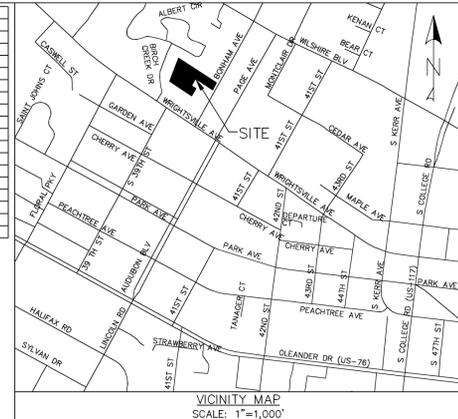


SHEET INDEX	
1A	COVER SHEET
1	SITE PLAN
2	DRAINAGE & UTILITY PLAN
3	EXISTING CONDITIONS & DEMOLITION PLAN
4	EXISTING CONDITIONS & DEMOLITION PLAN
5	EXISTING CONDITIONS & DEMOLITION PLAN
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7	DETAIL SHEET
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9	SOIL TEST & DRAINAGE AREA MAP
10	DRAINAGE AREA MAP
11	LANDSCAPE PLAN
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13	PLAN PROFILE
14	SANITARY SEWER DETAIL SHEET
15	SANITARY SEWER DETAIL SHEET
16	WATER DETAIL SHEET
17	WATER DETAIL SHEET



- LEGEND**
- = EXISTING IRON PIPE
  - = SET IRON ROD
  - ⊙ = SET PK NAIL
  - ⊕ = EXISTING POWER POLE
  - ⊗ = EXISTING WATER METER
  - ⊠ = EXISTING MAILBOX
  - ⊛ = EXISTING LIGHT POLE
  - ⊞ = EXISTING FIRE HYDRANT
  - ⊚ = EXISTING TREE
  - ⊘ = EXISTING TREE (TO BE REMOVED)
  - = EXISTING CONTOUR
  - = CENTERLINE
  - R/W = EXISTING OVERHEAD LINE
  - = EXISTING DITCH
  - = EXISTING FENCE
  - = PROPERTY LINE
  - = ADJACENT LOT LINES (APPROX.)
  - = PROPOSED BUFFER/SOLID FENCE
  - = PROPOSED SETBACK
  - = PROPOSED STREET YARD
  - ▨ = PROPOSED IMPERVIOUS CONCRETE
  - ▨ = PROPOSED FOUNDATION PLANTING
  - ▨ = PROPOSED LIMITS OF DISTURBANCE
  - ▨ = PROPOSED OPEN SPACE
  - ▨ = PROPOSED ACTIVE RECREATION (OPEN SPACE)
  - ▨ = PROPOSED PASSIVE RECREATION (OPEN SPACE)

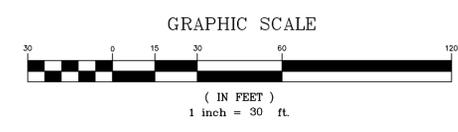
**OPEN SPACE**  
 REQUIRED OPEN SPACE =  $0.35 \times 106,955 = 37,434.25$  SF = 0.86 ACRES  
 REQUIRED RECREATION AREA =  $0.5 \times 37,434.25 = 18,717.13$  SF  
 REQUIRED ACTIVE RECREATION AREA =  $0.5 \times 18,717.13 = 9,358.57$  SF  
 PROVIDED ACTIVE RECREATION AREA = 9,386.72 SF  
 REQUIRED PASSIVE RECREATION AREA =  $0.5 \times 18,717.13 = 9,358.57$  SF  
 PROVIDED PASSIVE RECREATION AREA = 9,864.27 SF  
 PROVIDED TOTAL RECREATION AREA = 19,250.99 SF  
 PROVIDED OPEN SPACE = 44,413.97 SF = 1.02 ACRES (TOTAL SITE AREA MINUS STREET YARD AREAS, INTERIOR LANDSCAPING ISLANDS, FOUNDATION PLANTING AREAS, BUFFERS, IMPERVIOUS SURFACE AREAS, & WOOD DECK PATIOS)

REV. NO.	DESCRIPTION	DATE
1	REVISED PER CITY OF WILMINGTON	3-15-13

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

**Approved Construction Plan**

Name	Date
Planning	_____
Public Utilities	_____
Traffic	_____
Fire	_____



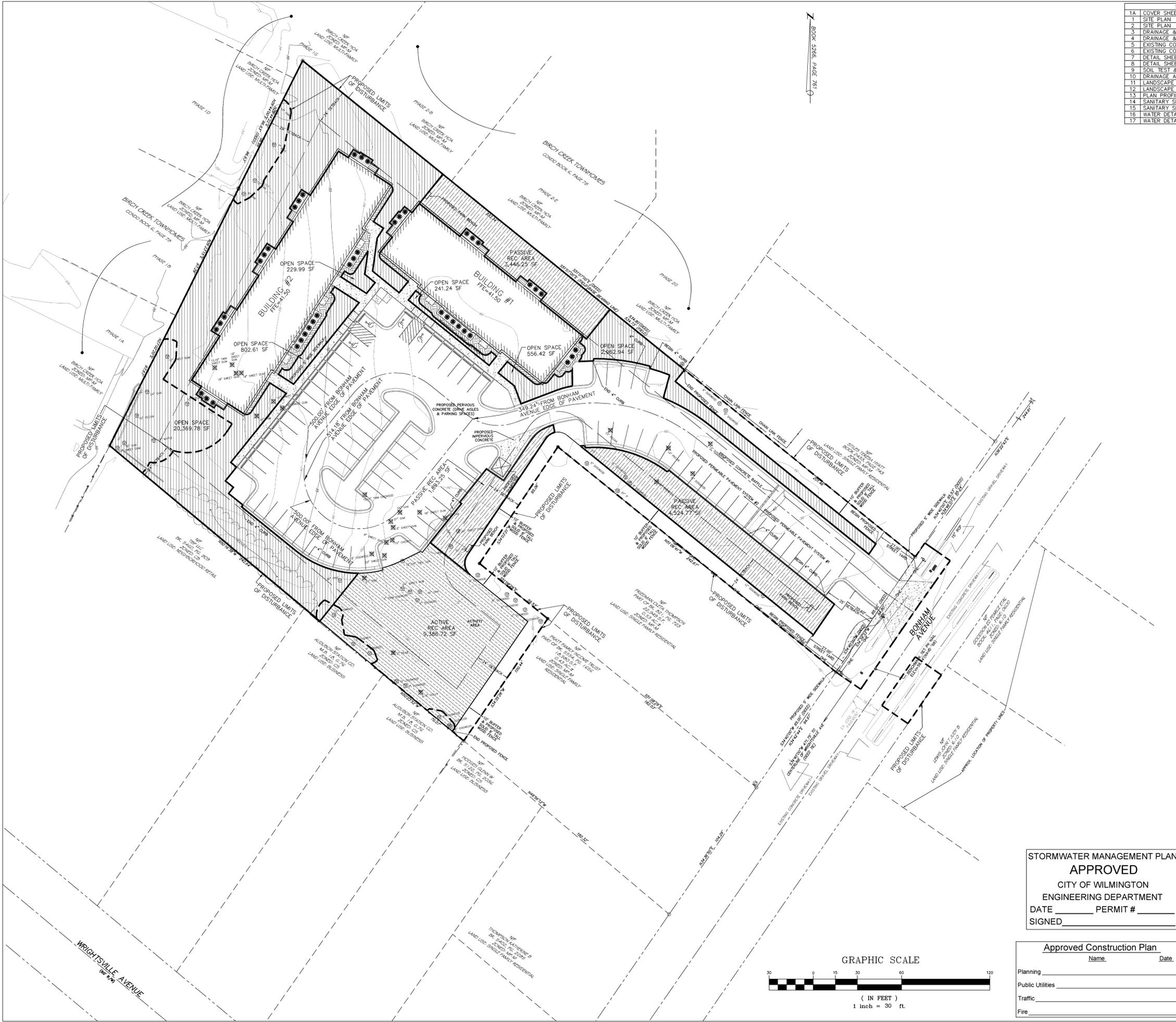
COVER SHEET  
 1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

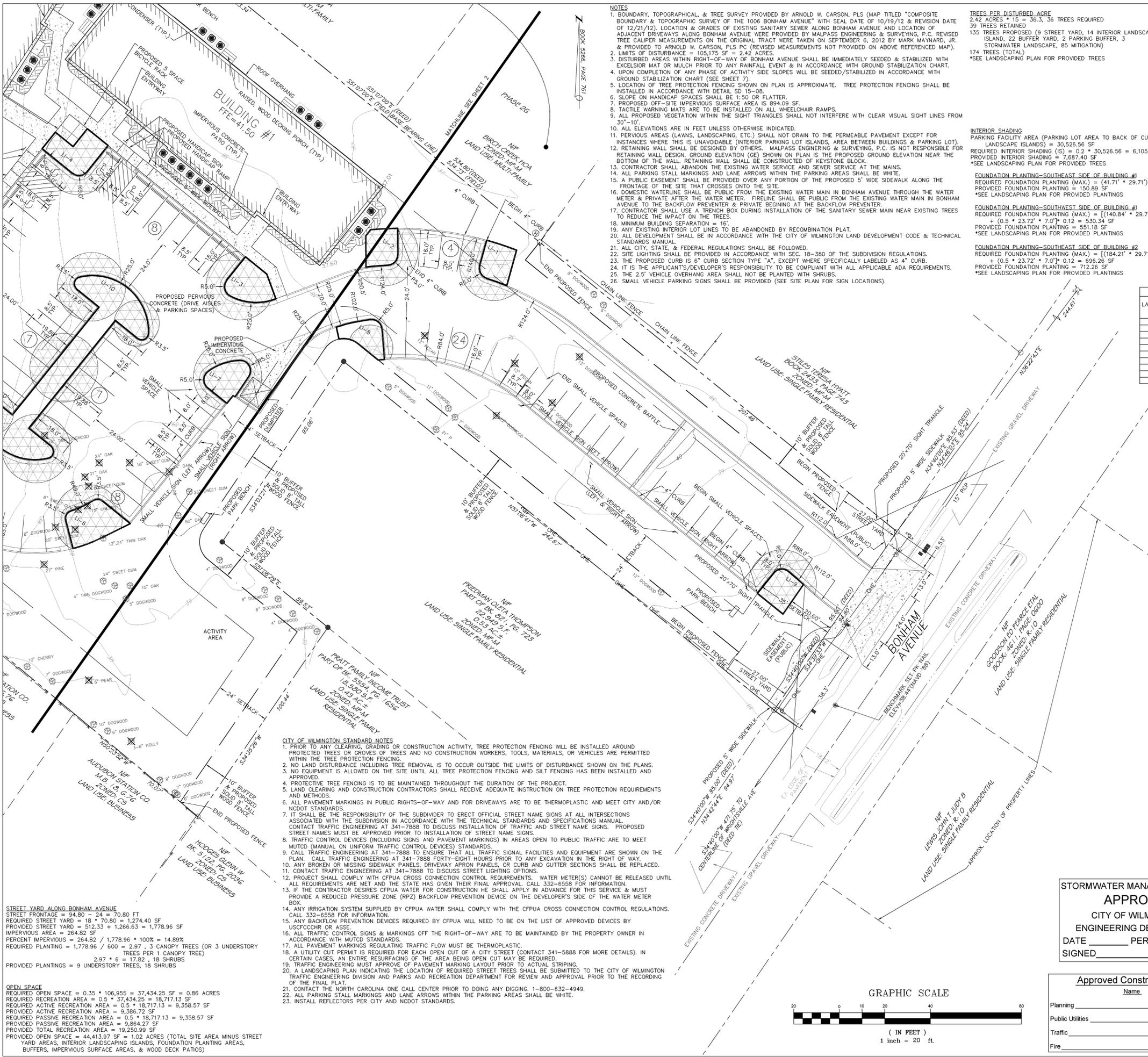
DATE: 2-7-13  
 SCALE: 1"=30'  
 DRAWN: JCB  
 CHECKED: JEM  
 PROJECT NO: 219

MALPASS ENGINEERING & SURVEYING, P.C.  
 1134 SHIPYARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-5843  
 Fax 910-392-5203 License No. C-2320

Owner: 1280M LLC  
 P.O. BOX 12229  
 WILMINGTON, NORTH CAROLINA 28402

SHEET NO: 1A  
 OF: 17





**STREET YARD ALONG BONHAM AVENUE**  
 STREET FRONTAGE = 94.80 = 24' + 70.80 FT  
 REQUIRED STREET YARD = 18' \* 70.80 = 1,274.40 SF  
 PROVIDED STREET YARD = 512.33 + 1,266.63 = 1,778.96 SF  
 IMPERVIOUS AREA = 264.82 SF  
 PERCENT IMPERVIOUS = 264.82 / 1,778.96 \* 100% = 14.89%  
 REQUIRED PLANTING = 1,778.96 / 600 = 2.97 \* 3 CANOPY TREES (OR 3 UNDERSTORY TREES PER 1 CANOPY TREE)  
 2.97 \* 6 = 17.82 \* 18 SHRUBS  
 PROVIDED PLANTINGS = 9 UNDERSTORY TREES, 18 SHRUBS

**OPEN SPACE**  
 REQUIRED OPEN SPACE = 0.35 \* 106,955 = 37,434.25 SF = 0.86 ACRES  
 REQUIRED RECREATION AREA = 0.5 \* 37,434.25 = 18,717.13 SF  
 REQUIRED ACTIVE RECREATION AREA = 0.5 \* 18,717.13 = 9,358.57 SF  
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- CITY OF WILMINGTON STANDARD NOTES**
- 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.
  - NO LAND DISTURBANCE INCLUDING TREE REMOVAL IS TO OCCUR OUTSIDE THE LIMITS OF DISTURBANCE SHOWN ON THE PLANS.
  - NO EQUIPMENT IS ALLOWED ON THE SITE UNTIL ALL TREE PROTECTION FENCING AND SILT FENCING HAS BEEN INSTALLED AND APPROVED.
  - PROTECTIVE TREE FENCING IS TO BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.
  - LAND CLEARING AND CONSTRUCTION CONTRACTORS SHALL RECEIVE ADEQUATE INSTRUCTION ON TREE PROTECTION REQUIREMENTS AND METHODS.
  - ALL PAVEMENT MARKINGS IN PUBLIC RIGHTS-OF-WAY AND FOR DRIVEWAYS ARE TO BE THERMOPLASTIC AND MEET CITY AND/OR NCDOT STANDARDS.
  - IT SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER TO ERECT OFFICIAL STREET NAME SIGNS AT ALL INTERSECTIONS ASSOCIATED WITH THE SUBDIVISION IN ACCORDANCE WITH THE TECHNICAL STANDARDS AND SPECIFICATIONS MANUAL.
  - CONTACT TRAFFIC ENGINEERING AT 341-7888 TO DISCUSS INSTALLATION OF TRAFFIC AND STREET NAME SIGNS. PROPOSED STREET NAMES MUST BE APPROVED PRIOR TO INSTALLATION OF STREET NAME SIGNS.
  - TRAFFIC CONTROL DEVICES (INCLUDING SIGNS AND PAVEMENT MARKINGS) IN AREAS OPEN TO PUBLIC TRAFFIC ARE TO MEET MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) STANDARDS.
  - CALL TRAFFIC ENGINEERING AT 341-7888 TO ENSURE THAT ALL TRAFFIC SIGNAL FACILITIES AND EQUIPMENT ARE SHOWN ON THE PLAN. CALL TRAFFIC ENGINEERING AT 341-7888 FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION IN THE RIGHT OF WAY.
  - ANY BROKEN OR MISSING SIDEWALK PANELS, DRIVEWAY APRON PANELS, OR CURB AND GUTTER SECTIONS SHALL BE REPLACED.
  - CONTACT TRAFFIC ENGINEERING AT 341-7888 TO DISCUSS STREET LIGHTING OPTIONS.
  - PROJECT SHALL COMPLY WITH CFPWA CROSS CONNECTION CONTROL REQUIREMENTS. WATER METER(S) CANNOT BE RELEASED UNTIL ALL REQUIREMENTS ARE MET AND THE STATE HAS GIVEN THEIR FINAL APPROVAL. CALL 332-6558 FOR INFORMATION.
  - IF THE CONTRACTOR DESIRES CFPWA WATER FOR CONSTRUCTION HE SHALL APPLY IN ADVANCE FOR THIS SERVICE & MUST PROVIDE A REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTION DEVICE ON THE DEVELOPER'S SIDE OF THE WATER METER BOX.
  - ANY IRRIGATION SYSTEM SUPPLIED BY CFPWA WATER SHALL COMPLY WITH THE CFPWA CROSS CONNECTION CONTROL REGULATIONS. CALL 332-6558 FOR INFORMATION.
  - ANY BACKFLOW PREVENTION DEVICES REQUIRED BY CFPWA WILL NEED TO BE ON THE LIST OF APPROVED DEVICES BY USFCOCHR OR ASSE.
  - ALL TRAFFIC CONTROL SIGNS & MARKINGS OFF THE RIGHT-OF-WAY ARE TO BE MAINTAINED BY THE PROPERTY OWNER IN ACCORDANCE WITH MUTCD STANDARDS.
  - ALL PAVEMENT MARKINGS REGULATING TRAFFIC FLOW MUST BE THERMOPLASTIC.
  - A UTILITY CUT PERMIT IS REQUIRED FOR EACH OPEN CUT OF A CITY STREET (CONTACT 341-5888 FOR MORE DETAILS). IN CERTAIN CASES, AN ENTIRE RESURFACING OF THE AREA BEING OPEN CUT MAY BE REQUIRED.
  - TRAFFIC ENGINEERING MUST APPROVE OF PAVEMENT MARKING LAYOUT PRIOR TO ACTUAL STRIPING.
  - 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.
  - CONTACT THE NORTH CAROLINA ONE CALL CENTER PRIOR TO DOING ANY DIGGING. 1-800-632-4949.
  - ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
  - INSTALL REFLECTORS PER CITY AND NCDOT STANDARDS.

- NOTES**
- BOUNDARY, TOPOGRAPHICAL, & TREE SURVEY PROVIDED BY ARNOLD W. CARSON, PLS (MAP TITLED "COMPOSITE BOUNDARY & TOPOGRAPHIC SURVEY OF THE 1006 BONHAM AVENUE" WITH SEAL DATE OF 10/19/12 & REVISION DATE OF 12/21/12). LOCATION & GRADES OF EXISTING SANITARY MAIN ALONG BONHAM AVENUE AND LOCATION OF ADJACENT DRIVEWAYS ALONG BONHAM AVENUE WERE PROVIDED BY MALPASS ENGINEERING & SURVEYING, P.C. REVISED TREE CALIPER MEASUREMENTS ON THE ORIGINAL TRACT WERE TAKEN ON SEPTEMBER 6, 2012 BY MARK MAYNARD, JR. & PROVIDED TO ARNOLD W. CARSON, PLS PC (REVISED MEASUREMENTS NOT PROVIDED ON ABOVE REFERENCED MAP).
  - LIMITS OF DISTURBANCE = 105,175 SF = 2.42 ACRES.
  - DISTURBED AREAS WITHIN RIGHT-OF-WAY OF BONHAM AVENUE SHALL BE IMMEDIATELY SEEDDED & STABILIZED WITH EXCELRIOR MAT OR MULCH PRIOR TO ANY RAINFALL EVENT & IN ACCORDANCE WITH GROUND STABILIZATION CHART.
  - UPON COMPLETION OF ANY PHASE OF ACTIVITY SIDE SLOPES WILL BE SEEDDED/STABILIZED IN ACCORDANCE WITH GROUND STABILIZATION CHART (SEE SHEET 7).
  - LOCATION OF TREE PROTECTION FENCING SHOWN ON PLAN IS APPROXIMATE. TREE PROTECTION FENCING SHALL BE INSTALLED IN ACCORDANCE WITH DETAIL SD-15-08.
  - SLOPE ON HANDICAP SPACES SHALL BE 1:50 OR FLATTER.
  - PROPOSED OFF-SITE IMPERVIOUS SURFACE AREA IS 894.09 SF.
  - TACTILE WARNING MATS ARE TO BE INSTALLED ON ALL WHEELCHAIR RAMPS.
  - ALL PROPOSED VEGETATION WITHIN THE SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30'-10'.
  - ALL ELEVATIONS ARE IN FEET UNLESS OTHERWISE INDICATED.
  - PERVIOUS AREAS (LAWNS, LANDSCAPING, ETC.) SHALL NOT DRAIN TO THE PERMEABLE PAVEMENT EXCEPT FOR INSTANCES WHERE THIS IS UNAVOIDABLE (INTERIOR PARKING LOT ISLANDS, AREA BETWEEN BUILDINGS & PARKING LOT).
  - RETAINING WALL SHALL BE DESIGNED BY OTHERS. MALPASS ENGINEERING & SURVEYING, P.C. IS NOT RESPONSIBLE FOR RETAINING WALL DESIGN. GROUND ELEVATION (GE) SHOWN ON PLAN IS THE PROPOSED GROUND ELEVATION NEAR THE BOTTOM OF THE WALL. RETAINING WALL SHALL BE CONSTRUCTED OF KEYSTONE BLOCK.
  - CONTRACTOR SHALL ABANDON THE EXISTING WATER SERVICE AND SEWER SERVICE AT THE MAINS.
  - ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
  - A PUBLIC EASEMENT SHALL BE PROVIDED OVER ANY PORTION OF THE PROPOSED 5' WIDE SIDEWALK ALONG THE FRONTAGE OF THE SITE THAT CROSSES ONTO THE SITE.
  - DOMESTIC WATERLINE SHALL BE PUBLIC FROM THE EXISTING WATER MAIN IN BONHAM AVENUE THROUGH THE WATER METER & PRIVATE AFTER THE WATER METER. FIRELINE SHALL BE PUBLIC FROM THE EXISTING WATER MAIN IN BONHAM AVENUE TO THE BACKFLOW PREVENTER & PRIVATE BEGINNING AT THE BACKFLOW PREVENTER.
  - CONTRACTOR SHALL USE A TRENCH BOX DURING INSTALLATION OF THE SANITARY SEWER MAIN NEAR EXISTING TREES TO REDUCE THE IMPACT ON THE TREES.
  - MINIMUM BUILDING SEPARATION = 15'.
  - ANY EXISTING INTERIOR LOT LINES SHALL BE ABANDONED BY RECOMBINATION PLAT.
  - ALL DEVELOPMENT SHALL BE IN ACCORDANCE WITH THE CITY OF WILMINGTON LAND DEVELOPMENT CODE & TECHNICAL STANDARDS MANUAL.
  - ALL CITY, STATE, & FEDERAL REGULATIONS SHALL BE FOLLOWED.
  - SITE LIGHTING SHALL BE PROVIDED IN ACCORDANCE WITH SEC. 18-380 OF THE SUBDIVISION REGULATIONS.
  - THE PROPOSED CURB IS 6" CURB SECTION TYPE "A", EXCEPT WHERE SPECIFICALLY LABELED AS 4" CURB.
  - IT IS THE APPLICANT'S/DEVELOPER'S RESPONSIBILITY TO BE COMPLIANT WITH ALL APPLICABLE ADA REQUIREMENTS.
  - THE 2.5' VEHICLE OVERHANG AREA SHALL NOT BE PLANTED WITH SHRUBS.
  - SMALL VEHICLE PARKING SIGNS SHALL BE PROVIDED (SEE SITE PLAN FOR SIGN LOCATIONS).

