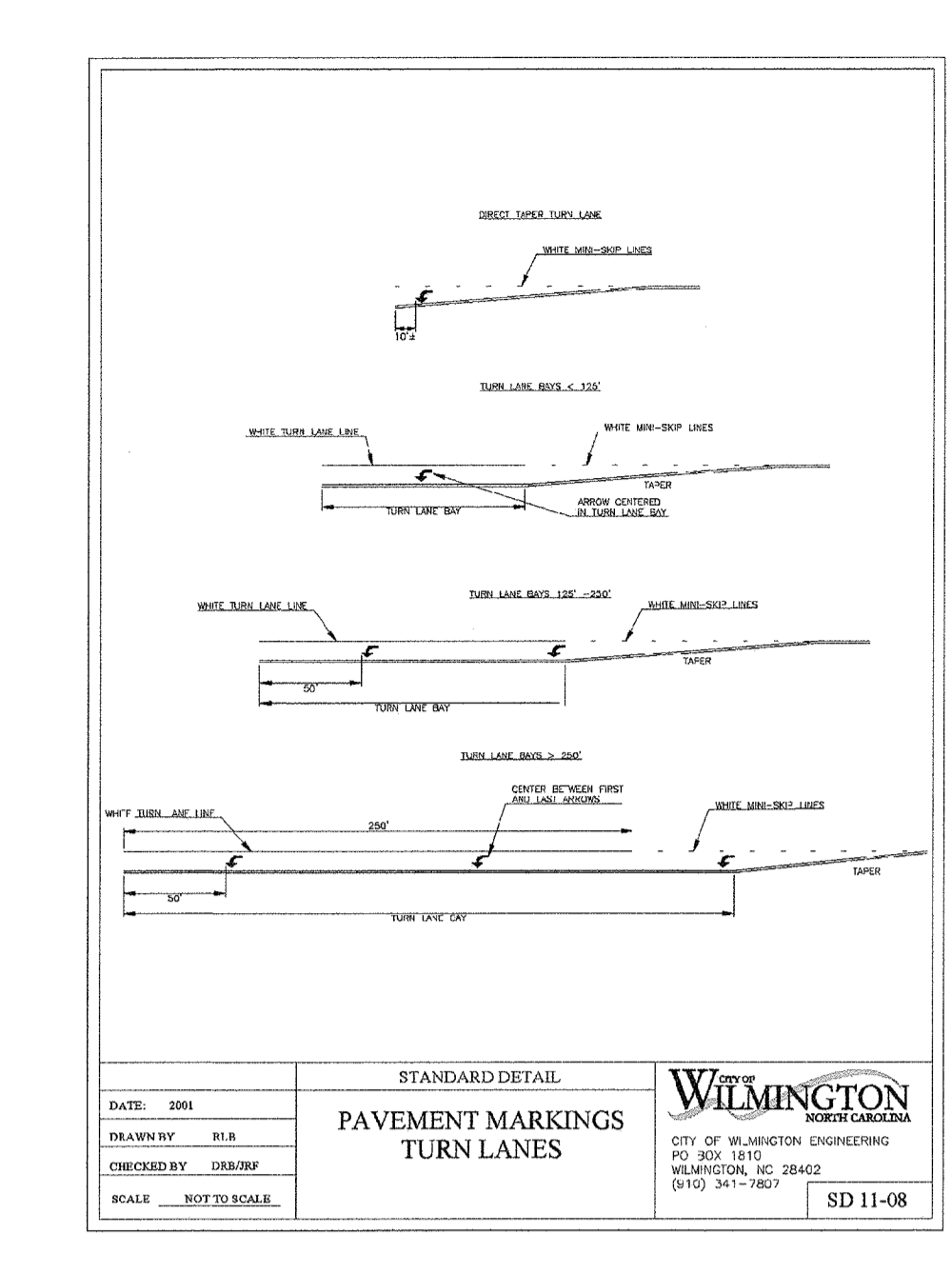
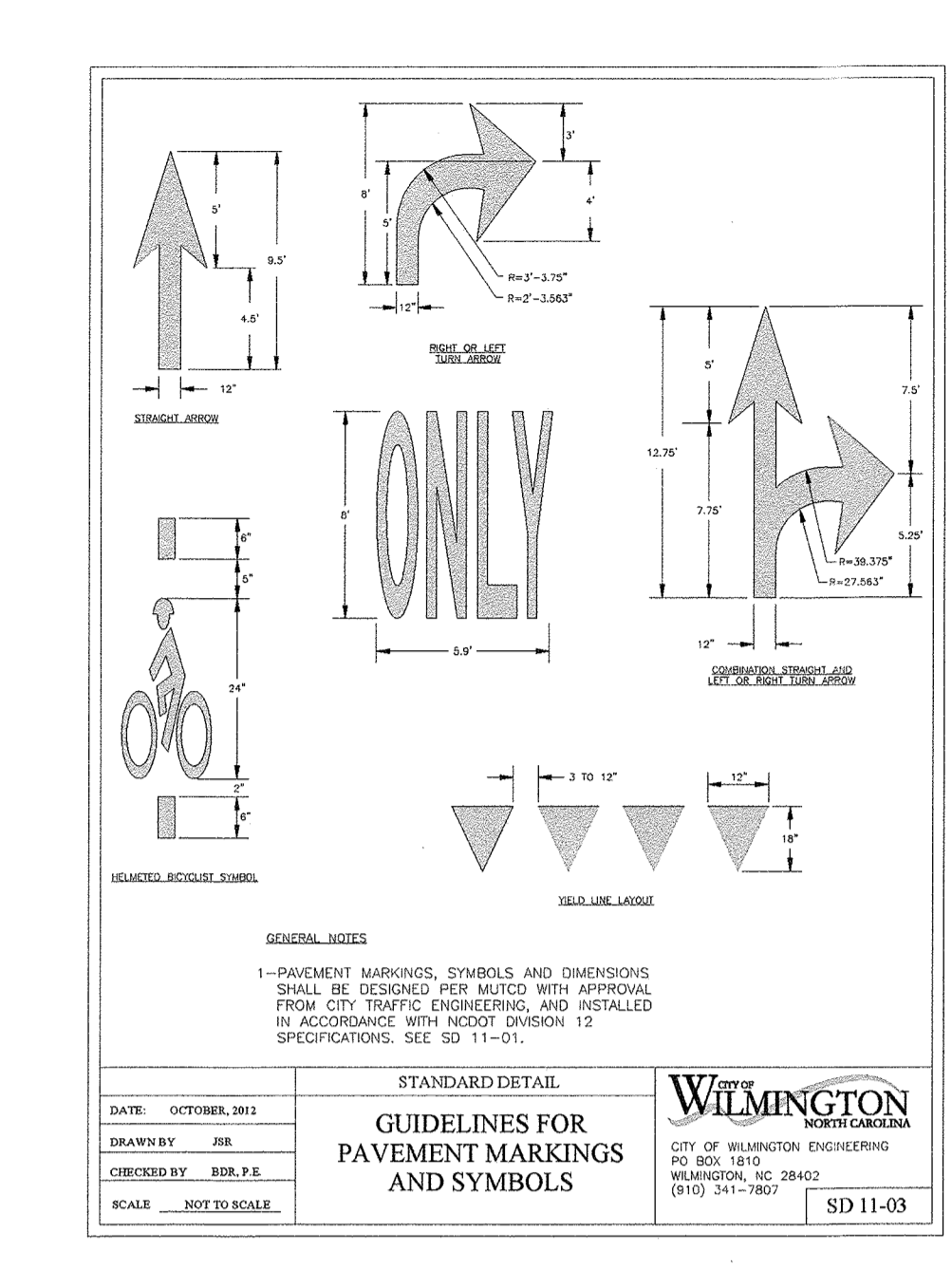
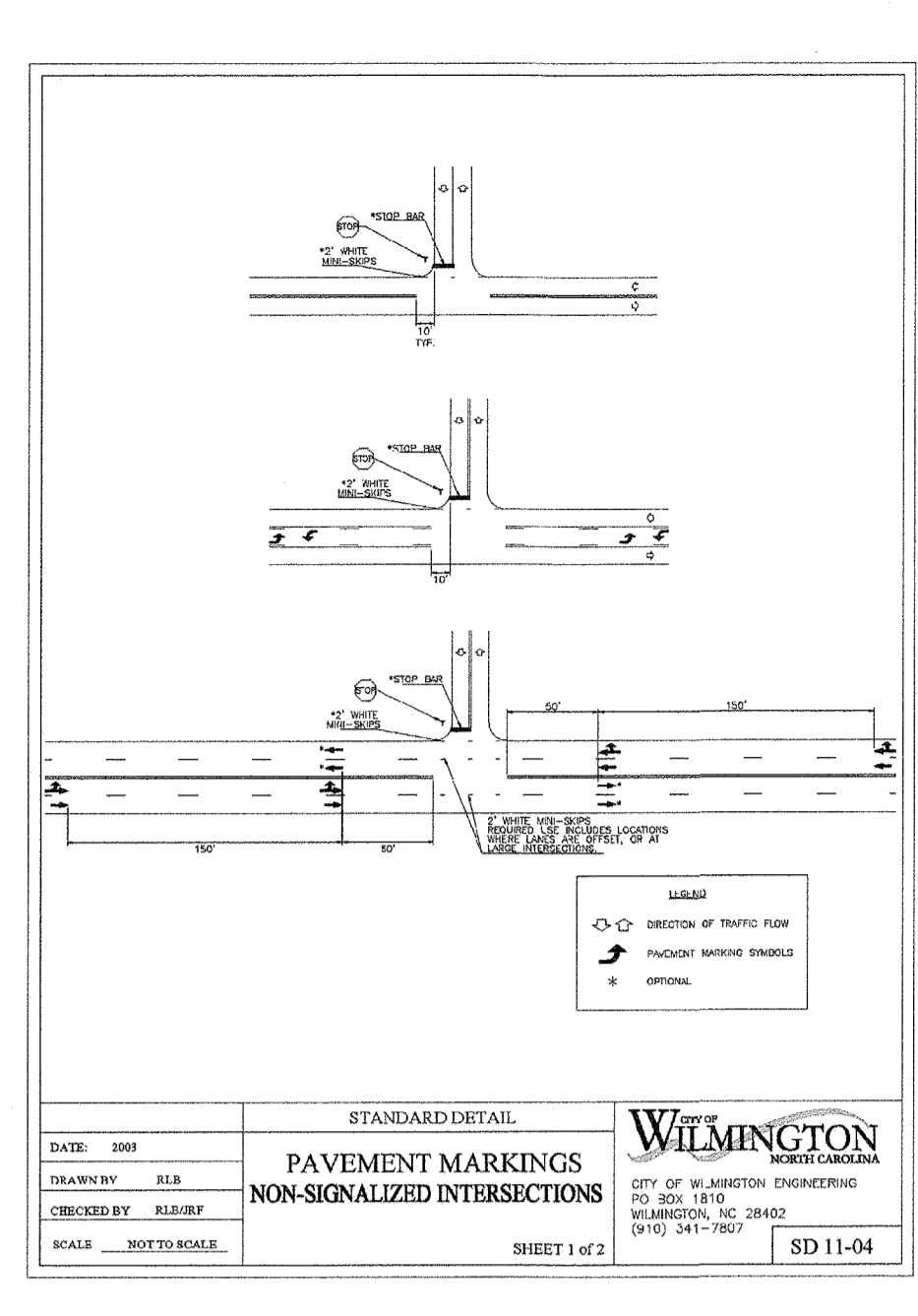
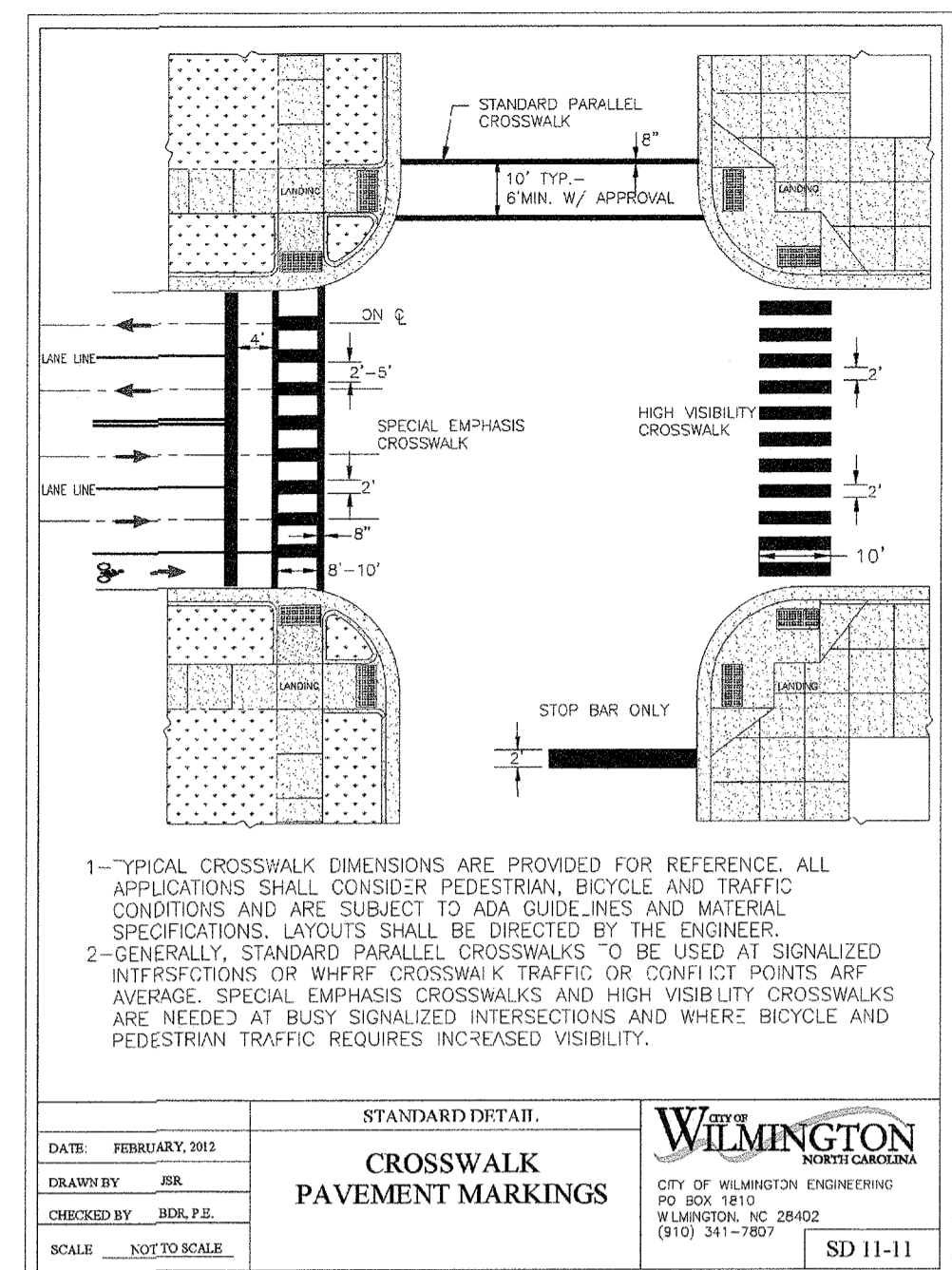
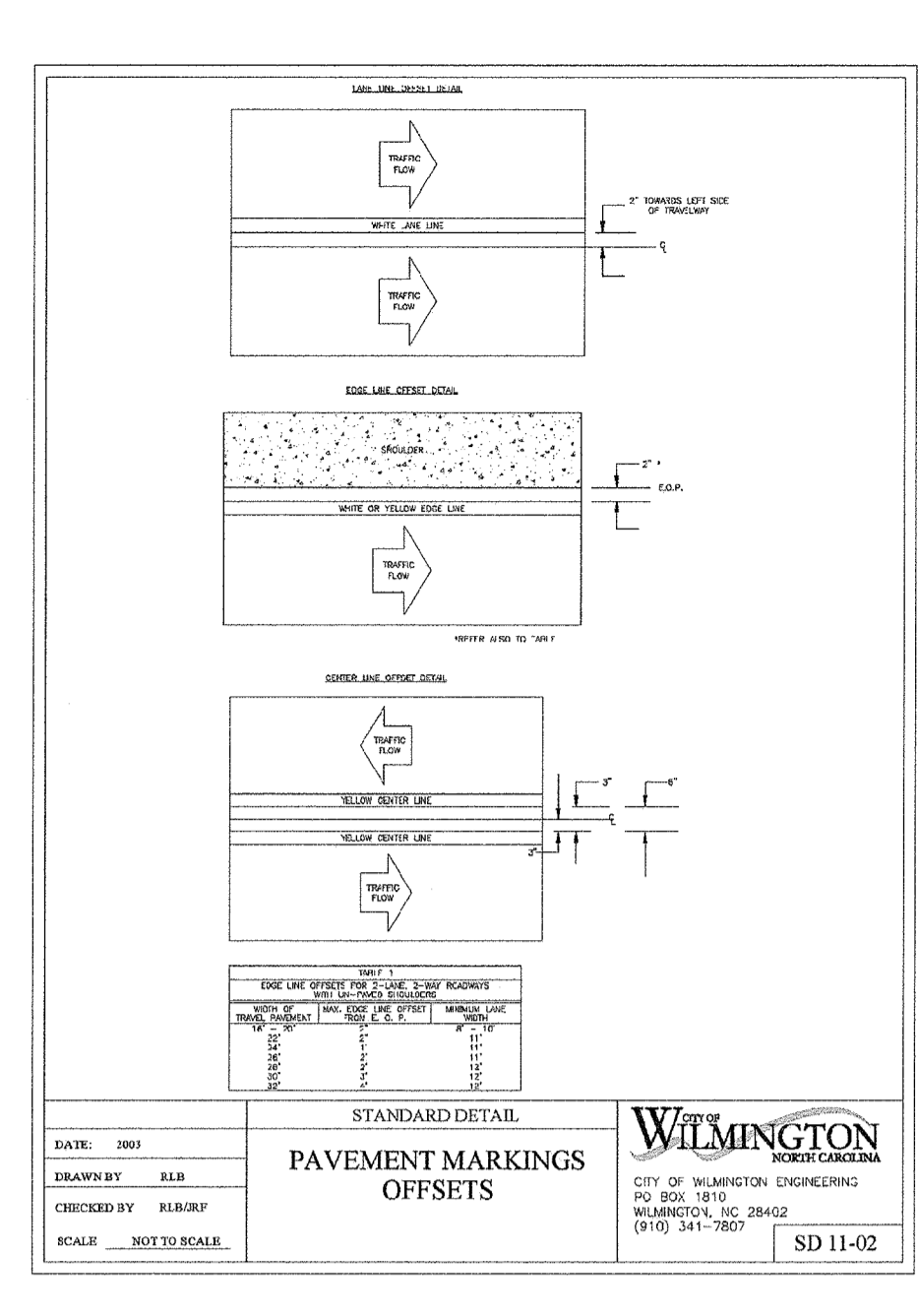
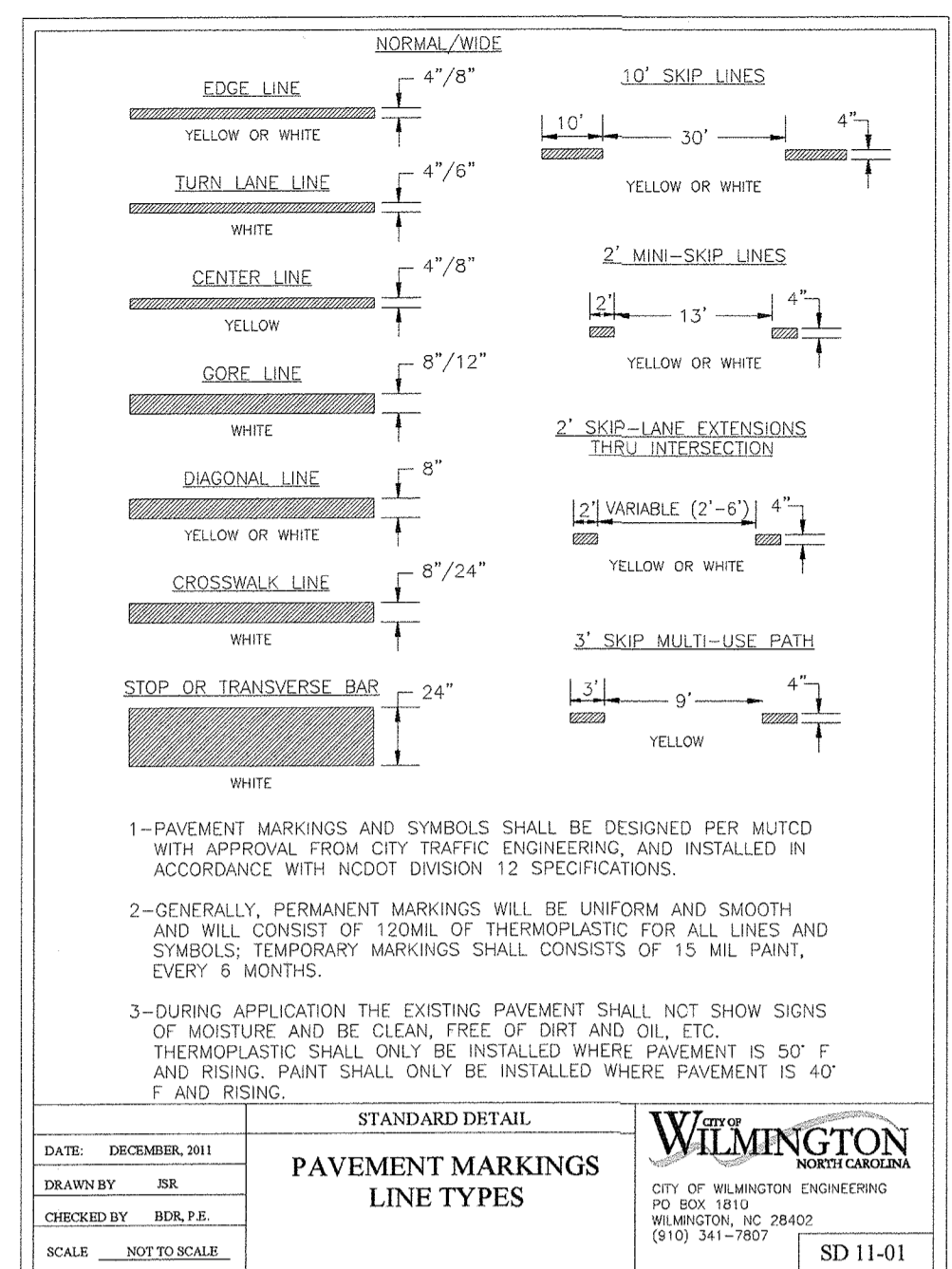
Wilmington New Hanover County North Carolina

