



LINCOLN COUNTY PLANNING & INSPECTIONS DEPARTMENT

302 NORTH ACADEMY STREET, SUITE A, LINCOLNTON, NORTH CAROLINA 28092
704-736-8440 OFFICE 704-736-8434 INSPECTION REQUEST LINE 704-732-9010 FAX

To: Board of Commissioners
Planning Board

From: Randy Hawkins, Zoning Administrator

Date: March 19, 2014

Re: Watershed Conditional Use Permit #18
Dr. Matt Motteler, applicant
Parcel ID# 89693

The following information is for use by the Lincoln County Board of Commissioners and Planning Board at their joint meeting/public hearing on April 7, 2013.

REQUEST

The applicant is requesting a conditional use permit to allow the use of the high-density option in the WS-IV Critical Area of the Catawba/Lake Norman Watershed. The applicant is proposing to expand an office building and add parking spaces. The high-density option would allow the development to have a built-upon surface area covering up to 50 percent of the site, with the use of engineered stormwater controls. (Otherwise, in this watershed district, non-residential developments that require an erosion control plan are limited to a built-upon area of 24 percent.).

SITE AREA AND DESCRIPTION

The 0.9-acre parcel is located at 623 N. NC 16 Hwy., on the west side of N.C. 16 Business about 300 feet north of Townsend Drive. It is adjoined on both sides by property zoned B-N and on the rear by property zoned I-G (General Industrial). The property on the opposite side of N.C. 16 Business is zoned R-CR (Residential and Commercial/Recreational). Land uses in this area include business, industrial and residential. This property is located at the perimeter of an area designated by the Land Use Plan as a community center, where services and activities for the surrounding area are recommended to be concentrated.

HIGH-DENSITY OPTION REQUIREMENTS

Under the water-supply watershed regulations of the Lincoln County Unified Development Ordinance, the Catawba/Lake Norman Watershed is designated for the use of the high-density option. The option requires the use of stormwater control structures to control and treat the runoff from the first one-inch of rain. The structures must be designed to meet the Best Management Practices (BMP) standards of the N.C. Department of Environment and Natural Resources. In this case, the plans call for a three bioretention areas.

The regulations require the developer to post a bond or other financial security in an amount not less than 1.25 times the cost of constructing the necessary stormwater controls. In addition, a binding agreement must be signed, requiring the owner to maintain, repair and, if necessary, reconstruct the structures in accordance with an approved operations and maintenance plan. Once the stormwater controls have been constructed and inspected, and prior to the release of the financial security, the applicant is required to deposit with the county either cash or a similar approved instrument in an amount equal to 15 percent of the total construction cost or 100 percent of the cost of maintaining the controls over a 20-year period, whichever is greater.



County Of Lincoln, North Carolina

Planning Board

Applicant **Dr. Matt Motteler**

Application No. **WSCUP #18**

Parcel# **89693**

Zoning District **B-N**

Proposed Conditional Use **high-density option in Catawba/Lake Norman Watershed**

FINDINGS OF FACT

1. The use will not materially endanger the public health or safety if located where proposed and developed according to plan. YES _____ NO _____

FACTUAL REASONS CITED: _____

2. The use meets all required conditions and specifications. YES _____ NO _____

FACTUAL REASONS CITED: _____

3. The use will not substantially injure the value of adjoining or abutting property unless the use is a public necessity. YES _____ NO _____

FACTUAL REASONS CITED: _____

4. The location and character of use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located and will be in general conformity with the Land Use Plan for the area in question. YES _____ NO _____

FACTUAL REASONS CITED: _____

After having held a Public Hearing on _____ and in light of the Findings of Facts listed herein, the following action was taken by the Lincoln County Planning Board:

In recommending such Conditional Use, the following conditions were recommended by the Lincoln County Planning Board:



Watershed Conditional Use Permit

Application

Lincoln County Planning and Inspections Department
Zoning Administrator
302 N. Academy St., Suite A, Lincolnton, NC 28092

PART I

Applicant Name: Dr. Matt Matteler

Applicant Address: 623 N. Hwy 16, Denver, NC

Applicant Phone Number: 704-483-2263

Property Owner Name: CEC Property Investments, LLC

Property Owner Address: 623 N Hwy 16, Denver, NC

Property Owner Phone Number: 704-483-2263

PART II

Property Location: 623 N Hwy 16, Denver, NC

Property ID (10 digits): 4602685200 Property size: .917 acres

Parcel # (5 digits): 89693 Deed Book(s): 2167 Page(s): 777

PART III

Watershed District: Lake Norman WS-IVC

Briefly describe how the property is being used and any existing structures.

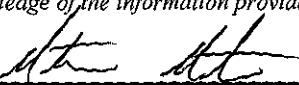
The existing facility is a professional office building, providing eye care.

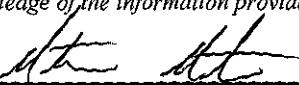
Briefly describe the proposed project and the why it would require a Watershed Conditional Use Permit.

The attached plan identifies a proposed future 2,500 sf addition with an additional 10 parking spaces. Due to the proposed ultimate site exceeding 24% impervious, permanent SWM facilities are proposed to treat the first 1" of runoff and 85% TSS.

\$1,000.00 APPLICATION FEE MUST BE RECEIVED BEFORE PROCESSING.

I hereby certify that all knowledge of the information provided for this application and attachments is true and correct to the best of my knowledge.


Applicant's Signature


2-21-14

Date

APPLICANT'S PROPOSED FINDINGS OF FACT
FOR A CONDITIONAL USE PERMIT

Application No. **WSCUP #18**

Applicant **Dr. Matt Motteler**

Property Location **623 N. NC 16 Hwy.** Zoning District **B-N**

Proposed Conditional Use **high-density option in Catawba/Lake Norman Watershed**

PROPOSED FINDINGS

1. The use will not materially endanger the public health or safety if located where proposed and developed according to plan.

This is an existing development that was properly permitted and approved. A relatively small expansion of the building and parking area is proposed.

2. The use meets all required conditions and specifications.

The plans have been reviewed by staff and found to comply with the requirements for the high-density option.

3. The use will not substantially injure the value of adjoining or abutting property unless the use is a public necessity.

This property is adjoined on both sides by property zoned business and on the rear by property zoned industrial. A business is located on the opposite side of the road.

4. The location and character of use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located and will be in general conformity with the Land Use Plan for the area in question.

This is an existing business area. This property is adjoined by property zoned business. This property is located at the perimeter of an area designated by the Land Use Plan as a community center, where services and activities for the surrounding area are recommended to be concentrated.

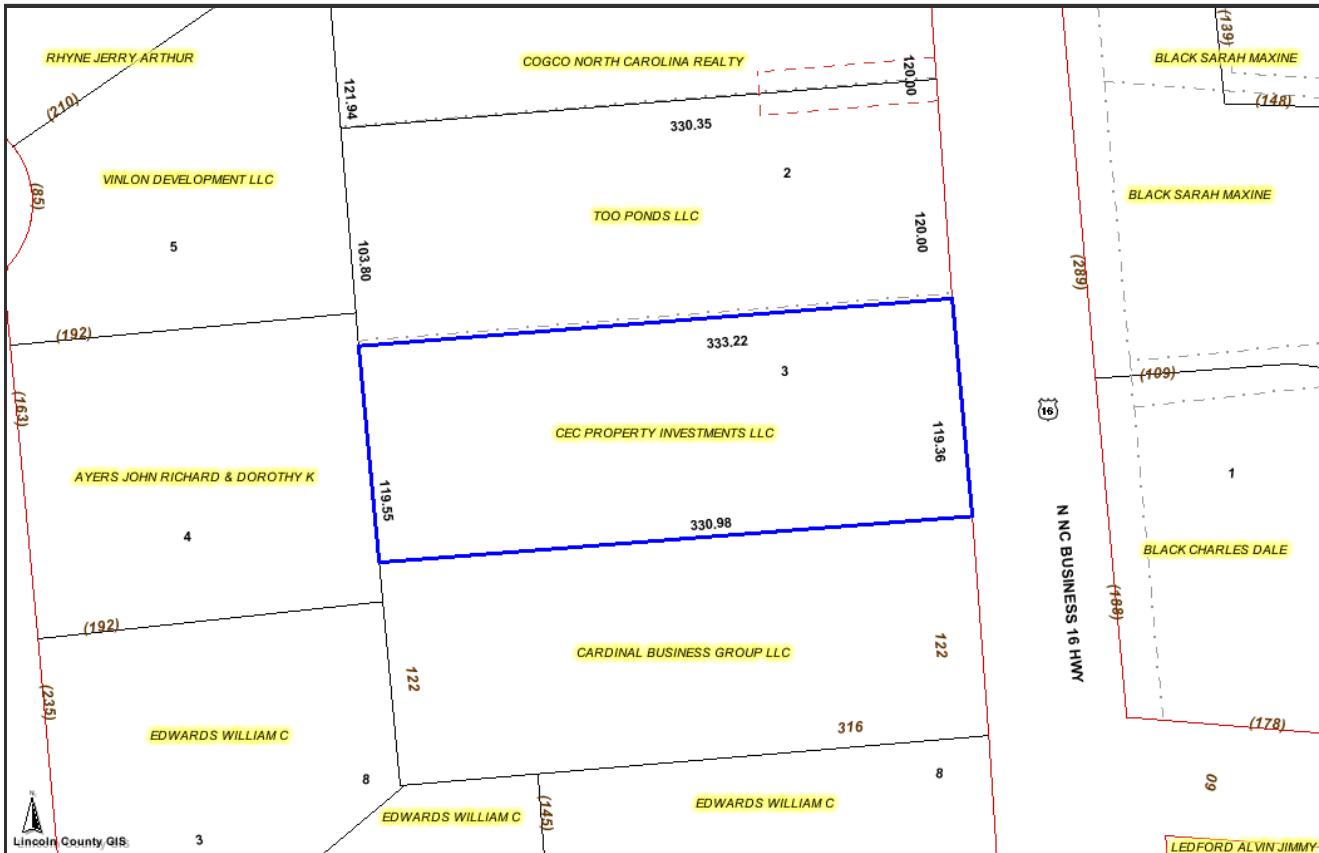


Lincoln County, NC

Office of the Tax Administrator, GIS Mapping Division

Lincoln County and its mapping contractors assume no legal responsibility for the information contained on this map. This map is not to be used for land conveyance. The map is based on NC State Plane Coordinate System 1983 NAD.