**TREES PER DISTURBED ACRE**  
 2.42 ACRES \* 15 = 36.3, 36 TREES REQUIRED  
 39 TREES RETAINED  
 135 TREES PROPOSED (9 STREET YARD, 14 INTERIOR LANDSCAPE ISLAND, 22 BUFFER YARD, 2 PARKING BUFFER, 3 STORMWATER LANDSCAPE, 85 MITIGATION)  
 174 TREES (TOTAL)  
 \*SEE LANDSCAPING PLAN FOR PROVIDED TREES

**INTERIOR SHADING**  
 PARKING FACILITY AREA (PARKING LOT AREA TO BACK OF CURB MINUS LANDSCAPE ISLANDS) = 30,526.56 SF  
 REQUIRED INTERIOR SHADING (IS) = 0.2 \* 30,526.56 = 6,105.32 SF  
 PROVIDED INTERIOR SHADING = 7,687.40 SF  
 \*SEE LANDSCAPING PLAN FOR PROVIDED TREES

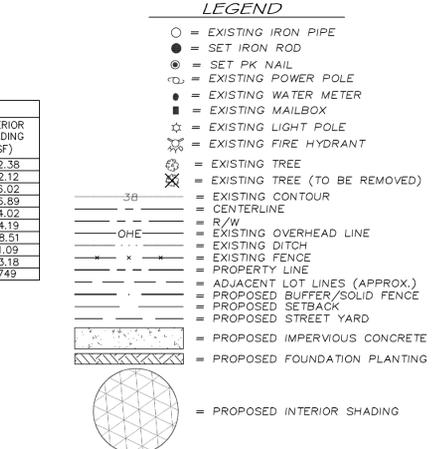
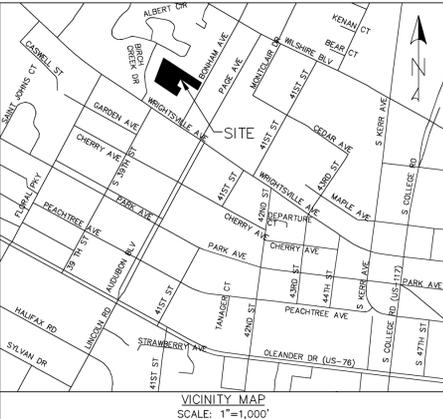
**FOUNDATION PLANTING—SOUTHWEST SIDE OF BUILDING #1**  
 REQUIRED FOUNDATION PLANTING (MAX.) = (41.71' \* 29.71') \* 0.12 = 148.71 SF  
 PROVIDED FOUNDATION PLANTING = 150.89 SF  
 \*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

**FOUNDATION PLANTING—SOUTHWEST SIDE OF BUILDING #1**  
 REQUIRED FOUNDATION PLANTING (MAX.) = [(140.84' \* 29.71') + (70.09' \* 2.17') + (0.5 \* 23.72' \* 7.0')] \* 0.12 = 530.34 SF  
 PROVIDED FOUNDATION PLANTING = 551.18 SF  
 \*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

**FOUNDATION PLANTING—SOUTHWEST SIDE OF BUILDING #2**  
 REQUIRED FOUNDATION PLANTING (MAX.) = [(184.21' \* 29.71') + (113.46' \* 2.17') + (0.5 \* 23.72' \* 7.0')] \* 0.12 = 696.26 SF  
 PROVIDED FOUNDATION PLANTING = 712.26 SF  
 \*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

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**INTERIOR LANDSCAPING ISLANDS**

LANDSCAPE ISLAND	TOTAL AREA (SF)	IMPERVIOUS AREA (SF)	PERCENT IMPERVIOUS	INTERIOR SHADING (SF)
LI-1	217.17	0	0	522.38
LI-2	217.86	0	0	522.12
LI-3	284.49	0	0	646.02
LI-4	312.76	0	0	626.89
LI-5	285.65	0	0	604.02
LI-6	351.90	0	0	624.19
LI-7	244.73	0	0	668.51
LI-8	217.76	0	0	191.99
LI-9	216.71	0	0	533.18
LI-10	1,466.02	0	0	2,749

**SITE DATA**  
 PROPERTY OWNER: 128MM LLC  
 PROJECT ADDRESS: 1006 BONHAM AVENUE  
 PIN NUMBER: R05514-001-022-000, PART OF R05514-001-021-000, PART OF R05514-001-020-000  
 ZONING DISTRICT: MF-M  
 FLOOD AREA: THIS LOT IS LOCATED IN ZONES "X" ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAP, MAP NUMBER 3720313700 J, DATED: 4-3-06 (PER ARNOLD W. CARSON, PLS)  
 BUILDING SETBACKS, REQUIRED: FRONT-35', REAR-29', INTERIOR SIDE-24', CORNER LOT SIDE-34' (ADDITIONAL 4' REAR & SIDE DUE TO BUILDING HEIGHT)  
 BUILDING SETBACKS, PROPOSED: FRONT-272.66', REAR-29.5', INTERIOR SIDE-25.5'  
 SITE AREA: 106,955 SF = 2.46 ACRES ±  
 EXISTING BUILDING AREA: 1,911.65 SF = 0.05 ACRES  
 EXISTING BUILDING LOT COVERAGE: 1,911.65 / 106,955 \* 100% = 1.79%  
 PROPOSED BUILDING AREA (FOOTPRINT EXCLUDING PATIOS): 13,862.85 SF = 0.32 ACRES  
 PROPOSED BUILDING LOT COVERAGE: 13,862.85 / 106,955 \* 100% = 12.97%  
 ALLOWABLE MAXIMUM BUILDING HEIGHT (BASED ON REQUIRED SETBACK USED): 45'  
 PROPOSED BUILDING HEIGHT (FFE TO HALFWAY BETWEEN HIGHEST PEAK & EAVE): 41.14' (BLDG #1) & 44.63' (BLDG #2)  
 NUMBER OF EXISTING BUILDINGS: 2  
 NUMBER OF PROPOSED BUILDINGS: 2 (42 UNITS TOTAL)  
 BUILDING SIZE:

BUILDING	SQUARE FOOTAGE (1ST STORY)	SQUARE FOOTAGE (2ND STORY)	SQUARE FOOTAGE (3RD STORY)	NUMBER OF UNITS	NUMBER OF ONE OF TWO OF THREE BEDROOM UNITS	NUMBER OF ONE OF TWO OF THREE BEDROOM UNITS	NUMBER OF ONE OF TWO OF THREE BEDROOM UNITS	EXISTING / PROPOSED
HOUSE	1,510.02	N/A	N/A	N/A	N/A	N/A	N/A	EXISTING (TO BE REMOVED)
SHED	421.63	N/A	N/A	N/A	N/A	N/A	N/A	EXISTING (TO BE REMOVED)
1	5,990.73	5,990.73	6,020.85	24	6	6	6	PROPOSED
2	7,872.12	7,872.12	7,902.24	18	6	12	6	PROPOSED

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

BEFORE DEVELOPMENT		AFTER DEVELOPMENT	
AREAS (SF)	% OF SITE	EX. (SF)	PROPOSED (SF)
BUILDINGS	1,911.65	1.79	
GRAVEL	977.90	0.91	
TOTAL	2,889.55	2.70	
BUILDINGS (INCLUDES ROOF OVERHANG)	0	15,008.86	15,008.86
PAVEMENT	0	3,606.42	3,606.42
PERVIOUS PAVEMENT (AFTER 75% CREDIT)	0	6,742.05	6,742.05
SIDEWALK	0	2,508.15	2,508.15
OTHER (CONCRETE PATIOS & CONDENSERS)	0	1,164.60	1,164.60
TOTAL	0	29,030.08	29,030.08

**OFF STREET PARKING CALCULATIONS:**  
 MIN. PARKING REQ. (RESIDENTIAL) = [1.5 x 12] (1 BDRM) + [2 x 18] (2 BDRM) + [2.25 x 12] (3 BDRM) = 81 SPACES  
 MAX. PARKING REQ. (RESIDENTIAL) = 2.5 x 42 = 105 SPACES  
 NUMBER OF PROPOSED PARKING SPACES = 84 (20 SPACES ARE SMALL VEHICLE SPACES)  
 MAX. NUMBER OF ALLOWABLE SMALL VEHICLE SPACES = 0.25 x 81 = 20 SPACES  
 MIN. NUMBER OF REQ. HANDICAPPED SPACES PER ADA STANDARDS FOR ACCESSIBLE DESIGN = 4 SPACES  
 NUMBER OF PROPOSED HANDICAPPED SPACES = 4 SPACES  
 NUMBER OF REQ. BICYCLE PARKING SPACES = 10 SPACES  
 NUMBER OF PROPOSED BICYCLE PARKING SPACES = 10 SPACES  
 THIS SITE IS NOT WITHIN A SPECIAL HIGHWAY OVERLAY DISTRICT OR ANY OTHER ZONING OVERLAY DISTRICT PER THE CITY OF WILMINGTON ZONING MAP (MAP 3137-3, DATED: JULY 30, 2008)  
 CAMA LAND USE CLASSIFICATION PER THE 2008 CAMA PLAN UPDATE LAND CLASSIFICATION MAP IS URBAN.

REV. NO.	DESCRIPTION	DATE
1	REVISED TO ADJUST LAYOUT	1-11-13
2	REVISED PER CITY OF WILMINGTON	3-15-13

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

**Approved Construction Plan**

Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

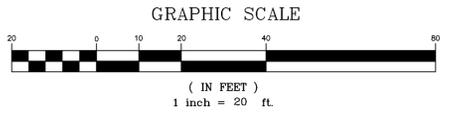
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 1006 BONHAM AVENUE  
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 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

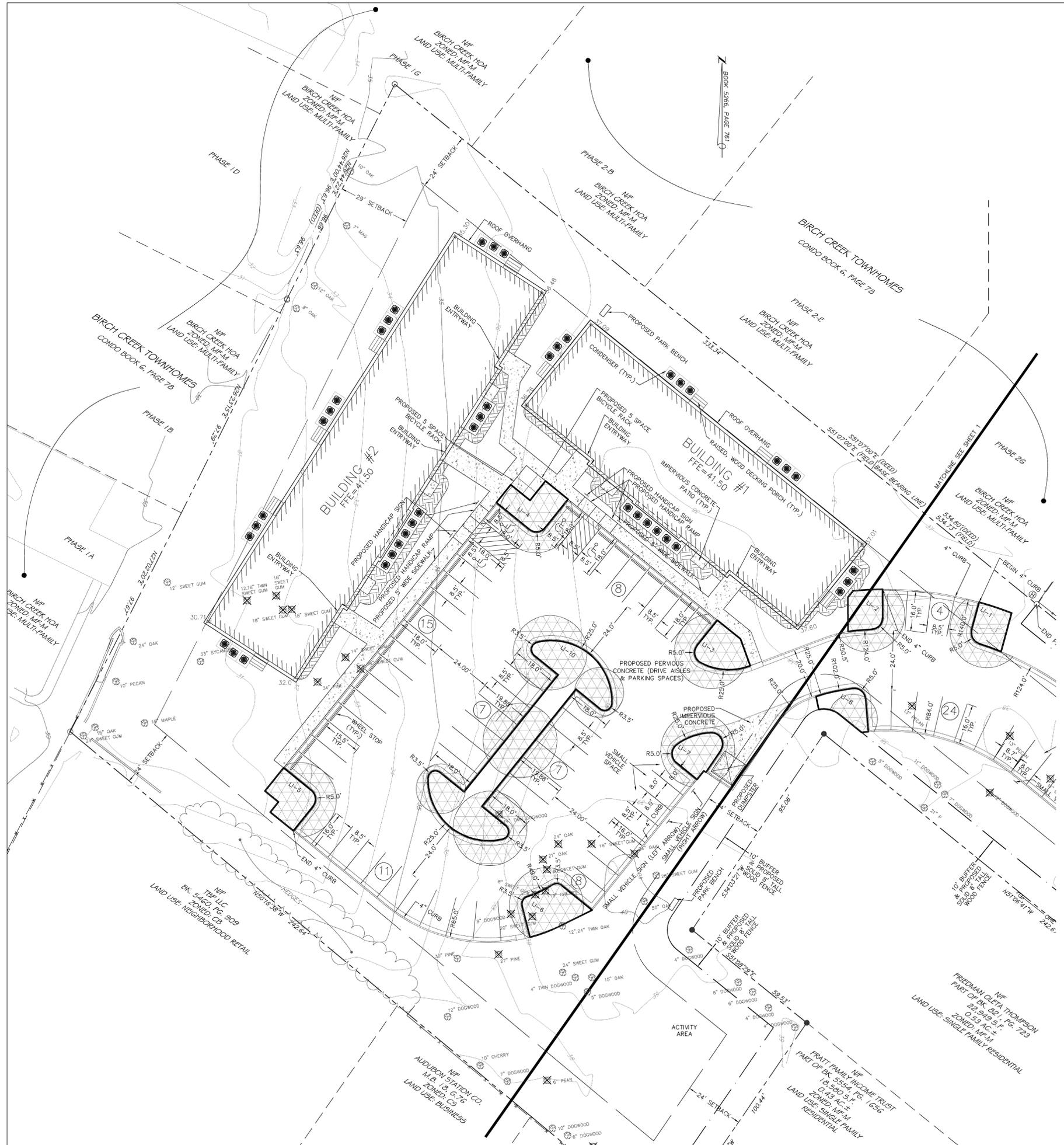
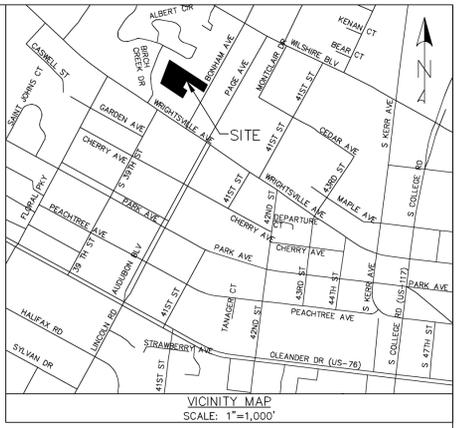
**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

**MALPASS ENGINEERING & SURVEYING, P.C.**  
 1134 SHIPYARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-5843  
 Fax 910-392-5203 License No. C-2380

**Owner:** 128MM LLC  
 P.O. BOX 1229  
 WILMINGTON, NORTH CAROLINA 28402

DATE: 1-7-13  
 SCALE: 1" = 20'  
 DRAWN: JCB  
 CHECKED: JEM  
 PROJECT NO: 219  
 SHEET NO: 1  
 OF: 17





**GRAPHIC SCALE**



( IN FEET )  
1 inch = 20 ft.

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**STORMWATER MANAGEMENT PLAN**  
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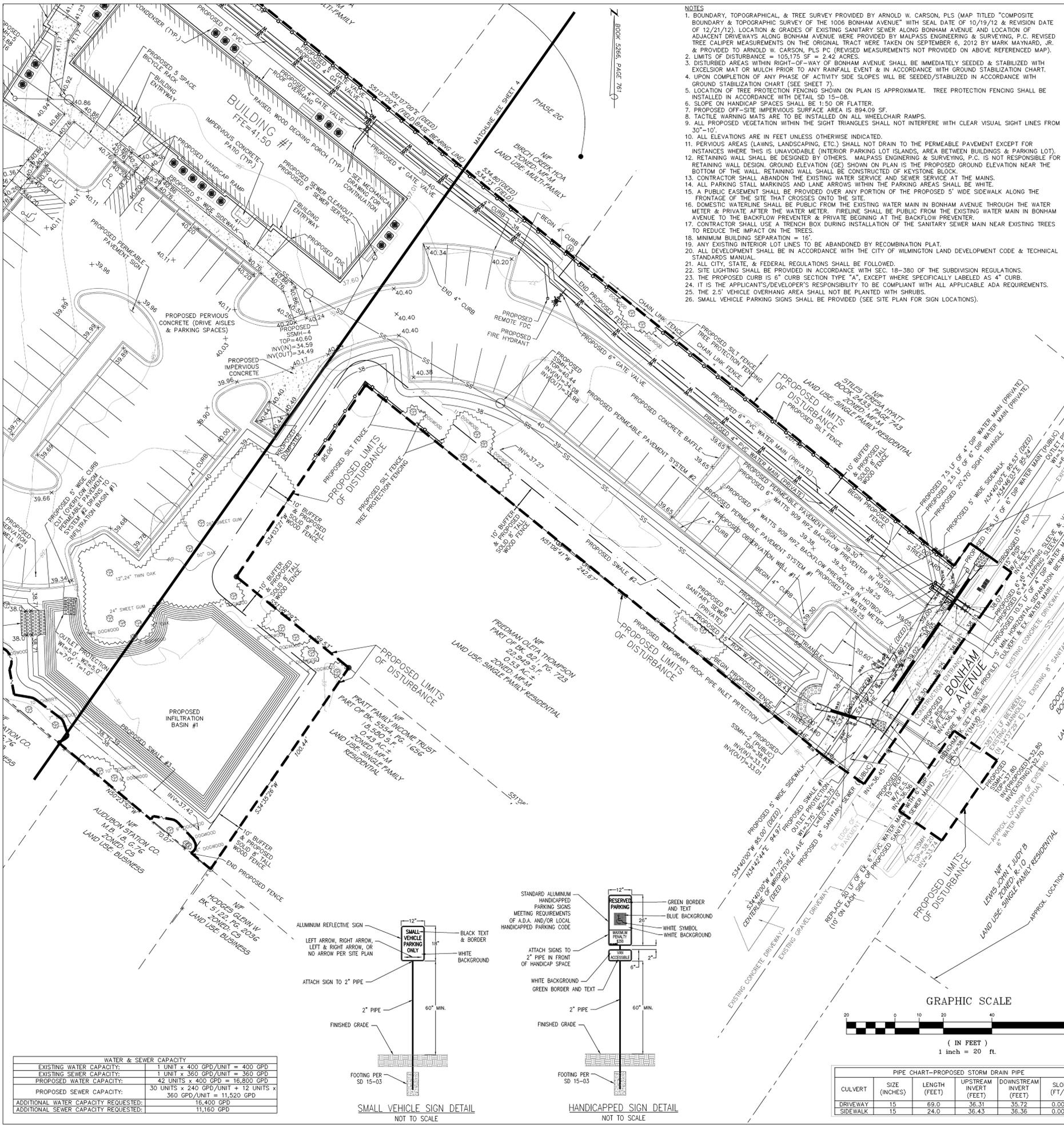
SITE PLAN  
1006 BONHAM AVENUE  
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CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

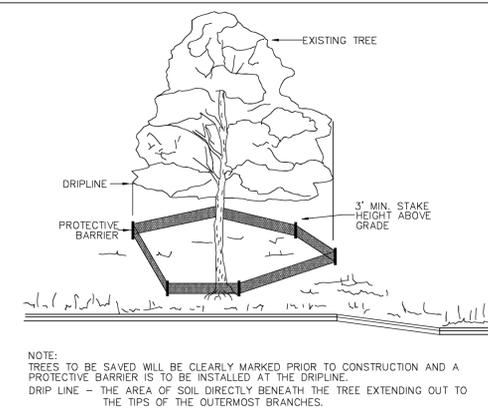
**MALPASS ENGINEERING & SURVEYING, P.C.**  
1134 SHYPARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-5843  
Fax 910-392-5203 License No. C-2320

Owner: 1288M LLC  
P.O. BOX 1229  
WILMINGTON, NORTH CAROLINA 28402

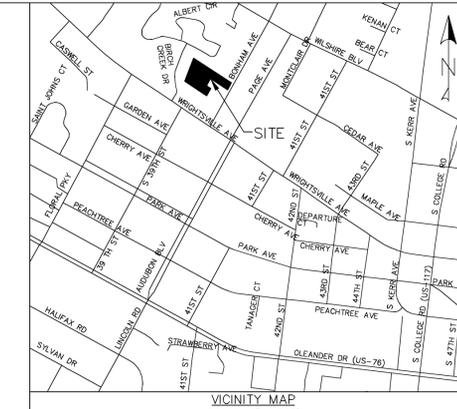
DATE: 1-7-13  
SCALE: 1"=20'  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 219  
SHEET NO: 2  
OF: 17



- NOTES**
- BOUNDARY, TOPOGRAPHICAL, & TREE SURVEY PROVIDED BY ARNOLD W. CARSON, PLS (MAP TITLED "COMPOSITE BOUNDARY & TOPOGRAPHIC SURVEY OF THE 1006 BONHAM AVENUE" WITH SEAL DATE OF 10/19/12 & REVISION DATE OF 12/21/12). LOCATION & GRADES OF EXISTING SANITARY SEWER ALONG BONHAM AVENUE AND LOCATION OF ADJACENT DRIVEWAYS ALONG BONHAM AVENUE WERE PROVIDED BY MALPASS ENGINEERING & SURVEYING, P.C. REVISED TREE CALIPER MEASUREMENTS ON THE ORIGINAL TRACT WERE TAKEN ON SEPTEMBER 5, 2012 BY MARK MAYNARD, JR. & PROVIDED TO ARNOLD W. CARSON, PLS PC (REVISED MEASUREMENTS NOT PROVIDED ON ABOVE REFERENCED MAP).
  - LIMITS OF DISTURBANCE = 105,175 SF = 2.42 ACRES.
  - DISTURBED AREAS WITHIN RIGHT-OF-WAY OF BONHAM AVENUE SHALL BE IMMEDIATELY SEEDED & STABILIZED WITH EXCELSION MAT OR MULCH PRIOR TO ANY RAINFALL EVENT & IN ACCORDANCE WITH GROUND STABILIZATION CHART.
  - UPON COMPLETION OF ANY PHASE OF ACTIVITY SIDE SLOPES WILL BE SEEDED/STABILIZED IN ACCORDANCE WITH GROUND STABILIZATION CHART (SEE SHEET 7).
  - LOCATION OF TREE PROTECTION FENCING SHOWN ON PLAN IS APPROXIMATE. TREE PROTECTION FENCING SHALL BE INSTALLED IN ACCORDANCE WITH DETAIL SD 15-08.
  - SLOPE ON HANDICAP SPACES SHALL BE 1:50 OR FLATTER.
  - PROPOSED OFF-SITE IMPERVIOUS SURFACE AREA IS 894.09 SF.
  - TACTILE WARNING MATS ARE TO BE INSTALLED ON ALL WHEELCHAIR RAMPS.
  - ALL PROPOSED VEGETATION WITHIN THE SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30'-10'.
  - ALL ELEVATIONS ARE IN FEET UNLESS OTHERWISE INDICATED.
  - PERVIOUS AREAS (LAWNS, LANDSCAPING, ETC.) SHALL NOT DRAIN TO THE PERMEABLE PAVEMENT EXCEPT FOR INSTANCES WHERE THIS IS UNAVOIDABLE (INTERIOR PARKING LOT ISLANDS, AREA BETWEEN BUILDINGS & PARKING LOT).
  - RETAINING WALL SHALL BE DESIGNED BY OTHERS. MALPASS ENGINEERING & SURVEYING, P.C. IS NOT RESPONSIBLE FOR RETAINING WALL DESIGN. GROUND ELEVATION (GE) SHOWN ON PLAN IS THE PROPOSED GROUND ELEVATION NEAR THE BOTTOM OF THE WALL. RETAINING WALL SHALL BE CONSTRUCTED OF KEYSTONE BLOCK.
  - CONTRACTOR SHALL ABANDON THE EXISTING WATER SERVICE AND SEWER SERVICE AT THE MAINS.
  - ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
  - A PUBLIC EASEMENT SHALL BE PROVIDED OVER ANY PORTION OF THE PROPOSED 5' WIDE SIDEWALK ALONG THE FRONTAGE OF THE SITE THAT CROSSES ONTO THE SITE.
  - DOMESTIC WATERLINE SHALL BE PUBLIC FROM THE EXISTING WATER MAIN IN BONHAM AVENUE THROUGH THE WATER METER & PRIVATE AFTER THE WATER METER. FIRELINE SHALL BE PUBLIC FROM THE EXISTING WATER MAIN IN BONHAM AVENUE TO THE BACKFLOW PREVENTER & PRIVATE BEGINNING AT THE BACKFLOW PREVENTER.
  - CONTRACTOR SHALL USE A TRENCH BEHIND DURING INSTALLATION OF THE SANITARY SEWER MAIN NEAR EXISTING TREES TO REDUCE THE IMPACT ON THE TREES.
  - MINIMUM BUILDING SEPARATION = 15'.
  - ANY EXISTING UTILITY LOT LINES TO BE ABANDONED BY RECOMBINATION PLAT.
  - ALL DEVELOPMENT SHALL BE IN ACCORDANCE WITH THE CITY OF WILMINGTON LAND DEVELOPMENT CODE & TECHNICAL STANDARDS MANUAL.
  - ALL CITY, STATE, & FEDERAL REGULATIONS SHALL BE FOLLOWED.
  - SITE LIGHTING SHALL BE PROVIDED IN ACCORDANCE WITH SEC. 18-380 OF THE SUBDIVISION REGULATIONS.
  - THE PROPOSED CURB IS 6" CURB SECTION TYPE "A", EXCEPT WHERE SPECIFICALLY LABELED AS 4" CURB.
  - IT IS THE APPLICANT'S/DEVELOPER'S RESPONSIBILITY TO BE COMPLIANT WITH ALL APPLICABLE ADA REQUIREMENTS.
  - THE 2.5' VEHICLE OVERHANG AREA SHALL NOT BE PLANTED WITH SHRUBS.
  - SMALL VEHICLE PARKING SIGNS SHALL BE PROVIDED (SEE SITE PLAN FOR SIGN LOCATIONS).



