

W:\1\13-0481\130481-Helmsdale\CD\2013 Updated Plans\Sheets\CD COVER.dwg - Wednesday, March 15, 2017 10:57:14 AM - PALK, SANDRA

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

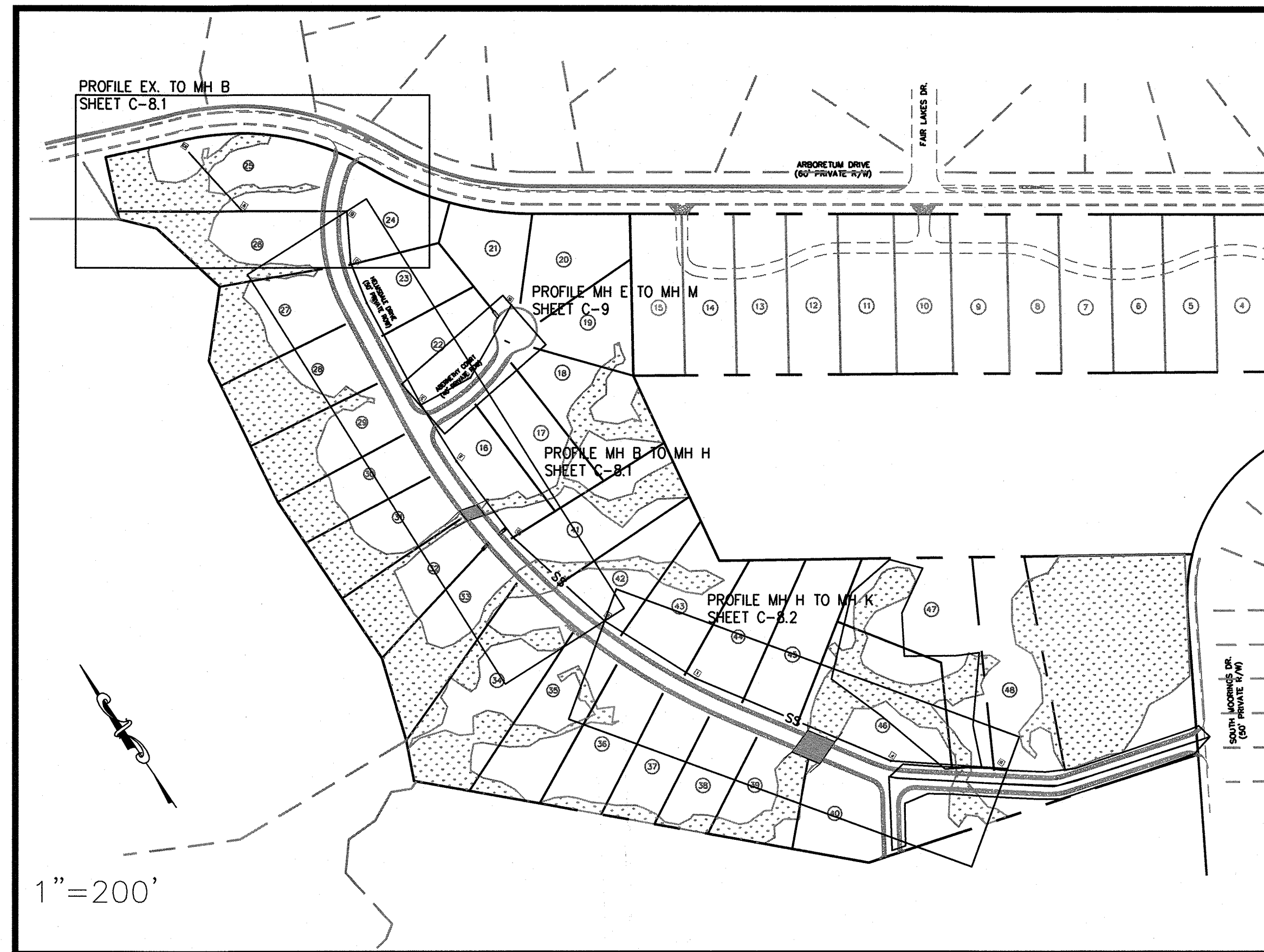
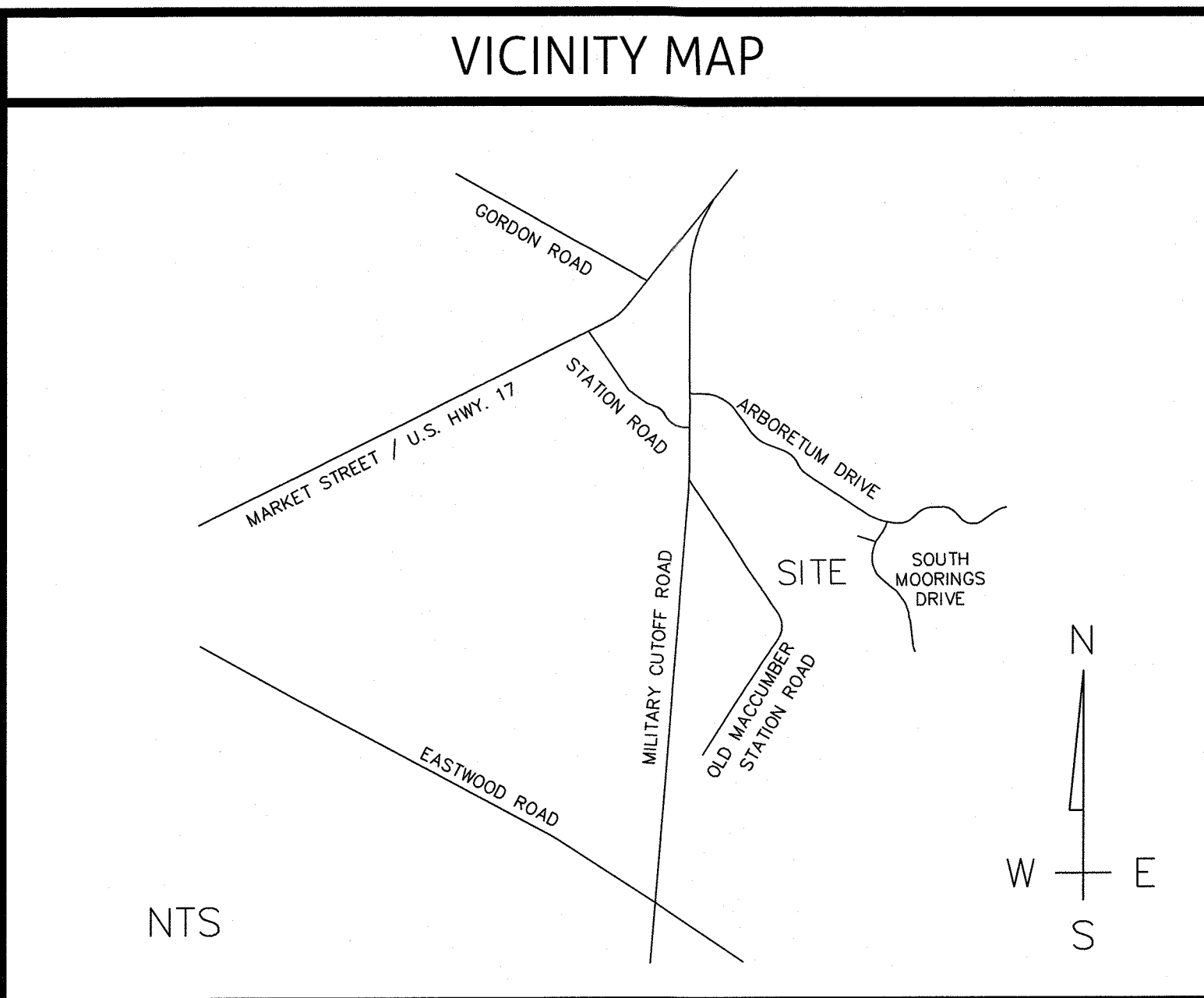
Approved Construction Plan  
Name \_\_\_\_\_ Date \_\_\_\_\_  
Planning \_\_\_\_\_  
Public Utilities \_\_\_\_\_  
Traffic \_\_\_\_\_  
Fire \_\_\_\_\_

NCDENR PWSS WATER PERMIT #: 07-01574  
WATER CAPACITY: \_\_\_\_\_ GPD  
DIWO SEWER PERMIT #: WQ0033225  
SEWER CAPACITY: \_\_\_\_\_ GPD  
SEWER SHED # AND PLANT: \_\_\_\_\_  
SEWER TO FLOW THROUGH NEI: YES or NO (CIRCLE ONE)

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

# SITE DEVELOPMENT PLANS FOR HELMSDALE @ LANDFALL PHASE 2 CITY OF WILMINGTON, NC

AUGUST 14, 2007  
(UPDATED MARCH 2017)



PROPERTY ADDRESS: 558 ARBORETUM DRIVE, WILMINGTON, NC 28405

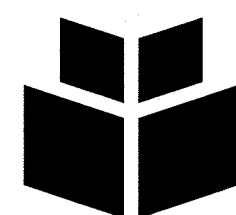
LEGEND		
DESCRIPTION	EXISTING	PROPOSED
1' CONTOUR INTERVAL	---	---
5' CONTOUR INTERVAL	---	---
PROPERTY LINE	---	---
ROADWAY CENTERLINE	---	---
RIGHT OF WAY LIMITS	---	---
EASEMENT LINE	---	---
CURB & GUTTER	---	---
SANITARY SEWER FACILITIES	---	---
STORM SEWER FACILITIES	---	---
WATERLINE	---	---
FIRE HYDRANT ASSEMBLY	---	---
FENCING STRUCTURE	---	---
WOODSLINE	---	N/A
WATERWAYS	---	N/A
TREE PROTECTION FENCE	N/A	TP
SILT FENCE	N/A	SF

## DEVELOPER/OWNER

HELMSDALE INVESTORS, LCC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
(919) 481-3000

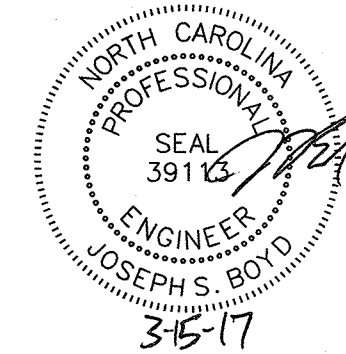
ATTN: TIM SMITH

## PREPARED BY:



**WithersRavenel**  
Engineers | Planners | Surveyors

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



THIS PLAN SET WAS DESIGNED AND  
LAST SIGNED BY GARRY S. PAPE (PE  
LICENSE # 031315) ON 7/9/08. THIS  
REVISED SET IS ONLY PER REVISIONS  
BY THE GOVERNING AGENCIES AND  
VARIOUS SITE EDITS.

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## SITE DEVELOPMENT DATA

DEVELOPMENT DATA :  
TOTAL LOTS PROPOSED - 33  
IMPERVIOUS SURFACE (PROPOSED):  
ROADWAY - 79,966 SF  
SIDEWALK - 26,526 SF  
LOTS - 185,658 SF

### GENERAL NOTES:

- NEW HANOVER COUNTY PARCEL NO.(S):  
3158(15) - 64 - 5396
- TOTAL TRACT AREA: 31.94 ACRES
- EXISTING ZONING DISTRICT: R-20(PR)
- LAND CLASSIFICATION:  
RESOURCE PROTECTION & CONSERVATION
- SETBACKS (CITY OF WILMINGTON):  
FRONT-30  
SIDE-15  
BACK-25
- THIS PHASE IS LOCATED IN ZONE "AE" ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S INSURANCE RATE MAP COMMUNITY-PANEL NUMBER 3720315800J DATED APRIL 3, 2006, 100-YEAR FLOOD ELEV=10.00

**NOTE:**  
ALL DESIGN AND CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE CITY OF WILMINGTON, THE CAPE FEAR UTILITY AUTHORITY & STATE OF NORTH CAROLINA



COORDINATION NOTES:

- THE CONTRACTOR IS REQUIRED TO OBTAIN ANY/ALL PERMITS REQUIRED FOR CONSTRUCTION OF THESE PLANS.
- ALL WORK IS TO BE IN ACCORDANCE WITH THE CITY OF WILMINGTON, CAPE FEAR PUBLIC UTILITY AUTHORITY, NEW HANOVER COUNTY, AND THE STATE OF NORTH CAROLINA.
- THE CONTRACTOR IS TO ESTABLISH AND CHECK ALL HORIZONTAL AND VERTICAL CONTROLS TO BE USED WITH THE PROJECT. IN ADDITION, THE CONTRACTOR IS TO COMPUTE THE LAYOUT OF THE ENTIRE SITE PLAN IN ADVANCE OF BEGINNING ANY WORK ASSOCIATED WITH THE SUBJECT PLANS. CONTRACTOR SHALL EMPLOY A PROFESSIONAL SURVEYOR TO PERFORM SITE IMPROVEMENT STAKEOUT(S).
- ANY TIME WORK IS PERFORMED OFF-SITE OR WITHIN AN EXISTING EASEMENT, THE CONTRACTOR IS TO NOTIFY THE HOLDER OF SAID EASEMENT AS TO THE NATURE OF PROPOSED WORK, AND TO FOLLOW ANY GUIDELINES OR STANDARDS WHICH ARE ASSOCIATED WITH OR REFERENCED IN THE RECORDED EASEMENT.
- THE CONTRACTOR SHALL SCHEDULE A PRECONSTRUCTION MEETING WITH THE CITY OF WILMINGTON INSPECTOR AND NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO THE MEETING. AT A MINIMUM; THE CONTRACTOR, CITY INSPECTOR, AND ENGINEER SHALL ATTEND THIS MEETING.

GENERAL NOTES:

- THE TOPOGRAPHY AND UTILITIES HAVE BEEN PROVIDED BY WITHERS & RAVENEL. THE BOUNDARY AND WETLAND SURVEY HAVE BEEN PROVIDED BY HOBBS SURVEYING COMPANY, INC. THE TREE SURVEY HAS BEEN PROVIDED BY HANOVER DESIGN SERVICES, PA.
- REASONABLE CARE HAS BEEN EXERCISED IN SHOWING THE LOCATION OF EXISTING UTILITIES ON THE PLANS. THE EXACT LOCATION OF ALL EXISTING UTILITIES IS NOT KNOWN IN ALL CASES. THE CONTRACTOR SHALL EXPLORE THE AREA AHEAD OF DITCHING OPERATIONS BY OBSERVATIONS, ELECTRONIC DEVICES, HAND DIGGING AND BY PERSONAL CONTACT WITH THE UTILITY COMPANIES. IN ORDER TO LOCATE EXISTING UTILITIES IN ADVANCE OF TRENCHING OPERATIONS SO AS TO ELIMINATE OR MINIMIZE DAMAGE TO EXISTING UTILITIES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS RESULTING FROM ANY DAMAGE TO THE EXISTING UTILITY LINES INCLUDING LOSS OF UTILITY REVENUES. CONTRACTOR SHALL ARRANGE FOR TEMPORARY SUPPORT OF EXISTING UTILITIES, SUCH AS POLES, CONDUITS, FIBER OPTIC CABLES, TELEPHONE CABLES, WATER LINES, ETC.
- CONTRACTOR SHALL COMPLY WITH THE LATEST REVISIONS AND INTERPRETATIONS OF THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT. CONTRACTOR SHALL PLAN AND CONSTRUCT WORK SO AS TO CAUSE MINIMUM INCONVENIENCE TO THE OWNER AND THE PUBLIC.
- CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN AT ALL TIMES DURING THE PROGRESS OR TEMPORARY SUSPENSION OF WORK, SUITABLE BARRIERS, FENCES, SIGNS OR OTHER ADEQUATE PROTECTION, INCLUDING FLAGMEN AND WATCHMEN AS NECESSARY TO INSURE THE SAFETY OF THE PUBLIC AS WELL AS THOSE ENGAGED IN THE CONSTRUCTION WORK. CONSTRUCTION SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "CONSTRUCTION AND MAINTENANCE OPERATIONS SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" BY THE DOT.
- ALL MATERIAL CLEARED OR DEMOLISHED BY THE CONTRACTOR IN ORDER TO CONSTRUCT THE WORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROPERLY DISPOSED OF OFF-SITE.
- ALL WORK BY THE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR AFTER THE OWNER ACCEPTS THE WORK.
- CONTRACTOR SHALL CALL THE NORTH CAROLINA ONE-CALL CENTER AT 1 (800) 632-4949 AND ALLOW THE CENTER TO LOCATE EXISTING UTILITIES BEFORE DIGGING.
- CONTRACTOR SHALL REMOVE ASPHALT, AGGREGATE BASE COURSE, AND CONCRETE CURB & GUTTER WITHIN LIMITS OF DEMOLITION AS SHOWN ON PLAN.
- ALL PAVEMENT MARKINGS IN PUBLIC RIGHT-OF-WAYS AND FOR DRIVEWAYS ARE TO BE THERMOPLASTIC AND MEET CITY AND/OR NCDOT STANDARDS. [DETAIL SD-13 CoW TECH STDS]
- ALL SIGNS AND PAVEMENT MARKINGS IN AREAS OPEN TO PUBLIC TRAFFIC ARE TO MEET MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) STANDARDS. [DETAIL SD 15-13 CoW TECH STDS]
- ALL TRAFFIC CONTROL SIGNS AND MARKINGS OFF THE RIGHT-OF-WAY ARE TO BE MAINTAINED BY THE PROPERTY OWNER IN ACCORDANCE WITH MUTCD STANDARDS.
- ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
- A UTILITY CUT PERMIT IS REQUIRED FOR EACH OPEN CUT IN A CITY STREET. NOTE THIS ON THE PLAN AND CONTACT 341-5888 FOR MORE DETAILS. IN CERTAIN CASES AN ENTIRE RESURFACING OF THE AREA BEING OPEN CUT MAY BE REQUIRED.
- 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. THE SUBDIVIDER MAY ACQUIRE AND ERECT OFFICIAL STREET NAME SIGNS OR MAY CHOOSE TO CONTRACT WITH THE CITY TO INSTALL THE STREET SIGNS AND THE SUBDIVIDER SHALL PAY THE COST OF SUCH INSTALLATION. CONTRACT 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.
- ANY BROKEN OR MISSING SIDEWALK PANELS, DRIVEWAY PANELS AND CURBING WILL BE REPLACED.
- A LANDSCAPING PLAN INDICATING THE LOCATION OF REQUIRED STREET TREES SHALL BE SUBMITTED TO THE CITY OF WILMINGTON TRAFFIC ENGINEERING DIVISION AND PARKS AND RECREATION DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO THE RECORDING OF THE FINAL PLAT. [SD 15-14 CoW TECH STDS]
- CONTACT TRAFFIC ENGINEERING AT 341-7888 FORTY- EIGHT HOURS PRIOR TO ANY EXCAVATION IN THE RIGHT OF WAY.
- IF THESE UNITS ARE SOLD AT ANY POINT, THE BUYER MUST RECEIVE A SUBDIVISION STREET DISCLOSURE STATEMENT. PLEASE NOTE THIS ON THE SITE PLAN AND ADVISE THE PROPERTY OWNER OF THIS REQUIREMENT.

DEMOLITION NOTES:

- CONTRACTOR TO COORDINATE WITH THE OWNER TO PROPERLY MAINTAIN OR RELOCATE EXISTING SERVICE CONNECTIONS WHEN NECESSARY.
- CONTRACTOR IS TO WALK THE SITE AND BECOME FAMILIAR WITH THE SCOPE OF DEMOLITION REQUIRED. ALL DEMOLITION WORK REQUIRED TO CONSTRUCT NEW SITE IMPROVEMENTS WILL BE PERFORMED BY THE CONTRACTOR AND WILL BE UNCLASSIFIED EXCAVATION.
- DEMOLITION SHALL INCLUDE BUT IS NOT LIMITED TO THE EXCAVATION, HAULING AND OFFSITE DISPOSAL OF CONCRETE PADS, CONCRETE DITCHES, FOUNDATIONS, SLABS, STEPS, AND STRUCTURES; ABANDONED UTILITIES, BUILDINGS, PAVEMENTS AND ALL MATERIALS CLEARED AND STRIPPED TO THE EXTENT NECESSARY AS DIRECTED BY THE SOILS ENGINEER FOR THE INSTALLATION OF THE NEW IMPROVEMENTS AND WITHIN THE LIMITS OF CLEARING AND GRADING AND AS SHOWN ON THESE PLANS.
- THE CONTRACTOR SHALL PROTECT ALL ADJACENT PROPERTY, STRUCTURES AND UTILITIES ON THE PROPERTY NOT TO BE DEMOLISHED. DAMAGE TO PROPERTIES OF OTHERS DUE TO THE CONTRACTOR'S ACTIVITIES SHALL BE REPLACED IN KIND BY THE CONTRACTOR AT NO COST TO OWNER.
- ELECTRIC, TELEPHONE, SANITARY SEWER, WATER AND STORM SEWER UTILITIES THAT SERVICE OFF-SITE PROPERTIES SHALL BE MAINTAINED DURING THE CONSTRUCTION PROCESS BY THE CONTRACTOR.
- EXISTING UTILITIES NOT INTENDED FOR DEMOLITION SHALL BE MAINTAINED, PROTECTED AND UNDISTURBED DURING DEMOLITION.
- ALL EXISTING IMPROVEMENTS INDICATED OR REQUIRED TO BE DEMOLISHED SHALL INCLUDE REMOVAL FROM THE PROPERTY AND PROPER DISPOSAL.
- CONTRACTOR SHALL COORDINATE RELOCATION OF ALL EXISTING OVER HEAD AND UNDERGROUND UTILITIES INCLUDING CABLE, GAS, TELEPHONE AND ELECTRIC AND ANY OTHER UTILITIES THROUGH THE SITE WITH THE RESPECTIVE COMPANIES.
- PROVIDE SMOOTH SAW CUT OF EXISTING PAVEMENTS, CURBS AND GUTTERS AND SIDEWALKS TO BE DEMOLISHED.
- ALL DEMOLITION WORK SHALL BE DONE IN STRICT ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS AS WELL AS OSHA REGULATIONS.
- INFORMATION CONCERNING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS, BUT THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATIONS OF THE MAINS BY DIGGING TEST PITS BY HAND.

EROSION AND SEDIMENT CONTROL NOTES

EROSION CONTROL AND SEQUENCE OF CONSTRUCTION NOTES:

- CLEAR AND REMOVE FROM SITE ALL TREES, ROOTS, ROOT MAT, ETC. FROM THE AREA WITHIN DESIGNATED CLEARING LIMITS.
- PLANT GRASS OVER ALL GRADED AREAS WITHIN 21 CALENDAR DAYS OF CEASE OF ANY GRADING ACTIVITY.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING AND RESTORING TO PRE-CONSTRUCTION CONDITIONS ANY AREAS OUTSIDE THE PROJECT LIMITS THAT MAY INADVERTENTLY BE DAMAGED DUE TO THE FAILURE OF THE EROSION MEASURES
- DURING GRADING AND AFTER GRADING HAS BEEN COMPLETED, CONTRACTOR SHALL CONTINUE TO MAINTAIN PERMANENT AND TEMPORARY EROSION CONTROL MEASURES UNTIL FINAL INSPECTION AND APPROVAL BY THE NEW HANOVER COUNTY ENGINEERING DEPARTMENT.
- WATER, FERTILIZE, MOW AND MAINTAIN SPRIGGED, SODDED AND PLANTED AREAS UNTIL FINAL APPROVAL BY NEW HANOVER COUNTY.
- 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.
- DRY DETENTION BASINS TO BE USED AS SEDIMENT TRAPS DURING LAND DISTURBING ACTIVITIES.

MAINTENANCE PLAN

- ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF-PRODUCING RAINFALL BUT IN NO CASE LESS THAN ONCE EVERY WEEK AND WITHIN 24 HOURS OF EVERY HALF INCH RAINFALL. ANY NEEDED REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED.
- ALL POINTS OF EGRESS WILL HAVE CONSTRUCTION ENTRANCES THAT WILL BE PERIODICALLY TOP-DRESSED WITH AN ADDITIONAL 2 INCHES OF #4 STONE TO MAINTAIN PROPER DEPTH. THEY WILL BE MAINTAINED IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE SITE. IMMEDIATELY REMOVE OBJECTIONABLE MATERIAL SPILLED WASHED OR TRACKED ONTO THE CONSTRUCTION ENTRANCE OR ROADWAYS.
- SEDIMENT WILL BE REMOVED BEHIND THE SEDIMENT FENCE WHEN IT BECOMES 0.5 FEET DEEP AT THE FENCE. THE SEDIMENT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER. SILT FENCE STAKES WILL BE SPACED 6 FEET APART UNLESS A WIRE BACKING IS USED WITH 8 FOOT STAKE SPACING.
- SEDIMENT WILL BE REMOVED FROM SEDIMENT TRAPS WHEN THE DESIGNED STORAGE REPLACE WHEN THE SEDIMENT POOL NO LONGER DRAINS OR WHEN THE ROCK IS DISLODGED. BAFFLES WILL BE REPAIRED OR REPLACED IF THEY COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE. THEY WILL BE REPLACED PROMPTLY. SEDIMENT WILL BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE 1ST BAFFLE.
- ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDDED AS NECESSARY, AND MULCHED ACCORDING TO SPECIFICATIONS IN THE VEGETATIVE PLAN TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER. ALL SLOPES WILL BE STABILIZED WITHIN 21 CALENDAR DAYS. ALL OTHER AREAS WILL BE STABILIZED WITHIN 15 WORKING DAYS.
- SEDIMENT WILL BE REMOVED FROM AROUND TEMPORARY ROCK CHECK DAMS ONCE A WEEK AND AFTER EVERY RAIN EVENT.

STABILIZATION NOTES

- SLOPES LEFT EXPOSED WILL, WITHIN 21 CALENDAR DAYS OF ANY PHASE OF GRADING, BE PLANTED OR OTHERWISE PROVIDED WITH GROUND COVER, DEVICES, OR STRUCTURES TO RESTRAIN EROSION.
- ALL OTHER DISTURBED AREAS SHALL BE PLANTED OR OTHERWISE PROVIDED PERMANENT GROUND COVER WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT WHICHEVER PERIOD IS SHORTER.

PERMANENT SEEDING SCHEDULE -- MIXTURE 5CP

SEEDING MIXTURE	RATE (LB/ACRE)
SPECIES	
CENTPEDE GRASS	10-20

Seeding Dates

MARCH - JUNE

Soil Amendments

APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY 300 LB/ACRE 10-10-10 FERTILIZER.

Mulch

DO NOT MULCH.

Maintenance

FERTILIZE VERY SPARINGLY LB/ACRE NITROGEN IN SPRING WITH NO PHOSPHORUS. CENTPEDE GRASS CANNOT TOLERATE HIGH PH OR EXCESS FERTILIZER.

TEMPORARY SEEDING-LATE WINTER/EARLY SPRING

Seeding Mixture

WINTER AND EARLY SPRING

SPECIES	RATE (LB/ACRE)
Rye (GRAIN)	120
ANNUAL LESPEDEZA (KOBE IN PIEDMONT AND COASTAL PLAIN, KOREAN IN MOUNTAINS)	50

OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE.

SUMMER

SPECIES	RATE (LB/ACRE)
GERMAN MILLET	40

FALL

SPECIES	RATE (LB/ACRE)
RYE (GRAIN)	120

Seeding dates

COASTAL PLAIN - DEC.1-APR. 15 - LATE WINTER AND EARLY SPRING  
APRIL 15 - AUG. 15 - SUMMER  
AUG. 15 - DEC. 30 - FALL

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, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

GENERAL GRADING NOTES

- REASONABLE CARE HAS BEEN EXERCISED IN SHOWING THE LOCATION OF EXISTING UTILITIES ON THE PLANS. THE EXACT LOCATION OF SUCH UTILITIES IS NOT KNOWN IN ALL CASES. THE CONTRACTOR SHALL EXPLORE THE AREA AHEAD OF THE DITCHING OPERATION BY OBSERVATIONS, ELECTRONIC DEVICES, HAND DIGGING AND BY PERSONAL CONTACT WITH THE UTILITY COMPANIES IN ORDER TO LOCATE EXISTING UTILITIES IN ADVANCE OF THE TRENCHING OPERATIONS SO AS TO AVOID AND PREVENT DAMAGE TO THE EXISTING UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COST RESULTING FROM ANY DAMAGE TO THE EXISTING UTILITY LINES INCLUDING BUT NOT LIMITED TO REPAIRS AND LOSS SERVICE REVENUE. CONTRACTOR SHALL ARRANGE FOR TEMPORARY SUPPORT OF EXISTING UTILITIES, SUCH AS POLES, CONDUITS, FIBER OPTIC CABLES, TELEPHONE CABLES, WATER LINES, ETC...
- CONTRACTOR SHALL COMPLY WITH THE LATEST REVISIONS AND INTERPRETATIONS OF THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT.
- CONTRACTOR SHALL PLAN AND CONSTRUCT WORK SO AS TO CAUSE MINIMUM INCONVENIENCE TO THE OWNER AND THE PUBLIC. THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN AT ALL TIMES DURING THE PROGRESS OR TEMPORARY SUSPENSION OF WORK, SUITABLE BARRIERS, FENCES, SIGNS OR OTHER ADEQUATE PROTECTION, INCLUDING FLAG MEN AND WATCHMEN AS NECESSARY TO INSURE THE SAFETY OF THE PUBLIC AS WELL AS THOSE ENGAGED IN THE CONSTRUCTION WORK. CONSTRUCTION SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "CONSTRUCTION AND MAINTENANCE OPERATIONS SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" BY THE NCDOT.
- ALL MATERIAL CLEARED AND GRUBBED BY THE CONTRACTOR IN ORDER TO CONSTRUCT THE WORK, SUCH AS TREES, VEGETATION, FENCING, ETC... SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROPERLY DISPOSED OF OFF-SITE OR BURNED IF PROPER PERMITS ARE RECEIVED.

SITE NOTES

- ANY DISCREPANCY IN THIS PLAN AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO START OF CONSTRUCTION. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL SETBACKS, EASEMENTS AND DIMENSIONS SHOWN HEREON BEFORE BEGINNING CONSTRUCTION.
- THE GENERAL CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES AND R.O.W.'S PUBLIC OR PRIVATE, PRIOR TO WORKING IN THESE AREAS.
- CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC SHALL BE PROTECTED FROM INJURY, AND ADJOINING PROPERTY PROTECTED FROM DAMAGE.
- ACCESS TO UTILITIES, FIRE HYDRANTS, STREET LIGHTING, ETC., SHALL REMAIN UNDISTURBED, UNLESS COORDINATED WITH THE RESPECTIVE UTILITY.
- DO NOT SCALE THIS DRAWING AS IT IS A REPRODUCTION AND SUBJECT TO DISTORTION.
- THE GENERAL CONTRACTOR SHALL REMOVE ALL DEBRIS FROM THE SITE UPON COMPLETION OF THE PROJECT AND AT LEAST ONCE A WEEK DURING CONSTRUCTION.
- THE GENERAL CONTRACTOR SHALL KEEP THE AREA OUTSIDE THE "CONSTRUCTION LIMITS" BROOM CLEAN AT ALL TIMES.
- CONTRACTOR SHALL MAINTAIN AN "AS-BUILT" SET OF DRAWINGS TO RECORD THE EXACT LOCATION OF ALL PIPING PRIOR TO CONCEALMENT. DRAWINGS SHALL BE GIVEN TO THE OWNER UPON COMPLETION OF THE PROJECT WITH A COPY OF THE TRANSMITTAL LETTER TO THE ENGINEER.
- IF DEPARTURES FROM THE SPECIFICATIONS OR DRAWINGS ARE DEEMED NECESSARY BY THE CONTRACTOR, DETAILS OF SUCH DEPARTURES AND REASONS THEREOF SHALL BE GIVEN TO THE OWNER FOR REVIEW. NO DEPARTURES FROM THE CONTRACT DOCUMENT SHALL BE MADE WITHOUT THE PERMISSION OF THE OWNER.
- CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES. THE LOCATION OF ALL EXISTING UTILITIES ARE NOT NECESSARILY SHOWN ON PLANS AND WHERE SHOWN ARE ONLY APPROXIMATE. THE CONTRACTOR SHALL ON HIS INITIATIVE AND AT NO EXTRA COST HAVE LOCATED ALL UNDERGROUND LINES AND STRUCTURES AS NECESSARY. NO CLAIMS FOR DAMAGES OR EXTRA COMPENSATION SHALL ACCRUE TO THE CONTRACTOR FROM THE PRESENCE OF SUCH PIPE OTHER OBSTRUCTIONS OR FROM DELAY DUE TO REMOVAL OR REARRANGEMENT OF THE SAME. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO UNDERGROUND STRUCTURES. CONTACT NORTH CAROLINA ONE CALL TOLL FREE 1-800-632-4949 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL NONSUBSCRIBING UTILITIES.
- ALL PERMITS RELATIVE TO PROJECT MUST BE OBTAINED, PRIOR TO CONSTRUCTION
- ALL CONSTRUCTION TO BE IN ACCORDANCE WITH PERMITS ISSUED AND APPLICABLE STATE, COUNTY, AND LOCAL CODES.
- FOR BUILDING DIMENSIONS, SEE ARCHITECTURAL DRAWINGS.
- ALL DIMENSIONS AND RADII ARE TO OUTSIDE FACE OF BUILDING OR TO FACE OF CURB UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL INSPECTIONS, CERTIFICATIONS, EQUIPMENT, ETC., THAT MAY BE REQUIRED.
- THE ENGINEER AND/OR OWNER DISCLAIM ANY ROLE IN THE CONSTRUCTION MEANS AND METHODS ASSOCIATED WITH THE PROJECT AS SET FORTH IN THESE PLANS.

CONSTRUCTION NOTES:

- THE CONSTRUCTION RELEASE BY THE CITY OF WILMINGTON WILL ADDRESS INFRASTRUCTURE PHASING REQUIREMENTS AND APPLICANT IS ENCOURAGED TO CONTACT THE WILMINGTON FIRE DEPARTMENT FOR GUIDANCE.

GRADING & STORMWATER MANAGEMENT NOTES:

- STORMWATER MANAGEMENT WILL MEET BOTH THE STATE OR NORTH CAROLINA AND CITY OF WILMINGTON REQUIREMENTS. PROJECT HAS BEEN DESIGNED TO MEET THE "LOW-DENSITY" STANDARDS WITH MAXIMUM IMPERVIOUS SURFACES OF 25% WHERE ROOFTOP RUNOFF DOES NOT DRAIN TO THE STREETS IT WILL BE DIRECTED BY GUTTERS AND DOWNSPOUTS TO INDIVIDUAL INFILTRATION TRENCHES ON EACH LOT. STREET RUNOFF WILL BE DIRECTED FROM CURB FLUMES THROUGH MINIMUM 100' GRASSED SWALES, AND INTO WETLANDS FOR BIO-RETENTION AND INFILTRATION.
- TREE PRESERVATION / REMOVAL PERMIT IS REQUIRED PRIOR TO CLEARING AND LAND DISTURBANCE.
- NO EQUIPMENT IS ALLOWED ON THE SITE UNTIL ALL TREE PROTECTION FENCING AND SILT FENCING HAS BEEN INSTALLED AND APPROVED.
- PROTECTIVE 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.

EXISTING UTILITY NOTES:

- IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO VERIFY THE ACTUAL LOCATION AND AVAILABILITY OF ALL EXISTING AND PROPOSED UTILITIES IN THE FIELD PRIOR TO GROUND BREAKING.
- EXISTING UTILITIES AND STRUCTURES SHOWN, BOTH UNDERGROUND AND ABOVE GROUND ARE BASED ON A FIELD SURVEY AND THE BEST AVAILABLE RECORD DRAWINGS. THE CONTRACTOR SHALL FIELD VERIFY FIELD CONDITIONS PRIOR TO BEGINNING RELATED CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE IMMEDIATELY.

UTILITY CONTACTS:

- CONTACT THE NORTH CAROLINA ONE CALL CENTER PRIOR TO DOING ANY DIGGING. 1-800-632-4949.

NOTICE REQUIRED:

ALL EXISTING UNDERGROUND UTILITIES SHALL BE PHYSICALLY LOCATED BY CONTRACT PRIOR TO THE BEGINNING OF ANY CONSTRUCTION IN THE VICINITY OF SAID UTILITIES.

CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION AT LEAST TWO WORKING DYAS, BUT NOT MORE THAN TEN WORKING DAYS PRIOR TO ANY EXCAVATION OR DEMOLITION.

CONTACT "CAROLINA ONE CALL" AT  
1-800-632-4949

EMERGENCY DIAL 911

POLICE - FIRE - RESCUE

UTILITY NOTES:

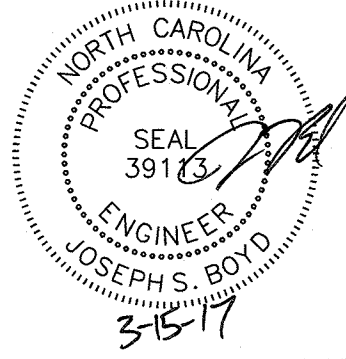
- EXISTING WATER AND SANITARY SEWER SERVICES ARE CURRENTLY AVAILABLE TO THE SITE FROM PUBLIC SYSTEMS. WATER SERVICE AND SANITARY SEWER SERVICE WILL BE PROVIDED BY CAPE FEAR PUBLIC UTILITY AUTHORITY.
- ALL UTILITY SERVICES, SUCH AS ELECTRIC POWER, CATV, GAS, AND TELEPHONE SHALL BE INSTALLED UNDERGROUND.
- PROJECT SHALL COMPLY WITH CAPE FEAR PUBLIC UTILITY AUTHORITY CROSS CONNECTION CONTROL REQUIREMENTS. WATER METER(S) CANNOT BE RELEASED UNTIL ALL REQUIREMENTS ARE MET AND N.C.D.E.N.R. HAS ISSUED THEIR "FINAL APPROVAL". CALL 332-6560 FOR INFORMATION.
- ALL COMMERCIAL WATER SERVICES AND ANY IRRIGATION SYSTEMS SUPPLIED BY C.F.P.U.A. WATER SHALL HAVE A BACKFLOW PREVENTION DEVICE ACCEPTABLE TO THE CITY AND APPROVED BY USCFCCCHR OR ASSE. CALL 332-6560 FOR INFORMATION.
- WATER AND SEWER SERVICES CAN NOT BE ACTIVATED ON NEW MAINS UNTIL THE ENGINEER'S CERTIFICATION AND AS-BUILTS ARE RECEIVED AND "FINAL APPROVAL" ISSUED BY THE PUBLIC WATER SUPPLY SECTION OF NCDENR, AND "FINAL ENGINEERING CERTIFICATION" ISSUED BY DIVISION OF WATER QUALITY SECTION OF N.C.D.E.N.R.
- IF CONTRACTOR DESIRES WATER FOR CONSTRUCTION, HE SHALL APPLY IN ADVANCE FOR THIS SERVICE AND MUST PROVIDE A REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTION DEVICE ON THE DEVELOPER'S SIDE OF THE WATER METER BOX.
- WHEN PVC WATER MAINS AND SERVICES ARE PROPOSED, THE PIPES ARE TO BE MARKED WITH NO. 10 INSULATED COPPER WIRE INSTALLED AND STRAPPED TO THE PIPES WITH DUCT TAPE. THE INSULATED WIRE IS TO BE STRIPPED TO BARE WIRE AND SECURED TO ALL VALVES AND FITTINGS. THIS WIRE IS TO BE ACCESSIBLE IN ALL VALVE AND METER BOXES TO AID IN FUTURE LOCATION OF FACILITIES.
- THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OR EXISTING UTILITIES DURING CONSTRUCTION. DAMAGED ITEMS HALL BE REPAIRED TO AT LEAST THE QUALITY OR WORKMANSHIP FOUND IN THE ORIGINAL ITEM.
- SOLID WASTE DISPOSAL TO BE SERVED BY CITY, AND PROVIDED BY INDIVIDUAL WASTE BINS FOR EACH LOT.

FIRE & LINE SAFETY NOTES:

- LANDSCAPING CANNOT BLOCK OR IMPEDE THE FDC OR FIRE HYDRANTS. A 3-FOOT (3') 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.
- TEMPORARY STREET SIGNS SHALL BE INSTALLED AT EACH STREET INTERSECTION WHEN CONSTRUCTION OF NEW ROADWAYS ALLOWS PASSAGE BY VEHICLES.

TRAFFIC NOTES:

- ALL SIGNS AND PAVEMENT MARKINGS IN AREAS OPEN TO PUBLIC TRAFFIC ARE TO MEET MUTCD STANDARDS.
- ANY BROKEN OR MISSING SIDEWALK PANELS AND/OR CURBING SHALL BE REPLACED.
- A LANDSCAPING PLAN, INDICATING THE LOCATION OR REQUIRED STREET TREES SHALL BE SUBMITTED TO THE TRAFFIC ENGINEERING DIVISION AND PARKS AND RECREATION DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO THE RECORDING OF THE FINAL PLAT. PLAN SHALL ADHERE TO SD 15-17.



THIS PLAN SET WAS DESIGNED AND  
LAST SIGNED BY GARRY S. PAPE (PE  
LICENSE # 031315) ON 7/9/08. THIS  
REVISED SET IS ONLY PER REVISIONS  
BY THE GOVERNING AGENCIES AND  
VARIOUS SITE EDITS.

Approved Construction Plan	
Name	Date
Planning _____	
Traffic _____	
Fire _____	

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

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

SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale
	ADDED NOTES PER CITY COMMENTS	6/06/14	JSB			
2	UPDATED NOTES & SIG BLOCKS PER COW COMMENTS	12/01/15	JSB	Drawn By	W&R	Date 12/19/13
				Checked By	JSB	Job No. 03050283.01

HELMSDALE @ LANDFALL - PHASE II

CITY OF WILMINGTONNEW HANOVERNORTH CAROLINA

GENERAL NOTES

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

WITHERS & RAVENEL  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.wITHERSRAVENEL.com

Sheet No.

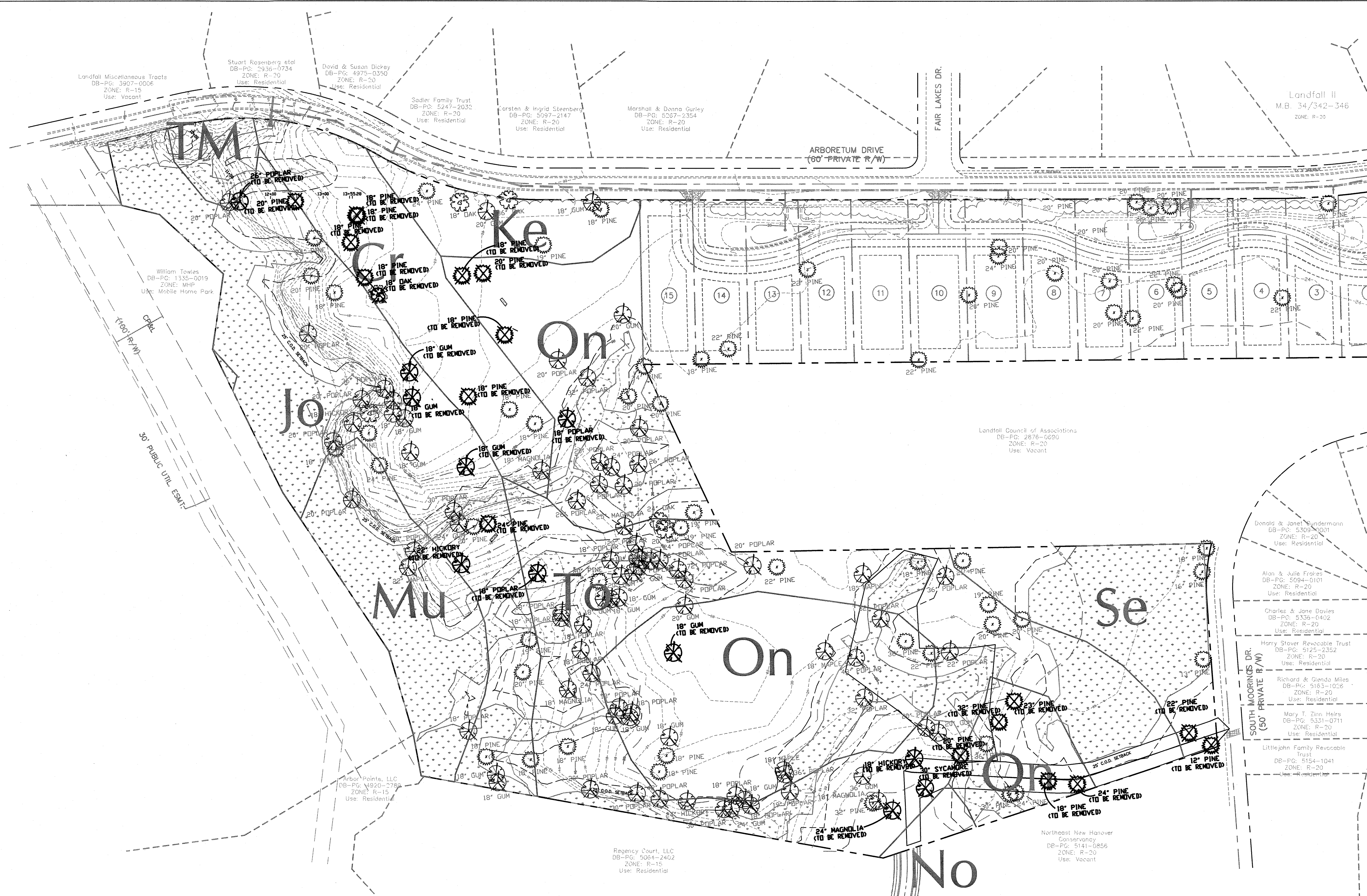
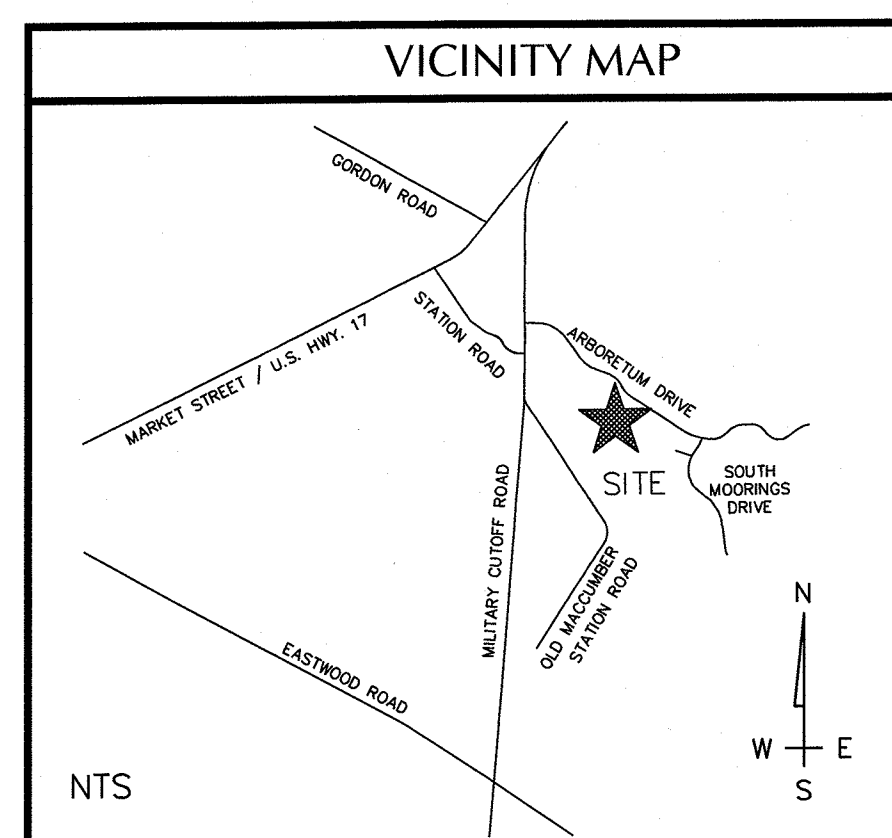
C-1





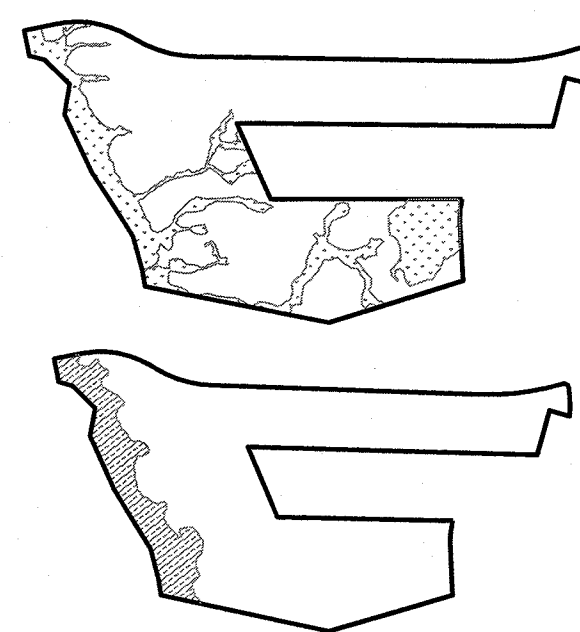


1. Soils Types: (Ks) Kenansville, (Js) Johnston, (Ss) Seagate, (Cr) Craven, (On) Onslow, (To) Tarhunta, (Mu) Murville, (No) Norfolk, (TM) Tidal Marsh.
2. This property is not impacted by any AEC.
3. There are Conservation Overlay boundaries affecting this property.
4. This site is not impacted by any recognized historic or archeological significance.
5. No cemeteries were evidenced on the site.
6. Existing vegetation has been located and is labeled.
7. There is evidence of jurisdictional wetlands on the site. The boundaries have been certified by the Corps of Engineers.  
All wetlands areas or areas contained within wetlands areas may not be filled, disturbed, or altered in any way unless properly permitted by the north carolina department of environment and natural resources and/or the u.s. army corp of engineers.  
No wetlands fill permits will be required. Wetland crossings will be bridged and left undisturbed.
8. There is no evidence of endangered species or habitat issues on the site.
9. A large area of this proposed development is located in within a Special Flood Hazard boundary, Zone AE (El 10).
10. Research resulted in no findings of proposed thoroughfares, bike routes, pedestrian sidewalks or trails, or transit facilities affecting this project.
11. The NCDWQ Drainage Basin Classification is classified as SA waters. These waters drain to the tributary of Howe Creek.