Date: 2/25/2014 Scale: 1 Inch = 100 Feet



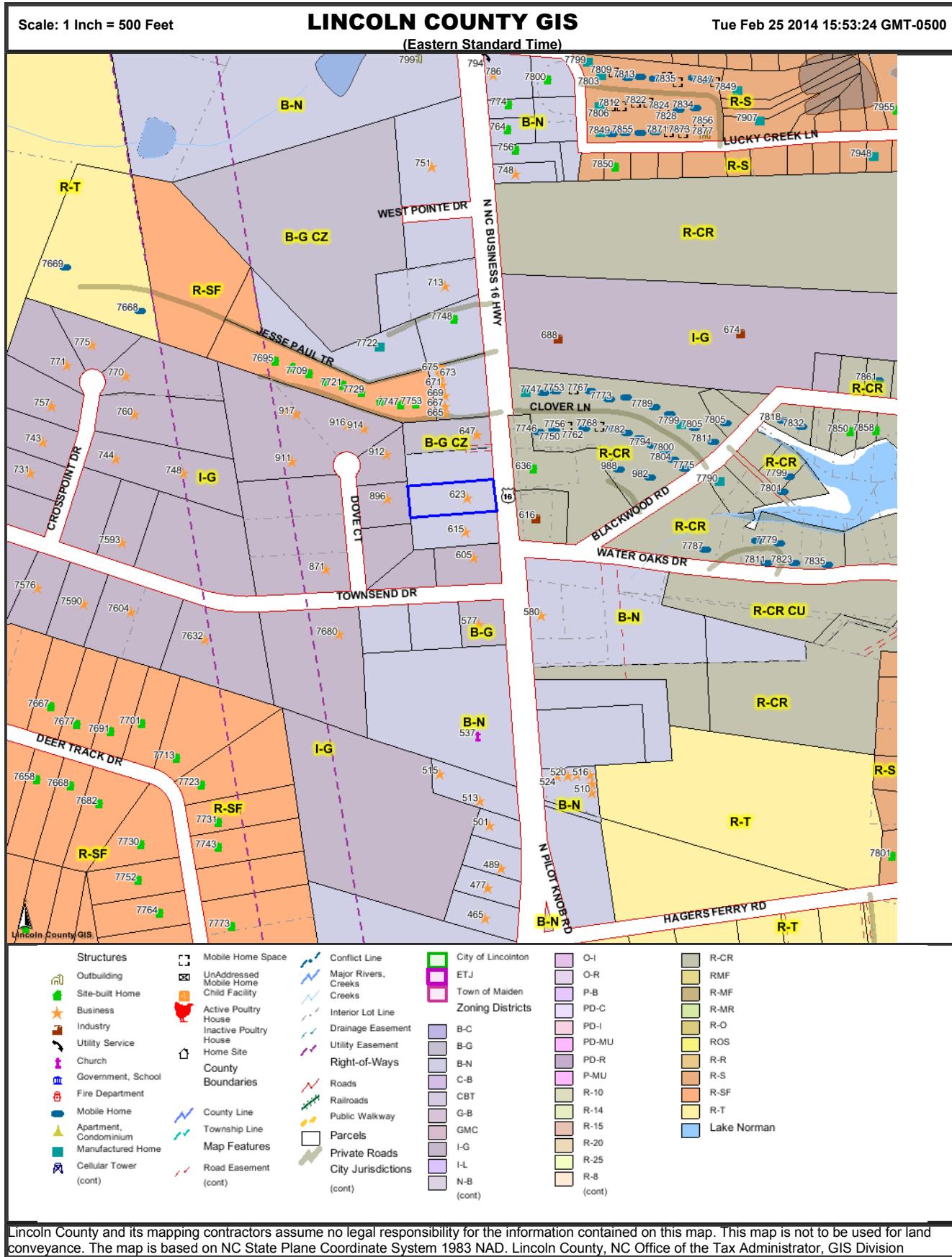
PHOTOS



89693

PARCEL INFORMATION FOR 4602-68-5200

Parcel ID	89693	Owner	CEC PROPERTY INVESTMENTS LLC		
Map	4602-02	Mailing	623 N NC 16 HWY		
Account	0223924	Address	DENVER NC 28037		
Deed	2167-777	Recorded	12/30/2009		
Land Value	\$298,275	Total Value	\$865,484		
----- All values are for tax year 2014. -----					
Subdivision	Lot 3 TOO PONDS LLS RECOMBINATION		Plat	15-212	
Description	#3LT TOO PONDS LLC RECOMB		Deed Acres	1	
Address	623 N NC 16 HWY		Tax Acres	0.91	
Township	CATAWBA SPRINGS		Tax/Fire District	EAST LINCOLN / EL SEWER	
Main Improvement	MEDICAL OFFICE			Value	\$539,871
Main Sq Feet	4384	Stories	1 Year Built		2013
Zoning District	Calculated Acres	Voting Precinct TRIANGLE (TR30)		Calculated Acres	0.91
B-N	0.91				
Watershed Class				Sewer District	
WS-IVC	0.91	In the sewer District			0.91
2000 Census County			Tract	Block	
37109			071100	2016	0.78
37109			071200	4028	0.13
Flood	Zone Description	Panel			
X	NO FLOOD HAZARD	3710460200			0.91



STORMWATER MAINTENANCE PLAN

FOR

CAROLINA EYE CARE
DENVER, NORTH CAROLINA

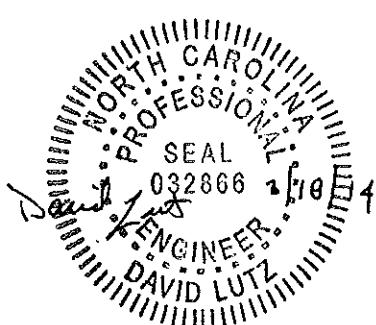
PREPARED BY:

CES GROUP ENGINEERS, LLP
274 N. HWY 16, SUITE 300
DENVER, NC 28037
PHONE: 704-489-1500

OWNER:

CEC PROPERTY INVESTMENTS, LLC
623 N. HWY 16
DENVER, NC

DATE: MARCH 18, 2014



STORMWATER OPERATION AND MAINTENANCE PLAN

CAROLINA EYE CARE, DENVER, NORTH CAROLINA

The following document includes requirements for the three (3) proposed bio-retention facilities at Carolina Eye Care in Denver, North Carolina.

The site lies within a WS-IV Critical area, which requires engineered stormwater controls for impervious areas between 24% - 50%. The BMP shall control and treat the first one inch of rainfall and achieve a minimum of 85% of total suspended solids removal.

Per the Lincoln County Unified Development Ordinance, the following shall apply:

Inspection Fees

1. Inspection of all stormwater control structures will be conducted:
 - b) Prior to the structure being placed into operation;
 - c) Annually once the stormwater control structures have been approved by the County, and
 - d) Any time after improvements, modifications or changes to said structures have been made by the owning entity.
2. A fee pursuant to §9.2.2.B, shall be required to be paid by the owning entity prior to each such inspection being conducted.

Operations and Maintenance Plan

1. Any stormwater control structure approved by the Board of Commissioners shall be predicated on the developer and the County entering into a binding operations and maintenance plan. Said plan shall require the owning entity of the structure(s) to maintain, repair, and, if necessary, reconstruct said structure(s) in accordance with the operation and maintenance plan provided by the developer to the County. Said plan must be approved by the Board of Commissioners prior to or in conjunction with approval of the high density option for said project.
2. A separate plan must be provided by the developer for each stormwater control structure, containing, at a minimum, what operation and maintenance actions are needed and will be undertaken, what specific quantitative criteria will be used for determining when those actions are to be taken, and who is responsible for such actions. The Plan shall clearly indicate what steps will be taken for restoring a stormwater control structure to design specifications if a failure occurs.
3. Amendments to the Plan and/or specifications of the stormwater control structure(s) may only be approved by the Board of Commissioners. Proposed changes shall be prepared by a North Carolina registered professional engineer or landscape architect (to the extent that the General Statutes allow) and submitted to the County for approval. Such amendments shall be accompanied by all information and fees prescribed in §9.2.2.

4. If the Board of Commissioners finds that the Plan, once approved, is inadequate for any reason, the Director shall notify the owning entity of any changes mandated by the County and a time frame in which changes to the Plan shall be made.

Financial Guarantees

All new stormwater control structures approved employing the high density option shall be conditioned on the posting of adequate financial assurance for the purpose of constructing, maintaining, repairing or reconstructing said devices.

1. If the Board of Commissioners approves the use of the high density option for a particular project, it may do so only after the applicant has posted a surety bond, cash, or equivalent security, in an amount not less than 1.25 times the cost of constructing the necessary stormwater control structure(s). Such financial security shall be made payable to Lincoln County and shall be in a form prescribed by the Board of Commissioners. All construction costs shall be verified by the County and the County may assess the applicant for actual costs associated with such verification. The total cost of the stormwater control structure shall include the value of all materials such as piping and other structures, seeding and soil stabilization, design and engineering, grading, excavation, fill, and etc. The costs shall not be prorated as part of a larger project, but rather shall be priced as an individual project.
2. Once the stormwater control structure(s) has been constructed and inspected in the manner provided in §7.3.9.G, and approved by the Board of Commissioners, the Board of Commissioners may authorize the release of up to 75 percent of the surety bond or other equivalent device outlined in §7.3.9.E.1. The remaining portion of the surety bond or equivalent device may be released to the owning entity in accordance with §7.3.9.G .
3. Prior to said release, however, the applicant shall be required to deposit with the County either cash or similar instrument approved by the Board of Commissioners in an amount equal to 15 percent of the total construction cost (See §7.3.9.E) or 100 percent of the cost of maintaining, repairing or reconstructing said structure over a 20 year period, whichever is greater. The estimated cost of maintaining the stormwater control structure shall be consistent with the approved operation and maintenance plan provided by the applicant as outlined in §7.3.9.D.

Default

1. Upon default of the applicant to complete the stormwater control structure as spelled out in the performance bond or other equivalent security, the Board of Commissioners may obtain and use all or any portion of the funds necessary to complete the improvements based on actual construction costs. The Board of Commissioners shall return any funds not spent in completing the improvements to the owning entity.
2. Upon default of the owning entity to maintain, repair and, if necessary, reconstruct the stormwater control structure in accordance with the approved operations and maintenance plan, the Board of Commissioners shall obtain and use any portion of the security outlined in

§7.3.9.F to make necessary improvements based on the actual costs borne by the County to make such improvements.

Inspections of Newly Constructed Stormwater Structures

All new stormwater control structures shall be inspected by the County after the owning entity notifies the Director that all construction has been completed. At this inspection the owning entity shall provide:

1. A signed deed, related easements and survey plat for the structure in a manner suitable for filing with the Lincoln County Register of Deeds Office, if ownership of the stormwater control structure(s) is to be transferred to another person, firm, or entity. (This requirement will be waived for any repair work when such deed has previously been filed.)
2. A certification by an engineer or landscape architect (to the extent allowable by the General Statutes) stating that the stormwater control structure is complete and consistent with the approved Plan and all specifications previously stipulated by the County.
3. The Director shall forthwith present the materials submitted by the owning entity along with the County's inspection report to the Board of Commissioners for their review and approval. If the Board of Commissioners approves the inspection report and accepts the certification, deed and easements, the Director shall forthwith file said deed with the Lincoln County Register of Deeds Office. Release of up to 75 percent of the surety bond or equivalent security as called for in §7.3.9.E.1 shall be made in a manner as prescribed in §7.3.9.E.2 and §7.3.9.E.3.
4. If deficiencies are found as a result of the inspection, the Board of Commissioners shall direct the owning entity to make necessary improvements. Reinspections will be made thereafter. No release of any funds shall be made by the County until all deficiencies are properly addressed to the County's satisfaction.
5. No sooner than one year after approval of the stormwater control structure(s) by the County, the owning entity may petition the Board of Commissioners to release the remaining value of the posted bond or security called for in §7.3.9.E.1. Upon receipt of said petition, the County shall forthwith inspect the stormwater control structure to determine whether the structure is performing as designed and intended. Once the inspection is made, the Director shall forthwith present the inspection report and recommendations to the Board of Commissioners.
6. An occupancy permit shall not be issued for any structure within the permitted development until the Board of Commissioners approves the stormwater control structure in the manner as herein prescribed.