**METHOD OF TREE PROTECTION DURING CONSTRUCTION**  
SD 15-08  
NOT TO SCALE

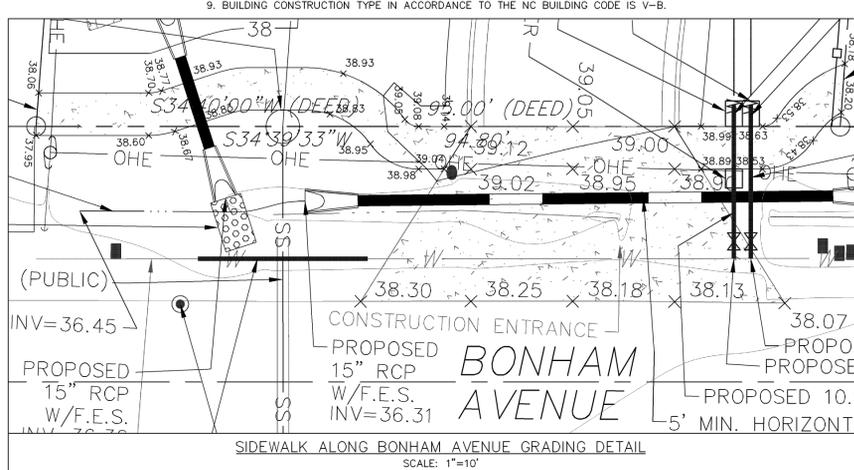


**VICINITY MAP**  
SCALE: 1"=1,000'

- LEGEND**
- = EXISTING IRON PIPE
  - = SET IRON ROD
  - = SET PK NAIL
  - = EXISTING POWER POLE
  - = EXISTING WATER METER
  - = EXISTING MAILBOX
  - ☆ = EXISTING LIGHT POLE
  - ☆ = EXISTING TREE HYDRANT
  - = EXISTING TREE
  - = EXISTING CONTOUR
  - = CENTERLINE
  - = R/W
  - = EXISTING OVERHEAD LINE
  - = EXISTING DITCH
  - = EXISTING FENCE
  - = EXISTING WATER MAIN
  - = EXISTING SANITARY SEWER MAIN
  - = PROPERTY LINE
  - = ADJACENT LOT LINES (APPROX.)
  - = PROPOSED BUFFER/SOLID FENCE
  - = PROPOSED CULVERT
  - = PROPOSED STREET YARD
  - = PROPOSED WATER MAIN
  - = PROPOSED SANITARY SEWER
  - = PROPOSED GATE VALVE
  - = PROPOSED FIRE HYDRANT
  - = APPROX. EX. SPOT ELEVATION
  - = PROPOSED SPOT ELEVATION
  - = PROPOSED CONTOUR
  - = PROPOSED SILT FENCE
  - = PROPOSED TREE PROTECTION FENCE
  - = PROPOSED LIMITS OF DISTURBANCE
  - = PROPOSED SWALE

- UTILITY SEPARATION NOTES**
- WATER MAINS SHALL HAVE A MINIMUM COVER OF 3'.
  - SANITARY SEWER MAINS SHALL HAVE A MINIMUM COVER OF 3' OR D.I.P. SHALL BE USED.
  - HORIZONTAL SEPARATION BETWEEN WATER AND SANITARY SEWER SHALL BE 10' BETWEEN EDGE OF PIPES.
  - WATER OVER SANITARY SEWER: >18" OR USE D.I.P. (ON BOTH) 10' ON EITHER SIDE OF CROSSING. SANITARY SEWER OVER WATER: USE D.I.P. (ON BOTH) 10' ON EITHER SIDE OF CROSSING.
  - A 24" VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND SANITARY SEWER OR USE D.I.P. ON SANITARY SEWER 10' ON EITHER SIDE OF CROSSING.
  - VERTICAL SEPARATION BETWEEN WATER AND STORM SEWER: WATER OVER STORM SEWER: >18" OR USE D.I.P. ON WATER 10' ON EITHER SIDE OF CROSSING. STORM SEWER OVER WATER: USE D.I.P. ON WATER 10' ON EITHER SIDE OF CROSSING.
  - ALL SANITARY SEWER MANHOLES WITH A DROP OF 30" OR GREATER SHALL HAVE AN INSIDE DIAMETER OF 5' WITH AN INSIDE DROP STRUCTURE.
  - GRAVITY SANITARY SEWER WITHIN 50' OF WETLANDS SHALL BE D.I.P. AND MEET WATER MAIN MATERIALS, TESTING METHODS AND ACCEPTABILITY STANDARDS (15A NCAC 18C).
  - SANITARY SEWER MANHOLES MUST BE GREATER THAN 50' FROM WETLANDS, AS MEASURED TO THE CLOSEST OUTSIDE EDGE.

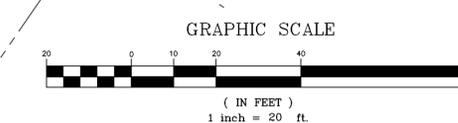
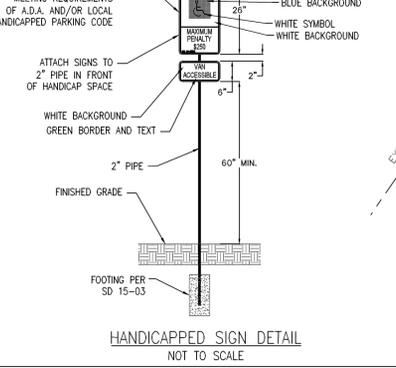
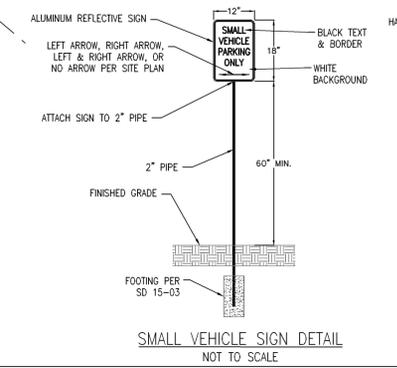
- FIRE AND LIFE SAFETY NOTES**
- LANDSCAPING OR PARKING CANNOT BLOCK OR IMPEDE THE FDC OR FIRE HYDRANTS. A 3-FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE HYDRANT AND FDC.
  - HYDRANTS MUST BE LOCATED WITHIN 8' OF THE CURB.
  - NEW HYDRANTS MUST BE AVAILABLE FOR USE PRIOR TO CONSTRUCTION OF THE BUILDING(S).
  - CONTRACTOR SHALL MAINTAIN AN ALL WEATHER ACCESS FOR EMERGENCY VEHICLES AT ALL TIMES DURING CONSTRUCTION.
  - UNDERGROUND FIRE LINE AND PRIVATE WATER MAINS MUST BE PERMITTED AND INSPECTED BY THE WILMINGTON FIRE DEPARTMENT FROM THE PUBLIC RIGHT-OF-WAY TO THE BUILDING. CONTACT THE WILMINGTON FIRE DEPARTMENT DIVISION OF FIRE AND LIFE SAFETY AT 910-343-0606 FOR ADDITIONAL INFORMATION.
  - A MINIMUM OF 5' SHALL SEPARATE UNDERGROUND FIRE LINES OR PRIVATE WATER MAINS FROM OTHER UNDERGROUND UTILITIES.
  - HYDRANT MUST BE WITHIN 150' OF THE FDC.
  - THE FDC MUST BE WITHIN 40' OF FIRE APPARATUS PLACEMENT.
  - BUILDING CONSTRUCTION TYPE IN ACCORDANCE TO THE NC BUILDING CODE IS V-B.



**BONHAM AVENUE GRADING DETAIL**  
SCALE: 1"=10'

**WATER & SEWER CAPACITY**

EXISTING WATER CAPACITY:	1 UNIT x 400 GPD/UNIT = 400 GPD
EXISTING SEWER CAPACITY:	1 UNIT x 360 GPD/UNIT = 360 GPD
PROPOSED WATER CAPACITY:	42 UNITS x 400 GPD = 16,800 GPD
PROPOSED SEWER CAPACITY:	30 UNITS x 240 GPD/UNIT + 12 UNITS x 360 GPD/UNIT = 11,520 GPD
ADDITIONAL WATER CAPACITY REQUESTED:	16,400 GPD
ADDITIONAL SEWER CAPACITY REQUESTED:	11,160 GPD



**PIPE CHART—PROPOSED STORM DRAIN PIPE**

CULVERT	SIZE (INCHES)	LENGTH (FEET)	UPSTREAM INVERT (FEET)	DOWNSTREAM INVERT (FEET)	SLOPE (FT/FT)
DRIVEWAY	15	69.0	36.31	35.72	0.0086
SIDEWALK	15	24.0	36.43	36.36	0.0029

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

**Approved Construction Plan**  
Name \_\_\_\_\_ Date \_\_\_\_\_

Planning \_\_\_\_\_  
Public Utilities \_\_\_\_\_  
Traffic \_\_\_\_\_  
Fire \_\_\_\_\_

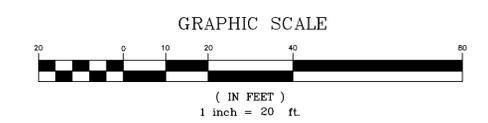
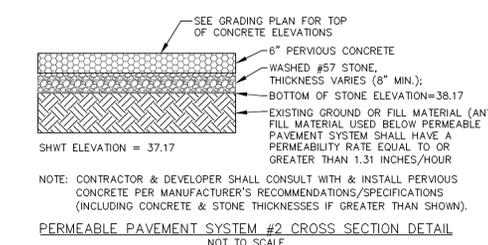
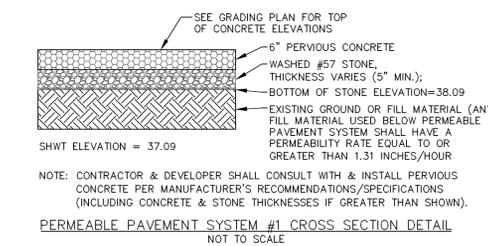
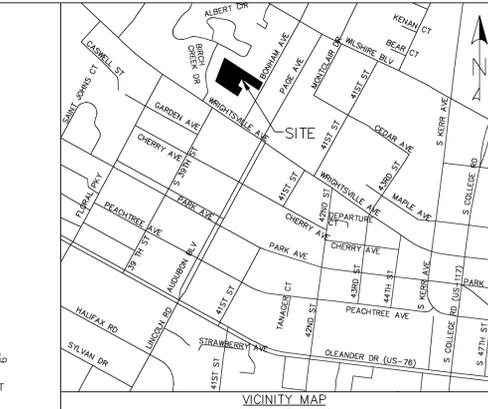
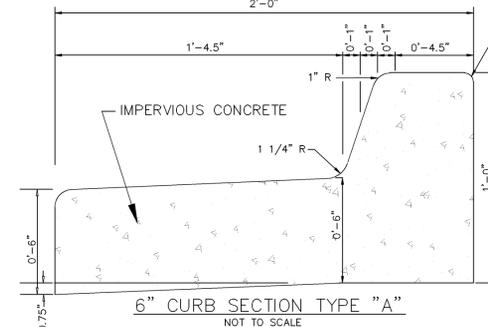
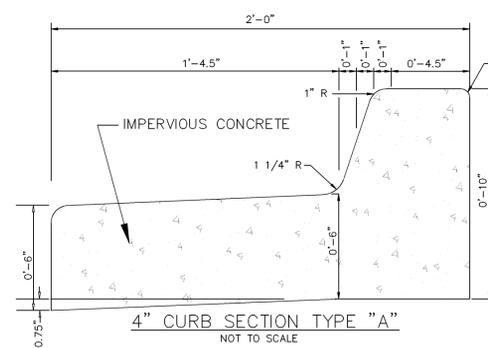
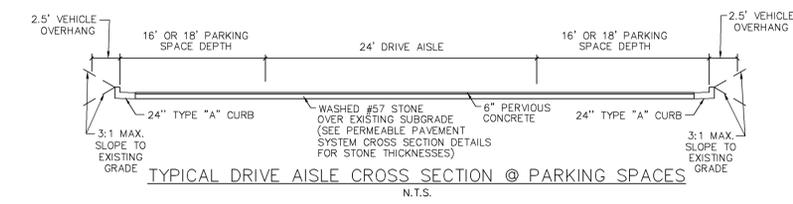
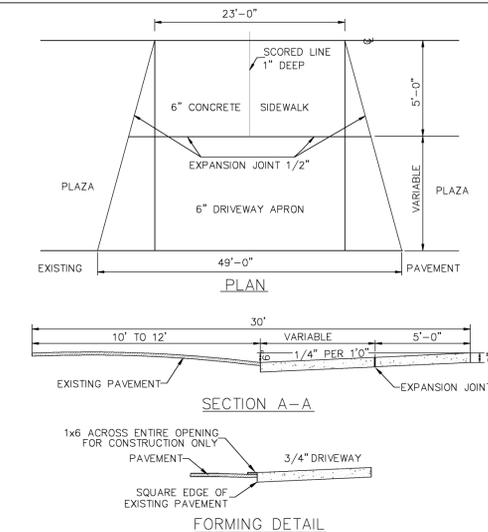
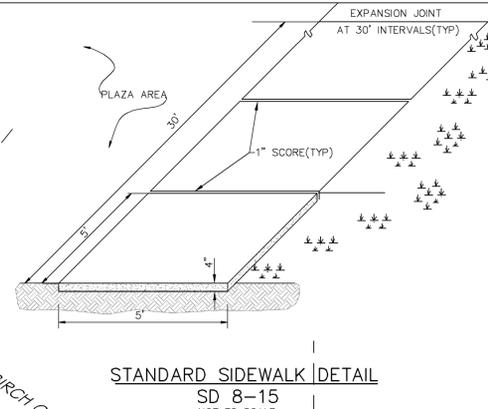
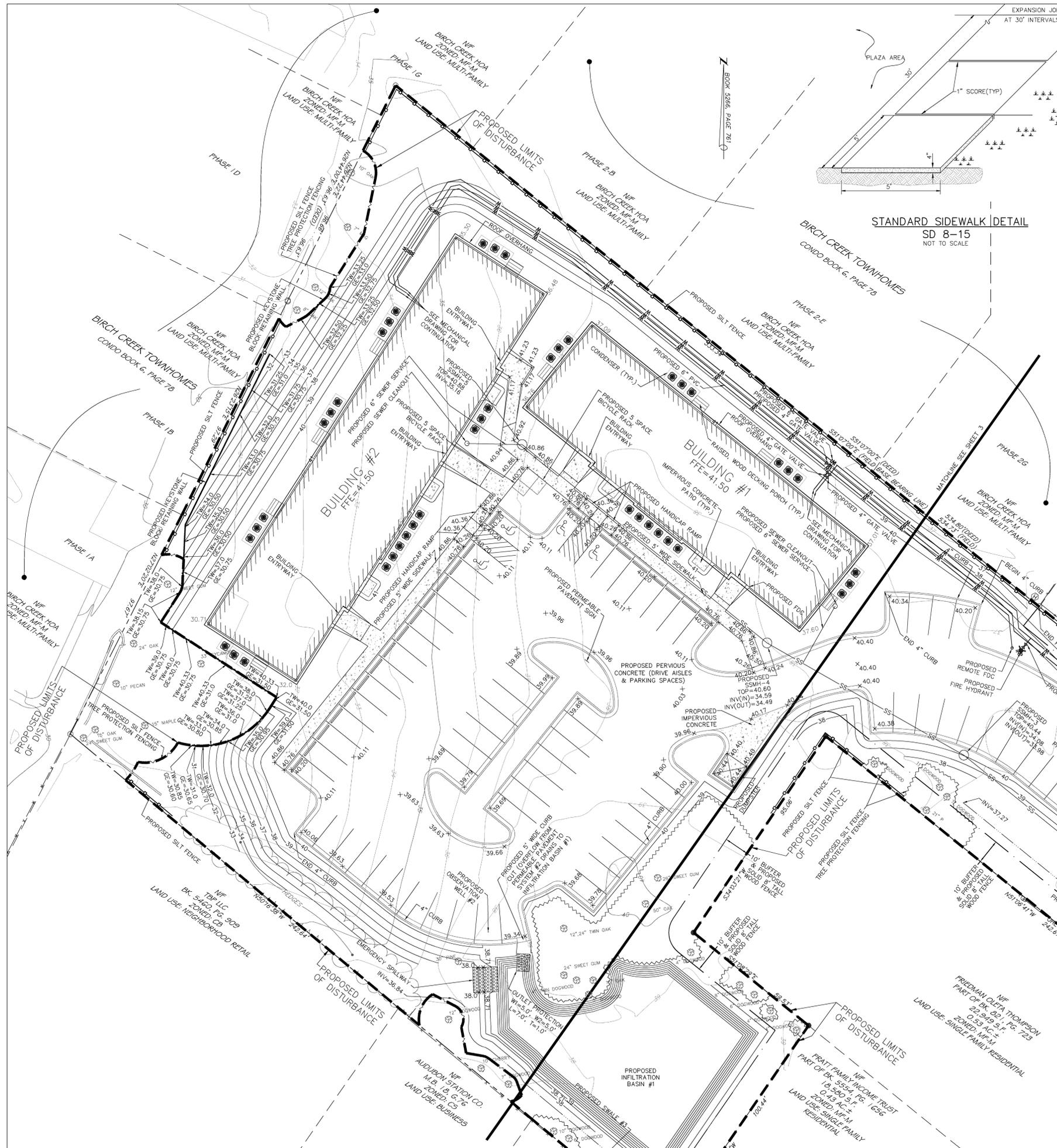
**BONHAM APARTMENTS**  
CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

MALPASS ENGINEERING & SURVEYING, P.C.  
1134 SHIPYARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-5843  
Fax 910-392-5203 License No. C-2380

Owner: 1280M LLC  
P.O. BOX 1229  
WILMINGTON, NORTH CAROLINA 28402

DATE: 1-7-13  
SCALE: 1"=20'  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 219  
SHEET NO: 3  
OF: 17



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

Approved Construction Plan		
Name	Date	
Planning		
Public Utilities		
Traffic		
Fire		

REV. NO.	DESCRIPTION	DATE
1	REVISED TO ADJUST LAYOUT.	1-11-13
2	REVISED PER CITY OF WILMINGTON.	3-15-13

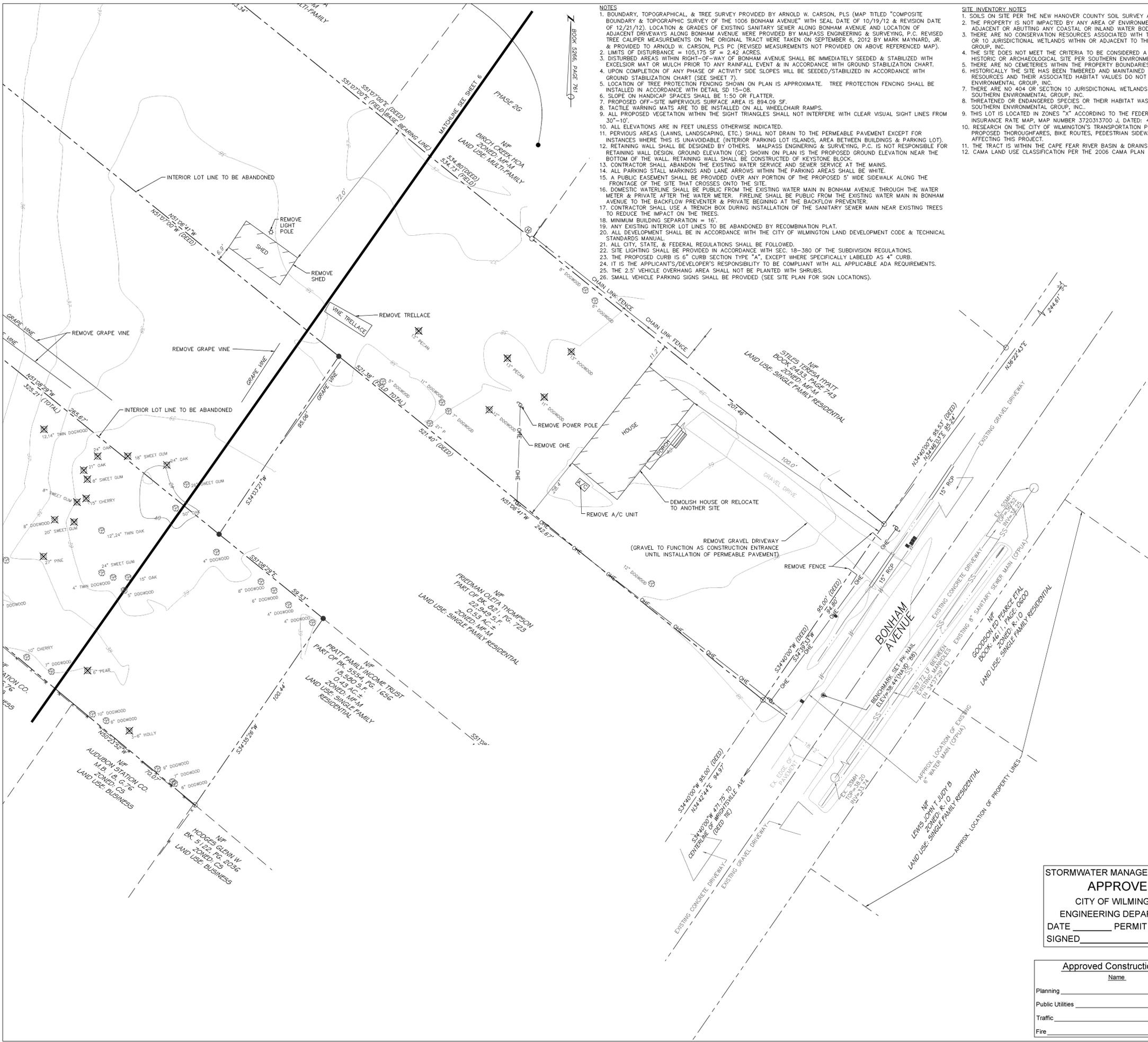
**BONHAM APARTMENTS**  
 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**MALPASS ENGINEERING & SURVEYING, P.C.**  
 1134 SHPPARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-5843 License No. C-2320  
 Fax 910-392-5203

**DRAINAGE & UTILITY PLAN**  
 1006 BONHAM AVENUE  
 29-519 2/F  
 0.53 AC ±  
 ZONED MF-M  
 LAND USE: SINGLE FAMILY RESIDENTIAL

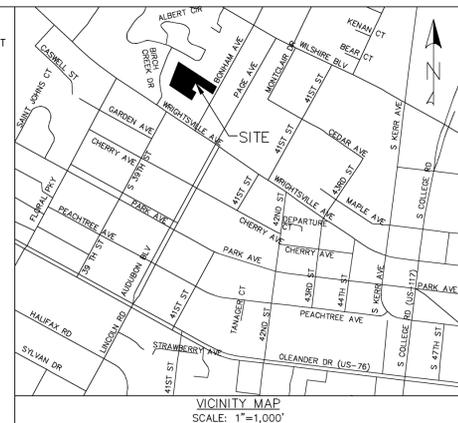
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 SHEET NO: 4  
 OF: 17

OWNER: 128UM LLC  
 P.O. BOX 1229  
 WILMINGTON, NORTH CAROLINA 28402



- NOTES**
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  - CONTRACTOR SHALL USE A TRENCH BOX DURING INSTALLATION OF THE SANITARY SEWER MAIN NEAR EXISTING TREES TO REDUCE THE IMPACT ON THE TREES.
  - MINIMUM BUILDING SEPARATION = 16'.
  - ANY EXISTING INTERIOR LOT LINES TO BE ABANDONED BY RECOMBINATION PLAT.
  - ALL DEVELOPMENT SHALL BE IN ACCORDANCE WITH THE CITY OF WILMINGTON LAND DEVELOPMENT CODE & TECHNICAL STANDARDS MANUAL.
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  - THE 2.5' VEHICLE OVERHANG AREA SHALL NOT BE PLANTED WITH SHRUBS.
  - SMALL VEHICLE PARKING SIGNS SHALL BE PROVIDED (SEE SITE PLAN FOR SIGN LOCATIONS).

