

SITE DEVELOPMENT PLANS FOR: Bragg Road Development Company, LLC

716 Bragg Drive Wilmington, NC 28412 (Permit # _____)

Project Number: 2014-090
DWG Name: 2014-090 Details.dwg
Drawing Scale: AS NOTED
Date of Project: 10-21-2014
Engineer of Record:
Jason Henderson, P.E.
South Carolina P.E. 22496
Georgia P.E. 63071
North Carolina P.E. 031306
Alabama P.E. 32054

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civil design, PLLC
bluewatercivil.com
19 Washington Park Suite 100 • Greenville, SC 29601
www.bluewatercivil.com • info@bluewatercivil.com

Certificates of Authorization:
SC C04212 - GA PEF005865
NC P0868 - AL CA4056

BRAGG ROAD DEV. COMPANY, LLC
Bragg Drive
Wilmington, NC

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



Bluewater Civil Design, PLLC
NC 02-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	3-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER NC DOT / WILMINGTON COMMENTS

TITLE SHEET

C001

- #### City of Wilmington Standard Notes
- Prior to any clearing, grading or construction activity, tree protection fencing shall be installed around protected trees or groves of trees. No construction workers, tools, materials, or vehicles are permitted within the tree protection fencing.
 - Any trees and/or areas designated to be protected must be properly barricaded with fencing and protected throughout construction to insure that no clearing, grading or staging of materials will occur in those areas.
 - No equipment is allowed on site until all tree protection fencing and silt fencing is installed and approved. Protective fencing is to be maintained throughout the duration of the project, and contractors shall receive adequate instruction on tree protection methods.
 - All pavement markings in public rights-of-way and for driveways are to be thermoplastic and meet City and/or NCDOT standards.
 - Once streets are open to traffic, contact Traffic Engineering regarding the installation of traffic and street name signs. Proposed street names must be approved prior to installation of street name signs.
 - Traffic control devices (including signs and pavement markings) in areas open to public traffic are to meet MUTCD (Manual on Uniform Traffic Control Devices) standards.
 - Contact Traffic Engineering at 910-341-7888 to ensure that all traffic signal facilities and equipment are shown on the plan.
 - Call Traffic Engineering at 910-341-7888 forty-eight (48) hours prior to any excavation in the right-of-way.
 - Traffic Engineering must approve of pavement marking prior to actual striping.
 - All parking stall markings and lane arrows within the parking areas shall be white.
 - All traffic control signs and markings off the right-of-way are to be maintained by the property owner in accordance with MUTCD Standards.
 - Stop signs and street signs to remain in place during construction.
 - Tactile warning mats will be installed on all wheelchair ramps.
 - A utility cut permit is required for each open cut of a city street.
 - Any broken or missing sidewalk panels, driveway panels, and curbing will be replaced.
 - Contact Karen Dixon at 910-341-7888 to discuss street lighting options.
 - Water and sewer service shall meet Cape Fear Public Utility Authority (CFPUA) details and specifications.
 - Project shall comply with CFPUA Cross Connection Control requirements. Water meter(s) cannot be released until all requirements are met and the State has given their final approval. Call 910-343-3910 for information.
 - 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.
 - Any irrigation system supplied by CFPUA water shall comply with the CFPUA Cross Connection Control regulations. Call 910-343-3910 for information.
 - Any irrigation system shall be equipped with a rain and freeze sensor.
 - Any backflow prevention devices required by the CFPUA will need to be on the list of approved devices by USCFCCHRR or ASSE.
 - Contractor to field verify existing water and sewer service locations, sizes and materials prior to construction. Engineer to be notified of any conflicts.
 - Contractor shall maintain all-weather access for emergency vehicles at all times during construction.
 - Underground fire line(s) must be permitted and inspected by the Wilmington Fire Department from the public right-of-way to the building. Contact the Wilmington Fire Department Division of Fire and Life Safety at 910-341-0696.
 - No obstructions are permitted in the space between thirty (30) inches and ten (10) feet above the ground within the triangular sight distance.
 - Contact the North Carolina One Call Center at 1-800-632-4949 prior to doing any digging, clearing, or grading

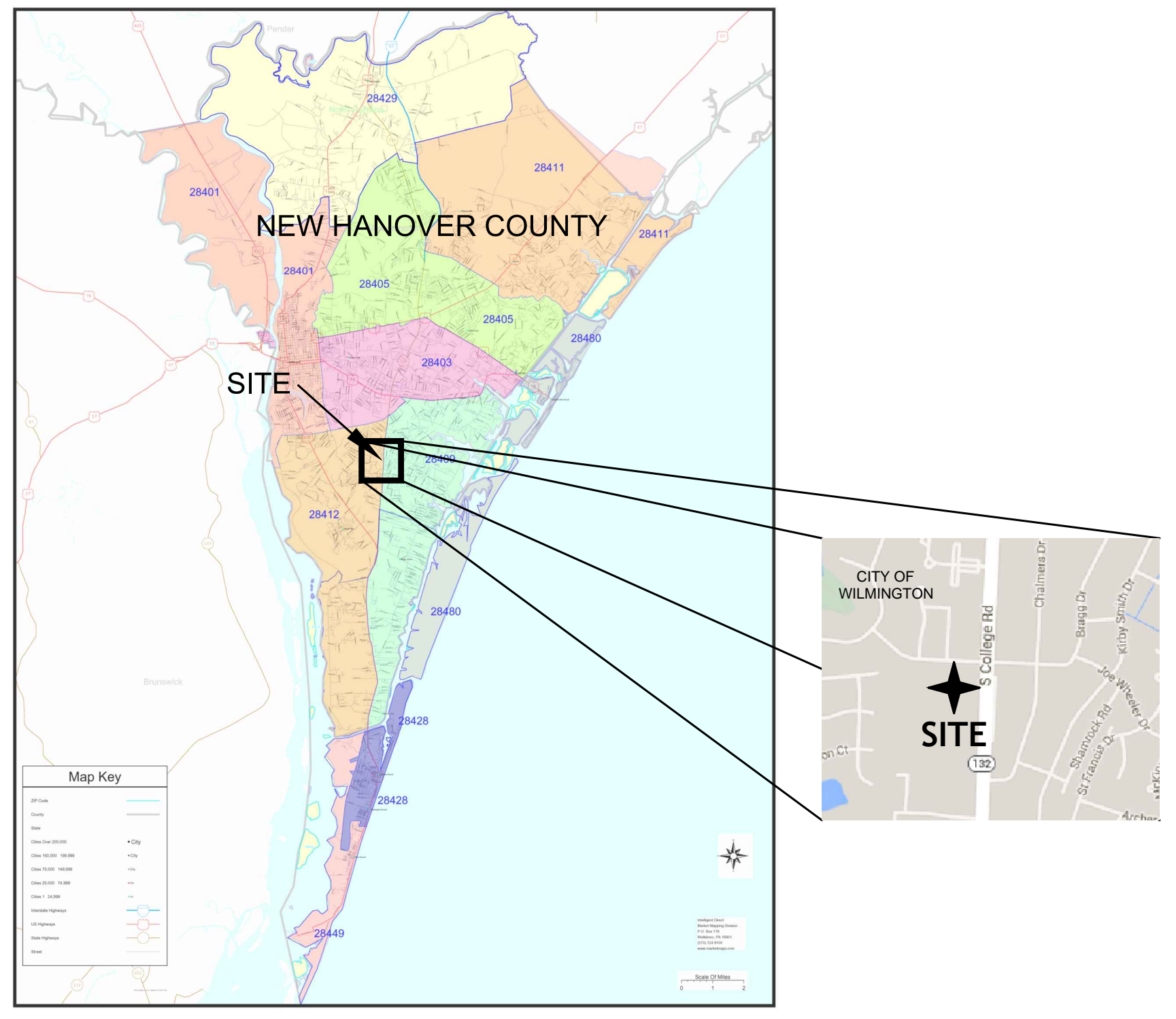


Approved Construction Plan
Name _____ Date _____
Planning _____
Traffic _____
Fire _____

WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
Signed: _____

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

LOCATION MAP



SITE CONTACTS

- PLANNING / PERMIT COORDINATOR**
AGENCY: City of Wilmington Planning, Development, & Trans.
ADDRESS: 305 Chestnut Street
Wilmington, NC 28402
PHONE: 910-341-3257
CONTACT: Jim Diepenbrock
EMAIL: jim.diepenbrock@wilmingtonnc.gov
- LANDSCAPING**
AGENCY: City of Wilmington Planning, Development, & Trans.
ADDRESS: 305 Chestnut Street
Wilmington, NC 28402
PHONE: 910-341-3257
CONTACT: Jim Diepenbrock
EMAIL: jim.diepenbrock@wilmingtonnc.gov
- FIRE DISTRICT**
AGENCY: City of Wilmington Fire Department
ADDRESS: 801 Market Street
Wilmington, NC 28401-4730
PHONE: 910-343-3917
CONTACT: Captain Chris Elrod
EMAIL: chris.elrod@wilmingtonnc.gov
- STORMWATER**
AGENCY: City of Wilmington, Engineering
ADDRESS: 102 N. Third St., PO Box 1810
Wilmington, NC 28402
PHONE: 910-341-5856
CONTACT: Rob Gordon
EMAIL: rob.gordon@wilmingtonnc.gov
- TRAFFIC ENGINEERING**
AGENCY: City of Wilmington/Wilmington MPO
ADDRESS: 305 Chestnut Street, 4th Floor
Wilmington, NC 28402-1810
PHONE: 910-341-4677
CONTACT: Dave Brent
EMAIL: dave.brent@wilmingtonnc.gov
- WATER**
AGENCY: Cape Fear Public Utility Authority
ADDRESS: 235 Government Center Drive
Wilmington, NC 28403
PHONE: 910-332-6620
CONTACT: Bernice Johnson
EMAIL: bernice.johnson@cfpuia.org
- SEWER**
AGENCY: Cape Fear Public Utility Authority
ADDRESS: 235 Government Center Drive
Wilmington, NC 28403
PHONE: 910-332-6620
CONTACT: Bernice Johnson
EMAIL: bernice.johnson@cfpuia.org
- ELECTRIC - TRANSMISSION**
AGENCY: Duke Energy - Asset Protection
ADDRESS: 8645 Trade Street
Letland, NC 28451
PHONE: 910-520-3911
CONTACT: Bill Wilder
EMAIL: Bill.Wilder@duke-energy.com
- ELECTRIC - DISTRIBUTION**
AGENCY: Duke Energy - Distribution Engineering
ADDRESS: 404 Raleigh Street
Wilmington, NC 28412
PHONE: 910-604-2547
CONTACT: Mark A. Hatfield
EMAIL: mark.hatfield@duke-energy.com
- N.C.D.O.T.**
AGENCY: NC Dept. of Transportation
ADDRESS: 300 Division Dr.
Wilmington, NC 28401
PHONE: 910-251-2655
CONTACT: Anthony Law
EMAIL: alaw@ncdot.gov

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*BOUNDARY & TOPOGRAPHIC SURVEY (BY ROBERT SESSOMS & ASSOCIATES, PLLC)

DEVELOPER

COMPANY: Bragg Drive Development Company, LLC
ADDRESS: 3920 Magazine Street
New Orleans, LA 70115
PHONE: 864.271.3894
CONTACT: Gordon Kolb, Jr.
EMAIL: gordo@ghkinc.com

CIVIL ENGINEER

COMPANY: Bluewater Civil Design, PLLC
ADDRESS: 19 Washington Park - Suite 100
Greenville, SC 29601
PHONE: 864.326.4204
CONTACT: Jason S. Henderson, P.E.
EMAIL: jason@bluewatercivil.com

SURVEYOR

COMPANY: Robert Sessoms & Associates, PLLC
ADDRESS: 4033 Chandler Drive
Wilmington, NC 28412
PHONE: 910-352-8846
CONTACT: Robert Sessoms
EMAIL: rsessoms@rssurveying.com

ARCHITECT

COMPANY: Jared Ducote Architect
ADDRESS: 600 South Barracks Street, Suite 210-6
Pensacola, FL 32502
PHONE: 850-439-1552
CONTACT: Jared Ducote
EMAIL: jared@jaredducote.com

DESIGNER'S CERTIFICATION:

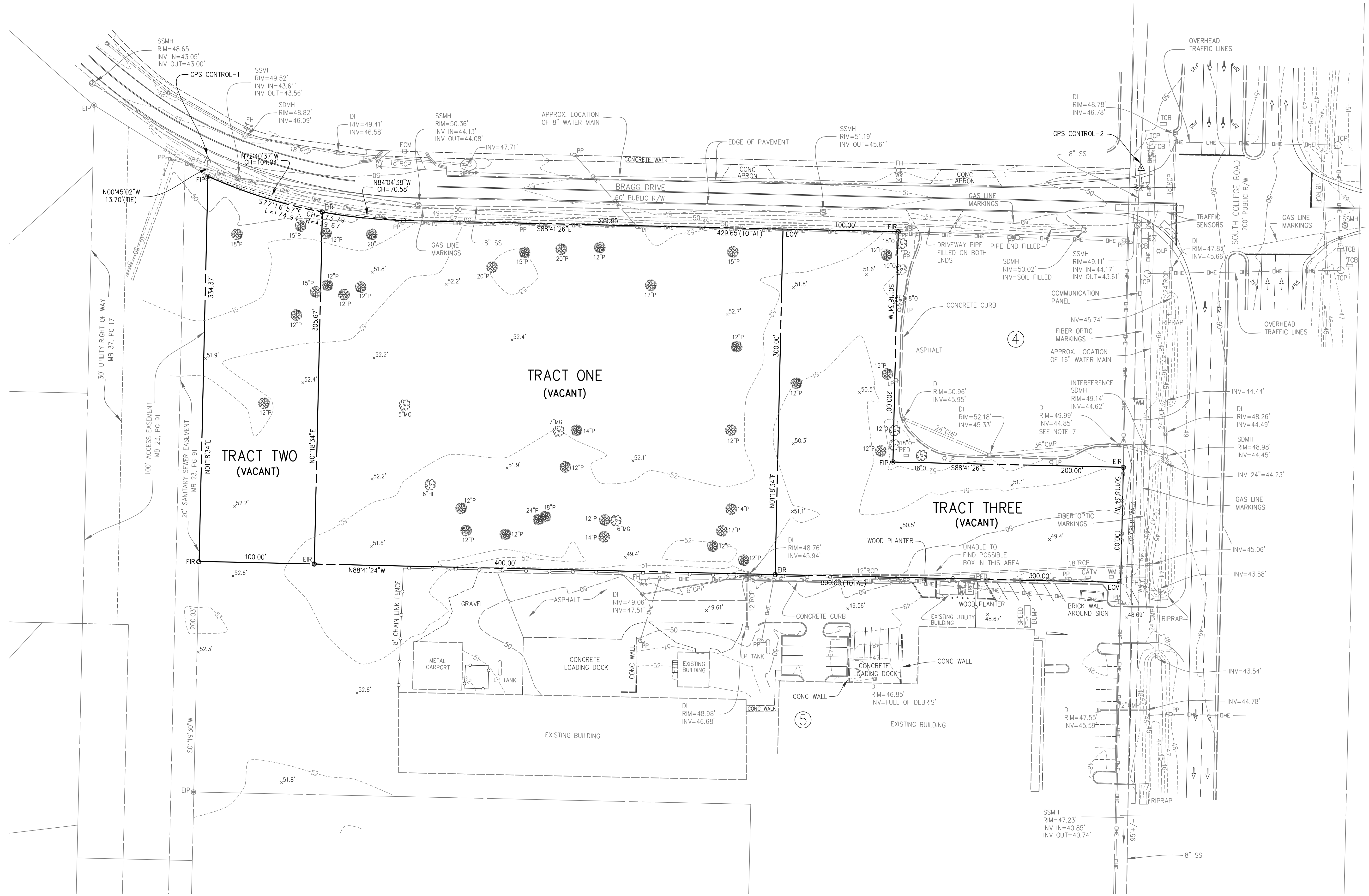
I hereby certify that these plans have been prepared in accordance with the latest Wilmington Standards and Specifications for Storm Water Management and Chapter 20 of the Code of Ordinances of the City of Wilmington.

4-30-2015
JASON S. HENDERSON, P.E., BLUEWATER CIVIL DESIGN, PLLC - NCPE# 031306 DATE

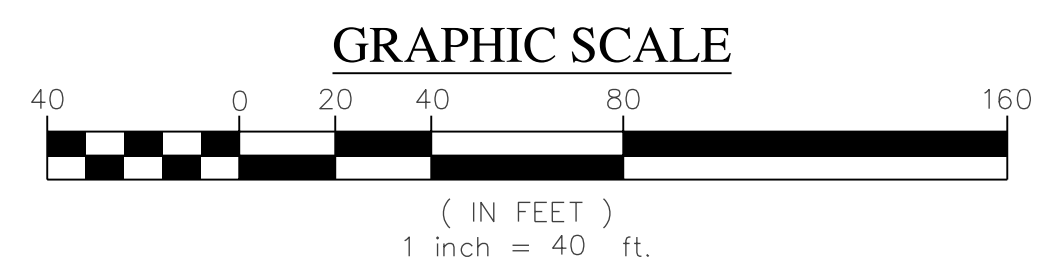
OWNER'S CERTIFICATION:

I/We hereby certify that any clearing, grading, construction or development, or all of these, will be done pursuant to these plans and that the applicable Stormwater Management conditions and requirements of the City of Wilmington, the State of North Carolina and the Federal Government and its agencies are hereby made part of these plans.

DATE



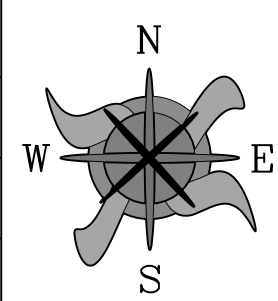
SEE SHEET 1 FOR NOTES AND CERTIFICATIONS



SURVEY

ROBERT G. SESSOMS
PROFESSIONAL LAND SURVEYOR
LICENSE NUMBER L-4659

SCALE	1" = 40'
DATE	09/26/2014
DRAWN BY	RGS
RSA PROJECT	#14.153



Robert Sessoms & Associates, PLLC
Professional Land Surveyors
NC LICENSE # P-0884
4055 CHANDLER DRIVE
WILMINGTON, NC 28405
PH - 910-352-8846
EMAIL - RSSESSOMS@SURVEYING.COM

BRAGG DRIVE 60' PUBLIC R/W

Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina PE# 2146
 Georgia PE# 03571
 North Carolina PE# 03106
 Alabama PE# 03504
 Louisiana PE# 38891
 Virginia PE# 60203118

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 Bragg Drive
 Wilmington, NC

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 Planning _____
 Traffic _____
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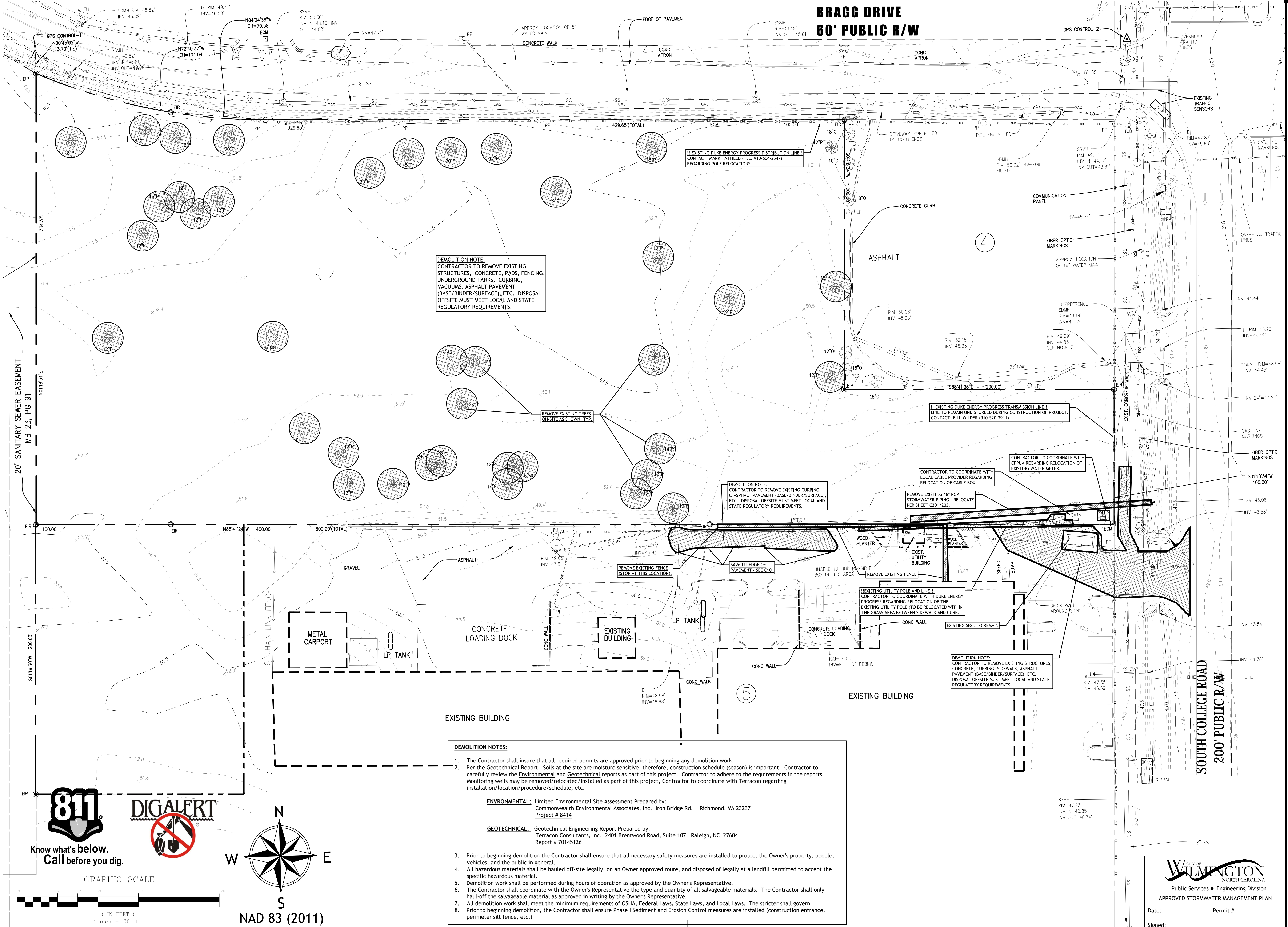


Bluewater Civil Design, PLLC
 No. 0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
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D	4-16-2015	100% TENTANT SUBMITTAL
E	4-30-2015	REVISED PER HCDOT/WILMINGTON COMMENTS

DEMOLITION PLAN

C002



DEMOLITION NOTE:
 CONTRACTOR TO REMOVE EXISTING STRUCTURES, CONCRETE, PADS, FENCING, UNDERGROUND TANKS, CURBING, VACUUMS, ASPHALT PAVEMENT (BASE/BINDER/SURFACE), ETC. DISPOSAL OFFSITE MUST MEET LOCAL AND STATE REGULATORY REQUIREMENTS.

DEMOLITION NOTE:
 CONTRACTOR TO REMOVE EXISTING CURBING & ASPHALT PAVEMENT (BASE/BINDER/SURFACE), ETC. DISPOSAL OFFSITE MUST MEET LOCAL AND STATE REGULATORY REQUIREMENTS.

CONTRACTOR TO COORDINATE WITH LOCAL CABLE PROVIDER REGARDING RELOCATION OF CABLE BOX.

CONTRACTOR TO COORDINATE WITH CPPLA REGARDING RELOCATION OF EXISTING WATER METER.

EXISTING UTILITY POLE AND LINE:
 CONTRACTOR TO COORDINATE WITH DUKE ENERGY REGARDING RELOCATION OF THE EXISTING UTILITY POLE (TO BE RELOCATED WITHIN THE GRASS AREA BETWEEN SIDEWALK AND CURB).

DEMOLITION NOTE:
 CONTRACTOR TO REMOVE EXISTING STRUCTURES, CONCRETE, CURBING, SIDEWALK, ASPHALT PAVEMENT (BASE/BINDER/SURFACE), ETC. DISPOSAL OFFSITE MUST MEET LOCAL AND STATE REGULATORY REQUIREMENTS.

DEMOLITION NOTES:

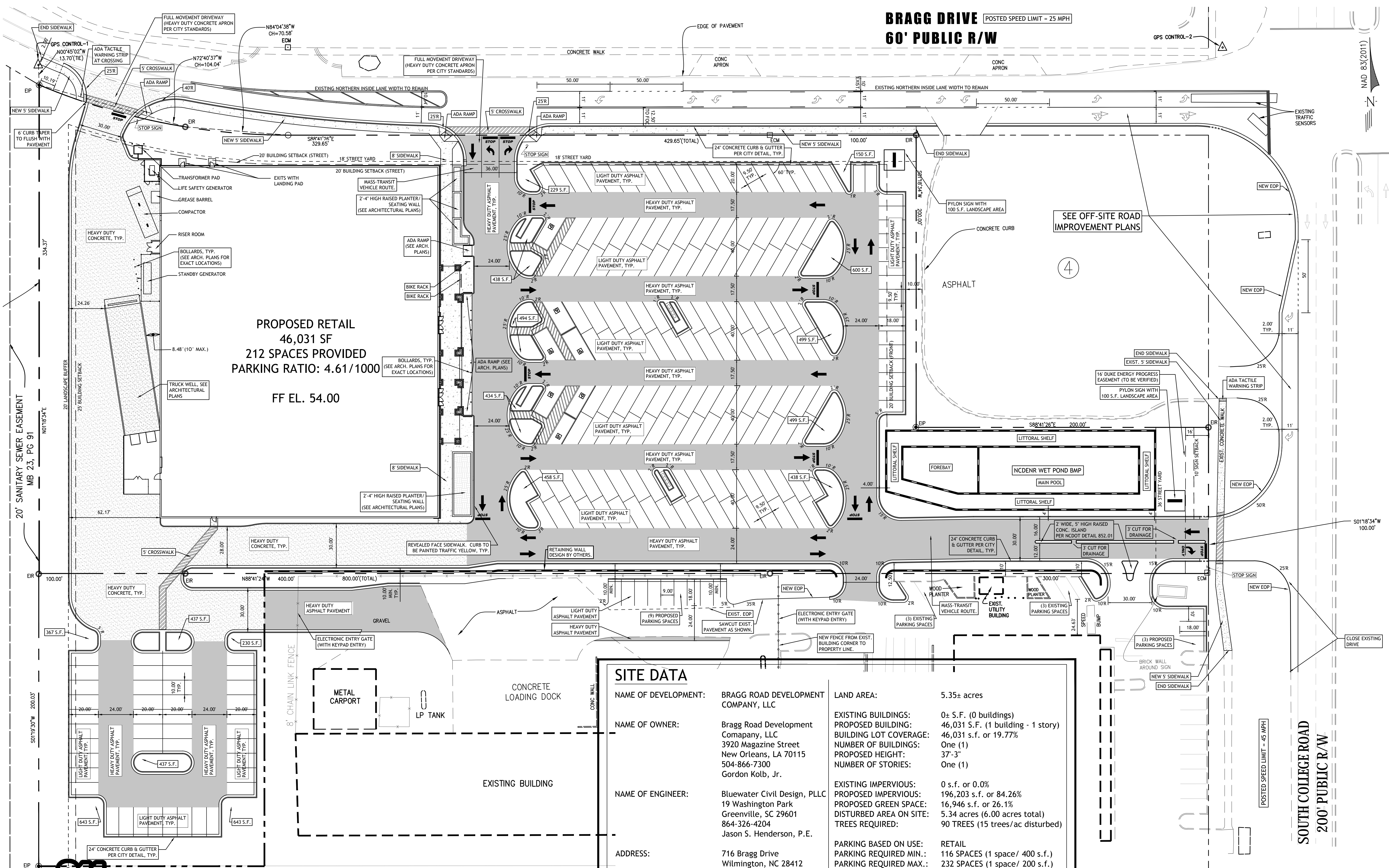
- The Contractor shall ensure that all required permits are approved prior to beginning any demolition work.
- Per the Geotechnical Report - Soils at the site are moisture sensitive, therefore, construction schedule (season) is important. Contractor to carefully review the Environmental and Geotechnical reports as part of this project. Contractor to adhere to the requirements in the reports. Monitoring wells may be removed/relocated/installed as part of this project, Contractor to coordinate with Terracon regarding installation/location/procedure/schedule, etc.

ENVIRONMENTAL: Limited Environmental Site Assessment Prepared by: Commonwealth Environmental Associates, Inc. Iron Bridge Rd. Richmond, VA 23237 Project # 8414

GEOTECHNICAL: Geotechnical Engineering Report Prepared by: Terracon Consultants, Inc. 2401 Brentwood Road, Suite 107 Raleigh, NC 27604 Report # 70145126

- Prior to beginning demolition the Contractor shall ensure that all necessary safety measures are installed to protect the Owner's property, people, vehicles, and the public in general.
- All hazardous materials shall be hauled off-site legally, on an Owner approved route, and disposed of legally at a landfill permitted to accept the specific hazardous material.
- Demolition work shall be performed during hours of operation as approved by the Owner's Representative.
- The Contractor shall coordinate with the Owner's Representative the type and quantity of all salvageable materials. The Contractor shall only haul-off the salvageable material as approved in writing by the Owner's Representative.
- All demolition work shall meet the minimum requirements of OSHA, Federal Laws, State Laws, and Local Laws. The stricter shall govern.
- Prior to beginning demolition, the Contractor shall ensure Phase I Sediment and Erosion Control measures are installed (construction entrance, perimeter silt fence, etc.)

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____



BRAGG DRIVE POSTED SPEED LIMIT = 25 MPH
60' PUBLIC R/W

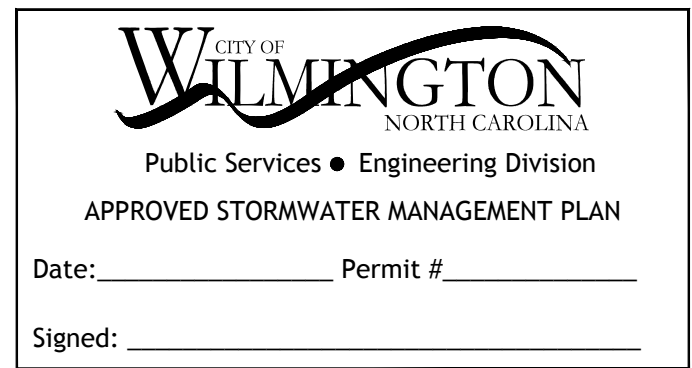
PROPOSED RETAIL
46,031 SF
212 SPACES PROVIDED
PARKING RATIO: 4.61/1000
FF EL. 54.00

SITE DATA

NAME OF DEVELOPMENT:	BRAGG ROAD DEVELOPMENT COMPANY, LLC	LAND AREA:	5.35± acres
NAME OF OWNER:	Bragg Road Development Company, LLC 3920 Magazine Street New Orleans, LA 70115 504-866-7300 Gordon Kolb, Jr.	EXISTING BUILDINGS:	0± S.F. (0 buildings)
NAME OF ENGINEER:	Bluewater Civil Design, PLLC 19 Washington Park Greenville, SC 29601 864-326-4204 Jason S. Henderson, P.E.	PROPOSED BUILDING:	46,031 S.F. (1 building - 1 story)
ADDRESS:	716 Bragg Drive Wilmington, NC 28412	BUILDING LOT COVERAGE:	46,031 s.f. or 19.77%
PID:	R06600-001-005-000 R06610-006-002-000 R06600-001-019-000 P.O. R06610-006-014-000	NUMBER OF BUILDINGS:	One (1)
ZONING:	CB Community Business	PROPOSED HEIGHT:	37'-3"
SETBACKS REQ'D:	20' front- 20' corner side - 10' rear - 0' interior side	NUMBER OF STORIES:	One (1)
SETBACKS PROP'D:	309' front- 20' corner side - 82' rear - 37' interior side	EXISTING IMPERVIOUS:	0 s.f. or 0.0%
		PROPOSED IMPERVIOUS:	196,203 s.f. or 84.26%
		PROPOSED GREEN SPACE:	16,946 s.f. or 26.1%
		DISTURBED AREA ON SITE:	5.34 acres (6.00 acres total)
		TREES REQUIRED:	90 TREES (15 trees/ac disturbed)
		PARKING BASED ON USE:	RETAIL
		PARKING REQUIRED MIN.:	116 SPACES (1 space/ 400 s.f.)
		PARKING REQUIRED MAX.:	232 SPACES (1 space/ 200 s.f.)
		PROPOSED PARKING:	212 SPACES
		HANDICAP PARKING REQ'D:	7 SPACES
		HANDICAP PARKING PROV'D:	7 SPACES
		BICYCLE PARKING REQ'D:	15 SPACES
		BICYCLE PARKING PROV'D:	16 SPACES
		CAMA Land Use:	Urban
		EXISTING FLOW NEEDS:	0 GPD (WATER & SEWER)
		PROPOSED FLOW NEEDS:	5,984 GPD (WATER & SEWER)

CURBING NOTE:
 ALL CURBING ON PRIVATE PROPERTY SHALL BE 24" CONCRETE CURB AND GUTTER PER CITY OF WILMINGTON STANDARD DETAIL SD 7-01.

ADA RAMP NOTE:
 TACTILE WARNING MATS ARE TO BE INSTALLED ON ALL ADA RAMP.



ARCHITECTURAL NOTE:
 CONTRACTOR TO REFER TO ARCHITECTURAL PLANS FOR EXACT DIMENSIONS OF BUILDING, SIDEWALKS ADJACENT TO BUILDING, COLUMN LOCATIONS, DOOR/ENTRY LOCATIONS, BOLLARDS, COMPACTORS, ELECTRICAL/MECHANICAL EQUIPMENT, TRUCK WELL, ROOF DRAIN DOWNSPOUTS, AND ALL UTILITY CONNECTIONS.

BUILDING FOOTING NOTE:
 IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE BETWEEN THE CIVIL PLANS / ARCHITECTURAL PLANS / STRUCTURAL PLANS REGARDING THE GROUND ELEVATIONS DIRECTLY EXTERNAL OF THE BUILDING IN RELATION TO THE STRUCTURAL BUILDING FOOTINGS.

SITE LIGHTING NOTE:
 SEE SITE LIGHTING PLAN (E-101) FOR ALL POLE LOCATIONS, FIXTURE AND PHOTOMETRIC INFORMATION. POLE LOCATIONS ARE SHOWN ON THIS PLAN FOR INFORMATION ONLY.

SITE LANDSCAPING NOTE:
 SEE LANDSCAPE PLANS FOR ALL PERMANENT VEGETATION REQUIREMENTS/INFORMATION. I.E. SOD, TREES, SHRUBS, MULCHING, ETC.

811 DIGALERT
 Know what's below. Call before you dig.

GRAPHIC SCALE
 (IN FEET)
 1 inch = 30 ft

NAD 83 (2011)

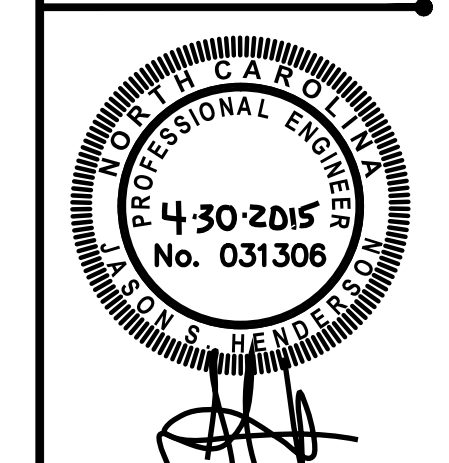
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 Jason Henderson, P.E.
 South Carolina REG 21466
 Georgia REG 03571
 North Carolina REG 01306
 Alabama REG 37504
 Louisiana REG 38891
 Virginia REG 60203118

bluewater
 civil design, PLLC
 bluewatercivil.com • info@bluewatercivil.com
 19 Washington Park Suite 100 • Greenville, SC 29601
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 Bragg Drive
 Wilmington, NC

Certificates of Authorization:
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Approved Construction Plan
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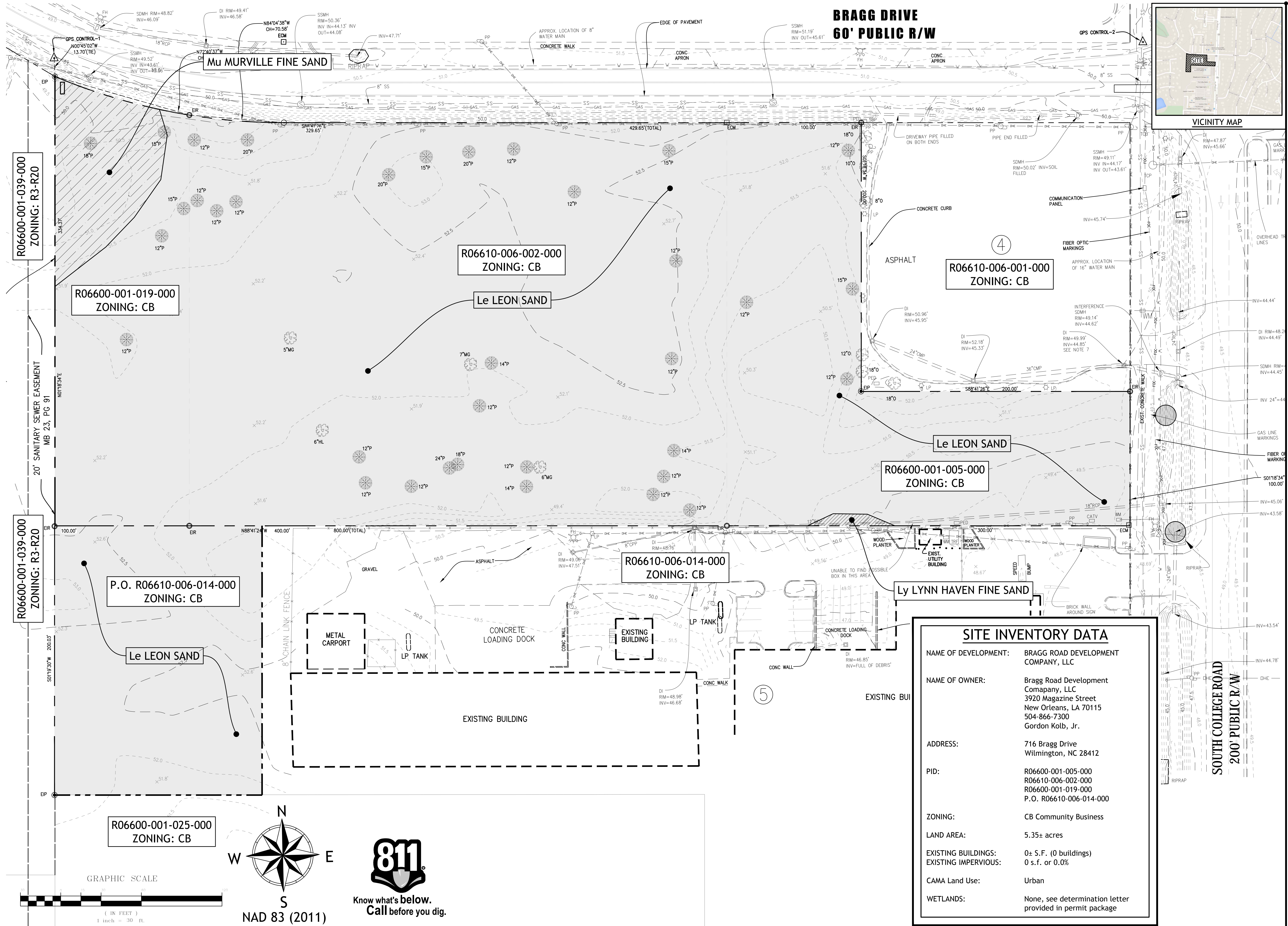


Bluewater Civil Design, PLLC
 No. 2-0868

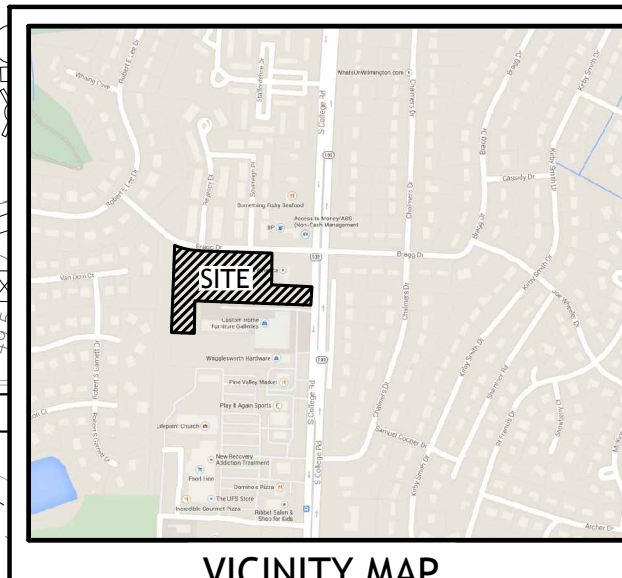
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SITE PLAN

C101



**BRAGG DRIVE
60' PUBLIC R/W**



VICINITY MAP

**R06610-006-001-000
ZONING: CB**

**R06610-006-002-000
ZONING: CB**

**R06600-001-019-000
ZONING: CB**

**R06600-001-039-000
ZONING: R3-R20**

**R06600-001-039-000
ZONING: R3-R20**

**P.O. R06610-006-014-000
ZONING: CB**

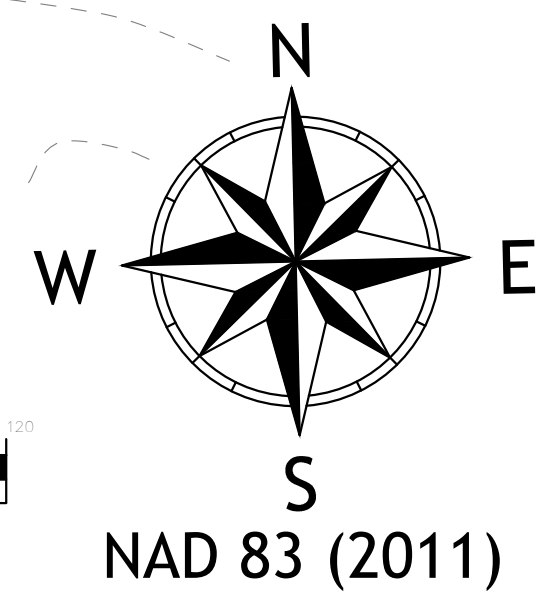
Le LEON SAND

**R06600-001-025-000
ZONING: CB**

**R06600-001-005-000
ZONING: CB**

**R06610-006-014-000
ZONING: CB**

Ly LYNN HAVEN FINE SAND



SITE INVENTORY DATA	
NAME OF DEVELOPMENT:	BRAGG ROAD DEVELOPMENT COMPANY, LLC
NAME OF OWNER:	Bragg Road Development Company, LLC 3920 Magazine Street New Orleans, LA 70115 504-866-7300 Gordon Kolb, Jr.
ADDRESS:	716 Bragg Drive Wilmington, NC 28412
PID:	R06600-001-005-000 R06610-006-002-000 R06600-001-019-000 P.O. R06610-006-014-000
ZONING:	CB Community Business
LAND AREA:	5.35± acres
EXISTING BUILDINGS:	0± S.F. (0 buildings)
EXISTING IMPERVIOUS:	0 s.f. or 0.0%
CAMA Land Use:	Urban
WETLANDS:	None, see determination letter provided in permit package

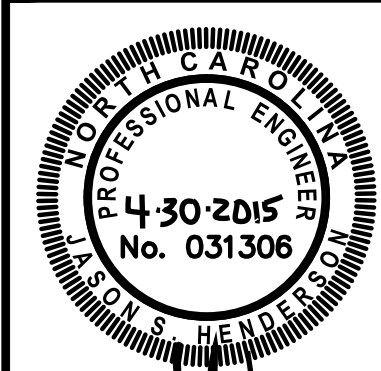
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DWG Name: 2014-090 D1 - Site Inventory.dwg
Drawing Scale: as noted
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Engineer of Record:
Jason Henderson, P.E.
South Carolina P.E. #246
Georgia P.E. #0351
North Carolina P.E. #1306
Alabama P.E. #12054
Louisiana P.E. #8895
Virginia P.E. #6203318

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BR DEVELOPMENTS, INC.
NEW ORLEANS

**BRAGG ROAD DEV.
COMPANY, LLC**
Bragg Drive
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SITE INVENTORY PLAN

C102

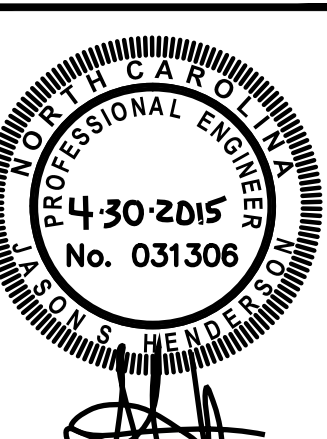
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60' PUBLIC R/W**

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 Bragg Drive
 Wilmington, NC

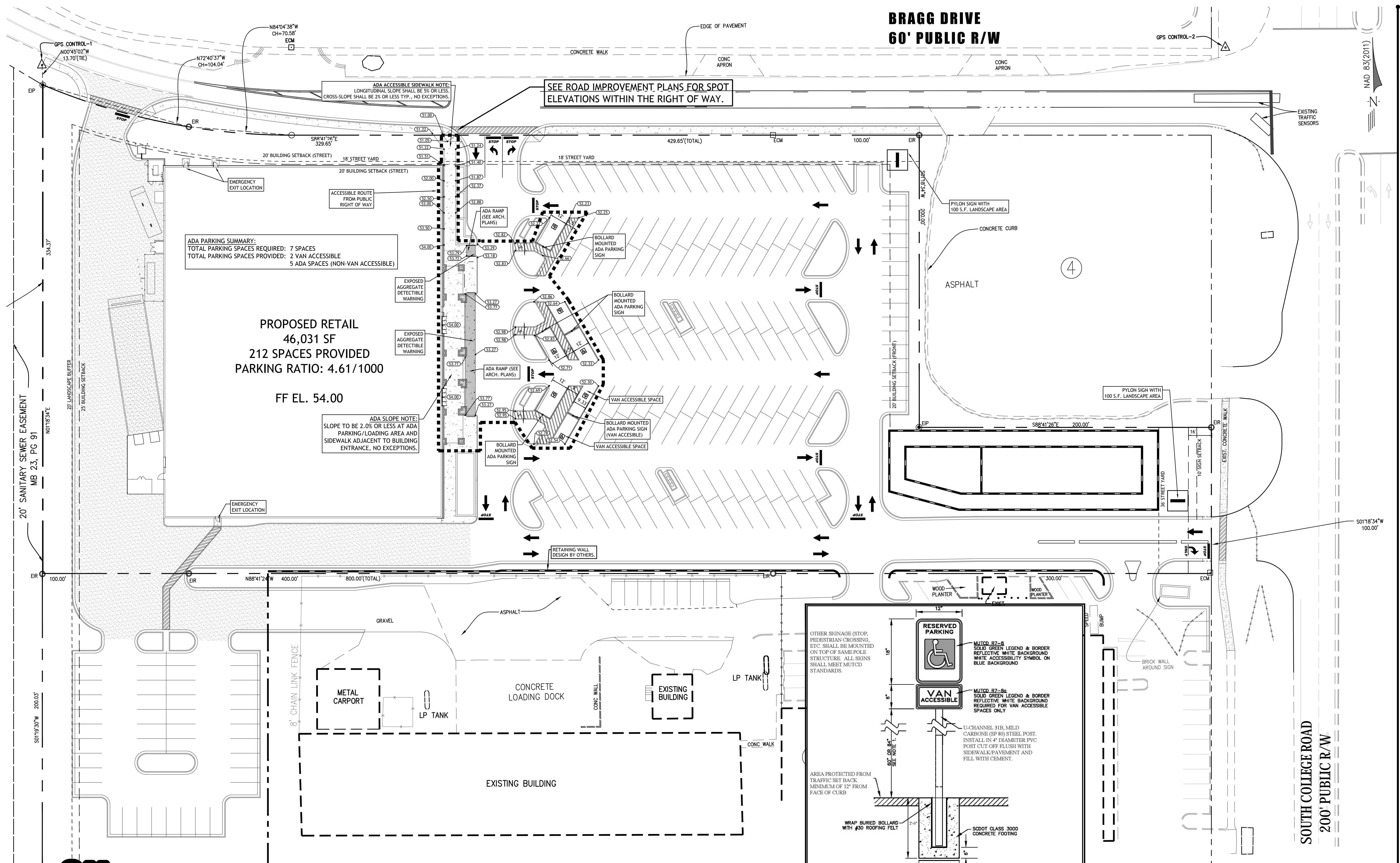


Bluewater Civil Design, PLLC
 No. P-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER HCOOT/WILMINGTON COMMENTS

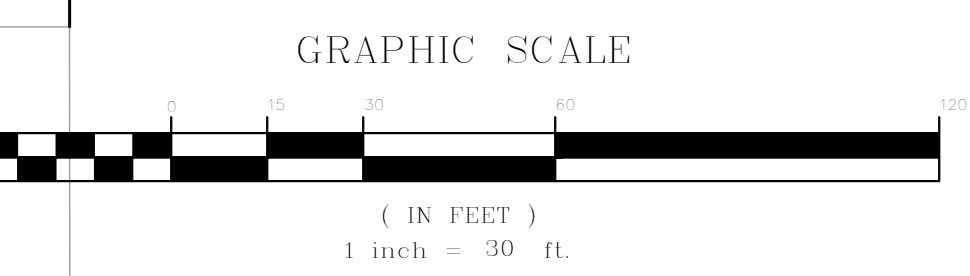
ACCESSIBILITY PLAN

C103



CURBING NOTE:
 ALL CURBING ON PRIVATE PROPERTY SHALL BE 24" CONCRETE CURB AND GUTTER PER CITY OF WILMINGTON STANDARD DETAIL SD 7-01.

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



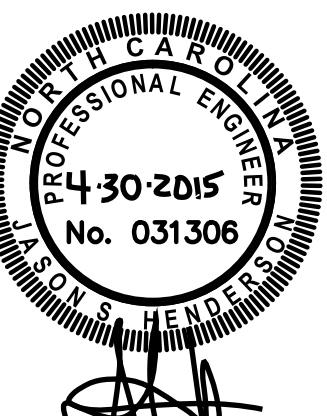
**BRAGG DRIVE
60' PUBLIC R/W**

Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: as noted
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina PE# 21406
 Georgia PE# 03171
 North Carolina PE# 03106
 Alabama PE# 03104
 Louisiana PE# 38891
 Virginia PE# 60203118

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 civil design, PLLC
 bluewatercivil.com • info@bluewatercivil.com
 19 Washington Park Suite 100 • Greenville, SC 29601
 www.bluewatercivil.com

Certificates of Authorization:
 SC C04212 - GA PEF005865
 NC P0868 - AL CA4065E
BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

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

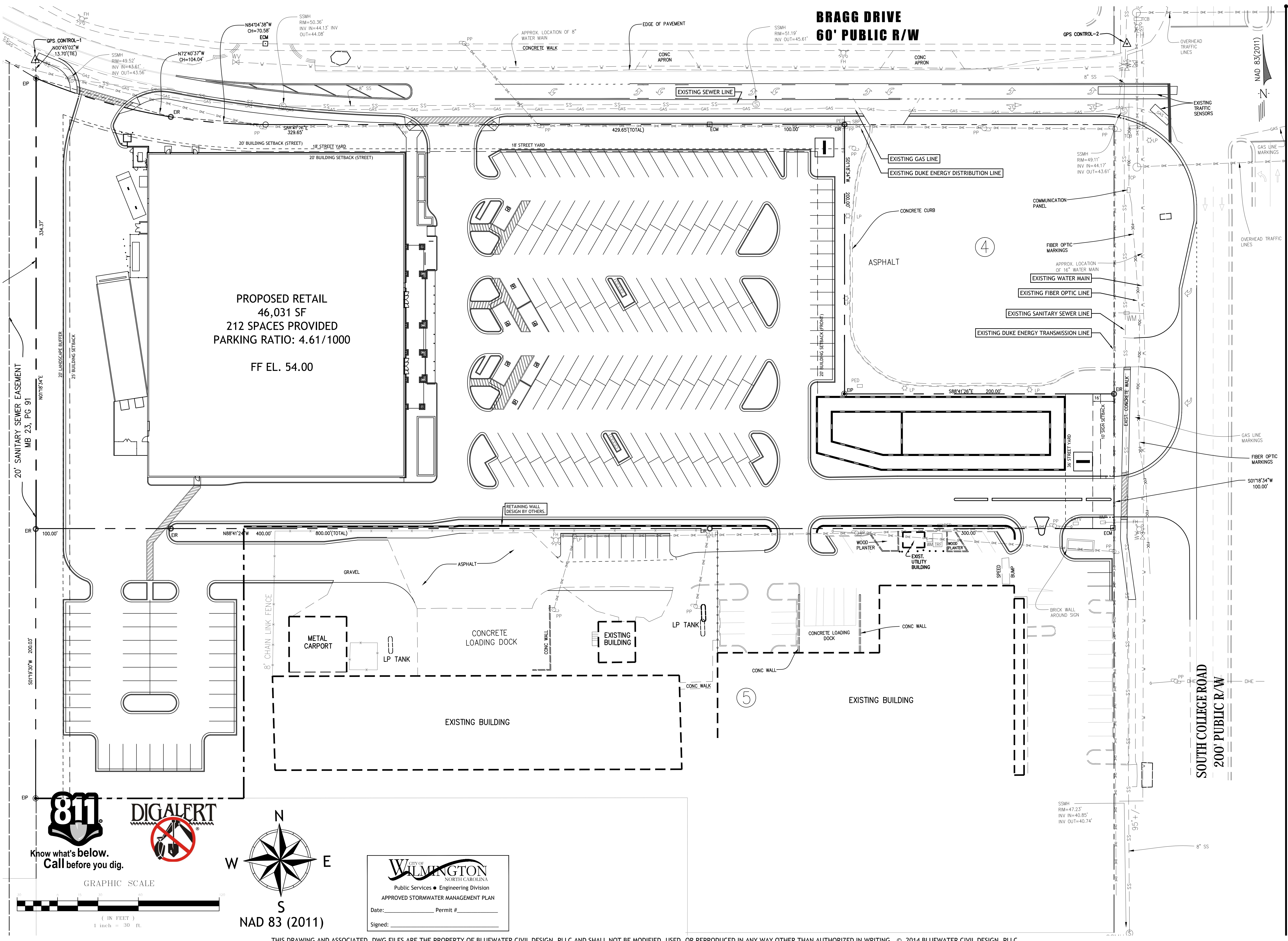


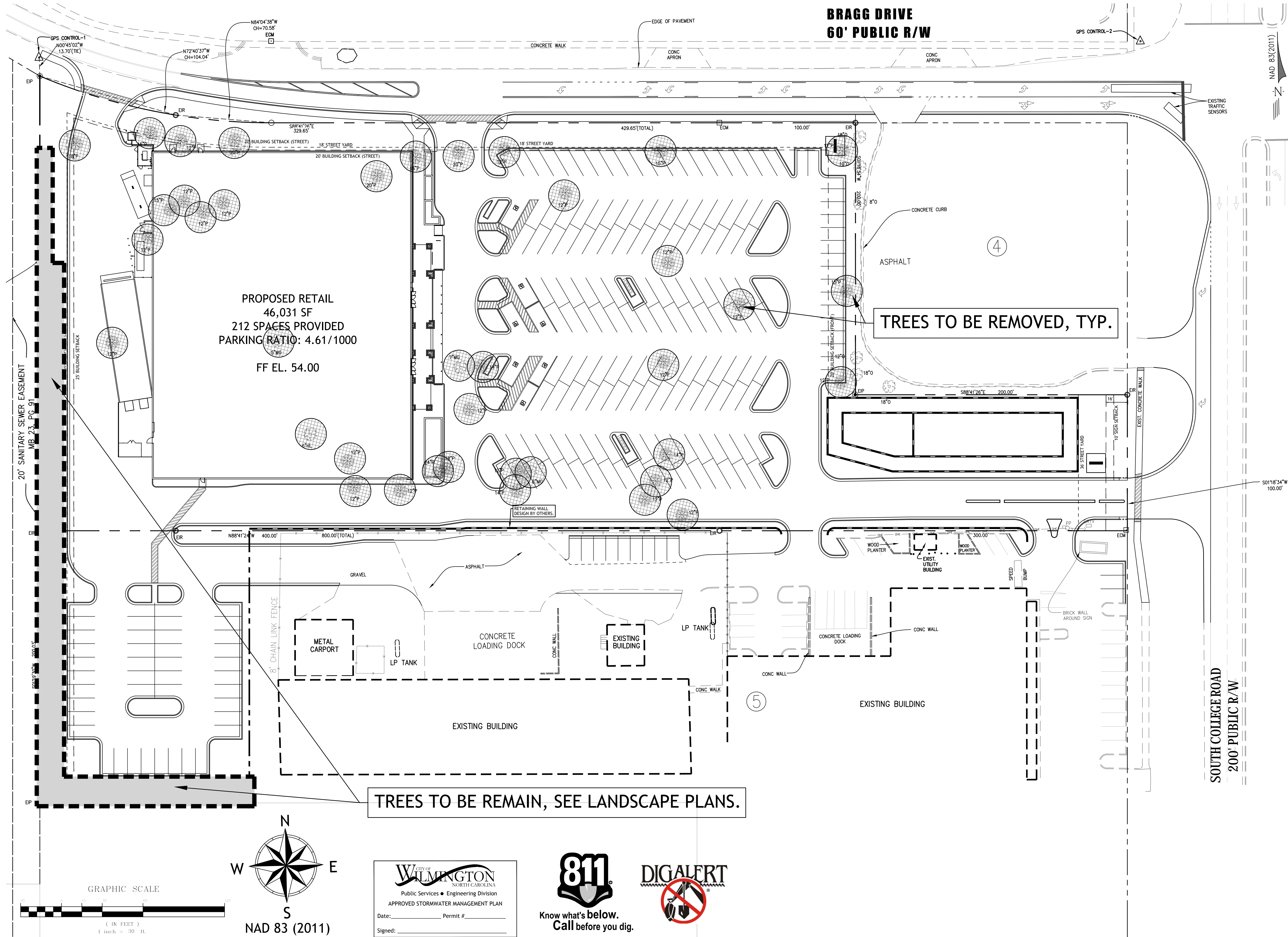
Bluewater Civil Design, PLLC
 NC-P-0868

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E	4-30-2015	REVISED PER HCOOT/WILMINGTON COMMENTS

**SITE PLAN /
EXISTING UTILITY
OVERLAY**

C104



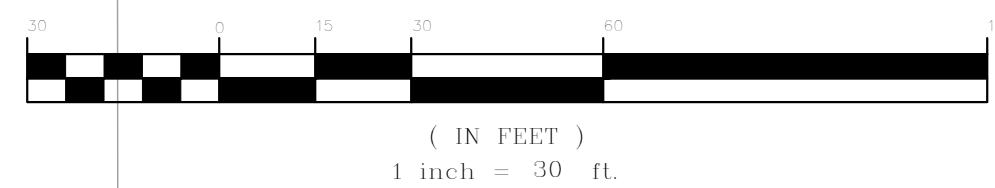


PROPOSED RETAIL
 46,031 SF
 212 SPACES PROVIDED
 PARKING RATIO: 4.61/1000
 FF EL. 54.00

TREES TO BE REMOVED, TYP.

TREES TO BE REMAIN, SEE LANDSCAPE PLANS.

GRAPHIC SCALE



CITY OF WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____
 Signed: _____



Know what's below.
 Call before you dig.



BRAGG DRIVE
60' PUBLIC R/W

SOUTH COLLEGE ROAD
200' PUBLIC R/W

Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: as noted
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina PE 21466
 Georgia PE 03717
 North Carolina PE 03106
 Alabama PE 32054
 Louisiana PE 38891
 Virginia PE 60203118

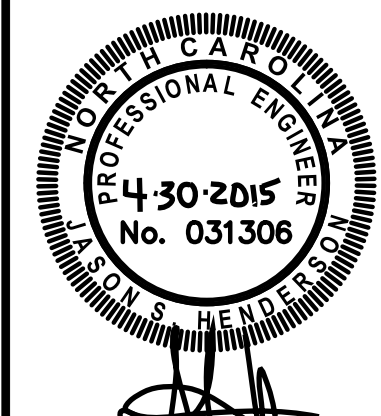
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 www.bluewatercivil.com • info@bluewatercivil.com

Certificates of Authorization:
 SC C04212 - GA PEF005865
 NC P0868 - AL CA4065E

BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

Approved Construction Plan

Name	Date
Planning	Traffic
Fire	



Bluewater Civil Design, PLLC
 NC P-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
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E	4-30-2015	REVISED PER HCDOT/WILMINGTON COMMENTS

SITE PLAN / TREE
 REMOVAL OVERLAY

C105

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BRAGG DRIVE 60' PUBLIC R/W

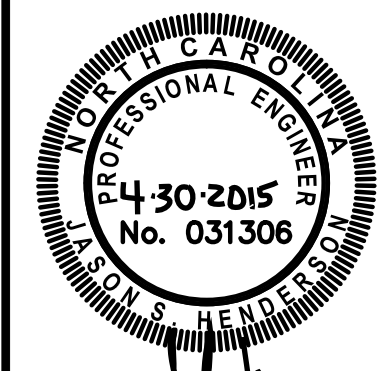
Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina Reg. No. 2146
 Georgia Reg. No. 3371
 North Carolina Reg. No. 21306
 Alabama Reg. No. 21074
 Louisiana Reg. No. 38891
 Virginia Reg. No. 60203118

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Certificates of Authorization:
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 NC P0868 - AL CA0605E

BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

Approved Construction Plan
 Name: _____
 Date: _____
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 Traffic: _____
 Fire: _____

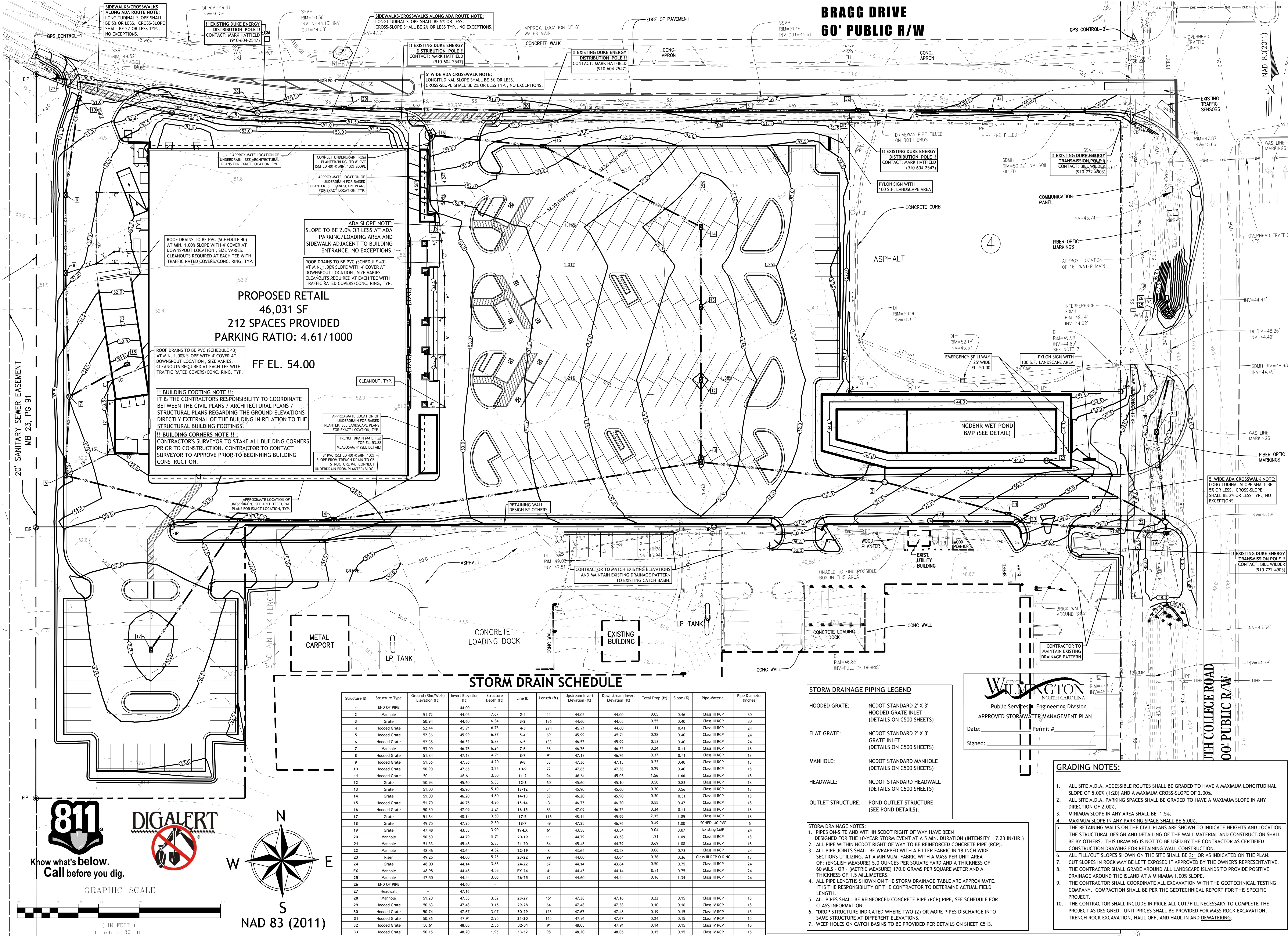


Bluewater Civil Design, PLLC
 NC P-0868

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GRADING & DRAINAGE PLAN

C201



PROPOSED RETAIL
 46,031 SF
 212 SPACES PROVIDED
 PARKING RATIO: 4.61/1000
 FF EL. 54.00

!! BUILDING FOOTING NOTE !!
 IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE BETWEEN THE CIVIL PLANS / ARCHITECTURAL PLANS / STRUCTURAL PLANS REGARDING THE GROUND ELEVATIONS DIRECTLY EXTERNAL OF THE BUILDING IN RELATION TO THE STRUCTURAL BUILDING FOOTINGS.

!! BUILDING CORNERS NOTE !!
 CONTRACTOR'S SURVEYOR TO STAKE ALL BUILDING CORNERS PRIOR TO CONSTRUCTION. CONTRACTOR TO CONTACT SURVEYOR TO APPROVE PRIOR TO BEGINNING BUILDING CONSTRUCTION.

STORM DRAIN SCHEDULE

Structure ID	Structure Type	Ground (Rim/Weir) Elevation (ft)	Invert Elevation (ft)	Structure Depth (ft)	Line ID	Length (ft)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Total Drop (ft)	Slope (%)	Pipe Material	Pipe Diameter (inches)
1	END OF PIPE	44.00										
2	Manhole	51.72	44.05	7.67	2-1	11	44.05	44.00	0.05	0.46	Class III RCP	30
3	Grate	50.94	44.60	6.34	3-2	136	44.60	44.05	0.55	0.40	Class III RCP	30
4	Hooded Grate	52.44	45.71	6.73	4-3	274	45.71	44.60	1.11	0.41	Class III RCP	24
5	Hooded Grate	52.36	45.99	6.37	5-4	69	45.99	45.71	0.28	0.40	Class III RCP	24
6	Hooded Grate	52.35	46.52	5.83	6-5	133	46.52	45.99	0.53	0.40	Class III RCP	24
7	Manhole	53.00	46.76	6.24	7-6	58	46.76	46.52	0.24	0.41	Class III RCP	18
8	Hooded Grate	51.84	47.13	4.71	8-7	91	47.13	46.76	0.37	0.41	Class III RCP	18
9	Hooded Grate	51.56	47.36	4.20	9-8	58	47.36	47.13	0.23	0.40	Class III RCP	18
10	Hooded Grate	50.90	47.65	3.25	10-9	72	47.65	47.36	0.29	0.40	Class III RCP	15
11	Hooded Grate	50.11	46.61	3.50	11-2	94	46.61	45.05	1.56	1.66	Class III RCP	18
12	Grate	50.93	45.60	5.33	12-3	60	45.60	45.10	0.50	0.83	Class III RCP	18
13	Grate	51.00	45.90	5.10	13-12	54	45.90	45.60	0.30	0.56	Class III RCP	18
14	Grate	51.00	46.20	4.80	14-13	59	46.20	45.90	0.30	0.51	Class III RCP	18
15	Hooded Grate	51.70	46.75	4.95	15-14	131	46.75	46.20	0.55	0.42	Class III RCP	18
16	Hooded Grate	50.30	47.09	3.21	16-15	83	47.09	46.75	0.34	0.41	Class III RCP	18
17	Grate	51.64	48.14	3.50	17-5	116	48.14	45.99	2.15	1.85	Class III RCP	18
18	Grate	49.75	47.25	2.50	18-7	49	47.25	46.76	0.49	1.00	SCHED. 40 PVC	6
19	Grate	47.48	43.58	3.90	19-EX	61	43.58	43.54	0.04	0.07	Existing CMP	24
20	Manhole	50.50	44.79	5.71	20-19	111	44.79	43.58	1.21	1.09	Class III RCP	18
21	Manhole	51.33	45.48	5.85	21-20	64	45.48	44.79	0.69	1.08	Class III RCP	18
22	Manhole	48.46	43.64	4.82	22-19	8	43.64	43.58	0.06	0.73	Class III RCP	24
23	Riser	49.25	44.00	5.25	23-22	99	44.00	43.64	0.36	0.36	Class III RCP O-RING	18
24	Grate	48.00	44.14	3.86	24-22	67	44.14	43.64	0.50	0.75	Class III RCP	24
EX	Manhole	48.98	44.45	4.53	EX-24	41	44.45	44.14	0.31	0.75	Class III RCP	24
25	Manhole	47.50	44.44	3.06	25-24	12	44.44	44.44	0.16	1.34	Class III RCP	24
26	END OF PIPE	44.60										
27	Headwall	47.16										
28	Manhole	51.20	47.38	3.82	28-27	151	47.38	47.16	0.22	0.15	Class III RCP	18
29	Hooded Grate	50.63	47.48	3.15	29-28	64	47.48	47.38	0.10	0.16	Class III RCP	18
30	Hooded Grate	50.74	47.67	3.07	30-29	123	47.67	47.48	0.19	0.15	Class III RCP	15
31	Hooded Grate	50.86	47.91	2.95	31-30	145	47.91	47.67	0.24	0.15	Class III RCP	15
32	Hooded Grate	50.61	48.05	2.56	32-31	91	48.05	47.91	0.14	0.15	Class III RCP	15
33	Hooded Grate	50.15	48.20	1.95	33-32	98	48.20	48.05	0.15	0.15	Class III RCP	15

STORM DRAINAGE PIPING LEGEND

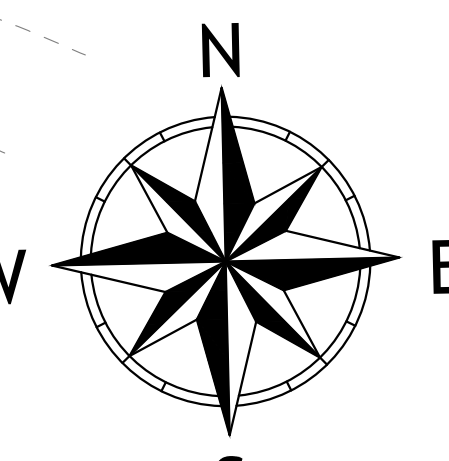
- HOODED GRATE:** NCDOT STANDARD 2' X 3' HOODED GRATE INLET (DETAILS ON C500 SHEETS)
- FLAT GRATE:** NCDOT STANDARD 2' X 3' GRATE INLET (DETAILS ON C500 SHEETS)
- MANHOLE:** NCDOT STANDARD MANHOLE (DETAILS ON C500 SHEETS)
- HEADWALL:** NCDOT STANDARD HEADWALL (DETAILS ON C500 SHEETS)
- OUTLET STRUCTURE:** POND OUTLET STRUCTURE (SEE POND DETAILS).

