



**STROUD ENGINEERING, P.A.**

CONSULTING ENGINEERS  
102-D CINEMA DRIVE  
WILMINGTON, NORTH CAROLINA 28403  
(910) 815-0775

January 7, 2016

City of Wilmington, Engineering Division  
212 Operations Center Drive  
Wilmington, NC 28412  
Attn: Rob Gordon, PE

Re: Sea Pines Apartments  
Response to Stormwater Review received by email on December 21, 2015

Dear Rob,

The attached plans, calculations, and other supporting information are in response to the reference email. Addresses to your numbered issues herein copied are provided below in blue:

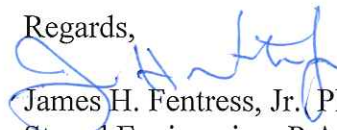
Engineering has reviewed the revised plans for sea Pines apartments and have the following comments:

1. The proposed drainage area for the existing pond is different than what is listed on the existing permit. Please show and label the drainage area for the existing pond on the BUA/DA exhibit on the stormwater details page. *The drainage basin for the existing pond has been reduced in area as some of its area now goes to the new infiltration basin. This area was delineated on prior submissions however was ambiguously annotated as Limits of Disturbance, LOD, where the two were coincidental. I have changed the linetype of the LOD line and more appropriately annotated the basin delineation. I hope clarifies the issue.*
2. If you have the full application & supplement included with the State permit, please forward or obtain from DEQ. We will need the previously approved supplement to include with our permit. *I am including the original application and supplement recovered from the State's record.*
3. Please forward the Engineer's Certification for the Existing Wet Pond for our files. *I have been unable to locate an Engineer's Certification for the existing pond. I don't believe it was ever done. I was not the original designer however I am in a position to certify the existing pond only I would prefer to certify the entire project as modified.*
4. Note Only – Please make the State aware of your intent to consolidate permits with the City and provide them with any required documentation (you are welcome to point them to our protrak system for plan review). We will cc them on the final permit and provide them with all of our approval docs. However, there are occasionally unforeseen issues between the two permits that complicate rescission of the State permit – in which case your client would be subject to both permits. It is best to have DEQ review ahead of time to avoid these potential complications. *I have emailed Georgette Scott to notify the State of our ongoing process. I have provided her a link to Protrak that she, or her constituents, may review all prior submissions.*

5. I have modified p4 of the application to match the other calculations submitted as attached. No action necessary unless you feel there is an error. **I concur with what you have done.**
6. The elevations in the "Bypass Spillway Detail" do not appear to match up with the basin & outlet structure detail elevations. Please revise. **I have revised the outlet structure detail to show overflow into the top of the structure at the 100 year water surface elevation. Both details are now consistent.**
7. Please specify the top width of the infiltration system berm. **I have labeled the top width of the infiltration berm to be two feet.**
8. Please specify how the basin is meeting the requirements of SD 15-16. Landscaping is required at least at 100' intervals around the perimeter of the pond. There is landscaping proposed on the West side of the basin, but not the east. Most existing trees are being removed. Please clarify. **I am including the landscape plan revised to show how the pond shall be planted in keeping with the SD 15-16.**

We hope that this addresses your issues. You can contact me at (910) 815-0775 or by email at [jfentress@stroudengineer.com](mailto:jfentress@stroudengineer.com) should additional information be required in this regard.

Regards,



James H. Fentress, Jr. PE, PLS  
Stroud Engineering, P.A.

Attachments

JHF/jf

File F:\master\pw-1168\wpd\STORMWATER RESPONSE 010416.doc

**DIVISION OF WATER QUALITY**

A&K 97155

**NORTH CAROLINA STORMWATER MANAGEMENT PERMIT APPLICATION**

**I. GENERAL INFORMATION**

*(Please print clearly or type)*

1. Project Name: Sea Pines Apartments
2. Location, directions to project (include County, Address, State Road) Attach map. Intersection of S. 17th Street Extension, St. Andrews Drive, and Hearthside Drive in Wilmington
3. Owner's Name: Sea Pines Apartments, L.L.C. Phone: 910-799-5264
4. Owner's Mailing Address: P.O. Box 5601  
 City Wilmington State NC Zip 28403
5. Nearest Receiving Stream Doctors Branch Class C Sw
6. Project description Construction of 156 unit apartment complex with clubhouse and parking

**II. PERMIT INFORMATION**

1. Permit No. *(To be filled in by DWQ)* SW8970733
2. Application Date 7/21/97 (resubmitted 8-26-97) Fee enclosed \$ 385.00
3. Permit Type  New  Renewal  Modification (existing Permit No.)
4. Proj Type  Low Density  Detention  Infiltration  Redevelop  General  Alter  Offsite
5. Other State/Federal Permits/Approvals Required *(Check appropriate blanks)*  
 CAMA Major  Sedimentation/Erosion Control  404 Permit

**III. BUILT UPON AREA** *(Please see NCAC 2H.1005 thru .1007 for applicable density limits)*

	<u>Project</u> <u>Drainage</u> <u>Basin</u>	<u>Pond</u> <u>Drainage</u> <u>Basin</u>	<u>Breakdown of Impervious Area</u> <i>(Please indicate below the design impervious area)</i>
Classification	<u>C Sw</u>		Buildings <u>1.16 Ac.</u>
Existing Built-upon Area	<u>0</u>		Streets <u>0</u>
Proposed Built-upon Area	<u>3.82 Ac.</u>	<u>3.75</u>	Parking/SW <u>2.66 Ac.</u>
Total Project Area	<u>9.10 Ac.</u>	<u>7.55</u>	Other <u>0</u>
% Impervious Area	<u>42%</u>	<u>50%</u>	Totals <u>3.82 Ac.</u>

**IV. STORMWATER TREATMENT** *(Describe how the runoff will be treated)*

Detention pond with 90% TSS removal

**V. DEED RESTRICTIONS AND PROTECTIVE COVENANTS**

Deed restrictions and protective covenants are required to be recorded for all low density projects and all subdivisions prior to the sale of any lot. Please see Attachment A for the specific items that must be recorded for the type of project applied for.

By your signature below, you certify that the recorded deed restrictions and protective covenants for this project shall include all the items required by the permit, that the covenants will be binding on all parties and persons claiming under them, that they will run with the land, that the covenant cannot be changed or deleted without concurrence from the State, and that they will be recorded prior to the sale of any lot.

**VI. OWNER'S CERTIFICATION**

I, Walter Winter, certify that the information included on this permit

*(Please print or type name clearly)*

application form is correct, that the project will be constructed in conformance with the approved plans, that the deed restrictions will be recorded with all required permit conditions, and that to the best of my knowledge, the proposed project complies with the requirements of 15A NCAC 2H.1000.

I authorize the below named person or firm to submit stormwater plans on my behalf.

Walter Winter Walter Winter, -Member 7/17/17  
Owner/Authorized Agent Signature and Title Date

**VII. AGENT AUTHORIZATION (MUST BE COMPLETED)**

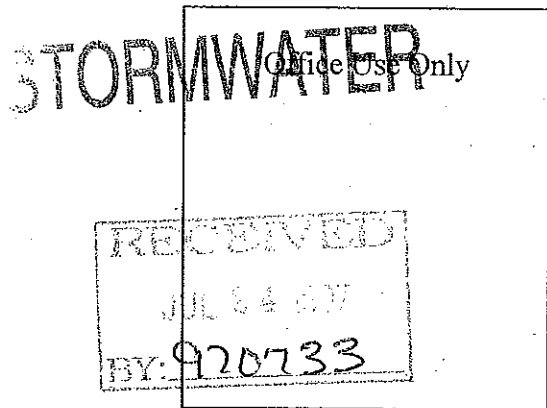
Person or firm name C. Lawrence Sneed, Jr., P.E./ Andrew & Kuske Consulting Engineers, Inc.

Mailing Address 902 Market Street

City Wilmington State NC Zip 28401 Phone 910-343-9653

Please submit application, fee, plans and calculations to the appropriate Regional Office.

cc: Applicant/WiRO/Central Files



Permit Number: SW 8970733  
(to be provided by DWQ)

Drainage Area Number: \_\_\_\_\_

## Wet Detention Basin Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

The wet detention basin system is defined as the wet detention basin, pretreatment including forebays and the vegetated filter if one is provided.

This system (check one):

does  does not incorporate a vegetated filter at the outlet.

This system (check one):

does  does not incorporate pretreatment other than a forebay.

Important maintenance procedures:

- Immediately after the wet detention basin is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).
- No portion of the wet detention pond should be fertilized after the first initial fertilization that is required to establish the plants on the vegetated shelf.
- Stable groundcover should be maintained in the drainage area to reduce the sediment load to the wet detention basin.
- If the basin must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain should be minimized to the maximum extent practical.
- Once a year, a dam safety expert should inspect the embankment.