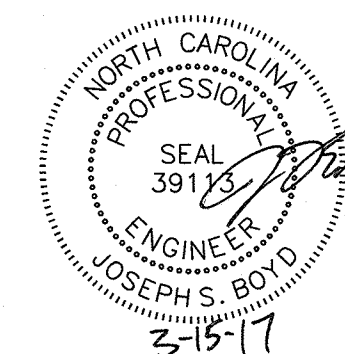
WETLANDS / UPLANDS  
9.13±AC. / 22.83±AC.

100YR FLOOD BOUNDARY  
5.51± AC. IN BOUNDARY  
26.45± AC. OUT OF BOUNDARY



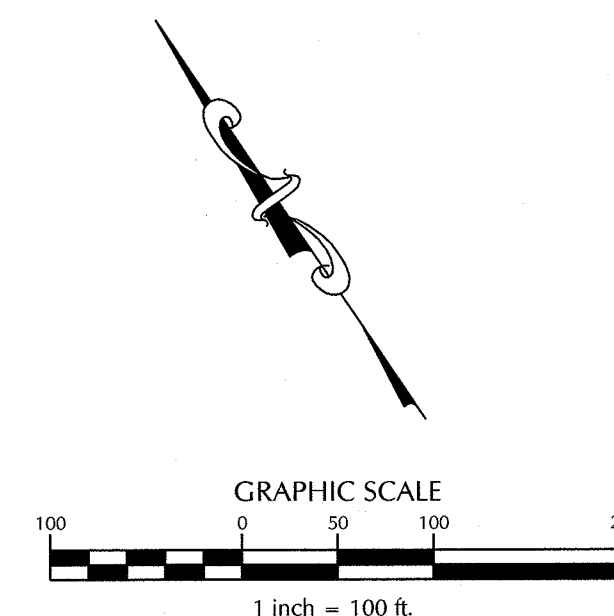
<u>Approved Construction Plan</u> <u>Name</u> _____ <u>Date</u> _____	
Planning	_____
Public Utilities	_____
Traffic	_____
Fire	_____

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



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

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SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale	1"=100'
1	UPDATED ROAD LABELS	6/4/14	JSB	Drawn By	W&R	Date	12/19/13
				Checked By	JSB	Job No.	03050283.01

HELMSDALE @ LANDFALL - PHASE II

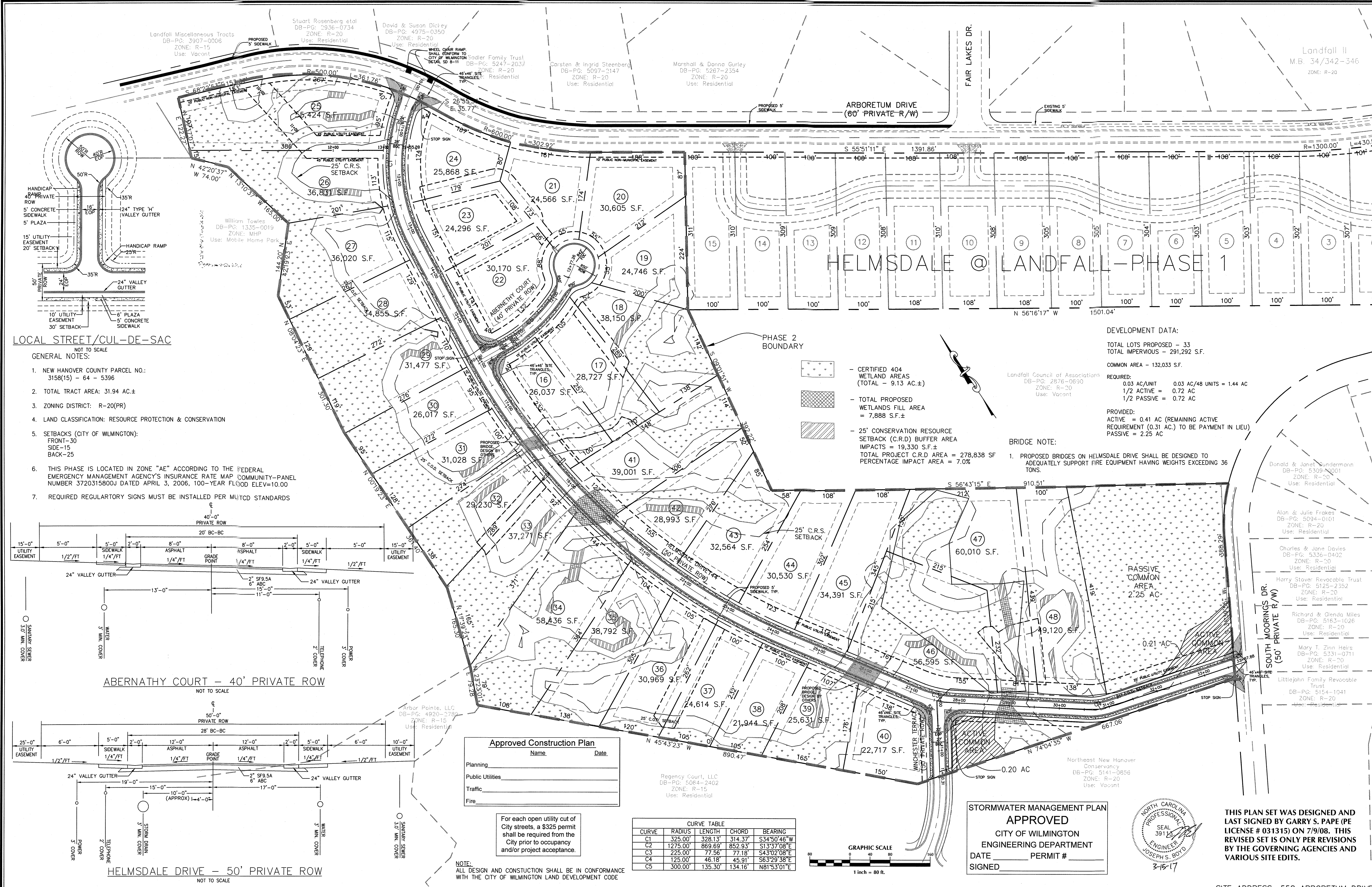
## SITE INVENTORY MAP

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

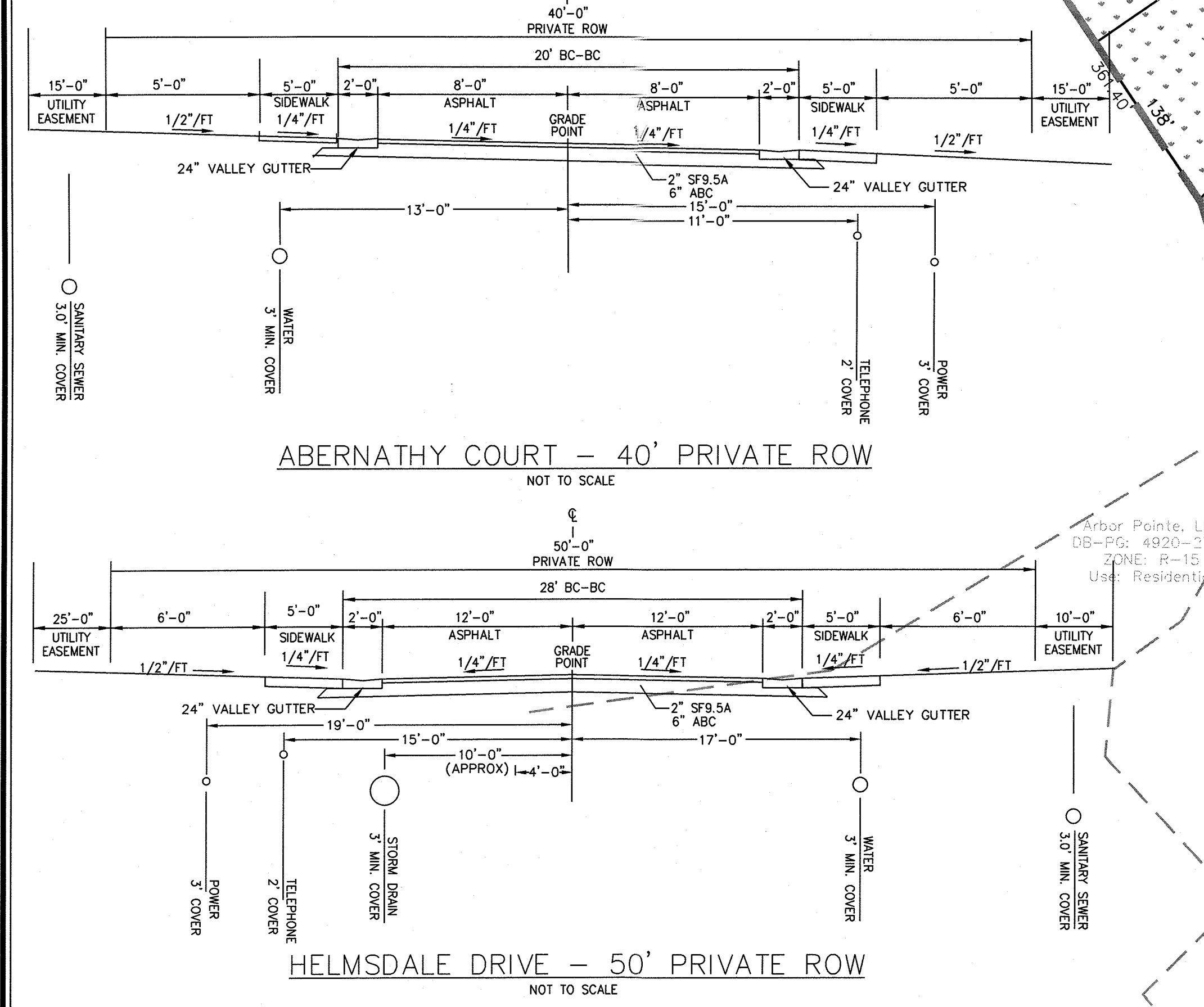
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Sheet No.  
**C-3.1**





- LOCAL STREET/CUL-DE-SAC**
- NOT TO SCALE
- GENERAL NOTES:
1. NEW HANOVER COUNTY PARCEL NO.: 3158(15) - 64 - 5396
  2. TOTAL TRACT AREA: 31.94 AC.±
  3. ZONING DISTRICT: R-20(PR)
  4. LAND CLASSIFICATION: RESOURCE PROTECTION & CONSERVATION
  5. SETBACKS (CITY OF WILMINGTON):  
FRONT-30  
SIDE-15  
BACK-25
  6. THIS PHASE IS LOCATED IN ZONE "AE" ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S INSURANCE RATE MAP COMMUNITY-PANEL NUMBER 3720315800J DATED APRIL 3, 2006, 100-YEAR FLOOD ELEV=10.00
  7. REQUIRED REGULATORY SIGNS MUST BE INSTALLED PER MUTCD STANDARDS



**Approved Construction Plan**

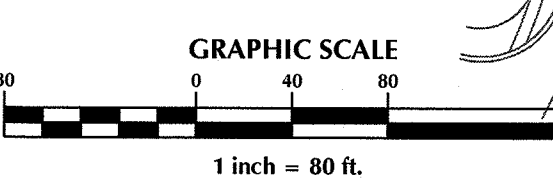
Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

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

NOTE: ALL DESIGN AND CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE CITY OF WILMINGTON LAND DEVELOPMENT CODE

**CURVE TABLE**

CURVE	RADIUS	LENGTH	CHORD	BEARING
C1	325.00'	328.13'	314.37'	S34°50'46" W
C2	1275.00'	869.69'	852.93'	S13°37'08" E
C3	225.00'	77.56'	77.18'	S43°02'08" E
C4	125.00'	46.18'	45.91'	S63°29'38" E
C5	300.00'	135.30'	134.16'	N81°53'01" E



**DEVELOPMENT DATA:**

TOTAL LOTS PROPOSED - 33  
TOTAL IMPERVIOUS - 291,292 S.F.

COMMON AREA - 132,033 S.F.

REQUIRED:

0.03 AC/UNIT	0.03 AC/48 UNITS = 1.44 AC
1/2 ACTIVE =	0.72 AC
1/2 PASSIVE =	0.72 AC

PROVIDED:

ACTIVE = 0.41 AC (REMAINING ACTIVE REQUIREMENT 0.31 AC.) TO BE PAYMENT IN LIEU  
PASSIVE = 2.25 AC

**BRIDGE NOTE:**

1. PROPOSED BRIDGES ON HELMSDALE DRIVE SHALL BE DESIGNED TO ADEQUATELY SUPPORT FIRE EQUIPMENT HAVING WEIGHTS EXCEEDING 36 TONS.

**STORMWATER MANAGEMENT PLAN**

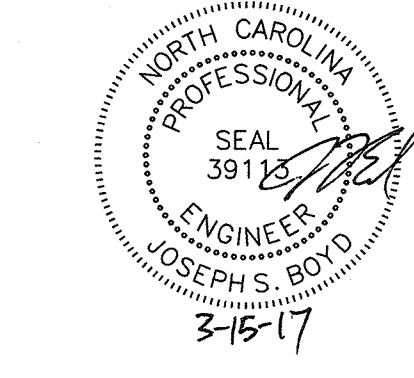
**APPROVED**

CITY OF WILMINGTON

ENGINEERING DEPARTMENT

DATE \_\_\_\_\_ PERMIT # \_\_\_\_\_

SIGNED \_\_\_\_\_



THIS PLAN SET WAS DESIGNED AND LAST SIGNED BY GARRY S. PAPE (PE LICENSE # 031315) ON 7/9/08. THIS REVISED SET IS ONLY PER REVISIONS BY THE GOVERNING AGENCIES AND VARIOUS SITE EDITS.

No.	Revision	Date	By
1	CITY OF WILMINGTON COMMENTS	7/25/07	JBS
2	UPDATED C.R.D. SETBACKS	4/25/14	JSB
3	UPDATED SIDEWALK LOCATIONS & ROAD LABELS	6/6/14	JSB

Designer	W&R	Scale	1"=80'
Drawn By	W&R	Date	12/19/13
Checked By	JSB	Job No.	03050283.01

**HELMSDALE @ LANDFALL - PHASE II**

CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

**SITE LAYOUT**

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

**WITHERS & RAVENEL**

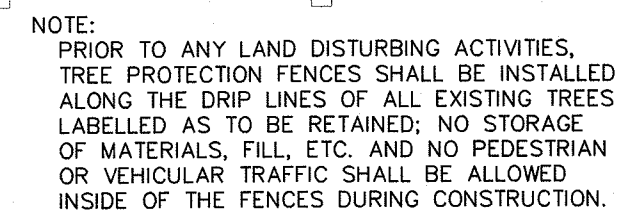
ENGINEERS | PLANNERS | SURVEYORS

1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.wITHERSRAVENEL.com

Sheet No.  
**C-3.2**



1. No land disturbance including tree removal is to occur outside the limits of disturbance shown on the plans. [18-457(b)]
2. Protective fencing is to be properly maintained throughout the duration of the project.[18-458]
3. Land clearing and construction contractors shall receive adequate instruction on tree protection requirements and methods.[18-457(d)]
4. Any trees and/or areas designated to be protected must be properly barricaded with fencing and protected throughout construction to insure that no clearing and grading or staging of materials will occur in those areas.[18-458]
5. No equipment is allowed on the site until all tree protection fencing and silt fencing has been installed and approved. [18-458]
6. Regulated and significant trees in the street yard [18-456(c)] and any trees in any required buffers [18-456(d)] area required to be retained.

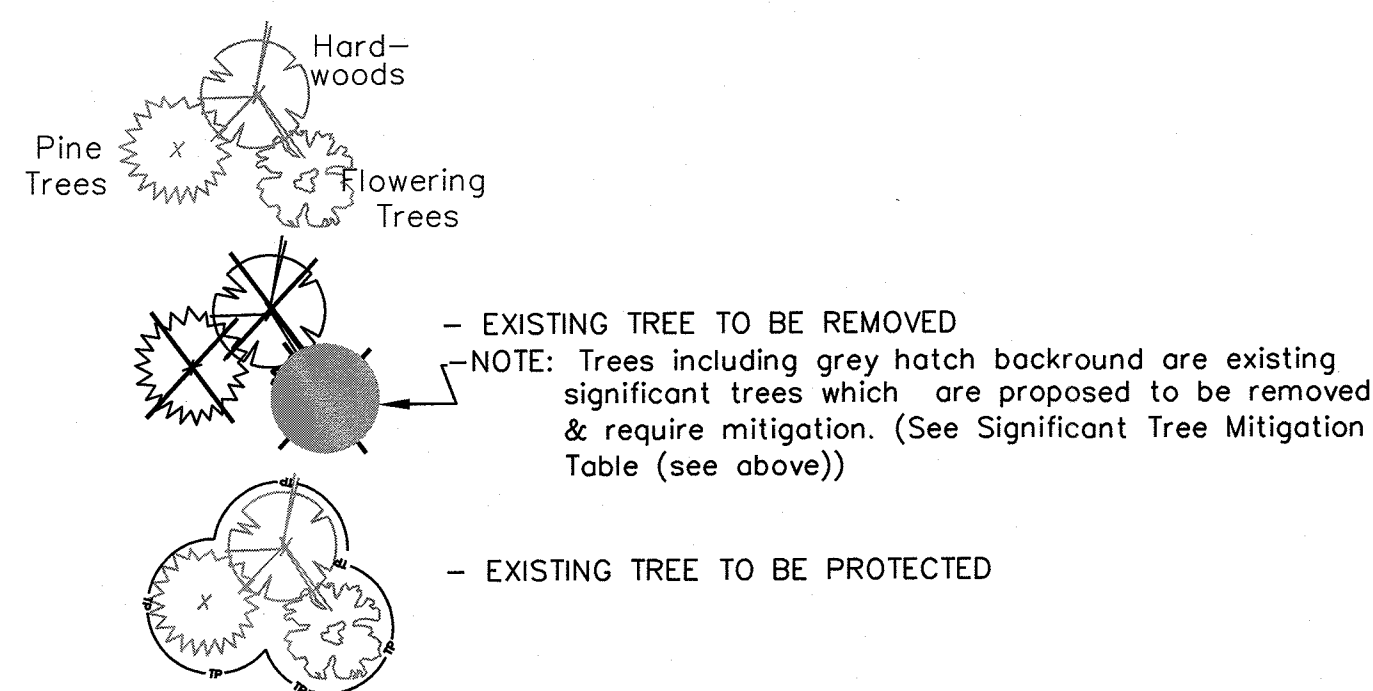


### SIGNIFICANT TREE MITIGATION

TREES TO BE MITIGATED	MITIGATION VALUE (\$2)	REQUIRED	PROVIDED
1 - 26" POPLAR	⊙ (200%)	25" (17-3" CAL.)	EX. TREE CREDIT
1 - 36" POPLAR	⊙ (200%)	72" (24-3" CAL.)	EX. TREE CREDIT
1 - 30" POPLAR	⊙ (200%)	60" (20-3" CAL.)	EX. TREE CREDIT
1 - 26" POPLAR	⊙ (200%)	25" (17-3" CAL.)	EX. TREE CREDIT
1 - 24" MAGNOLIA	⊙ (200%)	48" (16-3" CAL.)	EX. TREE CREDIT
1 - 30" SYCAMORE	⊙ (150%)	60" (20-3" CAL.)	EX. TREE CREDIT

ALL SIGNIFICANT TREES FOUND WITHIN THE CLEARING LIMITS WILL BE MITIGATED PER CITY OF WILMINGTON ZONING ORDINANCE BY PRESERVATION OF OPEN SPACE AND/OR TREE CREDITS.

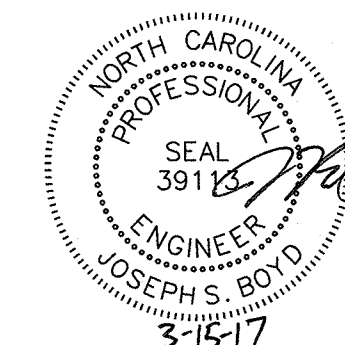
TREE PRESERVATION/REMOVAL KEY



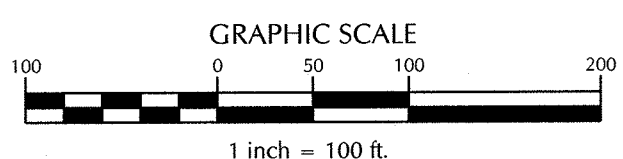
<u>Approved Construction Plan</u>	
<u>Name</u>	<u>Date</u>
Planning _____	
Public Utilities _____	
Traffic _____	
Fire _____	

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

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



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SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale	1"=100'
1	UPDATED ROAD LABELS	6/4/14	JSB	Drawn By	RCM	Date	9/27/07
				Checked By	JSB	Job No.	03050283.01

# HELMSDALE @ LANDFALL - PHASE II

CITY OF WILMINGTON      NEW HANOVER      NORTH CAROLINA

## TREE PRESERVATION PLAN

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS

Sheet No.  
C-3.3



GENERAL UTILITY NOTES:

1. PROJECT SHALL COMPLY WITH CAPE FEAR PUBLIC UTILITY AUTHORITY (CFPUA) CROSS CONNECTION REQUIREMENTS. WATER METER(S) CANNOT BE SET AND ACTIVATED ON NEW MAINS UNTIL ALL REQUIREMENTS ARE MET AND NCDENR HAS ISSUED THEIR "FINAL APPROVAL". CALL 799-6064 FOR INFORMATION.
2. IF THE CONTRACTOR DESIRES CFPUA WATER FOR CONSTRUCTION HE SHALL APPLY IN ADVANCE FOR THIS SERVICE AND MUST PROVIDE A REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTION DEVICE ON THE DEVELOPER'S SIDE OF THE WATER METER BOX.
3. CFPUA REGULATIONS DO NOT ALLOW SEPARATE WATER CONNECTIONS TO THE PUBLIC MAINS FOR IRRIGATION SYSTEMS. TO USE CFPUA WATER FOR IRRIGATION IT WILL NEED TO GO THROUGH THE DOMESTIC WATER METER AND SUBJECT TO THE NORMAL BILLING RATES. CALL 799-6064 FOR INFORMATION.
4. WHEN PVC WATER MAINS AND/OR POLYETHYLENE SERVICES ARE PROPOSED, THE PIPES ARE TO BE MARKED WITH NO. 10 INSULATED COPPER WIRE INSTALLED THE ENTIRE LENGTH AND STRAPPED TO THE PIPES WITH DUCT TAPE. THE INSULATED WIRE IS TO BE STRIPPED TO BARE WIRE AND SECURED TO ALL VALVES AND FITTINGS. THIS WIRE IS TO BE ACCESSIBLE AT ALL VALVES, FIRE HYDRANTS, AND WATER METER BOXES TO AID IN FUTURE LOCATIONS OF FACILITIES.
5. STREET TREES ARE NOT TO BE PLANTED OVER WATER MAINS OR WITHIN UTILITY EASEMENTS.
6. STATE WATER AND SEWER PERMITS AS WELL AS A WATER EXTENSION AGREEMENT SHALL BE OBTAINED PRIOR TO RELEASE OF THE PROJECT FOR CONSTRUCTION.

Approved Construction Plan

Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

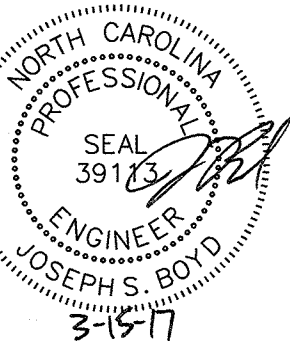
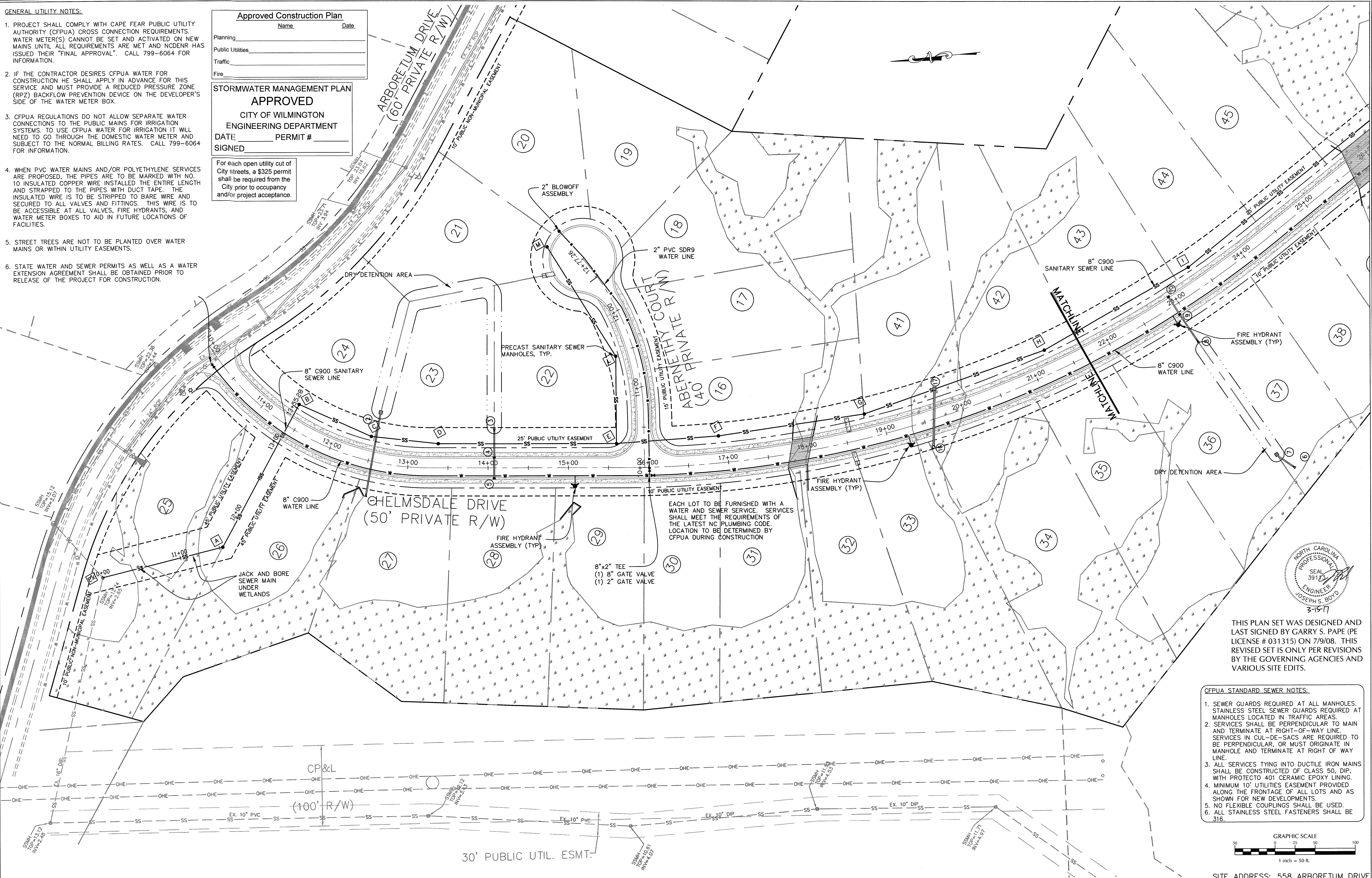
STORMWATER MANAGEMENT PLAN

APPROVED

CITY OF WILMINGTON  
ENGINEERING DEPARTMENT

DATE PERMIT #  
SIGNED

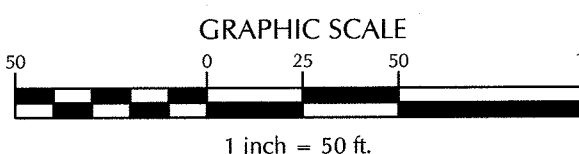
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CFPUA STANDARD SEWER NOTES:

1. SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
2. 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.
3. ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
4. MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
5. NO FLEXIBLE COUPLINGS SHALL BE USED.
6. ALL STAINLESS STEEL FASTENERS SHALL BE 316.



SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale	1"=50'
1	CITY OF WILMINGTON WATER COMMENTS	07/03/07	W&R				
2	CITY OF WILMINGTON WATER COMMENTS	07/09/07	W&R				
3	CFPUA COMMENTS	12/20/13	JSB				
4	CFPUA COMMENTS, SIDEWALK & ROAD LABEL UPDATE	08/05/14	JSB				

Drawn By	W&R	Date	12/19/13
Checked By	JSB	Job No.	03050283.01

HELMSDALE @ LANDFALL - PHASE II  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

UTILITY PLAN

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.withersravenel.com

Sheet No.  
C-4.1



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2. IF THE CONTRACTOR DESIRES CFPUA WATER FOR CONSTRUCTION HE SHALL APPLY IN ADVANCE FOR THIS SERVICE AND MUST PROVIDE A REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTION DEVICE ON THE DEVELOPER'S SIDE OF THE WATER METER BOX.
3. CFPUA REGULATIONS DO NOT ALLOW SEPARATE WATER CONNECTIONS TO THE PUBLIC MAINS FOR IRRIGATION SYSTEMS. TO USE CFPUA WATER FOR IRRIGATION IT WILL NEED TO GO THROUGH THE DOMESTIC WATER METER AND SUBJECT TO THE NORMAL BILLING RATES. CALL 799-6064 FOR INFORMATION.
4. WHEN PVC WATER MAINS AND/OR POLYETHYLENE SERVICES ARE PROPOSED, THE PIPES ARE TO BE MARKED WITH NO. 10 INSULATED COPPER WIRE INSTALLED THE ENTIRE LENGTH AND STRAPPED TO THE PIPES WITH DUCT TAPE. THE INSULATED WIRE IS TO BE STRIPPED TO BARE WIRE AND SECURED TO ALL VALVES AND FITTINGS. THIS WIRE IS TO BE ACCESSIBLE AT ALL VALVES, FIRE HYDRANTS, AND WATER METER BOXES TO AID IN FUTURE LOCATIONS OF FACILITIES.
5. STREET TREES ARE NOT TO BE PLANTED OVER WATER MAINS OR WITHIN UTILITY EASEMENTS.
6. STATE WATER AND SEWER PERMITS AS WELL AS A WATER EXTENSION AGREEMENT SHALL BE OBTAINED PRIOR TO RELEASE OF THE PROJECT FOR CONSTRUCTION.

EACH LOT TO BE FURNISHED WITH A  
WATER AND SEWER SERVICE.  
SERVICES SHALL MEET REQUIREMENTS  
OF THE LATEST NC PLUMBING CODE.  
LOCATION TO BE DETERMINED BY  
CFRUA DURING CONSTRUCTION

8" C900 -  
SANITARY SEWER

8" C900 —  
WATER LINE

DRY DETENTION AREA

CFPUA STANDARD SEWER NOTES:

1. SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
2. 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.
3. ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
4. MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
5. NEW FLEXIBLE CONDUITS SHALL BE USED.
6. ALL STAINLESS STEEL FASTENERS SHALL BE 316.

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

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

Approved Construction Plan

---

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

Planning \_\_\_\_\_

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

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

GRAPHIC SCALE

50 0 25 50 100

1 inch = 50 ft.

SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale	1"=50'
1	CITY OF WILMINGTON WATER COMMENTS	07/03/07	W&R	Drawn By	W&R	Date	12/19/13
2	CITY OF WILMINGTON WATER COMMENTS	07/09/07	W&R				
3	CFPUA COMMENTS	12/20/13	JSB	Checked By	JSB	Job No.	03050283.0
4	CFPUA COMMENTS, SIDEWALK & ROAD LABEL UPDATE	08/05/14	JSB				

HELMSDALE @ LANDFALL - PHASE II

CITY OF WILMINGTON      NEW HANOVER      NORTH CAROLINA

## UTILITY PLAN

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

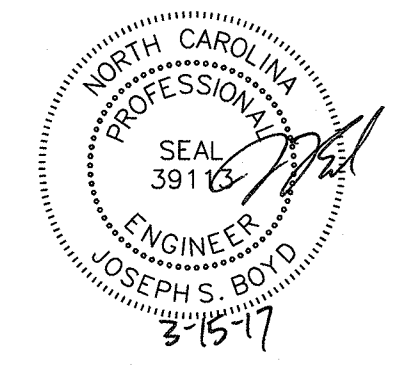
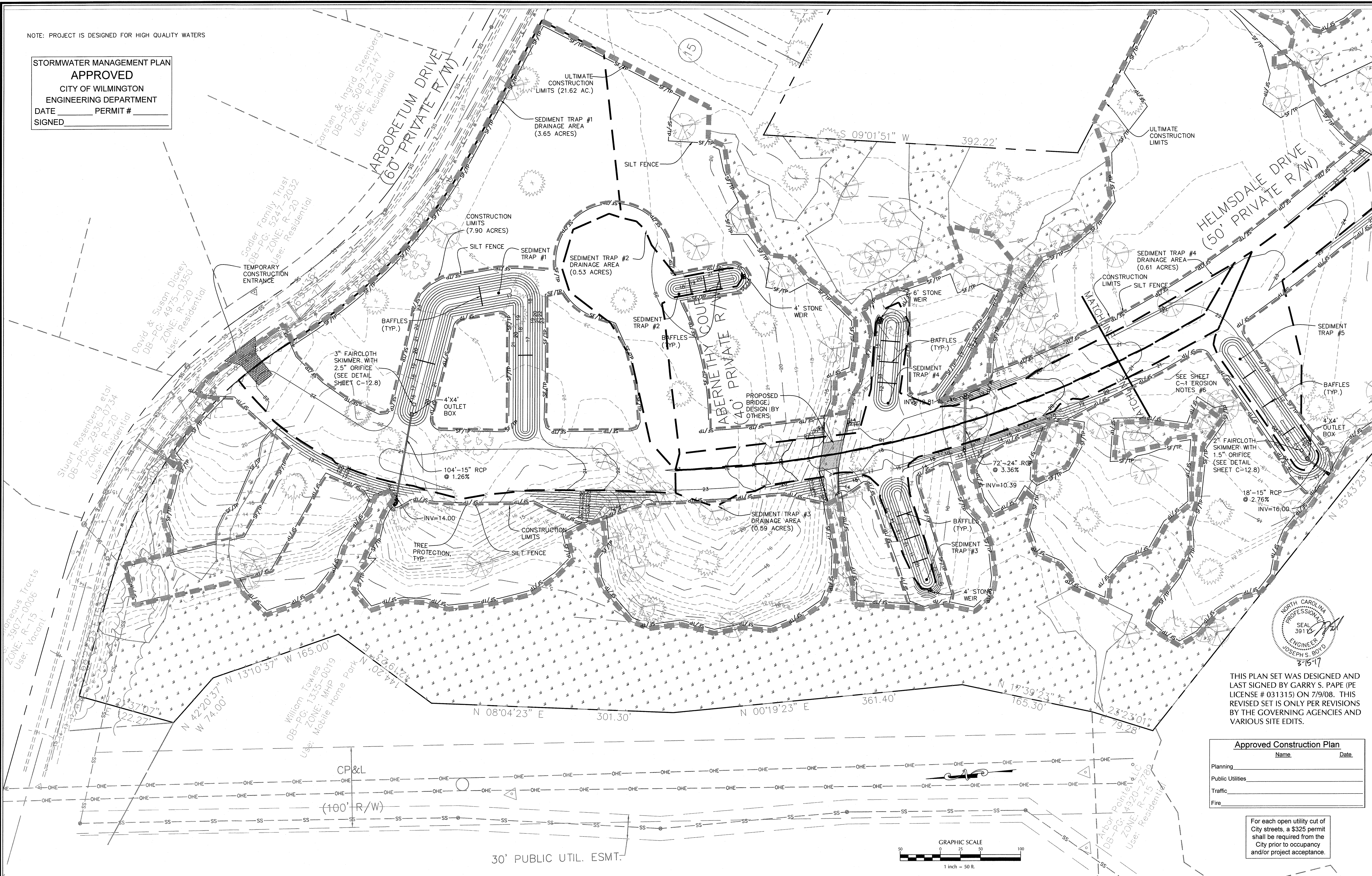
**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS

Sheet No.  
**C-4.2**



NOTE: PROJECT IS DESIGNED FOR HIGH QUALITY WATERS

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



THIS PLAN SET WAS DESIGNED AND LAST SIGNED BY GARRY S. PAPE (PE LICENSE # 031315) ON 7/9/08. THIS REVISED SET IS ONLY PER REVISIONS BY THE GOVERNING AGENCIES AND VARIOUS SITE EDITS.

Approved Construction Plan	
Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

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

SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By
1	NHC EC COMMENTS	07/29/14	JSB

Designer	W&R	Scale	1"=50'
Drawn By	W&R	Date	12/19/13
Checked By	JSB	Job No.	03050283.01

HELMSDALE @ LANDFALL - PHASE II  
CITY OF WILMINGTON    NEW HANOVER    NORTH CAROLINA

EROSION CONTROL PLAN

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

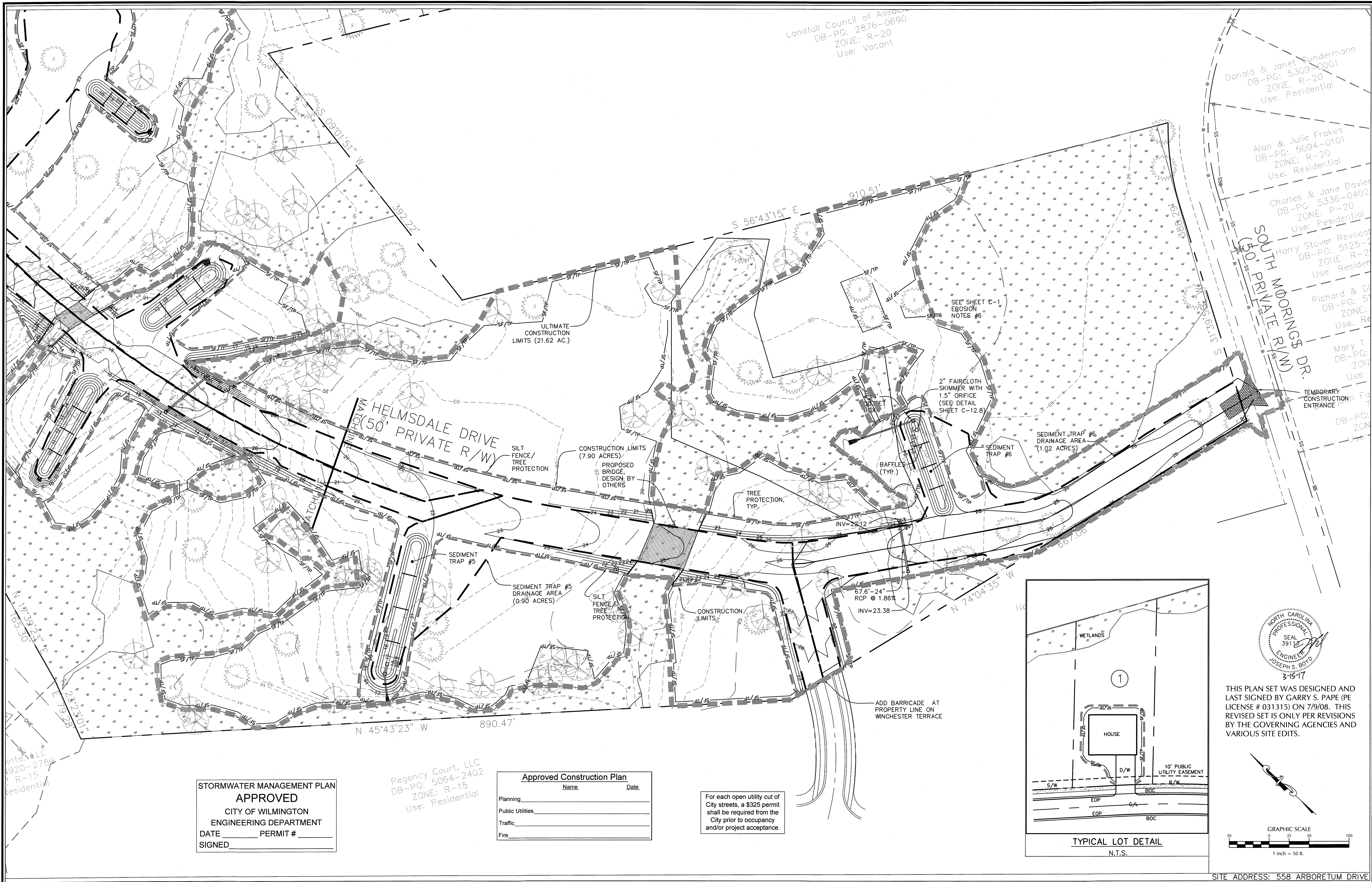
**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 Tel: 910-256-9277 Fax: 910-256-2584 www.wITHERS&RAVENEL.com

Sheet No.  
**C-5.1**

W:\13\13-0481\130481-Helmsdale\CD\2013 Updated Plans\SHEETS\C-5 EROSION CNTRL PLAN.dwg - March 15, 2017 - PAUL SANDRA



W:\13-0485\130485-Helmsdale\130485-EROSION CNTRL PLAN.dwg - March 15, 2017 - PAUL SANDRA



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

Regency Court, LLC  
DB-PG: 5064-2402  
ZONE: R-15  
Use: Residential

Approved Construction Plan		
	Name	Date
Planning		
Public Utilities		
Traffic		
Fire		

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

No.	Revision	Date	By
1	NHC EC COMMENTS	07/29/14	JSB

Designer	W&R	Scale	1"=50'
Drawn By	W&R	Date	12/19/13
Checked By	JSB	Job No.	03050283.01

HELMSDALE @ LANDFALL - PHASE II  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

## EROSION CONTROL PLAN

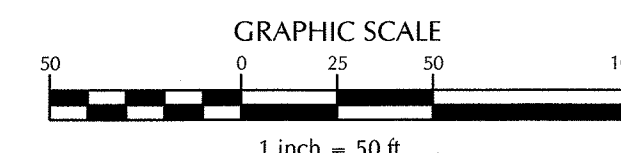
PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.withersravenel.com

Sheet No.  
**C-5.2**



1. PROJECT IS DESIGNED FOR HIGH QUALITY WATERS
2. ALL GRASSED SWALES TO BE SODDED WITH CENTIPEDEGRASS OR EQUIVALENT GRASS THAT WILL HAVE A PERMISSIBLE VELOCITY GREATER THAN 4.0 FT/S PER TABLE 8.05a OF THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL

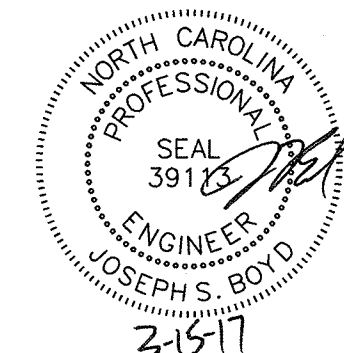


THIS PLAN SET WAS DESIGNED AND  
LAST SIGNED BY GARRY S. PAPE (PE  
LICENSE # 031315) ON 7/9/08. THIS  
REVISED SET IS ONLY PER REVISIONS  
BY THE GOVERNING AGENCIES AND  
VARIOUS SITE EDITS.