STORM DRAINAGE NOTES:

- PIPES ON-SITE AND WITHIN SCOTD RIGHT OF WAY HAVE BEEN DESIGNED FOR THE 10-YEAR STORM EVENT AT A 5 MIN. DURATION (INTENSITY = 7.23 IN/HR.)
- ALL PIPE WITHIN NCDOT RIGHT OF WAY TO BE REINFORCED CONCRETE PIPE (RCP).
- ALL PIPE JOINTS SHALL BE WRAPPED WITH A FILTER FABRIC IN 18-INCH WIDE SECTIONS UTILIZING, AT A MINIMUM, FABRIC WITH A MASS PER UNIT AREA OF: (ENGLISH MEASURE) 5.0 OUNCES PER SQUARE YARD AND A THICKNESS OF 60 MILS - OR - (METRIC MEASURE) 170.0 GRAMS PER SQUARE METER AND A THICKNESS OF 1.5 MILLIMETERS.
- ALL PIPE LENGTHS SHOWN ON THE STORM DRAINAGE TABLE ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE ACTUAL FIELD LENGTH.
- ALL PIPES SHALL BE REINFORCED CONCRETE PIPE (RCP) PIPE, SEE SCHEDULE FOR CLASS INFORMATION.
- "DROP" STRUCTURE INDICATED WHERE TWO (2) OR MORE PIPES DISCHARGE INTO SAME STRUCTURE AT DIFFERENT ELEVATIONS.
- WEEP HOLES ON CATCH BASINS TO BE PROVIDED PER DETAILS ON SHEET C513.

GRADING NOTES:

- ALL SITE A.D.A. ACCESSIBLE ROUTES SHALL BE GRADED TO HAVE A MAXIMUM LONGITUDINAL SLOPE OF 5.00% (1:20) AND A MAXIMUM CROSS-SLOPE OF 2.00%.
- ALL SITE A.D.A. PARKING SPACES SHALL BE GRADED TO HAVE A MAXIMUM SLOPE IN ANY DIRECTION OF 2.00%.
- MINIMUM SLOPE IN ANY AREA SHALL BE 1.5%.
- MAXIMUM SLOPE IN ANY PARKING SPACE SHALL BE 5.00%.
- THE RETAINING WALLS ON THE CIVIL PLANS ARE SHOWN TO INDICATE HEIGHTS AND LOCATION. THE STRUCTURAL DESIGN AND DETAILING OF THE WALL MATERIAL AND CONSTRUCTION SHALL BE BY OTHERS. THIS DRAWING IS NOT TO BE USED BY THE CONTRACTOR AS CERTIFIED CONSTRUCTION DRAWING FOR RETAINING WALL CONSTRUCTION.
- ALL FILL/CUT SLOPES SHOWN ON THE SITE SHALL BE 3:1 OR AS INDICATED ON THE PLAN.
- CUT SLOPES IN ROCK MAY BE LEFT EXPOSED IF APPROVED BY THE OWNER'S REPRESENTATIVE.
- THE CONTRACTOR SHALL GRADE AROUND ALL LANDSCAPE ISLANDS TO PROVIDE POSITIVE DRAINAGE AROUND THE ISLAND AT A MINIMUM 1.00% SLOPE.
- THE CONTRACTOR SHALL COORDINATE ALL EXCAVATION WITH THE GEOTECHNICAL TESTING COMPANY. COMPACTION SHALL BE PER THE GEOTECHNICAL REPORT FOR THIS SPECIFIC PROJECT.
- THE CONTRACTOR SHALL INCLUDE IN PRICE ALL CUT/FILL NECESSARY TO COMPLETE THE PROJECT AS DESIGNED. UNIT PRICES SHALL BE PROVIDED FOR MASS ROCK EXCAVATION, TRENCH ROCK EXCAVATION, HAUL OFF, AND HAUL IN AND DEWATERING.



Know what's below.
 Call before you dig.

GRAPHIC SCALE

(IN FEET)
 1 inch = 30 ft.

NAD 83 (2011)

**BRAGG DRIVE
60' PUBLIC R/W**

Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina REG 2146
 Georgia REG 03717
 North Carolina REG 03136
 Alabama REG 33919
 Louisiana REG 38891
 Virginia REG 66020318

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 civil design
 bluewater civil design, PLLC
 19 Washington Park Suite 100 • Greenville, SC 29601
 www.bluewatercivil.com • info@bluewatercivil.com

Certificates of Authorization:
 SC C04212 - GA PEF005865
 NC P0868 - AL CA4065E
BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

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

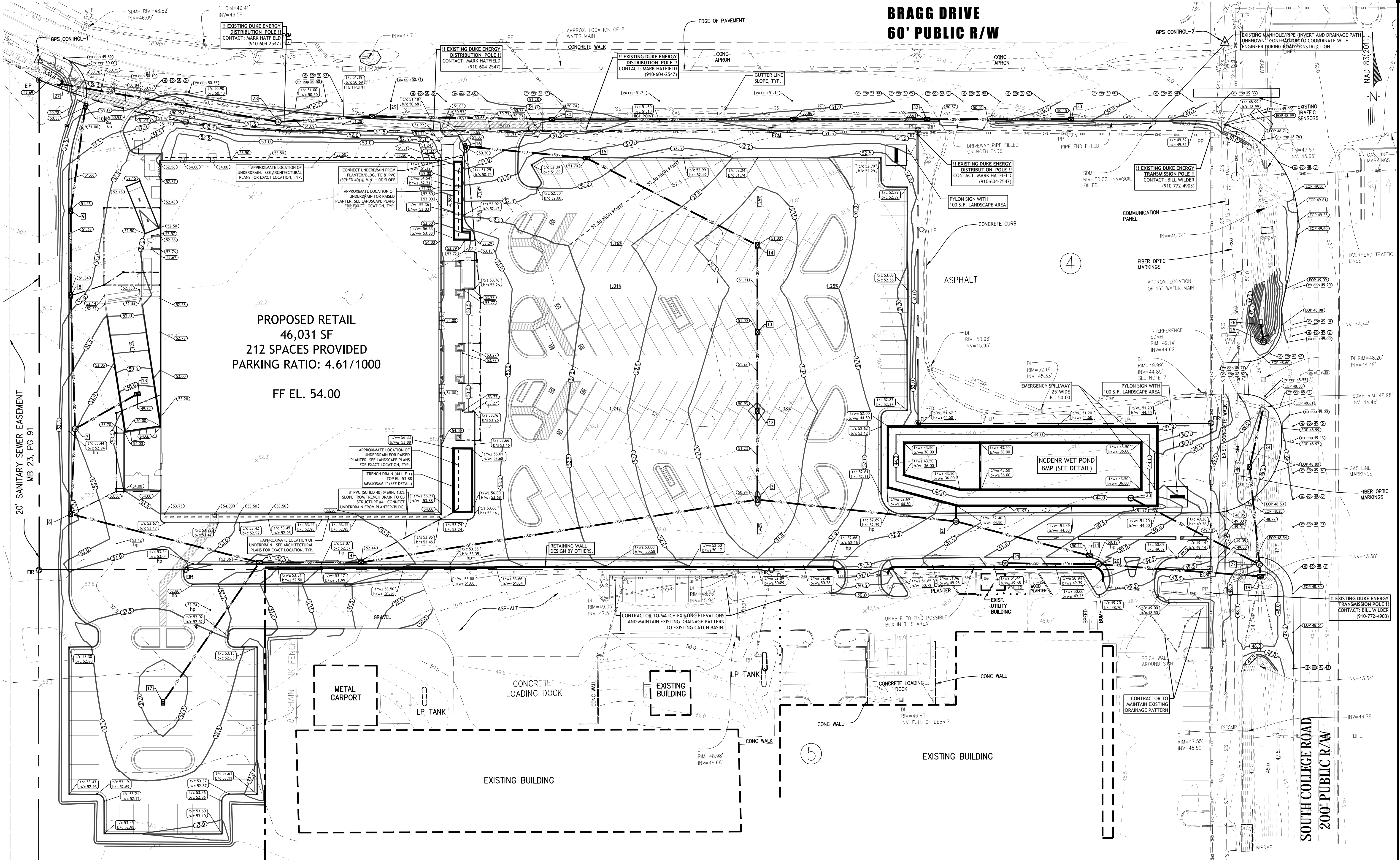


Bluewater Civil Design, PLLC
 NC 2-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
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E	4-30-2015	REVISED PER HCDOT/WILMINGTON COMMENTS

SPOT ELEVATIONS PLAN

C201-A

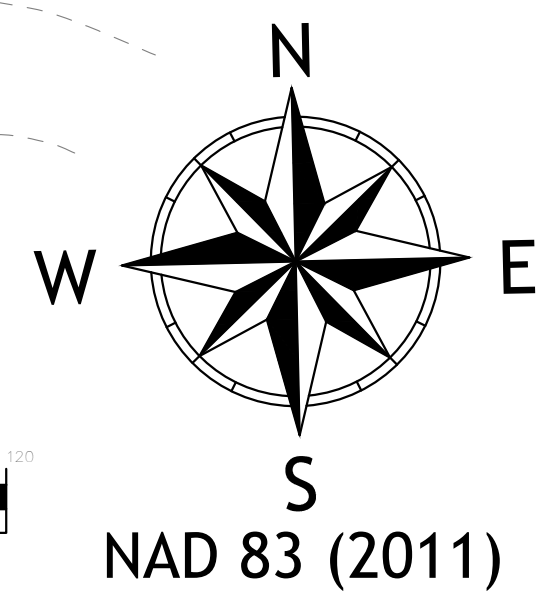
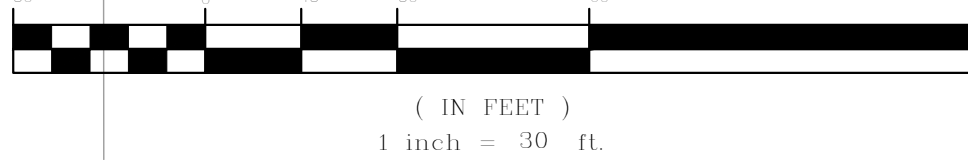


DIGALERT

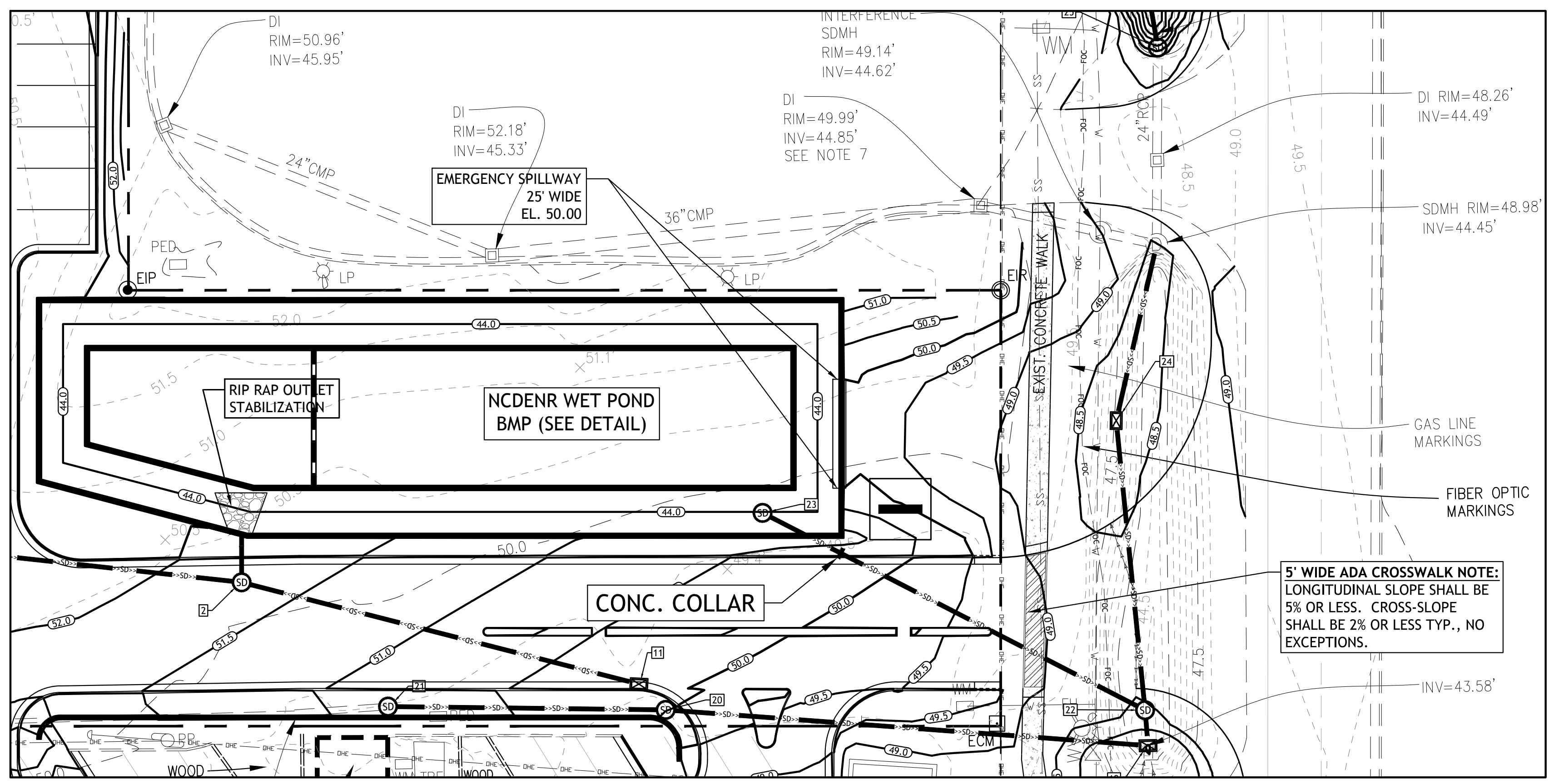
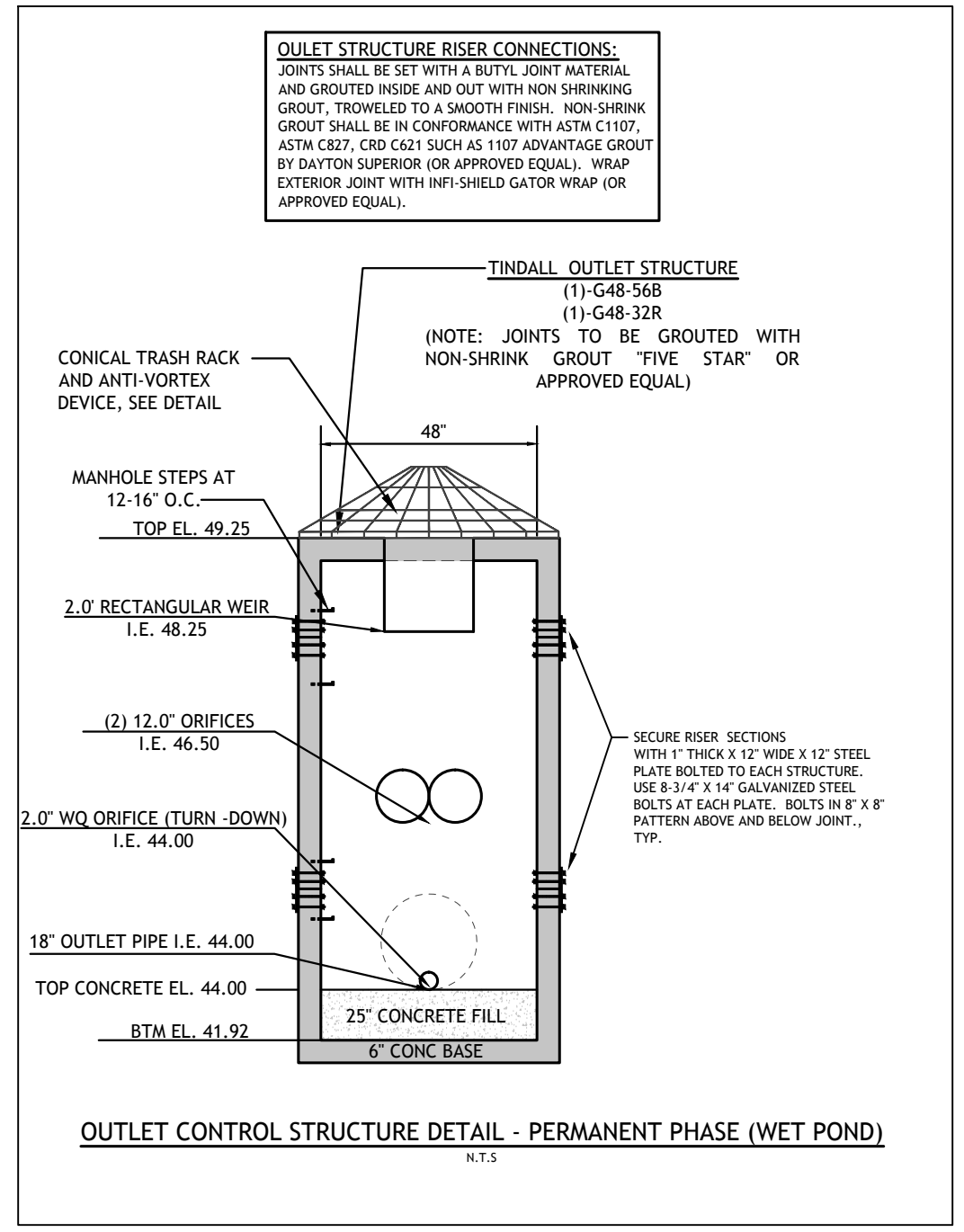
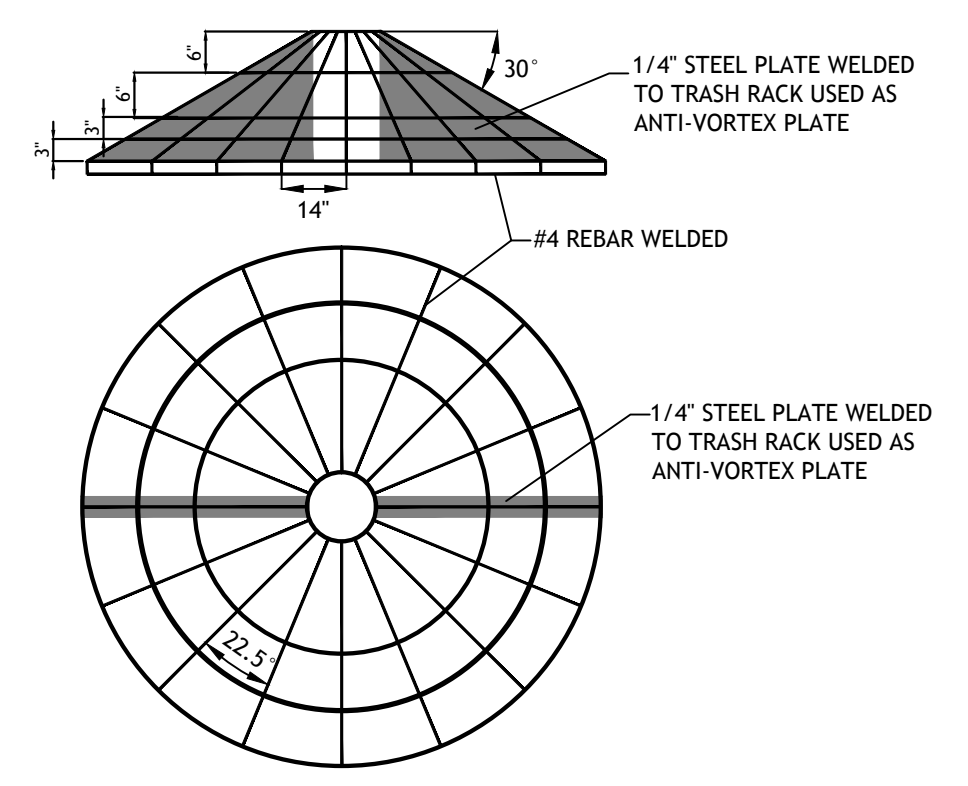
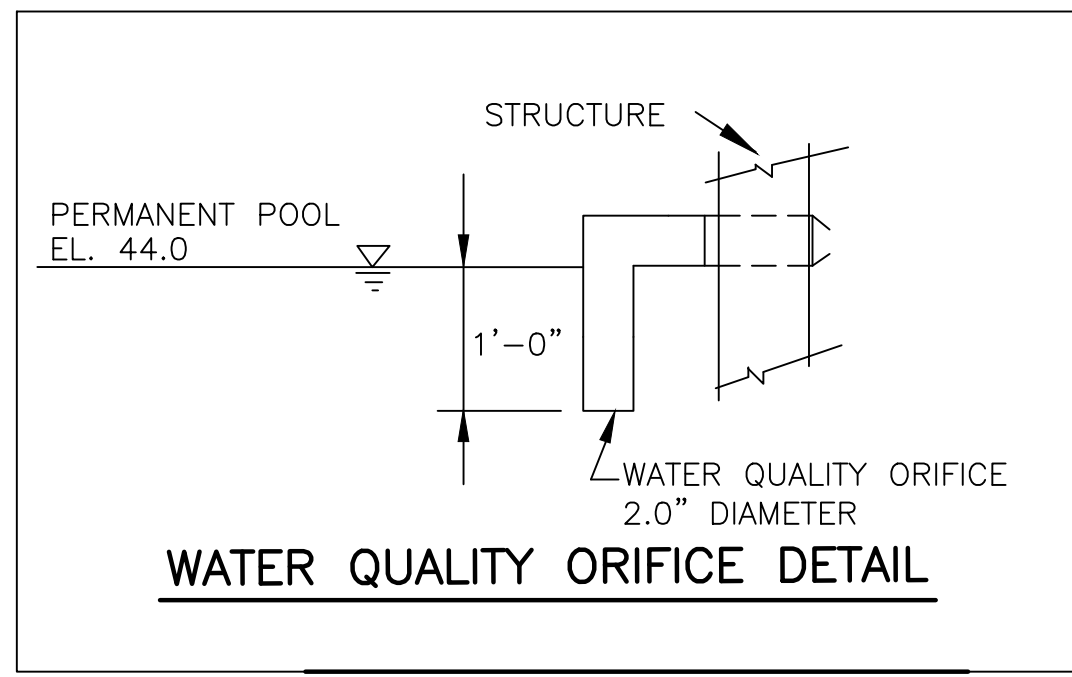


Know what's below.
 Call before you dig.

GRAPHIC SCALE



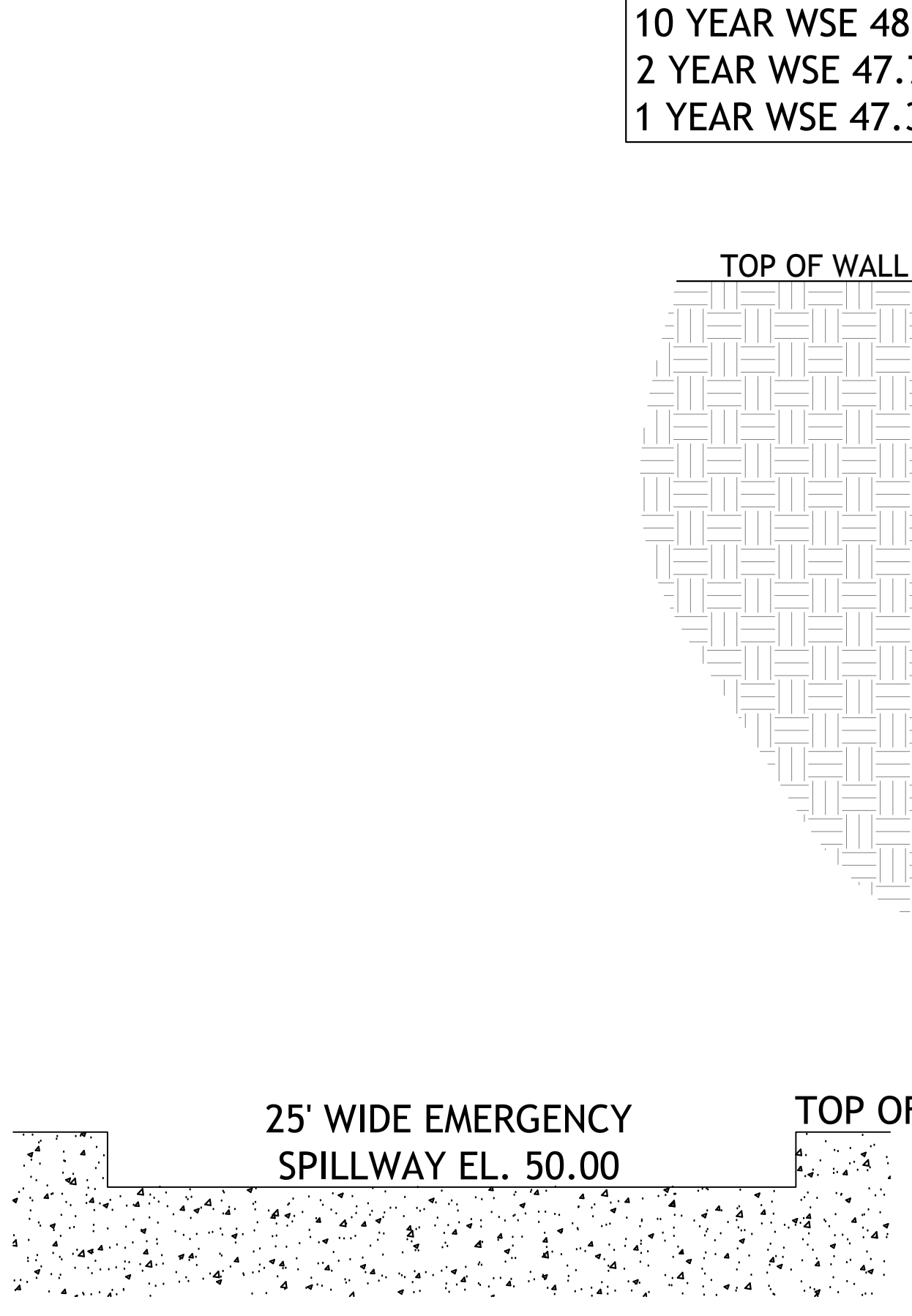
WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____



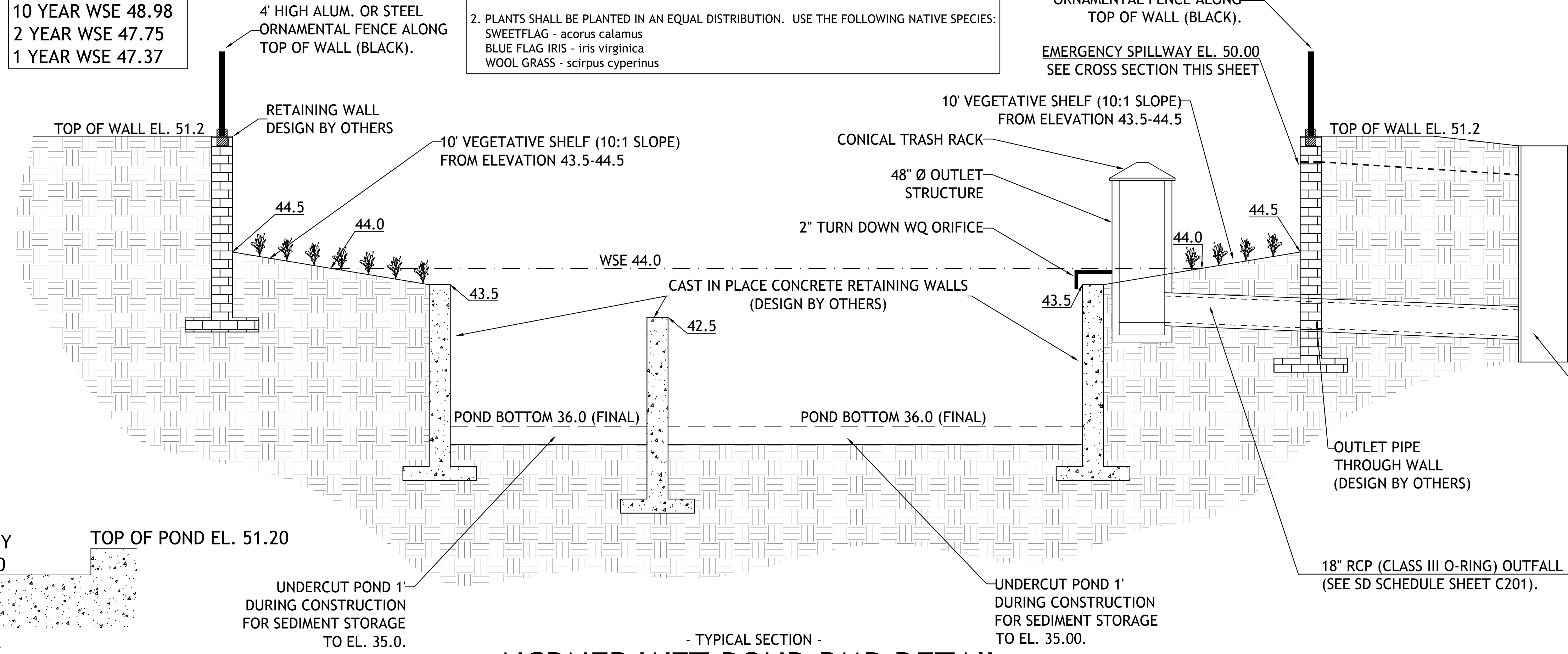
1" = 20'

100 YEAR WSE	50.20
25 YEAR WSE	49.53
10 YEAR WSE	48.98
2 YEAR WSE	47.75
1 YEAR WSE	47.37

- LITTORAL SHELF NOTES:**
- PLANT DENSITY SHALL EQUAL 50 PLANTS PER 200 S.F. OF SHELF: 4,125 S.F. OF SHELF = 1,032 PLANTS
 - PLANTS SHALL BE PLANTED IN AN EQUAL DISTRIBUTION. USE THE FOLLOWING NATIVE SPECIES:
 SWEETFLAG - acorus calamus
 BLUE FLAG IRIS - iris virginica
 WOOL GRASS - scirpus cyperinus



NTS



NTS

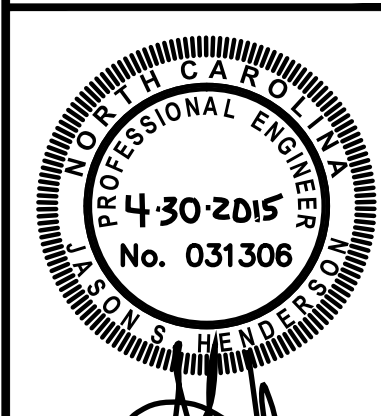
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 South Carolina PE# 21465
 Georgia PE# 03717
 North Carolina PE# 031306
 Alabama PE# 32874
 Louisiana PE# 38895
 Virginia PE# 60203318

bluewater civil design, PLLC
 bluewatercivil.com • info@bluewatercivil.com
 19 Washington Park Suite 100 • Greenville, SC 29601

Certificates of Authorization:
 SC C04212 - GA PE#005865
 NC P0868 - AL CA4065E

BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

Approved Construction Plan
 Name: _____ Date: _____
 Planning: _____ Traffic: _____ Fire: _____



Bluewater Civil Design, PLLC
 NC-P-0868

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...

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

WET POND BMP PLAN & DETAILS

C201-B

**BRAGG DRIVE
60' PUBLIC R/W**

Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina REG 21466
 Georgia REG 03374
 North Carolina REG 03106
 Alabama REG 32054
 Louisiana REG 38891
 Virginia REG 60203118

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 19 Washington Park Suite 100 • Greenville, SC 29601
 www.bluewatercivil.com • info@bluewatercivil.com

Certificates of Authorization:
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**BRAGG ROAD DEV.
COMPANY, LLC**
 Bragg Drive
 Wilmington, NC

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

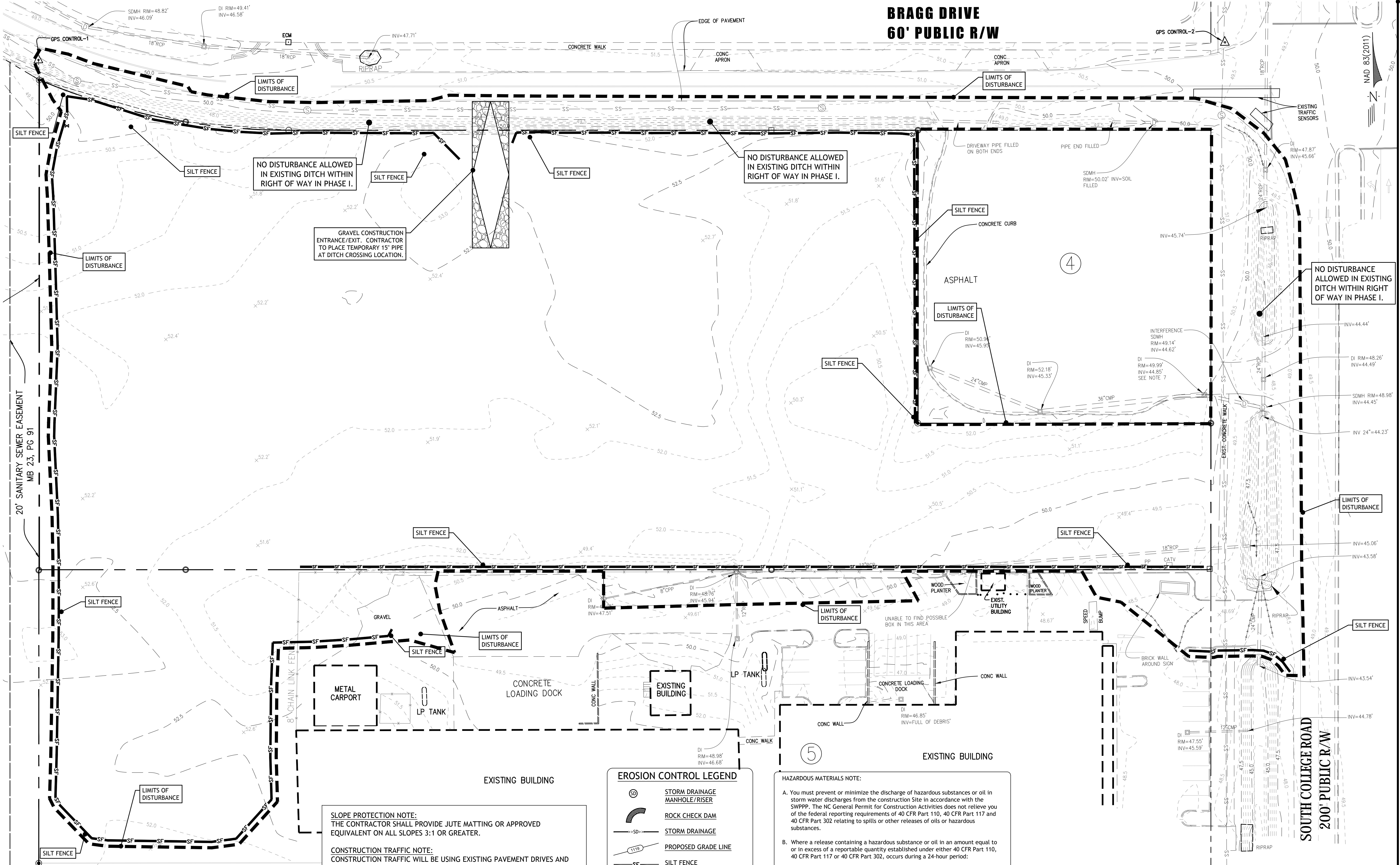


Bluewater Civil Design, PLLC
 NC 03-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
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E	4-30-2015	REVISED PER NCDOT/WILMINGTON COMMENTS
...

PHASE I EROSION CONTROL PLAN - PERIMETER

C202

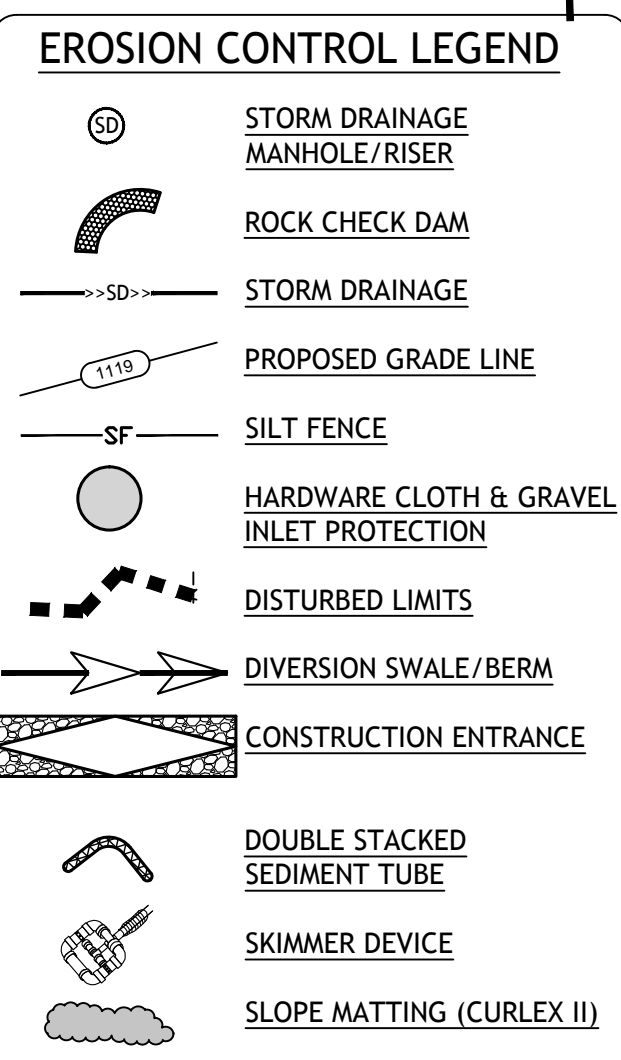


SLOPE PROTECTION NOTE:
 THE CONTRACTOR SHALL PROVIDE JUTE MATTING OR APPROVED EQUIVALENT ON ALL SLOPES 3:1 OR GREATER.

CONSTRUCTION TRAFFIC NOTE:
 CONSTRUCTION TRAFFIC WILL BE USING EXISTING PAVEMENT DRIVES AND SHALL INSURE THAT THEY ARE NOT TRACKING SEDIMENT OFF-SITE. CONTRACTOR SHALL MONITOR AND WASH OFF TIRES IF REQUIRED.

MAINTENANCE STATEMENT:
 EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION CONTROL AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

DUST CONTROL:
 THE CONTRACTOR SHALL USE ALL REASONABLE MEANS (e.g. WATER TRUCK, TARPS, MULCH, GRASSING, ETC.) NECESSARY TO REDUCE DUST DURING DEMOLITION AND CONSTRUCTION.



HAZARDOUS MATERIALS NOTE:

A. You must prevent or minimize the discharge of hazardous substances or oil in storm water discharges from the construction site in accordance with the SWPPP. The NC General Permit for Construction Activities does not relieve you of the federal reporting requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 relating to spills or other releases of oils or hazardous substances.

B. Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302, occurs during a 24-hour period:

- You must notify the NCDENR's Emergency Response Section at 800-258-0368 and the National Response Center (NRC) (800) 424-8802 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 as soon as Site staff have knowledge of the discharge; and
- You must modify the SWPPP as required under Subpart 3.11 within 14 calendar days of knowledge of the release to: provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, you must review your SWPPP to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and you must modify your SWPPP where appropriate.

GENERAL EROSION CONTROL NOTE:
 ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED PER N.C.D.E.N.R. BMP MANUAL. THE CONTRACTOR SHALL REFERENCE THE STORMWATER POLLUTION PREVENTION MANUAL (SWPPP) FOR ALL EROSION CONTROL PROCEDURES ON SITE.

DISTURBANCE NOTE:
 STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED.

NOTE:
 TEMPORARY CONSTRUCTION SIGNS SHALL NOT BE PLACED WITHIN THE ROAD RIGHT OF WAY OR SIGHT TRIANGLES.

811 Know what's below. Call before you dig.
DIGALERT

GRAPHIC SCALE
 (IN FEET)
 1 inch = 30 ft.

NAD 83 (2011)

BRAGG DRIVE 60' PUBLIC R/W

Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina PE# 21466
 Georgia PE# 03711
 North Carolina PE# 01306
 Alabama PE# 32054
 Louisiana PE# 38891
 Virginia PE# 60203118

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 www.bluewatercivil.com • info@bluewatercivil.com

Certificates of Authorization:
 SC C04212 - GA PE005865
 NC P0868 - AL CA4065E

BRAGG ROAD DEV.
COMPANY, LLC
 Bragg Drive
 Wilmington, NC

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

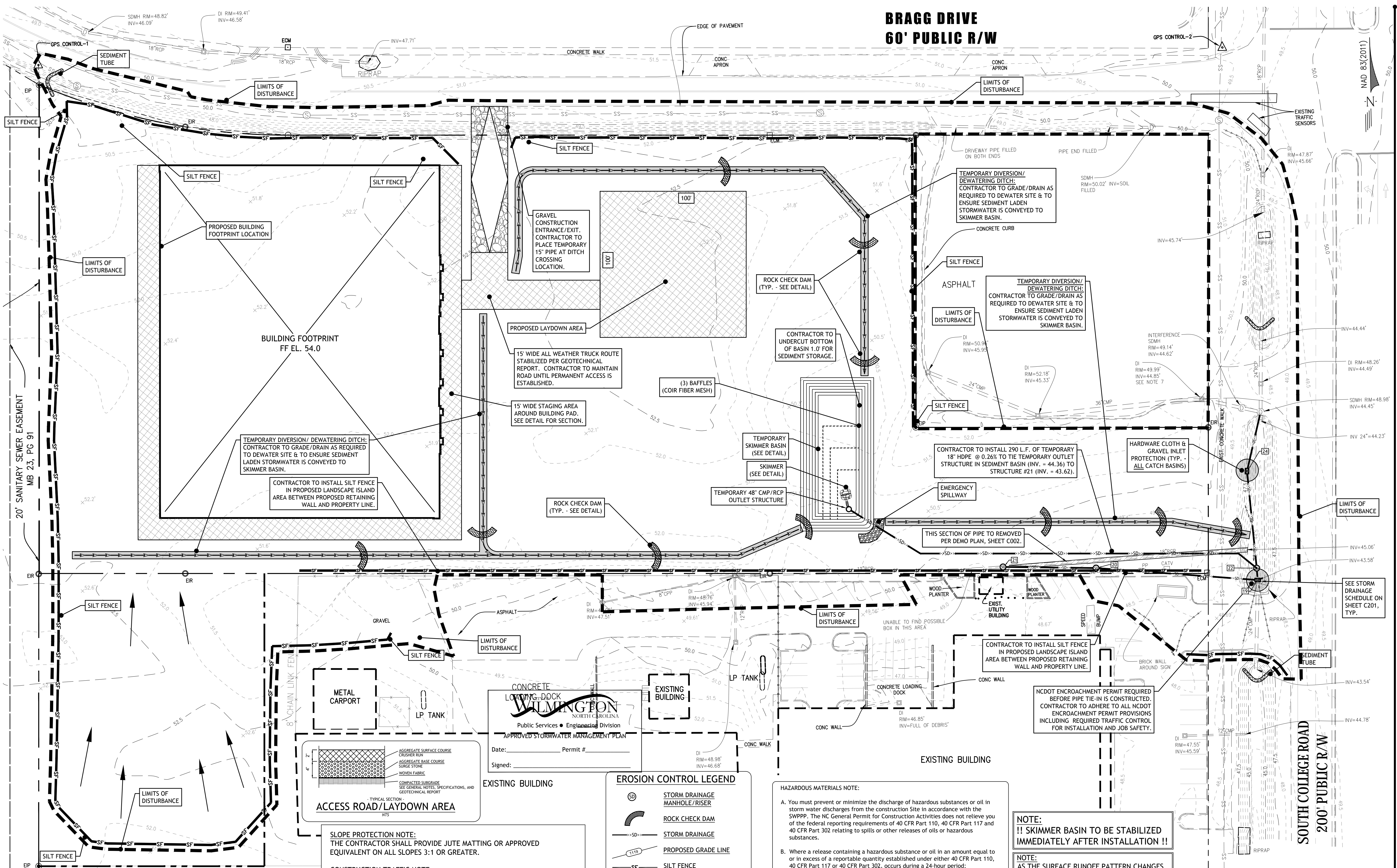


Bluewater Civil Design, PLLC
 NC-P-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER NCDOT/WILMINGTON COMMENTS

PHASE II-A EROSION CONTROL PLAN

C203

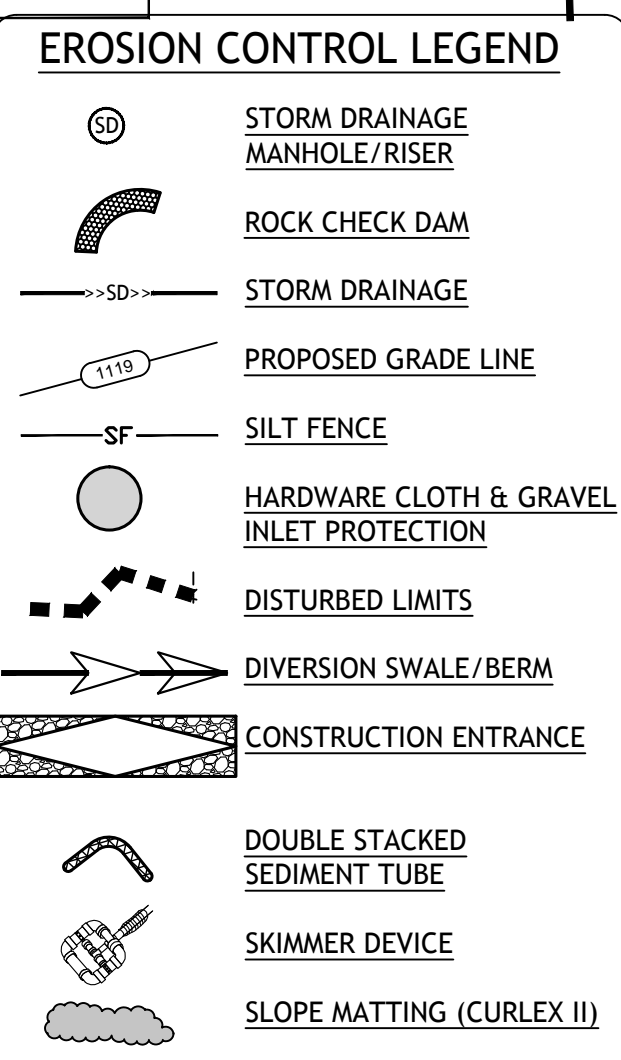


SLOPE PROTECTION NOTE:
 THE CONTRACTOR SHALL PROVIDE JUTE MATTING OR APPROVED EQUIVALENT ON ALL SLOPES 3:1 OR GREATER.

CONSTRUCTION TRAFFIC NOTE:
 CONSTRUCTION TRAFFIC WILL BE USING EXISTING PAVEMENT DRIVES AND SHALL INSURE THAT THEY ARE NOT TRACKING SEDIMENT OFF-SITE. CONTRACTOR SHALL MONITOR AND WASH OFF TIRES IF REQUIRED.

MAINTENANCE STATEMENT:
 EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION CONTROL AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

DUST CONTROL:
 THE CONTRACTOR SHALL USE ALL REASONABLE MEANS (e.g. WATER TRUCK, TARPS, MULCH, GRASSING, ETC.) NECESSARY TO REDUCE DUST DURING DEMOLITION AND CONSTRUCTION.



HAZARDOUS MATERIALS NOTE:

A. You must prevent or minimize the discharge of hazardous substances or oil in storm water discharges from the construction site in accordance with the SWPPP. The NC General Permit for Construction Activities does not relieve you of the federal reporting requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 relating to spills or other releases of oils or hazardous substances.

B. Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302, occurs during a 24-hour period:

- You must notify the NCDENR's Emergency Response Section at 800-258-0368 and the National Response Center (NRC) (800) 424-8802 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 as soon as Site staff have knowledge of the discharge; and
- You must modify the SWPPP as required under Subpart 3.11 within 14 calendar days of knowledge of the release to: provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, you must review your SWPPP to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and you must modify your SWPPP where appropriate.

GENERAL EROSION CONTROL NOTE:
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NOTE:
 !! SKIMMER BASIN TO BE STABILIZED IMMEDIATELY AFTER INSTALLATION !!

NOTE:
 AS THE SURFACE RUNOFF PATTERN CHANGES DURING CONSTRUCTION, ADDITIONAL TEMPORARY DIVERSION DITCHES MAY BE NECESSARY TO DIRECT FLOW TO THE TEMPORARY SKIMMER BASIN.

DISTURBANCE NOTE:
 STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED.

NOTE:
 TEMPORARY CONSTRUCTION SIGNS SHALL NOT BE PLACED WITHIN THE ROAD RIGHT OF WAY OR SIGHT TRIANGLES.

STORM DRAINAGE NOTES:

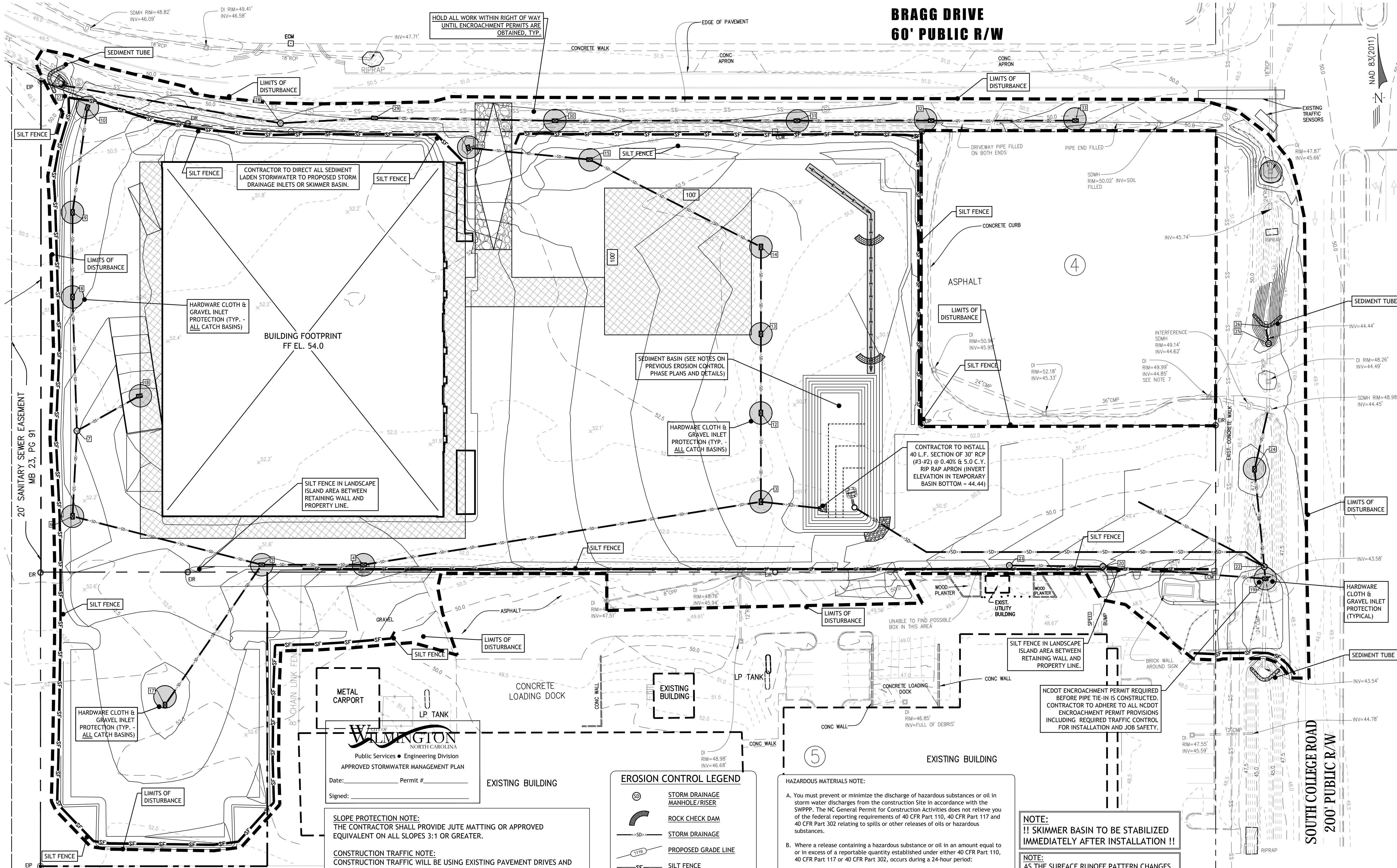
- PIPES ON-SITE AND WITHIN SCOTD RIGHT OF WAY HAVE BEEN DESIGNED FOR THE 10-YEAR STORM EVENT AT A 5 MIN. DURATION (INTENSITY = 6.7 IN/HR.)
- ALL PIPE WITHIN NCDOT RIGHT OF WAY TO BE REINFORCED CONCRETE PIPE (RCP).
- ALL PIPE JOINTS SHALL BE WRAPPED WITH A FILTER FABRIC IN 18-INCH WIDE SECTIONS UTILIZING, AT A MINIMUM, FABRIC WITH A MASS PER UNIT AREA OF (ENGLISH MEASURE) 5.0 OUNCES PER SQUARE YARD AND A THICKNESS OF 60 MILS - OR - (METRIC MEASURE) 170.0 GRAMS PER SQUARE METER AND A THICKNESS OF 1.5 MILLIMETERS.
- ALL PIPE LENGTHS SHOWN ON THE STORM DRAINAGE TABLE ARE APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE ACTUAL FIELD LENGTHS.
- ALL PIPES SHALL BE REINFORCED CONCRETE PIPE (RCP) PIPE, SEE SCHEDULE FOR CLASS INFORMATION.
- *DROP STRUCTURE INDICATED WHERE TWO (2) OR MORE PIPES DISCHARGE INTO SAME STRUCTURE AT DIFFERENT ELEVATIONS.

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DIGALERT

GRAPHIC SCALE
 (IN FEET)
 1 inch = 30 ft.

NAD 83 (2011)



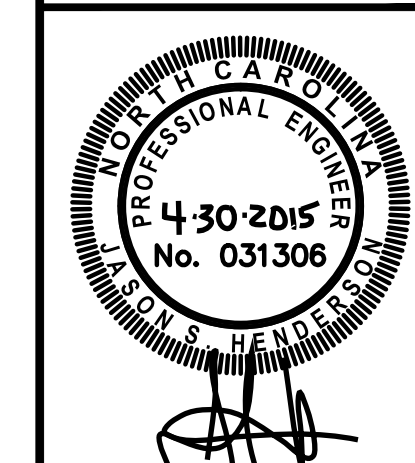
**BRAGG DRIVE
60' PUBLIC R/W**

Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina PE# 21406
 Georgia PE# 03571
 North Carolina PE# 03106
 Alabama PE# 32054
 Louisiana PE# 38893
 Virginia PE# 60203118

blue WATER
 civil design
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 19 Washington Park Suite 100 • Greenville, SC 29601
 www.bluewatercivil.com • info@bluewatercivil.com

BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

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



Bluewater Civil Design, PLLC
 No. 00868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
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C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER NCDOT/WILMINGTON COMMENTS

PHASE II-B EROSION CONTROL PLAN

C204

SLOPE PROTECTION NOTE:
 THE CONTRACTOR SHALL PROVIDE JUTE MATTING OR APPROVED EQUIVALENT ON ALL SLOPES 3:1 OR GREATER.

CONSTRUCTION TRAFFIC NOTE:
 CONSTRUCTION TRAFFIC WILL BE USING EXISTING PAVEMENT DRIVES AND SHALL INSURE THAT THEY ARE NOT TRACKING SEDIMENT OFF-SITE. CONTRACTOR SHALL MONITOR AND WASH OFF TIRES IF REQUIRED.

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DUST CONTROL:
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- EROSION CONTROL LEGEND**
- STORM DRAINAGE MANHOLE/RISER
 - ROCK CHECK DAM
 - STORM DRAINAGE
 - PROPOSED GRADE LINE
 - SILT FENCE
 - HARDWARE CLOTH & GRAVEL INLET PROTECTION
 - DISTURBED LIMITS
 - DIVERSION SWALE/BERM
 - CONSTRUCTION ENTRANCE
 - DOUBLE STACKED SEDIMENT TUBE
 - SKIMMER DEVICE
 - SLOPE MATTING (CURLEX II)

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 Know what's below. Call before you dig.
 GRAPHIC SCALE
 1 inch = 30 feet
 NAD 83 (2011)

**BRAGG DRIVE
60' PUBLIC R/W**

Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina PE# 21465
 Georgia PE# 03571
 North Carolina PE# 03106
 Alabama PE# 32054
 Louisiana PE# 38891
 Virginia PE# 6020313

blue WATER
 civil design
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 19 Washington Park Suite 100 • Greenville, SC 29601
 www.bluewatercivil.com • info@bluewatercivil.com

Certificates of Authorization:
 SC 004212 - GA PE#005865
 NC P0868 - AL CA4065E

**BRAGG ROAD DEV.
COMPANY, LLC**
 Bragg Drive
 Wilmington, NC

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

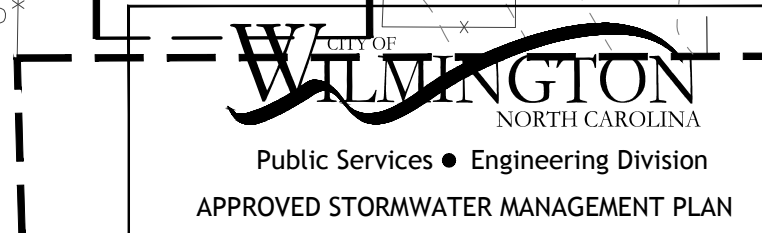
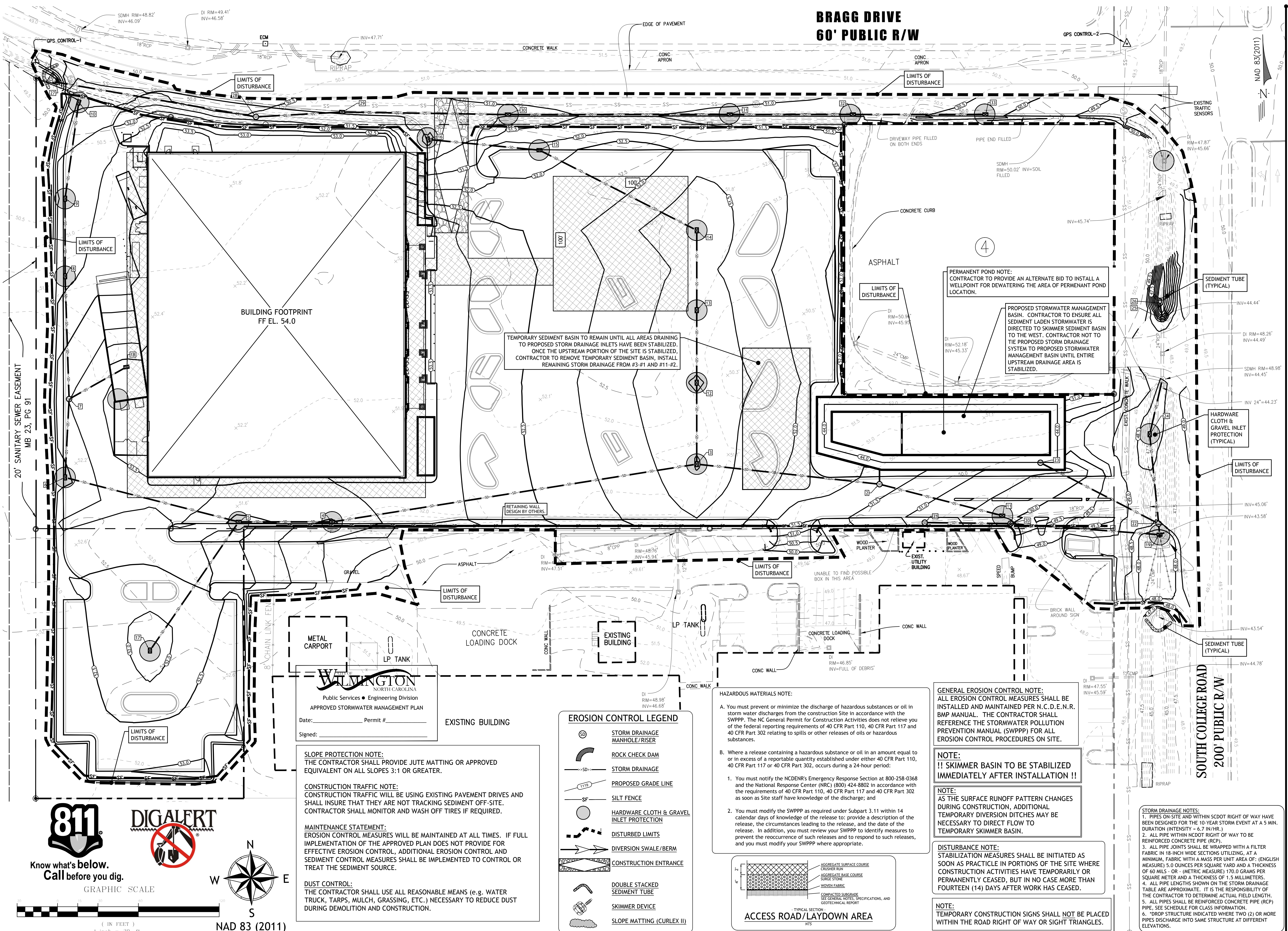


Bluewater Civil Design, PLLC
 NC-P-0868

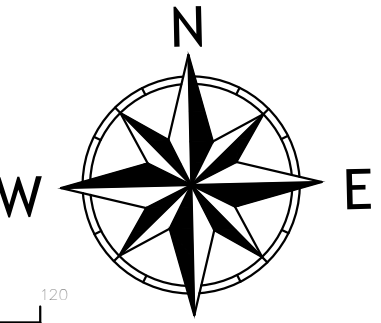
PLAN REVISION	ISSUE DATE	ISSUE COMMENT
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C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
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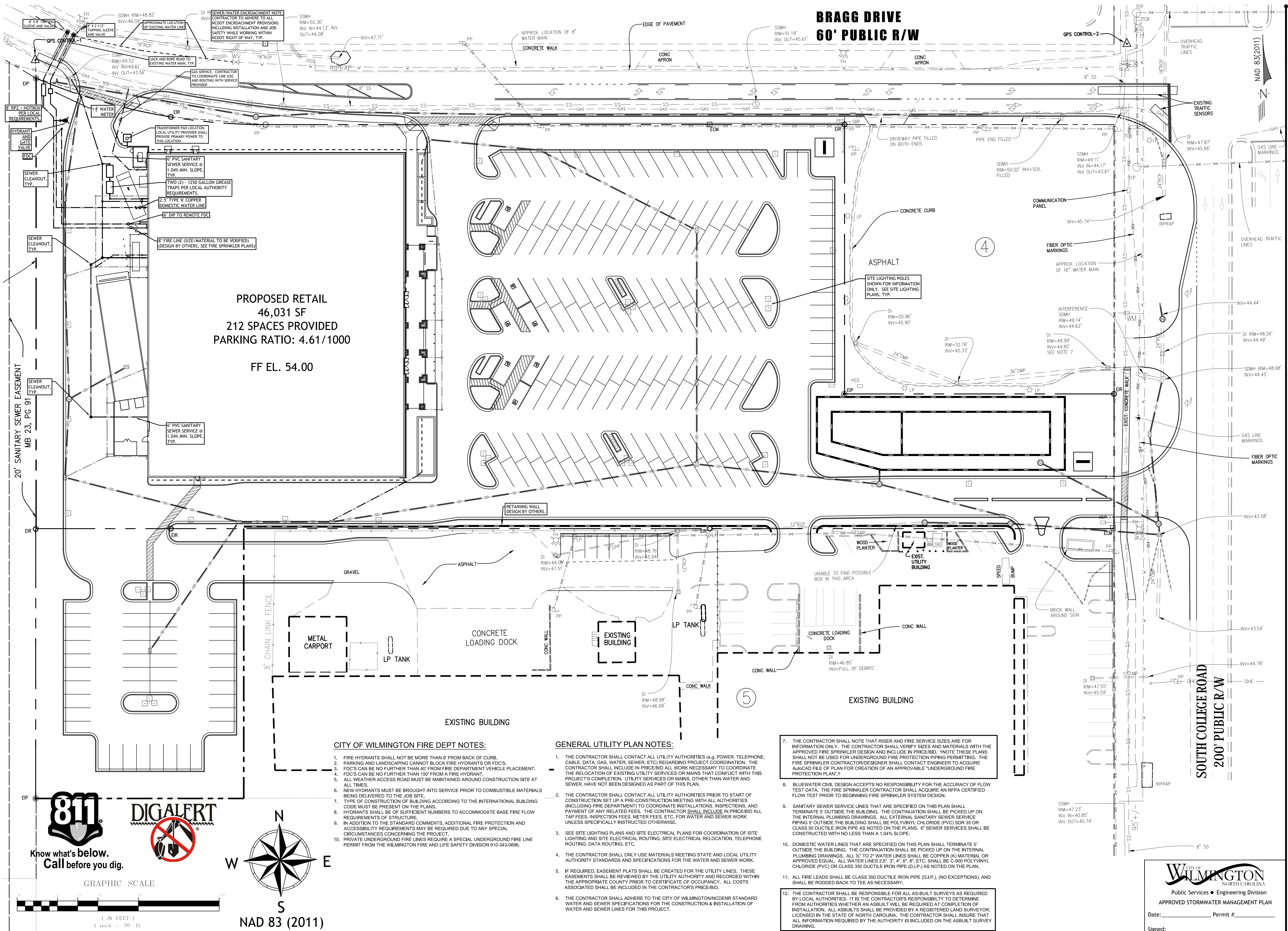
PHASE III EROSION CONTROL PLAN

C205



Date: _____ Permit # _____
 Signed: _____





PROPOSED RETAIL
 46,031 SF
 212 SPACES PROVIDED
 PARKING RATIO: 4.61/1000
 FF EL. 54.00

- CITY OF WILMINGTON FIRE DEPT NOTES:**
1. FIRE HYDRANTS SHALL NOT BE MORE THAN 8' FROM BACK OF CURB. PARKING AND LANDSCAPING CANNOT BLOCK FIRE HYDRANTS OR FDC'S.
 2. FDC'S CAN BE NO FURTHER THAN 40' FROM FIRE DEPARTMENT VEHICLE PLACEMENT.
 3. FDC'S CAN BE NO FURTHER THAN 150' FROM A FIRE HYDRANT.
 4. ALL WEATHER ACCESS ROAD MUST BE MAINTAINED AROUND CONSTRUCTION SITE AT ALL TIMES.
 5. NEW HYDRANTS MUST BE BROUGHT INTO SERVICE PRIOR TO COMBUSTIBLE MATERIALS BEING DELIVERED TO THE JOB SITE.
 6. TYPE OF CONSTRUCTION OF BUILDING ACCORDING TO THE INTERNATIONAL BUILDING CODE MUST BE PRESENT ON THE PLANS.
 7. HYDRANTS SHALL BE OF SUFFICIENT NUMBERS TO ACCOMMODATE BASE FIRE FLOW REQUIREMENTS OF STRUCTURE.
 8. IN ADDITION TO THE STANDARD COMMENTS, ADDITIONAL FIRE PROTECTION AND ACCESSIBILITY REQUIREMENTS MAY BE REQUIRED DUE TO ANY SPECIAL CIRCUMSTANCES CONCERNING THE PROJECT.
 9. PRIVATE UNDERGROUND FIRE LINES REQUIRE A SPECIAL UNDERGROUND FIRE LINE PERMIT FROM THE WILMINGTON FIRE AND LIFE SAFETY DIVISION 910-343-0866.