- SITE INVENTORY NOTES**
- SOILS ON SITE PER THE NEW HANOVER COUNTY SOIL SURVEY ARE SH (SEAGATE PART) & JO (JOHNSTON).
  - THE PROPERTY IS NOT INTERFERED BY ANY AREA OF ENVIRONMENTAL CONCERN (AEC). THE PROPERTY IS NOT ADJACENT OR ABUTTING ANY COASTAL OR INLAND WATER BODY PER SOUTHERN ENVIRONMENTAL GROUP, INC.
  - THERE ARE NO CONSERVATION RESOURCES ASSOCIATED WITH THIS PROJECT, AS THERE ARE NO SECTION 404 OR 10 JURISDICTIONAL WETLANDS WITHIN OR ADJACENT TO THE PROPERTY PER SOUTHERN ENVIRONMENTAL GROUP, INC.
  - THE SITE DOES NOT MEET THE CRITERIA TO BE CONSIDERED A LOCAL, STATE OR FEDERAL RECOGNIZED HISTORIC OR ARCHAEOLOGICAL SITE PER SOUTHERN ENVIRONMENTAL GROUP, INC.
  - THERE ARE NO GEOMETRIES WITHIN THE PROPERTY BOUNDARIES PER SOUTHERN ENVIRONMENTAL GROUP, INC. HISTORICALLY THE SITE HAS BEEN TIMBERED AND MAINTAINED AS A RESIDENTIAL YARD; THEREFORE FOREST RESOURCES AND THEIR ASSOCIATED HABITAT VALUES DO NOT APPEAR ON THE SITE PER SOUTHERN ENVIRONMENTAL GROUP, INC.
  - THERE ARE NO 404 OR SECTION 10 JURISDICTIONAL WETLANDS WITHIN THE PROPERTY BOUNDARIES PER SOUTHERN ENVIRONMENTAL GROUP, INC.
  - THREATENED OR ENDANGERED SPECIES OR THEIR HABITAT WAS NOT OBSERVED DURING THE SITE VISIT PER SOUTHERN ENVIRONMENTAL GROUP, INC.
  - THIS LOT IS LOCATED IN ZONES "X" ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAP, MAP NUMBER 3720313700 J, DATED: 4-3-06 (PER ARNOLD W. CARSON, PLS).
  - RESEARCH ON THE CITY OF WILMINGTON'S TRANSPORTATION PLANNING WEBSITE RESULTED IN NO FINDINGS OF PROPOSED THOROUGHFARES, BIKE ROUTES, PEDESTRIAN SIDEWALKS OR TRAILS, OR TRANSIT FACILITIES AFFECTING THIS PROJECT.
  - THE TRACT IS WITHIN THE CAPE FEAR RIVER BASIN & DRAINS TO BURNT MILL CREEK (C.S.W.).
  - CAMA LAND USE CLASSIFICATION PER THE 2006 CAMA PLAN UPDATE LAND CLASSIFICATION MAP IS URBAN.



- LEGEND**
- = EXISTING IRON PIPE
  - = SET IRON ROD
  - ⊙ = SET PK NAIL
  - ⊕ = EXISTING POWER POLE
  - ⊗ = EXISTING WATER METER
  - ⊞ = EXISTING MAILBOX
  - ⊠ = EXISTING LIGHT POLE
  - ⊛ = EXISTING FIRE HYDRANT
  - ⊚ = EXISTING TREE
  - ⊙ = EXISTING TREE (TO BE REMOVED)
  - ⊘ = EXISTING CONTOUR
  - = CENTERLINE
  - = R/W
  - = EXISTING OVERHEAD LINE
  - = EXISTING DITCH
  - = EXISTING FENCE
  - = EXISTING WATER MAIN
  - = EXISTING SANITARY SEWER MAIN
  - = PROPERTY LINE
  - = ADJACENT LOT LINES (APPROX.)

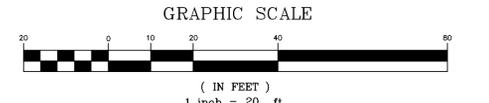
**SITE DATA**  
 PROPERTY OWNER: 12BMM LLC  
 PROJECT ADDRESS: 1006 BONHAM AVENUE  
 PIN NUMBER: R05514-001-022-000, PART OF R05514-001-021-000, PART OF R05514-001-020-000  
 ZONING DISTRICT: MF-M  
 FLOOD AREA: THIS LOT IS LOCATED IN ZONES "X" ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAP, MAP NUMBER 3720313700 J, DATED: 4-3-06 (PER ARNOLD W. CARSON, PLS)  
 BUILDING SETBACKS, REQUIRED: FRONT-35', REAR-29', INTERIOR SIDE-24', CORNER LOT SIDE-34' (ADDITIONAL 4' REAR & SIDE DUE TO BUILDING HEIGHT)  
 BUILDING SETBACKS, PROPOSED: FRONT-272.66', REAR-29.5', INTERIOR SIDE-25.5'  
 SITE AREA: 106,955 SF = 2.46 ACRES ±  
 EXISTING BUILDING AREA: 1,911.65 SF = 0.05 ACRES  
 EXISTING BUILDING LOT COVERAGE: 1,911.65 / 106,955 \* 100% = 1.79%  
 PROPOSED BUILDING AREA (FOOTPRINT EXCLUDING PATIOS): 13,862.85 SF = 0.32 ACRES  
 PROPOSED BUILDING LOT COVERAGE: 13,862.85 / 106,955 \* 100% = 12.97%  
 ALLOWABLE MAXIMUM BUILDING HEIGHT (BASED ON REQUIRED SETBACK USED): 45'  
 PROPOSED BUILDING HEIGHT (FFE TO HALFWAY BETWEEN HIGHEST PEAK & EAVE): 41.14' (BLDG #1) & 44.63' (BLDG #2)  
 NUMBER OF EXISTING BUILDINGS: 2  
 NUMBER OF PROPOSED BUILDINGS: 2 (42 UNITS TOTAL)  
 BUILDING SIZE:

BUILDING	SQUARE FOOTAGE (1ST STORY)	SQUARE FOOTAGE (2ND STORY)	SQUARE FOOTAGE (3RD STORY)	NUMBER OF UNITS	NUMBER OF ONE BEDROOM UNITS	NUMBER OF TWO BEDROOM UNITS	NUMBER OF THREE BEDROOM UNITS	EXISTING / PROPOSED
HOUSE	1,510.02	N/A	N/A	N/A	N/A	N/A	N/A	EXISTING (TO BE REMOVED)
SHED	401.63	N/A	N/A	N/A	N/A	N/A	N/A	EXISTING (TO BE REMOVED)
1	5,990.73	5,990.73	6,020.85	18	6	6	6	PROPOSED
2	7,872.12	7,872.12	7,902.24	24	6	12	6	PROPOSED

TOTAL AMOUNT & PERCENT OF IMPERVIOUS SURFACE AREAS ON-SITE:							
BEFORE DEVELOPMENT		AFTER DEVELOPMENT					
AREA (SF)	% OF SITE	EX (SF)	PROPOSED (SF) TOTAL (SF) % OF SITE				
BUILDINGS	1,911.65	1.79	BUILDINGS (INCLUDES ROOF OVERHANG)	0	15,008.86	15,008.86	14.03
GRAVEL	977.90	0.91	PAVEMENT	0	3,606.42	3,606.42	3.37
TOTAL	2,889.55	2.70	PERVIOUS PAVEMENT (AFTER 75% CREDIT)	0	6,742.05	6,742.05	6.30
			SIDEWALK	0	2,508.15	2,508.15	2.35
			OTHER (CONCRETE PATIOS & CONDENSERS)	0	1,164.60	1,164.60	1.09
			TOTAL	0	29,030.08	29,030.08	27.14

**OFF STREET PARKING CALCULATIONS:**  
 MIN. PARKING REQ. (RESIDENTIAL) = [1.5 x 12] (1 BDRM) + [2 x 18] (2 BDRM) + [2.25 x 12] (3 BDRM) = 81 SPACES  
 MAX. PARKING REQ. (RESIDENTIAL) = 2.5 x 42 = 105 SPACES  
 NUMBER OF PROPOSED PARKING SPACES = 84 (20 SPACES ARE SMALL VEHICLE SPACES)  
 MAX. NUMBER OF ALLOWABLE SMALL VEHICLE SPACES = 0.25 x 81 = 20 SPACES  
 MIN. NUMBER OF REQ. HANDICAPPED SPACES PER ADA STANDARDS FOR ACCESSIBLE DESIGN = 4 SPACES  
 NUMBER OF PROPOSED HANDICAPPED SPACES = 4 SPACES  
 NUMBER OF REQ. BICYCLE PARKING SPACES = 10 SPACES  
 NUMBER OF PROPOSED BICYCLE PARKING SPACES = 10 SPACES  
 THIS SITE IS NOT WITHIN A SPECIAL HIGHWAY OVERLAY DISTRICT OR ANY OTHER ZONING OVERLAY DISTRICT PER THE CITY OF WILMINGTON ZONING MAP (MAP 3137-3, DATED: JULY 30, 2008)  
 CAMA LAND USE CLASSIFICATION PER THE 2006 CAMA PLAN UPDATE LAND CLASSIFICATION MAP IS URBAN.



REV. NO.	DESCRIPTION	DATE
1	REVISED TO ADD TREES TO BE REMOVED.	1-11-13
2	REVISED PER CITY OF WILMINGTON.	3-15-13

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

**Approved Construction Plan**

Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

EXISTING CONDITIONS & DEMOLITION PLAN  
 1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

MALPASS ENGINEERING & SURVEYING, P.C.  
 1134 SHIPYARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-5843 License No. C-2380  
 Fax 910-392-5203

Owner: 12BMM LLC  
 P.O. BOX 1229  
 WILMINGTON, NORTH CAROLINA 28402

DATE: 1-7-13  
 SCALE: 1"=20'  
 DRAWN: JCB  
 CHECKED: JEM  
 WILMINT NO: PROJECT NO: 219  
 SHEET NO: 5  
 OF: 17



**Permanent Seeding**  
 Specifications #11 - Specifications  
 (Specifications are as per the "Erosion and Sediment Control Planning and Design Manual" of the state of North Carolina.)  
 Table 6.11p - Seeding No. 10CP for: Well-to Poorly Drained soils with Good Moisture Retention; Low Maintenance  
 Seeding mixture  
 Species Rate (lb/acre)  
 Tall fescue 80  
 Pensacola Bahiagrass 50  
 Sericea lespedeza 30  
 Koba lespedeza 10  
 Seeding Notes  
 1. From Sept. 1 - Mar. 1, use unscarified sericea seed  
 2. On poorly drained sites omit sericea and increase Koba to 30 lb/acre.  
 3. Where a neat appearance is desired, omit sericea and increase Koba to 40 lb/acre.  
 Nurse plants  
 Between Apr. 15 & Aug. 15, add 10 lb/acre German millet or 15 lb/acre Sudangrass. Prior to May 1 or after Aug. 15, add 25 lb/acre rye (grain).  
 Seeding dates  
 Best Possible  
 Early spring: Feb. 15 - Mar. 20 Feb. 15 - Apr. 30  
 Fall: Sept. 1 - Sept. 30 Sept. 1 - Oct. 31

Soil amendments - Apply lime and fertilizer according to soil tests, or apply 3,000-5,000 lb/acre ground agricultural limestone (use the lower rate on sandy soils) and 1,000 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor straw by tacking with asphalt, netting, or riving or by crimping with a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - If growth is less than fully adequate, reseed, fertilize, and mulch immediately following erosion or other damage. Reseed, fertilize, and mulch damaged areas immediately.

Table 6.11q - Seeding No. 2CP for: Well-to Poorly Drained soils with Good Moisture Retention; High Maintenance  
 Seeding mixture  
 Species Rate (lb/acre)  
 Tall fescue (blend of two or three improved varieties) 200  
 Rye (grain) 25  
 Seeding dates  
 Best: Sept. 15 - Oct. 15  
 Possible: Sept. 1 - Oct. 31 or Feb. 15 - Apr. 30  
 Soil amendments - Apply lime and fertilizer according to soil tests, or apply 3,000-5,000 lb/acre ground agricultural limestone (use the lower rate on sandy soils) and 1,000 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor straw by tacking with asphalt, netting, or riving or by crimping with a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Fertilize according to soil tests or apply 40 lb/acre nitrogen in Jan. or Feb., 40 lb in Sept., and 40 lb in Nov. from a 12-4-8, 16-4-8, or similar turf fertilizer. Avoid fertilizer applications during wet weather, as this increases stand losses to disease. Reseed, fertilize, and mulch damaged areas immediately. Mow to a height of 2.5-3.5 inches as needed.

Table 6.11r - Seeding No. 3CP for: Dry Sands to Sandy Loams; High Maintenance, Fine Turf  
 Seeding mixture  
 Species Rate (bu/1,000 ft<sup>2</sup>)  
 Tifway or Tifway II Minimum: 3  
 Hybrid Bermudagrass Rapid cover: 10  
 Seeding Notes  
 1. Sprig or sod (Practice 6.12, Sodding). Moisture is essential during initial establishment. Sod must be kept well watered for 2-3 weeks, but can be planted earlier or later than sprigs.  
 2. Common Bermuda can be seeded or sprigged but does not produce a high-quality turf. It is also less cold tolerant than the hybrids, more weed prone, and a pest in flower beds and specimen plantings.  
 Planting dates  
 Apr. - July  
 Soil amendments - Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10-10-10 fertilizer, or 50 lb/acre nitrogen from turf-type slow-release fertilizer. Add 25-50 lb/acre nitrogen at 2- to 3-week intervals through midsummer.  
 Sprigging - Plant sprigs in furrows with a tractor-drawn transplanter, or broadcast by hand.  
 Turf sods - Lay sods 4-6 inches deep and 2 ft apart. Place sprigs about 2 ft apart in the row with one end at or above ground level (Figure 6.11d).  
 Broadcast of rates shown above, and press sprigs into the top 1/2-2 inches of soil with a disk set straight so that sprigs are not brought back toward the surface.  
 Mow - Do not mow until sods are well established.  
 Maintenance - Water as needed and mow to 3/4- to 1-inch height. Topdress with 40 lb/acre nitrogen in Apr., 50 lb in May, 50 lb in June, 30 lb in July, and 25-50 lb in Aug.

Table 6.11s - Seeding No. 4CP for: Well-Drained Sandy Loams to Dry Sands, Coastal Plain and Eastern Edge of Piedmont; Low-to Medium-Care Lawns  
 Seeding mixture  
 Species Rate  
 Centipedegrass 10-20 lb/acre (seed) or 33 bu/acre (sprigs)  
 Seeding dates  
 Mar. - June  
 (Sprigging can be done through July where water is available for irrigation.)  
 Soil amendments - Apply lime and fertilizer according to soil tests, or apply 300 lb/acre 10-10-10.  
 Sprigging - Plant sprigs in furrows with a tractor-drawn transplanter, or broadcast by hand.  
 Furrows should be 4-6 inches deep and 2 ft apart. Place sprigs about 2 ft apart in the row with one end at or above ground level (Figure 6.11d).  
 Broadcast of rates shown above, and press sprigs into the top 1/2-2 inches of soil with a disk set straight so that sprigs are not brought back toward the surface.  
 Mow - Do not mow until sods are well established.  
 Maintenance - Fertilize very sparingly - 20 lb/acre nitrogen in spring with no phosphorus. Centipedegrass cannot tolerate high pH or excess fertilizer.

Table 6.11t - Seeding No. 5CP for: Well-Drained Sandy Loams to Dry Sands; Low Maintenance  
 Seeding mixture  
 Species Rate (lb/acre)  
 Pensacola Bahiagrass 50  
 Sericea lespedeza 30  
 Common Bermudagrass 10  
 German millet 10  
 Seeding Notes  
 1. Where a neat appearance is desired, omit sericea.  
 2. Use common Bermuda only on isolated sites where it cannot become a pest. Bermudagrass may be replaced with 5 lb/acre centipedegrass.  
 Seeding dates  
 Apr. 1 - July 15  
 Soil amendments - Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor by tacking with asphalt, riving, or netting or by crimping with a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Refertilize the following Apr. with 50 lb/acre nitrogen. Repeat as growth requires. May be mowed only once a year. Where a neat appearance is desired, omit sericea and mow as often as needed.

Table 6.11v - Seeding No. 7CP for: Grass-lined Channels; Coastal Plain, Lower Piedmont, and Dry Soils in the Central Piedmont  
 Seeding mixture  
 Species Rate (lb/acre)  
 Common Bermudagrass 40-80 (1-2 lb/1,000 ft<sup>2</sup>)  
 Seeding dates  
 Coastal Plain: Apr. - July  
 Piedmont: Apr. 15 - June 30  
 Soil amendments - Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10-10-10 fertilizer.  
 Mulch - Use jute, excelsior matting, or other effective channel lining material to cover the bottom of channels and ditches. The lining should extend above the highest calculated depth of flow. On channel side slopes above this height, and on requiring temporary linings, apply 4,000 lb/acre grain straw and anchor straw by stapling netting over the top.  
 Mulch and anchoring materials must not be allowed to wash down slopes where they can clog drainage devices.  
 Maintenance - A minimum of 3 weeks is required for establishment. Inspect and repair mulch frequently. Refertilize the following Apr. with 50 lb/acre nitrogen.

Refer to Appendix B.02 for botanical names.

**Temporary Seeding**  
 Specifications #10 - Specifications  
 (Specifications are as per the "Erosion and Sediment Control Planning and Design Manual" of the state of North Carolina.)  
 Table 6.10a - Temporary Seeding Recommendations for Late Winter and Early Spring  
 Seeding Mixture  
 Species Rate (lb/acre)  
 Rye (grain) 120  
 Annual lespedeza (Koba in Piedmont and Coastal Plain, Korean in Mountains) 50  
 Omit annual lespedeza when duration of temporary cover is not to extend beyond June.  
 Seeding dates  
 Mountains - Above 2500 ft: Feb. 15-May 15  
 Below 2500 ft: Feb. 1-May 1  
 Piedmont - Jan. 1-May 1  
 Coastal Plain - Dec. 1-Apr. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Refertilize if growth is not fully adequate. Reseed, fertilize and mulch immediately following erosion or other damage.

Table 6.10b Temporary Seeding Recommendations for Summer  
 Seeding mixture  
 Species Rate (lb/acre)  
 German millet 40  
 In the Piedmont and Mountains, a small-stemmed Sudangrass may be substituted at a rate of 50 lb/acre.  
 Seeding dates  
 Mountains - May 15-Aug. 15  
 Piedmont - May 1-Aug. 15  
 Coastal Plain - Apr. 15-Aug. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Refertilize if growth is not fully adequate. Reseed, fertilize and mulch immediately following erosion or other damage.

Table 6.10c Temporary Seeding Recommendations for Fall  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Aug. 15-Dec. 30  
 Coastal Plain and Piedmont - Aug. 15-Dec. 30  
 Soil amendments - Follow soil tests or apply 2,000 lb/acre ground agricultural limestone and 1,000 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10d Temporary Seeding Recommendations for Winter  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Dec. 15-Mar. 15  
 Piedmont - Dec. 15-Mar. 15  
 Coastal Plain - Dec. 15-Mar. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10e Temporary Seeding Recommendations for Spring  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Mar. 15-Jun. 15  
 Piedmont - Mar. 15-Jun. 15  
 Coastal Plain - Mar. 15-Jun. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10f Temporary Seeding Recommendations for Summer  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Jun. 15-Sep. 15  
 Piedmont - Jun. 15-Sep. 15  
 Coastal Plain - Jun. 15-Sep. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10g Temporary Seeding Recommendations for Fall  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Sep. 15-Dec. 15  
 Piedmont - Sep. 15-Dec. 15  
 Coastal Plain - Sep. 15-Dec. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10h Temporary Seeding Recommendations for Winter  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Dec. 15-Mar. 15  
 Piedmont - Dec. 15-Mar. 15  
 Coastal Plain - Dec. 15-Mar. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10i Temporary Seeding Recommendations for Spring  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Mar. 15-Jun. 15  
 Piedmont - Mar. 15-Jun. 15  
 Coastal Plain - Mar. 15-Jun. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10j Temporary Seeding Recommendations for Summer  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Jun. 15-Sep. 15  
 Piedmont - Jun. 15-Sep. 15  
 Coastal Plain - Jun. 15-Sep. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10k Temporary Seeding Recommendations for Fall  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Sep. 15-Dec. 15  
 Piedmont - Sep. 15-Dec. 15  
 Coastal Plain - Sep. 15-Dec. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10l Temporary Seeding Recommendations for Winter  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Dec. 15-Mar. 15  
 Piedmont - Dec. 15-Mar. 15  
 Coastal Plain - Dec. 15-Mar. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10m Temporary Seeding Recommendations for Spring  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Mar. 15-Jun. 15  
 Piedmont - Mar. 15-Jun. 15  
 Coastal Plain - Mar. 15-Jun. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

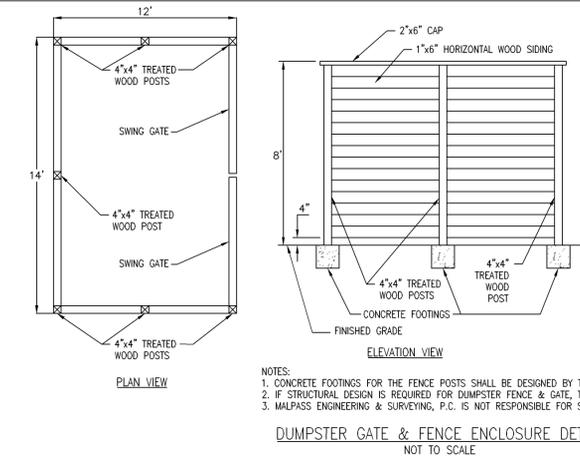
Table 6.10n Temporary Seeding Recommendations for Summer  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Jun. 15-Sep. 15  
 Piedmont - Jun. 15-Sep. 15  
 Coastal Plain - Jun. 15-Sep. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10o Temporary Seeding Recommendations for Fall  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Sep. 15-Dec. 15  
 Piedmont - Sep. 15-Dec. 15  
 Coastal Plain - Sep. 15-Dec. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10p Temporary Seeding Recommendations for Winter  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Dec. 15-Mar. 15  
 Piedmont - Dec. 15-Mar. 15  
 Coastal Plain - Dec. 15-Mar. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10q Temporary Seeding Recommendations for Spring  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Mar. 15-Jun. 15  
 Piedmont - Mar. 15-Jun. 15  
 Coastal Plain - Mar. 15-Jun. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

Table 6.10r Temporary Seeding Recommendations for Summer  
 Seeding mixture  
 Species Rate (lb/acre)  
 Rye 120  
 Seeding dates  
 Mountains - Jun. 15-Sep. 15  
 Piedmont - Jun. 15-Sep. 15  
 Coastal Plain - Jun. 15-Sep. 15  
 Soil amendments - Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.  
 Mulch - Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.  
 Maintenance - Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Koba (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.