After the wet detention pond is established, it should be inspected **once a month and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance should be kept in a known set location and must be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the wet detention basin	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.

Permit Number: SW 897 0733  
 (to be provided by DWQ)

Drainage Area Number: \_\_\_\_\_

BMP element:	Potential problem:	How I will remediate the problem:
The inlet device: pipe or swale	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
The forebay	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The vegetated shelf	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The main treatment area	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Algal growth covers over 50% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).

Permit Number: SW 8970733  
 (to be provided by DWQ)

Drainage Area Number: \_\_\_\_\_

BMP element:	Potential problem:	How I will remediate the problem:
The embankment	Shrubs have started to grow on the embankment.	Remove shrubs immediately.
	Evidence of muskrat or beaver activity is present.	Use traps to remove muskrats and consult a professional to remove beavers.
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair.	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the local NC Division of Water Quality Regional Office, or the 401 Oversight Unit at 919-733-1786.

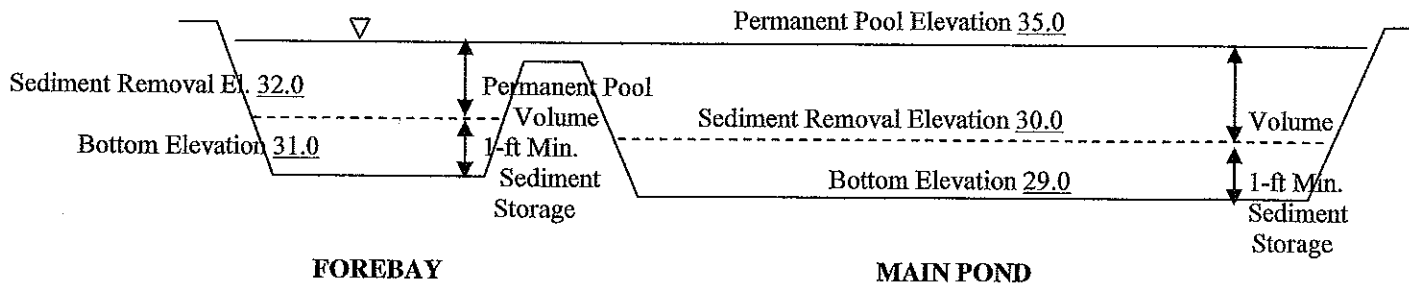
The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

When the permanent pool depth reads 5.0 feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads 3.0 feet in the forebay, the sediment shall be removed.

**BASIN DIAGRAM**

(fill in the blanks)



Permit Number: SW 8970733  
(to be provided by DWQ)

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed above. I agree to notify DWQ of any problems with the system or prior to any changes to the system or responsible party.

Project name: Sea Pines Apartments

BMP drainage area number: \_\_\_\_\_

Print name: Mark L. Maynard

Title: Member-Manager

Address: P.O. Box 1229 Wilmington, NC 28402

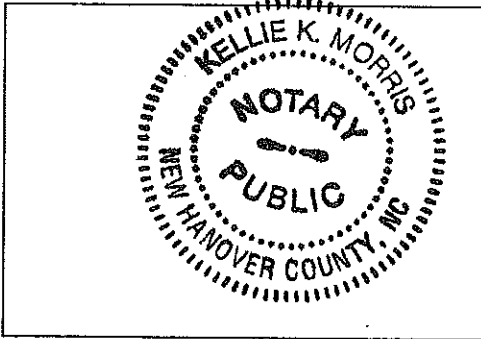
Phone: 910-251-5030

Signature: \_\_\_\_\_

Date: 7/31/08

Note: The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.

I, Kellie K. Morris, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Mark Maynard personally appeared before me this 31<sup>st</sup> day of July, 2008, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,

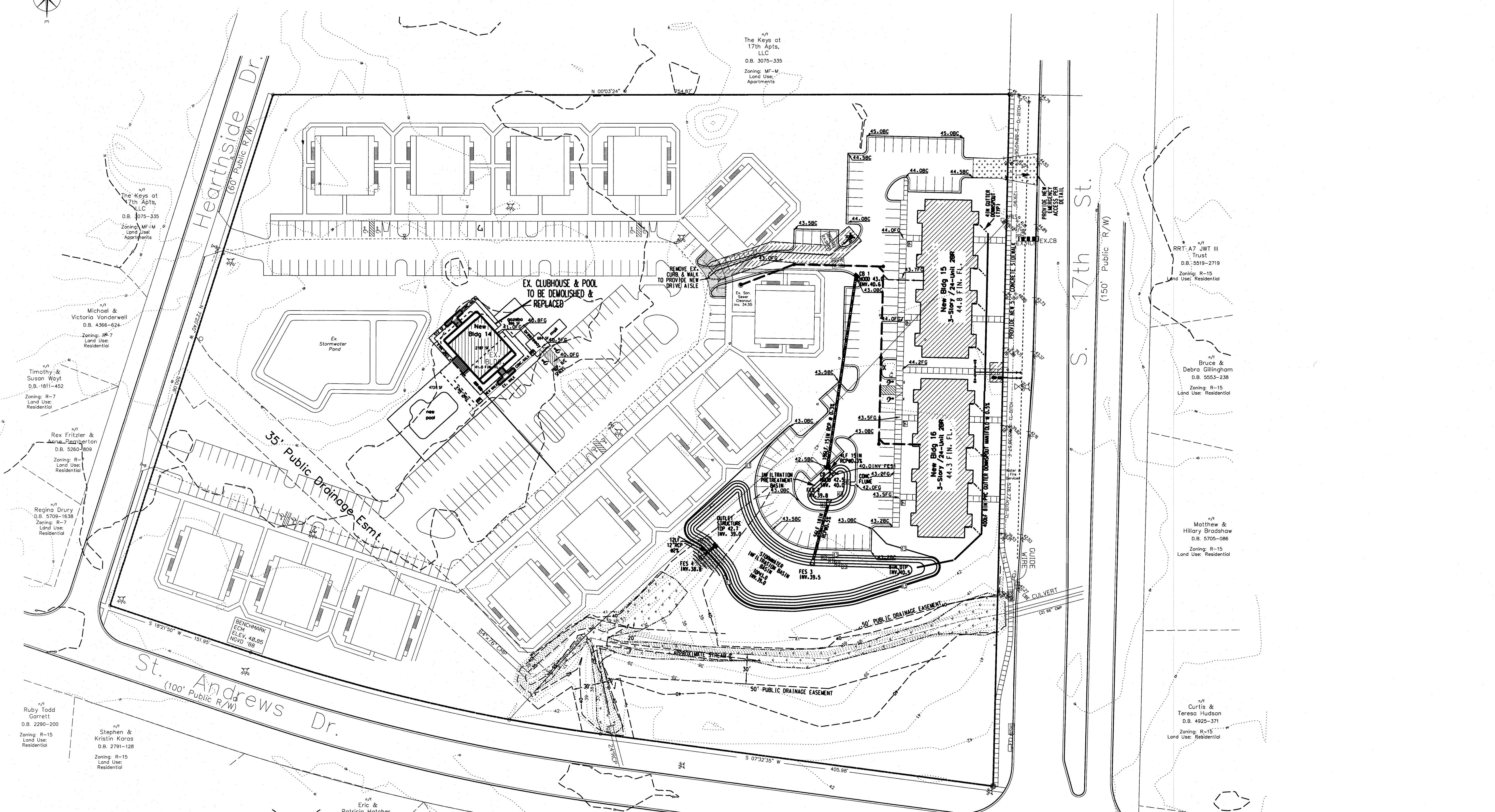
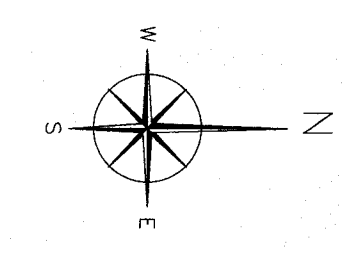


SEAL

My commission expires June 22, 2010



CONSTRUCTION PLAN SET



n/a The Keys at 7th Apts, LLC  
D.B. 3075-335  
Zoning: MF-M  
Land Use: Apartments

n/a Michael & Victoria Vanderwell  
D.B. 4366-624  
Zoning: R-7  
Land Use: Residential

n/a Timothy & Susan Woyt  
D.B. 1811-452  
Zoning: R-7  
Land Use: Residential

n/a Rex Fritzer & Aene Robertson  
D.B. 5260-809  
Zoning: R-7  
Land Use: Residential

n/a Regina Drury  
D.B. 5709-1636  
Zoning: R-7  
Land Use: Residential

n/a Ruby Todd Garrett  
D.B. 2290-200  
Zoning: R-15  
Land Use: Residential

n/a Stephen & Kristin Karas  
D.B. 2791-128  
Zoning: R-15  
Land Use: Residential