- GENERAL UTILITY PLAN NOTES:**
1. THE CONTRACTOR SHALL CONTACT ALL UTILITY AUTHORITIES (e.g. POWER, TELEPHONE, CABLE, DATA, GAS, WATER, SEWER, ETC) REGARDING PROJECT COORDINATION. THE CONTRACTOR SHALL INCLUDE IN PRICE/BID ALL WORK NECESSARY TO COORDINATE THE RELOCATION OF EXISTING UTILITY SERVICES OR MAINS THAT CONFLICT WITH THIS PROJECT'S COMPLETION. UTILITY SERVICES OR MAINS, OTHER THAN WATER AND SEWER, HAVE NOT BEEN DESIGNED AS PART OF THIS PLAN.
 2. THE CONTRACTOR SHALL CONTACT ALL UTILITY AUTHORITIES PRIOR TO START OF CONSTRUCTION SET UP A PRE-CONSTRUCTION MEETING WITH ALL AUTHORITIES (INCLUDING FIRE DEPARTMENT) TO COORDINATE INSTALLATIONS, INSPECTIONS, AND PAYMENT OF ANY RELATED FEES. THE CONTRACTOR SHALL INCLUDE IN PRICE/BID ALL TAP FEES, INSPECTION FEES, METER FEES, ETC. FOR WATER AND SEWER WORK UNLESS SPECIFICALLY INSTRUCTED OTHERWISE.
 3. SEE SITE LIGHTING PLANS AND SITE ELECTRICAL PLANS FOR COORDINATION OF SITE LIGHTING AND SITE ELECTRICAL ROUTING, SITE ELECTRICAL RELOCATION, TELEPHONE ROUTING, DATA ROUTING, ETC.
 4. THE CONTRACTOR SHALL ONLY USE MATERIALS MEETING STATE AND LOCAL UTILITY AUTHORITY STANDARDS AND SPECIFICATIONS FOR THE WATER AND SEWER WORK.
 5. IF REQUIRED, EASEMENT PLATS SHALL BE CREATED FOR THE UTILITY LINES. THESE EASEMENTS SHALL BE REVIEWED BY THE UTILITY AUTHORITY AND RECORDED WITHIN THE APPROPRIATE COUNTY PRIOR TO CERTIFICATE OF OCCUPANCY. ALL COSTS ASSOCIATED SHALL BE INCLUDED IN THE CONTRACTOR'S PRICE/BID.
 6. THE CONTRACTOR SHALL ADHERE TO THE CITY OF WILMINGTON/CNCDENR STANDARD WATER AND SEWER SPECIFICATIONS FOR THE CONSTRUCTION & INSTALLATION OF WATER AND SEWER LINES FOR THIS PROJECT.

7. THE CONTRACTOR SHALL NOTE THAT RISER AND FIRE SERVICE SIZES ARE FOR INFORMATION ONLY. THE CONTRACTOR SHALL VERIFY SIZES AND MATERIALS WITH THE APPROVED FIRE SPRINKLER DESIGN AND INCLUDE IN PRICE/BID. INNOTE THESE PLANS SHALL NOT BE USED FOR UNDERGROUND FIRE PROTECTION PIPING PERMITTING. THE FIRE SPRINKLER CONTRACTOR/DESIGNER SHALL CONTACT ENGINEER TO ACQUIRE AutoCAD FILE OF PLAN FOR CREATION OF AN APPROVABLE "UNDERGROUND FIRE PROTECTION PLAN".
8. BLUEWATER CIVIL DESIGN ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF FLOW TEST DATA. THE FIRE SPRINKLER CONTRACTOR SHALL ACQUIRE AN NPPA CERTIFIED FLOW TEST PRIOR TO BEGINNING FIRE SPRINKLER SYSTEM DESIGN.
9. SANITARY SEWER SERVICE LINES THAT ARE SPECIFIED ON THIS PLAN SHALL TERMINATE 5' OUTSIDE THE BUILDING. THE CONTINUATION SHALL BE PICKED UP ON THE INTERNAL PLUMBING DRAWINGS. ALL EXTERNAL SANITARY SEWER SERVICE PIPING 5' OUTSIDE THE BUILDING SHALL BE POLYVINYL CHLORIDE (PVC) SDR 35 OR CLASS 50 DUCTILE IRON PIPE AS NOTED ON THE PLANS. 6" SEWER SERVICES SHALL BE CONSTRUCTED WITH NO LESS THAN A 1.04% SLOPE.
10. DOMESTIC WATER LINES THAT ARE SPECIFIED ON THIS PLAN SHALL TERMINATE 5' OUTSIDE THE BUILDING. THE CONTINUATION SHALL BE PICKED UP ON THE INTERNAL PLUMBING DRAWINGS. ALL 3/4" TO 2" WATER LINES SHALL BE COPPER (K) MATERIAL OR APPROVED EQUAL. ALL WATER LINES 2.5", 3", 4", 6", 8", ETC. SHALL BE C-900 POLYVINYL CHLORIDE (PVC) OR CLASS 350 DUCTILE IRON PIPE (D.I.P.) AS NOTED ON THE PLAN.
11. ALL FIRE LEADS SHALL BE CLASS 350 DUCTILE IRON PIPE (D.I.P.), (NO EXCEPTIONS), AND SHALL BE RODDED BACK TO TEE AS NECESSARY.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL AS-BUILT SURVEYS AS REQUIRED BY LOCAL AUTHORITIES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE FROM AUTHORITIES WHETHER AN ASBUILT WILL BE REQUIRED AT COMPLETION OF INSTALLATION. ALL ASBUILT SHALL BE PROVIDED BY A REGISTERED LAND SURVEYOR LICENSED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL INSURE THAT ALL INFORMATION REQUIRED BY THE AUTHORITY IS INCLUDED ON THE ASBUILT SURVEY DRAWING.

811 DIGALERT
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GRAPHIC SCALE
 (IN FEET)
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NAD 83 (2011)

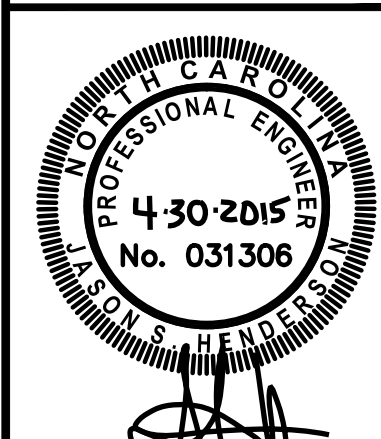
Project Number: 2014-090
 DWG Name: 2014-090 D1.dwg
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 www.bluewatercivil.com

Certificates of Authorization:
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BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

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



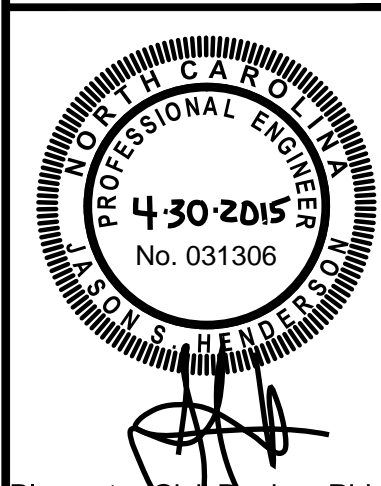
Bluewater Civil Design, PLLC
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WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

UTILITY PLAN
C301

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



Bluewater Civil Design, PLLC
 NC 00-0868

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E	4-30-2015	REVISED PER HCOOT/WILMINGTON COMMENTS
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NOTES & DETAILS

C502

SECTION 2930 – SEEDING AND LANDSCAPING

1.1 INTRODUCTION
 This section covers the furnishing of all labor, equipment, material and any other items necessary for landscaping of all areas of the site disturbed by construction operations and all earth surfaces of embankments including rough and fine grading, topsoil if required, fertilizer, lime, seeding and mulching. The Contractor shall adapt his operations to variations in weather or soil conditions as necessary for successful establishment and growth of grasses or legumes.

1.2 CATALOG CUT SUBMITTALS
 Contractor shall submit 4 copies of catalog cuts to Engineer for review for all materials that are required to complete the work as described in the associated plans. Engineer will retain two sets of original submittals and return two sets to the Contractor with the appropriate response annotated.

1.3 STORAGE AND HANDLING
 Contractor shall take all prudent and customary measures to ensure that all materials stay moisture free and are not degraded by storage or handling. All lime and fertilizer shall be kept free from hardening or caking and if this occurs they shall be pulverized to their original state. All seed shall be further protected such that it is not subjected to heat or rodents. If degradation occurs and the materials no longer hold the mineral values advertised then they shall be removed from the site and new materials applied.

1.4 MATERIALS
A. Lime
 The quality of lime and all operations in connection with the furnishing of this material shall comply with the requirements of the North Carolina Lime Law and regulations adopted by the NC- Board of Agriculture.
 Lime shall be agriculture grade ground dolomite limestone. It shall contain not less than 85% of the calcium and magnesium carbonates and shall be of such fineness that at least 90% will pass a No. 10 sieve and at least 50% will pass a No. 100 sieve.

B. Fertilizer
 The quality of fertilizer and all operations in connection with the furnishing of this material shall comply with the requirements of the North Carolina Fertilizer Law and regulations adopted by the NC- Board of Agriculture.
 Fertilizer shall be 10-10-10 grades. Upon written approval of the Engineer a different grade of fertilizer may be used, provided the rate of application is adjusted to provide the same amounts of plant food.

Section 2930-1

1.5 PREPERATION
A. Protection of Existing Vegetation
 The Contractor shall not remove or damage vegetation, which is outside the Clearing Limits established by the Owner/Engineer or as displayed on the plans. All trees that are damaged and scheduled to remain shall be repaired in an acceptable manner promptly to prevent progressive deterioration. Vegetation which is scheduled to be replaced or is damaged beyond repair during construction operations shall be replaced with a similar size and species. Where this is not feasible the property owner shall be compensated for the vegetation damaged. Damage incurred during construction operations and due to insufficient protection shall be paid at the Contractors expense.
 Existing vegetation not indicated for removal shall be protected against unnecessary cutting, breaking or skimming of roots, skinning or bruising of bark or smothering of vegetation by placing stockpiles of excavated material against the trunk or excessively over roots within the drip line. Vegetation shall also be protected against excessive vehicle or foot traffic within the drip line.
 Roots cut during excavation shall be properly protected by either asphalt sealing or in some cases wrapping exposed roots in wet burlap to prevent drying.

B. Grading
 Rough grading of the area shall be achieved as soon as the excavated area is backfilled and compacted. Rough grading shall be defined as all material restored which is required to bring the area to finish grade and acceptable surface drainage for storm water which provides for water to flow from the site in such a manner as that it does not place unusual risk to unsuspecting users of adjacent areas or inhabitants.
 Fine grading of the area shall be achieved in a timely manner after completion of rough grading of the area. Fine grading shall consist of shaping final contours to ensure proper drainage and removing all debris or construction waste materials to provide an acceptable appearance. Construction area subject to finish grading shall have soil loosened to a depth of not less than 6 inches in a manner approved by the Engineer to promote seed growth. All finish landscaping shall be completed on a section-by-section basis where it is reasonable to expect completion of landscaping.
 All grading, landscaping, and erosion control measures shall be properly pursued and maintained in order to maintain and acceptable appearance of the project. If such time occurs as this perception is degraded then the Engineer may suspend progress on the project until the issues are appropriately addressed.

Section 2930-3

C. Surface and Bed Preparation
 The Contractor shall smooth or shape surface contours outside the project site when such contours are detrimental to the seedbed preparation or will pose foreseeable problems with future maintenance of the area. The Engineer shall direct the Contractor to what extent outside areas shall be affected or the Contractor may elect to work with individual property owners with written verification delivered to the Engineer/Owner of the agreement with the property owner's signature.

1.c Level Areas and Slopes Less than 2:1
 The construction area shall have soil loosened to a depth not less than 6 inches and shall be free from all debris, clods and all other irregularities which would prohibit a smooth, shaped finish grade. Top 3 inches of soil shall be worked to a clod free finish suitable for planting seed.

2.c Slopes Greater Than 2:1
 The construction area shall have soil loosened and acceptable for vegetation growth but the surface shall be free from all debris, clods and other irregularities. The surface may be track finished, scarified, grooved or punctured so as to provide a place for seed and other planting material to lodge. In the case of such slopes the Engineer may allow partial completion of the slope sections at different times to promote stabilization. If the vegetation growth is acceptable the Engineer may allow this to remain as the permanent ground cover.
 The Contractor shall not pursue the finished preparation of surface areas to be landscaped if the soil is frozen, marginally wet or when the Engineer deems it unsuitable for working conditions.

D. Rate of Application
 Seed shall be applied by means of Broadcast Spreader, Hydro-Seeder or other previously approved method. In no case shall seed, lime, or fertilizer be spread by hand. The rates of application for seed, lime and fertilizer shall be as follows, unless a variance is permitted by the Engineer in writing prior to performing work.

1.d Limestone
 In the absence of a soil test performed at the Contractors expense and given to the Engineer on letterhead from the testing laboratory, Limestone shall be applied at the rate of 2000 lb/ acre.

Section 2930-4

2.d Fertilizer
 In the absence of a soil test performed at the Contractors expense and given to the Engineer on letterhead from the testing laboratory, Fertilizer shall be applied at the rate of 1000 lb/ acre. Fertilizer shall be 10-10-10 grade, unless a variance is permitted by the Engineer in writing prior to performing work. A second application at 500-lb/ acre shall be applied to the area when the grass has reached a blade height of 3 inches or 45 days which ever comes first.

3.d Seed
 The type and rate of application shall vary at different times of the year and shall be applied at the rate and type appropriate for the time of year. All rates of application are measured in pounds per acre.

a. Fall and Winter (Sept. 1 to May 1)
 85 pounds of Ky-31 tall fescue mixed with 15 pounds of rye grain.

b. Spring and Summer (May 1 to September 1)
 100 pounds of Ky-31 tall fescue mixed with 10 pounds of rye grain.

c. Cut of Fill slopes greater than 2:1
 The application rate on cut or fill slopes greater than 2:1 shall include the appropriate mix above for the time of year along with; 40 lb/acre of sericea lespedeza (hulled in spring or summer and unhulled in fall and winter) and either 15 pounds of Sudan grass in spring and summer or 25 pounds of rye cereal per acre in fall and winter.

4.d Mulch
 Mulch shall be straw mulch applied at a rate of approximately 3000 pounds per acre. Straw shall be applied at such rate necessary to thoroughly cover and protect all finish grading, seed, lime and fertilizer but not smother the maturation of seed.

E. Application
 Application of all limestone, fertilizer, seed and mulch shall be completed immediately following final preparation of the seed bed and shall not be pursued during a time when the Engineer deems weather to be non-conducive for seed growth, i.e. ground wet, frozen, etc. Lime, fertilizer and seed shall be distributed uniformly over the prepared seedbed at the specific rate of application and then harrowed, raked, or otherwise thoroughly worked or mixed into the seedbed. Immediately following the covering operation, the seedbed shall be properly compacted as directed in the manner and degree approved by the Engineer.

Section 2930-5

NEW HANOVER COUNTY BMP MAINTENANCE NOTES:

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

TEMPORARY AND PERMANENT SEEDING NOTES

- The Contractor shall follow the "Supplemental Technical Specification Z-3" except for any specification on payment or submittals to the Resident Construction Engineer (RCE). The Engineer of Record or Owner's Representative shall be substituted for the RCE.
- All disturbed areas not receiving pavement, mulch, or landscaping shall be permanently grassed per these specifications.
- All disturbed areas with no activity for more than 14 days shall be temporarily grassed per these specifications.
- The Contractor shall include in his contract price to the Owner all costs necessary to permanently grass the site meeting the definition of "stabilized" as defined by the NPDES General Permit (100% coverage and 70% density) or as may be required by the local issuing authority if stricter. It is the Contractor's responsibility to know these requirements and estimate the cost to meet these requirements.
- All topsoil stripped from the site shall be spread over areas to be grassed and landscaped to a uniform depth as to use all native topsoil.

Section 2930-6

When a hydraulic seeder is used for application of seed and fertilizer, the seed shall not remain in water containing fertilizer for more than 1 hour prior to application unless otherwise permitted by the Engineer.

The Engineer may permit modifications to the requirements for covering or compacting lime, fertilizer and seed in the prepared seedbed if the Contractor requests modification due to height, steepness of slope or non-conductive soil conditions. Modifications may be considered if the case of: Slopes greater than 2:1 and Slopes where surface is to rocky to successfully permit compaction or covering of the seedbed. Modifications may be permitted to include reduction of application rates and reduction or elimination of compaction requirements.

All equipment normal and prudent for the preparation of seedbed and uniform distribution of lime, fertilizer and seed shall be approved by the Engineer prior to use on the project. In the event of malfunctioning or improperly maintained equipment, the Engineer reserves the right to suspend work on the project until such time as the equipment is restored to good repair and properly operational.

F. Mulching
 Mulch shall be spread uniformly over all seeded areas at a rate of 1 1/2 to 2 tons per acre in a continuous, uniform blanket. Mulch shall be spread by hand or by approved mechanical shredder or blower which will provide a uniform blanket. An acceptable application shall be one that completely covers the ground but still allows some sunlight to penetrate and air to circulate while providing effective soil moisture conservation and reduced erosion. Mulching operation shall be pursued immediately following final seedbed preparation.
 Tack or other approved binding material shall be applied over top of mulch in all necessary areas to ensure mulch will be held in place during adverse conditions. The rate and method of application shall be completed as directed by the Engineer.
 The Contractor shall implement sufficient precautions to prevent mulch from entering drainage structures through displacement by wind, water or other causes. The Contractor shall remove completely any blockage to drainage structures, which may occur.

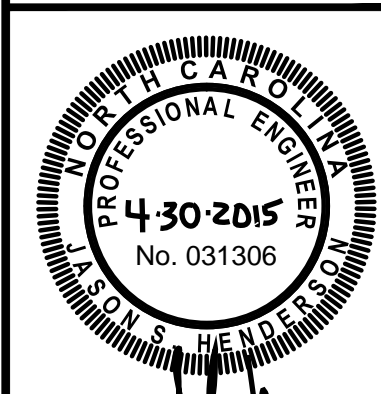
G. Maintenance
 Grassed areas shall be accepted when a 95% cover of permanent grasses is achieved and weeds are not the dominant foliage. The Contractor shall keep all grassed areas in good condition, reseeding and mowing if and when necessary as directed by the Engineer. A good lawn shall be established over the entire project area and shall be maintained by the Contractor in an approved manner and kept in an approved condition until final acceptance.

Section 2930-6

Section 2930-7

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

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



Bluewater Civil Design, PLLC
 NC P-0868

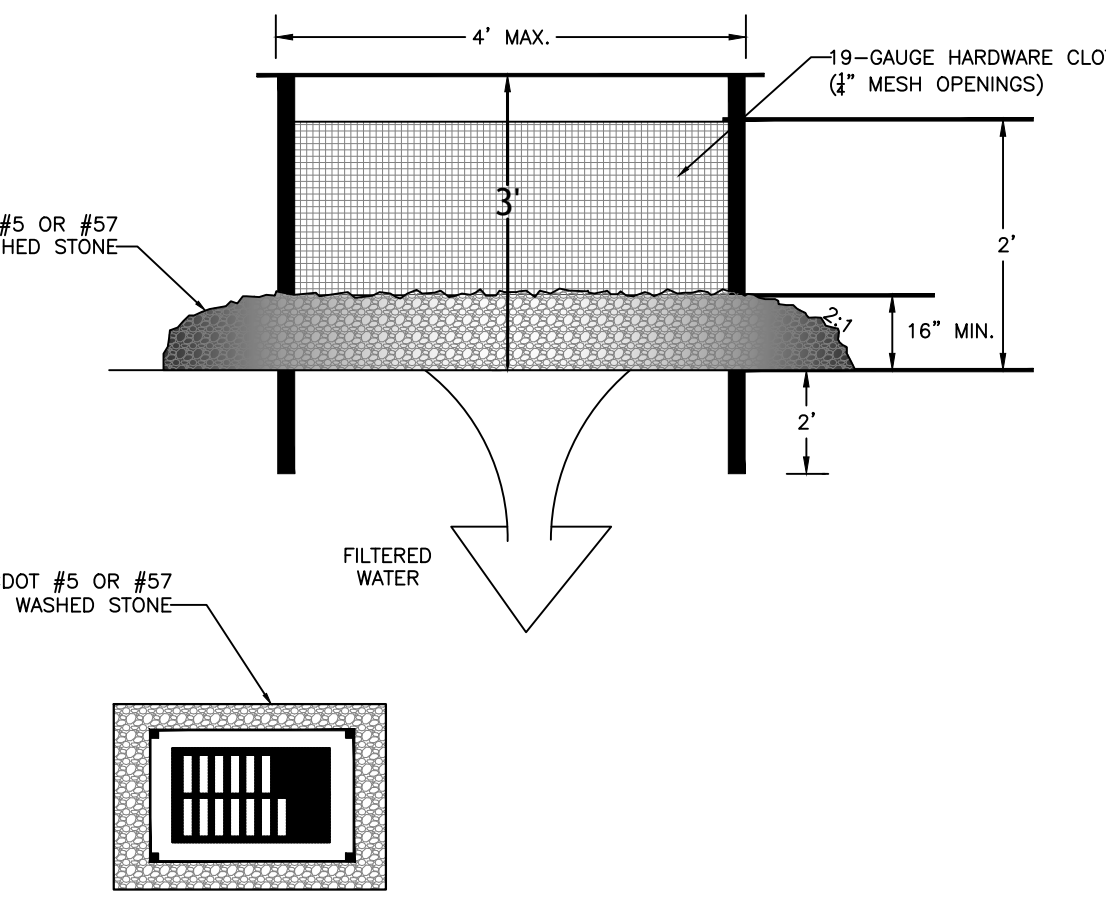
PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER HCOOT/WILMINGTON COMMENTS
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NOTES & DETAILS

C503

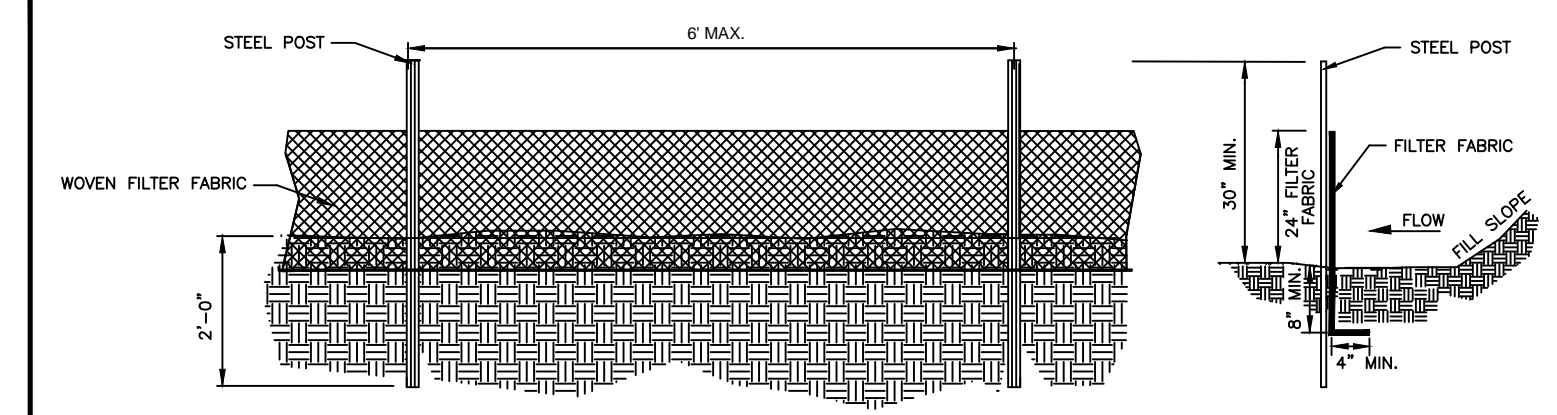
- GENERAL NOTES:**
- UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
 - DRIVE 6-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EQUALLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
 - SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACE A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
 - PLACE CLEAN GRAVEL (NO DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 18 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
 - ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
 - COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUND COVER.

MAINTENANCE:
 Inspect inlets at least weekly and after each significant (1/2 inch or greater) rainfall event. Clear the mesh wire of any debris or other objects to provide adequate flow for subsequent rains. Take care not to damage or undercut the wire mesh during sediment removal. Replace stone as needed.



HARDWARE CLOTH AND GRAVEL INLET PROTECTION

NOT TO SCALE

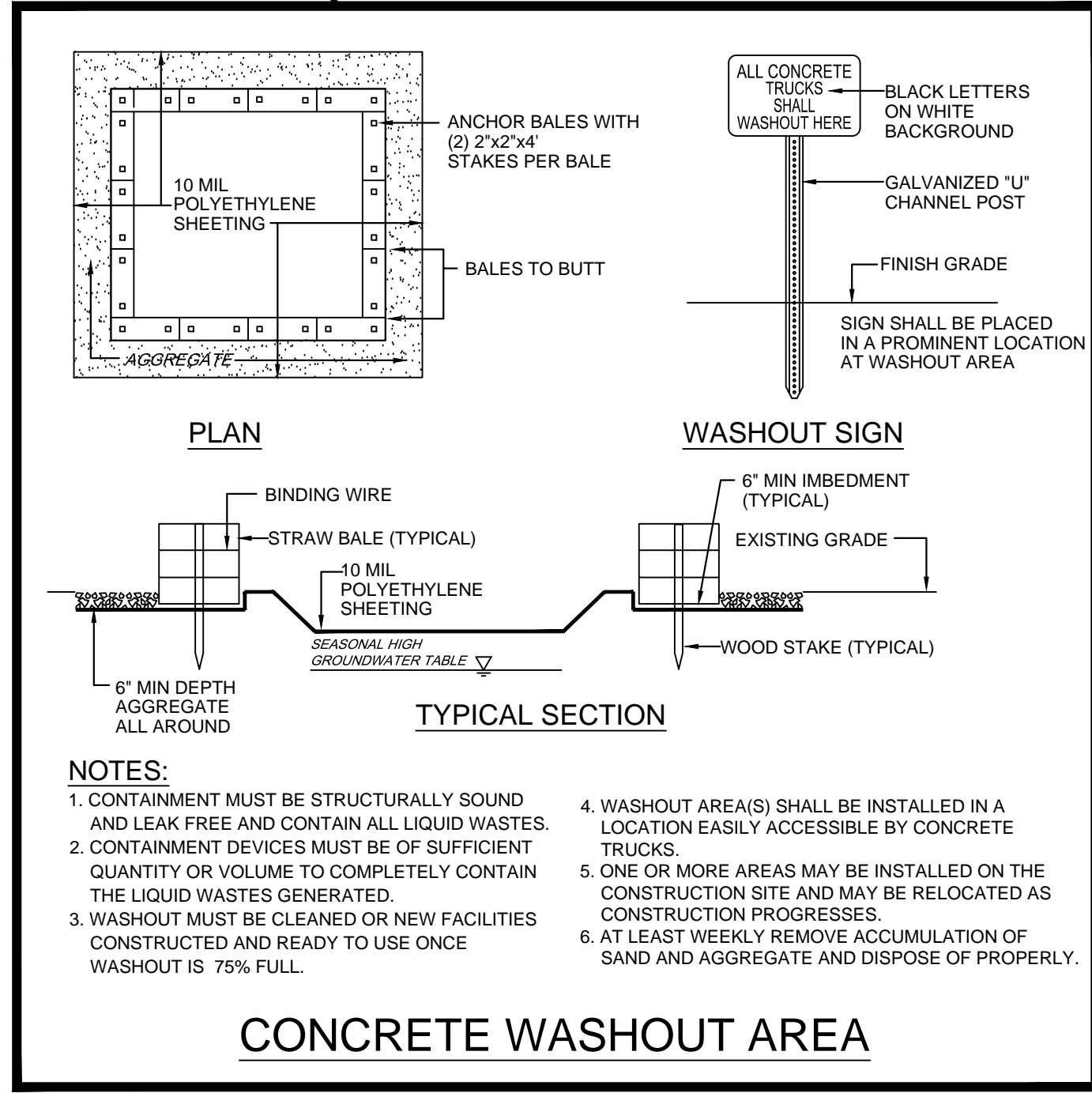


- GENERAL NOTES:**
- WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
 - STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
 - TURN SILT FENCE UP SLOPE AT ENDS.
 - ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS. (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
 - DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
 - SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
 - DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

- MAINTENANCE NOTES:**
- FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
 - SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
 - SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH APPROX. HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEED.

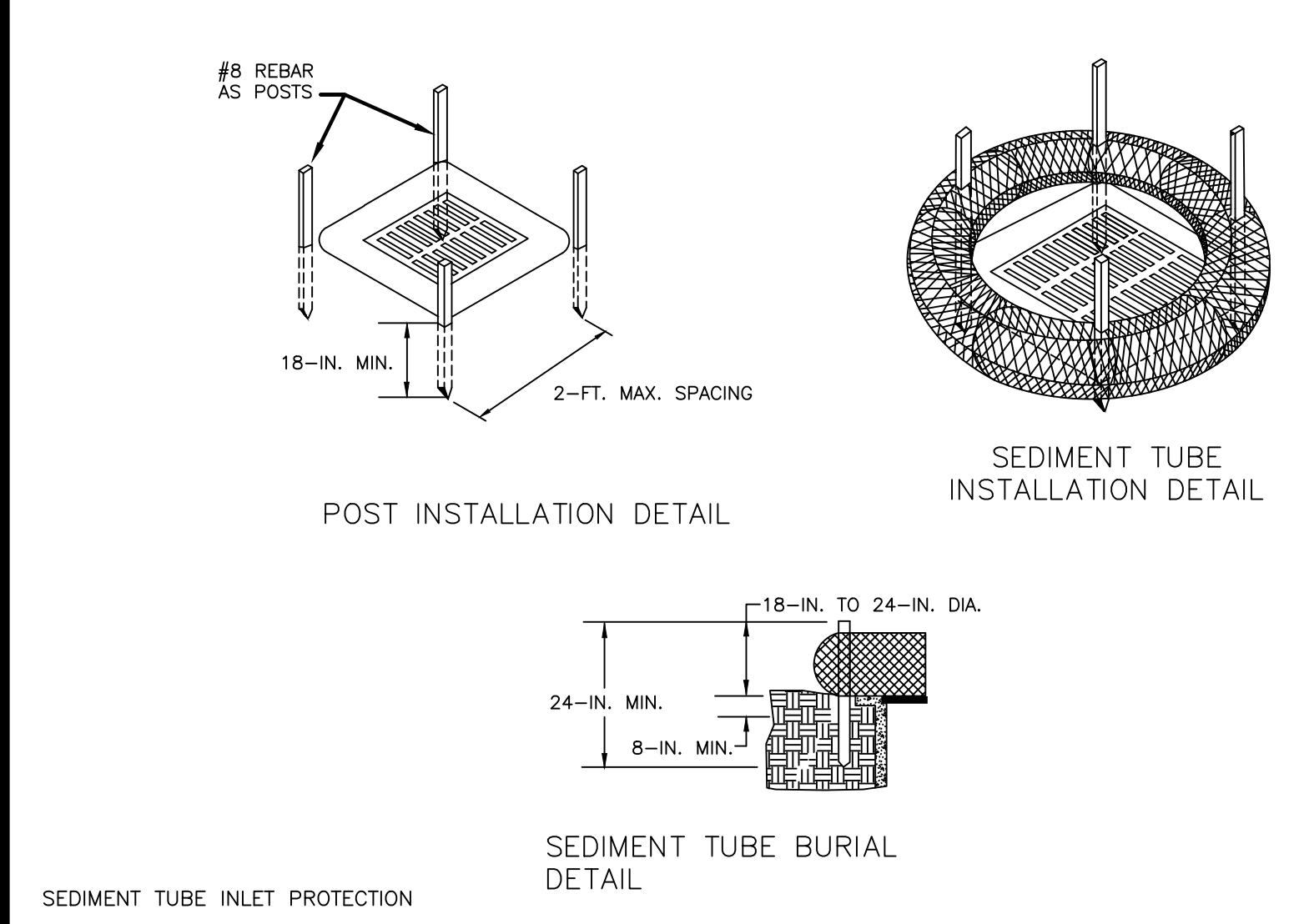
TEMPORARY SILT FENCE

NOT TO SCALE



CONCRETE WASHOUT AREA

- NOTES:**
- CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
 - CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
 - WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
 - WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
 - ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
 - AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.



SEDIMENT TUBE INLET PROTECTION

Materials
 Sediment tubes for Type A Inlet Structure Filters exhibit the following properties:
 Produced by a Manufacturer experienced in sediment tube manufacturing.
 Composed of compacted geotextiles, curled excelsior wood, natural coconut fibers, hardwood mulch or a mix of these materials enclosed by a flexible netting material. Straw, straw fiber, straw bales, pine needles, and leaf mulch are not allowed under this specification. Utilizes outer netting that consists of seamless, high-density polyethylene photodegradable materials treated with ultraviolet stabilizers or a seamless, high-density polyethylene non-degradable materials. Diameter ranging from 18-inches to 24-inches. Curled excelsior wood, or natural coconut rolled erosion control products (RECPs) that are rolled up to create a sediment tube are not allowed under this specification. Select applicable Sediment Tubes from the SCDOT approved products list.

Use #8 REBAR posts that meet the following minimum physical requirements:

Installation:
 Remove all rocks, clods, vegetation or other obstructions so installed sediment tubes have direct contact with the underlying soil or surface. Install sediment tubes by laying them flat on the ground. Construct a small trench to a depth that is 20% of the sediment tube diameter. Lay the sediment tube in the trench and compact the upstream sediment tube soil interface. Do not completely bury sediment tubes during installation. Lap the ends of adjacent sediment tubes a minimum of 6-inches to prevent flow and sediment from passing through the field joint. Never stack sediment tubes on top of one another. Install sediment tubes using REBAR stakes a minimum of 48-inches in length placed on 2-foot centers. Intertwine the stakes with the outer mesh on the downstream side, and drive the stakes in the ground to a minimum depth of 24-inches leaving with 12-inches of stake above the exposed sediment tube.

Inspection and Maintenance:
 Inspect every seven calendar days and within 24-hours after each rainfall event that produces 1/2-inches or more of precipitation. Inspect sediment tubes after installation for gaps under the tubes and for gaps between joints of adjacent ends of sediment tubes. Repair rills, gullies, and all undercutting near sediment tubes. Remove and/or replace installed sediment tubes as required to adapt to changing construction site conditions. Remove all sediment tubes from the site when the functional longevity is exceeded as determined by the Engineer, Inspector or Manufacturer's Representative. Dispose of sediment tubes in regular means as non-hazardous, inert material.

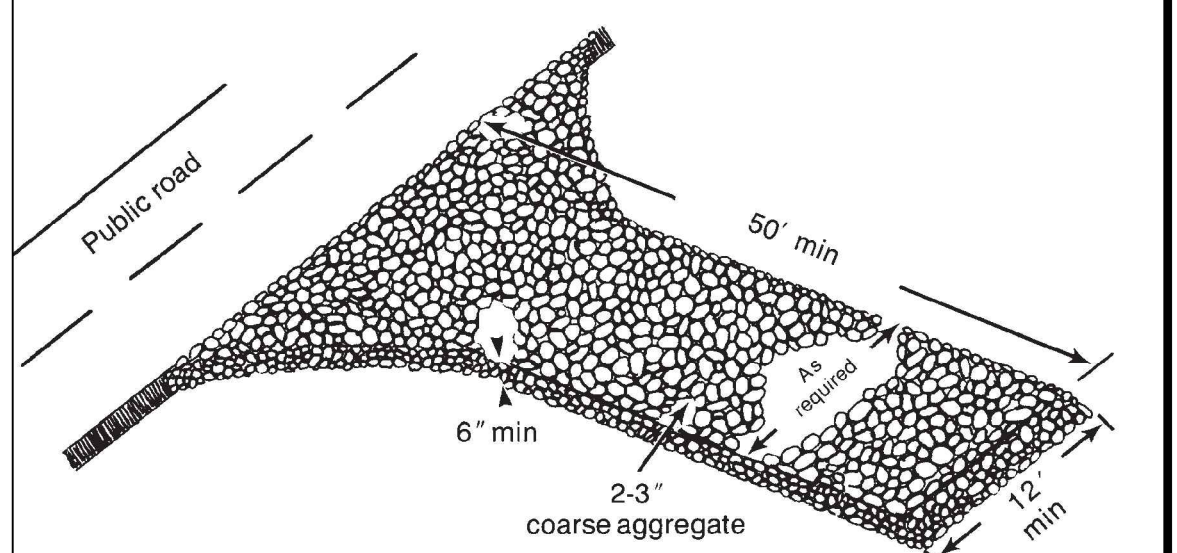
TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

Definition A graveled area or pad located at points where vehicles enter and leave a construction site.

Purpose To provide a buffer area where vehicles can drop their mud and sediment to avoid transporting it onto public roads, to control erosion from surface runoff, and to help control dust.

Conditions Where Practice Applies Whenever traffic will be leaving a construction site and moving directly onto a public road or other paved off-site area. Construction plans should limit traffic to properly constructed entrances.

Design Criteria **Aggregate Size**—Use 2-3 inch washed stone.
Dimensions of gravel pad—
 Thickness: 6 inches minimum
 Width: 12-foot minimum or full width at all points of the vehicular entrance and exit area, whichever is greater
 Length: 50-foot minimum
Location—Locate construction entrances and exits to limit sediment from leaving the site and to provide for maximum utility by all construction vehicles (Figure 6.06a). Avoid steep grades, and entrances at curves in public roads.



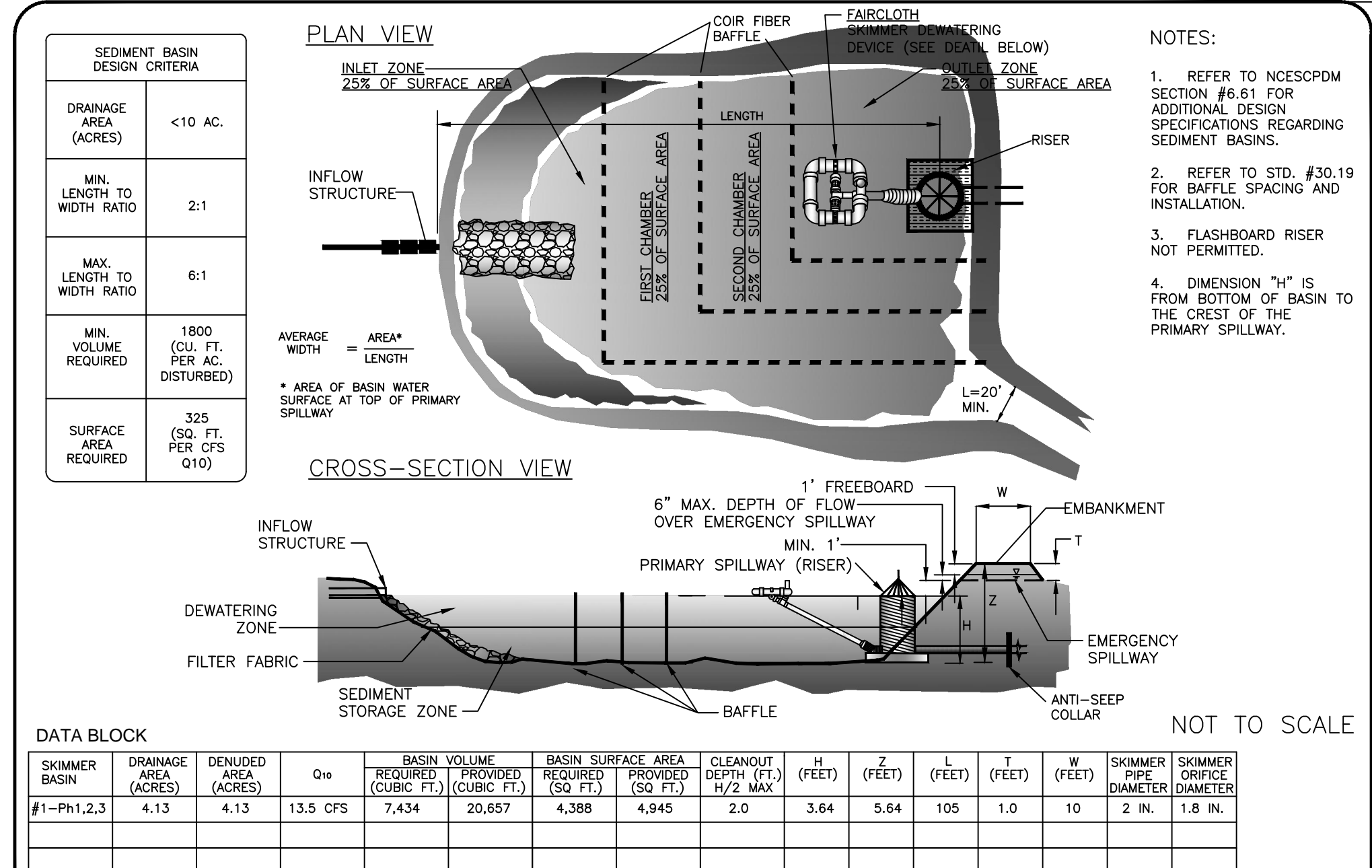
Washing—If conditions at the site are such that most of the mud and sediment are not removed by vehicles traveling over the gravel, the tires should be washed. Washing should be done on an area stabilized with crushed stone that drains into a sediment trap or other suitable disposal area. A wash rack may also be used to make washing more convenient and effective.

- Construction Specifications**
- Clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade it.
 - Place the gravel to the specific grade and dimensions shown on the plans, and smooth it.
 - Provide drainage to carry water to a sediment trap or other suitable outlet.
 - Use geotextile fabrics because they improve stability of the foundation in locations subject to seepage or high water table.

Maintenance Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic treading with 2-inch stone. After each rainfall, inspect any structure used to trap sediment and clean it out as necessary. Immediately remove all objectionable materials spilled, washed, or tracked onto public roadways.

- References**
- Runoff Conveyance Measures
 6.30, Grass-lined Channels
 - Sediment Traps and Barriers
 6.60, Temporary Sediment Trap

WILMINGTON
 NORTH CAROLINA
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

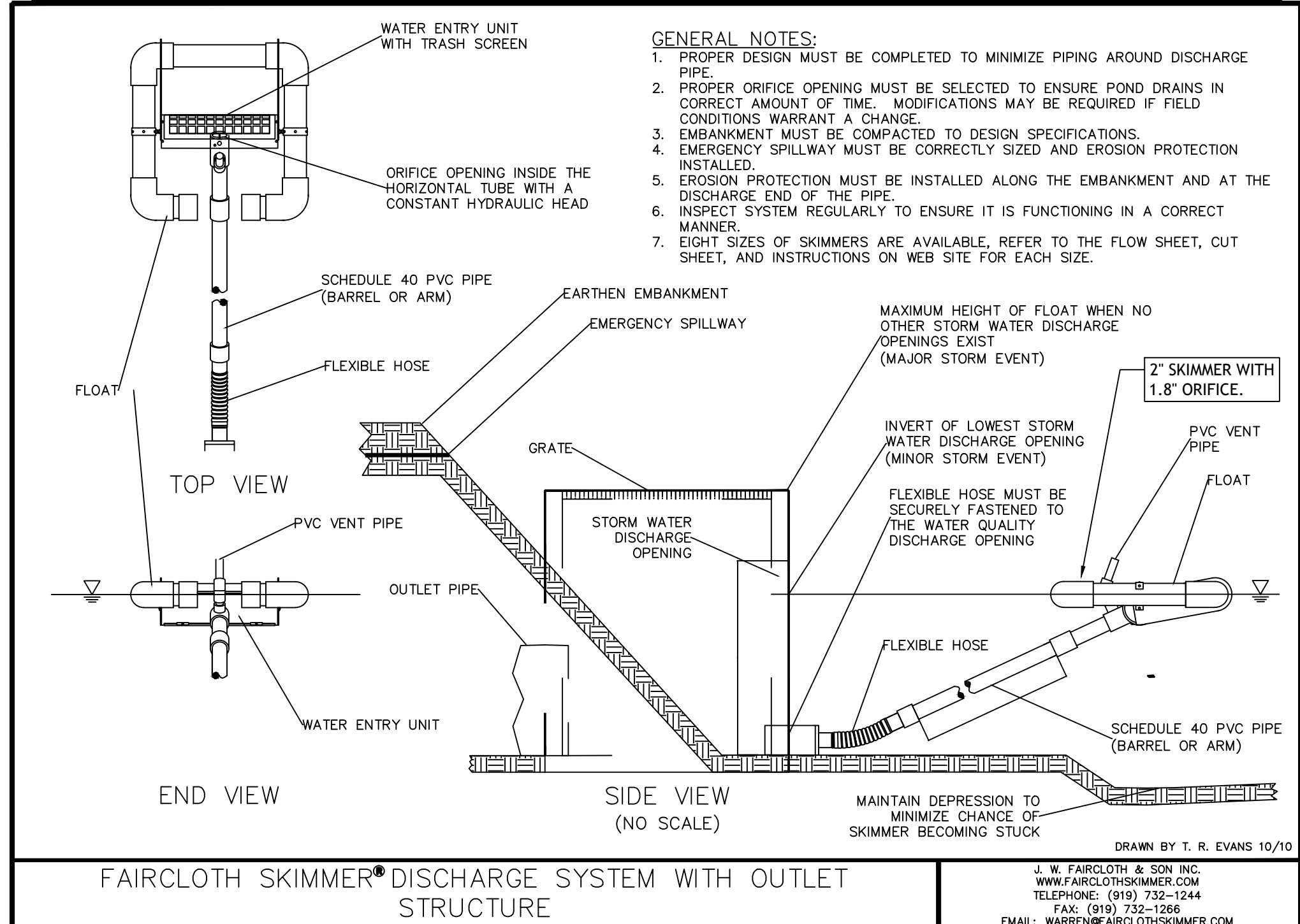


SKIMMER SEDIMENT BASIN

GENERAL NOTES:

- AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MATERIAL. THE BASIN AREA SHALL BE CLEARED.
- THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRaversing WITH EQUIPMENT WHILE BEING CONSTRUCTED. SPILLWAYS SHOULD NOT BE CONSTRUCTED THROUGH FILL SECTIONS. ALL SPILLWAYS SHOULD BE LINED AND/OR RIPRAPPED.
- SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO DEPTH SHOWN ON STANDARD. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA IN SUCH A MANNER THAT IT WILL NOT ERODE.
- THE TRAP SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NECESSARY.
- CONSTRUCTION OPERATION SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
- ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER, UNLESS CERTIFIED BY REGISTERED GEOTECHNICAL ENGINEER.
- SEDIMENT BASIN EMBANKMENTS SHOULD BE PROVIDED WITH EROSION CONTROL AND STABILIZATION.
- STORAGE AREA MAY BE CONSTRUCTED IN ANY SHAPE PROVIDED THE MINIMUM STORAGE VOLUME REQUIREMENT IS MET. THE BASIN SHOULD ALSO BE ORIENTED SUCH THAT THE FILTER AND THE MAIN FLOW OF WATER AND SEDIMENT ARE ON OPPOSITE ENDS ON THE LONGER BASIN DIMENSIONS.
- THE LENGTH OF THE STONE OUTLET (SPILLWAY) IS TO BE BASED ON A 10 YEAR STORM.
- WHENEVER TOPOGRAPHY ALLOWS, THE BASIN LENGTH SHOULD BE TWICE (2X) THE BASIN WIDTH, TO ALLOW FOR SETTLING. BAFFLES SHALL BE INSTALLED IN ALL BASINS.
- CLEANOUT STAKES SHALL BE PLACED IN ALL SEDIMENT BASINS AT THE LOW POINT IN THE BASIN. THE STAKES SHALL BE MARKED SHOWING THE HALF FULL, CLEANOUT POINT, OF THE BASIN.
- SAFETY FENCING 3' HIGH SHOULD BE PLACED AROUND ALL SEDIMENT BASINS.
- FOR DESIGN OF SEDIMENT BASINS, REFER TO THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
- FOR SLOPES GREATER THAN 10° IN LENGTH AND PROTECTED BY SILT FENCE AT THE TOE OF THE SLOPE, SLOPE TERRACING WILL BE REQUIRED.
- THE BERM ON SEDIMENT BASINS SHALL BE SEEDED ONCE FINAL GRADE HAS BEEN REACHED. THE SILT FENCE MAY BE REMOVED IF PERMISSION HAS BEEN GRANTED BY THE CITY LAND DEVELOPMENT INSPECTOR AFTER THE GRASS HAS GERMINATED AND STABLE GROUND HAS BEEN ESTABLISHED.
- WASHED STONE AND WIRE BACKING SHALL BE USED WITH SILT FENCE WHENEVER SILT FENCE IS PLACED AT THE TOE OF A SLOPE >10° VERTICAL OR ALONG ANY CHANNEL OR WATER COURSE WHERE 50' OF BUFFER IS NOT PROVIDED.

GENERAL NOTES—SEDIMENT BASINS



CITY OF WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____
Signed: _____

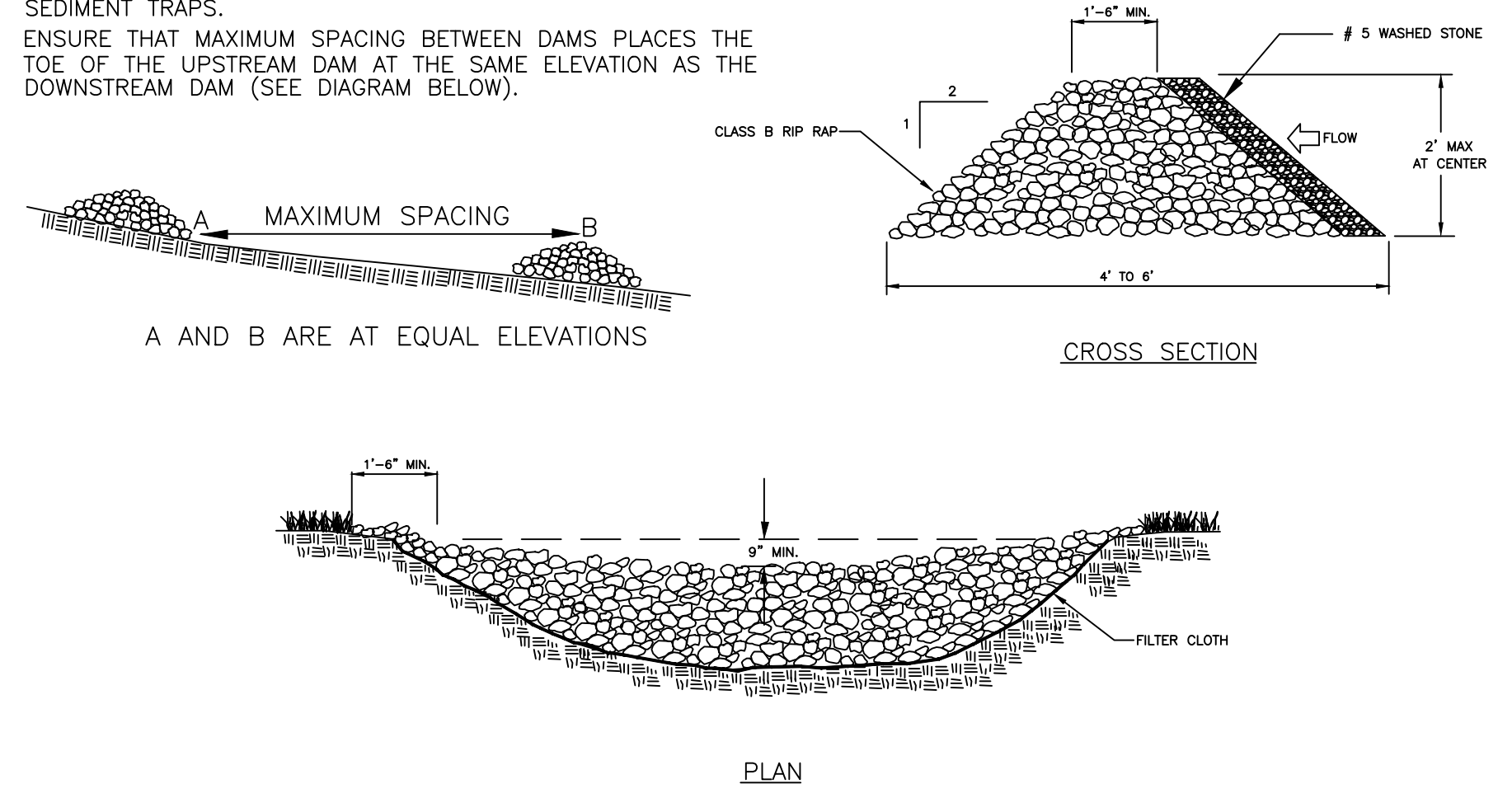
STD. & SPEC. #	TITLE	SPECIAL REQUIREMENTS & NOTES
6.17	ROLLED EROSION CONTROL PRODUCTS	—
6.51	HARDWARE CLOTH & GRAVEL INLET PROTECTION	—
6.60	TEMPORARY SEDIMENT TRAP	WEIR TOP WIDTH 10' MIN., BOTTOM 7' MIN.
6.61	SEDIMENT BASIN	FLASH BOARD RISER NOT PERMITTED
6.64	SKIMMER SEDIMENT BASIN	1ST BAFFLE: COIR FIBER 2ND BAFFLE: COIR FIBER 3RD BAFFLE: COIR FIBER

THE STANDARDS & SPECIFICATIONS SHOWN ARE FROM THE "NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" (NCESCPDM) PREPARED BY NC DEPT. OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR).

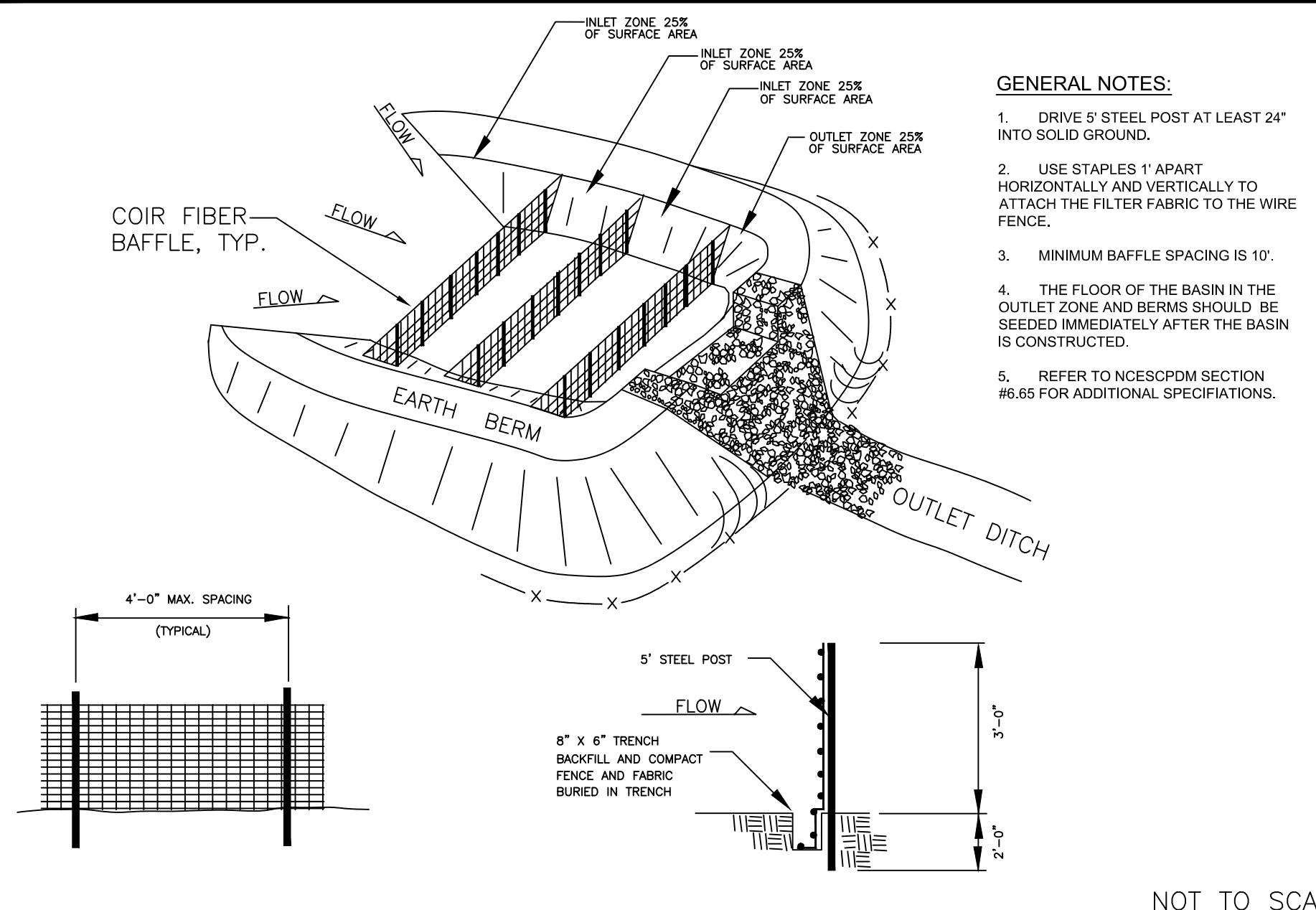
SPECIAL EROSION CONTROL REQUIREMENTS & NOTES

GENERAL NOTES:

- RIPRAP SIZE TO BE DESIGNED BY ENGINEER.
- CHECK DAMS MAY BE USED IN SLOPING DITCHES OR CHANNELS TO SLOW VELOCITY OR TO CREATE SEDIMENT TRAPS.
- ENSURE THAT MAXIMUM SPACING BETWEEN DAMS PLACES THE TOE OF THE UPSTREAM DAM AT THE SAME ELEVATION AS THE DOWNSTREAM DAM (SEE DIAGRAM BELOW).



TEMPORARY ROCK CHECK DAM



BAFFLE INSTALLATION

Project Number: 2014-090
DWG Name: 2014-090 Details.dwg
Drawing Scale: AS NOTED
Date of Project: 10-21-2014
Engineer of Record:
Jason Henderson, P.E.
South Carolina P.E. #2406
Georgia P.E. #20711
North Carolina P.E. #13136
Alabama P.E. #2054

bluewater
civil design, PLLC
bluewatercivil.com • info@bluewatercivil.com
19 Washington Park Suite 100 • Greenville, SC 29601
www.bluewatercivil.com

Certificates of Authorization:
SC C04212 - GA PEF005865
NC P0868 - AL CA4065E

BRAGG ROAD DEV. COMPANY, LLC
Bragg Drive
Wilmington, NC

Approved Construction Plan

Name: _____ Date: _____
Planning: _____
Traffic: _____
Fire: _____



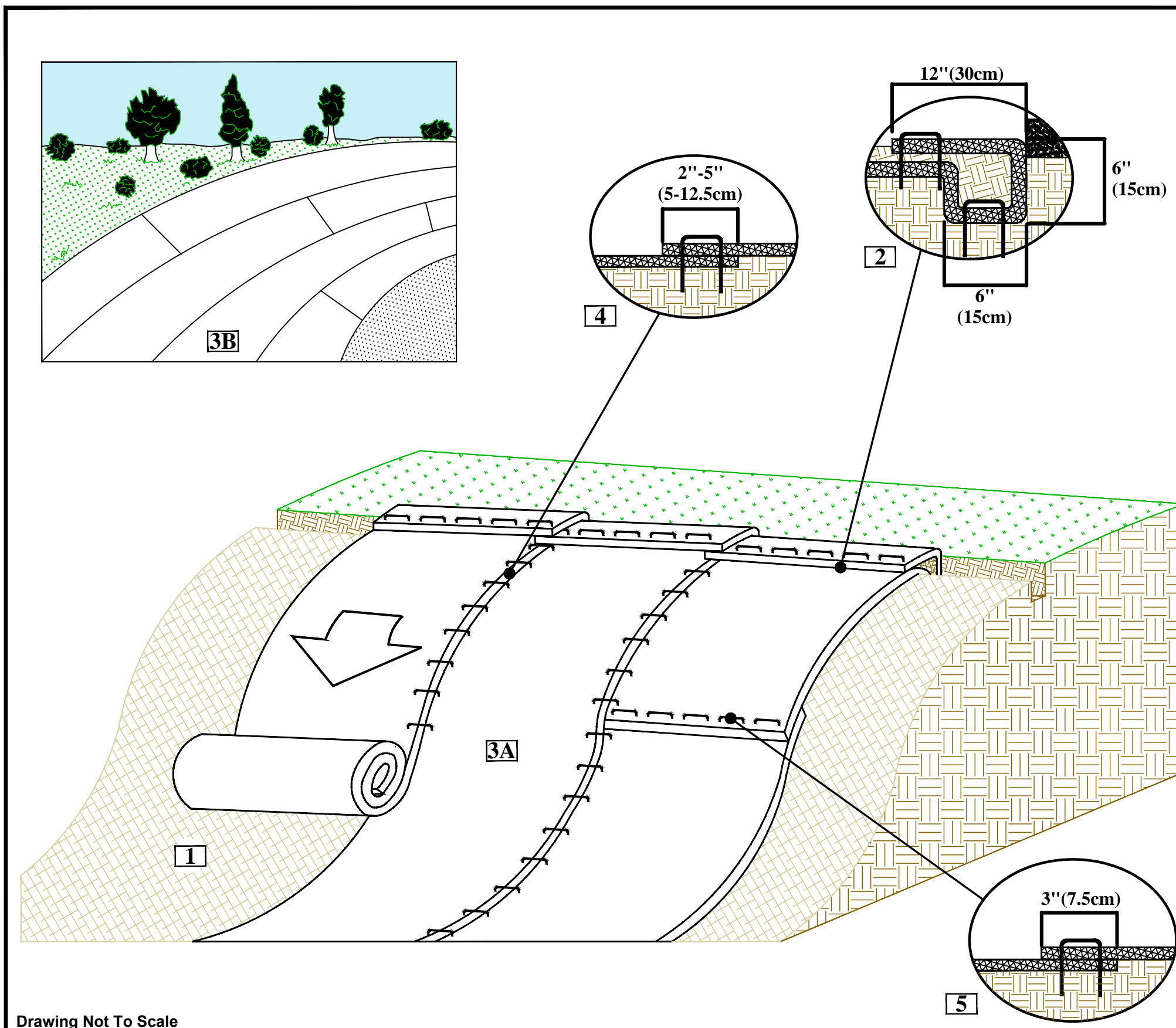
Bluewater Civil Design, PLLC
NC P-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER HCOOT/WILMINGTON COMMENTS

NOTES & DETAILS

C504

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENTANT SUBMITTAL
E	4-30-2015	REVISED PER HCDOT/WILMINGTON COMMENTS
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SLOPE INSTALLATION DETAIL

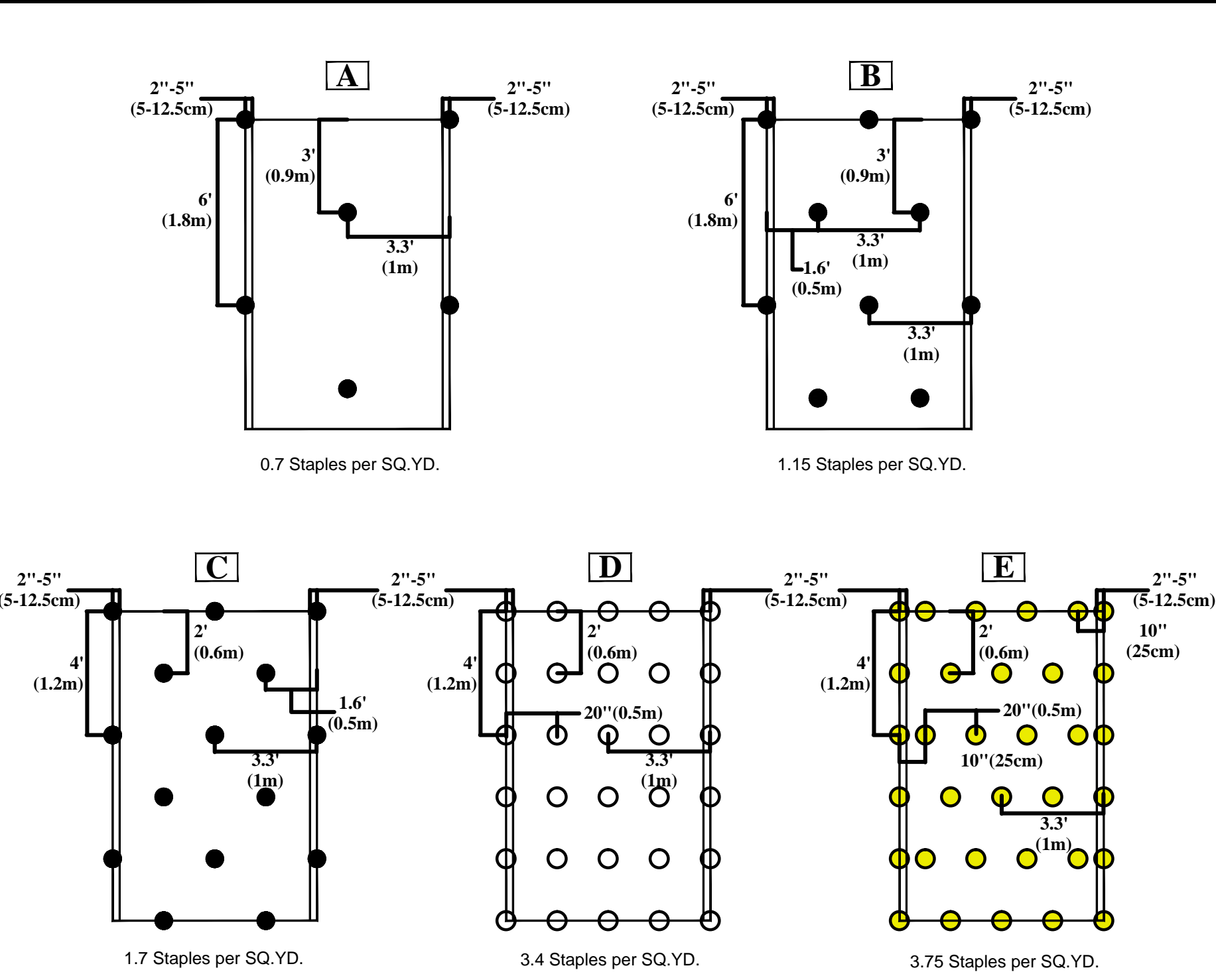
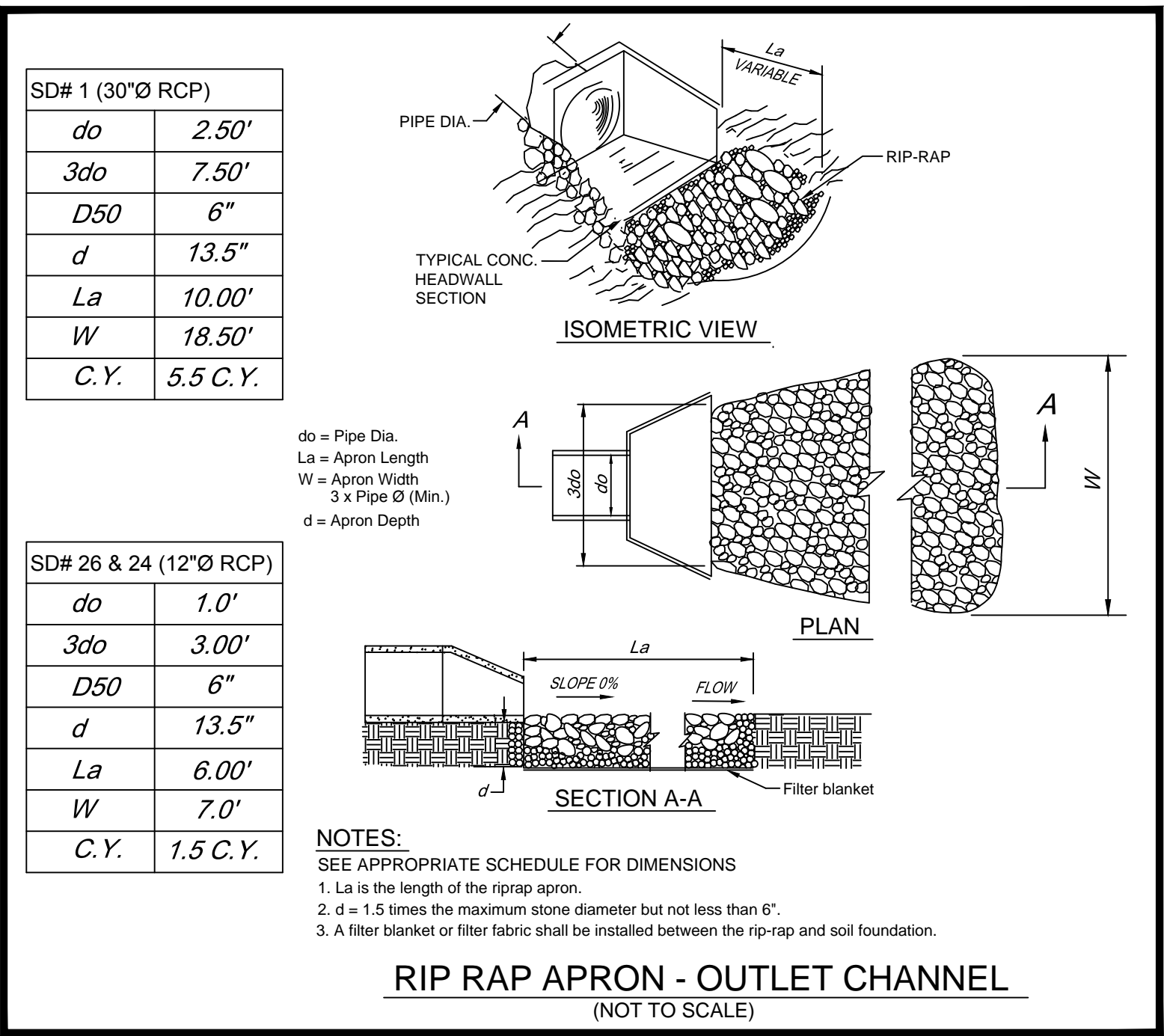
1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6"(15cm) deep X 6"(15cm) wide trench with approximately 12"(30cm) of RECPs extended beyond the up-slope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12"(30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12"(30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12"(30cm) apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with approximately 2" - 5" (5-12.5cm) overlap depending on the RECPs type.
5. Consecutive RECPs spliced down the slope must be end over end (Shingle style) with an approximate 3"(7.5cm) overlap. Staple through overlapped area, approximately 12"(30cm) apart across entire RECPs width.