NOTES:  
 1. CONCRETE FOOTINGS FOR THE FENCE POSTS SHALL BE DESIGNED BY THE FENCE CONTRACTOR.  
 2. IF STRUCTURAL DESIGN IS REQUIRED FOR DUMPSTER FENCE & GATE, THEN DEVELOPER SHALL CONSULT WITH A STRUCTURAL ENGINEER.  
 3. MALPASS ENGINEERING & SURVEYING, P.C. IS NOT RESPONSIBLE FOR STRUCTURAL INTEGRITY OF DUMPSTER FENCE, GATE OR PAD.  
**DUMPSTER GATE & FENCE ENCLOSURE DETAIL**  
 NOT TO SCALE

**CONSTRUCTION SEQUENCE FOR INSTALLATION OF PERMEABLE PAVEMENT (NCDNR STORMWATER BMP MANUAL CHAPTER 18)**  
 1. ENSURE ACCEPTABLE CONDITIONS FOR CONSTRUCTION  
 -PERVIOUS SURFACES MUST BE GRADED TO DRAIN AWAY FROM THE PERMEABLE PAVEMENT, EXCEPT WHERE THIS IS UNAVOIDABLE, SUCH AS PARKING LOT ISLANDS, AND AREA BETWEEN BUILDINGS & PARKING LOT.  
 -IMPERVIOUS AREAS MUST BE GRADED TO DRAIN TO THE PERMEABLE PAVEMENT AREAS.  
 -AREAS ADJACENT TO THE PERMEABLE PAVEMENT ARE STABILIZED (VEGETATION, MULCH, STRAW, FIBER BLANKETS, ETC.) IN ORDER TO PREVENT EROSION & POSSIBLE CONTAMINATION WITH SEDIMENTS.  
 -APPLY ADDITIONAL MULCH IF WASHOUT OCCURS. REPAIR THE SOLE GRADE, RESEED, AND REINSTALL MULCH. CONTINUE INSPECTIONS UNTIL VEGETATION IS FIRMLY ESTABLISHED.  
 -ALL PERMEABLE PAVEMENT AREAS ARE CLEARLY MARKED ON THE SITE.  
 2. EXCAVATE PERMEABLE PAVEMENT AREA & PREPARE SUBGRADE SURFACE  
 -EXCAVATE TO 15 DAY SUBGRADE CONDITIONS & AVOID EXCAVATING IMMEDIATELY AFTER STORMS WITHOUT A SUFFICIENT DRYING PERIOD.  
 -DO NOT ALLOW EQUIPMENT TO CROSS THE PAVEMENT AREA AFTER EXCAVATION HAS BEGUN.  
 -OPERATE EXCAVATION EQUIPMENT FROM OUTSIDE THE EXCAVATION AREA OR FROM UNEXCAVATED PORTIONS OF THE AREA USING AN EXCAVATION STAGING PLAN.  
 -USE EQUIPMENT WITH TRACKS RATHER THAN TIRES TO MINIMIZE SOIL COMPACTION WHEN EQUIPMENT ON THE SUBGRADE SURFACE IS UNAVOIDABLE.  
 -DIG THE FINAL 9 TO 12 INCHES BY USING THE TEETH OF THE EXCAVATOR BUCKET TO LOOSEN SOIL & DO NOT SMEAR THE SUBGRADE SOIL SURFACE. FINAL GRADING OR SMOOTHING OF SUBGRADE SHOULD BE DONE BY HAND IF POSSIBLE.  
 -THE FINAL SUBGRADE SLOPE SHALL NOT EXCEED 0.5%. THE FINAL SUBGRADE SHALL BE SURVEYED BEFORE PROCEEDING WITH INSTALLATION.  
 -MINIMIZE THE TIME BETWEEN EXCAVATION AND PLACEMENT OF THE AGGREGATE.  
 -AFTER THE SUBGRADE SLOPE IS VERIFIED, SCARIFY THE SOIL SUBGRADE SURFACE TO MAINTAIN THE SOILS PRE-DISTURBANCE INFILTRATION RATE.  
 -DO NOT SCARIFY THE PAVEMENT, USE THE EXCAVATOR BUCKETS TEETH TO RAKE THE SURFACE OF THE SUBGRADE.  
 3. TEST THE SUBGRADE SOIL INFILTRATION RATE (INFILTRATION SYSTEMS ONLY)  
 -IMMEDIATELY AFTER EXCAVATION & BEFORE THE AGGREGATE IS PLACED, CONDUCT A DIRECT MEASUREMENT OF THE SOIL'S INFILTRATION RATE. INFILTRATION TESTING SHALL BE PERFORMED BY AN APPROPRIATELY-QUALIFIED PROFESSIONAL.  
 -RESULTS OF THE INFILTRATION TESTING SHALL BE PROVIDED TO THE ENGINEER.  
 -IF THE SOIL TEST SHOWS INFILTRATION RATE(S) THAT ARE LOWER THAN THE RATE(S) USED IN THE DESIGN, THEN ADDITIONAL SCARIFICATION, RIPPING, OR TRENCHING OF THE SOIL WILL BE NEEDED.  
 -CONTRACTOR SHALL CONTACT & RECEIVE APPROVAL FROM ENGINEER OF RECORD TO CONTINUE INSTALLATION OF PERMEABLE PAVEMENT.

4. PLACE GEOTEXTILES AND GEOMEMBRANE (IF APPLICABLE)  
 -FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR THE APPROPRIATE OVERLAP BETWEEN ROLLS OF MATERIAL. SECURE THE MATERIAL TO ENSURE IT DOES NOT MOVE OR WRINKLE WHEN PLACING AGGREGATE.  
 5. PLACE OBSERVATION WELLS(S)  
 -PLACE OBSERVATION WELL(S) ACCORDING TO THE PLAN AND VERIFY THAT THE ELEVATIONS ARE CORRECT.  
 6. PLACE & COMPACT AGGREGATE BASE  
 -INSPECT ALL AGGREGATE TO ENSURE THEY ARE CLEAN, FREE OF FINES, AND CONFORM TO THE PLANS.  
 -IF AGGREGATE DELIVERED TO THE SITE CANNOT BE IMMEDIATELY PLACED INTO THE EXCAVATION, THEY SHOULD BE STOCKPILED ON AN IMPERVIOUS SURFACE, GEOTEXTILE, OR ON AN IMPERVIOUS MATERIAL TO KEEP THE AGGREGATE FREE OF SEDIMENT.  
 -IF AGGREGATE BECOMES CONTAMINATED WITH SEDIMENT, THEN IT SHALL BE REPLACED WITH CLEAN AGGREGATE.  
 -BEFORE PLACING THE AGGREGATE BASE, REMOVE ANY ACCUMULATION OF SEDIMENTS ON THE FINISHED SOIL SUBGRADE.  
 -IF THE EXPOSED SUBGRADE HAS BEEN SUBJECT TO RAINFALL BEFORE PLACEMENT OF THE AGGREGATE, THEN THE SUBGRADE SURFACE MUST BE SCARIFIED TO BREAK UP THE RESULTING SURFACE CRUST.  
 -SLOPES & ELEVATIONS SHALL BE CHECKED ON THE SOIL SUBGRADE AND THE FINISHED ELEVATION OF BASE (AFTER COMPACTION) OR BEDDING MATERIALS TO ASSURE THEY CONFORM TO THE PLANS AND SPECIFICATIONS.  
 -THE AGGREGATE SHALL BE SPREAD (NOT DUMPED) BY A FRONT-END LOADER OR FROM DUMP TRUCKS DEPOSITING FROM NEAR THE EDGE OF THE EXCAVATED AREA OR DIRECTLY ON DEPOSITED AGGREGATE PILES. MOISTEN AND SPREAD THE WASH STONE WITHOUT DRIVING ON THE SOIL SUBGRADE. BE CAREFUL NOT TO DAMAGE THE OBSERVATION WELLS DURING COMPACTION.  
 -FOLLOW COMPACTION RECOMMENDATIONS BY THE PERMEABLE PAVEMENT MANUFACTURER OR THAT FROM INDUSTRY GUIDELINES.  
 -BE SURE THAT CORNERS, AREAS AROUND UTILITY STRUCTURES AND OBSERVATION WELLS, & TRANSITION AREAS TO OTHER PAVEMENTS ARE ADEQUATELY COMPACTED.  
 -DO NOT CRUSH AGGREGATES DURING COMPACTION.  
 -SURE VEGETATION GROWING IN THE BOTTOM OF THE BASIN DOES NOT HOLD DOWN THE SKIMMER. REPAIR THE Baffles IF THEY ARE DAMAGED.  
 -EDGE RESTRAINTS AND BARRIERS BETWEEN PERMEABLE IMPERVIOUS PAVEMENT SHALL BE INSTALLED PER THE PLAN.  
 -BEFORE MOVING ON TO CONSTRUCTION STEP 8, BE CERTAIN THE DESIGN AND INSTALLATION ARE CONSISTENT.

8. INSTALL CURB RESTRAINTS AND PAVEMENT BARRIERS  
 -PERVIOUS CONCRETE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST VERSION OF ACI 522.1 SPECIFICATION FOR PERVIOUS CONCRETE.  
 -INSTALLATION OF THE PERVIOUS CONCRETE MAY BE ACCOMPLISHED USING EITHER THE ONE-STEP OR THE TWO-STEP METHOD.  
 9. PROTECT THE PAVEMENT THROUGH PROJECT COMPLETION  
 -IF IT IS NOT POSSIBLE TO INSTALL THE PERMEABLE PAVEMENT AT THE END OF THE SITE CONSTRUCTION TIMELINE, THEN PROTECT THE PAVEMENT UNTIL PROJECT COMPLETION. THIS SHALL BE DONE BY:  
 A) ROUTING CONSTRUCTION ACCESS THROUGH OTHER PORTIONS OF THE SITE SO THAT NO CONSTRUCTION TRAFFIC PASSES THROUGH THE PERMEABLE PAVEMENT SITE (INSTALL BARRIERS/FENCES AS NEEDED).  
 B) IF THIS IS NOT POSSIBLE, PROTECT THE PAVEMENT PER THE CONSTRUCTION DOCUMENTS. PROTECTION TECHNIQUES THAT MAY BE USED INCLUDE MATS, PLASTIC SHEETING, BARRIERS TO LIMIT ACCESS, OR MOVING THE STABILIZED CONSTRUCTION ENTRANCE.  
 C) SCHEDULE STREET SWEEPING DURING AND AFTER CONSTRUCTION TO PREVENT SEDIMENT FROM ACCUMULATING ON THE PAVEMENT.

PERMEABLE PAVEMENT SIGN DETAIL  
 NOT TO SCALE  
 PERMEABLE PAVEMENT SIGN DETAIL  
 NOT TO SCALE  
 PERMEABLE PAVEMENT SIGN DETAIL  
 NOT TO SCALE

STANDARD N.C. "STOP" SIGN  
 NOT TO SCALE  
 STANDARD INFORMATION SIGN  
 NOT TO SCALE  
 STREET NAME SIGN  
 (SEE NOTE)  
 NOT TO SCALE

STANDARD SIGN INSTALLATION LOCATION  
 SD 15-03  
 NOT TO SCALE  
 PERVIOUS & CONVENTIONAL CONCRETE BOUNDARY DETAIL  
 NOT TO SCALE  
 OBSERVATION WELL DETAIL  
 NOT TO SCALE  
 TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT DETAIL  
 NOT TO SCALE

CONCRETE Baffle CROSS SECTION DETAIL  
 NOT TO SCALE  
 CONCRETE Baffle CROSS SECTION DETAIL  
 NOT TO SCALE

PERVIOUS & CONVENTIONAL CONCRETE BOUNDARY DETAIL  
 NOT TO SCALE  
 OBSERVATION WELL DETAIL  
 NOT TO SCALE  
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CONCRETE Baffle CROSS SECTION DETAIL  
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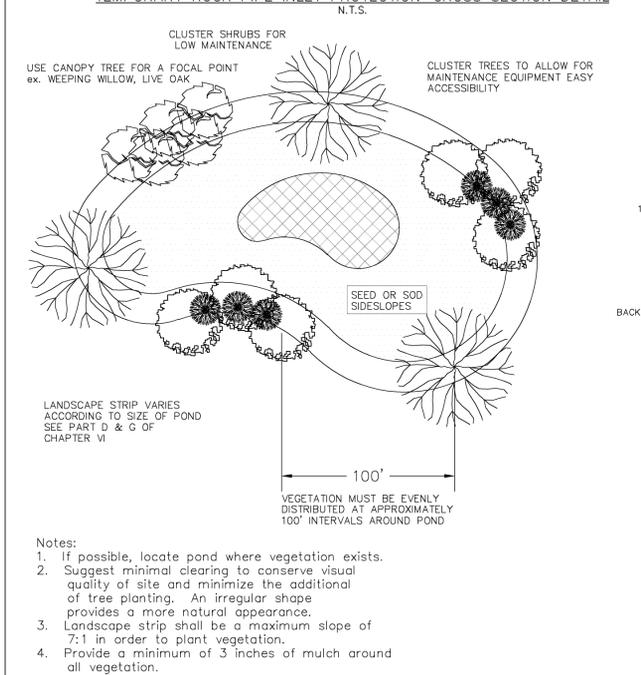
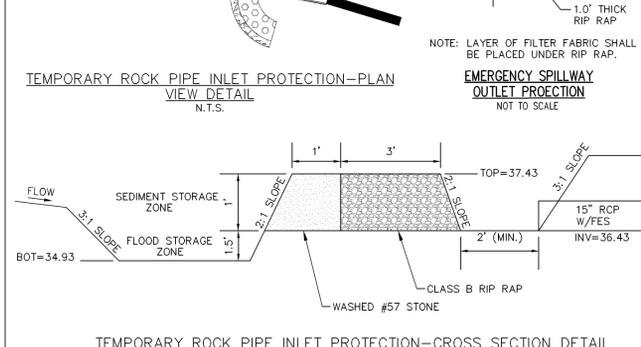
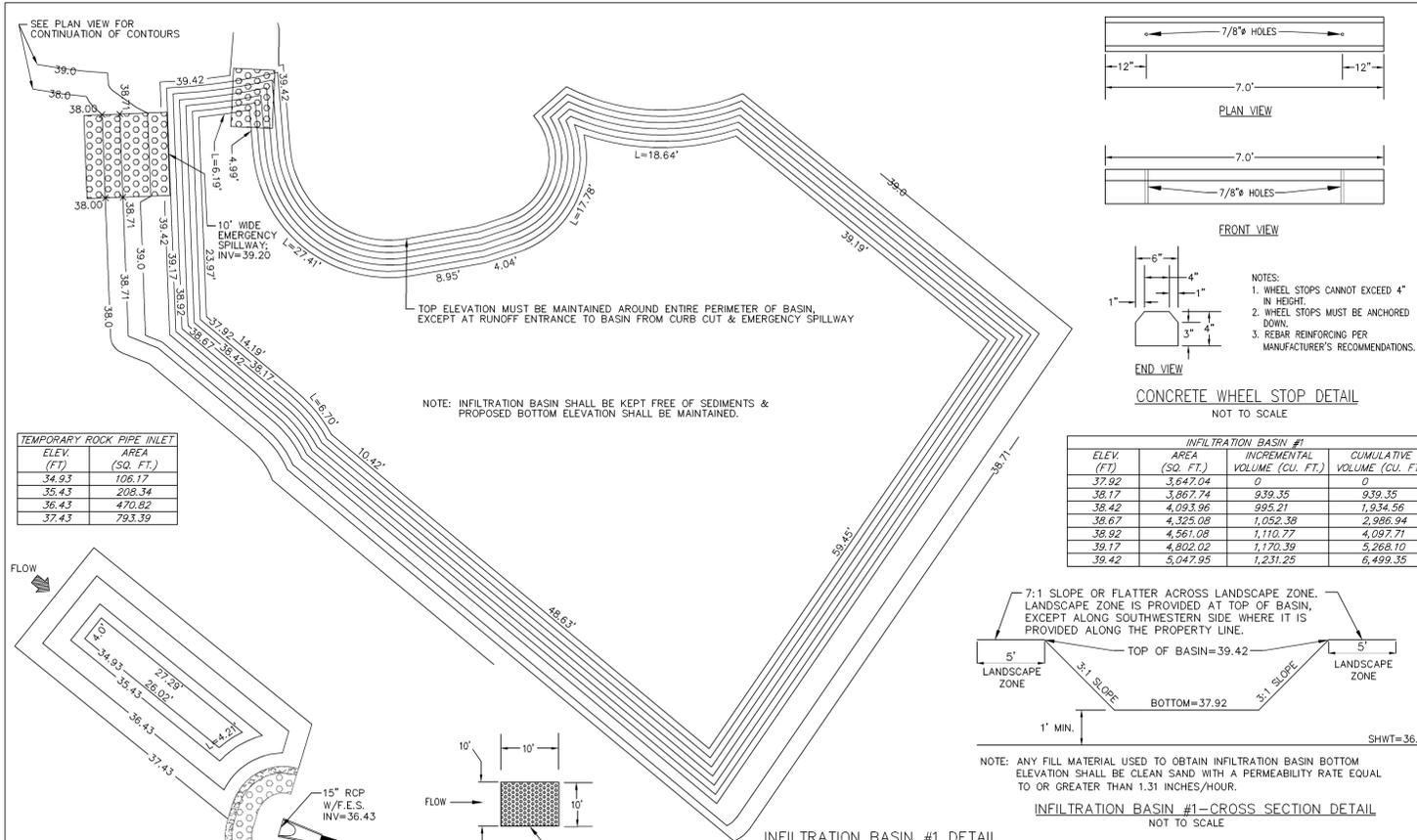
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 OBSERVATION WELL DETAIL  
 NOT TO SCALE  
 TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT DETAIL  
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CONCRETE Baffle CROSS SECTION DETAIL  
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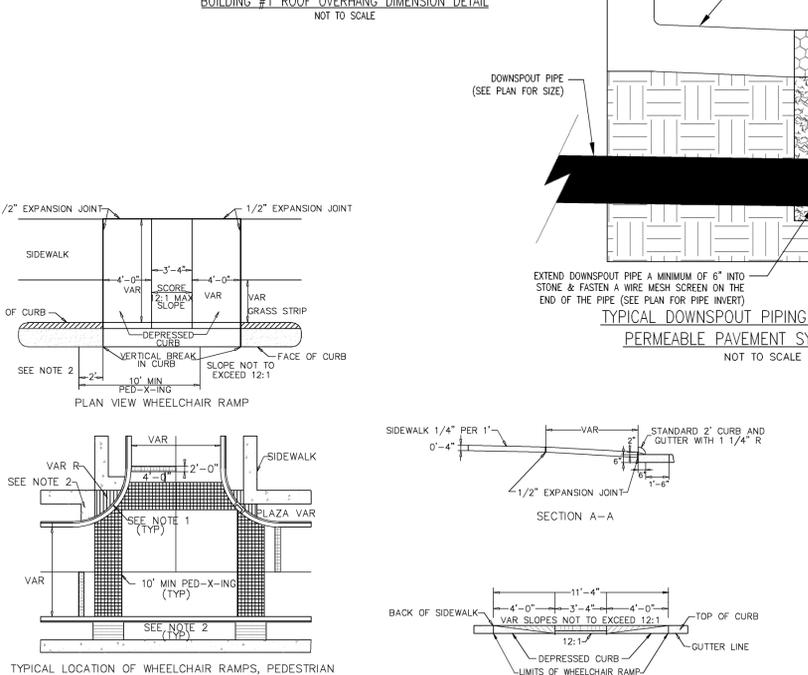
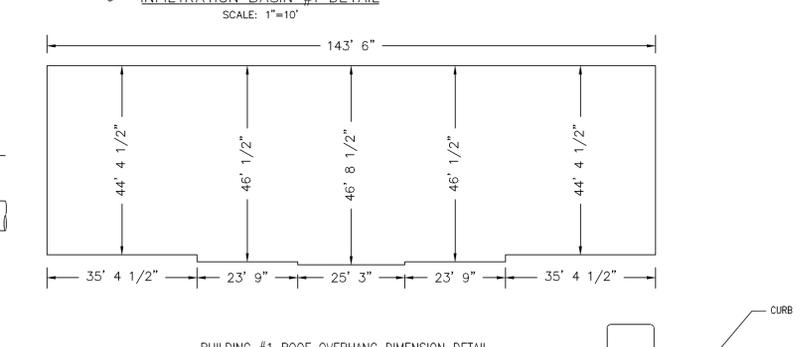
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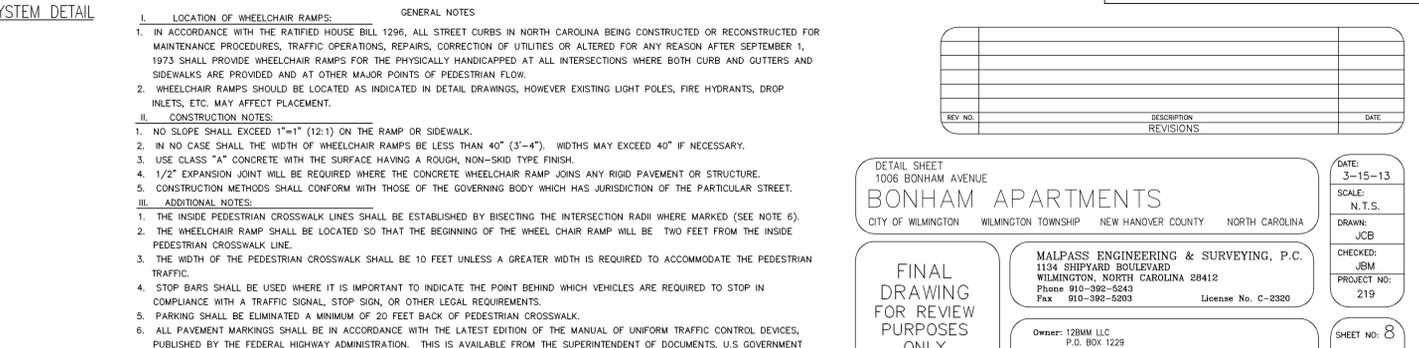
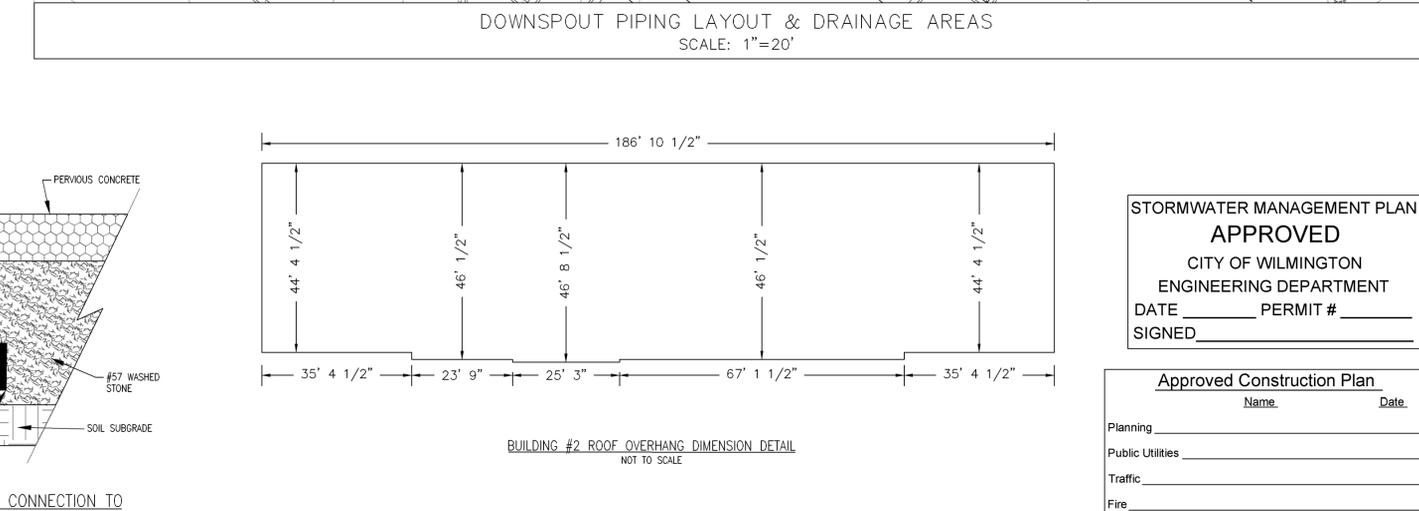
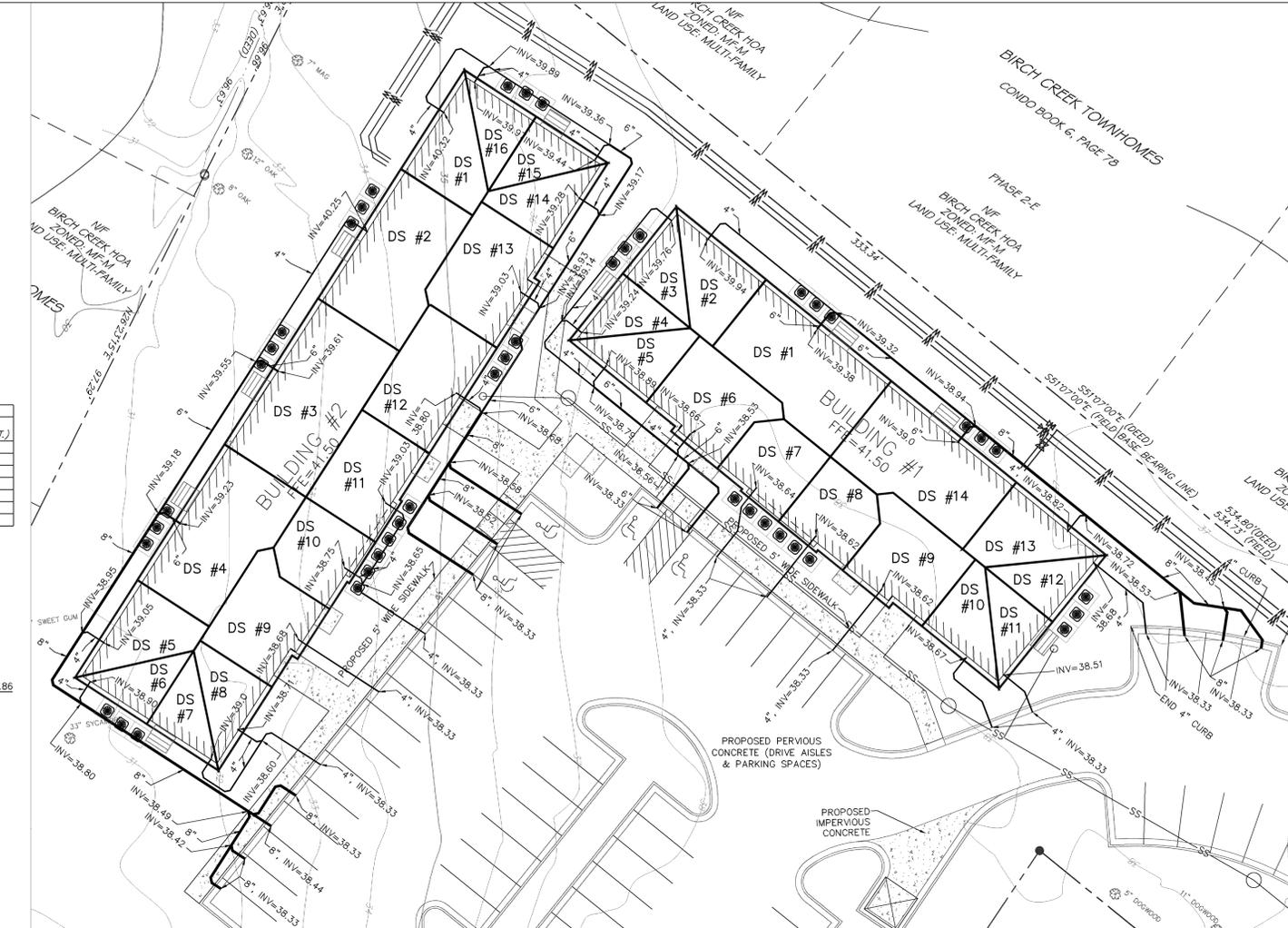
MAINTENANCE PLAN  
 1. ALL EROSION CONTROL MEASURES WILL BE CHECKED EVERY 7 DAYS OR AFTER EACH RAIN PRODUCING 1/2 INCHES OR MORE WHICH EVER COMES FIRST.  
 2. SEDIMENT WILL BE REMOVED FROM BEHIND SILT FENCES WHERE SEDIMENT IS 0.5 FEET DEEP AND REPAIR FABRIC IF TORN, LEAKING OR FAILING.  
 3. ALL POINTS OF EGRESS WILL HAVE CONSTRUCTION ENTRANCES THAT WILL BE PERIODICALLY TOP-DRESSED WITH AN ADDITIONAL 2 INCHES OF #4 STONE TO MAINTAIN PROPER DEPTH. THEY WILL BE MAINTAINED IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE SITE. IMMEDIATELY REMOVE OBJECTIONABLE MATERIAL SPILLED, WASHED, OR TRACKED ONTO THE CONSTRUCTION ENTRANCE OR ROADWAYS.  
 4. CHECK SEDIMENT BASINS AFTER PERIODS OF SIGNIFICANT RUNOFF. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT ACCUMULATES TO ONE-HALF THE DESIGN DEPTH. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE PERMEABLE PAVEMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA. GRAVEL WILL BE CLEANED OR REPLACED WHEN THE SEDIMENT POOL NO LONGER DRAINS PROPERLY OR IF THE ROCK IS DISLOADED.  
 5. INSPECT TEMPORARY SEDIMENT TRAPS AFTER EACH SIGNIFICANT RAINFALL. REMOVE SEDIMENT AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. PLACE THE SEDIMENT THAT IS REMOVED IN THE DESIGNED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL



**TYPICAL STORM WATER FACILITY LANDSCAPING PLAN**  
SD 15-16



**GUIDELINES FOR WHEELCHAIR RAMPS & DEPRESSED CURBS**  
SD 8-11



**GUIDELINES FOR WHEELCHAIR RAMPS**  
SD 8-09

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

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

REV. NO.	DESCRIPTION	DATE

DETAIL SHEET  
1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

DATE: 3-15-13  
SCALE: N.T.S.  
DRAWN: JCB  
CHECKED: JEM  
PROJECT NO: 219

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

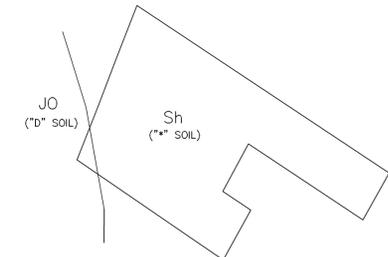
MALPASS ENGINEERING & SURVEYING, P.C.  
1134 SHYPARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-5843  
Fax 910-392-5203 License No. C-2380

Owner: 1280M LLC  
P.O. BOX 1229  
WILMINGTON, NORTH CAROLINA 28402

SHEET NO: 8  
OF: 17

SOIL TEST RESULTS PER S&ME, INC.				
TEST LOCATION	EXISTING GROUND ELEVATION (FEET)*	SHWT (INCHES BELOW GROUND SURFACE)**	SHWT ELEVATION (FEET)**	HYDRAULIC CONDUCTIVITY RATE (INCHES PER HOUR)**
1	38.00	11 (PERCHED)	37.09	5.71
		27 (APPARENT)	35.75	1.31
2	37.42	10 (PERCHED)	36.59	6.19
		24 (APPARENT)	35.42	
3	36.81	8 (PERCHED)	36.15	5.33
		21 (APPARENT)	35.06	
4	37.95	13 (PERCHED)	36.87	6.76
		27 (APPARENT)	35.70	2.90
6	38.31	18 (PERCHED)	36.81	2.67
		33 (APPARENT)	35.56	
7	38.08	11 (PERCHED)	37.17	3.14
		27 (APPARENT)	35.83	
8	35.49	13	34.41	5.14
9	31.36	8	30.70	4.36
10	32.87	10	32.04	2.24
11	38.45	24	36.45	4.99
12	38.61	21	36.86	2.76

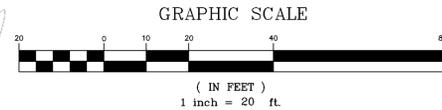
\* INFORMATION PROVIDED BY ARNOLD W. CARSON, PLS.  
 \*\* INFORMATION PROVIDED BY S&ME, INC.  
 \*\*\* CALCULATED BASED ON INFORMATION PROVIDED BY OTHERS



SOIL TYPE DETAIL  
NOT TO SCALE

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

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



REV. NO.	DESCRIPTION	DATE

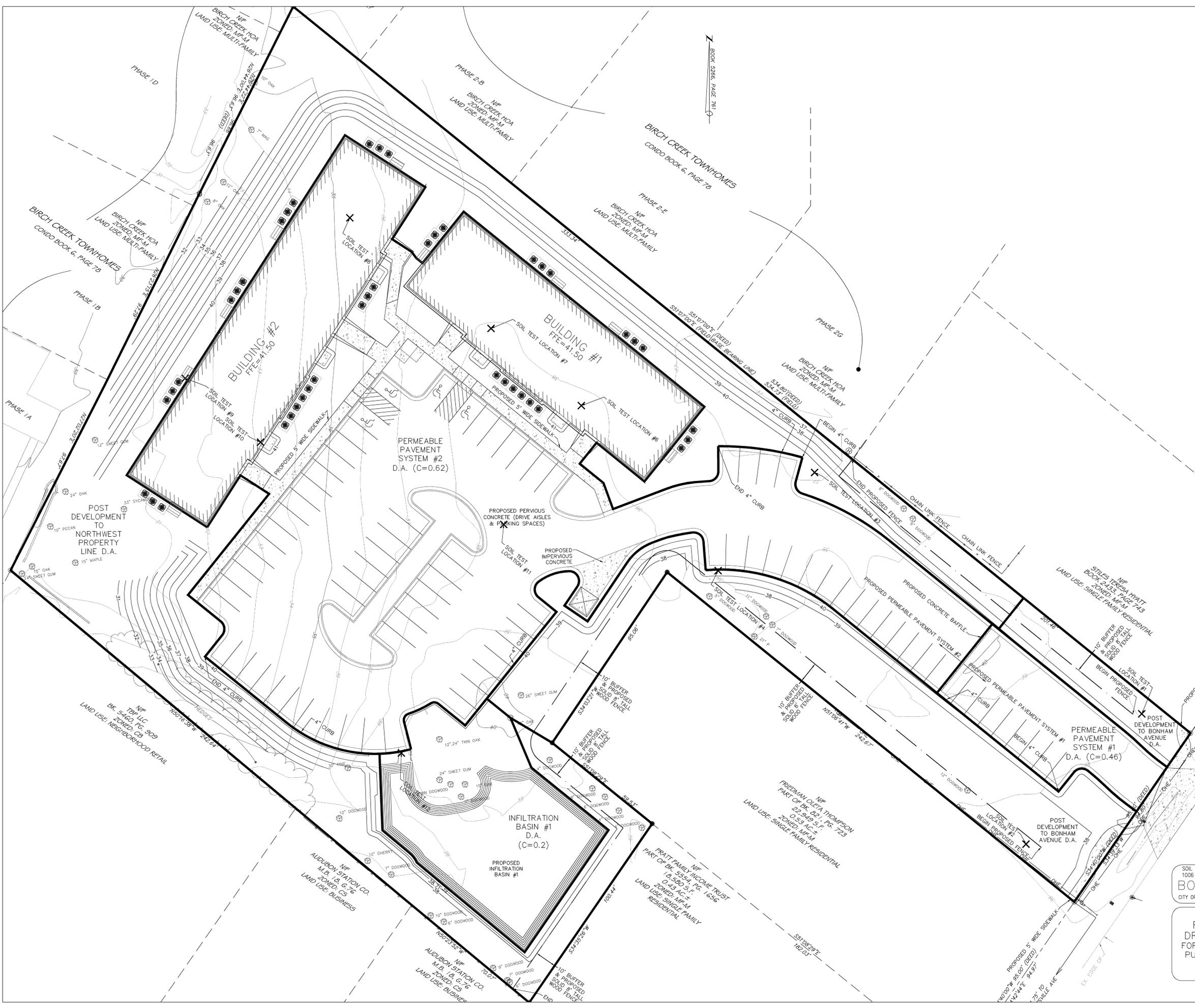
SOIL TEST & DRAINAGE AREA MAP  
 1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

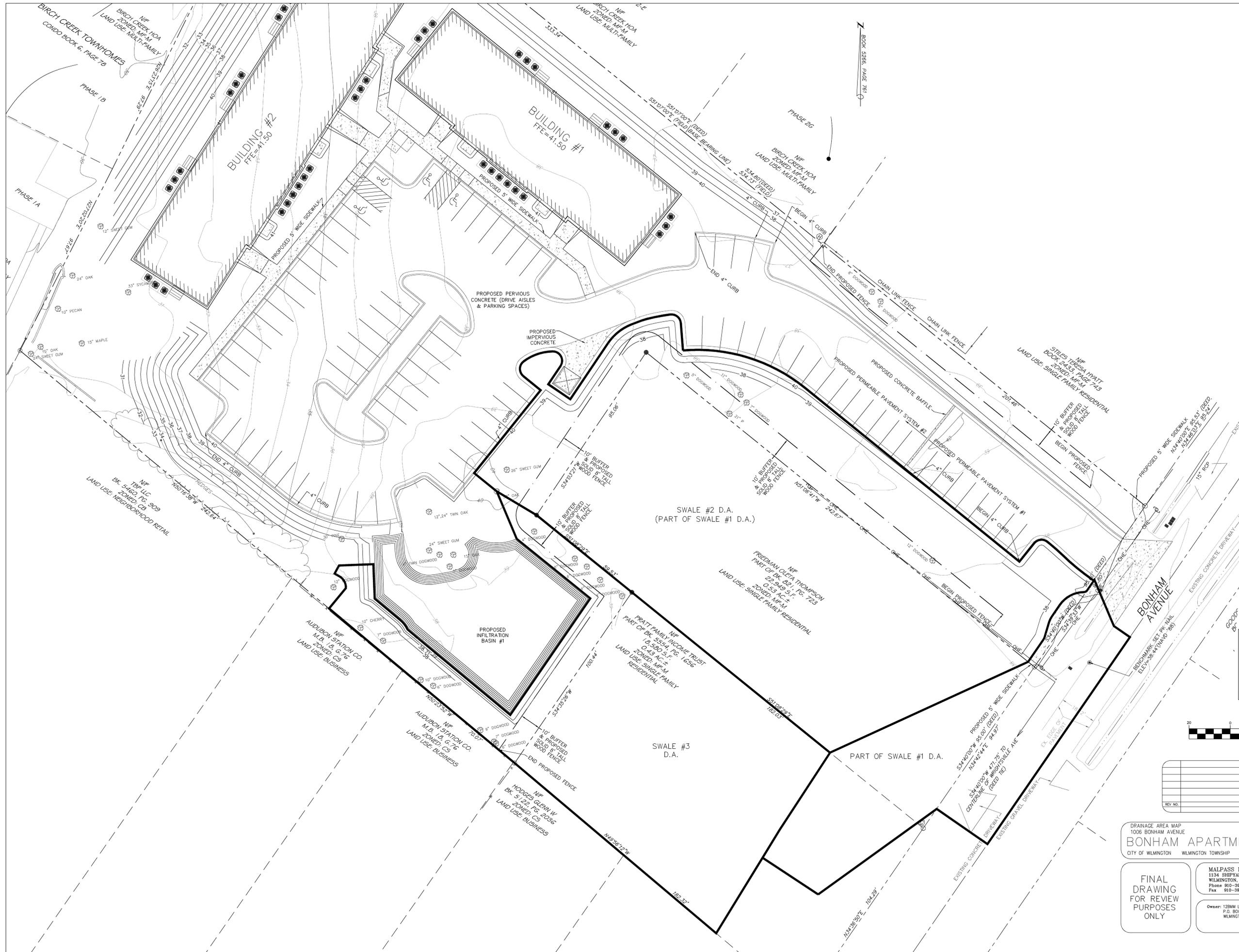
**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

MALPASS ENGINEERING & SURVEYING, P.C.  
 1134 SHPPYARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-5843 License No. C-2320  
 Fax 910-392-5203

Owner: 128UM LLC  
 P.O. BOX 1229  
 WILMINGTON, NORTH CAROLINA 28402

DATE: 3-15-13  
 SCALE: 1"=20'  
 DRAWN: JCB  
 CHECKED: JEM  
 PROJECT NO: 219  
 SHEET NO: 9  
 OF: 17

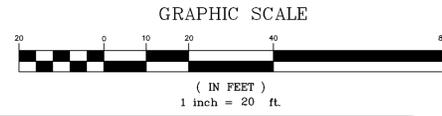




**STORMWATER MANAGEMENT PLAN**  
**APPROVED**  
 CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE \_\_\_\_\_ PERMIT # \_\_\_\_\_  
 SIGNED \_\_\_\_\_

**Approved Construction Plan**

Name	Date
Planning	_____
Public Utilities	_____
Traffic	_____
Fire	_____



REV. NO.	DESCRIPTION	DATE

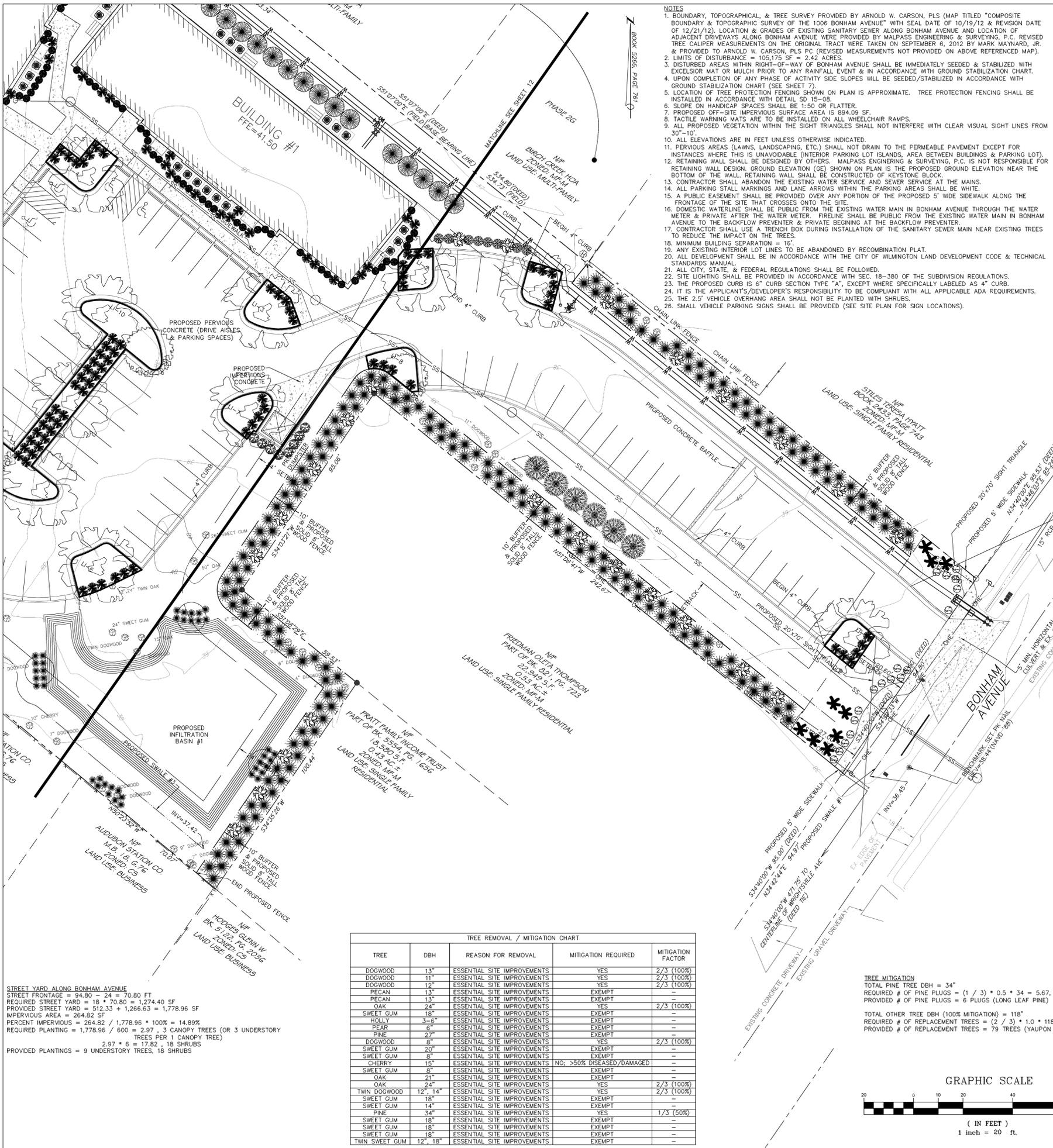
DRAINAGE AREA MAP  
 1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

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 SHEET NO: 10  
 OF: 17



- NOTES**
- BOUNDARY, TOPOGRAPHICAL, & TREE SURVEY PROVIDED BY ARNOLD W. CARSON, PLS (MAP TITLED "COMPOSITE BOUNDARY & TOPOGRAPHIC SURVEY OF THE 1006 BONHAM AVENUE" WITH SEAL DATE OF 10/19/12 & REVISION DATE OF 12/21/12). LOCATION & GRADES OF EXISTING SANITARY SEWER ALONG BONHAM AVENUE AND LOCATION OF ADJACENT DRIVEWAYS ALONG BONHAM AVENUE WERE PROVIDED BY MALPASS ENGINEERING & SURVEYING, P.C. REVISED TREE CALIPER MEASUREMENTS ON THE ORIGINAL TRACT WERE TAKEN ON SEPTEMBER 6, 2012 BY MARK MAYNARD, JR. & PROVIDED TO ARNOLD W. CARSON, PLS PC (REVISED MEASUREMENTS NOT PROVIDED ON ABOVE REFERENCED MAP).
  - LIMITS OF DISTURBANCE = 105,175 SF = 2.42 ACRES.
  - DISTURBED AREAS WITHIN RIGHT-OF-WAY OF BONHAM AVENUE SHALL BE IMMEDIATELY SEEDDED & STABILIZED WITH EXCELRIOR MAT OR MAT CH PRIOR TO ANY RAINFALL EVENT & IN ACCORDANCE WITH GROUND STABILIZATION CHART.
  - UPON COMPLETION OF ANY PHASE OF ACTIVITY SIDE SLOPES WILL BE SEEDDED/STABILIZED IN ACCORDANCE WITH GROUND STABILIZATION CHART (SEE SHEET 7).
  - LOCATION OF TREE PROTECTION FENCING SHOWN ON PLAN IS APPROXIMATE. TREE PROTECTION FENCING SHALL BE INSTALLED IN ACCORDANCE WITH DETAIL SD-15-08.
  - SLOPE ON HANDICAP SPACES SHALL BE 1:50 OR FLATTER.
  - PROPOSED OFF-SITE IMPERVIOUS SURFACE AREA IS 894.09 SF.
  - TACTILE WARNING MATS ARE TO BE INSTALLED ON ALL WHEELCHAIR RAMPS.
  - ALL PROPOSED VEGETATION WITHIN THE SIGHT TRIANGLES SHALL NOT INTERFERE WITH CLEAR VISUAL SIGHT LINES FROM 30'-10'-0".
  - ALL ELEVATIONS ARE IN FEET UNLESS OTHERWISE INDICATED.
  - PERVIOUS AREAS (LAWNS, LANDSCAPING, ETC.) SHALL NOT DRAIN TO THE PERMEABLE PAVEMENT EXCEPT FOR INSTANCES WHERE THIS IS UNAVOIDABLE (INTERIOR PARKING LOT ISLANDS, AREA BETWEEN BUILDINGS & PARKING LOT).
  - RETAINING WALL SHALL BE DESIGNED BY OTHERS. MALPASS ENGINEERING & SURVEYING, P.C. IS NOT RESPONSIBLE FOR RETAINING WALL DESIGN. GROUND ELEVATION (GE) SHOWN ON PLAN IS THE PROPOSED GROUND ELEVATION NEAR THE BOTTOM OF THE WALL. RETAINING WALL SHALL BE CONSTRUCTED OF KEYSTONE BLOCK.
  - CONTRACTOR SHALL ABANDON THE EXISTING WATER SERVICE AND SEWER SERVICE AT THE MAINS.
  - ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
  - A PUBLIC EASEMENT SHALL BE PROVIDED OVER ANY PORTION OF THE PROPOSED 5' WIDE SIDEWALK ALONG THE FRONTAGE OF THE SITE THAT GROSSES ONTO THE SITE.
  - DOMESTIC WATERLINE SHALL BE PUBLIC FROM THE EXISTING WATER MAIN IN BONHAM AVENUE THROUGH THE WATER METER & PRIVATE AFTER THE WATER METER. FIRELINE SHALL BE PUBLIC FROM THE EXISTING WATER MAIN IN BONHAM AVENUE TO THE BACKFLOW PREVENTER & PRIVATE BEGINNING AT THE BACKFLOW PREVENTER.
  - CONTRACTOR SHALL USE A TRENCH BOX DURING INSTALLATION OF THE SANITARY SEWER MAIN NEAR EXISTING TREES TO REDUCE THE IMPACT ON THE TREES.
  - MINIMUM BUILDING SEPARATION = 15'.
  - ANY EXISTING INTERIOR LOT LINES TO BE ABANDONED BY RECOMBINATION PLAT.
  - ALL DEVELOPMENT SHALL BE IN ACCORDANCE WITH THE CITY OF WILMINGTON LAND DEVELOPMENT CODE & TECHNICAL STANDARDS MANUAL.
  - ALL CITY, STATE, & FEDERAL REGULATIONS SHALL BE FOLLOWED.
  - SITE LIGHTING SHALL BE PROVIDED IN ACCORDANCE WITH SEC. 18-380 OF THE SUBDIVISION REGULATIONS.
  - THE PROPOSED CURB IS 6" CURB SECTION TYPE "A", EXCEPT WHERE SPECIFICALLY LABELED AS 4" CURB.
  - IT IS THE APPLICANT'S/DEVELOPER'S RESPONSIBILITY TO BE COMPLIANT WITH ALL APPLICABLE ADA REQUIREMENTS.
  - THE 2.5' VEHICLE OVERHANG AREA SHALL NOT BE PLANTED WITH SHRUBS.
  - SMALL VEHICLE PARKING SIGNS SHALL BE PROVIDED (SEE SITE PLAN FOR SIGN LOCATIONS).