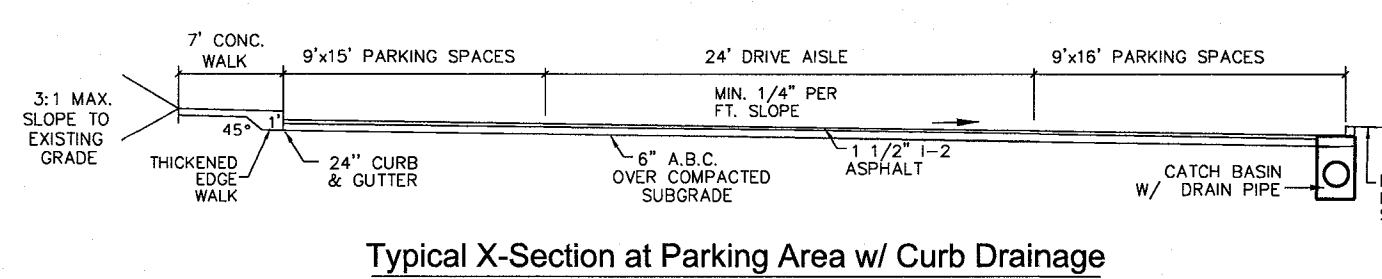
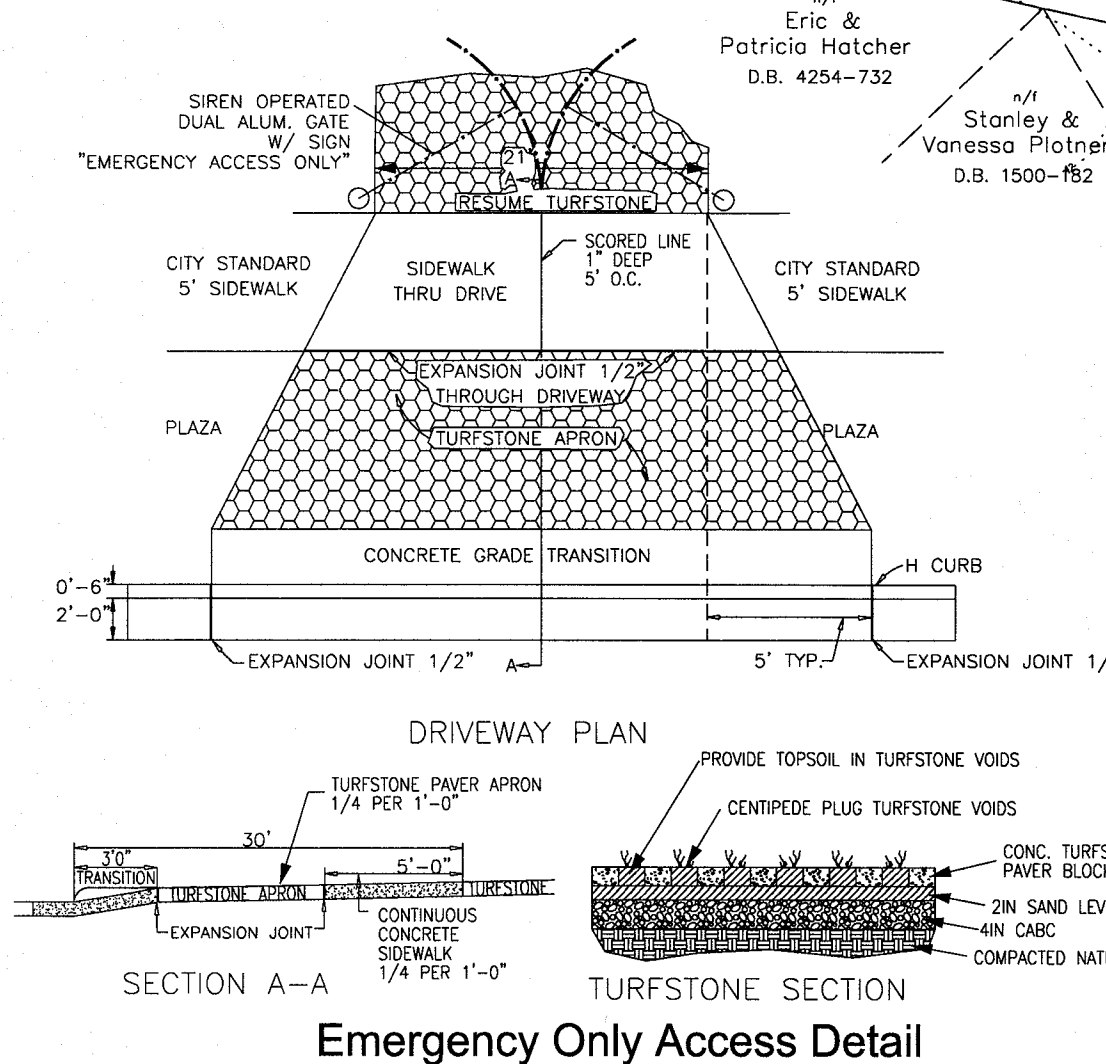
n/a The Keys at 17th Apts, LLC  
D.B. 3075-335  
Zoning: MF-M  
Land Use: Apartments

n/a RRT: A7 JWt III Trust  
D.B. 5519-2719  
Zoning: R-15  
Land Use: Residential

n/a Bruce & Debra Gillingham  
D.B. 5553-238  
Zoning: R-15  
Land Use: Residential

n/a Matthew & Hillary Bradshaw  
D.B. 5705-086  
Zoning: R-15  
Land Use: Residential

n/a Curtis & Teresa Hudson  
D.B. 4925-371  
Zoning: R-15  
Land Use: Residential



REVISIONS	
BY	DATE DESCRIPTION
JHF	1. 10/29/15 PER CITY STORM
JHF	2. 12/15/15 PER C/P/A

DESIGNED: JHF DATE: 5/6/15  
DRAWN: KBN SCALE: 1" = 50'  
APPROVED: JHF SHEET 4 OF 9

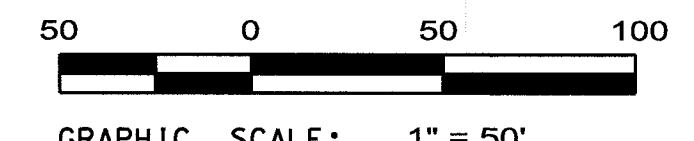
OWNER: Sea Pines Apartments, LLC  
ADDRESS: 10 S Cardinal Dr.  
Wilmington, NC 28403  
PHONE: 910-251-5030

**STROUD ENGINEERING, P.A.**  
102-D CINEMA DRIVE  
WILMINGTON, NORTH CAROLINA 28403  
(910) 815-0775 (910) 815-0593 FAX

Approved Construction Plan	
Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