Drawing Not To Scale

Tensor. NORTH AMERICAN GREEN
 5401 St. Wendel - Cynthia Rd. PH: 800-722-2040
 Poseyville, IN 47633 www.nagreen.com

Disclaimer:
 The information presented herein is general design information only. For specific applications, consult an independent professional for further design guidance.

Drawn on: 3-16-11



STAPLE PATTERN GUIDE

- 4:1 Slopes (A)
- 3:1 Slopes (B)
- 2:1 Slopes (C)
- 1:1 & Steeper Slopes (D)
- Medium/High Flow Channel (D)
- High Flow Channel And Shoreline (E)

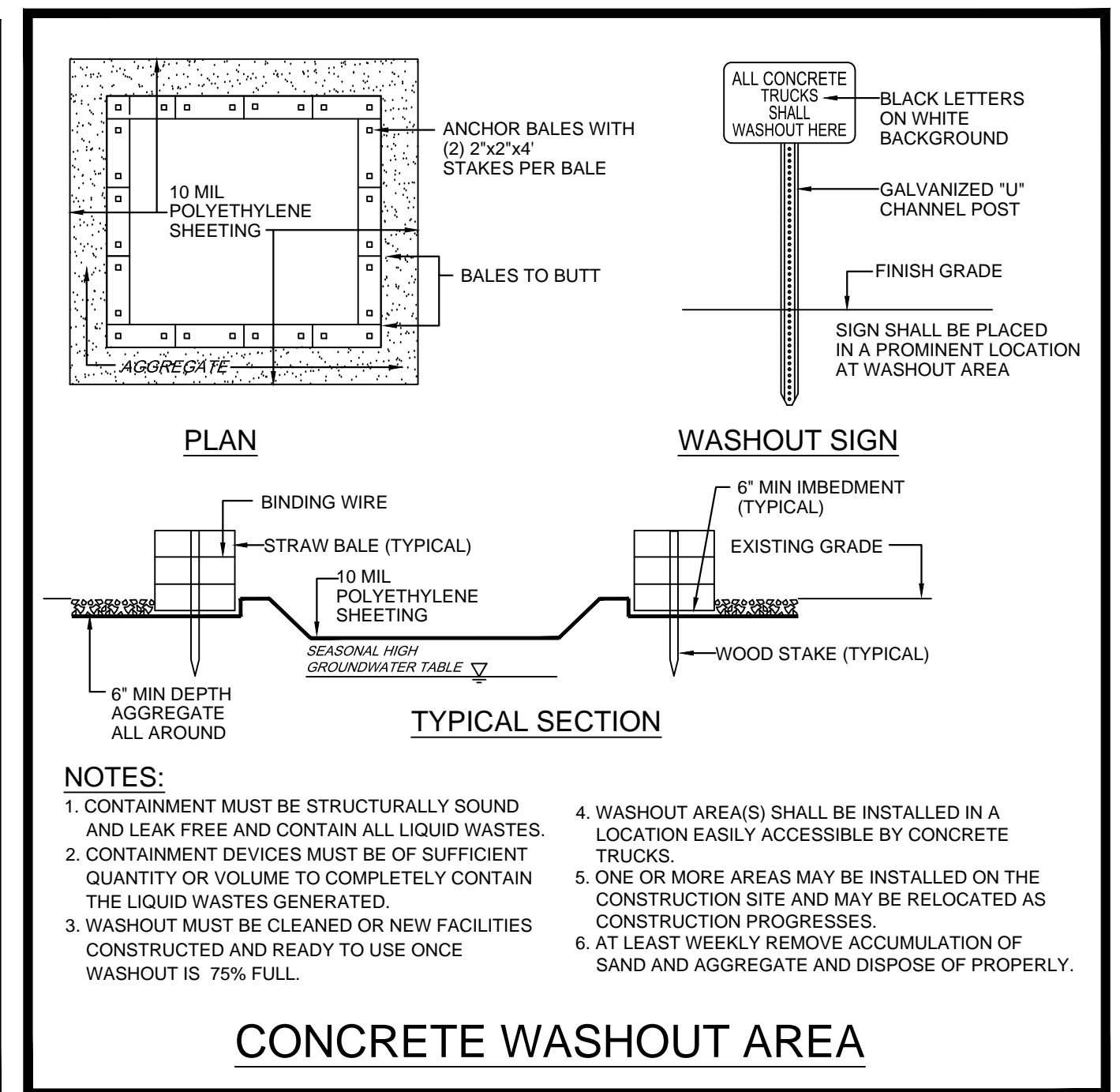
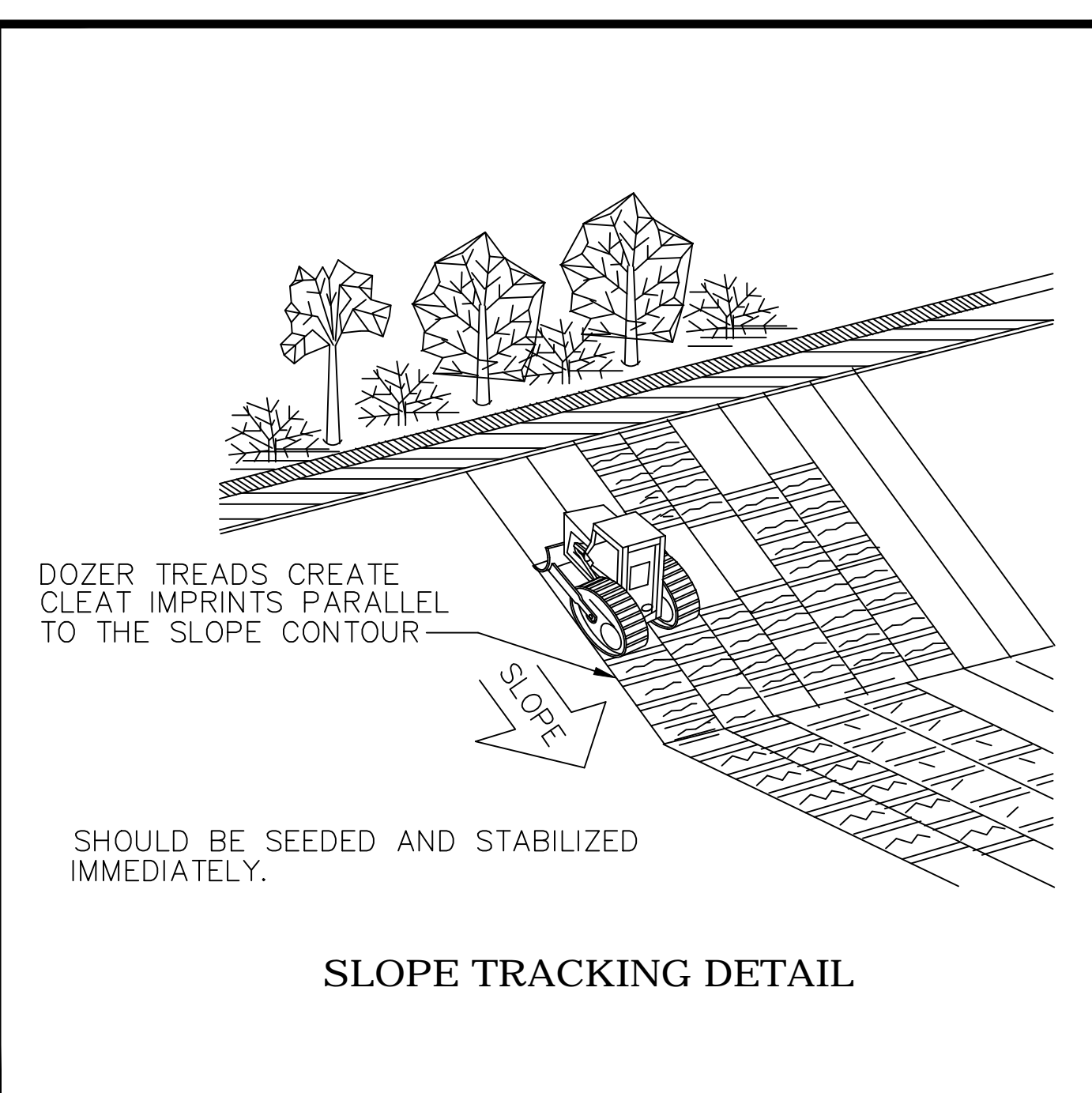
NOTES:
 * Use ECMDs® for more accurate staple pattern selection.

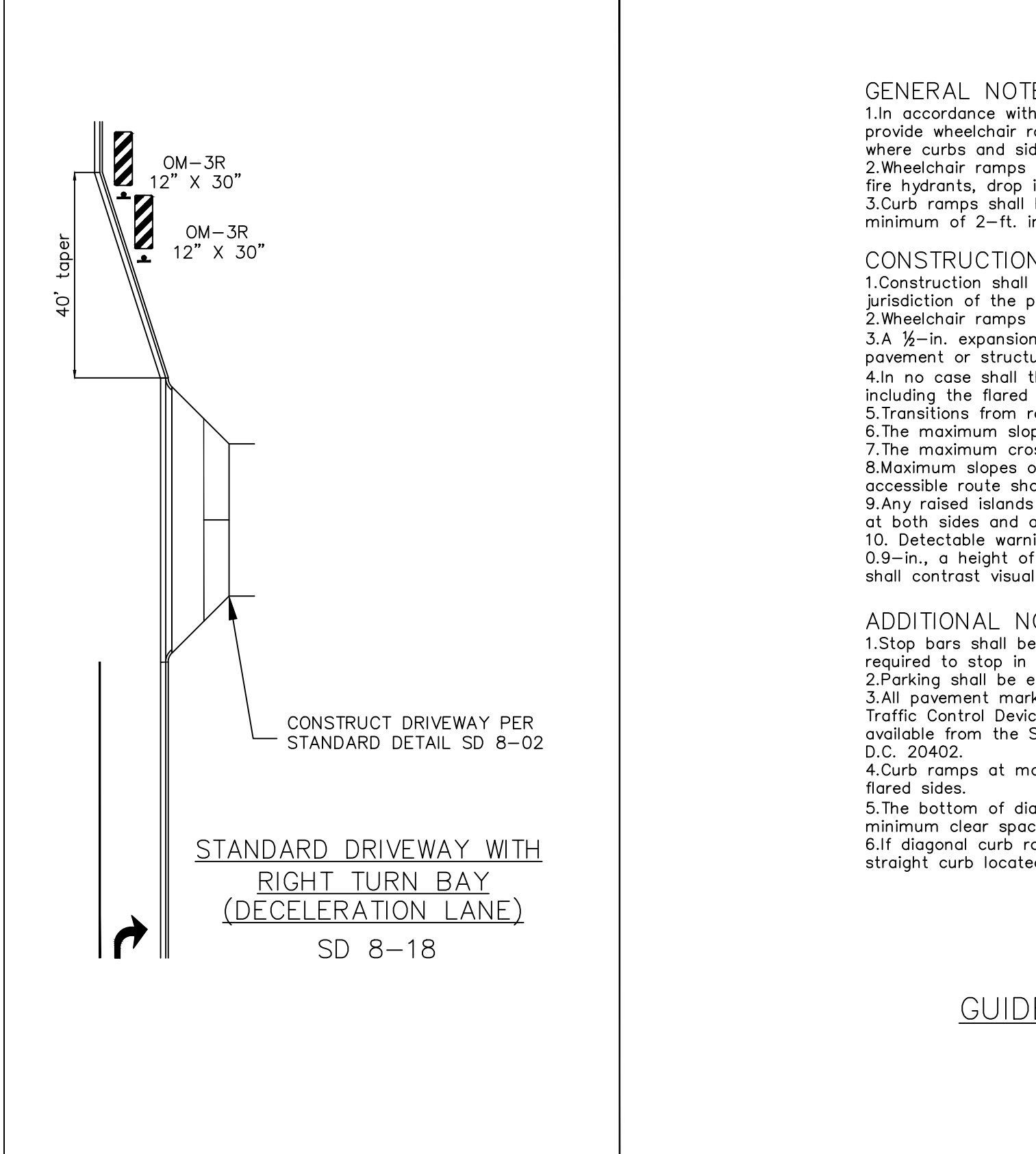
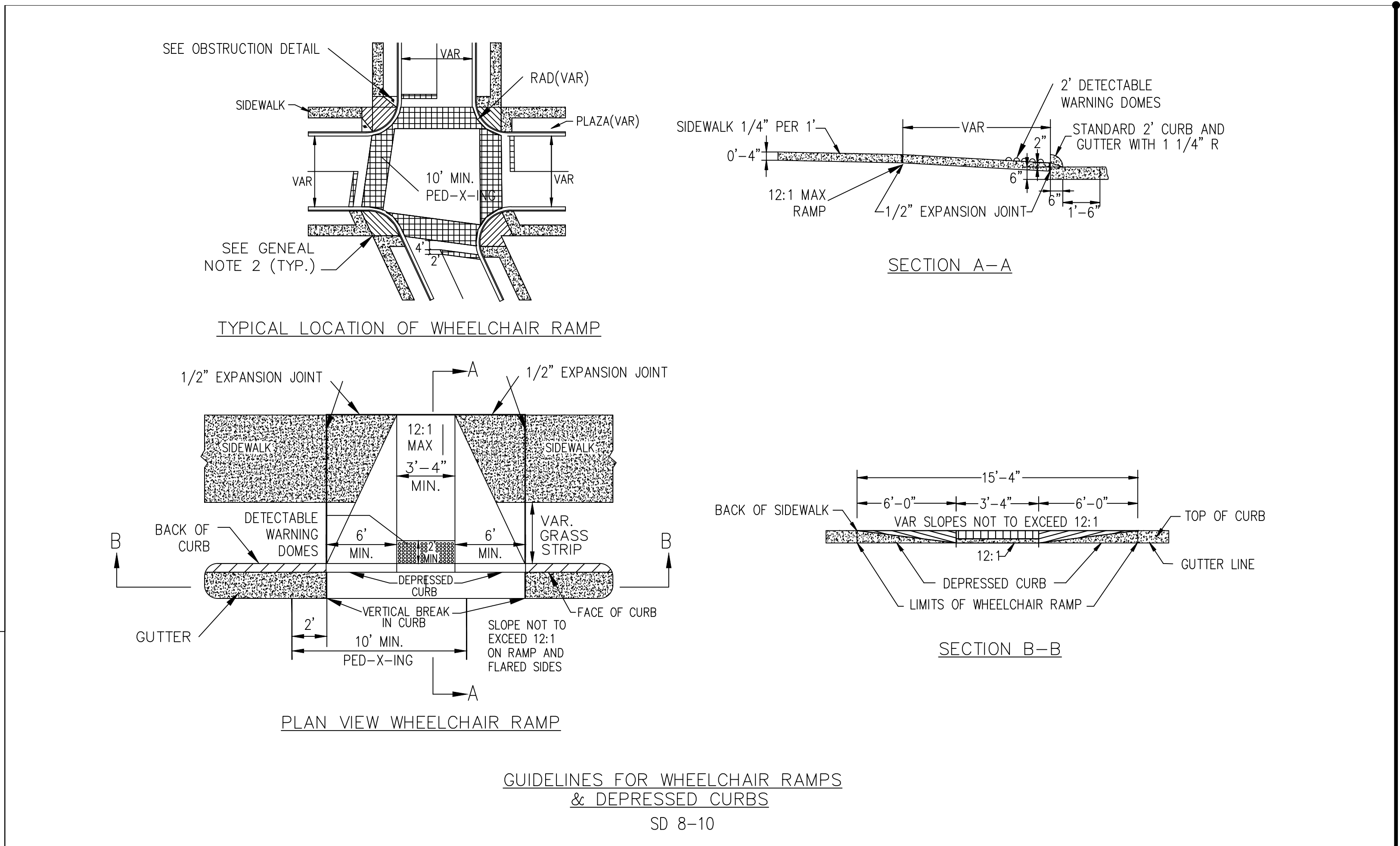
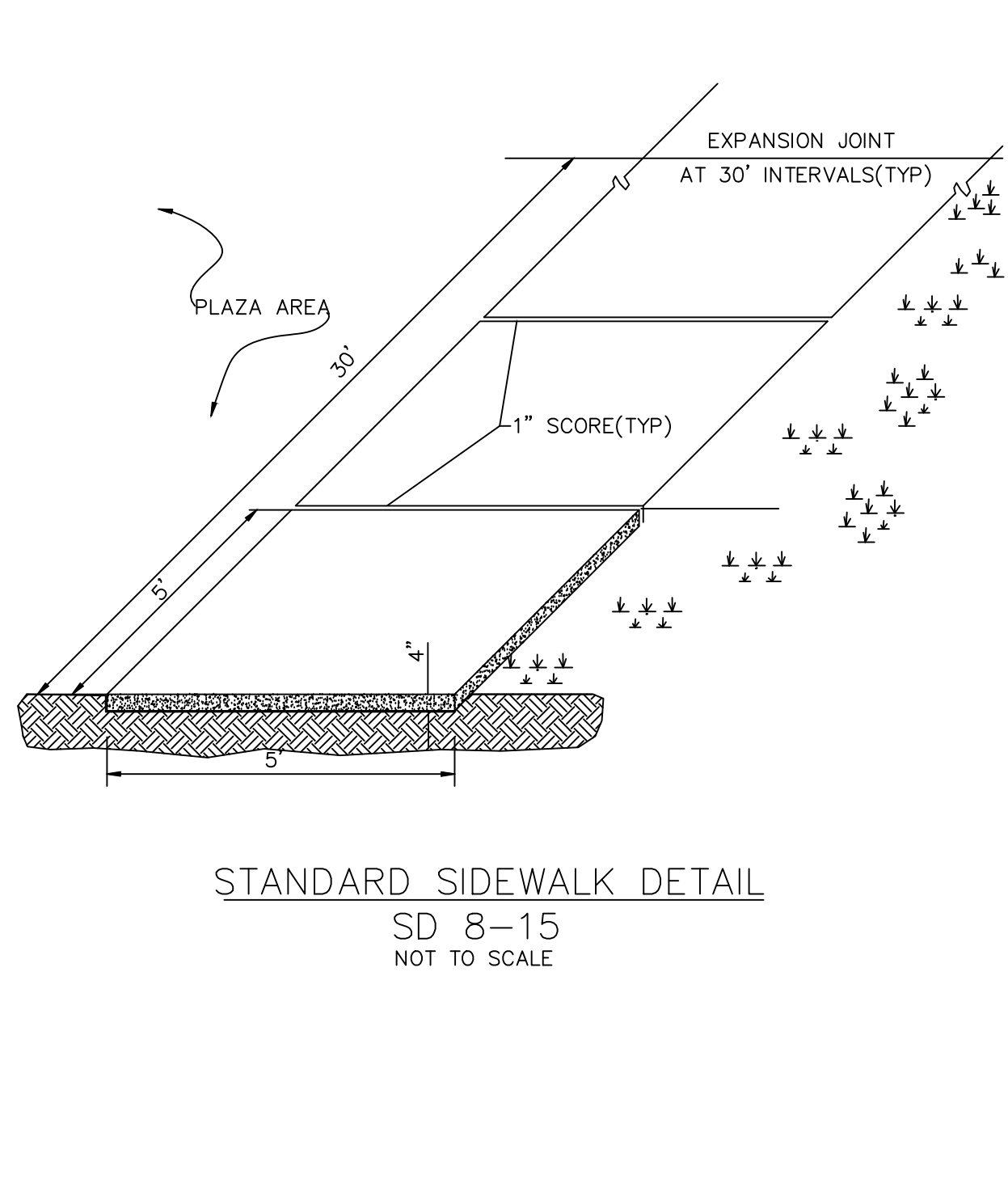
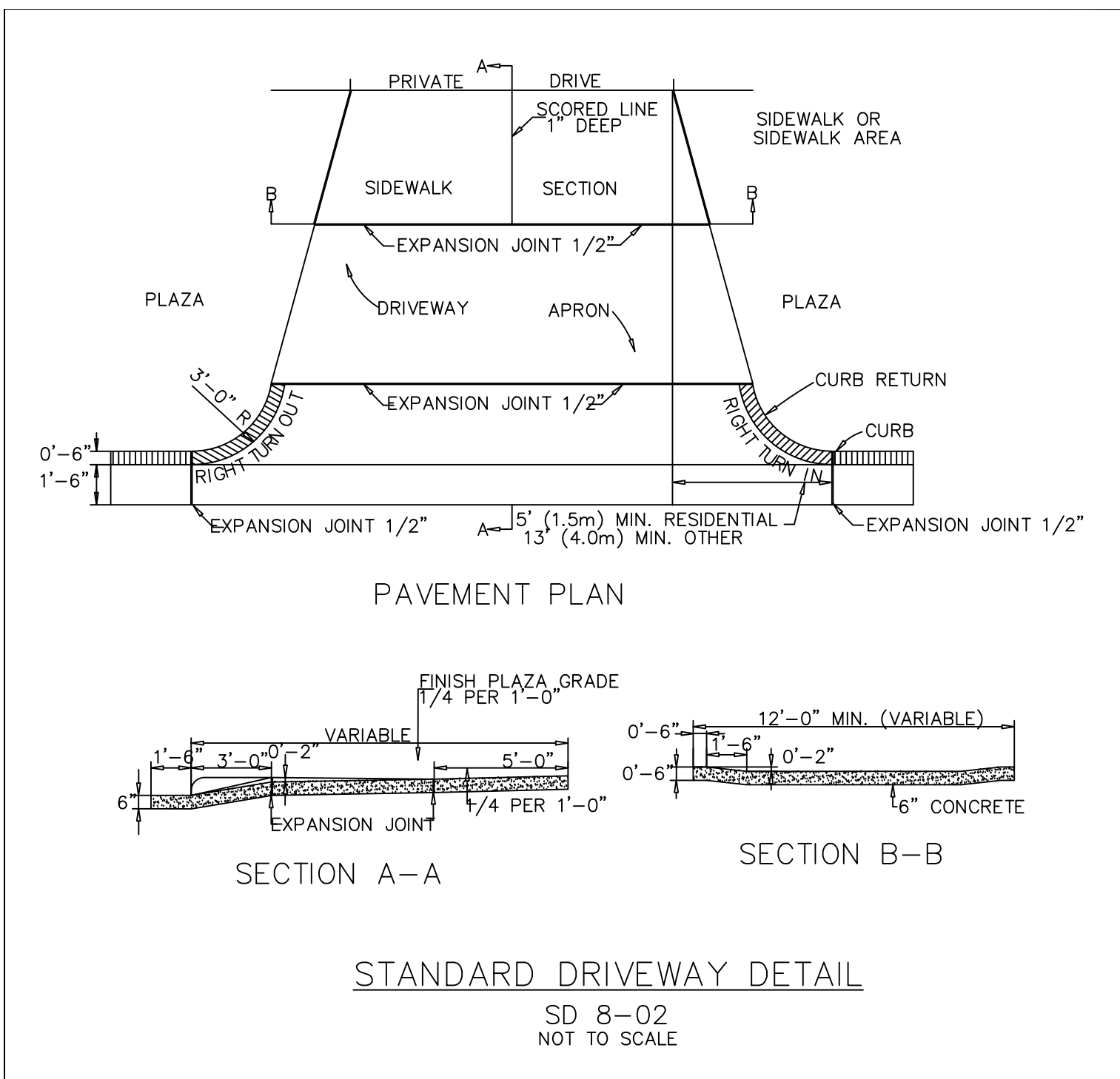
Drawing Not To Scale

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 Poseyville, IN 47633 www.nagreen.com

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Drawn on: 3-16-11





GENERAL NOTES

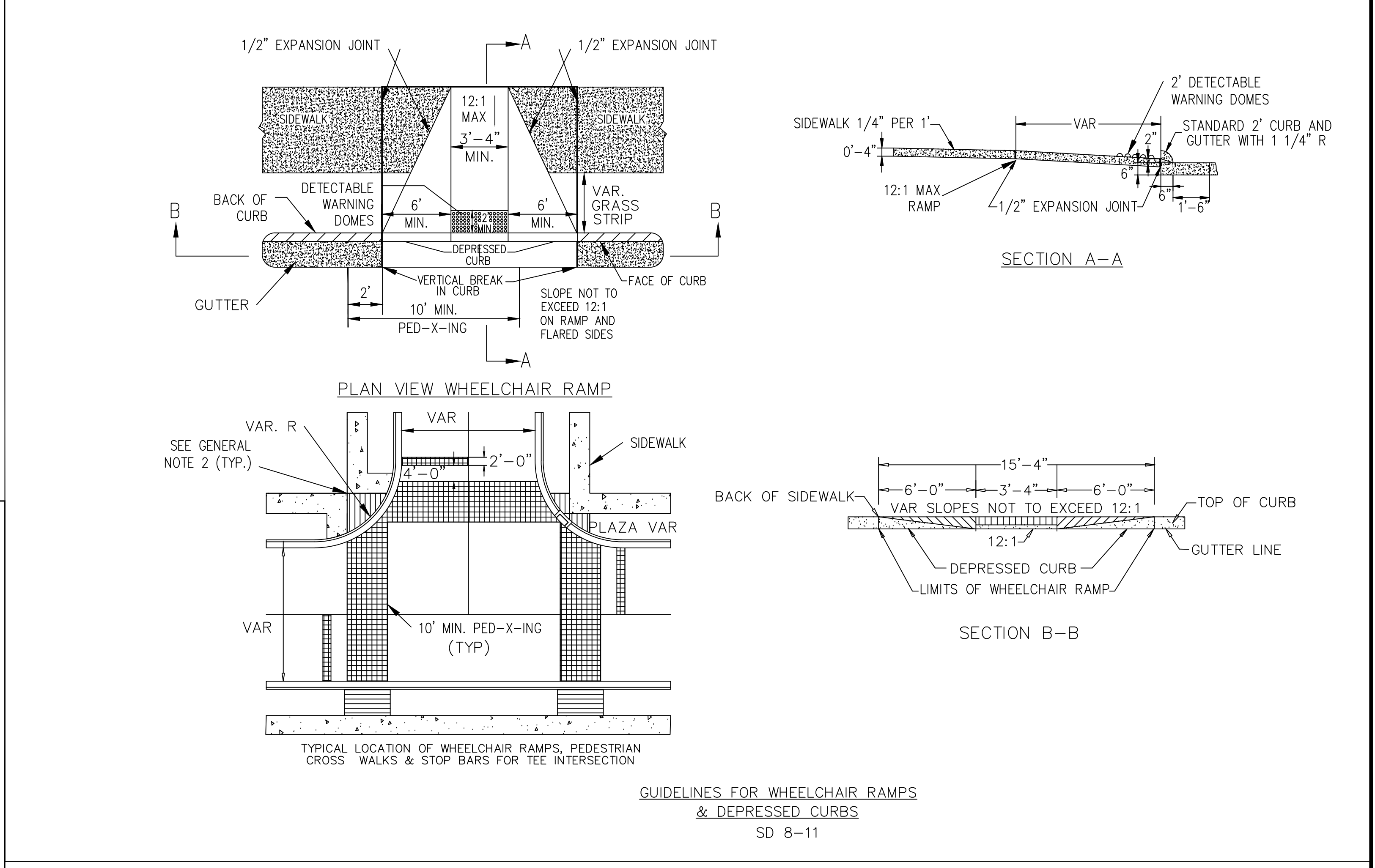
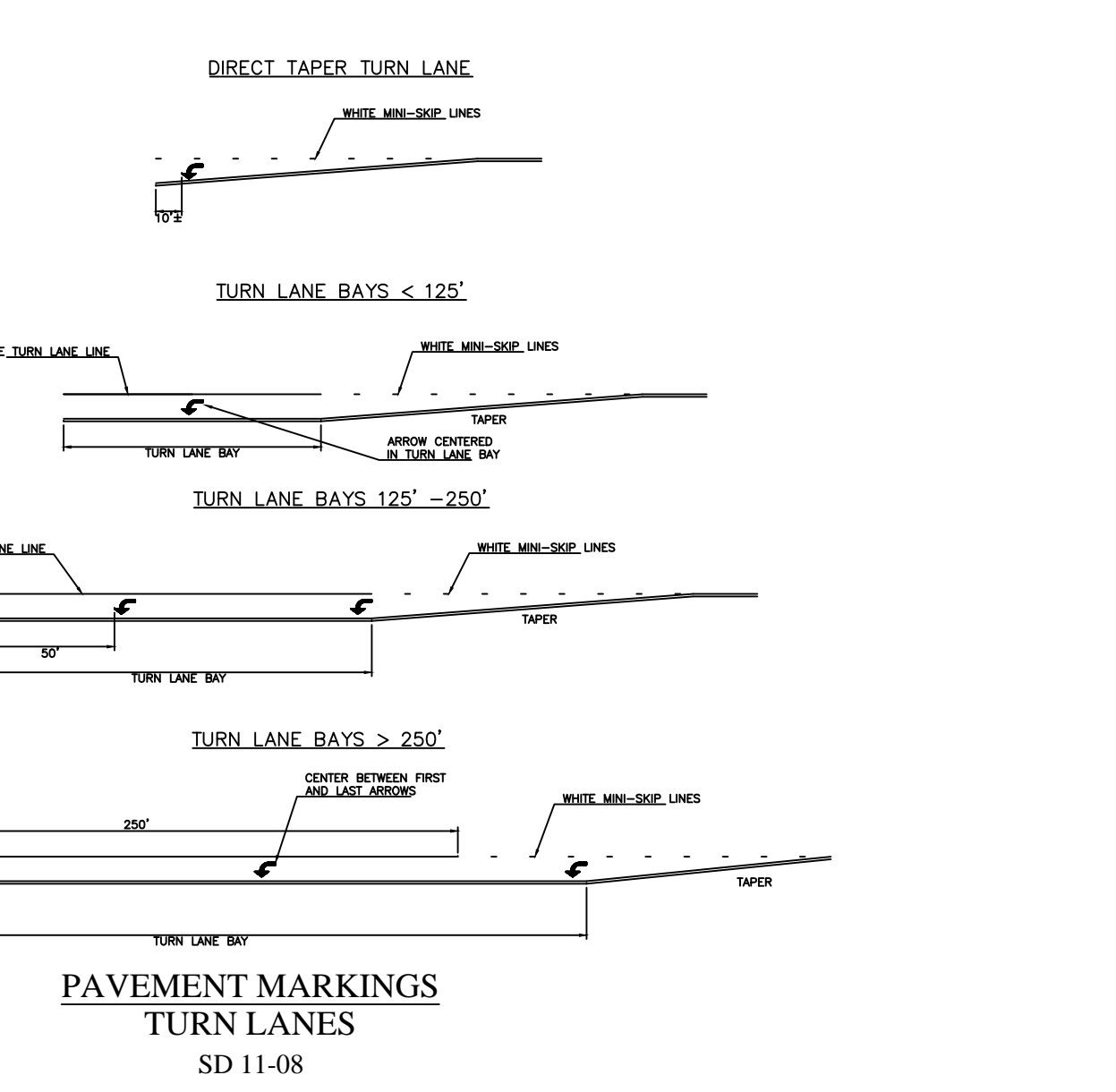
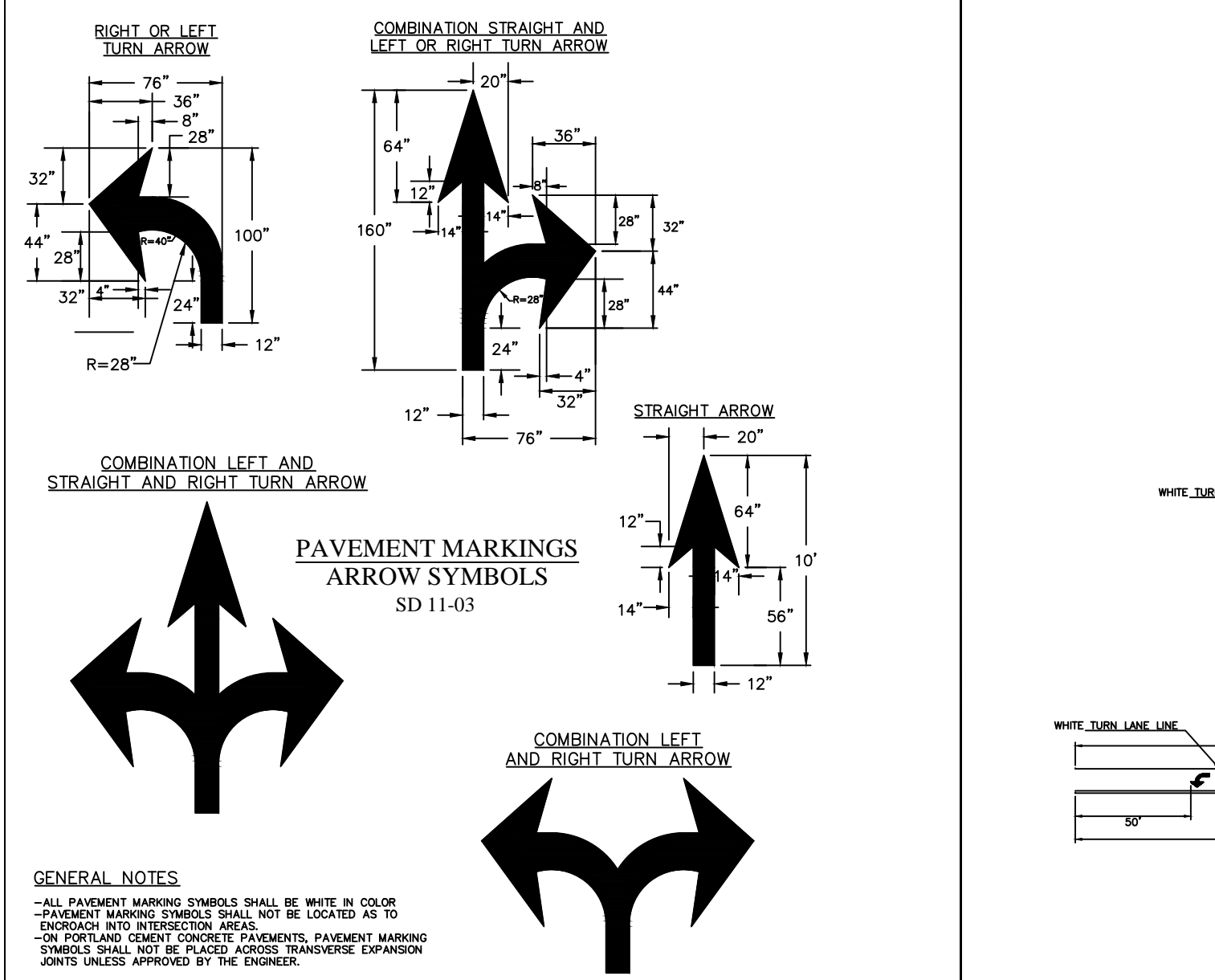
- In accordance with N.C.G.S. 136-44.14, all street curbs being constructed or reconstructed shall provide wheelchair ramps for the physically handicapped on each side of any street or road, where curbs and sidewalks are provided and at other major points of pedestrian flow.
- Wheelchair ramps shall be located as indicated in detail drawings; however, existing light poles, fire hydrants, drop inlets, etc. may affect placement.
- Curb ramps shall have detectable warnings extending the full width of the ramp and a minimum of 2-ft. in length.

CONSTRUCTION NOTES

- Construction shall conform with construction standards of the governing body which has jurisdiction of the particular street. concrete with the surface having a "A" finish.
- Wheelchair ramps shall be constructed of Class rough, non-skid type finish.
- A 1/2-in. expansion joint shall be required where the concrete wheelchair ramp joins any rigid pavement or structure.
- In no case shall the width of a curb ramp or curb cut be less than 40-in. (3-ft., 4-in.), not including the flared sides.
- Transitions from ramps to walks, gutters or streets shall be flush and free of abrupt changes.
- The maximum slope on the curb ramp run is 1:12.
- The maximum cross slope of the curb ramp is 1:50.
- Maximum slopes of adjoining gutters, road surface immediately adjacent to the curb ramp, or accessible route shall not exceed 1:20.
- Any raised islands in crossings shall be cut through level with the street or have curb ramps at both sides and a level area at least 48-in. long between the curb ramps.
- Detectable warnings shall consist of raised truncated domes with a diameter of nominal 0.9-in., a height of nominal 0.2-in. and a center-to-center spacing of nominal 2.35-in. and shall contrast visually with adjoining surfaces, either light-on-dark, or dark-on-light.

ADDITIONAL NOTES

- Stop bars shall be used where it is important to indicate the point behind which vehicles are required to stop in compliance with a traffic signal, stop sign or other legal requirement.
- Parking shall be eliminated a minimum of 20 feet back of the pedestrian crosswalk.
- All pavement markings shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices, published by the Federal Highway Administration. This document is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
- Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides.
- The bottom of diagonal (corner type) curb ramps at marked crossings shall have 48-in. minimum clear space within the markings.
- If diagonal curb ramps have flared sides, they shall have at least a 24-in. long segment of straight curb located on each side of the curb ramp and within the marked crossing.



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

Project Number: 2014-090
 DWG Name: 2014-090 Details.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record:
 Jason Henderson, P.E.
 South Carolina P.E. 22006
 Georgia P.E. 62071
 North Carolina P.E. 031306
 Alabama P.E. 32054

bluewater civil design, PLLC
 bluewatercivil.com • info@bluewatercivil.com
 19 Washington Park Suite 100 • Greenville, SC 29601

BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

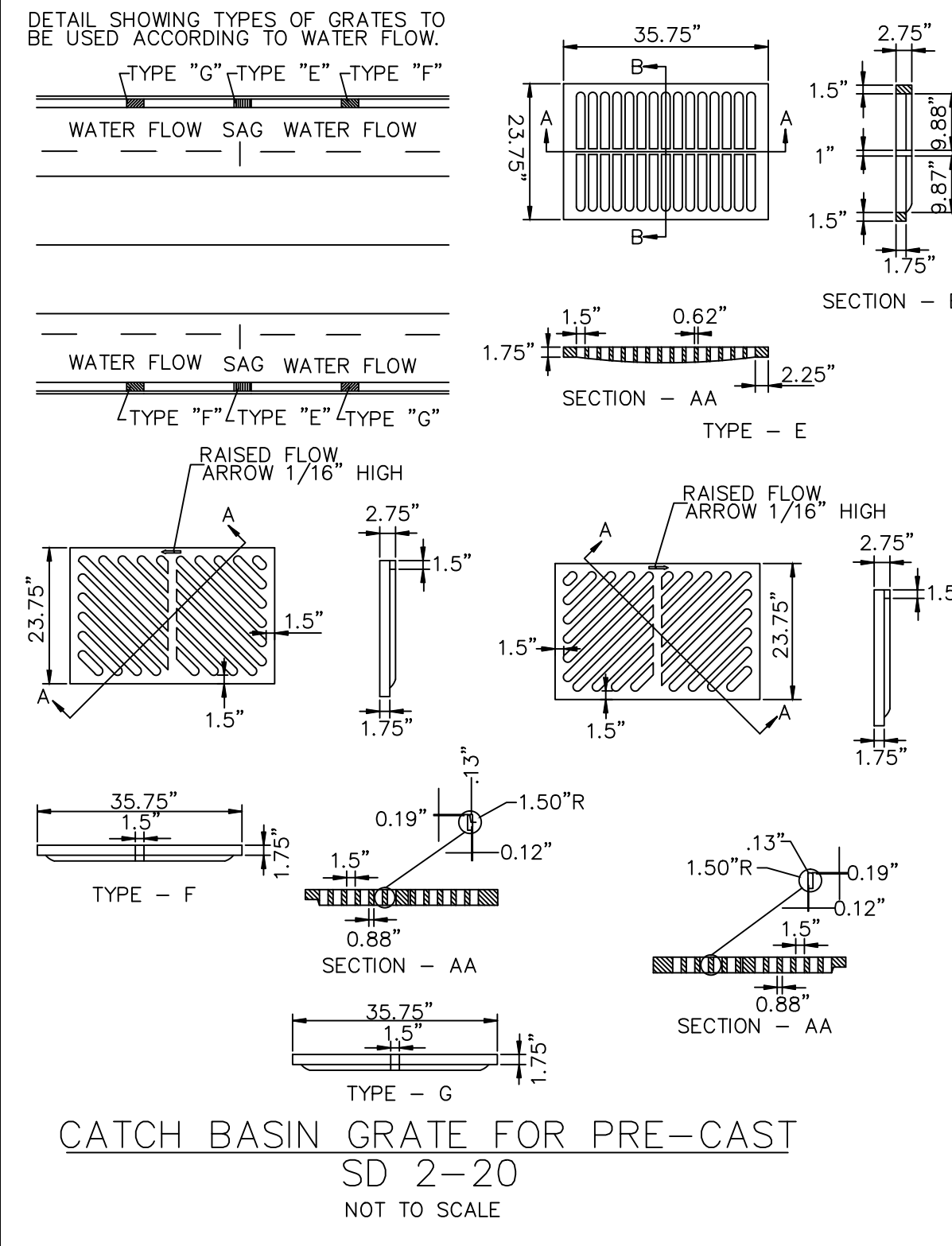
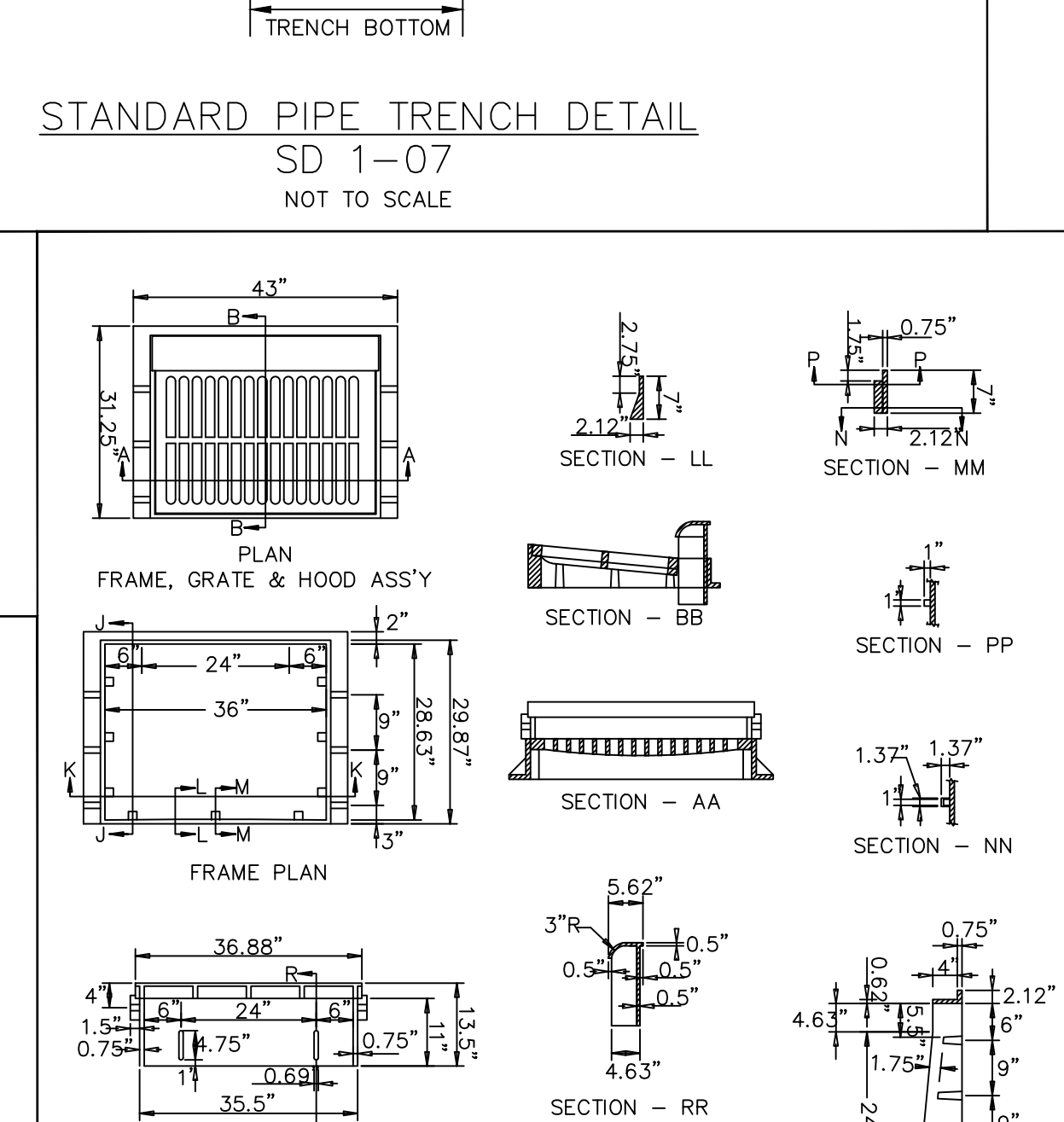
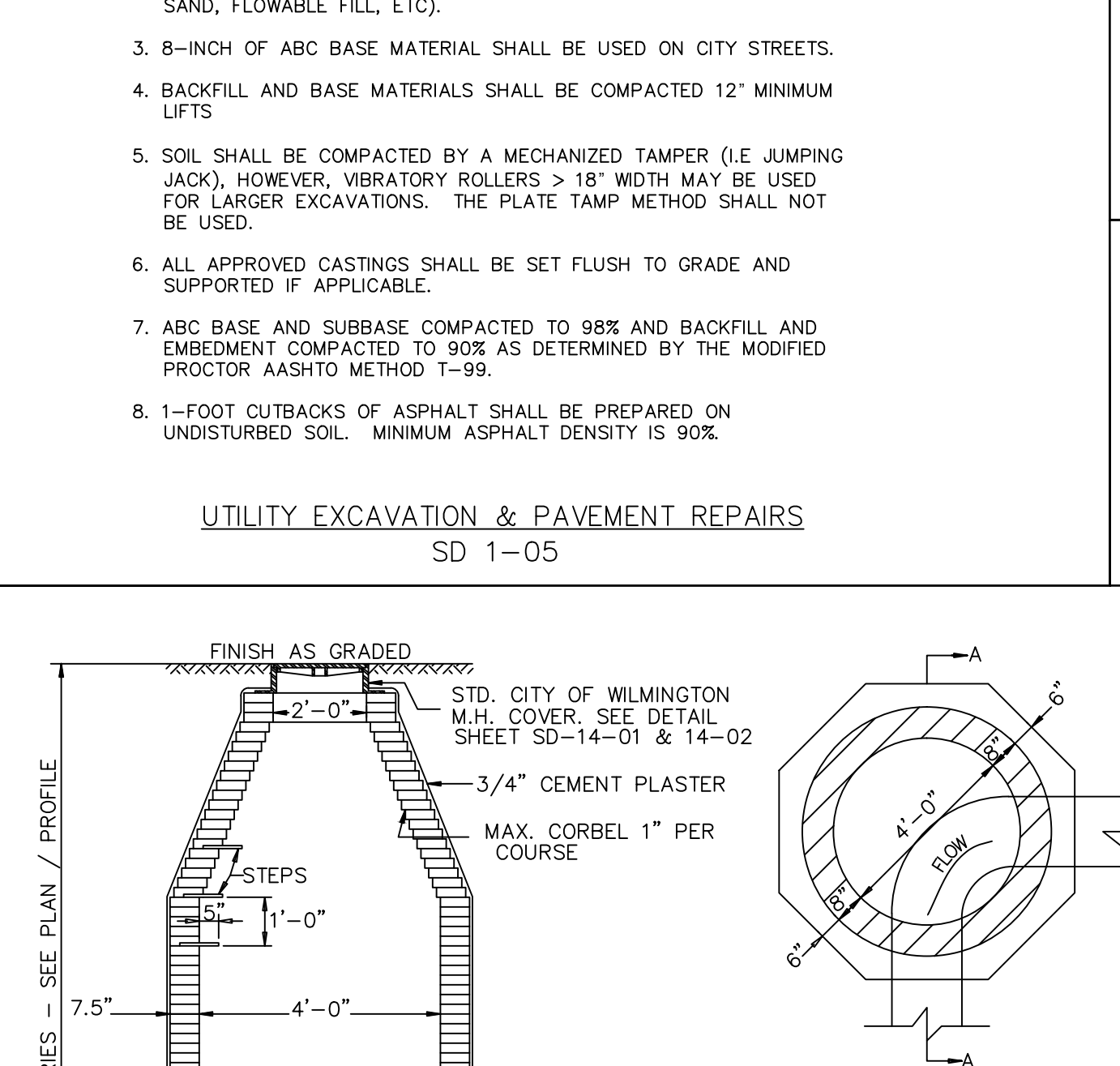
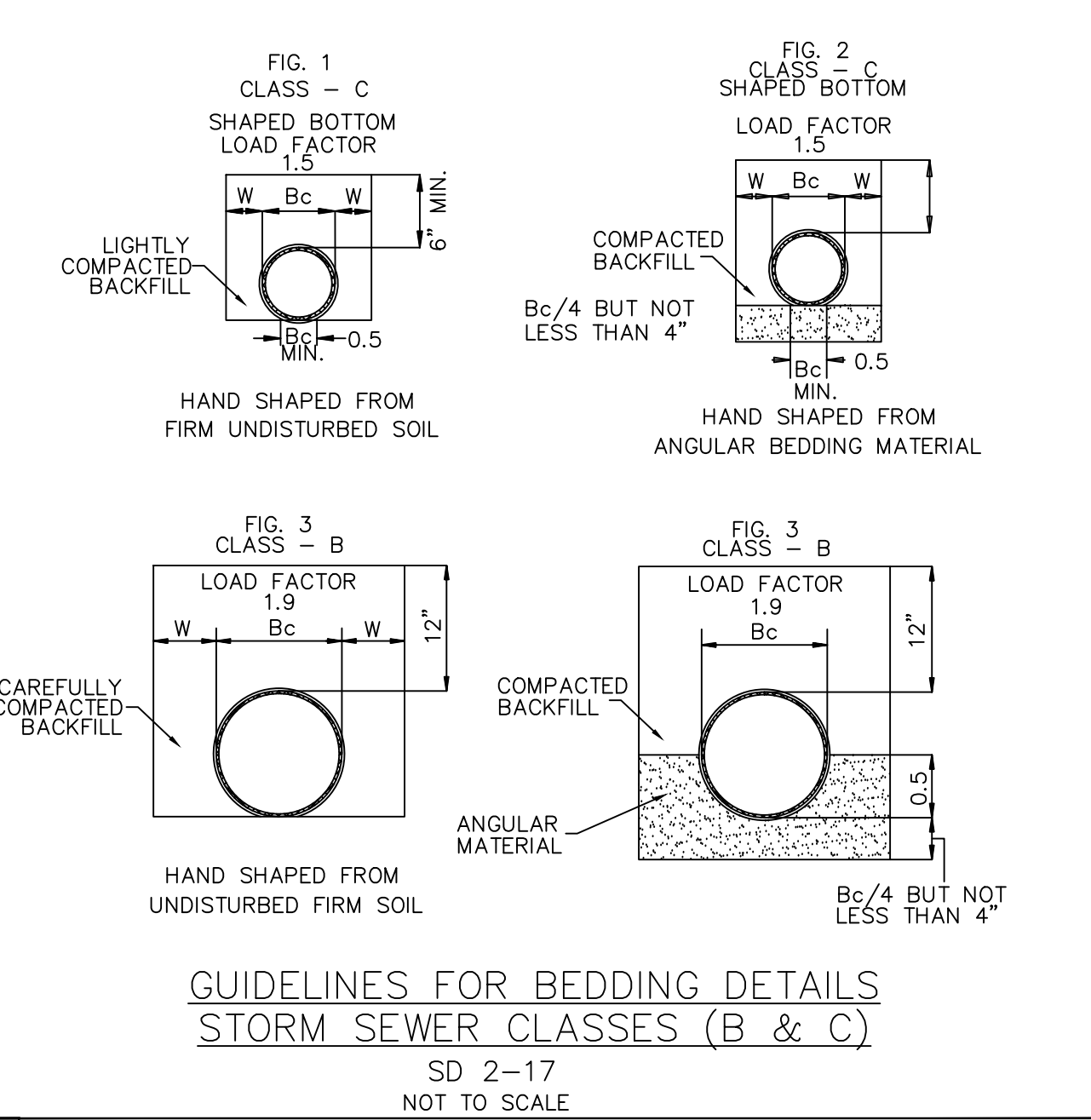
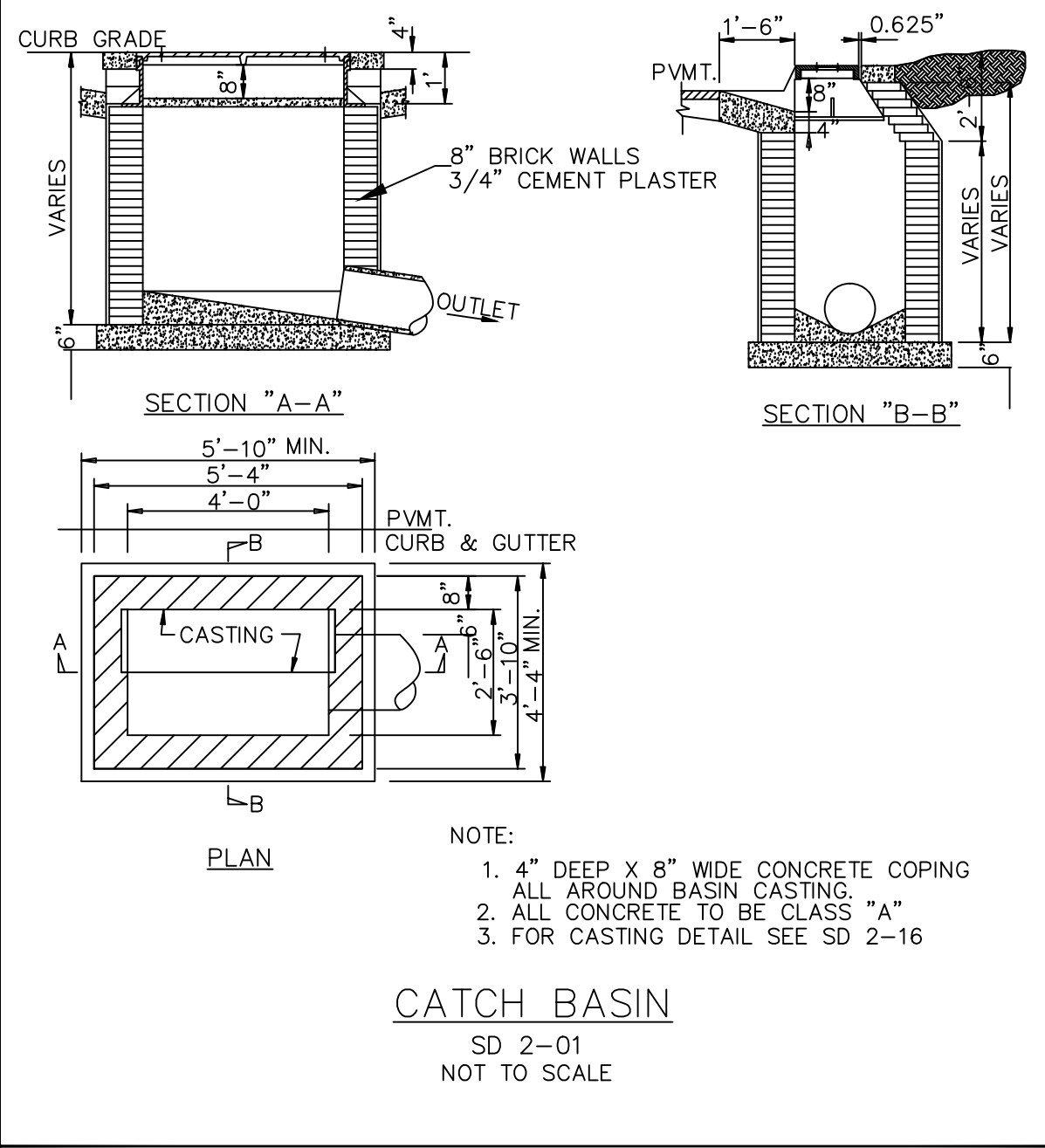
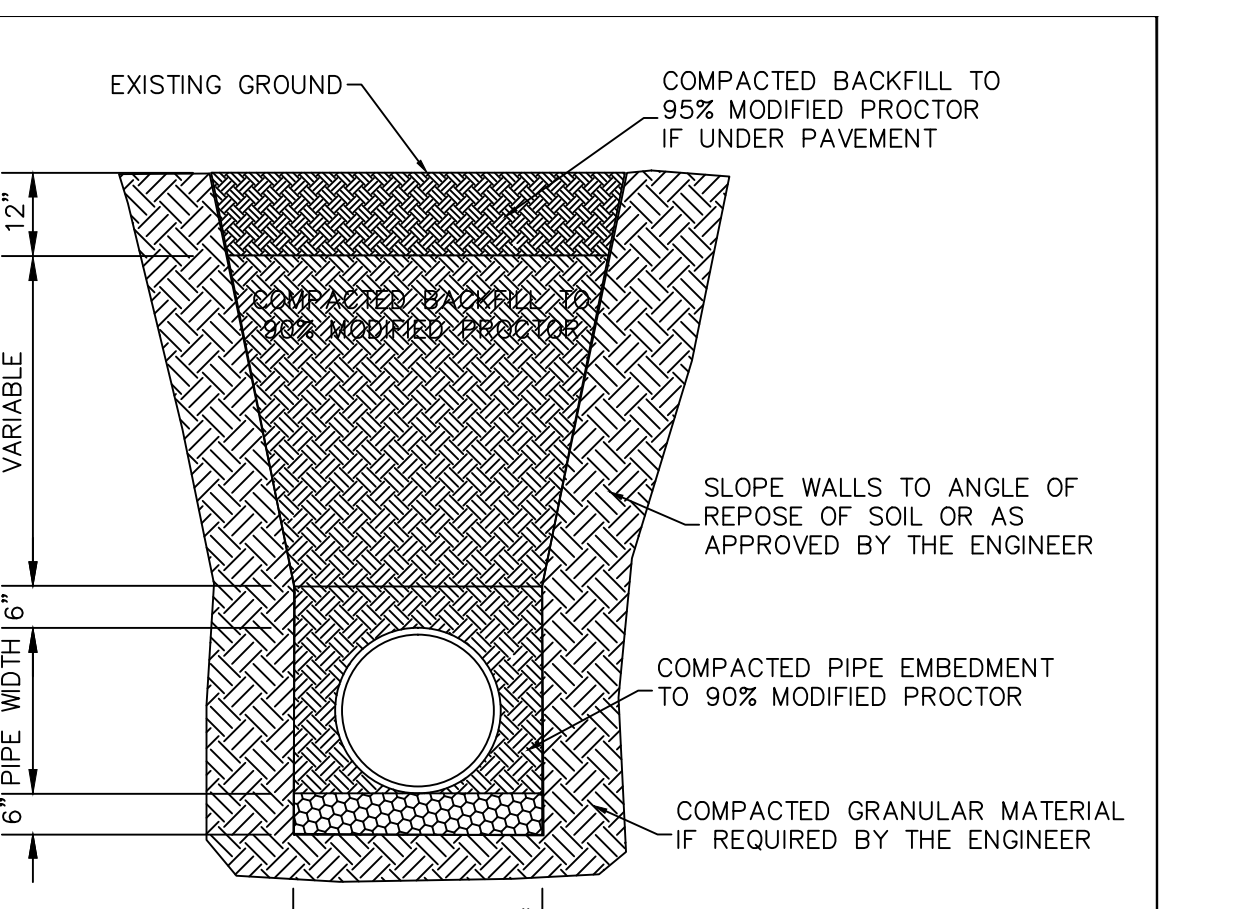
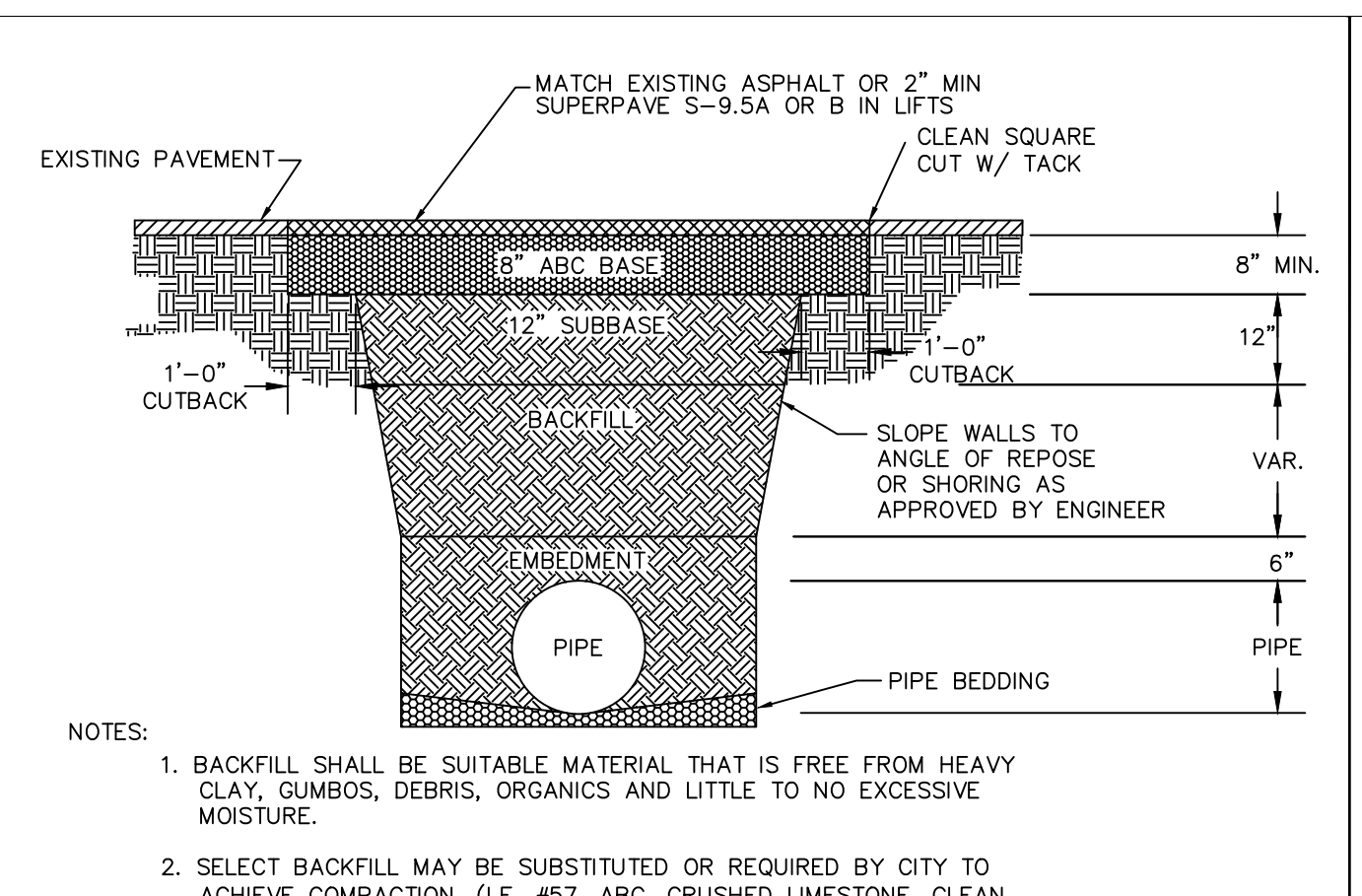
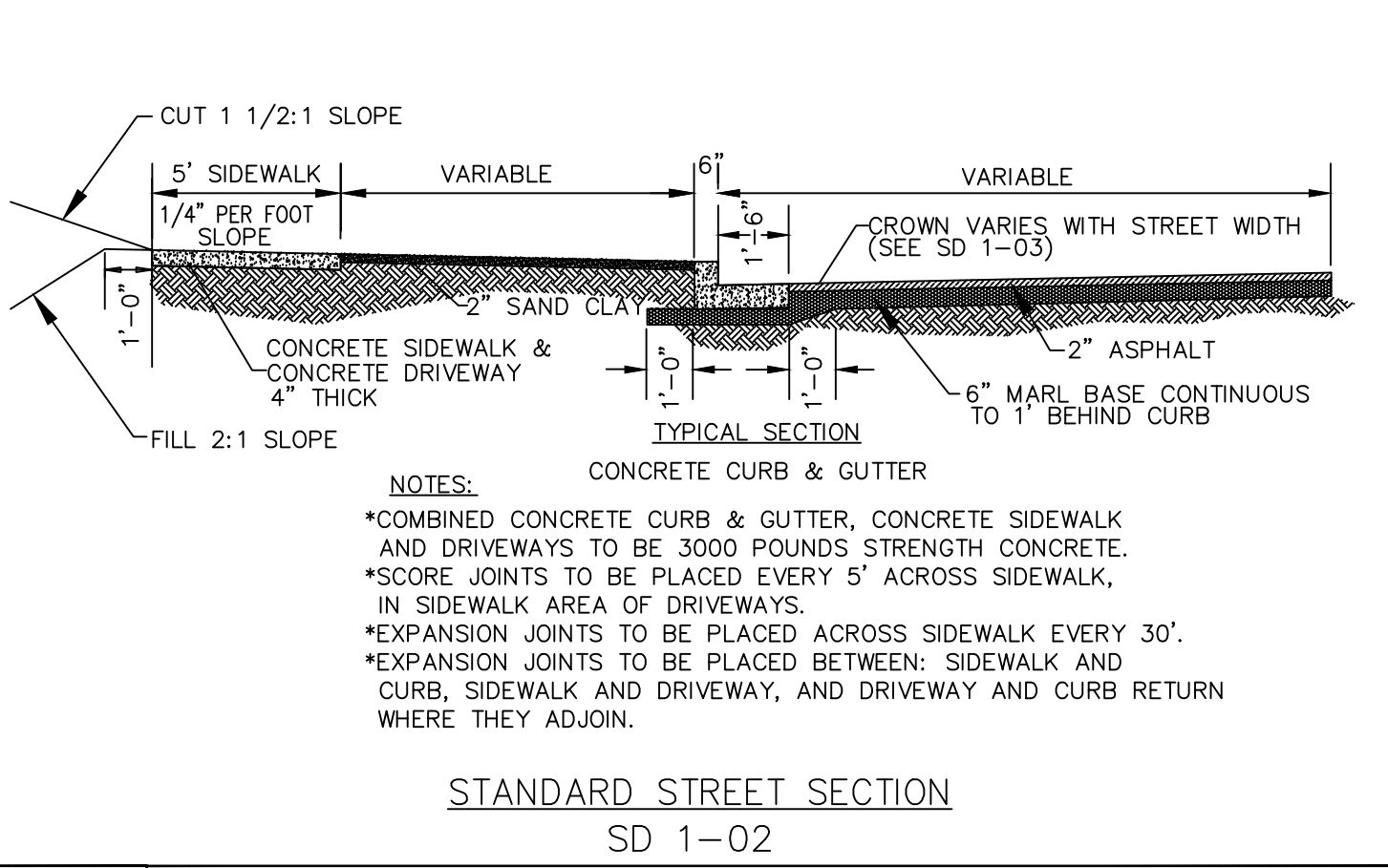
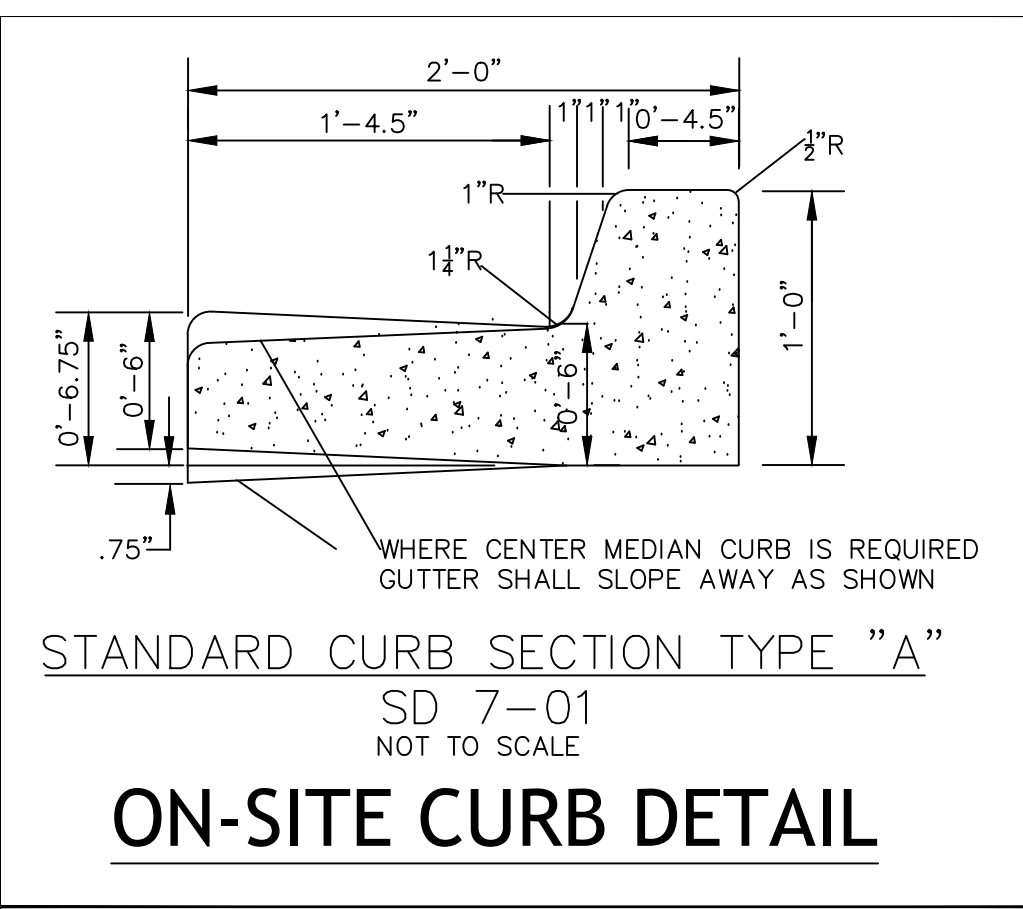
Approved Construction Plan
 Name: _____ Date: _____
 Planning: _____
 Traffic: _____
 Fire: _____

PROFESSIONAL ENGINEER
 NORTH CAROLINA
 4-30-2015
 No. 031306
 JASON HENDERSON

Bluewater Civil Design, PLLC
 No. 0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER NCDOT/WILMINGTON COMMENTS
...