Annual Inspection of Stormwater Structures

1. All stormwater control structures shall be inspected by the County on an annual basis to determine whether the structures are performing as designed and intended. Records of inspection shall be maintained on forms approved or supplied by the North Carolina Department of Environment and Natural Resources (NCDENR). Annual inspections shall begin within one year of approval of the Board of Commissioner's approval of the filing date of the deed for the stormwater control structure. A fee, in accordance with a fee schedule adopted by the Board of Commissioners shall be charged to the owning entity for annual inspections (and re-inspections) made. A copy of each inspection report shall be filed with the Director.
2. In the event the County's report indicates the need for corrective action or improvements, the Director shall notify the owning entity of the needed improvements and the date by which such improvements are to be completed. All improvements shall be consistent with the adopted operations plan and specifications. Once such improvements are made, the owning entity shall forthwith contact the Director and ask that an inspection be made.

Vegetation and Grounds Management

1. Landscaping and grounds management shall be the responsibility of the owning entity of said structure(s). However, vegetation shall be not established or allowed to mature to the extent that the integrity of the structure(s) is in any way threatened or diminished, or to the extent of interfering with any easement of access to the structure.
2. Except for routine landscaping and grounds maintenance, the owning entity shall notify the Director prior to any repair or reconstruction of the structure. All improvements shall be consistent with the approved Plan and specifications for that structure. After notification by the owning entity, County staff shall inspect the completed improvements and inform the owning entity of any required additions, changes, or modifications needed to complete said improvements. A time period for making such changes shall also be stipulated by the County. A fee, in accordance with a fee schedule adopted by the Board of Commissioners, shall be charged to the owning entity for each inspection (or re-inspection) made.

Common Maintenance Issues

Bioretention facilities require plant, soil, mulch, and under-drain maintenance to ensure optimal infiltration, storage, and pollutant removal capabilities. Bioretention maintenance requirements are typical landscape care procedures and include:

1. Watering: Plants should be selected to be tolerant of the bioretention facility's particular conditions. Watering should not be required after establishment (about 2 to 3 years). However, watering may be required during prolonged dry periods after plants are established.

2. Erosion Control: Inspect flow entrances, ponding area, and surface overflow areas periodically. Replace soil, plant material, and/or mulch in areas where erosion has occurred. Erosion problems should not occur with proper design except during extreme weather events. If erosion problems do occur, the following issues should be re-assessed: flow volumes from the contributing drainage area and bioretention size; flow velocities and gradients within the bioretention facility; flow dissipation and erosion protection methods in the pretreatment and NCDENR in-flow areas. If sediment is deposited in the bioretention facility, immediately determine the source, remove excess deposits, and correct the problem.
3. Plant Material: Depending on plants selected and aesthetic requirements, occasional pruning and removal of dead plant material may be necessary. Replace all dead plants. However, if specific plants consistently have a high mortality rate, assess the cause and replace with appropriate species. Periodic weeding is necessary until groundcover plants are established. Weeding should become less frequent if an appropriate plant density has been used.
4. Nutrients and Pesticides: The soil media and plant material should have been selected for optimum fertility, plant establishment, and growth within the particular conditions of each bioretention facility. Nutrient and pesticide inputs should NOT be required and will degrade the pollutant processing capability of the bioretention facility, as well as contribute to additional pollutant loading to receiving waters. By design, bioretention facilities are typically specified in watersheds where phosphorous and nitrogen levels are often elevated. Therefore, these should not be limiting nutrients with regard to plant health. If in question, have the soil analyzed for fertility.
5. Mulch: Replace mulch annually in bioretention facilities where heavy metal deposition is likely (e.g., drainage areas that include commercial/industrial uses, parking lots, or roads). In residential or other settings where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 4 inch depth at least once every two years.
6. Soil media: Soil mixes for bioretention facilities are design to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research indicates that metal accumulation should not present a toxicity concern for at least 20 years in bioretention facilities (USEPA 2000). Further, replacing mulch where heavy metal deposition is likely provides an additional factor of safety for prolonged bioretention performance. If in question, have soil analyzed for fertility and pollutant levels.

When the filtering capacity diminishes substantially (e.g., when water ponds on the surface for more than 12 hours), remedial actions must be taken. One possible problem is that underdrain pipe systems can become clogged. Annual flushing through pipe cleanouts is recommended to facilitate unclogging of the pipes without disturbing the bioretention areas. If the water still ponds for more than 12 hours, the top few inches of

material should be removed and replaced with fresh material. The removed sediments should be disposed of in an acceptable manner (e.g., landfill). If that does not solve the problem, more extensive rebuilding is required.

Bioretention Operation and Maintenance Agreement

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

Important operation and maintenance procedures:

- Immediately after the bioretention cell is established, the plants will be watered twice weekly if needed until the plants become established (commonly six weeks).
- Snow, mulch or any other material will NEVER be piled on the surface of the bioretention cell.
- Heavy equipment will NEVER be driven over the bioretention cell.
- Special care will be taken to prevent sediment from entering the bioretention cell.
- Once a year, a soil test of the soil media will be conducted.

After the bioretention cell is established, I will inspect it once a month and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County). Records of operation and maintenance will be kept in a known set location and will be available upon request.

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

BMP element:	Potential problems:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the bioretention cell	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
The inlet device: pipe, stone verge or swale	The pipe is clogged (if applicable).	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged (if applicable).	Replace the pipe.
	Erosion is occurring in the swale (if applicable).	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
	Stone verge is clogged or covered in sediment (if applicable).	Remove sediment and clogged stone and replace with clean stone.

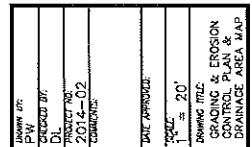
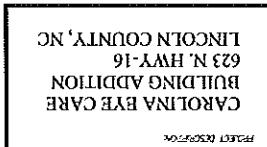
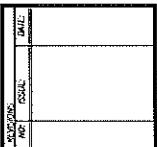
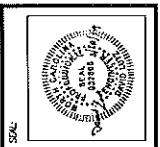
BMP element:	Potential problems:	How I will remediate the problem:
The pretreatment area	Flow is bypassing pretreatment area and/or gullies have formed.	Regrade if necessary to route all flow to the pretreatment area. Restabilize the area after grading.
	Sediment has accumulated to a depth greater than three inches.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and restabilize the pretreatment area.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand.
The bioretention cell: vegetation	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices.
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
	Tree stakes/wires are present six months after planting.	Remove tree stake/wires (which can kill the tree if not removed).
The bioretention cell: soils and mulch	Mulch is breaking down or has floated away.	Spot mulch if there are only random void areas. Replace whole mulch layer if necessary. Remove the remaining mulch and replace with triple shredded hard wood mulch at a maximum depth of three inches.
	Soils and/or mulch are clogged with sediment.	Determine the extent of the clogging - remove and replace either just the top layers or the entire media as needed. Dispose of the spoil in an appropriate off-site location. Use triple shredded hard wood mulch at a maximum depth of three inches. Search for the source of the sediment and remedy the problem if possible.
	An annual soil test shows that pH has dropped or heavy metals have accumulated in the soil media.	Dolomitic lime shall be applied as recommended per the soil test and toxic soils shall be removed, disposed of properly and replaced with new planting media.

BMP element:	Potential problems:	How I will remediate the problem:
The underdrain system (if applicable)	Clogging has occurred.	Wash out the underdrain system.
The drop inlet	Clogging has occurred.	Clean out the drop inlet. Dispose of the sediment off-site.
	The drop inlet is damaged	Repair or replace the drop inlet.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786.

BIO-RETENTION INSPECTION LOG

APPENDIX

- I. GRADING/BMP PLAN
- II. BMP DETAIL SHEET
- III. OPINION OF PROBABLE COST FOR BIO-RETENTION



CONSTRUCTION SEQUENCE

EROSION CONTROL NOTES

NOTES

LEGEND

1. ALL "STO" NUMBERS REFER TO THE HNC

TO START OF CONSTRUCTION AND SHALL NOTIFY ENGINEER OF
DISORDERS WHICH REQUIRE REDRESS.
2. ALL DIMENSIONS ARE IN FEET.

1. SURFACE WATER SYSTEMS. Rivers and streams in the aridized environment in plants, animals and in the soil are the primary water source with which to live.

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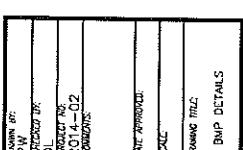
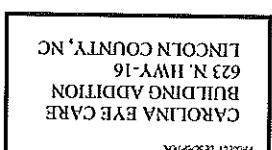
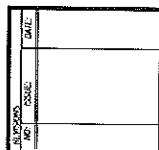
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CONTENTS OF PART 2

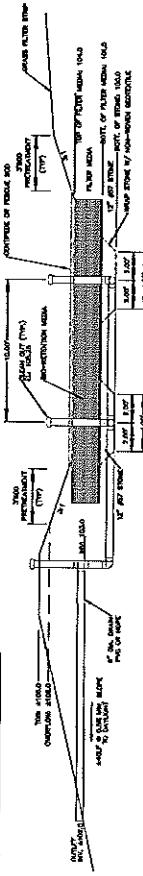
דרכן ירושלים

NOTE: PROVIDE CLEAROUT FOR BIO-RETENTION CELL/AREA UNDERDRAINS AT ALL BIDOS AND EVERY 75'-L.