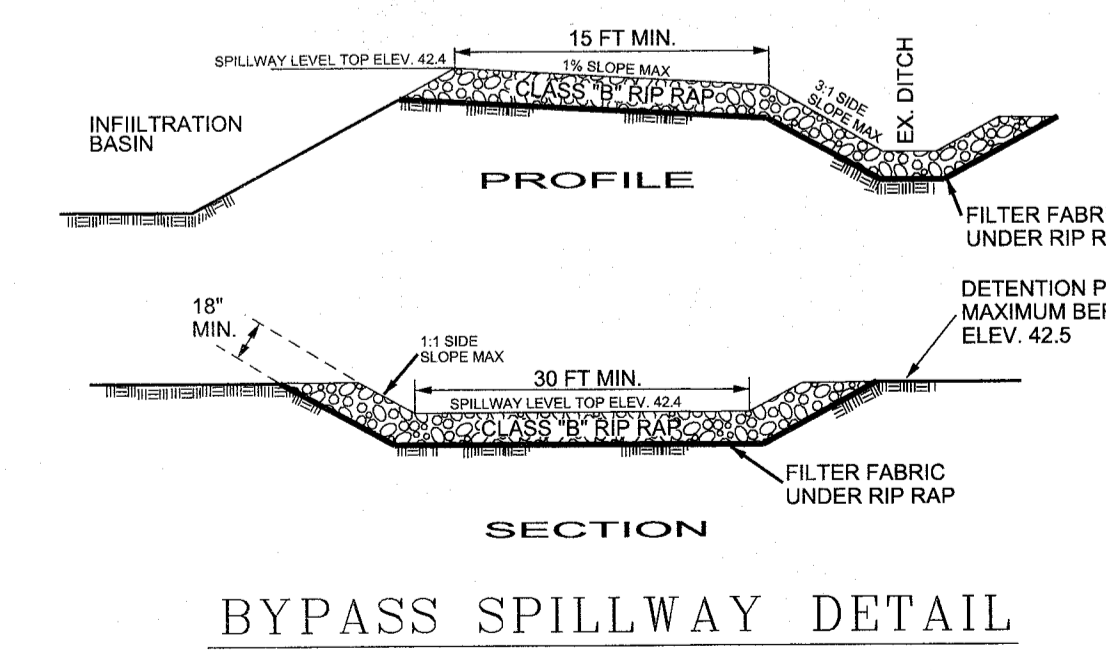
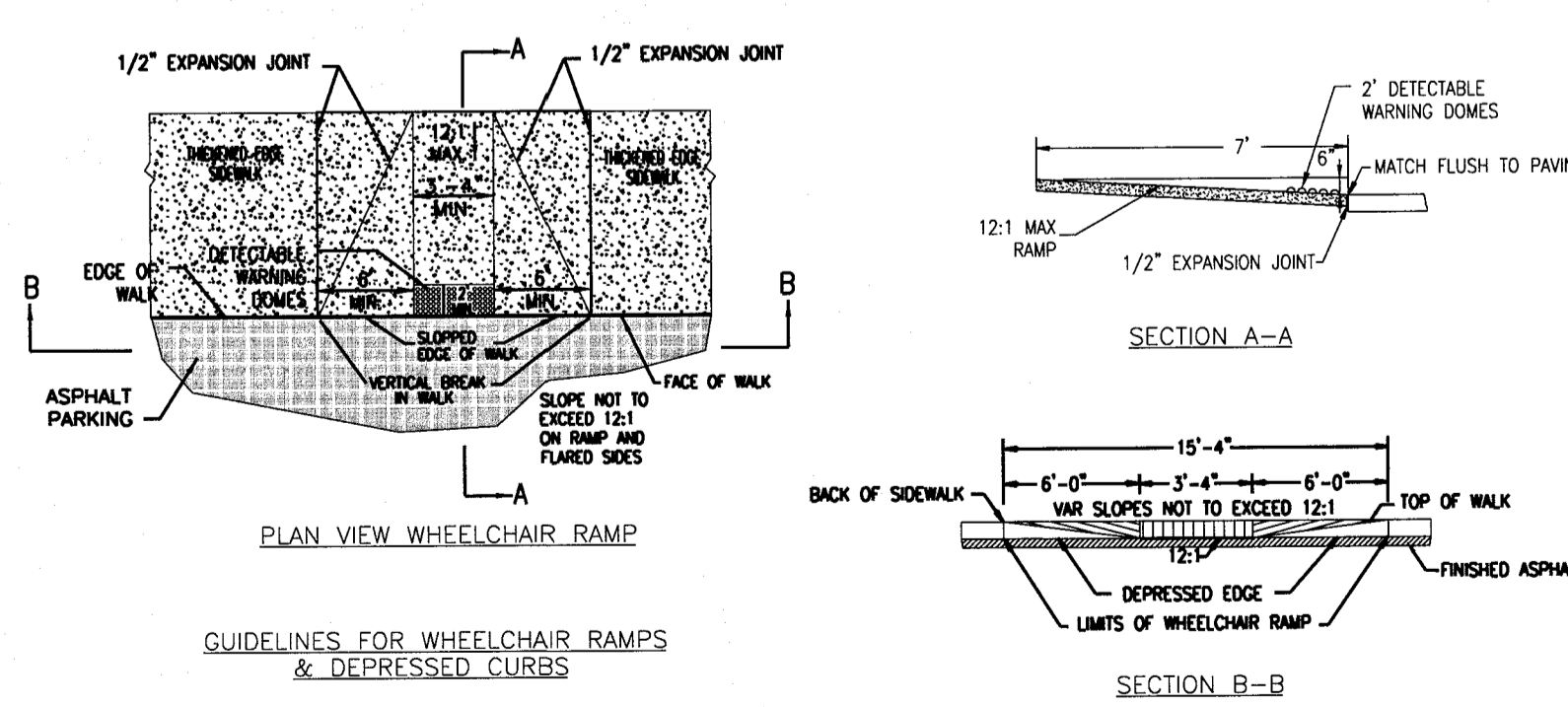
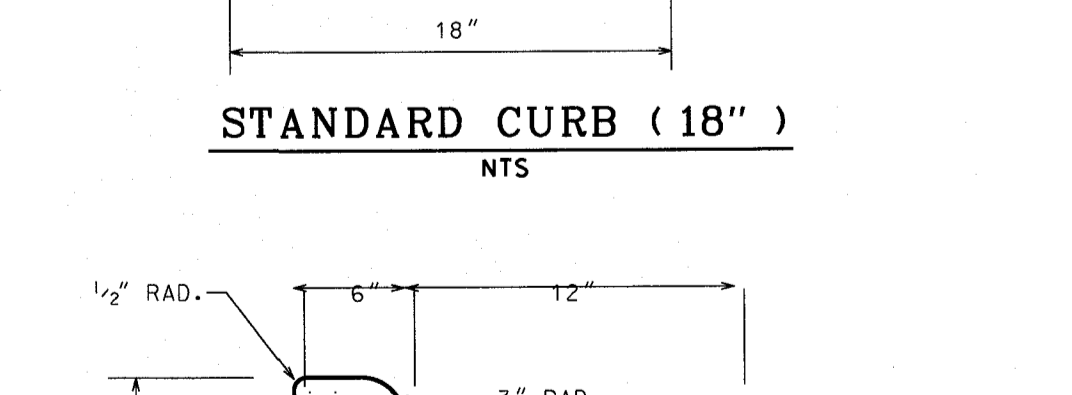
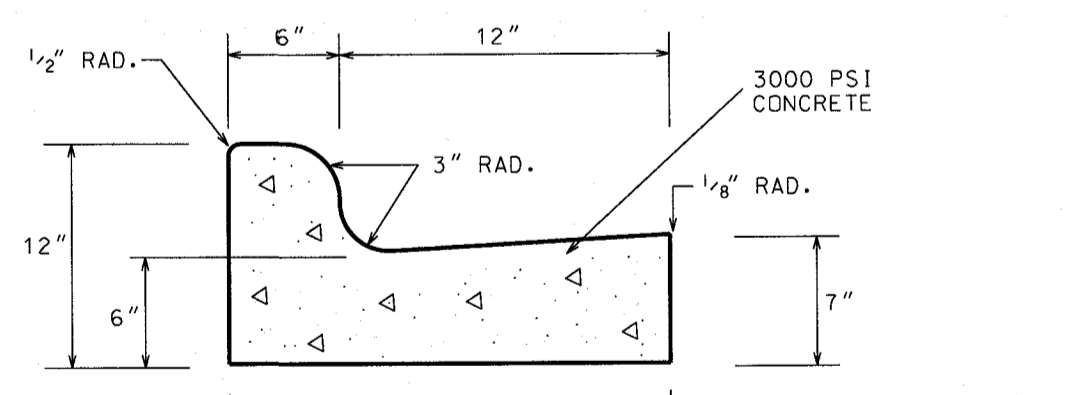
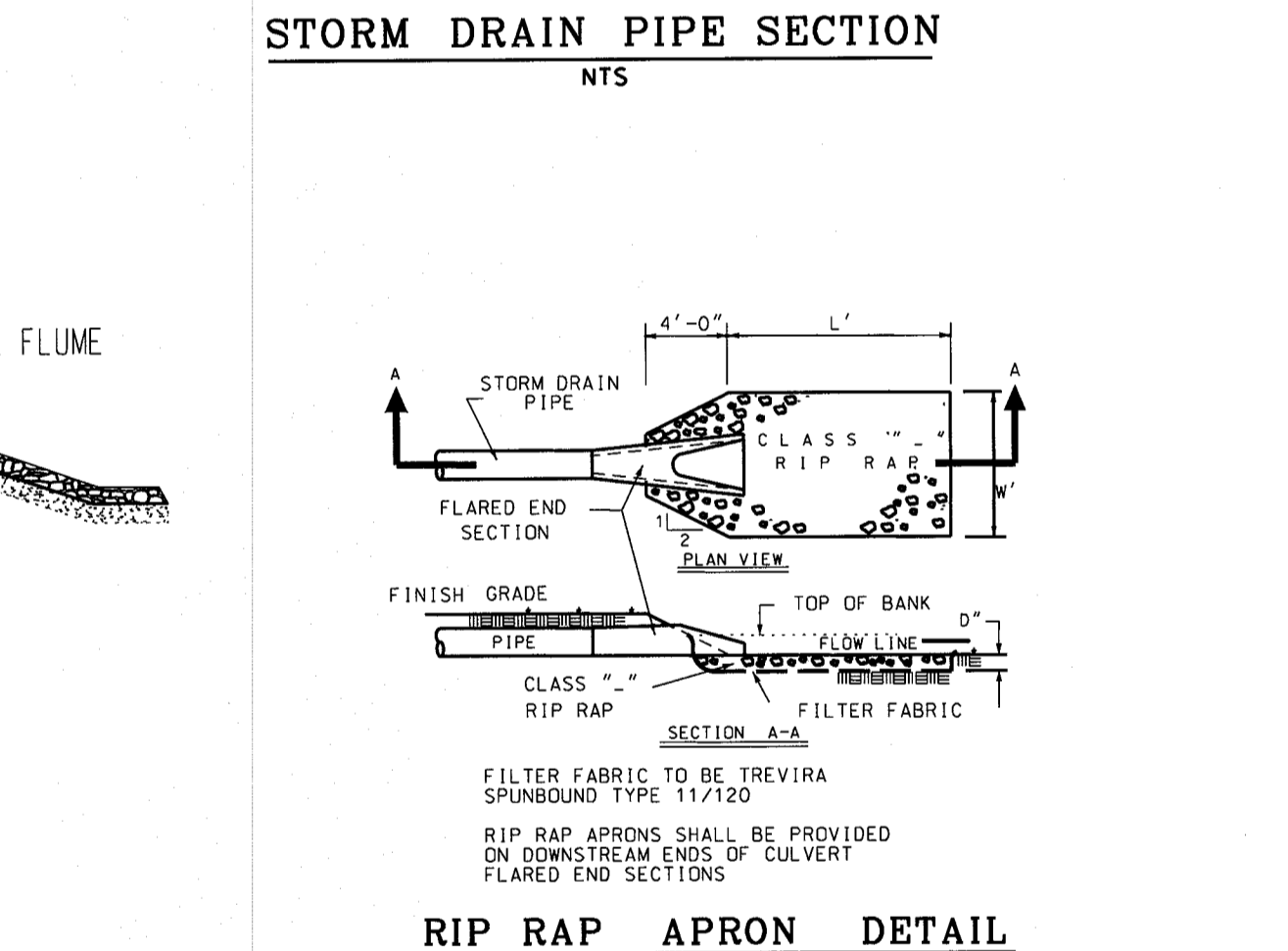