**PRIVATE INTERPARCEL ACCESS ROAD**

**PLAN & PROFILE**

**WithersRavenel**  
Engineers | Planners | Surveyors

1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com



TYPICAL DETAILS NOTE:  
THE TYPICAL DETAILS ON THIS SHEET WERE  
DESIGNED AND PREPARED BY OTHERS.

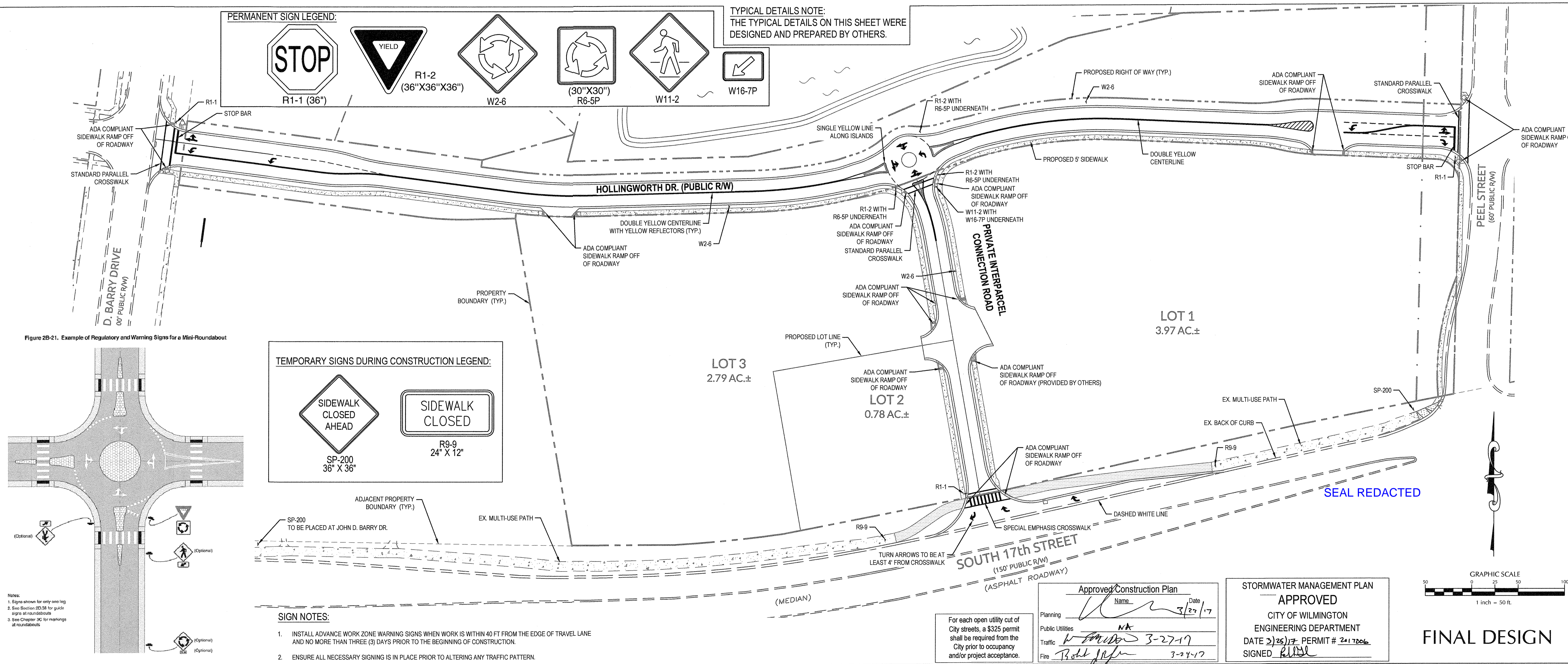
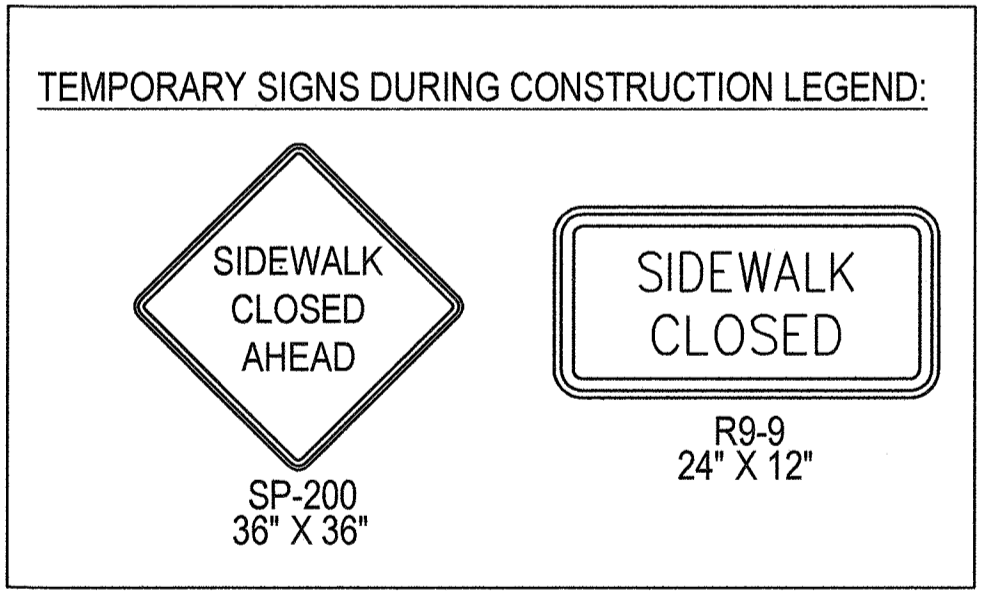
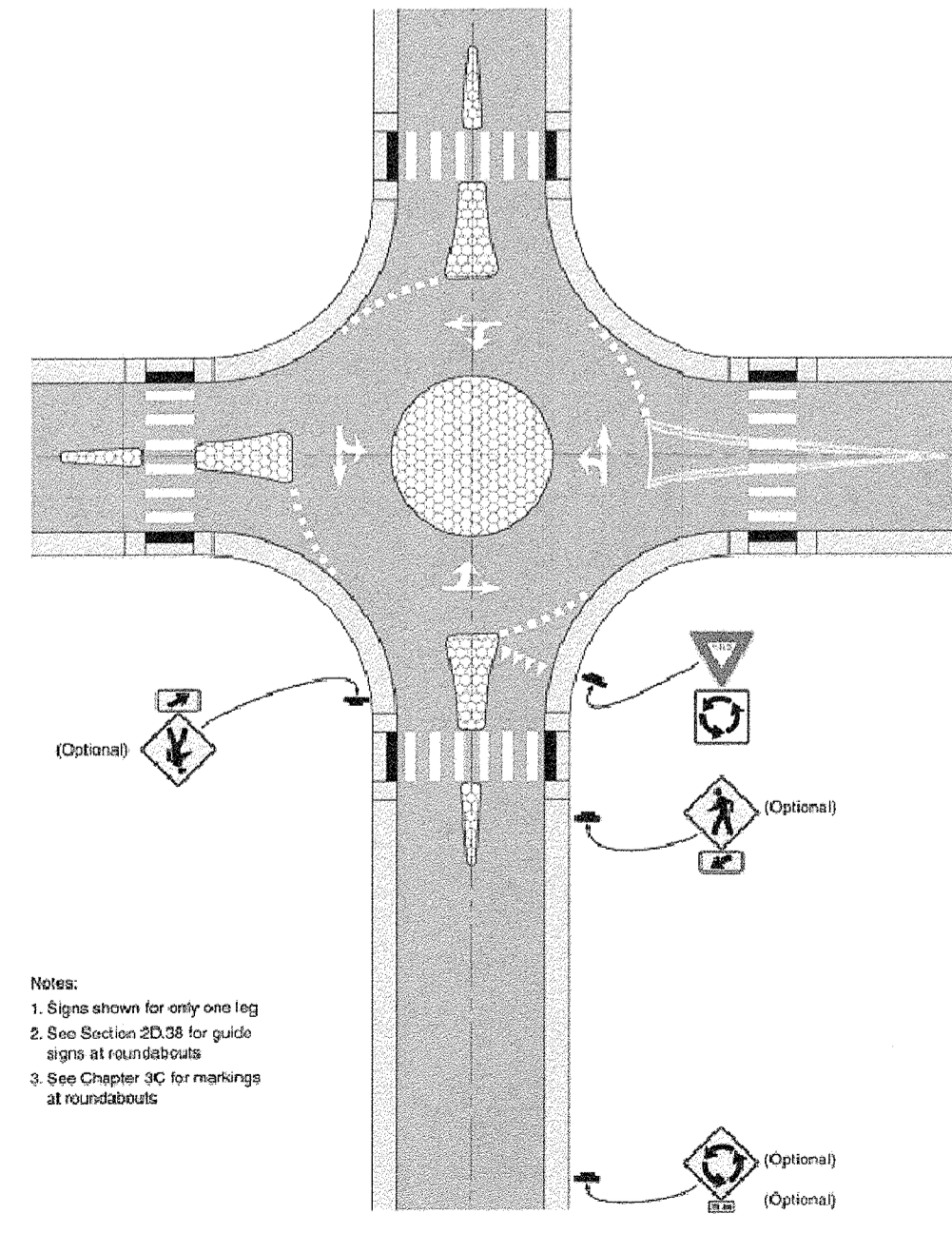


Figure 2B-21. Example of Regulatory and Warning Signs for a Mini-Roundabout



- SIGN NOTES:**
- INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
  - ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

Approved Construction Plan

Name: [Signature] Date: 3/27/17

Planning: [Signature] Date: 3-27-17

Public Utilities: NA

Traffic: [Signature] Date: 3-27-17

Fire: [Signature] Date: 3-27-17

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

STORMWATER MANAGEMENT PLAN

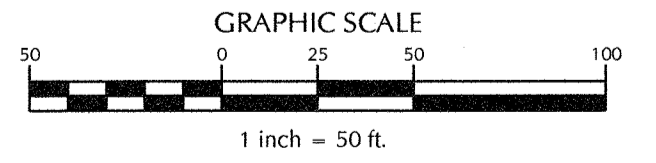
APPROVED

CITY OF WILMINGTON

ENGINEERING DEPARTMENT

DATE 3/25/17 PERMIT # 2417206

SIGNED [Signature]



FINAL DESIGN

No.	Revision	Date	By	Designer	Scale
1	REVISED PER CLIENT COMMENTS	11-16-16	JSB	JSB	1"=50'
2	ADD CROSSWALK @ PEEL & REVISED SIGNS PER COW COMMENTS	3-21-17	JSB	JSB	3/24/16
				Checked By	Job No.
				JWJ	03061193.01

**ARBOR COMMONS**

New Hanover County North Carolina

**PAVEMENT MARKINGS AND SIGNAGE PLAN**

**WithersRavenel**

Engineers | Planners | Surveyors

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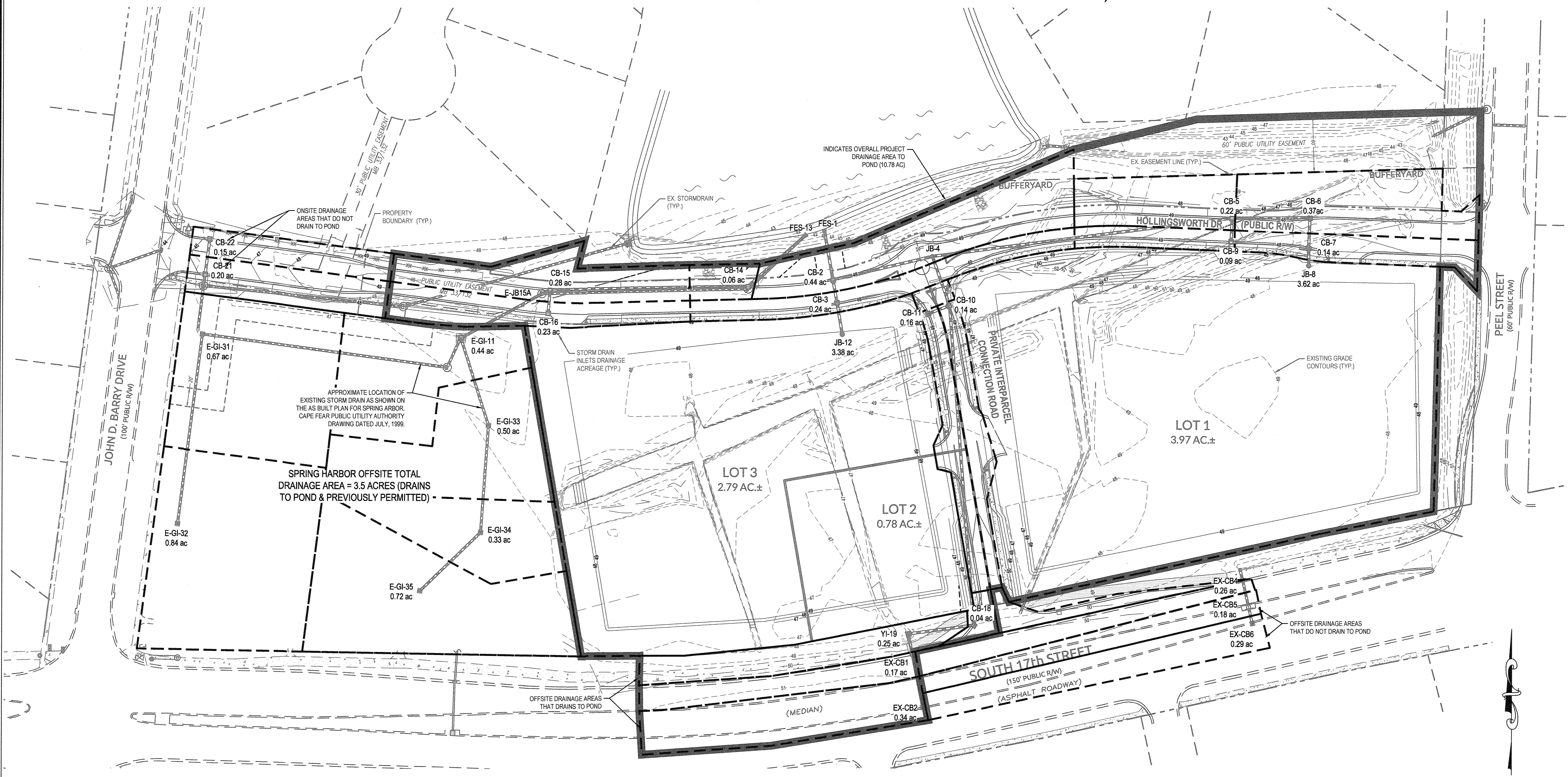
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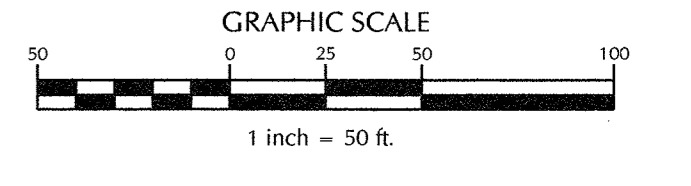
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 Planning: [Signature] Date: 3/21/17  
 Public Utilities: [Signature] Date: 3/21/17  
 Traffic: [Signature] Date: 3/21/17  
 Fire: [Signature] Date: 3/21/17

STORMWATER MANAGEMENT PLAN  
**APPROVED**  
 CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE 3/25/17 PERMIT # 2017006  
 SIGNED [Signature]

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



SEAL REDACTED



FINAL DESIGN

No.	Revision	Date	By
1	REVISED PER CLIENT COMMENTS	11-16-16	JSB
2	ADDED DA TO EX. CS 4-CB 7 PER CITY SW COMMENTS	12-19-16	JSB
3	ADDED OVERALL DA PER CITY SW COMMENTS	2-28-17	JSB

Designer	JSB	Scale	1"=50'
Drawn By	SLF	Date	10/10/2016
Checked By	JSB	Job No.	03061193.01