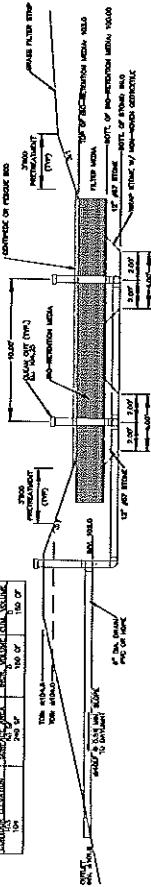
Copyright 2014 CES Group Engineers, LLP



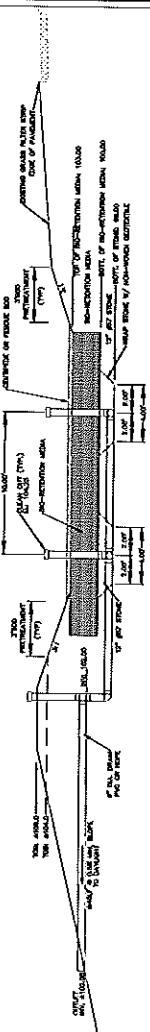
NAME OF CATCHING AREA, FT.	DRAGGING AREA (ft. by ft.)	VOLUME REACHED IN FT. ³	TIME REACHED IN MIN.	WATER LEVEL IN FT.	WATER LEVEL IN FT.	WATER LEVEL IN FT.	WATER LEVEL IN FT.
WATERFALL AREA, FT.	100 ft. by 100 ft.	100,000,000	100	100	100	100	100
WATERFALL AREA, FT.	100 ft. by 100 ft.	100,000,000	100	100	100	100	100
WATERFALL AREA, FT.	100 ft. by 100 ft.	100,000,000	100	100	100	100	100
WATERFALL AREA, FT.	100 ft. by 100 ft.	100,000,000	100	100	100	100	100