**TREES PER DISTURBED ACRE**  
 2.42 ACRES \* 15 = 36.3, 36 TREES REQUIRED  
 39 TREES RETAINED  
 135 TREES PROPOSED (9 STREET YARD, 14 INTERIOR LANDSCAPE ISLAND, 22 BUFFER YARD, 2 PARKING BUFFER, 3 STORMWATER TRENCH, 85 MITIGATION)  
 174 TREES (TOTAL)  
 \*SEE LANDSCAPING PLAN FOR PROVIDED TREES

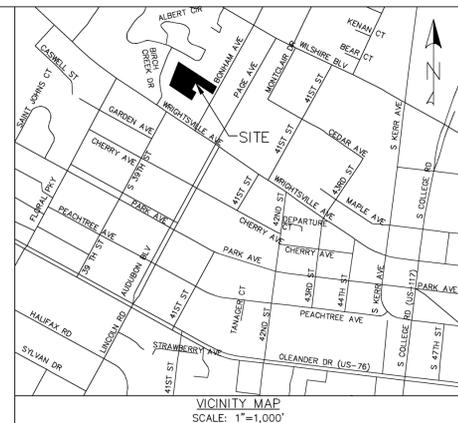
**INTERIOR SHADING**  
 PARKING FACILITY AREA (PARKING LOT AREA TO BACK OF CURB MINUS LANDSCAPE ISLANDS) = 30,526.56 SF  
 REQUIRED INTERIOR SHADING (IS) = 0.2 \* 30,526.56 = 6,105.32 SF  
 PROVIDED INTERIOR SHADING = 7,687.40 SF  
 \*SEE LANDSCAPING PLAN FOR PROVIDED TREES

**FOUNDATION PLANTING—SOUTHEAST SIDE OF BUILDING #1**  
 REQUIRED FOUNDATION PLANTING (MAX.) = (41.71' \* 29.71') \* 0.12 = 148.71 SF  
 PROVIDED FOUNDATION PLANTING = 150.89 SF  
 \*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

**FOUNDATION PLANTING—SOUTHWEST SIDE OF BUILDING #1**  
 REQUIRED FOUNDATION PLANTING (MAX.) = [(114.84' \* 29.71') + (70.09' \* 2.17') + (0.5' \* 23.72' \* 7.07') \* 0.12 = 530.34 SF  
 PROVIDED FOUNDATION PLANTING = 551.18 SF  
 \*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

**FOUNDATION PLANTING—SOUTHEAST SIDE OF BUILDING #2**  
 REQUIRED FOUNDATION PLANTING (MAX.) = [(1184.21' \* 29.71') + (113.46' \* 2.17') + (0.5' \* 23.72' \* 7.07') \* 0.12 = 696.26 SF  
 PROVIDED FOUNDATION PLANTING = 712.26 SF  
 \*SEE LANDSCAPING PLAN FOR PROVIDED PLANTINGS

INTERIOR LANDSCAPING ISLANDS				
LANDSCAPE ISLAND	TOTAL AREA (SF)	IMPERVIOUS AREA (SF)	PERCENT IMPERVIOUS	INTERIOR SHADING (SF)
LI-1	217.17	0	0	522.38
LI-2	217.86	0	0	522.12
LI-3	284.49	0	0	646.02
LI-4	312.76	0	0	626.89
LI-5	286.65	0	0	604.02
LI-6	351.90	0	0	624.19
LI-7	244.73	0	0	668.51
LI-8	217.76	0	0	191.09
LI-9	216.77	0	0	533.18
LI-10	1,466.02	0	0	2,749



- LEGEND**
- = EXISTING IRON PIPE
  - = SET IRON ROD
  - ⦿ = SET PK NAIL
  - ⊕ = EXISTING POWER POLE
  - ⊖ = EXISTING WATER METER
  - ⊞ = EXISTING MAILBOX
  - ☆ = EXISTING LIGHT POLE
  - ⊗ = EXISTING FIRE HYDRANT
  - ⊙ = EXISTING TREE
  - = EXISTING CONTOUR
  - = CENTERLINE
  - R/W = EXISTING OVERHEAD LINE
  - = EXISTING DITCH
  - = EXISTING FENCE
  - = PROPERTY LINE
  - = ADJACENT LOT LINES (APPROX.)
  - = PROPOSED BUFFER/SOLID FENCE
  - = PROPOSED STREET YARD
  - = PROPOSED WATER MAIN
  - = PROPOSED SANITARY SEWER
  - = PROPOSED GATE VALVE
  - ⊕ = PROPOSED FIRE HYDRANT
  - = PROPOSED SWALE

**PLANT SCHEDULE**

TREES	QTY	BOTANICAL NAME / COMMON NAME	CALIPER	HEIGHT @ PLANTING
11	ACER RUBRUM / RED MAPLE	2" (MIN.)		
3	CERCIS CANADENSIS / RED BUD	2" (MIN.)	8'-10'	
9	MAGNOLIA STELLATA / STAR MAGNOLIA	2" (MIN.)	8'-10'	
24	PRUNUS SERRULATA / JAPANESE FLOWERING CHERRY	2" (MIN.)	8'-10'	
3	BETULA NIGRA / RIVER BIRCH	2" (MIN.)		
79	ILEX VOMITORIA / YAUPON HOLLY	2" (MIN.)		
6	PINUS PALUSTRIS / LONG LEAF PINE	PLUGS		
8	PITTIOSPORUM TOBIRA / DWARF PITTIOSPORUM		12" (MIN.)	
18	ILEX CRENATA / HELLERI		12" (MIN.)	
119	ILEX VOMITORIA NANA / DWARF YAUPON HOLLY		12" (MIN.)	
71	HEMEROCALLIS SPP. / DAYLILY		12" (MIN.)	
84	LIGUSTRUM JAPONICUM / WAX LEAF LIGUSTRUM		36" (MIN.)	
8	ILEX CORNUTA / DWARF BUFORD HOLLY		36" (MIN.)	
40	PENNISETUM ALOOPECUROIDES CASSIAN / DWARF FOUNTAIN GRASS		12" (MIN.)	

**TREE REMOVAL / MITIGATION CHART**

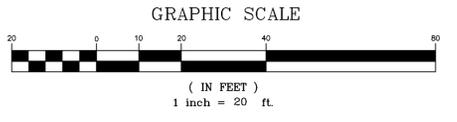
TREE	DBH	REASON FOR REMOVAL	MITIGATION REQUIRED	MITIGATION FACTOR
DOGWOOD	13"	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
DOGWOOD	11"	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
DOGWOOD	12"	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
PECAN	13"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
PECAN	13"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
OAK	24"	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
SWEET GUM	18"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
HOLLY	3-6"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
PEAR	6"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
PINE	27"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
DOGWOOD	8"	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
SWEET GUM	20"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
SWEET GUM	8"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
CHERRY	15"	ESSENTIAL SITE IMPROVEMENTS	NO; >50% DISEASED/DAMAGED	—
SWEET GUM	8"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
OAK	21"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
OAK	24"	ESSENTIAL SITE IMPROVEMENTS	YES	2/3 (100%)
TWIN DOGWOOD	12", 14"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
SWEET GUM	18"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
SWEET GUM	14"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
PINE	34"	ESSENTIAL SITE IMPROVEMENTS	YES	1/3 (50%)
SWEET GUM	18"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
SWEET GUM	18"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
SWEET GUM	18"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—
TWIN SWEET GUM	12", 18"	ESSENTIAL SITE IMPROVEMENTS	EXEMPT	—

**STREET YARD ALONG BONHAM AVENUE**  
 STREET FRONTAGE = 94.80 = 24 \* 70.80 FT  
 REQUIRED STREET YARD = 18 \* 70.80 = 1,274.40 SF  
 PROVIDED STREET YARD = 512.33 + 1,266.63 = 1,778.96 SF  
 IMPERVIOUS AREA = 264.82 SF  
 PERCENT IMPERVIOUS = 264.82 / 1,778.96 \* 100% = 14.89%  
 REQUIRED PLANTING = 1,778.96 / 600 = 2.97, 3 CANOPY TREES (OR 3 UNDERSTORY TREES PER 1 CANOPY TREE)  
 2.97 \* 6 = 17.82, 18 SHRUBS  
 PROVIDED PLANTINGS = 9 UNDERSTORY TREES, 18 SHRUBS

**TREE MITIGATION**  
 TOTAL PINE TREE DBH = 34"  
 REQUIRED # OF PINE PLUGS = (1 / 3) \* 0.5 \* 34 = 5.67, 6 PLUGS  
 PROVIDED # OF PINE PLUGS = 6 PLUGS (LONG LEAF PINE)  
 TOTAL OTHER TREE DBH (100% MITIGATION) = 118"  
 REQUIRED # OF REPLACEMENT TREES = (2 / 3) \* 1.0 \* 118 = 78.67, 79 TREES  
 PROVIDED # OF REPLACEMENT TREES = 79 TREES (YAUPON HOLLY)

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

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



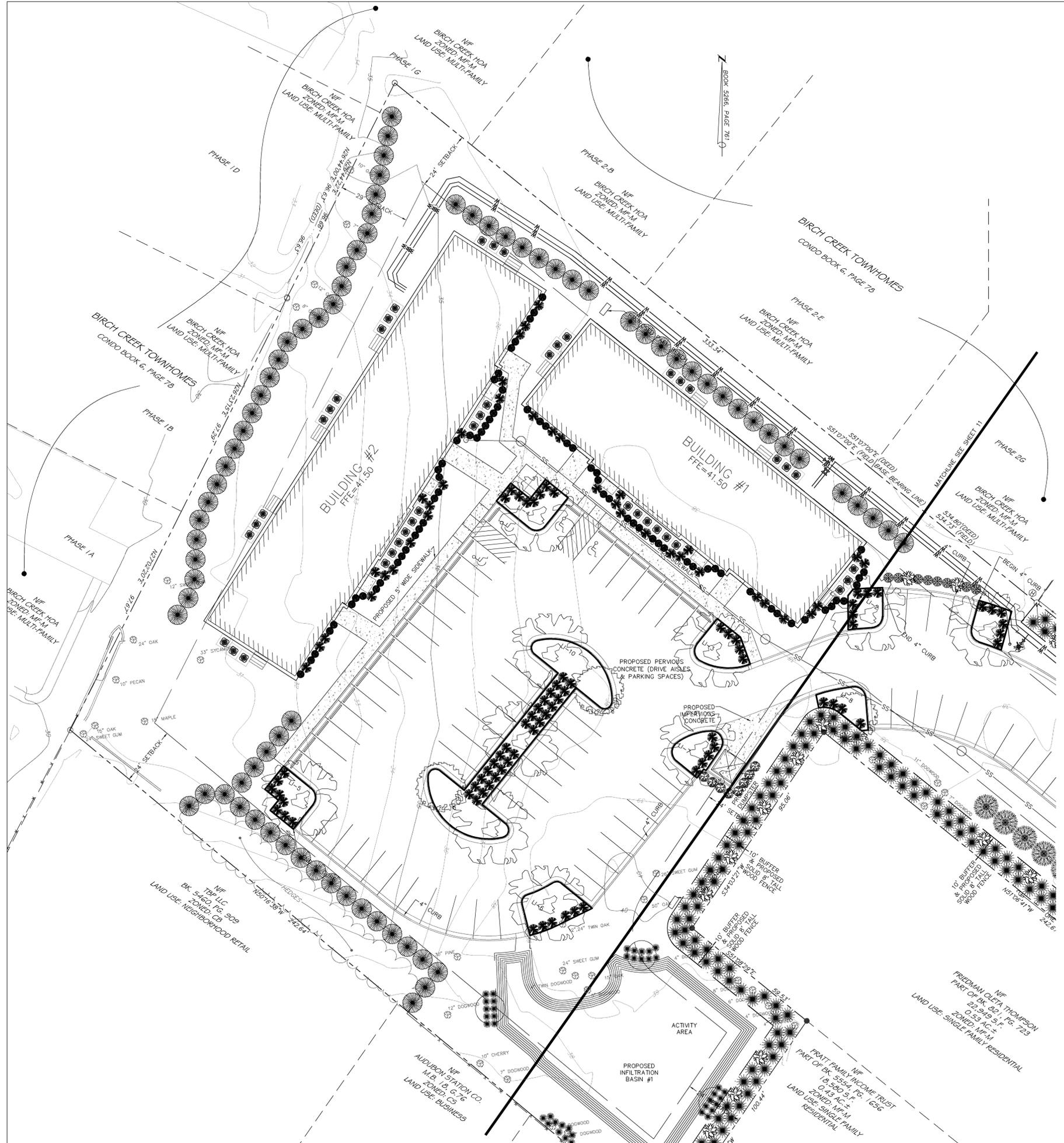
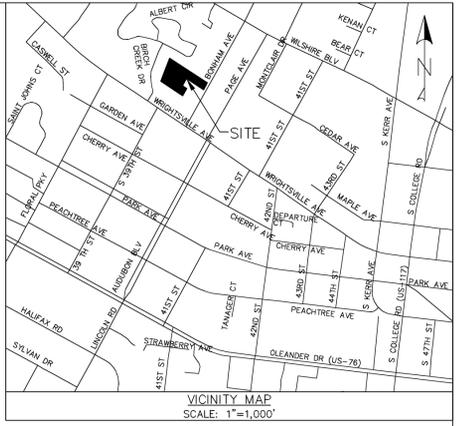
REV. NO.	DESCRIPTION	DATE

LANDSCAPE PLAN  
 1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**MALPASS ENGINEERING & SURVEYING, P.C.**  
 1134 SHIPYARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-5843  
 Fax 910-392-5203 License No. C-2380

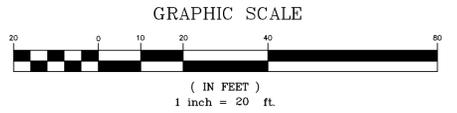
Owner: 128UM LLC  
 P.O. BOX 1229  
 WILMINGTON, NORTH CAROLINA 28402

DATE: 3-15-13  
 SCALE: 1"=20'  
 DRAWN: JCB  
 CHECKED: JEM  
 PROJECT NO: 219  
 SHEET NO: 11  
 OF: 17



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

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



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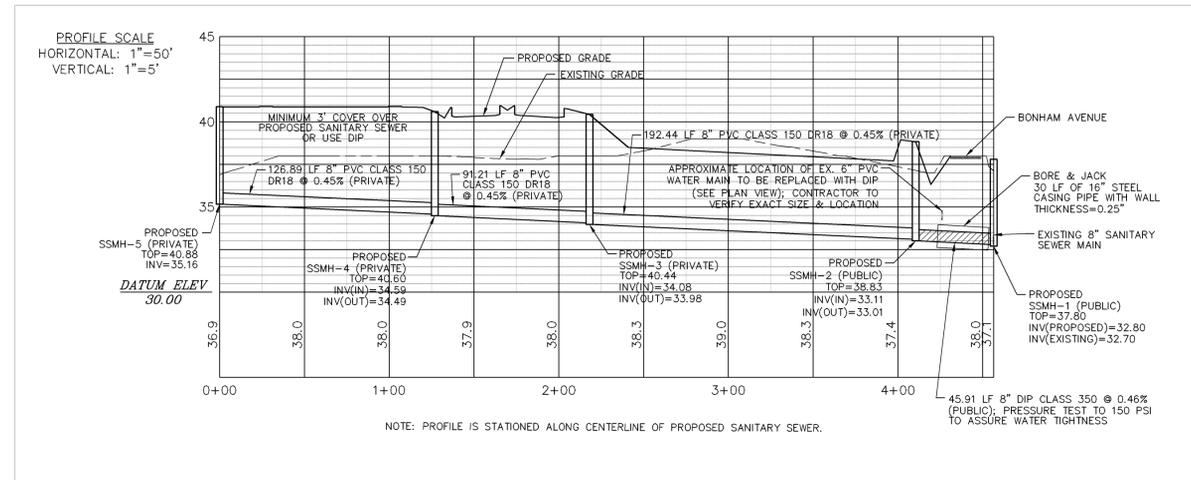
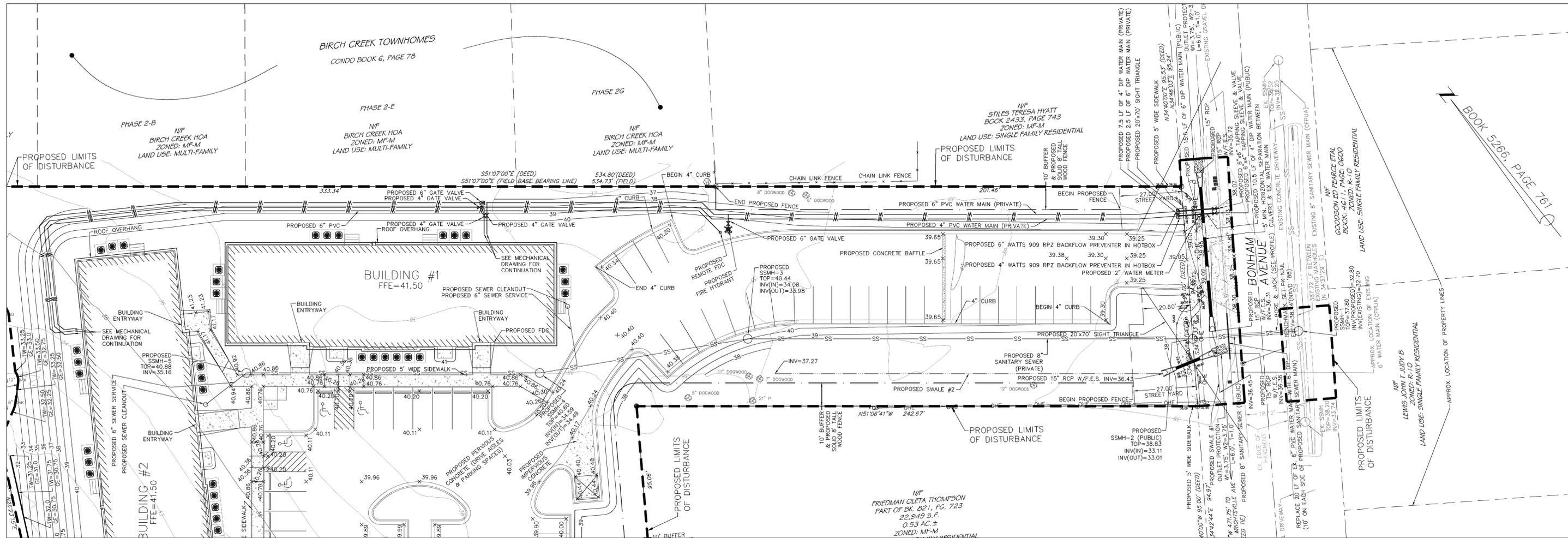
LANDSCAPE PLAN  
 1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

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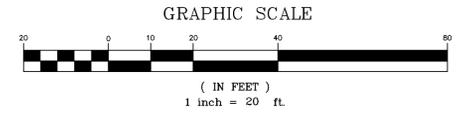
Owner: 1280M LLC  
 P.O. BOX 1229  
 WILMINGTON, NORTH CAROLINA 28402

DATE: 3-15-13  
 SCALE: 1"=20'  
 DRAWN: JCB  
 CHECKED: JEM  
 PROJECT NO: 219  
 SHEET NO: 12  
 OF: 17



**LEGEND**

- = EXISTING IRON PIPE
- = SET IRON ROD
- ⊙ = SET PK NAIL
- ⊕ = EXISTING POWER POLE
- ⊗ = EXISTING WATER METER
- ⊠ = EXISTING LIGHT BOX
- ☆ = EXISTING LIGHT POLE
- ⊛ = EXISTING FIRE HYDRANT
- ⊙ = EXISTING TREE
- = EXISTING CONTOUR
- — — = CENTERLINE
- — — = R/W
- — — = EXISTING OVERHEAD LINE
- — — = EXISTING DITCH
- — — = EXISTING FENCE
- — — = EXISTING WATER MAIN
- — — = EXISTING SANITARY SEWER MAIN
- — — = PROPERTY LINE
- — — = ADJACENT LOT LINES (APPROX.)
- — — = PROPOSED BUFFER/SOLID FENCE
- — — = PROPOSED CULVERT
- — — = PROPOSED STREET YARD
- — — = PROPOSED WATER MAIN
- — — = PROPOSED SANITARY SEWER
- — — = PROPOSED GATE VALVE
- — — = PROPOSED FIRE HYDRANT
- — — = PROPOSED SPOT ELEVATION
- — — = PROPOSED CONTOUR
- — — = PROPOSED LIMITS OF DISTURBANCE
- — — = PROPOSED SWALE



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

**Approved Construction Plan**

Name	Date
Planning _____	
Public Utilities _____	
Traffic _____	
Fire _____	

- CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:**
- SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
  - SERVICES SHALL BE PERPENDICULAR TO MAIN AND TERMINATE AT RIGHT-OF-WAY LINE. SERVICES IN CUL-DE-SACS ARE REQUIRED TO BE PERPENDICULAR, OR MUST ORIGINATE IN MANHOLE AND TERMINATE AT RIGHT-OF-WAY LINE.
  - ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
  - MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
  - NO FLEXIBLE COUPLINGS SHALL BE USED.
  - ALL STAINLESS STEEL FASTENERS SHALL BE 316.

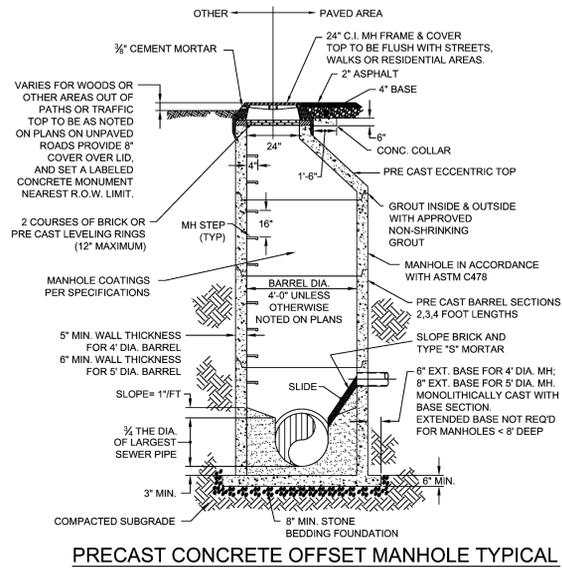
**STANDARD SEWER NOTES**  
(REQUIRED ON ALL SEWER PLAN AND PROFILE SHEETS)

PLAN PROFILE  
1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

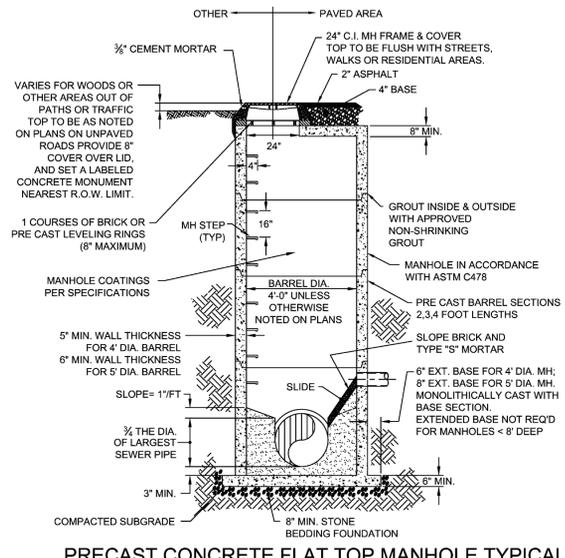
MALPASS ENGINEERING & SURVEYING, P.C.  
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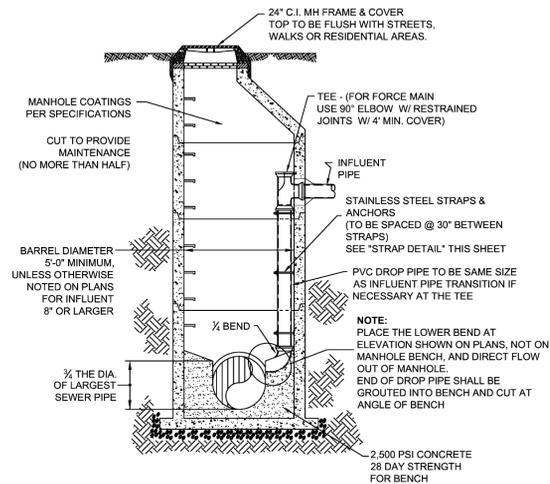
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CHECKED: JEM  
PROJECT NO: 219  
SHEET NO: 3  
OF: 17



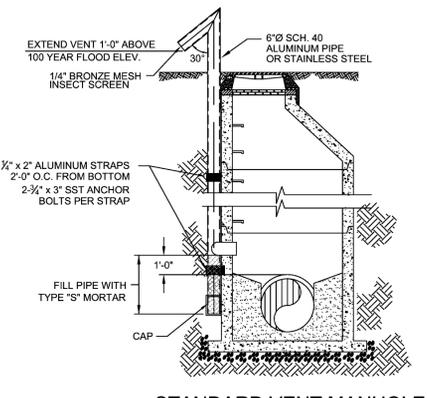
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NOT TO SCALE



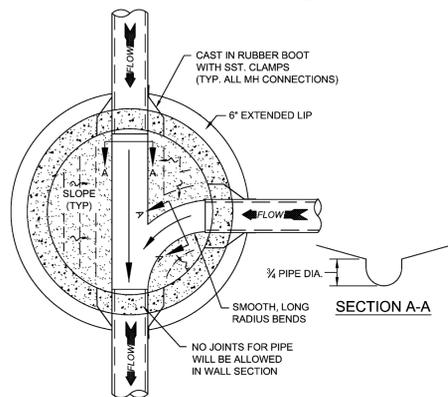
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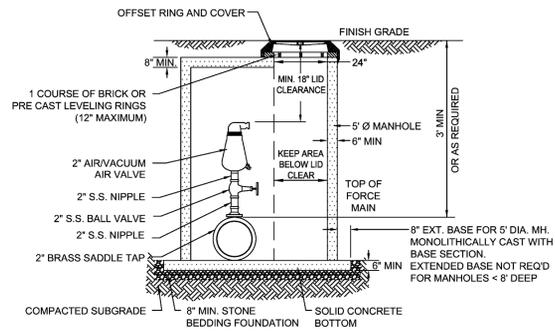
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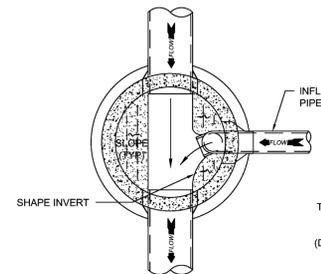
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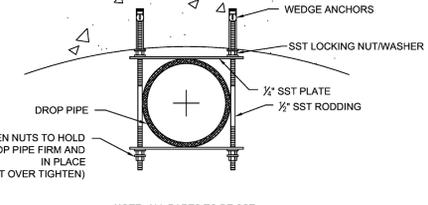
NOT TO SCALE



NOT TO SCALE



NOT TO SCALE



NOT TO SCALE

- CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD SEWER NOTES:**
- SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
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REQUIRED ON ALL SEWER PLAN AND PROFILE SHEETS

**GENERAL NOTES:**

- NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES BEFORE ANY CONSTRUCTION BEGINS.
- THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WHILE CONSTRUCTION IS IN PROGRESS.
- THE CONTRACTOR IS RESPONSIBLE FOR STABILIZATION OF ALL DISTURBED AREAS.
- THE CONTRACTOR IS RESPONSIBLE FOR LAY DOWN & STOCKPILE AREAS (TO ARRANGE AND INSURE COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS).

**THE DETAILS SHOWN HEREON SUPERCEDE CFPWA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04**

<b>CFPUA SANITARY SEWER</b>		DATE: 1/9/12
<b>STANDARD DETAILS</b>		SCALE: N/A
 CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560		DRAWN BY: CFPUA
Stewardship. Sustainability. Service.		CHECKED BY: CFPUA
		PROJECT NO.:
		SHEET NO: SSD-1

REV:	DESCRIPTION:	DATE:
1	AIR / VACUUM AND AIR RELEASE COMBINATION VALVE REVISED	10/26/12
2	STANDARD SEWER NOTE #6 REVISED	12/10/12

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

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

SANITARY SEWER DETAIL SHEET  
1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

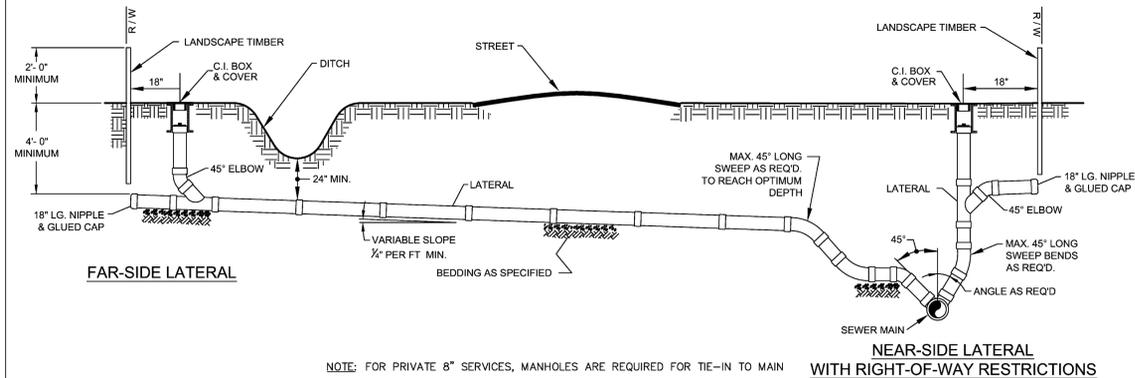
**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

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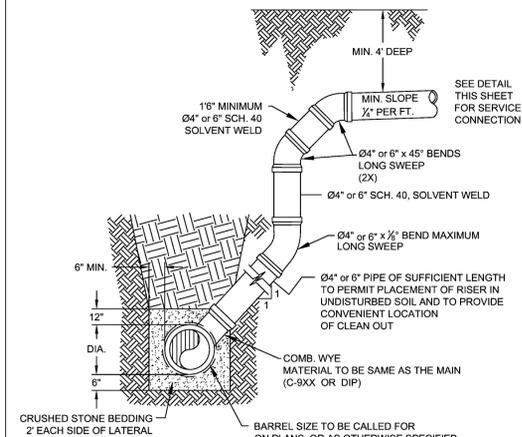
DATE:  
3-13-13  
SCALE:  
N.T.S.  
DRAWN:  
JCB  
CHECKED:  
JEM  
PROJECT NO:  
219  
SHEET NO: 14  
OF: 17

REV. NO.	DESCRIPTION	DATE



**STANDARD SERVICE CONNECTION TO SANITARY SEWER**

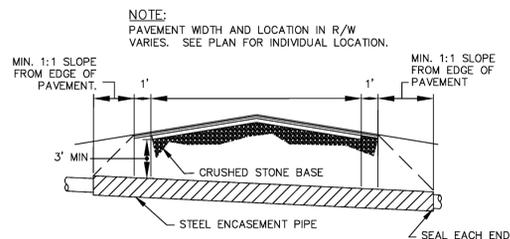
NOT TO SCALE



**DEEP SERVICE LATERAL**

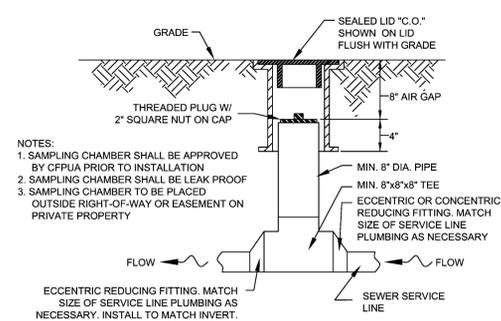
(MAIN DEPTH GREATER THAN 8ft)

NOT TO SCALE



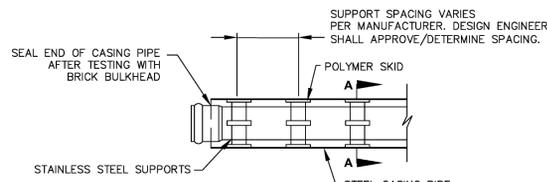
**TYPICAL BORING/JACKING DETAIL**

NOT TO SCALE



**SAMPLING CHAMBER**

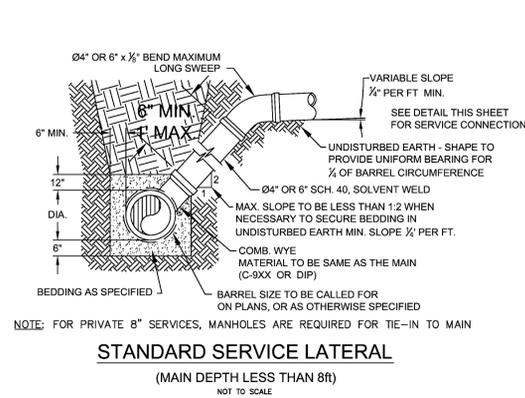
NOT TO SCALE



**SECTION A-A**

**PIPE CASING SUPPORT DETAIL**

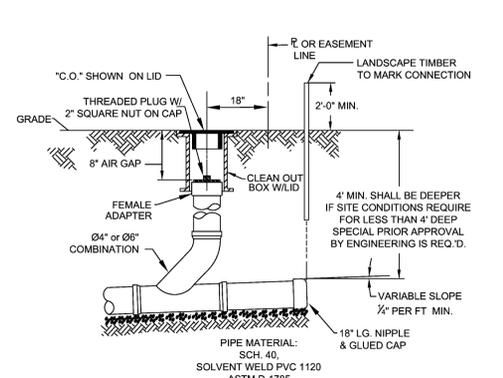
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**STANDARD SERVICE LATERAL**

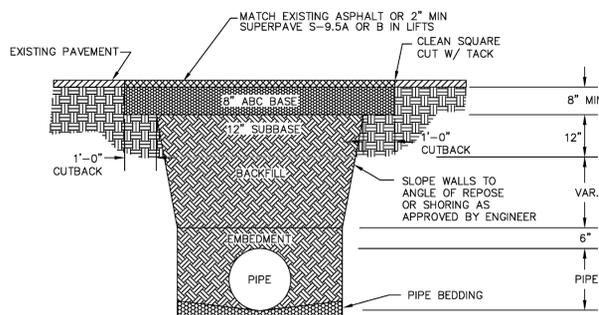
(MAIN DEPTH LESS THAN 8ft)

NOT TO SCALE



**SERVICE CONNECTION & CLEAN-OUT**

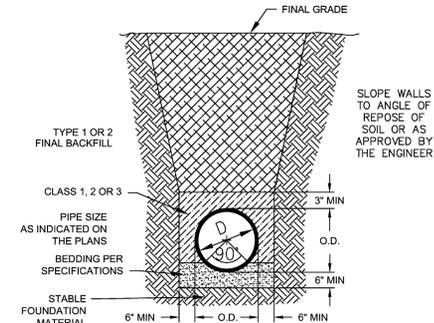
NOT TO SCALE



**PAVEMENT REPAIR WHERE PIPE INSTALLED**

(FOR PRIVATE ROADS AND PAVED AREAS; CONTRACTOR TO MEET MIN. REQUIREMENTS AS DEFINED BY RIGHT-OF-WAY OWNER FOR PUBLIC ROAD REPAIRS)

NOT TO SCALE



**CL 50 DUCTILE IRON DR 18 PVC PIPE TRENCH DETAIL**

NOT TO SCALE

- NOTES:  
 1. BACKFILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBOS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.  
 2. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC.)  
 3. 8-INCH OF ABC BASE MATERIAL SHALL BE USED ON CITY STREETS.  
 4. BACKFILL AND BASE MATERIALS SHALL BE COMPACTED 12" MINIMUM LIFTS  
 5. SOIL SHALL BE COMPACTED BY A MECHANIZED TAMPER (I.E. JUMPING JACK), HOWEVER, VIBRATORY ROLLERS > 18" WIDTH MAY BE USED FOR LARGER EXCAVATIONS. THE PLATE TAMP METHOD SHALL NOT BE USED.  
 6. ALL APPROVED CASTINGS SHALL BE SET FLUSH TO GRADE AND SUPPORTED IF APPLICABLE.  
 7. ABC BASE AND SUBBASE COMPACTED TO 98% AND BACKFILL AND EMBEDMENT COMPACTED TO 90% AS DETERMINED BY THE MODIFIED PROCTOR AASHTO METHOD T-99.  
 8. 1-FOOT CUTBACKS OF ASPHALT SHALL BE PREPARED ON UNDISTURBED SOIL. MINIMUM ASPHALT DENSITY IS 90%.

**GENERAL NOTES:**

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**THE DETAILS SHOWN HEREON SUPERCEDE CFPWA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04**

REV.	DESCRIPTION:	DATE:
1	SAMPLING CHAMBER REVISED	10/26/12

**CFPUA SANITARY SEWER**

**STANDARD DETAILS**

**SHEET NO: SSD-2**

CAPE FEAR PUBLIC UTILITY AUTHORITY  
 235 GOVERNMENT CENTER DRIVE  
 WILMINGTON, NC 28403  
 OFFICE: (910)332-6560

DATE: 1/9/12  
 SCALE: N/A  
 DRAWN BY: CFPWA  
 CHECKED BY: CFPWA  
 PROJECT NO.:

**STORMWATER MANAGEMENT PLAN APPROVED**

CITY OF WILMINGTON  
 ENGINEERING DEPARTMENT  
 DATE: \_\_\_\_\_ PERMIT # \_\_\_\_\_  
 SIGNED: \_\_\_\_\_

**Approved Construction Plan**

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

Planning: \_\_\_\_\_  
 Public Utilities: \_\_\_\_\_  
 Traffic: \_\_\_\_\_  
 Fire: \_\_\_\_\_

REV. NO.	DESCRIPTION	DATE

SANITARY SEWER DETAIL SHEET  
 1006 BONHAM AVENUE  
**BONHAM APARTMENTS**  
 CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

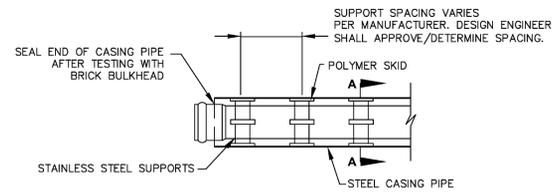
**FINAL DRAWING FOR REVIEW PURPOSES ONLY**

MALPASS ENGINEERING & SURVEYING, P.C.  
 1134 SHPPARD BOULEVARD  
 WILMINGTON, NORTH CAROLINA 28412  
 Phone 910-392-5843  
 Fax 910-392-5293 License No. C-2320

Owner: 1280M LLC  
 P.O. BOX 1229  
 WILMINGTON, NORTH CAROLINA 28402

DATE: 3-13-13  
 SCALE: N.T.S.  
 DRAWN: JCB  
 CHECKED: JEM  
 PROJECT NO: 219  
 SHEET NO: 15  
 OF: 17





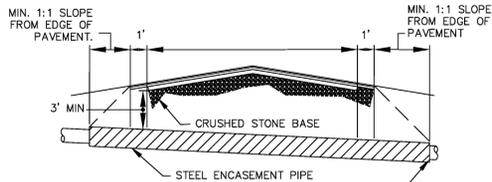
NOTE: PIPE SUPPORT TO BE PLACED TO PROVIDE PROPER SUPPORT, ALIGNMENT, AND GRADE AS SPECIFIED. CONTINUOUS SUPPORTS MAY BE USED AS ALTERNATIVE. OIL, GREASE, OR PETROLEUM PRODUCT MAY NOT BE USED AS LUBRICANT.



SECTION A-A  
PIPE CASING SUPPORT DETAIL

NOT TO SCALE

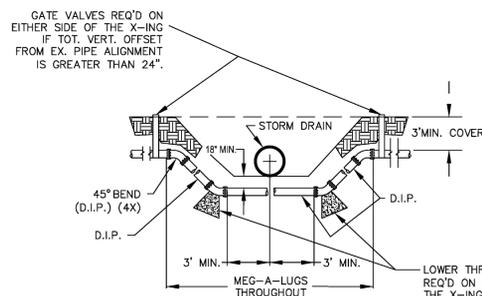
NOTE: PAVEMENT WIDTH AND LOCATION IN R/W VARIES. SEE PLAN FOR INDIVIDUAL LOCATION.



NOTES:  
1. CASING WILL BE INSTALLED AT LINE AND GRADE SHOWN ON INDIVIDUAL PROFILE FOR EACH CROSSING. BORING/JACKING TO LINE AND GRADE IS REQUIRED.  
2. TRACER WIRE SHALL BE CONTINUED THROUGH CASING.

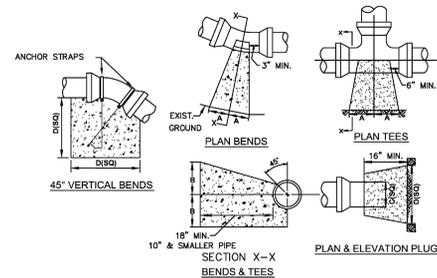
TYPICAL BORING/JACKING DETAIL

NOT TO SCALE



NOTE: USE D.I.P. (CL50 OR BETTER)  
WATER MAIN DITCH & STORM DRAIN CROSSING

NOT TO SCALE

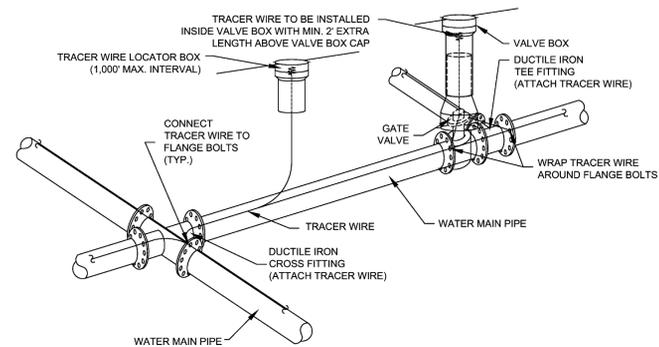


SIZE	90° BENDS		45° BENDS		22 1/2° BENDS		TEES/PLUGS		45° VERT. BENDS
	A	B	A	B	A	B	A	B	
3"	8"	6"	5"	6"	3"	7"	6"	8"	27"
4"	8"	9"	5"	8"	3"	11"	6"	9"	28"
6"	14"	11"	9"	9"	8"	8"	12"	9"	36"
8"	16"	16"	12"	12"	10"	13"	14"	13"	42"
10"	18"	22"	15"	14"	14"	16"	18"	15"	50"
12"	20"	28"	18"	17"	16"	16"	22"	18"	62"
14"	26"	29"	21"	19"	18"	18"	26"	20"	72"
16"	33"	29"	25"	21"	20"	21"	32"	21"	83"
18"	40"	30"	28"	24"	22"	23"	36"	24"	88"

NOTES: 1. BASED ON 160 PSI TEST PRESSURE AND 2000 PSF SOIL BEARING CAPACITY.  
2. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.  
3. USE MEG-A-LUG (PREFERRED) IN LIEU OF BLOCKING AND RODDING.

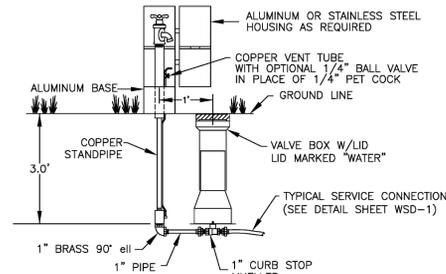
THRUST BLOCK DETAIL

NOT TO SCALE



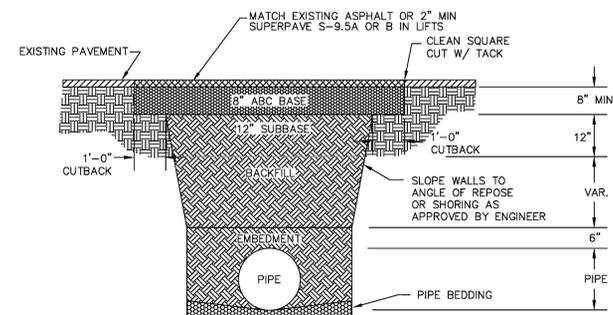
NOTES:  
1. TRACER WIRE SHALL BE #10 COPPER SOLID CORE COPPER WIRE WITH GAS AND OIL RESISTANT INSULATION.  
2. WIRE SHALL BE STRAPPED TO ALL PVC WATER MAIN PIPING WITH DUCT TAPE AT 12-FT. INTERVALS.  
3. SECURE WIRE TO ALL TEE AND CROSS FITTINGS.  
4. ALL WIRE SPLICES SHALL HAVE WATER PROOF WIRE CONNECTIONS.

TRACER WIRE DETAIL



SAMPLING STATION

NOT TO SCALE

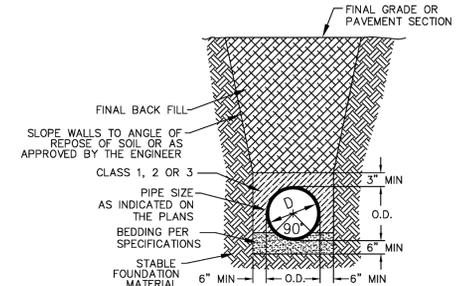


NOTES:  
1. BACKFILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.  
2. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC).  
3. 8-INCH OF ABC BASE MATERIAL SHALL BE USED ON CITY STREETS.  
4. BACKFILL AND BASE MATERIALS SHALL BE COMPACTED 12" MINIMUM LIFTS.  
5. SOIL SHALL BE COMPACTED BY A MECHANIZED TAMPER (I.E. JUMPING JACK), HOWEVER, VIBRATORY ROLLERS > 18" WIDTH MAY BE USED FOR LARGER EXCAVATIONS. THE PLATE TAMP METHOD SHALL NOT BE USED.  
6. ALL APPROVED CASTINGS SHALL BE SET FLUSH TO GRADE AND SUPPORTED IF APPLICABLE.  
7. ABC BASE AND SUBBASE COMPACTED TO 98% AND BACKFILL AND EMBEDMENT COMPACTED TO 90% AS DETERMINED BY THE MODIFIED PROCTOR KASHTO METHOD T-98.  
8. 1-FOOT CUTBACKS OF ASPHALT SHALL BE PREPARED ON UNDISTURBED SOIL. MINIMUM ASPHALT DENSITY IS 90%.

PAVEMENT REPAIR WHERE PIPE INSTALLED

(FOR PRIVATE ROADS AND PAVED AREAS;  
CONTRACTOR TO MEET MIN. REQUIREMENTS AS DEFINED BY  
RIGHT-OF-WAY OWNER FOR PUBLIC ROAD REPAIRS)

NOT TO SCALE



CL 50 DUCTILE IRON  
DR 18 PVC PIPE TRENCH DETAIL

NOT TO SCALE

GENERAL NOTES:

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THE DETAILS SHOWN HEREON SUPERCEDE CFPUA  
WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

CFPUA WATER DISTRIBUTION SYSTEM

DATE: 1/9/12  
SCALE: N/A  
DRAWN BY: CFPUA  
CHECKED BY: CFPUA  
PROJECT NO.:

STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY  
235 GOVERNMENT CENTER DRIVE  
WILMINGTON, NC 28403  
OFFICE: (910)332-6560

SHEET NO:  
WSD-2

REV:	DESCRIPTION:	DATE:

REV. NO.	DESCRIPTION REVISIONS	DATE

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

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

WATER DETAIL SHEET  
1006 BONHAM AVENUE  
BONHAM APARTMENTS  
CITY OF WILMINGTON WILMINGTON TOWNSHIP NEW HANOVER COUNTY NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY

MALPASS ENGINEERING & SURVEYING, P.C.  
1134 SHIPYARD BOULEVARD  
WILMINGTON, NORTH CAROLINA 28412  
Phone 910-392-5843  
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