NOTES & DETAILS
C506



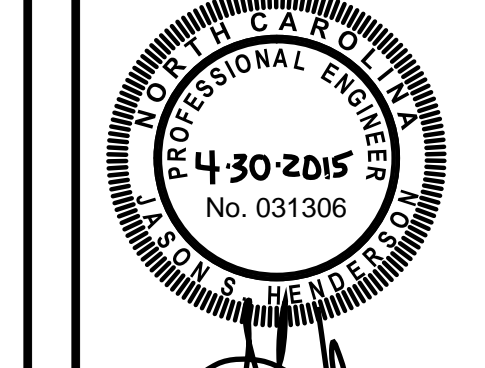
Project Number: 2014-090
DWG Name: 2014-090 Details.dwg
Drawing Scale: AS NOTED
Date of Project: 10-21-2014
Engineer of Record:
Jason Henderson, P.E.
South Carolina P.E. 22484
Georgia P.E. 62071
North Carolina P.E. 031306
Alabama P.E. 32054

blue WATER
civil design, PLLC
bluewatercivil.com • info@bluewatercivil.com
19 Washington Park Suite 100 • Greenville, SC 29601

Certificates of Authorization:
SC 04212 - GA PEF005865
NC P0868 - AL CA4065E

BRAGG ROAD DEV.
COMPANY, LLC
Bragg Drive
Wilmington, NC

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

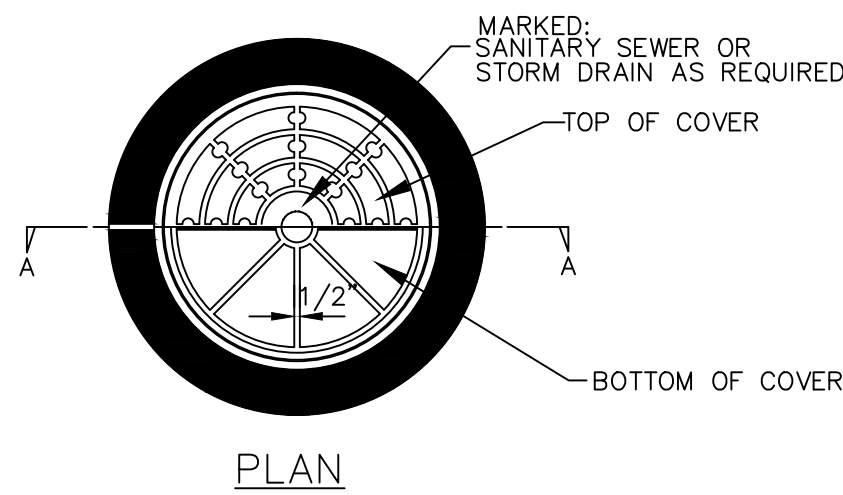


Bluewater Civil Design, PLLC
NC P-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
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...

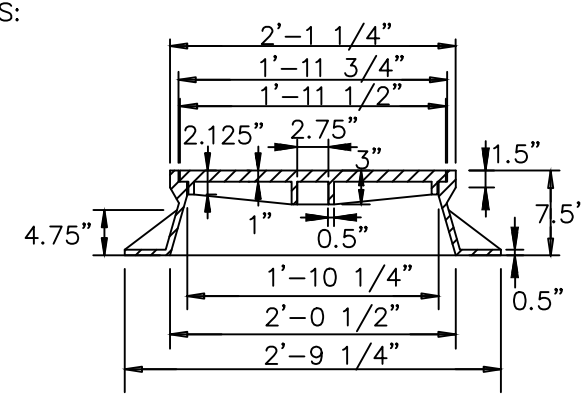
WILMINGTON
NORTH CAROLINA
Public Services • Engineering Division
APPROVED STORMWATER MANAGEMENT PLAN
Date: _____ Permit # _____
Signed: _____

C507

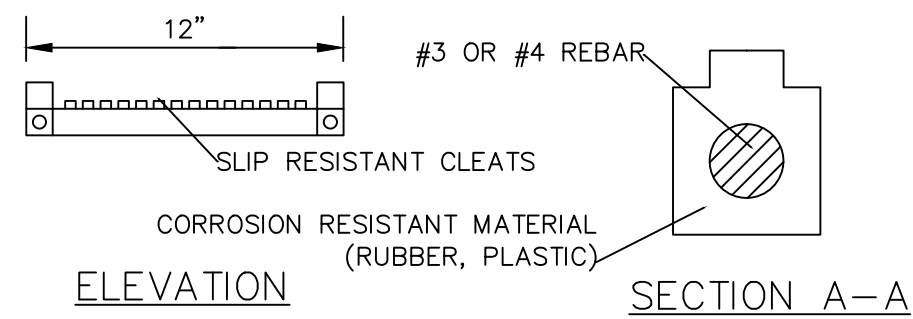
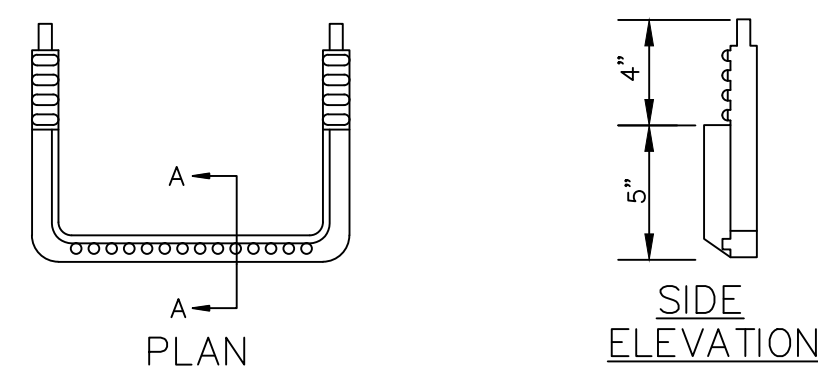


NOTE:
RING & COVER CONTACT SURFACES SHALL BE MACHINED SO AS TO INSURE EVEN BEARING OF COVER ON RING

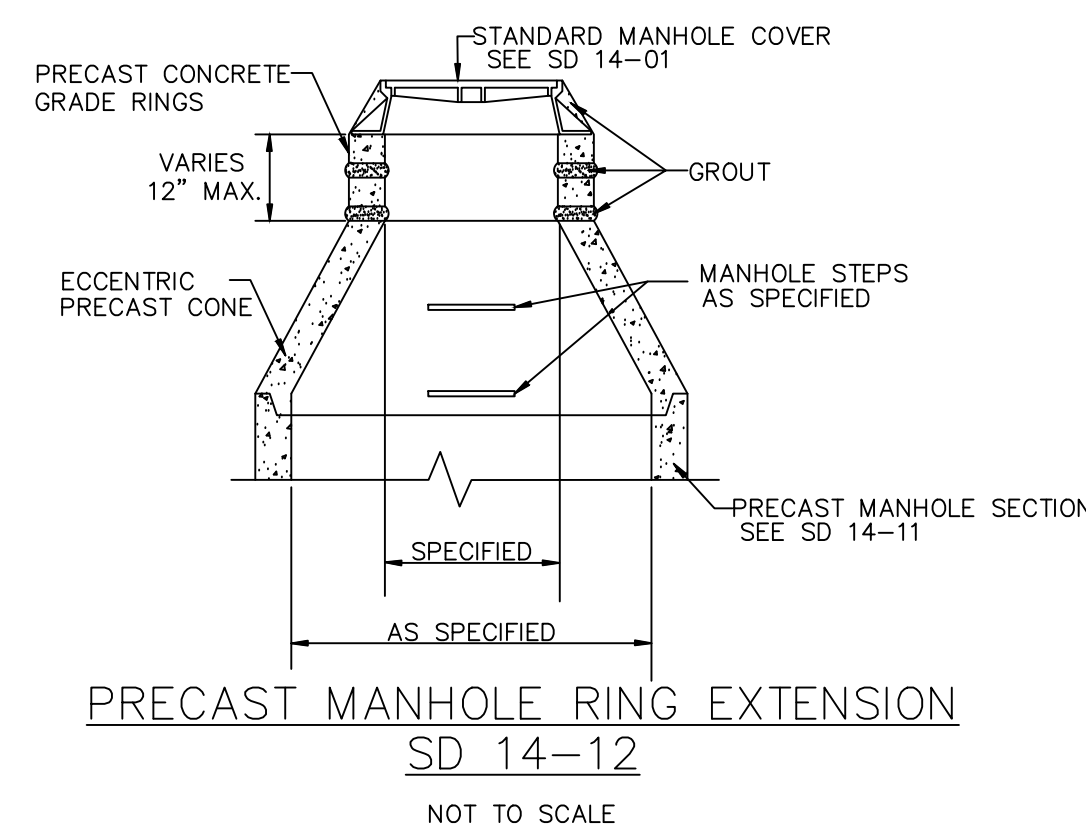
MINIMUM WEIGHTS:
RING 190 LBS.
COVER 120 LBS.



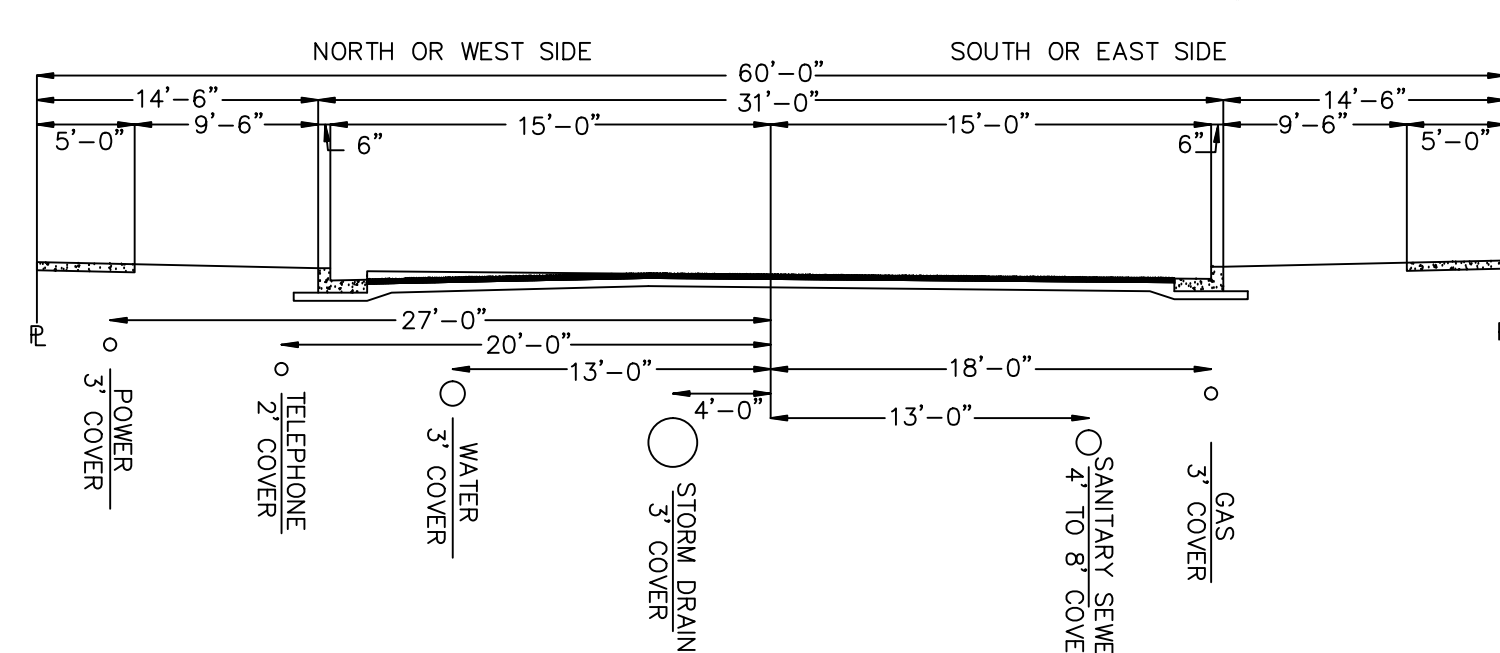
SECTION "A-A"
STANDARD MANHOLE RING AND COVER
SD 14-01
NOT TO SCALE



STANDARD SLIP RESISTANT MANHOLE STEP
SD 14-10
NOT TO SCALE



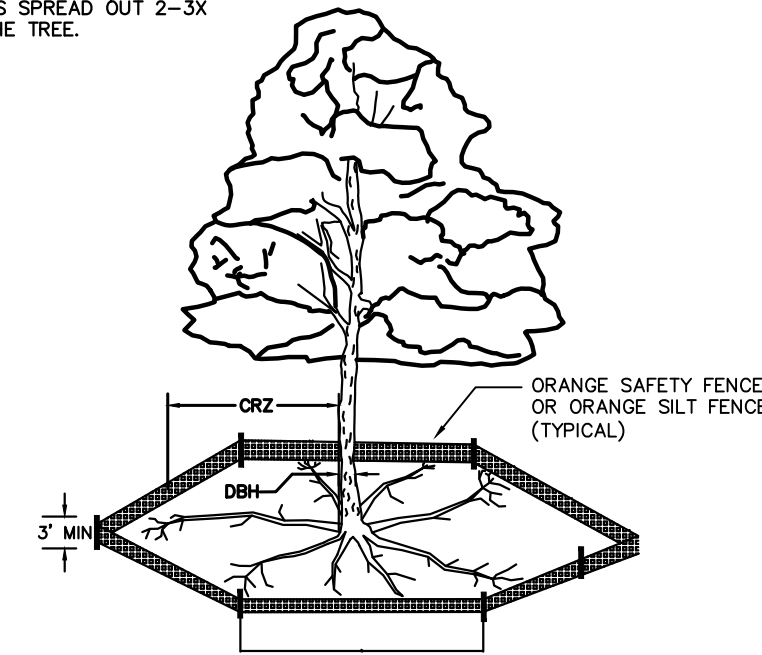
PRECAST MANHOLE RING EXTENSION
SD 14-12
NOT TO SCALE



NOTE:
WHEN POSSIBLE FLUSH MOUNTED OR BELOW GROUND DISTRIBUTION OR JUNCTION BOXES TO BE USED BY UTILITIES.

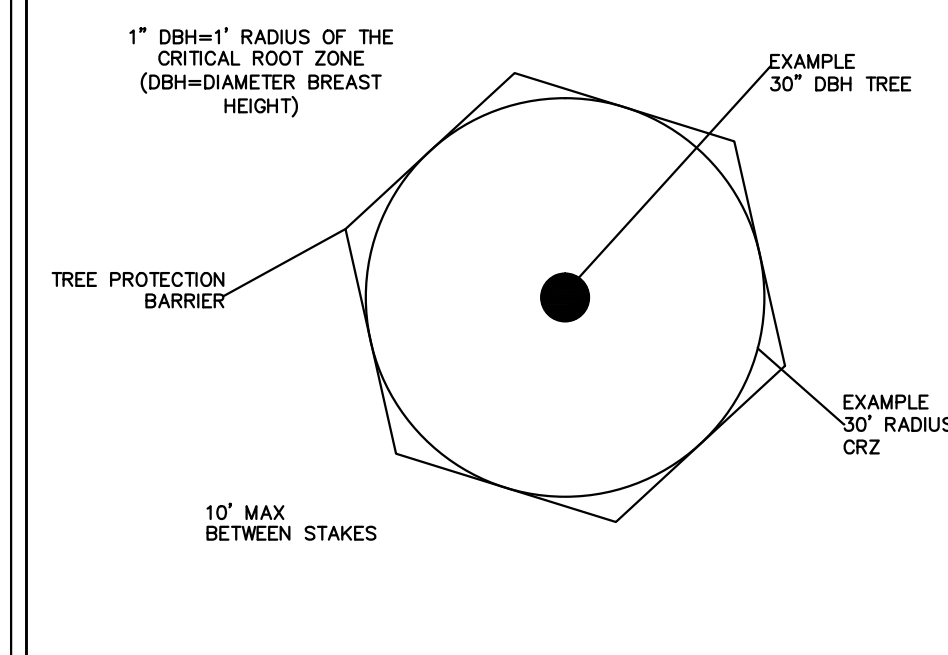
STANDARD UTILITY LOCATION
SD 15-05
NOT TO SCALE

NOTE:
THE CRITICAL ROOT ZONE (CRZ) OF A TREE'S ROOTS LAY 85% OF MOST TREE ROOTS ARE FOUND IN THE TOP 24" OF THE SOIL AND SUPPLY THE MAJORITY OF NUTRIENTS AND WATER. GENERALLY, ROOTS SPREAD OUT 2-3X THE HEIGHT OF THE TREE.



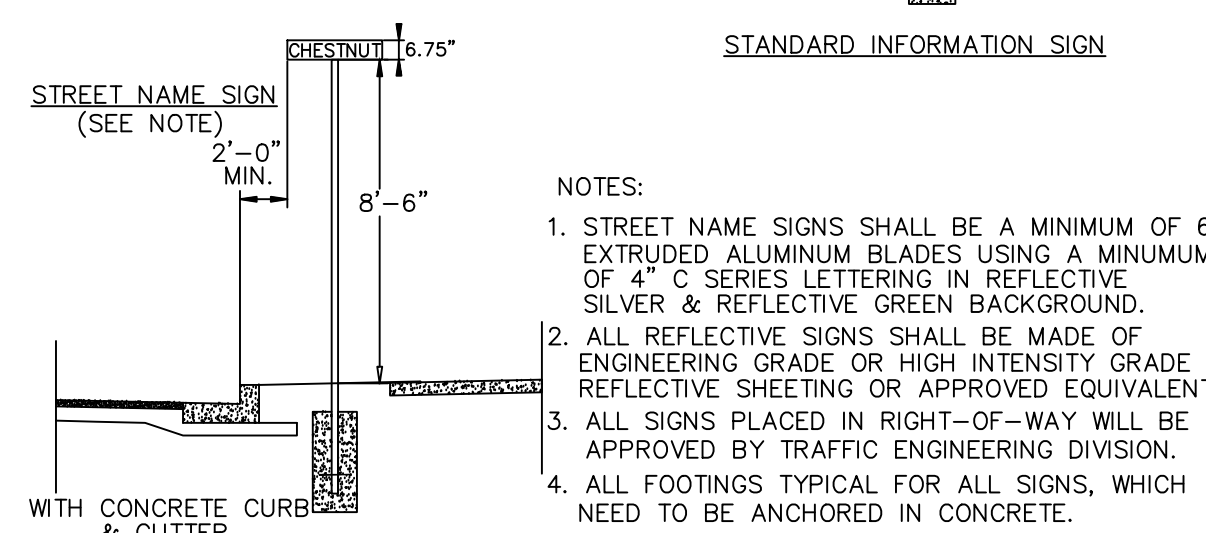
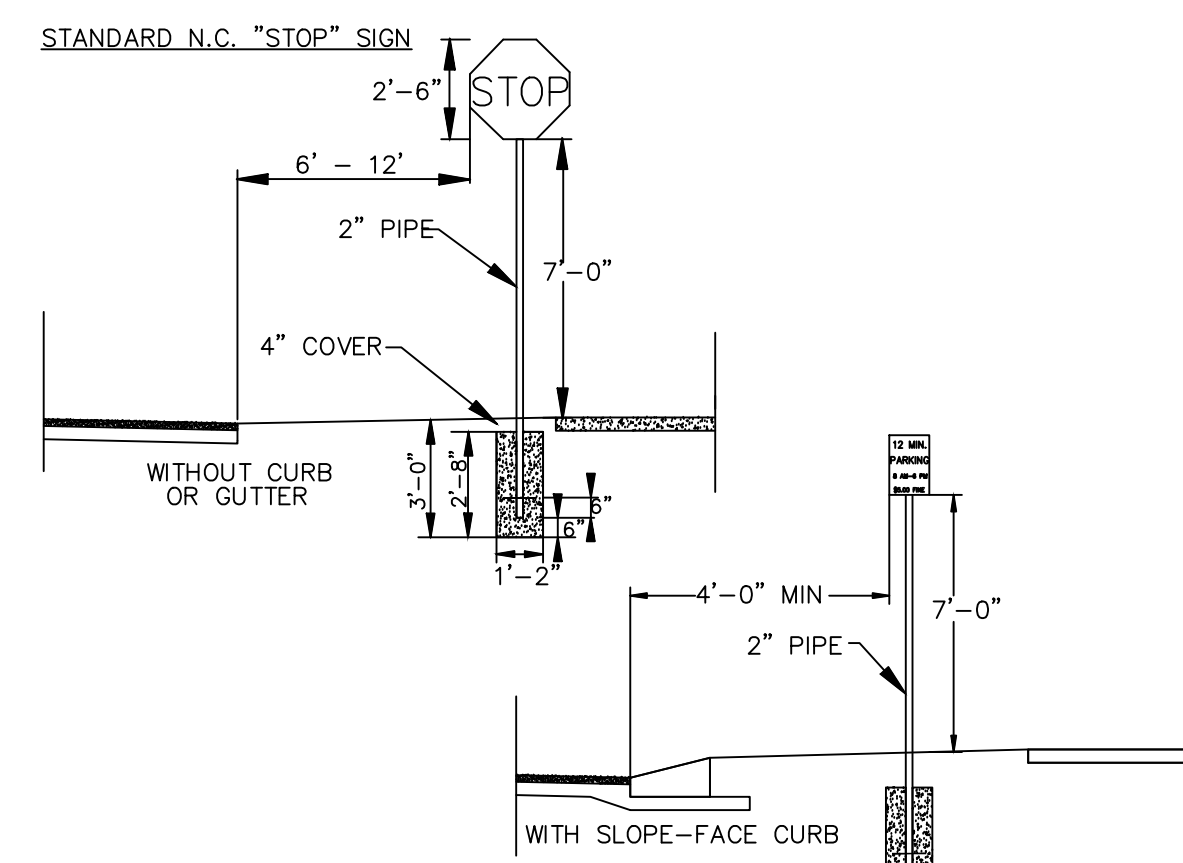
NOTES:
1. PROTECT CRITICAL ROOT ZONE (CRZ) OF TREES PRIOR TO CONSTRUCTION. CLEARLY MARK THE TREES AND ERECT A PROTECTIVE BARRIER AT THE CRZ. BARRIER SHALL BE MAINTAINED UNTIL CONSTRUCTION IS COMPLETE.
2. CRZ RADIUS IS 1 FT PER INCH OF TREE DIAMETER AT BREAST HEIGHT (DBH).
3. WHERE SIDEWALKS AND PATHWAYS PASS WITHIN CRZ, EXTRA CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE ROOTS. ALTERNATE CONSTRUCTION METHODS, SUCH AS A REINFORCED SIDEWALK, SHALL BE IMPLEMENTED AS NECESSARY.
4. FOR ALL TREES, CUTTING OF LARGE STRUCTURAL ROOTS LOCATED NEAR THE BASE OF THE TRUNK IS PROHIBITED. DO NOT COMPACT SOIL BENEATH TREES. NO VEHICLE SHALL BE ALLOWED TO PARK UNDER TREES. NO HEAVY MATERIALS SHALL BE STORED BENEATH TREES. DAMAGING THE BARK WITH LAWNMOWERS, CONSTRUCTION EQUIPMENT, OR ANYTHING ELSE IS PROHIBITED. CONTRACTOR SHALL REPAIR DAMAGE TO TREES.
5. FAILING TO INSTALL OR MAINTAIN PROTECTION MEASURES MAY RESULT IN A STOP WORK ORDER AND FINE OF \$500/DAY. DISTURBANCE OTHER THAN THAT ALLOWED ON THE APPROVED PLAN WILL REQUIRE OWNER TO POST A LETTER OF CREDIT FOR 3 YRS FOR TREE MITIGATION.

DATE: NOV. 2011	DRAWN BY: JSR	CITY OF WILMINGTON NORTH CAROLINA
CHECKED BY: BDM, P.E.	SCALE: NOT TO SCALE	CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON, NC 28402 (910) 341-7807
STANDARD DETAIL TREE PROTECTION DURING CONSTRUCTION		SD 15-09

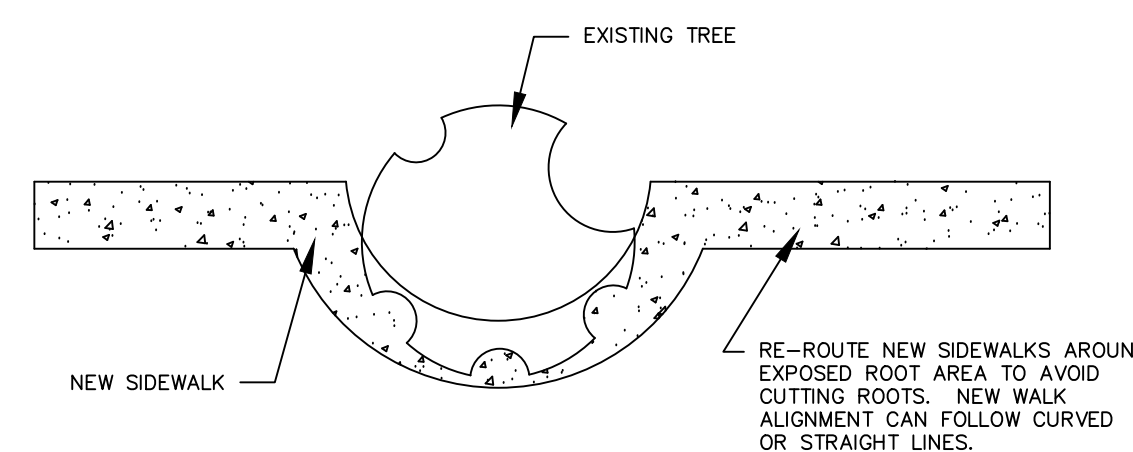
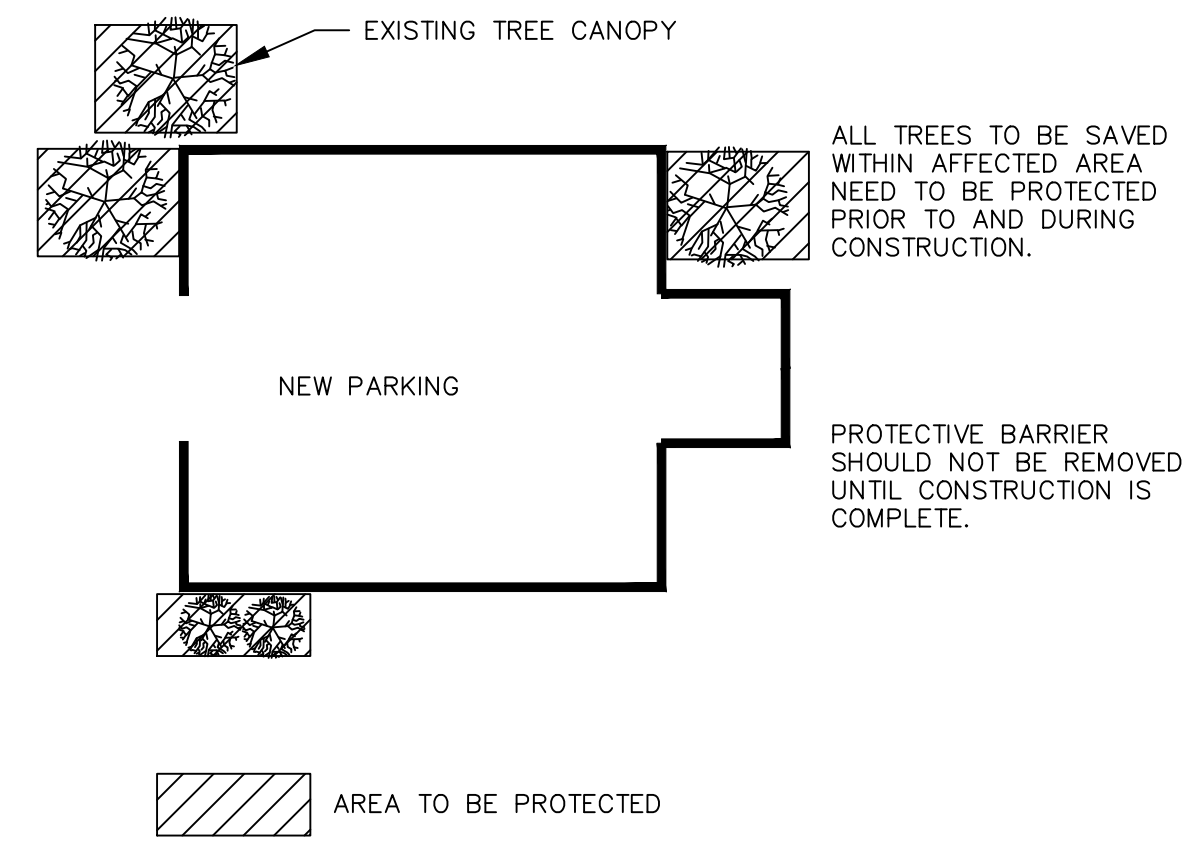


NOTE: DRAWINGS ARE NOT TO SCALE. USE AS A GUIDE FOR DETERMINING MINIMUM CRZ.

DATE: NOV. 2011	DRAWN BY: JSR	CITY OF WILMINGTON NORTH CAROLINA
CHECKED BY: BDM, P.E.	SCALE: NOT TO SCALE	CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON, NC 28402 (910) 341-7807
STANDARD DETAIL TREE PROTECTION DURING CONSTRUCTION		SD 15-09

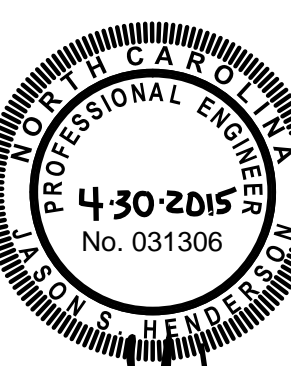


STANDARD SIGN INSTALLATION LOCATION
SD 15-03
NOT TO SCALE



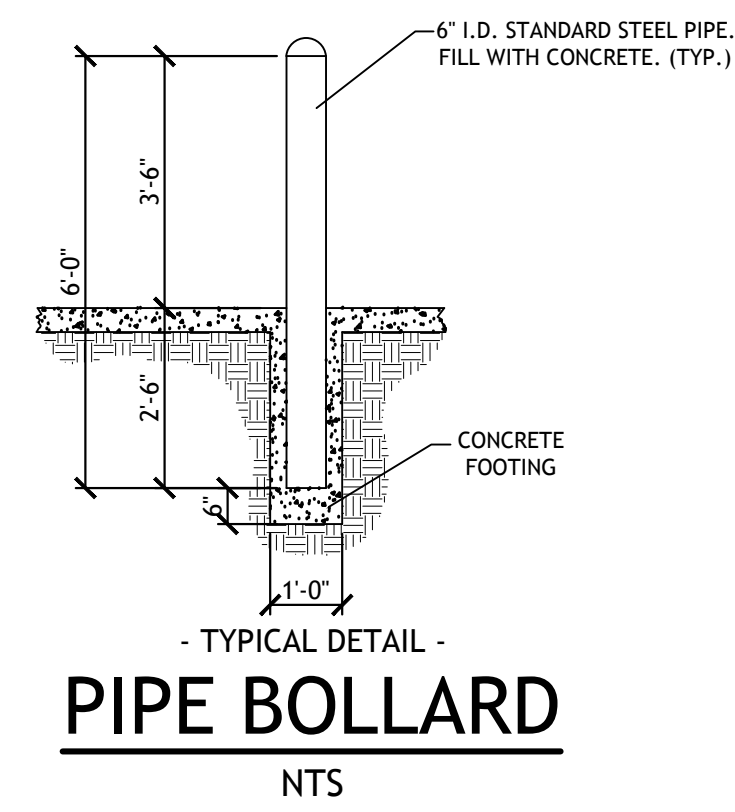
EXISTING TREE PROTECTIVE BARRIERS
SD 15-15

Approved Construction Plan	Name	Date
	Planning	
	Traffic	
	Fire	

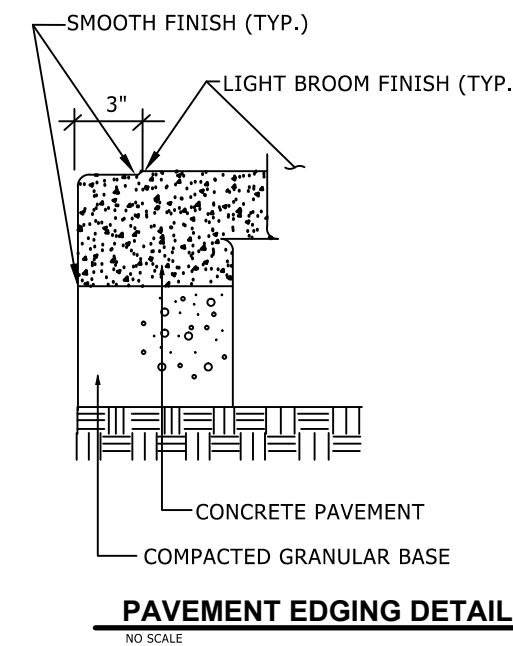


Bluewater Civil Design, PLLC
No. 0868

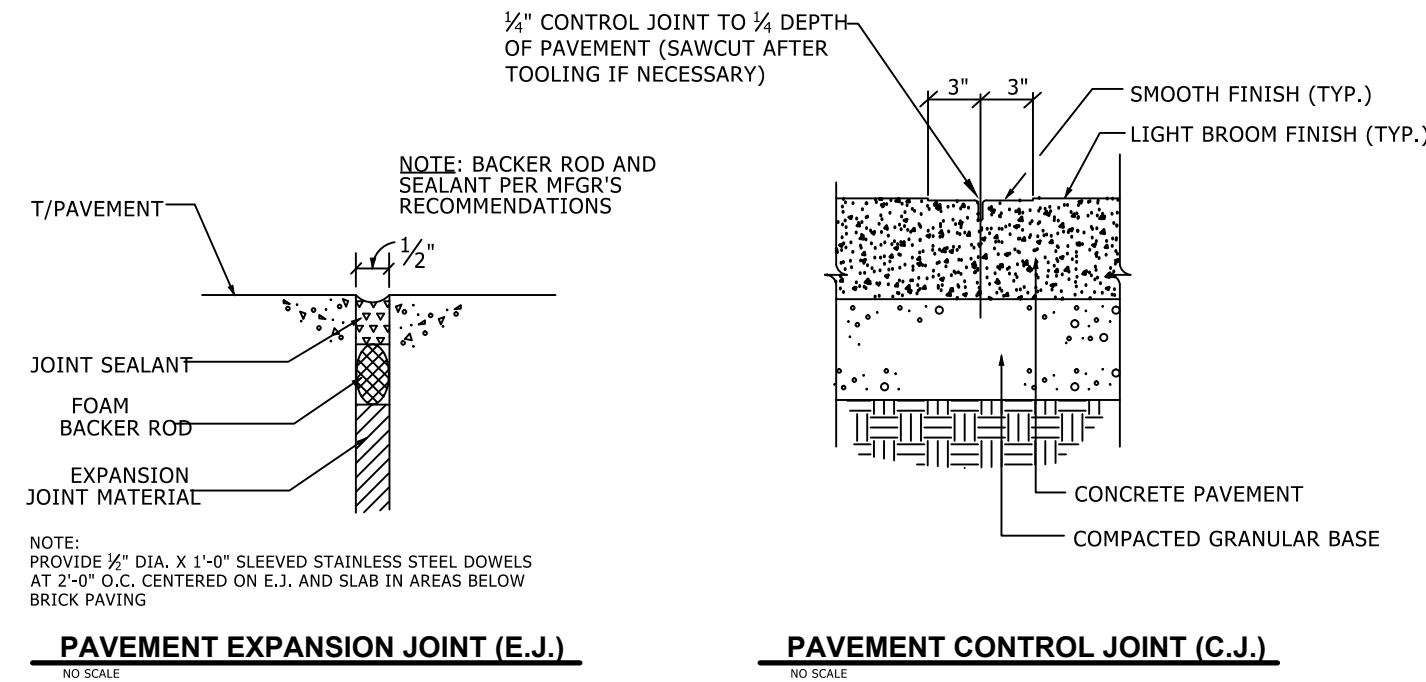
PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
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E	4-30-2015	REVISED PER HCOOT/WILMINGTON COMMENTS
...



- TYPICAL DETAIL -
PIPE BOLLARD
NTS

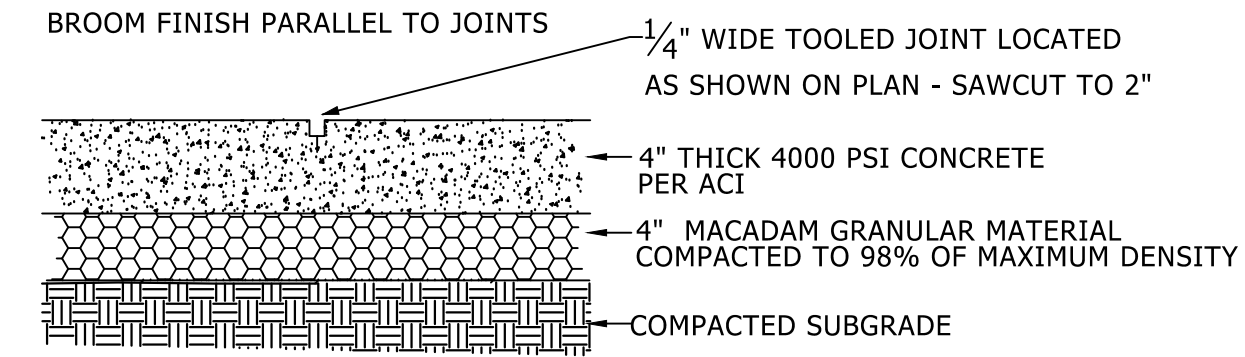


PAVEMENT EDGING DETAIL
NO SCALE



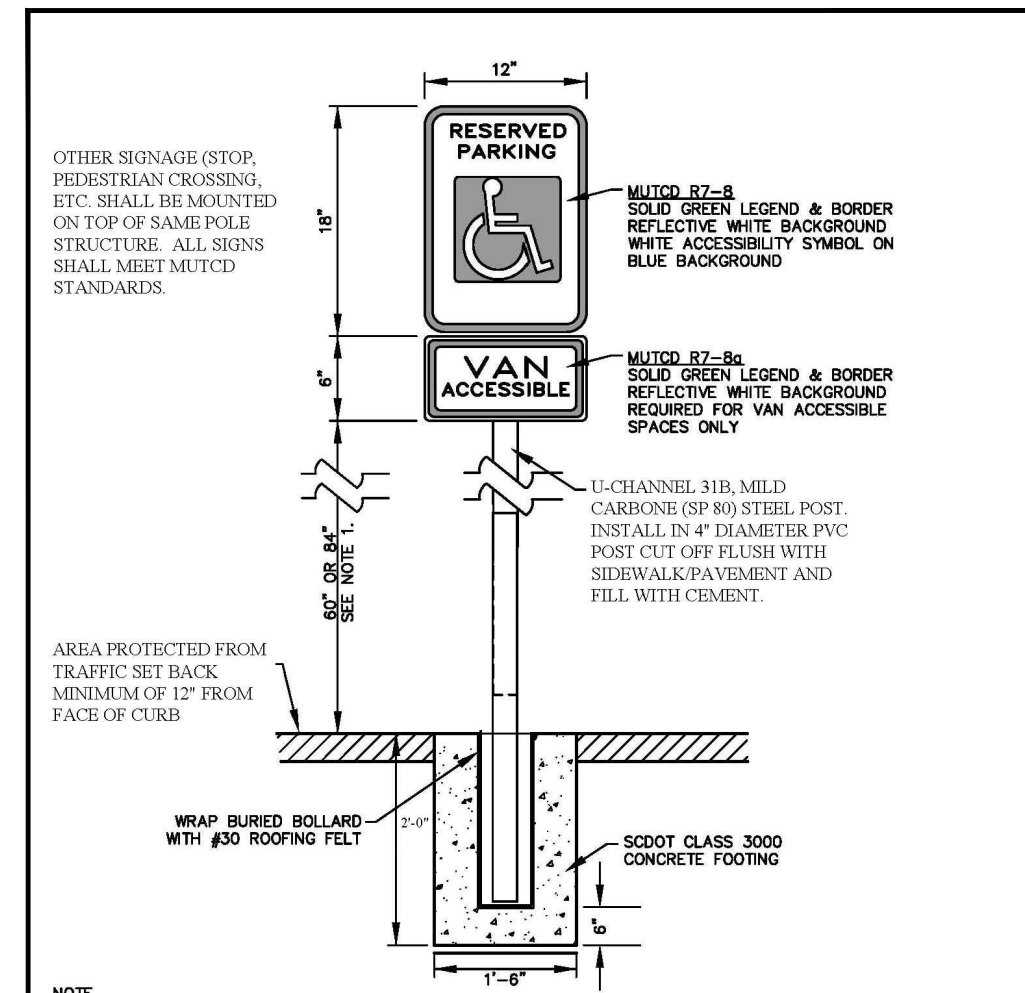
PAVEMENT EXPANSION JOINT (E.J.)
NO SCALE

- TYPICAL DETAIL -
CONCRETE SIDEWALK FINISHES (ON-SITE)
NTS



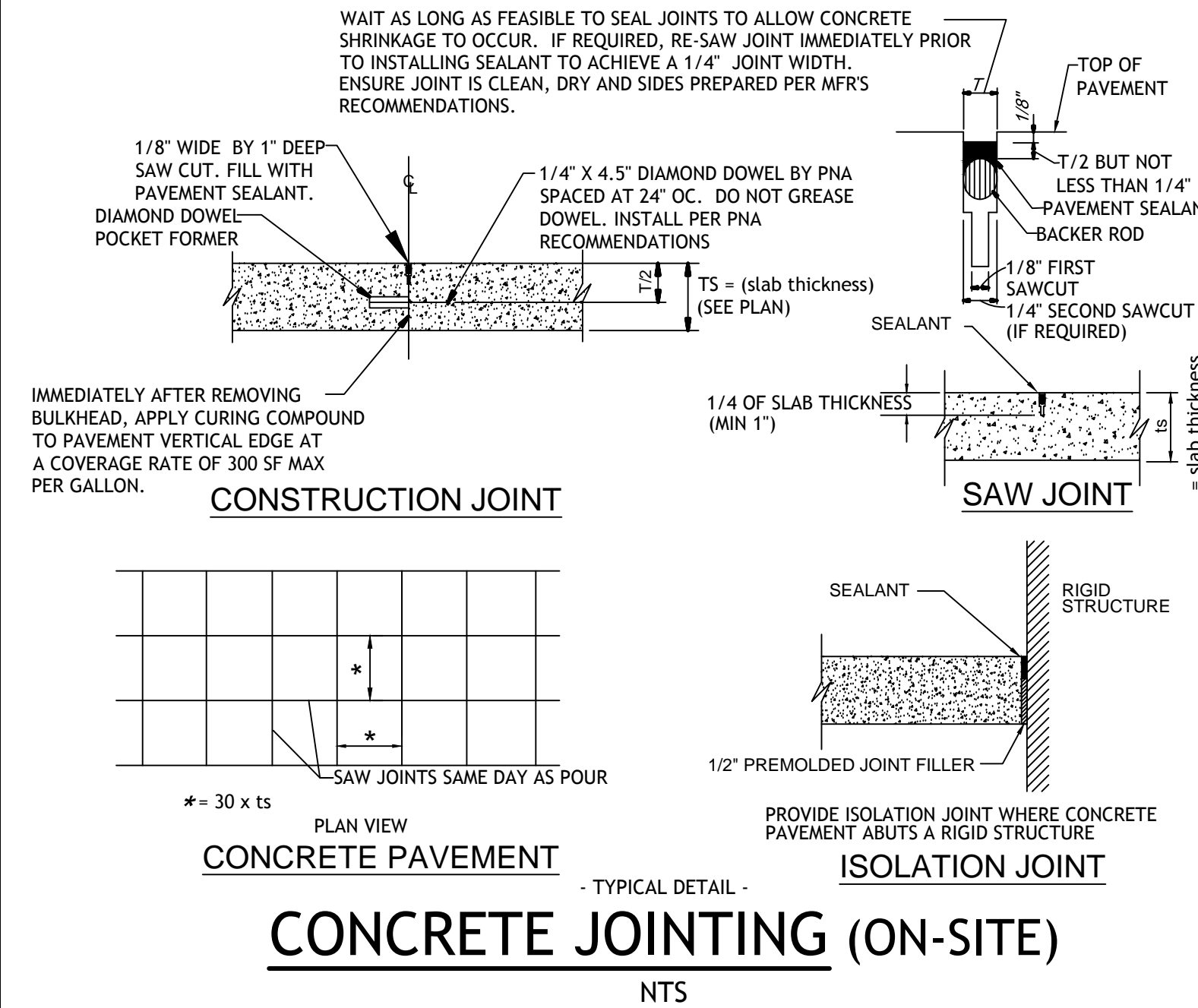
NOTES:
EXPANSION JOINTS SHALL BE INSTALLED SUCH THAT NO SINGLE DIMENSION EXCEEDS 40 FT AND ALSO AREA BETWEEN EXPANSION JOINTS NOT TO EXCEED 250 SQ.FT. SEAL ALL EXPANSION JOINTS.
1/2" EXPANSION PAPER SHALL BE PLACED AT ALL LOCATIONS THAT NEW SIDEWALK ABUTS CONCRETE CURB, EXISTING SIDEWALK, LIGHTPOLE BASES AND RETAINING WALLS.
SEAL ALL EXPANSION JOINTS.
SNAP-CAP EXPANSION JOINT STRIPS CAN BE USED ON ALL EXPANSION JOINTS.

- TYPICAL DETAIL -
CONCRETE SIDEWALK (ON-SITE)
NTS



NOTE:
1. 12" x 18" ACCESSIBILITY SIGN (87-8) SHALL BE MOUNTED 7" FROM FINISH GRADE TO BOTTOM EDGE OF SIGN FACE. MOUNTING HEIGHT MAY BE REDUCED TO 5" IF PLACED IN A LANDSCAPE AREA IN WHICH PEDESTRIANS ARE NOT EXPECTED TO USE.
2. BOLLARD MAY BE OMITTED IF INSTALLED IN LANDSCAPE AREAS. WHEN INSTALLED IN LANDSCAPE AREAS, MOUNTING POST SHALL BE DESIGN A MINIMUM OF 3" BELOW FINISH GRADE. ALTERNATE MOUNTING POSTS MUST BE APPROVED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION.
3. SIGNAGE SHALL BE INSTALLED IN FRONT OF EACH ACCESSIBLE SPACE, CENTERED ON THE WIDTH OF THE SPACE.
4. REFER TO AMERICANS WITH DISABILITIES ACT AND ARCHITECTURAL BARRIERS ACT ACCESSIBILITY GUIDELINES (ADAAG), LATEST EDITION, FOR REQUIRED NUMBER OF ACCESSIBLE SPACES. PER ADAAG, ONE VAN ACCESSIBLE SPACE SHALL BE PROVIDED, MINIMUM, WITH ADDITIONAL VAN ACCESSIBLE SPACES PER ADAAG REQUIREMENTS.
5. ALL SIGNAGE SHALL BE ENGINEER GRADE, .080 ALUMINUM REFLECTIVE SIGN MEETING THE REQUIREMENTS OF THE MUTCD AND ADAAG.

- TYPICAL DETAIL -
A.D.A. SIGNAGE (ON SITE)
NTS



- TYPICAL DETAIL -
CONCRETE JOINTING (ON-SITE)
NTS

Project Number: 2014-090
DWG Name: 2014-090 Details.dwg
Drawing Scale: AS NOTED
Date of Project: 10-21-2014
Engineer of Record:
Jason Henderson, P.E.
South Carolina PE# 22894
Georgia PE# 63071
North Carolina PE# 031306
Alabama PE# 32054

bluewater
civil design, PLLC
bluewatercivil.com • info@bluewatercivil.com
19 Washington Park Suite 100 • Greenville, SC 29601