BIORETENTION AREA #1 DETAIL



BIORETENTION AREA #2 DETAIL



BIORETENTION AREA #3 DETAIL

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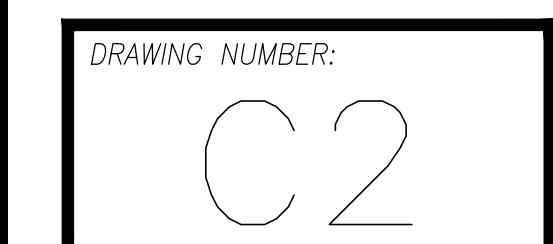
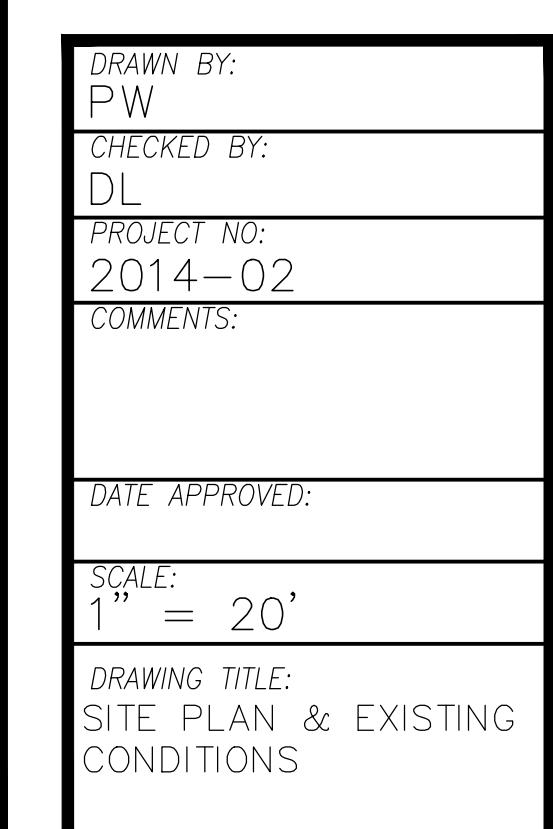
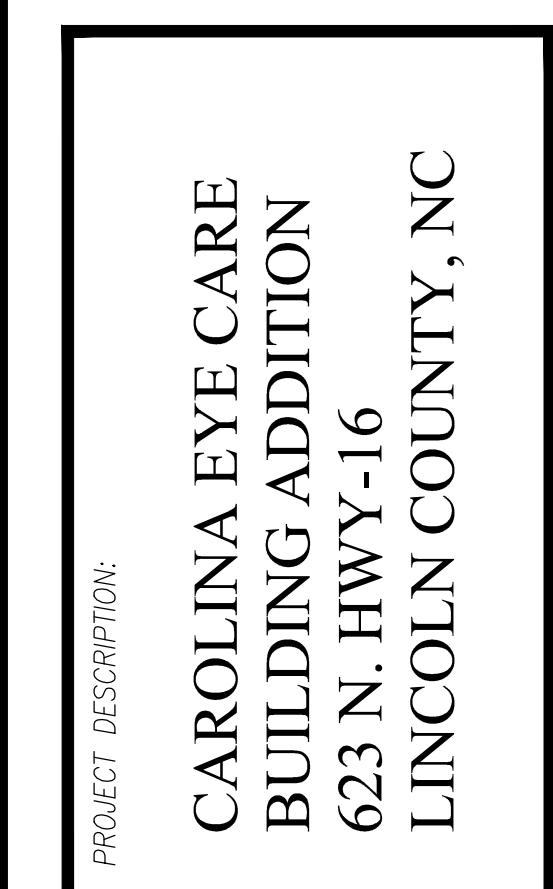
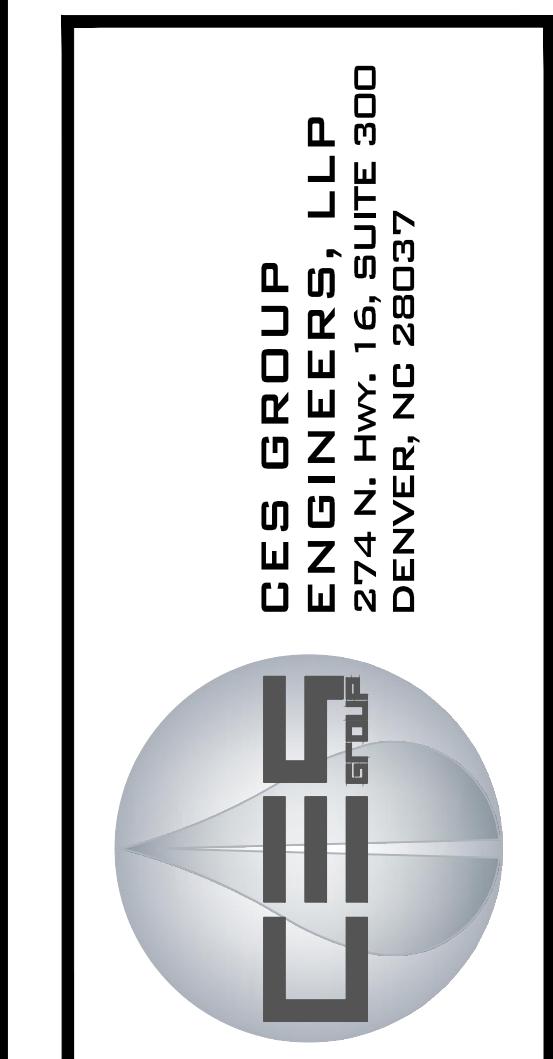
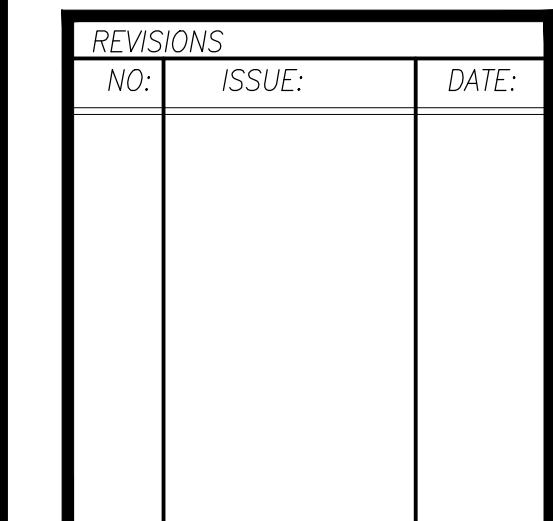
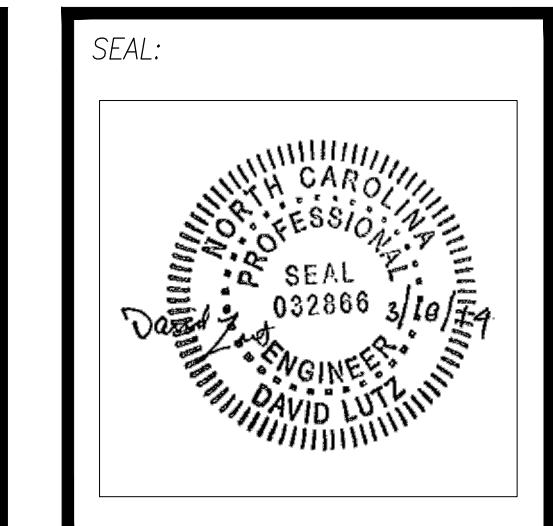
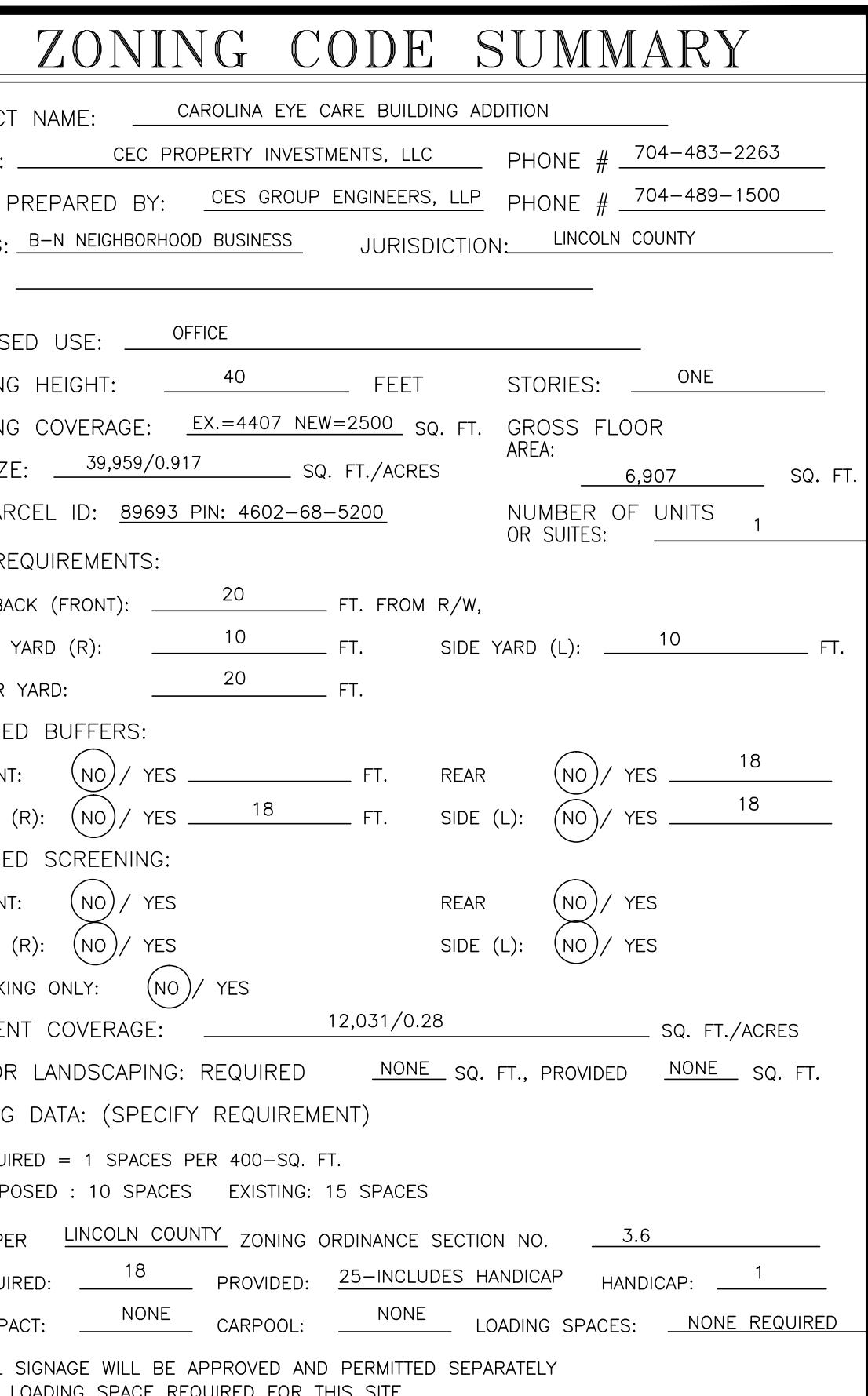
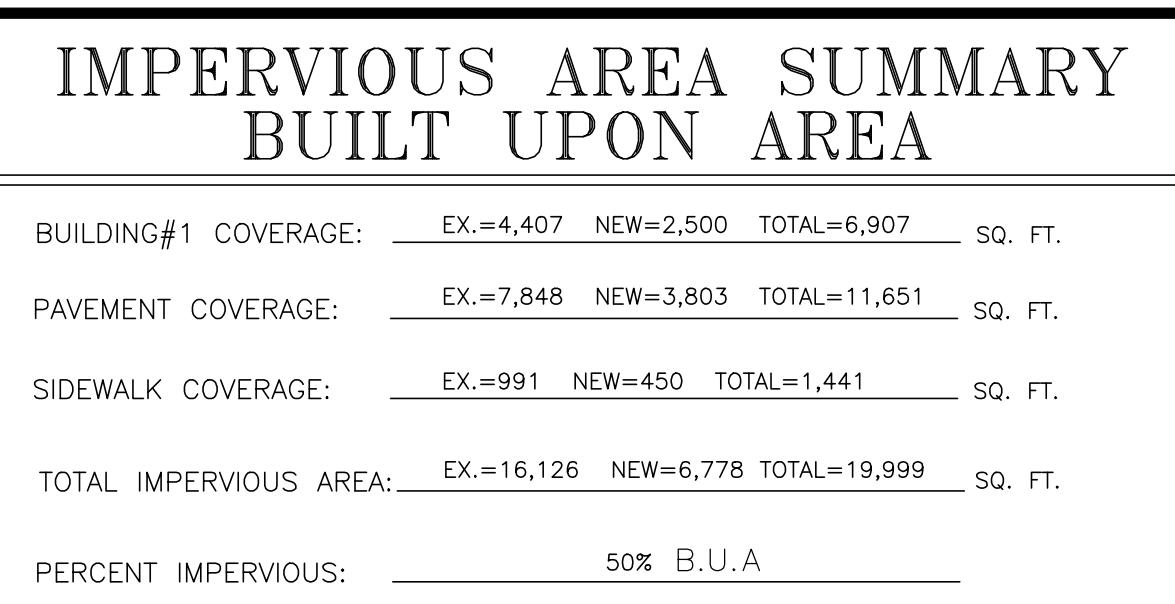
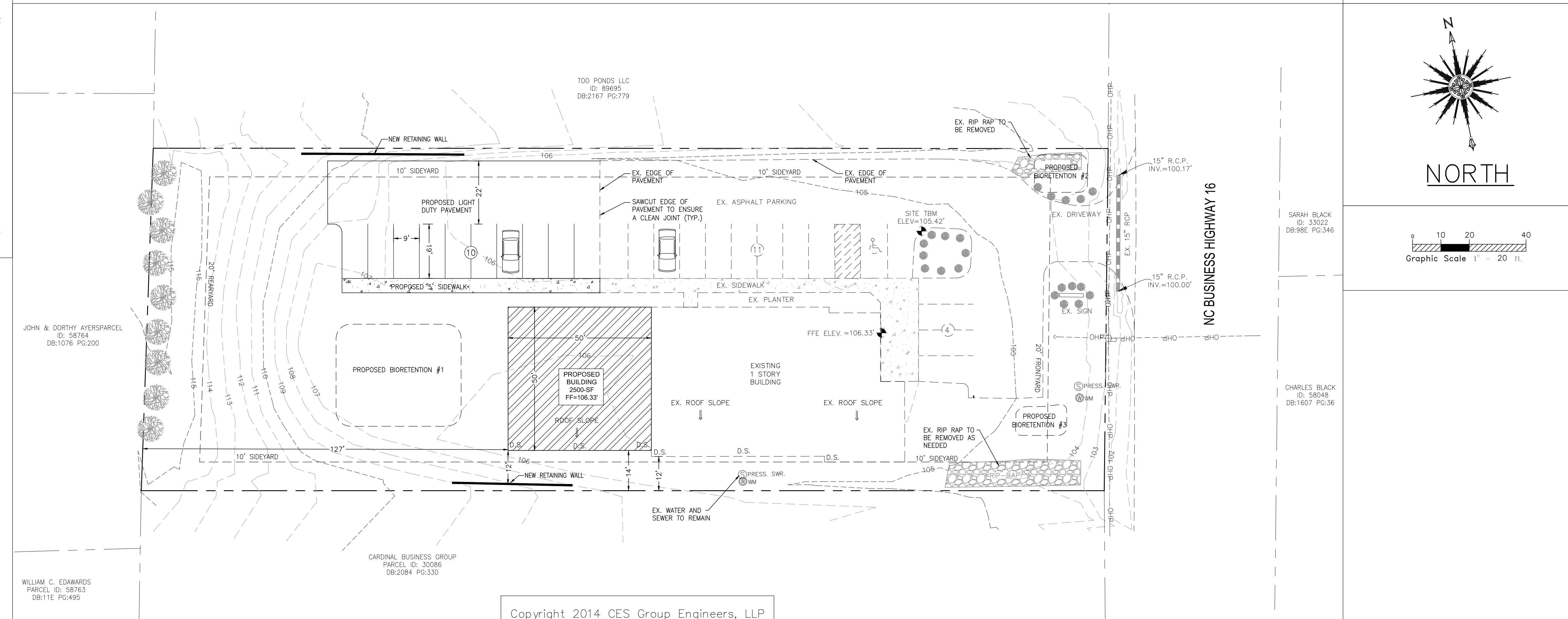
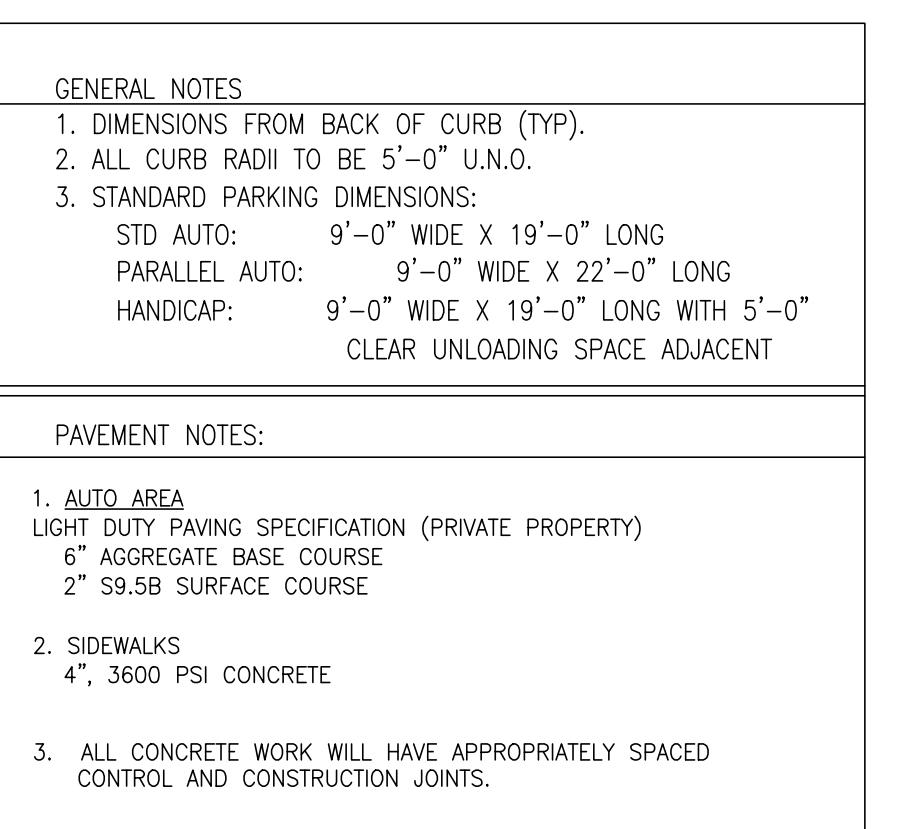
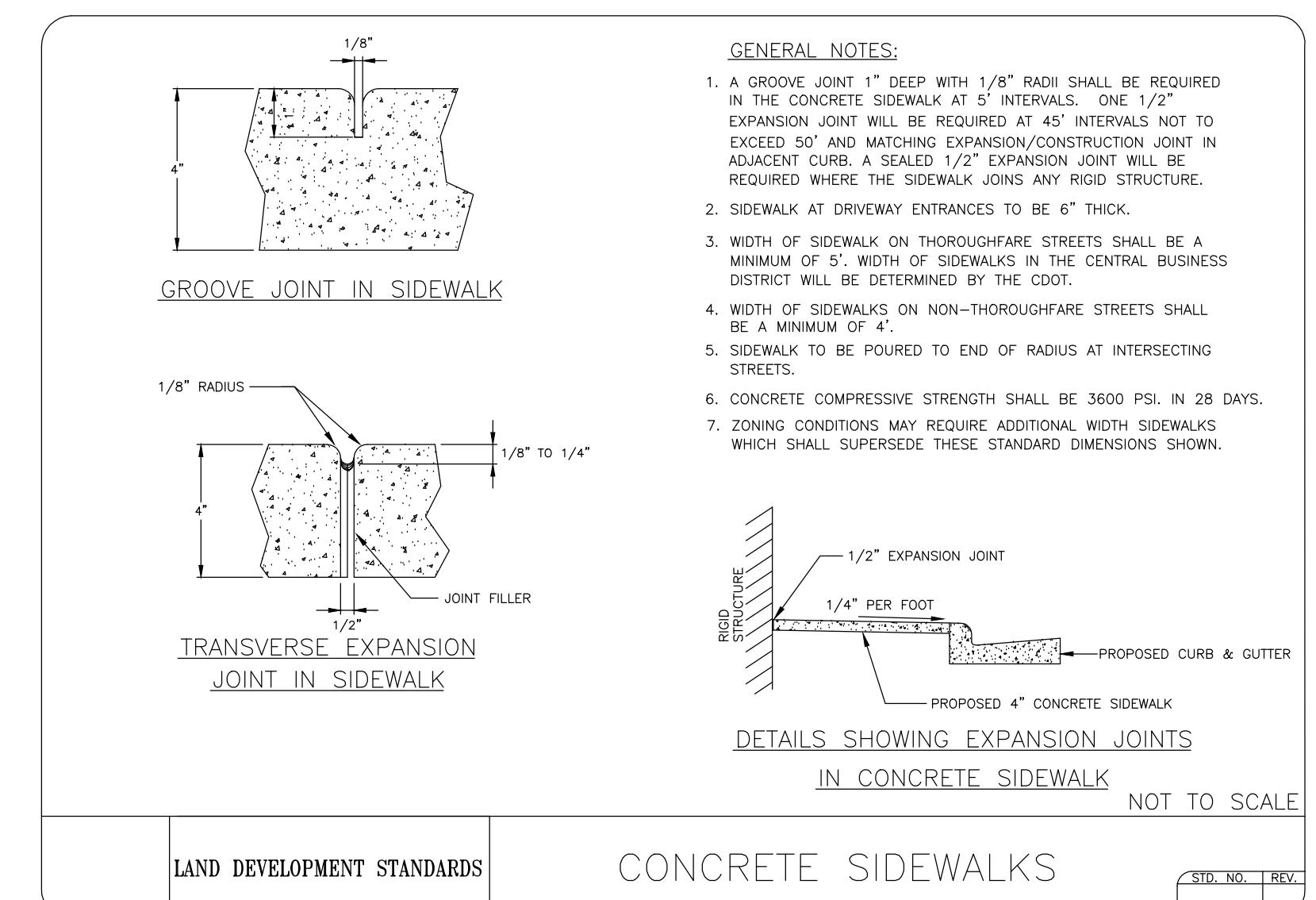
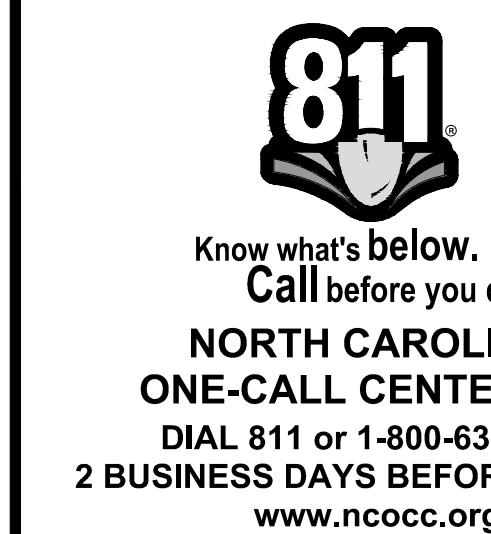
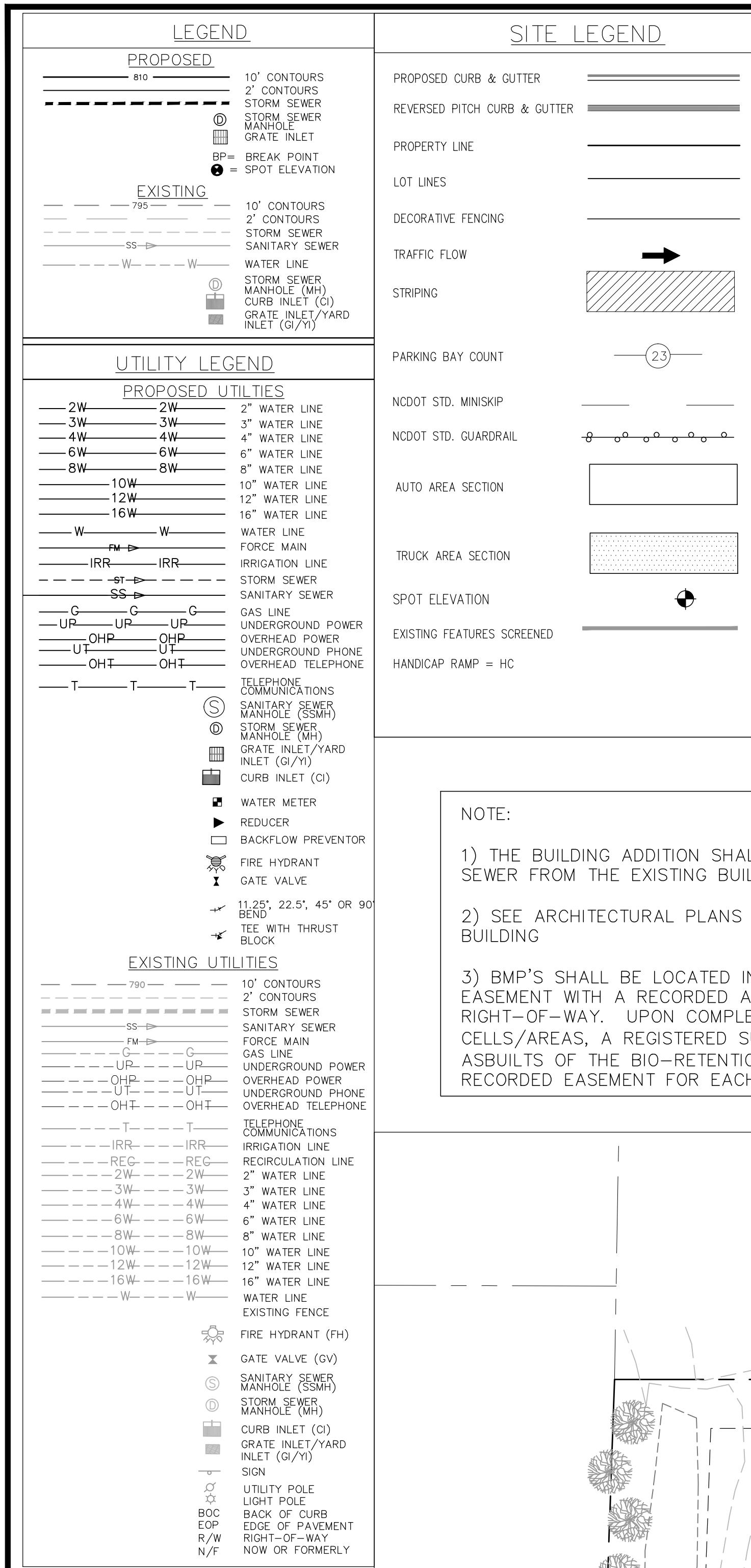
Engineer's Cost Opinion