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

Approved Construction Plan	
Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

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



SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale	1"=50'
1	NHC EC COMMENTS	06/30/14	JSB	Drawn By	W&R	Date	12/19/13
				Checked By	JSB	Job No.	03050283.0

# HELMSDALE @ LANDFALL - PHASE II

## GRADING PLAN

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS

Sheet No.  
**C-6.1**



Landfall Council of Assoc  
DB-PG: 2876-0690  
ZONE: R-20  
Use: Vacant

- NOTES:
1. PROJECT IS DESIGNED FOR HIGH QUALITY WATERS
  2. ALL GRASSED SWALES TO BE SODDED WITH CENTIPEDEGRASS OR EQUIVALENT GRASS THAT WILL HAVE A PERMISSIBLE VELOCITY GREATER THAN 4.0 FT/S PER TABLE 8.05a OF THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

Donald & Janet Sundermann  
DB-PG: 5309-0001  
ZONE: R-20  
Use: Residential

Alan & Julie Frakes  
DB-PG: 5094-0101  
ZONE: R-20  
Use: Residential

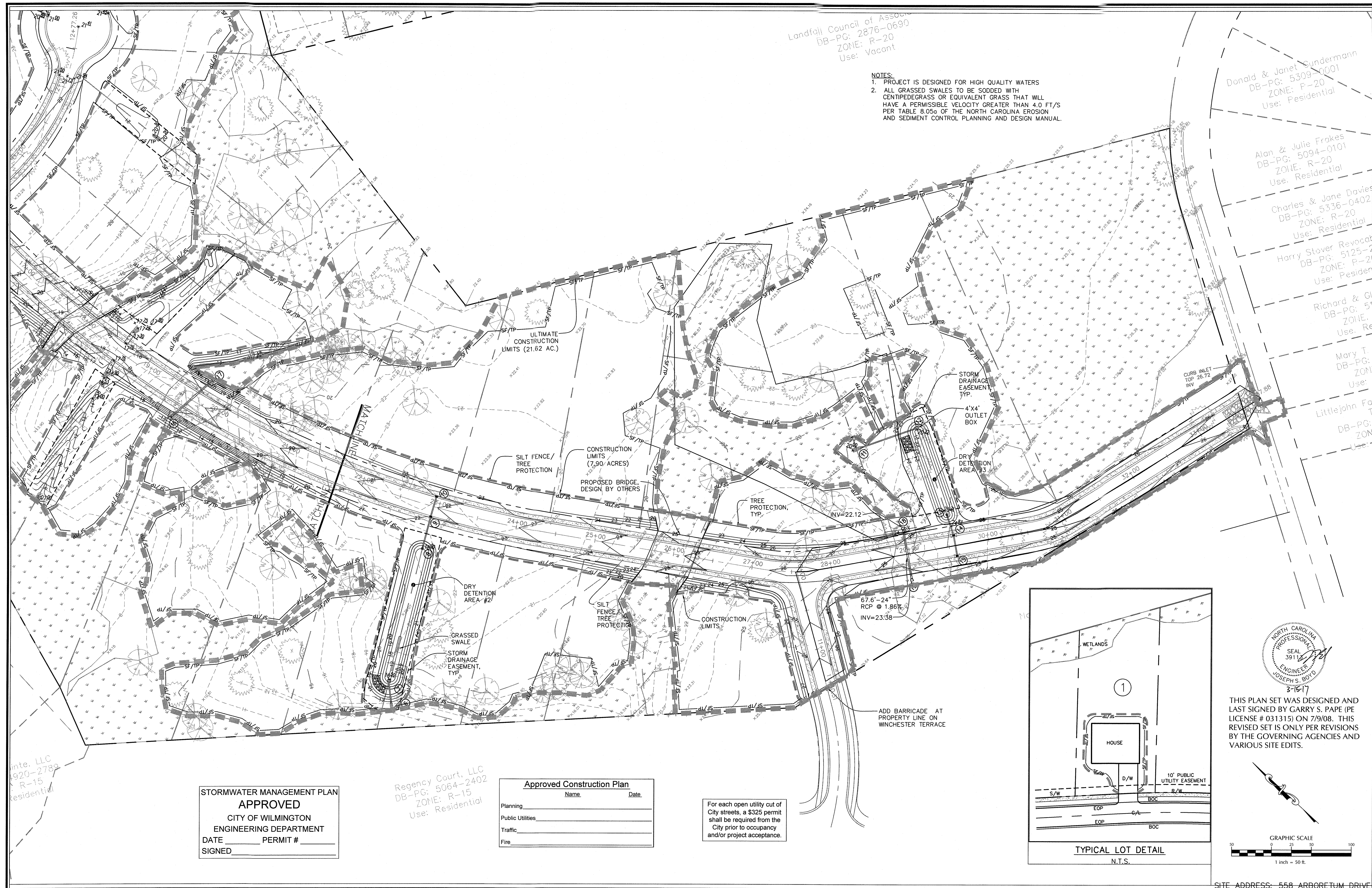
Charles & Jane Davies  
DB-PG: 5336-0402  
ZONE: R-20  
Use: Residential

Harry Stover Revocat  
DB-PG: 5125-0001  
ZONE: P-2  
Use: Residen

Richard & G  
DB-PG: 5100-0001  
ZONE: R-20  
Use: Re

Mary T.  
DB-PG: 5100-0001  
ZONE: R-20  
Use:

Littlejohn F  
DB-PG: 5100-0001  
ZONE: R-20  
Use:

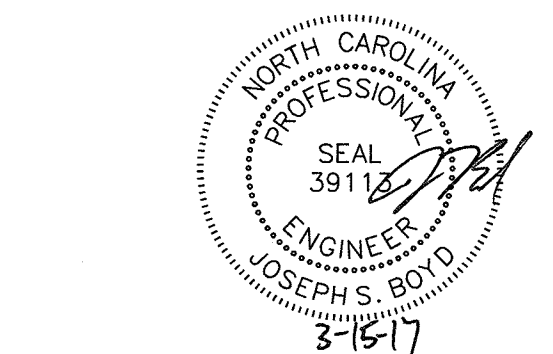
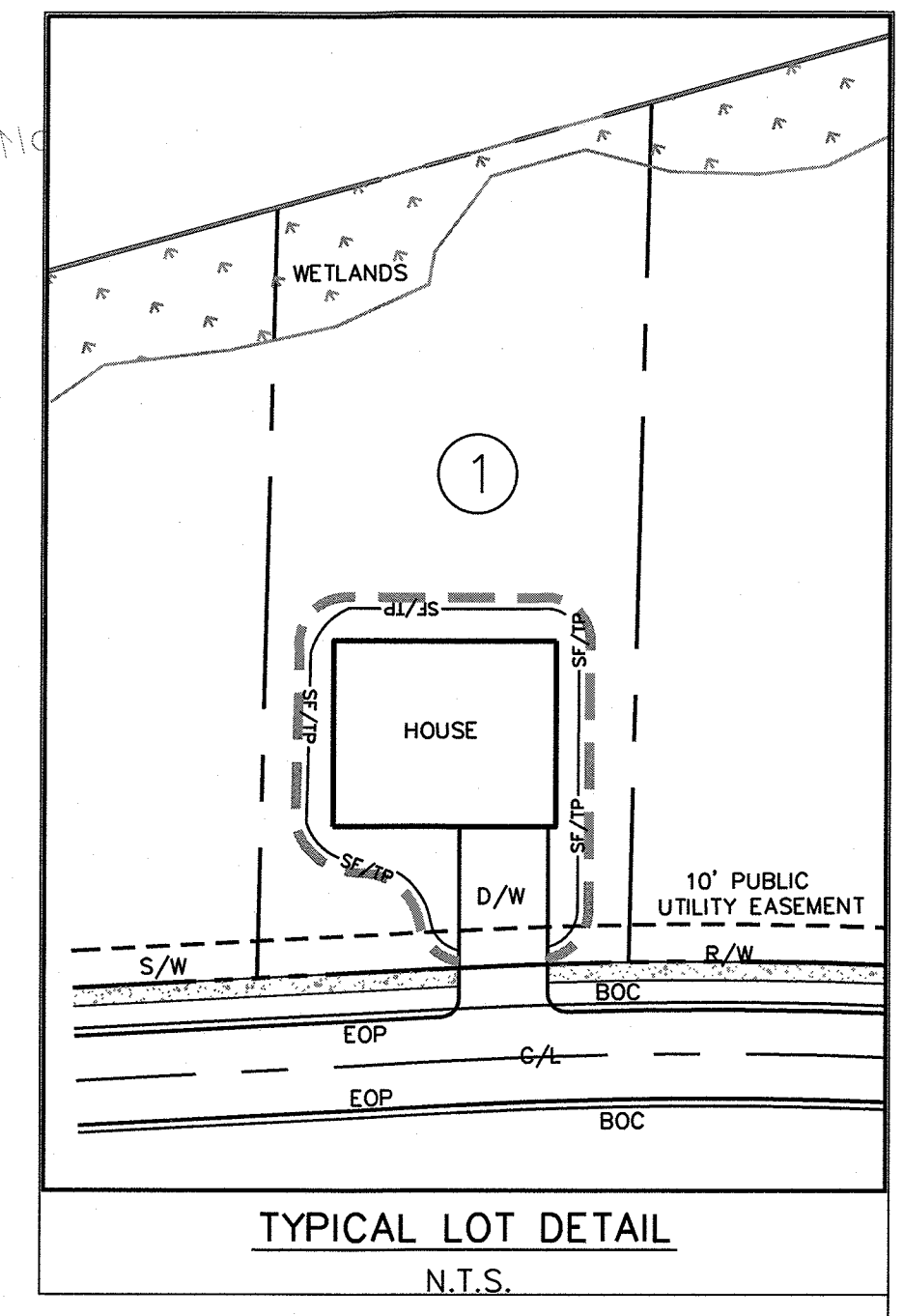


STORMWATER MANAGEMENT PLAN  
APPROVED  
CITY OF WILMINGTON  
ENGINEERING DEPARTMENT  
DATE \_\_\_\_\_ PERMIT # \_\_\_\_\_  
SIGNED \_\_\_\_\_

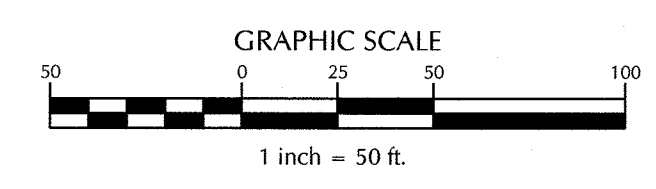
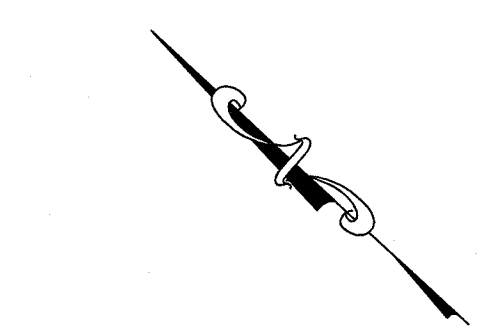
Regency Court, LLC  
DB-PG: 5064-2402  
ZONE: R-15  
Use: Residential

Approved Construction Plan		
	Name	Date
Planning		
Public Utilities		
Traffic		
Fire		

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



THIS PLAN SET WAS DESIGNED AND LAST SIGNED BY GARRY S. PAPE (PE LICENSE # 031315) ON 7/9/08. THIS REVISED SET IS ONLY PER REVISIONS BY THE GOVERNING AGENCIES AND VARIOUS SITE EDITS.



SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale	1"=50'
1	NHC EC COMMENTS	06/30/14	JSB				
				Drawn By	W&R	Date	12/19/13
				Checked By	JSB	Job No.	03050283.01

**HELMSDALE @ LANDFALL - PHASE II**  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

**GRADING PLAN**

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 Tel: 910-256-9227 Fax: 910-256-2384 www.wITHERSRAVENEL.com

Sheet No.  
**C-6.2**

W:\1313-0483\130481-Helmsdale\CAD\2013 Updated Plans\SHEETS\C-6 GRADING PLAN.dwg: March 15, 2017 - FALK, SANDRA

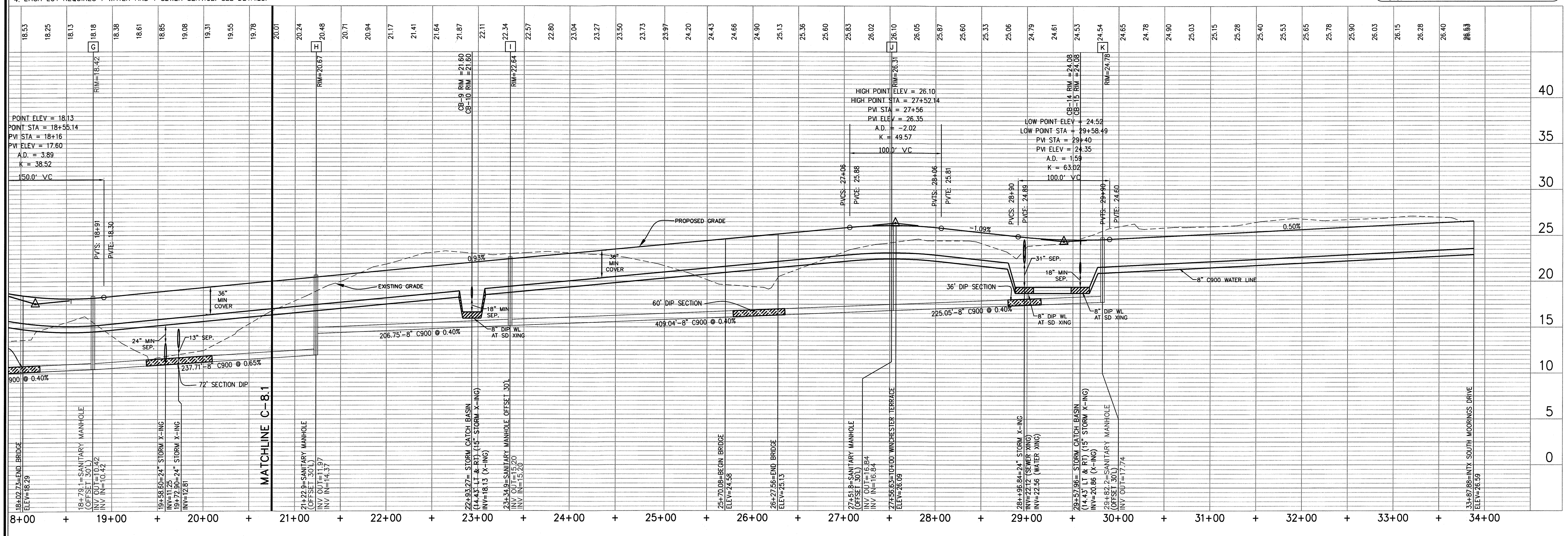






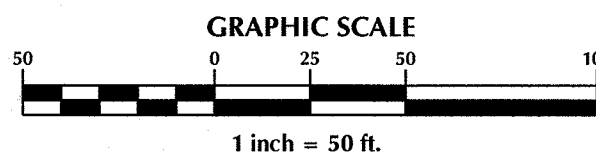






CORRECTED INVERT SEWER ELEVATIONS 07/28/14 JSB										SITE ADDRESS: 558 ARBORETUM DRIVE																																																	
<table><tr><td>No.</td><td>Revision</td><td>Date</td><td>By</td></tr><tr><td>1</td><td>CITY OF WILMINGTON WATER COMMENTS</td><td>07/09/07</td><td>W&amp;R</td></tr><tr><td>2</td><td>NEW HANOVER COUNTY SEWER COMMENTS</td><td>08/21/07</td><td>W&amp;R</td></tr><tr><td>3</td><td>CFPUA COMMENTS</td><td>12/20/13</td><td>JSB</td></tr><tr><td>4</td><td>CFPUA COMMENTS</td><td>04/01/14</td><td>JSB</td></tr><tr><td>5</td><td>CFPUA COMMENTS &amp; SIDEWALK UPDATE</td><td>06/04/14</td><td>JSB</td></tr></table>				No.	Revision	Date	By	1	CITY OF WILMINGTON WATER COMMENTS	07/09/07	W&R	2	NEW HANOVER COUNTY SEWER COMMENTS	08/21/07	W&R	3	CFPUA COMMENTS	12/20/13	JSB	4	CFPUA COMMENTS	04/01/14	JSB	5	CFPUA COMMENTS & SIDEWALK UPDATE	06/04/14	JSB	<table><tr><td>Designer</td><td>W&amp;R</td><td>Scale</td><td>1"=50'</td></tr><tr><td>Drawn By</td><td>W&amp;R</td><td>Date</td><td>12/19/13</td></tr><tr><td>Checked By</td><td>JSB</td><td>Job No.</td><td>03050283.01</td></tr></table>		Designer	W&R	Scale	1"=50'	Drawn By	W&R	Date	12/19/13	Checked By	JSB	Job No.	03050283.01	<div>HELMSDALE @ LANDFALL - PHASE II</div> <div>CITY OF WILMINGTON      NEW HANOVER      NORTH CAROLINA</div>				<div>HELMSDALE DRIVE</div> <div>PLAN &amp; PROFILE (SHEET 2 OF 2)</div>				<div>PREPARED FOR: HELMSDALE INVESTORS, LLC 100 WESTON ESTATES WAY CARY, NC 27513 919-481-3000</div>				<div>WITHERS &amp; RAVENEL</div> <div>ENGINEERS   PLANNERS   SURVEYORS</div> <div>1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.wITHERSRAVENEL.com</div>				<div>Sheet No.</div> <div>C-8.2</div>	
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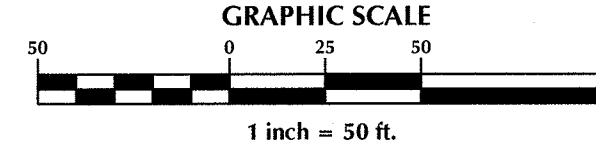
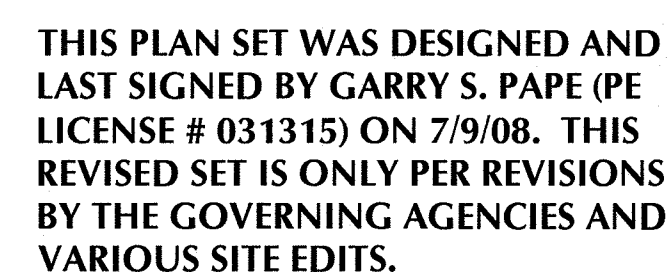


1" = 50' HORIZ.  
1" = 5' VERT.

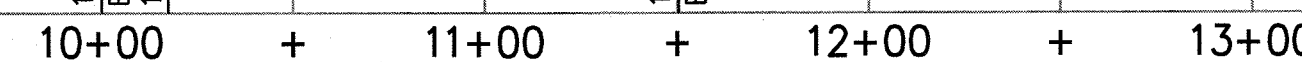


1. WATER MAINS SHALL BE INSTALLED WITH MINIMUM 36" COVER PER THE CFPWA & NCDENR.
2. CONTRACTOR SHALL MAINTAIN A 24" VERTICAL SEPARATION BETWEEN WATER AND SEWER.
3. CONTRACTOR SHALL INSTALL ADDITIONAL HORIZONTAL AND VERTICAL BENDS AS NECESSARY TO MAINTAIN THE GENERAL GRADE FOR PROPOSED WATER MAINS.
4. ALL VALVE BOX RIMS SHALL BE INSTALLED AND ADJUSTED TO THE FINISHED PAVEMENT GRADE.
5. IF WATER MAIN AND/OR STORM DRAIN IS WITHIN 24" VERTICAL SEPARATION OF THE SEWER MAIN THE SEWER MAIN MATERIAL NEEDS TO BE DUCTILE IRON PIPE (DIP).
6. SEWER MAIN THROUGH ANY WETLANDS TO BE DUCTILE IRON PIPE (DIP).
7. EACH LOT REQUIRES 1 WATER AND SEWER SERVICE. SEE DETAILS.

1. SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
2. 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.
3. ALL SERVICES TYING INTO DUCTILE IRON MAINS SHALL BE CONSTRUCTED OF CLASS 50, DIP, WITH PROTECTO 401 CERAMIC EPOXY LINING.
4. MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
5. NO FLEXIBLE COUPLINGS SHALL BE USED.
6. ALL STAINLESS STEEL FASTENERS SHALL BE 316.



1" = 50' HORIZ.  
1" = 5' VERT.



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

6 CORRECTED INVERT SEWER ELEVATIONS 07/28/14 JSE

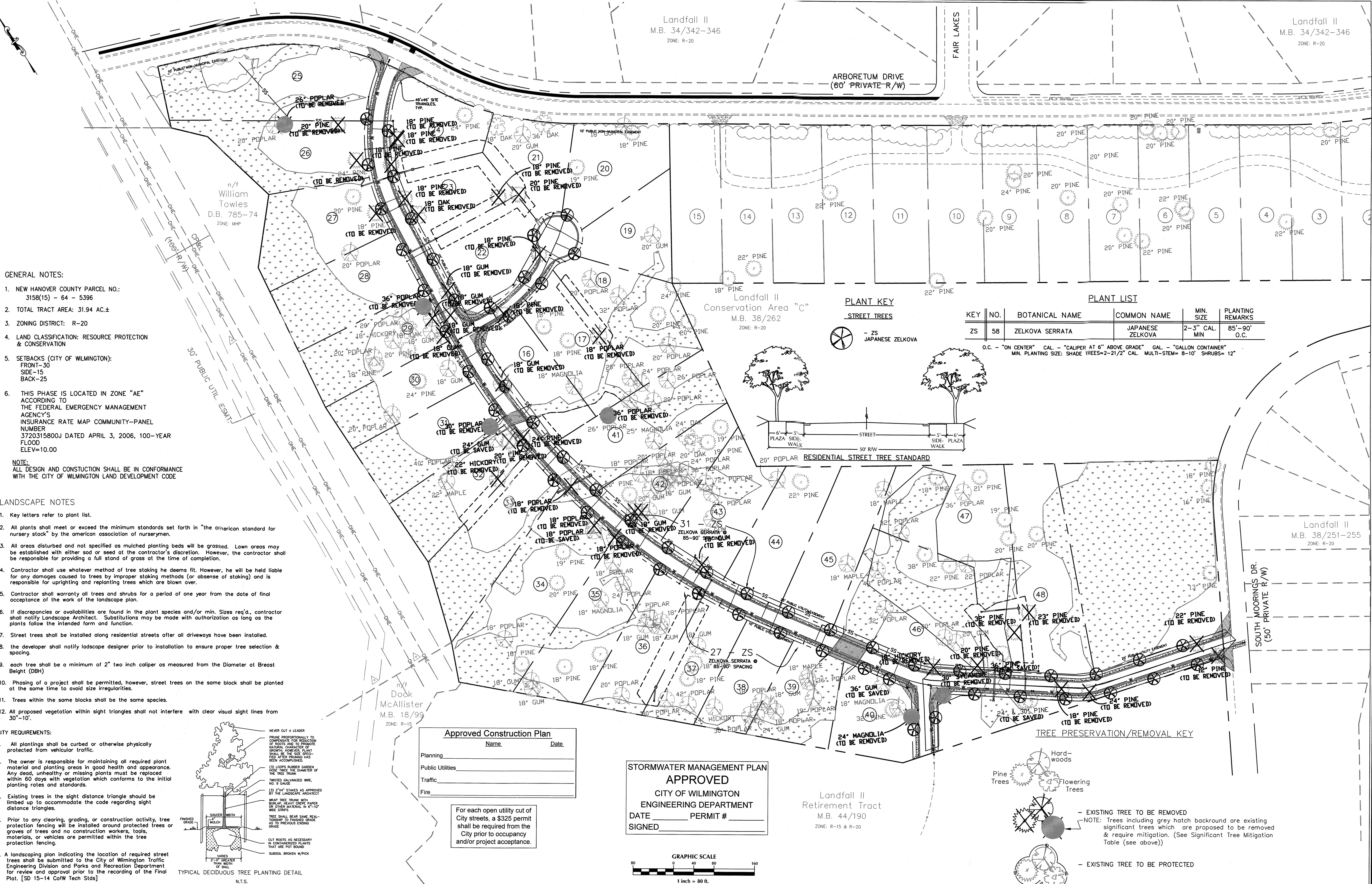
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Drawn By	W&R	Date	12/19/13
Checked By	JSB	Job No.	03050283.0

## ABERNATHY COURT & WINCHESTER TERRACE PLAN & PROFILE

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS

**C-9**





GENERAL NOTES:

1. NEW HANOVER COUNTY PARCEL NO.: 3158(15) - 64 - 5396
2. TOTAL TRACT AREA: 31.94 AC.±
3. ZONING DISTRICT: R-20
4. LAND CLASSIFICATION: RESOURCE PROTECTION & CONSERVATION
5. SETBACKS (CITY OF WILMINGTON): FRONT-30 SIDE-15 BACK-25
6. THIS PHASE IS LOCATED IN ZONE "AE" ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S INSURANCE RATE MAP COMMUNITY-PANEL NUMBER 3720315800J DATED APRIL 3, 2006, 100-YEAR FLOOD ELEV=10.00

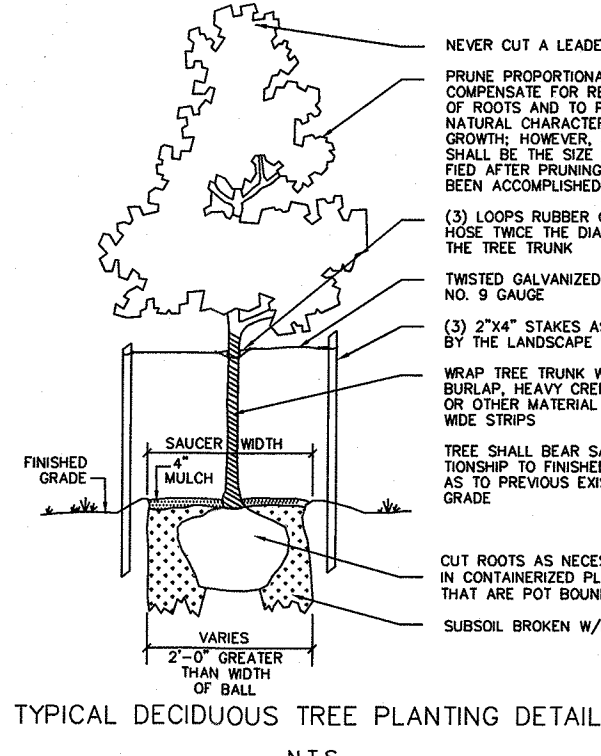
NOTE:  
ALL DESIGN AND CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE CITY OF WILMINGTON LAND DEVELOPMENT CODE

LANDSCAPE NOTES

1. Key letters refer to plant list.
2. All plants shall meet or exceed the minimum standards set forth in "the American standard for nursery stock" by the American Association of Nurserymen.
3. All areas disturbed and not specified as mulched planting beds will be grassed. Lawn areas may be established with either sod or seed at the contractor's discretion. However, the contractor shall be responsible for providing a full stand of grass at the time of completion.
4. Contractor shall use whatever method of tree staking he deems fit. However, he will be held liable for any damages caused to trees by improper staking methods (or absence of staking) and is responsible for uprooting and replanting trees which are blown over.
5. Contractor shall warranty all trees and shrubs for a period of one year from the date of final acceptance of the work of the landscape plan.
6. If discrepancies or availabilities are found in the plant species and/or min. sizes req'd., contractor shall notify Landscape Architect. Substitutions may be made with authorization as long as the plants follow the intended form and function.
7. Street trees shall be installed along residential streets after all driveways have been installed.
8. The developer shall notify landscape designer prior to installation to ensure proper tree selection & spacing.
9. Each tree shall be a minimum of 2" two inch caliper as measured from the Diameter at Breast Height (DBH)
10. Phasing of a project shall be permitted, however, street trees on the same block shall be planted at the same time to avoid size irregularities.
11. Trees within the same blocks shall be the same species.
12. All proposed vegetation within sight triangles shall not interfere with clear visual sight lines from 30'-10'.

CITY REQUIREMENTS:

1. All plantings shall be curbed or otherwise physically protected from vehicular traffic.
2. The owner is responsible for maintaining all required plant material and planting areas in good health and appearance. Any dead, unhealthy or missing plants must be replaced within 60 days with vegetation which conforms to the initial planting rates and standards.
3. Existing trees in the sight distance triangle should be limited up to accommodate the code regarding sight distance triangles.
4. 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.
5. A landscaping plan indicating the location of required street trees shall be submitted to the City of Wilmington Traffic Engineering Division and Parks and Recreation Department for review and approval prior to the recording of the Final Plat. [SD 15-14 CoW Tech Stds]

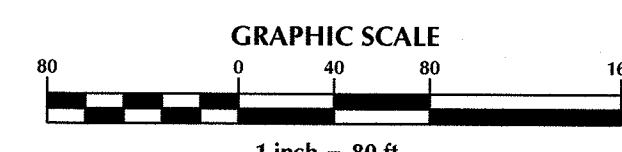


Approved Construction Plan

Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

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

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



PLANT LIST

KEY	NO.	BOTANICAL NAME	COMMON NAME	MIN. SIZE	PLANTING REMARKS
ZS	58	ZELKOVA SERRATA	JAPANESE ZELKOVA	2-3" CAL. MIN	85'-90' O.C.

O.C. - "ON CENTER" CAL. - "CALIPER AT 6" ABOVE GRADE" GAL. - "GALLON CONTAINER" MIN. PLANTING SIZE: SHADE TREES=2-21/2" CAL. MULTI-STEM= 8-10" SHRUBS= 12"

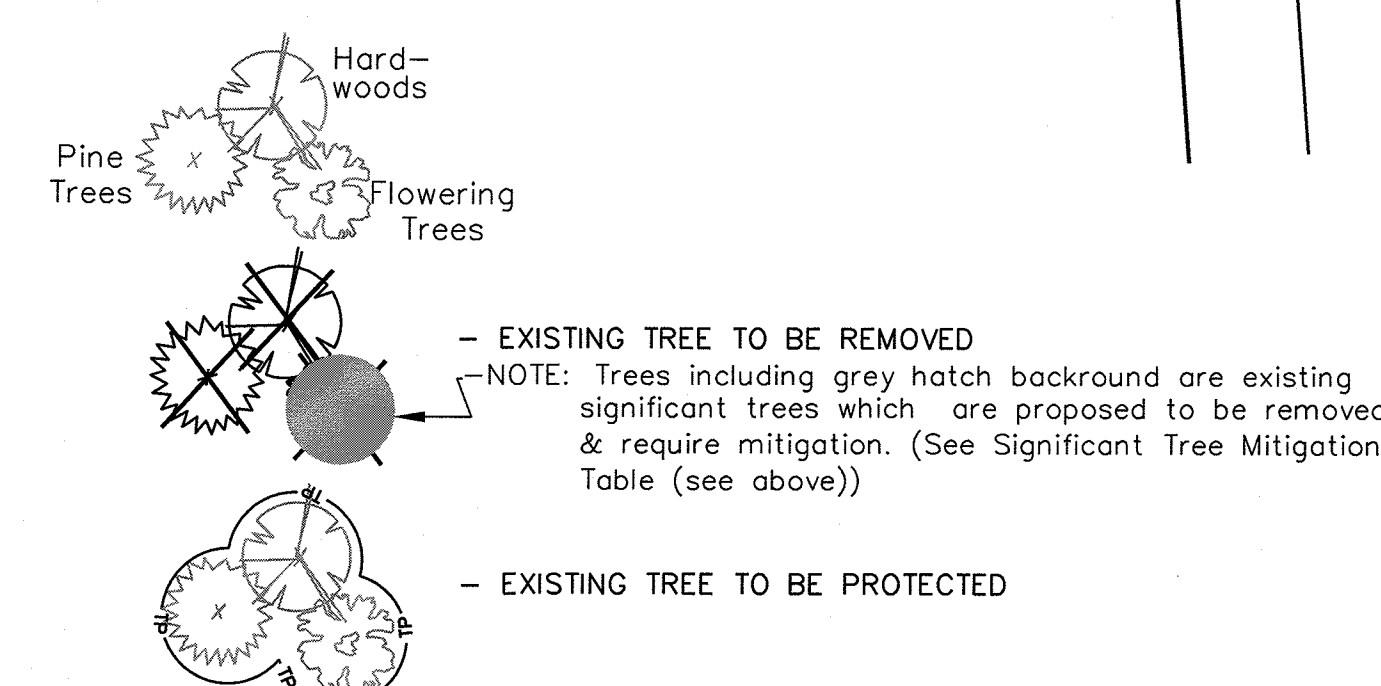
PLANT KEY

STREET TREES



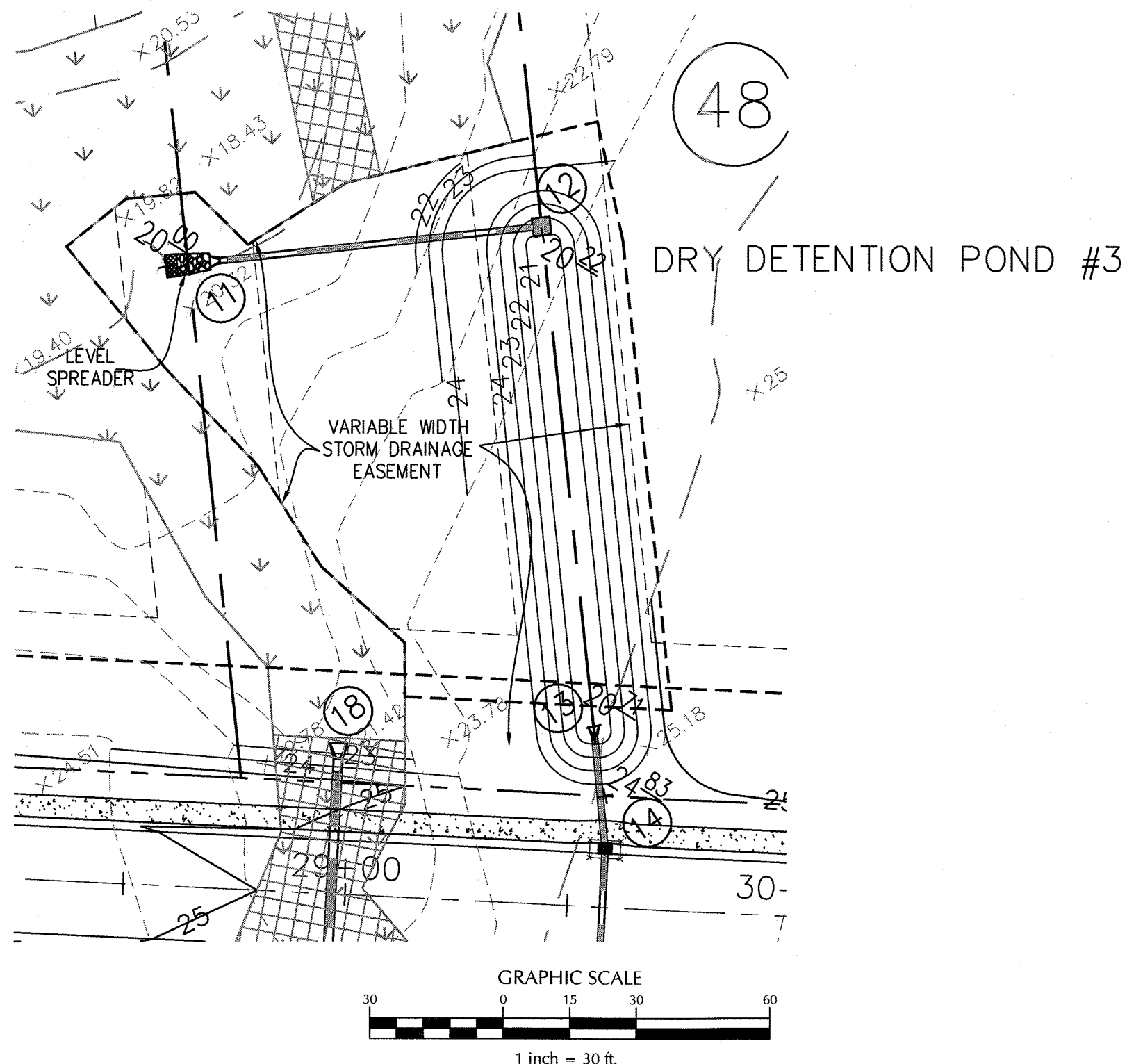
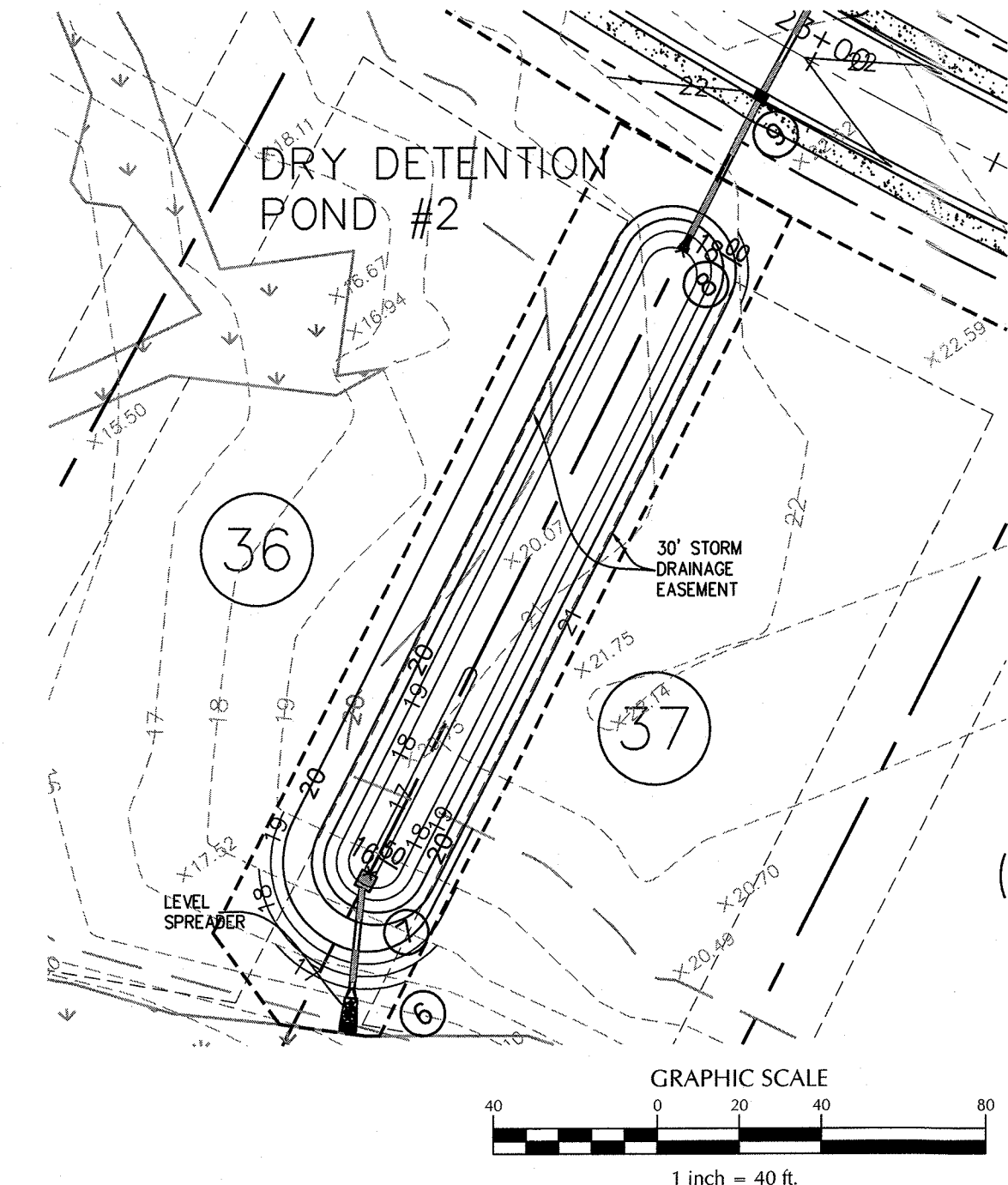
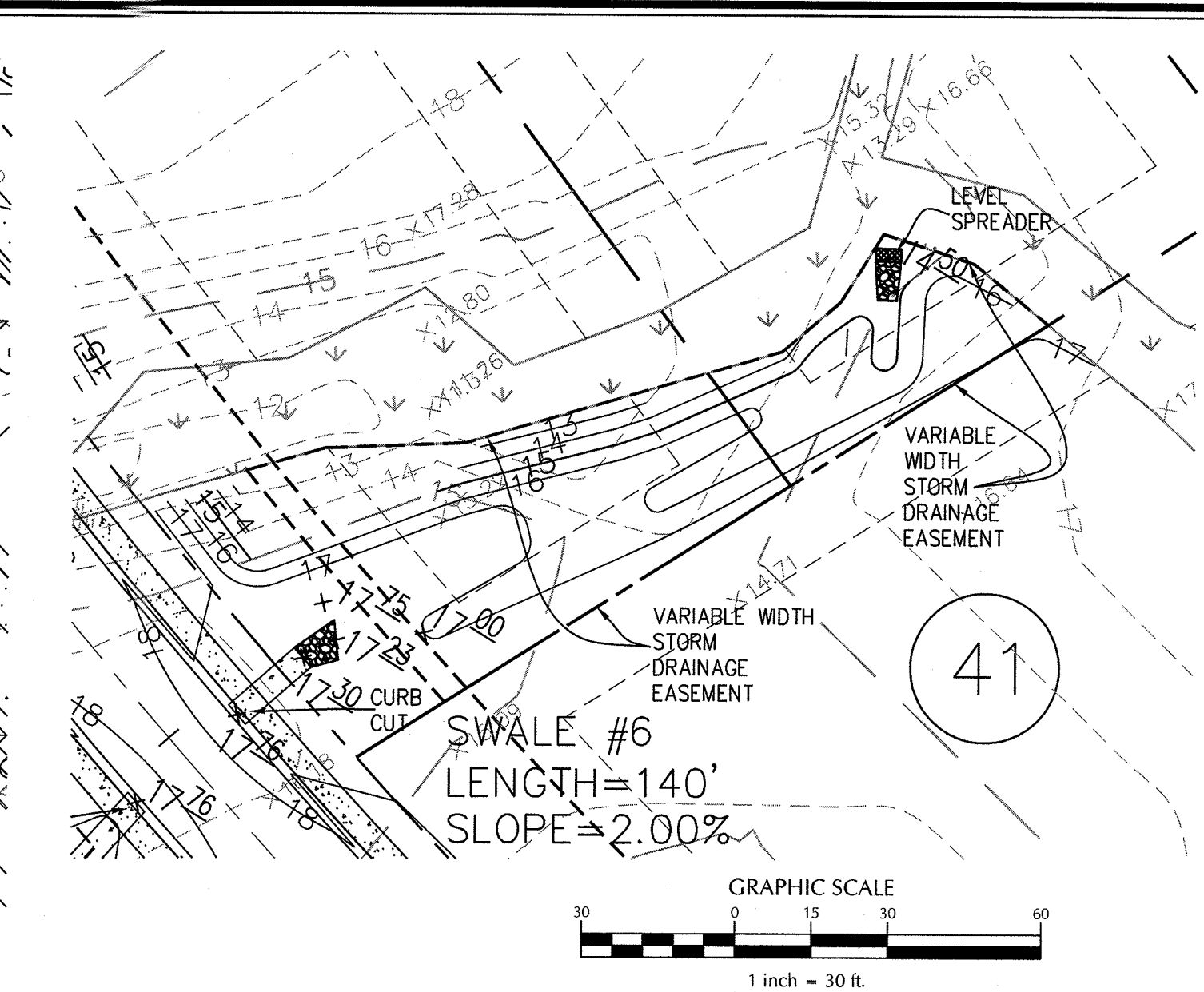
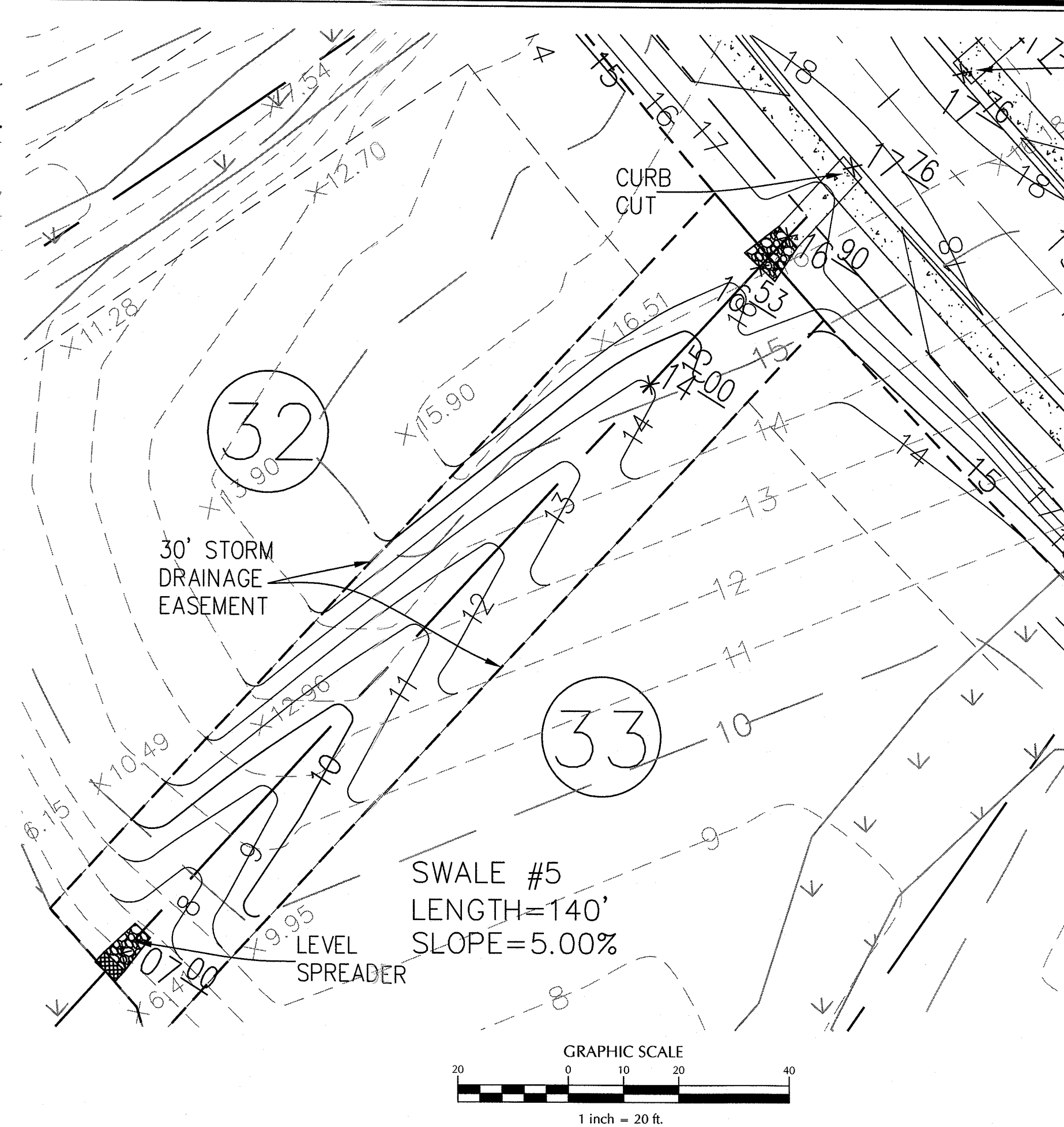
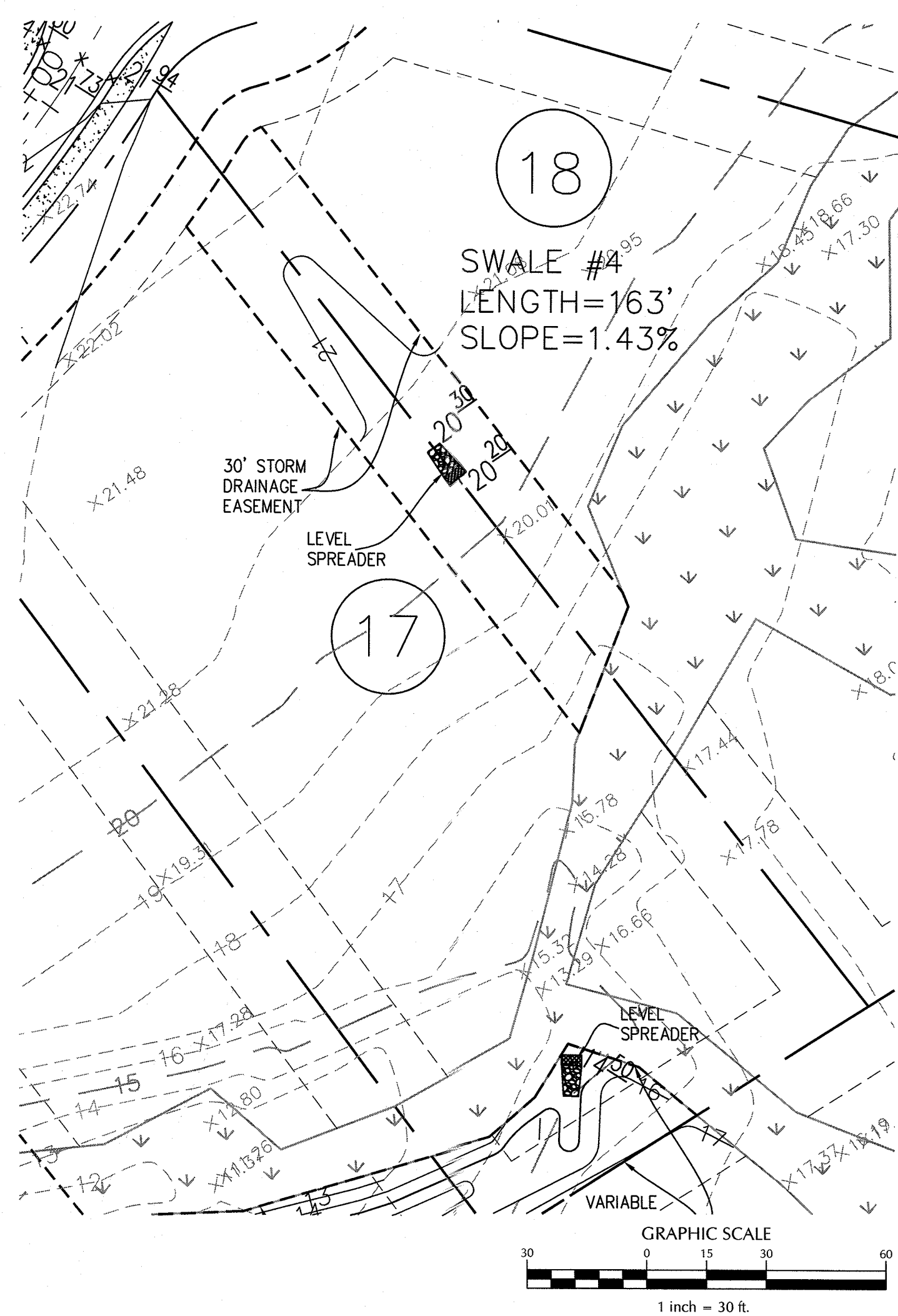
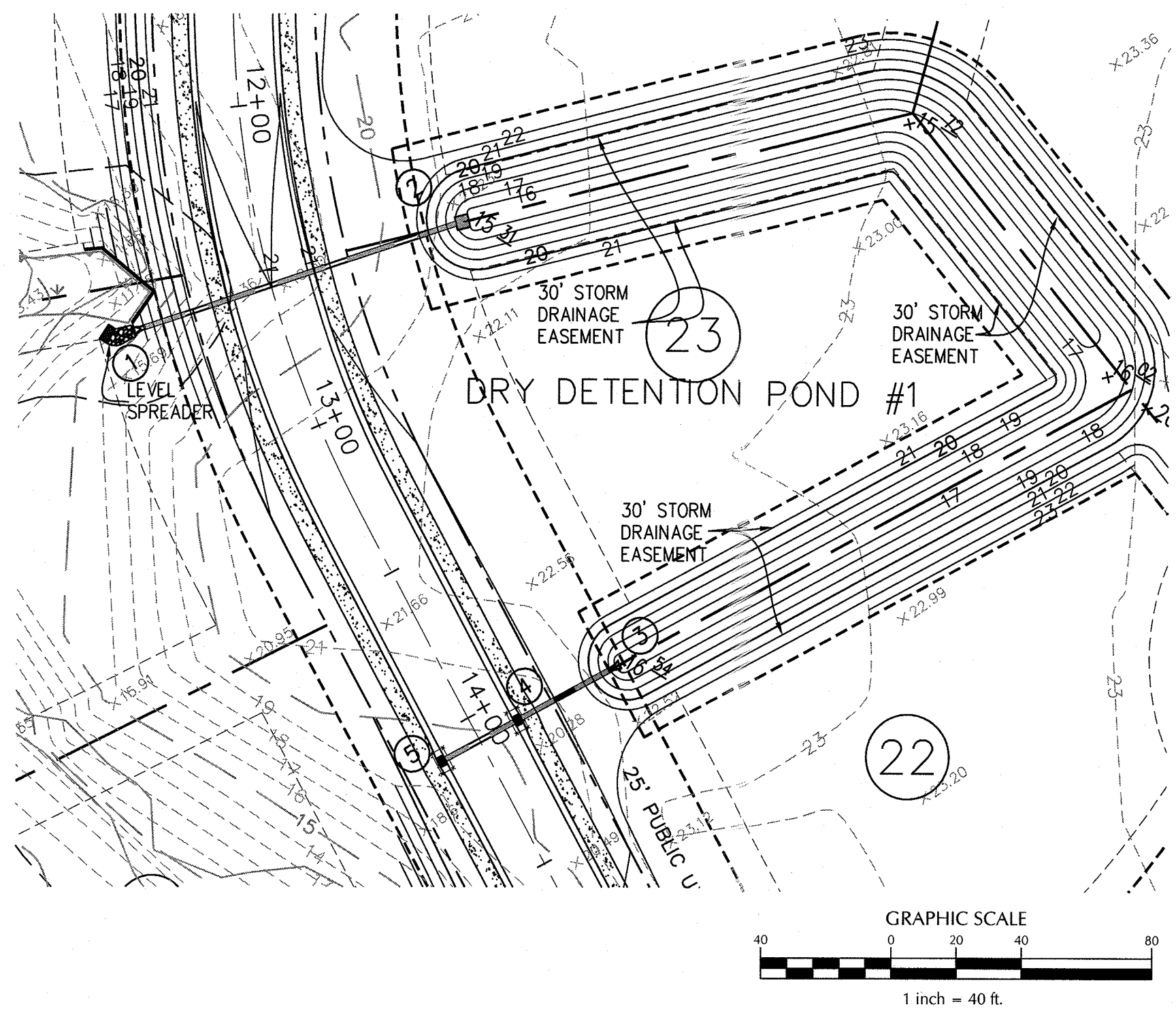
RESIDENTIAL STREET TREE STANDARD