Certificates of Authorization:
SC C04212 - GA PEF005865
NC P0868 - AL CA4065E

BRAGG ROAD DEV.
COMPANY, LLC
Bragg Drive
Wilmington, NC

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



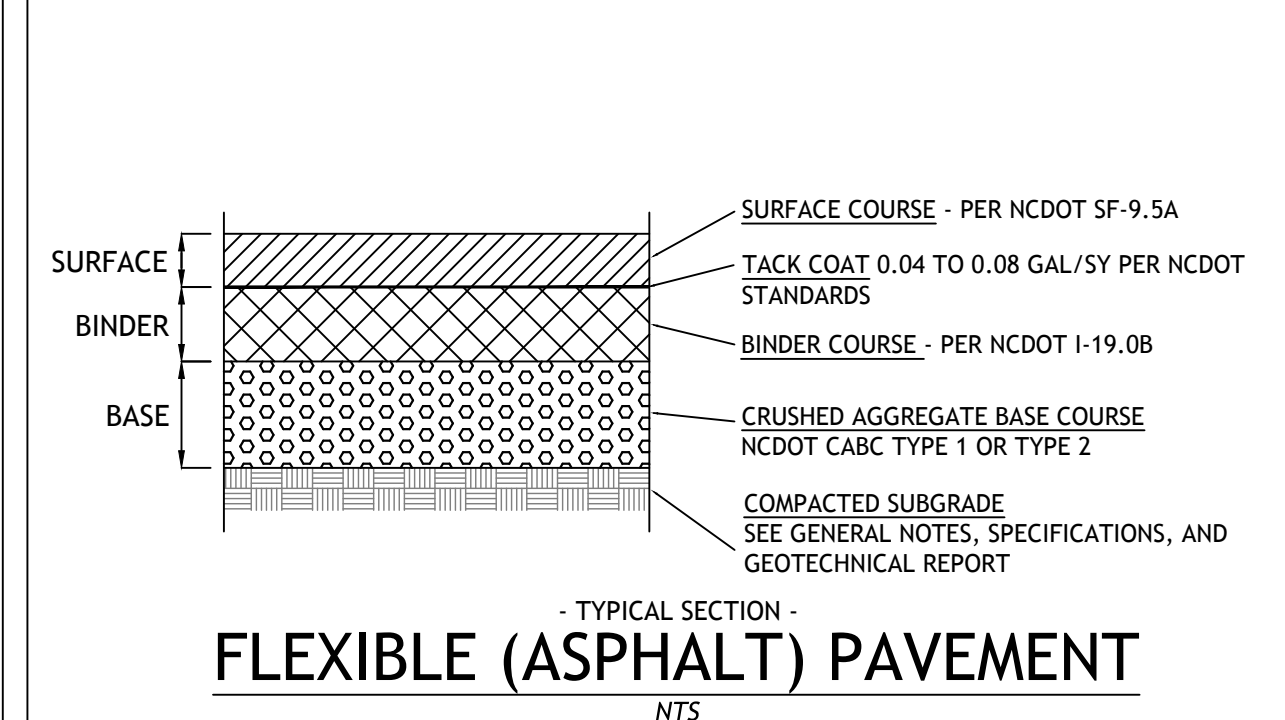
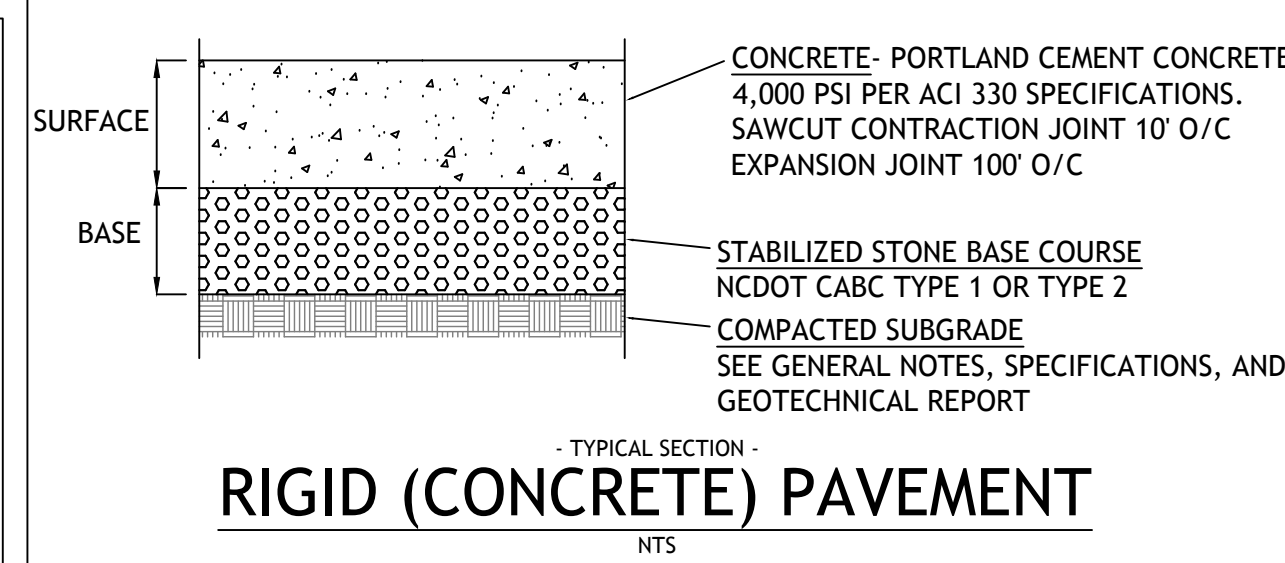
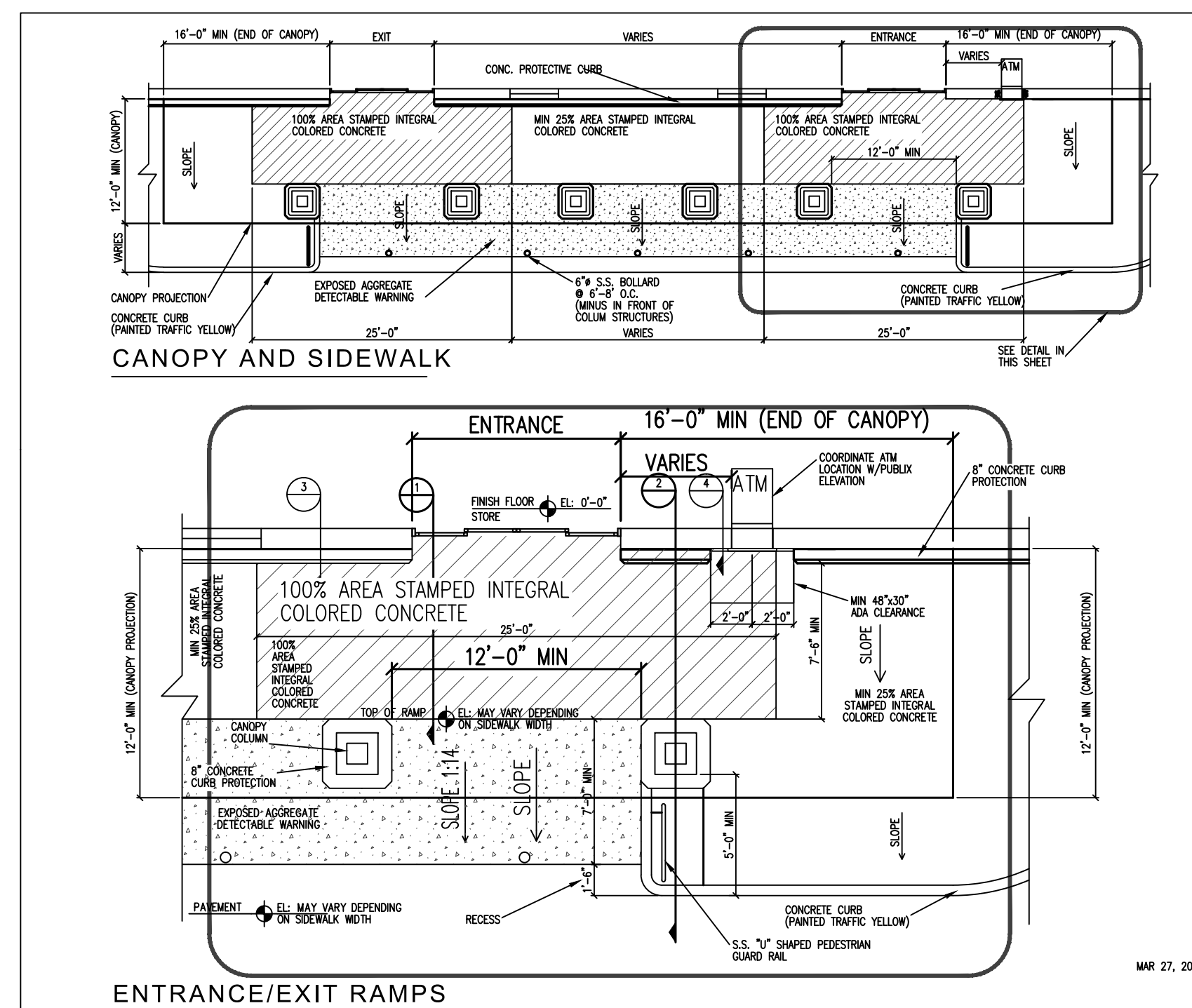
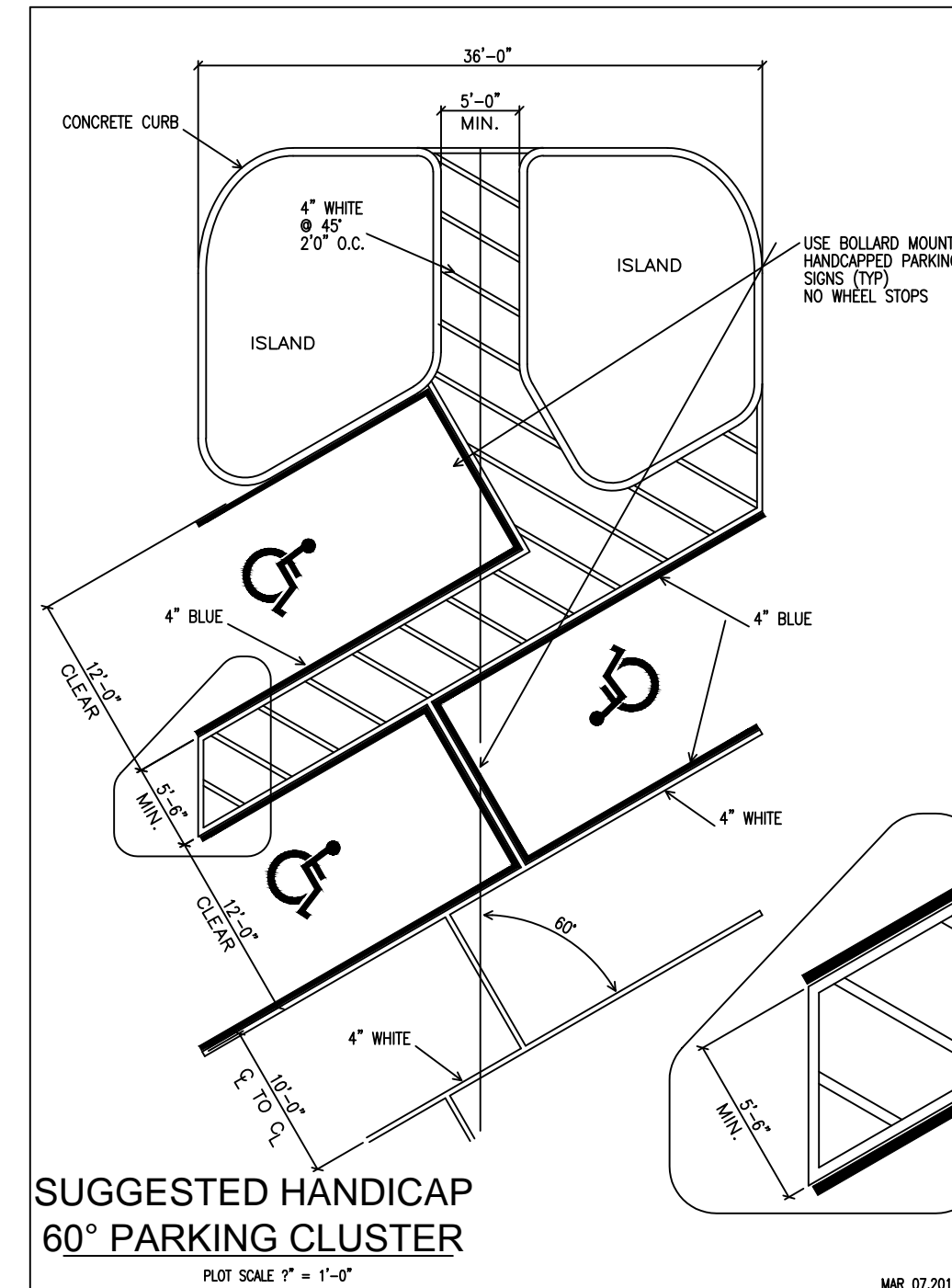
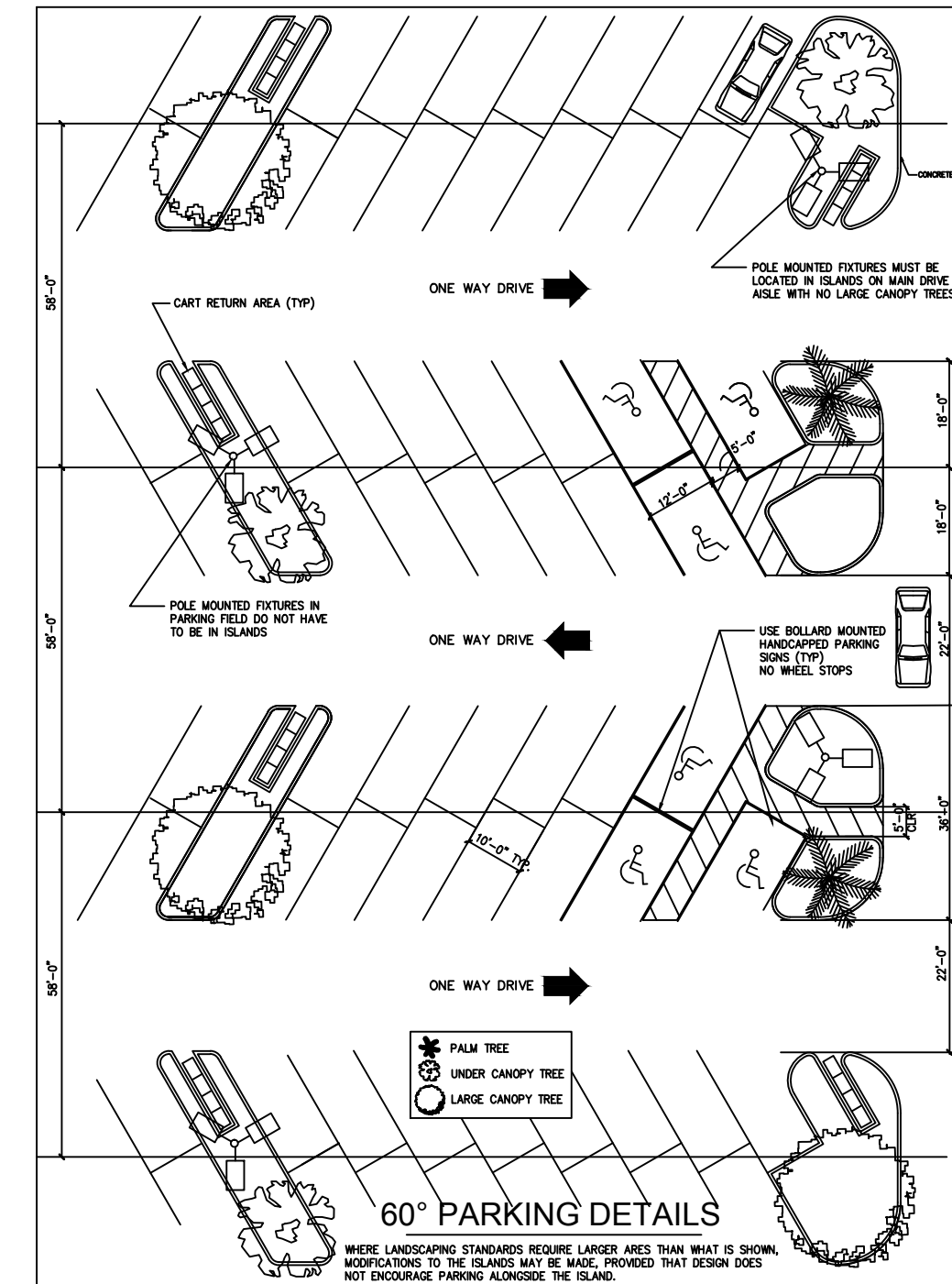
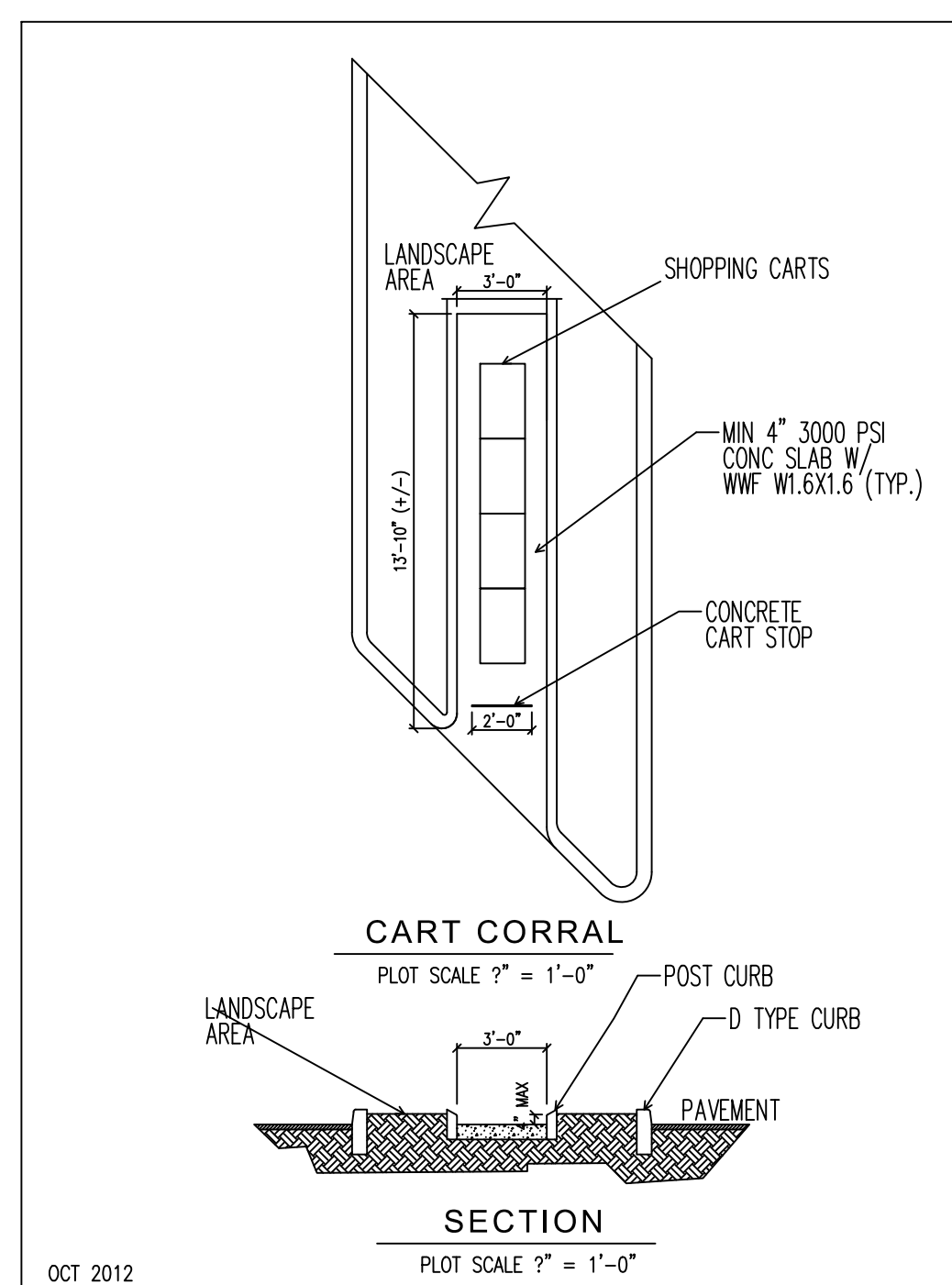
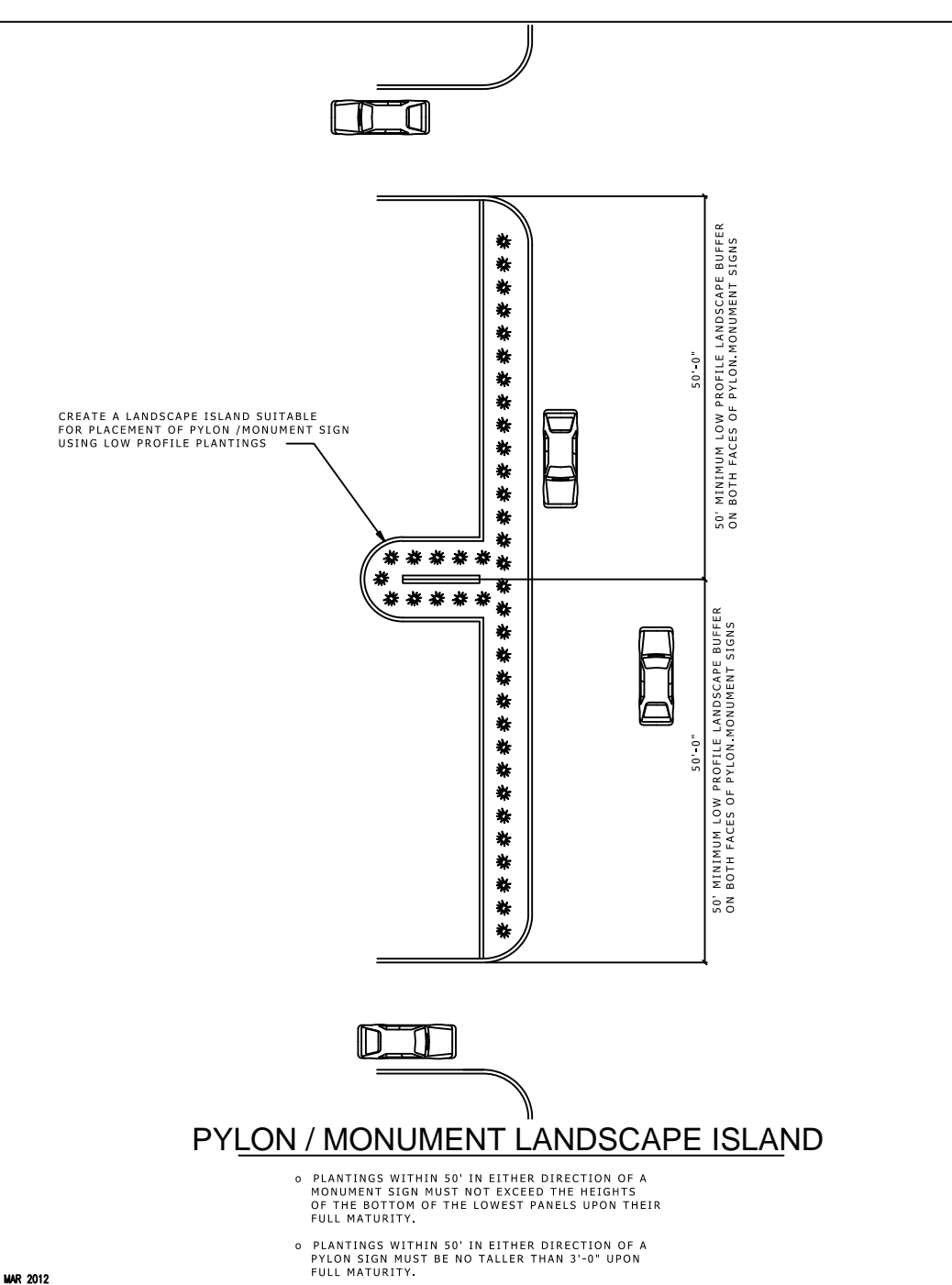
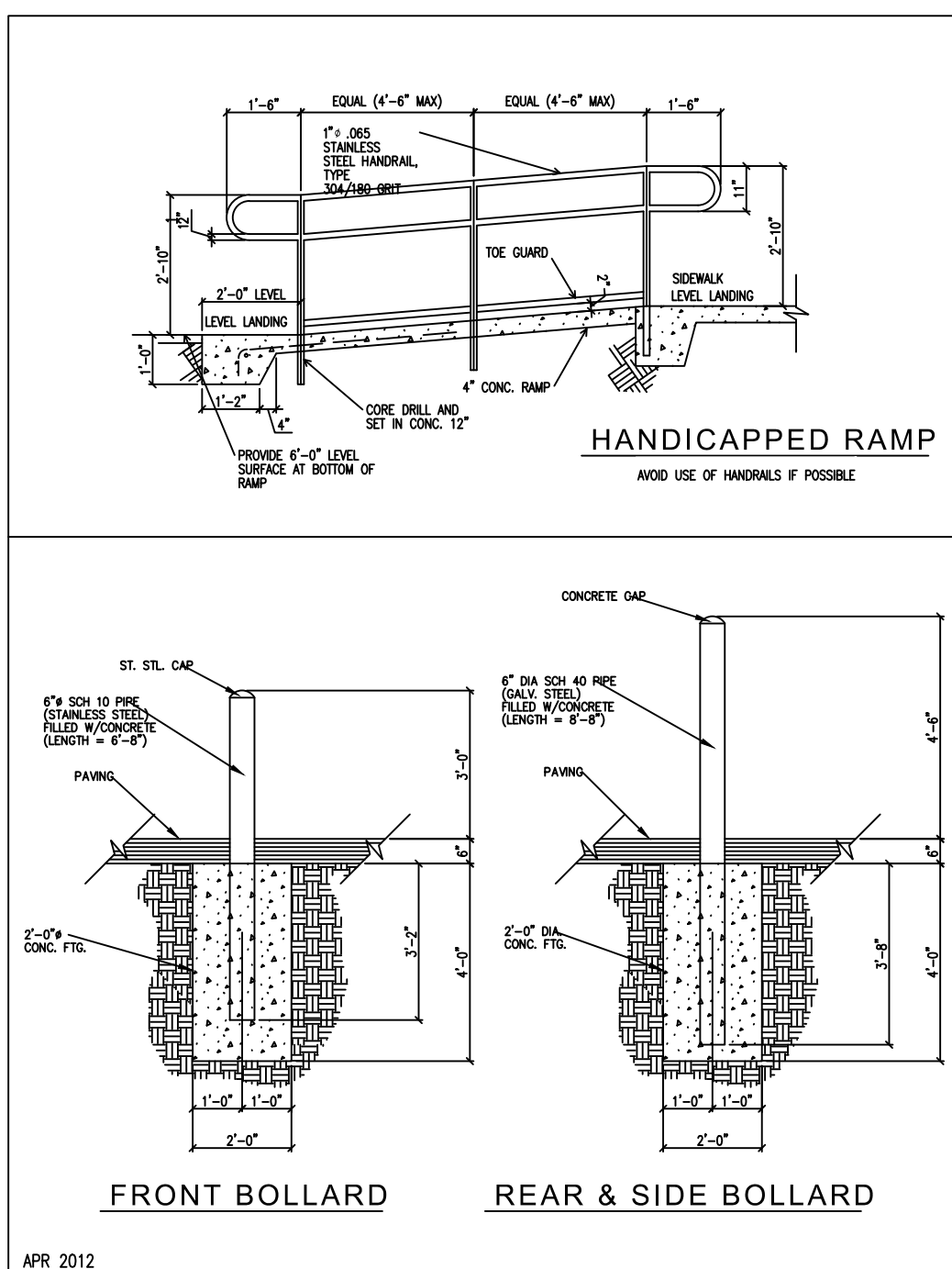
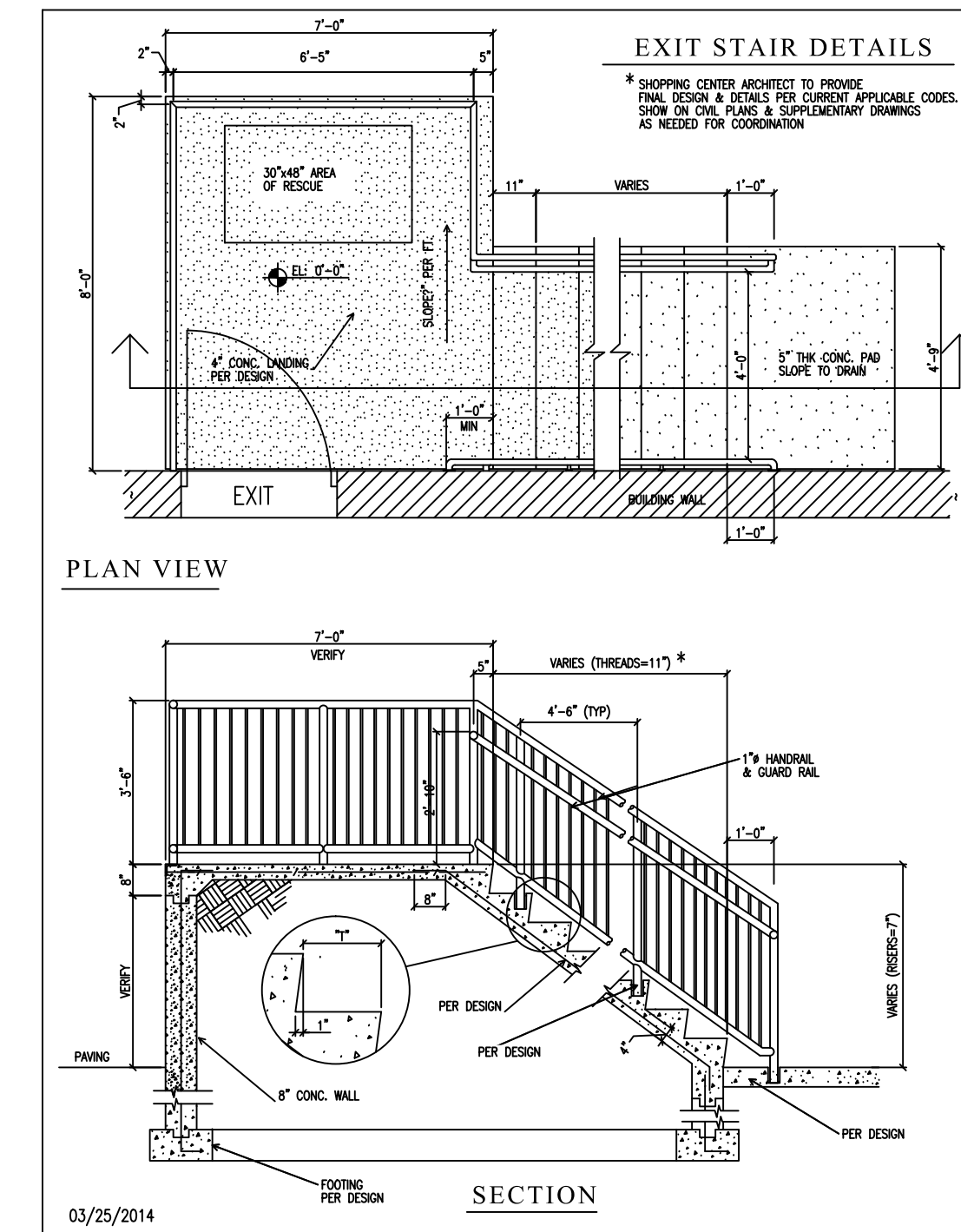
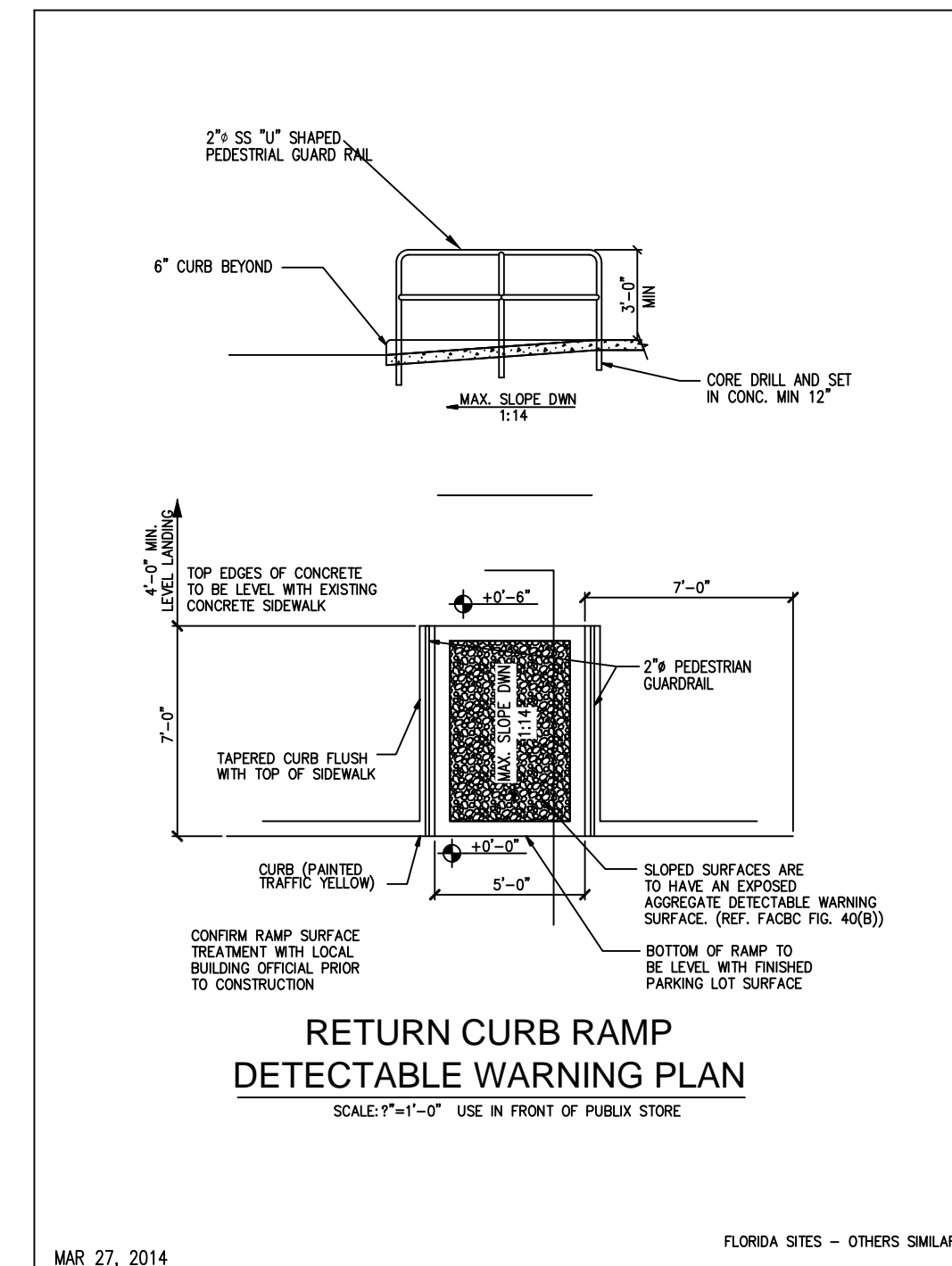
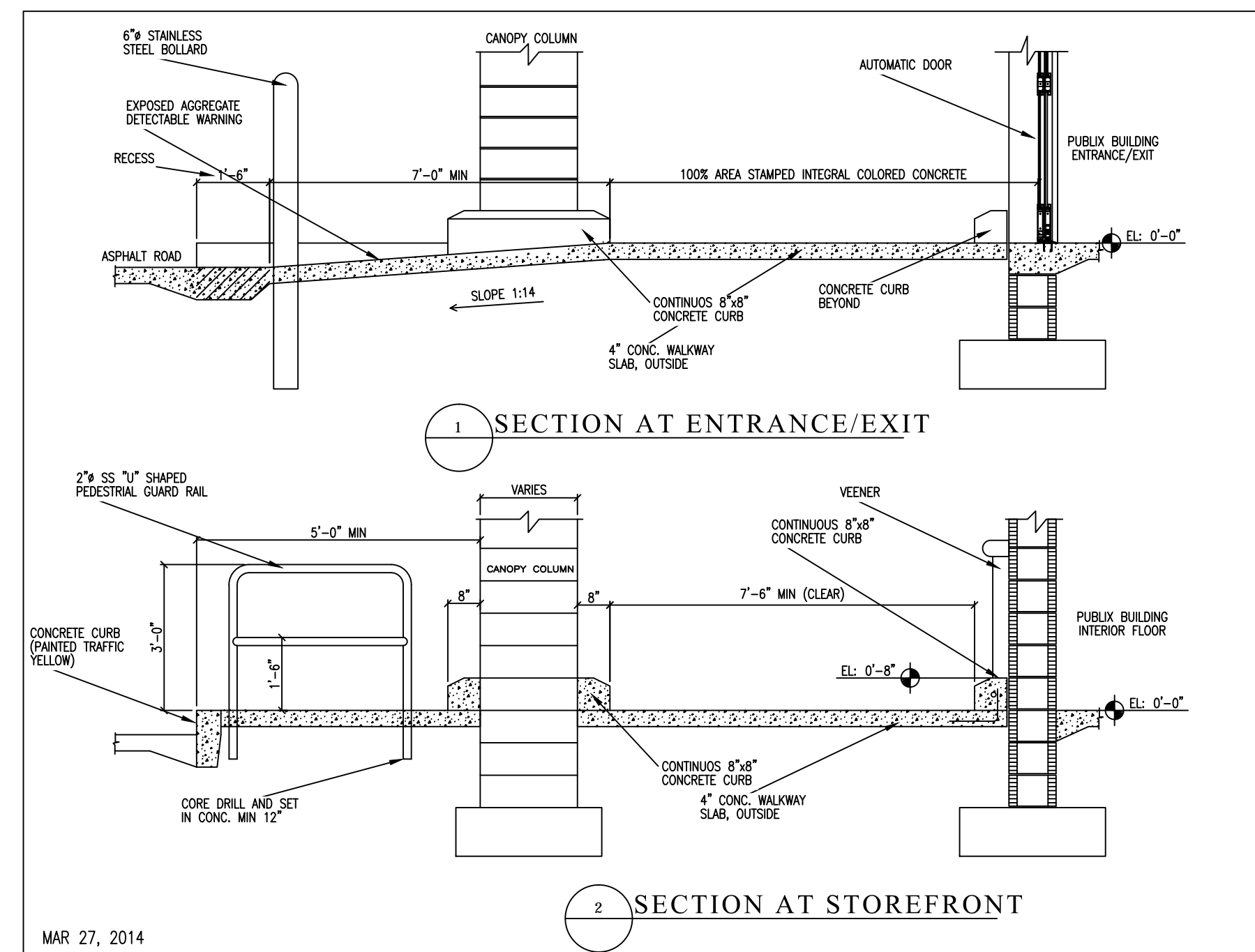
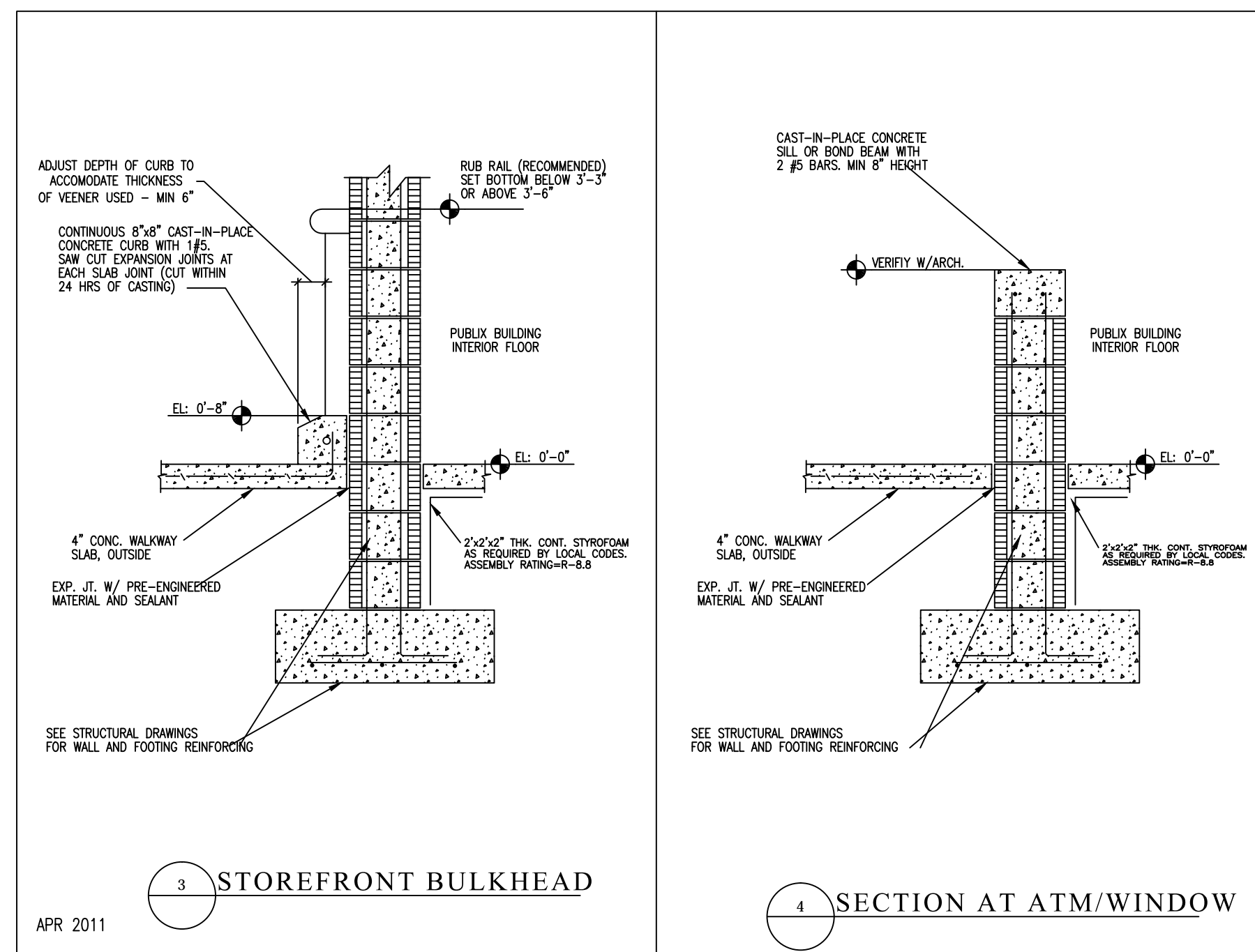
Bluewater Civil Design, PLLC
NC P0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER HCOOT/WILMINGTON COMMENTS
...

NOTES & DETAILS

C509

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



Recommended Pavement Sections

Pavement Type	Material	Layer Thickness (inches)	
		Light Duty	Heavy Duty
Rigid	Portland Cement Concrete (4,000 psi)	5	7
	Crushed Aggregate Base Course (NCDOT CAB C Type 1 or Type 2)	4	6
Flexible (Superpave)	Asphalt Surface (NCDOT SF-9.5A)	3.0'	1.5
	Asphalt Binder (NCDOT I-19.0B)	--	2.5
	Crushed Aggregate Base Course (NCDOT CAB C Type 1 or Type 2)	6	8

1. Placed in two 1.5 inch lifts

*NOTE: COURSE DEPTHS PROVIDED BY TERRACON PER REPORT #: 70145126

Project Number: 2014-090
DWG Name: 2014-090 Details.dwg
Drawing Scale: AS NOTED
Date of Project: 10-21-2014
Engineer of Record:
Jason Henderson, P.E.
South Carolina P.E. 22406
Georgia P.E. 63071
North Carolina P.E. 031306
Alabama P.E. 32054

BRAGG ROAD DEV.
COMPANY, LLC
Bragg Drive
Wilmington, NC

Approved Construction Plan
Name: _____
Date: _____
Planning: _____
Traffic: _____
Fire: _____

PROFESSIONAL ENGINEER
NORTH CAROLINA
4-30-2015
No. 031306
JASON HENDERSON

Bluewater Civil Design, PLLC
NC 0868

PLN REVISION	ISSUE DATE	ISSUE COMMENT
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D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER NCDOT/WILMINGTON COMMENTS
...

NOTES & DETAILS
C510

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR PROPOSED CURB AND GUTTER

CURB RAMP

ISOMETRIC VIEW

SECTION A-A

SECTION B-B

PLAN VIEW

DETECTABLE WARNING DOMES

NOTES:

1. DETECTABLE WARNING DOMES WILL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. DETECTABLE WARNING DOMES WILL CONTRAST VISIBLY WITH ADJACENT SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

PAY LIMITS FOR CURB RAMP

RAMP WIDTH AREA IS VARIABLE

W	A	MIN. A-D	X	B
6'	0.0'	5.8'	5.8'	5.0'
6'	0.0'	5.8'	5.8'	6.0'
7'	0.0'	7.3'	6.3'	5.0'
7'	0.0'	7.3'	6.3'	6.0'
8'	0.0'	8.8'	7.8'	5.0'
8'	0.0'	8.8'	7.8'	6.0'
9'	0.0'	10.3'	8.8'	5.0'
9'	0.0'	10.3'	8.8'	6.0'
10'	0.0'	11.8'	9.8'	5.0'
10'	0.0'	11.8'	9.8'	6.0'

GENERAL NOTES:

1. DETECTABLE WARNING DOMES WILL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. DETECTABLE WARNING DOMES WILL CONTRAST VISIBLY WITH ADJACENT SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

EXPANSION JOINT (SEE STD. 848-01)

NOTE: A PORTION OF ONE OR BOTH RAMPS MAY EXTEND OUTSIDE THE RETURN.

4' x 4' CLEAR SPACE MUST BE MAINTAINED WITHIN CURB RAMP LIMITS. (SEE NOTE 10)

4' MIN. CURB BETWEEN RAMPS

DUAL RAMPS ANY RADIUS (4' MIN. FLOOR WIDTH)

SHEET 1 OF 3

848.05

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR PROPOSED CURB AND GUTTER

CURB RAMP

DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS

DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES

ROADWAY PLAN SYMBOL FOR PROPOSED CURB RAMP

PROPOSED CURB RAMP W/ LANDING

PROPOSED OR FUTURE SIDEWALK

ALLOWABLE LOCATIONS

DUAL RAMP RADII.....ANY

SHEET 2 OF 3

848.05

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR CURB RAMPS

NOTES

1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.
3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.
6. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
8. CONSTRUCT THE RUNNING SLOPE OF THE RAMP 0.33% MAXIMUM.
9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
12. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR MEDIAN ISLANDS A MINIMUM OF 5'x5' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
13. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
14. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
16. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE MUTCD.
18. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

SHEET 3 OF 3

848.05

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

GENERAL NOTES:

1. D.O. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
2. O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
3. H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL.

UNDISTURBED EARTH MATERIAL.

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

SHEET 1 OF 3

300.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR METHOD OF PIPE INSTALLATION

RIGID PIPE

GENERAL NOTES:

1. D.O. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
2. O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
3. H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.

UNDISTURBED EARTH MATERIAL.

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

SHEET 2 OF 3

300.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR PAVEMENT MARKINGS

LINE TYPES AND OFFSETS

CONTINUOUS LINES

EDGE LINE: YELLOW OR WHITE, 4"/8"

LANE LINE: WHITE, 4"/8"

CENTER LINE: YELLOW, 4"/8"

GORE LINE: WHITE, 6"/12"

DIAGONAL LINE: YELLOW OR WHITE, 12" 45 MPH OR HIGHER, 6" LESS THAN 45 MPH

CROSSWALK LINE: WHITE, 8" TRANSVERSE, 24" LONGITUDINAL

RxR LINE: WHITE, 16"

STOP OR TRANSVERSE BAR: WHITE, 24"

10'-30'/SP SKIP LINE: UNLESS OTHERWISE SHOWN, USE 10'-30'/SP SKIPS FOR SKIP LANE LINES AND SKIP CENTER LINES. YELLOW OR WHITE, 4"/8"

2'-6'/SP MINI-SKIP LINE: UNLESS OTHERWISE SHOWN, USE 2'-6'/SP MINI-SKIPS FOR LANE LINE EXTENSIONS THROUGH INTERSECTIONS, EDGE LINE EXTENSIONS THROUGH INTERSECTIONS AND MINI-SKIPS USED FOR BICYCLE LANE LINES. YELLOW OR WHITE, 4"/8"

3'-3'/SP MINI-SKIP LINE: UNLESS OTHERWISE SHOWN, USE 3'-3'/SP MINI-SKIPS FOR THE WHITE EDGE LINE EXTENSIONS AT ROUNDABOUTS. WHITE, 12"

3'-9'/SP MINI-SKIP LINE: UNLESS OTHERWISE SHOWN, USE 3'-9'/SP MINI-SKIPS FOR MINI-SKIP LANE LINES AND LINE EXTENSIONS THROUGH TAPERS. WHITE, 4"/8"

GENERAL NOTES:

1. USE 6" LANE, EDGE, AND CENTER LINES ON ALL FULL CONTROL OF ACCESS FACILITIES AND OTHER ROUTES AS DIRECTED BY THE ENGINEER.
2. LANE LINES INDICATED AS "WIDE" ON THE ROADWAY STANDARD DRAWINGS SHALL BE AT LEAST TWICE THE WIDTH OF THE NORMAL LINE.
3. GORE LINES SHALL BE TWICE THE WIDTH OF THE NORMAL LINE.

SHEET 1 OF 2

1205.01

WILMINGTON NORTH CAROLINA

Public Services • Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____

Signed: _____

C511

Project Number: 2014-090
 DWG Name: 2014-090 Details.dwg
 Drawing Scale: AS NOTED
 Date of Project: 10-21-2014
 Engineer of Record: Jason Henderson, P.E.
 South Carolina PE# 22006
 Georgia PE# 62071
 North Carolina PE# 031306
 Alabama PE# 32054

bluewater civil design, PLLC
 bluewatercivil.com • info@bluewatercivil.com
 19 Washington Park Suite 100 • Greenville, SC 29601

Certificates of Authorization:
 SC 00412 - GA PE#005865
 NC P0688 - AL CA4065E

BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

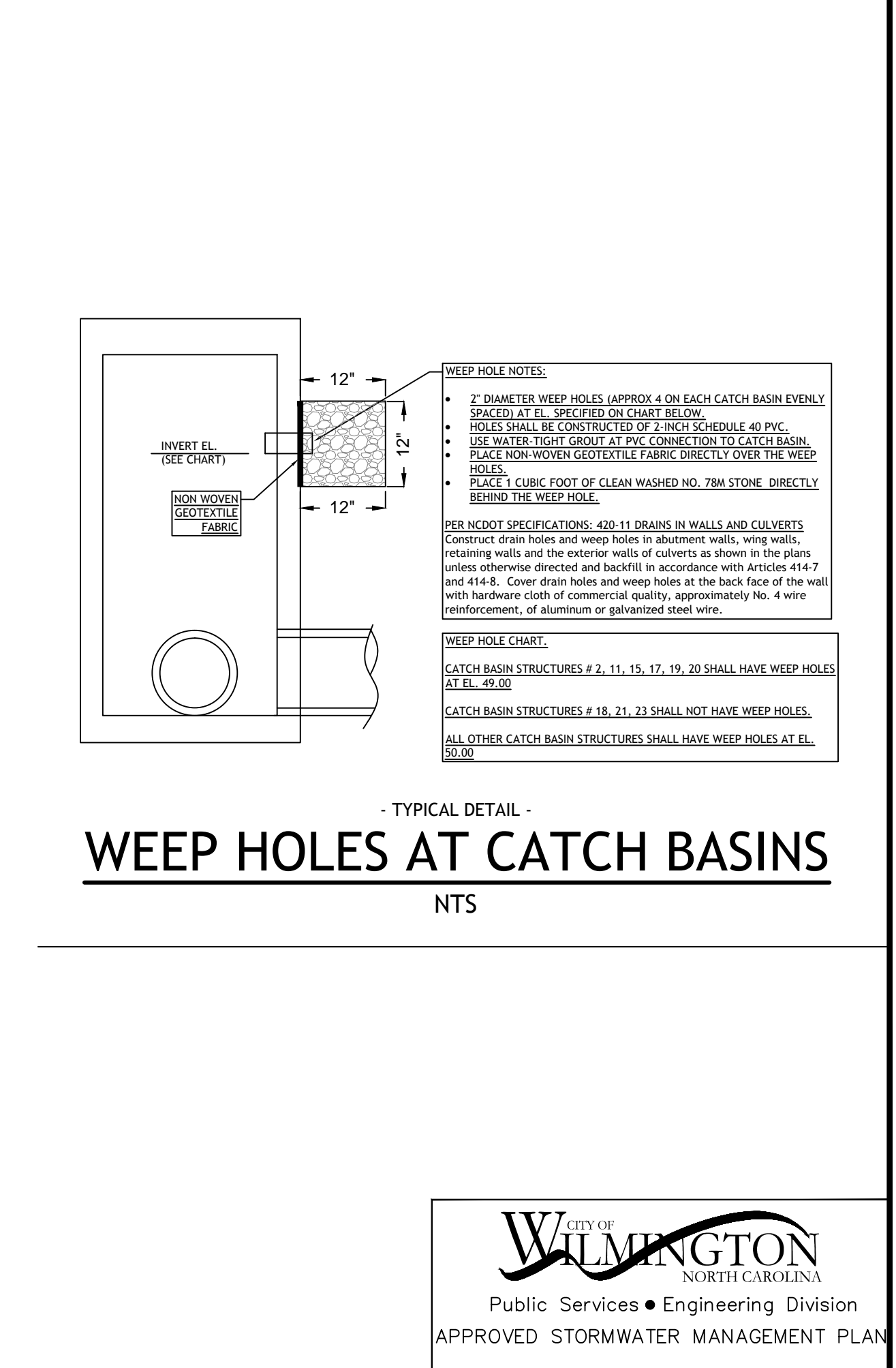
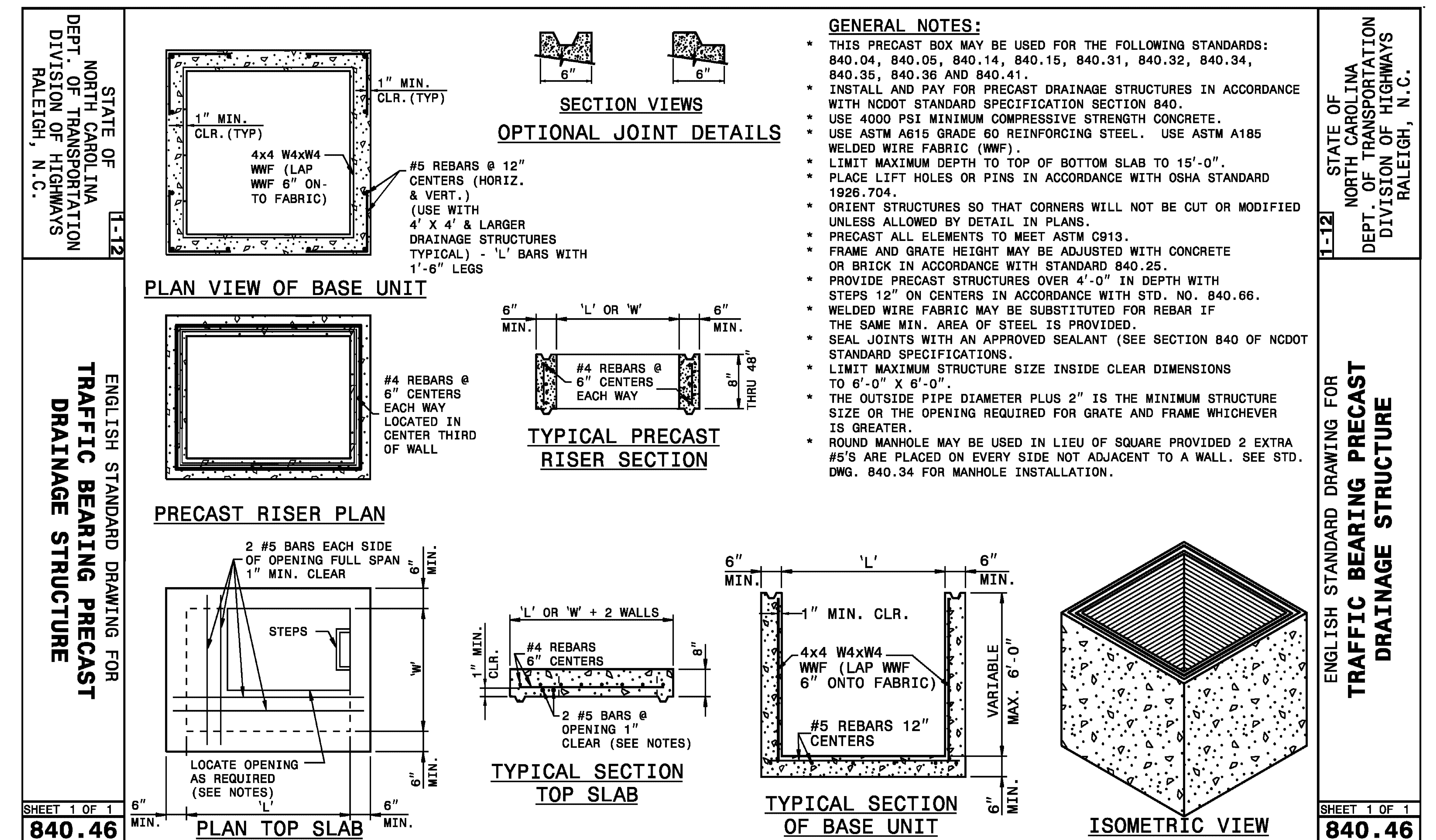
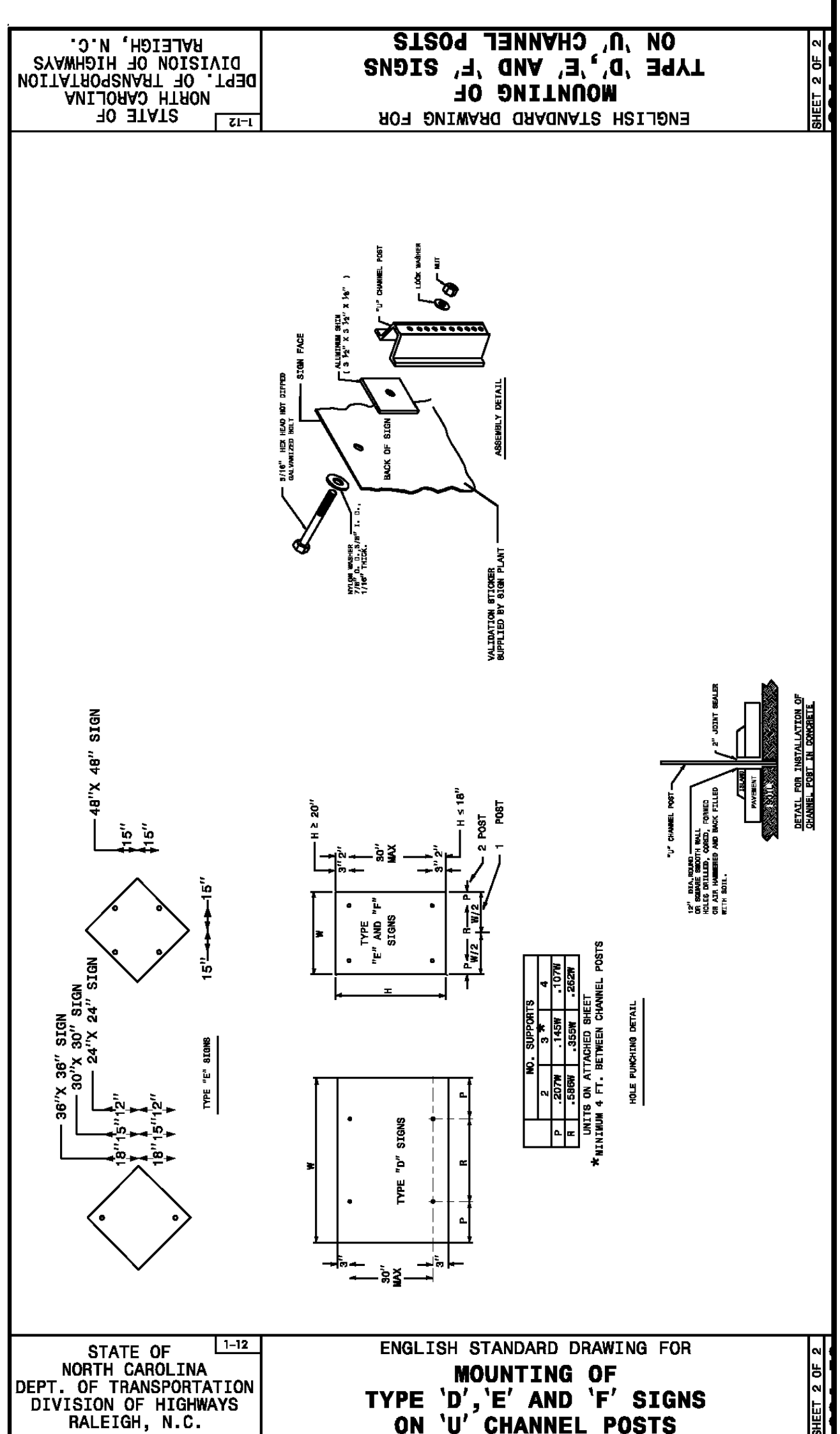
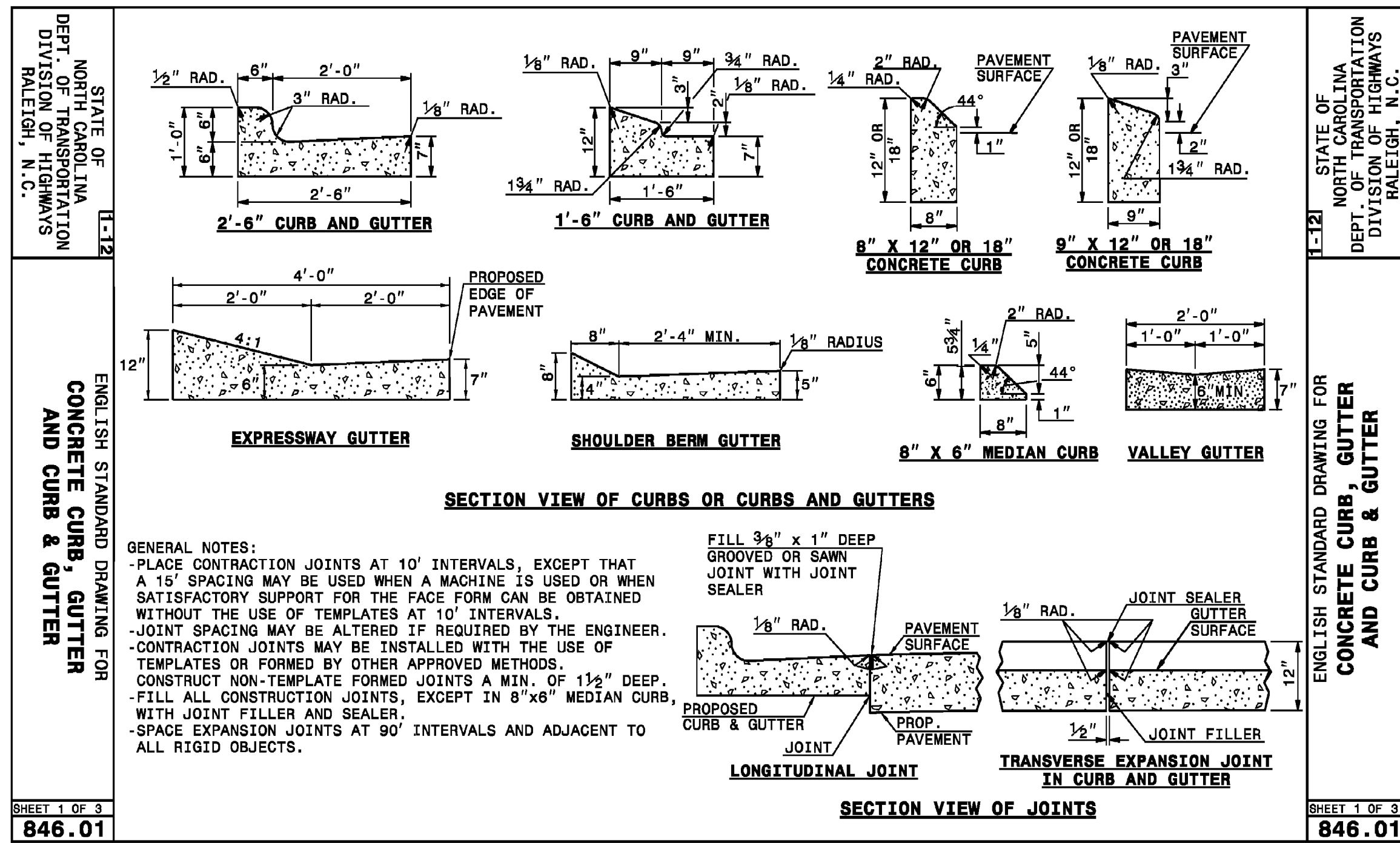
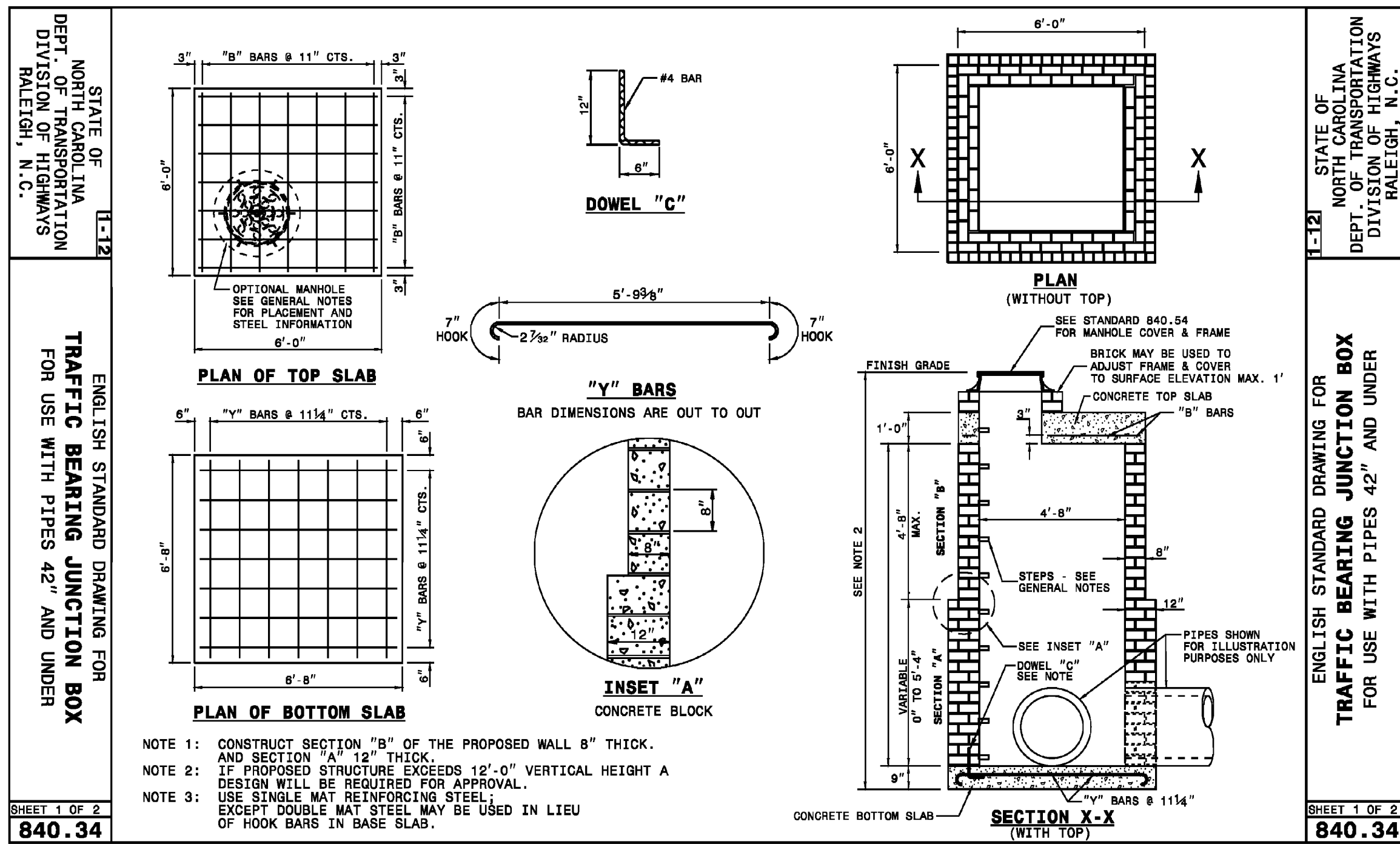
Approved Construction Plan
 Name: _____ Date: _____
 Planning: _____
 Traffic: _____
 Fire: _____

Professional Engineer
 NORTH CAROLINA
 4-30-2015
 No. 031306
 JASON HENDERSON

Bluewater Civil Design, PLLC
 NC#-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
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NOTES & DETAILS



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 Alabama P.E. 32054

bluewater civil design, PLLC
 bluewatercivil.com • info@bluewatercivil.com
 19 Washington Park Suite 100 • Greenville, SC 29601

Certificates of Authorization:
 SC 04212 - GA PEF005865
 NC P0868 - AL CA40656

BRAGG ROAD DEV. COMPANY, LLC
 Bragg Drive
 Wilmington, NC

Approved Construction Plan
 Name: _____
 Date: _____
 Planning: _____
 Traffic: _____
 Fire: _____

PROFESSIONAL ENGINEER
 JASON HENDERSON
 No. 031306
 EXPIRES 12/31/2015

Bluewater Civil Design, PLLC
 NC 02-0868

PLANNING REVISION

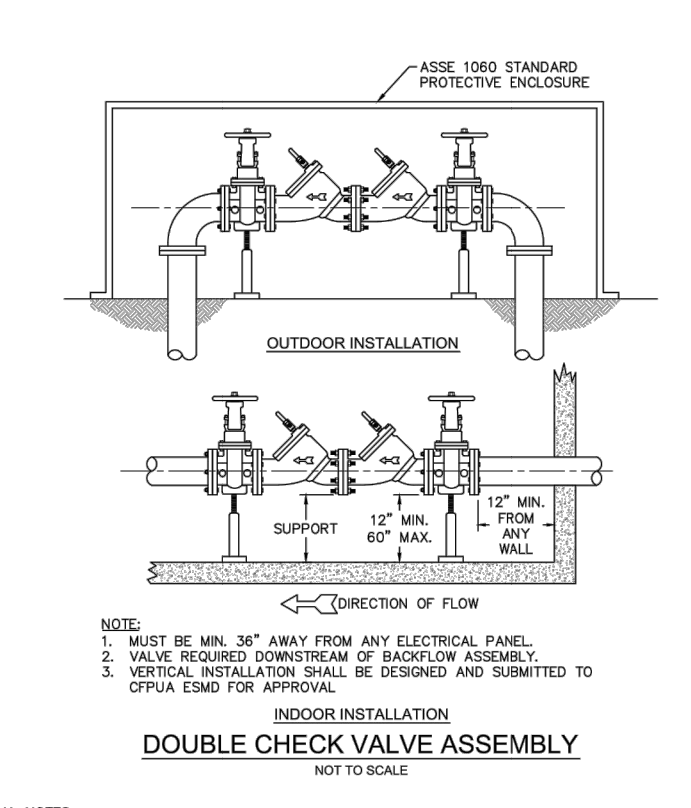
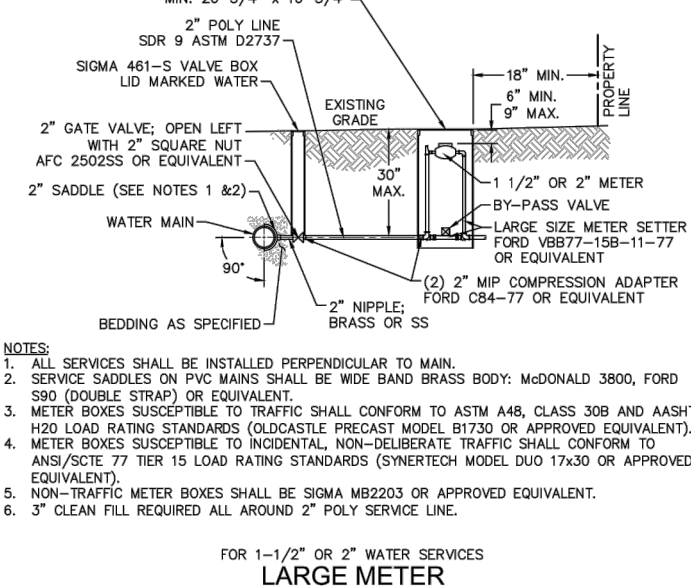
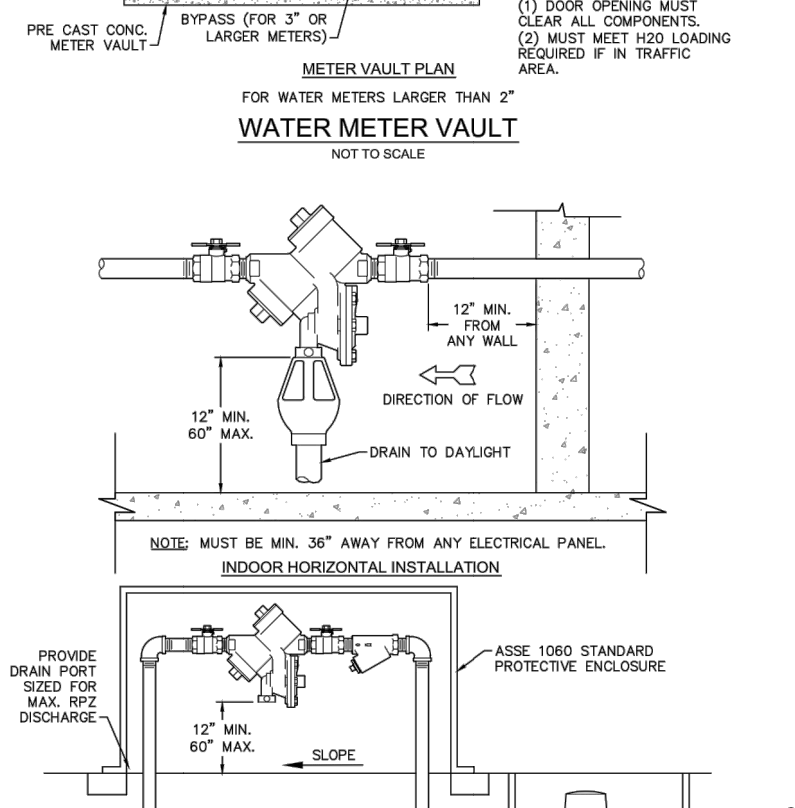
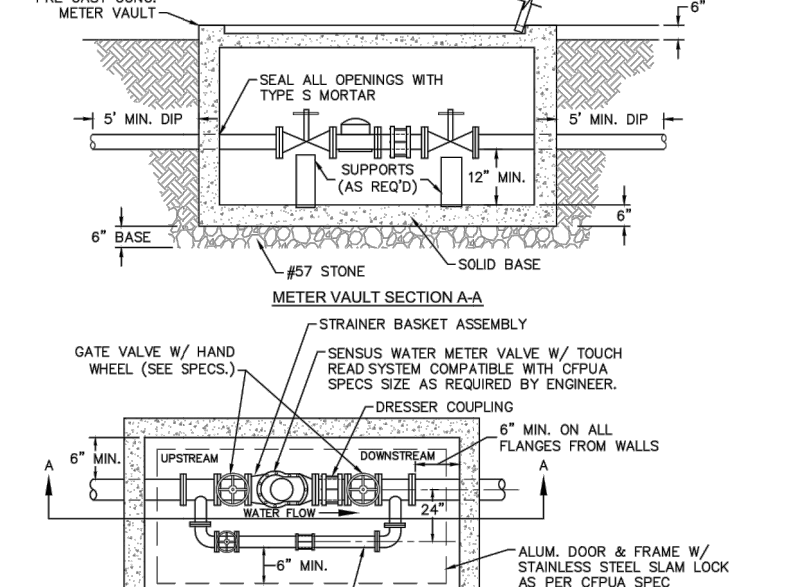
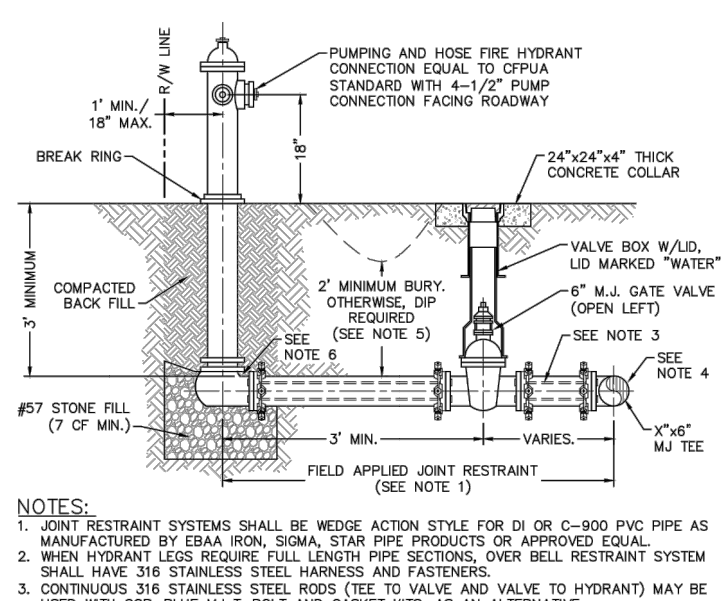
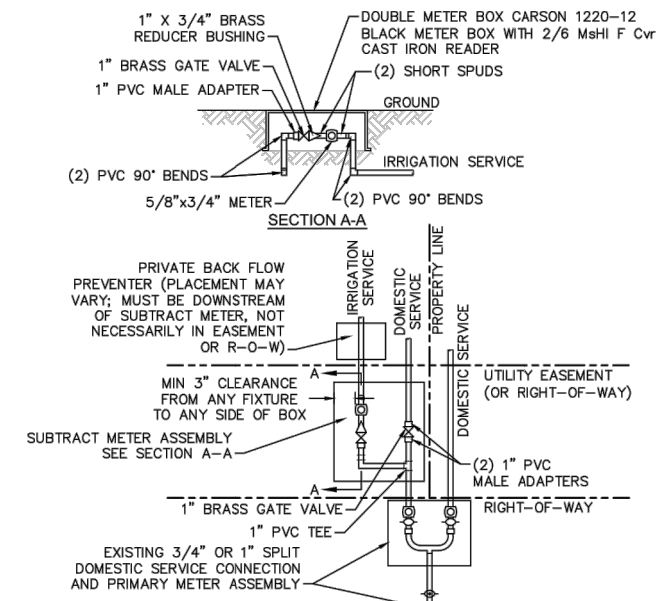
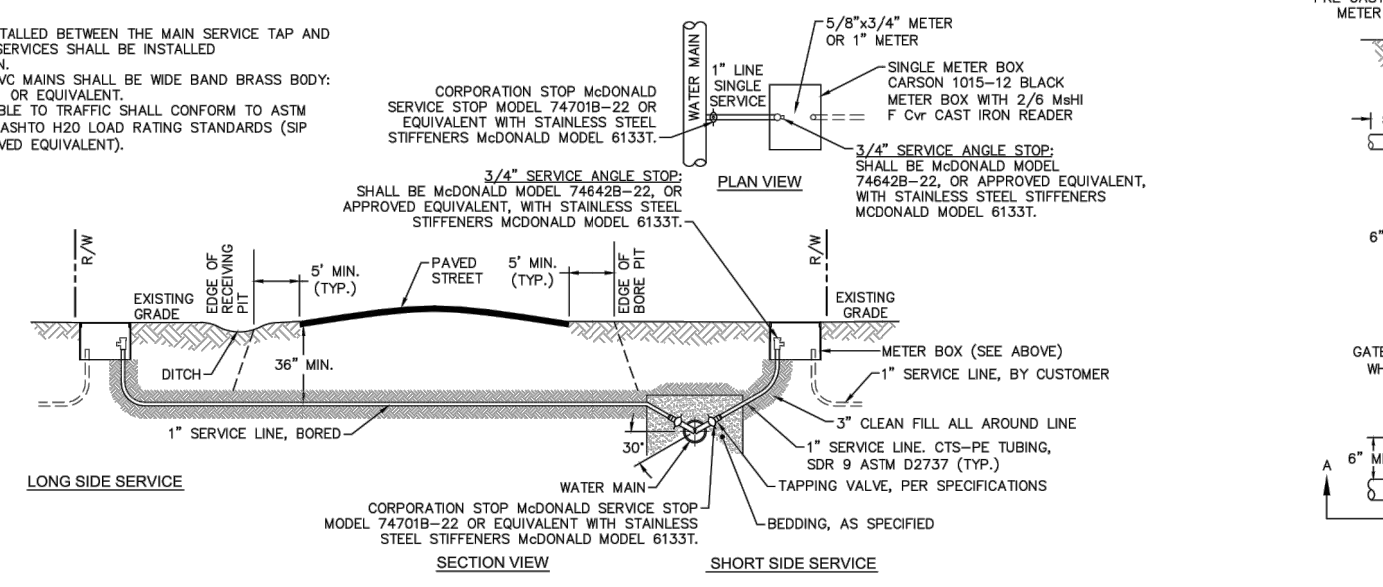
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NOTES & DETAILS

C513

City of Wilmington, North Carolina
 Public Services • Engineering Division
 APPROVED STORMWATER MANAGEMENT PLAN
 Date: _____ Permit # _____
 Signed: _____

- NOTES:**
- NO CONT SHALL BE INSTALLED BETWEEN THE MAIN SERVICE TAP AND THE METER.
 - USE SERVICE TAP TO MAIN SERVICE LINE SHALL BE INSTALLED PERPENDICULAR TO MAIN SERVICE LINE.
 - USE SERVICE TAP TO MAIN SERVICE LINE SHALL BE INSTALLED PERPENDICULAR TO MAIN SERVICE LINE.
 - METER BOXES SUSCEPTIBLE TO TRAFFIC SHALL CONFORM TO ASTM A48, CLASS 30B AND ASHTO H20 LOAD RATING STANDARDS (SP MODEL 4400 OR APPROVED EQUIVALENT).



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

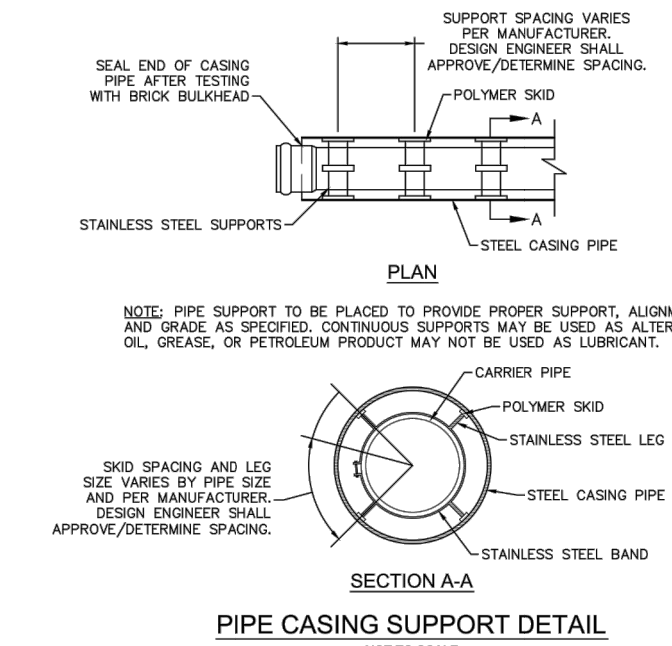
REV.	DESCRIPTION	DATE
1	Single Service Connection, Double Service Connection, and Large Meter Revisions	10/2012
2	Double Service Connection and Fire Hydrant Details Revisions	11/2013
3	Fire Hydrant Detail Revisions	01/2014

CFPUA WATER DISTRIBUTION SYSTEM

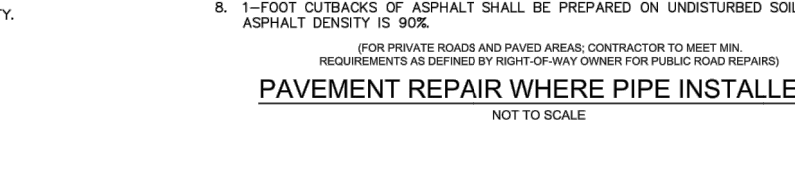
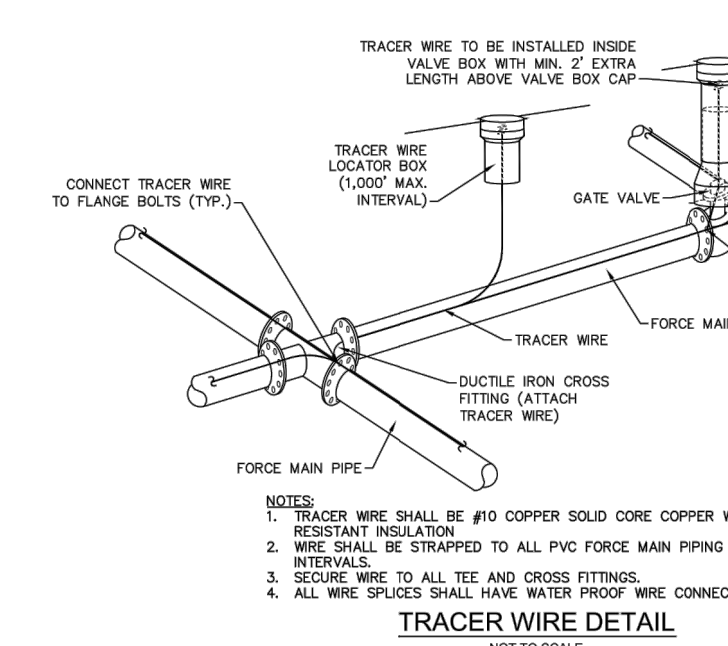
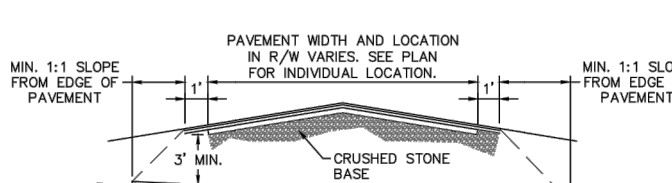
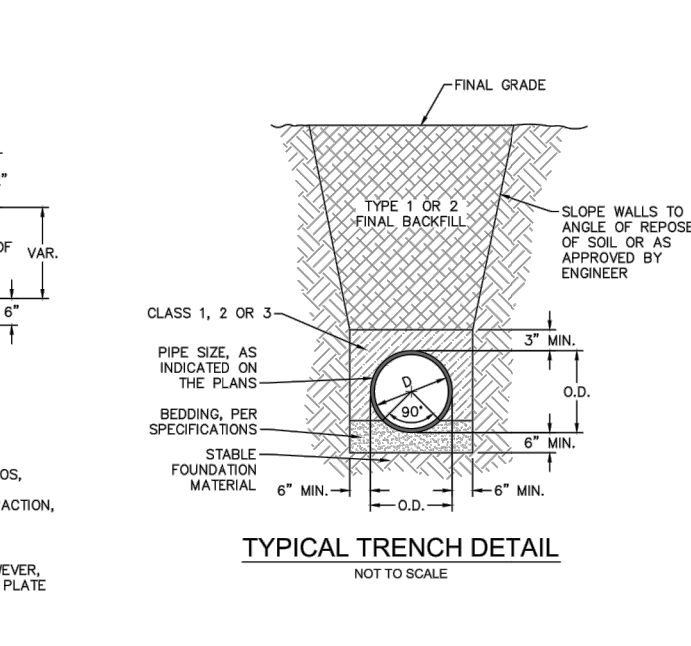
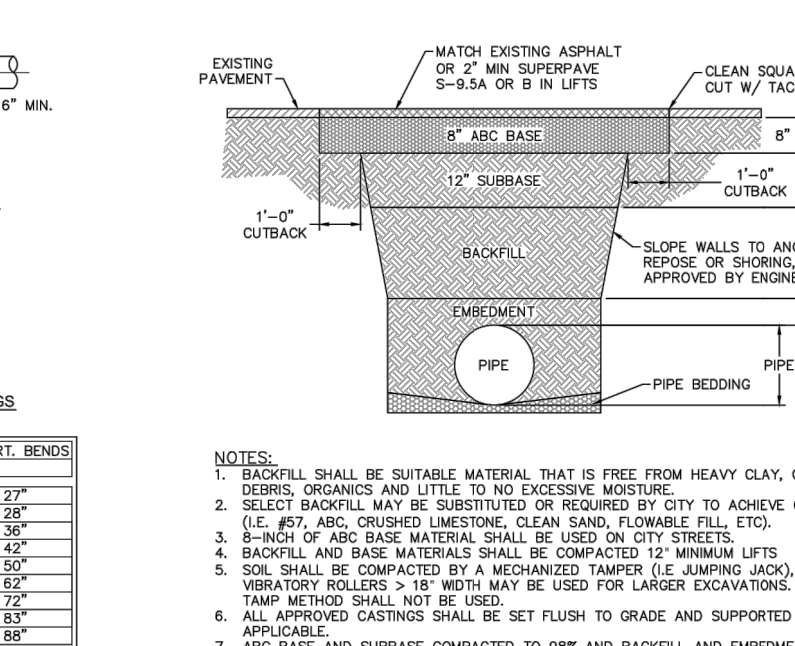
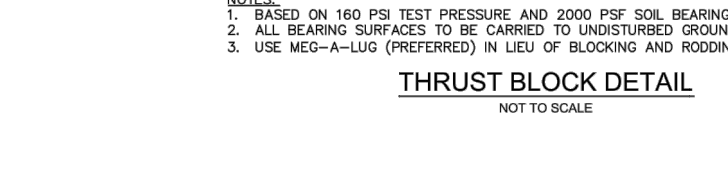
STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE: (910)332-6500

SHEET NO: WSD-1



SIZE	90 BENDS	45 BENDS	22 1/2 BENDS	TEES/PLUGS	45 DEG. BENDS
1/2"	10'	15'	20'	10'	10'
3/4"	15'	20'	25'	15'	15'
1"	20'	25'	30'	20'	20'
1 1/4"	25'	30'	35'	25'	25'
1 1/2"	30'	35'	40'	30'	30'
2"	40'	45'	50'	40'	40'
2 1/2"	50'	55'	60'	50'	50'
3"	60'	65'	70'	60'	60'
3 1/2"	70'	75'	80'	70'	70'
4"	80'	85'	90'	80'	80'
4 1/2"	90'	95'	100'	90'	90'
5"	100'	105'	110'	100'	100'
6"	110'	115'	120'	110'	110'
8"	130'	135'	140'	130'	130'
10"	150'	155'	160'	150'	150'



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

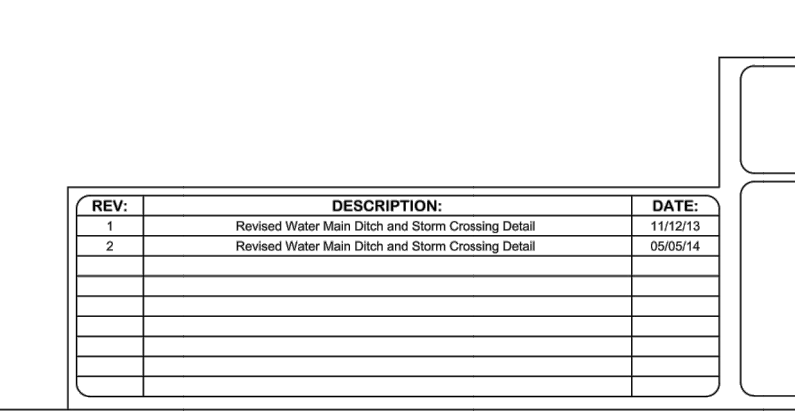
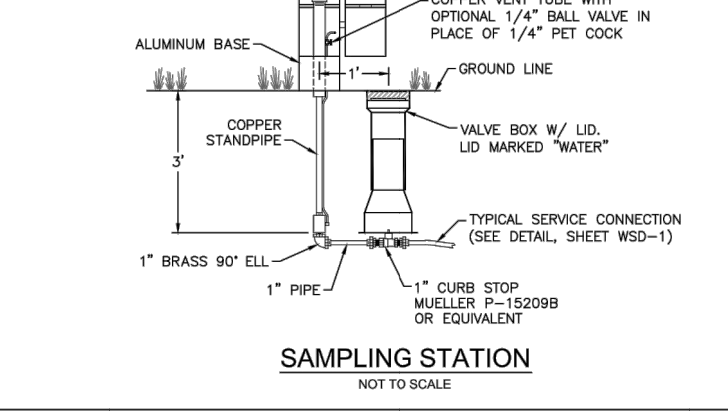
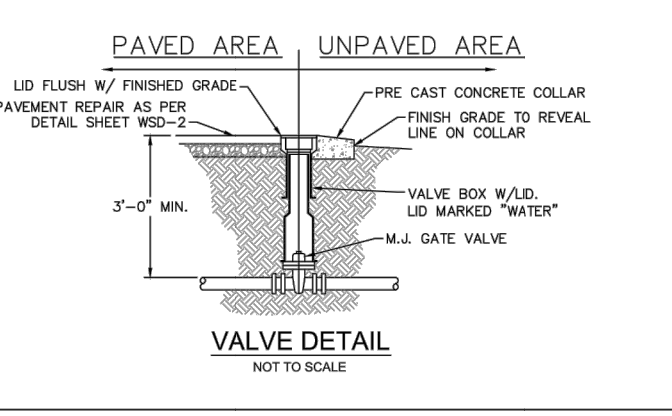
REV.	DESCRIPTION	DATE
1	Revised Water Main Ditch and Storm Crossing Detail	11/13/13
2	Revised Water Main Ditch and Storm Crossing Detail	05/2014

CFPUA WATER DISTRIBUTION SYSTEM

STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE: (910)332-6500

SHEET NO: WSD-2



PROJECT: CAPE FEAR PUBLIC UTILITY AUTHORITY PROJECT SIGN

SHEET TITLE: PROJECT SIGN PLAN

CAPE FEAR PUBLIC UTILITY AUTHORITY
235 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE: (910)332-6500

NAME OF PROJECT - LINE 1
NAME OF PROJECT - LINE 2

CONTRACTOR:
ENGINEER:

FOR MORE INFORMATION, CALL 332-6704 OR EMAIL COMMUNICATIONS@CFPUA.ORG

GRAPHIC SCALE
SCALE: 1 inch = 1 ft.