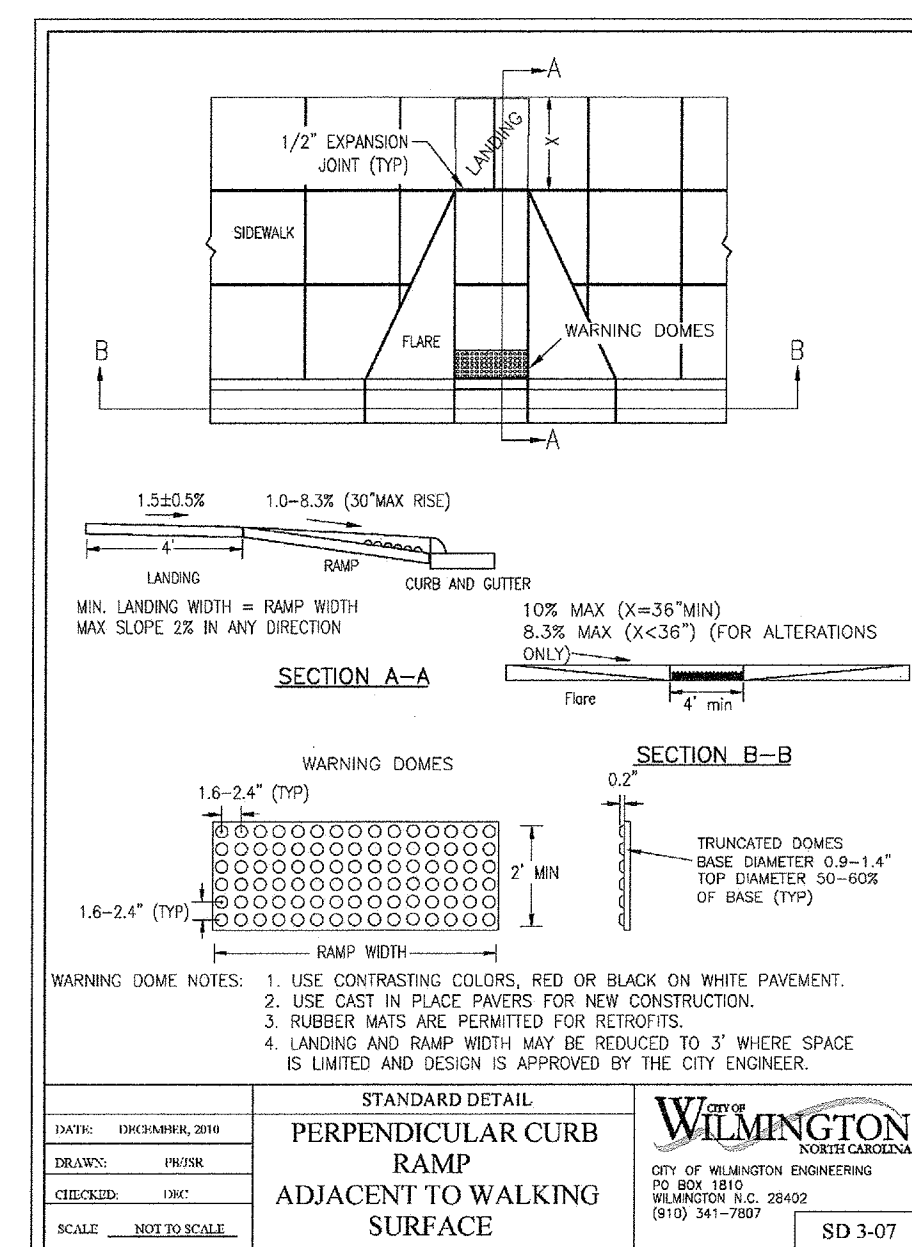
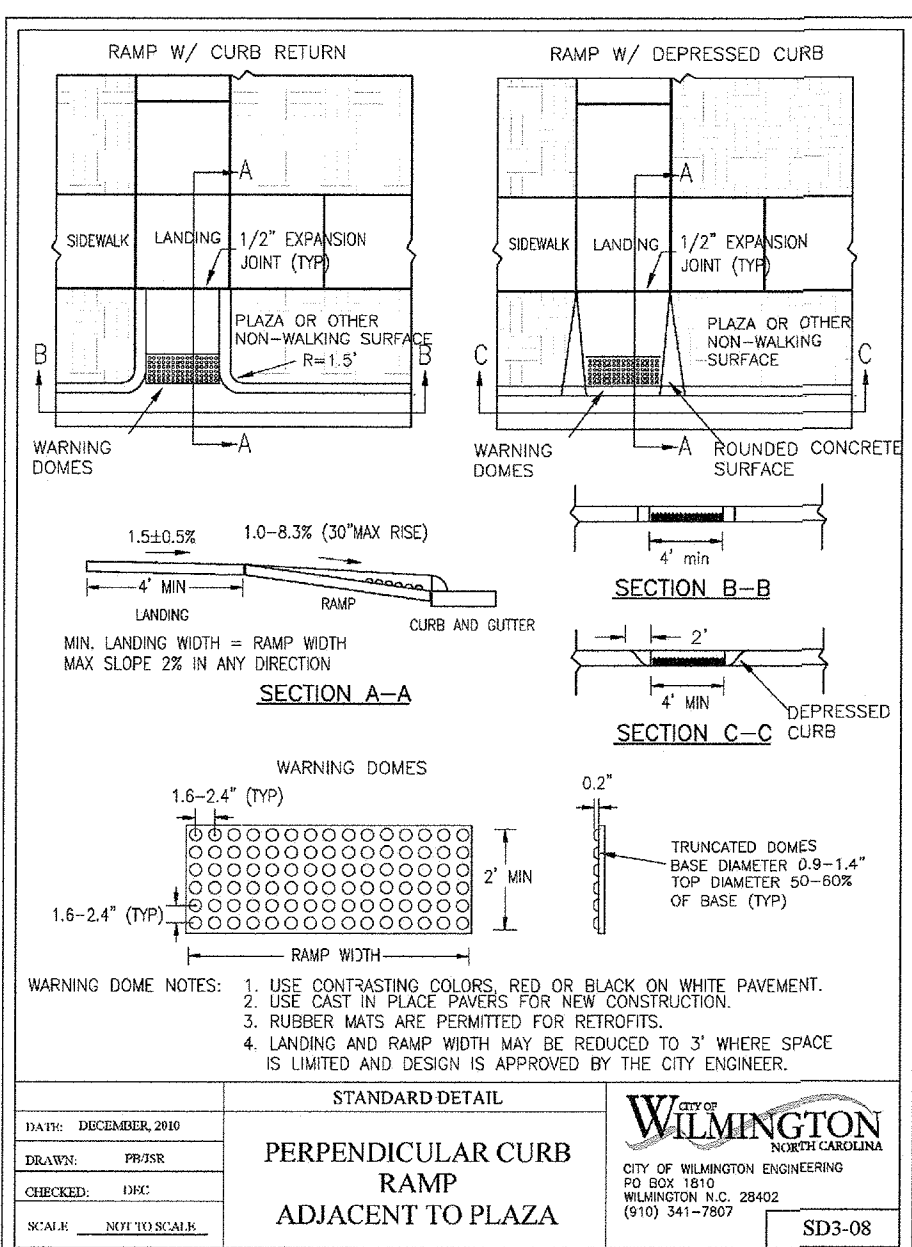
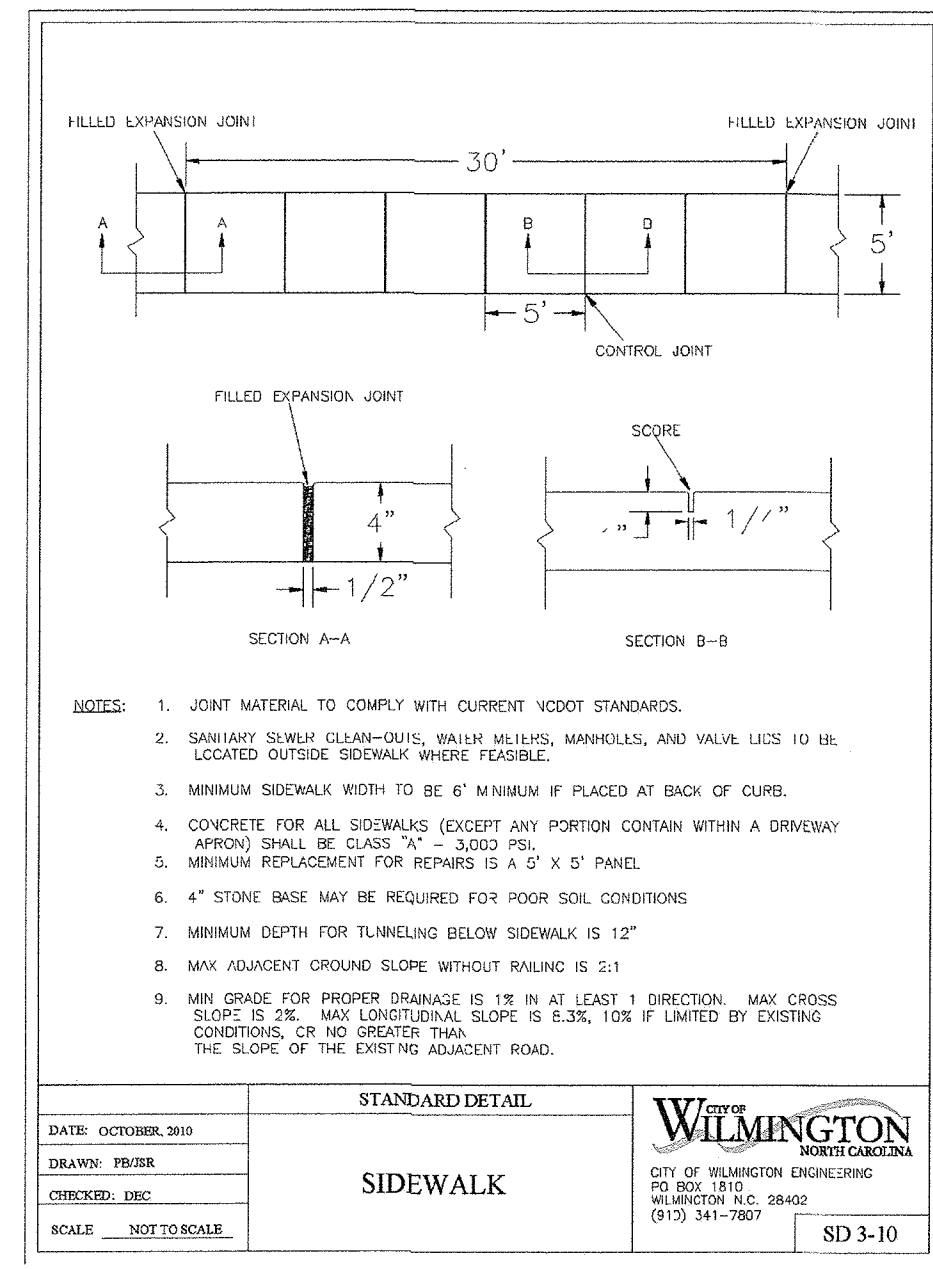
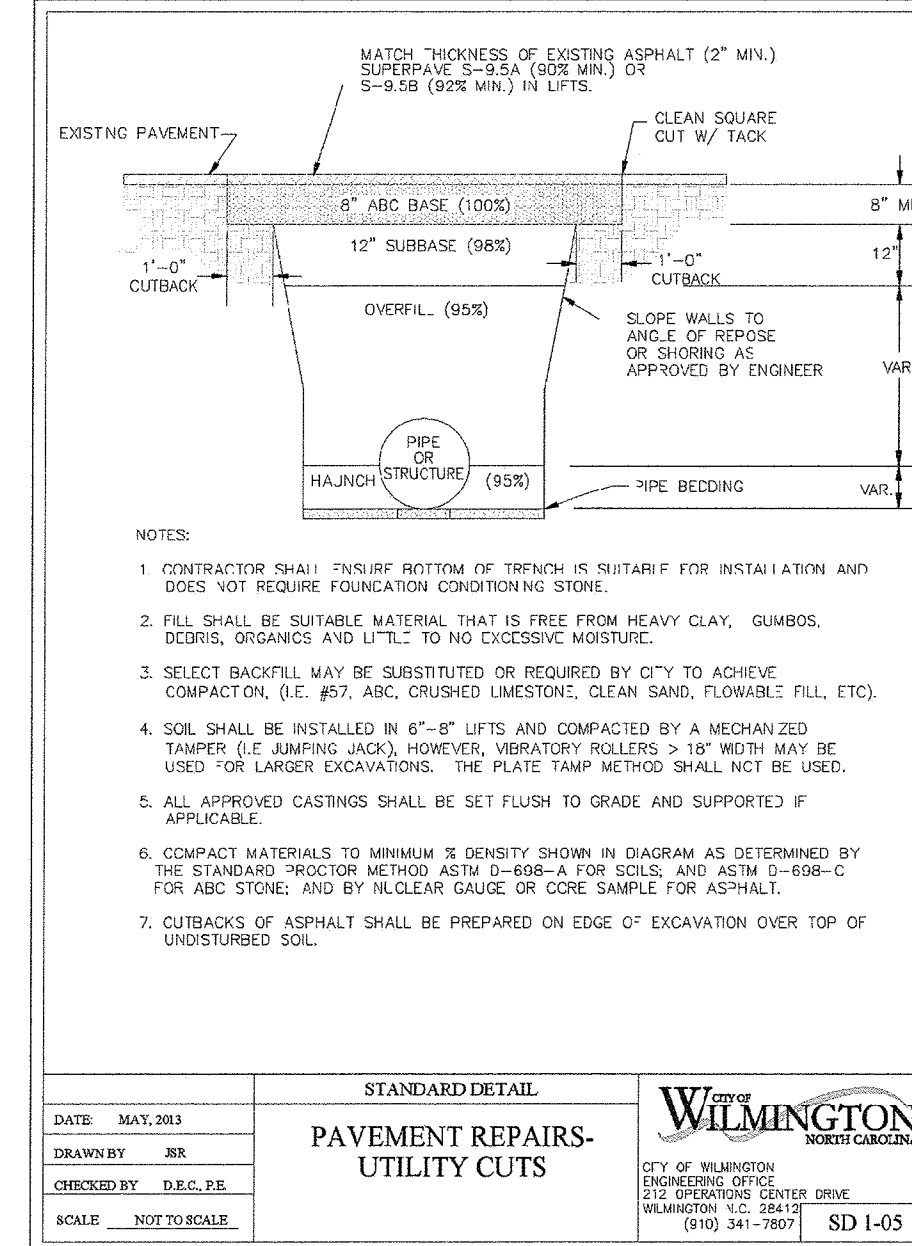
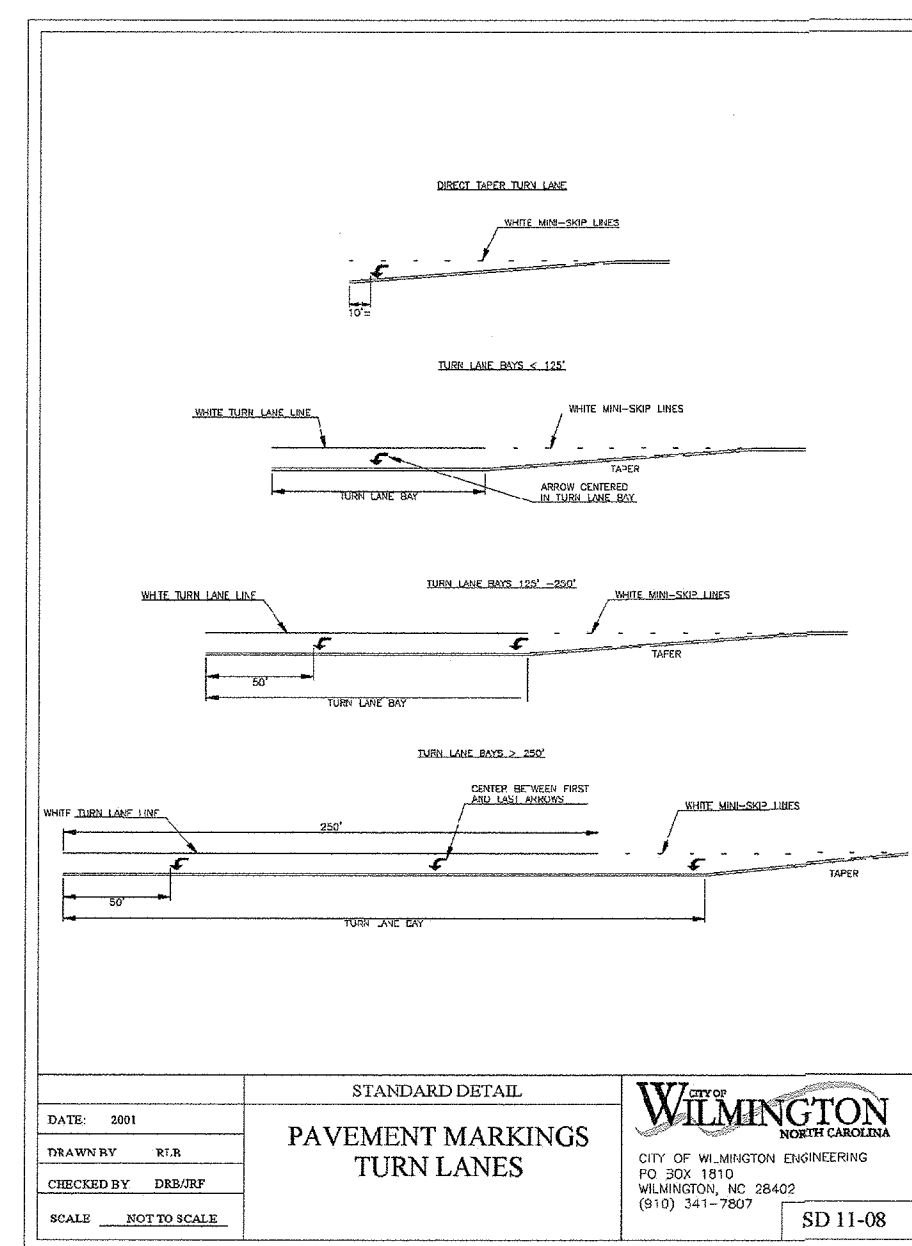
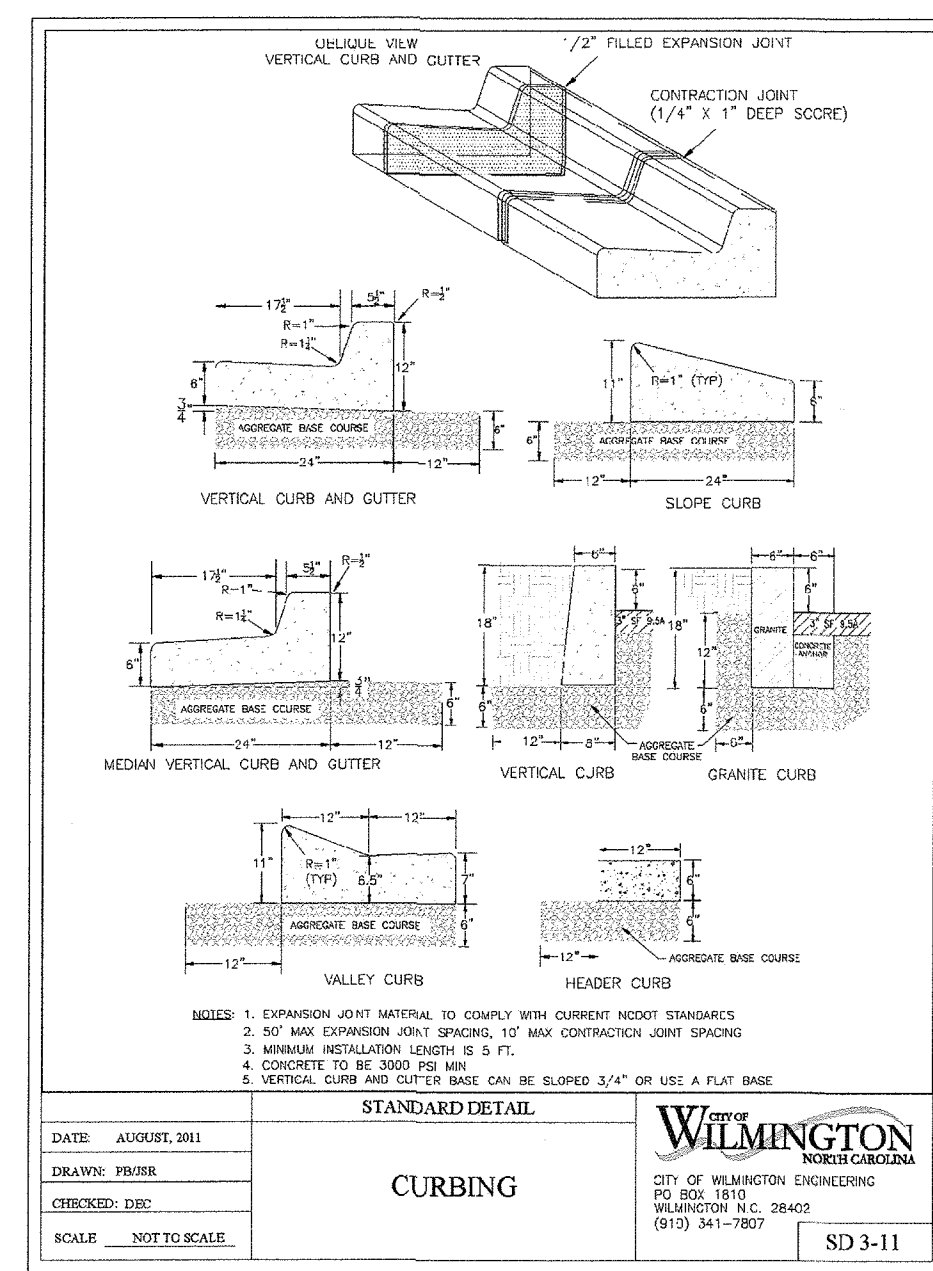
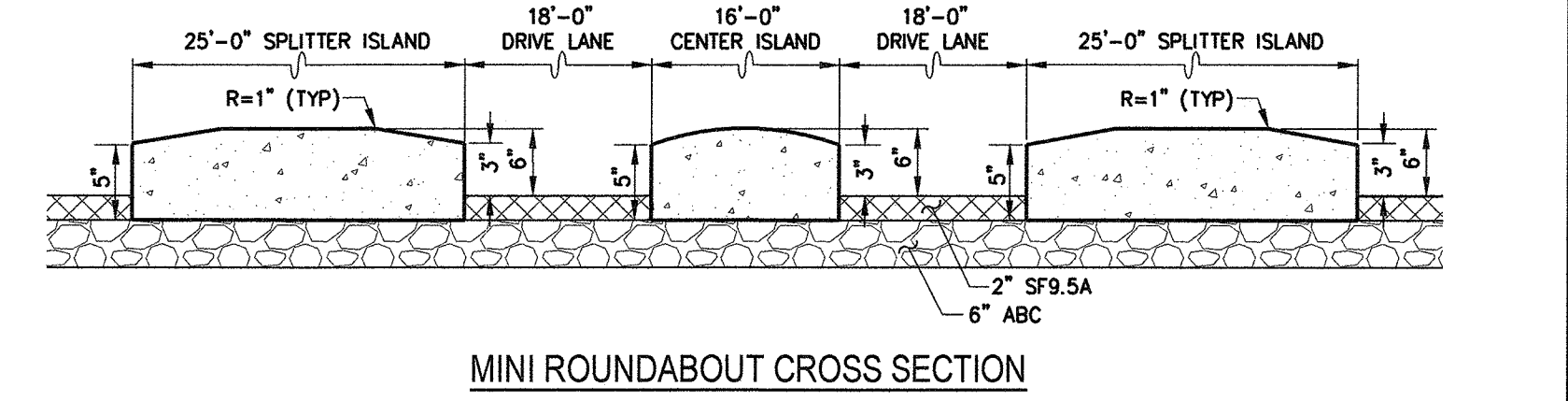
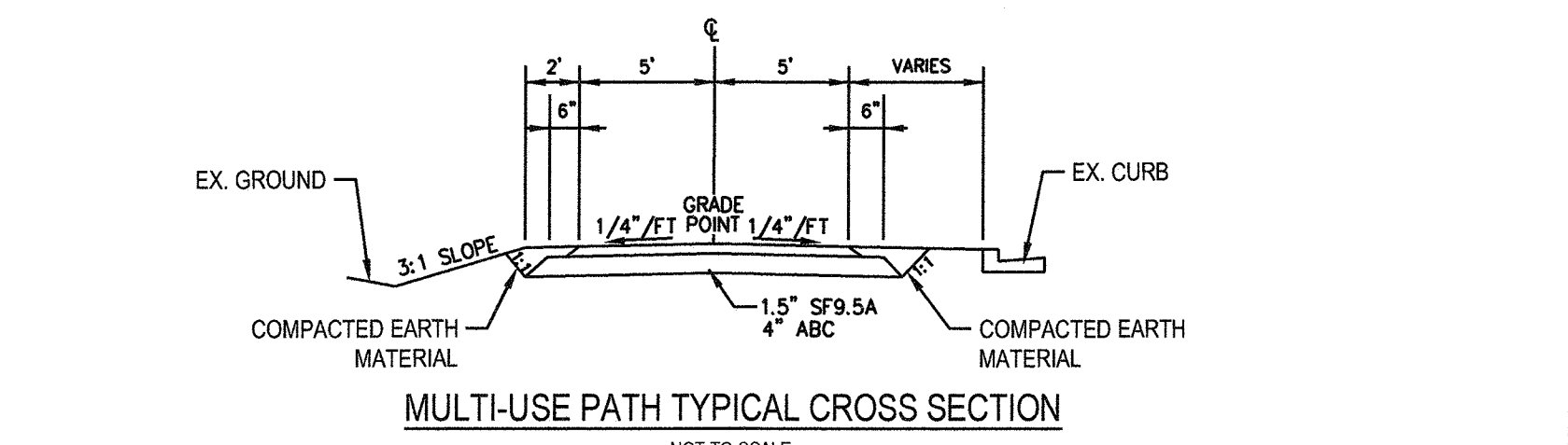
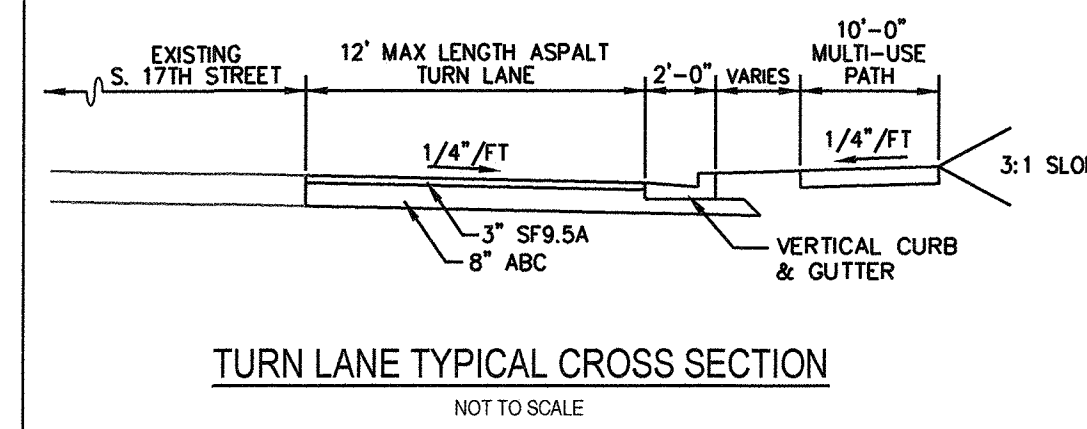