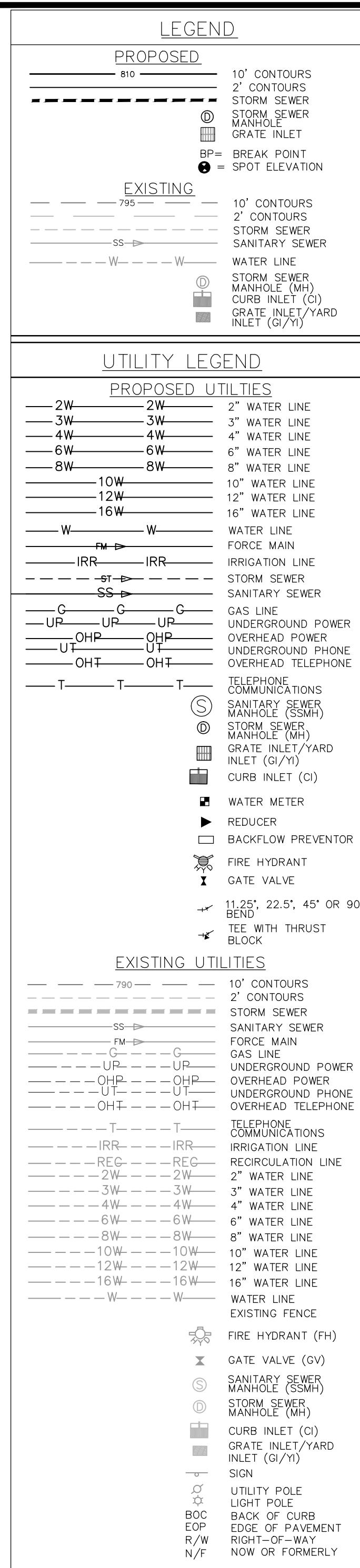
Caroline Eye Care - BMP Construction Cost
 Denver, North Carolina
 3/18/2014

Item	Unit	Quantity	Unit Price	Total
Construction stakeout	LS	1	\$400.00	\$400.00
Mobilization/Demobilization	LS	1	\$500.00	\$500.00
Excavation and grading	CY	190	\$5.00	\$950.00
6" Solid PVC Pipe	LF	292	\$6.00	\$1,752.00
6" Perforated w/ fabric and stone	LF	60	\$12.00	\$720.00
Sod	SF	1,500	\$0.50	\$750.00
Bio-retention media	CY	93	\$35.00	\$3,255.00
P300 Matting	SF	400	\$3.00	\$1,200.00
				\$0.00
Subtotal				\$9,527.00
Contingency			10%	\$952.70
Total				\$10,479.70
15% of Construction Cost				\$1,571.96

Estimated Cost for 20 Year Maintenance

Item	Time / Year	Unit Cost / Time	Total
Flush underdrains	1	\$50.00	\$50.00
Aerate sod and clean up plugs	1	\$80.00	\$80.00
Remove sediment/debris from around BMP	2	\$50.00	\$100.00
			\$0.00
Subtotal			\$230.00
20 Year Maintenance Total			\$4,600.00





NOTES

1. THE LOCATION OF UTILITIES IS APPROXIMATE AS PRESENTED. CONTRACTOR SHALL FIELD VERIFY ACTUAL LOCATIONS PRIOR TO START OF CONSTRUCTION AND SHALL NOTIFY ENGINEER OF DISCREPANCIES THAT REQUIRE REDESIGN.
2. ALL DIMENSIONS ARE IN FEET.

SEEDBED PREPARATION NOTES

1. SURFACE WATER CONTROL MEASURES TO BE INSTALLED ACCORDING TO PLANS.
2. AREAS TO BE SEEDED SHALL BE RIPPED AND SPREAD WITH AVAILABLE TOPSOIL 3" DEEP. TOTAL SEEDBED PREPARED DEPTH SHALL BE 4".
3. LOOSE ROCKS, ROCKS AND OTHER OBSTRUCTIONS SHALL NOT INTERFERE WITH THE ESTABLISHMENT AND MAINTENANCE OF VEGETATION. THE SURFACE FOR FINAL SEEDBED PREPARATION AT FINISHED GRADES SHOWN SHALL BE SMOOTH AND DEVOID OF ROCKS.
4. IF NO SOIL TEST IS TAKEN, FERTILIZER AND LIME ARE TO BE USED AS DESCRIBED ABOVE. IN ADDITION, 15 LBS/1000 S.F. OF SUPERPHOSPHATE IS TO BE PROVIDED.
5. IF SOIL TEST IS TAKEN, PROVIDE FERTILIZER AND LIME ACCORDING TO RESULTS.
6. LIME AND FERTILIZER SHALL BE APPLIED UNIFORMLY AND MIXED WITH THE SOIL DURING SEEDBED PREPARATION.