BRAGG ROAD DEV. COMPANY, LLC
Bragg Drive
Wilmington, NC

bluewater civil design, PLLC
bluewatercivil.com • info@bluewatercivil.com

19 Washington Park Suite 100 • Greenville, SC 29601

Project Number: 2014-090
DWG Name: 2014-090 Details.dwg
Drawing Scale: as noted
Date of Project: 10-21-2014
Engineer of Record: Jason Henderson, P.E.
South Carolina P.E. 22496
Georgia P.E. 62071
North Carolina P.E. 031306
Alabama P.E. 32054

Certificates of Authorization:
SC 00412 - GA PEF005865
NC P0688 - AL CA4065E

Approved Construction Plan
Name: _____ Date: _____
Planning: _____
Traffic: _____
Fire: _____

Professional Engineer
No. 031306
JASON HENDERSON

Bluewater Civil Design, PLLC
No. P-0868

PLAN REVISION

REVISION	ISSUE DATE	ISSUE COMMENT
A	2-3-2015	ISSUED FOR PERMITS
B	2-25-2015	REVISED PER COMMENTS
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS
D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER NC007/WILMINGTON COMMENTS

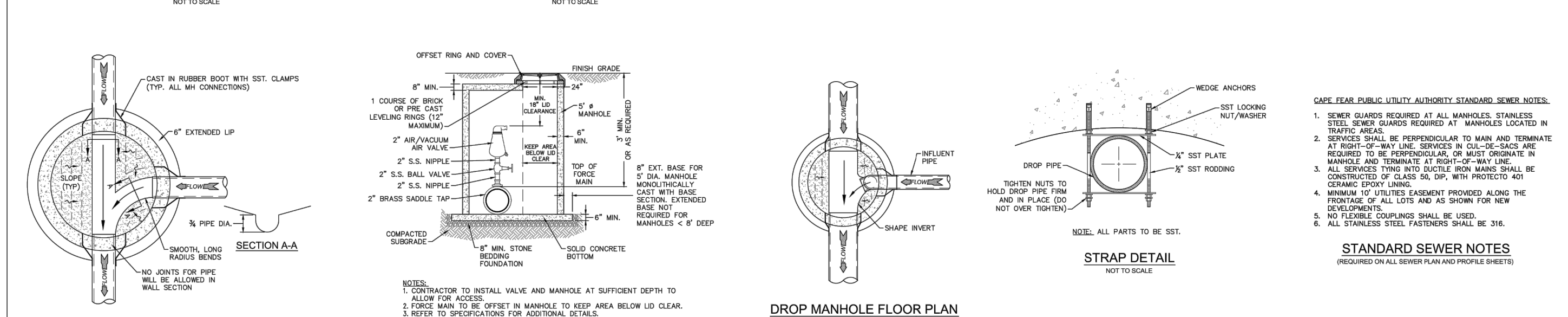
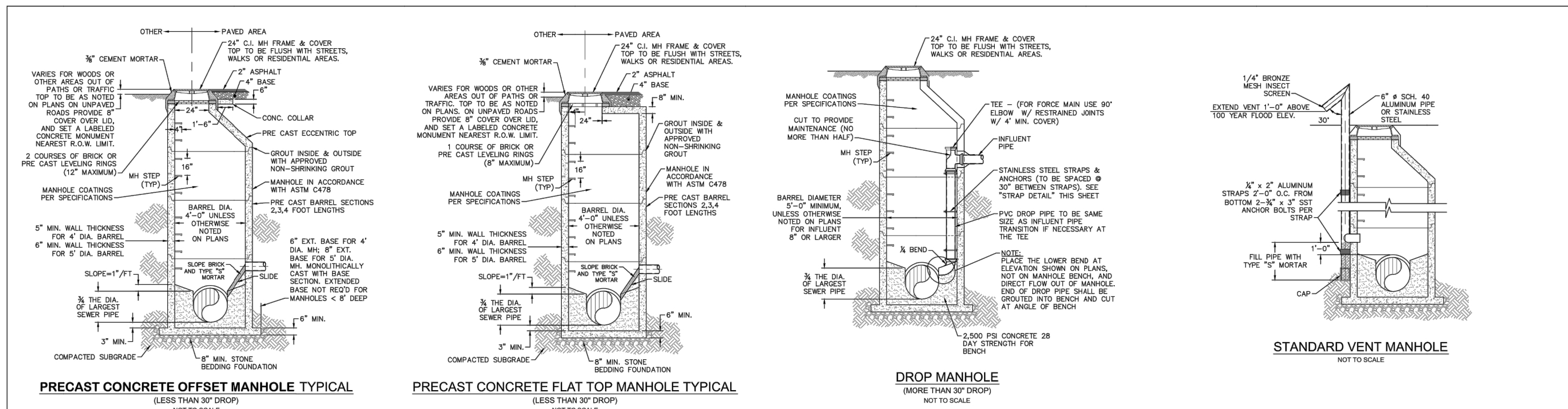
NOTES & DETAILS

APPROVED STORMWATER MANAGEMENT PLAN

Date: _____ Permit # _____

Signed: _____

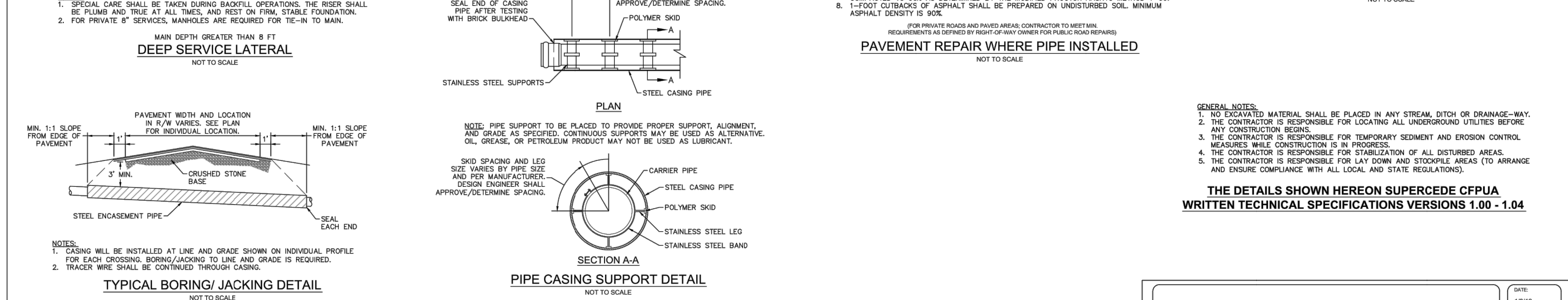
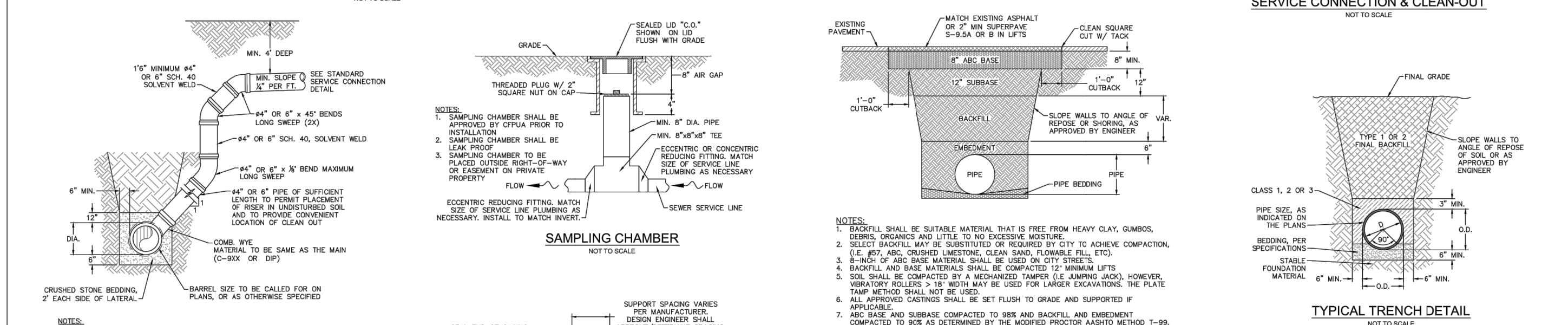
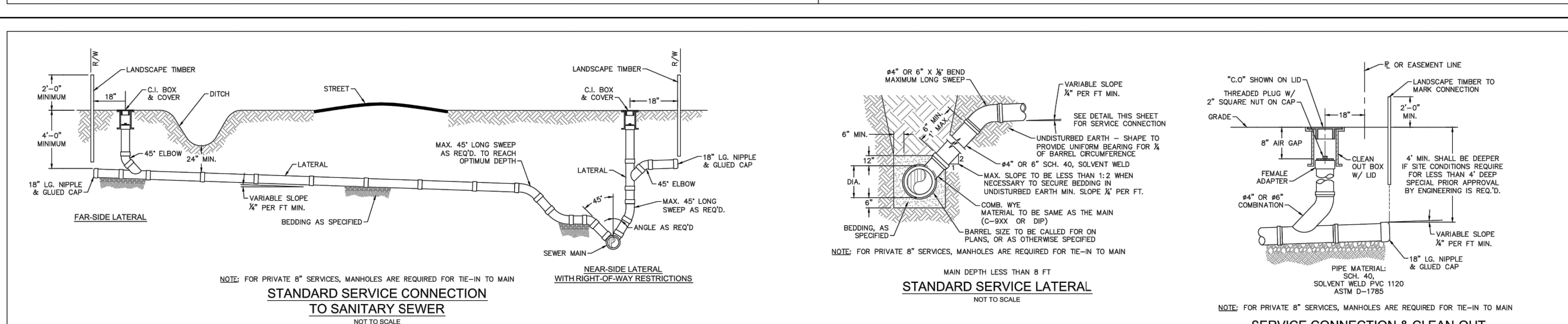
C514



STANDARD SEWER 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 SEGMENT 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 CFPWA WRITTEN TECHNICAL SPECIFICATIONS VERSIONS 1.00 - 1.04

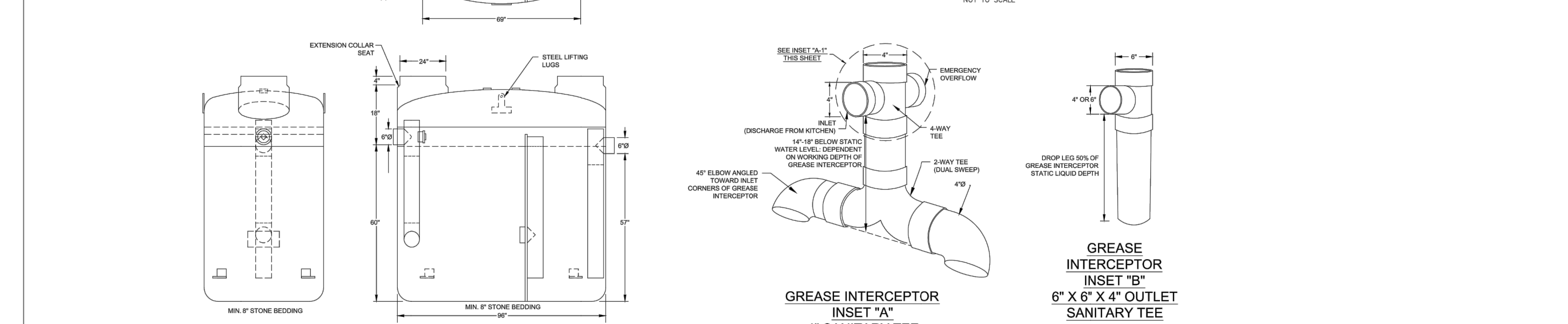
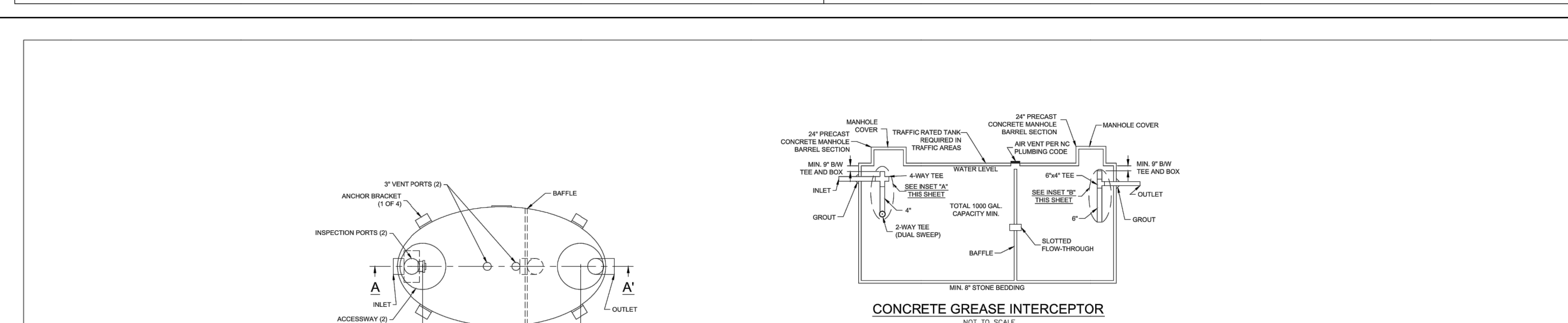
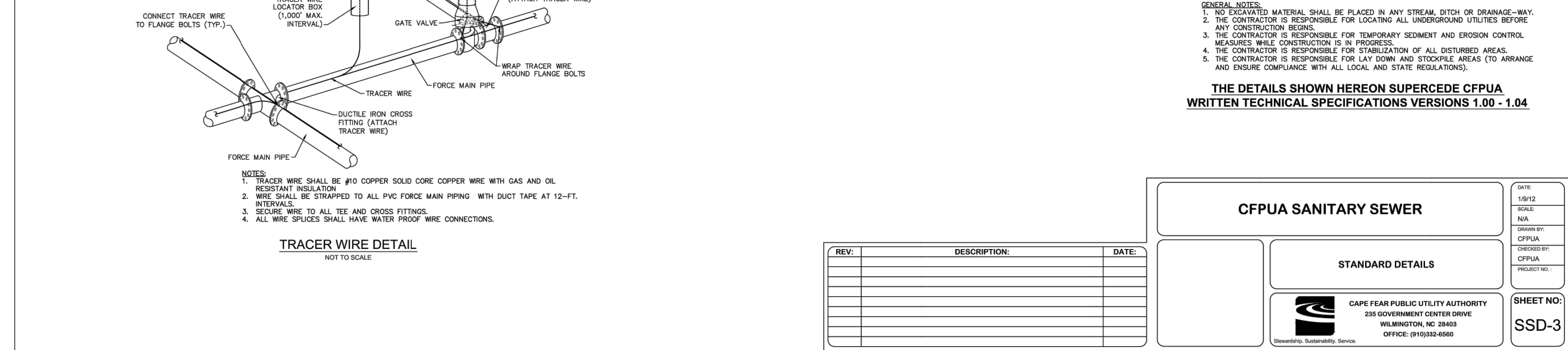
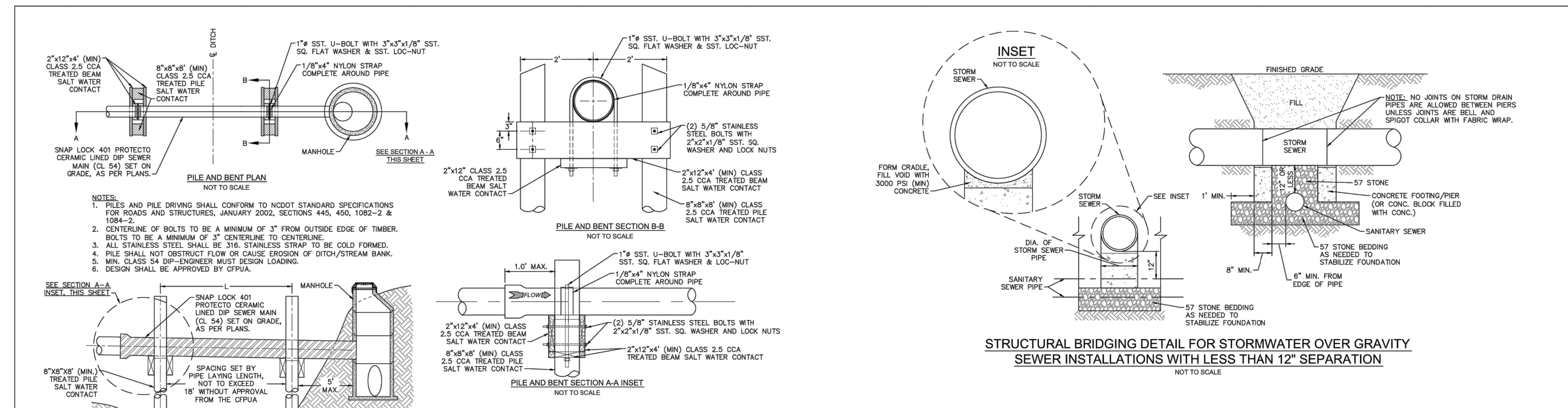


CFPUA SANITARY SEWER

STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY
238 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE (910)283-6880

SHEET NO. **SSD-1**



CFPUA SANITARY SEWER

STANDARD DETAILS

CAPE FEAR PUBLIC UTILITY AUTHORITY
238 GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403
OFFICE (910)283-6880

SHEET NO. **SSD-2**

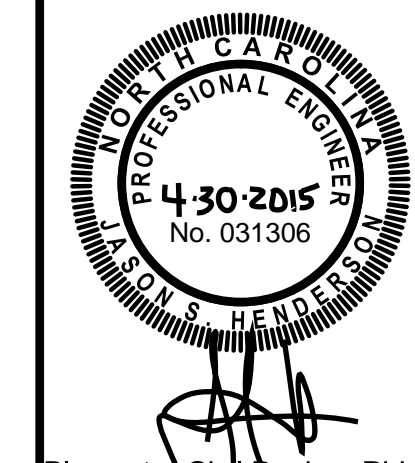
Project Number: 2014-090
DWG Name: 2014-090 Details.dwg
Drawing Scale: as noted
Date of Project: 10-21-2014
Engineer of Record:
Jason Henderson, P.E.
South Carolina PE# 22406
Georgia PE# 020711
North Carolina PE# 031306
Alabama PE# 12054

bluewater
civil design, PLLC
bluewater civil design, PLLC
19 Washington Park Suite 100 • Greenville, SC 29601
www.bluewatercivil.com • info@bluewatercivil.com

Certificates of Authorization:
SC 00412 - GA PE#05865
NC 0668 - AL CA#0656

BRAGG ROAD DEV. COMPANY, LLC
Bragg Drive
Wilmington, NC

Approved Construction Plan
Name: _____
Date: _____
Planning: _____
Traffic: _____
Fire: _____

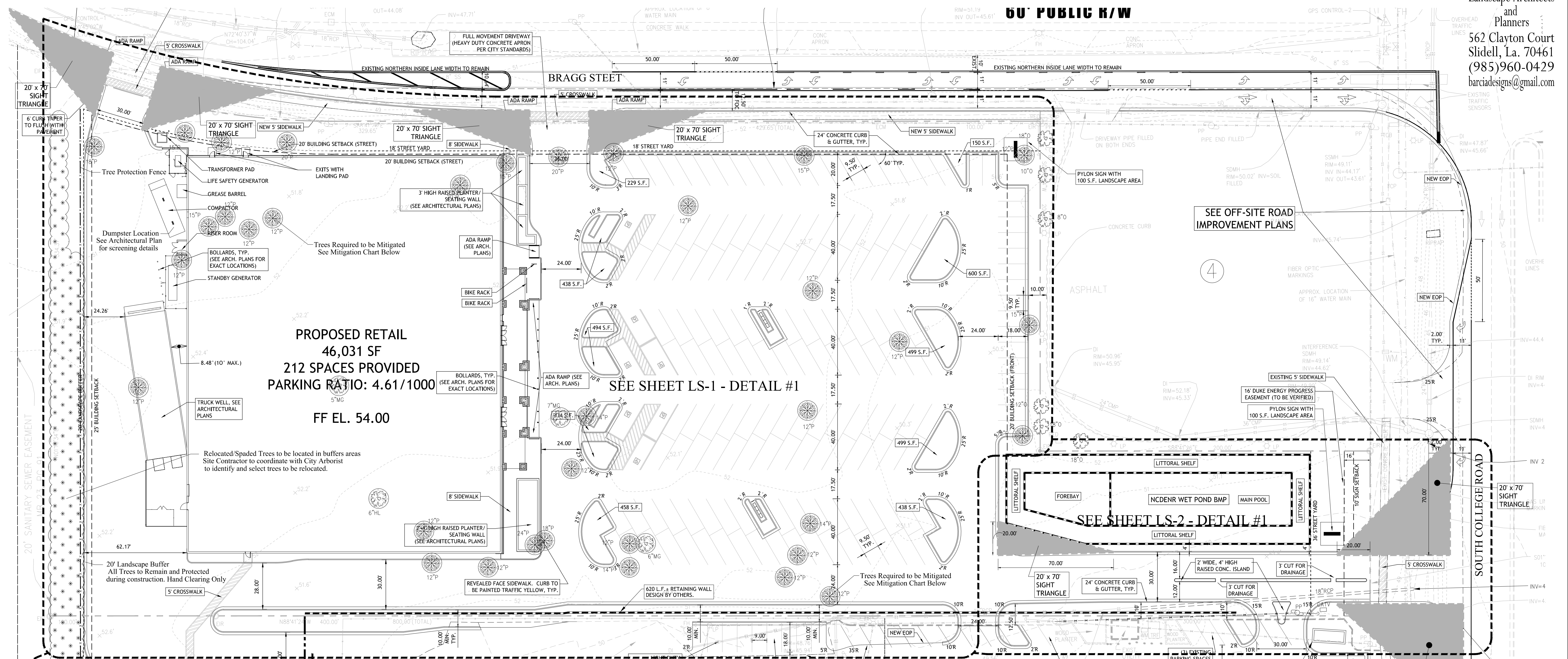


Bluewater Civil Design, PLLC
NC# 0968

PLAN REVISION	DATE	ISSUE	COMMENT
A	2-3-2015	ISSUED FOR PERMITS	
B	2-25-2015	REVISED PER COMMENTS	
C	4-2-2015	REVISED PER NEW HANDOVER COMMENTS	
D	4-16-2015	100% TENANT SUBMITTAL	
E	4-30-2015	REVISED PER HCO/OT/WILMINGTON COMMENTS	

NOTES & DETAILS

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



PROPOSED RETAIL
 46,031 SF
 212 SPACES PROVIDED
 PARKING RATIO: 4.61/1000
 FF EL. 54.00

SEE SHEET LS-1 - DETAIL #1

SEE SHEET LS-2 - DETAIL #1

SEE SHEET LS-2 - DETAIL #2

TREES TO BE MITIGATED

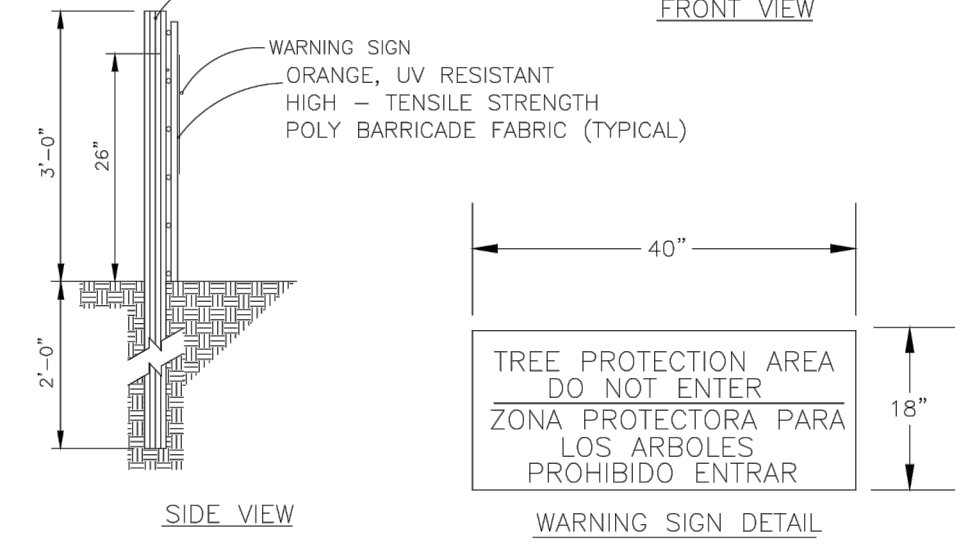
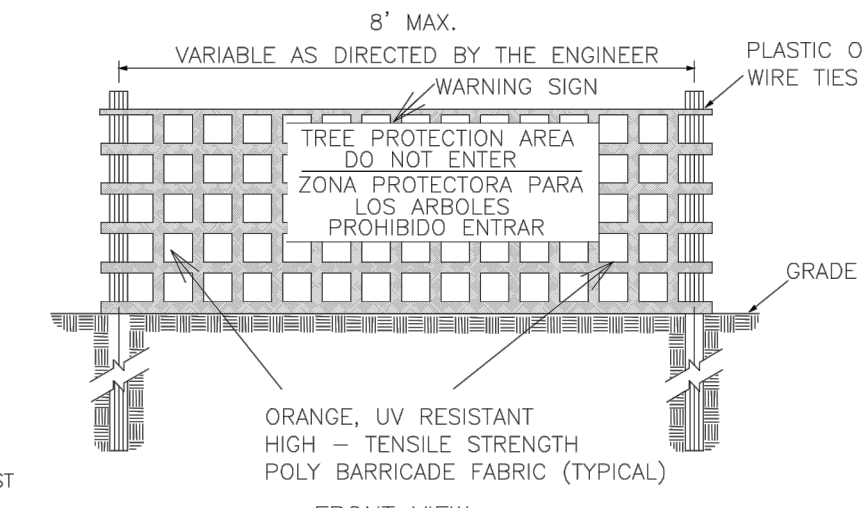
Qty	Item	Type	Caliper "	Cal. /3	Required Replacement Trees
3	Magnolia	Regulated	18 Total Cal. "	6 Cal. "	(3) 2" Cal. Canopy trees
1	Holly	Regulated	6 Total Cal. "	2 Cal. "	(1) 2" Cal. Canopy trees
34	Pine	Regulated	462 Total Cal. "	154 Plugs	154 Pine Plugs or Payment to the City Tree Improvement Fund

LANDSCAPE REQUIREMENTS

Area	Area	Planting Density	Requirements
Street Yard Landscaping	Bragg Street	8,385sf/600 = 14 x 6 =	14 Canopy or 42 Understory trees required (Existing Power Lines)
	College Road	2,040sf/600 = 3 x 6 =	3 Canopy or 9 Understory trees required
			18 Shrubs Required
Parking Lot Landscaping	Interior Area Landscape (Front)	+/- 68,000sf / 20% / 707 =	19 Canopy Trees Required
	Interior Area Landscape (Rear)	+/- 18,000sf / 20% / 707 =	5 Canopy Trees Required
	Perimeter Planting	1,121lf / 27 =	41 Canopy Trees Required
	Foundation Planting	4,978sf / 12% =	598 sf Landscape Area Required
Buffer Yards	Rear abutting Residential		20' wide planting strip All existing trees to remain. Hand Clearing Only. Where existing buffer area that does not meet the trees buffer requirement. Landscape Contractor will be required to use existing trees on site to meet requirement. Contractor will coordinate with city arborist to select trees that are suitable to be relocated/spaded.

Summary of Landscape Provided

- (31) - Canopy Trees
- (94) - Understory Trees
- (537) - Annuals/ Perennials
- (579) - Shrubs
- (3,148) - Groundcover
- (1,155) - Littoral Wetland Plantings



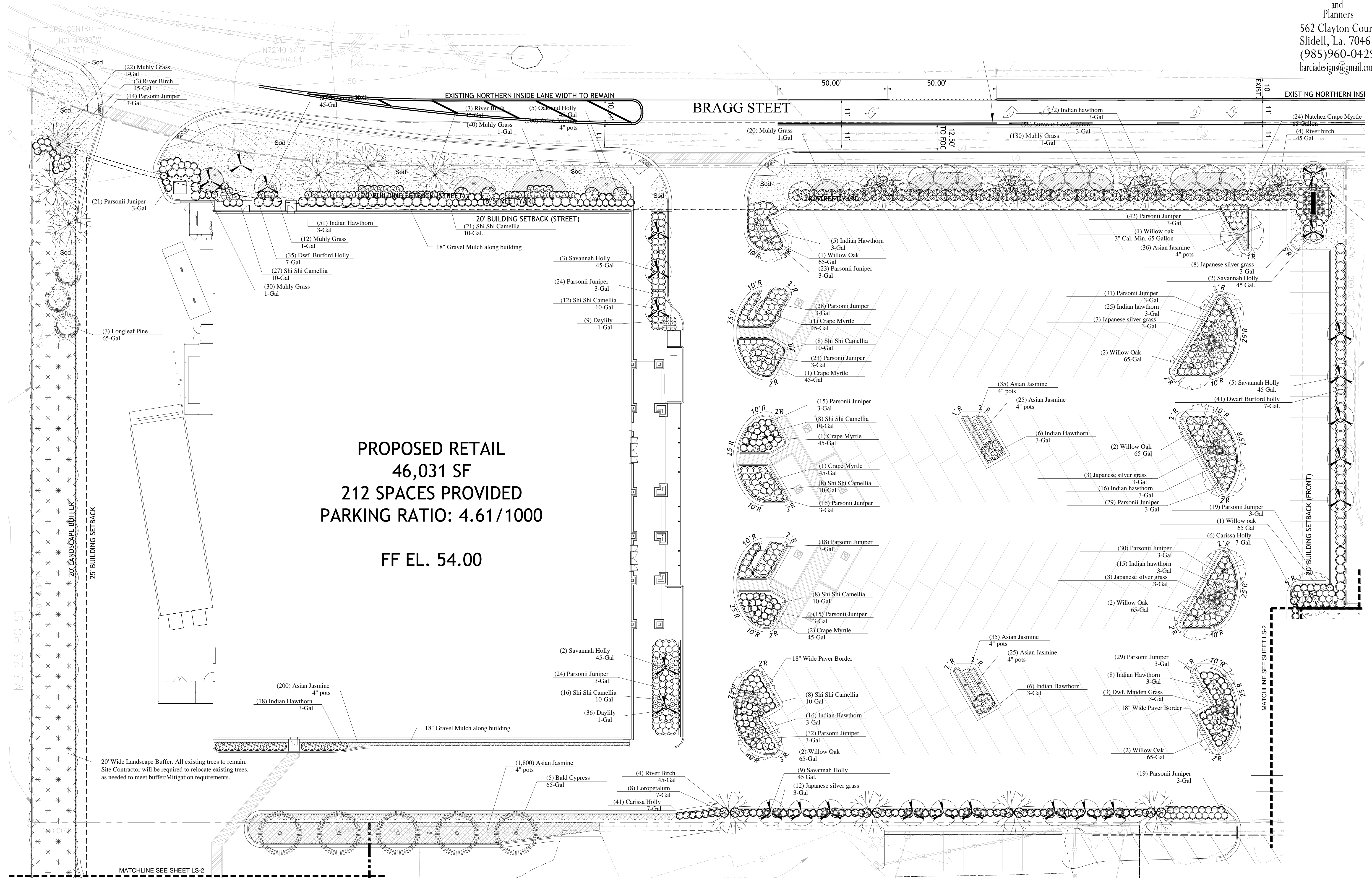
- NOTES:
- THE TREE PROTECTION FENCING SHALL NOT BE VIOLATED FOR THE ENTIRE DURATION OF THE PROJECT WITHOUT APPROVAL FROM URBAN FORESTRY STAFF.
 - WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL. LETTERS TO BE 3" HIGH, MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
 - SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER. FOR TREE PROTECTION AREAS LESS THAN 100' IN PERIMETER, PROVIDE NO LESS THAN TWO SIGNS PER PROTECTION AREA.
 - ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC. MAINTAIN TREE PROTECTION FENCE AND SIGNS THROUGHOUT DURATION OF PROJECT.
 - TREE PROTECTION FENCING AND SIGNAGE SHALL BE REMOVED AFTER CONSTRUCTION.
 - ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OF WILMINGTON, BASED ON ACTUAL FIELD CONDITIONS.

I HEREBY CERTIFY THAT THIS PLAN AND SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A duly LICENSED ENGINEER UNDER THE LAWS OF THE STATE OF N. CAROLINA AS SIGNIFIED BY MY HAND AND SEAL.

NO.	DATE	BY	DESCRIPTION	REVISIONS

LANDSCAPE REQUIREMENTS/ EXISTING TREE PLAN
 SOUTH COLLEGE ROAD & BRAGG DRIVE
 WILMINGTON, NORTH CAROLINA

CADD PLOT:
 LANDSCAPE BASE 4-29-15 (DWG)
 DRAWN BY:
 DATE: 4/30/2015
 REVIEWED:



PROPOSED RETAIL
 46,031 SF
 212 SPACES PROVIDED
 PARKING RATIO: 4.61/1000
 FF EL. 54.00

I HEREBY CERTIFY THAT
 THIS PLAN AND
 SPECIFICATION WAS
 PREPARED BY ME OR UNDER
 MY DIRECT SUPERVISION
 AND THAT I AM A duly
 LICENSED PROFESSIONAL
 ENGINEER UNDER THE LAWS
 OF THE STATE OF N. CAROLINA
 AS SIGNED BY MY HAND
 AND SEAL.

NO.	DATE	BY	DESCRIPTION	REVISIONS

LANDSCAPE PLANTING PLAN
 SOUTH COLLEGE ROAD & BRAGG DRIVE
 WILMINGTON, NORTH CAROLINA
 CADD PLOT:
 LANDSCAPE BASE 4-29-15.DWG
 DRAWN BY:
 DATE: 4/30/2015
 REVIEWED:
 LS-1

SECTION 02900 – LANDSCAPING

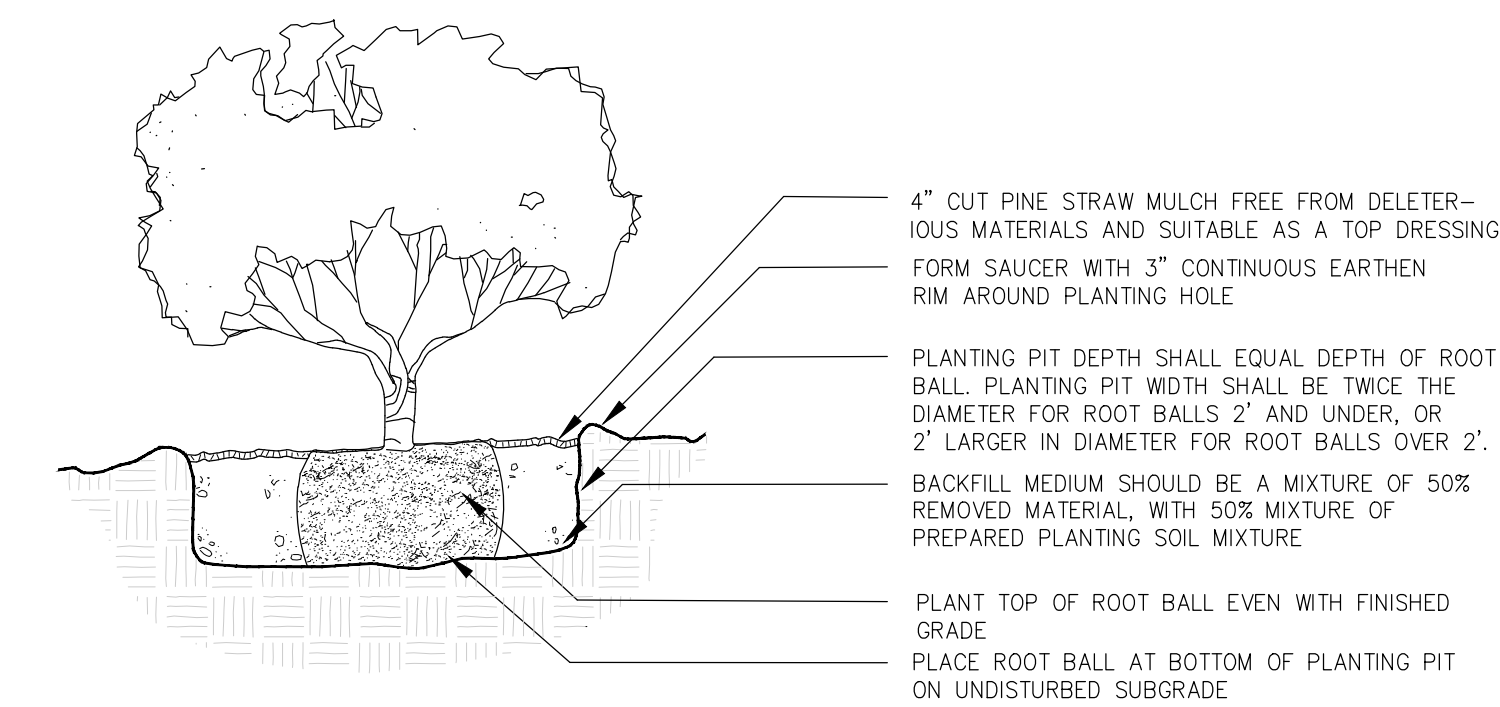
1.1 GENERAL

- A. Submittals: In addition to product certificates, submit the following:
 1. Certification of grass seed from seed vendor for each seed mixture.
 2. Planting schedule indicating anticipated dates and locations for each type of planting.
- B. Quality Assurance: Provide trees, shrubs, ground covers, and plants of quality, size, genus, species, and variety indicated, complying with applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock."
- C. Special Warranty: Warrant trees, shrubs and ground covers for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, abnormal weather conditions unusual for warranty period, or incidents which are beyond Contractor's control.
 1. Remove and replace unhealthy and dead trees and shrubs within the warranty period.
- D. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations to produce a uniformly smooth lawn for not less than the following:
 1. Seeded Lawns: 60 days after date of Substantial Completion.
 2. Sodded Lawns: 30 days after date of Substantial Completion.

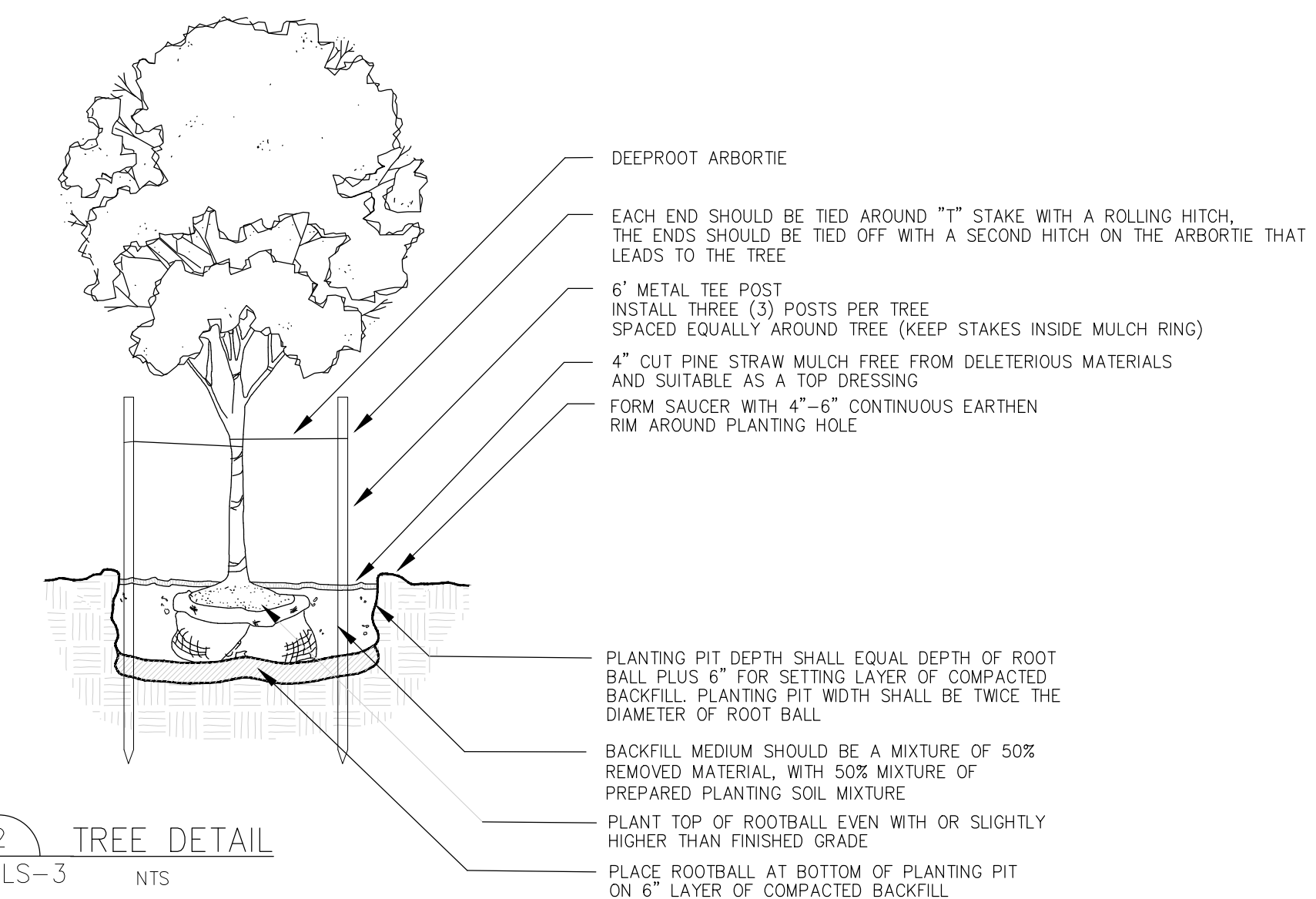
1.2 PRODUCTS

- A. Trees and Shrubs: Well-shaped, fully branched, healthy, vigorous nursery-grown stock of sizes and grades indicated, free of disease, insects, eggs, larvae, and defects, conforming to ANSI Z60.1.
 1. Provide balled and burlapped trees and shrubs.
 2. Provide container grown trees and shrubs.
 - B. Ground Covers and Plants: Established and well rooted in removable containers or integral peat pots and with not less than the minimum number and length of runners required by ANSI Z60.1 for the pot size indicated.
 - C. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
 1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated.
 - D. Sod: Certified turfgrass sod complying with ASPA specifications for machine-cut thickness, size, strength, moisture content, and mowed height, and free of weeds and undesirable native grasses. Provide viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
 1. Species: Provide sod of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated.
 - E. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch (25 mm) or larger in any dimension, and other extraneous materials harmful to plant growth.
 1. Topsoil Source: Amend existing surface soil to produce topsoil. Supplement with imported topsoil when required.
 2. Imported topsoil: Equal parts of sharp sand, peat moss and composted bark.
 - F. Lime: ASTM C 602, Class T, agricultural limestone.
 - G. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.
 - H. Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
 - I. Bonemeal: Commercial, raw, finely ground; minimum of 4 percent nitrogen and 20 percent phosphoric acid.
 - J. Superphosphate: Commercial, phosphate mixture, soluble; minimum of 20 percent available phosphoric acid.
 - K. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:
 1. Composition: 1 lb per 1000 sq. ft. (0.5 kg per 100 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 - L. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 1. Composition: 5 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight.
 - M. Organic Mulch: Organic mulch, free from deleterious materials and suitable as a top dressing, consisting of ground or shredded bark, wood or bark chips, salt hay or threshed straw, or shredded hardwood.
 - N. Peat Mulch: Provide peat moss in natural, shredded, or granulated form, of fine texture, with a pH range of 4 to 6.
 - O. Mineral Mulch: Hard, durable riverbed gravel or crushed stone, washed free of loam, sand, clay, and other foreign substances.
 1. Size Range: 1-1/2 inches (38 mm) maximum, 3/4 inch (19 mm) minimum.
 - P. Steel Edging: ASTM A 569 (ASTM A 569M), rolled edge, standard pointed steel edging and accessories, fabricated in sections with loops stamped from or welded to face of sections approximately 30 inches (760 mm) apart to receive stakes.
 1. Edging Size: 3/16 inch (4.8 mm) wide by 4 inches (102 mm) deep.
- 1.3 EXECUTION
- A. Planting Soil Preparation: Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth. Mix soil amendments and fertilizers with topsoil at rates indicated.
 - B. Lawn Planting Preparation: Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous materials.
 1. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.
 2. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
 - C. Lawn Planting Preparation: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, remove and dispose of existing grass, vegetation, and turf.
 1. Till surface soil to a depth of at least 6 inches (150 mm). Apply soil amendments and initial fertilizers and mix thoroughly into top 4 inches (100 mm) of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
 - D. Grade lawn areas to a smooth, even surface with loose, uniformly fine texture. Remove trash, debris, stones larger than 1-1/2 inches (38 mm) in any dimension, and other objects that may interfere with planting or maintenance operations.
 - E. Moisten prepared lawn areas before planting when soil is dry and allow surface to dry before planting.
 - F. Ground Cover and Plant Bed Preparation: Loosen subgrade of planting bed areas to a minimum depth of 6 inches (150 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous materials.
 1. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
 - G. Ground Cover and Plant Bed Preparation: Till soil in beds to a minimum depth of 8 inches (200 mm) and mix with specified soil amendments and fertilizers.
 - H. Excavation for Trees and Shrubs: Excavate pits with vertical sides and with bottom of excavation slightly raised at center to assist drainage. Excavate approximately 1-1/2 times as wide as ball diameter and deep enough to allow placing of root ball on a setting layer of planting soil. Loosen hard subsoil in bottom of excavation.
 - I. Planting Trees and Shrubs: Set stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades.
 1. Place a setting layer of compacted planting soil.
 2. Remove burlap and wire baskets from tops of balls and partially from sides, but do not remove from under balls. Do not use planting stock if ball is cracked or broken before or during planting operation.
 3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets.
 4. Dish and tamp top of backfill to form a 3-inch- (75-mm-) high mound around the rim of the pit. Do not cover top of root ball with backfill.
 - J. Tree and Shrub Pruning: Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character. Shrub sizes indicated are size after pruning.
 - K. Planting Ground Cover and Plants: Space 24 inches (600 mm) apart, unless otherwise indicated. Dig holes large enough to allow spreading of roots, and backfill with planting soil. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
 - L. Mulching: Completely cover area to be mulched. Apply mulch and finish level with adjacent finish grades. Do not place mulch against trunks or stems.
 1. Mulch Type and Thickness: Cut pine straw, 3 inches (75 mm) thick as indicated on drawings.
 - M. Seeding Lawns: Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other. Rake seed lightly into top 1/8 inch (3 mm) of topsoil, roll lightly, and water with fine spray.
 1. Seeding Rate: 3 to 4 lb per 1000 sq. ft. (1.5 to 2 kg per 100 sq. m).
 2. Protect seeded areas with slopes less than 1:6 against erosion by spreading straw mulch after completion of seeding operations and anchor by crimping into topsoil. Spread uniformly at a minimum rate of 2 tons per acre (45 kg per 100 sq. m).
 - N. Sodding Lawns: Lay sod to form a solid mass with tightly fitted joints within 24 hours of stripping. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
 1. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer.
 2. Saturate sod with fine water spray within 2 hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below the sod.
 - O. Edgings: Install edgings where indicated and anchor with stakes driven below top elevation of edging according to manufacturer's recommendations.
 - P. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

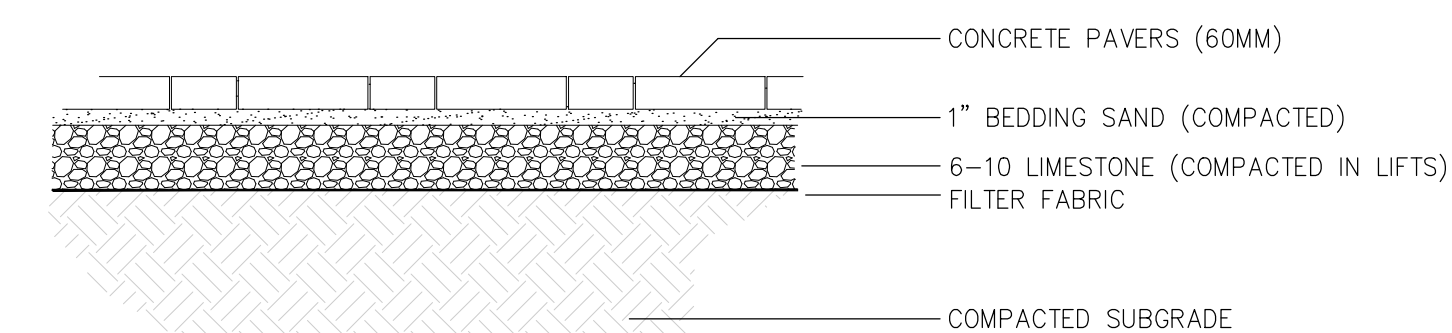
END OF SECTION 02900



1 SHRUB DETAIL
LS-3 NTS



2 TREE DETAIL
LS-3 NTS



CONCRETE PAVERS (FIELD STONE):
MANUFACTURER: BELGARD
PRODUCT: DUBLIN COBBLE
PATTERN: 3 PIECE PATTERN
COLOR: DANVILLE BEIGE

JOINT SAND:
MANUFACTURER: TECHNISEAL
HP2 POLYMERIC JOINT SAND
COLOR: BUFF

3 CONCRETE PAVER DETAIL
LS-3 NTS

Alphonse Barcia
LS-3
Landscape Architects
and
Planners
562 Clayton Court
Slidell, La. 70461
(985)960-0429
barciadesigns@gmail.com

jared ducote architect
600 South Barracks Street, Suite 210-6
Pensacola Florida 32502
850/439-1552 (p)
850/439-1554 (f)

I HEREBY CERTIFY THAT
THIS PLAN AND
SPECIFICATION WAS
PREPARED BY ME OR UNDER
MY DIRECT SUPERVISION
AND THAT I AM A LICENSED
ENGINEER UNDER THE LAWS
OF THE STATE OF N. CAROLINA
AS SIGNED BY MY HAND
AND SEAL.

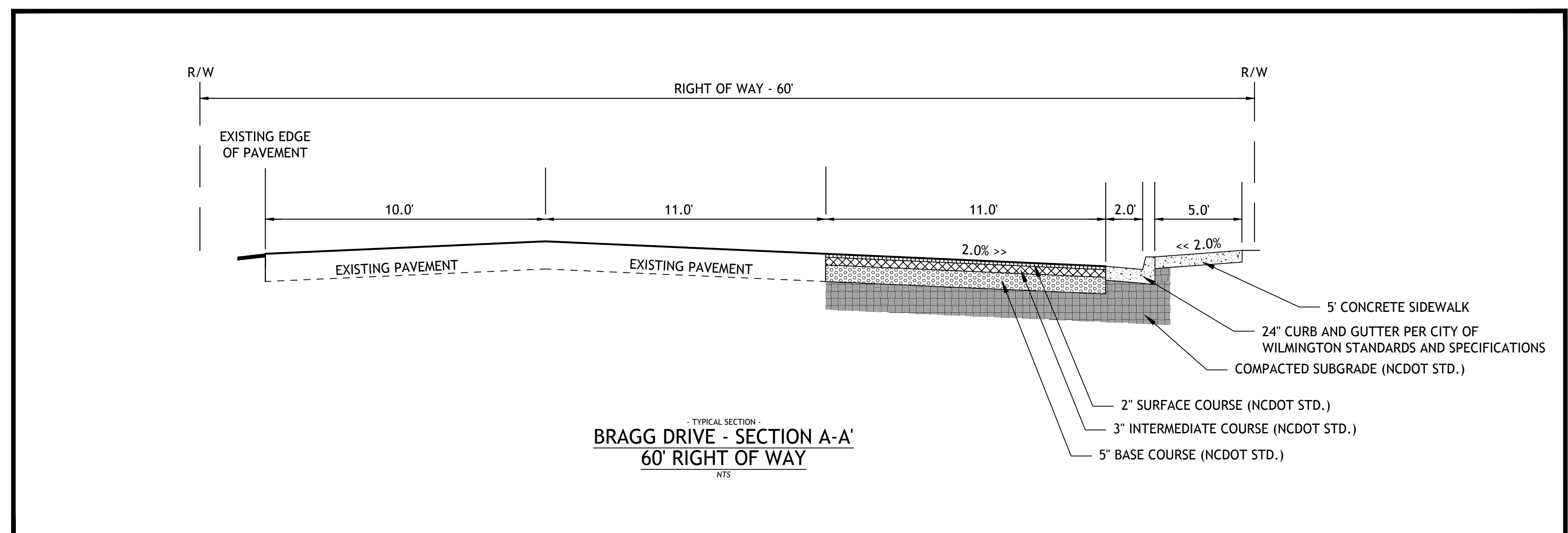
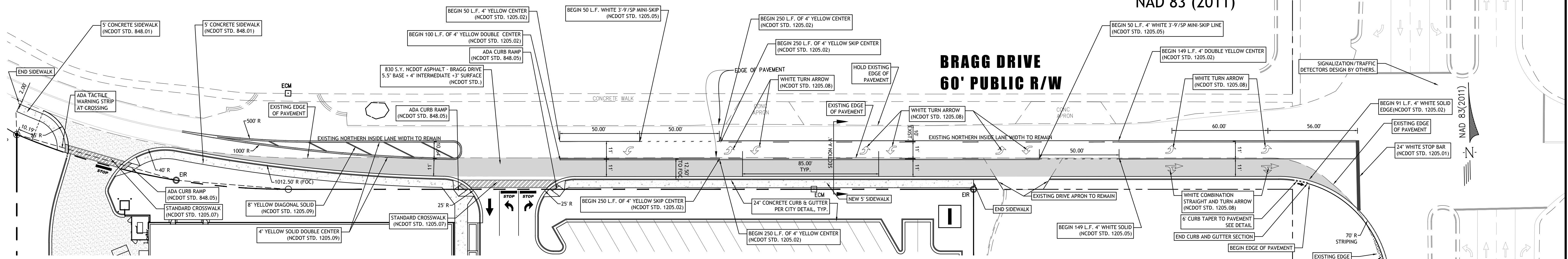
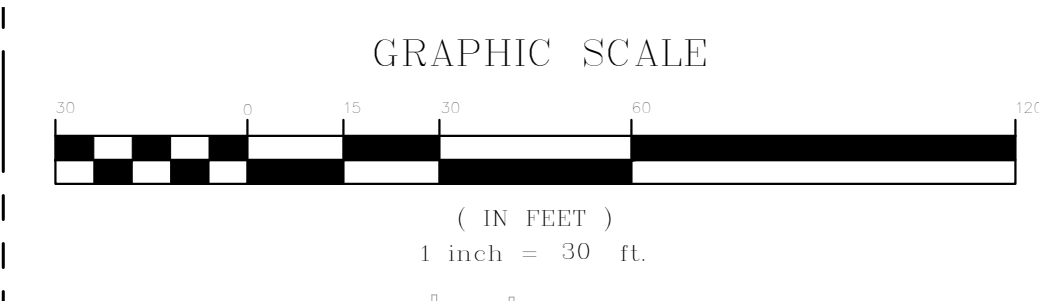
NO.	DATE	BY	DESCRIPTION

LANDSCAPE DETAILS AND SPECS
SOUTH COLLEGE ROAD & BRAGG DRIVE
WILMINGTON, NORTH CAROLINA

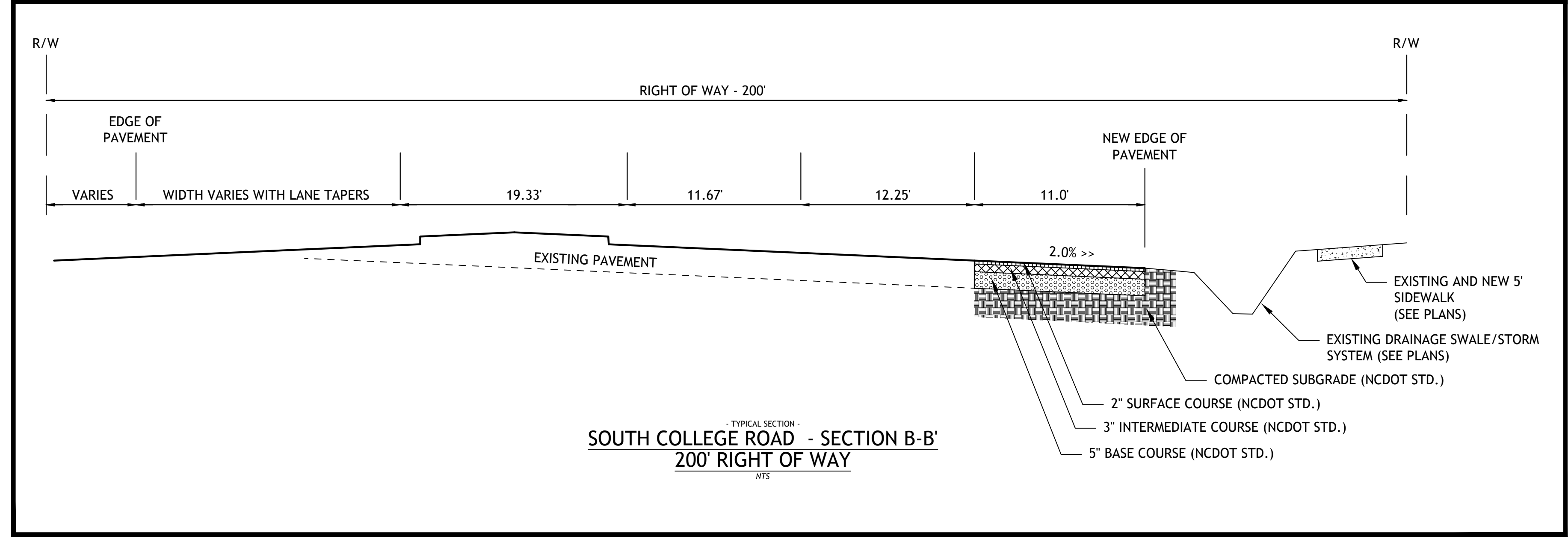
CADD PLOT:
LANDSCAPE BASE 4-29-15.DWG
DRAWN BY:
DATE: 4/30/2015
REVIEWED:



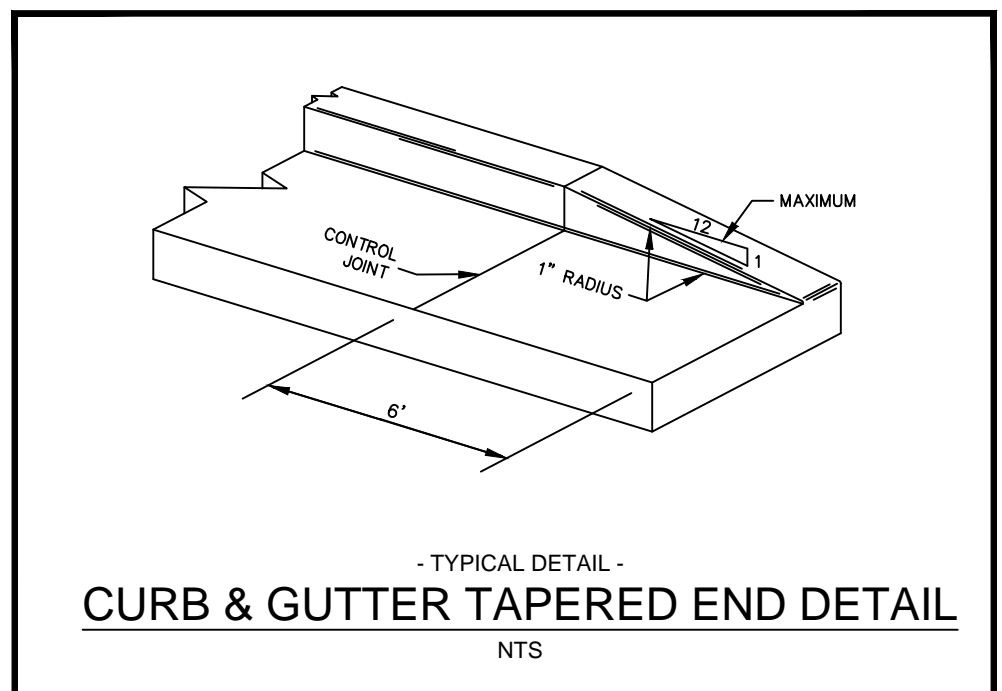
Know what's below.
Call before you dig.