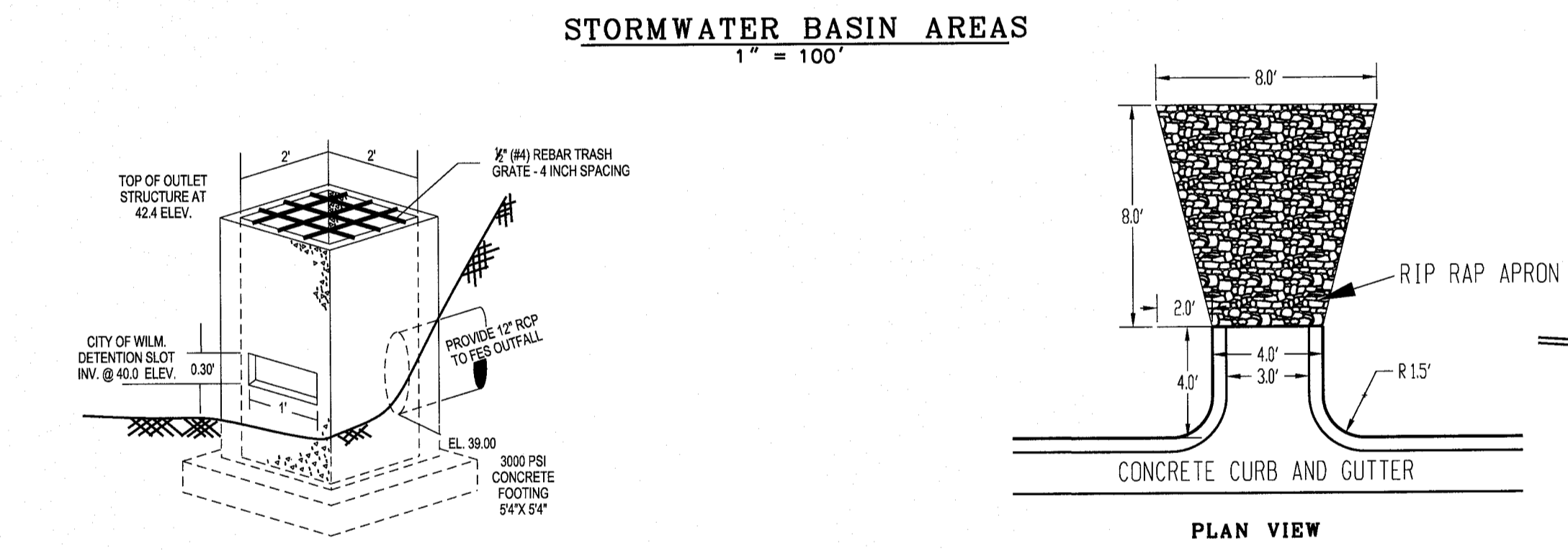
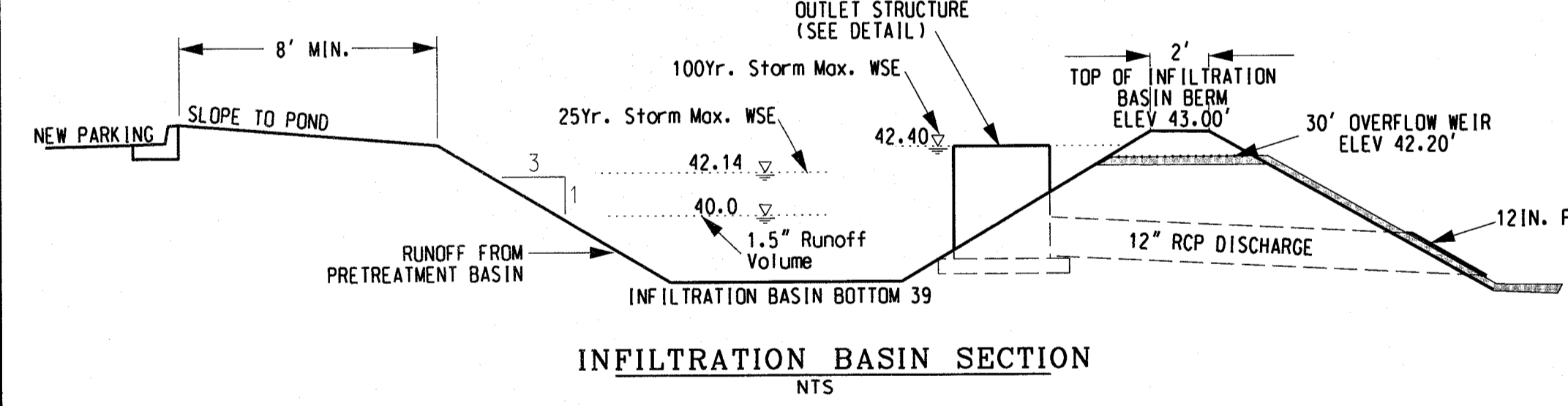
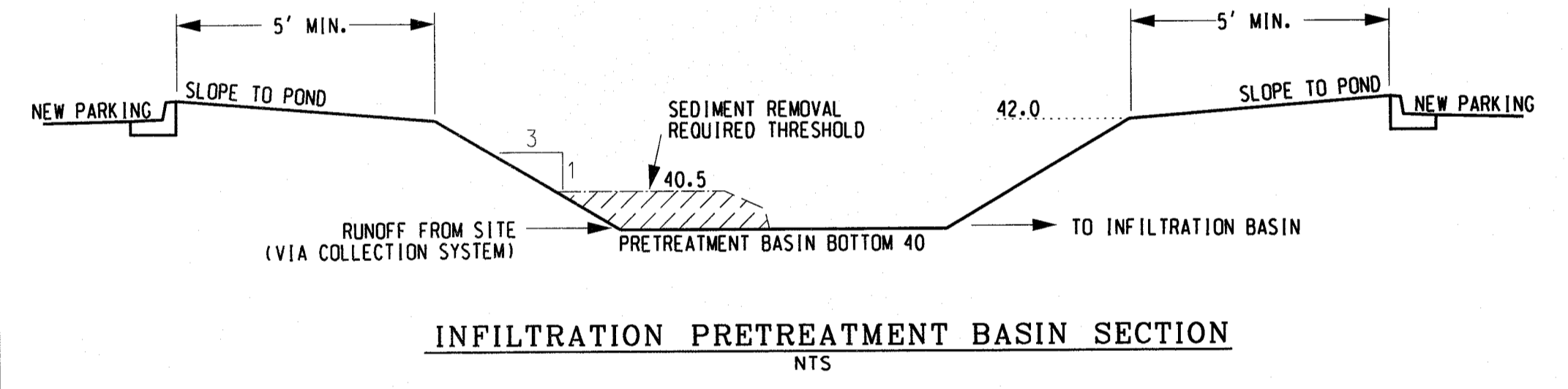
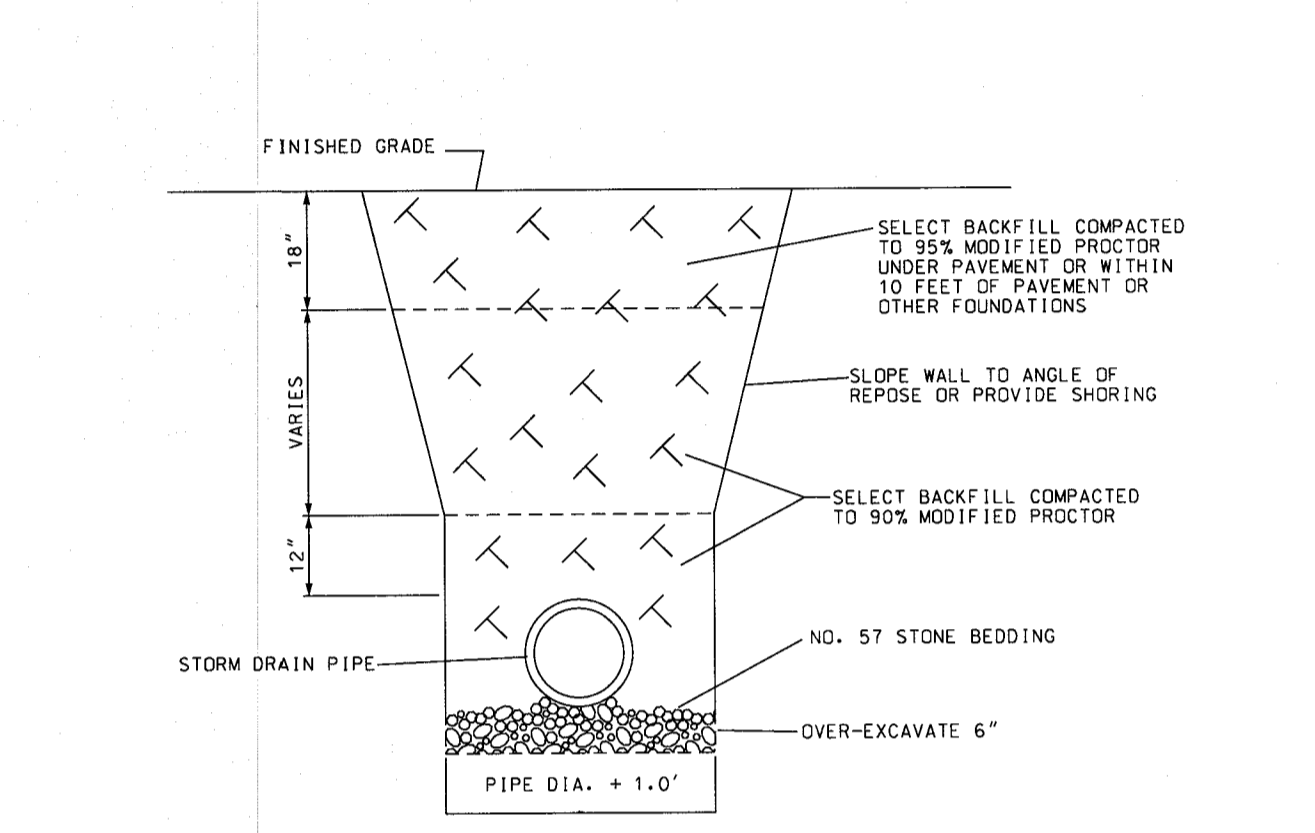
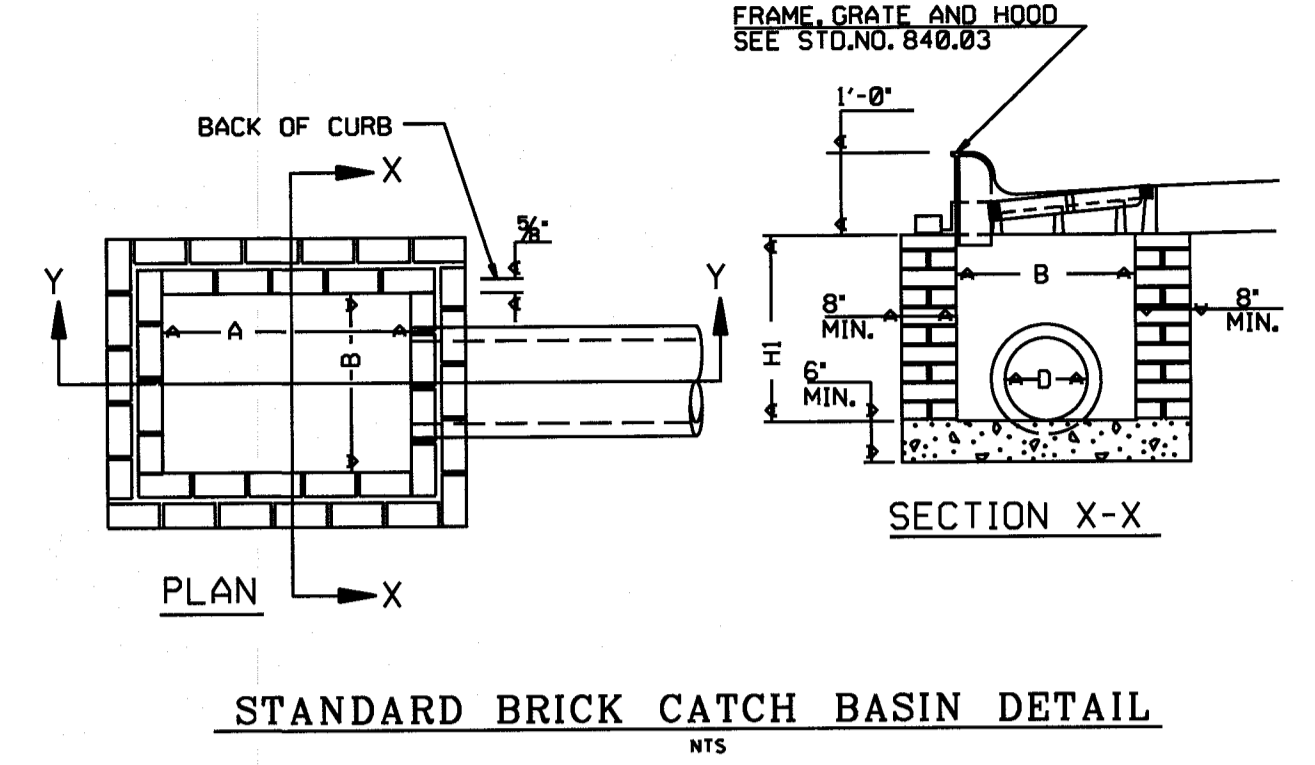
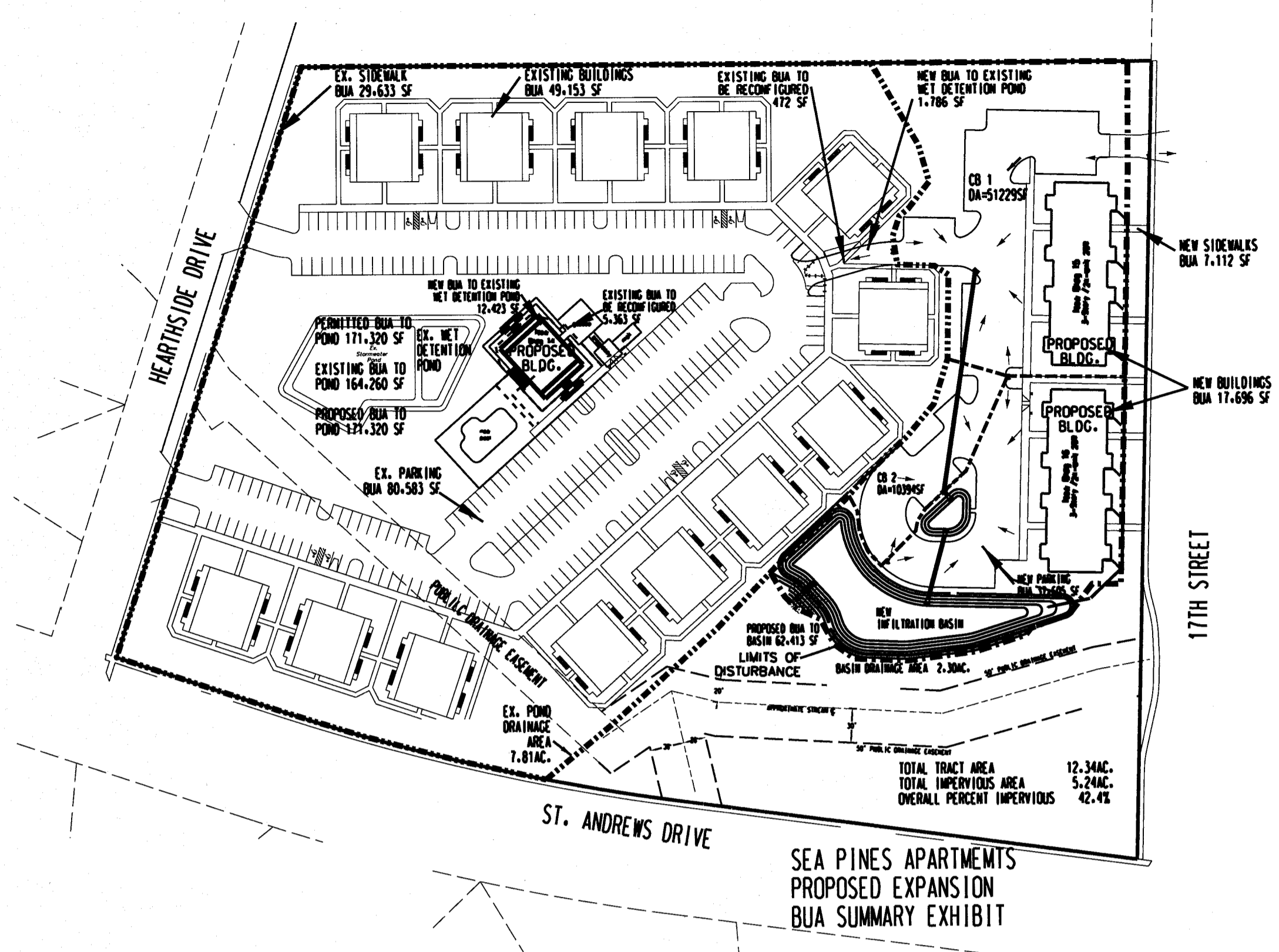