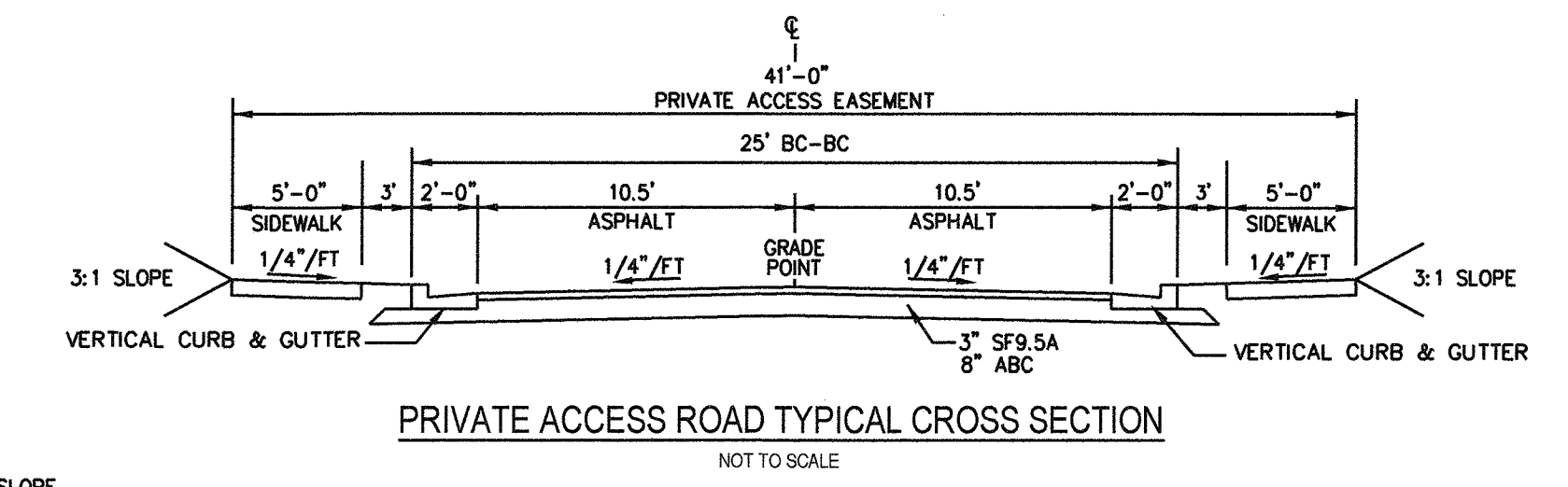
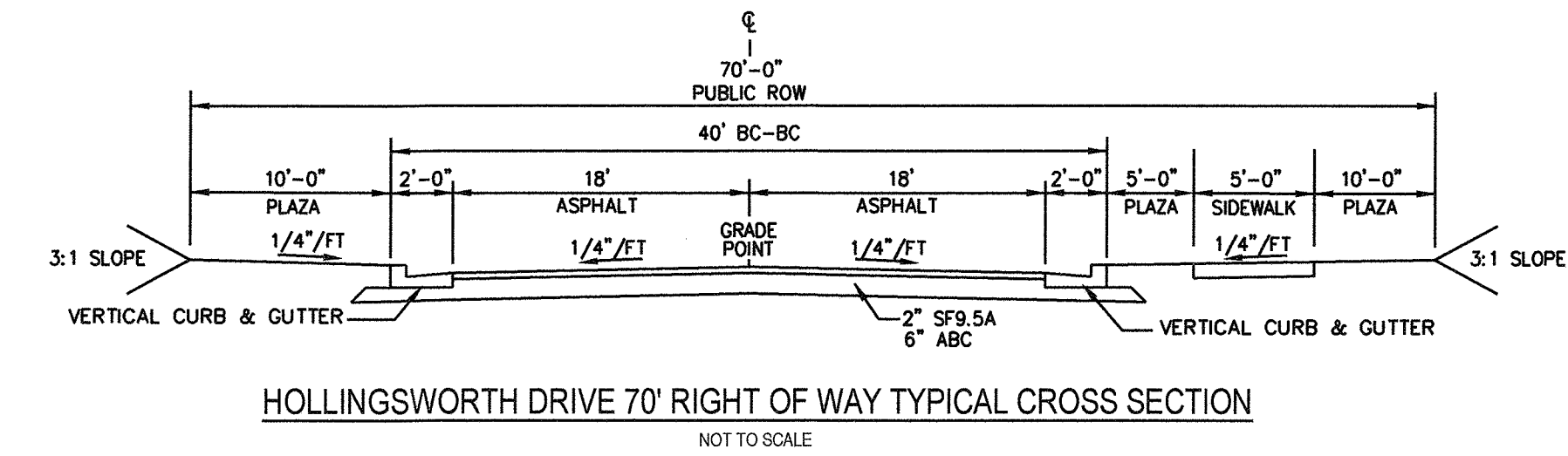
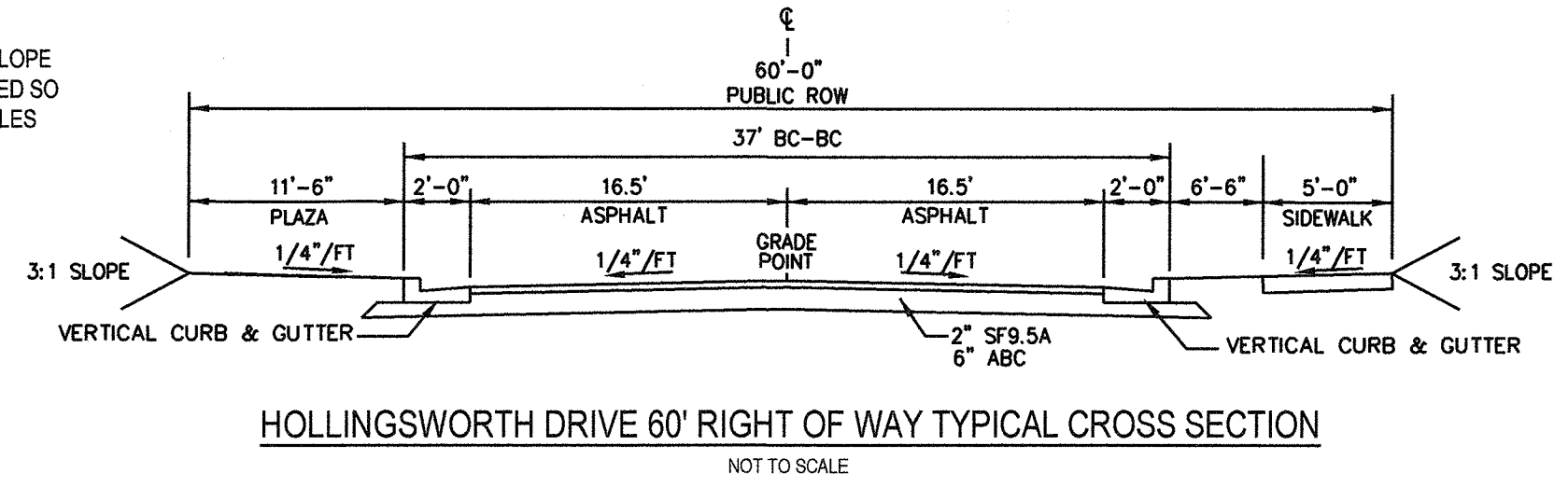
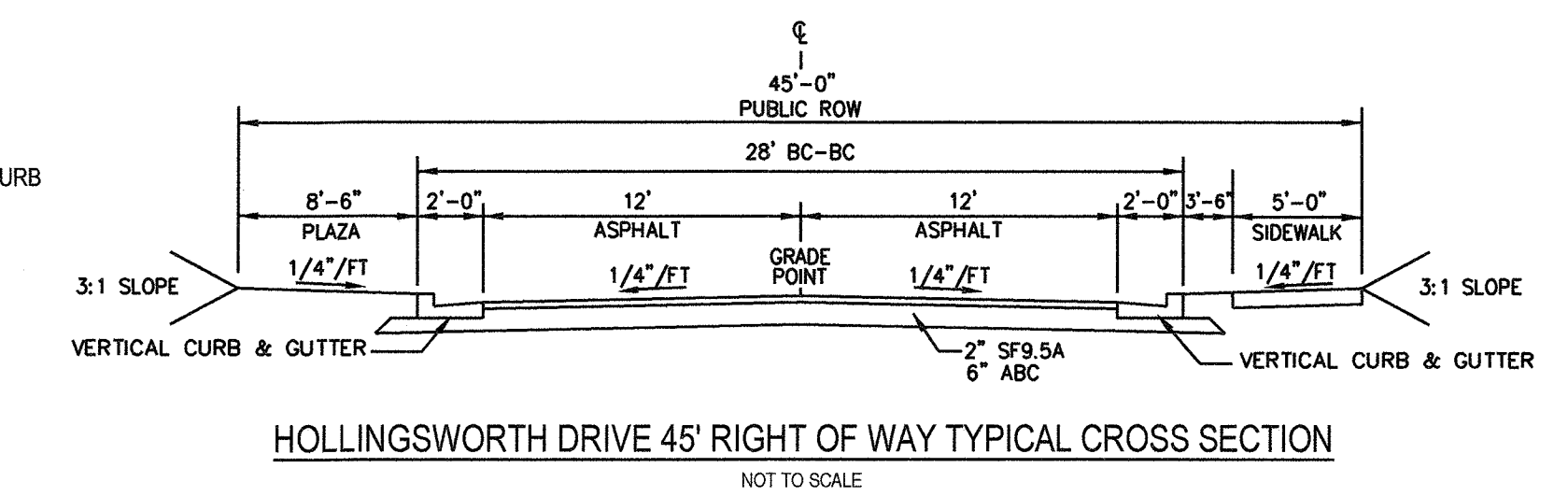
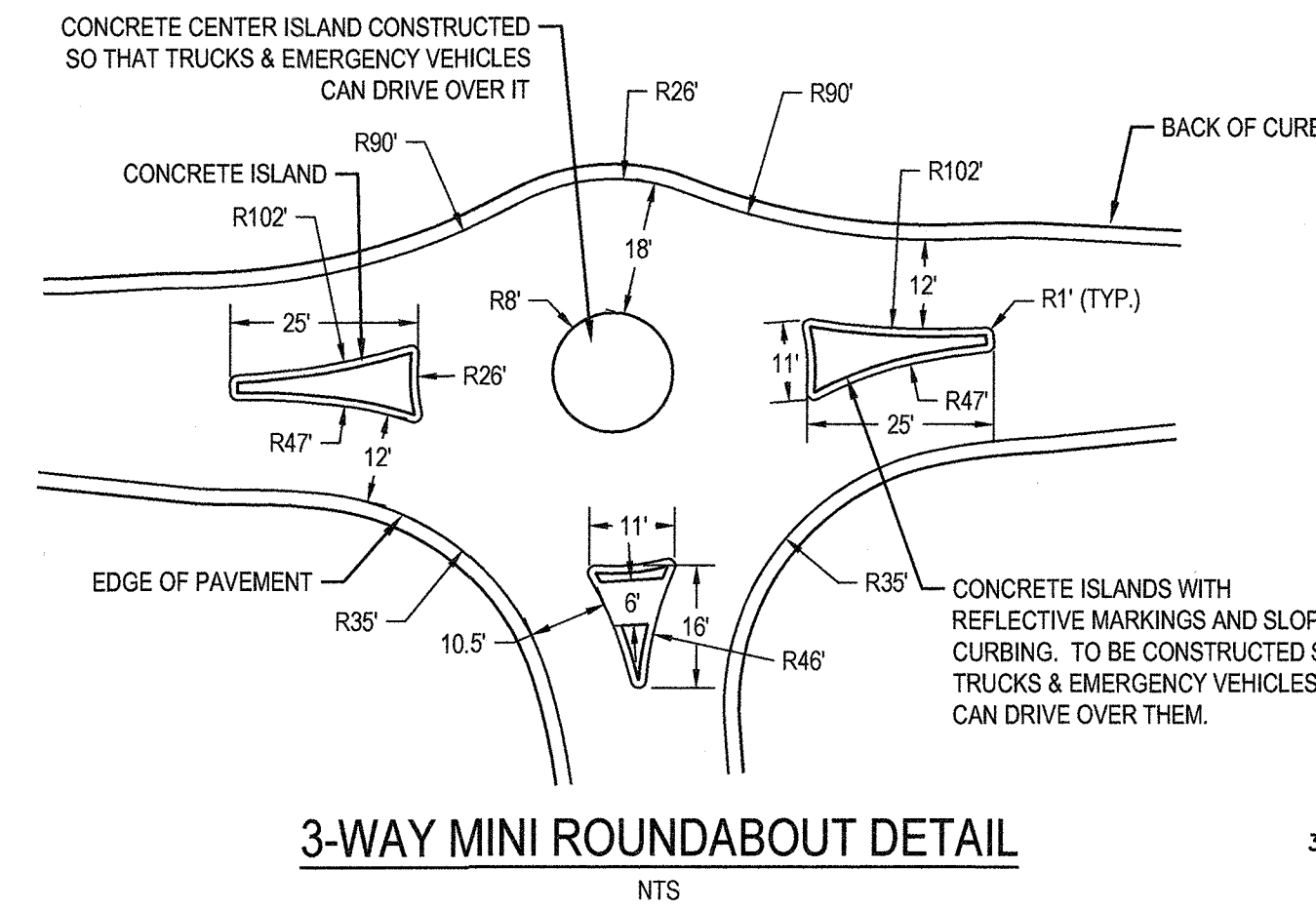
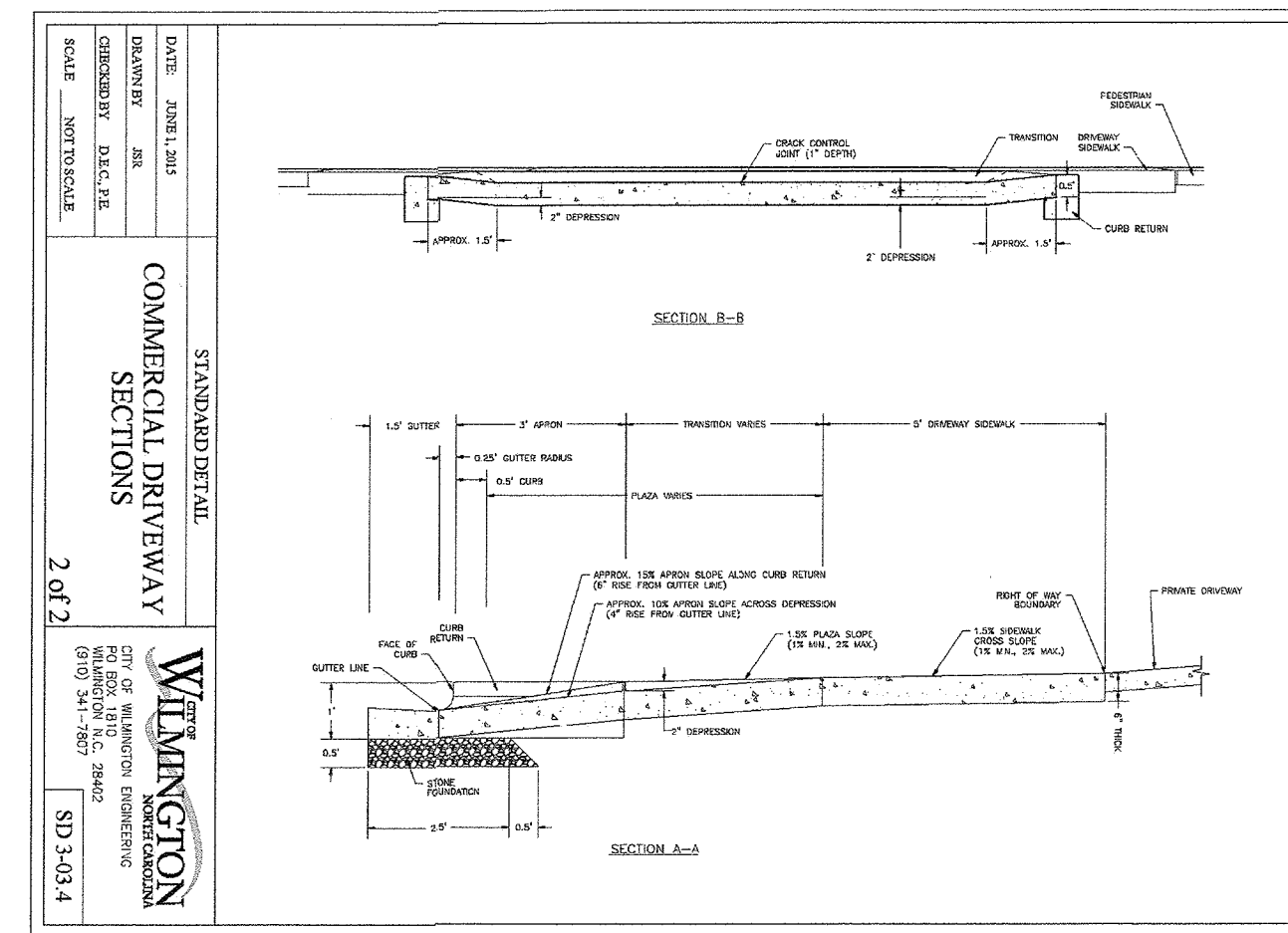
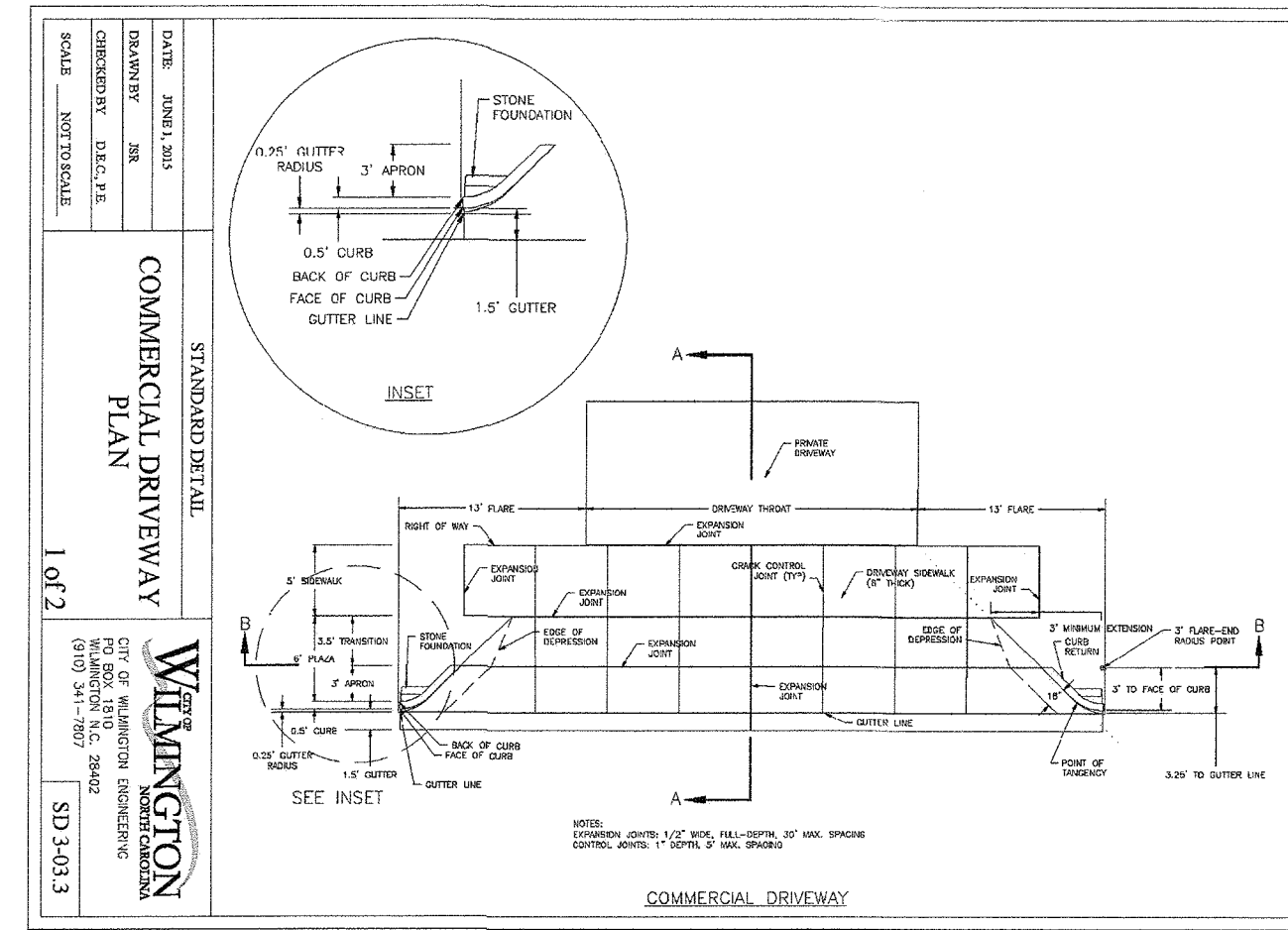
**ARBOR COMMONS**  
 Wilmington New Hanover County North Carolina