SEEDING SCHEDULE

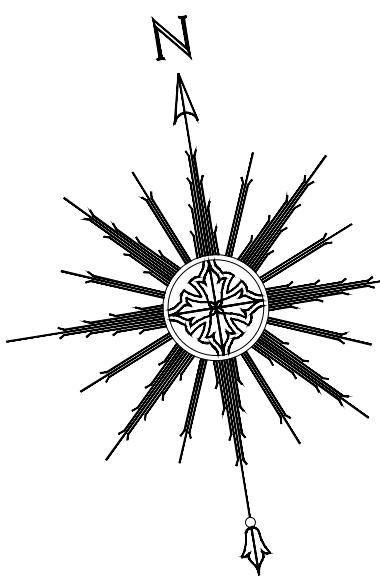
1. FOR SEEDING OF SITES WITH A 2:1 SLOPE OR FLATTER USE THE FOLLOWING U.S. DEPARTMENT OF AGRICULTURE SPECS.
 - A) 100 LBS OF KENTUCKY 31 FESCUE PER ACRE.
 - B) 15 LBS. HULLED BERMUDAGRASS PER ACRE.
 - C) 10 LBS. KOBE LESPEDEZA PER ACRE.
 - D) 30 LBS. SERICEA LESPEDEZA
 - E) 15 LBS. OF GERMAN MILLET PER ACRE.
 - F) 1000 LBS. OF 10-10-10 FERTILIZER PER ACRE.
 - G) 4000 LBS. OF LIME PER ACRE.
 - H) 500 LBS. OF 0-20-0 SUPER PHOSPHATE PER A
 - I) 4000 LBS. OF STRAW MULCH PER ACRE.
 - J) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - K) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - L) 1000 LBS. OF 10-10-10 FERTILIZER PER ACRE.
 - M) 4000 LBS. OF STRAW MULCH PER ACRE.
 - N) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - O) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - P) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - Q) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - R) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - S) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - T) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - U) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - V) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - W) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - X) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - Y) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
 - Z) 225 GALLONS OF EMULSIFIED ASPHALT PER ACRE.
2. 3' PRETREATMENT BORDER AND BIO-RETENTION CELL/AREA SHALL BE CENTIPEDE OR FESCUE SOD.

EROSION CONTROL NOTES

1. ALL "STD." NUMBERS REFER TO THE LINCOLN COUNTY LAND DEVELOPMENT STANDARDS MANUAL.
2. ON-SITE BURIAL PITS REQUIRE AN ON-SITE DEMOLITION LANDFILL PERMIT FROM THE ZONING ADMINISTRATOR.
3. ANY GRADING BEYOND THE DENUDED LIMITS SHOWN ON THE PLAN IS A VIOLATION OF THE COUNTY EROSION CONTROL ORDINANCE AND IS SUBJECT TO A FINE.
4. GRADING MORE THAN ONE ACRE WITHOUT AN APPROVED EROSION CONTROL PLAN IS A VIOLATION OF THE COUNTY EROSION CONTROL ORDINANCE AND IS SUBJECT TO A FINE.
5. ALL SLOPES MUST BE SEEDED AND MULCHED WITHIN 21 CALENDAR DAYS.
6. ADDITIONAL MEASURES TO CONTROL EROSION AND SEDIMENT MAY BE REQUIRED BY A REPRESENTATIVE OF THE COUNTY.
7. SLOPES SHALL BE GRADED NO STEEPER THAN 2:1.
8. A DRIVEWAY PERMIT FOR CONSTRUCTION ENTRANCES INSIDE THE NCDOT R/W MUST BE PRESENTED AT PRE-CONSTRUCTION MEETING.
9. REQUEST PRE-FINAL INSPECTION FOR "PUNCH LIST" ITEMS.
10. REQUEST FINAL INSPECTION FROM LINCOLN COUNTY NATURAL RESOURCES.

CONSTRUCTION SEQUENCE

1. OBTAIN PLAN APPROVAL FROM LINCOLN COUNTY NATURAL RESOURCES.
2. SET UP PRE-CONSTRUCTION CONFERENCE ON-SITE WITH EROSION CONTROL INSPECTOR AND ENGINEER TO DISCUSS EROSION CONTROL MEASURES.
3. INSTALL SILT FENCE, CHECK DAMS AND INLET PROTECTION.
4. CALL FOR ON-SITE INSPECTION BY EROSION CONTROL INSPECTOR. WHEN EROSION CONTROL MEASURES ARE APPROVED, BEGIN CONSTRUCTION.
5. COMPLETE SITE CONSTRUCTION WITHIN THE PROJECT LIMITS AND STABILIZE SITE.
6. MAINTAIN AND RECORD SELF INSPECTIONS PER 15A NCAC 04B.0131 OF NCDENR FOR EACH PHASE OF PROJECT TO ENSURE EROSION AND SEDIMENTATION CONTROL PLAN BEING FOLLOWED.
7. EROSION AND SEDIMENTATION CONTROL MEASURES MUST BE INSPECTED AT LEAST ONCE PER 7 CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL EVENT GREATER THAN 0.5 INCHES PER 24 HOUR PERIOD.
8. REMOVE ALL EROSION CONTROL DEVICES, SPREADING AND SEEDING ACCUMULATED SEDIMENT. REMOVAL OF EROSION CONTROL MEASURES SHALL BE APPROVED BY EROSION CONTROL INSPECTOR.
9. REQUEST PRE-FINAL INSPECTION FOR "PUNCH LIST" ITEMS.
10. REQUEST FINAL INSPECTION FROM LINCOLN COUNTY NATURAL RESOURCES.

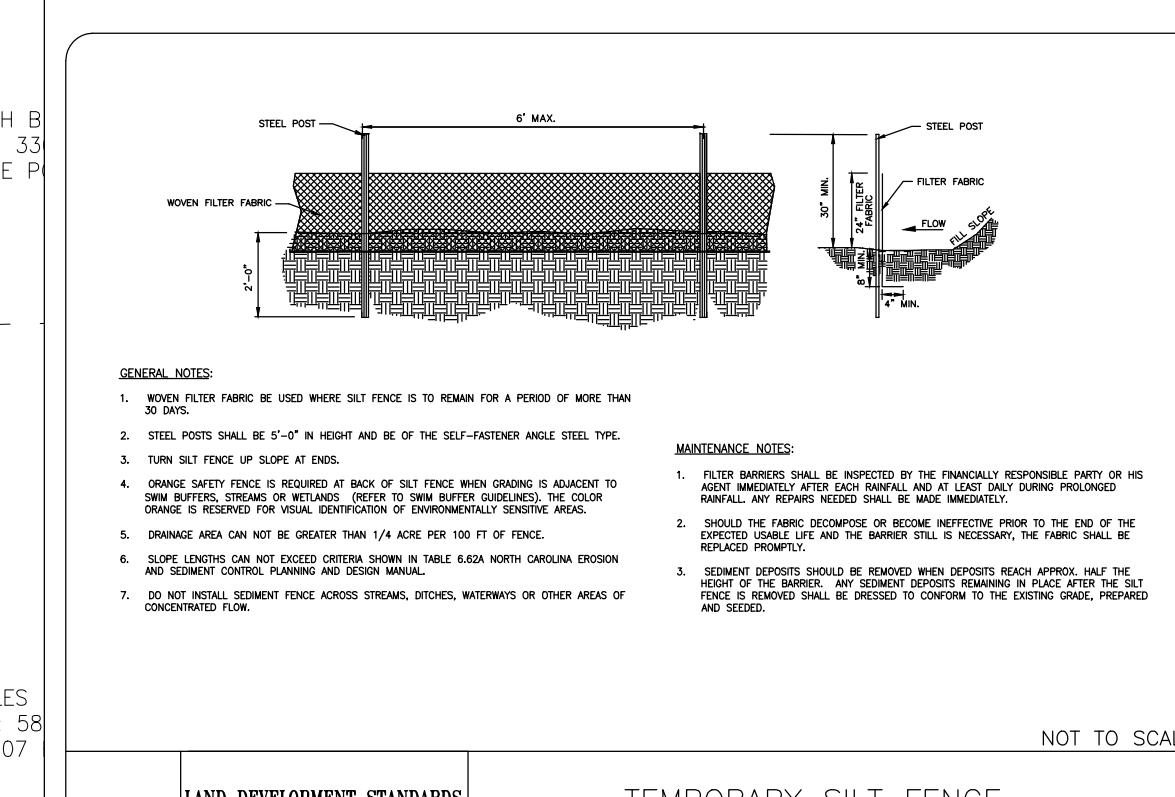
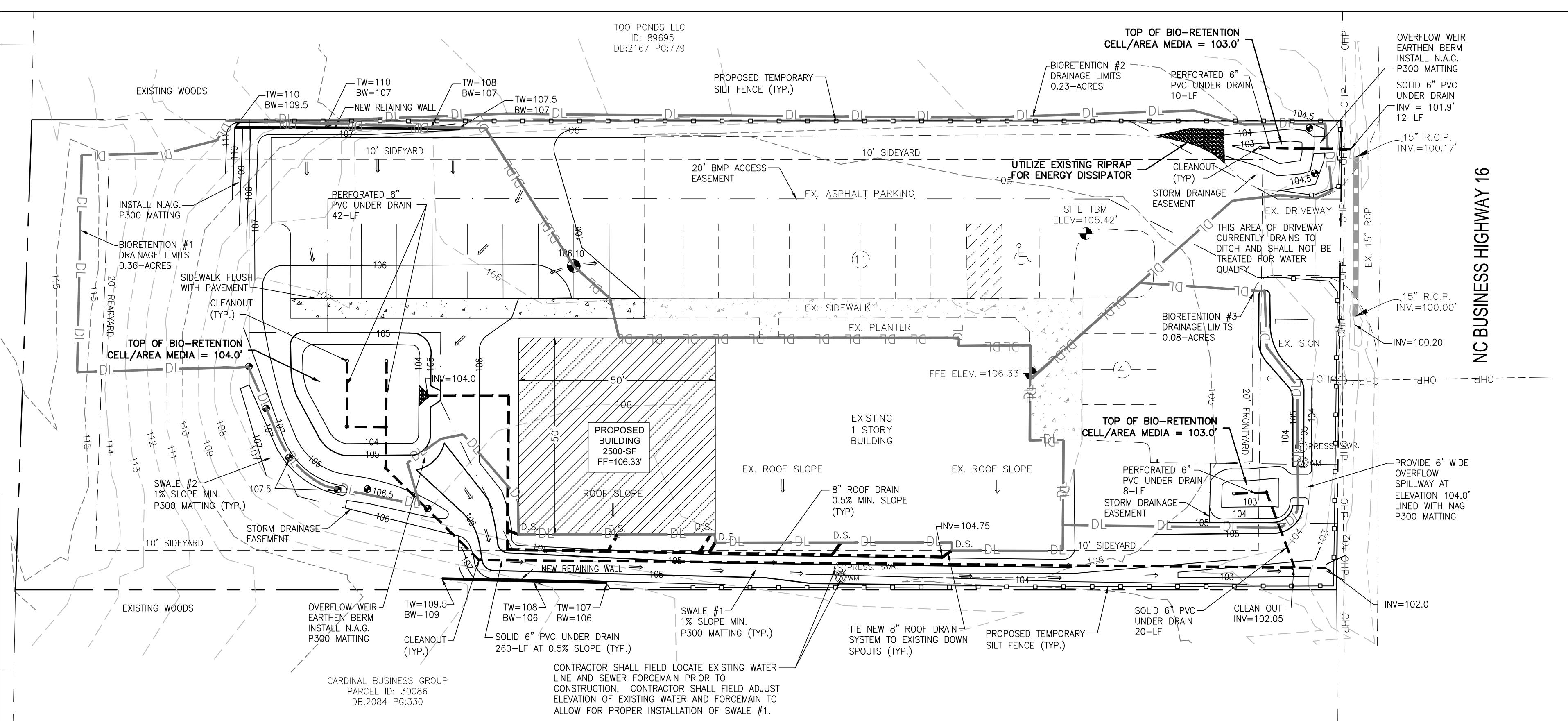
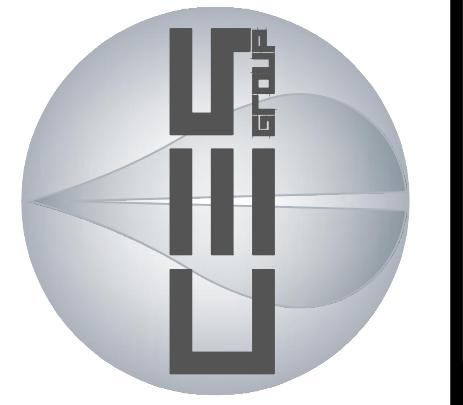


Graphic Scale 1 = 20 ft.



REVISIONS	NO:	ISSUE:	DATE:

CES GROUP
ENGINEERS, LLP
274 N Hwy. 16, Suite 300
DENVER, NC 28037



PROJECT DESCRIPTION:
CAROLINA EYE CARE
BUILDING ADDITION
623 N. HWY-16
LINCOLN COUNTY, NC

DRAWN BY:
PW
CHECKED BY:
DL
PROJECT NO:
2014-02
COMMENTS:

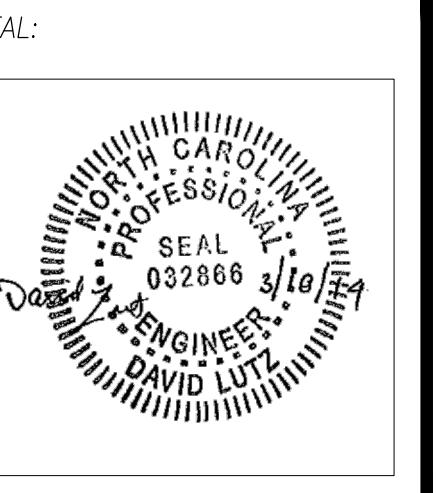
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SCALE:
1" = 20'
DRAWING TITLE:
GRADING & EROSION
CONTROL PLAN &
DRAINAGE AREA MAP

DRAWING NUMBER:
C3

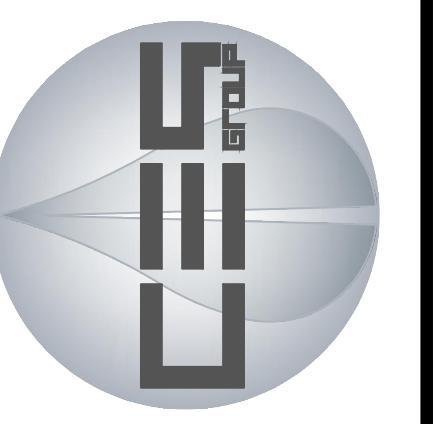


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DENVER, NC 28037



PROJECT DESCRIPTION:
CAROLINA EYE CARE
BUILDING ADDITION
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2014-02
COMMENTS:

DATE APPROVED:
SCALE:
DRAWING TITLE:
BMP DETAILS

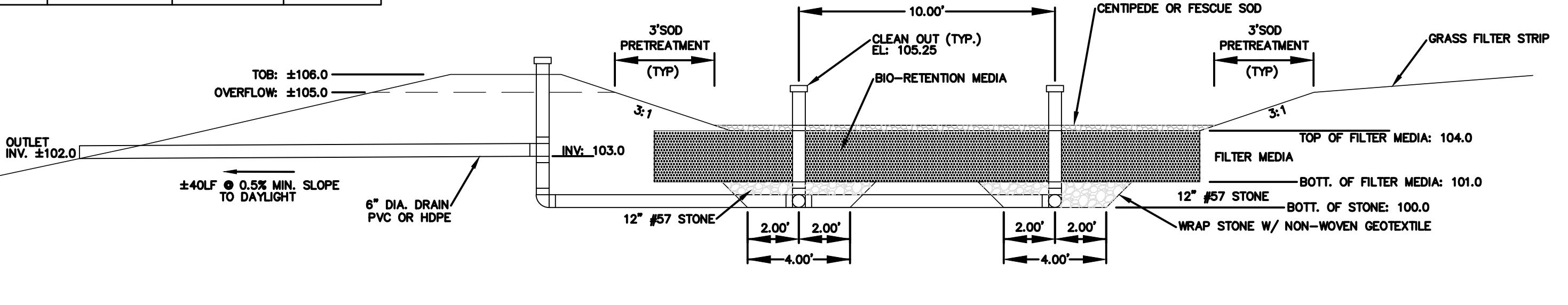
DRAWING NUMBER:

C4

GRASS FILTER STRIP AND TOP OF MEDIA:
SOD SHALL BE FESCUE OR CENTIPEDE GRASS.
FILTER MEDIA MIX REQUIREMENTS:
85-90% SAND
8-12% FINES
3-5% ORGANIC
1. THE SOIL MIX SHOULD BE UNIFORM AND FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR MATERIAL GREATER THAN 2 INCHES.
2. SHALL BE A HOMOGENOUS SOIL MIX OF 85-88 PERCENT BY VOLUME SAND (USDA SOIL TEXTURAL CLASSIFICATION), 8 TO 12 PERCENT FINES (SILT AND CLAY), AND 3 TO 5 PERCENT ORGANIC MATTER (SUCH AS PEAT MOSS) SHALL BE USED.
3. THE PHOSPHORUS CONTENT OF THE SOIL MIX SHALL BE LOW.
4. SOIL MEDIA SHOULD BE SENT TO NC DEPARTMENT OF AGRICULTURE [NODA] LABS TO BE ANALYZED.
5. THE P-INDEX FOR BIORETENTION SOIL MEDIA SHOULD ALWAYS RANGE BETWEEN 10 AND 30, REGARDLESS OF THE TARGET POLLUTANT.
6. THE MEDIA SHALL BE TESTED TO DETERMINE AN ACTUAL DRAINAGE RATE AFTER PLACEMENT.
7. MEDIA PERMEABILITY OF 1-6 IN./HR IS REQUIRED.
8. PONDED WATER SHALL COMPLETELY DRAIN INTO SOIL WITHIN 12 HOURS. SOIL SHALL DRAIN TO A LEVEL OF 24 INCHES BELOW SOIL SURFACE WITHIN 48 HOURS.

BIORETENTION AREA #1	DRAINAGE AREA (AC)	VOLUME REQUIRED	BMP SUR. AREA REQ.	BMP SUR. AREA PROV.	MAX. POOL DEPTH	MULCH DEPTH	MEDIA DEPTH	TOP OF MEDIA ELEV.
	0.36	836 CF	836 SF	872 SF	1'	3"	3"	104"

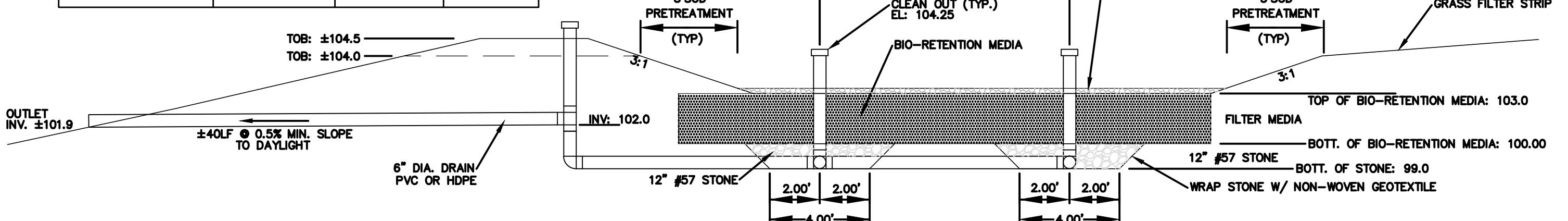
VOLUME CALCULATION: CONTOUR ELEVATION	SURFACE AREA	INCR. VOLUME	CUM. VOLUME
104	679 SF	0	0
105	1,014 SF	847 CF	847 CF



BIORETENTION AREA #1 DETAIL

BIORETENTION AREA #2	DRAINAGE AREA (AC)	VOLUME REQUIRED	BMP SUR. AREA REQ.	BMP SUR. AREA PROV.	MAX. POOL DEPTH	MULCH DEPTH	MEDIA DEPTH	TOP OF MEDIA ELEV.
	0.23	567 CF	567 SF	230 SF	1'	3"	3"	103"

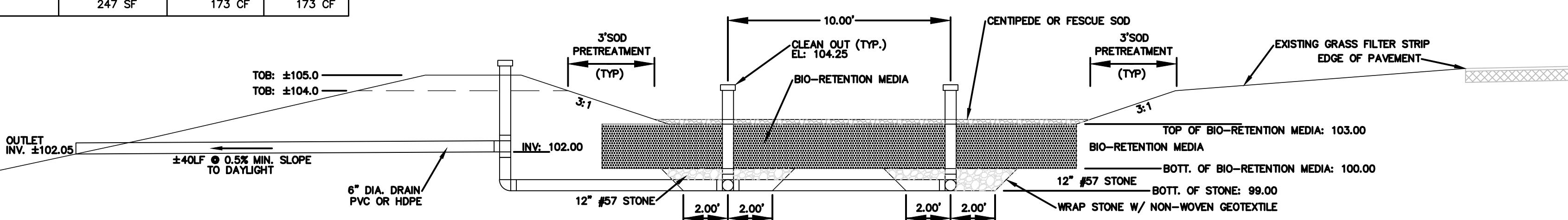
VOLUME CALCULATION: CONTOUR ELEVATION	SURFACE AREA	INCR. VOLUME	CUM. VOLUME
103	60 SF	0	0
104	240 SF	150 CF	150 CF



BIORETENTION AREA #2 DETAIL

BIORETENTION AREA #3	DRAINAGE AREA (AC)	VOLUME REQUIRED	BMP SUR. AREA REQ.	BMP SUR. AREA PROV.	MAX. POOL DEPTH	MULCH DEPTH	MEDIA DEPTH	TOP OF MEDIA ELEV.
	0.08	168 CF	168 SF	172 SF	1'	3"	3"	103"

VOLUME CALCULATION: CONTOUR ELEVATION	SURFACE AREA	INCR. VOLUME	CUM. VOLUME
103	98 SF	0	0
104	247 SF	173 CF	173 CF



BIORETENTION AREA #3 DETAIL