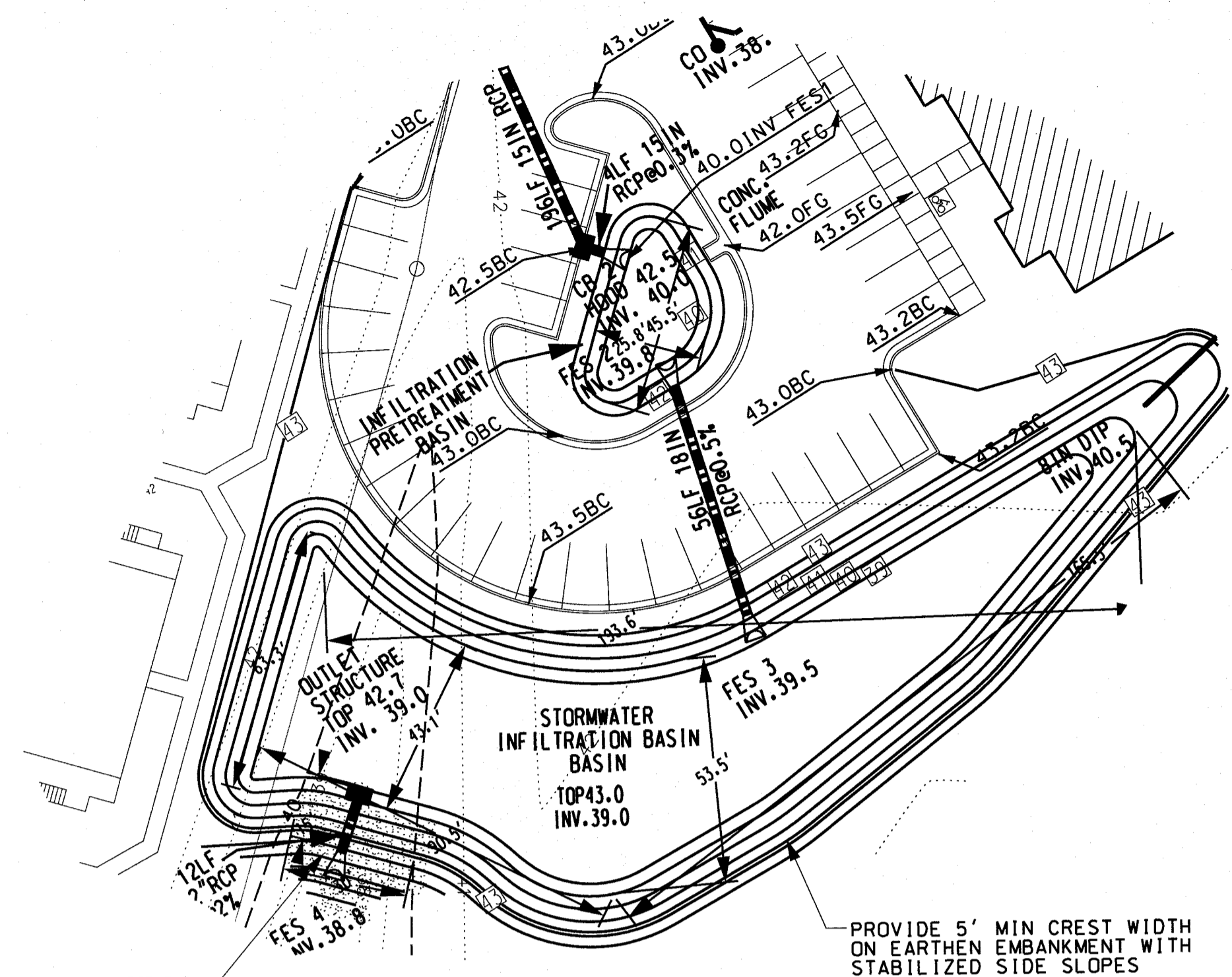
**CITY OF WILMINGTON**  
NORTH CAROLINA  
Public Services • Engineering Division  
APPROVED STORMWATER MANAGEMENT PLAN  
Date: \_\_\_\_\_ Permit # \_\_\_\_\_  
Signed: \_\_\_\_\_