**DRAINAGE AREA PLAN**

**WithersRavenel**  
 Engineers | Planners | Surveyors  
 1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com

Sheet No.  
**C-12**

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

**STORMWATER MANAGEMENT PLAN APPROVED**  
 CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE 3/25/17 PERMIT # 2017006  
 SIGNED [Signature]

**Approved Construction Plan**  
 Name [Signature] Date 3/27/17  
 Planning [Signature]  
 Public Utilities [Signature]  
 Traffic [Signature]  
 Fire [Signature]

TYPICAL DETAILS NOTE:  
 THE TYPICAL DETAILS ON THIS SHEET WERE DESIGNED AND PREPARED BY OTHERS.

FINAL DESIGN

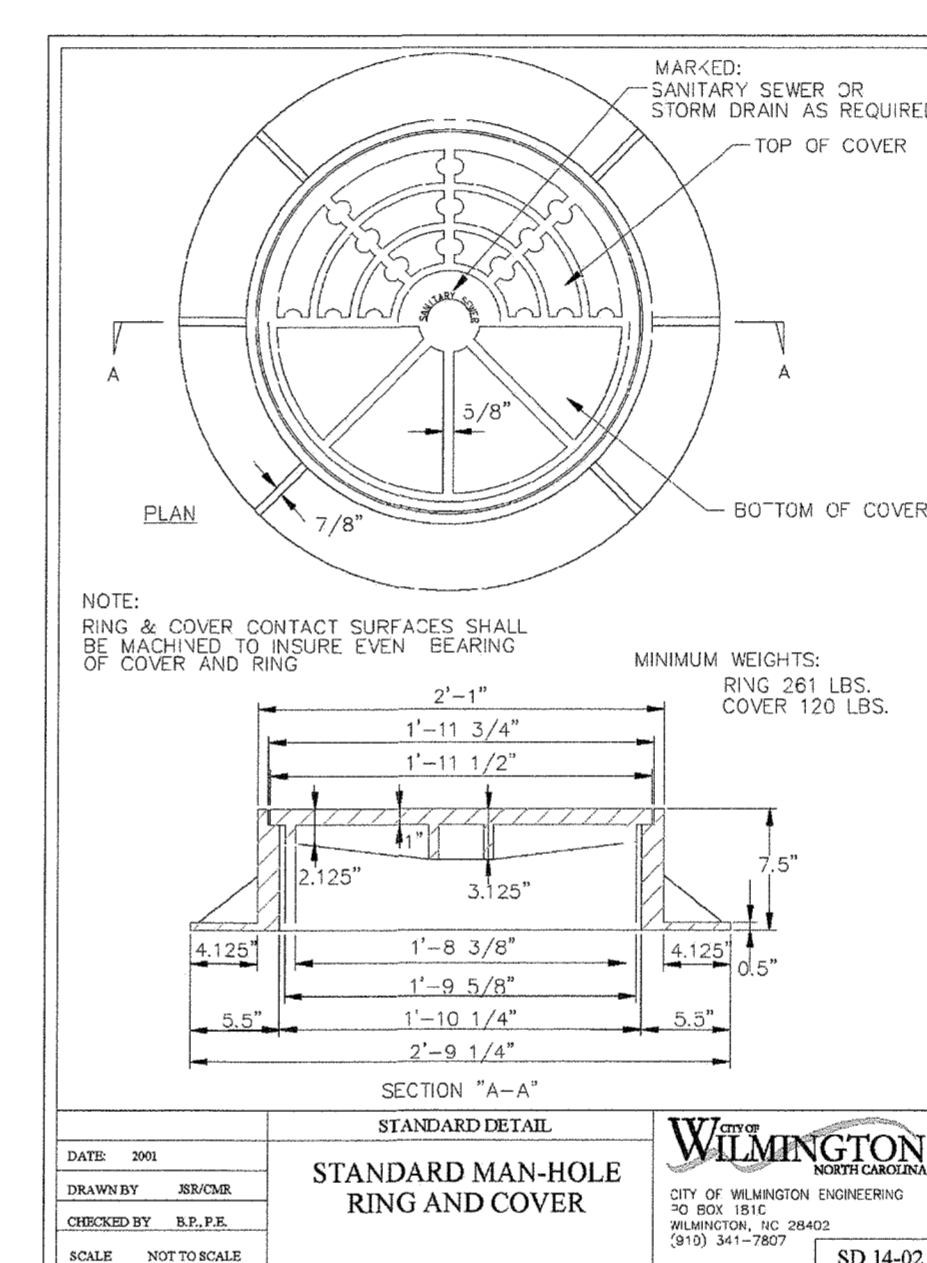
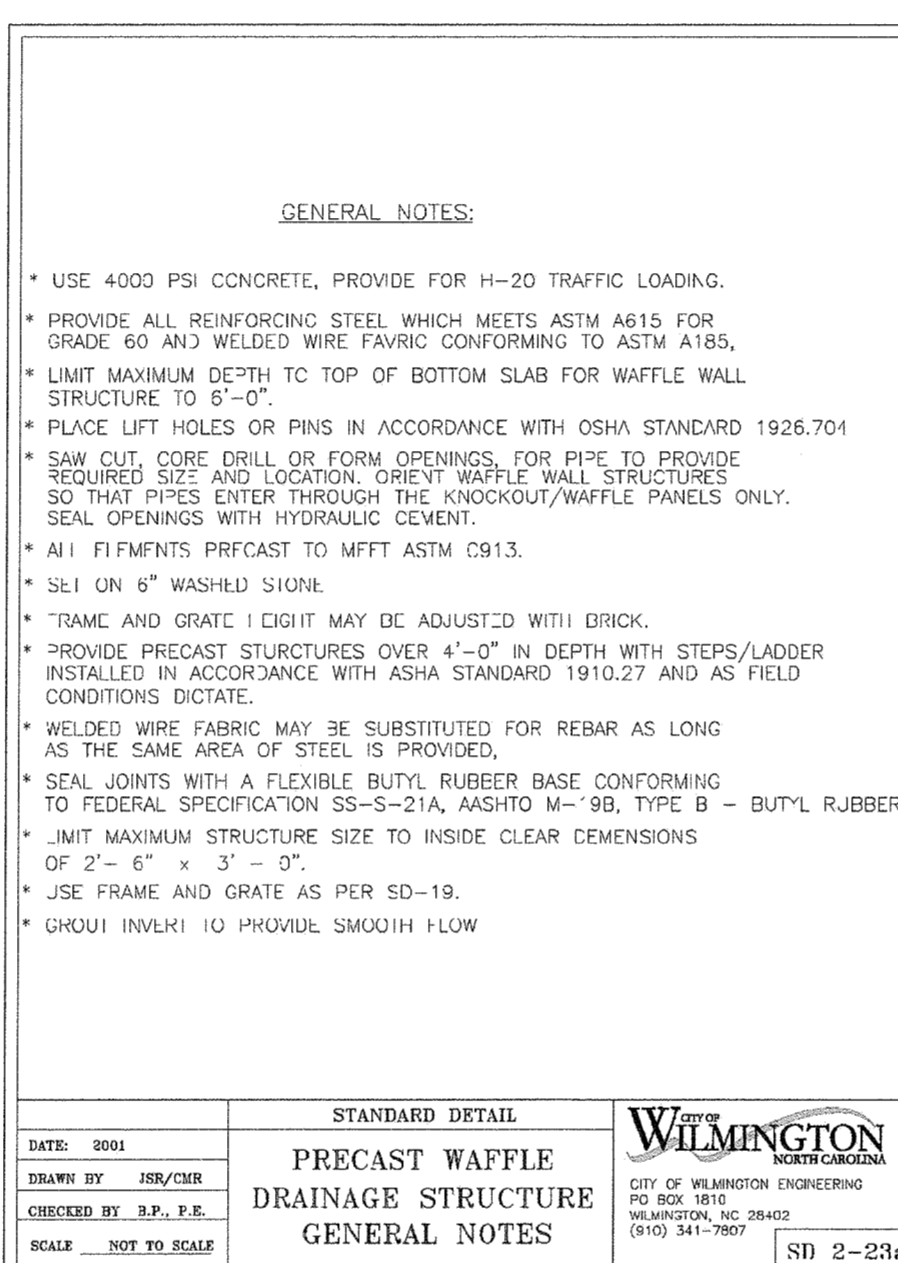
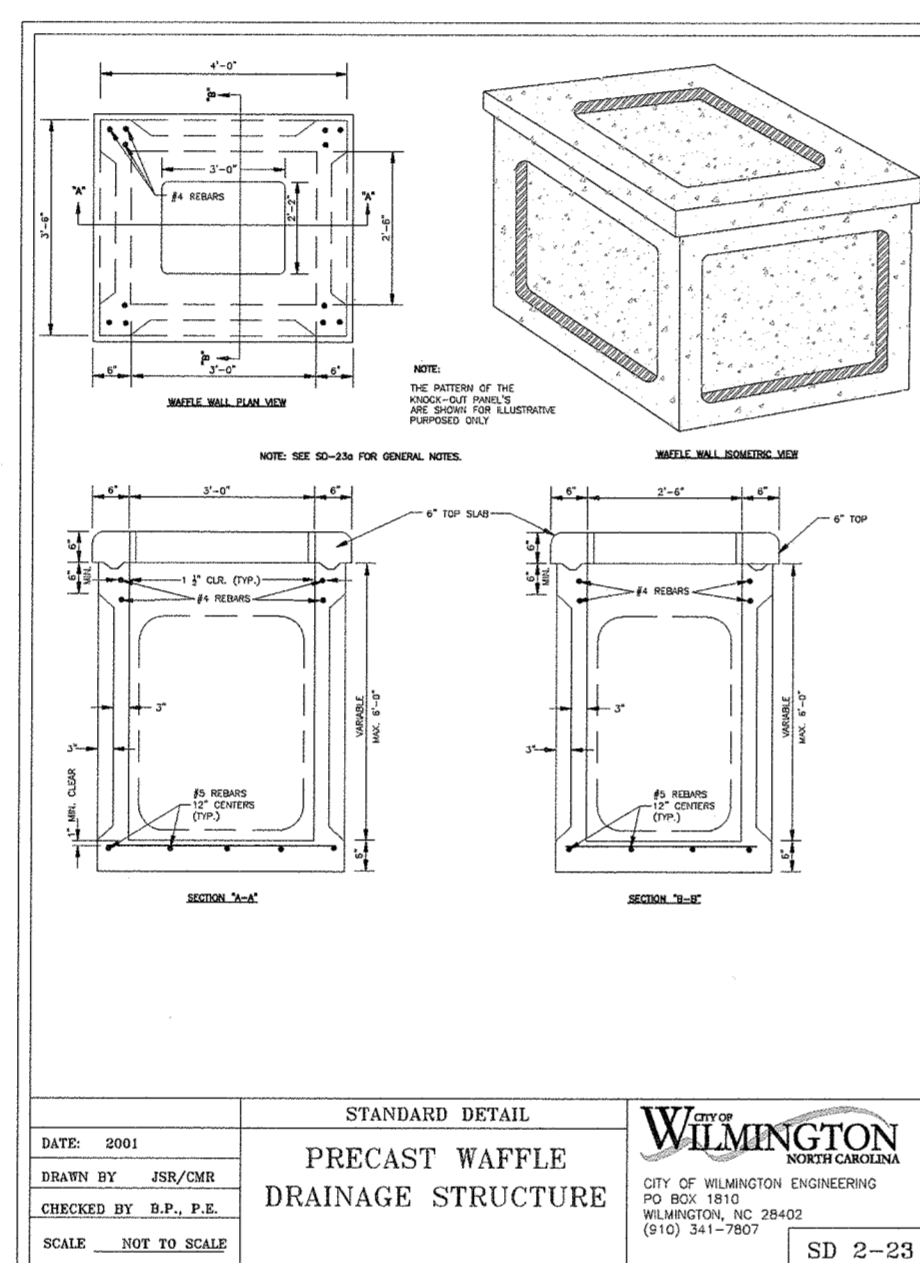
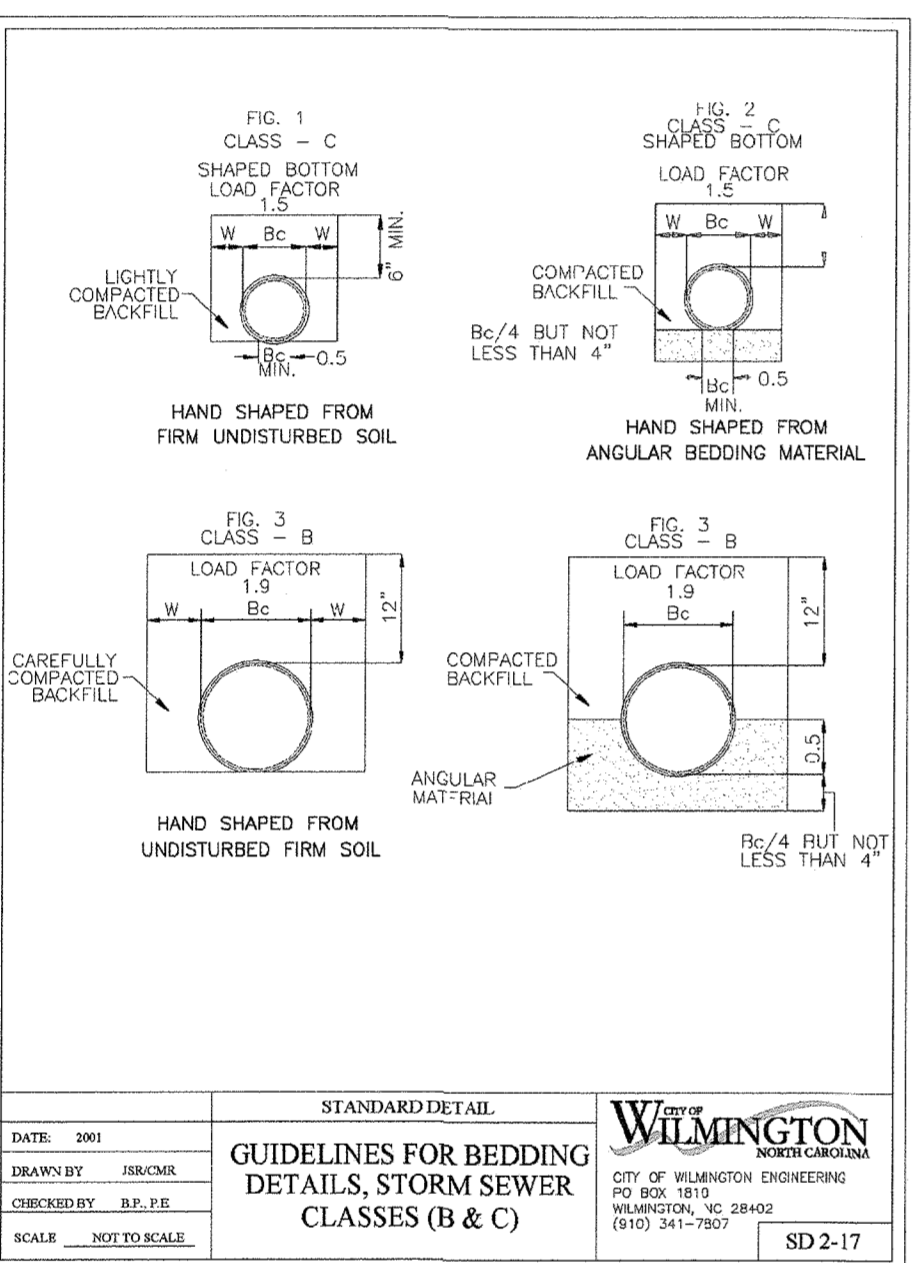
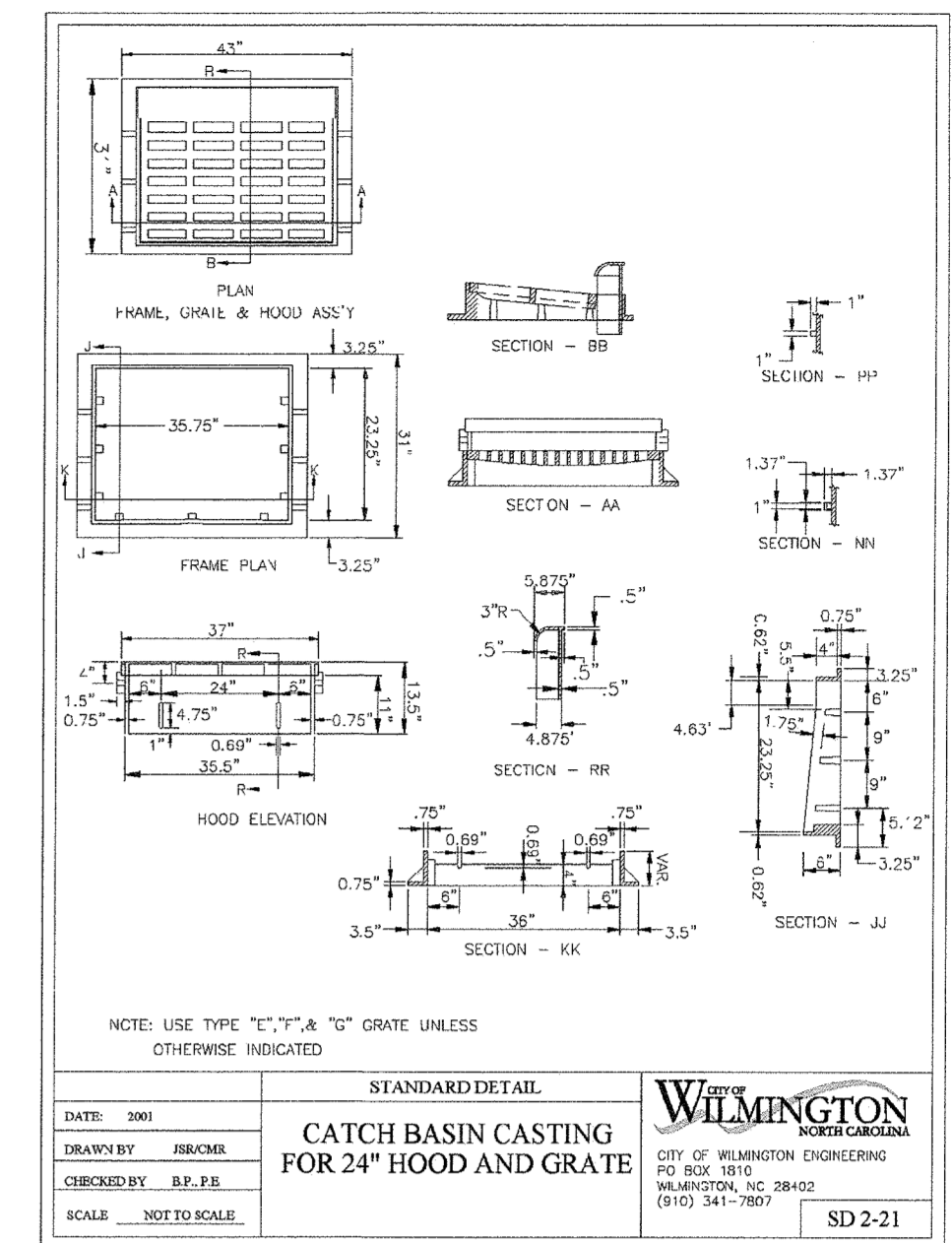
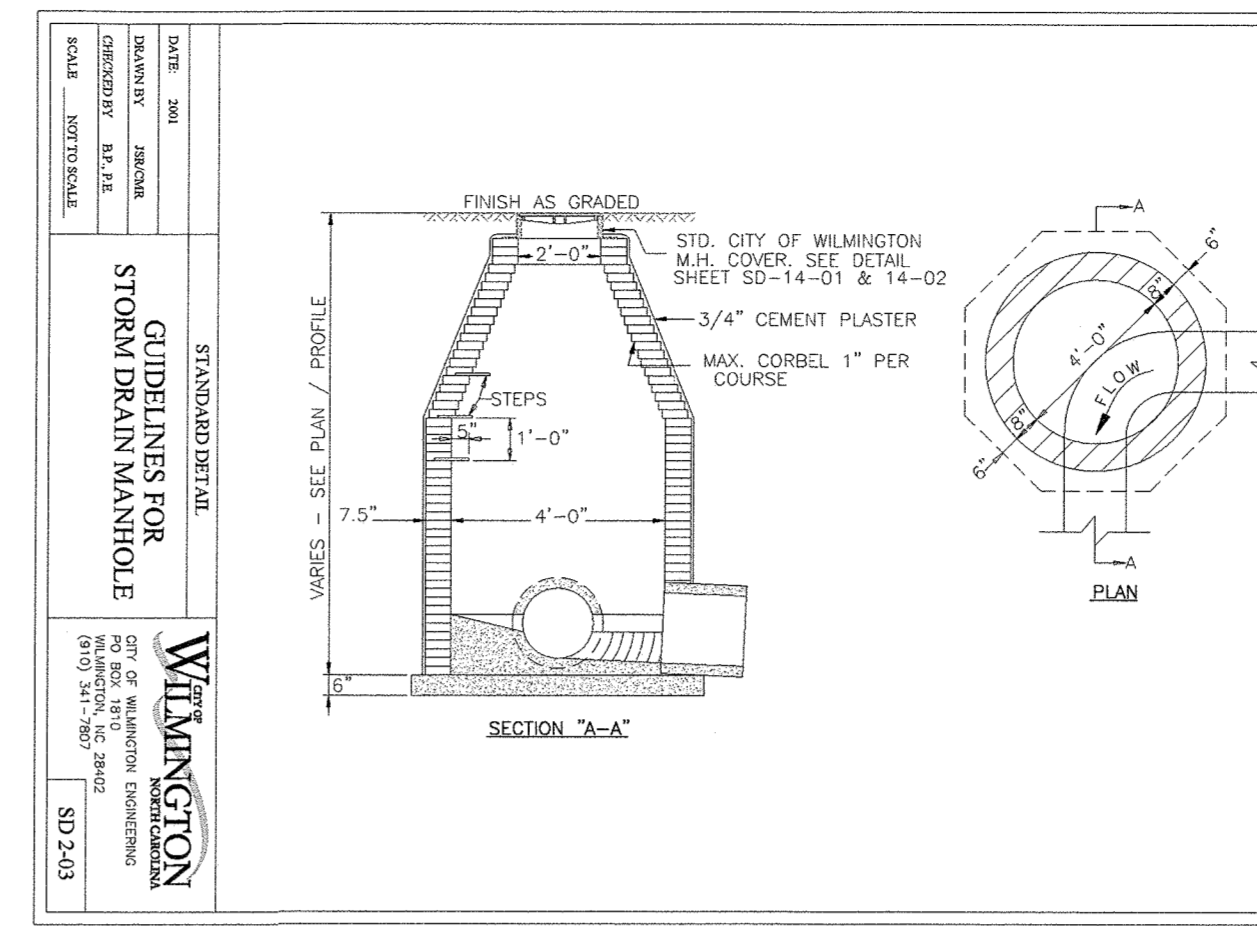
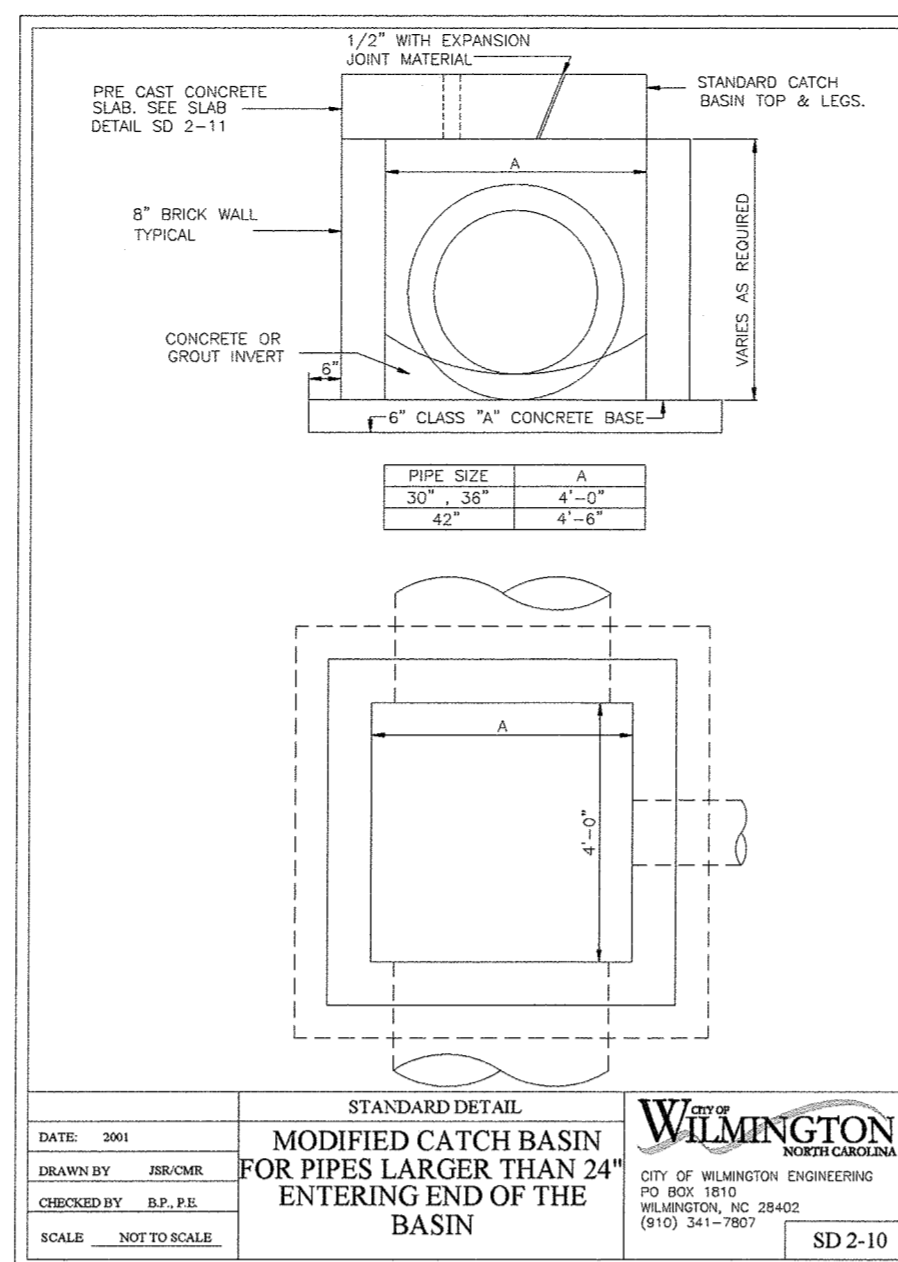
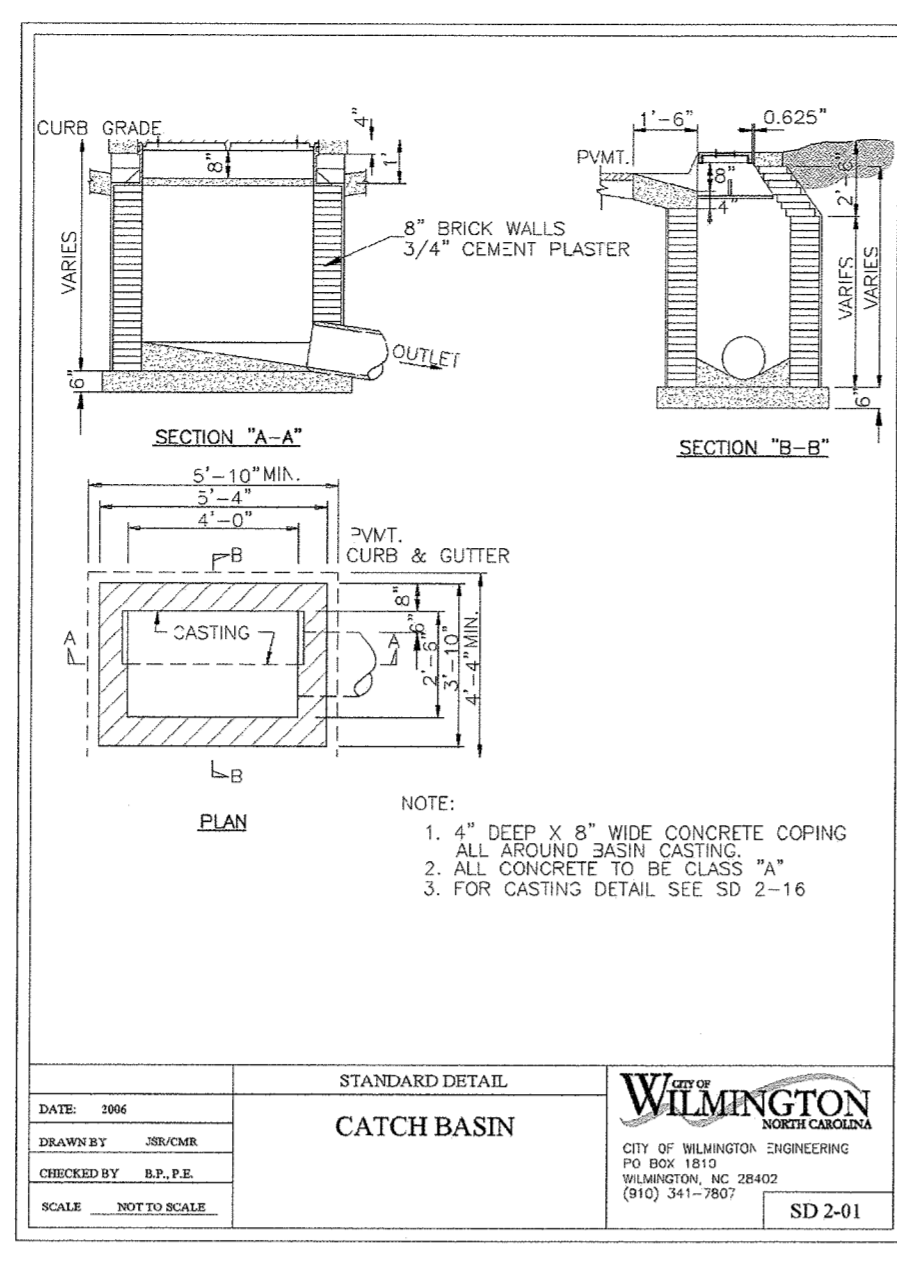
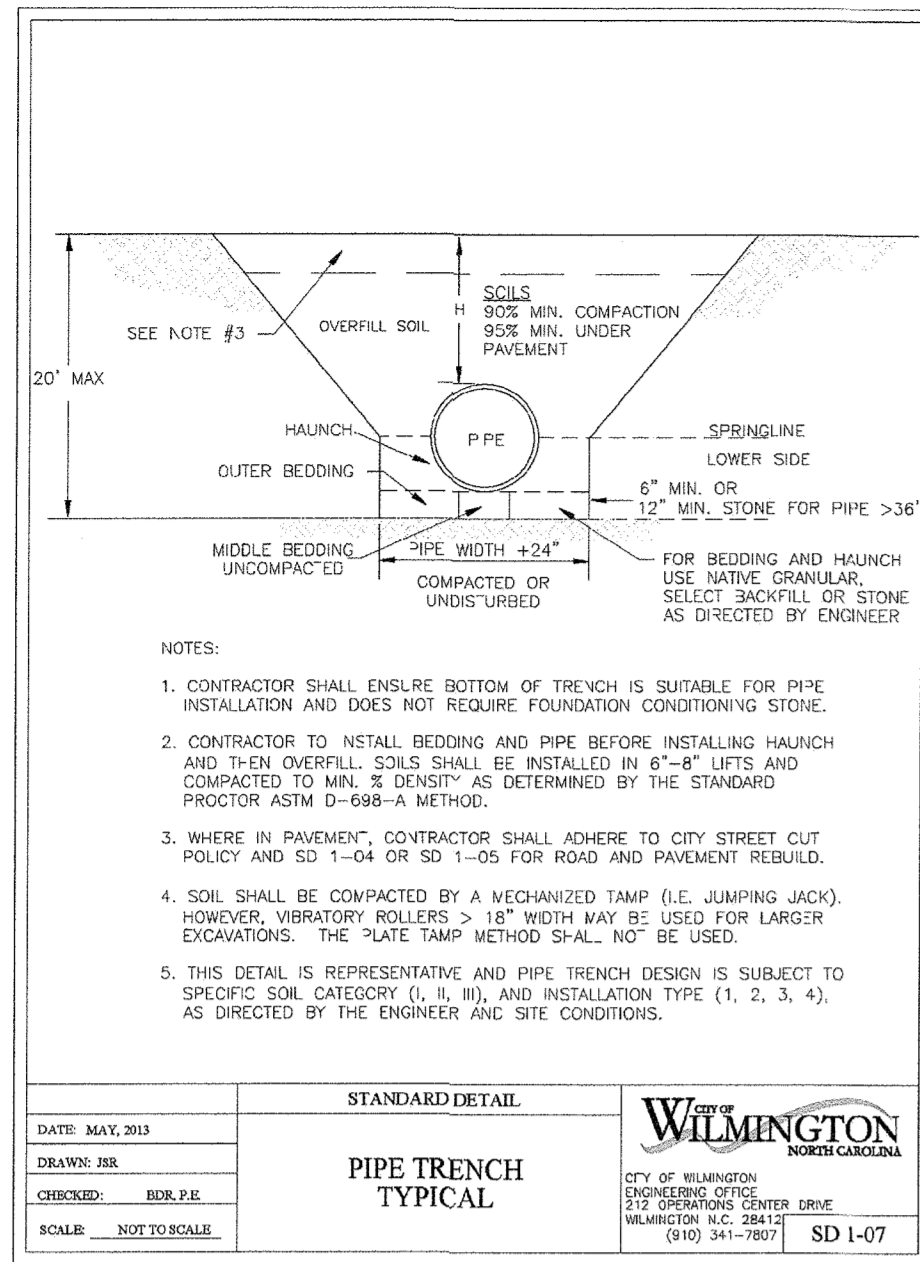
No.	Revision	Date	By
1	REVISED BY ROW STREET TO HAVE 6 PLAZA	9-27-16	JSB
2	REVISED SIDEWALK & ADDED MUP DETAIL PER COW SW	10-13-16	JSB
3	REVISED PER CLIENT COMMENTS	11-16-16	JSB
4	REVISED TRAFFIC CIRCLE PER COW COMMENTS	2-6-17	JSB
5	ADDED TURN LANE CROSS SECTION PER COW COMMENTS	2-17-17	JSB

Designer: NA Scale: NTS  
 Drawn By: JSB Date: 6/30/16  
 Checked By: JWW Job No.: 03061193.01  
 Wilmington, North Carolina

ARBOR COMMONS  
 New Hanover County  
 ROADWAY DETAILS  
 North Carolina

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 Engineers | Planners | Surveyors  
 1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | T: 910.256.9277 | License #: C-0832 | www.withersravenel.com

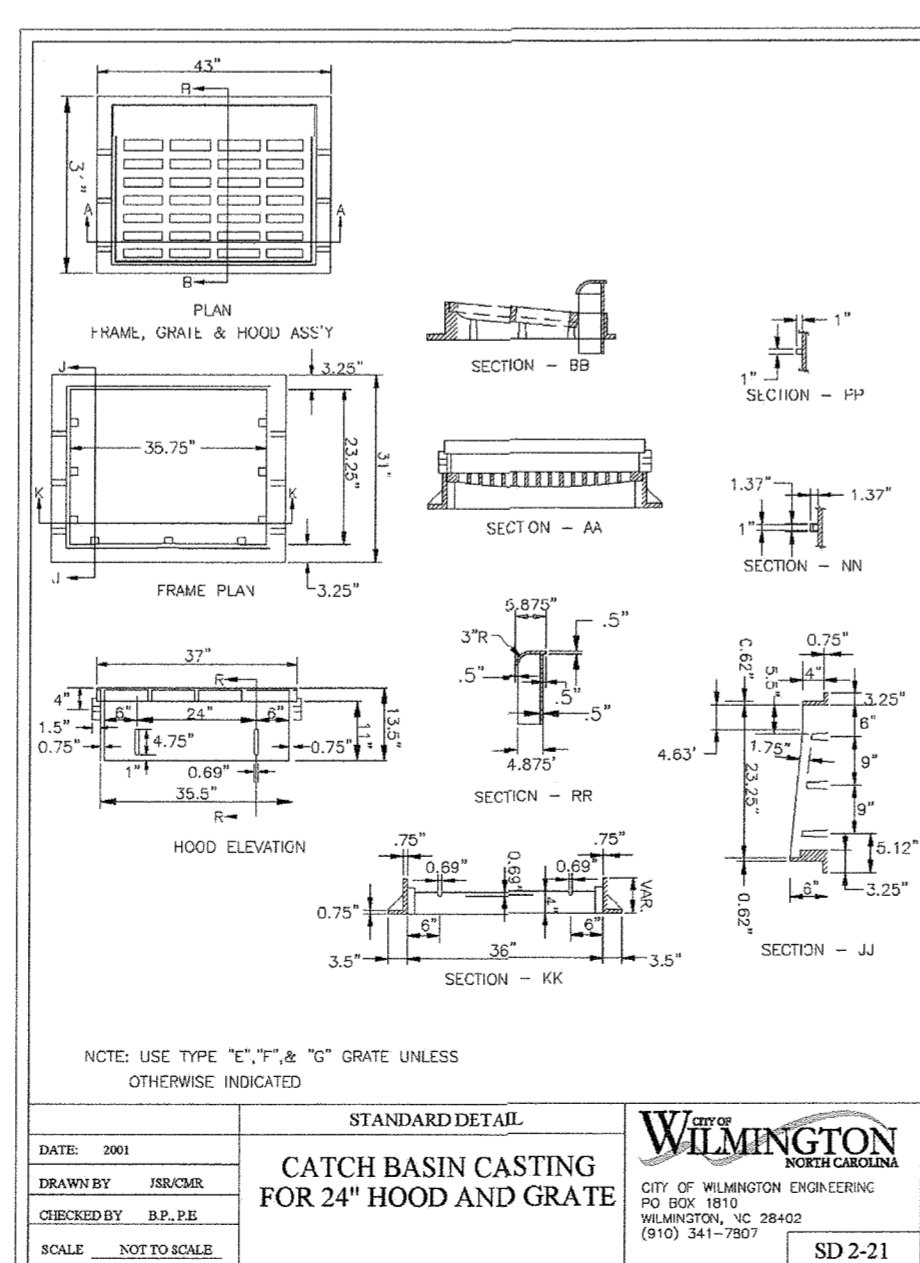
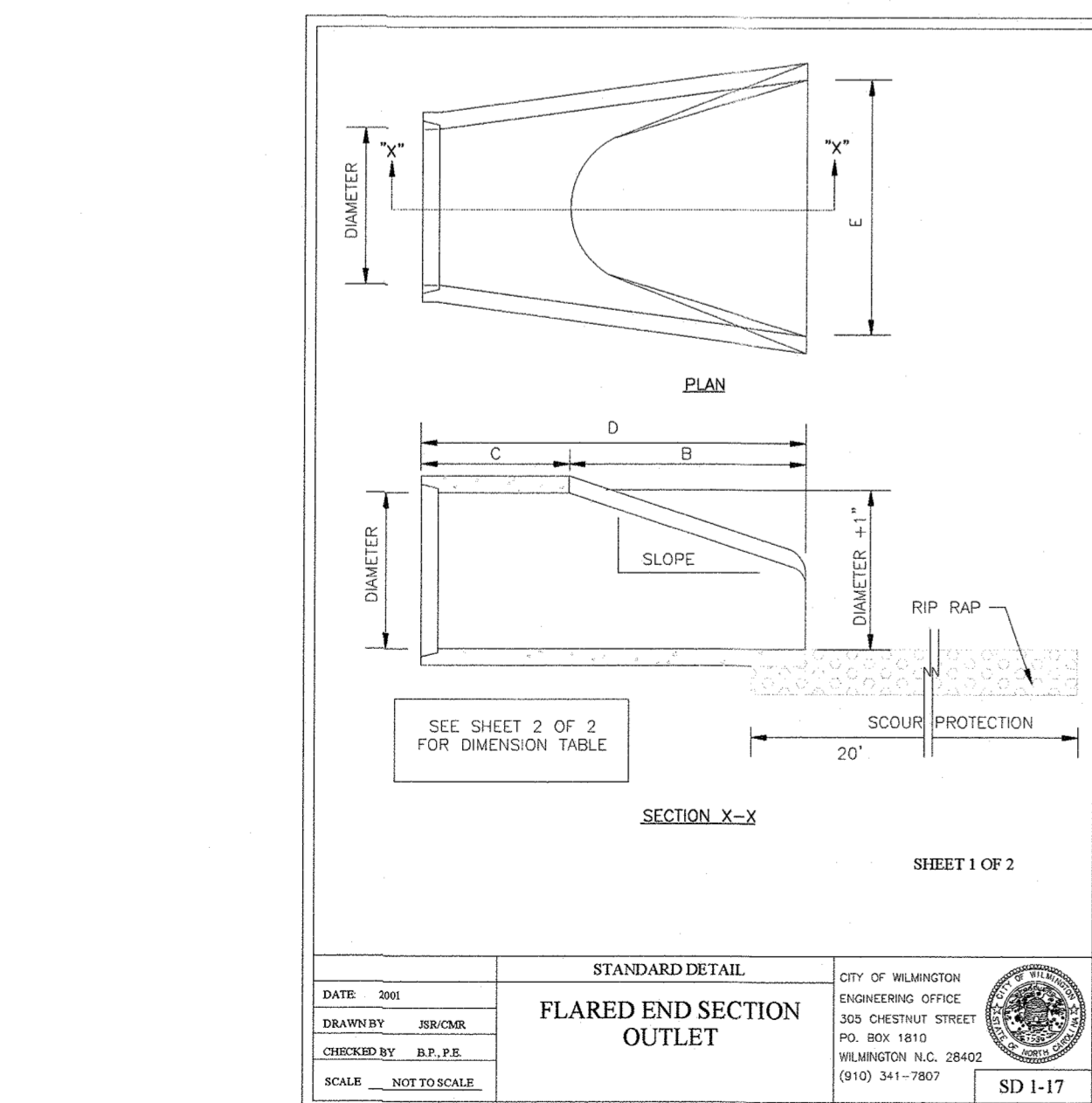
Sheet No. D-6



**NOTE:**  
1. STRUCTURAL DESIGN OF END SECTION SHALL CONFORM WITH THAT OF STANDARD REINFORCED CONCRETE.

PIPE DIAMETER	WALL THICKNESS	RS DIFF	R	C	D	F	JUNIT WEIGHT	
12	2 1/4	3:1	24	48	73	24	730	
15	2 1/4	3:1	27	46	73	30	910	
18	2 1/2	3:1	27	46	73	36	1190	
21	2 3/4	3:1	36	37	73	42	1370	
24	3	3:1	42	31	1/2	73	48	1770
27	3 1/4	3:1	48	25	1/2	73	54	2150
30	3 1/2	3:1	54	19	3/4	73	60	2380
33	3 3/4	3:1	60	36	96	66	3870	
36	4	3:1	63	34	3/4	97	72	5320
42	4 1/2	3:1	63	35	98	78	5920	
48	5	3:1	72	26	98	84	7470	
54	5 1/2	2.4:1	66	34	100	90	8610	
60	6	2:1	60	39	99	96	11180	
72	7	2:1	78	21	99	108	13880	

DIMENSIONS IN INCHES WEIGHTS IN POUNDS



**STORMWATER MANAGEMENT PLAN APPROVED**  
 CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE 3/23/17 PERMIT # 2017006  
 SIGNED [Signature]

**Approved Construction Plan**

Planning	[Signature]	Date	3/27/17
Public Utilities	ML		
Traffic	[Signature]	3-27-17	
Fire	[Signature]	3-24-17	

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

SEAL REDACTED

TYPICAL DETAILS NOTE:  
THE TYPICAL DETAILS ON THIS SHEET WERE DESIGNED AND PREPARED BY OTHERS.

**FINAL DESIGN**

No.	Revision	Date	By
1	ADD STORM INTERFERENCE MANHOLE DETAIL	10-19-16	JSB

**ARBOR COMMONS**  
 New Hanover County  
 North Carolina

Designer: NA  
 Drawn By: JSB  
 Checked By: JWW

Scale: NTS  
 Date: 6/30/16  
 Job No.: 03061193.01

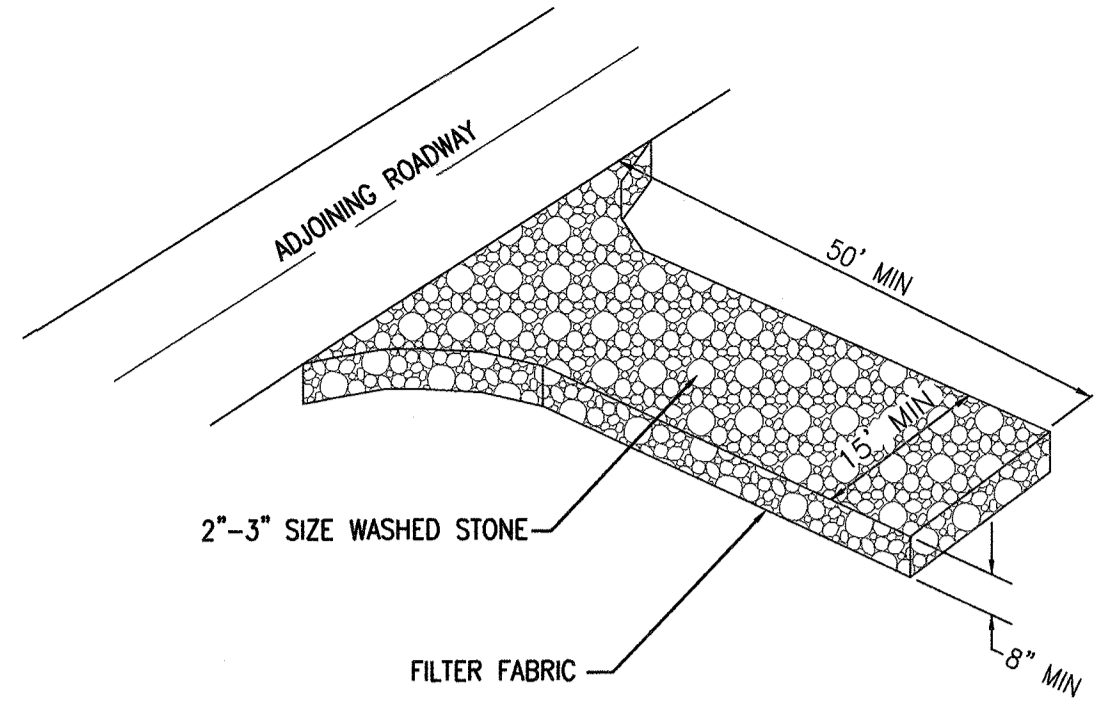
**STORMDRAIN DETAILS**

**WithersRavenel**  
 Engineers | Planners | Surveyors  
 1410 Commonwealth Drive, Suite 101 | Wilmington, NC 28403 | t: 910.256.9277 | license #: C-0832 | www.withersravenel.com

Sheet No. **D-7**

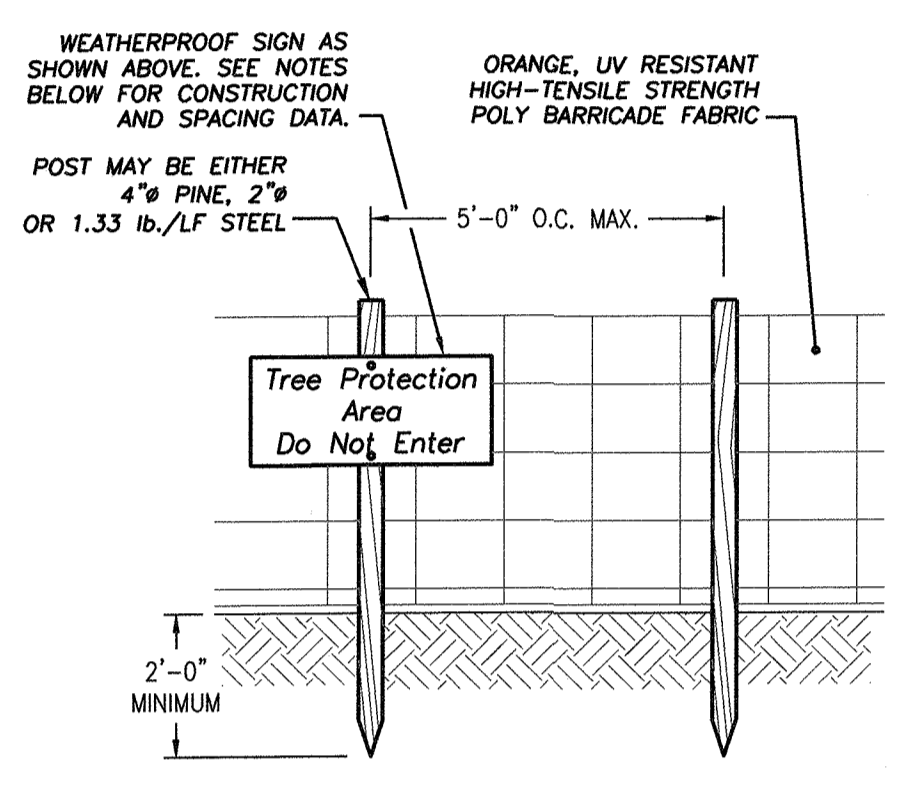
W:\03061193\01\193.01-4.dwg Common\CAD\DETAILS.dwg - Friday, February 17, 2017 1:41:19 PM - BDW - GSEB7N

- NOTES:**
1. PROVIDE TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS.
  2. LOCATE ENTRANCE TO PROVIDE MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES.
  3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING, OR DIRECT FLOW, OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
  4. ANY MATERIAL WHICH MAKES IT ONTO THE ROAD MUST BE CLEANED UP IMMEDIATELY.
  5. APPLICABLE AT ALL POINTS OF INGRESS UNTIL SITE IS STABILIZED. FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE MUST BE PROVIDED.
  6. WHEN TEMPORARY CONSTRUCTION ENTRANCES ARE LOCATED ON PAVED SURFACES, PLACE MINIMUM OF 2" OF SCREENINGS OR SAND TO HELP FACILITATE IN CLEAN-UP AND SITE RESTORATION.



**TEMPORARY CONSTRUCTION ENTRANCE**

NTS

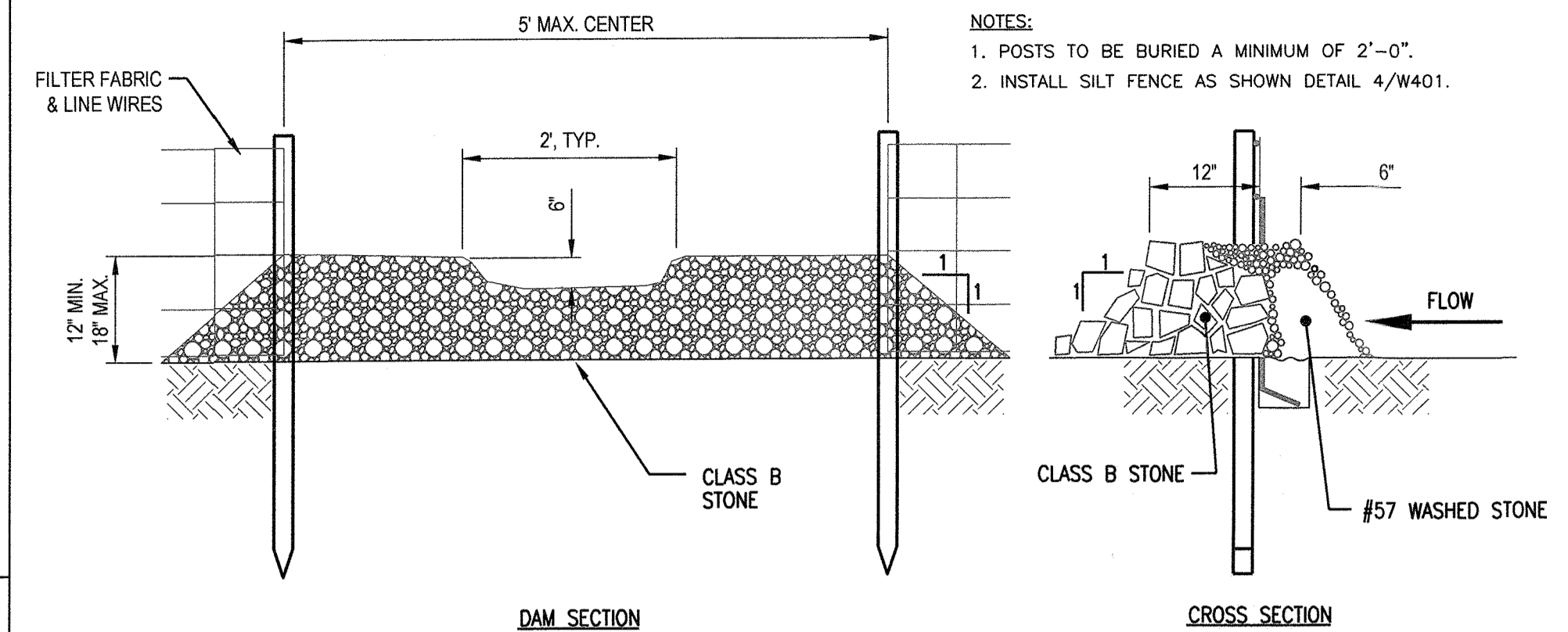


**TREE PROTECTION FENCE**

NTS

- NOTES:**
1. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
  2. LETTERS ARE TO BE 3" HIGH MIN., CLEARLY LEGIBLE AND SPACED AS DETAILED.
  3. SIGNS ARE TO BE PLACED NO GREATER THAN 200' ON CENTER.
  4. PLACE SIGN AT EACH END OF LINEAR TREE PROTECTION AREA AND ON CENTER THEREAFTER. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
  5. ATTACH SIGNS SECURELY TO FENCE POST AND FABRIC.
  6. MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.

**MAINTENANCE:**  
INSPECT FOR SIGNIFICANT EROSION AROUND THE EDGES & BETWEEN SILT FENCE & DRAIN. INSTALL PROTECTIVE RIP-RAP LINERS IN PORTIONS OF THE CHANNEL WHERE EROSION OCCURS. REMOVE SEDIMENT ACCUMULATED BEHIND THE DRAINS AS REQUIRED PREVENTING DAMAGE TO SILT FENCE & ADJACENT VEGETATION. ADD STONES TO DRAINS AS REQUIRED MAINTAINING DESIGN HEIGHT & CROSS SECTION.



**SILT FENCE OUTLET**

NTS

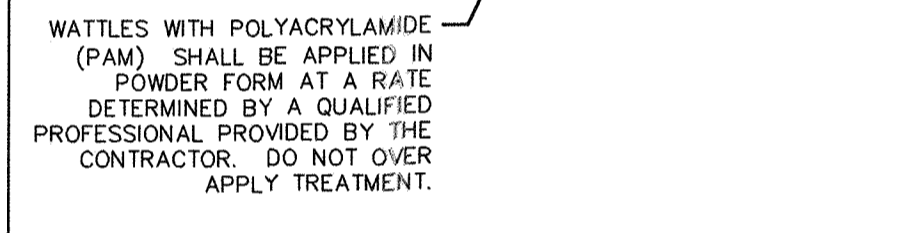
**WATTLE MAINTENANCE NOTES:**  
INSPECT COMPOST SOCKS WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT (1/2 INCH OR GREATER). REMOVE ACCUMULATED SEDIMENT AND ANY DEBRIS. THE COMPOST SOCK MUST BE REPLACED IF CLOGGED OR TORN. IF PONDING BECOMES EXCESSIVE, THE SOCK MAY NEED TO BE REPLACED WITH A LARGER DIAMETER OR A DIFFERENT MEASURE. THE SOCK NEEDS TO BE REINSTALLED IF UNDERMINED OR DISLODGED. THE COMPOST SOCK SHALL BE INSPECTED UNTIL LAND DISTURBANCE IS COMPLETE AND THE AREA ABOVE THE MEASURE HAS BEEN PERMANENTLY STABILIZED.

**POLYACRYLAMIDE MAINTENANCE NOTES:**  
INSPECT WATTLES AT LEAST WEEKLY OR AFTER A RAINFALL EVENT OF 1/2 INCH OR GREATER TO MAKE SURE WATTLES REMAIN IN PLACE, ARE MOIST AND ARE NOT COVERED IN SEDIMENT.

DEGRADATION OF POLYMER COAGULANT/FLOCCULANT IS EXPECTED TO OCCUR AS A RESULT OF HIGH RAINFALL, MECHANICAL DEGRADATION, CHEMICAL, AND BIOLOGICAL HYDROLYSIS, SUNLIGHT, SALT, AND TEMPERATURE EFFECTS. REAPPLY POLYMER COAGULANT/FLOCCULANT IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. REAPPLICATION IS NOT REQUIRED UNLESS POLYMER COAGULANT/FLOCCULANT TREATED AREAS ARE DISTURBED OR TURBIDITY OR WATER QUALITY SHOW THE NEED FOR AN ADDITIONAL APPLICATION. REAPPLY UNDISTURBED POLYMER COAGULANT/FLOCCULANT TREATED AREAS AS NEEDED. FURTHER POLYMER COAGULANT/FLOCCULANT APPLICATIONS MAY BE REQUIRED FOR STEEP SLOPES, HIGHLY SILTY AND CLAYEY SOILS, LONG GRADES, AND HIGH TRAFFIC OR PRECIPITATION AREAS.

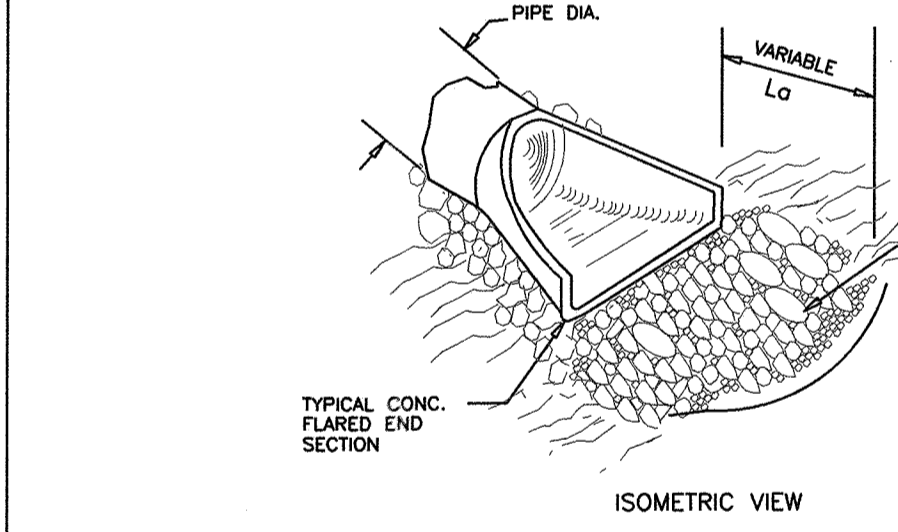
MAINTAIN ALL EQUIPMENT TO PROVIDE THE APPLICATION RATES RECOMMENDED BY THE MANUFACTURER. IN AN APPROVED AREA, RINSE ALL EQUIPMENT USED TO MIX AND APPLY POLYMER COAGULANT/FLOCCULANT THOROUGHLY WITH WATER TO AVOID FORMATION OF RESIDUES.

REUSE OR DISPOSE RECOVERED FLOCCULATED SEDIMENTS CONTAINING POLYMER COAGULANT/FLOCCULANT IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.



**WATTLE DETAIL**

NTS

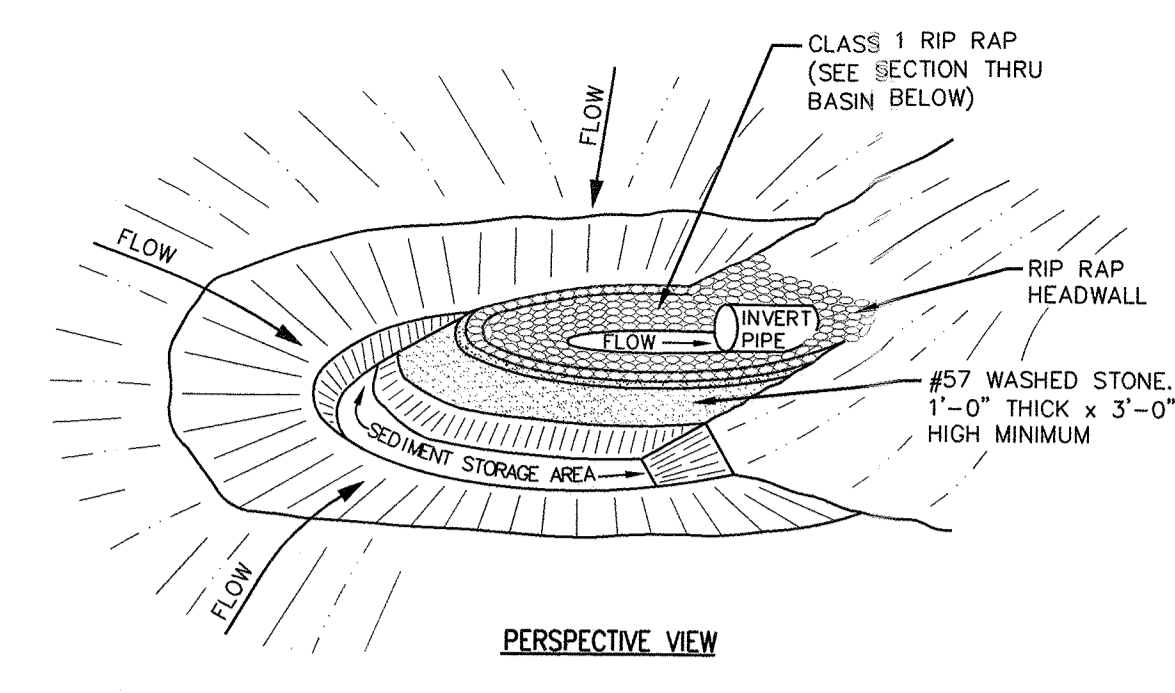


**ENERGY DISSIPATOR SCHEDULE**

ENERGY DISSIPATOR NO.	PIPE DIAMETER (in)	APRON THICKNESS (in)	L <sub>a</sub> (ft)	WIDTH (W) (ft)	3d <sub>o</sub>	RIPRAP SIZE
FES#1	36	36	15	18	9	CLASS 2
FES#13	36	24	13	16	9	CLASS 1

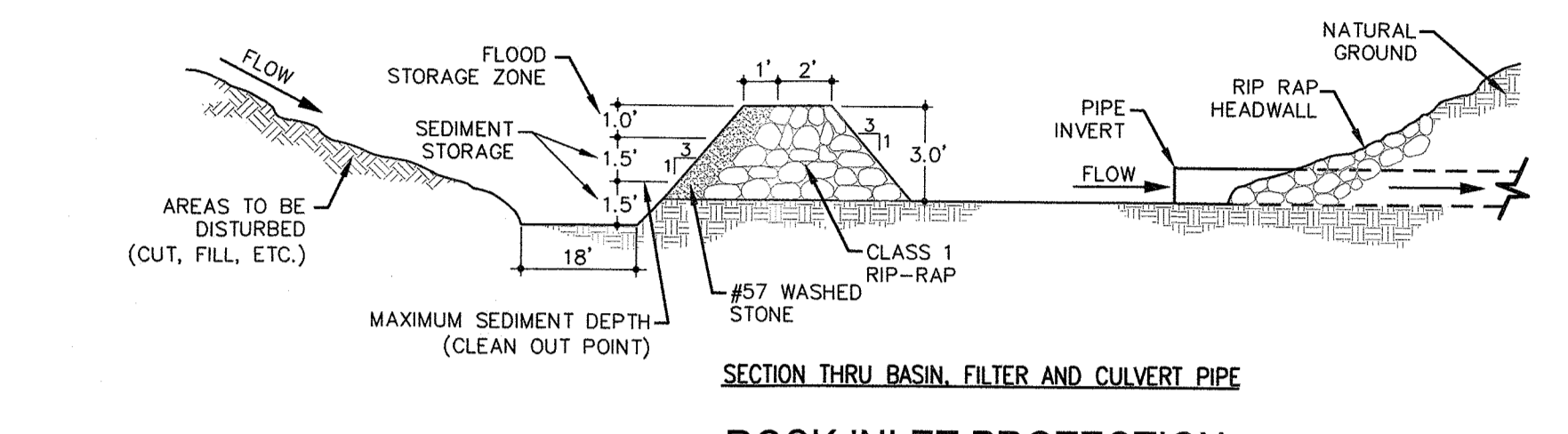
**RIP RAP ENERGY DISSIPATOR**

N.T.S.



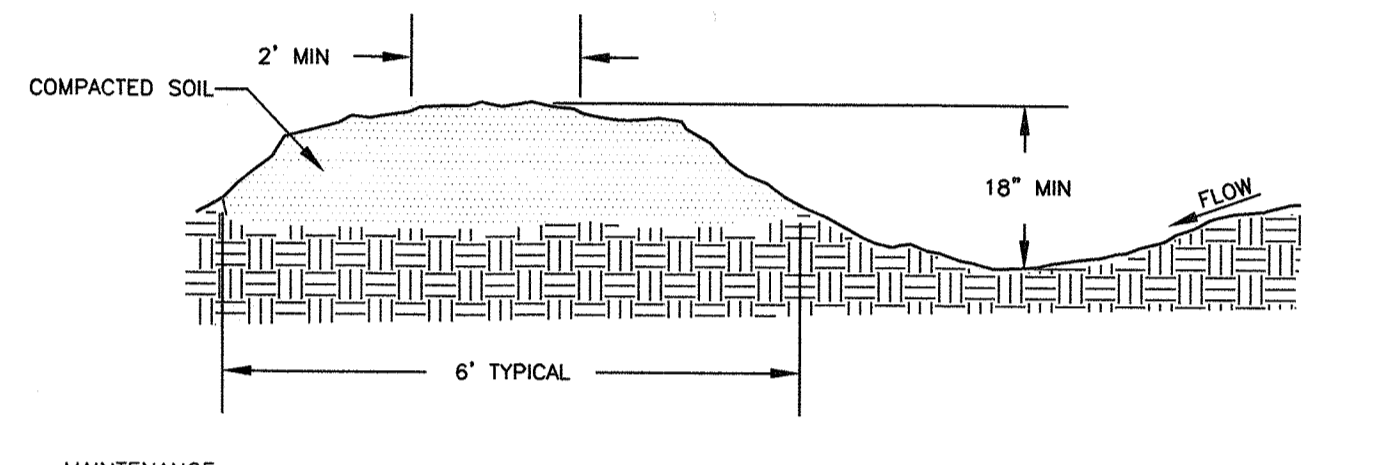
**ROCK INLET PROTECTION**

NTS



**SECTION THRU BASIN, FILTER AND CULVERT PIPE**

NTS

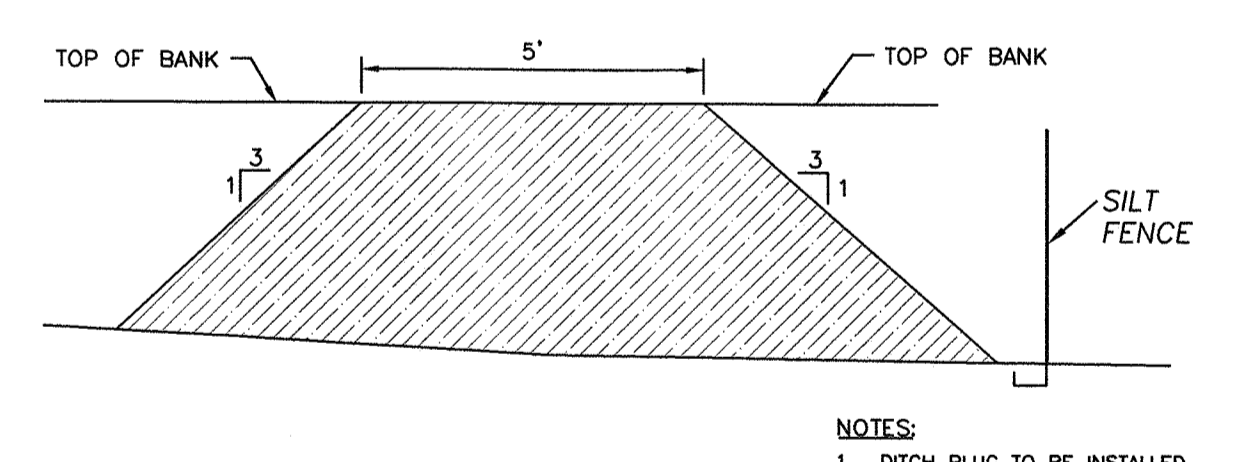


**TEMPORARY DIVERSION BERMS**

TD#	DRAINAGE AREA (AC)	RUNOFF COEFFICIENT	SLOPE (%)	CONSTRUCTED DEPTH (FT)	NORMAL DEPTH (FT)	TOP WIDTH (FT)	VELOCITY (FPS)
1	2.65	0.35	0.25	1.5	1.45	6	1.59
2	0.20	0.35	0.25	1.5	0.55	6	0.84
3	0.18	0.35	0.25	1.5	0.53	6	0.82
4	2.68	0.35	0.25	1.5	1.46	6	1.60

**TEMPORARY DIVERSION SWALE**

NTS



**DITCH PLUG**

NTS

- SEEDBED PREPARATION:**
1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
  2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
  3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
  4. APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL.
  5. CONTINUE TILLAGE UNTIL A WELL PULVERIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
  6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
  7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
  8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RE-SEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE OVER 60% DAMAGED, RE-ESTABLISH FOLLOWING ORIGINAL LIME FERTILIZER AND SEEDING RATES.
  9. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.
- CONSULT CONSERVATION ENGINEER OR SOIL CONSERVATION SERVICE FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENUDED AREAS. THE VEGETATION RATES ARE THOSE WHICH DO WELL UNDER LOCAL CONDITIONS; OTHER SEEDING RATES COMBINATIONS ARE POSSIBLE.
- \* TEMPORARY-RESEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW OVER 12" IN HEIGHT BEFORE MOWING.

**STORMWATER MANAGEMENT PLAN APPROVED**  
CITY OF WILMINGTON  
ENGINEERING DEPARTMENT  
DATE 3/25/17 PERMIT # 2017006  
SIGNED *[Signature]*

Approved Construction Plan  
Name *[Signature]* Date 3/27/17  
Planning *[Signature]*  
Public Utilities *[Signature]*  
Traffic *[Signature]*  
Fire *[Signature]*

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

**FINAL DESIGN**

No.	Revision	Date	By	Designer	Scale
1	REVISED PER NHC EC COMMENTS & CITY COMMENTS	10-28-16	JSB	JSB	NTS
2	ADDED ROCK INLET PROTECTION DETAIL PER NHC EC COMMENTS	11-21-16	JSB	JSB	6/30/16
3	REVISED WATTLE DETAIL PER NHC EC COMMENTS	12-13-16	JSB	JSB	03061193.01

**ARBOR COMMONS**  
New Hanover County  
Wilmington  
North Carolina

**EROSION CONTROL DETAILS**

**WithersRavenel**  
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Sheet No. **D-8**