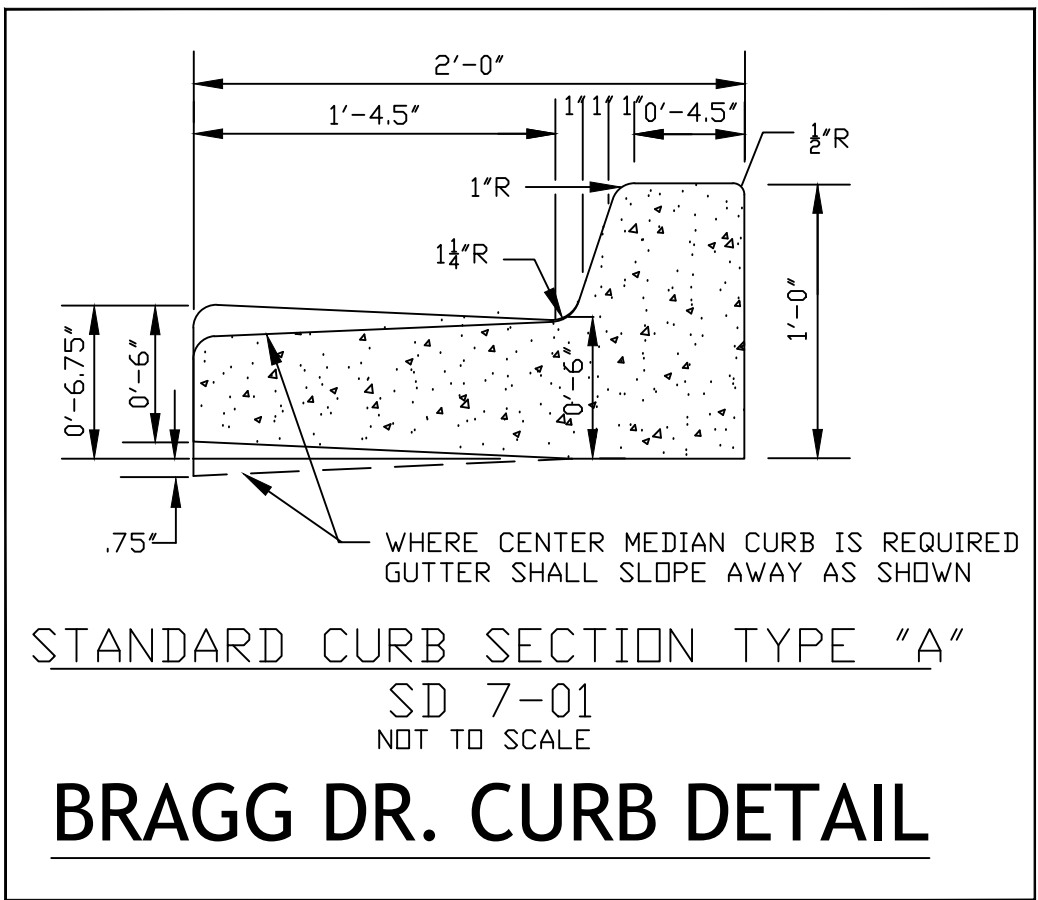
TYPICAL SECTION -
BRAGG DRIVE - SECTION A-A'
60' RIGHT OF WAY
NTS



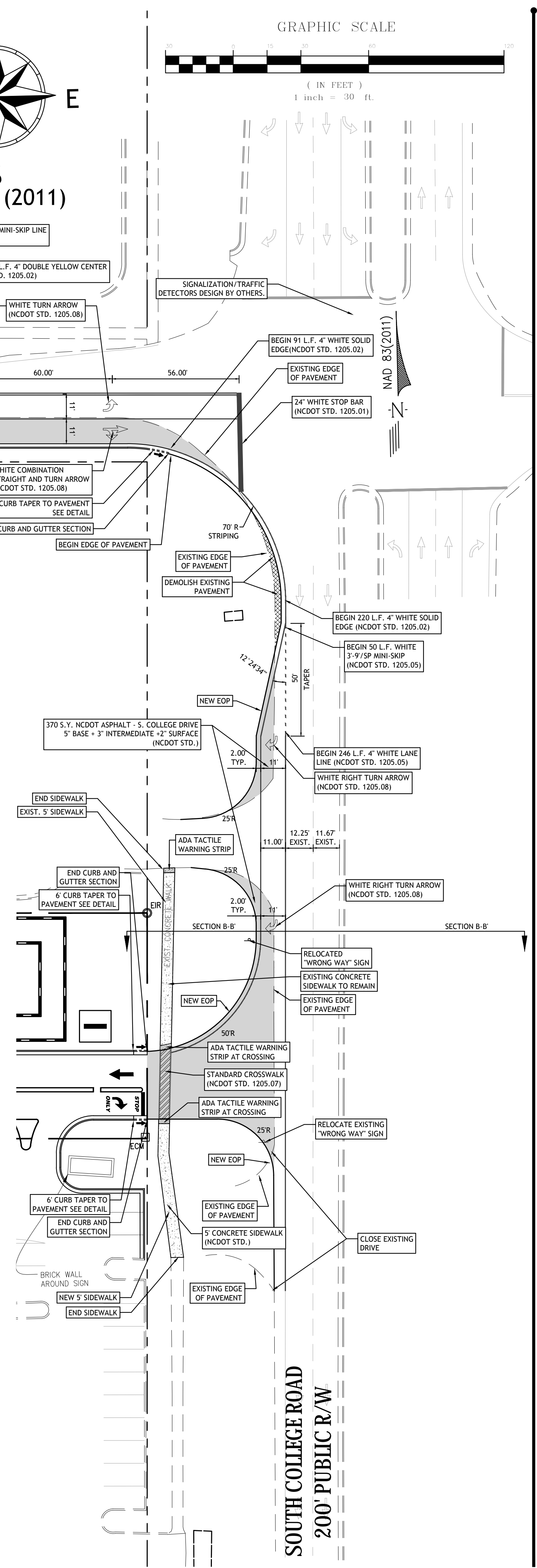
TYPICAL SECTION -
SOUTH COLLEGE ROAD - SECTION B-B'
200' RIGHT OF WAY
NTS



TYPICAL DETAIL -
CURB & GUTTER TAPERED END DETAIL
NTS



STANDARD CURB SECTION TYPE "A"
SD 7-01
NDT TO SCALE
BRAGG DR. CURB DETAIL

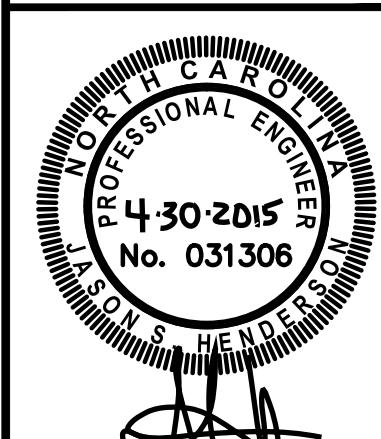


Project Number: 2014-090
DWG Name: 2014-090 D1.dwg
Drawing Scale: AS NOTED
Date of Project: 10-21-2014
Engineer of Record:
Jason Henderson, P.E.
South Carolina PE# 21466
Georgia PE# 03571
North Carolina PE# 03106
Alabama PE# 12054
Louisiana PE# 38891
Virginia PE# 60203318

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19 Washington Park Suite 100 • Greenville, SC 29601

BRAGG ROAD DEV.
COMPANY, LLC
Bragg Drive
Wilmington, NC

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



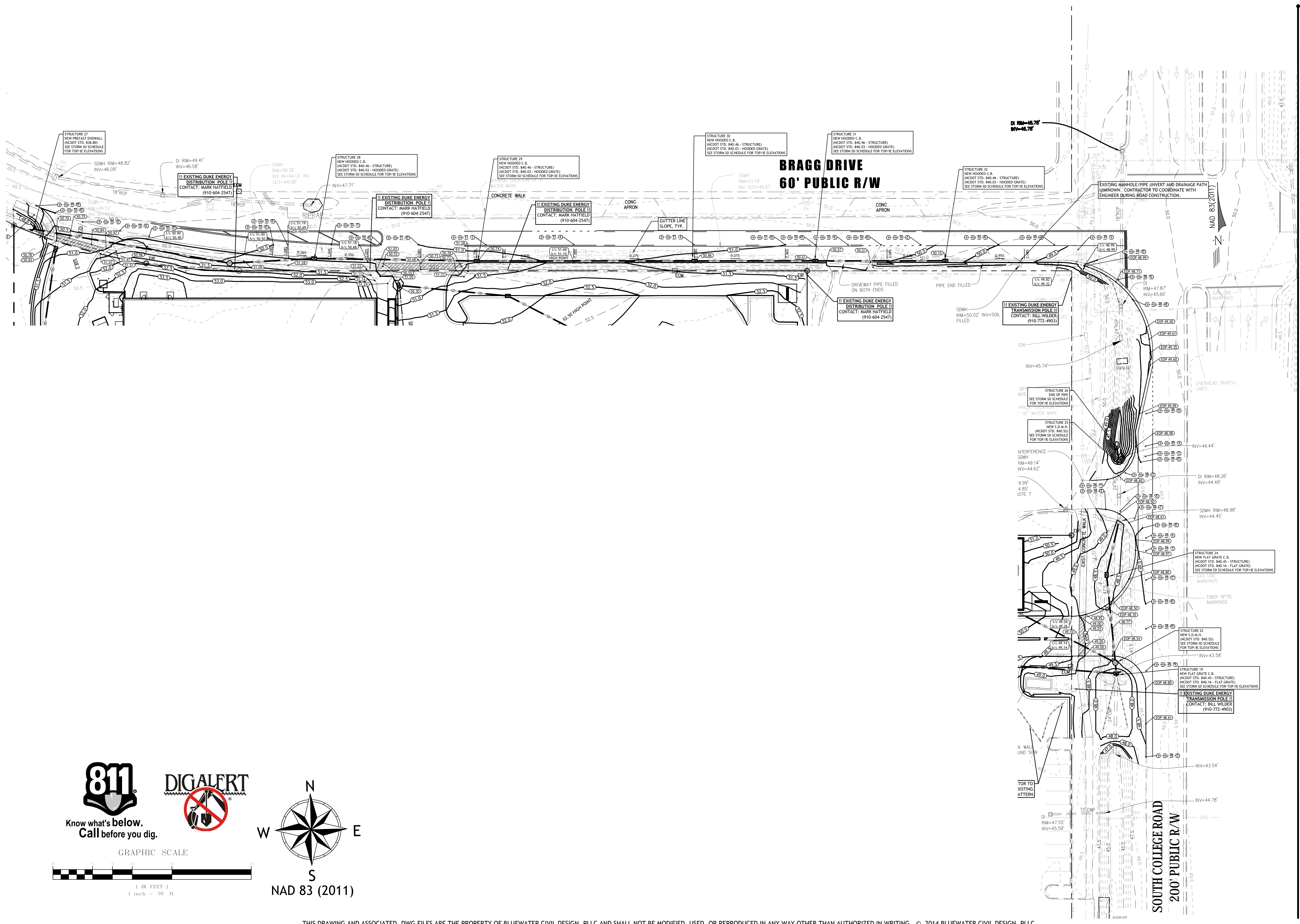
Bluewater Civil Design, PLLC
NC-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
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D	4-16-2015	100% TENANT SUBMITTAL
E	4-30-2015	REVISED PER NCDOT/WILMINGTON COMMENTS

ROAD IMPROVEMENTS:
LAYOUT/PAVEMENT/
MARKINGS

R101

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
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811
 Know what's below.
 Call before you dig.

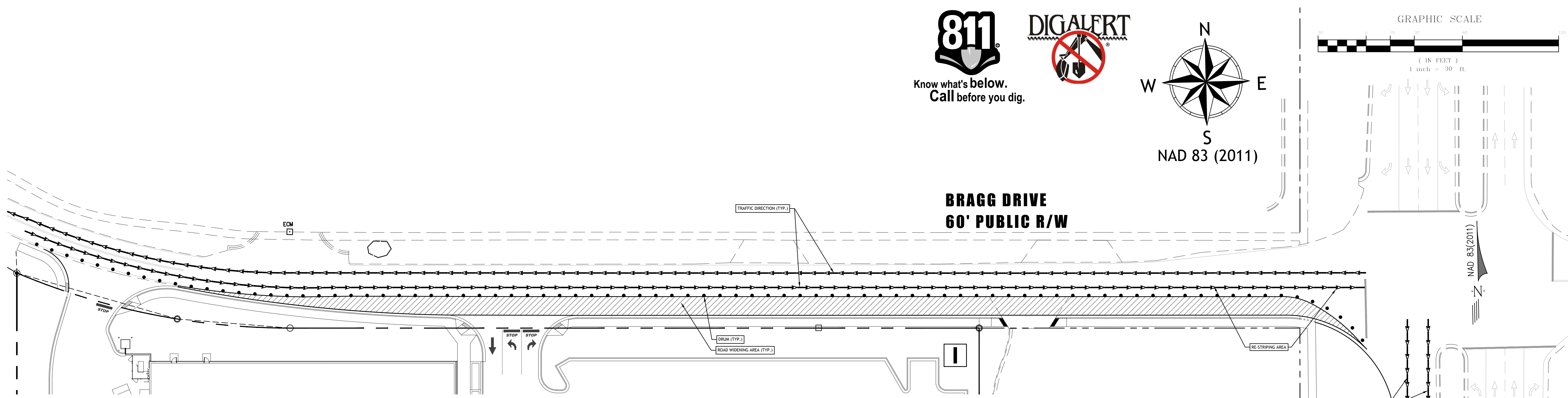
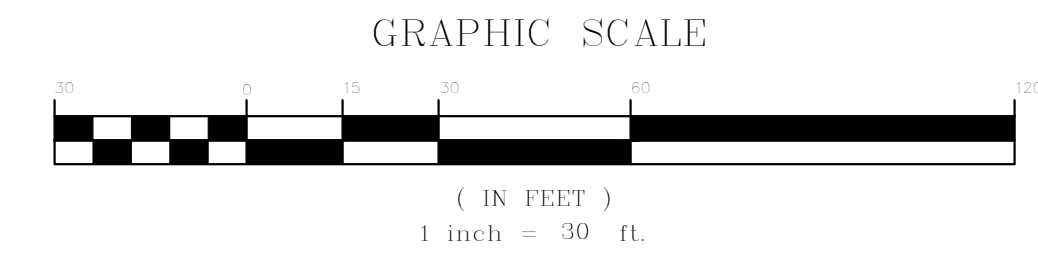
DIGALERT

GRAPHIC SCALE
 (IN FEET)
 1 inch = 30 ft

NAD 83 (2011)



Know what's below.
Call before you dig.



BRAGG DRIVE 60' PUBLIC R/W

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY LANE CLOSURES
2-LANE, 2-WAY ROADWAY - 1 LANE CLOSED

FOR PAVEMENT MARKING
ON BRAGG DRIVE

INSET FOR 2 LANE ROADWAYS
WITH 2-WAY TURN LANE
ALL OTHER DEVICES ARE THE SAME AS ABOVE

GENERAL NOTES FOR FLAGGER OPERATIONS:
1. REFER TO STD. 1101.11 SHEET 4 FOR SIGN SPACING.
2. INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC.
3. REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
4. PLACE CONES THRU THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.
5. EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE FLAGGER (REFER TO STD. 1101.11 SHEET 2).
6. DO NOT STOP TRAFFIC IN ANY ONE DIRECTION FOR MORE THAN 5 MINUTES AT A TIME.
7. DRUMS OR BEYOND SIGNS MAY BE USED IN LIEU OF CONES. REFER TO ROADWAY STANDARD DRAWING 1101.01 FOR SIGNING REQUIREMENTS.
8. USE FLAGGERS TO CONTROL TRAFFIC AT INTERSECTIONS AFFECTED BY THE LANE CLOSURE. SIGNING MUST BE LOCATED AT INTERSECTIONS WITH THE FLAGGER SIGNING (STD. 1101.01) PLACED IMMEDIATELY UPSTREAM TO THE LANE CLOSURE AND DOWNSTREAM TO THE LANE CLOSURE.
9. REFER TO 2006 MUTCD, CHAPTER 6, FOR FLAGGER CONTROL, REQUIREMENTS, AND PROCEDURES.
10. DO NOT EXCEED A 1/2 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TWP OR AS DIRECTED BY THE ENGINEER.

GENERAL NOTES FOR PILOT CAR OPERATIONS:
1. USE PILOT CARS WHEN DIRECTED BY THE ENGINEER.
2. IF ROADWAY WIDTH IS LESS THAN 50 FEET (60' TO 80' FOR SOME) MAY NOT BE REQUIRED. THE PILOT CAR MUST BE LOCATED AT THE REAR OF THE WORK AREA.
3. CONES ARE ALWAYS REQUIRED IN THE UPSTREAM AND DOWNSTREAM TAPPERS.
4. REMOVE SIGN (S) "PILOT CAR FOLLOW ME" AT A CONSPICUOUS POSITION ON THE REAR OF THE WORK AREA.
5. DO NOT INSTALL MORE THAN ONE (1) PAIR OF LANE CLOSURE, MEASURED FROM THE BEGINNING OF THE WORK AREA.
6. ADVISE RESIDENTS AND BUSINESS WITHIN THE LANE CLOSURE LIMITS ABOUT METHODS OF SAFE EGRESS AND INGRESS FROM DRIVEWAYS DURING FLAGGING AND PILOT CAR OPERATIONS.

LEGEND:
▲ FLAGGER
● CONE
□ PORTABLE SIGN
→ DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY LANE CLOSURES
2-LANE, 2-WAY ROADWAY - 1 LANE CLOSED

SHEET 1 OF 15
1101.02

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY SHOULDER CLOSURES

SHOULDER CLOSURE ON CONTROLLED ACCESS FACILITIES - > 60 MPH

SHOULDER CLOSURE ON DIVIDED FACILITIES - ≤ 55 MPH

SHOULDER CLOSURE ON UNDIVIDED ROADWAYS (SEE NOTE 5)

GENERAL NOTES:
1. PLACE SHOULDER CLOSURE SIGNS ON THE SAME SIDE AS THE SHOULDER THAT IS CLOSED.
2. PLACE DRUMS IN THE SHOULDER TAPER AT THE MAXIMUM SPACING EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE WORK AREA IS EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.
3. USE STATIONARY SIGNS FOR LONG TERM OPERATIONS (LONGER THAN 3 DAYS).
4. REFER TO STD. 1101.11 FOR "L" DISTANCE AND SIGN SPACING.
5. THE TWO-LANE, TWO-WAY DRIVING MAY BE APPLIED TO UNDIVIDED, MULTI-LANE FACILITIES.

LEGEND:
□ DRUM
□ STATIONARY OR PORTABLE SIGN
→ DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY SHOULDER CLOSURES

SHEET 1 OF 1
1101.04

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
DETAIL WORK ZONE WARNING SIGNS
TWO-WAY UNDIVIDED (L-LINES)

ROADWAYS INTERSECTING ALONG 2 WAY UNDIVIDED WORK ZONE (Y-LINES)

GENERAL NOTES:
1. USE FLUORESCENT ORANGE SHEETING (TYPE V11 OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS, UNLESS COVERED.
2. DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK, UNLESS COVERED.
3. SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.
4. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
5. USE 3LB STEEL U-CHEANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHEANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1004-1.1(B). MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHEANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1101.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHEANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
6. WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01.
7. DO NOT BACK BRACE SIGN SUPPORTS.

LEGEND:
□ STATIONARY SIGN
→ DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
DETAIL WORK ZONE WARNING SIGNS
TWO-WAY UNDIVIDED
WORK ZONE SIGNS

SHEET 3 OF 3
1101.01

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
WORK ZONE ADVANCE WARNING SIGNS FOR
FACILITIES 55 MPH

DETAIL A

DETAIL B

DETAIL C

DETAIL D

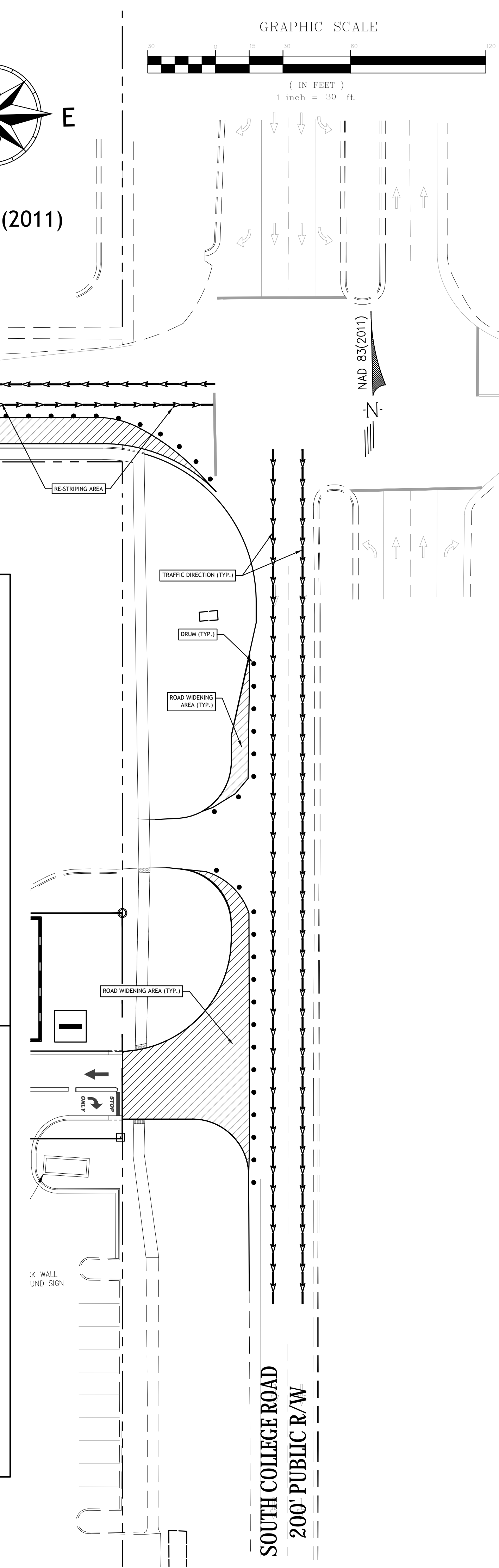
GENERAL NOTES:
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6. WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01.
7. DO NOT BACK BRACE SIGN SUPPORTS.
8. TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

LEGEND:
□ STATIONARY SIGN
→ DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
WORK ZONE ADVANCE WARNING SIGNS FOR
FACILITIES 55 MPH

SHEET 2 OF 3
1101.01

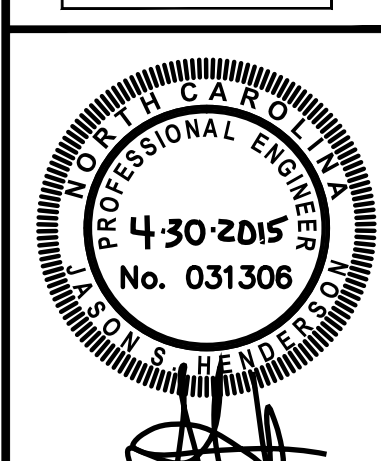


Project Number: 2014-090
DWG Name: 2014-090 D1.dwg
Drawing Scale: AS NOTED
Date of Project: 10-21-2014
Engineer of Record:
Jason Henderson, P.E.
South Carolina PE# 21406
Georgia PE# 03571
North Carolina PE# 03106
Alabama PE# 0504
Louisiana PE# 38891
Virginia PE# 60203118

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Certificates of Authorization:
SC 04212 - GA PE#005865
NC P0868 - AL CA4065E

BRAGG ROAD DEV.
COMPANY, LLC
Bragg Drive
Wilmington, NC

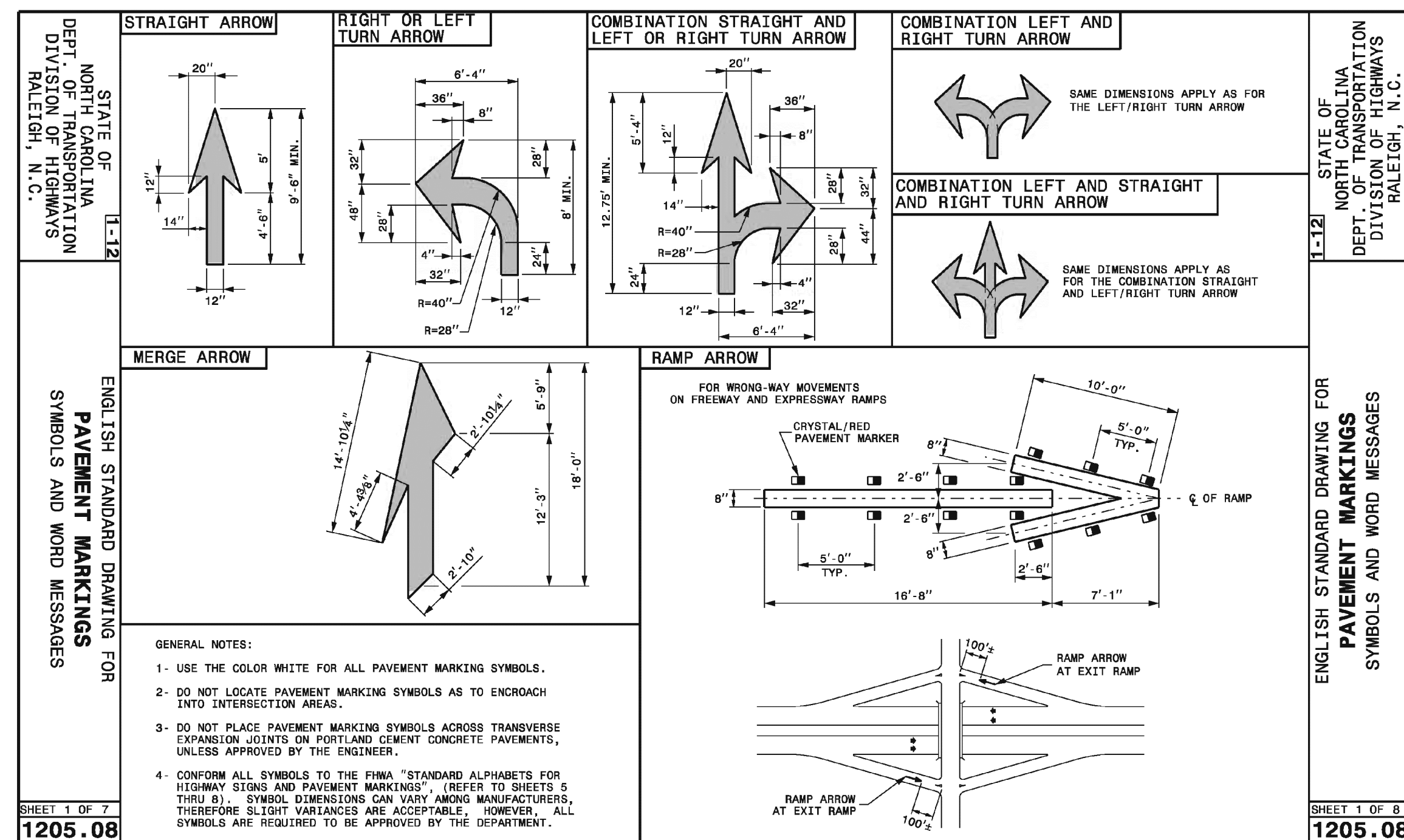
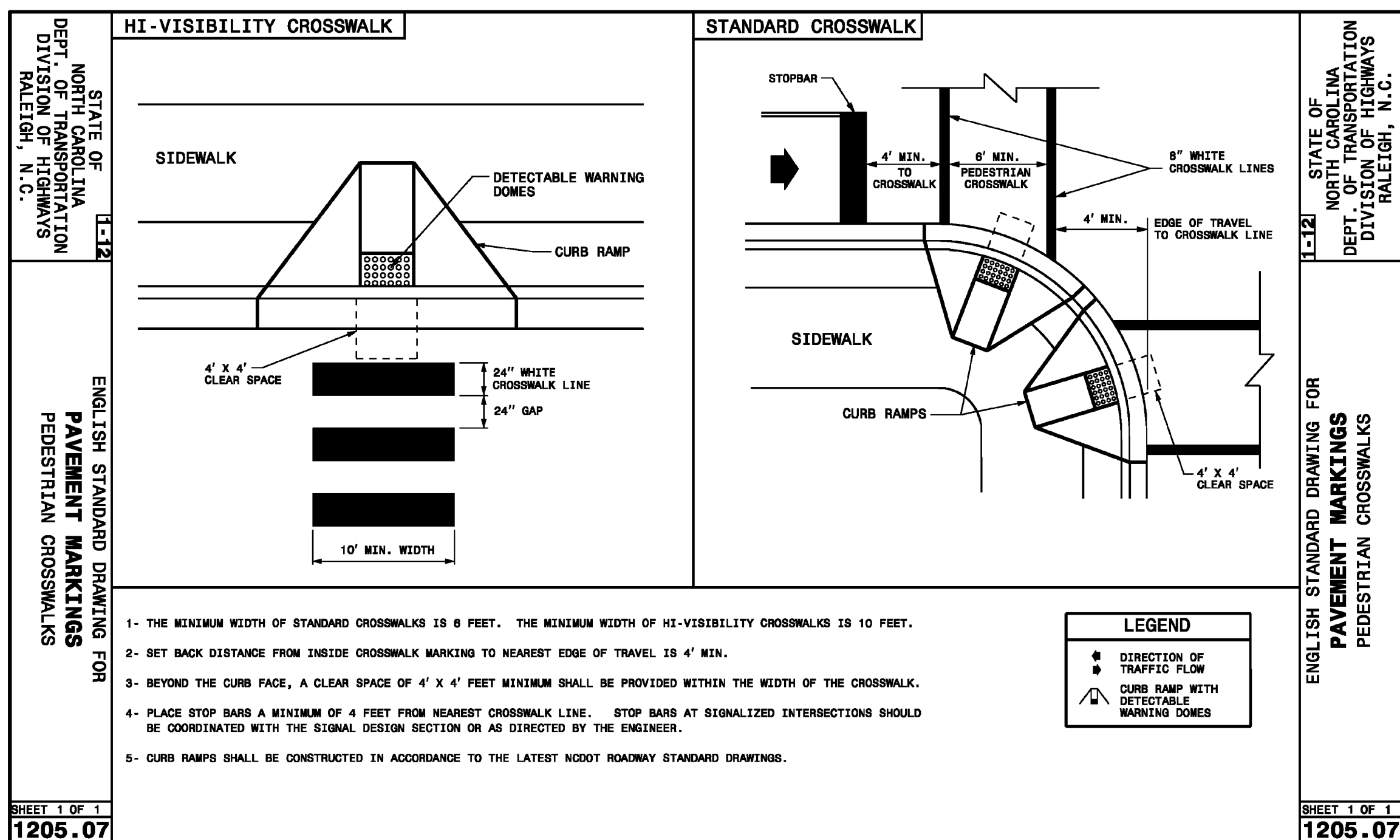
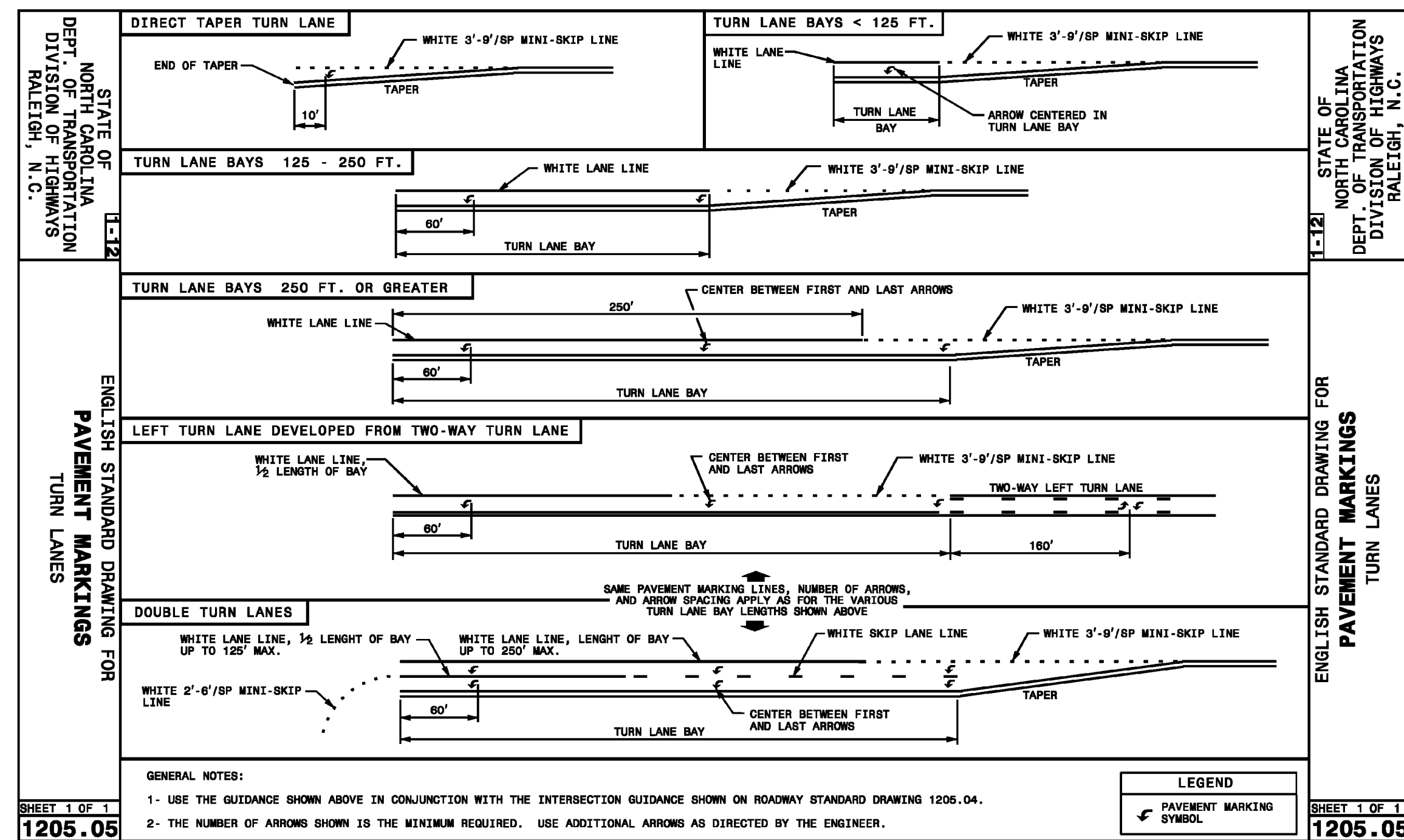
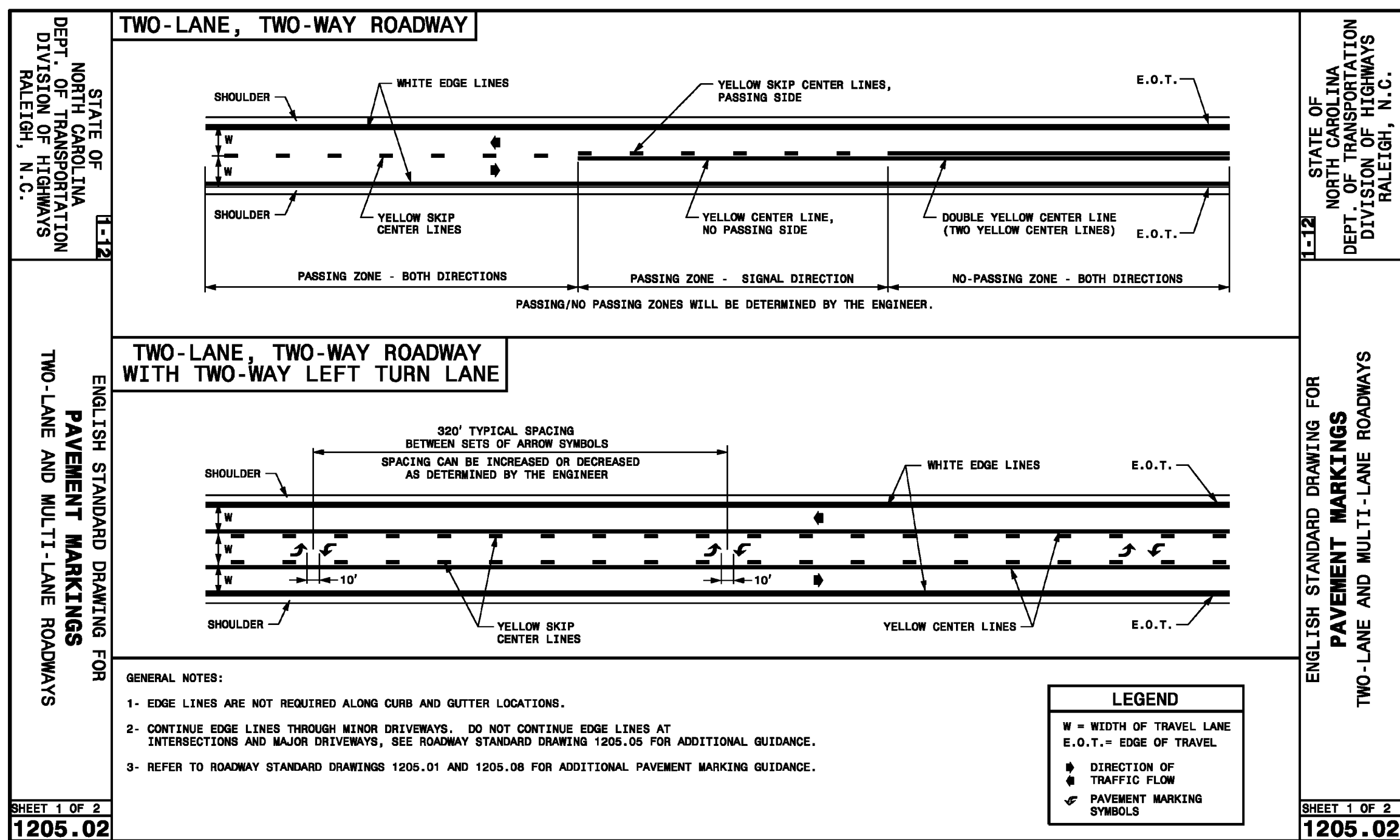
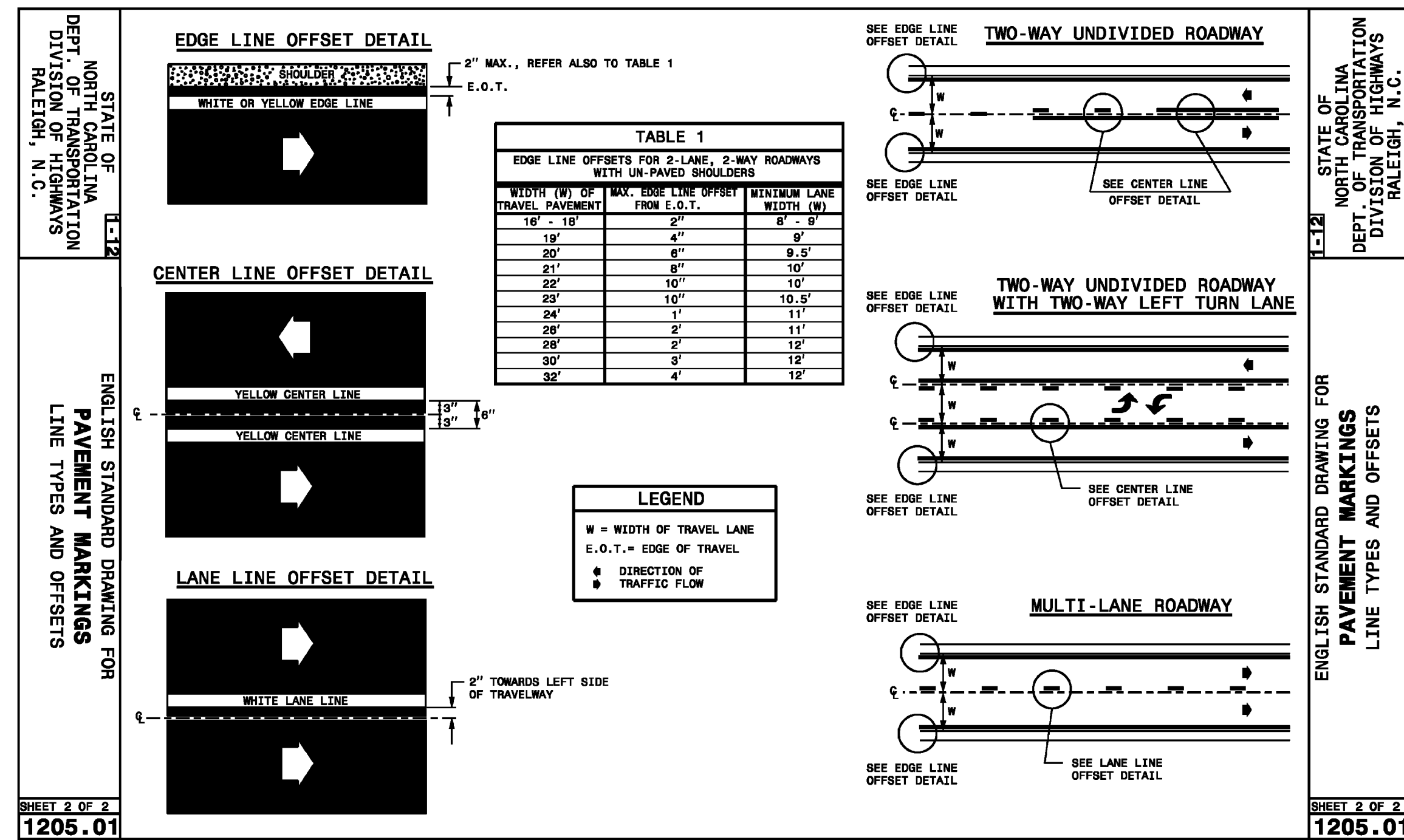
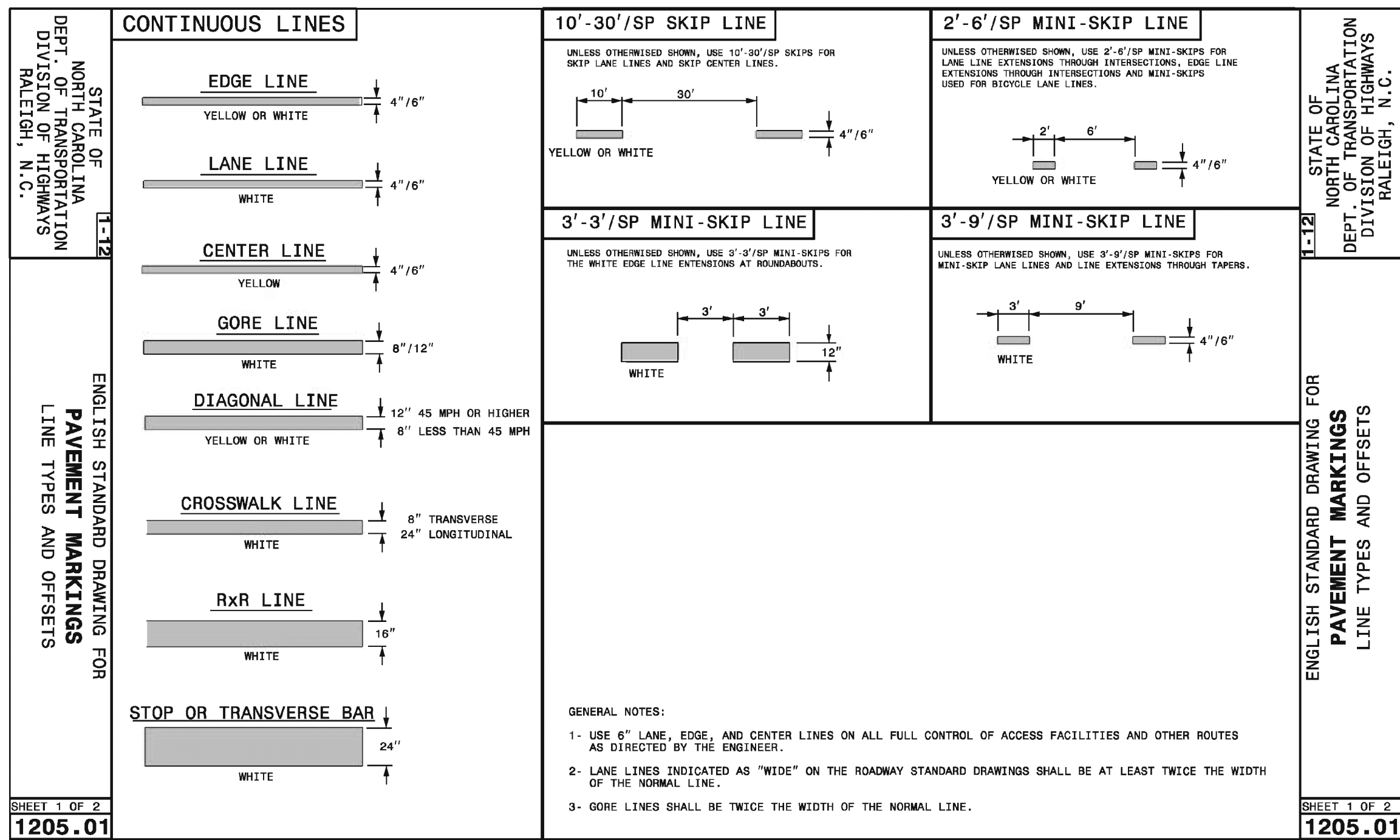


Bluewater Civil Design, PLLC
NC-0868

PLAN REVISION	ISSUE DATE	ISSUE COMMENT
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D	4-16-2015	100% TENTANT SUBMITTAL
E	4-30-2015	REVISED PER NCDOT/WILMINGTON COMMENTS
...

ROAD IMPROVEMENTS:
TRAFFIC CONTROL

R103



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR PAVEMENT MARKINGS LINE TYPES AND OFFSETS

SHEET 2 OF 2
1205.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR PAVEMENT MARKINGS TURN LANES

SHEET 1 OF 1
1205.05

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR PAVEMENT MARKINGS SYMBOLS AND WORD MESSAGES

SHEET 1 OF 8
1205.08

Approved Construction Plan

Name _____ Date _____

Planning _____ Traffic _____ Fire _____

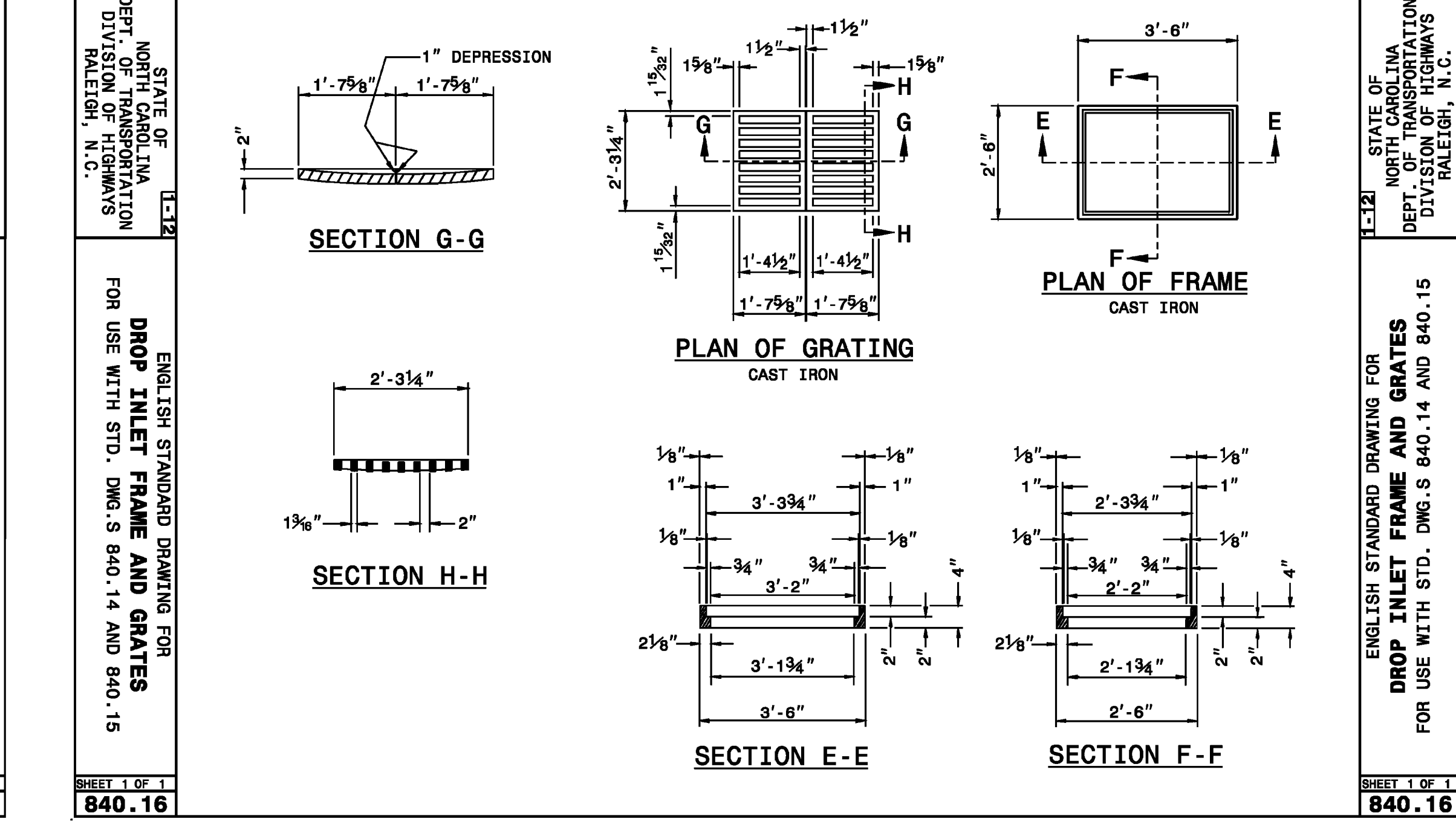
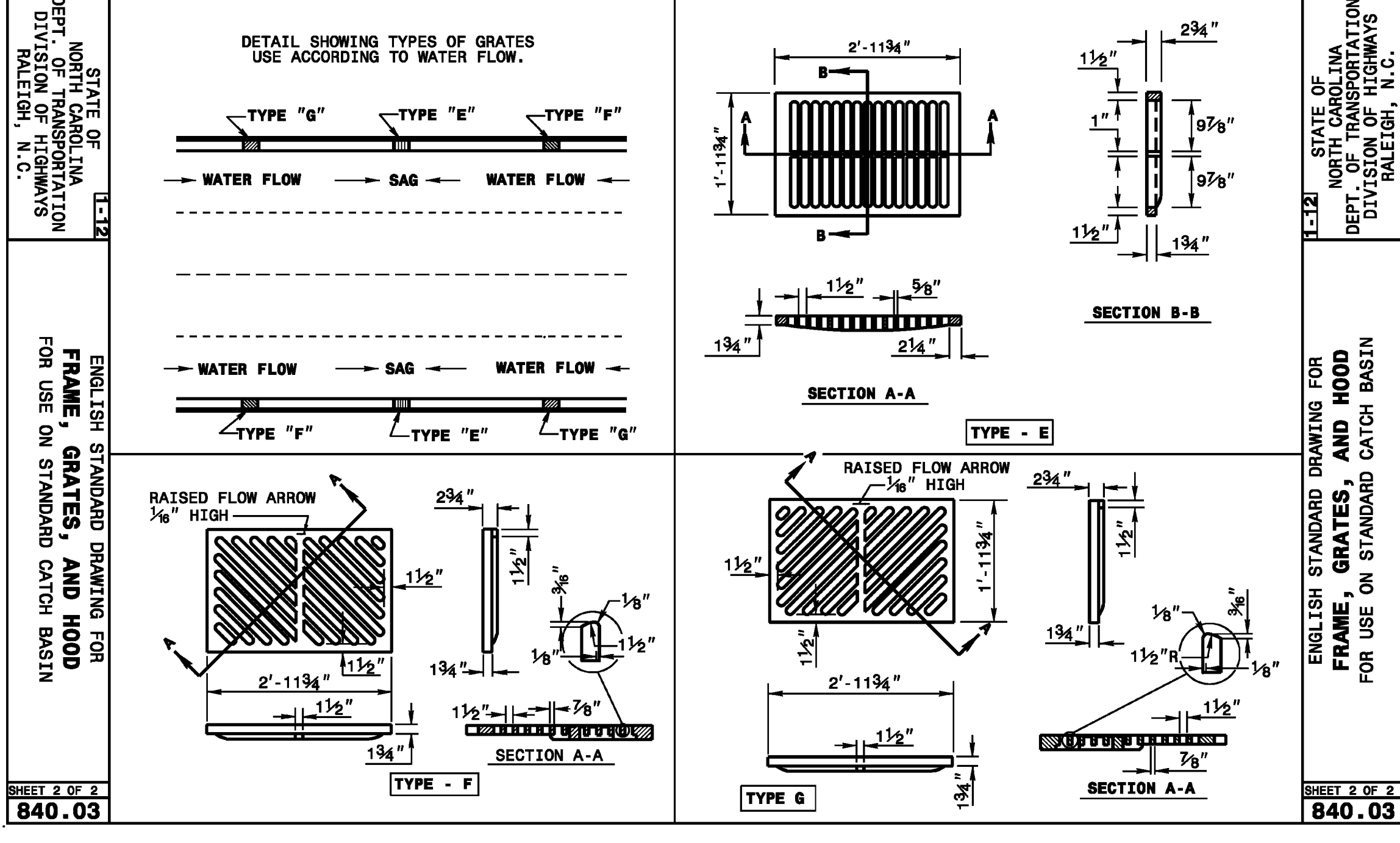
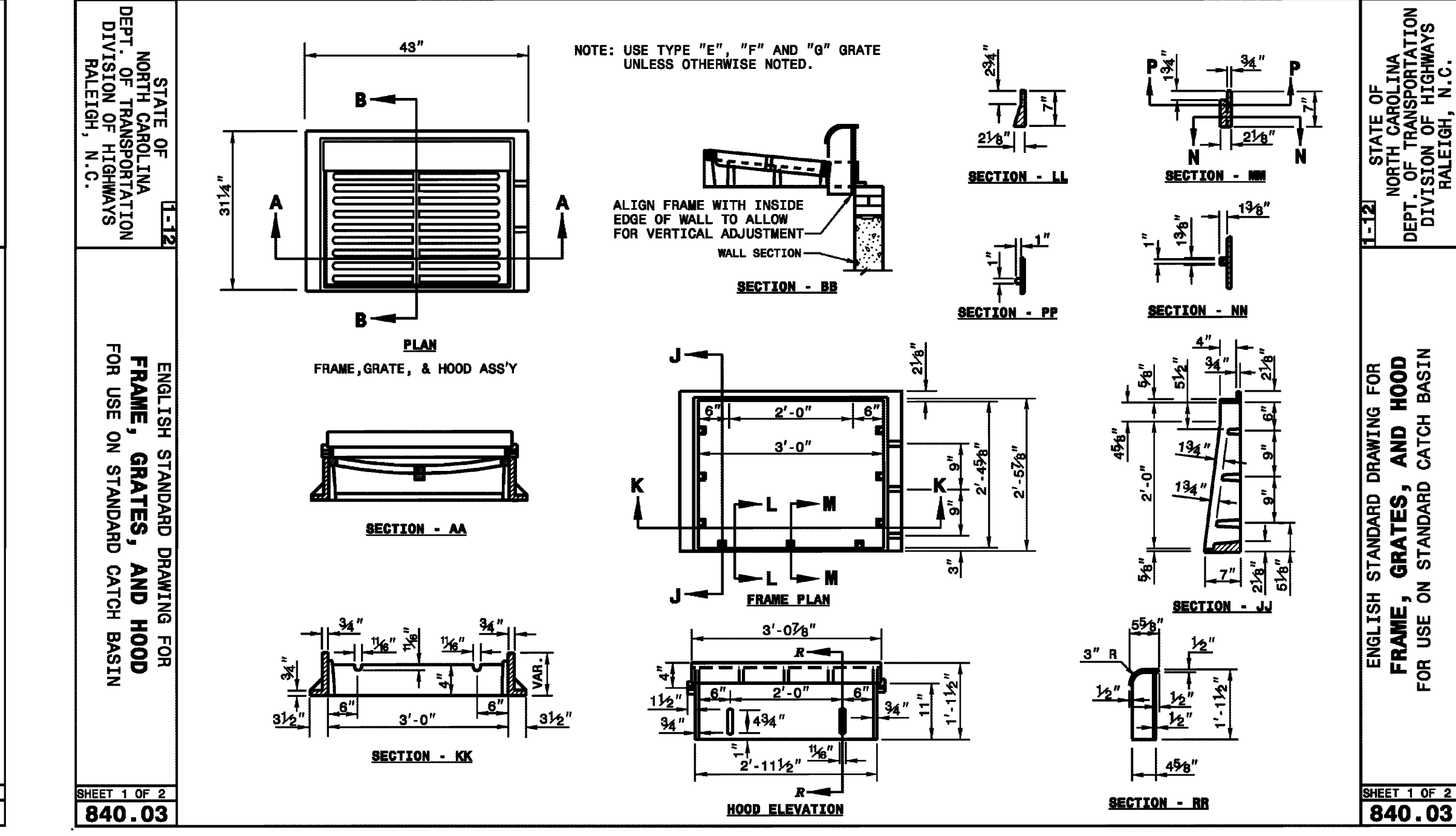
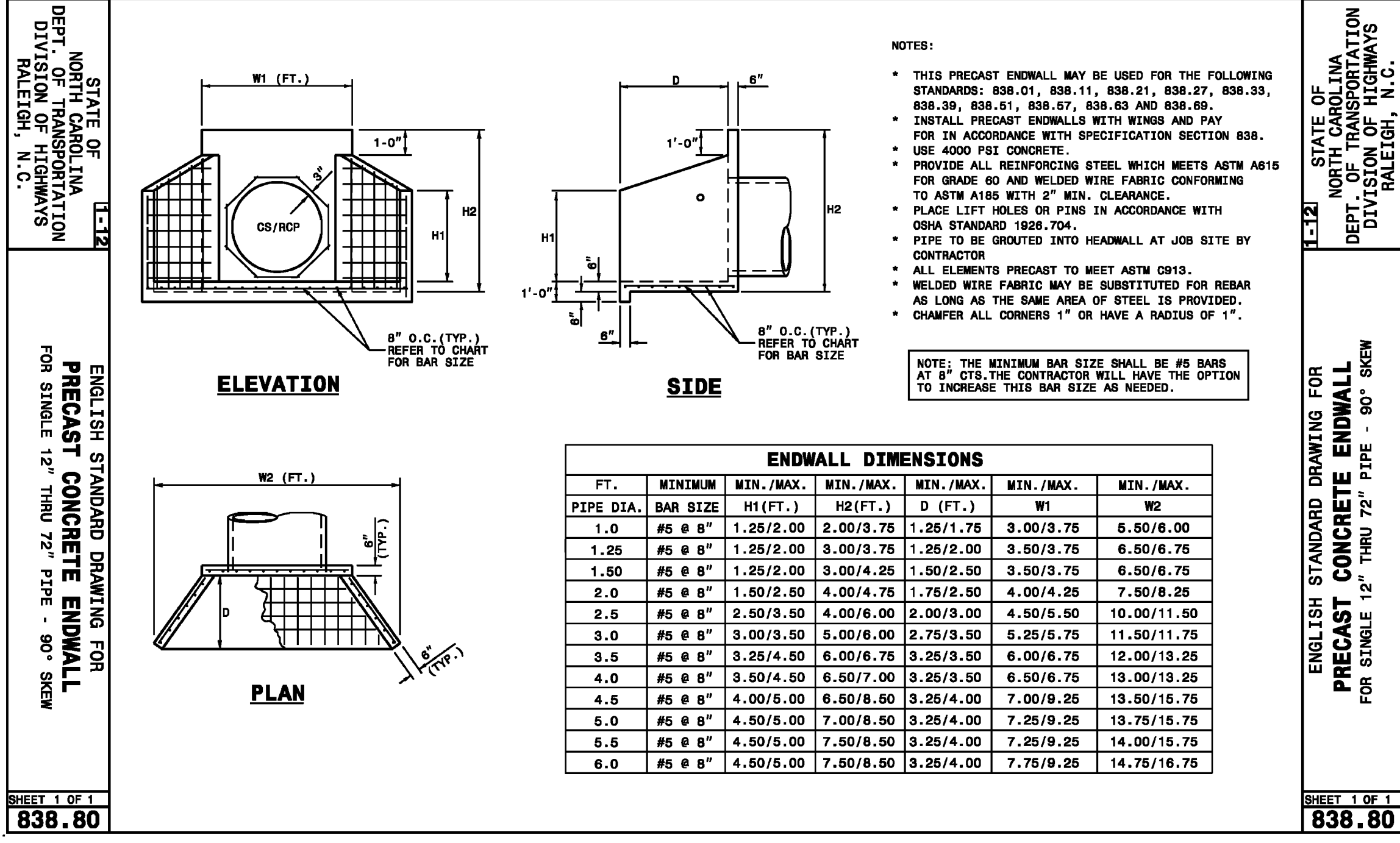
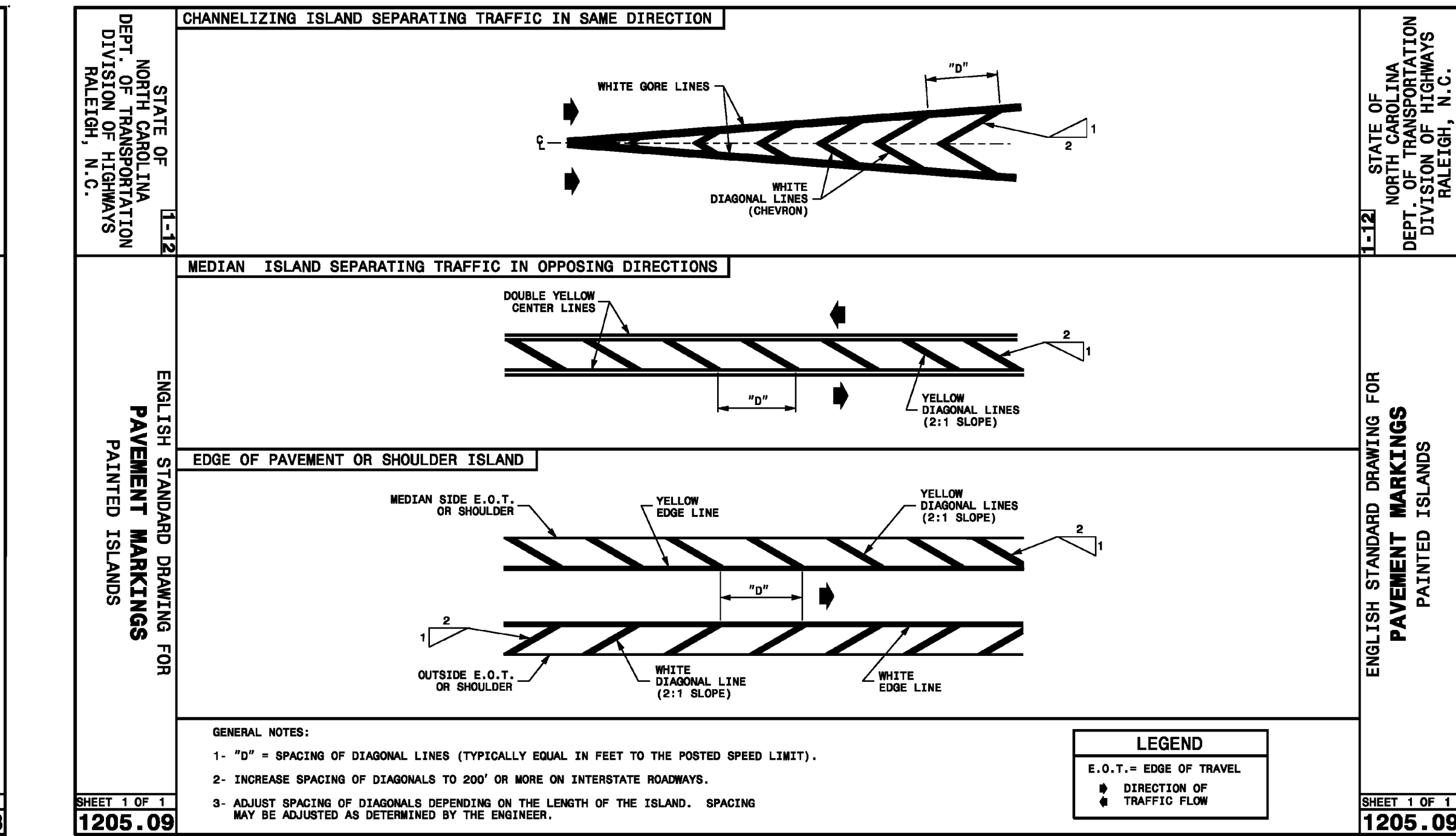
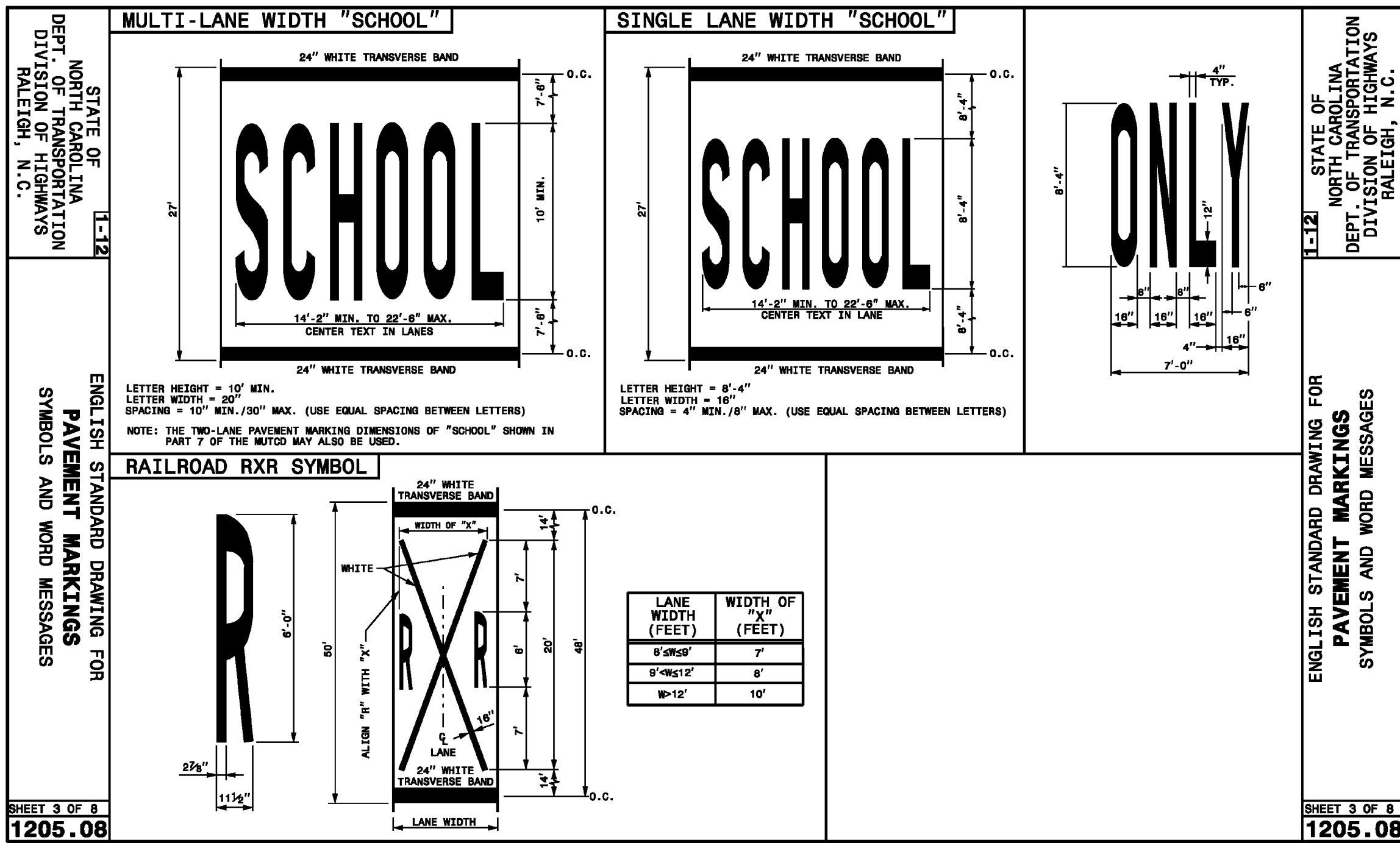


Bluewater Civil Design, PLLC
 No. 00868

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ROAD IMPROVEMENTS DETAILS

R104



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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR PRECAST DRAINAGE STRUCTURE (SOLID AND WAFFLE WALL)

SECTION 'A-A' SECTION 'B-B' SECTION 'C-C' SECTION 'D-D'

WAFFLE WALL ISOMETRIC VIEW SOLID WALL ISOMETRIC VIEW

THE PATTERN OF THE KNOCK-OUT PANELS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.

ENGLISH STANDARD DRAWING FOR PRECAST DRAINAGE STRUCTURE (SOLID AND WAFFLE WALL)

SHEET 1 OF 2 840.45

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR TRAFFIC BEARING PRECAST DRAINAGE STRUCTURE

SECTION VIEWS OPTIONAL JOINT DETAILS

PLAN VIEW OF BASE UNIT PRECAST RISER PLAN

TYPICAL PRECAST RISER SECTION TYPICAL SECTION TOP SLAB

TYPICAL SECTION OF BASE UNIT ISOMETRIC VIEW

GENERAL NOTES:
 • THIS PRECAST BOX MAY BE USED FOR THE FOLLOWING STANDARDS: 840.04, 840.05, 840.14, 840.15, 840.31, 840.32, 840.34, 840.35, 840.36 AND 840.41.
 • INSTALL AND PAY FOR PRECAST DRAINAGE STRUCTURES IN ACCORDANCE WITH NCDDT STANDARD SPECIFICATION SECTION 840.
 • USE 4000 PSI MINIMUM COMPRESSIVE STRENGTH CONCRETE.
 • USE ASTM A615 GRADE 60 REINFORCING STEEL. USE ASTM A193 WELDED WIRE FABRIC (WWF).
 • LIMIT MAXIMUM DEPTH TO TOP OF BOTTOM SLAB TO 15'-0".
 • PLACE LIFT HOLES OR PINS IN ACCORDANCE WITH OSHA STANDARD 1926.704.
 • ORIENT STRUCTURES SO THAT CORNERS WILL NOT BE CUT OR MODIFIED UNLESS ALLOWED BY DETAIL IN PLANS.
 • PRECAST ALL ELEMENTS TO MEET ASTM C913.
 • FRAME AND GRATE HEIGHT MAY BE ADJUSTED WITH CONCRETE OR BRICK IN ACCORDANCE WITH STANDARD 840.25.
 • PROVIDE PRECAST STRUCTURES OVER 4'-0" IN DEPTH WITH STEPS 12" ON CENTERS IN ACCORDANCE WITH STD. NO. 840.66.
 • WELDED WIRE FABRIC MAY BE SUBSTITUTED FOR REBAR IF THE SAME MIN. AREA OF STEEL IS PROVIDED.
 • SEAL JOINTS WITH AN APPROVED SEALANT (SEE SECTION 840 OF NCDDT STANDARD SPECIFICATIONS).
 • LIMIT MAXIMUM STRUCTURE SIZE INSIDE CLEAR DIMENSIONS TO 6'-0" X 6'-0".
 • THE OUTSIDE PIPE DIAMETER PLUS 2" IS THE MINIMUM STRUCTURE SIZE OR THE OPENING REQUIRED FOR GRATE AND FRAME WHICHEVER IS GREATER.
 • ROUND MANHOLE MAY BE USED IN LIEU OF SQUARE PROVIDED 2 EXTRA #6'S ARE PLACED ON EVERY SIDE NOT ADJACENT TO A WALL. SEE STD. DWG. 840.34 FOR MANHOLE INSTALLATION.

ENGLISH STANDARD DRAWING FOR TRAFFIC BEARING PRECAST DRAINAGE STRUCTURE

SHEET 1 OF 1 840.46

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR PRECAST MANHOLE 4', 5' AND 6' DIAMETER

ALTERNATE CONE SECTION FLAT TOP SLAB TYPICAL MANHOLE SECTION

D	W	T	As
INTERNAL DIAMETER (FT.)	MIN. WALL THICKNESS (IN.)	MIN. TOP/BOTTOM SLAB THICKNESS (IN.)	MIN. CIRCUMFERENTIAL AREA OF STEEL PER VERTICAL FT. (SQ. IN.)
4	4	8	0.12
5	5	8	0.15
6	6	8	0.18

GENERAL NOTES:
 USE 4000 PSI MINIMUM COMPRESSIVE STRENGTH CONCRETE.
 FABRICATE, ASSEMBLE AND DESIGN PRECAST MANHOLE COMPONENTS ACCORDANCE WITH AASHTO M199.
 ASSEMBLE RISER AND GRADE RINGS WITH THE STEPS SPACED 12" FROM THE TOP TO THE BOTTOM OF THE MANHOLE.
 WHERE THE MANHOLE IS EXPOSED TO ROAD TRAFFIC, CONSTRUCT THE TOP OF THE MANHOLE FLUSH WITH THE GROUND AND A MINIMUM OF 8" ABOVE THE GROUND AT OTHER LOCATIONS.
 LIMIT DEPTH OF FILL TO 30'-0" FROM FINISH GRADE TO TOP OF BOTTOM SLAB.
 THE MIN. SLAB THICKNESS 'T' IS THE DIMENSION OF THE THINNEST PORTION OF THE TOP/BOTTOM SLAB.
 * TOP MAT OF REINFORCEMENT MAY BE NEGLECTED IF TOP SLAB HAS A DISTINGUISHABLE TOP AND BOTTOM.

ENGLISH STANDARD DRAWING FOR PRECAST MANHOLE 4', 5' AND 6' DIAMETER

SHEET 1 OF 1 840.52

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR DRAINAGE STRUCTURE STEPS

PLAN ELEVATION SIDE ELEVATION

CAST IRON REINFORCING STEEL

NOTES:
 INSTALL ALL STEPS PROTRUDING 4" FROM INSIDE FACE OF STRUCTURE WALL. STEPS DIFFERING IN DIMENSIONS, CONFIGURATION, OR MATERIALS FROM THOSE SHOWN MAY ALSO BE USED PROVIDED THE CONTRACTOR HAS FURNISHED THE ENGINEER WITH DETAILS OF THE PROPOSED STEPS AND HAS RECEIVED WRITTEN APPROVAL FROM THE ENGINEER FOR THE USE OF SUCH STEPS.

ENGLISH STANDARD DRAWING FOR DRAINAGE STRUCTURE STEPS

SHEET 1 OF 1 840.66