**SEAL 20643**  
ENGINEER  
JAMES H. FENTRESS, JR., P.E.  
DATE: 5/17/2015



STORMWATER PLAN FOR  
**Sea Pines Apartments**  
WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

GENERAL NOTES:  
 MORTAR JOINTS 1/2" TO 3/4" THICK.  
 CLASS "B" CONCRETE TO BE USED THROUGHOUT.  
 THE POURING OF FLOOR SLAB TO BE ACCOMPLISHED BY FORMING.  
 DEDUCT FOR PIPES FROM TOTAL CU.YDS. OF BRICK MASONRY.  
 ALL CATCH BASINS OVER 3'-0" IN DEPTH TO BE PROVIDED WITH STEPS 1'-2" ON CENTER. STEPS SHALL BE IN ACCORDANCE WITH STD. NO. 848.83.  
 USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.  
 JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF CLAY BRICK.  
 IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STD. NO. 848.83.  
 FOR 8'-0" IN HEIGHT OR LESS, USE 8" WALL. OVER 8'-0" IN HEIGHT, USE 12" WALL TO 6'-0" FROM TOP OF WALL AND 8" WALL FOR THE REMAINING 6'-0". QUANTITIES TO BE ADJUSTED ACCORDINGLY.



RIP RAP APRON SCHEDULE				
FES#	STONE CLASS	DEPTH	WIDTH	LENGTH
1	B	15"	4'-0"	6'
2	B	15"	4'-0"	6'

Approved Construction Plan

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

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

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

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

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

**WILMINGTON**  
 NORTH CAROLINA

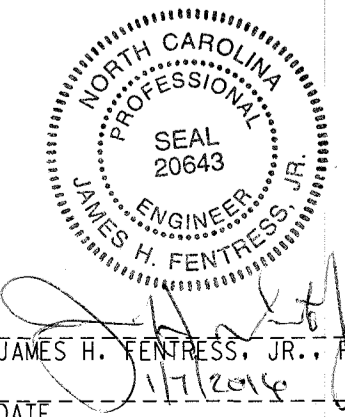
Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

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

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

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



NC DENR PWSS WATER PERMIT #: 07-00695  
 WATER CAPACITY: 21,600 GPD GPD  
 DWQ SEWER PERMIT #: WQ0031430  
 SEWER CAPACITY: 19,440 GPD GPD  
 SEWER SHED # AND PLANT: MOTTS CREEK  
 SEWER TO FLOW THROUGH NEI: YES OR (C) (CIRCLE ONE)