TREE PRESERVATION/REMOVAL KEY



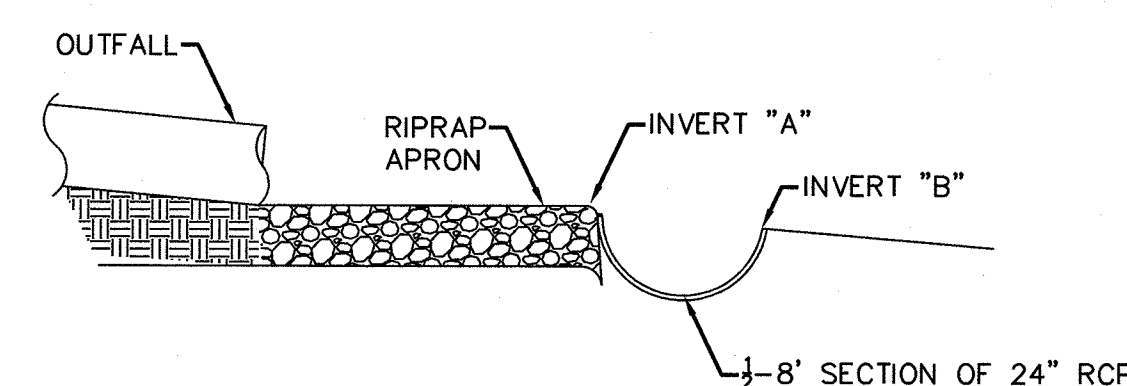
W:\1313-0480\130481-Helmsdale-Phase II-Landscape Plan.dwg - March 15, 2017 - FALK, SANDRA





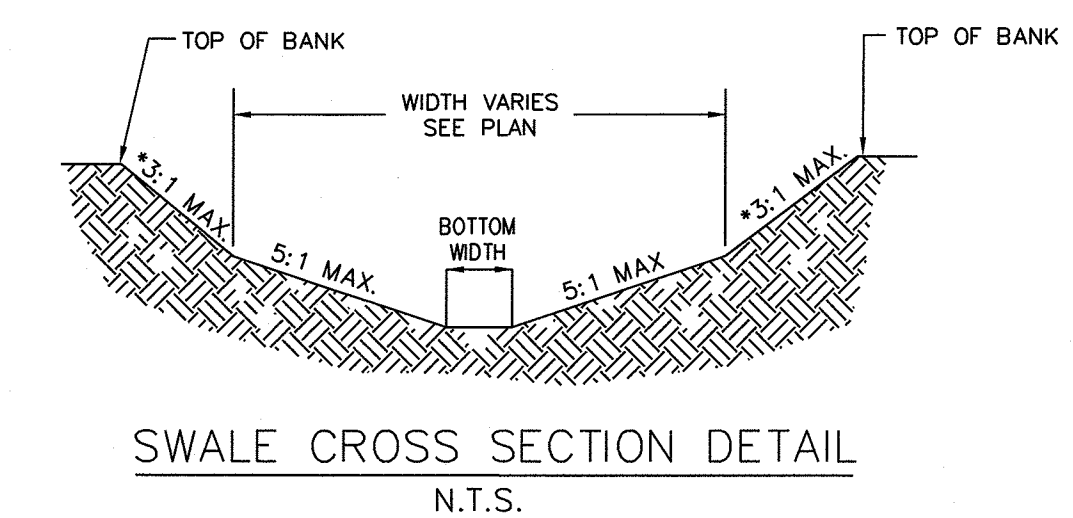
# SWALE CALCULATIONS

SWALE	DRAINAGE AREA	STARTING ELEVATION	OUTLET ELEVATION	LENGTH (ft)	SLOPE	CROSS SLOPE	SWALE LINER
1	3.65	16.54	15.31	410	0.30%	5:1 BOTTOM 1' 3:1 ABOVE 1' DEPTH	GRASS
4	1.20	16.04	13.70	163	1.43%	5:1 BOTTOM 1' 3:1 ABOVE 1' DEPTH	GRASS
5	0.53	14.00	7.0	140	5.00%	5:1 BOTTOM 1' 3:1 ABOVE 1' DEPTH	GRASS
6	0.99	17.30	14.50	140	2.00%	5:1 BOTTOM 1' 3:1 ABOVE 1' DEPTH	GRASS
2	0.98	18.00	16.50	168	0.89%	5:1 BOTTOM 1' 3:1 ABOVE 1' DEPTH	GRASS
3	1.18	20.71	20.22	109	0.45%	5:1 BOTTOM 1' 3:1 ABOVE 1' DEPTH	GRASS



OUTLET	INVERT A	INVERT B	RIPRAP (NCDOT CLASS B, 18" THICK)		
			LENGTH (ft)	UPSTREAM WIDTH (ft)	DOWNSTREAM WIDTH (ft)
OUTLET FROM POND#1	14.00	13.90	8.00	4.00	10.00
OUTLET FROM SWALE#4	13.50	13.40	6.00	3.00	4.00
OUTLET FROM SWALE#5	7.00	6.90	6.00	3.00	4.00
OUTLET FROM SWALE#6	14.50	14.40	6.00	3.00	4.00
OUTLET FROM POND#2	16.00	15.90	5.00	3.00	6.00
OUTLET FROM POND#3	20.00	19.90	5.00	3.00	6.00

LEVEL SPREADER  
NTS

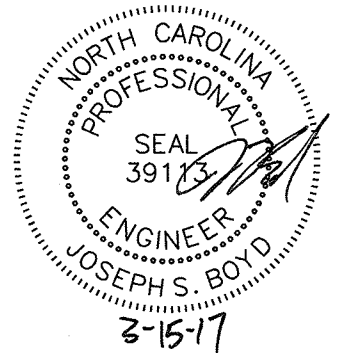


STORMWATER MANAGEMENT PLAN  
APPROVED  
CITY OF WILMINGTON  
ENGINEERING DEPARTMENT  
DATE PERMIT #  
SIGNED

Approved Construction Plan

Name Date  
Planning  
Public Utilities  
Traffic  
Fire

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



THIS PLAN SET WAS DESIGNED AND LAST SIGNED BY GARRY S. PAPE (PE LICENSE # 031315) ON 7/9/08. THIS REVISED SET IS ONLY PER REVISIONS BY THE GOVERNING AGENCIES AND VARIOUS SITE EDITS.

SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By
1	UPDATED RIP RAP TABLE	07/29/14	JSB

HELMSDALE @ LANDFALL - PHASE II  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

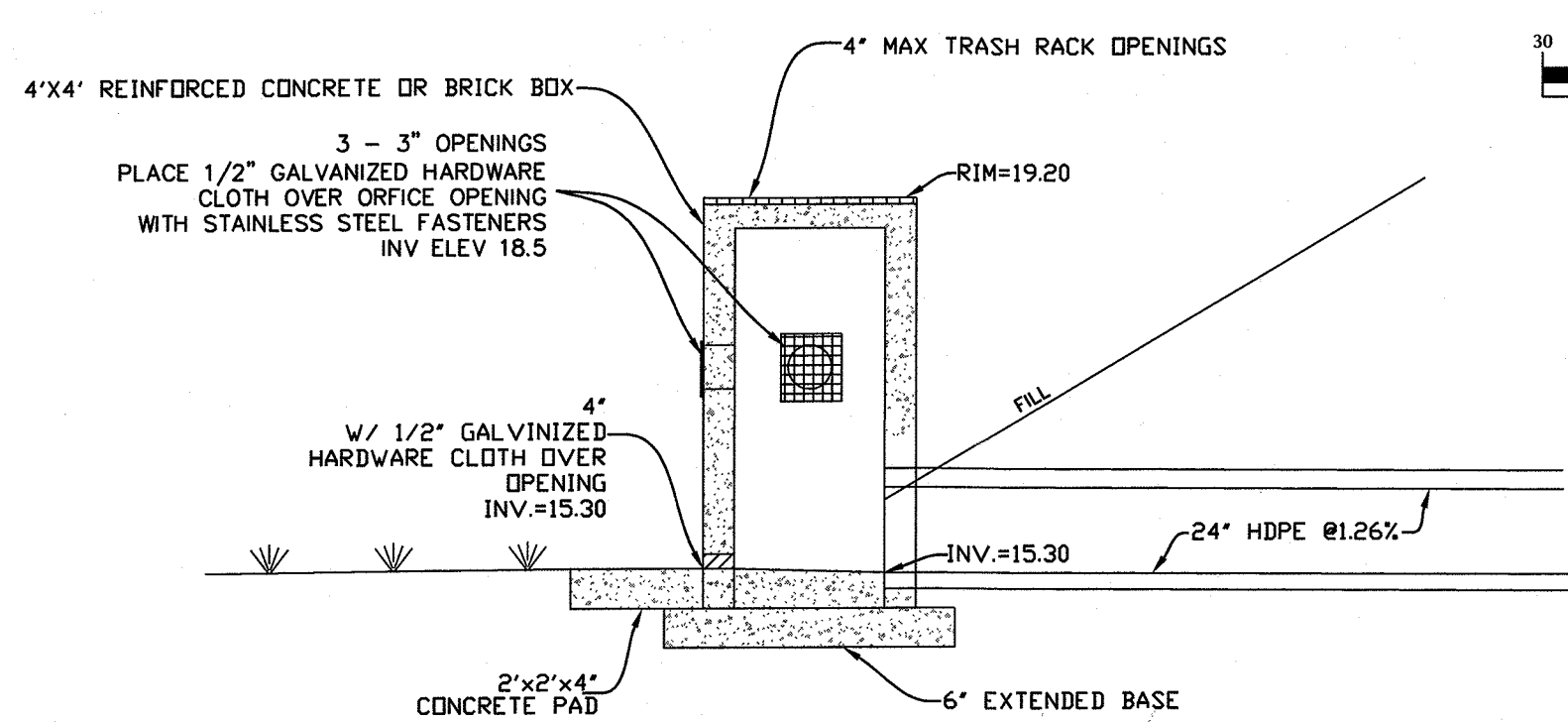
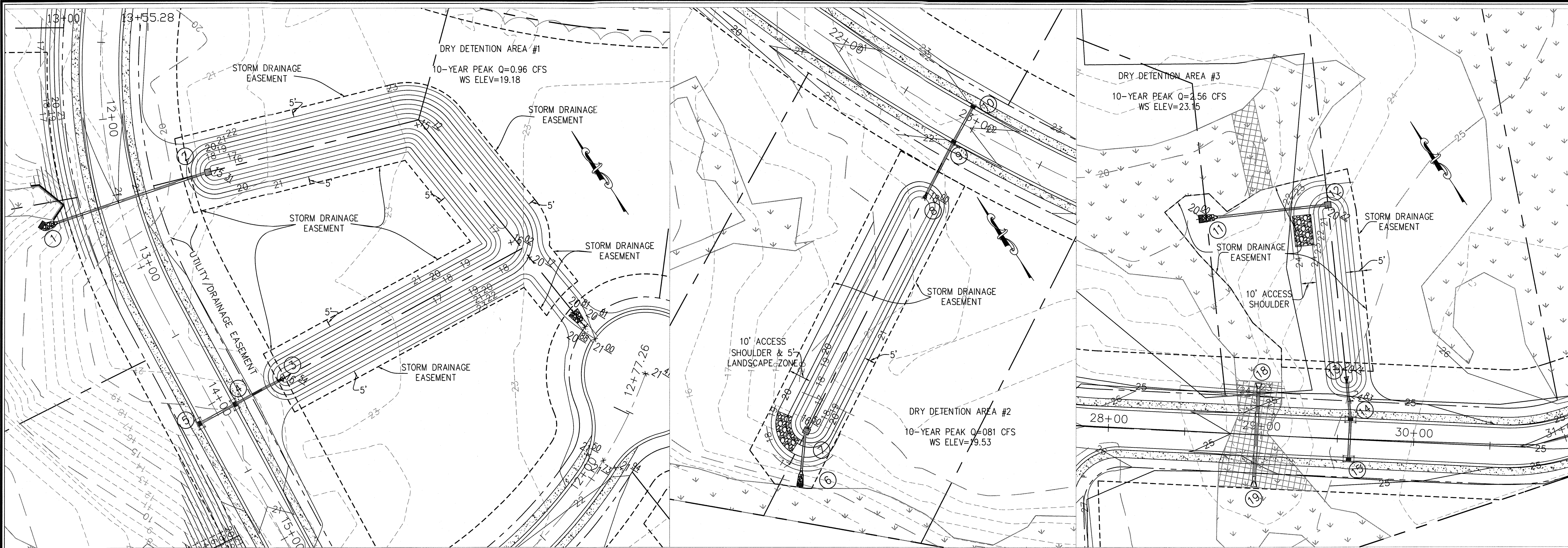
## SWALE DETAILS

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

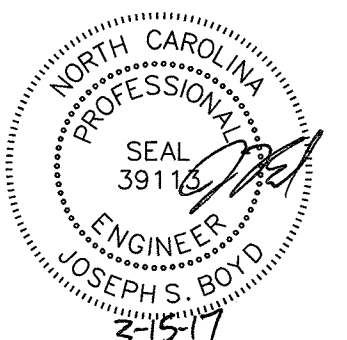
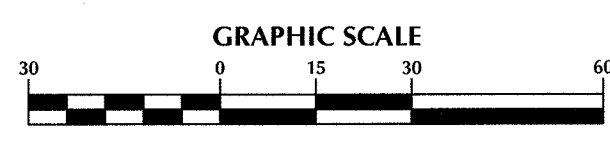
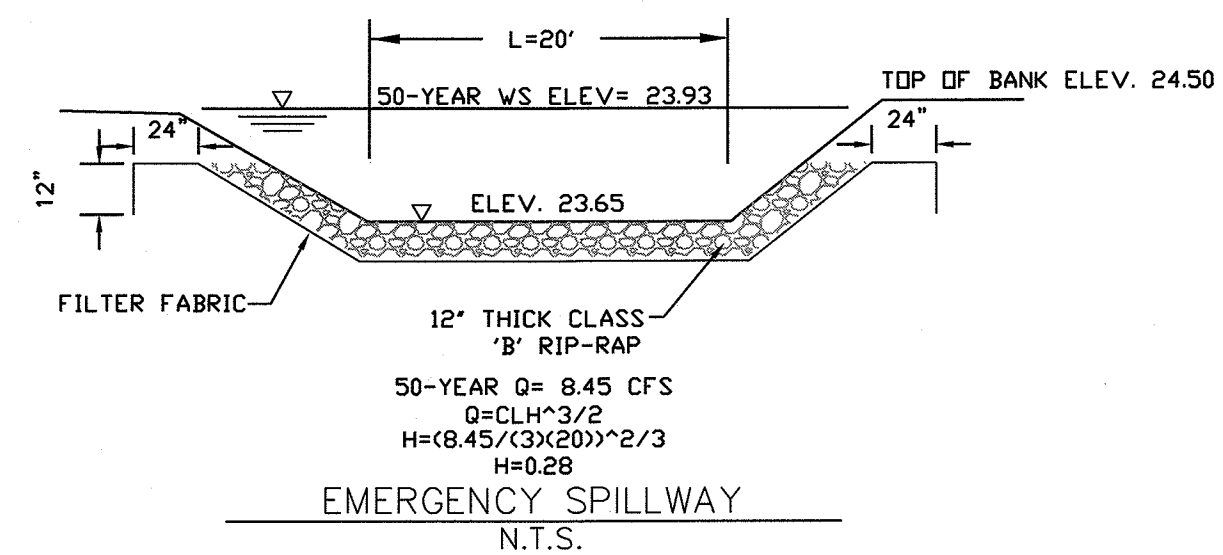
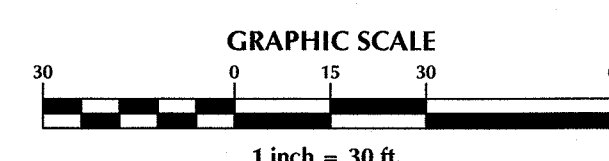
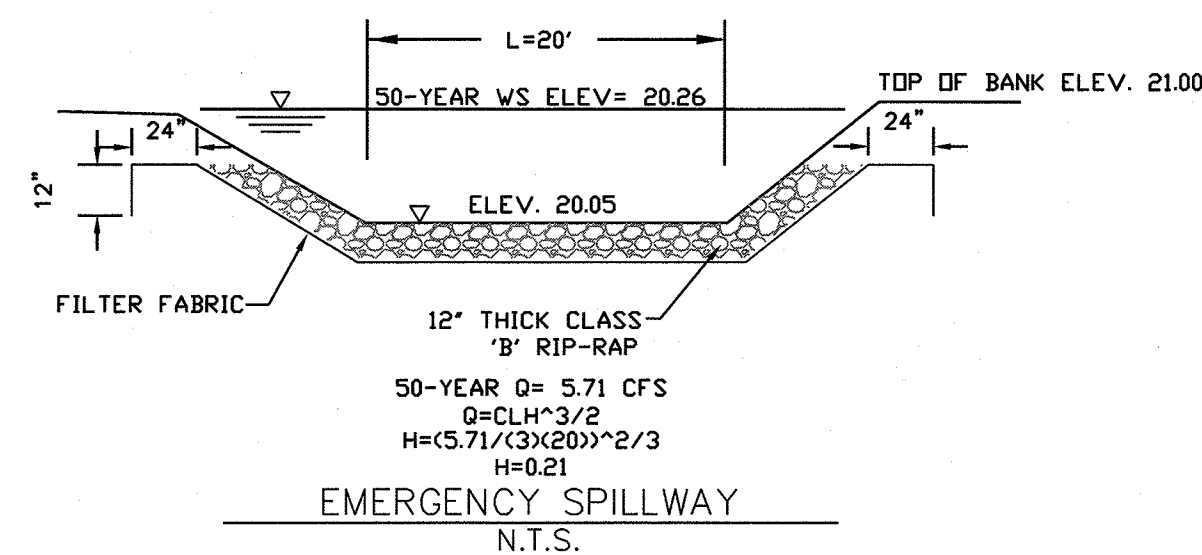
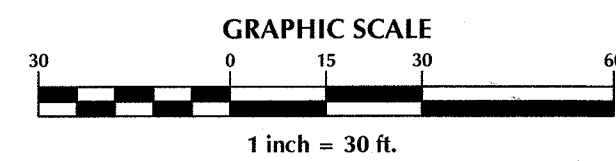
**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2384 www.wITHERSRAVENEL.com

Sheet No.  
C-11.1





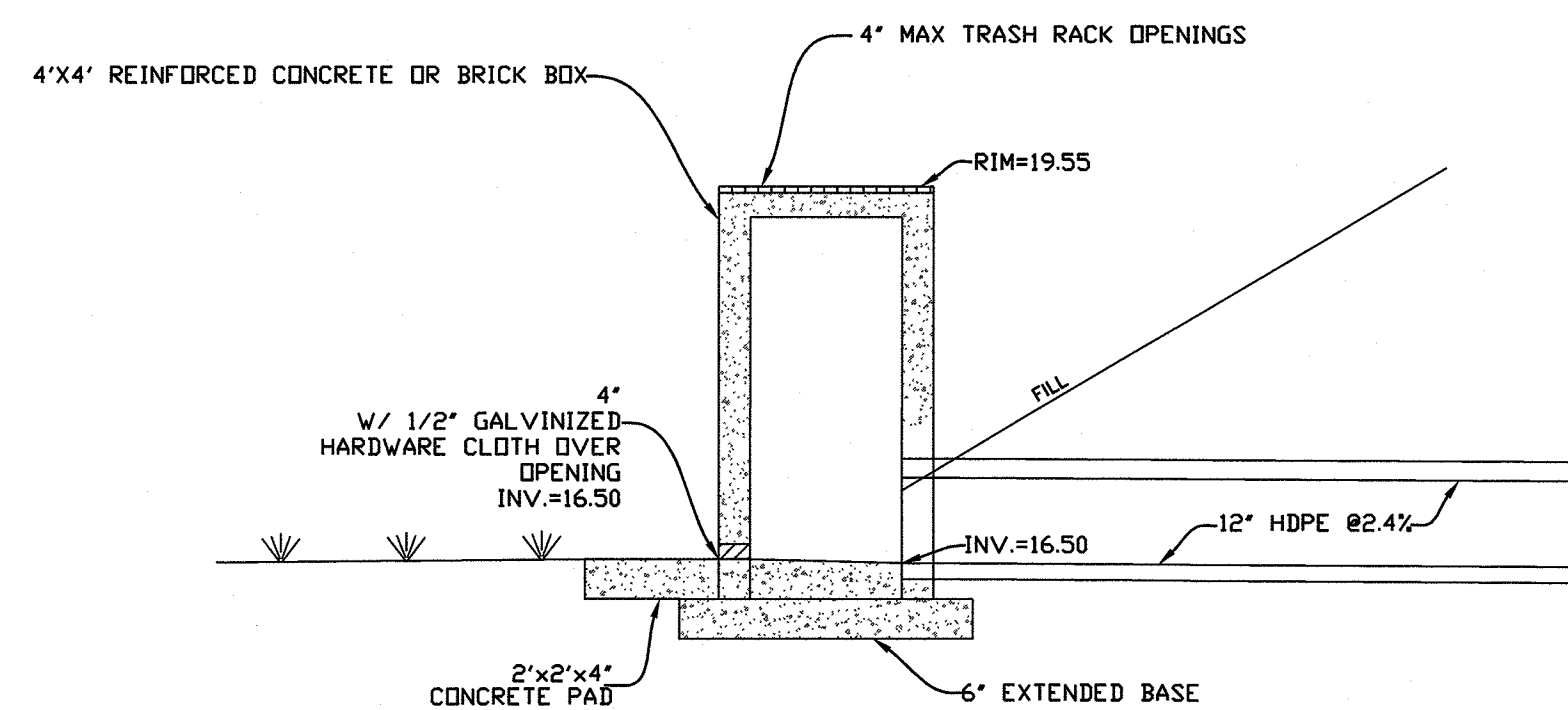
OUTLET STRUCTURE DETAIL-POND #1  
N.T.S.



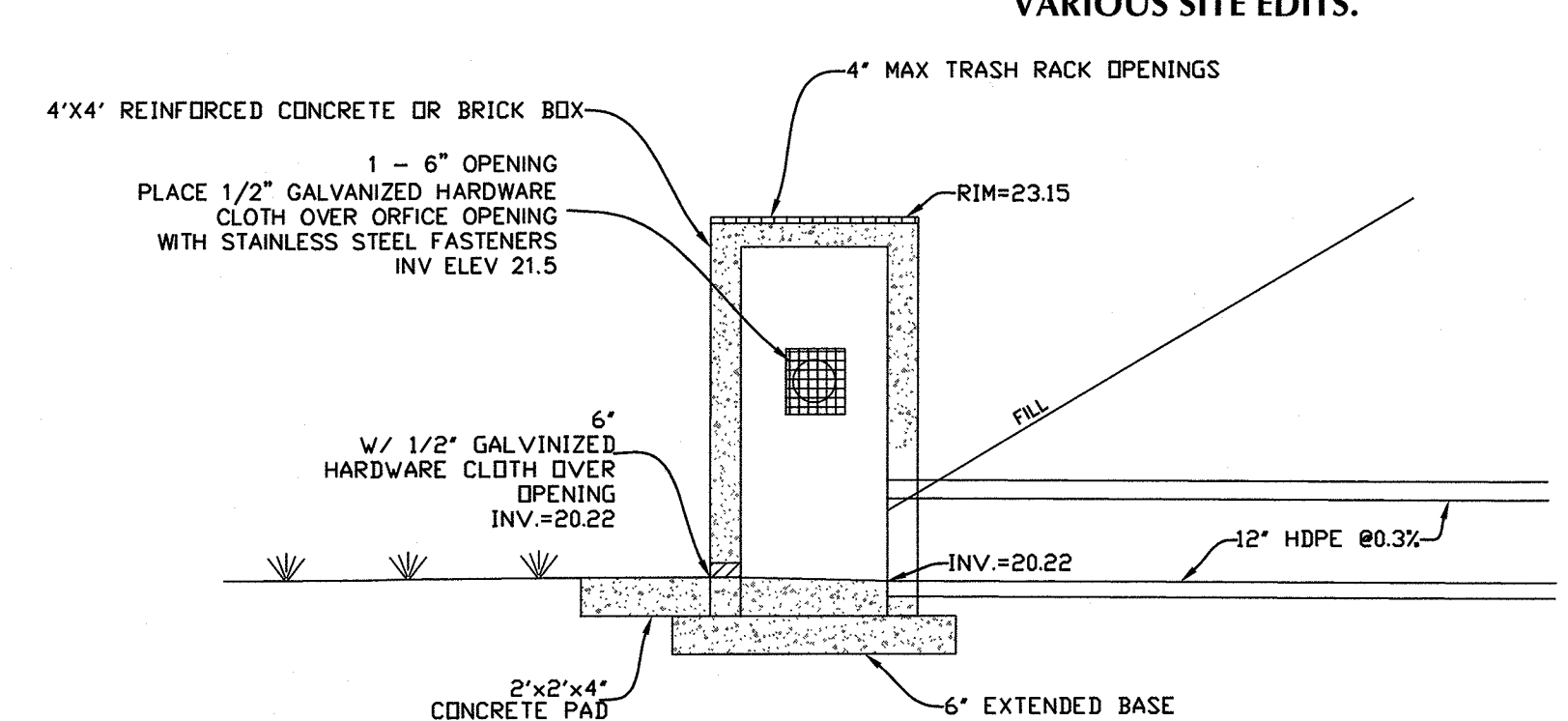
THIS PLAN SET WAS DESIGNED AND  
LAST SIGNED BY GARRY S. PAPE (PE  
LICENSE # 031315) ON 7/9/08. THIS  
REVISED SET IS ONLY PER REVISIONS  
BY THE GOVERNING AGENCIES AND  
VARIOUS SITE EDITS.

**NOTE:**

1. 5' AREA OFF TOP OF BANK TO BE USED FOR LANDSCAPING.



OUTLET STRUCTURE DETAIL-POND #2  
N.T.S.



OUTLET STRUCTURE DETAIL-POND #3  
N.T.S.

Approved Construction Plan				
No.	Revision	Date	By	Design

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

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

**HELMSDALE @ LANDFALL - PHASE II**  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

## DRY DETENTION AREA DETAILS

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

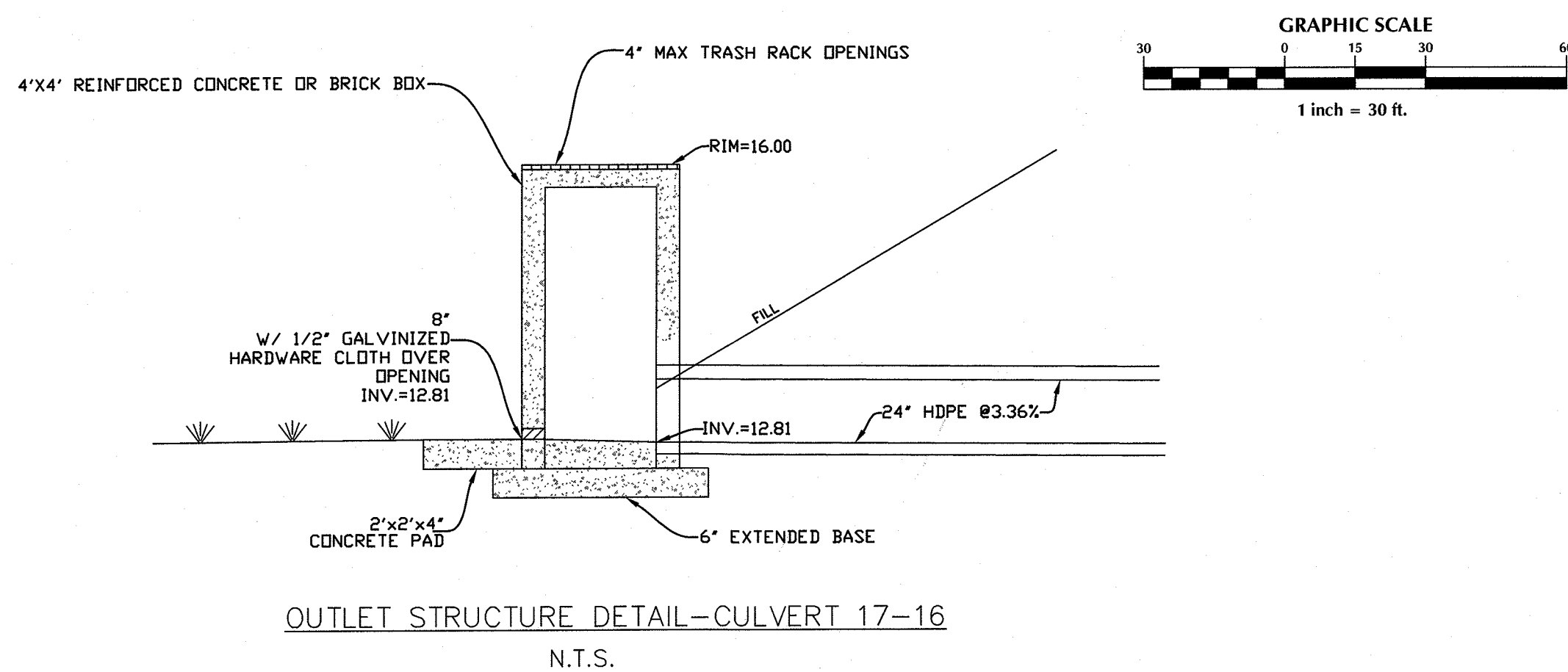
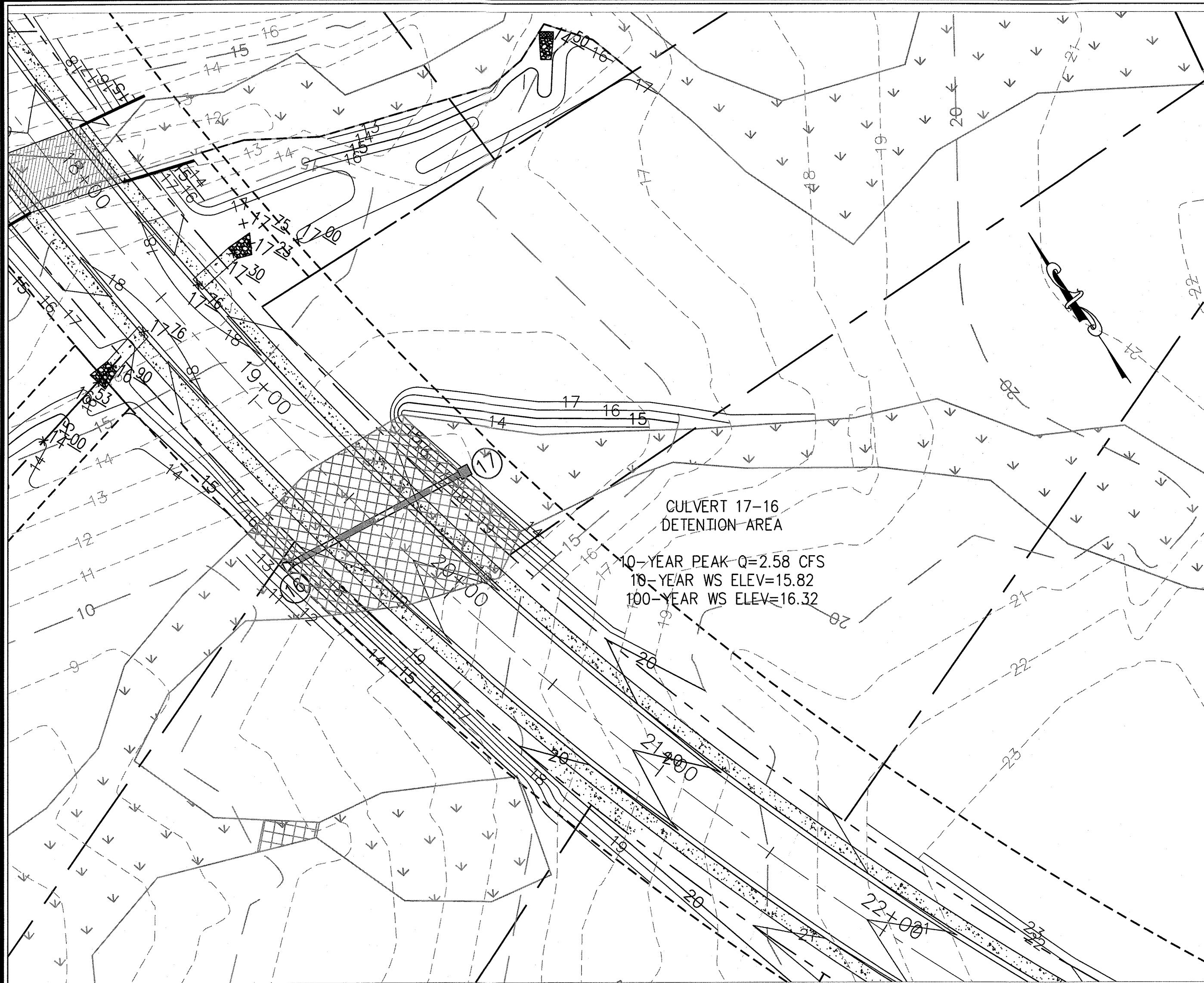
**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2384 www.wITHERSRAVENEL.com

Sheet No.

**C-11.2**

SITE ADDRESS: 558 ARBORETUM DRIVE

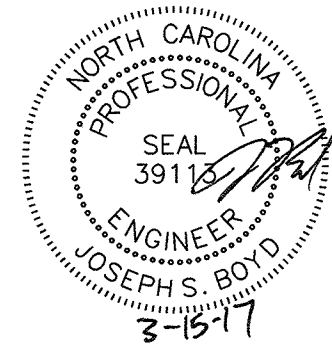




Approved Construction Plan			
No.	Revision	Date	By

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

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



THIS PLAN SET WAS DESIGNED AND LAST SIGNED BY GARRY S. PAPE (PE LICENSE # 031315) ON 7/9/08. THIS REVISED SET IS ONLY PER REVISIONS BY THE GOVERNING AGENCIES AND VARIOUS SITE EDITS.

SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale	N/A

HELMSDALE @ LANDFALL - PHASE II  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

## DRY DETENTION AREA DETAILS

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

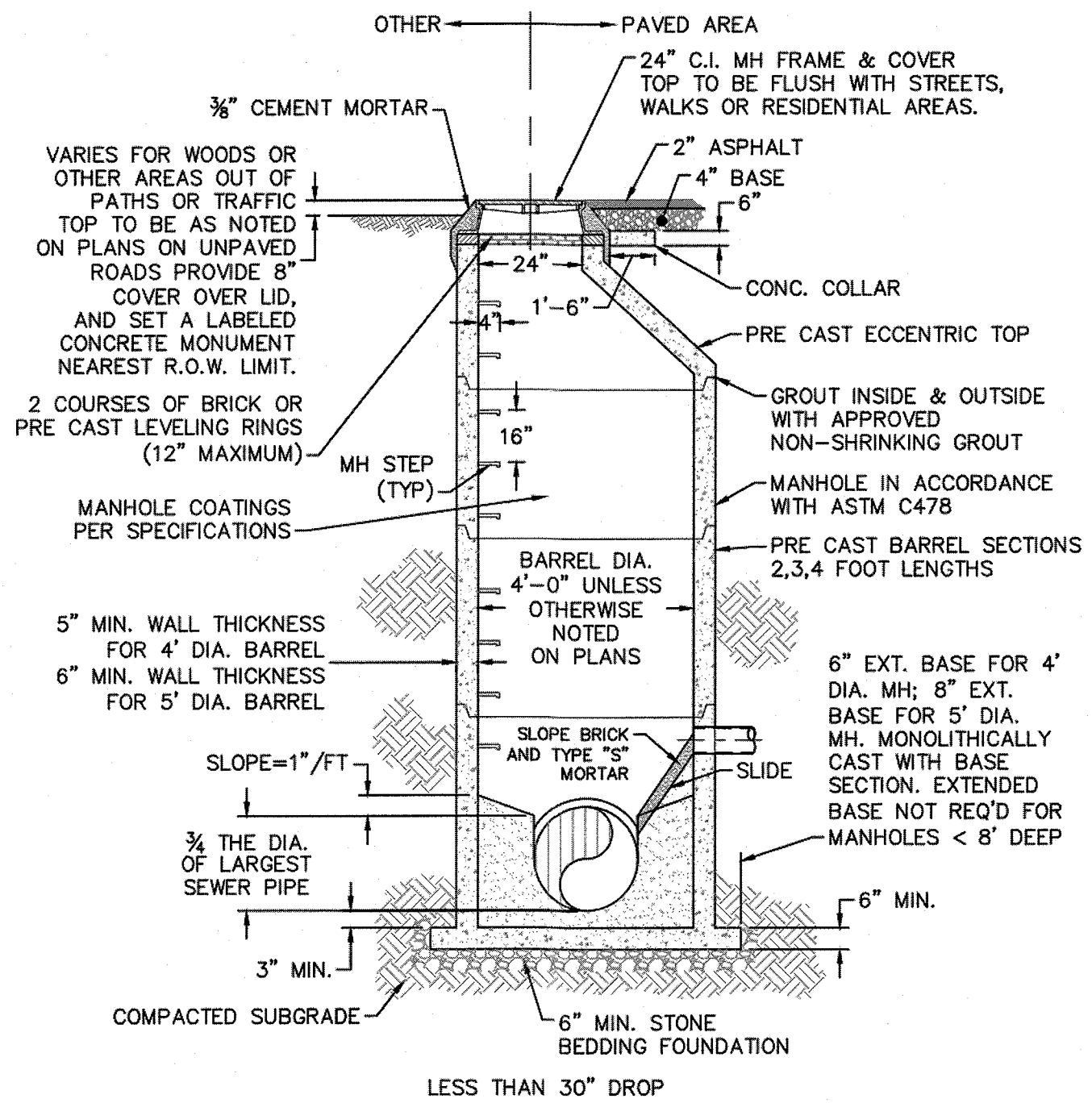
**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.wITHERSRAVENEL.COM

Sheet No.  
**C-11.3**

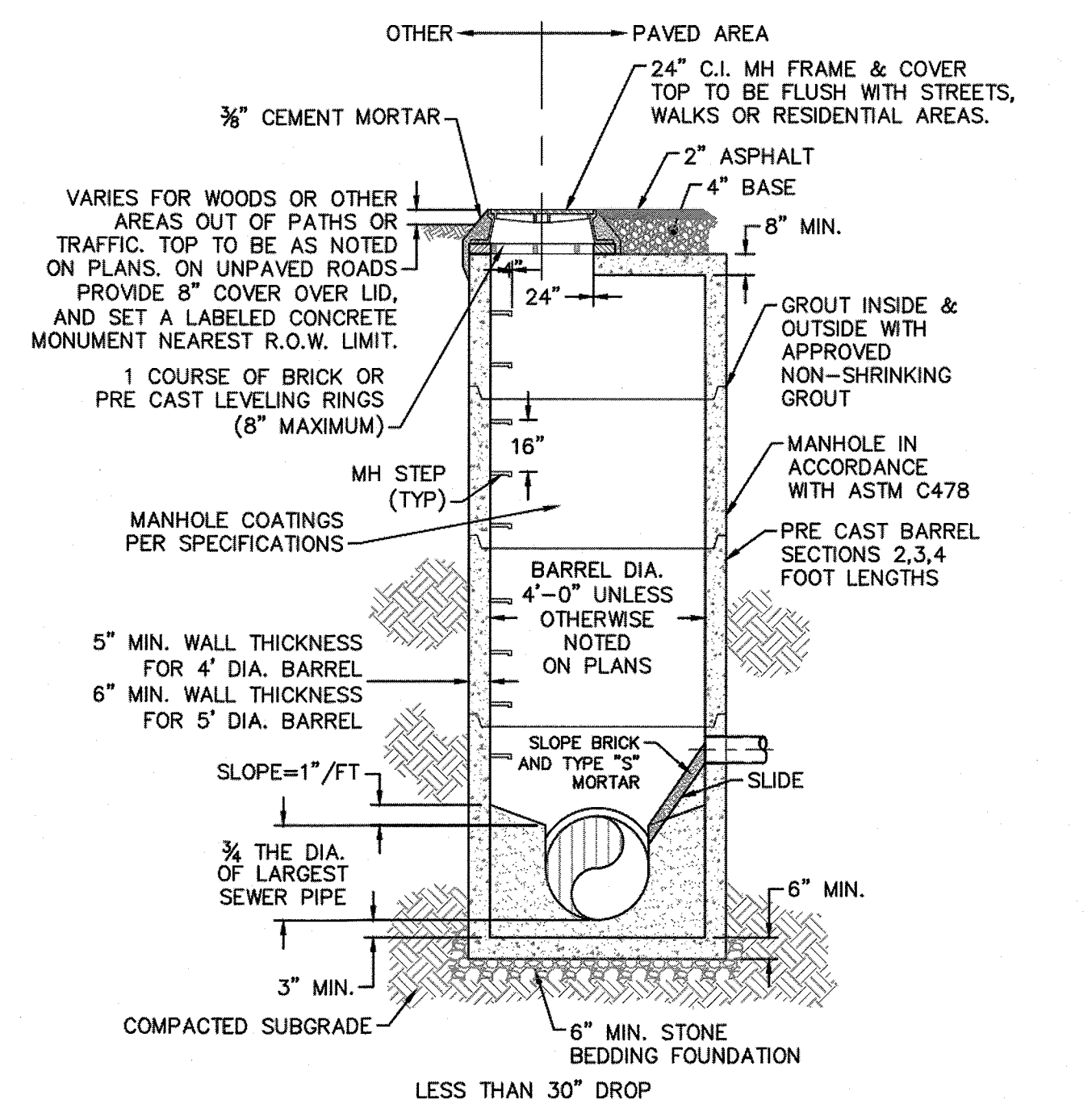




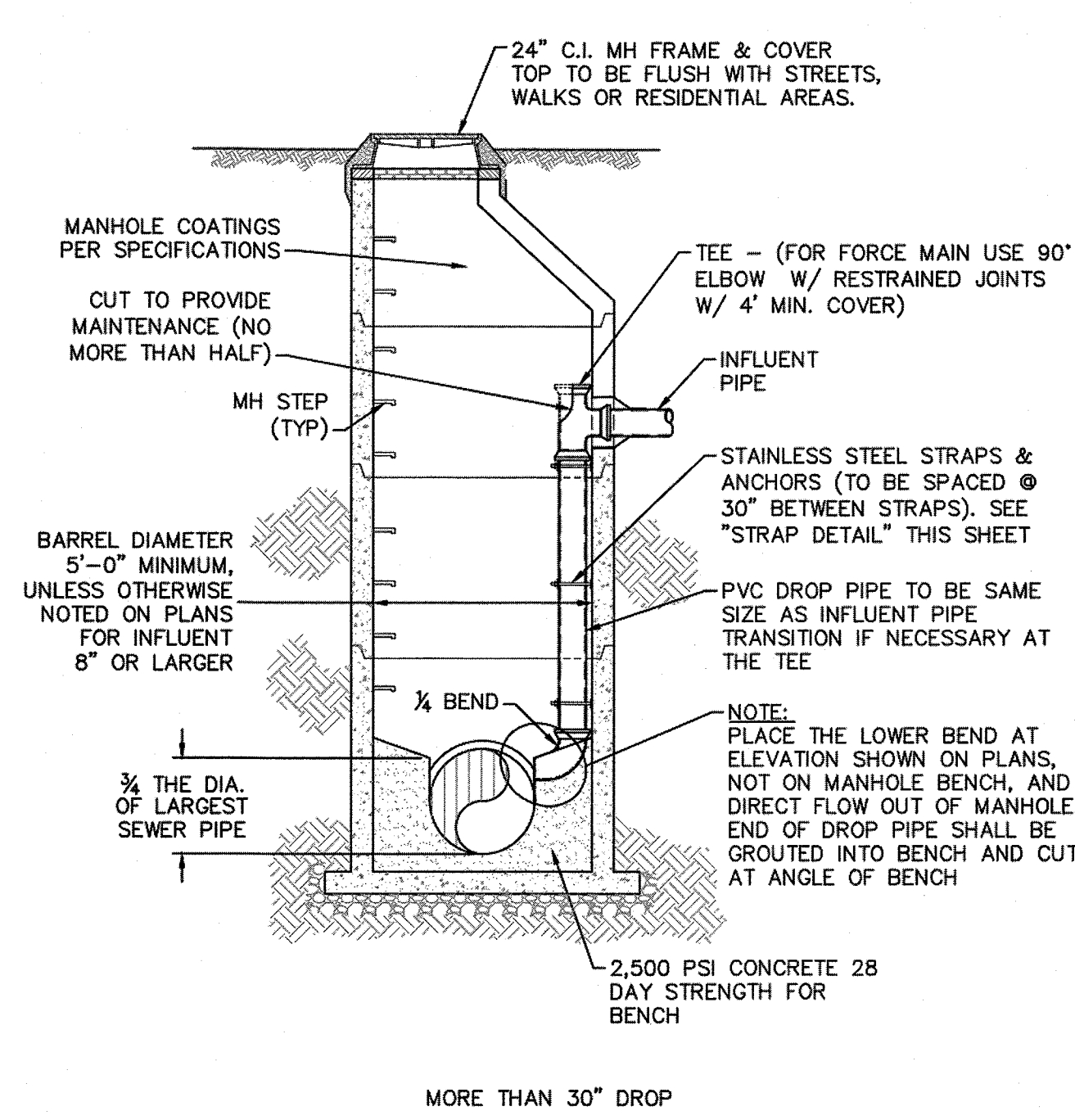




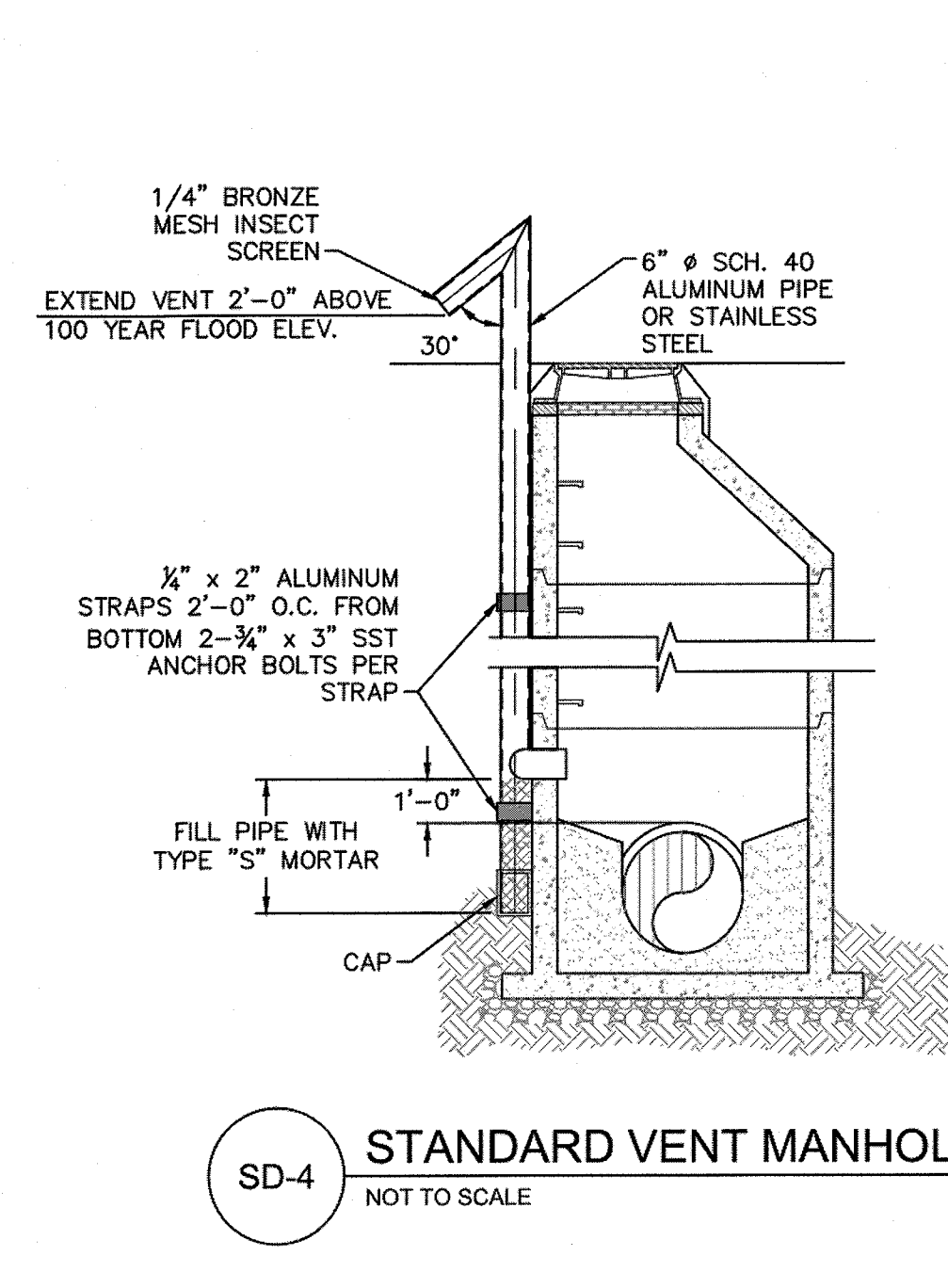
SD-1 PRECAST CONCRETE OFFSET MANHOLE TYPICAL  
NOT TO SCALE



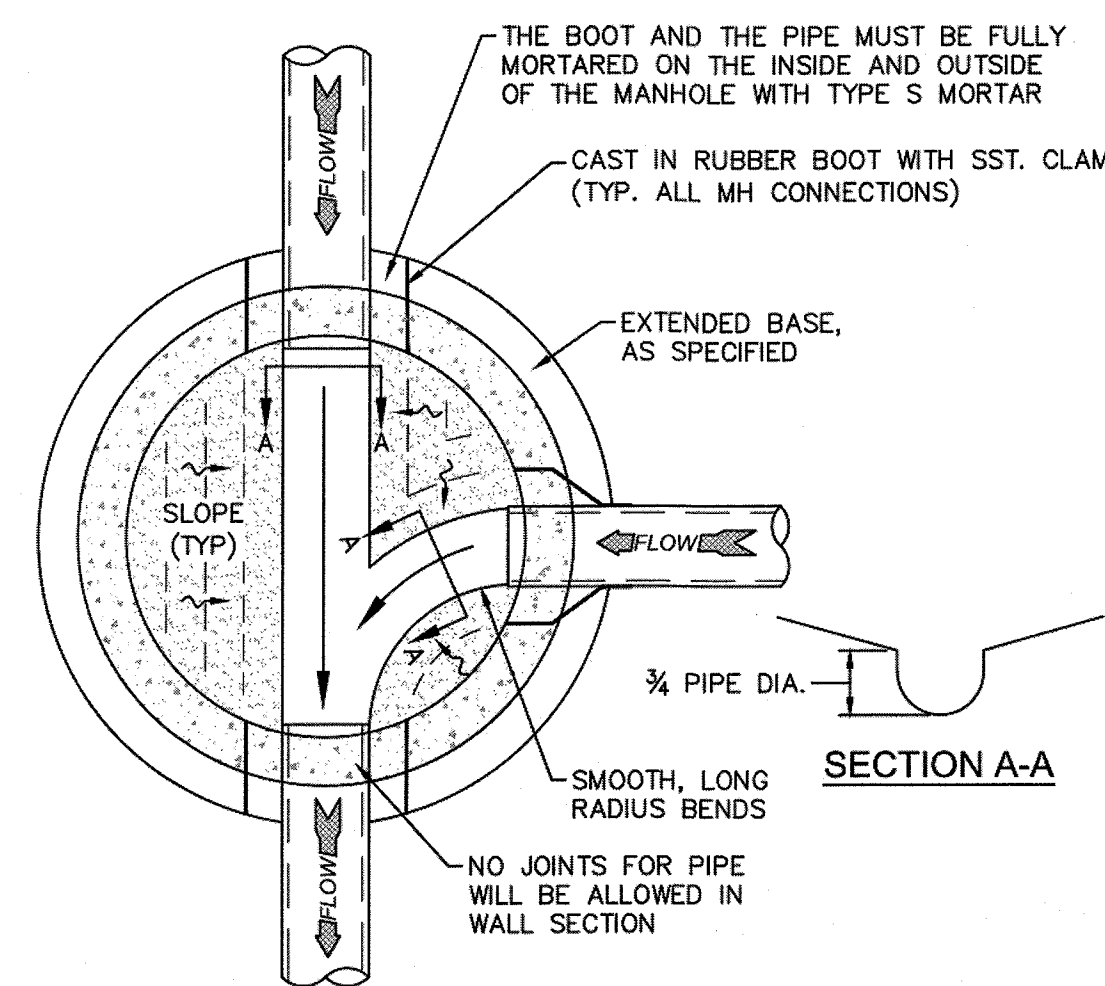
SD-2 PRECAST CONCRETE FLAT TOP MANHOLE TYPICAL  
NOT TO SCALE



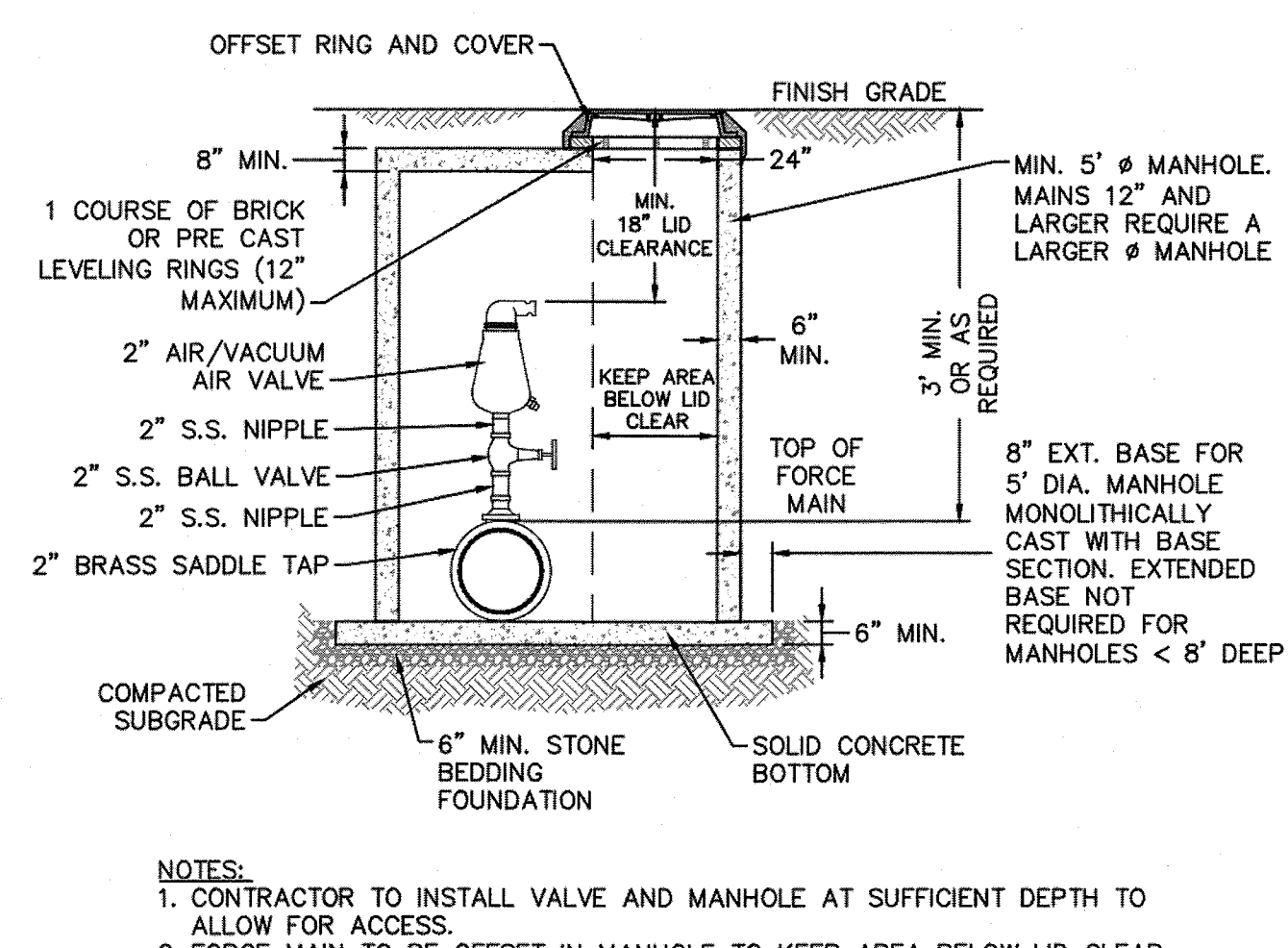
SD-3 DROP MANHOLE  
NOT TO SCALE



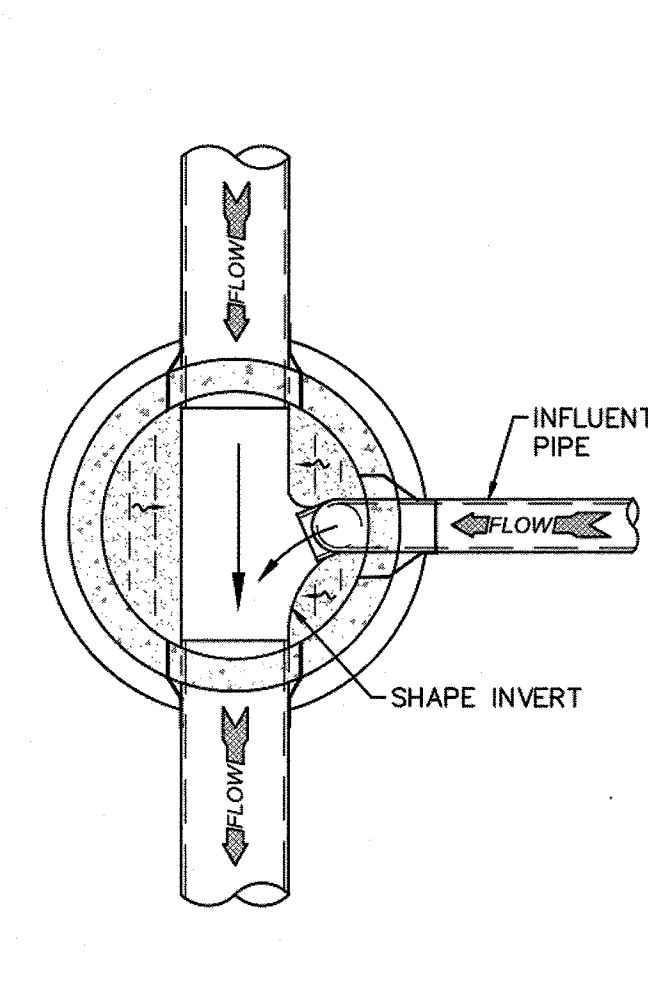
SD-4 STANDARD VENT MANHOLE  
NOT TO SCALE



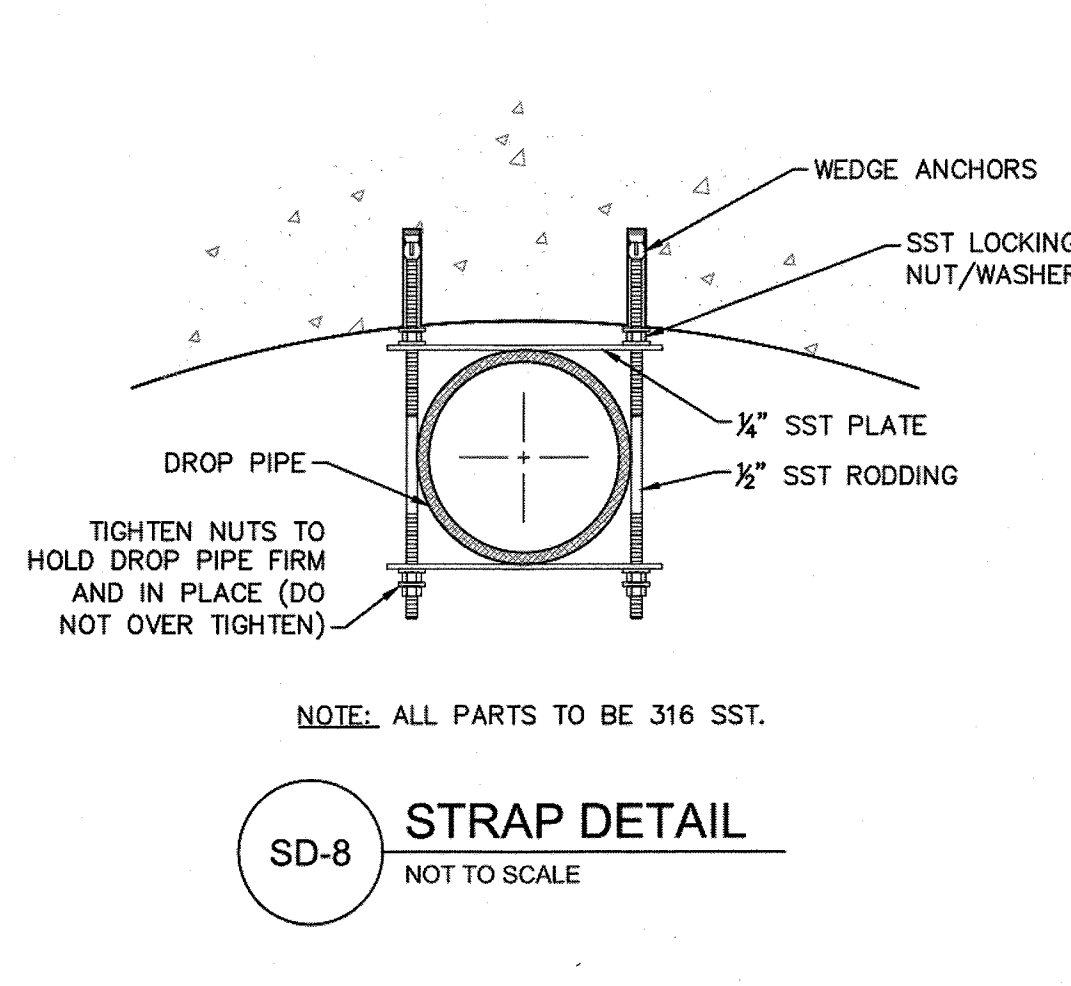
SD-5 MANHOLE FLOOR PLAN  
NOT TO SCALE



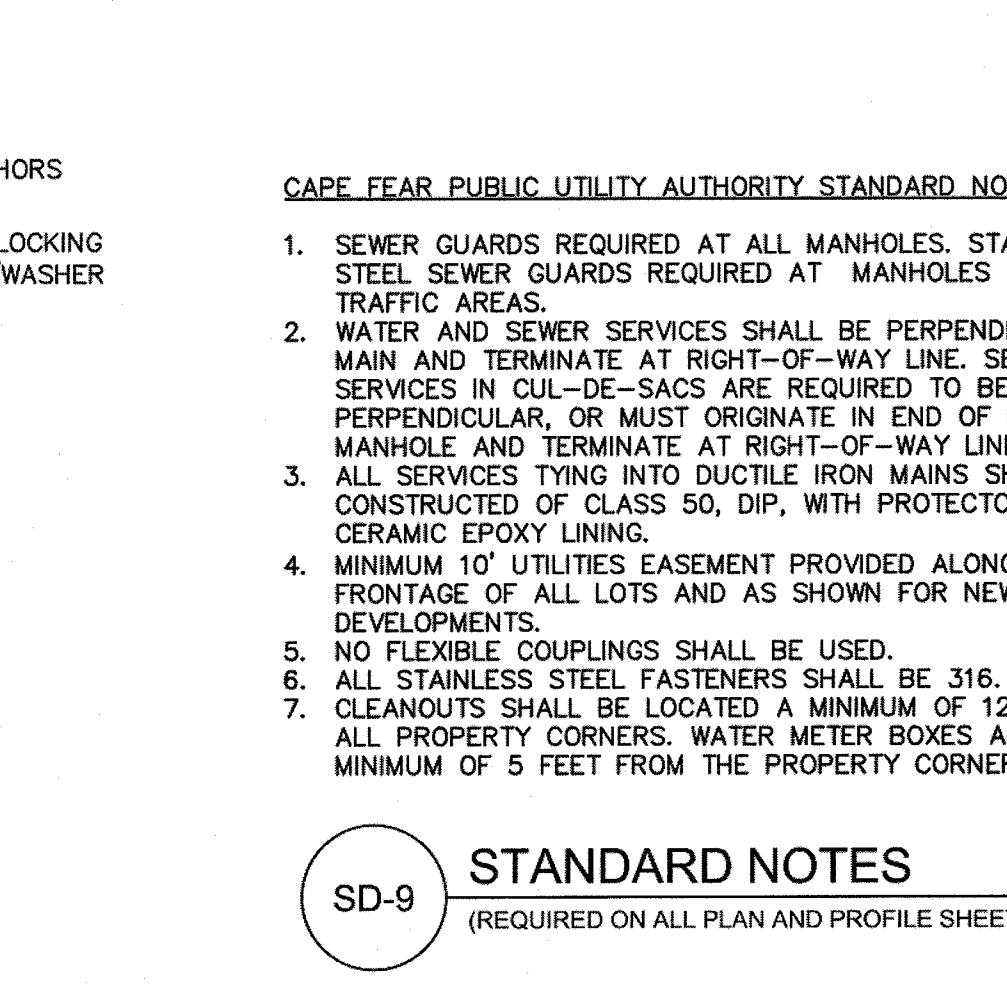
SD-6 AIR/VACUUM AND AIR RELEASE COMBINATION VALVE  
NOT TO SCALE



SD-7 DROP MANHOLE FLOOR PLAN  
NOT TO SCALE



SD-8 STRAP DETAIL  
NOT TO SCALE



SD-9 STANDARD NOTES  
(REQUIRED ON ALL PLAN AND PROFILE SHEETS)

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

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

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

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

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

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

REV.	DESCRIPTION:	DATE:
1	AIR / VACUUM AND AIR RELEASE COMBINATION VALVE REVISED	10/26/12
2	STANDARD SEWER NOTE #6 REVISED	12/10/12
3	REVISED STANDARD VENT MANHOLE TO EXTEND VENT 2'-0" ABOVE 100 YR FLOOD	11/20/14
4	Revised Multiple Details	02/15/16

**CFPUA SANITARY SEWER**

**STANDARD DETAILS**

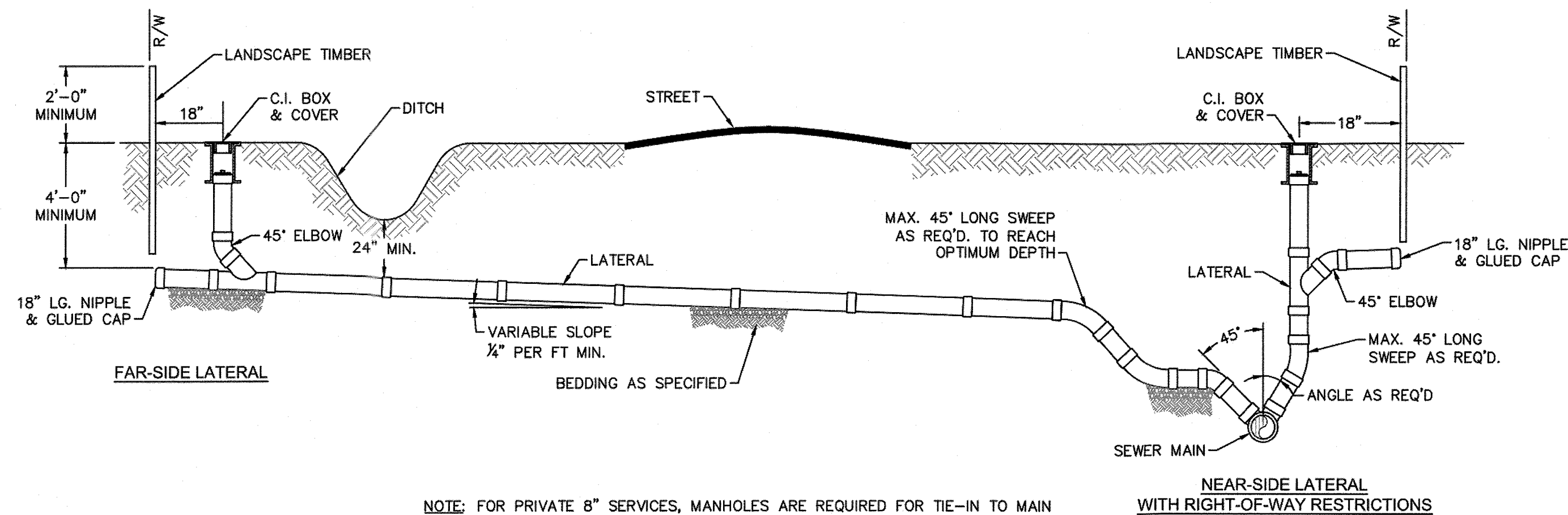
CAPE FEAR PUBLIC UTILITY AUTHORITY  
235 GOVERNMENT CENTER DRIVE  
WILMINGTON, NC 28403  
OFFICE: (910)332-6560

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

SHEET NO: **SSD-1**

SITE ADDRESS: 558 ARBORETUM DRIVE

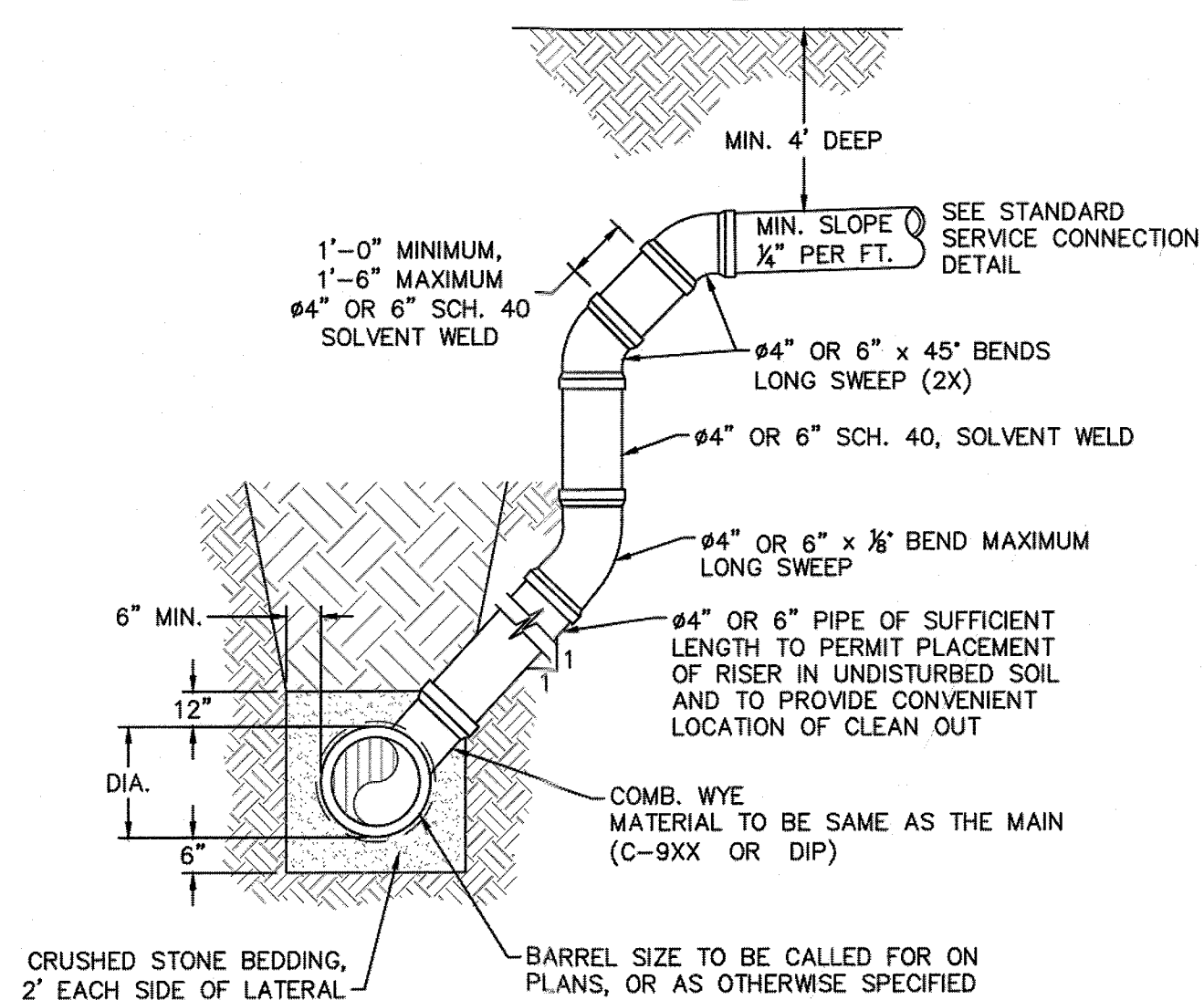




NOTE: FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR TIE-IN TO MAIN

### STANDARD SERVICE CONNECTION TO SANITARY SEWER

SD-19 NOT TO SCALE

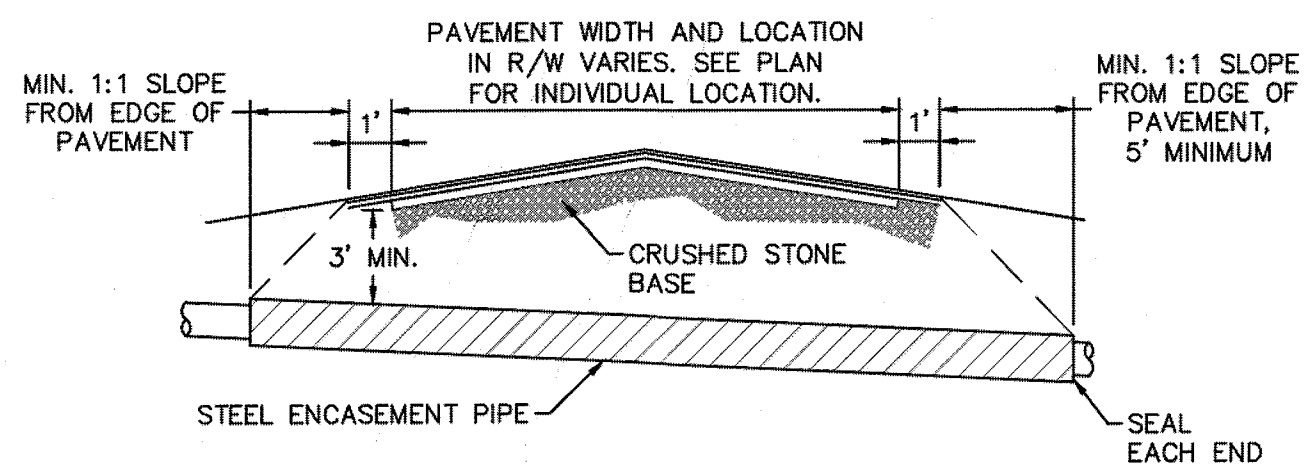


- NOTES:
- SPECIAL CARE SHALL BE TAKEN DURING BACKFILL OPERATIONS. THE RISER SHALL BE PLUMB AND TRUE AT ALL TIMES, AND REST ON FIRM, STABLE FOUNDATION.
  - FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

### SD-12 DEEP SERVICE LATERAL

MAIN DEPTH GREATER THAN 8 FT

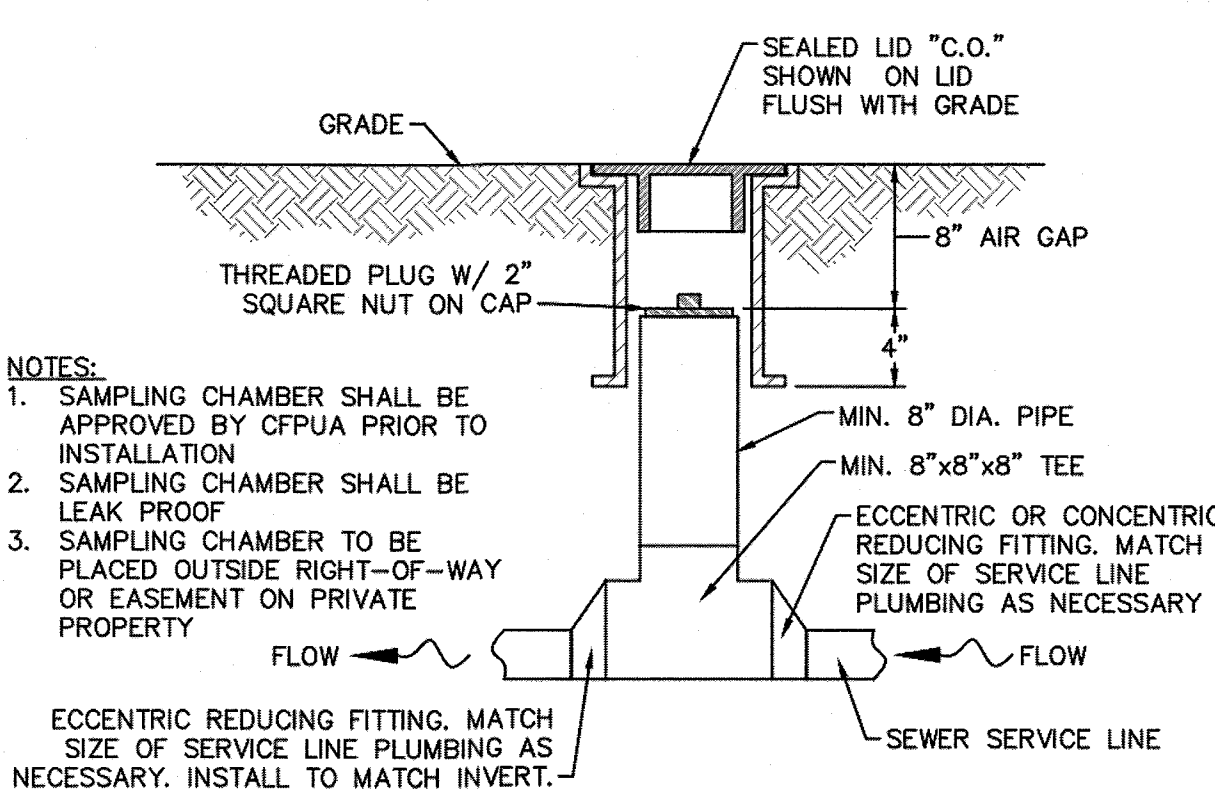
NOT TO SCALE



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

### SD-16 TYPICAL BORING/ JACKING DETAIL

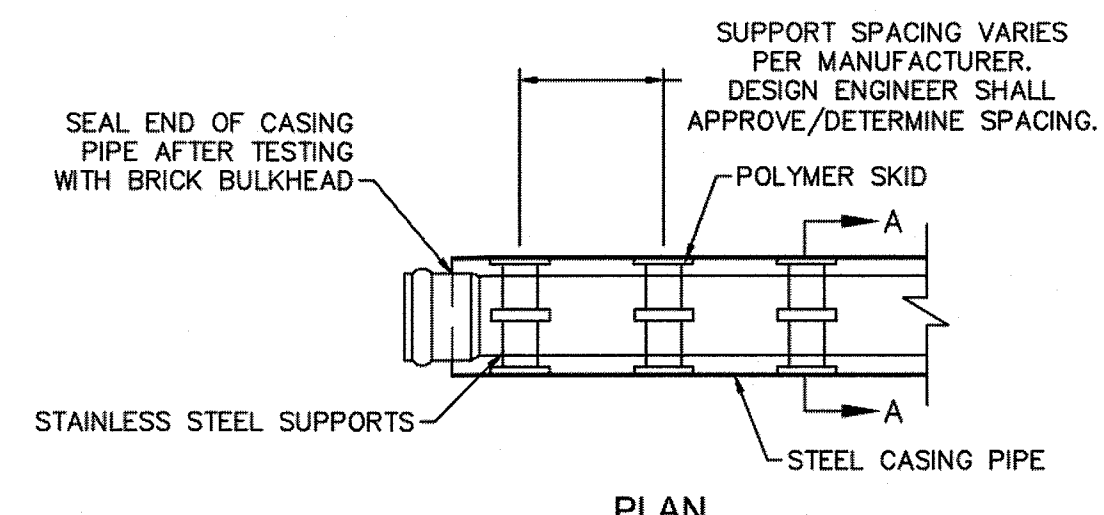
NOT TO SCALE



- NOTES:
- SAMPLING CHAMBER SHALL BE APPROVED BY CFPUA PRIOR TO INSTALLATION.
  - SAMPLING CHAMBER SHALL BE LEAK PROOF.
  - SAMPLING CHAMBER TO BE PLACED OUTSIDE RIGHT-OF-WAY OR EASEMENT ON PRIVATE PROPERTY.

### SD-13 SAMPLING CHAMBER

NOT TO SCALE



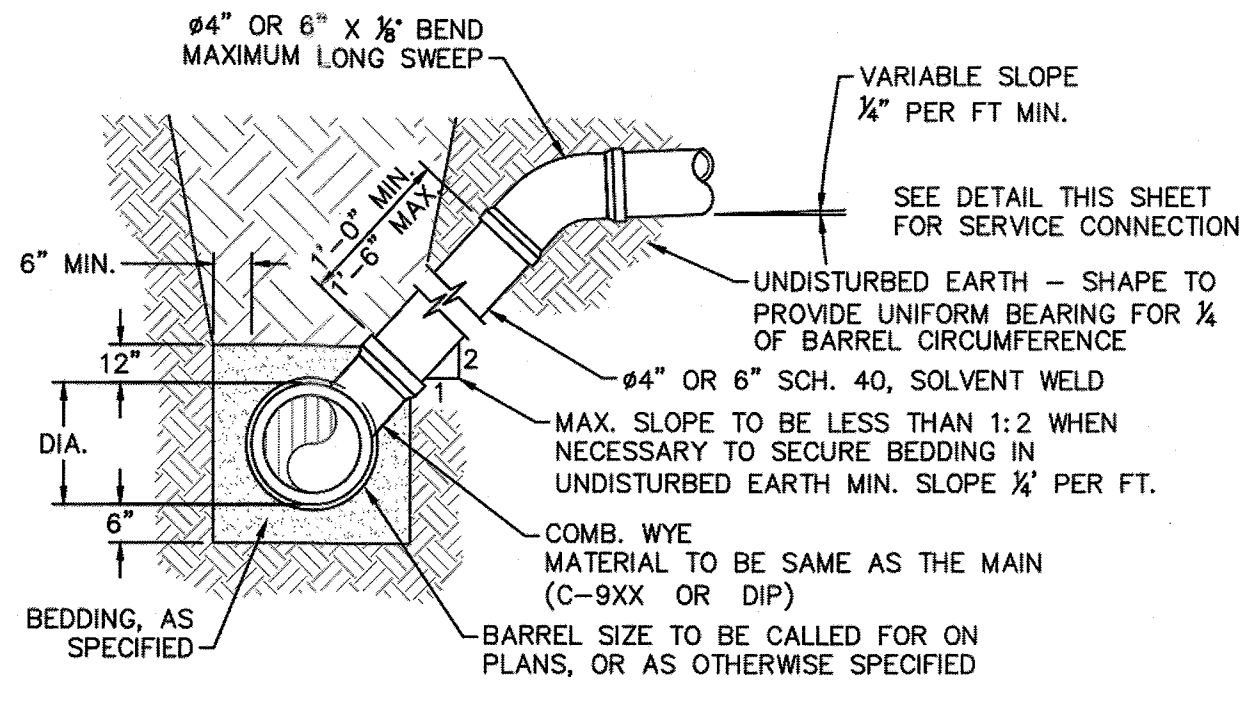
NOTE: PIPE SUPPORT TO BE PLACED TO PROVIDE PROPER SUPPORT, ALIGNMENT, AND GRADE AS SPECIFIED. CONTINUOUS SUPPORTS MAY BE USED AS ALTERNATIVE. OIL, GREASE, OR PETROLEUM PRODUCT MAY NOT BE USED AS LUBRICANT.

SKID SPACING AND LEG SIZE VARIES BY PIPE SIZE AND PER MANUFACTURER. DESIGN ENGINEER SHALL APPROVE/DETERMINE SPACING.

### SD-17 PIPE CASING SUPPORT DETAIL

NOTE: ALL STAINLESS STEEL PARTS TO BE 316 SST.

NOT TO SCALE

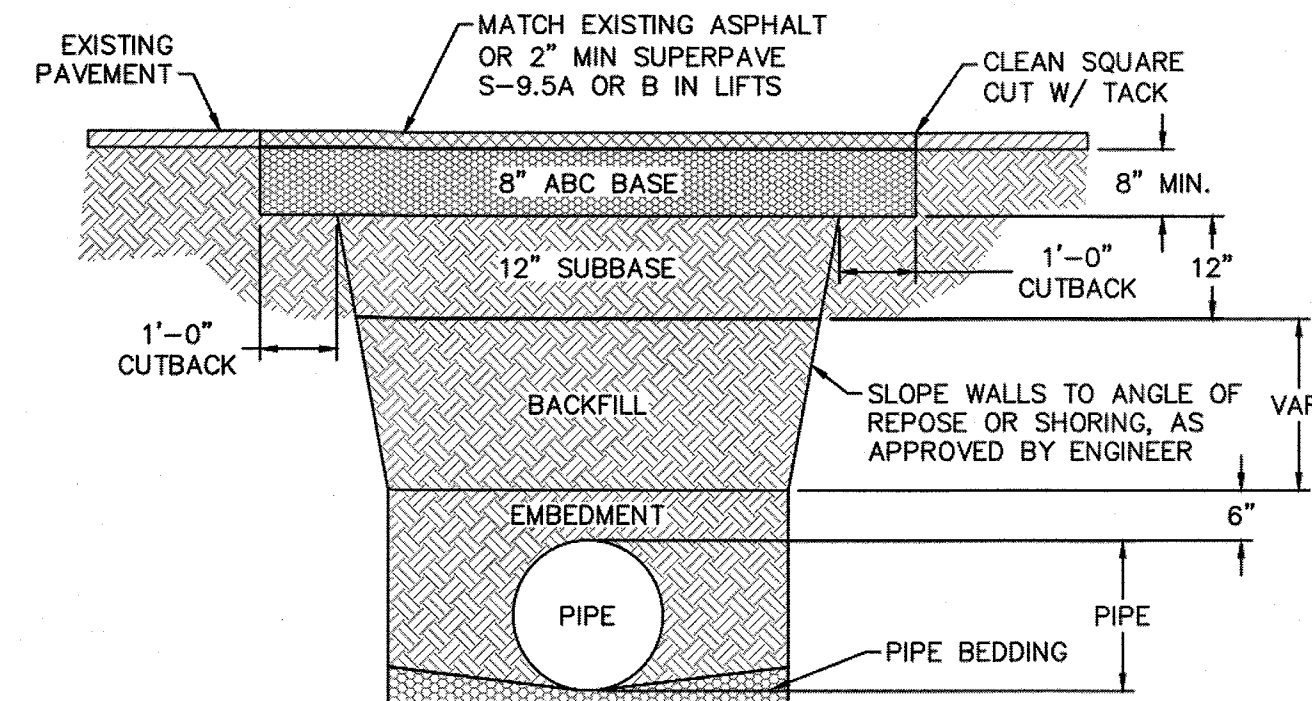


NOTE: FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

### SD-10 STANDARD SERVICE LATERAL

MAIN DEPTH LESS THAN 8 FT

NOT TO SCALE

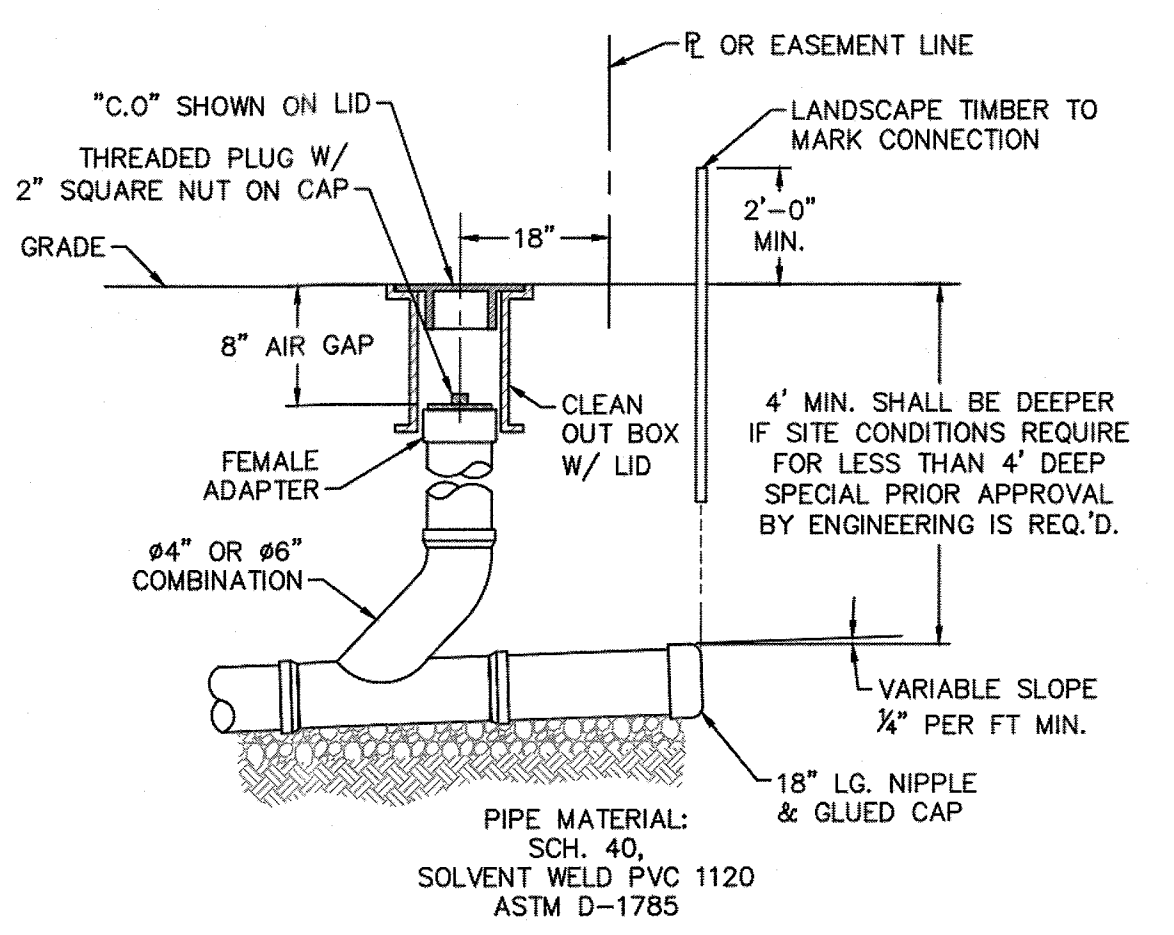


- NOTES:
- BACKFILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBOS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.
  - SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC).
  - 8-INCH OF ABC BASE MATERIAL SHALL BE USED ON CITY STREETS.
  - BACKFILL AND BASE MATERIALS SHALL BE COMPACTED 12\"/>

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

### SD-14 PAVEMENT REPAIR WHERE PIPE INSTALLED

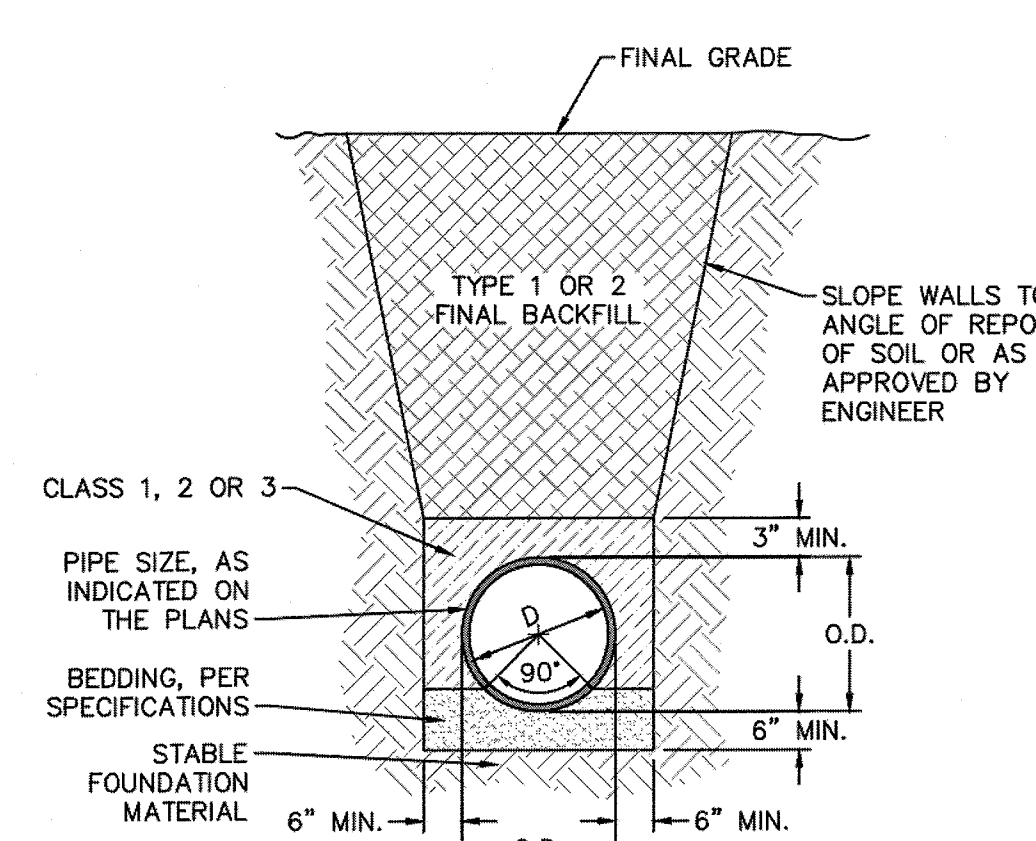
NOT TO SCALE



NOTE: FOR PRIVATE 8" SERVICES, MANHOLES ARE REQUIRED FOR CONNECTION TO SYSTEM AND AT THE PROPERTY LINE, WITH REQUIRED EASEMENT.

### SD-11 SERVICE CONNECTION AND CLEAN-OUT

NOT TO SCALE



### SD-15 TYPICAL TRENCH DETAIL

NOT TO SCALE

- 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 AND STOCKPILE AREAS (TO ARRANGE AND ENSURE COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS).

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

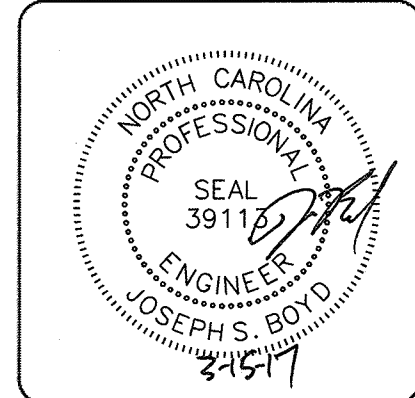
TYPICAL DETAILS NOTE:  
THE TYPICAL DETAILS ON THIS SHEET WERE DESIGNED AND PREPARED BY OTHERS.

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

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

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

REV.	DESCRIPTION:	DATE:
1	SAMPLING CHAMBER REVISED	10/26/12
2	Revised Multiple Details	02/15/16



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: CFPUA  
CHECKED BY: CFPUA  
PROJECT NO.:  
SHEET NO: SSD-2

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.wITHERSRAVENEL.com

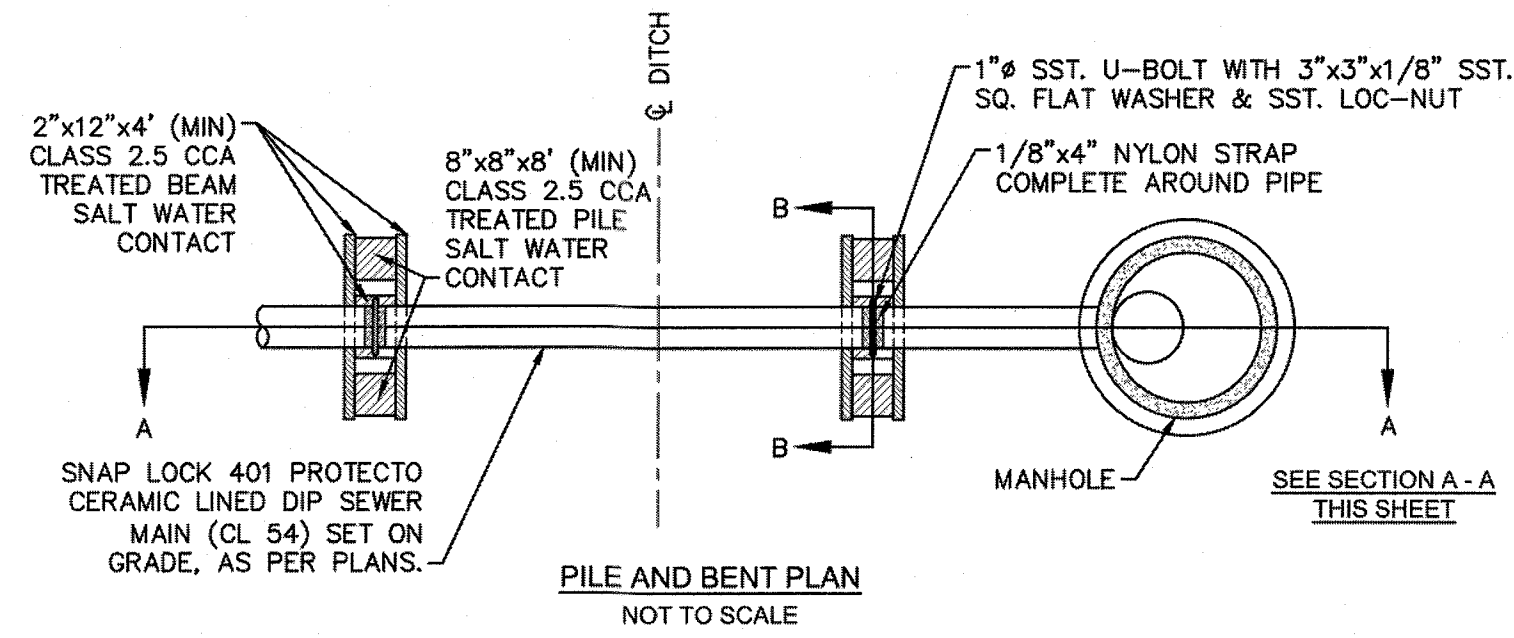
**HELMSDALE @ LANDFALL - PHASE II**  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

CAPE FEAR PUBLIC UTILITY AUTHORITY  
SEWER DETAILS

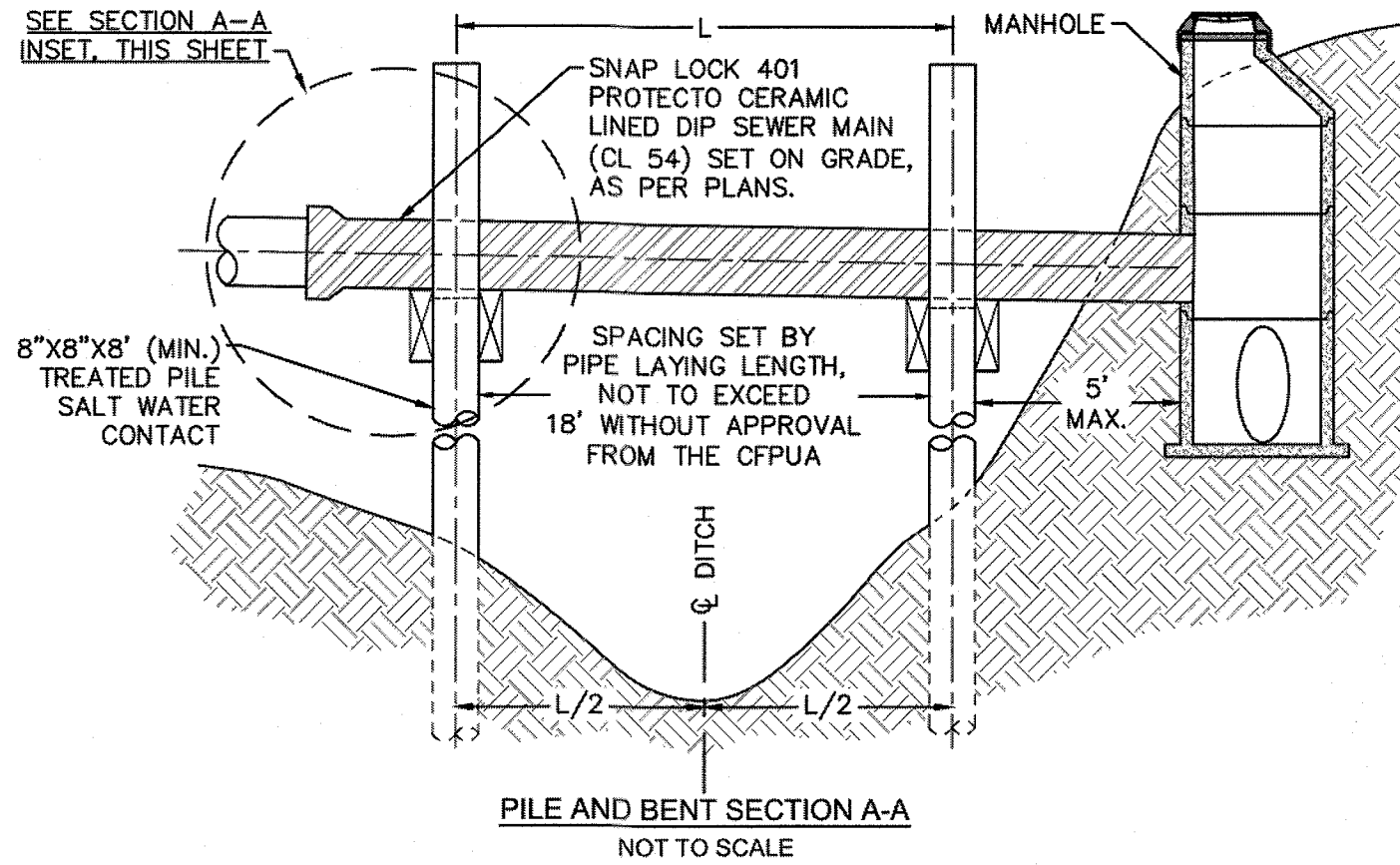
PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

Sheet No. C-12.3

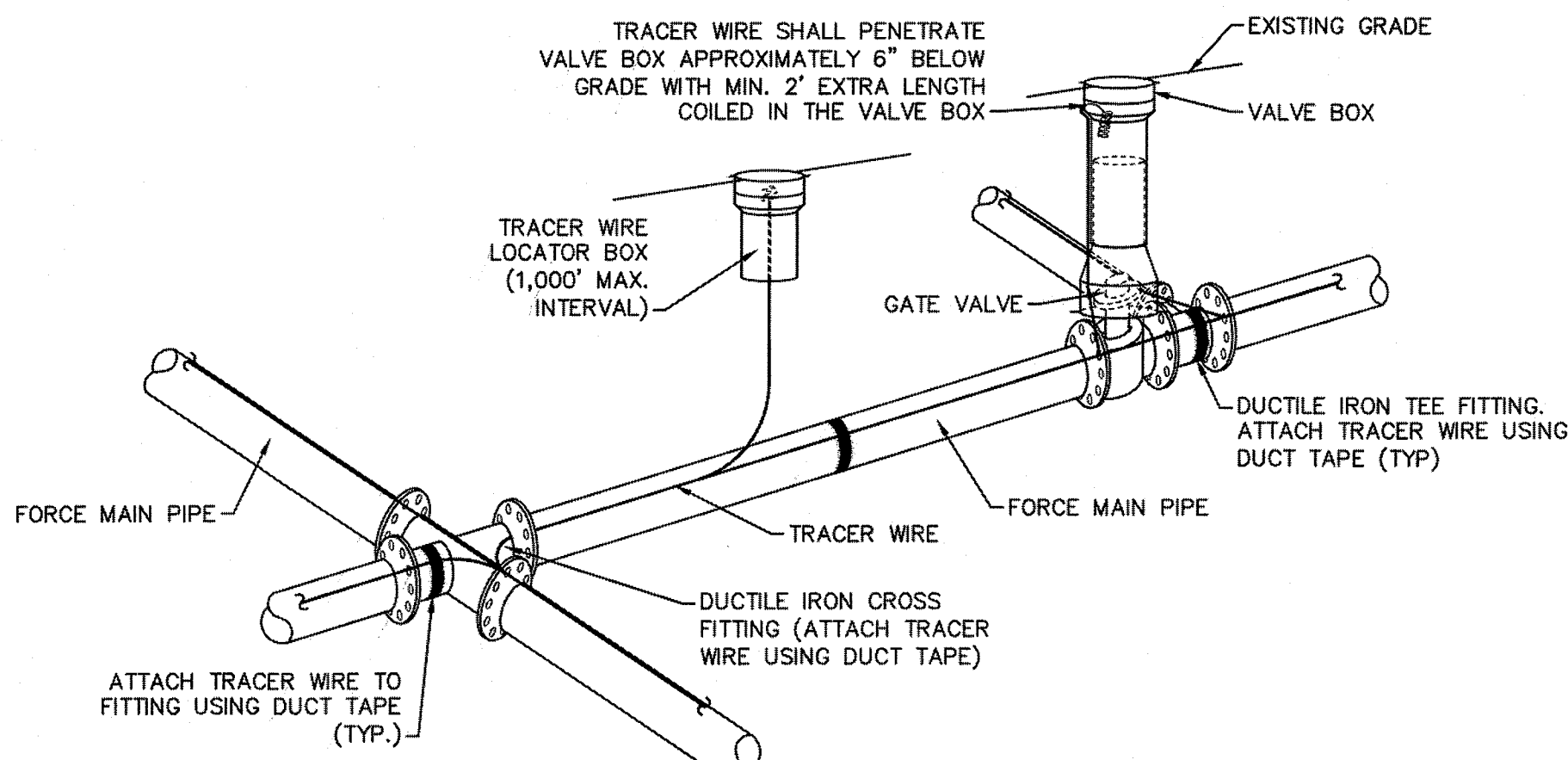




- NOTES:
1. PILES AND PILE DRIVING SHALL CONFORM TO NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, JANUARY 2002, SECTIONS 445, 450, 1082-2 & 1084-2.
  2. CENTERLINE OF BOLTS TO BE A MINIMUM OF 3" FROM OUTSIDE EDGE OF TIMBER. BOLTS TO BE A MINIMUM OF 3" CENTERLINE TO CENTERLINE.
  3. ALL STAINLESS STEEL SHALL BE 316. STAINLESS STRAP TO BE COLD FORMED.
  4. PILE SHALL NOT OBSTRUCT FLOW OR CAUSE EROSION OF DITCH/STREAM BANK.
  5. MIN. CLASS 54 DIP-ENGINEER MUST DESIGN LOADING.
  6. DESIGN SHALL BE APPROVED BY CFPUA.

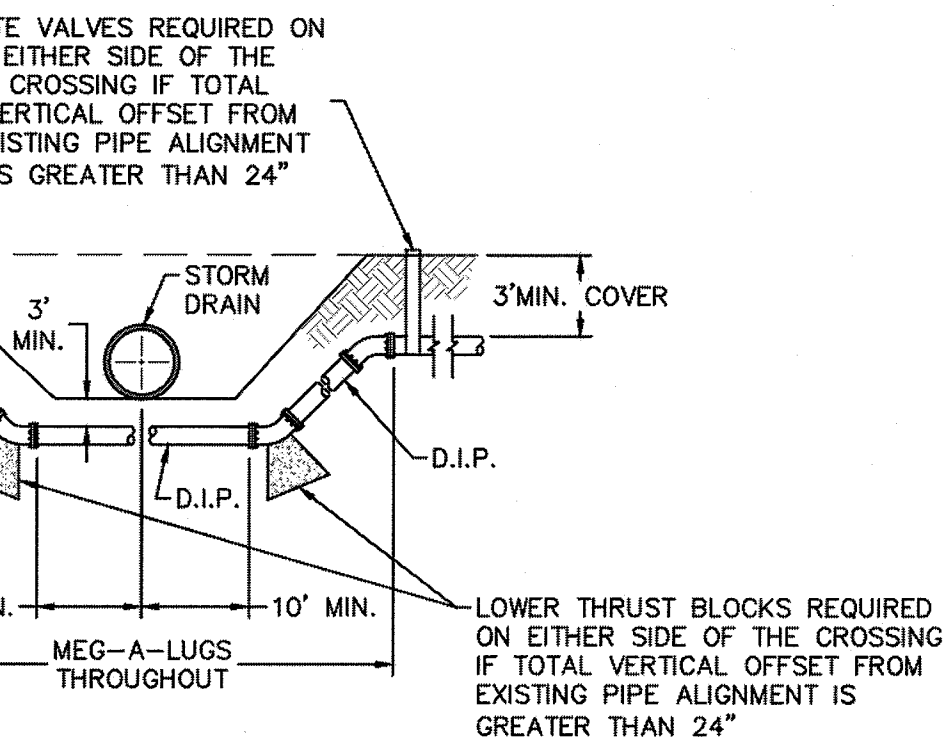
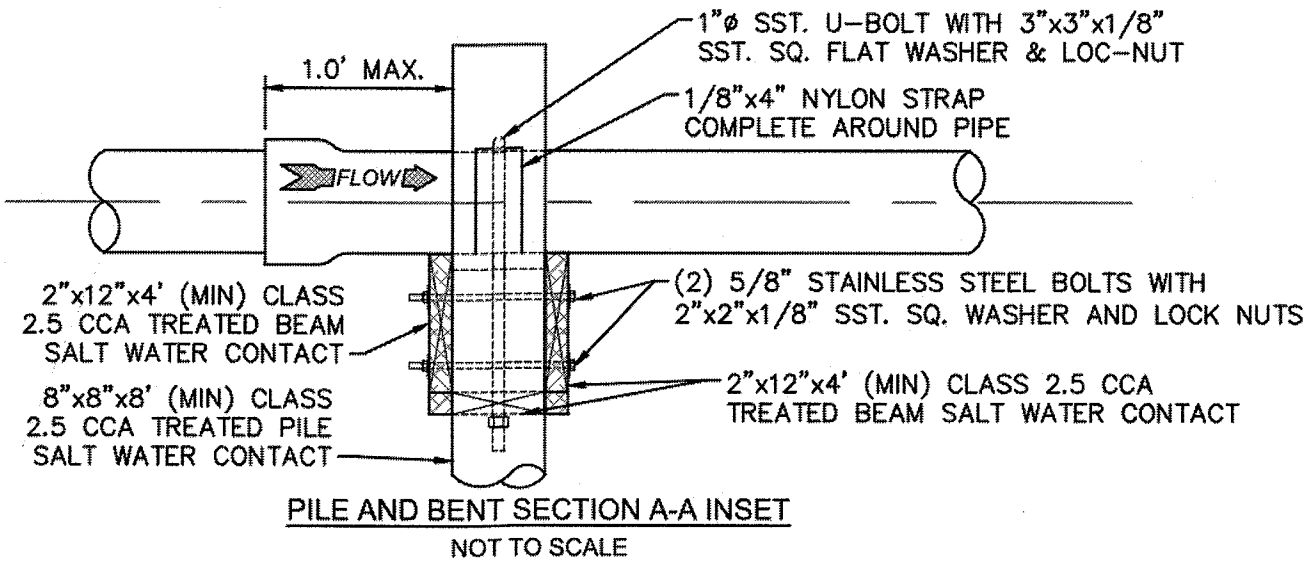
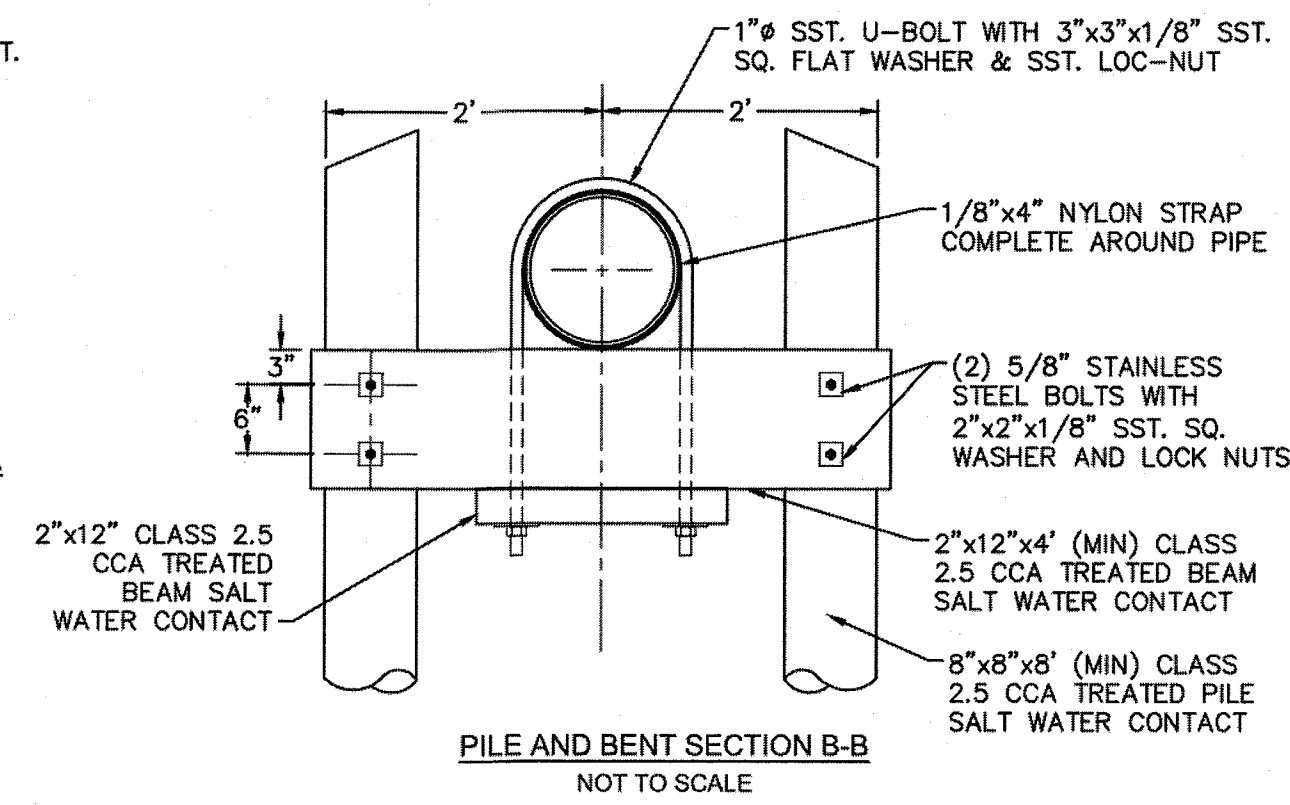


SD-20 PILE AND BENT DETAIL  
NOT TO SCALE



- 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 FORCE MAIN PIPING WITH DUCT TAPE AT 12 FOOT INTERVALS ALONG THE PIPE.
  3. SECURE WIRE TO ALL TEE AND CROSS FITTINGS WITH DUCT TAPE.
  4. ALL SPLICES IN THE WIRE SHALL BE MADE WITH 3M DBR DIRECT BURY SPLICE KIT AN UNDERGROUND RATED, WATERTIGHT, AND APPROVED SPLICE CONNECTOR OR APPROVED EQUAL.

SD-21 TRACER WIRE DETAIL  
NOT TO SCALE



NOTE: USE D.I.P. (CL50 OR BETTER)

SD-18 FORCE MAIN DITCH AND STORM DRAIN CROSSING  
NOT TO SCALE

Approved Construction Plan	
Name	Date
Planning	
Public Utilities	
Traffic	
Fire	

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

REV.	DESCRIPTION:	DATE:
1	ADDED NOTES TO THE STRUCTURAL BRIDGING DETAIL	03/11/15
2	Revised Tracer Wire Detail	10/20/15
3	Revised Force Main Ditch and Storm Drain Crossing Detail	02/15/16

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

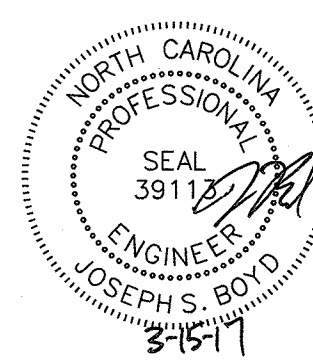
- GENERAL NOTES:
1. NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
  2. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES BEFORE ANY CONSTRUCTION BEGINS.
  3. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES WHILE CONSTRUCTION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

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

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

CFPUA SANITARY SEWER

STANDARD DETAILS



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: CFPUA  
CHECKED BY: CFPUA  
PROJECT NO.:

SHEET NO:  
SSD-3

SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale
				Drawn By	W&R	Date 12/19/13
				Checked By	JSB	Job No. 03050283.01

HELMSDALE @ LANDFALL - PHASE II  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

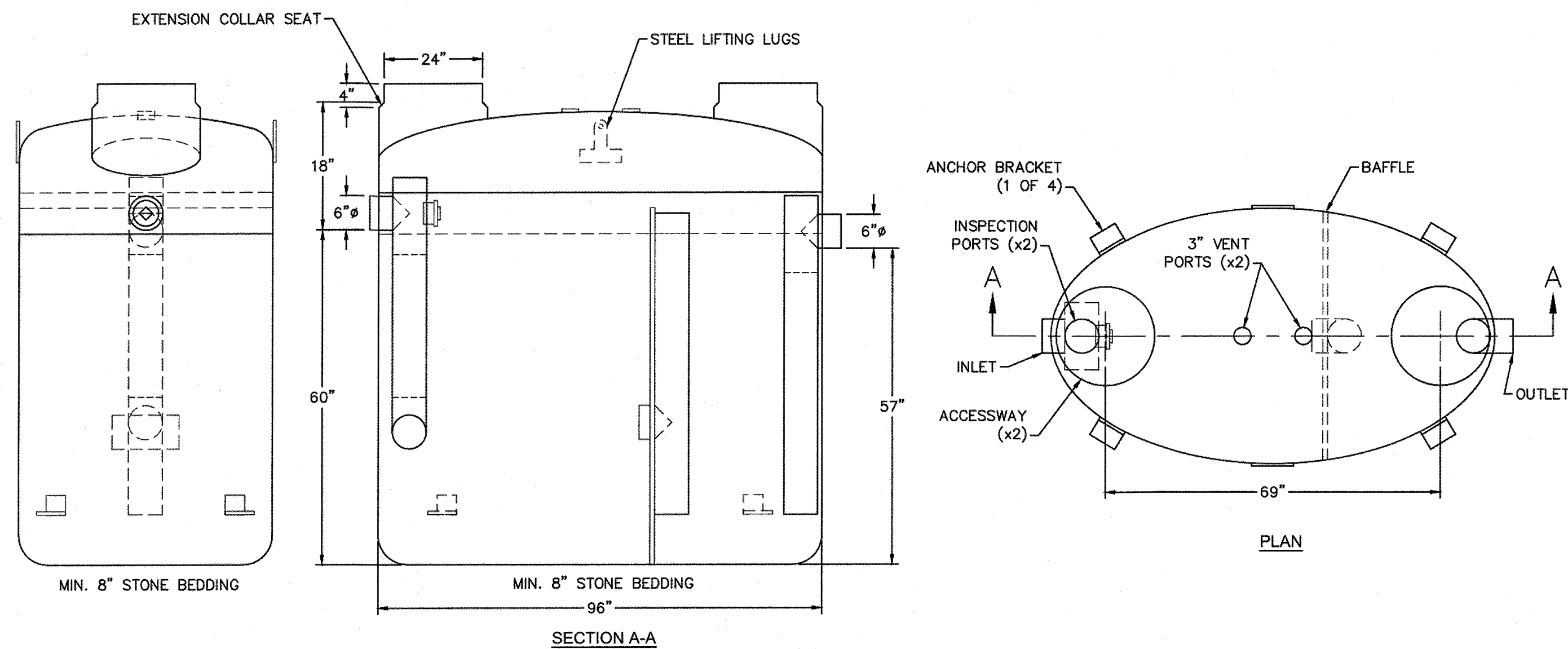
CAPE FEAR PUBLIC UTILITY AUTHORITY  
SEWER DETAILS

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

WITHERS & RAVENEL  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.withersravenel.com

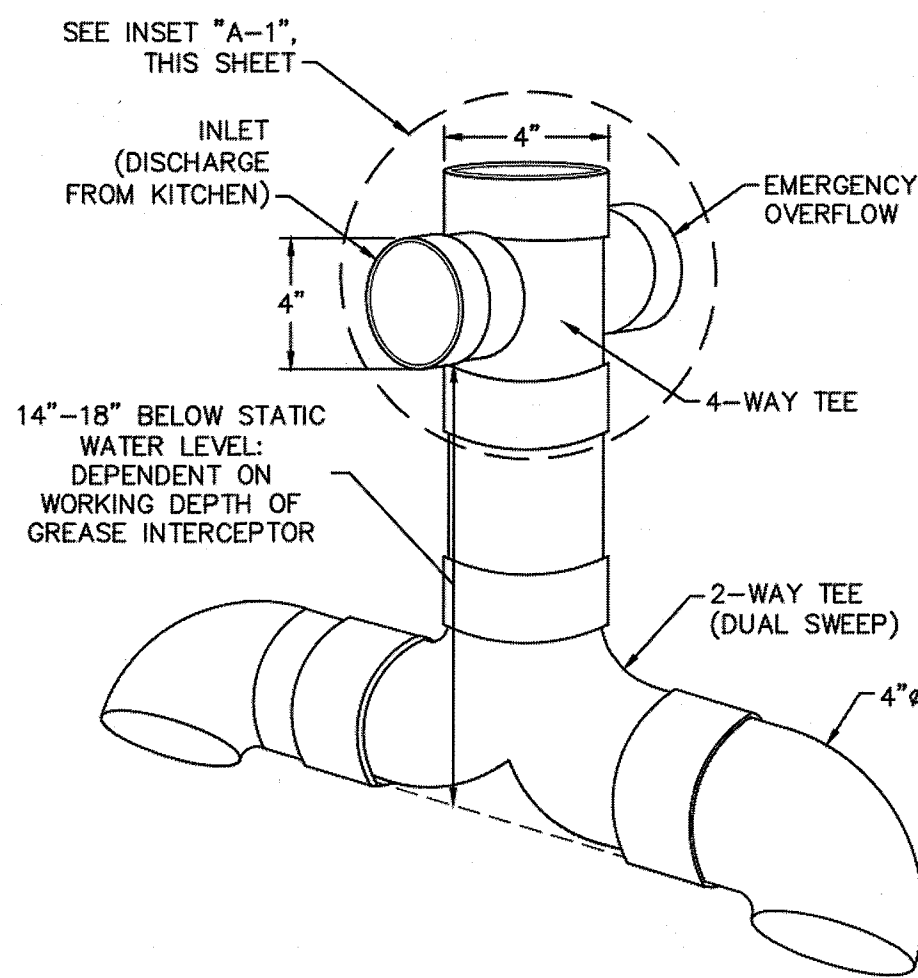
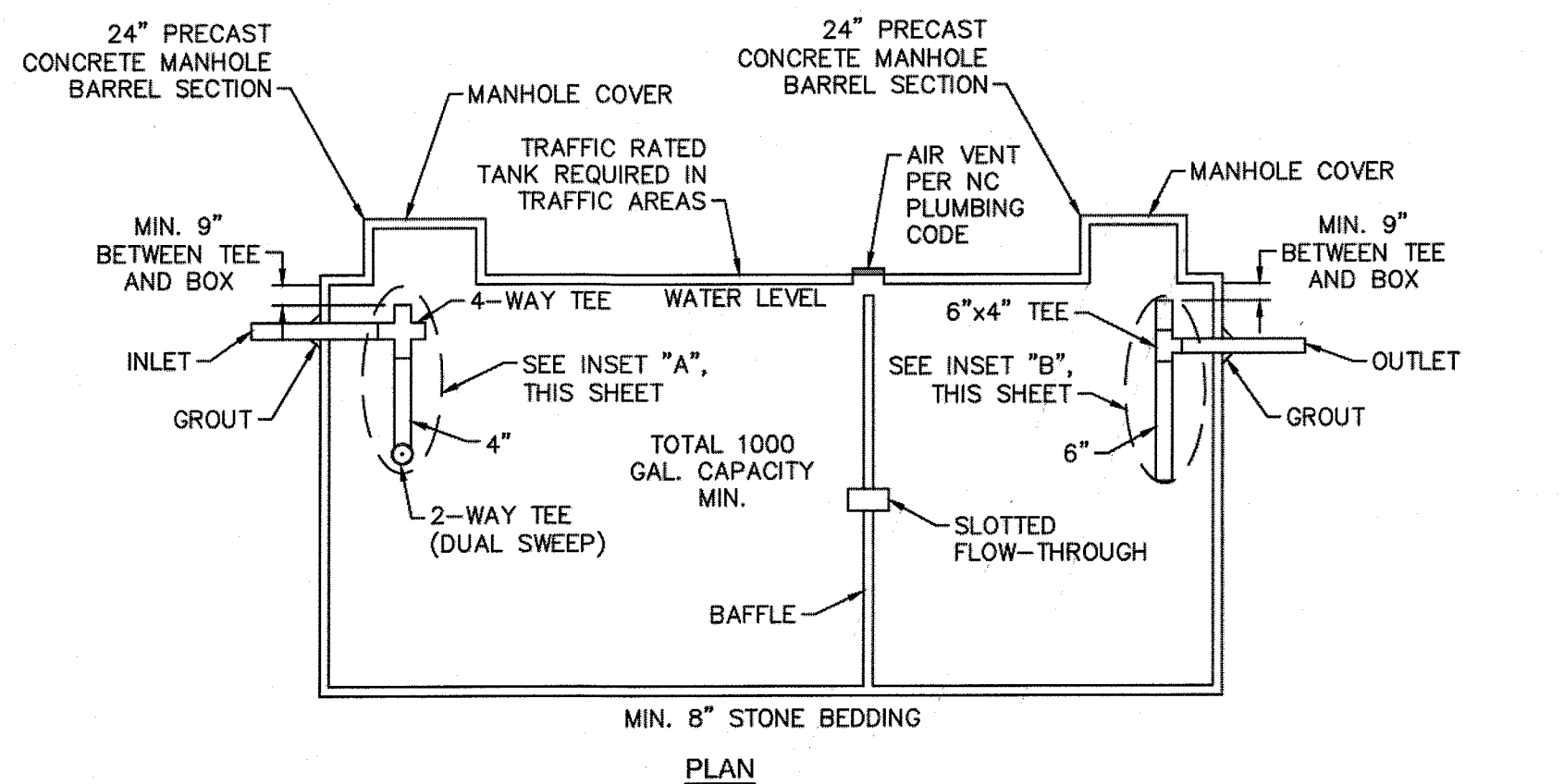
Sheet No.  
C-12.4





- NOTES:
1. FOR GRAVITY APPLICATIONS ONLY.
  2. MIN. THICKNESS: 1/4" WALL AND 3/8" TOP AND BOTTOM BOWLS.
  3. STANDARD PIPE STUBS ARE SOCKET SDR 35 PVC.
  4. EXTENSION COLLARS SHALL BE CAULKED WITH SIKAFLEX OR EQUIVALENT FOR WATERTIGHT SEAL.
  5. FOLLOW MANUFACTURE'S SPECS FOR TRAFFIC OR PEDESTRIAN LOADING.

**SD-22 FIBERGLASS GREASE INTERCEPTOR**  
NOT TO SCALE



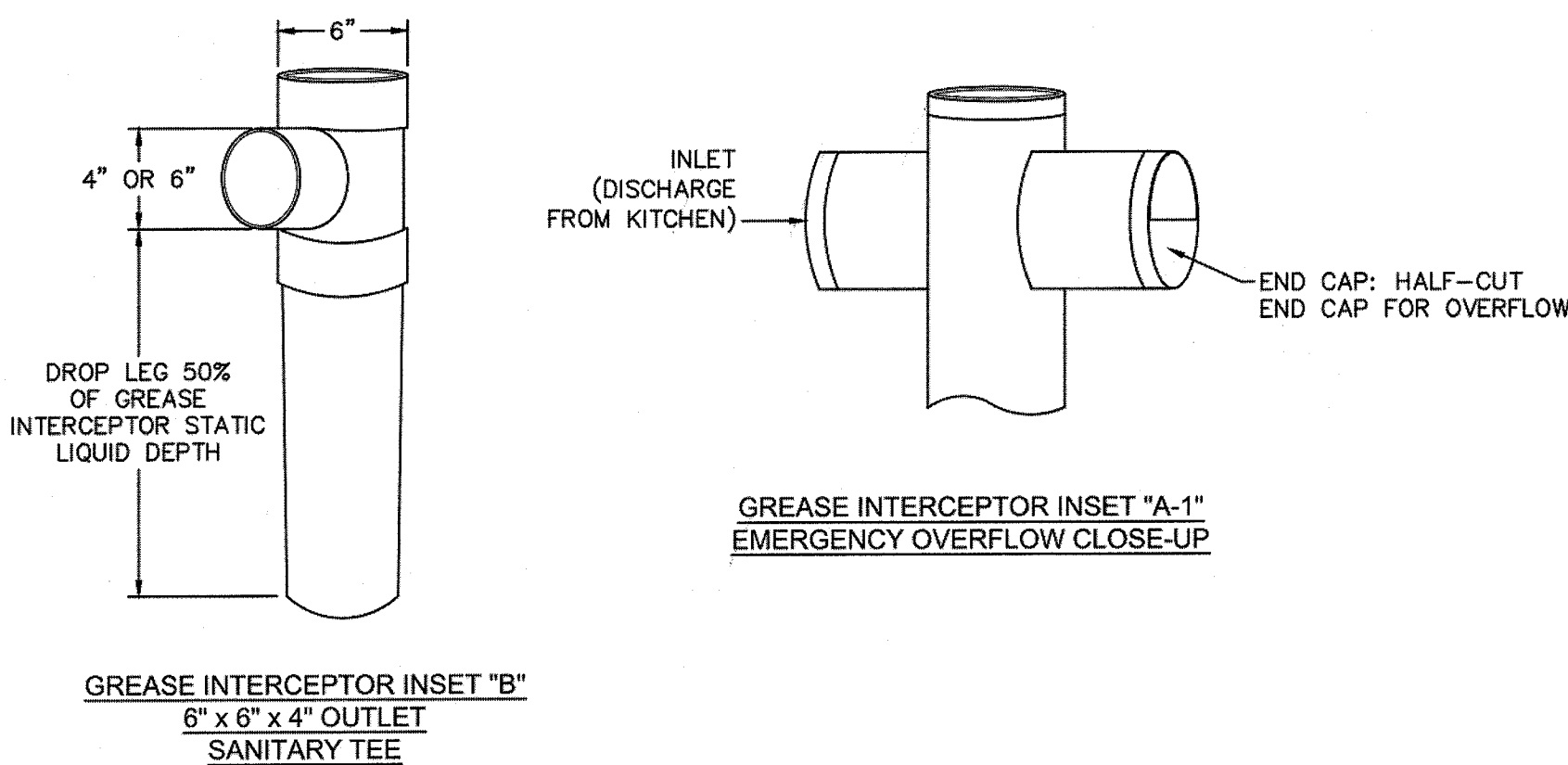
**GREASE INTERCEPTOR INSET "A"**  
4" SANITARY TEE

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

- GENERAL NOTES:
1. NO EXCAVATED MATERIAL SHALL BE PLACED IN ANY STREAM, DITCH OR DRAINAGE-WAY.
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**THE DETAILS SHOWN HEREON SUPERCEDE CFPUA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04**

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



**GREASE INTERCEPTOR INSET "A-1"**  
EMERGENCY OVERFLOW CLOSE-UP

**GREASE INTERCEPTOR INSET "B"**  
6" x 6" x 4" OUTLET  
SANITARY TEE

**SD-23 CONCRETE GREASE INTERCEPTOR**  
NOT TO SCALE

**Approved Construction Plan**

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

Planning \_\_\_\_\_

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

Traffic \_\_\_\_\_

Fire \_\_\_\_\_

**STORMWATER MANAGEMENT PLAN**

**APPROVED**

CITY OF WILMINGTON  
ENGINEERING DEPARTMENT

DATE \_\_\_\_\_ PERMIT # \_\_\_\_\_

SIGNED \_\_\_\_\_

REV:	DESCRIPTION:	DATE:

**CFPUA SANITARY SEWER**

**STANDARD DETAILS**

**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:** CFPUA  
**CHECKED BY:** CFPUA  
**PROJECT NO.:** \_\_\_\_\_

**SHEET NO.:** SSD-4

**DATE:** 3-15-17  
**SEAL:** 39113  
**ENGINEER:** JOSEPH S. BOYD

**Stewardship, Sustainability, Service.**

SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By	Designer	W&R	Scale

**HELMSDALE @ LANDFALL - PHASE II**

CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

CAPE FEAR PUBLIC  
UTILITY AUTHORITY  
SEWER DETAILS

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

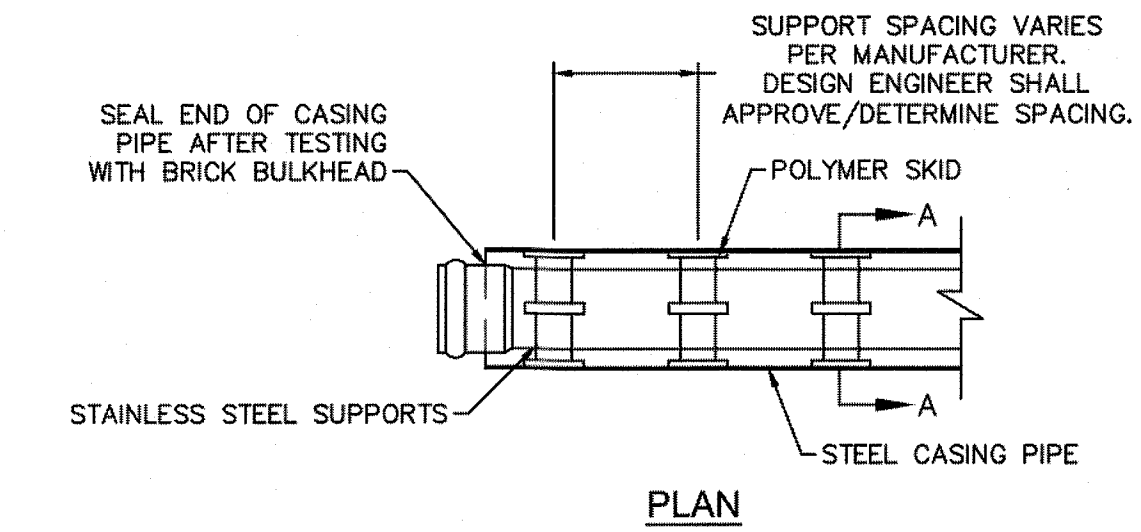
**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.withersravenel.com

Sheet No.  
**C-12.5**

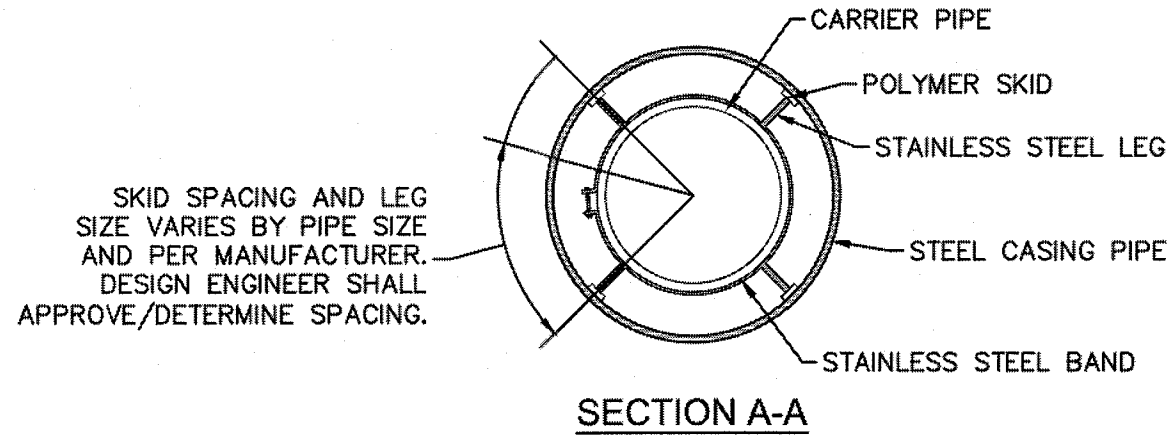




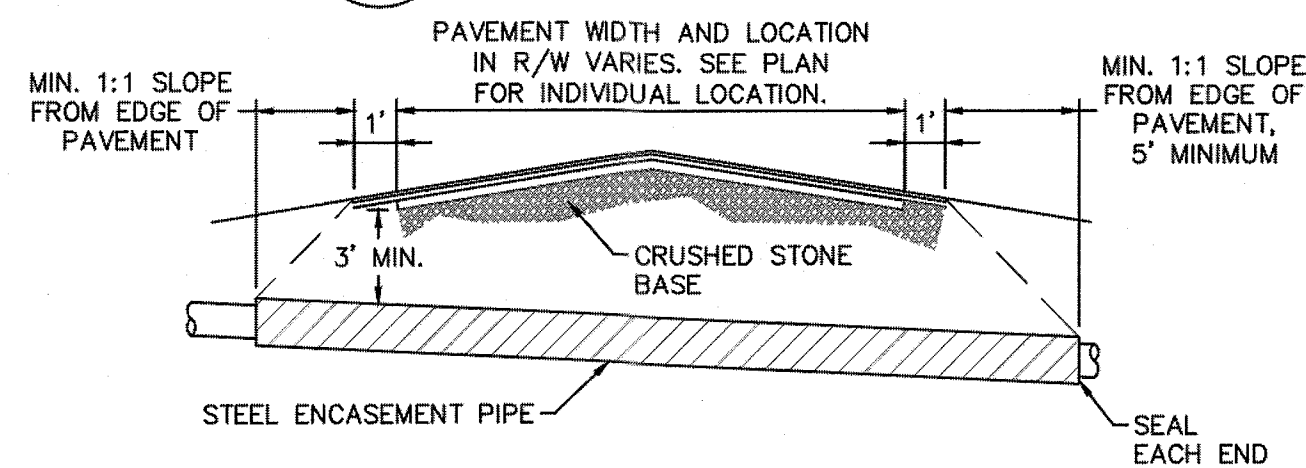




NOTE: PIPE SUPPORT TO BE PLACED TO PROVIDE PROPER SUPPORT, ALIGNMENT, AND GRADE AS SPECIFIED. CONTINUOUS SUPPORTS MAY BE USED AS ALTERNATIVE. OIL, GREASE, OR PETROLEUM PRODUCT MAY NOT BE USED AS LUBRICANT.

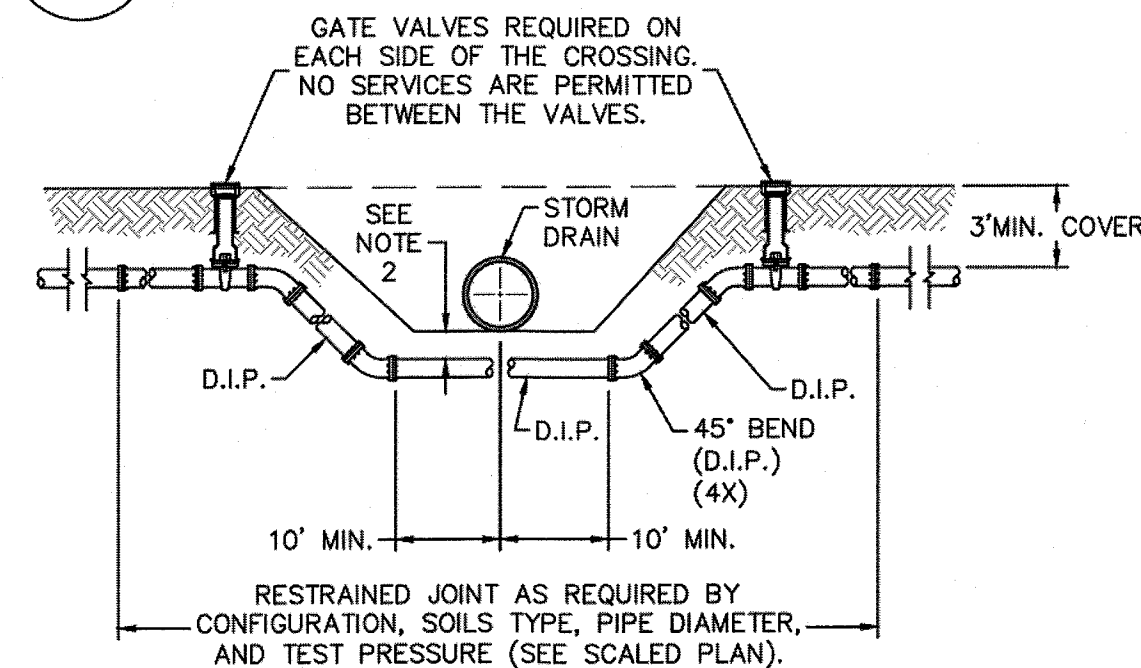


WD-15 PIPE CASING SUPPORT DETAIL  
NOT TO SCALE



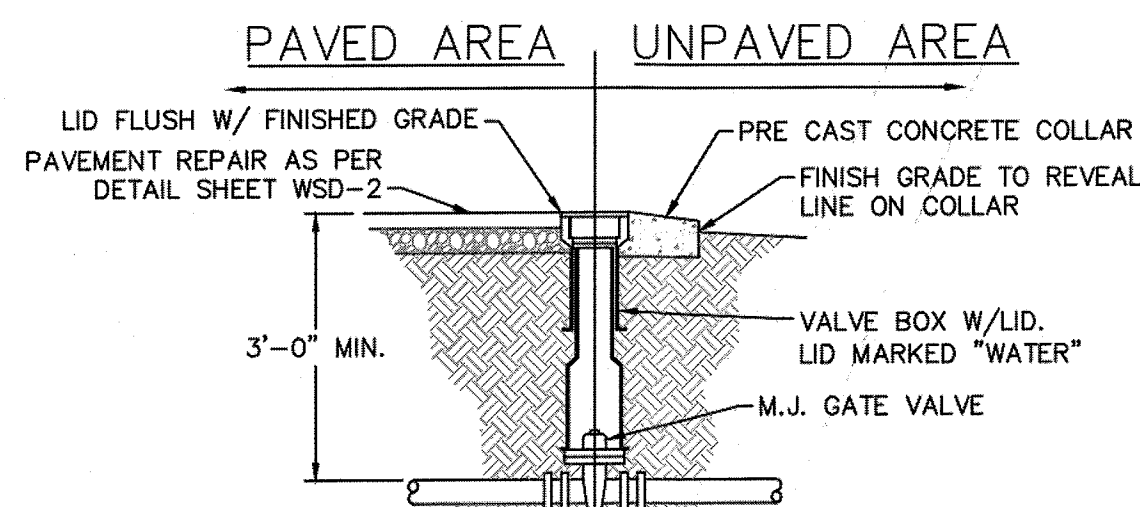
NOTES:  
1. CASING WILL BE INSTALLED AT LINE AND GRADE SHOWN ON INDIVIDUAL PROFILE FOR EACH CROSSING. BORING/JACKING TO LINE AND GRADE IS REQUIRED.  
2. TRACER WIRE SHALL BE CONTINUED THROUGH CASING.

WD-16 TYPICAL BORING/JACKING DETAIL  
NOT TO SCALE

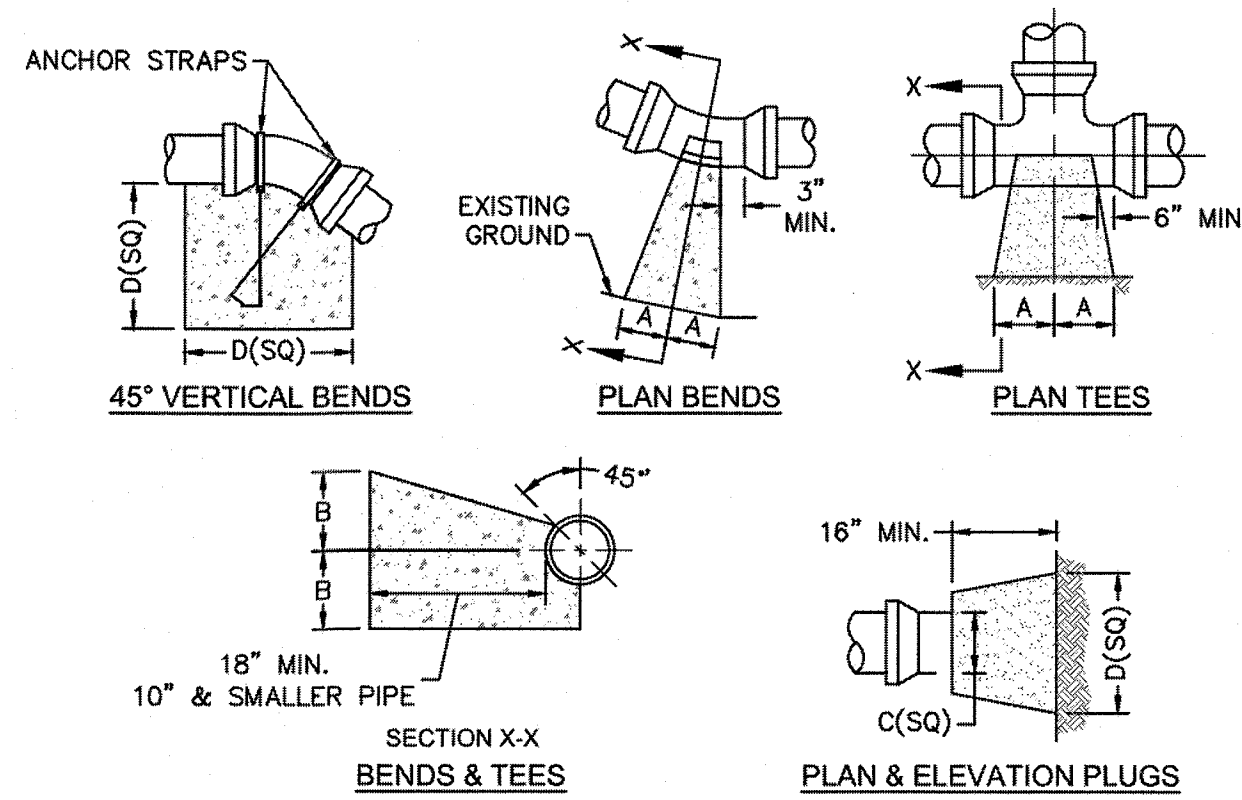


NOTES:  
1. USE PRESSURE CLASS 350 DIP, UNLESS SPECIFIED OTHERWISE.  
2. MINIMUM DEPTH REQUIRED, UNLESS SPECIFIED OTHERWISE BY CFPWA:  
a. IN DOT R/W, 36" MIN. TYPICAL, OR 24" MIN. WHEN CROSSING A DITCH LINE.  
b. ALL OTHER LOCATIONS, 30" MIN.  
c. WHEN STORM DRAIN INVERT IS BURIED AT OR BELOW ABOVE DEPTHS, 18" MIN. CLEARANCE IS REQUIRED.

WD-2 WATER MAIN DITCH AND STORM DRAIN CROSSING  
NOT TO SCALE



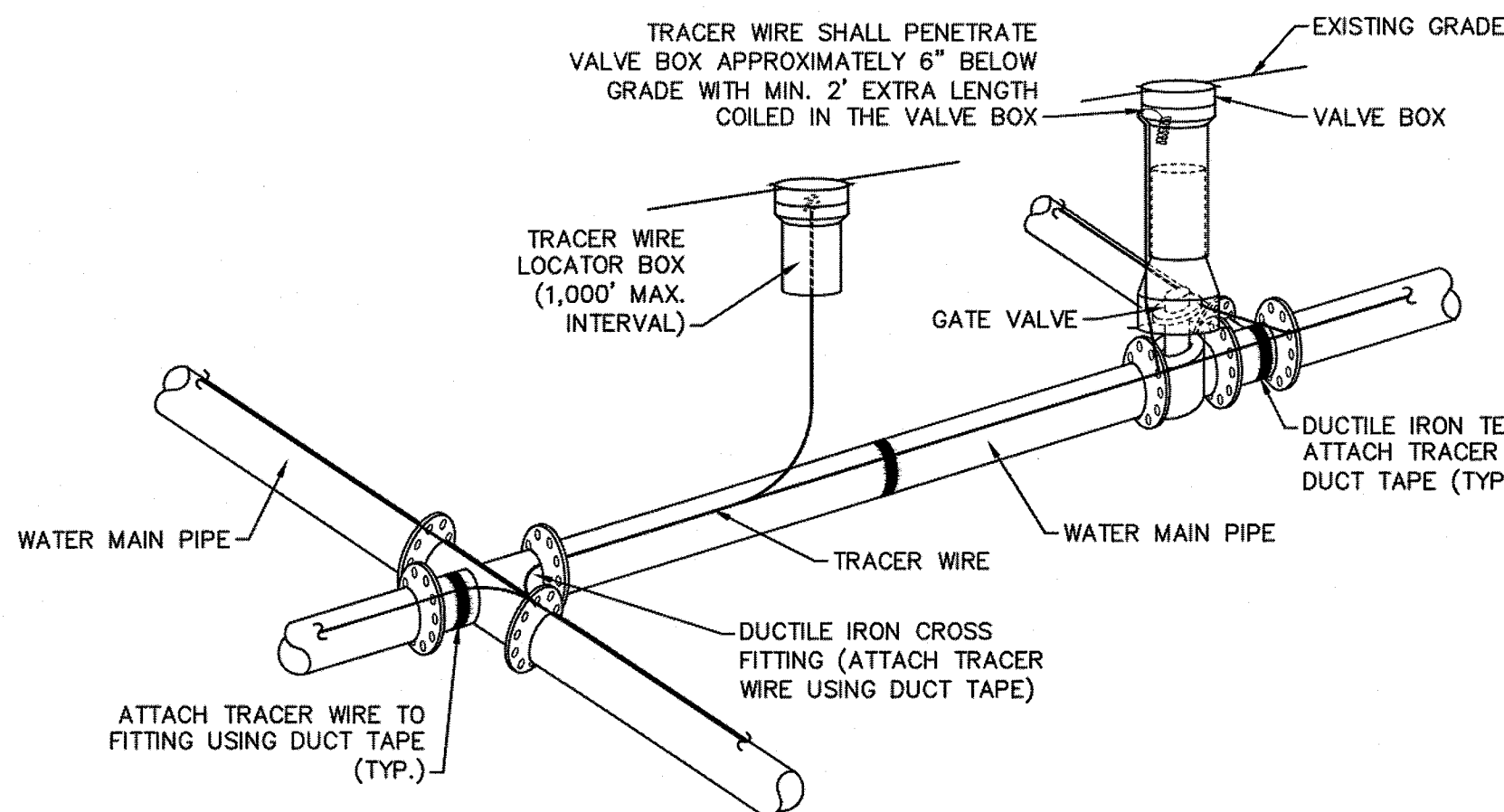
WD-3 VALVE DETAIL  
NOT TO SCALE



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

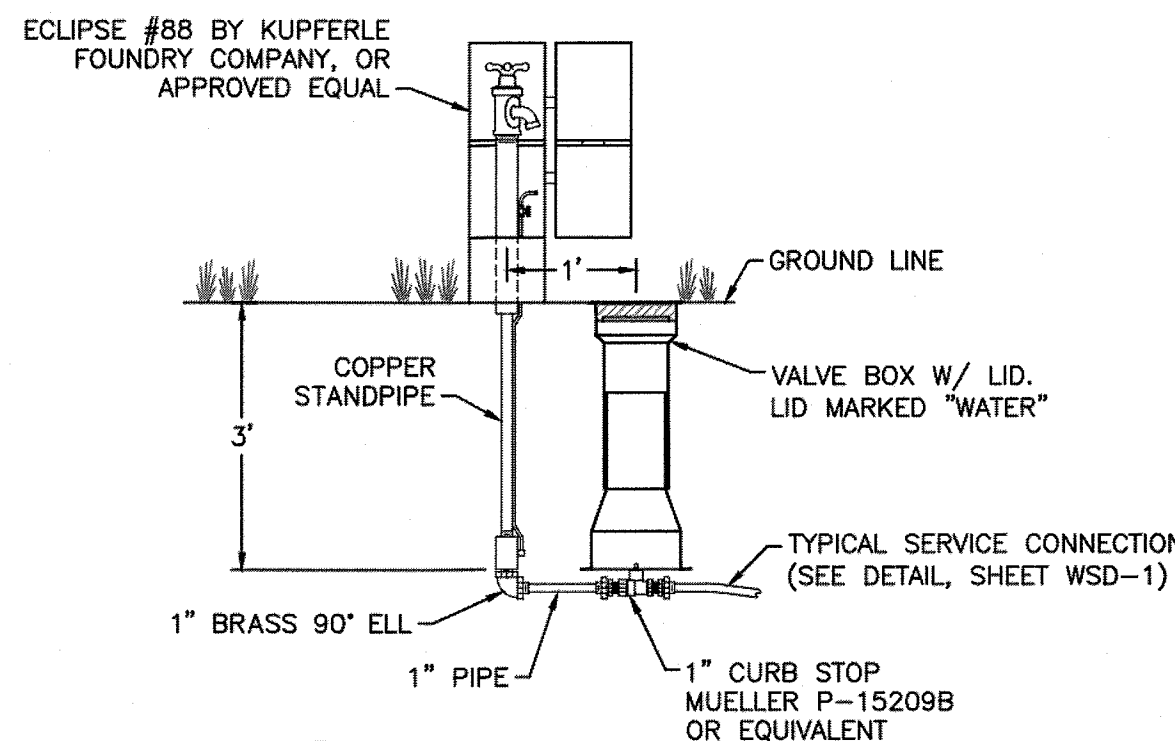
NOTES:  
1. BASED ON 160 PSI TEST PRESSURE AND 2000 PSF SOIL BEARING CAPACITY.  
2. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.  
3. USE MEG-A-LUG (PREFERRED) IN LIEU OF BLOCKING AND RODDING.

WD-4 THRUST BLOCK DETAIL  
NOT TO SCALE

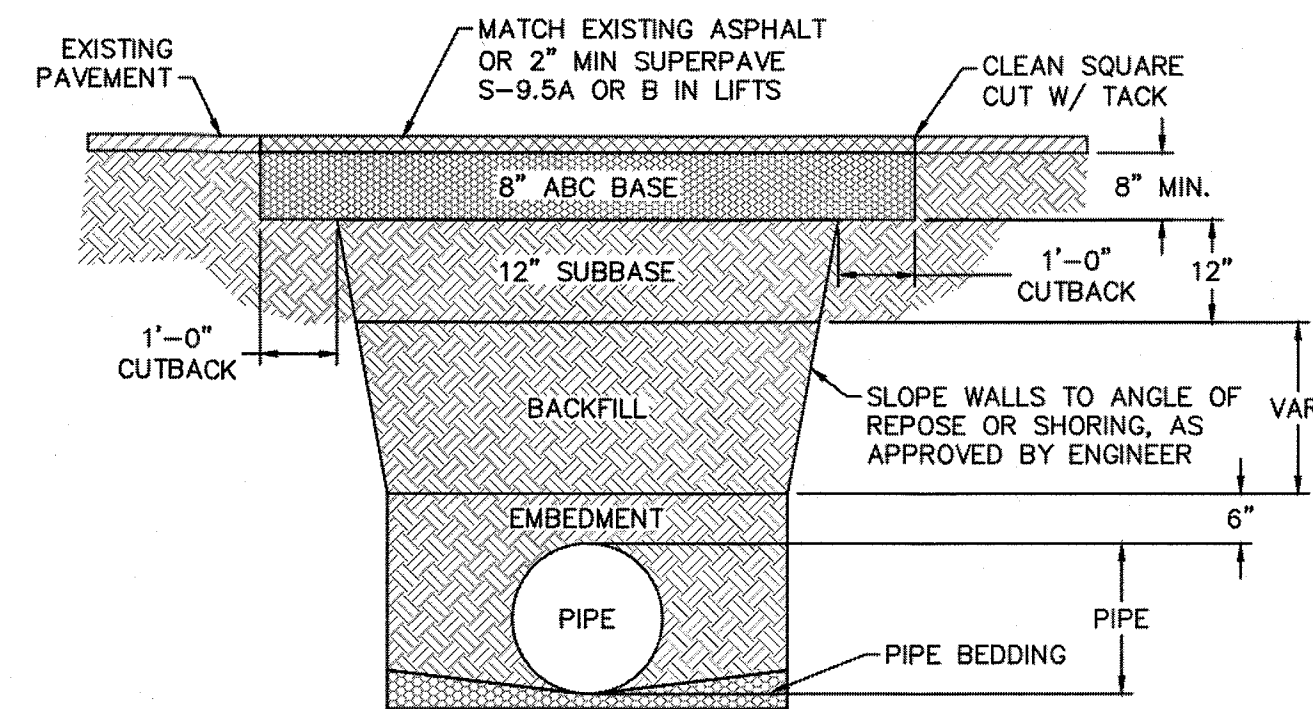


NOTES:  
1. TRACER WIRE SHALL BE #10 COPPER SOLID CORE COPPER WIRE WITH GAS AND OIL RESISTANT INSULATION.  
2. WIRE SHALL BE STRAPPED TO ALL PVC WATER MAIN PIPING WITH DUCT TAPE AT 12 FOOT INTERVALS ALONG THE PIPE.  
3. SECURE WIRE TO ALL TEE AND CROSS FITTINGS WITH DUCT TAPE.  
4. ALL SPLICES IN THE WIRE SHALL BE MADE WITH 3M DBR DIRECT BURY SPLICE KIT AN UNDERGROUND RATED, WATERTIGHT, AND APPROVED SPLICE CONNECTOR OR APPROVED EQUAL.

WD-17 TRACER WIRE DETAIL  
NOT TO SCALE



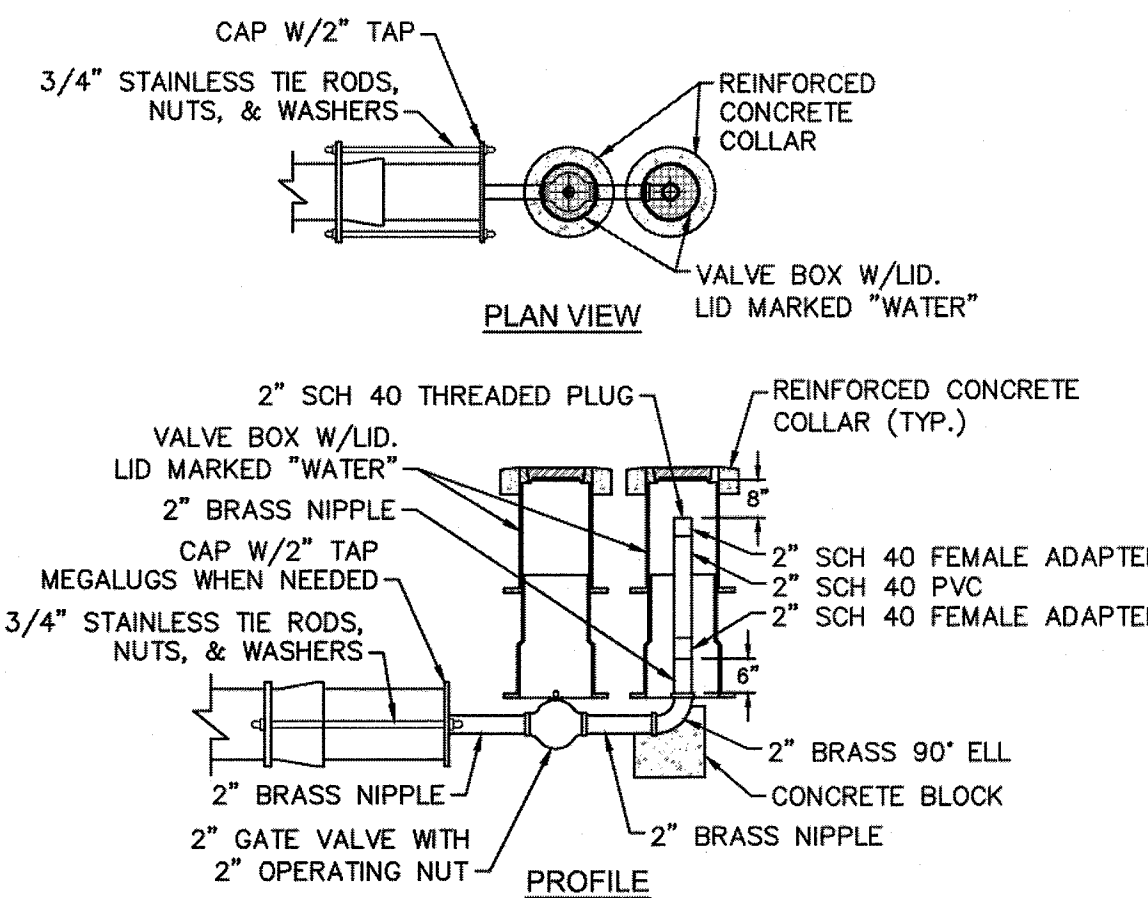
WD-6 SAMPLING STATION  
NOT TO SCALE



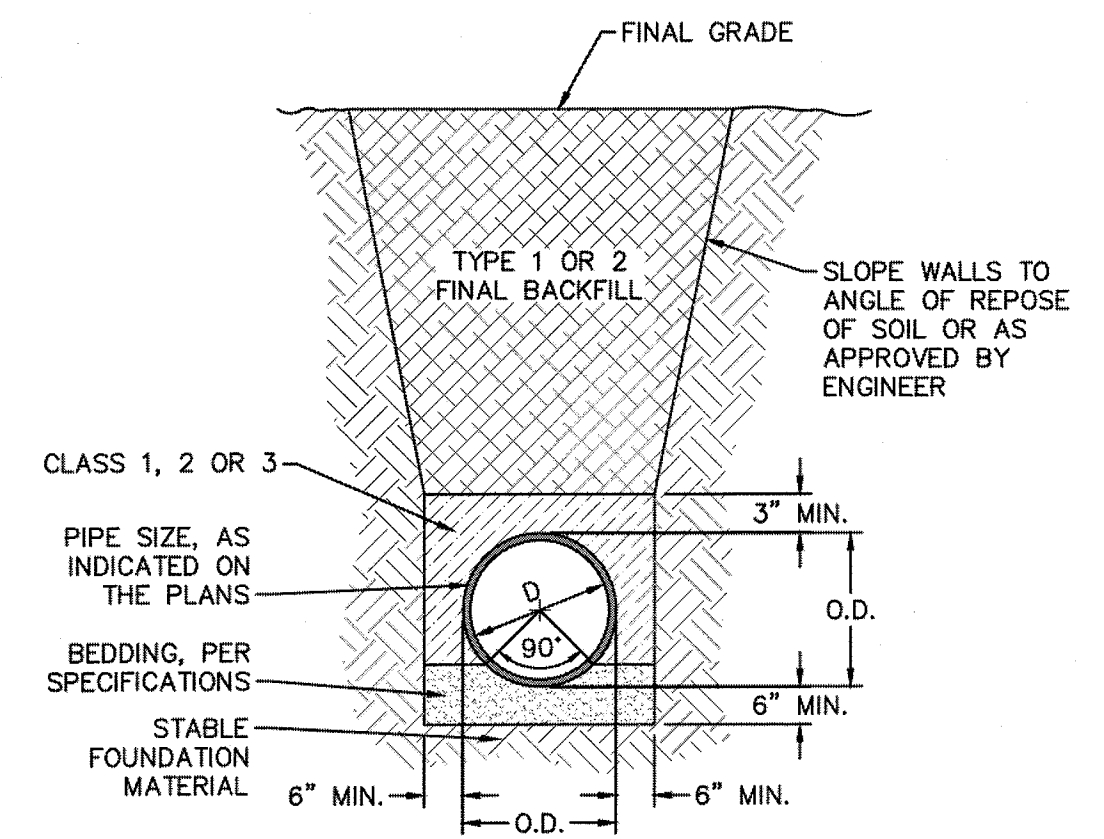
NOTES:  
1. BACKFILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBS, DEBRIS, ORGANICS AND LITTLE TO NO EXCESSIVE MOISTURE.  
2. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION, (I.E. #57, ABC, CRUSHED LESTONE, CLEAN SAND, FLOWABLE FILL, ETC).  
3. 8-INCH OF 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%.

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

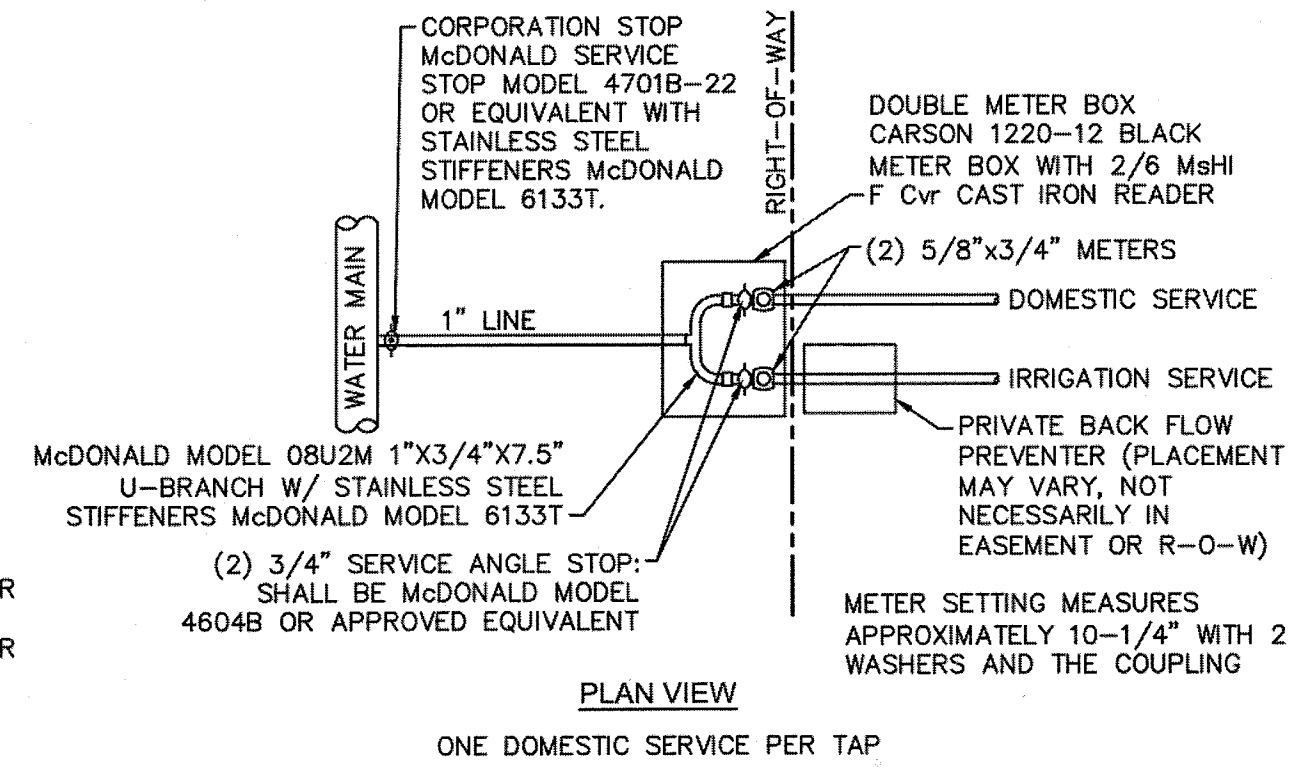
WD-14 PAVEMENT REPAIR WHERE PIPE INSTALLED  
NOT TO SCALE



WD-5 2" BLOW-OFF  
NOT TO SCALE



WD-13 TYPICAL TRENCH DETAIL  
NOT TO SCALE



WD-9 DOUBLE SERVICE CONNECTION  
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 \_\_\_\_\_

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

REV:	DESCRIPTION:	DATE:
1	Revised Water Main Ditch and Storm Crossing Detail	11/12/13
2	Revised Water Main Ditch and Storm Crossing Detail	05/08/14
3	Revised Tracer Wire Detail	10/20/15
4	Added Backflow Preventer to Double Service Connection Detail	02/01/16
5	Revised Sampling Station Detail	02/15/16

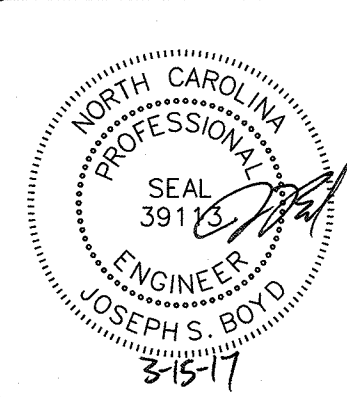
GENERAL NOTES:  
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THE DETAILS SHOWN HEREON SUPERCEDE CFPWA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

TYPICAL DETAILS NOTE:  
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### CFPWA WATER DISTRIBUTION SYSTEM

#### STANDARD DETAILS



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.:

SHEET NO.: WSD-2

SITE ADDRESS: 558 ARBORETUM DRIVE

HELMSDALE @ LANDFALL - PHASE II  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

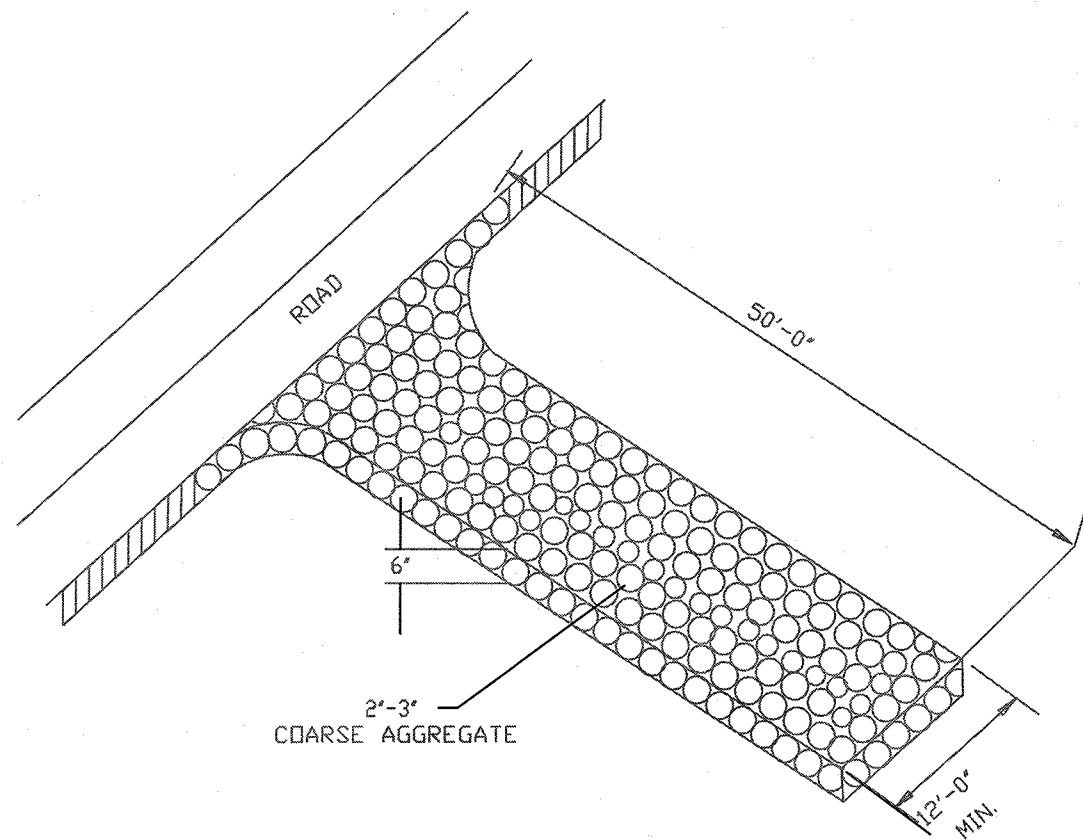
CAPE FEAR PUBLIC UTILITY AUTHORITY  
WATER DETAILS

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

WITHERS & RAVENEL  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.withersravenel.com

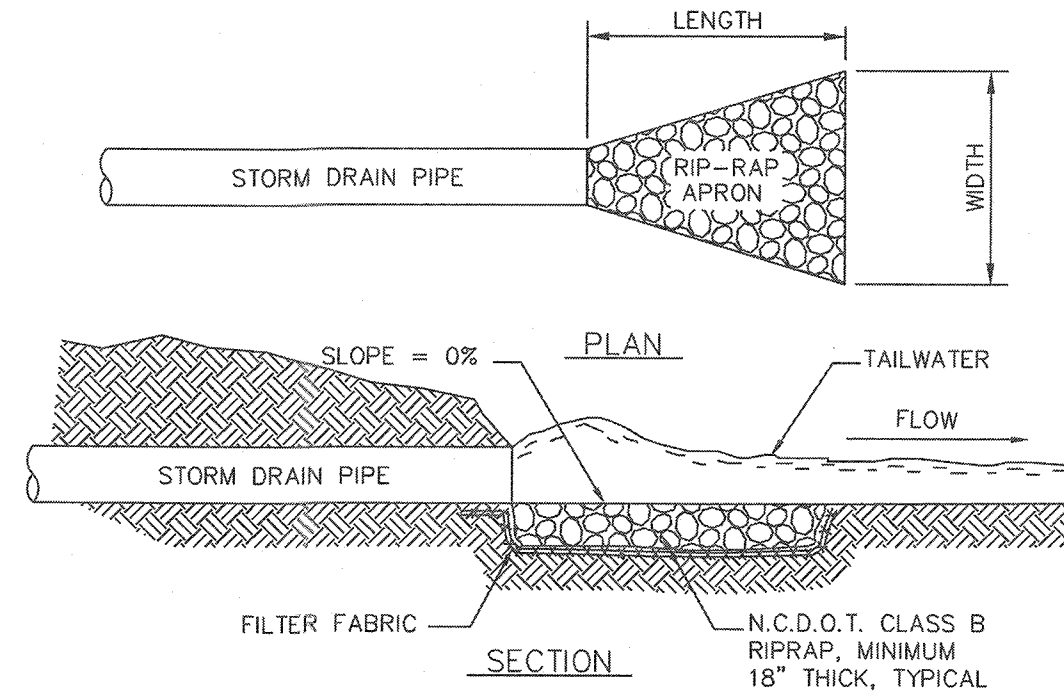
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CONSTRUCTION ENTRANCE/EXIT

SD 13-03  
N.T.S.

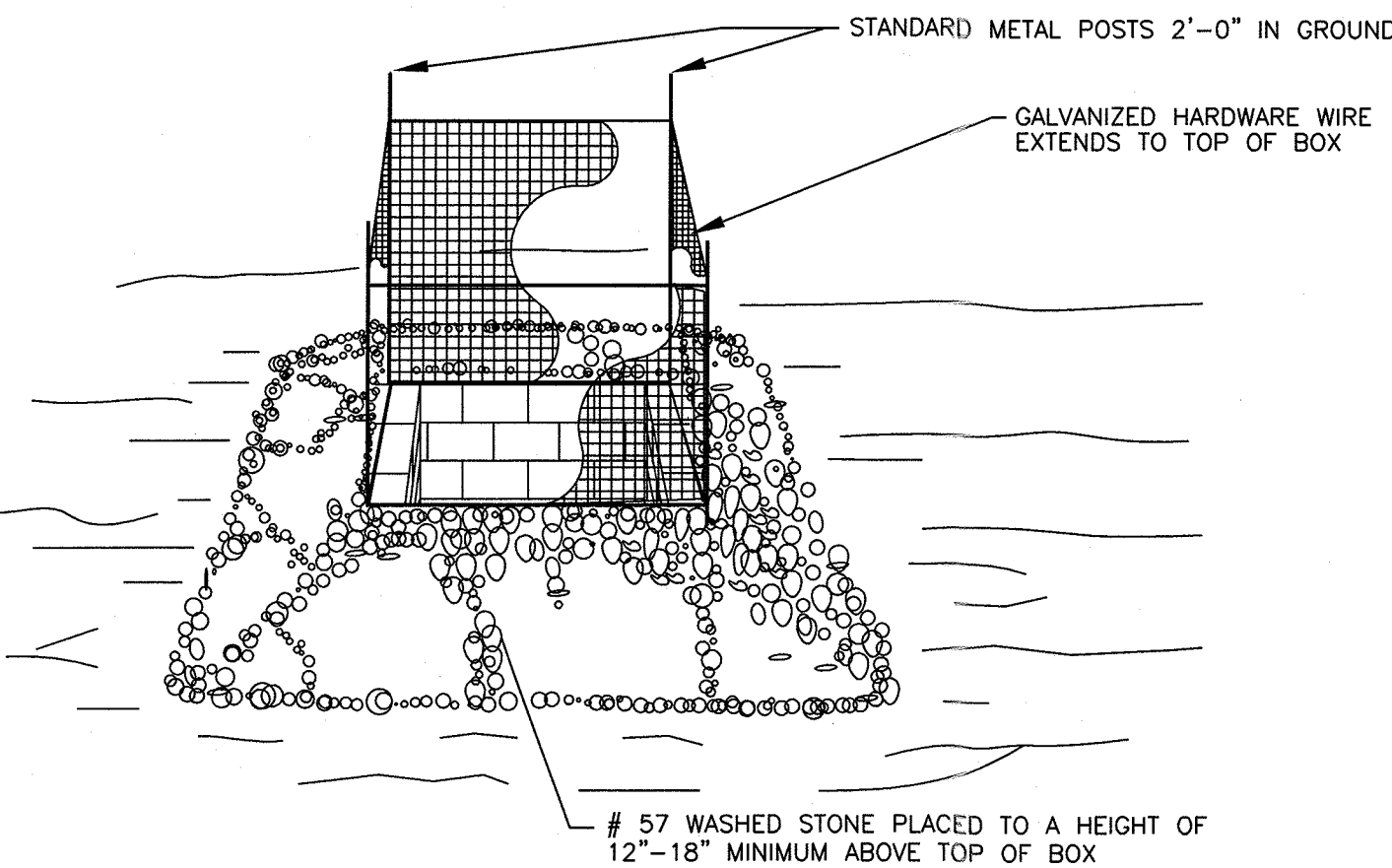


RIP-RAP SCHEDULE

#	PIPE DIA. (IN.)	LENGTH (FT.)	UPSTREAM WIDTH (FT.)	DOWNSIDE WIDTH (FT.)
@FES-1	15	8.00	4.00	10.00
@FES-3	15	8.00	4.00	10.00
@FES-6	12	5.00	3.00	6.00
@FES-8	15	8.00	4.00	10.00
@FES-11	12	5.00	3.00	6.00
@FES-13	15	8.00	4.00	10.00
@FES-16	24	9.00	6.00	9.00
@FES-18	24	9.00	6.00	11.00

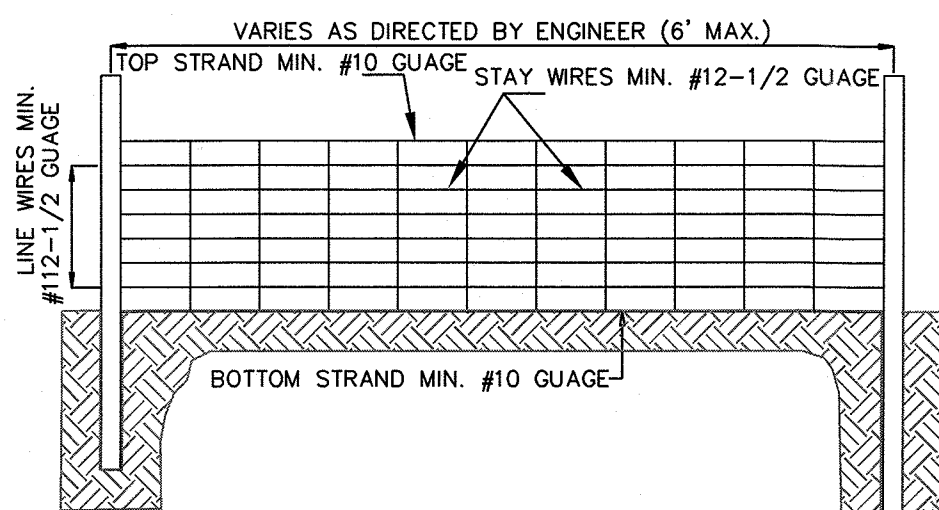
RIP-RAP APRON

N.T.S.



STANDARD CATCH BASIN/YARD INLET PROTECTION

N.T.S.

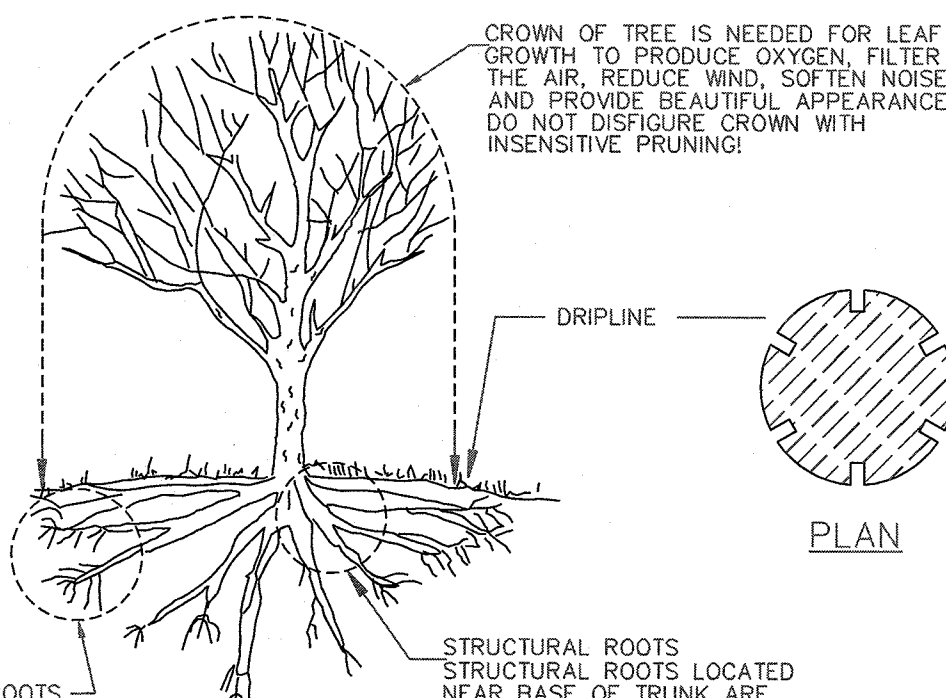


- NOTES:
1. WIRE SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES W/12" STAY SPACING
  2. FILTER FABRIC SHALL BE A MINIMUM OF 36" IN WIDTH AND SHALL BE FASTENED ABSOLUTELY TO THE WIRE AS DIRECTED BY THE ENGINEER
  3. STEEL POSTS SHALL BE 5' 0" IN HEIGHT AND BE OF SELF FASTENER ANGLE STEEL TYPE
  4. STEEL POSTS SHALL BE A MINIMUM OF 6' IN HEIGHT AND 3" OR MORE IN DIAMETER. WIRE FABRIC SHALL BE FASTENED TO STEEL POST WITH NOT LESS THAN #9 WIRE STAPLES 1-1/2" LONG

ANCHOR FILTER FABRIC SKIRT AS DIRECTED BY THE ENGINEER

GUIDELINES FOR TEMPORARY SILT FENCE DETAIL

SD 13-01  
N.T.S.



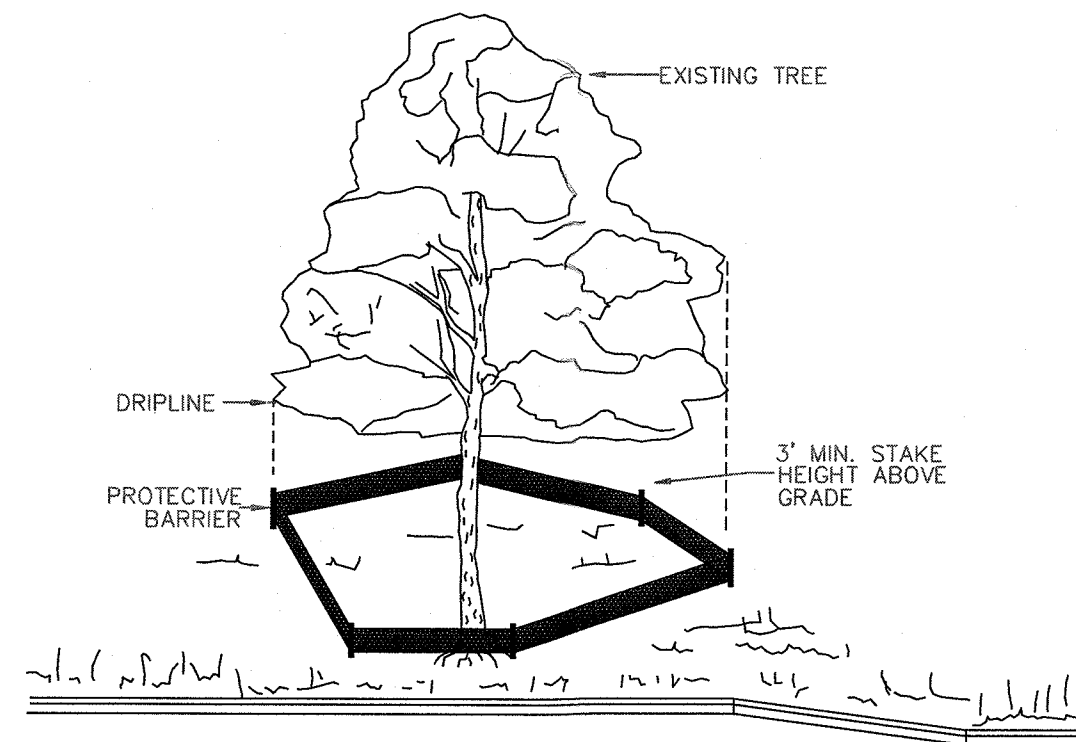
CROWN OF TREE IS NEEDED FOR LEAF GROWTH TO PRODUCE OXYGEN, FILTER THE AIR, REDUCE WIND, SOFTEN NOISE, AND PROVIDE BEAUTIFUL APPEARANCE. DO NOT DISFIGURE CROWN WITH INSENSITIVE PRUNING!

FEEDER ROOTS - FEEDER ROOTS ARE LOCATED AT "DRIPLINE" OF TREE AND PROVIDE TREE WITH MOISTURE AND NUTRIENTS. SEE NOTE 1 & NOTE 4

STRUCTURAL ROOTS - STRUCTURAL ROOTS LOCATED NEAR BASE OF TRUNK ARE NEEDED TO GIVE SUPPORT TO ENTIRE TREE. IF REMOVED, TREE CAN FALL AND DAMAGE PROPERTY. SEE NOTE 2 & NOTE 4

METHOD OF TREE PROTECTION DURING CONSTRUCTION

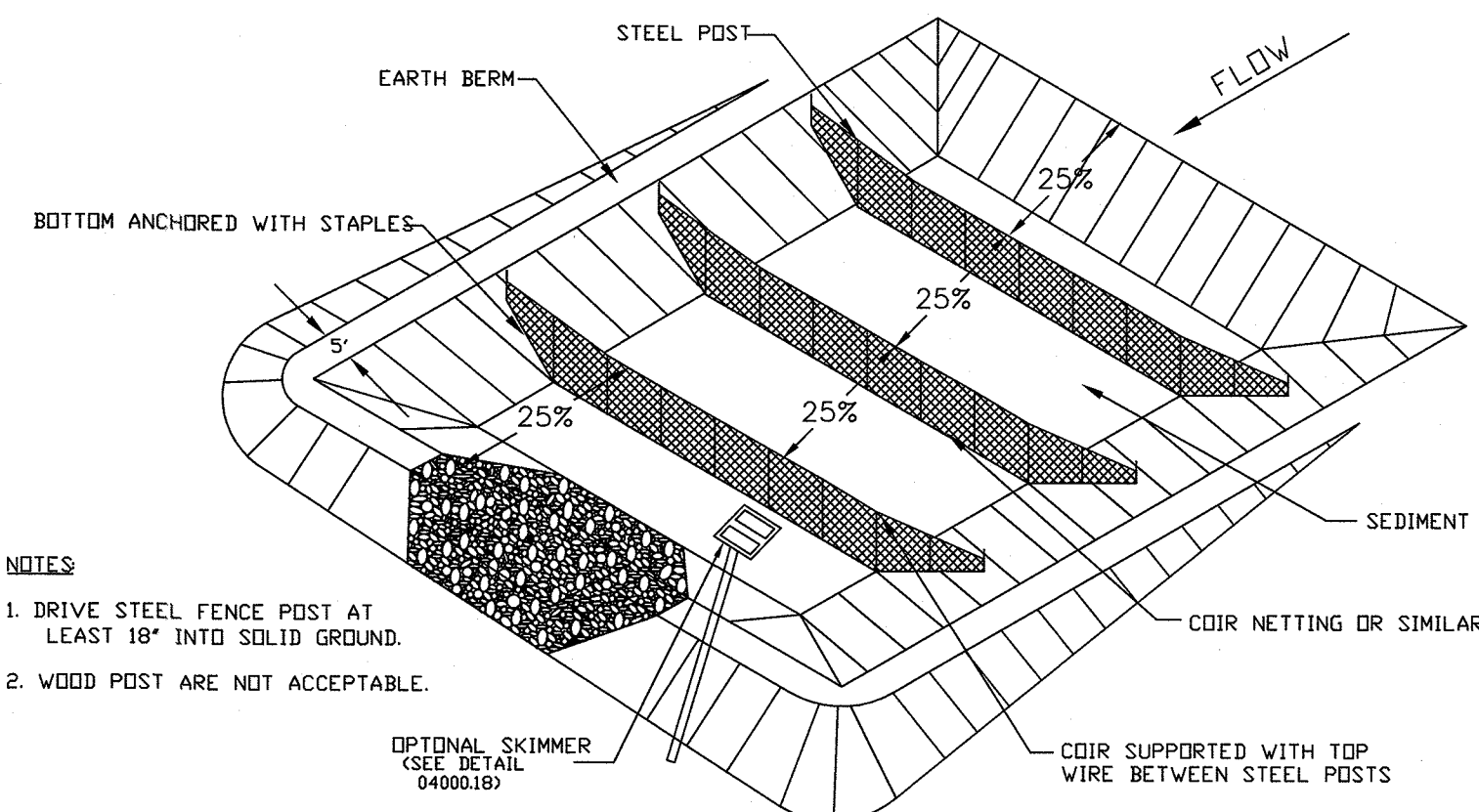
SD 15-09  
N.T.S.



NOTE:  
TREES TO BE SAVED WILL BE CLEARLY MARKED PRIOR TO CONSTRUCTION AND A PROTECTIVE BARRIER IS TO BE INSTALLED AT THE DRIPLINE.  
DRIPLINE - THE AREA OF SOIL DIRECTLY BENEATH THE TREE EXTENDING OUT TO THE TIPS OF THE OUTERMOST BRANCHES.

METHOD OF TREE PROTECTION DURING CONSTRUCTION

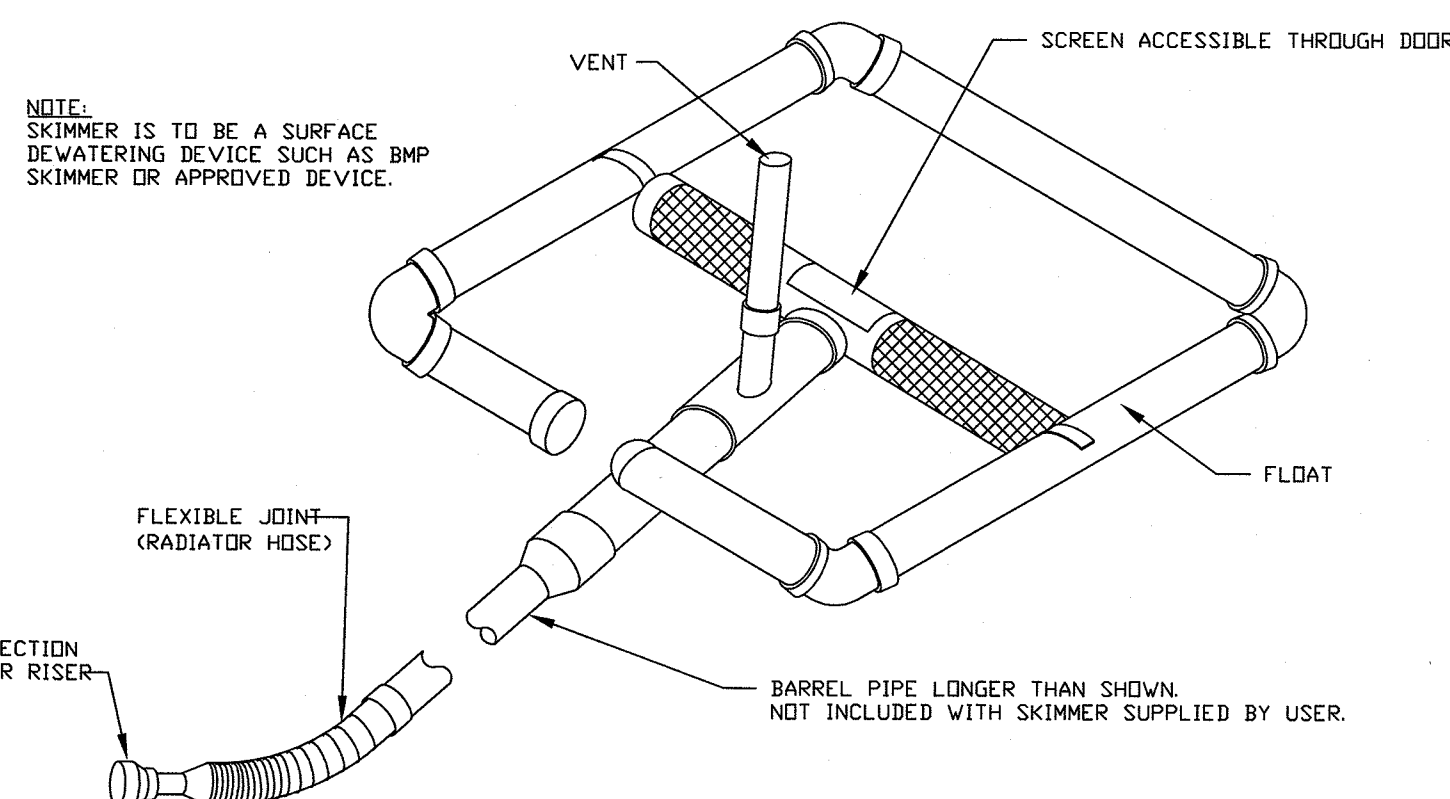
SD 15-08  
N.T.S.



- NOTES
1. DRIVE STEEL FENCE POST AT LEAST 18" INTO SOLID GROUND.
  2. WOOD POST ARE NOT ACCEPTABLE.

PERSPECTIVE VIEW

STANDARD SKIMMER FILTER BASIN



NOTE:  
SKIMMER IS TO BE A SURFACE DEWATERING DEVICE SUCH AS BMP SKIMMER OR APPROVED DEVICE.

BARREL PIPE LONGER THAN SHOWN NOT INCLUDED WITH SKIMMER SUPPLIED BY USER.

STANDARD FAIRCLOTH SKIMMER DETAIL

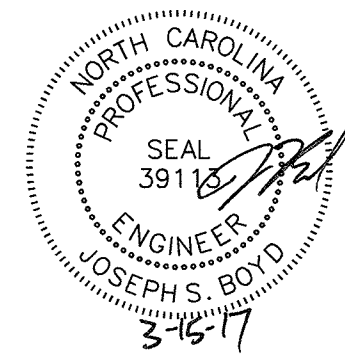
MAINTENANCE

INSPECT SKIMMER SEDIMENT BASINS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (ONE-HALF INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT ACCUMULATES TO ONE-HALF THE HEIGHT OF THE FIRST BAFFLE. PULL THE SKIMMER TO ONE SIDE SO THAT THE SEDIMENT UNDERNEATH IT CAN BE EXCAVATED. EXCAVATE THE SEDIMENT FROM THE ENTIRE BASIN, NOT JUST AROUND THE SKIMMER OR THE FIRST CELL. MAKE SURE VEGETATION GROWING IN THE BOTTOM OF THE BASIN DOES NOT HOLD DOWN THE SKIMMER.

REPAIR THE BAFFLES IF THEY ARE DAMAGED. RE-ANCHOR THE BAFFLES IF WATER IS FLOWING UNDERNEATH OR ROUND THEM.

CHECK THE FABRIC LINED SPILLWAY FOR DAMAGE AND MAKE ANY REQUIRED REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE SKIMMER AND POOL AREAS.

FREEZING WEATHER CAN RESULT IN ICE FORMING IN THE BASIN. SOME SPECIAL PRECAUTIONS SHOULD BE TAKEN IN THE WINTER TO PREVENT THE SKIMMER FROM PLUGGING WITH ICE.



THIS PLAN SET WAS DESIGNED AND  
LAST SIGNED BY GARRY S. PAPE (PE  
LICENSE # 031315) ON 7/9/08. THIS  
REVISED SET IS ONLY PER REVISIONS  
BY THE GOVERNING AGENCIES AND  
VARIOUS SITE EDITS.

MAINTENANCE

IF THE SKIMMER IS CLOGGED WITH TRASH AND THERE IS WATER IN THE BASIN, USUALLY JERKING ON THE ROPE WILL MAKE THE SKIMMER BOB UP AND DOWN AND DISLODGE THE DEBRIS AND RESTORE FLOW. IF THIS DOES NOT WORK, PULL THE SKIMMER OVER TO THE SIDE OF THE BASIN AND REMOVE THE DEBRIS. ALSO CHECK THE ORIFICE INSIDE THE SKIMMER TO SEE IF IT IS CLOGGED; IF SO REMOVE THE DEBRIS.

IF THE SKIMMER ARM OR BARREL PIPE IS CLOGGED, THE ORIFICE CAN BE REMOVED AND THE OBSTRUCTION CLEARED WITH A PLUMBER'S SNAKE OR BY FLUSHING WITH WATER. BE SURE AND REPLACE THE ORIFICE BEFORE REPOSITIONING THE SKIMMER.

SITE ADDRESS: 558 ARBORETUM DRIVE

No.	Revision	Date	By
1	NHC EC COMMENTS	06/30/14	JSB
2	UPDATED RIP RAP TABLE	07/29/14	JSB

Designer	W&R	Scale	NTS
Drawn By	W&R	Date	12/19/13
Checked By	JSB	Job No.	03050283.01

HELMSDALE @ LANDFALL - PHASE II  
CITY OF WILMINGTON NEW HANOVER NORTH CAROLINA

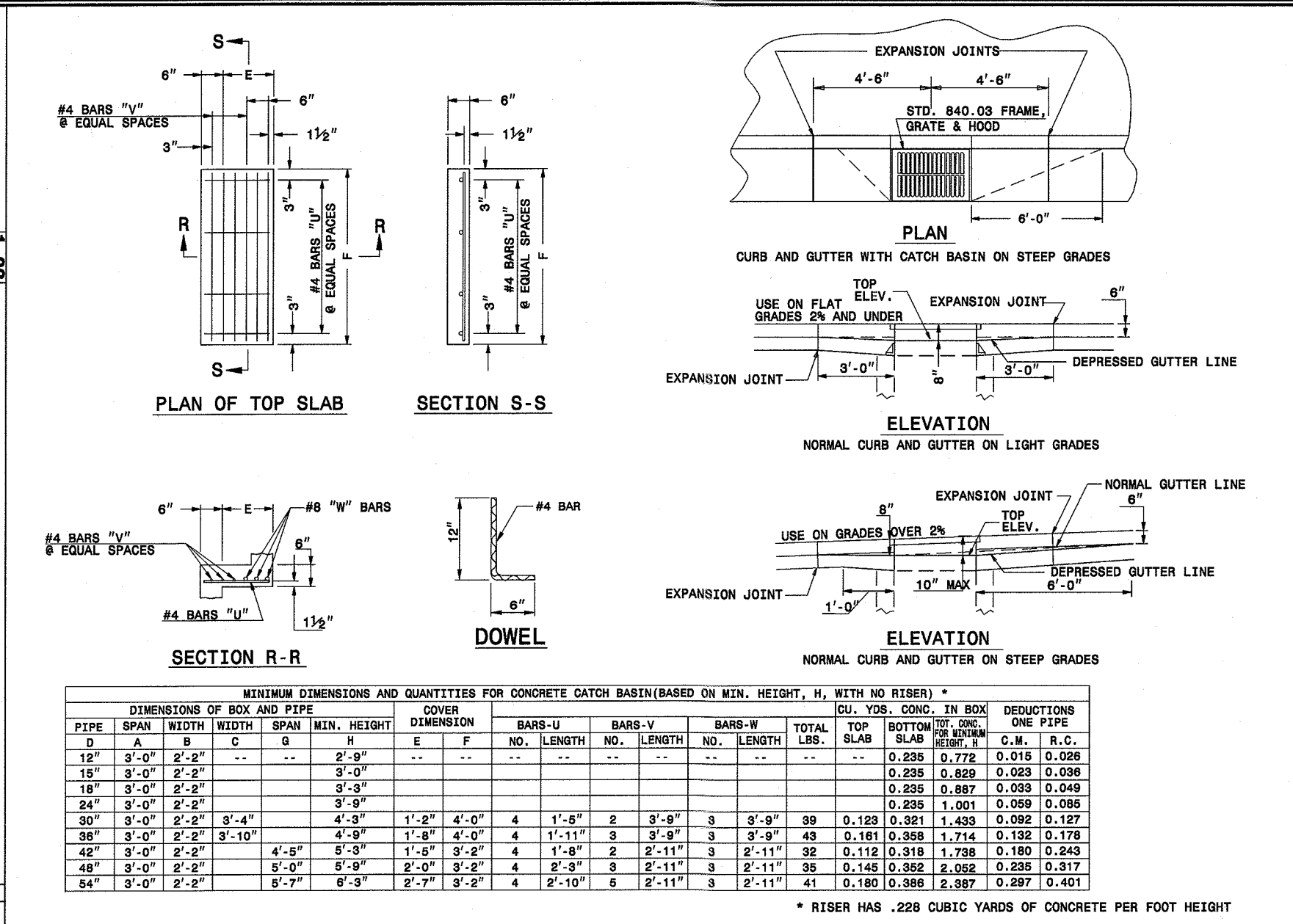
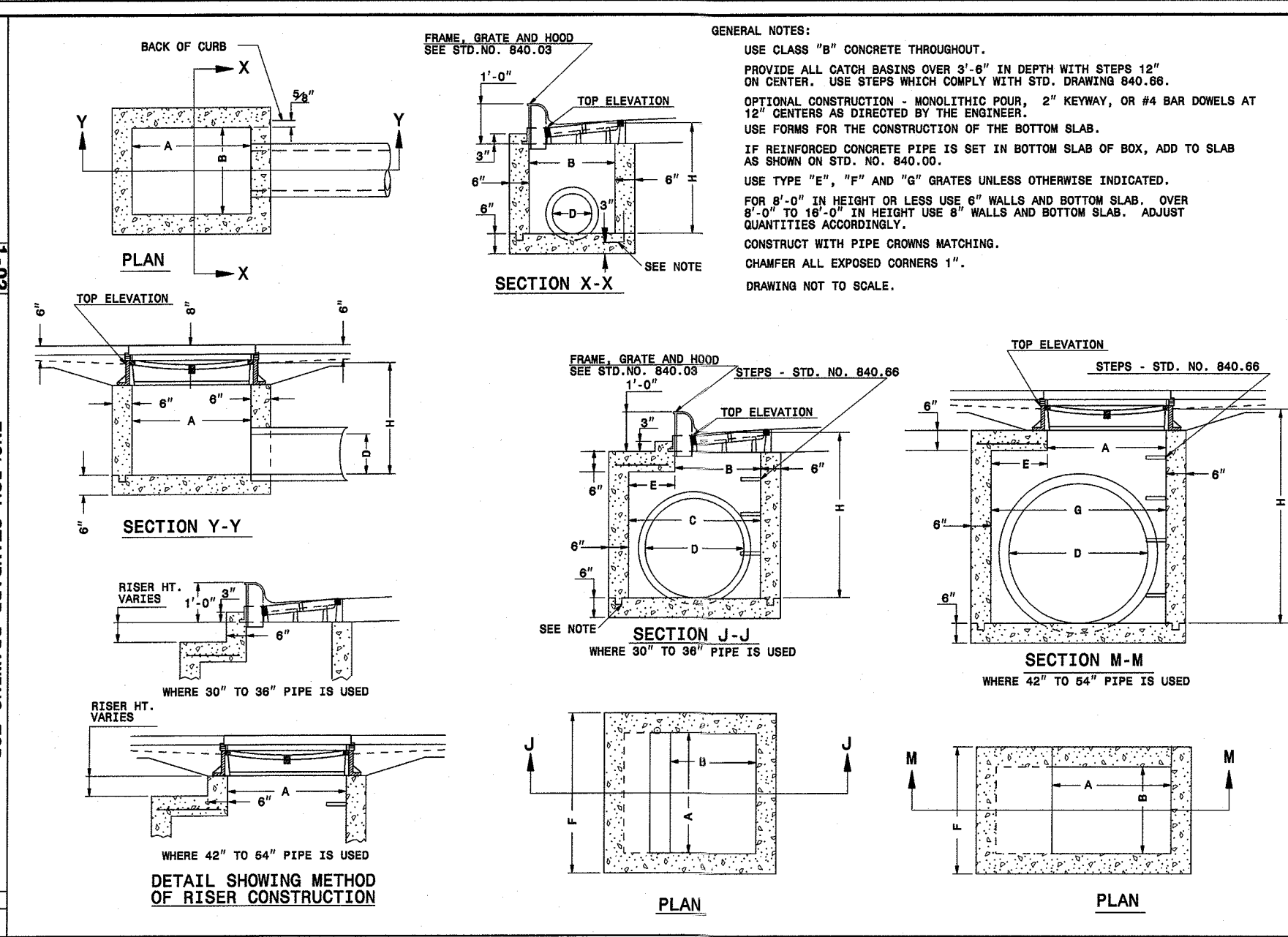
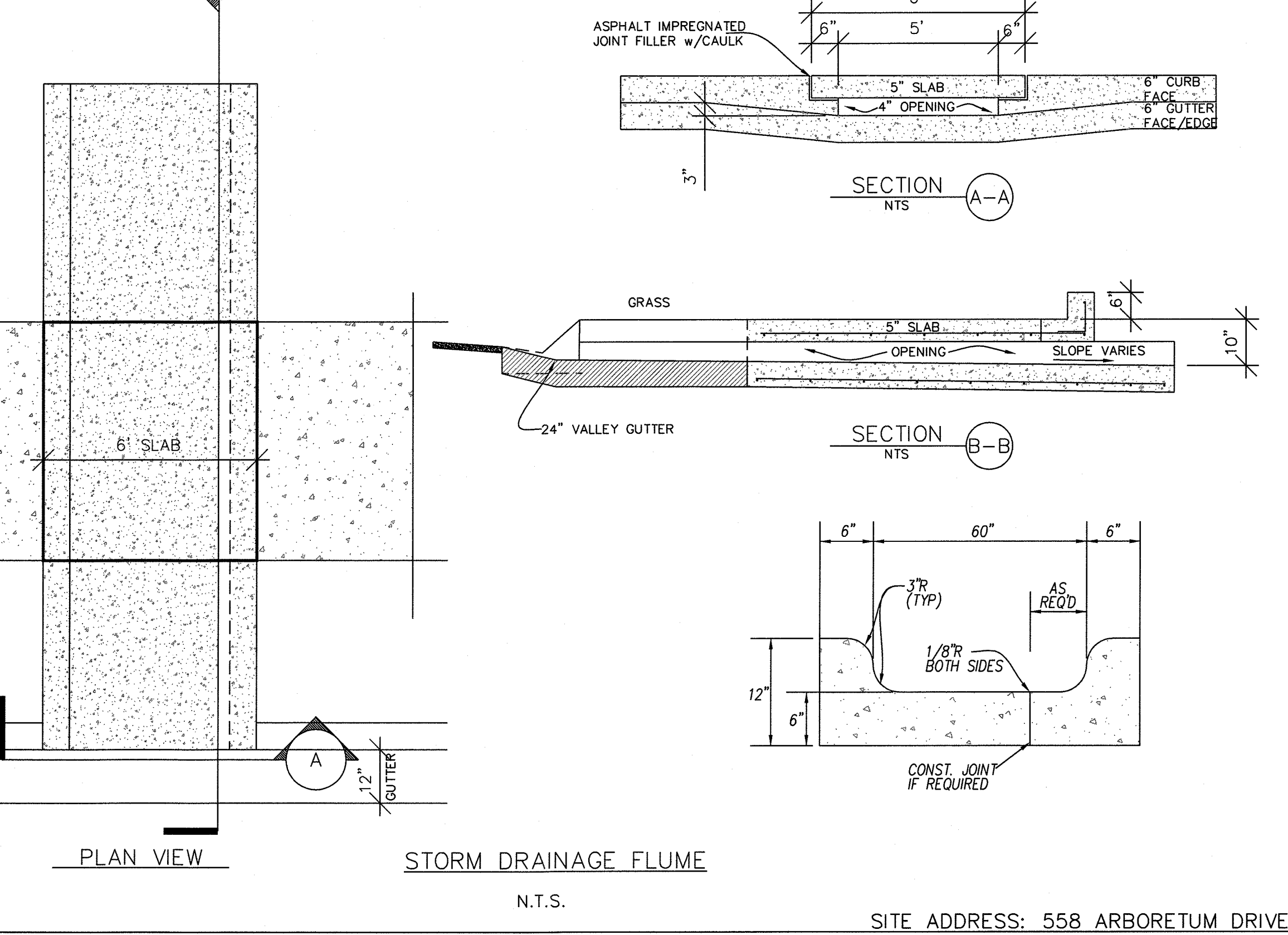
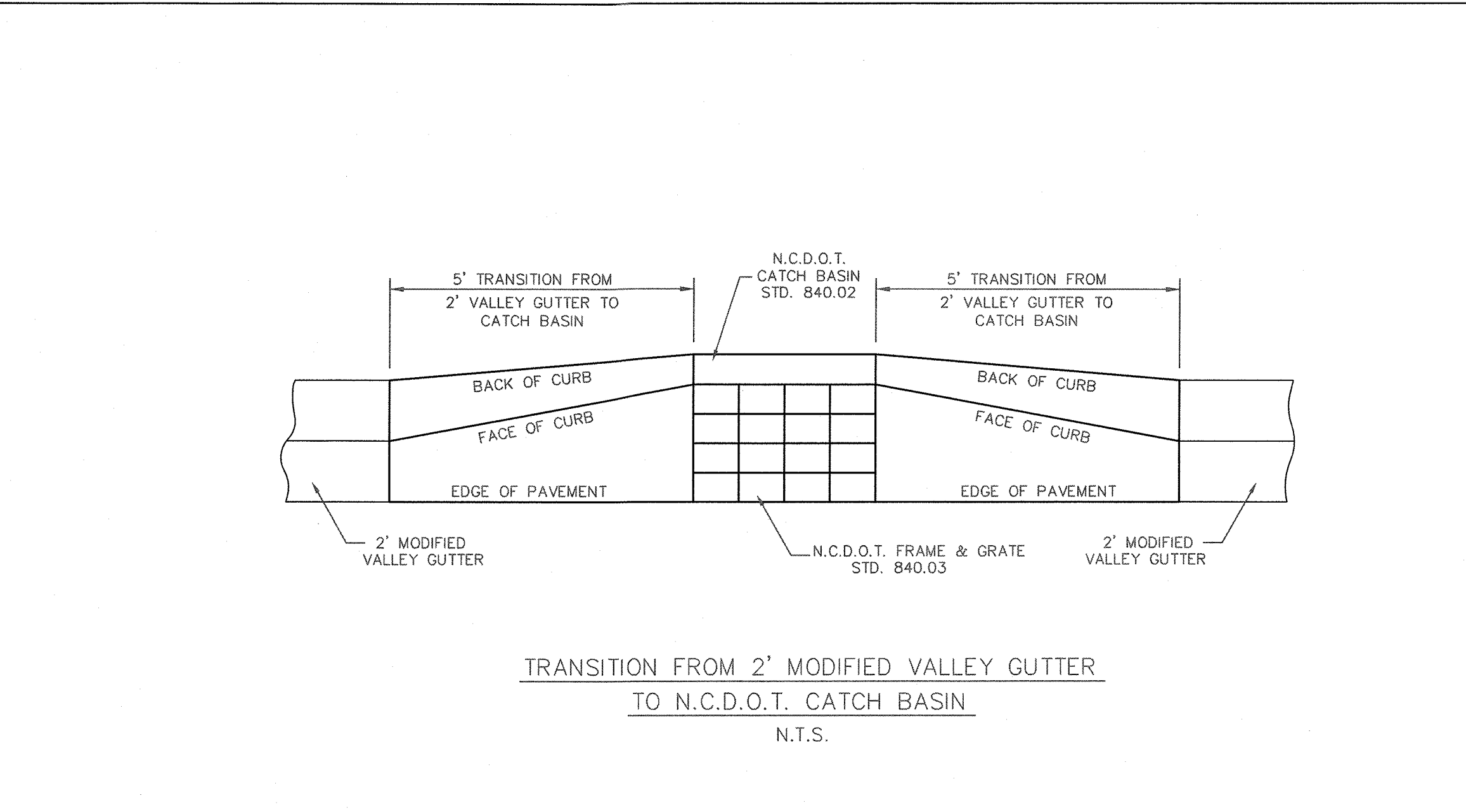
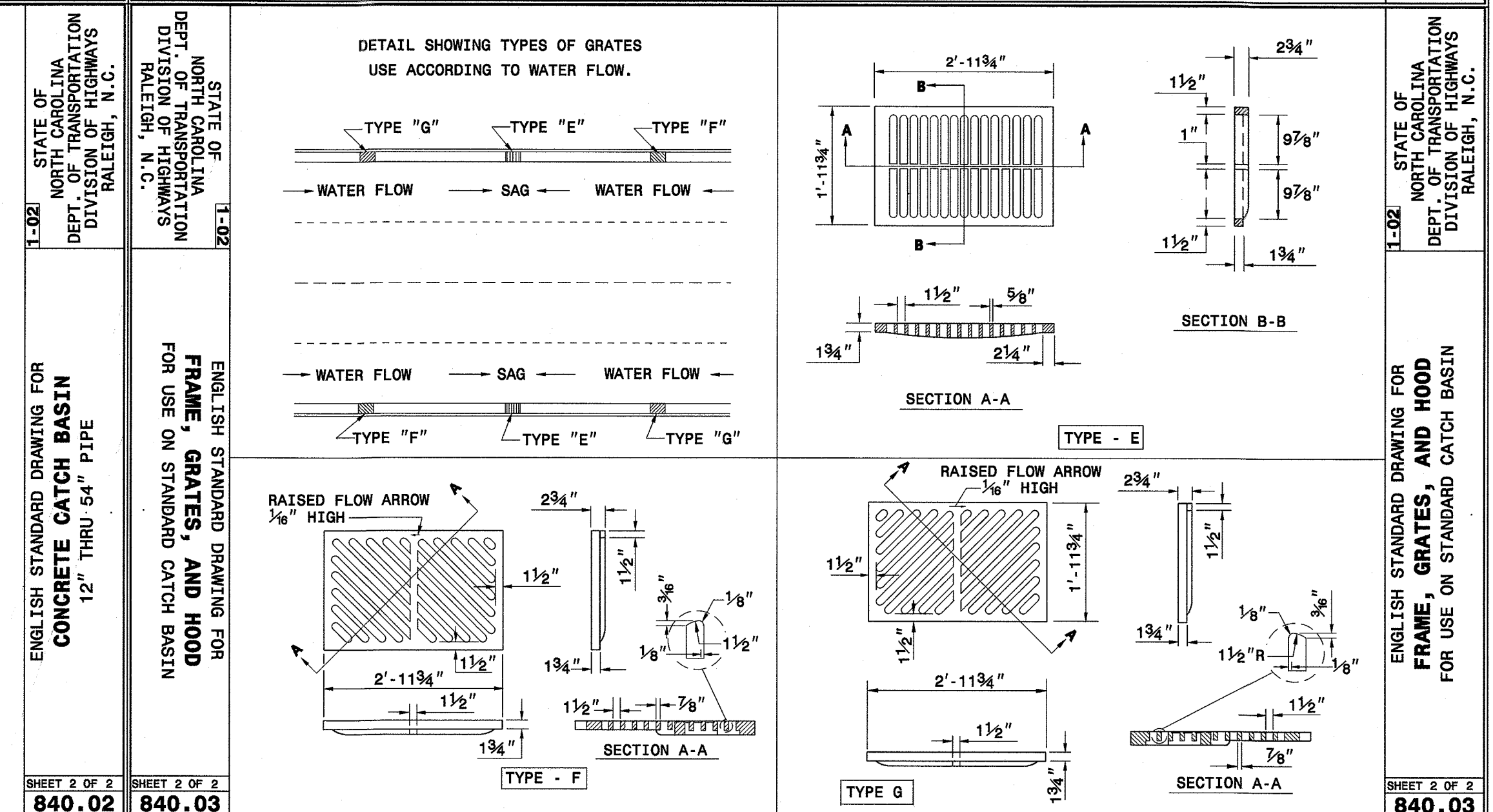
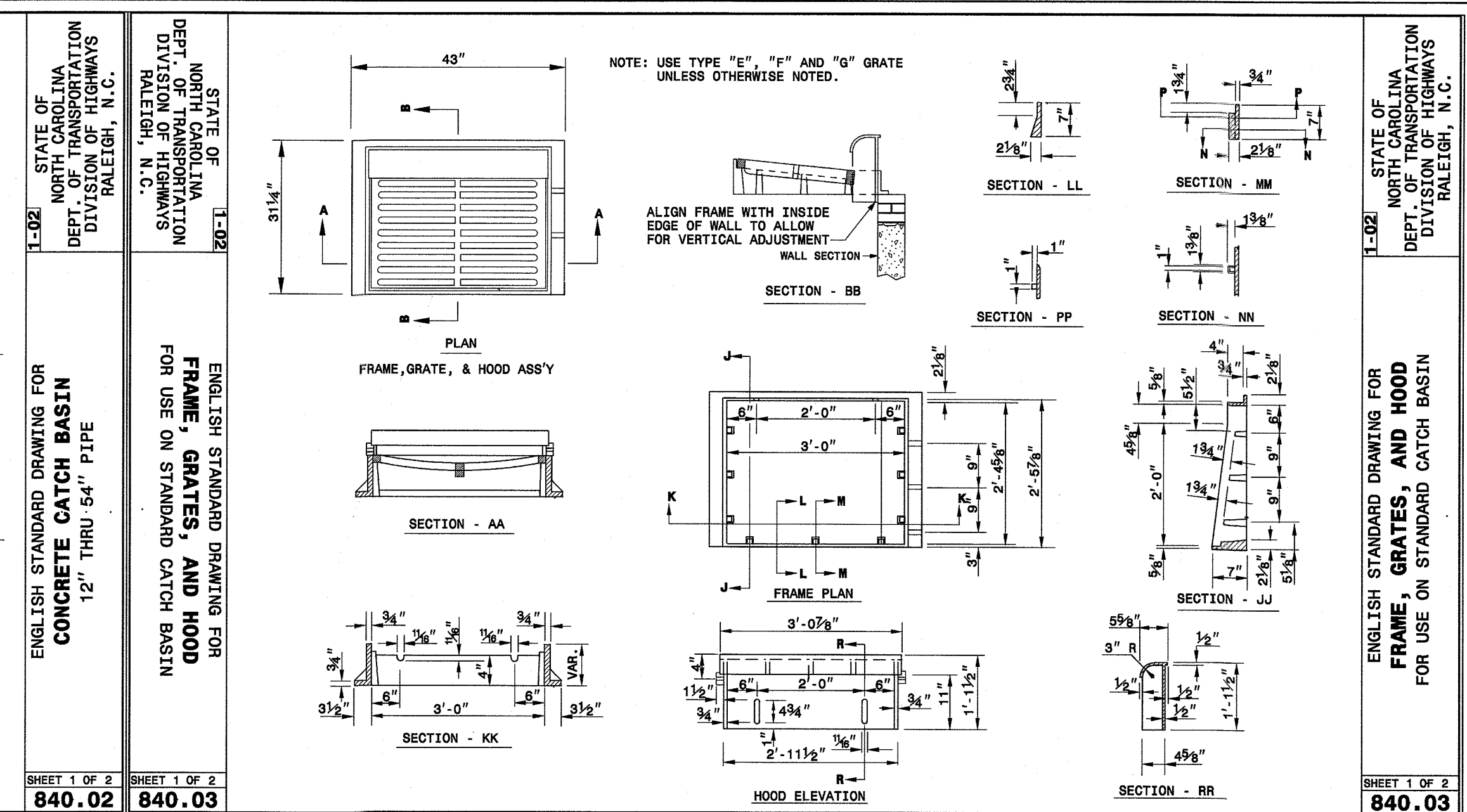
EROSION & SEDIMENT  
CONTROL DETAILS

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
919-481-3000

**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS  
1410 Commonwealth Drive, Suite 101, Wilmington, North Carolina 28403 tel: 910-256-9277 fax: 910-256-2584 www.withersravenel.com

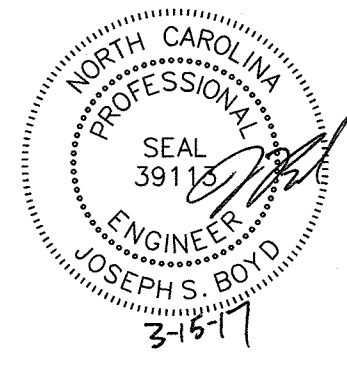
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**C-12.8**



[illegible]

<b>STORMWATER MANAGEMENT PLAN</b> <b>APPROVED</b> CITY OF WILMINGTON ENGINEERING DEPARTMENT DATE _____ PERMIT # _____ SIGNED _____	<b>Approved Construction Plan</b> Name _____ Date _____ Planning _____ Public Utilities _____ Traffic _____ Fire _____
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For each open utility cut of City streets, a \$325 permit shall be required from the City prior to occupancy and/or project acceptance.



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LAST SIGNED BY GARRY S. PAPE (PE  
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REVISED SET IS ONLY PER REVISIONS  
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No.	Revision	Date	By	Designer	W&R	Scale	NTS
				Drawn By	W&R	Date	12/19/13
				Checked By	JSB	Job No.	03050283.01

# HELMSDALE @ LANDFALL - PHASE II

CITY OF WILMINGTON      NEW HANOVER      NORTH CAROLINA

## STORM DRAINAGE DETAILS

PREPARED FOR:  
HELMSDALE INVESTORS, LLC  
100 WESTON ESTATES WAY  
CARY, NC 27513  
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Sheet No.  
**C-12.9**