**STORMWATER DETAILS**

**Sea Pines Apartments**

WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

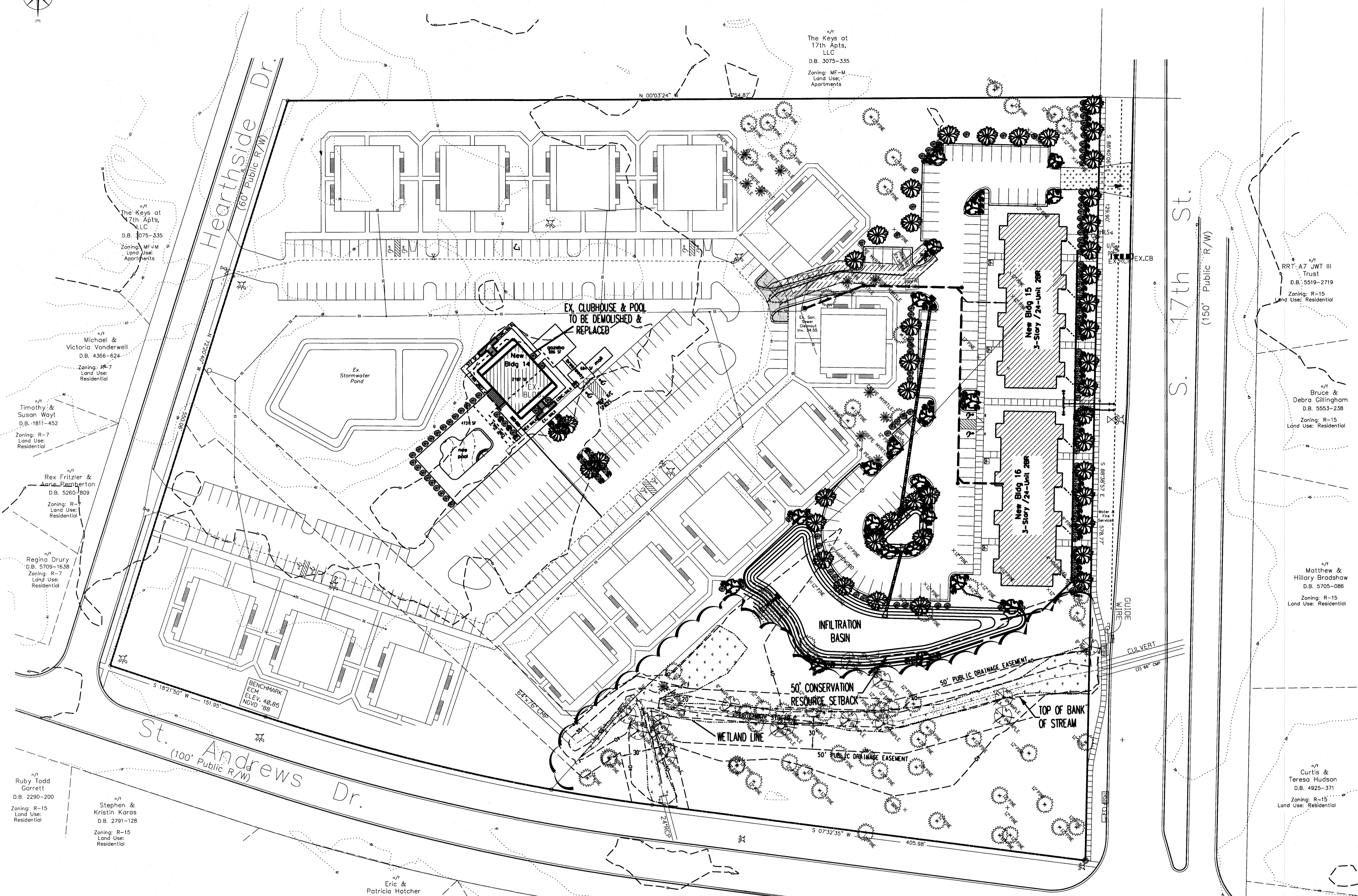
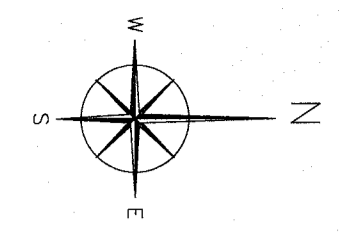
OWNER: PROJECT 48, LLC  
 ADDRESS: 10 S Cardinal Dr.  
 PHONE: 910-251-5030

DESIGNED: JHF  
 DRAWN: KBN  
 APPROVED: JHF  
 DATE: 7/21/15  
 SCALE: AS NOTED  
 SHEET: 8 OF 9

**STROUD ENGINEERING, P.A.**  
 102-D CINEMA DRIVE  
 WILMINGTON, NORTH CAROLINA  
 (910) 815-0775 (910) 815-0593 FAX

PROJECT NO.: PW-1061  
 DRAWING NO.: W-MASTER/PW-1061/DGN/DLM.DGN

CONSTRUCTION PLAN SET



n/a The Keys at 17th Apts, LLC  
 D.B. 3075-335  
 Zoning: MF-M  
 Land Use: Apartments

n/a Michael & Victoria Vanderwell  
 D.B. 4366-624  
 Zoning: R-7  
 Land Use: Residential

n/a Timothy & Susan Wayt  
 D.B. 1811-452  
 Zoning: R-7  
 Land Use: Residential

n/a Rex Fritzier & Anna Faerberlein  
 D.B. 5260-809  
 Zoning: R-7  
 Land Use: Residential

n/a Regino Drury  
 D.B. 5709-1638  
 Zoning: R-7  
 Land Use: Residential

n/a Ruby Todd Garrett  
 D.B. 2290-200  
 Zoning: R-15  
 Land Use: Residential

n/a Stephen & Kristin Karas  
 D.B. 2791-128  
 Zoning: R-15  
 Land Use: Residential

n/a Eric & Patricia Hatcher  
 D.B. 4254-732

n/a Stanley & Vanessa Pinger  
 D.B. 1500-82

n/a Robert & Tina Montgomery  
 D.B. 2311-277  
 Zoning: R-15  
 Land Use: Residential

n/a Christopher & Erica Yahn  
 D.B. 5784-440  
 Zoning: R-15  
 Land Use: Residential

n/a Maycon Cesar Gummara  
 D.B. 5799-2535  
 Zoning: R-15  
 Land Use: Residential

n/a Spring Arbor-Wilmington  
 D.B. 1977-352  
 Zoning: R-15  
 Land Use: Health Care

n/a n/a  
 D.B. 3075-335  
 Zoning: MF-M  
 Land Use: Apartments

n/a n/a  
 D.B. 5519-2719  
 Zoning: R-15  
 Land Use: Residential

n/a Bruce & Debra Gillingham  
 D.B. 5553-238  
 Zoning: R-15  
 Land Use: Residential

n/a Matthew & Hillary Bradshaw  
 D.B. 5705-086  
 Zoning: R-15  
 Land Use: Residential

n/a Curtis & Teresa Hudson  
 D.B. 4925-371  
 Zoning: R-15  
 Land Use: Residential

**LEGEND**

- x GRADING HIGH POINT
- DRAINAGE DIRECTION
- PROPOSED CATCH BASIN
- PROPOSED CONTOURS
- EX. NGDOT LIDAR CONTOUR
- PROP. 24" RCP STORM DRAIN
- PROPOSED SEWER CLEANOUT
- IRON REBAR SET
- EX. IRON PIPE
- EX. IRON PIPE
- CONTROL MONUMENT SET
- CONTROL PK NAIL SET
- EX. REG'D. HARDWOOD TREE
- EX. REG'D. PINE TREE
- EX. REG'D. FLOWERING TREE
- PROPOSED POMPACTA JUNIPER
- PROPOSED PITUSPORUM SHRUB
- PROPOSED TRIDENT MAPLE
- PROPOSED LIVE OAK
- TREE TO BE REMOVED

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

Approved Construction Plan

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

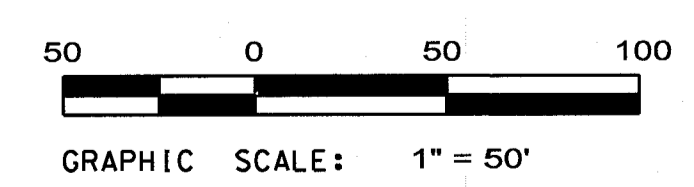
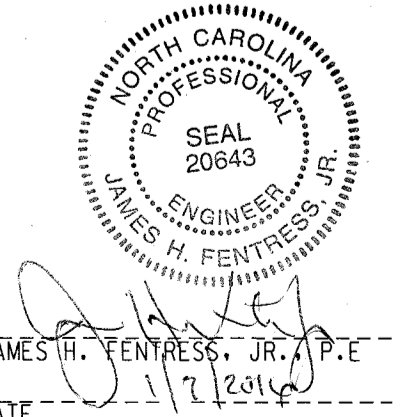
Planning: \_\_\_\_\_

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

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

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

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



**REVISIONS**

BY	NO.	DATE	DESCRIPTION
JHF	1.	10/29/15	PER CITY STORM
JHF	2.	12/15/15	PER CFPUR

DESIGNED: JHF DATE: 5/6/15  
 DRAWN: KBN SCALE: 1" = 50'  
 APPROVED: JHF SHEET 9 OF 9

OWNER: Sea Pines Apartments, LLC  
 ADDRESS: 10 S Cardinal Dr.  
 Wilmington, NC 28403  
 PHONE: 910-251-5030

STROUD ENGINEERING, P.A.  
 102-D CINEMA DRIVE  
 WILMINGTON, NORTH CAROLINA 28403  
 (910) 815-0775 (910) 815-0593 FAX

LANDSCAPING PLAN FOR  
**Sea Pines Apartments**  
 WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA