Pender County
Planning and Community Development

805 S. Walker Street
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AGENDA
Pender County Planning Board
Tuesday, March 1, 2016 7:00 p.m.
Pender County Public Meeting Room
805 S. Walker Street, Burgaw, North Carolina

Call to Order: Chairman Williams

Roll Call: Chairman Williams
Pender County Planning Board Members:
Williams: __ Fullerton __ Baker: __ Edens: __ McClammy: __ Nalee: __

1. **Adoption of the Agenda:**

2. **Adoption of the Minutes: (February 2, 2016)**

3. **Public Comment:**

(Public Hearings Open)

4. **Master Development Plan Revision:**
Signature Top Sail NC, LTD, applicant, on behalf of Capstone Ventures LLC., Ruth C. Kalmar Lewis et al, J L Morris Enterprises of Hampstead Inc., Morris Jeffrey Let al, and Signature Top Sail NC, LTD, owners, are requesting a revision to the previously approved Master Development Plan for the mixed use proposal known as Wyndwater. Specifically this request is to; increase the overall project area from ± 150.78 acres to ± 204.07 acres, increase the total units from ± 350 units to ± 500 units, increase project density from 3.1 units to 3.13 units per acre and to amend the side yard setback from twenty to fifteen feet. The subject property is zoned PD, Planned Development zoning district. The properties are located to the north of Doral Drive (SR 1693), northwest of Sloop Point Loop Road (SR 1563), south and east of the Cardinal Acres Lane (private) in the Topsail Township. The property may be further identified by Pender County PINs; 4214-04-6027-0000, 4214-22-2361-0000, 4214-31-1640-0000, 4213-59-0181-0000, 4214-12-3906-0000, 4214-22-7567-0000, 4214-04-9162-0000, 4214-23-2200-0000 and portion of the property located at 4214-50-8387-0000.

Anyone wishing to address the **Pender County Planning Board** shall make a request on the "Public Comment" **sign-up sheet. Please provide the information requested.**

If you wish to speak on ***a specific public hearing item***, please sign-in on the appropriate "Public Hearing" **sign- up sheet.** Speakers will be allowed to speak *prior* to any action/vote taken by the Board.

*A time limit of **two** minutes per speaker or up to **ten** minutes for groups of five or more, with a designated speaker will be imposed.

5. **Pender County Collector Street Plan:**
   Pender County is requesting to hold a public hearing on the Pender County Collector Street Plan. Following the public hearing, it's requested that the Planning Board make a recommendation for adoption.
   (Public Hearings Closed)

6. **Discussion Items:**
   a. **Planning Staff Items:**

   b. **Planning Board Members Items:**

7. **Next Meeting:** April 5, 2016

8. **Adjournment:**

PLANNING STAFF REPORT
MASTER DEVELOPMENT PLAN REVISION
WYNDWATER

SUMMARY:

Hearing Date:	March 1, 2016
Applicant:	Signature Top Sail NC, Ltd.
Property Owner:	Signature Top Sail NC, LTD, applicant, on behalf of Capstone Ventures LLC., Ruth C. Kalmar Lewis et al, J L Morris Enterprises of Hampstead Inc., Morris Jeffrey et al, and Signature Top Sail NC, LTD
Case Number:	147-2016

Development Proposal:
Signature Top Sail NC, Ltd. applicant, on behalf of Signature Top Sail NC, Ltd. and J L Morris Enterprises of Hampstead Inc., owners, is requesting a revision to the previously approved Master Development Plan known as Wyndwater. Specifically this request is to:

1. Increase the overall project area from ± 150.78 acres to ± 204.07 acres
2. Increase the overall project density 3.10 units per to 3.14 units per acre;
3. Change the front yard setbacks from twenty (20) feet to fifteen (15) feet for Phases I-VI;
4. Allow for "alternative" design for alleyway located in Phase III as shown on Master Development Plan submittal page C-2.3. Originally approved on October 13, 2015 this change will require a Preliminary Plat Revision for Phase III;
5. Allow for "alternative" design of a hammerhead in Phase IV as shown on Master Development Plan submittal page C-3.7. At current Phase IV has not been submitted.

Wyndwater consists of six (6) residential phases and areas identified as future development on the ± 204.07 acre project area. There are nine (9) tracts associated with this project. All elements and phases, both recorded and future development, are included in this Master Development Plan Revision. This revision includes setback changes to previously approved and recorded phases I and II.

Property Record Number, Acreage, and Location: The Master development Plan request consists of increasing the overall project area from ± 150.78 acres to ± 204.07 acres. The subject property is zoned PD, Planned Development zoning district. The properties are located to the north of Doral Drive (SR 1693), northwest of Sloop Point Loop Road (SR 1563), south and east of the Cardinal Acres Lane (private) in the Topsail Township. The property may be further identified by Pender County PINs; 4214-04-6027-0000, 4214-22-2361-0000, 4214-31-1640-0000, 4213-59-0181-0000, 4214-12-3906-0000, 4214-22-7567-0000, 4214-04-9162-0000, 4214-23-2200-0000 and portion of the property located at 4214-50-8387-0000.

RECOMMENDATION
Planning Staff is submitting the proposal for Planning Board disposition. The request is consistent with six (6) policies and conflicting with no policies in the 2010 Pender County Comprehensive Land Use Plan. The request is consistent with other approved planning documents; therefore Planning Staff recommends the approval of the Master Development Plan Revision request as detailed in the report.

Any and all future development, as well as all phases or changes to the Master Development Plan are subject to Planning Board review and approval.

HISTORY
Please see attachment 1.

MASTER DEVELOPMENT PLAN

Non-Residential
Currently the non-residential portion of the project is identified as "Commercial" and contains approximately 4.50 acres isolated on the western side of the subject property adjacent to US HWY 17. Any non-residential uses and phasing must be approved by the Planning Board as applicable.

Residential
Density
The latest Wyndwater Master Development Plan was approved at the July 7, 2015 Planning Board meeting with a net density of 3.10 units per acre. The request is to revise the density to 3.14 units per acre. The proposed Master Development Plan revision is to add one hundred fifty (150) units within the ± 53.29 acres of additional development area. According to Section 4.8.1.C the net density in the PD, Planned Development zoning district shall be a maximum of five (5) units per acre. All density calculations shall be in accordance with Ordinance requirements and examined further if any variables of the project change from the Master Development Plan submittal. This request is in compliance with the Pender County Unified Development Ordinance.

Overall Density

	Current Request
Total Acreage	204.07
Non-Residential Acreage	4.50
Wetlands Acreage	6.46
Right-of-Way Acreage	23.01
Open Space Acreage	17.41
Active	10.95
Passive	6.46
Total Units	500
Developable Land	159.15
Net Density	3.14

Total Requested Lots
The original Wyndwater Master Development Plan approval included 185 lots with future development. The Master Development Plan was later revised on July 7, 2015 to three hundred fifty (350) units. The current submittal for Master Development Plan revision request is five hundred (500) units.

Lot Requirements
As outlined in the Unified Development Ordinance, Section 4.8.1.D the Master Development Plan established the required lots sizes, yard setbacks, and building height. Building height was previously approved at thirty-eight (38) feet; there is no requested change to height. Minimum lot size was approved at 5,000 sq. feet and there is no requested change in minimum lot size.

Single-Family Detached and Single-Family Attached Duplex
The applicant is requesting a change for both housing types to the front yard setbacks for Phases I-VI:

Setbacks	Approved Distance	Proposed Distance
Front	20 feet	15 feet
Side	Zero Lot Line	
Rear	20 feet	
Corner	15 feet	

Landscaping & Buffers
All landscape and buffers are to be approved in accordance with Section 8.2.8, Pender County Unified Development Ordinance. In multi-family and Planned Developments a Buffer A is required along all boundaries adjacent to a street. A Buffer C is required along all boundaries adjacent to single-family residential uses or residential lots with a parcel size of less than one (1) acre and when a single-family structure is within fifty (50) feet of the boundary of the development. A Buffer B is required for all other boundaries.

The buffers shown on the proposed Master Development Plan revision are in compliance with the Pender County Unified Development Ordinance. The specific type of the buffer will be determined during the Preliminary Plat public hearing.

Open Space
Per the Pender County Unified Development Ordinance Section 7.6, all proposed residential subdivisions shall provide open space in the amount of 0.03 acres per dwelling unit within the subdivision; half of which must be designated active open space.

The required open space for the Master Development Plan area is fifteen (15) acres. Currently ± 17.41 acres of open space will be provided in this proposal with ± 10.95 acres to be dedicated as active open space and ± 6.46 acres to be dedicated as passive open space. The open space is in compliance with the Pender County Unified Development Ordinance requirements.

Open Space	Acreage
Required	6.12
Proposed	17.41
Active	10.95
Passive	6.46

The open spaces proposed are located in a usable shape for active recreation. The location of the proposed open spaces is in easily accessible areas for the future residents of the subdivision. The residents of the proposed subdivision will have suitable, safe, and convenient ingress and egress to the proposed active open space areas through sidewalks, roadways, and easements.

Recreational Units

Recreational facilities shall be in a configuration and location that is easily accessible to the dwelling units that they are designed to serve and may be placed within active or passive open space required areas. Recreational units are assigned a financial unit to be achieved via installation on the subject property or through a payment in lieu of in conjunction with the approved Pender County Parks & Recreation Master Plan. The timing of the installation or payment in lieu of installation shall be confirmed on the Master Development Plan per Section 7.6.2 of the Pender County Unified Development Ordinance.

Additionally the applicant is constructing a pool facility (NAICS 713940) with approximately twenty-two (22) parking spaces in Phase III. Per Section 7.10.1 Outdoor Recreation requires one (1) parking space per five hundred (500) square feet of enclosed floor area plus one (1) parking space per one thousand (1,000) square feet of outdoor use area. At this time the outdoor recreation will consist of approximately 18,000 square feet and the indoor will consist of ± 500 square feet. The submittal meets the open space requirements set forth in Section 7.6.1.C of the Pender County Unified Development Ordinance.

The applicant was approved with the concept of a payment in lieu of installation of the recreation units; which will be required prior to the recordation of the each phase. All future development will be evaluated for open space and recreational units at the time of submittal.

The applicant is working with Planning Staff and the Wilmington Metropolitan Planning Organization (WMPO) on a Surface Transportation Program-Direct Appointment (STP-DA) Funds submittal for the construction of a sidewalk along Doral Drive (SR 1693). If awarded funds, Pender County is responsible for 100 percent of the actual project costs up front and any additional funding which exceeds the submitted estimations. The minimum local match required on all STP-DA projects is twenty (20) percent.

In this case, the local cash match funding shall be taken from the required recreation payment from recorded phases in Wyndwater per Section 7.6.2 of the Pender County Unified Development Ordinance. The developer has agreed to cover any costs associated with project overages and will enter into a formal agreement prior to any funds expended. The additional eighty (80) percent reimbursements will come from the NCDOT. This proposed facility will intend to connect the Wyndwater subdivision via Doral Drive (SR 1693) to Hampstead Kiwanis Park with a sidewalk in the reserved NCDOT right of way; and the Safe Routes to School multi-use pathway along Sloop Point Loop (SR 1563) ultimately terminating at N. Topsail Elementary School (Attachment 2 and 3).

Roadways

Public Roadways

Public roadways must be built to NCDOT subdivision road standards as outlined in the NCDOT Subdivision Manual published in January 2010. These roadways are subject to NCDOT review and

approval through a Driveway Permit, the applicant must submit plans to the NCDOT for approval prior to Pender County approval of this Preliminary Plat submission.

The interconnected roadways extending through Phase IV and Phase V are shown as public, however, the secondary roadways that branch off of the main road are proposed to be private. The original Master Development Plan submittal did not include roadways throughout the entire project area; rather this was identified as "future development". The existing roadways from Phase I, II, III and VI will remain consistent with the previous approvals.

Private Roadways
Currently there are fifteen (15) private roadways proposed within the Wyndwater Master Development Plan. According to Section 7.5.3 all designated private streets shall be designed and constructed in compliance with the current NCDOT Subdivision Roads Minimum Construction Standards. The proposed private right-of-ways are identified on the Master Development Plan at forty (40) feet in width; which will meet the NCDOT standards as outlined in the 2010 Subdivision Manual with a curb and gutter section.

Private roadway certifications are required to be submitted and shown on the Final Plat.

Currently, the private roadway located to the west of Friendly Lane does not utilize an approved cul de sac design. The applicant is proposing an alternative hammerhead design. Per Section 7.5.1.F of the Pender County Unified Development Ordinance requires a bulb type turn around. The Planning Board must approve the current deviation from the Unified Development Ordinance specified turn around, the applicant will still be required to design and construct to NCDOT standards.

Street Connectivity and Access
The PD, Planned Development zoning district per Section 4.8.1.E district requires reasonable access to be provided to adjacent properties for development. Adequate connections to adjacent parcels will promote interconnectivity and build road networks throughout the County. Per Section 7.5.3.C.5 these roadways are required to be designated as public when connected to adjacent parcels.

Currently there are connections proposed north into adjacent parcels identified by PINs 4214-43-1229-0000 (Westbrook James Donald et al), 4214-32-5405-0000 (Red Fox Plantation LLC), and 4214-04-9162-0000 (Morris Jeffery L et al). These roadways provide reasonable access. There is a required connection north into PIN 4214-42-3064-0000 (Red Fox Plantation LLC) that has been shown as a cul de sac on the proposed Master Development Plan. These proposed connections to adjacent parcels are required per the Pender County Collector Street Plan that all new streets that have the potential to connect to adjacent developments be constructed to NCDOT standards and added to the state system.

The applicant is proposing one alley on the north side of Phase III bordering PINs 4214-23-2200-0000 (J L Morris Enterprises of Hampstead Inc.) and 4214-04-9162-0000 (Morris Jeffrey et al). The proposed alleyway will allow for rear load housing types. The proposed alleyways are classified as private roadways. Per Section 7.5.3.A all designated private streets shall be designed and constructed in compliance with the current NCDOT Subdivision Roads Minimum Construction Standards. Variations to right-of-way widths and geometric design may be permitted upon Planning Board review and approval where unique needs exist. The private alley will connect to a public designed and built roadway for means of alternative access. While the alley will provide access to the rear of the house the front will be facing a state maintained roadway.

Traffic
At this time an examination of traffic impact on the existing road network surrounding the subject properties has been conducted through a Traffic Impact Analysis (TIA). This required the coordination with NCDOT and the Wilmington Metropolitan Planning Organization (WMPO). The TIA determined what improvements are necessary to the existing roadway network. Any change in land uses or densities requires a revision of the TIA to meet the changes made to the proposed plan. The TIA required improvements are accomplished through the driveway permit which is revised during the Preliminary Plat process of each phase (Attachment 4).

Pedestrian Access
The Coastal Pender Collector Street Plan recommends five (5) foot sidewalks on both sides of the collector streets which are well connected to all sidewalks and walkways internal to adjacent developments. The applicant proposed a pedestrian easement on the main collector road in the subdivision (West Craftsman Way). The Sidewalk will extend from Phase II into Phase IV and will terminate at the adjacent property connection to PIN 4214-43-1229-0000 (Westbrook Donald James et al et al). Roadways located in phases V and VI may be required to be built to Collector Roadway standards. Further examination will be required during the Preliminary Plat approval process.

The previously approved Doral Drive (SR 1693) emergency access connection and pedestrian facility has not been constructed and is to be included in Phase III. The internal pedestrian connectivity will eventually connect into the awarded North Carolina Safe Routes to School pedestrian path connecting North Topsail Elementary and Hampstead Kiwanis Park.

The Master development Plan request consists of viable pedestrian connections and meets the Coastal Pender Collector Street Plans requirements.

Services (Wastewater/Water)
Wyndwater was approved with traditional on-site septic which is subject to review and approval by the Pender County Environmental Health Department. Phase I wastewater is treated by individual on-site septic systems. Phase II has a combination of septic and sewer provided by Pluris.

An Intent to Service letter was provided by the applicant on behalf of Pluris (Attachment 5). The wastewater approval is for up to two hundred ten (210) single family residences as Pluris accepts future capacity. The applicant shall work directly with Pluris and the County for wastewater approvals to service future development phases. A new letter of intent will be required to be submitted stating that Pluris is permitting more capacity for the latest revision of the Wyndwater Master Development Plan.

Phase	Total Lot Count	Wastewater treatment method
I	37	septic
IB	3	septic
II	38	18 septic/20 sewer
IIB	27	sewer

Pluris and the applicant are working together to satisfy the necessary steps for an increase in wastewater capacity.

Public water connection to Pender County Utilities was previously approved for Phase I and Phase II. The Pender County Utilities Department and Pender County Health Department are working closely with the applicant to satisfy applicable requirements.

Environmental Concerns

The Master Development Plan area does contain portions of environmentally sensitive areas including wetlands and floodplains.

Wetlands
There are ± 6.46 acres of wetlands on the Master Development Plan area, as shown on wetland delineation submitted to the Army Corps of Engineers. Any development within these areas may be subject to the permit requirements of Section 404 of the Clean Water Act. A Jurisdictional Determination of the Wetlands has been conducted by the Army Corps of Engineers and submitted for review. At current the applicant has avoided the placement of lots within the designated wetlands.

Flood
A portion of the subject property located directly east of US 17 that is located within the "Approximate Zone A" Special Flood Hazard Area, according to the 2007 Flood Insurance Rate Maps (FIRMs), Map Numbers 3720420400J and 3720421400J, Panel Numbers 4204 and 4214. This was the established flood zone at the time of the original Master Development Plan approval. However, with the preliminary FIRMs released this year, to serve as the best available data it appears that the amount of the parcel in the "Approximate Zone A" was reduced and the subject property contains "Zone AO" with an established depth of two (2) feet on Panel 4204 and contains "Zone AO" on Panel 4214. All development in these areas will require re-examination at the time of development submittal in accordance with the best available flood data. At current the applicant has avoided the placement of lots within the designated Special Flood Hazard Areas.

CAMA
After a preliminary analysis, it appears there are no CAMA Areas of Environmental Concern located on the project site. CAMA Areas of Environmental Concern are tidal and/or navigable waters within Pender County that are classified as Public Trust Area up to the normal high water line or normal water level and are subject to the CAMA.

Tree Survey
The PD, Planned Development zoning district requires a tree survey to be submitted prior to the Final Preliminary Plat approval, the applicant shall be required to update the tree survey due the expansion of the subject property. This request is in compliance with the Pender County Unified Development Ordinance (Attachment 6).

All applicable state and federal agency permits including a Stormwater Management Permit, Erosion Control Plan, wetlands impact permits, and NCDOT Driveway Permit will be required prior to the approval of the for each phase as applicable.

Technical Review Committee (TRC) Responses:
On Tuesday February 2, 2016 the Pender County Technical Review Committee reviewed the Master Development Plan known as Wyndwater. The responses collected can be seen in Attachment 7.

EVALUATION
A) Public Notifications: Public Notice of the proposal for the Master Development Plan Revision has been advertised in the *Pender-Topsail Post and Voice*. Adjacent property owners have been given written notice of the request, and a public notification sign has been placed on the property.
B) Existing Zoning in Area: The properties are located within a PD, Planned Development zoning district. The intent of the PD, Planned Development zoning district is to provide an alternative to a conventional development. The PD district allows projects of innovative design and layout that would not otherwise be permitted under this Ordinance because of the strict application of zoning district or general development standards. The PD district encourages progressive land planning and design concepts. The properties to the north and east are zoned RP, Residential Performance zoning district and the properties to the south and west are zoned PD, Planned Development zoning district.
C) Existing Land Use in Area: The subject property is zoned PD, Planned Development zoning district. The properties are located to the north of Doral Drive (SR 1693), northwest of Sloop Point Loop Road (SR 1563), south and east of the Cardinal Acres Lane (private) in the Topsail Township.
D) 2010 Comprehensive Land Use Plan: Mixed Use: The Mixed Use land use classification designates locations where a mixture of higher density/intensity uses is to be encouraged. Mixed Use areas should be characterized by physically and aesthetically unified developments containing a mixture of commercial, office, institutional, and high- and medium-density residential uses, arranged in a walkable, compact, pedestrian, and transit friendly manner.

Supporting Comprehensive Plan Policies and Goals:

a. **Growth Management Goal 1A.1** Manage the physical growth and development of Pender County by promoting more intensive land uses in key locations identified for such growth while preserving and protecting the unique physical character and social assets of the predominant rural lifestyle and coastal environment that makes the County a unique place to live.
    i. **Policy 1A.1.2**
    Encourage development in areas where the necessary infrastructure – roads, water, sewer, and schools - are available, planned or can be most cost effectively provided and extended to serve existing and future development
b. **Transportation Goal 2B.1** Manage the timing, location and intensity of growth by coordinating transportation improvements in accordance with the Comprehensive Land Use Plan and the Coastal Pender Collector Street Plan.
    i. **Policy 2B.1.4**
    Adopt regulations that require new developments and individual sites throughout the County to provide vehicular and pedestrian interconnectivity to existing or planned adjacent sites and adjoining developments.
    ii. **Policy 2B.1.9**
    As recommended in the Coastal Pender Collector Street Plan, all new streets that have the potential to connect to adjacent developments should be constructed to NCDOT secondary road standards and accepted for public maintenance to ensure future connectivity.

c. **Water and Sewer Goal 2A.1** manage the timing, location and intensity of growth By locating water and sewer improvements in accordance with the Comprehensive Land Use Plan and Water and Wastewater Master Plans.

The request is consistent with six (6) policies from the 2010 Pender County Comprehensive Land Use Plan and conflicts with none.

Previous Conditions

The following conditions are required of all phases of the development:

1. Provide connection to adjacent property for future development to the northwest of the subject property (documented under case #11067 Cardinal Pointe, as submitted to Planning Board in December 2013);

The applicant has provided connections to adjacent property Cardinal Pointe Master Development Plan (Case # 11067). As a portion of the original Cardinal Pointe Master Development Plan is now included in the Wyndwater Master Development Plan revision, the connections shall be re-examined. Coordination between the applicant and the adjacent property owner shall be necessary to ensure interconnectivity.

The Wyndwater road network, as shown on attached Mast Development Plan revision provides two (2) connections to the adjacent property to the northwest. One connection is a stub for future development, and the second is a temporary cul de sac (Attachment 8).

2. Provide connection to identified "Capstone Property" identified by Pender County PIN 4214-22-7567-0000;

Phase II identifies an adjacent right of way connection satisfying this criteria. The proposed connections can be seen on the attached Mast Development Plan revision showing the connections to the "Capstone Property."

3. Allow for "alternative" design for alleyway as shown on Master Development Plan submittal page C-3.4; and

The alternative design was recorded on Map Book 57, Page 14 at the Register of Deeds as an access easement in Phase I.

4. Allow for emergency access along the connection to Doral Drive (SR 1693).

This requirement was originally shown in Phase II for the safety and well-being of the home owners in the development. The developer has since requested that this emergency access be moved to the next phase of the development and provided to the same standards as required by Emergency Management. The Technical Review Committee meeting provided insight on this change. The Fire Marshal agreed that the same standards would be met and same safety measures would be in place for citizens if the connection was provided in Phase III as requested. It is the Planning Board's discretion if this change shall be approved.

5. *The temporary cul de sac shown on the western portion of the Master Development Plan (PG C-3.2 of Site Plan) shall be converted to a through roadway at the time of the adjacent parcel development; the roadway connecting the Wyndwater and Cardinal Pointe shall be built to collector street standards as outlined in Section 7.5.3.C. Coordination between the applicant and the adjacent property owner shall be necessary to ensure interconnectivity.*

At current the applicant is still working towards the permitting of Phase III.

6. *Additional to condition five (5), a second roadway connection shall be shown to the adjacent parcel (PIN: 4204-94-9912-0000 and identified as the Cardinal Pointe Master Development Plan Case # 11067). These connections shall be further delineated in each phase submittal for review and approval.*

At current the applicant is still working towards the permitting of Phase III.

Proposed Conditions for Master Development Plan

7. Provide adjacent property connection north to PIN 4214-43-1229-0000 (Westbrook tract).
8. Provide connection to Oak Circle (private).
9 Allow for "alternative" design for alleyway located in Phase III as shown on Master Development Plan submittal page C-2.3
10 Allow for "alternative" design of a hammerhead in Phase IV as shown on Master Development Plan submittal page C-3.7

Requested Revisions

The requests before the Board this evening are to approve a Master Development Plan revision to include:

1. Increase the overall project area from ± 150.78 acres to ± 204.07 acres
2. Increase the overall project density 3.10 units per to 3.14 units per acre;
3. Change the front yard setbacks from twenty (20) feet to fifteen (15) feet for Phases I-VI;
4. Allow for "alternative" design for alleyway located in Phase III as shown on Master Development Plan submittal page C-2.3. Originally approved on October 13, 2015 this change will require a Preliminary Plat Revision for Phase III;
5. Allow for "alternative" design of a hammerhead in Phase IV as shown on Master Development Plan submittal page C-3.7. At current Phase IV has not been submitted.

STAFF RECOMMENDATION

Planning Staff is submitting the proposal for Planning Board disposition. The request is consistent with six (6) policies included in the 2010 Pender County Comprehensive Land Use Plan and Pender County Unified Development Ordinance, as well as, other approved planning documents. Therefore Planning Staff conditionally recommends the approval of the Master Development Plan Revision requests as detailed in the report for the development known as Wyndwater. Any and all future development, phases or changes to the Master Development Plan are subject to the Planning Board review and conditionally approval.

BOARD ACTION FOR Master Development Plan Revision:

Motion: _____Seconded: _____

Approved: ____Denied:____ Unanimous: ____

Williams: ____ Fullerton: ____ Baker____ Edens: ____ McClammy: ____ Nalee: ____

NOTICE TO APPLICANT

1. Applicant or agent authorized in writing must attend the public hearing.
2. Once the public hearing has been advertised, the case will be heard unless the applicant withdraws the application or unless the Planning Board or other authorized person agrees to table or delay the hearing.
3. All fees are non-refundable
4. A complete application packet must be submitted prior to the deadline in order to be placed on the next Planning Board Agenda

Office Use Only

☐	**MDP Fees:** (*$500.00 plus $10/acre for the first 100 acres $5/acre thereafter)*	**Total Fee Calculation: $** $250 Revision

Attachments Included with Application: (Please include # of copies)

CD /other digital version	☐ Y ☐ N	Plan Sets	# of large	# of 11X17	Other documents/Reports	☐ Y ☐ N

Payment Method:	**Cash :** ☐ $_____	**Credit Card:** ☐ Master Card ☐ Visa	**Check:** ☐ Check # 9143

Application received by:	[illegible]	Date: 1-20-16
Application completeness approved by:	[illegible]	Date:
Date scheduled for public hearing:	2-2-16 TRC 3-1-16 Planning Board	

MASTER DEVELOPMENT PLAN CHECKLIST

	Signed Application Form (Both Applicant and Owner)
	Application fee
	Legible list of all property owners adjacent to the property upon which the use is to be located. The list shall include the mailing address & physical address of these property owners (The application will not be advertised for public hearing until the list is accurate & complete)
	One business size envelope legibly addressed with first class postage for each of the adjacent property owners on the above list.
	Project Narrative--Written description of the project (max of 3 pages) including the following: ☐ Location of the project and type of access to project site ☐ Detailed description of the activities to be undertaken on the site, including hrs. of operation,# of employees, etc. ☐ Description of all construction activities to be undertaken on the site ☐ Describe type of utilities that will serve project and status of approval from applicable providers ☐ List of all state and federal permits that will be required for the project ☐ Describe any potential impacts the project will have on the community or adjacent properties such as traffic, noise, etc. and explain efforts to mitigate these impacts (this item must be addressed by the applicant). The applicant may also wish to describe any positive benefits the project will provide for the community &/or neighbors of the project.

	Master Development Plan Contents All MDP's shall be prepared in accordance with the following specifications:
	The scale shall be one inch equals 100 feet or larger (the ratio of feet to inches shall be no more than one hundred feet to one inch) or at a scale acceptable to the Director. The scale shall be sufficient so that all features are discernible.
	No sheet shall be smaller than 24"x36" in size unless approved by the Administrator. If the MDP is prepared on more than one sheet, match lines shall clearly indicate where the sheets join.
	North arrow, a scale of 1:100 or larger and a legend describing all symbols.
	A boundary survey of the entire property related to true meridian & certified by a registered surveyor with all dimensions in ft & decimals of ft. A vicinity map at a suitable scale shall be provided showing the location of the project along with the location of all existing or approved public roads, streets or rights-of-way within 2,000 ft of the boundaries of the project.
	The total area of the property shall be specified.
	The topography shall be shown at 2 foot contour intervals.
	The title of the proposed project; the date, month, year the plan was prepared or revised; the name of the applicant(s), owner(s) and contract owner(s); and the names of the individuals or firms preparing the plan shall be clearly specified.
	A schedule of phases, with the approximate location of phase boundaries & the order in which the phases are to be developed, shall be provided.
	The use of all adjoining properties by zoning, parcel identification number (PIN) and current property owner(s).

APPLICATION FOR MASTER DEVELOPMENT PLAN

THIS SECTION FOR OFFICE USE			
Application No.	MDP / 147-2016	Date	1-20-16
Application Fee	$ 250 Revision	Receipt No.	160184
Pre-Application Conference	2-2-16	Hearing Date	3-1-16

SECTION 1: APPLICANT INFORMATION			
Applicant's Name:	TOP SOIL NC Signature ~~Pender County, NC~~, LP	Owner's Name:	TOP SOIL NC Signature ~~Pender County, NC~~, LP
Applicant's Address:	9337B Katy Freeway #377	Owner's Address:	9337B Katy Freeway #377
City, State, & Zip	Houston, Texas 77024	City, State, & Zip	Houston, Texas 77024
Phone Number:	713-822-3891	Phone Number:	713-822-3891
Legal relationship of applicant to land owner:	Owner		

SECTION 2: PROJECT INFORMATION				
Type of Master Development Plan	☐ Residential *RP, PD, RM MH District*	☐ Commercial *GB, OI, IT, GI District*	☑ Mixed Use *PD*	☐ Exempt
Property Identification Number (PIN):	4214-12-8251-0000	Total property acreage:	204.07	
Zoning Classification:	PD	Acreage to be disturbed:		
Project Address :	1040 Topsail Greens Drive			
Description of Project Location:	Project is located between Hwy 17 & Sloop Point Loop Road			
Describe activities to be undertaken on project site:	Development of Residential Lots & Future Commercial Sites			

SECTION 3: SIGNATURES			
Applicant's Signature	[signature]	Date:	1/16/16
Owner's Signature	[signature]	Date:	1/16/16

GSP CONSULTING

February 11, 2016

Pender County
Planning and Community Development
805 S. Walker Street
Burgaw, NC 28425

Re: Wyndwater
Master Development Plan Project Narrative

This project is located off and has direct access to Sloop Point Loop Road (SR 1563) in Hampstead, Pender County, North Carolina. This project will be developed in Phases. Phase 1 contains 42 lots to be served by Public NCDOT & Private subdivision roads serving all the lots as well as a Public waterline extension. Phase 1 sewer will be treated by the use of septic systems. Phase 2 contains 63 lots to be served by Public NCDOT & Private subdivision roads serving all the lots as well as a Public waterline extension. Phase 2 sewer will be treated by the use of septic systems owned by the individual lot owners & gravity sewer owned and operated by Pluris. Phase 3 contains approximately 107 single family lots & 40 duplex units to be served by Public NCDOT & Private subdivision roads serving all the lots as well as a Public waterline extension. Phase 3 sewer will be treated by the use of gravity sewer and a lift station owned and operated by Pluris. Phases 4 & 5 contain approximately 147 single family lots to be served by Public NCDOT & Private subdivision roads serving all the lots as well as a Public waterline extension. Phases 4 & 5 sewer will be treated by the use of gravity sewer and a lift station owned and operated by Pluris. Phase 6 contains approximately 127 single family lots & 81 duplex units to be served by Private subdivision roads serving all the lots as well as a Public waterline extension. Phase 6 sewer will be treated by the use of either septic systems owned by the individual lot owners or gravity sewer owned and operated by Pluris. The primary stormwater measures for the development will be closed conduit systems, road side ditches and overland sheet flow that will direct the runoff to proposed wet detention basins that will be designed to control the peak runoff from the 10-year storm event and will be analyzed for the 100-year storm event to prevent flooding of the proposed development. This development will require approvals from the USACOE for onsite wetlands, DENR-Public Water Supply Section for the water line extension, NCDOT for the driveway connection to SR 1563 and the subdivision streets & NCDENR-Division of Water Quality for the sewer and stormwater systems. The development will generate approximately 4,313 total daily trips with 332 in the AM peak hour and 416 in the PM peak hour based on the ITE Trip Generation Manual 8th edition using ITE Code 210 for single family homes & Code 230 for the duplex/townhome units. A TIA has been completed for the development and all recommended improvements will be completed as required by NCDOT.

Please contact me immediately at (910) 442-7870 or gpape@gsp-consulting.com if you have any questions or require additional information.

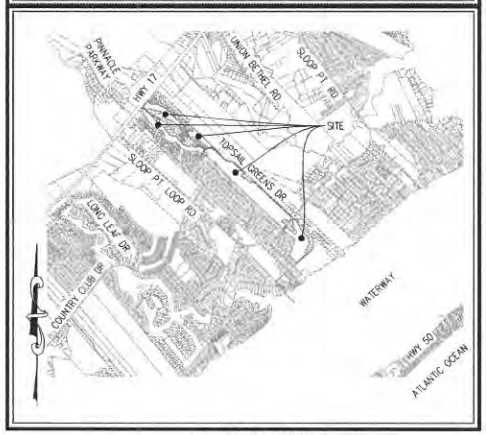
Sincerely,
GSP CONSULTING, PLLC.

Garry S. Pape, P.E.

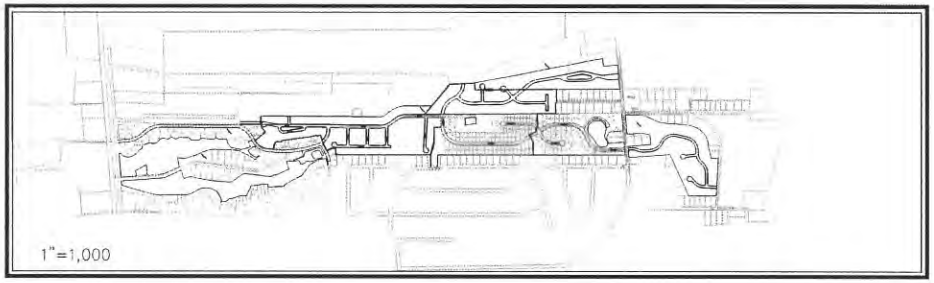
6626 Gordon Road, Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

MASTER DEVELOPMENT PLAN
FOR
WYNDWATER
PENDER COUNTY, NORTH CAROLINA
JANUARY 2016

VICINITY MAP



VICINITY MAP
(NTS)



LEGEND

DESCRIPTION	EXISTING	PROPOSED
1' CONTOUR INTERVAL		
5' CONTOUR INTERVAL		
PROPERTY LINE		
ROADWAY CENTERLINE		
RIGHT OF WAY LIMITS		
EASEMENT LINE		
CURB & GUTTER		
SANITARY SEWER FACILITIES		
STORM SEWER FACILITIES		
WATERLINE		
FIRE HYDRANT ASSEMBLY		
WATERWAYS		N/A

	PROPOSED		
PROPOSED LOT AND S.F.	X 5,000 s.f.	STREET SIGN	
OPEN SPACE LABEL	Ⓐ	404 WETLANDS	
OPEN SPACE		FLOW DIRECTION	
BUILDING SET BACKS			
PRIVATE SANITARY SET BACKS			

DEVELOPER/OWNER

Signature Top Sail NC, LP
9337b Katy Freeway #377
Houston, Texas 77024
Phone: (713) 789-0466

PREPARED BY:

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road, Unit C, Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659 License # P-0718

CERTIFICATE OF PRELIMINARY PLAT APPROVAL

APPROVED BY PENDER COUNTY UNIFIED DEVELOPMENT ADMINISTRATOR

SITE PLAN VALID FOR A PERIOD OF TWO (2) YEARS FROM APPROVAL DATE:

ADMINISTRATOR _____ DATE _____

INDEX OF SHEETS

SHT C-0	COVER SHEET
SHT C-1	GENERAL NOTES
SHT C-2.1	BOUNDARY SURVEY
SHT C-2.2	BOUNDARY SURVEY
SHT C-2.3	BOUNDARY SURVEY
SHT C-2.4	BOUNDARY SURVEY
SHT C-3.1	SITE PLAN
SHT C-3.2	SITE PLAN
SHT C-3.3	SITE PLAN
SHT C-3.4	SITE PLAN
SHT C-3.5	SITE PLAN
SHT C-3.6	SITE PLAN
SHT C-3.7	SITE PLAN
SHT C-4.1	UTILITY & STORMWATER MANAGEMENT PLAN
SHT C-4.2	UTILITY & STORMWATER MANAGEMENT PLAN
SHT C-4.3	UTILITY & STORMWATER MANAGEMENT PLAN
SHT C-4.4	UTILITY & STORMWATER MANAGEMENT PLAN
SHT C-4.5	UTILITY & STORMWATER MANAGEMENT PLAN
SHT C-4.6	UTILITY & STORMWATER MANAGEMENT PLAN
SHT C-4.7	UTILITY & STORMWATER MANAGEMENT PLAN

SITE DATA TABLE

DEVELOPMENT NOTES:

1. PENDER COUNTY PARCEL NO.: PIN 4214-12-8251-0000
2. TOTAL TRACT AREA: 8,889,076 SF = 204.07 AC.±
3. ZONING: PLANNED DEVELOPMENT (PD)
4. LAND CLASSIFICATION: VACANT
5. A PORTION OF THIS PROPERTY IS WITHIN A SPECIAL FLOOD HAZARD ZONE PER FEMA FLOOD INSURANCE RATE MAP #3720420400J, EFFECTIVE DATE 2/16/2007 AND FLOOD INSURANCE RATE MAP #3720421400J, EFFECTIVE DATE 2/16/2007.
6. THIS PROPERTY DOES NOT CONTAIN ANY A.E.C. AREAS OR IS UNDER CAMA JURISDICTION.
7. THIS PROPERTY DOES CONTAIN 404 FEDERAL WETLANDS WHICH HAVE BEEN APPROVED BY THE USACOE.

GENERAL NOTES:

1. OWNERSHIP REFERENCE: D.B. 4379 P.G 330
2. PROPERTY IS LOCATED IN PENDER COUNTY AND IS ZONED PLANNED DEVELOPMENT (PD).
3. A HOME OWNERS ASSOCIATION WILL BE FORMED TO GUARANTEE CONTINUAL MAINTENANCE OF THE COMMON AREAS AND OPEN SPACE.
4. ALL INTERIOR ROADWAYS ARE TO BE BUILT TO NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS.
5. INTERIOR ROADWAYS ARE TO BE PRIVATE AND PUBLIC AS DEPICTED ON THE MASTER PLAN OR FUTURE PRELIMINARY PLANS. PUBLIC ROADWAYS SHALL BE DEDICATED TO NORTH CAROLINA DEPARTMENT OF TRANSPORTATION.
6. A HOME OWNERS ASSOCIATION WILL BE FORMED PRIOR TO THE SALE OF ANY LOTS AND MEMBERSHIP WILL BE AUTOMATIC UPON PURCHASE.
7. THIS MASTER PLAN IS CONCEPTUAL AND IS SUBJECT TO CHANGE IN ACCORDANCE WITH THE PROVISIONS OF PENDER COUNTY DEVELOPMENT ORDINANCE.
8. THE DEVELOPERS HAVE THE SOLE RIGHT TO MODIFY THIS MASTER PLAN IN ACCORDANCE WITH MARKET CONDITIONS OR OTHER CONDITIONS WHICH INDICATE A CHANGE IS DESIRED OR REQUIRED. ANY AND ALL CHANGES MUST BE REVIEWED BY THE PLANNING DEPARTMENT AND IN SOME INSTANCES MAY REQUIRE PLANNING BOARD APPROVAL.
9. BUFFERS WILL BE PROVIDED PER CURRENT PENDER COUNTY ZONING ORDINANCE.
10. WETLANDS IMPACTED WILL BE MITIGATED IN ACCORDANCE WITH ANY REQUIREMENTS OF APPLICABLE STATE AND FEDERAL PERMITS.
11. ALL LOTS SHALL MEET CURRENT PENDER COUNTY UNIFIED DEVELOPMENT ORDINANCE REGULATIONS.
12. IT IS THE INTENT FOR PHASE 3 OF THIS DEVELOPMENT TO INCLUDE A POOL FACILITY AND MULTI-USE PATHS/SIDEWALKS WITHIN THE DEVELOPMENT.

SINGLE FAMILY DEVELOPMENT STANDARDS:

MINIMUM LOT DIMENSIONS:

AREA IN (S.F.)	12,000 SF (W/SEPTIC) 5,000 SF (W/SEWER)
MAX USABLE LOT AREA (%)	95%
MIN LOT WIDTH (FT)	70' (W/SEPTIC) 40' (W/SEWER)
MIN CHORD AT ROW (CUL-DE-SAC)	30'
MAX BLDG. HT. (FT)	35'

PROPOSED BUILDING SETBACKS:

FRONT –	15'
REAR –	20'
SIDE –	ZERO LOT LINE (10' MAINTENANCE EASEMENT BETWEEN STRUCTURES)
CORNER –	10'

ANY PERIPHERAL PROPERTY LINE STRUCTURES – AS PER NORTH CAROLINA STATE BUILDING CODE

SINGLE FAMILY ATTACHED DEVELOPMENT STANDARDS:

MINIMUM LOT DIMENSIONS:

AREA IN (S.F.)	5,000 SF
MAX USABLE LOT AREA (%)	95%
MIN LOT WIDTH (FT)	40'
MIN CHORD AT ROW (CUL-DE-SAC)	30'
MAX BLDG. HT. (FT)	35'

PROPOSED BUILDING SETBACKS:

FRONT –	15'
REAR –	20'
SIDE* –	ZERO LOT LINE (10' MAINTENANCE EASEMENT BETWEEN STRUCTURES)
CORNER –	10'

ANY PERIPHERAL PROPERTY LINE STRUCTURES – AS PER NORTH CAROLINA STATE BUILDING CODE

*TWO ATTACHED SINGLE FAMILY UNITS LOCATED ON ONE OR TWO LOTS THAT SHARE A COMMON WALL ALONG THE LOT LINE

REQUIRED OPEN SPACE:

500 LOTS * 0.03 AC/LOT = 15.00 AC±

PROVIDED OPEN SPACE

16.95 AC± TOTAL OPEN SPACE PROVIDED

NOTE: PROPOSED OPENSPACE/RECREATION SPACE AREAS ARE NOT FOR BUILDING OR STRUCTURAL DEVELOPMENT

DEVELOPMENT DATA:

TOTAL TRACT AREA =	204.07 AC
NON-RESIDENTIAL ACREAGE =	4.50 AC
WETLAND ACREAGE =	6.46 AC
RIGHT OF WAY ACREAGE =	23.01 AC
OPEN SPACE ACREAGE =	16.95 AC
ACTIVE =	10.95 AC
PASSIVE =	6.46 AC
TOTAL UNITS =	500
DEVELOPABLE LAND =	159.60 AC
NET DENSITY =	3.13 UNITS/AC

DEVELOPMENT DATA

TOTAL TRACT AREA = 8,889,076 SF = 204.07 AC.±
PROPOSED DENSITY 500 UNITS = 3.13 UNITS/AC
AVERAGE LOT SIZE – 12,364 SF
AREA OF LOTS PROPOSED – 4,351,984 SF = 99.91 AC±
AREA OF ROW PROPOSED – 1,002,434 SF = 23.01 AC±
TOTAL PROPOSED ROAD LENGTH – 20,835 L.F.±

IMPERVIOUS SURFACES –		
PROPOSED BUA –		
ROADS –	650,000 S.F.	
LOTS –	1,600,000 S.F.	
OTHER –	75,000 S.F.	
TOTAL –	2,325,000 S.F.	(26.2%)

TRIP GENERATION:

370 SINGLE FAMILY HOMES* & 121 DUPLEX/TOWNHOME UNITS**:
4,313 – TOTAL DAILY TRIPS
332 – AM PEAK HOUR
416 – PM PEAK HOUR
*PER ITE TRIP GENERATION MANUAL 8TH EDITION, ITE CODE 210
**PER ITE TRIP GENERATION MANUAL 8TH EDITION, ITE CODE 230

UTILITY DATA:

TOTAL – 500 UNITS @ 190 GPD/UNIT * 2.5 P.F. = 237,500 GPD

DEVELOPMENT NOTES:

1. ALL DEVELOPMENT SHALL BE IN ACCORDANCE WITH THE PENDER COUNTY UNIFIED DEVELOPMENT ORDINANCE.
2. PROJECT SHALL COMPLY WITH ALL CITY, STATE & FEDERAL REGULATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 051315 ENGINEER CHARLES E. GAUTIER, JR. 01/07/2016

NOTE:
ALL DESIGN AND CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE PENDER COUNTY UNIFIED DEVELOPMENT ORDINANCE & THE STATE OF NORTH CAROLINA

PROJECT NAME: WYNDWATER
GSP CONSULTING PROJECT #: 2016-0001

COORDINATION NOTES

1. THE CONTRACTOR IS REQUIRED TO OBTAIN ANY/ALL PERMITS REQUIRED FOR CONSTRUCTION OF THESE PLANS.
2. ALL WORK IS TO BE IN ACCORDANCE WITH PENDER COUNTY AND THE STATE OF NORTH CAROLINA

3. THE CONTRACTOR IS TO ESTABLISH AND CHECK ALL HORIZONTAL AND VERTICAL CONTROLS TO BE USED WITH THE PROJECT. IN ADDITION, THE CONTRACTOR IS TO COMPUTE THE LAYOUT OF THE ENTIRE SITE PLAN IN ADVANCE OF BEGINNING ANY WORK ASSOCIATED WITH THE SUBJECT PLANS. CONTRACTOR SHALL EMPLOY A PROFESSIONAL SURVEYOR TO PERFORM SITE IMPROVEMENT STAKEOUT(S).

4. ANYTIME WORK IS PERFORMED OFF-SITE OR WITHIN AN EXISTING EASEMENT, THE CONTRACTOR IS TO NOTIFY THE OWNER OF SAID EASEMENT AS TO THE NATURE OF PROPOSED WORK AND TO FOLLOW ANY GUIDELINES OR STANDARDS WHICH ARE ASSOCIATED WITH OR REFERENCED IN THE RECORDED EASEMENT

GENERAL NOTES:

1. EXISTING TOPOGRAPHY, BOUNDARY AND UTILITIES, HAVE BEEN PREPARED BY A FIELD SURVEY BY ATLANTIC COAST SURVEY, PLLC (P-0822) AND OTHER AVAILABLE INFORMATION.

2. REASONABLE CARE HAS BEEN EXERCISED IN SHOWING THE LOCATION OF EXISTING UTILITIES ON THE PLANS. THE EXACT LOCATION OF ALL EXISTING UTILITIES IS NOT KNOWN IN ALL CASES. THE CONTRACTOR SHALL EXPLORE THE AREA AHEAD OF DITCHING OPERATIONS BY OBSERVATIONS, ELECTRONIC DEVICES, HAND DIGGING AND BY PERSONAL CONTACT WITH THE UTILITY COMPANIES. IN ORDER TO LOCATE EXISTING UTILITIES IN ADVANCE OF TRENCHING OPERATIONS SO AS TO ELIMINATE OR MINIMIZE DAMAGE TO EXISTING UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS RESULTING FROM ANY DAMAGE TO THE EXISTING UTILITY LINES INCLUDING LOSS OF UTILITY REVENUES. CONTRACTOR SHALL ARRANGE FOR TEMPORARY SUPPORT OF EXISTING UTILITIES, SUCH AS POLES, CONDUITS, FIBER OPTIC CABLES, TELEPHONE CABLES, WATER LINES, ETC..

3. CONTRACTOR SHALL COMPLY WITH THE LATEST REVISIONS AND INTERPRETATIONS OF THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT.

4. CONTRACTOR SHALL PLAN AND CONSTRUCT WORK SO AS TO CAUSE MINIMUM INCONVENIENCE TO THE OWNER AND THE PUBLIC. THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN AT ALL TIMES DURING THE PROCESS OR TEMPORARY SUSPENSION OF WORK, SUITABLE BARRIERS, FENCES, SIGNS OR OTHER ADEQUATE PROTECTION, INCLUDING FLAGMEN AND WATCHMEN AS NECESSARY TO INSURE THE SAFETY OF THE PUBLIC AS WELL AS THOSE ENGAGED IN THE CONSTRUCTION WORK. CONSTRUCTION SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "CONSTRUCTION AND MAINTENANCE OPERATIONS SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" BY THE DOT.

5. ALL MATERIAL CLEARED OR DEMOLISHED BY THE CONTRACTOR IN ORDER TO CONSTRUCT THE WORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROPERLY DISPOSED OF OFF-SITE.

6. ALL WORK BY THE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR AFTER THE OWNER ACCEPTS THE WORK.

7. CONTRACTOR SHALL CALL THE NORTH CAROLINA ONE-CALL CENTER AT 1 (800) 632-4949 AND ALLOW THE CENTER TO LOCATE EXISTING UTILITIES BEFORE DIGGING.

8. CONTRACTOR SHALL REMOVE ASPHALT, AGGREGATE BASE COURSE, AND CONCRETE CURB & GUTTER WITHIN LIMITS OF DEMOLITION AS SHOWN ON PLAN.

DEMOLITION NOTES

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

EROSION AND SEDIMENT CONTROL NOTES

GENERAL NOTES:

1. CLEAR AND REMOVE FROM SITE ALL TREES, ROOTS, ROOT MAT, ETC. FROM THE AREA WITHIN DESIGNATED CLEARING LIMITS
2. PLANT GRASS OVER ALL GRADED AREAS AS SHOWN IN THE TABLE ON THIS SHEET OF CEASE OF ANY GRADING ACTIVITY.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING AND RESTORING TO PRE-CONSTRUCTION CONDITIONS ANY AREAS OUTSIDE THE PROJECT LIMITS THAT MAY INADVERTENTLY BE DAMAGED DUE TO THE FAILURE OF THE EROSION MEASURES
4. DURING GRADING AND AFTER GRADING HAS BEEN COMPLETED, CONTRACTOR SHALL CONTINUE TO MAINTAIN PERMANENT AND TEMPORARY EROSION CONTROL MEASURES UNTIL FINAL INSPECTION AND APPROVAL BY THE PCDENR DIVISION OF LAND QUALITY
5. WATER, FERTILIZE, MOW AND MAINTAIN SPRIGGED, SODDED AND PLANTED AREAS UNTIL FINAL APPROVAL BY THE PCDENR DIVISION OF LAND QUALITY
6. ANY BORROW MATERIAL BROUGHT ONTO SITE MUST BE FROM A LEGALLY OPERATED MINE OR OTHER APPROVED SOURCE.
7. ANY EXCESS MATERIAL REMOVED FROM SITE MUST BE HAULED TO A LEGALLY OPERATED MINE OR OTHER APPROVED SOURCE.

MAINTENANCE PLAN

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF-PRODUCING RAINFALL BUT IN NO CASE LESS THAN ONCE EVERY WEEK. ANY NEEDED REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED.

2. ALL CONSTRUCTION ENTRANCES WILL BE PERIODICALLY TOP DRESSED WITH AN ADDITIONAL 2 INCHES OR AS STONE TO MAINTAIN PROPER DEPTH. ANY SEDIMENT THAT IS TRACKED INTO THE STREET WILL BE IMMEDIATELY REMOVED.

3. SEDIMENT WILL BE REMOVED BEHIND THE SEDIMENT FENCE WHEN IT BECOMES 0.5 FEET DEEP AT THE FENCE. THE SEDIMENT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER. SILT FENCE STAKES WILL BE SPACED 6 FEET APART UNLESS A WIRE BACKING IS USED WITH 8 FOOT STAKE SPACING.

4. INSPECT INLET PROTECTION AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT. CLEAN 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.

5. 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.

6. INSPECT TEMPORARY SEDIMENT TRAPS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (ONE-HALF INCH OF GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT ACCUMULATES TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. PULL THE SKIMMER TO ONE SIDE SO THAT THE SEDIMENT UNDERNEATH IT CAN BE EXCAVATED. EXCAVATE THE SEDIMENT FROM THE ENTIRE BASIN, NOT JUST AROUND THE SKIMMER OR THE FIRST CELL. MAKE SURE VEGETATION GROWING IN THE BOTTOM OF THE BASIN DOES NOT HOLD DOWN THE SKIMMER. PLACE THE SEDIMENT THAT IS REMOVED IN THE DISPOSAL AREA, AND REPLACE THE PART OF THE GRAVEL FACING THAT IS IMPAIRED BY SEDIMENT.

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

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

   CHECK THE STRUCTURE FOR DAMAGE FROM EROSION OR PIPING. PERIODICALLY CHECK THE DEPTH OF THE SPILLWAY TO ENSURE IT IS A MINIMUM OF 1.5 FEET BELOW THE LOW POINT OF THE EMBANKMENT. IMMEDIATELY FILL ANY SETTLEMENT OF THE EMBANKMENT TO SLIGHTLY ABOVE DESIGN GRADE. ANY RIPRAP DISPLACED FROM THE SPILLWAY MUST BE REPLACED IMMEDIATELY.

   AFTER ALL SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS, AND STABILIZE PROPERLY.

7. INSPECT ENCELSIOR MATTING AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT REPAIR IMMEDIATELY. GOOD CONTACT WITH THE GROUND MUST BE MAINTAINED, AND EROSION MUST NOT OCCUR BENEATH THE MATTING. ANY AREAS OF THE MATTING THAT ARE DAMAGED OR NOT IN CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED. IF EROSION OCCURS DUE TO POORLY CONTROLLED DRAINAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREA PROTECTED. MONITOR AND REPAIR THE MATTING AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

7. INSPECT BAFFLES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY. EVENT REPAIR IMMEDIATELY. GOOD CONTACT WITH THE GROUND MUST

   BE SURE TO MAINTAIN ACCESS TO THE BAFFLES. SHOULD THE FABRIC OF A BAFFLE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.

   REMOVE SEDIMENT DEPOSITS WHEN IT REACHES HALF FULL TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE BAFFLES. TAKE CARE TO AVOID DAMAGING THE BAFFLES DURING CLEANOUT. SEDIMENT DEPTH SHOULD NEVER EXCEED HALF THE DESIGNED STORAGE DEPTH.

   AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED, REMOVE ALL BAFFLE MATERIALS AND UNSTABLE SEDIMENT DEPOSITS. BRING THE AREA TO GRADE, AND STABILIZE IT.

STABILIZATION NOTES

1. ALL DISTURBED AREAS WILL BE STABILIZED WITHIN 15 WORKING DAYS OF CEASE OF ANY PHASE OF ACTIVITY AND SLOPES WITHIN 21 CALENDAR DAYS

PERMANENT SEEDING SCHEDULE - MIXTURE 5CP

SPECIES	RATE (LB/ACRE)
CENTIPEDE GRASS	10-20

Seeding Dates

MARCH - JUNE.

Soil Amendments

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

Mulch

DO NOT MULCH

Maintenance

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

TEMPORARY SEEDING-LATE WINTER/EARLY SPRING

WINTER AND EARLY SPRING

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

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

SUMMER

SPECIES	RATE (LB/ACRE)
GERMAN MILLET	40

FALL

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

Seeding dates

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

Soil amendments

FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER.

Mulch

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

Maintenance

REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

GENERAL GRADING NOTES

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

SITE NOTES

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

GENERAL STORM SEWER NOTES

1. ALL STORM SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH PENDER COUNTY AND THE STATE OF NORTH CAROLINA REQUIREMENTS AS SPECIFIED ON THE DRAWINGS AND IN THE PROJECT SPECIFICATIONS.
2. BEDDING FOR ALL STORM SEWER PIPE SHALL BE AS SPECIFIED ON THE DRAWINGS, PROJECT SPECIFICATIONS, AND MANUFACTURER SPECIFICATIONS.
3. ALL STORM SEWER PIPES ON PRIVATE PROPERTY TO BE HDPE ADS N-12 OR EQUIVALENT UNLESS OTHERWISE SPECIFIED. ALL STORM SEWER PIPES LOCATED WITHIN THE PUBLIC ROW TO BE RCP CLASS III.
4. ALL STORM SEWER PIPES SHOWN AS RCP ON THE PLANS SHALL BE REINFORCED CONCRETE PIPE CONFORMING TO ASTM C-76 UNLESS INDICATED OTHERWISE ON PLANS.

GROUND STABILIZATION		
SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7-DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)

EXISTING UTILITY NOTES

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

UTILITY CONTACTS:

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

NOTICE REQUIRED

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

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

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

EMERGENCY DIAL 911 POLICE - FIRE - RESCUE

NORTH CAROLINA PROFESSIONAL SEAL 031315 ENGINEER GARRY S. PAPE 07/19/2016

No.	Revision	Date	By

Designer: GSP	Scale:
Drawn By: GSP	Date: January 2016
Checked By: P-0718	Job No.: 2016-0001

WYNDWATER
Topsail Township Pender County North Carolina

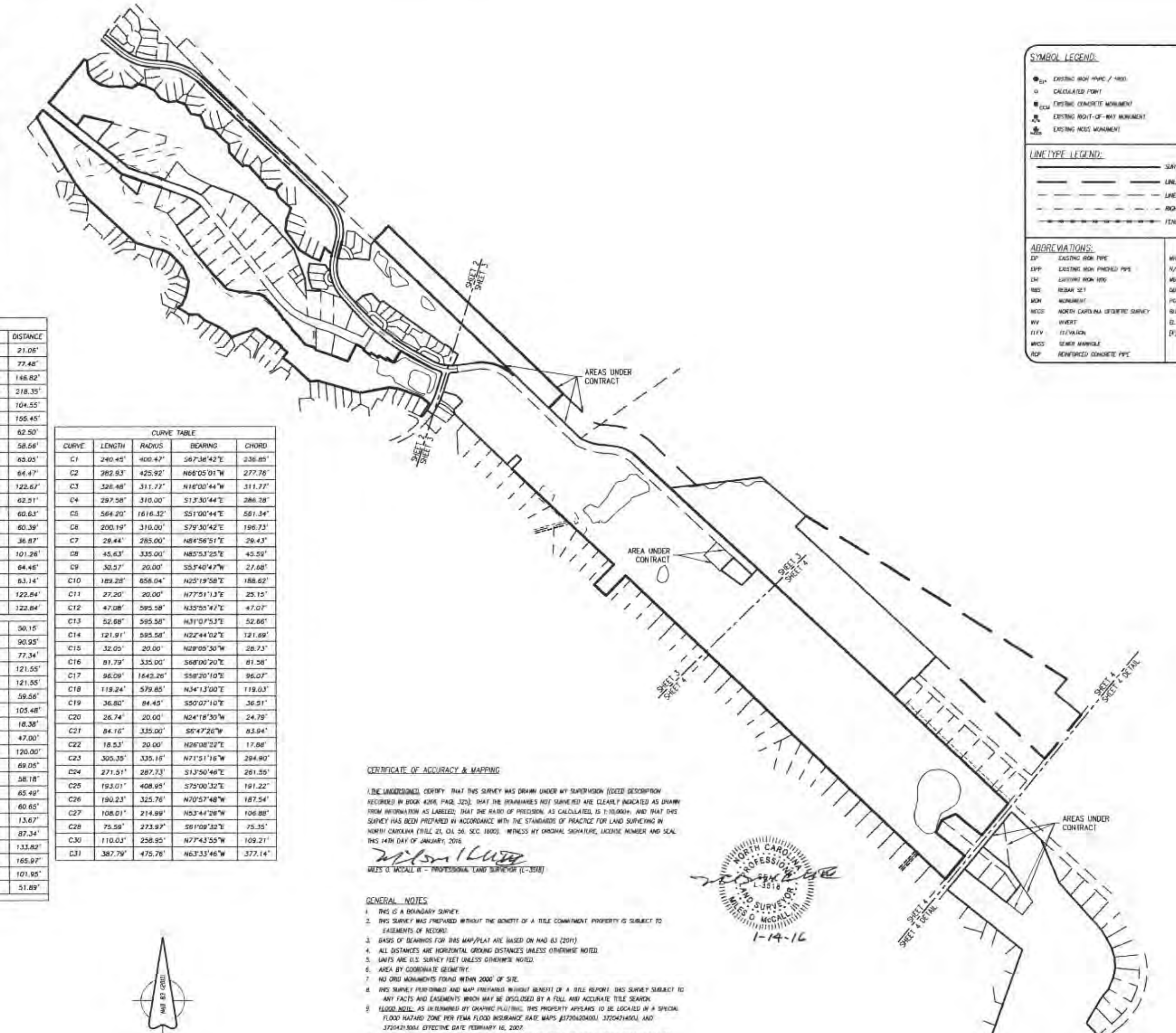
GENERAL NOTES

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
10378 KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
ENGINEERING
6628 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7878 fax: 910-799-6659

Sheet No.
C-1

VICINITY MAP
SCALE: 1" = 2000'



SYMBOL LEGEND:

- EIP: EXISTING IRON PIPE / ROD
- CALCULATED POINT
- ECM: EXISTING CONCRETE MONUMENT
- EXISTING RIGHT-OF-WAY MONUMENT
- EXISTING NGS MONUMENT

LINETYPE LEGEND:

- SURVEYED LINES (BOUNDARY)
- LINES NOT SURVEYED (BOUNDARY)
- LINES NOT SURVEYED (ADJOINERS)
- RIGHT-OF-WAY
- FENCE

ABBREVIATIONS:

EIP	EXISTING IRON PIPE	MHSD	STORM DRAIN MANHOLE
EIPP	EXISTING IRON PINCHED PIPE	N/F	NOW OR FORMERLY
EIR	EXISTING IRON ROD	MB	MAP BOOK / CABINET
RBS	REBAR SET	DB	DEED BOOK
MON	MONUMENT	PG	PAGE
NCGS	NORTH CAROLINA GEODETIC SURVEY	BLDG	BUILDING
INV	INVERT	EL	ELEVATION
ELEV	ELEVATION	[E]	EXISTING
MHSS	SEWER MANHOLE		
RCP	REINFORCED CONCRETE PIPE		

LINE TABLE

LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE
L1	S50°26'40"E	166.59'	L21	S32°04'24"W	20.00'	L41	N59°38'05"W	21.06'
L2	S85°06'50"E	118.39'	L22	N50°06'31"W	60.56'	L42	N76°50'06"W	77.48'
L3	S13°59'18"W	125.62'	L23	N32°04'24"E	9.51'	L43	N43°31'04"W	146.82'
L4	N41°00'44"W	125.62'	L24	N59°37'09"W	66.31'	L44	N39°25'50"W	218.35'
L5	N61°00'44"W	146.28'	L25	N34°38'29"W	26.46'	L45	N65°20'09"W	104.55'
L6	S8°00'42"E	25.00'	L26	N74°18'06"W	37.84'	L46	N21°35'55"E	155.45'
L7	S8°00'42"E	25.00'	L27	N74°11'52"W	26.86'	L47	S77°01'32"E	62.50'
L8	S16°48'58"W	130.96'	L28	N39°58'44"W	28.58'	L48	S64°27'32"E	58.56'
L9	S73°11'02"E	96.85'	L29	N40°17'24"W	32.78'	L49	S43°14'43"E	65.05'
L10	S46°07'28"E	86.37'	L30	N42°47'08"W	33.12'	L50	S43°26'47"E	64.47'
L11	S43°52'32"W	90.00'	L31	N39°05'27"W	61.11'	L51	S22°49'41"E	122.67'
L12	S6°56'19"E	31.40'	L32	N35°58'48"W	37.68'	L52	S8°18'50"W	62.51'
L13	N56°20'05"W	50.00'	L33	N37°47'40"W	41.19'	L53	S16°20'23"W	60.63'
L14	N16°46'58"E	118.61'	L34	N44°49'46"W	22.70'	L54	S24°26'05"W	60.39'
L15	S31°46'44"W	100.00'	L35	N37°44'54"W	38.84'	L55	S58°05'37"W	36.87'
L16	N56°24'18"W	60.02'	L36	N40°09'09"W	43.90'	L56	S56°36'27"E	101.26'
L17	S32°04'24"W	20.00'	L37	N39°15'05"W	46.95'	L57	N88°25'30"E	64.46'
L18	N54°19'13"W	60.12'	L38	N39°34'40"W	40.17'	L58	S50°39'32"E	63.14'
L19	S32°04'24"W	20.00'	L39	N47°20'35"W	43.09'	L59	S63°43'31"E	122.84'
L20	N52°13'06"W	60.30'	L40	N58°27'42"W	17.98'	L60	S63°43'31"E	122.84'
L61	S56°14'21"E	60.35'	L81	S74°53'02"E	57.08'	L101	S24°30'15"E	50.15'
L62	S40°42'23"E	60.92'	L82	N61°01'03"E	60.75'	L102	S20°28'12"W	90.95'
L63	N39°21'31"E	7.86'	L83	S73°34'28"E	59.06'	L103	S6°19'56"W	77.34'
L64	S50°33'47"E	59.78'	L84	S61°09'07"E	62.88'	L104	S58°24'21"E	121.55'
L65	N38°18'50"E	8.00'	L85	S37°30'40"E	77.34'	L105	S58°24'21"E	121.55'
L66	S50°25'14"E	60.02'	L86	S65°55'56"E	68.72'	L106	S69°20'00"E	59.56'
L67	S38°18'50"W	8.00'	L87	N83°11'14"E	60.43'	L107	N20°45'45"E	105.48'
L68	S50°25'14"E	60.02'	L88	S69°22'05"E	67.82'	L108	S37°26'26"E	18.38'
L69	S38°18'50"W	53.09'	L89	S29°50'29"E	83.30'	L109	N28°10'23"W	47.00'
L70	S51°43'31"E	93.42'	L90	S81°52'03"E	71.03'	L110	N84°52'25"W	120.00'
L71	N85°38'39"E	59.67'	L91	S22°22'47"E	94.98'	L111	S9°01'31"W	69.05'
L72	S73°57'48"E	69.49'	L92	S75°02'13"E	67.28'	L112	S9°01'03"E	58.18'
L73	S82°07'30"E	63.04'	L93	S41°50'49"E	75.11'	L113	S19°16'25"E	65.49'
L74	S71°00'04"E	60.72'	L94	S47°40'54"E	79.40'	L114	S84°52'25"E	60.65'
L75	S68°51'53"E	120.82'	L95	S3°27'01"E	84.14'	L115	S5°07'35"W	13.67'
L76	S51°28'28"E	73.62'	L96	N42°35'27"E	12.03'	L116	N4°02'50"W	87.34'
L77	S51°11'39"E	22.99'	L97	S78°51'09"E	38.39'	L117	N42°34'32"W	133.82'
L78	S32°20'36"E	61.52'	L98	S38°26'03"E	69.61'	L118	S34°20'28"W	165.97'
L79	S57°20'33"E	68.08'	L99	S74°57'13"E	55.41'	L119	N50°24'57"W	101.95'
L80	S76°55'22"E	70.43'	L100	S49°27'57"E	10.22'	L120	N12°12'44"E	51.89'
L121	N38°45'24"E	10.00'	L141	S47°24'11"W	76.65'			
L122	N59°04'00"E	12.63'	L142	N41°00'44"W	101.86'			
L123	S87°31'04"E	100.69'	L143	N83°10'34"W	30.40'			
L124	N76°30'08"E	24.30'	L144	S29°43'38"E	73.47'			
L125	S84°11'03"E	110.44'	L145	S27°44'38"E	79.35'			
L126	N6°19'45"E	112.50'	L146	S14°41'38"E	79.35'			
L127	N39°21'54"E	41.03'	L147	S1°41'38"E	79.35'			
L128	S44°14'20"W	9.40'	L148	S11°27'41"W	78.63'			
L129	N24°41'07"E	93.06'	L149	S24°06'12"W	79.52'			
L130	N54°25'04"W	61.11'	L150	S37°37'57"W	79.91'			
L131	N24°41'07"E	8.00'	L151	S35°42'22"W	19.66'			
L132	N54°25'27"W	60.99'	L152	N41°57'19"W	8.69'			
L133	S25°26'55"W	7.97'	L153	S26°32'54"W	20.00'			
L134	N54°33'03"W	123.00'	L156	S13°59'46"W	8.48'			
L135	N54°45'56"W	68.99'	L157	N9°38'46"E	9.23'			
L136	N53°49'32"W	186.05'						
L137	N54°29'46"W	188.49'						
L138	S47°32'27"W	21.09'						
L139	N42°35'18"W	94.36'						
L140	S76°28'02"W	68.64'						

CURVE TABLE

CURVE	LENGTH	RADIUS	BEARING	CHORD
C1	240.45'	400.47'	S67°38'42"E	236.85'
C2	282.93'	425.92'	N66°05'01"W	277.76'
C3	326.48'	311.77'	N16°00'44"W	311.77'
C4	297.58'	310.00'	S13°30'44"E	286.28'
C5	564.20'	1616.32'	S51°00'44"E	561.34'
C6	200.19'	310.00'	S79°30'42"E	196.73'
C7	29.44'	285.00'	N84°56'51"E	29.43'
C8	45.63'	335.00'	N85°53'25"E	45.59'
C9	30.57'	20.00'	S53°40'47"W	27.68'
C10	189.28'	656.04'	N25°19'58"E	188.62'
C11	27.20'	20.00'	N77°51'13"E	25.15'
C12	47.08'	595.58'	N35°55'47"E	47.07'
C13	52.68'	595.58'	N31°07'53"E	52.66'
C14	121.91'	595.58'	N22°44'02"E	121.69'
C15	32.05'	20.00'	N29°05'30"W	28.73'
C16	81.79'	335.00'	S68°00'20"E	81.58'
C17	96.09'	1642.26'	S58°20'10"E	96.07'
C18	119.24'	579.85'	N34°13'00"E	119.03'
C19	36.60'	84.45'	S50°07'10"E	36.51'
C20	26.74'	20.00'	N24°18'30"W	24.79'
C21	84.16'	335.00'	S6°47'26"W	83.94'
C22	18.53'	20.00'	N26°08'22"E	17.88'
C23	305.35'	335.16'	N71°51'16"W	294.90'
C24	271.51'	287.73'	S13°50'46"E	261.55'
C25	193.01'	408.95'	S75°00'32"E	191.22'
C26	190.23'	325.76'	N70°57'48"W	187.54'
C27	108.01'	214.99'	N53°44'26"W	106.88'
C28	75.59'	273.97'	S61°09'32"E	75.35'
C30	110.03'	258.95'	N77°43'55"W	109.21'
C31	387.79'	475.76'	N63°33'46"W	377.14'

CERTIFICATE OF ACCURACY & MAPPING

I, THE UNDERSIGNED, CERTIFY THAT THIS SURVEY WAS DRAWN UNDER MY SUPERVISION ((DEED DESCRIPTION RECORDED IN BOOK 4266, PAGE 325); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION AS LABELED; THAT THE RATIO OF PRECISION, AS CALCULATED, IS 1:10,000+; AND THAT THIS SURVEY HAS BEEN PREPARED IN ACCORDANCE WITH THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (TITLE 21, CH. 56. SEC. 1600). WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 14TH DAY OF JANUARY, 2016.

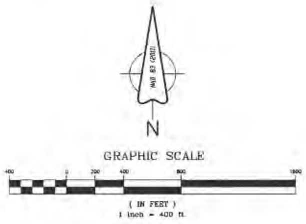
MILES O. MCCALL III – PROFESSIONAL LAND SURVEYOR (L-3518)

NORTH CAROLINA PROFESSIONAL SEAL L-3518 LAND SURVEYOR MILES O. McCALL III

1-14-16

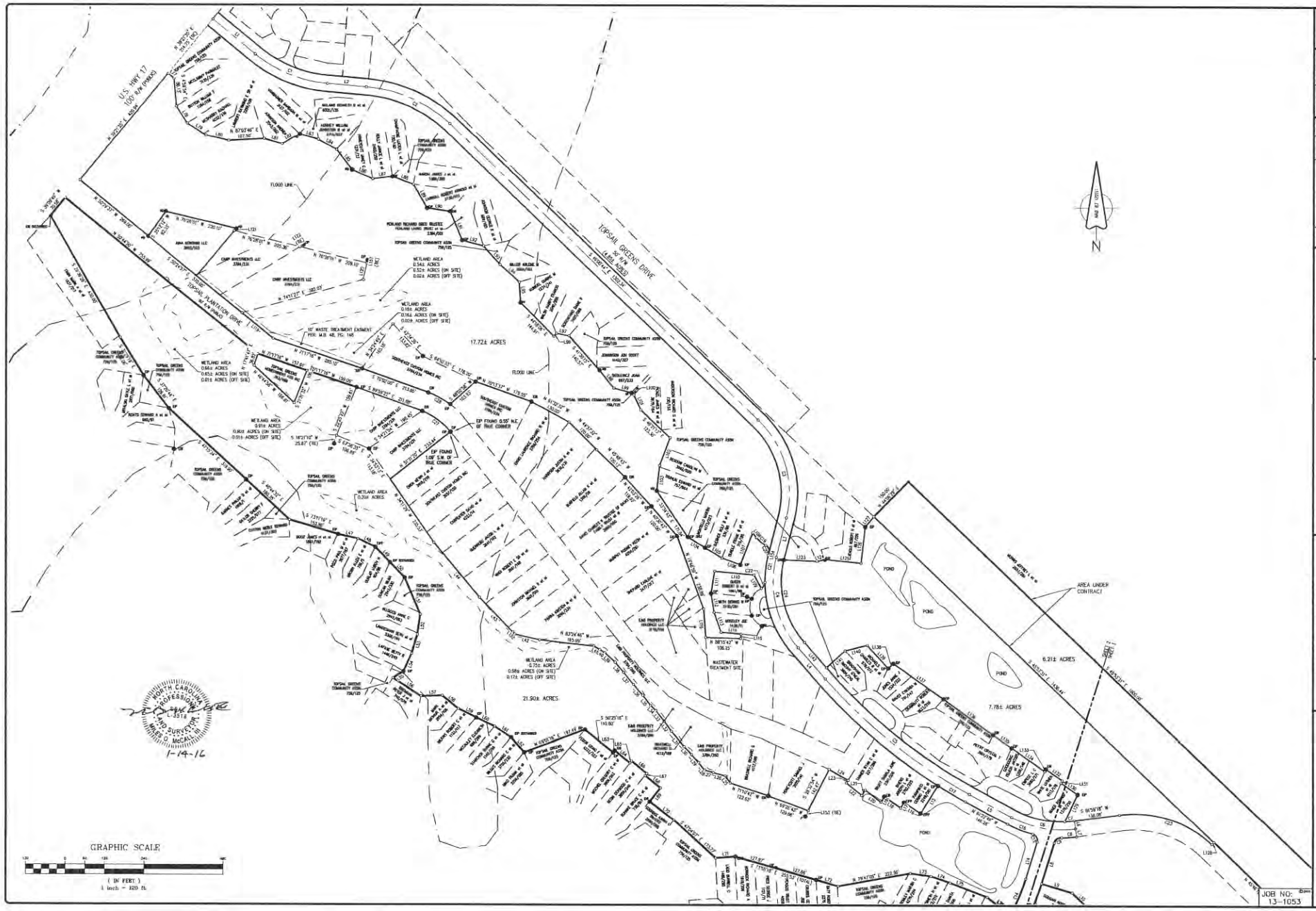
GENERAL NOTES

1. THIS IS A BOUNDARY SURVEY.
2. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE COMMITMENT. PROPERTY IS SUBJECT TO EASEMENTS OF RECORD.
3. BASIS OF BEARINGS FOR THIS MAP/PLAT ARE BASED ON NAD 83 (2011).
4. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES UNLESS OTHERWISE NOTED.
5. UNITS ARE U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
6. AREA BY COORDINATE GEOMETRY.
7. NO GRID MONUMENTS FOUND WITHIN 2000' OF SITE.
8. THIS SURVEY PERFORMED AND MAP PREPARED WITHOUT BENEFIT OF A TITLE REPORT. THIS SURVEY SUBJECT TO ANY FACTS AND EASEMENTS WHICH MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.
9. FLOOD NOTE: AS DETERMINED BY GRAPHIC PLOTTING, THIS PROPERTY APPEARS TO BE LOCATED IN A SPECIAL FLOOD HAZARD ZONE PER FEMA FLOOD INSURANCE RATE MAPS #3720420400J, 3720421400J, AND 3720421300J, EFFECTIVE DATE FEBRUARY 16, 2007.
10. UTILITY STATEMENT: THE UNDERGROUND UTILITIES SHOWN (IF ANY) HAVE BEEN LOCATED FROM COUNTY GIS INFORMATION, EXISTING DRAWINGS & FIELD SURVEY INFORMATION. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED, OR THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
11. COUNTY PARCEL #4214-12-8251-0000
12. TOTAL SITE AREA: 159.36± ACRES
13. MAP & DEED REFERENCES (PER PENDER COUNTY REGISTRY): MB: 8/96, 12/19, 12/20, 22/143, 23/26, 12/64, 22/33, 16/73, 48/148, 26/24. DB: 668/111, 757/373, 4266/327. (AND OTHERS THAT MAY BE SHOWN ON THIS MAP)
14. SITE ADDRESS: 1940 TOPSAIL GREENS DR. HAMPSTEAD, NC 28443

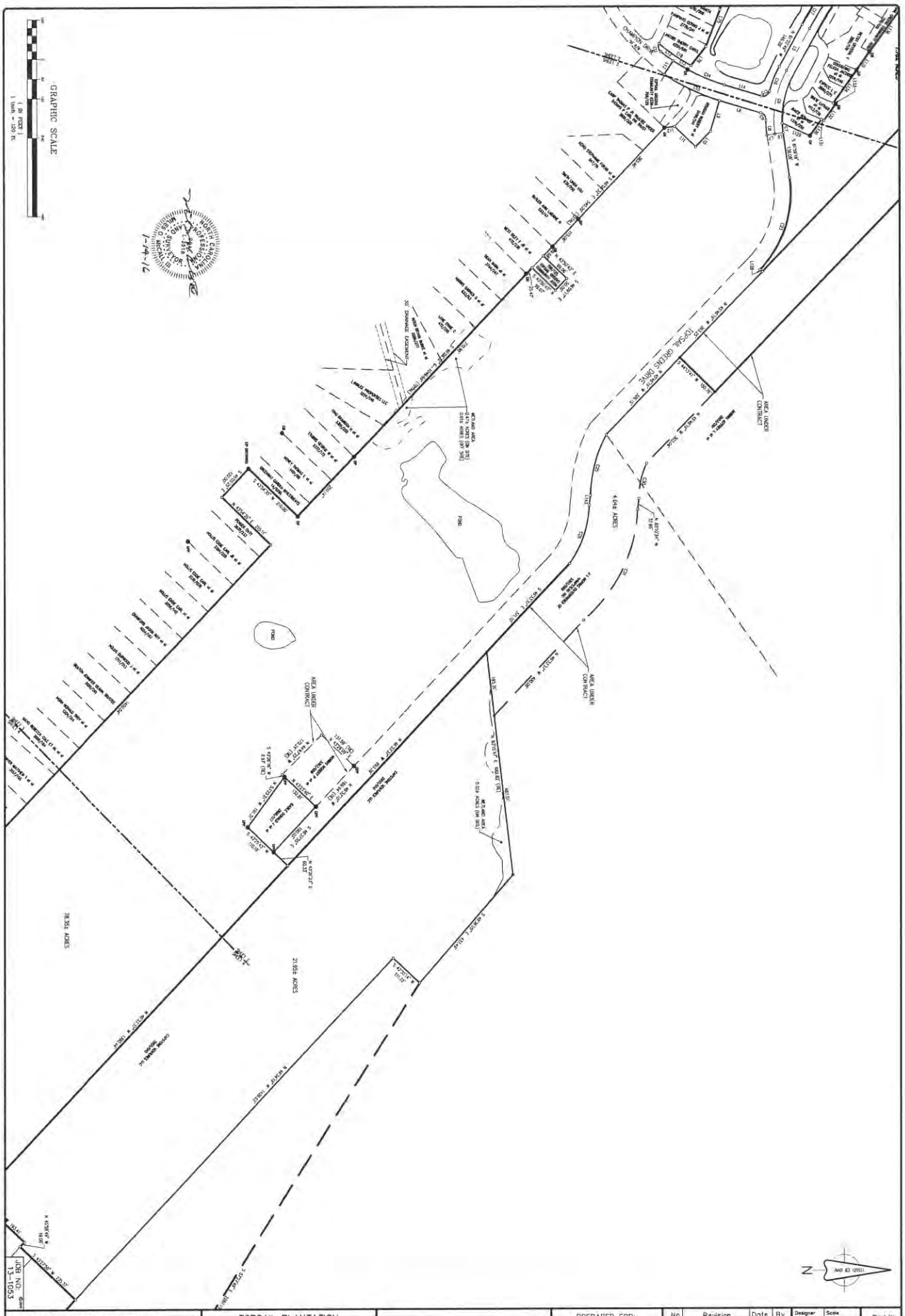


JOB NO: 13-1053

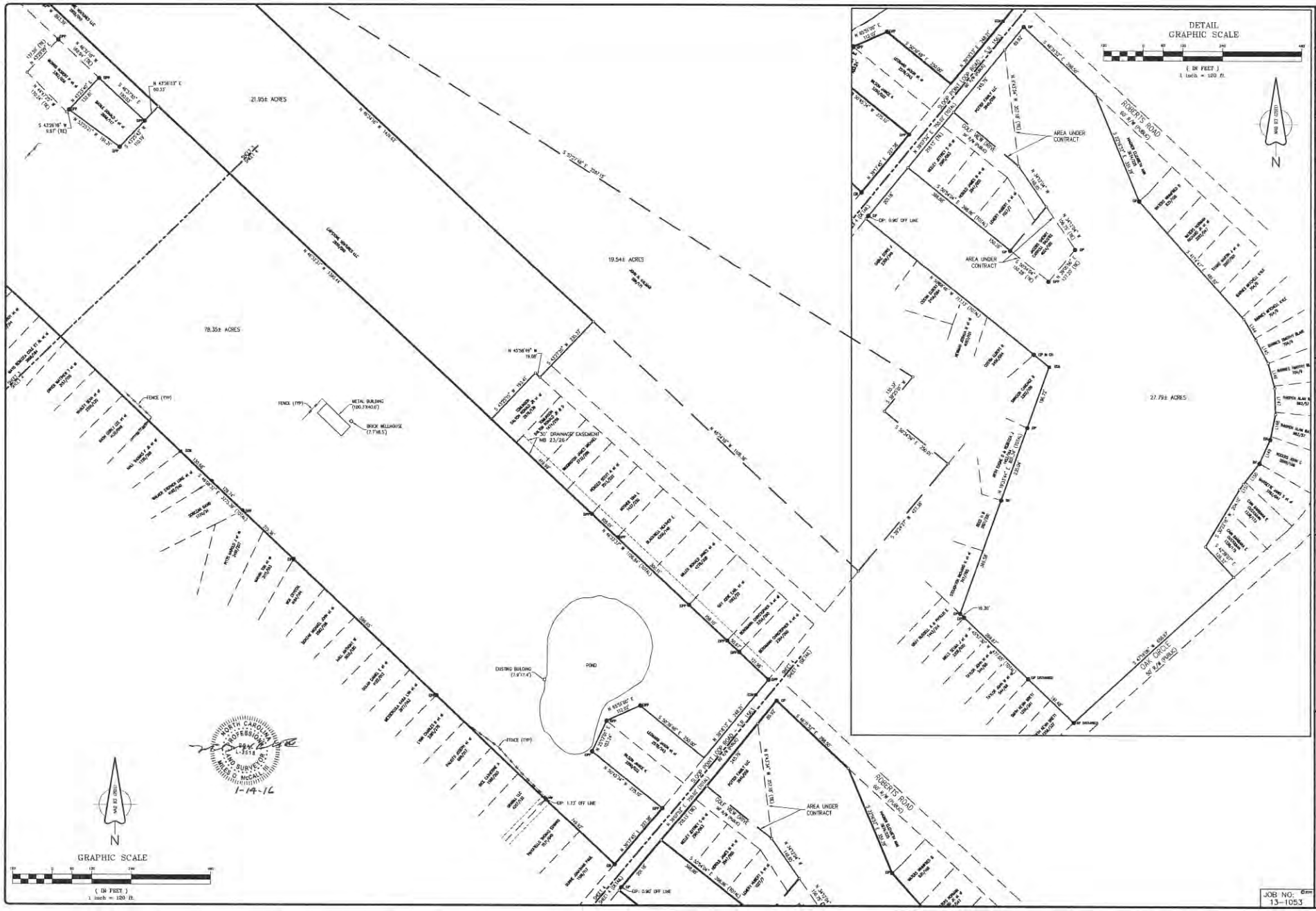
ATLANTIC COAST SURVEY, PLLC	TOPSAIL PLANTATION GOLF COURSE	BOUNDARY SURVEY	PREPARED FOR:	No.	Revision	Date	By	Designer	Scale AS NOTED	Sheet No.
P-0822 PO Box 12588 Wilmington, NC 28405 (910) 292-4889 www.atlanticcoastsurvey.com	Topsail Township · Pender County · North Carolina							Drawn By WRD/EB Checked By ACS	Date 5-20-2015 Job No. 13-1053	C-2.1



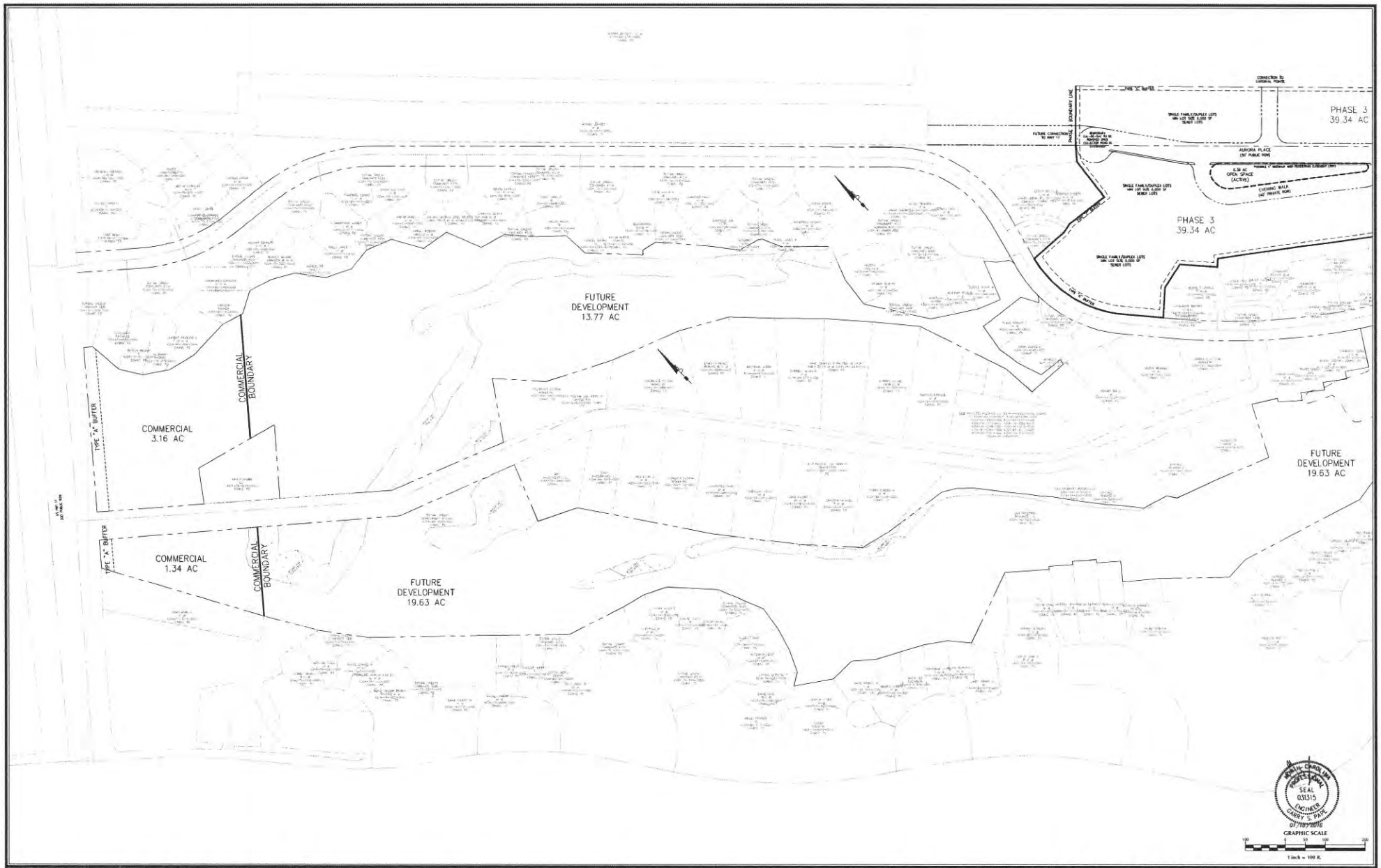
U.S. HWY 17
TOPSAIL GREENS DRIVE
TOPSAIL PLANTATION DRIVE
17.72± ACRES
21.90± ACRES
7.78± ACRES
6.21± ACRES
AREA UNDER CONTRACT
WASTEWATER TREATMENT SITE
POND
FLOOD LINE
GRAPHIC SCALE
(IN FEET)
1 inch = 120 ft.
NORTH CAROLINA PROFESSIONAL LAND SURVEYOR
MILES O. McCALL
1-14-16
JOB NO: 13-1053
ATLANTIC COAST SURVEY, PLLC
P-0822
PO Box 12588 Wilmington, NC 28405
(910) 292-4889 www.atlanticcoastsurvey.com
TOPSAIL PLANTATION GOLF COURSE
Topsail Township
Pender County
North Carolina
BOUNDARY SURVEY
PREPARED FOR:
No.
Revision
Date
By
Designer
Drawn By WRD/EB
Checked By ACS
Scale AS NOTED
Date 1-15-16
Job No. 13-1053
Sheet No.
C-2.2



ATLANTIC COAST SURVEY, PLLC	TOPSAIL PLANTATION GOLF COURSE	BOUNDARY SURVEY	PREPARED FOR:	No.	Revision	Date	By	Designer	Scale AS NOTED	Sheet No.
P-0822 PO Box 12588 Wilmington, NC 28405 (910) 292-4889 www.atlanticcoastsurvey.com	Topsail Township Pender County North Carolina							Drawn By WRD/EB	Date 1-5-16	C-2.3
								Checked By ACS	Job No. 13-1053	



DETAIL
GRAPHIC SCALE
(IN FEET)
1 inch = 120 ft.
21.95± ACRES
19.54± ACRES
78.35± ACRES
27.79± ACRES
ROBERTS ROAD
60' R/W (PUBLIC)
OAK CIRCLE
50' R/W (PUBLIC)
AREA UNDER CONTRACT
POND
EXISTING BUILDING
METAL BUILDING
BRICK WELLHOUSE
30' DRAINAGE EASEMENT
MB 23/26
FENCE (TYP)
GRAPHIC SCALE
(IN FEET)
1 inch = 120 ft.
NORTH CAROLINA PROFESSIONAL LAND SURVEYOR
L-3518
MILES O. McCALL, III
1-14-16
JOB NO: 13-1053
ATLANTIC COAST SURVEY, PLLC
P-0822
PO Box 12588 Wilmington, NC 28405
(910) 292-4889 www.atlanticcoastsurvey.com
TOPSAIL PLANTATION
GOLF COURSE
Topsail Township
Pender County
North Carolina
BOUNDARY SURVEY
PREPARED FOR:
No.
Revision
Date
By
Designer
Drawn By WRD/DB
Checked By ACS
Scale AS NOTED
Date 1-6-16
Job No. 13-1053
Sheet No.
C-2.4



No.	Revision	Date	By

Designer	GSP	Scale	1" = 100'
Drawn By	GSP	Date	January 2016
License #	P-0718	Job No.	2016-0001

WYNDWATER

Topsail Township — Pender County — North Carolina

SITE PLAN

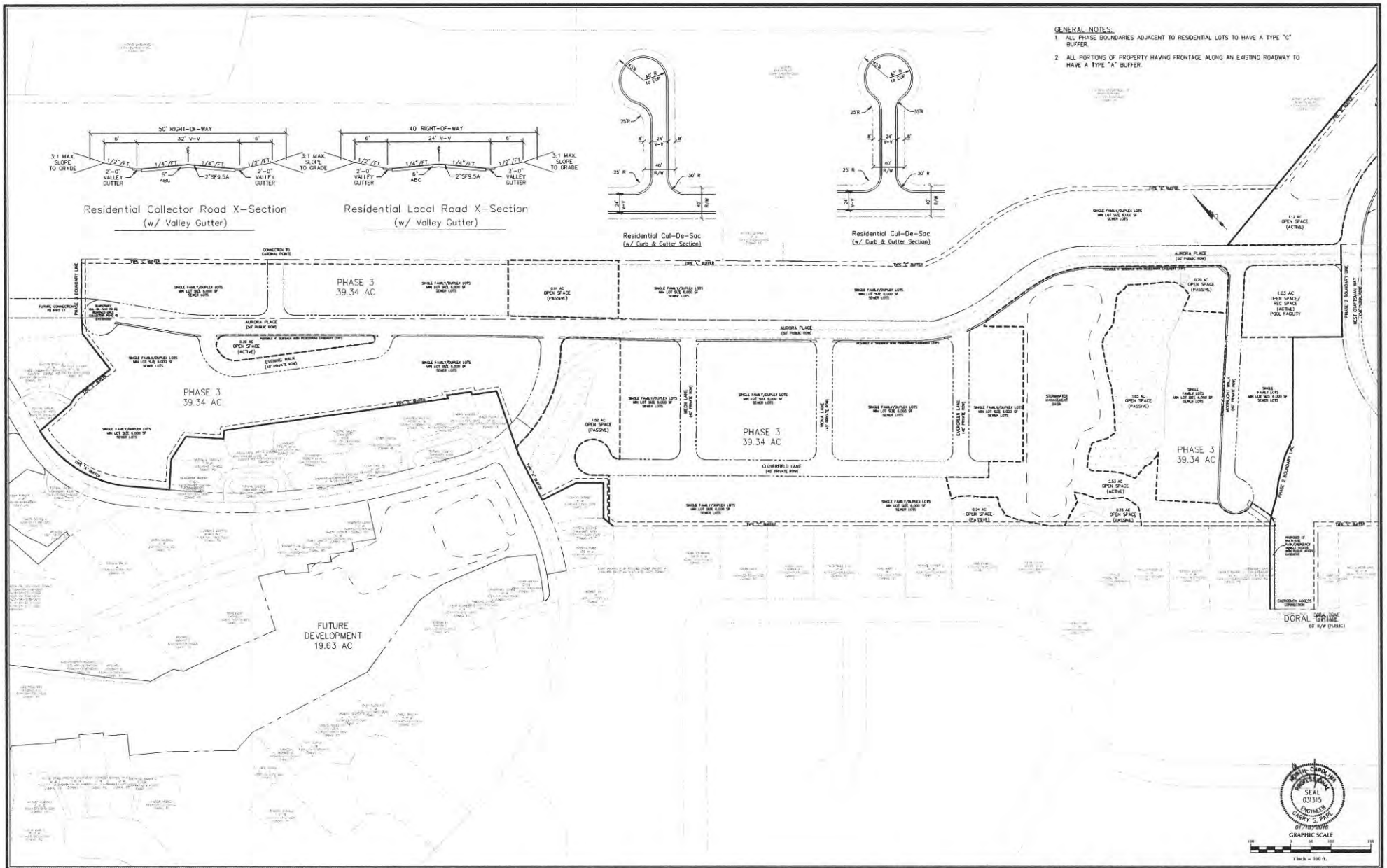
PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
9337B KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-3.1

GENERAL NOTES:

1. ALL PHASE BOUNDARIES ADJACENT TO RESIDENTIAL LOTS TO HAVE A TYPE "C" BUFFER.
2. ALL PORTIONS OF PROPERTY HAVING FRONTAGE ALONG AN EXISTING ROADWAY TO HAVE A TYPE "A" BUFFER.



No.	Revision	Date	By

Designer	GSP
Scale	1" = 100'
Drawn By	GSP
Date	January 2016
License #	P-0718
Job No.	2016-0001

WYNDWATER

Topsail Township — Pender County — North Carolina

SITE PLAN

PREPARED FOR:
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9332B KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

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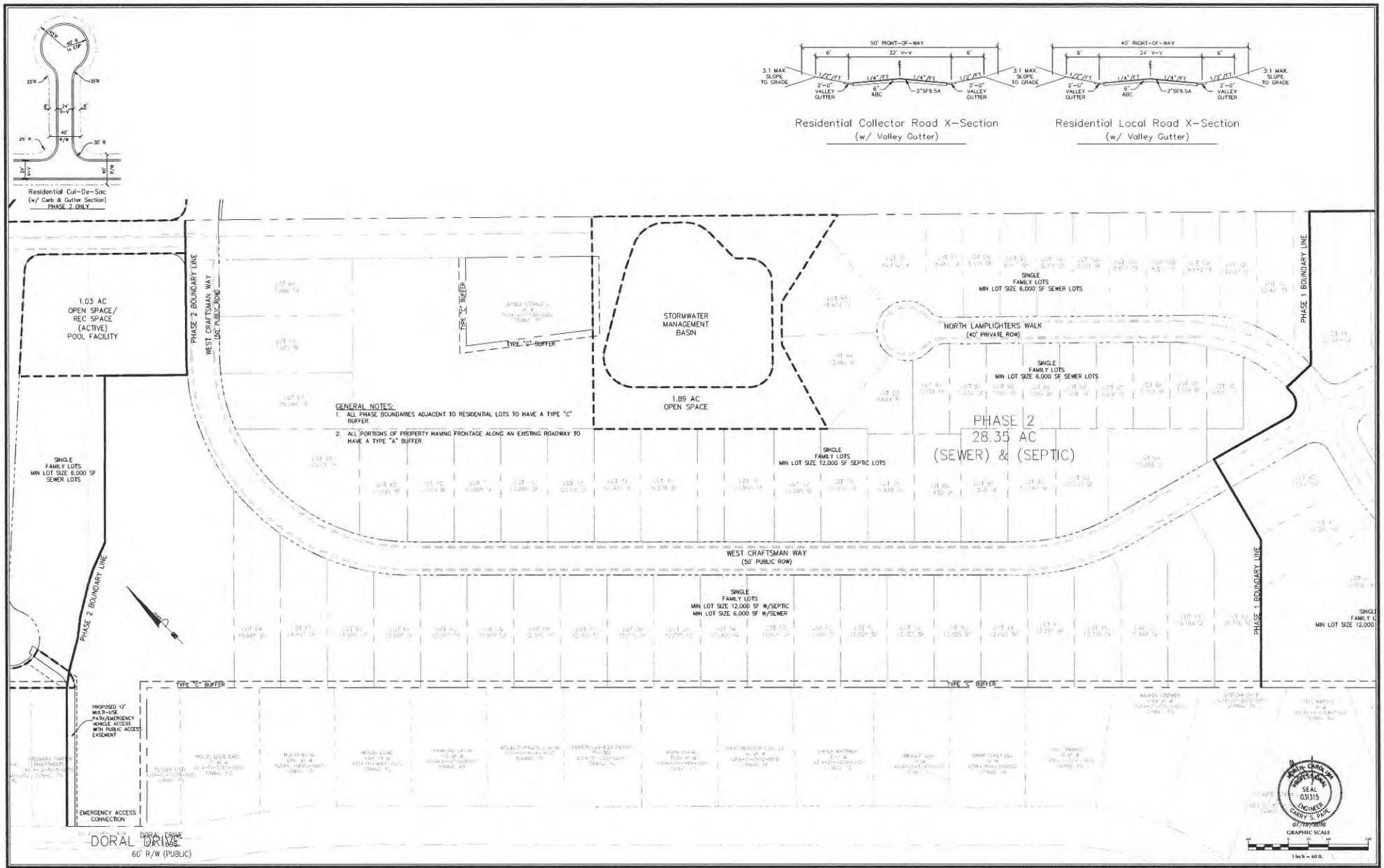
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-3.2



No.	Revision	Date	By

Designer	GSP
Scale	1" = 60'
Drawn By	GSP
Date	January 2016
License #	P-0718
Job No.	2016-0001

WYNDWATER

Topsail Township — Pender County — North Carolina

SITE PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
9337B KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
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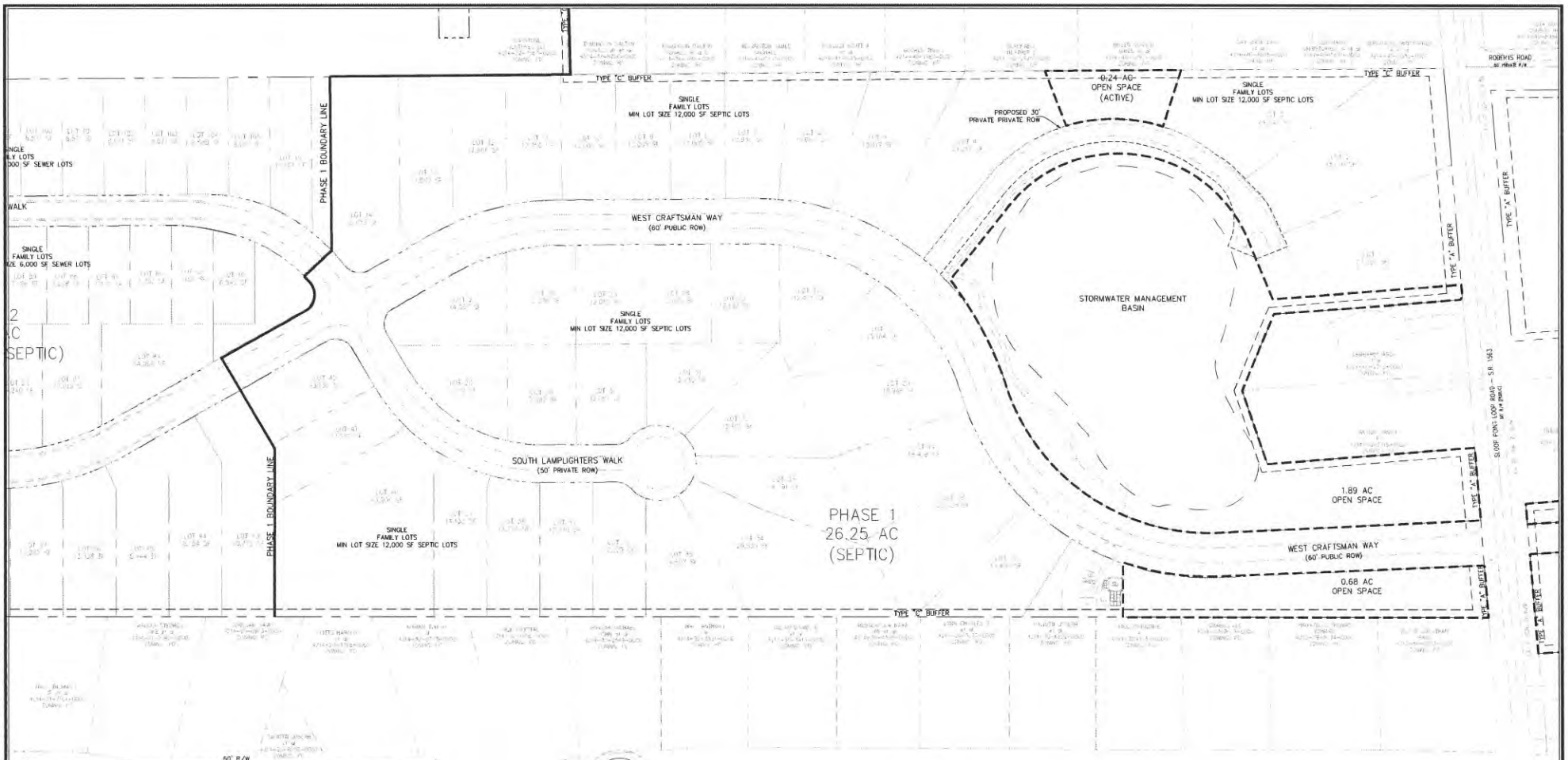
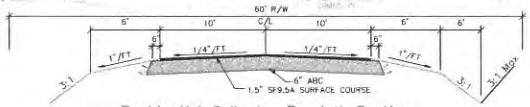
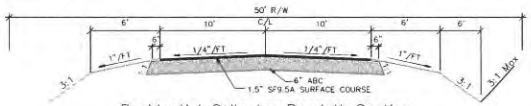
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-3.3

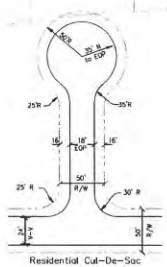




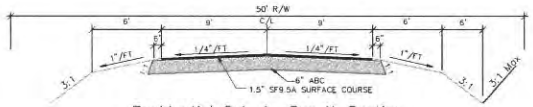
Residential Collector Road X-Section
(w/ Shoulder & Swale)(w/ Shoulder & Swale) Phase 1



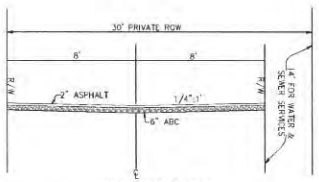
Residential Collector Road X-Section
(w/ Shoulder & Swale) Phase 1



Residential Cul-De-Sac
(w/ Shoulder Section)
PHASE 1 ONLY



Residential Cul-de-Sac X-Section
(w/ Shoulder & Swale) Phase 1



PRIVATE RIGHT OF WAY
NOT TO SCALE

GENERAL NOTES:

1. ALL PHASE BOUNDARIES ADJACENT TO RESIDENTIAL LOTS TO HAVE A TYPE "C" BUFFER.
2. ALL PORTIONS OF PROPERTY HAVING FRONTAGE ALONG AN EXISTING ROADWAY TO HAVE A TYPE "A" BUFFER.

NORTH CAROLINA PROFESSIONAL SEAL 031315 ENGINEER CHARLY S. PARK
01/19/2016

GRAPHIC SCALE
1 inch = 60 ft.

No.	Revision	Date	By

Designer	GSP	Scale	1" = 60'
Drawn By	GSP	Date	January 2016
License #	P-0718	Job No.	2016-0001

WYNDWATER

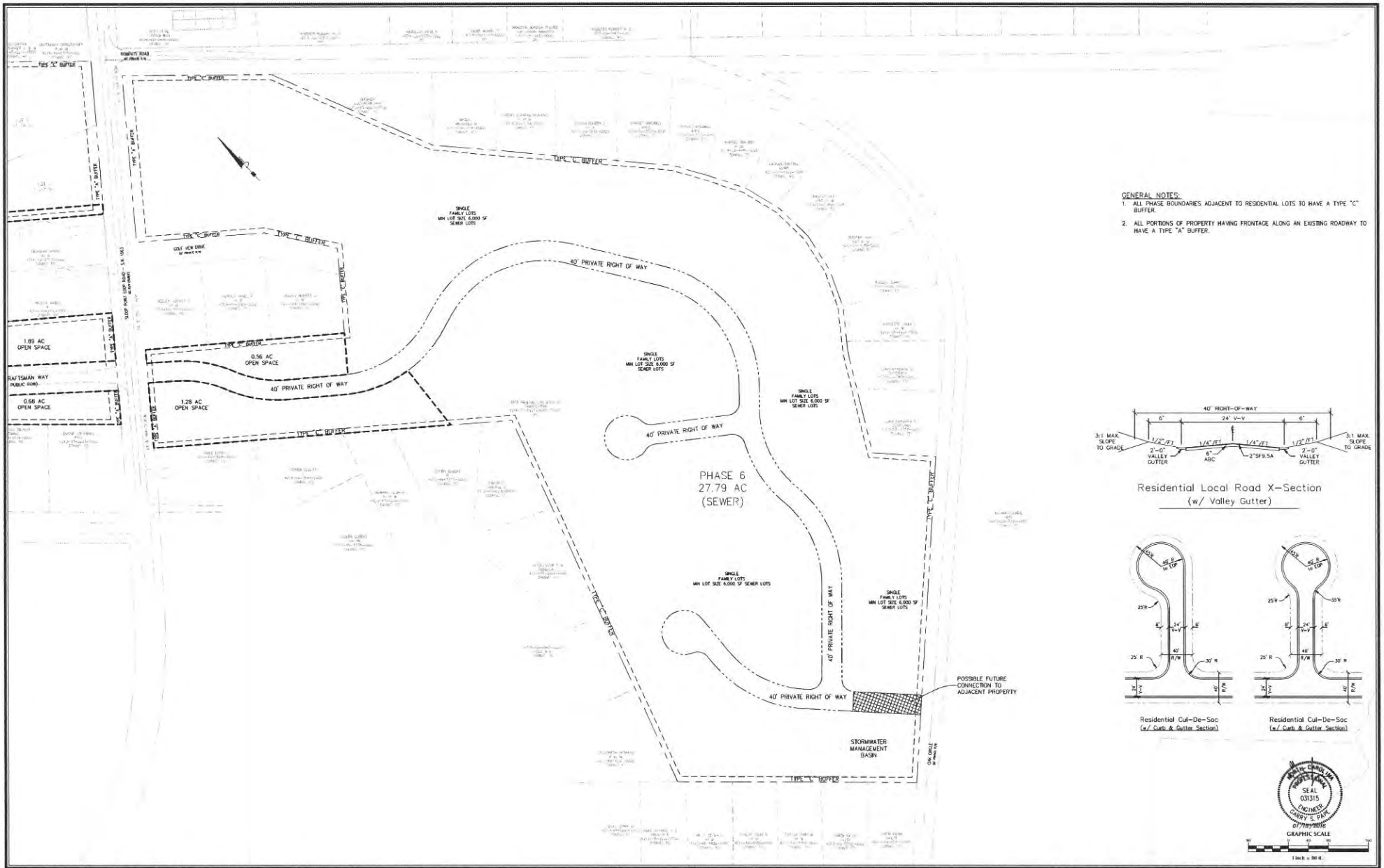
Topsail Township — Pender County — North Carolina

SITE PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
93378 KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-3.4



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Residential Local Road X-Section
(w/ Valley Gutter)

Residential Cul-De-Sac
(w/ Curb & Gutter Section)

Residential Cul-De-Sac
(w/ Curb & Gutter Section)

NORTH CAROLINA PROFESSIONAL SEAL 031315 ENGINEER GARRY S. PARK
07/19/2016

GRAPHIC SCALE
1 inch = 80 ft.

No.	Revision	Date	By

Designer	GSP	Scale	1" = 80'
Drawn By	GSP	Date	January, 2016
License #	P-0718	Job No.	2016-0001

WYNDWATER

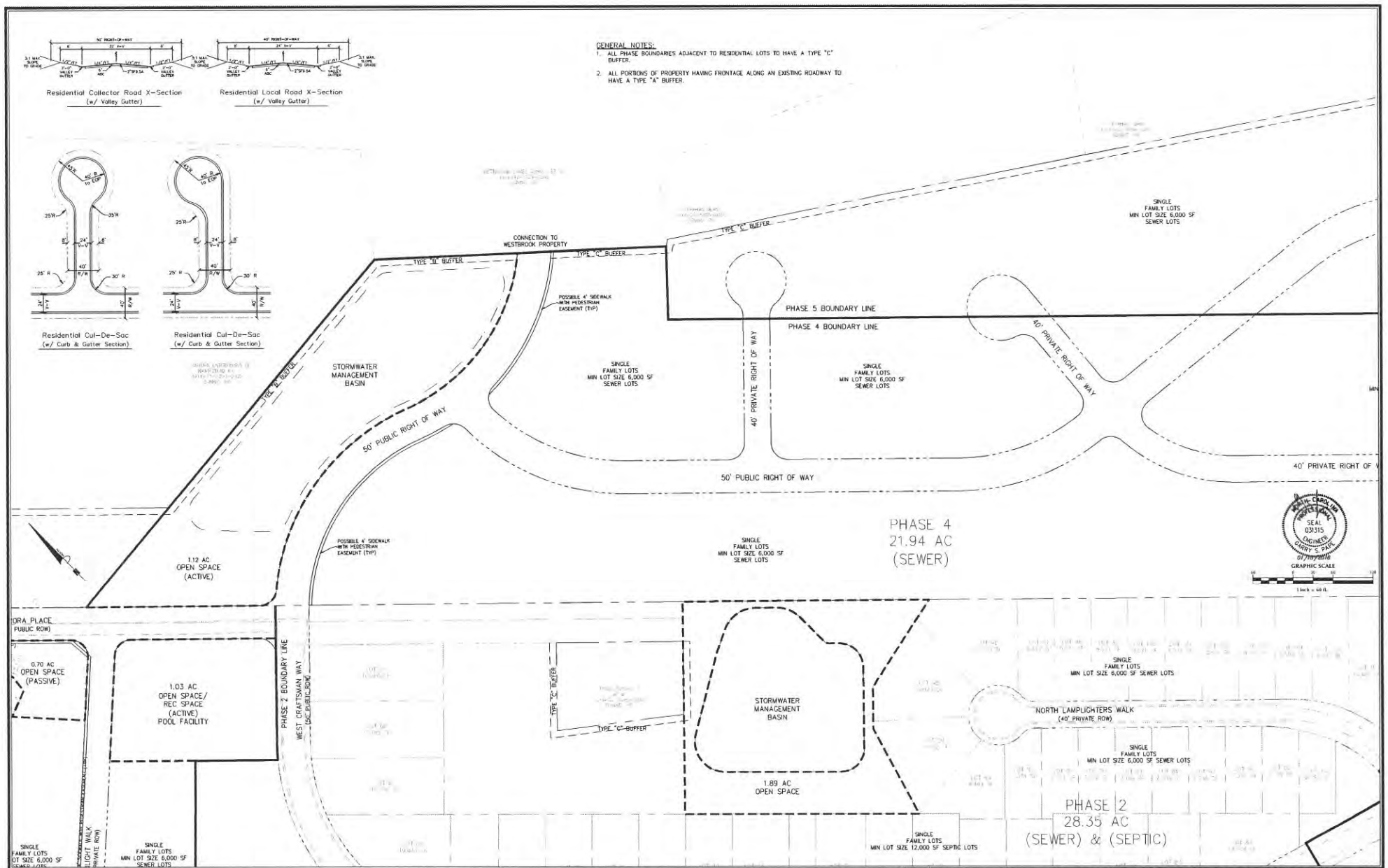
Topsail Township — Pender County — North Carolina

SITE PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
93378 KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-3.5



No.	Revision	Date	By

Designer	GSP
Drawn By	GSP
Scale	1" = 60'
Date	January 2016
Job No.	2016-0001
License #	P-0718

WYNDWATER

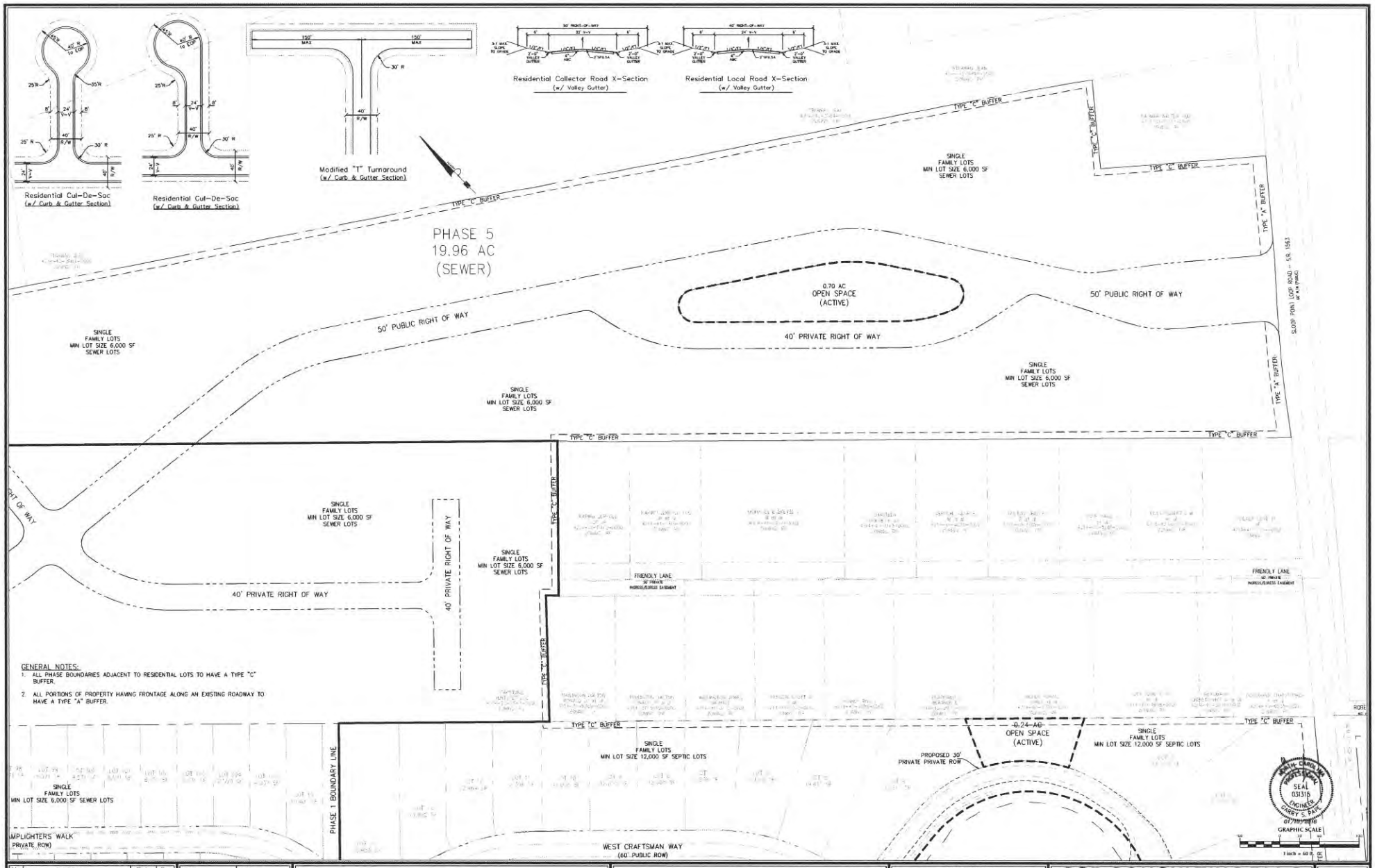
Topsail Township — Pender County — North Carolina

SITE PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
9337B KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-3.6



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No.	Revision	Date	By

Designer	GSP	Scale	1" = 60'
Drawn By	GSP	Date	January 2016
License #	P-0718	Job No.	2016-0001

WYNDWATER

Topsail Township — Pender County — North Carolina

SITE PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
9337B KATY FREEWAY #377
HOUSTON, TX 77024
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GSP CONSULTING, PLLC
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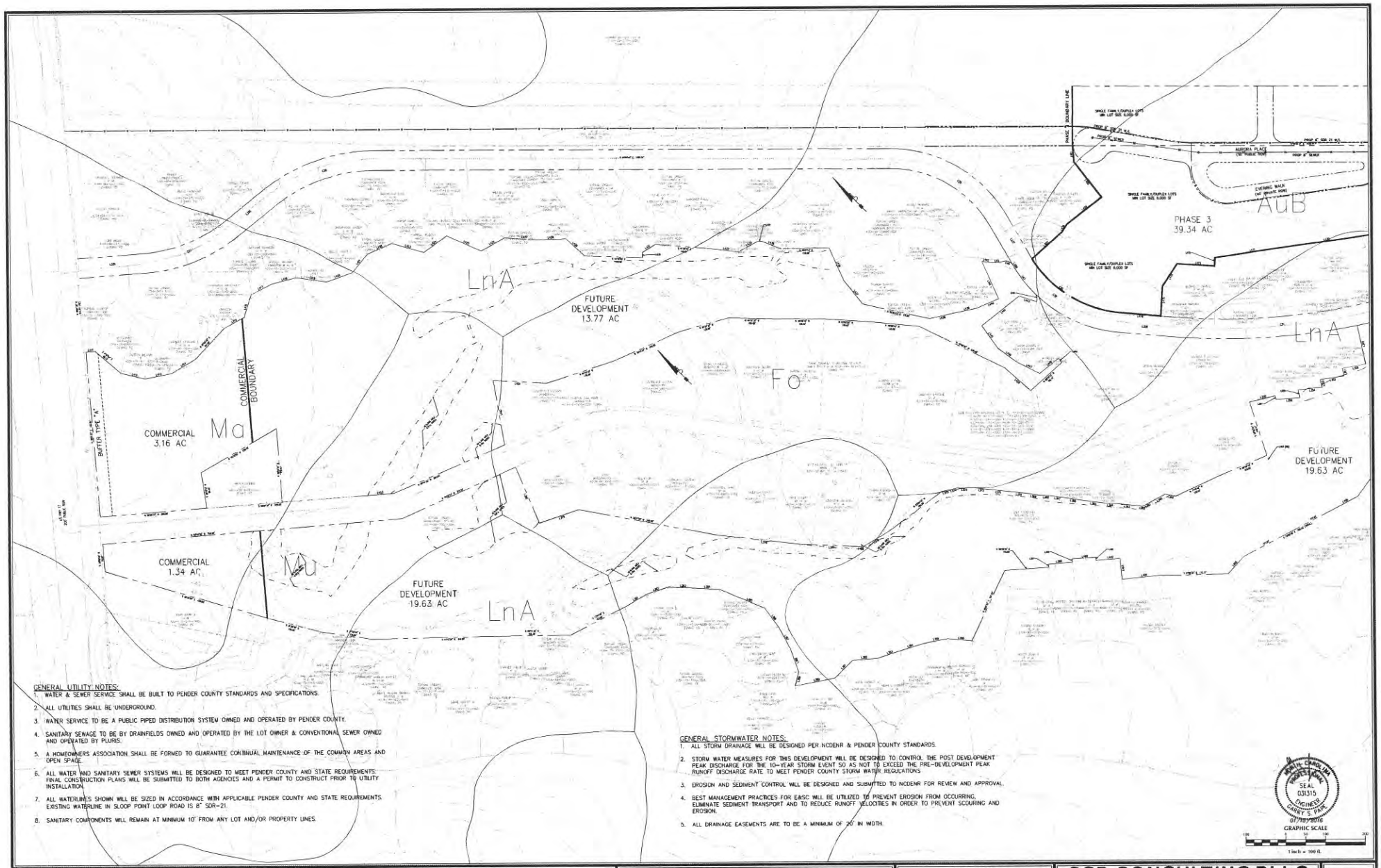
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-3.7



GENERAL UTILITY NOTES:

1. WATER & SEWER SERVICE SHALL BE BUILT TO PENDER COUNTY STANDARDS AND SPECIFICATIONS.
2. ALL UTILITIES SHALL BE UNDERGROUND.
3. WATER SERVICE TO BE A PUBLIC PIPED DISTRIBUTION SYSTEM OWNED AND OPERATED BY PENDER COUNTY.
4. SANITARY SEWAGE TO BE BY DRAINFIELDS OWNED AND OPERATED BY THE LOT OWNER & CONVENTIONAL SEWER OWNED AND OPERATED BY PLURIS.
5. A HOMEOWNERS ASSOCIATION SHALL BE FORMED TO GUARANTEE CONTINUAL MAINTENANCE OF THE COMMON AREAS AND OPEN SPACE.
6. ALL WATER AND SANITARY SEWER SYSTEMS WILL BE DESIGNED TO MEET PENDER COUNTY AND STATE REQUIREMENTS. FINAL CONSTRUCTION PLANS WILL BE SUBMITTED TO BOTH AGENCIES AND A PERMIT TO CONSTRUCT PRIOR TO UTILITY INSTALLATION.
7. ALL WATERLINES SHOWN WILL BE SIZED IN ACCORDANCE WITH APPLICABLE PENDER COUNTY AND STATE REQUIREMENTS. EXISTING WATERLINE IN SLOOP POINT LOOP ROAD IS 8" SDR-21.
8. SANITARY COMPONENTS WILL REMAIN AT MINIMUM 10' FROM ANY LOT AND/OR PROPERTY LINES.

GENERAL STORMWATER NOTES:

1. ALL STORM DRAINAGE WILL BE DESIGNED PER NCDENR & PENDER COUNTY STANDARDS.
2. STORM WATER MEASURES FOR THIS DEVELOPMENT WILL BE DESIGNED TO CONTROL THE POST DEVELOPMENT PEAK DISCHARGE FOR THE 10-YEAR STORM EVENT SO AS NOT TO EXCEED THE PRE-DEVELOPMENT PEAK RUNOFF DISCHARGE RATE TO MEET PENDER COUNTY STORM WATER REGULATIONS
3. EROSION AND SEDIMENT CONTROL WILL BE DESIGNED AND SUBMITTED TO NCDENR FOR REVIEW AND APPROVAL.
4. BEST MANAGEMENT PRACTICES FOR E&SC WILL BE UTILIZED TO PREVENT EROSION FROM OCCURRING, ELIMINATE SEDIMENT TRANSPORT AND TO REDUCE RUNOFF VELOCITIES IN ORDER TO PREVENT SCOURING AND EROSION.
5. ALL DRAINAGE EASEMENTS ARE TO BE A MINIMUM OF 20' IN WIDTH.

NORTH CAROLINA PROFESSIONAL SEAL 031315 ENGINEER HARRY S. PARK 01/19/2016

No.	Revision	Date	By

Designer	GSP	Scale	1" = 100'
Drawn By	GSP	Date	January 2016
License #	P-0718	Job No.	2016-0001

WYNDWATER

Topsail Township — Pender County — North Carolina

UTILITY & STORMWATER MANAGEMENT PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
9332B KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-4.1

GENERAL UTILITY NOTES:

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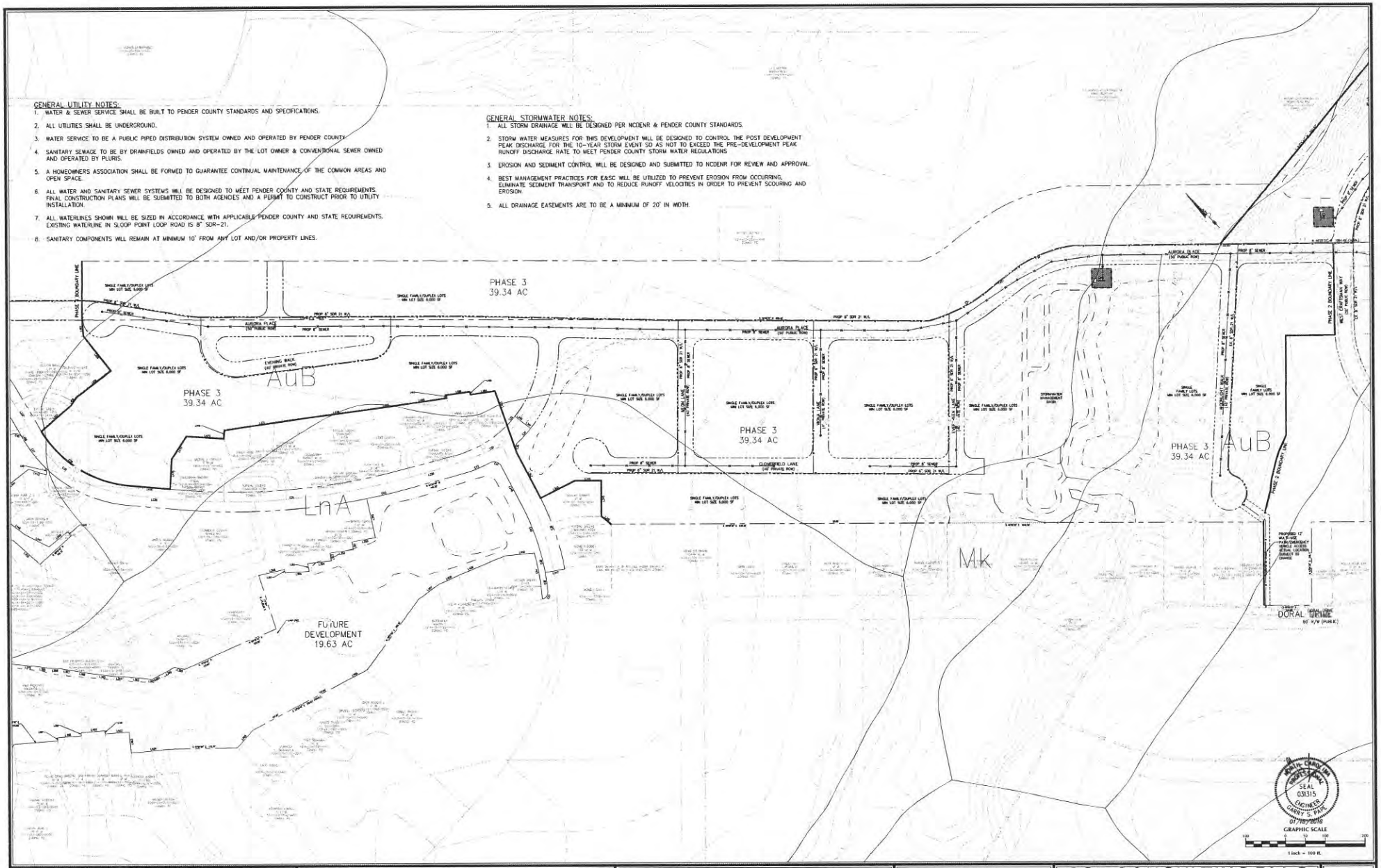

No.	Revision	Date	By

Designer	GSP	Scale	1" = 100'
Drawn By	GSP	Date	January 2016
License #	P-0718	Job No.	2016-0001

WYNDWATER

Topsail Township — Pender County — North Carolina

UTILITY & STORMWATER MANAGEMENT PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
9332B KATY FREEWAY #377
HOUSTON, TX 77024
713-784-0466

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-4.2

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GENERAL STORMWATER NOTES:

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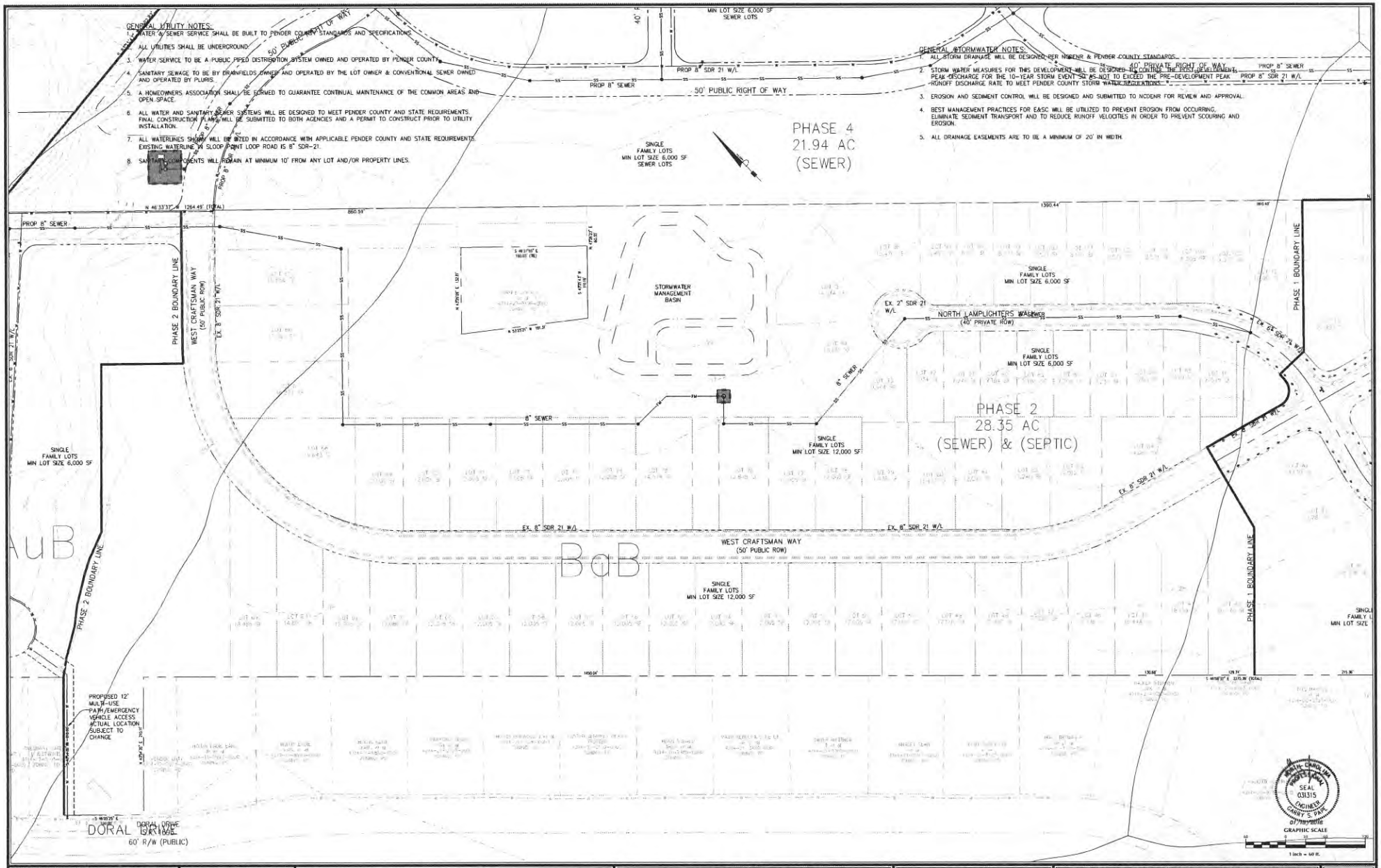

No.	Revision	Date	By

Designer	GSP	Scale	1" = 60'
Drawn By	GSP	Date	January, 2016
License #	P-0718	Job No.	2016-0001

WYNDWATER

Topsail Township — Pender County — North Carolina

UTILITY & STORMWATER MANAGEMENT PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
93378 KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-4.3

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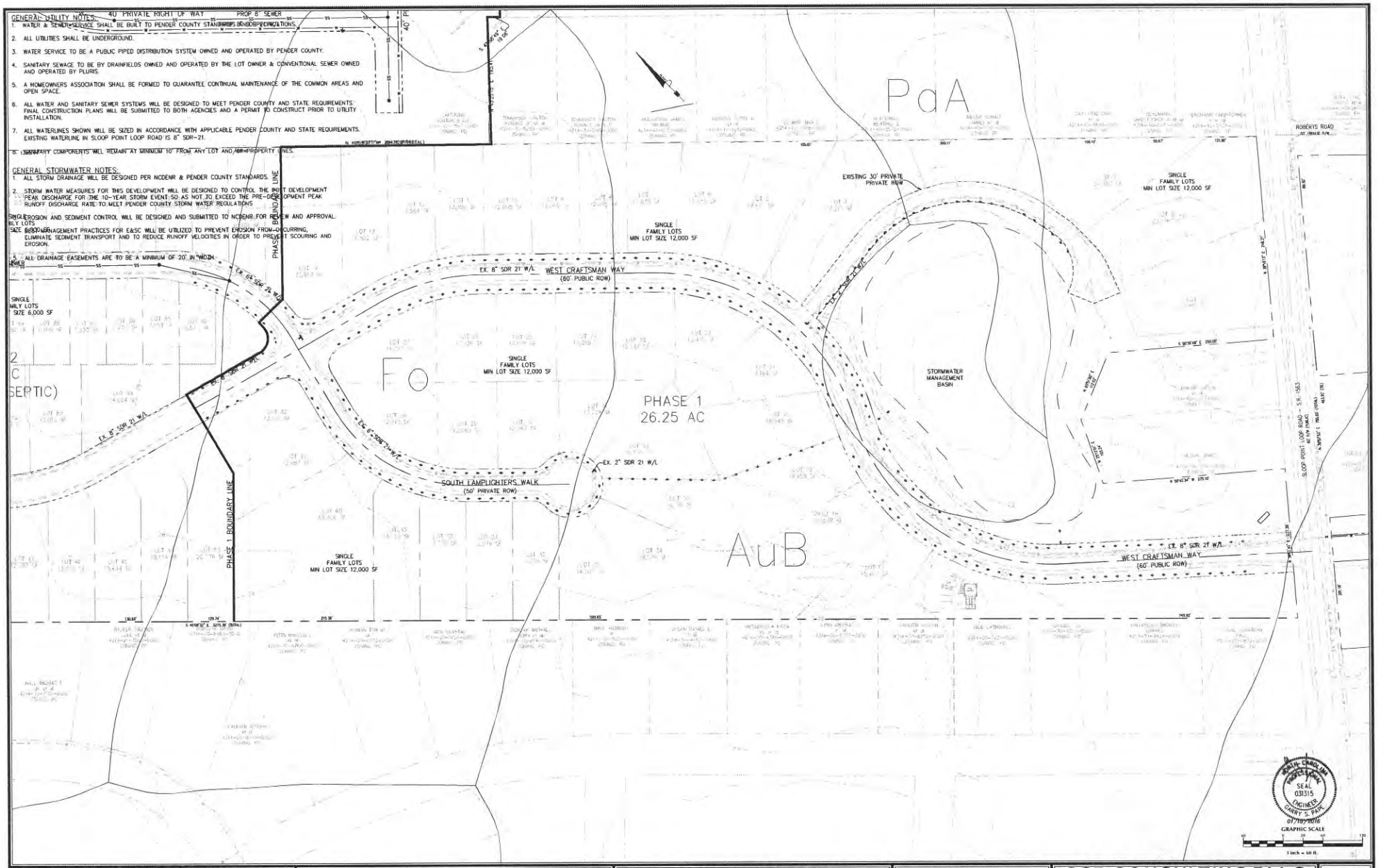


No.	Revision	Date	By

Designer	GSP	Scale	1" = 60'
Drawn By	GSP	Date	January 2016
License #	P-0718	Job No.	2016-0001

WYNDWATER

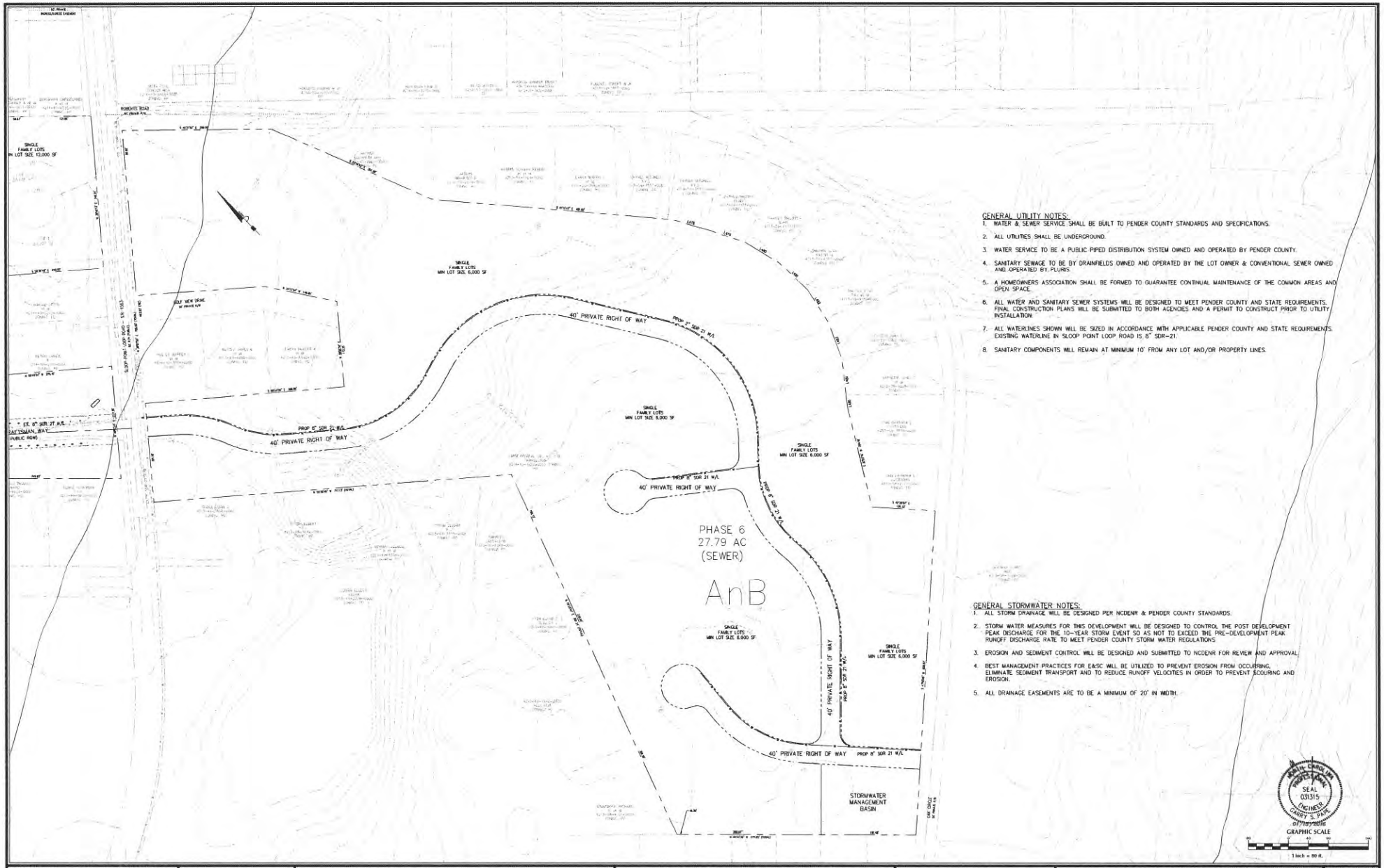
Topsail Township — Pender County — North Carolina

UTILITY & STORMWATER MANAGEMENT PLAN

PREPARED FOR:
SIGNATURE TOP SAIL NC, LP
9332B KATY FREEWAY #377
HOUSTON, TX 77024
713-789-0466

GSP CONSULTING, PLLC
ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No. C-4.4



GENERAL UTILITY NOTES:

1. WATER & SEWER SERVICE SHALL BE BUILT TO PENDER COUNTY STANDARDS AND SPECIFICATIONS.
2. ALL UTILITIES SHALL BE UNDERGROUND.
3. WATER SERVICE TO BE A PUBLIC PIPED DISTRIBUTION SYSTEM OWNED AND OPERATED BY PENDER COUNTY.
4. SANITARY SEWAGE TO BE BY DRAINFIELDS OWNED AND OPERATED BY THE LOT OWNER & CONVENTIONAL SEWER OWNED AND OPERATED BY PLURIS.
5. A HOMEOWNERS ASSOCIATION SHALL BE FORMED TO GUARANTEE CONTINUAL MAINTENANCE OF THE COMMON AREAS AND OPEN SPACE.
6. ALL WATER AND SANITARY SEWER SYSTEMS WILL BE DESIGNED TO MEET PENDER COUNTY AND STATE REQUIREMENTS. FINAL CONSTRUCTION PLANS WILL BE SUBMITTED TO BOTH AGENCIES AND A PERMIT TO CONSTRUCT PRIOR TO UTILITY INSTALLATION.
7. ALL WATERLINES SHOWN WILL BE SIZED IN ACCORDANCE WITH APPLICABLE PENDER COUNTY AND STATE REQUIREMENTS. EXISTING WATERLINE IN SLOOP POINT LOOP ROAD IS 8" SDR-21.
8. SANITARY COMPONENTS WILL REMAIN AT MINIMUM 10' FROM ANY LOT AND/OR PROPERTY LINES.

GENERAL STORMWATER NOTES:

1. ALL STORM DRAINAGE WILL BE DESIGNED PER NCDENR & PENDER COUNTY STANDARDS.
2. STORM WATER MEASURES FOR THIS DEVELOPMENT WILL BE DESIGNED TO CONTROL THE POST DEVELOPMENT PEAK DISCHARGE FOR THE 10-YEAR STORM EVENT SO AS NOT TO EXCEED THE PRE-DEVELOPMENT PEAK RUNOFF DISCHARGE RATE TO MEET PENDER COUNTY STORM WATER REGULATIONS.
3. EROSION AND SEDIMENT CONTROL WILL BE DESIGNED AND SUBMITTED TO NCDENR FOR REVIEW AND APPROVAL.
4. BEST MANAGEMENT PRACTICES FOR E&SC WILL BE UTILIZED TO PREVENT EROSION FROM OCCURRING, ELIMINATE SEDIMENT TRANSPORT AND TO REDUCE RUNOFF VELOCITIES IN ORDER TO PREVENT SCOURING AND EROSION.
5. ALL DRAINAGE EASEMENTS ARE TO BE A MINIMUM OF 20' IN WIDTH.

NORTH CAROLINA PROFESSIONAL SEAL 031315 ENGINEER CHARLY S. PARK
01/19/2016

No.	Revision	Date	By

Designer: CSP	Scale: 1" = 80'
Drawn By: CSP	Date: January 2016
License #: P-0718	Job No.: 2016-0001

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6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No. C-4.5

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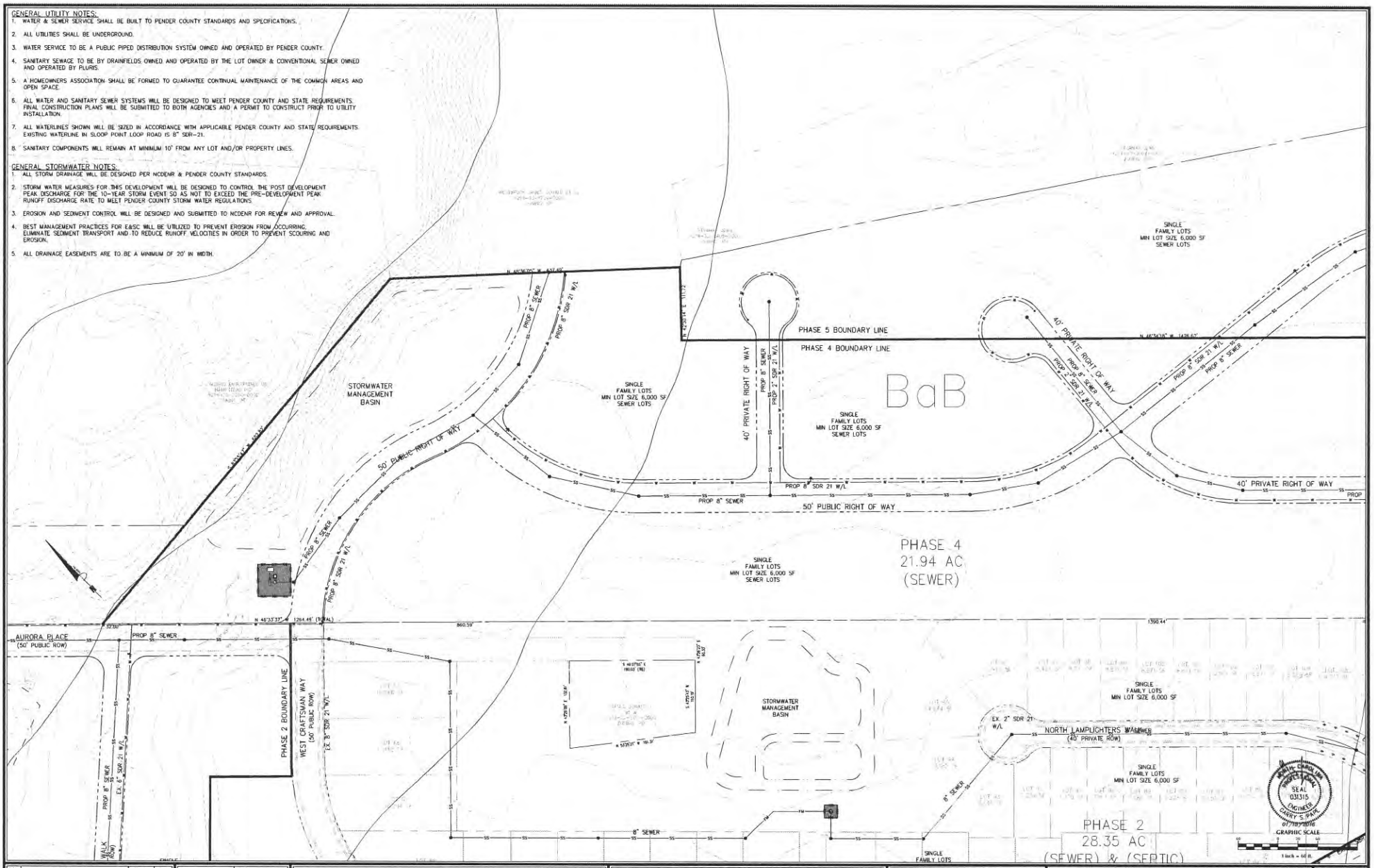

No.	Revision	Date	By

Designer: GSP	Scale: 1" = 60'
Drawn By: GSP	Date: January 2016
License #: P-0718	Job No.: 2016-0001

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Sheet No.
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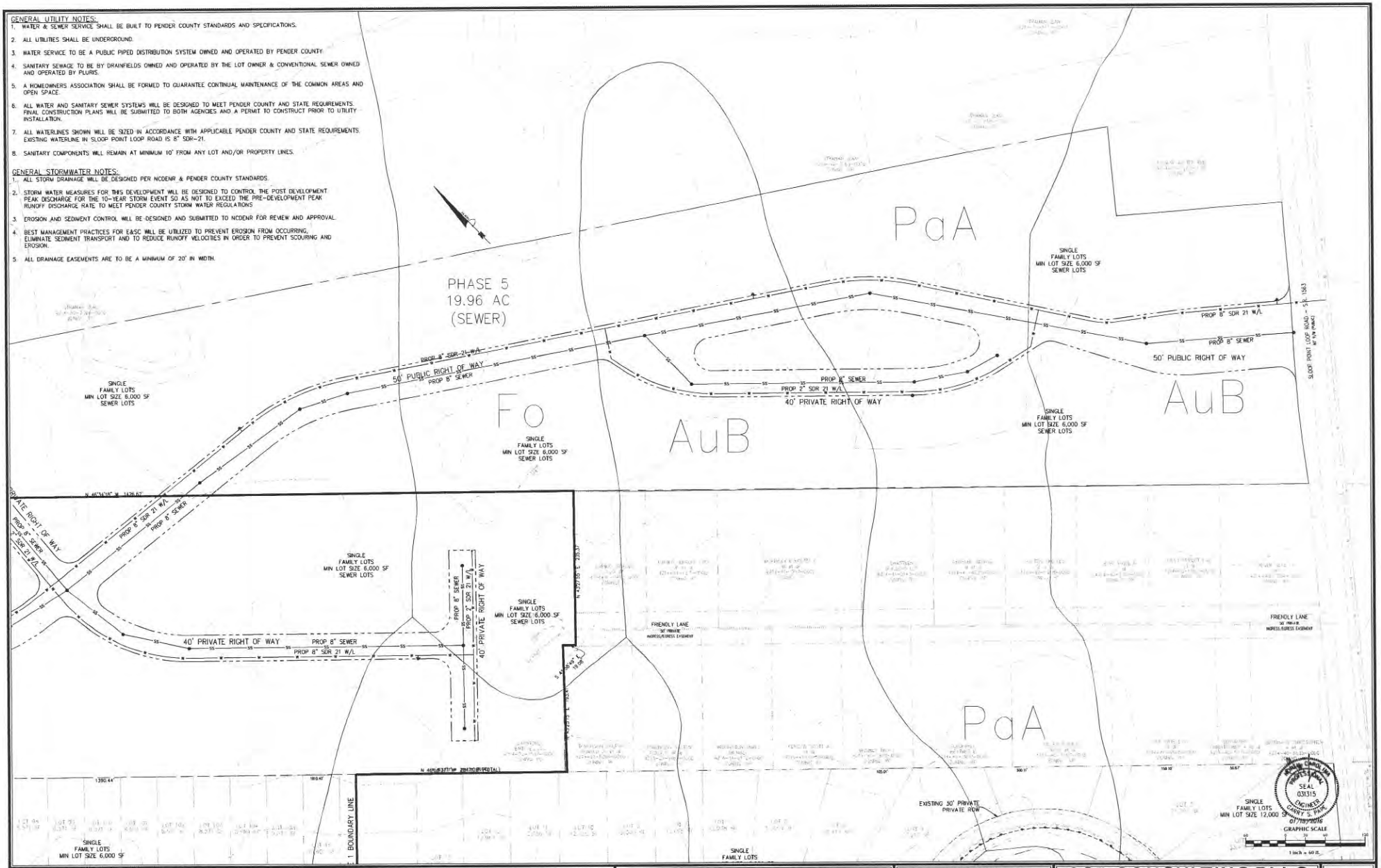

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Sheet No. C-4.7

Attachment 1

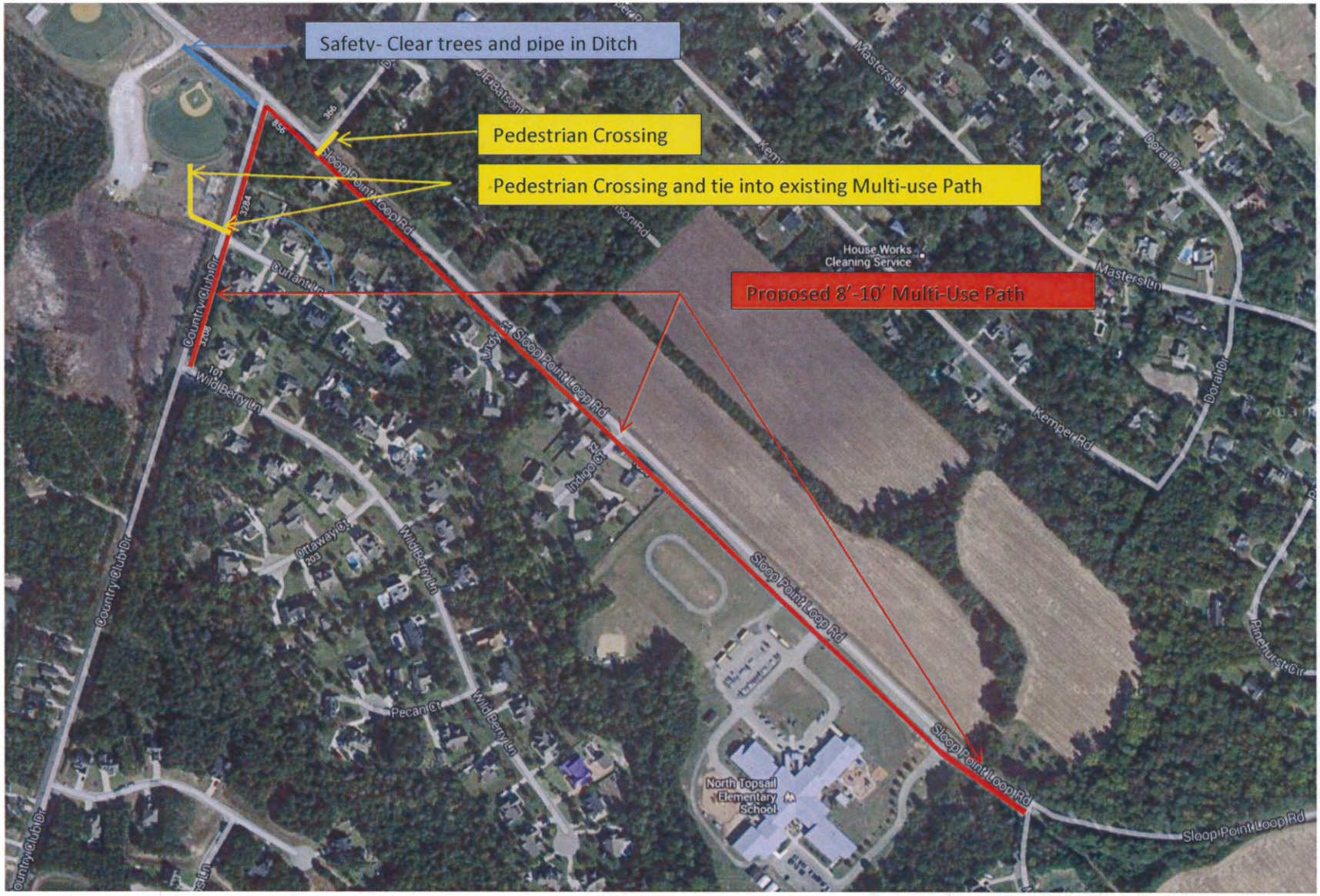
Case Type	Planning Board Date	Approved/Changes	Conditions
MDP	11/12/2013	Conditionally Approved for of ± 185 single family residential units and ± 58,370 square footage of commercial space to be located on approximately ± 143 acres	1. Provide connection to adjacent property to future development to the northwest (documented under case #11067 submitted for the December Planning Board meeting). 2. Provide connection to identified "Capstone Property" 3. Allow for "alternative" design for alleyway as shown on sheet C-3.4 4. Allow for emergency access along the connection to Doral Drive (SR 1693).
Phase I Preliminary Plat	3/4/2014	Approval issued for Phase One (1) includes forty-two (42) single family homes on approximately 25.58 acres.	All Master Development Plan conditions apply
Phase II Preliminary Plat	5/6/2014	Approval issued for Phase II includes fifty-five (55) single family homes on approximately 28.35 acres. On November 12, 2013 the Planning Board conditionally approved a Master Development Plan for the Oaks at Sloop Point, now known as Wyndwater.	All Master Development Plan conditions apply
MDP revision	1/6/2015	Approved for of ± 185 single family residential units and ± 58,370 square footage of commercial space to be located on approximately ± 143 acres with the addition of the Zero Lot line.	1. Provide connection to adjacent property to future development to the northwest (documented under case #11067 submitted for the December Planning Board meeting). 2. Provide connection to identified "Capstone Property" 3. Allow for "alternative" design for alleyway as shown on sheet C-3.4 4. Allow for emergency access along the connection to Doral Drive (SR 1693).
		Conditionally Approved for the increase of overall project area to include approximately ± 6.2 acres from the adjacent parcel to the northeast (Pender County	1. Provide connection to adjacent property to future development to the northwest (documented under case #11067 submitted for the December Planning Board meeting). 2. Provide connection to identified "Capstone Property" 3. Allow for "alternative" design for alleyway as shown on sheet C-3.4 4. Allow for emergency access along the connection to Doral Drive (SR 1693).

MDP revision	7/7/2015	PIN:4204-94-9912-0000), increasing the overall project density from 2.72 to 3.1 units per acre, adding attached duplex housing type, reducing the lot size from originally approved 12,000 sq. ft. to 5,000 sq. ft. for lots to be serviced by regional sewer, and changing the location of Emergency Access to Doral Drive from Phase II to Phase III. Increasing to ± 350 single family residential units	5. The temporary cul de sac shown on the western portion of the Master Development Plan (PG C-3.2 of Site Plan) shall be converted to a through roadway at the time of the adjacent parcel development; the roadway connecting the Wyndwater and Cardinal Pointe shall be built to collector street standards as outlined in Section 7.5.3.C. Coordination between the applicant and the adjacent property owner shall be necessary to ensure interconnectivity. 6. Additional to the condition five (5), a second roadway connection shall be shown to the adjacent parcel (PIN: 4204-94-9912-0000 and identified as the Cardinal Pointe Master Development Plan Case # 11067). These connections shall be further delineated in each phase submittal for review and approval.
Phase III	9/1/2015	Tabled the request for Phase III approval includes sixty-nine (69) single-family conventional lots and forty (40) single-family attached duplex lots. The subject properties are zoned PD, Planned Development zoning district.	All Master Development Plan conditions apply
Phase III	10/13/2015	Approval was issued for sixty-nine (69) single-family conventional lots and forty (40) single-family attached duplex lots. The subject properties are zoned PD, Planned Development zoning district.	All Master Development Plan conditions apply
Phase IIB Preliminary Plat	11/4/2015	Approval was issued for Phase IIB to include 27 lots to be placed on North Lamplighter Walk and 4 lots to be placed on West Craftmsman Way.	All Master Development Plan conditions apply

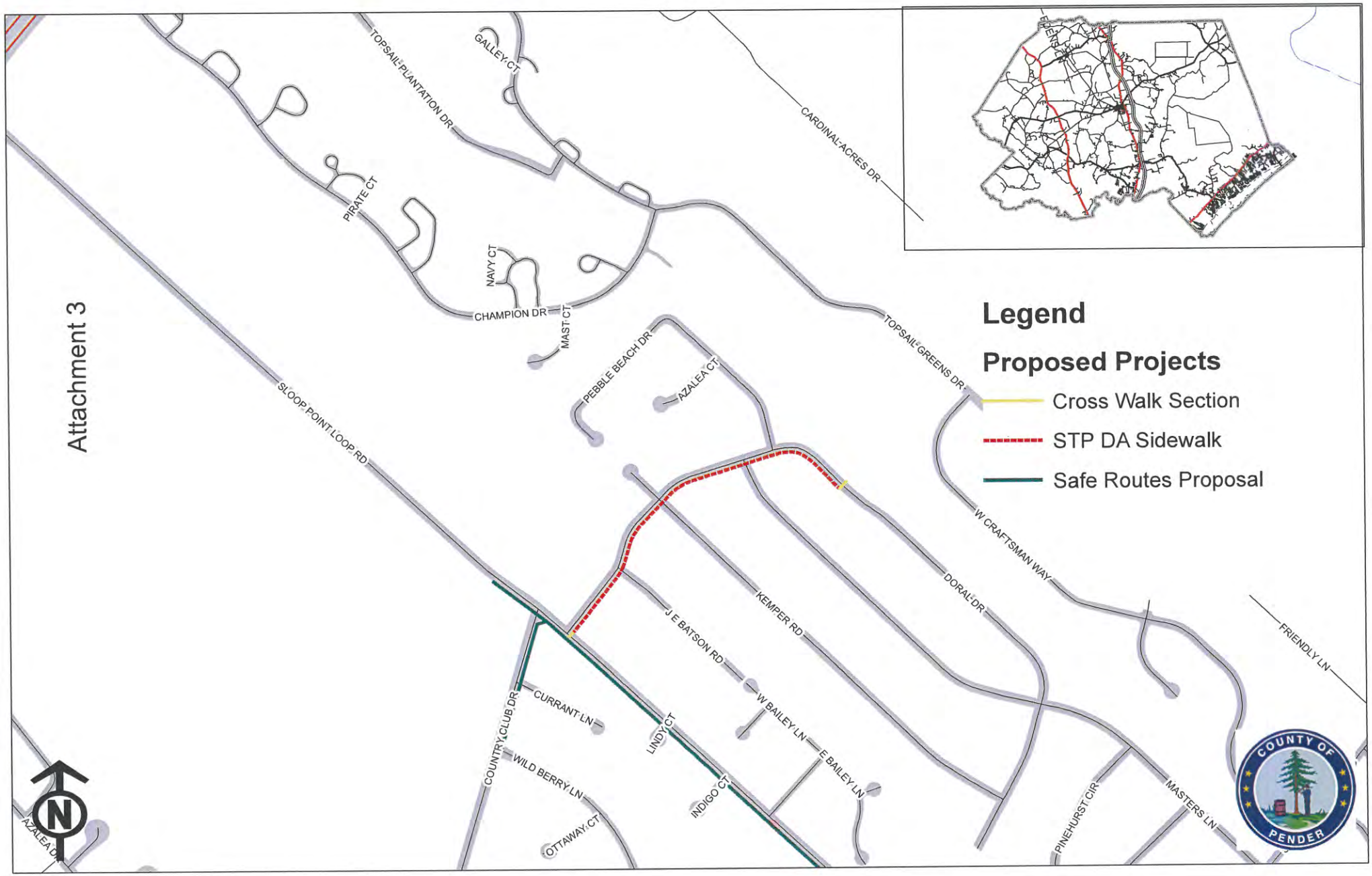
Phase	Map book/page	Recorded
I	57/14	11/4/2014
IB	58/72	10/27/2015
II	57/145	7/2/2015
IIB	58/127	2/10/2016

Hampstead SRTS Proposal – Pender County

Attachment 2



Attachment 3



Attachment 4

WMPO

305 Chestnut Street
PO Box 1810
Wilmington, NC 28402
Ph: (910) 341-3258
Fax: (910) 341-7801
www.wmpo.org

February 17, 2016

Dan Cumbo, PE
Davenport
3722 Shipyard Boulevard, Suite E
Wilmington, NC 28403

RE: Revised Approval of the Traffic Impact Analysis (TIA) associated with the proposed **Wyndwater Development**
Pender County, NC

The WMPO, NCDOT, and Pender County staffs have reviewed the Wyndwater Development TIA dated October 15, 2015 with updated Synchro files dated December 3, 2015. The approved document consists of the following phases:

Phase 1
- 110 Single Family Homes

Phase 2 (including phase1)
- 254 Single Family Homes
- 55 Townhomes

Phase 3 (including phases 1 and 2)
- 329 Single Family Homes
- 135 Townhomes
- 60,000 square ft. of Mini Storage

Phase 4/Full Build (including phases 1, 2, and 3)
- 379 Single Family Homes
- 155 Townhomes
- 60,000 square ft. of Mini Storage
- 100 Senior Adult Housing Dwelling units

We concur with the recommendations of the TIA as stated below with modifications shown in red:

Phase 1

Sloop Point Loop Road at Site Access 1 (northeast of Masters Lane)
- No improvements are recommended

Sloop Point Loop Road at Site Access 2 (northeast of Friendly Lane)
- This access will not be installed in this phase

US 17 at Topsail Greens Drive
- No improvements are recommended

US 17 at Topsail Plantation Drive
- No improvements are recommended

US 17 at Champion Drive
- No improvements are recommended

US 17 at Sloop Point Road
- No improvements are recommended

US 17 at Sloop Loop Point Road
- No improvements are recommended

Phase 2

Sloop Point Loop Road at Site Access 1 (northeast of Masters Lane)
- Provide a northbound left turn lane with 100 feet of storage and appropriate taper

Sloop Point Loop Road at Site Access 2 (northeast of Friendly Lane)
- This access will not be installed in this phase

US 17 at Topsail Greens Drive
- Three-lane cross-section: One Ingress, Two Egress
  - Egress
    - Shared left and through
    - Dedicated right turn

US 17 at Topsail Plantation Drive
- No improvements are recommended

US 17 at Champion Drive

- Three-lane cross-section: One Ingress, Two Egress
  - Egress
    - Shared left and through
    - Dedicated right turn

US 17 at Sloop Point Road

- No improvements are recommended

US 17 at Sloop Loop Point Road

- Restripe the existing pavement to provide a three-lane cross-section: One Ingress, Two Egress
  - Egress
    - Shared left and right
    - Dedicated left turn
- Provide signal modifications to facilitate striping changes

Phase 3

Sloop Point Loop Road at Site Access 1 (northeast of Masters Lane)

- Provide a southbound left-turn lane with 100 feet of storage and appropriate taper (once the east side access is installed)

Sloop Point Loop Road at Site Access 2 (northeast of Friendly Lane)

- No improvements are recommended

US 17 at Topsail Greens Drive

- No additional improvements are recommended

US 17 at Topsail Plantation Drive

- No additional improvements are recommended

US 17 at Champion Drive

- No additional improvements are recommended

US 17 at Sloop Point Road

- No improvements are recommended

US 17 at Sloop Loop Point Road

- No improvements are recommended

If changes are made to the proposed site driveways and/or use, the current trip distribution may need to be modified and would require a revised Traffic Impact Analysis to be submitted for review by the NCDOT, WMPO, and Pender County. This approval would become null and void.

The applicant is required to obtain all applicable Pender County and NCDOT permits for access to the road network. All applicable NCDOT and Pender County technical standards and policies shall apply.

Please contact me at 910-473-5130 with any questions regarding this approval.

Sincerely,

Amy Kimes, PE
Project Manager
Wilmington Metropolitan Planning Organization

Cc: Robert Vause, PE, District Engineer, NCDOT
Katie Hite, PE, Division Traffic Engineer, NCDOT
Kyle Breuer, Planning Director, Pender County
Megan O'Hare, Senior Planner, Pender County
Bill McDow, Transportation Planner, WMPO
Mike Kozlosky, Executive Director, WMPO

Attachment 5

PLURIS

February 9, 2016

Mike Pollak
Manager
Signature Topsail NC LTD
6450 Shinnwood Road
Wilmington, NC 28409

Re: Pluris Hampstead, LLC's Intent to Serve Signature Topsail NC LTD, Pender County

Dear Mr. Pollak,

This letter serves as confirmation of Pluris Hampstead, LLC's ("Pluris") intent to serve the above referenced development with wastewater treatment in accordance with the requirements of the North Carolina Department of Environmental Management ("DENR"), and the North Carolina Utilities Commission ("NCUC") to whom Pluris will be subject to for environmental and rate regulation respectively. In addition Pluris will be subject to the provisions of the County of Pender approved Special Use Permit.

It is our understanding that the initial phases of construction for the development will consist of one hundred fifty (150) single family residences, requiring wastewater treatment in the initial phases for a maximum flow of fifty-four thousand (54,000) gallons per day. Subsequent development phases may include up to two-hundred ten (210) single family residences.

DENR will allow the pumping and hauling of any wastewater for an interim period should any homes be completed prior to installation of the force main. Wastewater will be treated at the existing Pluris MBR plant.

Please note that this letter of intent to provide wastewater service to the development is contingent upon the execution of a Developer Agreement between Signature Topsail NC LTD and Pluris Hampstead, LLC.

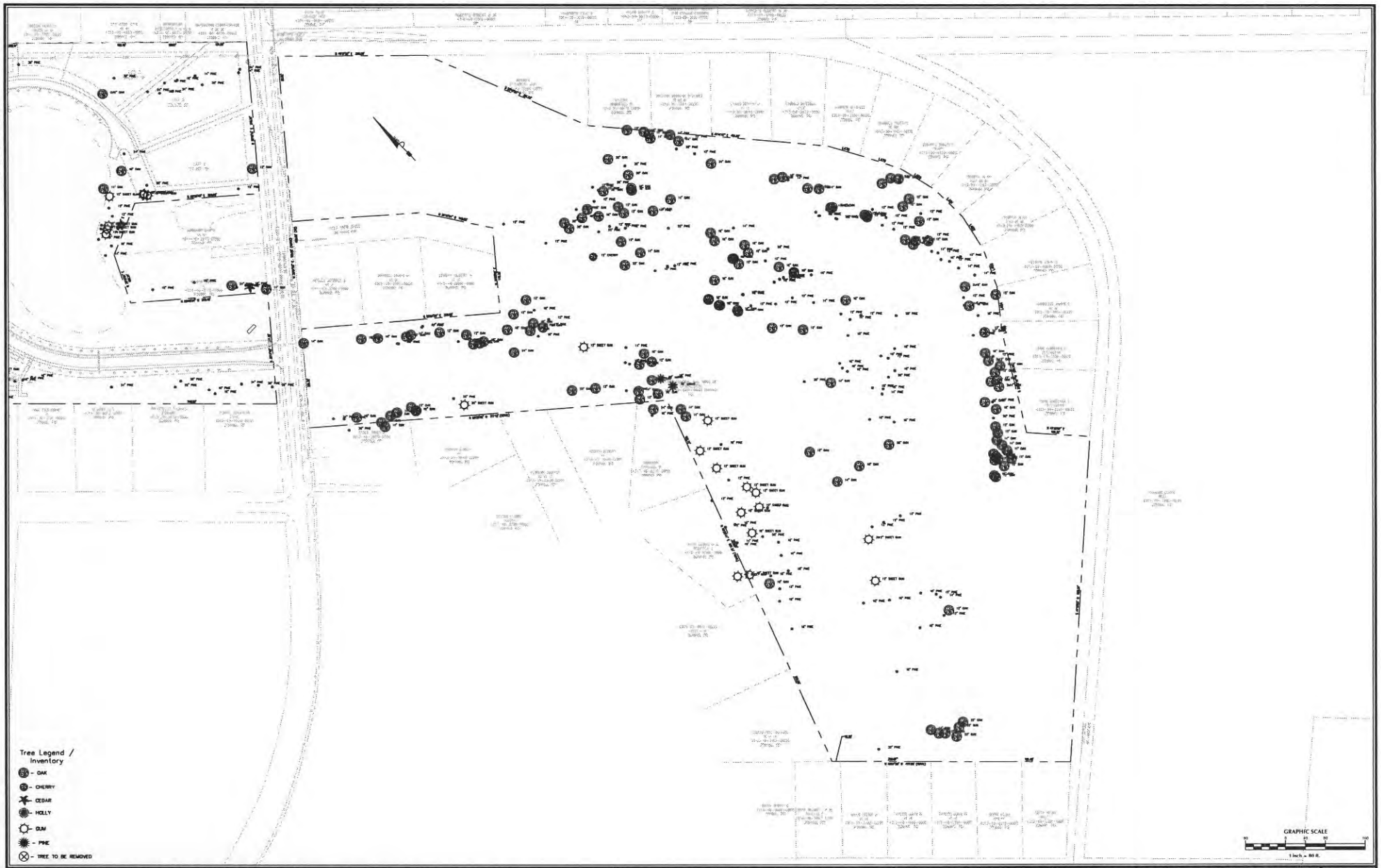
Should you have any questions, please feel free to contact me directly at my office at 910.327.2880.

Sincerely,

Randy Hoffer
Regional Manager, Pluris

1095 Hwy 210 Sneads Ferry, NC 28460 | T: 888.758.7471 | F: 910.327.0374 | www.plurisusa.com

Attachment 6



No.	Revision	Date	By

Designer: GSP	Scale: 1" = 80'
Drawn By: GSP	Date: January 2018
License #: P-0718	Job No.: 2016-0001

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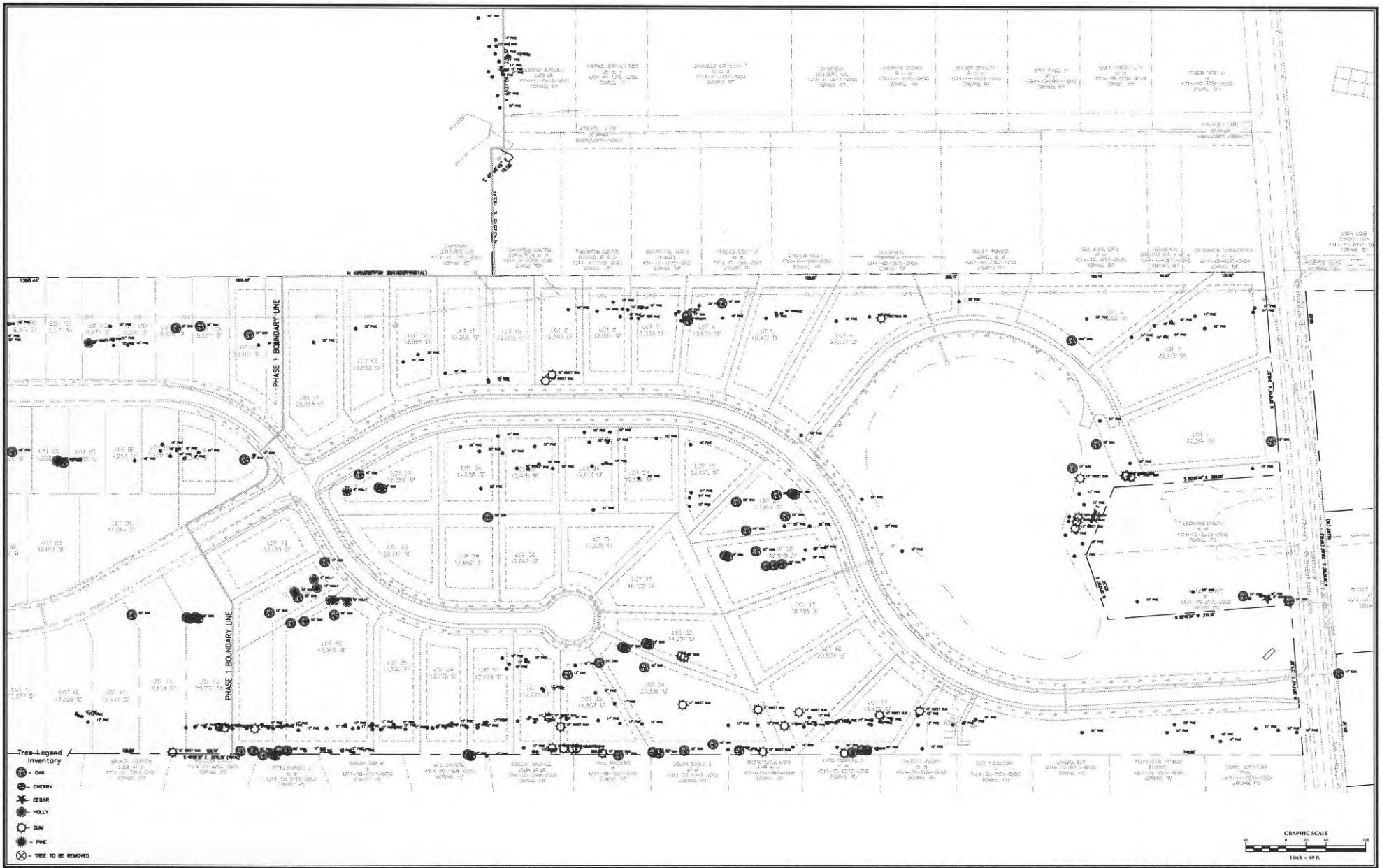
C-2.1



No.	Revision	Date	By

Designer: GSP	Scale: 1" = 60'
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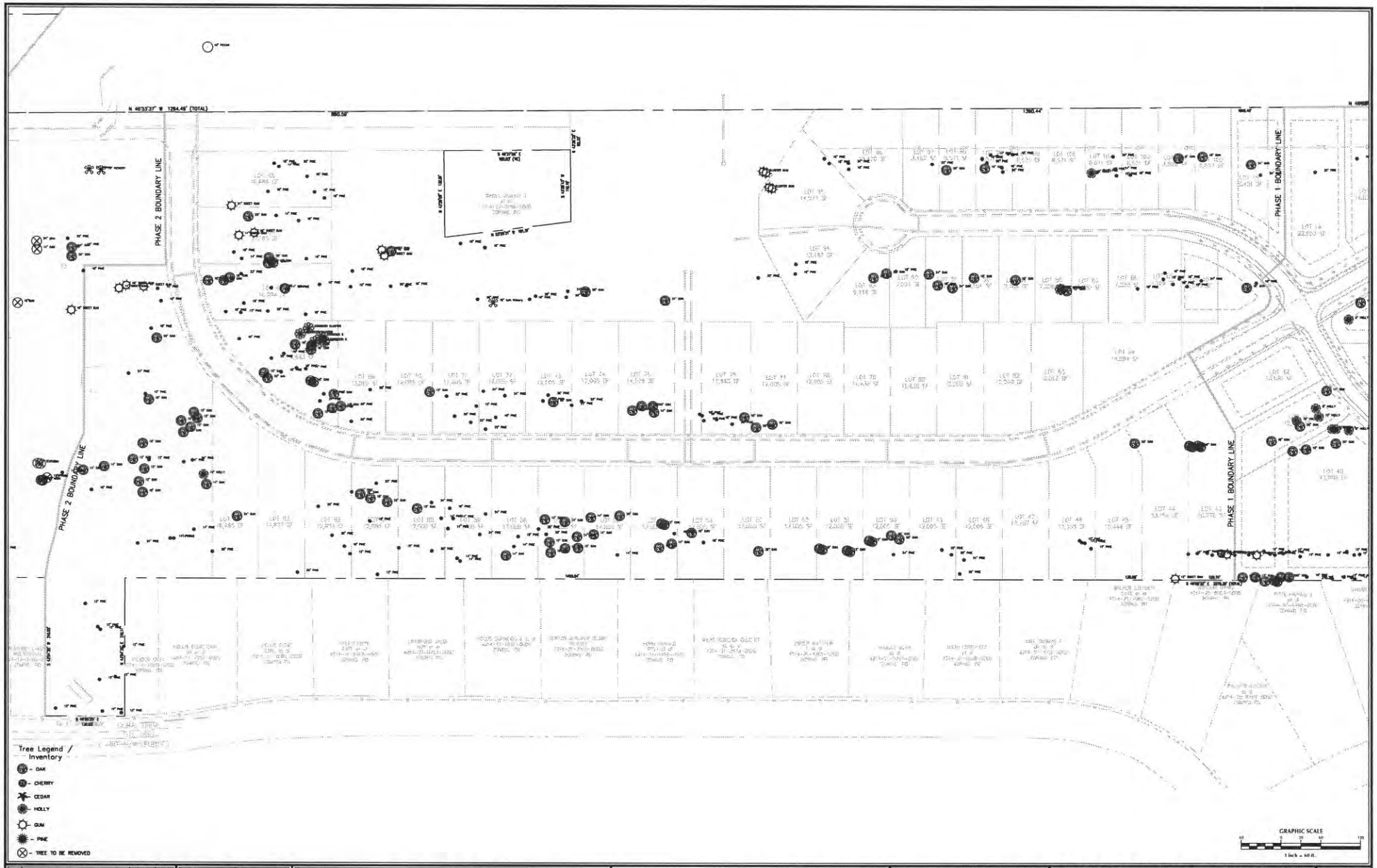

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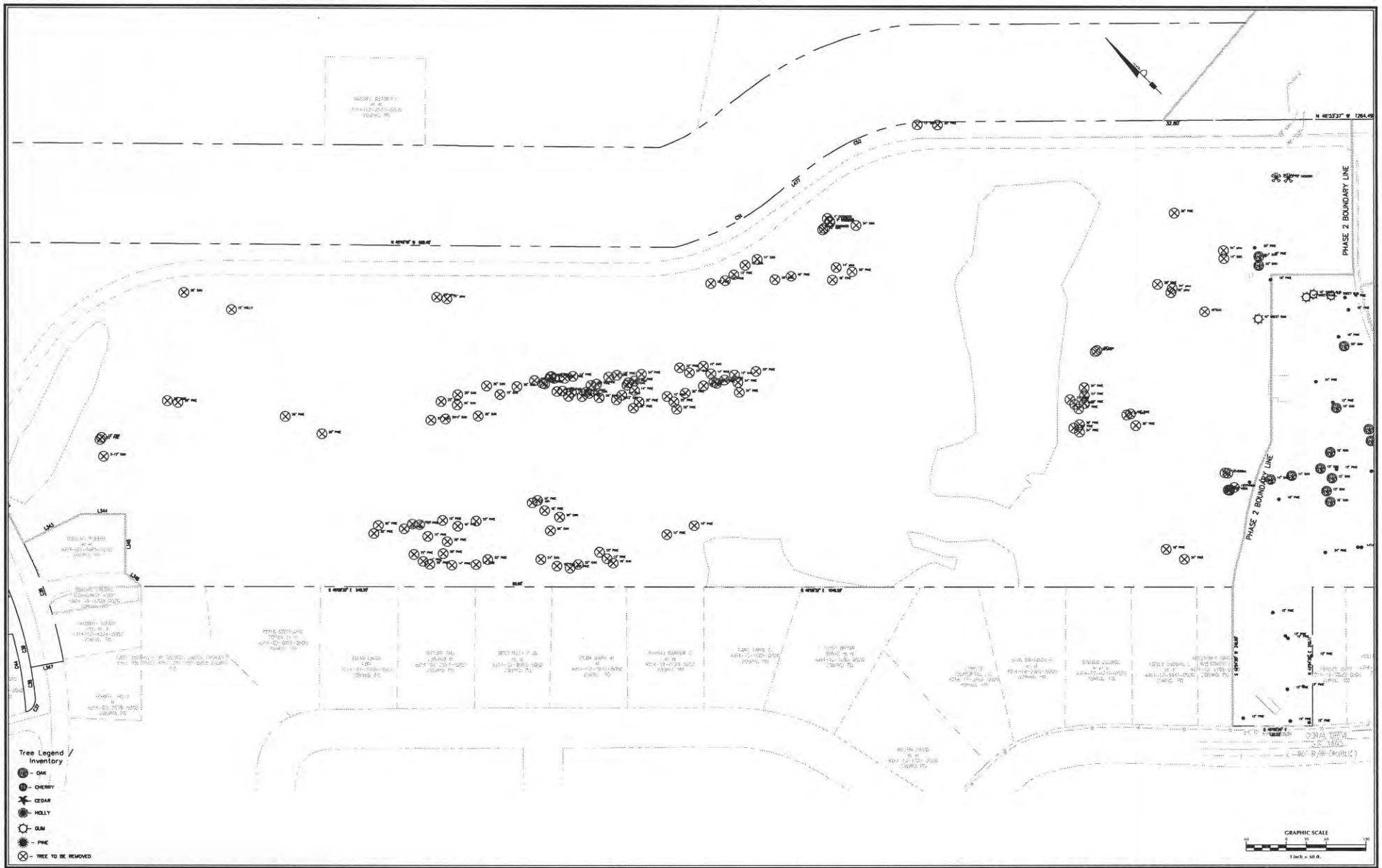

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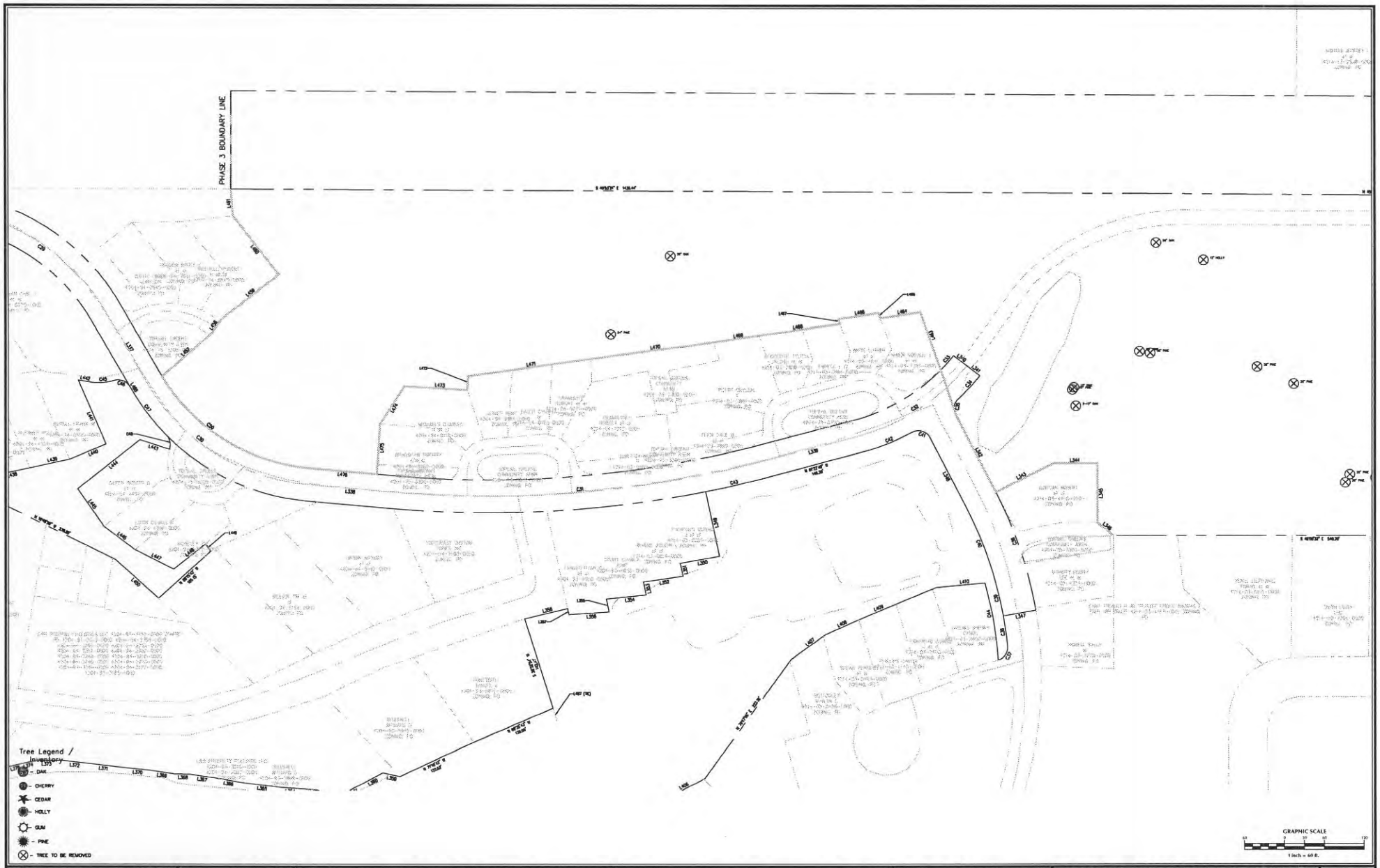

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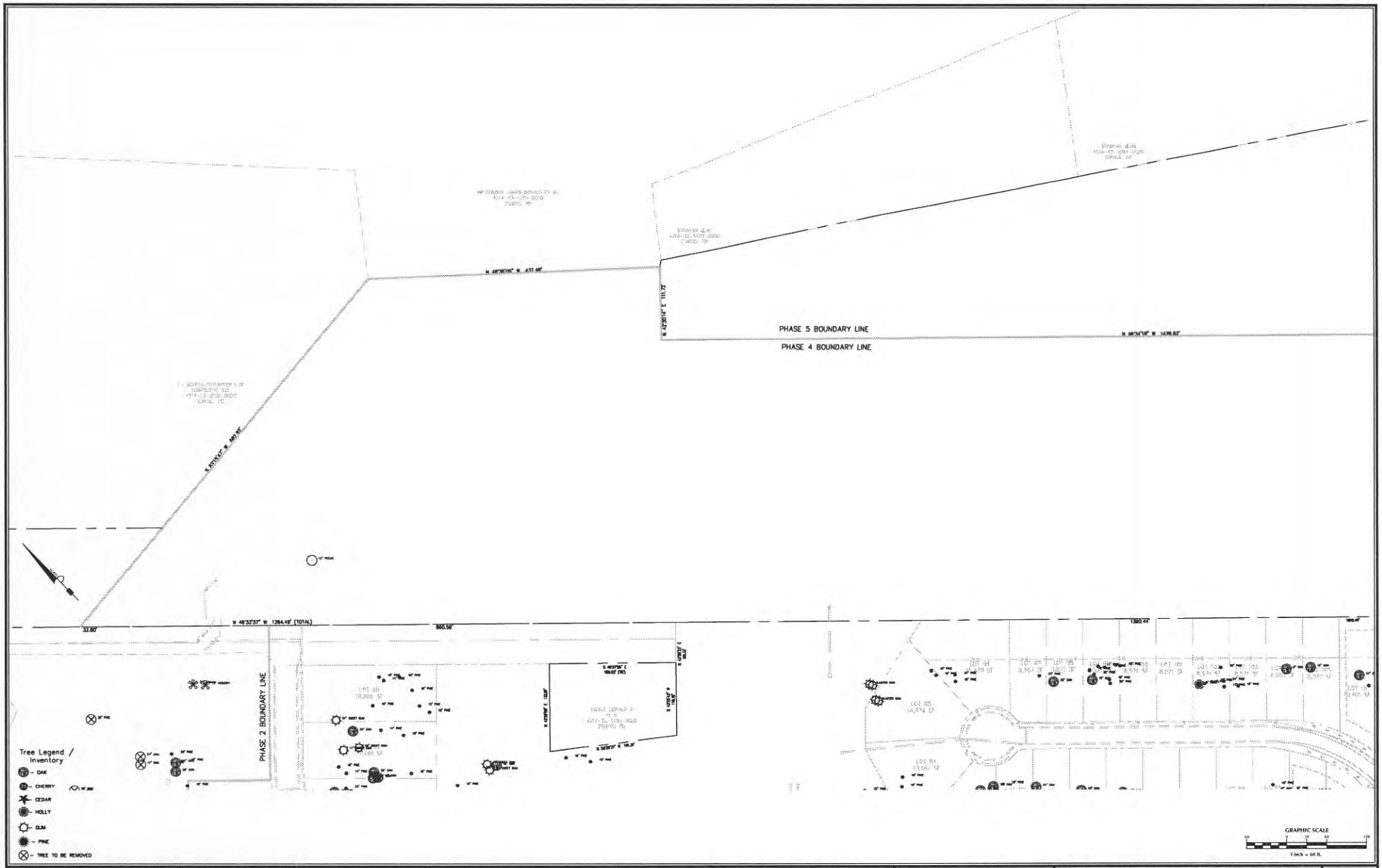

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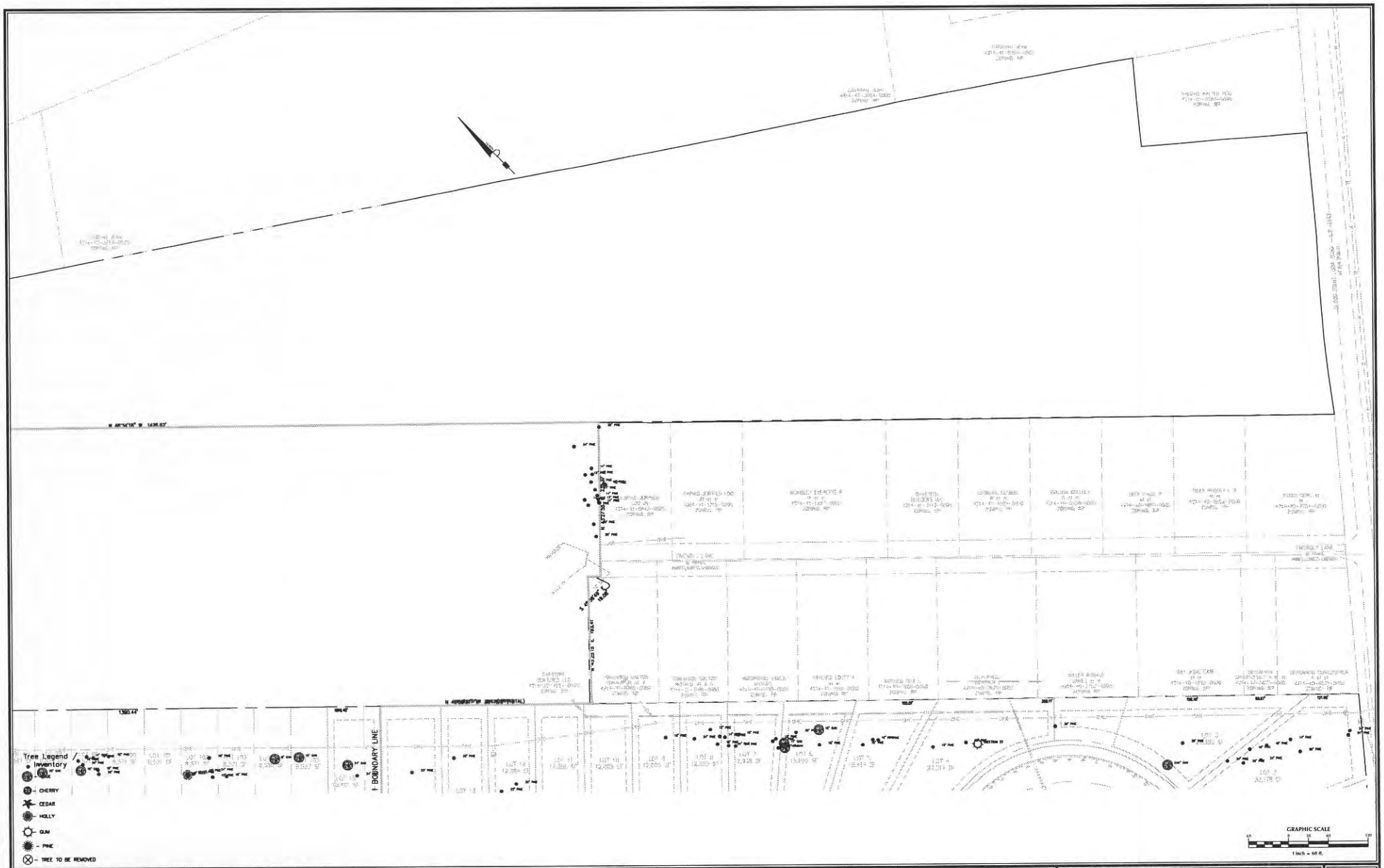

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ENGINEERING
6626 Gordon Road Unit C Wilmington, North Carolina 28411 tel: 910-442-7870 fax: 910-799-6659

Sheet No.
C-2.7

Attachment 7

TECHNICAL REVIEW COMMITTEE (TRC) RESPONSES:
On Tuesday February 2, 2015 the Pender County Technical Review Committee reviewed the proposed Wyndwater Master Development Plan Revision:

Cape Fear Council of Governments RPO
No Response.
Four County Electric Company
No Response.
NC DENR Division of Coastal Management
No Response.
NC DENR Division of Forestry
No Response.
NCDENR, Division of Energy, Mineral, and Land Resources - Land Quality Section
No Response.
NC DENR Division of Waste Management
No Response.
NC DENR Division of Water Quality
No Response.
NC DOT Division of Highways
No Response.
NC DOT Transportation Planning Branch
No Response.
NC Office of State Archaeology
No Response.
NC Wildlife Resources Commission
No Response.
Pender County Addressing Coordinator
Page C-3.1 - What are the plans for the future connection after temporary cul-de-sac is removed post collector street extension?
Page C-3.2 - Is Topsail Greens Drive being reconfigured? If so it will create the need for a new road name as well as possible re-addressing.
Page C - 3.6 - Will there be a 4 way intersection at Topsail Greens Drive and W Craftsman Way? Or will it be a T-Intersection?
Page C -3.7 – Why was a T-intersection chosen instead of cul-de-sac? Does it comply for Fire Code?

It was also mentioned to make sure the new street signs were in compliance with our Road Naming Ordinance

Pender County Building Inspections
No Response.
Pender County Emergency Management
No Response.
Pender County Environmental Health
Any lot using septic system will need to apply for permits with EH. The lots using sewer not need anything from EH.
Pender County Fire Marshal
No Response.
Pender County Flood Plain Management
A portion of the subject property located directly east of US 17 that is located within the "Approximate Zone A" Special Flood Hazard Area, according to the 2007 Flood Insurance Rate Maps (FIRMs), Map Numbers 3720420400J and 3720421400J, Panel Numbers 4204 and 4214. This was the established flood zone at the time of the original

Master Development Plan approval. However, with the preliminary FIRMs released this year, to serve as the best available data it appears that the amount of the parcel in the "Approximate Zone A" was reduced and the subject property contains "Zone AO" with an established depth of two (2) feet on Panel 4204 and contains "Zone AO" on Panel 4214. All development in these areas will require re-examination at the time of development submittal in accordance with the best available flood data.

Pender County Parks and Recreation

No Response.

Pender County Public Library

No Response.

Pender County Public Utilities

No Response.

Pender County Schools

No Response.

Pender County Sheriff's Department

No Response.

Pender County Soil and Water Conservation District

No Response.

Progress Energy Corporation

No Response.

US Army Corps of Engineers

No Response.

Wilmington Metropolitan Planning Organization

Requirements: Wyndwater MDP Plan Revision

The current project narrative does not match the submitted and approved TIA. If the Application/project has changed, an update to the TIA may be required.

The current narrative does not include the Commercial Mini-Storage, and Senior Adult Housing uses. Also the mix of SF homes and Townhouses is significantly different.

The number of phases for the MDP has increased from 3 phases in the TIA to 6 phases in the current narrative. Please explain the change in the number of proposed phases.

Provide street names for the proposed subdivision streets. The project has received plats for over 50 lots, therefore, addresses and streets should exist for the project.

The plans alternate between multiple cross sections. Show the cross section for the proposed 40' ROW, 50' ROW, 60' ROW and 40' and 50' Cul-De-Sac ROW on the site plan details page.

The proposed Cul-De-Sac cross sections on 40' ROW and 50' ROW will not accommodate Fire, School Bus and Rescue vehicles, due to the R35' radius. Increase the radius to R40 to accommodate Fire, School Bus and Rescue vehicles.

Provide dimensions for the proposed subdivision streets on the site plan.

Previous comments for MDP are still in place.

Show a detail for the pedestrian paths shown on the site plan, including the 12' Multi-use Path shown on sheet C-3.2.

Provide a standard street connection to Doral Drive at the phase 2 boundary.

Recommendations:

Provide an all-weather surface from the subdivision streets to the proposed lift station and wet detention basin.

The site plan, has the Stormwater management areas in the same location as the active recreation areas. These areas do not have the same function.

The site plan has designated wetland areas as passive active areas.

Please provide a standard driveway detail on the site plan.

Standardize the Cul-De-Sac ROW cross sections for 40' and 50' ROW to have the same pavement widths, Radius to EOP and Radius to Utility area. There were two sets of 40' Cul-De-Sac designs shown on the plan set.

Access to the sidewalk and 5' Mulch Multi-use path will require connection points. Please ensure the ditch and adjacent to the 6' grass shoulder do not prevent access to these pedestrian facilities. If pedestrian bridges or walkways are used to cross the ditch or shoulder, please provide details on these connection points.
Show proposed signs, including Stop Signs, Yield Signs and other regulatory signs.

Pender County Fire Marshal

Inspection Topics:
Requirements
Cul-De-Sacs Shall have a min. of 40ft radius (DOT Approved) **Status:** INFORMATION **Notes:** All stub outs over 150' must require a fire apparatus turn around
Hammer heads Hammer head shall be a min of 60' in both direction from the center of the end of the roadway with a min. of 120' total. Alternate Hammer head will be required to be 70' deep counting the roadway. **Status:** INFORMATION **Notes:** Page C-3.7 Hammer head Must not excess 150' in both directions

Additional Time Spent on Inspection:		
Category	**Start Date / Time**	**End Date / Time**

Pender County Flood Plain Management
No response
Pender County Parks and Recreation
No response
Pender County Public Library
No response
Pender County Public Utilities
Mr. Pape:

We have reviewed the Master Development Plans (MDP) dated 01/19/16 which you provided for the subject project. The PCU comments below were previously provided for Phase 3, Sections 1 and 2 and also need to be shown in the MDP.

Plans
Sheet C-1: Add PCU Standard Notes (previously provided).
Sheet C-4.1: Show a 30' public utility easement, centered on the 8" waterline, from the Phase 3 boundary line to Hwy 17.
Sheet C-4.2: Provide a temporary blow-off at the terminus of the 8" waterline between Phase 3, Section 1 and Phase 3, Section 2.
Sheet C-4.2: Extend a 6" waterline and provide a temporary blow-off in the road stub that leads to Cardinal Point.
Sheet C-4.2: Relocate the fire hydrant located on the 2" waterline within Evening Walk or upsize the waterline at that location to a 6" waterline.

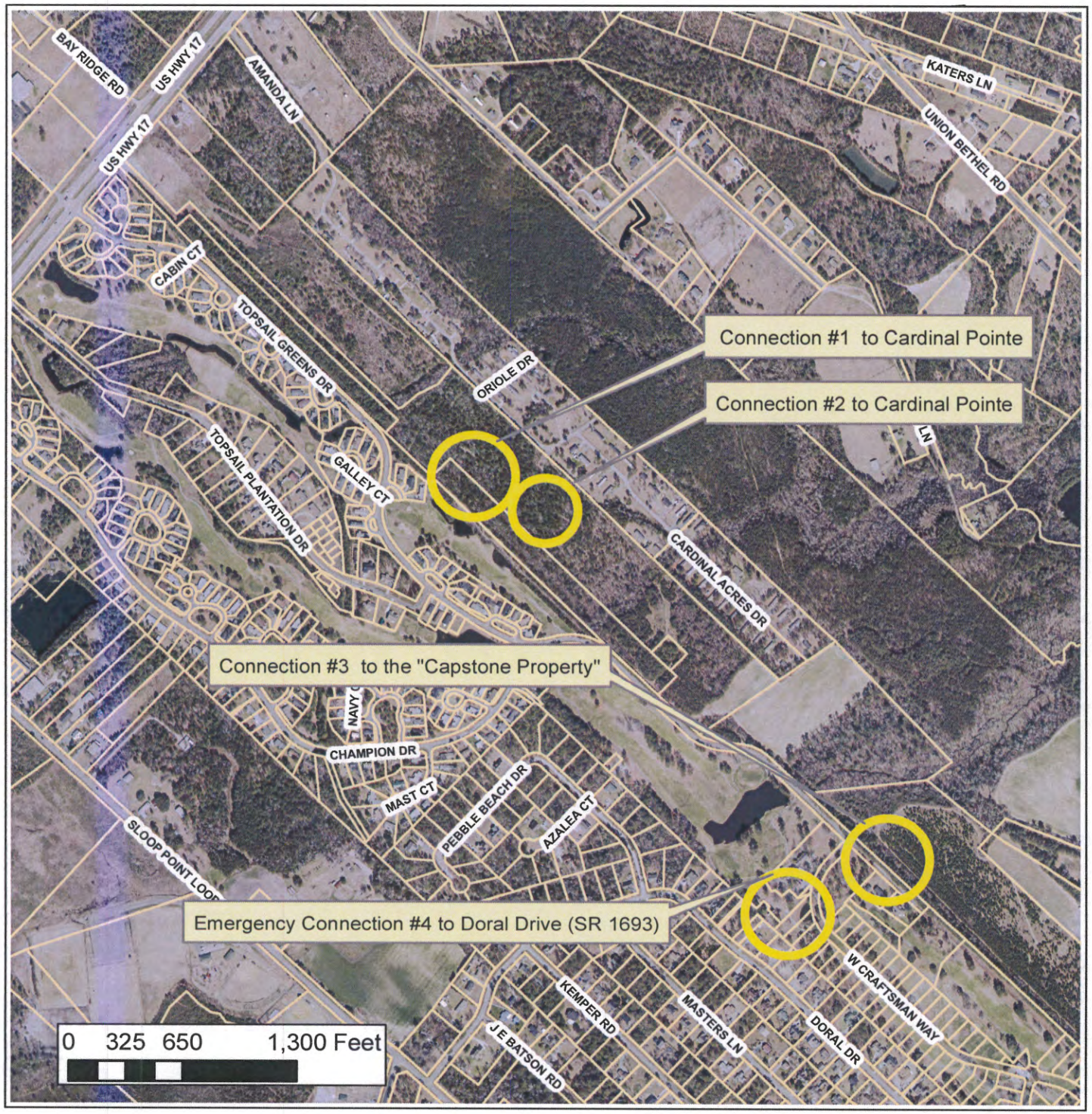
Sheet C-4.2: Extend a 6" waterline and provide a temporary blow-off in the road stub that connects with Topsail Greens Drive.
Sheet C-4.2: Add fire hydrant on Moonlight Walk.
Sheet C-4.2: Provide cross and temporary blow-off at the Phase 3, Section 1 and Phase 2 boundary line.
Sheets C-4.1 to C-4.7: Show sewer force main on the plans.

Additional Requirements & Clarifications
PCU is agreeable that the interconnection of the 8" waterline with the Hwy 17 waterline can occur during the Phase 3, Section 2 construction efforts but the watermain must be designed and permitted as part of Wyndwater – Phase 3, Section 1. In addition the required 30' public utility easement will be platted and recorded as part of Wyndwater – Phase 3, Section 1. Please note on the MDP.

The documents provided have been reviewed by Pender County Utilities for compliance with Pender County Utilities Standards. The developer and/or his consultant are responsible for compliance with all applicable federal, state, and location regulations as well as for obtaining all permits, licenses, and any other documentation/correspondence required prior to beginning construction of the proposed work, including any requirements imposed by the Pender County Planning and Inspections Department.

Pender County Schools
No response
Pender County Sheriff's Department
No response
Pender County Soil and Water Conservation District
Progress Energy Corporation
No response
US Army Corps of Engineers
No response
Wilmington Metropolitan Planning Organization

Attachment 8



Applicant:
Signature Top Sail NC, LTD

Owners:
Capstone Ventures LLC.,
Ruth C. Kalmar Lewis et al,
J L Morris Enterprises of Hampstead Inc.,
Morris Jeffrey Let al,
and Signature Top Sail NC, LTD

Master
Development Plan
Revision

Case Number:
147-2016

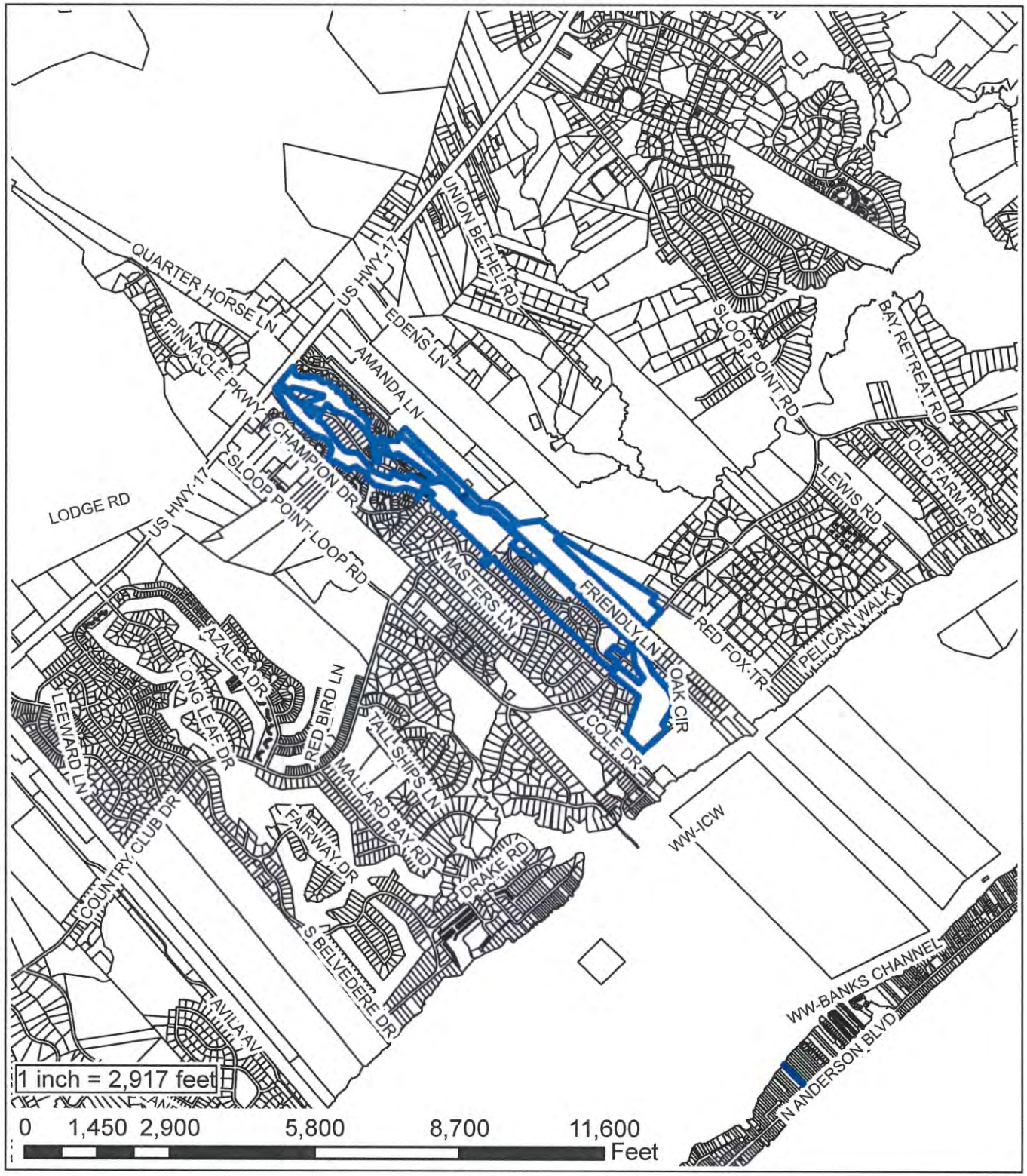
Wyndwater

Legend

- Wyndwater MDP Project Area
- Wyndwater Proposed Roadways
- Cardinal Pointe Proposed Roadways

N

Adjacent Connections



Applicant:
Signature Top Sail NC, LTD

Owners:
Capstone Ventures LLC.,
Ruth C. Kalmar Lewis et al,
J L Morris Enterprises of Hampstead Inc.,
Morris Jeffrey Let al,
and Signature Top Sail NC, LTD

Master
Development Plan
Revision

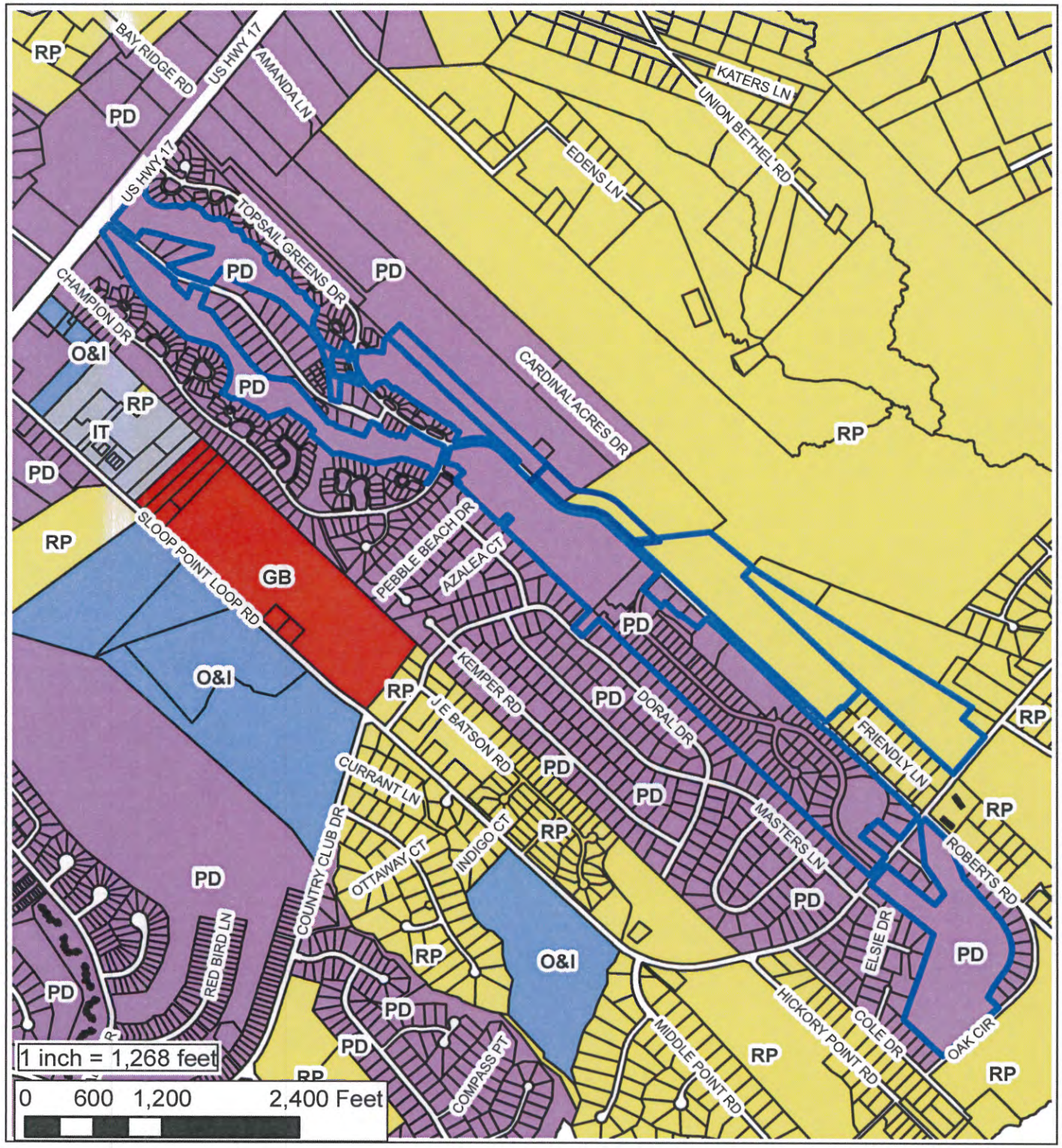
Case Number:
147-2016

Wyndwater

Subject Property

N

Vicinity



Applicant:
Signature Top Sail NC, LTD

Owners:
Capstone Ventures LLC.,
Ruth C. Kalmar Lewis et al,
J L Morris Enterprises of Hampstead Inc.,
Morris Jeffrey Let al,
and Signature Top Sail NC, LTD

Master
Development Plan
Revision

Case Number:
11035

Wyndwater

Legend

Subject Property

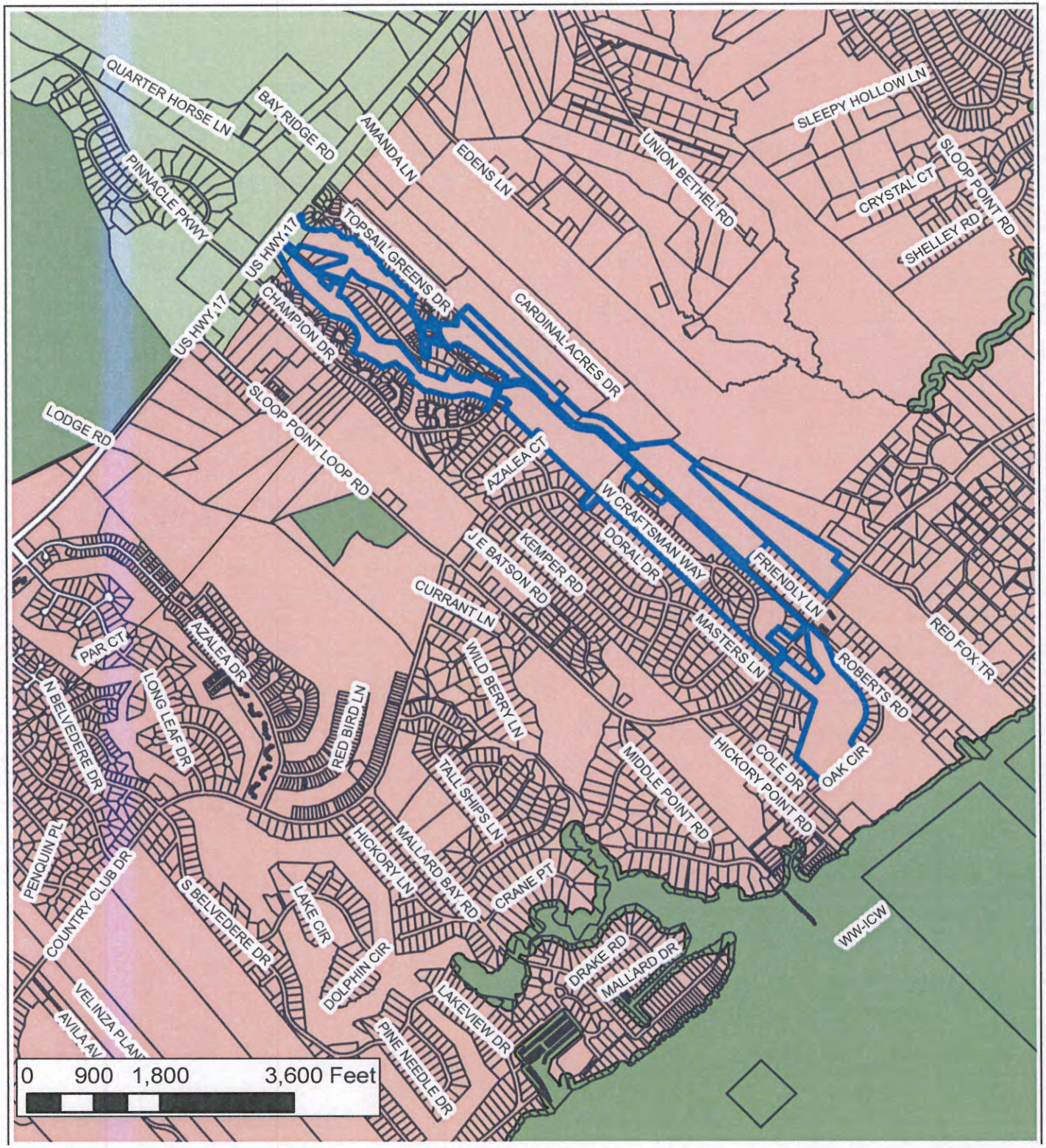
Zoning Classification

UDO Zoning

- General Business (GB)
- General Industrial (GI)
- Industrial Transition (IT)
- Office & Institutional (OI)
- Rural Agricultural (RA)
- Planned Development (PD)
- Residential Performance (RP)
- Environmental Conservation (EC)
- Incorporated Areas (INCORP)
- Manufactured Home Park (MH)
- Residential Mixed (MF)

N

Current Zoning



Applicant:
Signature Top Sail NC, LTD

Owners:
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Ruth C. Kalmar Lewis et al,
J L Morris Enterprises of Hampstead Inc.,
Morris Jeffrey Let al,
and Signature Top Sail NC, LTD

Master
Development Plan
Revision

Case Number:
147-2016

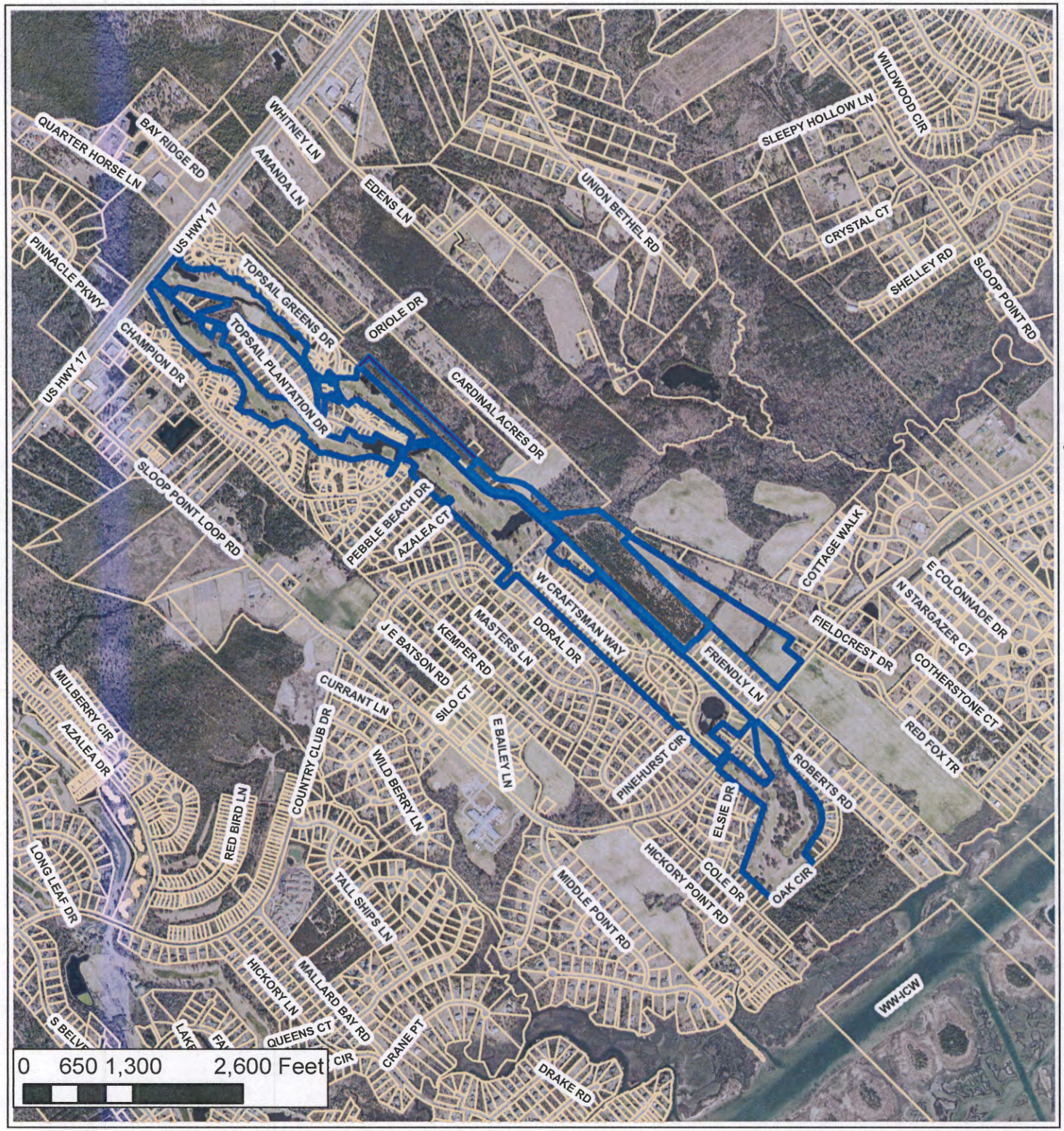
Wyndwater

Legend

- Subject Property
- Conservation
- Industrial
- Mixed Use
- Office, Institutional, Business
- Rural Growth
- Suburban Growth

N

Future Land Use



Applicant:
Signature Top Sail NC, LTD

Owners:
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Ruth C. Kalmar Lewis et al,
J L Morris Enterprises of Hampstead Inc.,
Morris Jeffrey Let al,
and Signature Top Sail NC, LTD

Master
Development Plan
Revision

Case Number:
147-2016

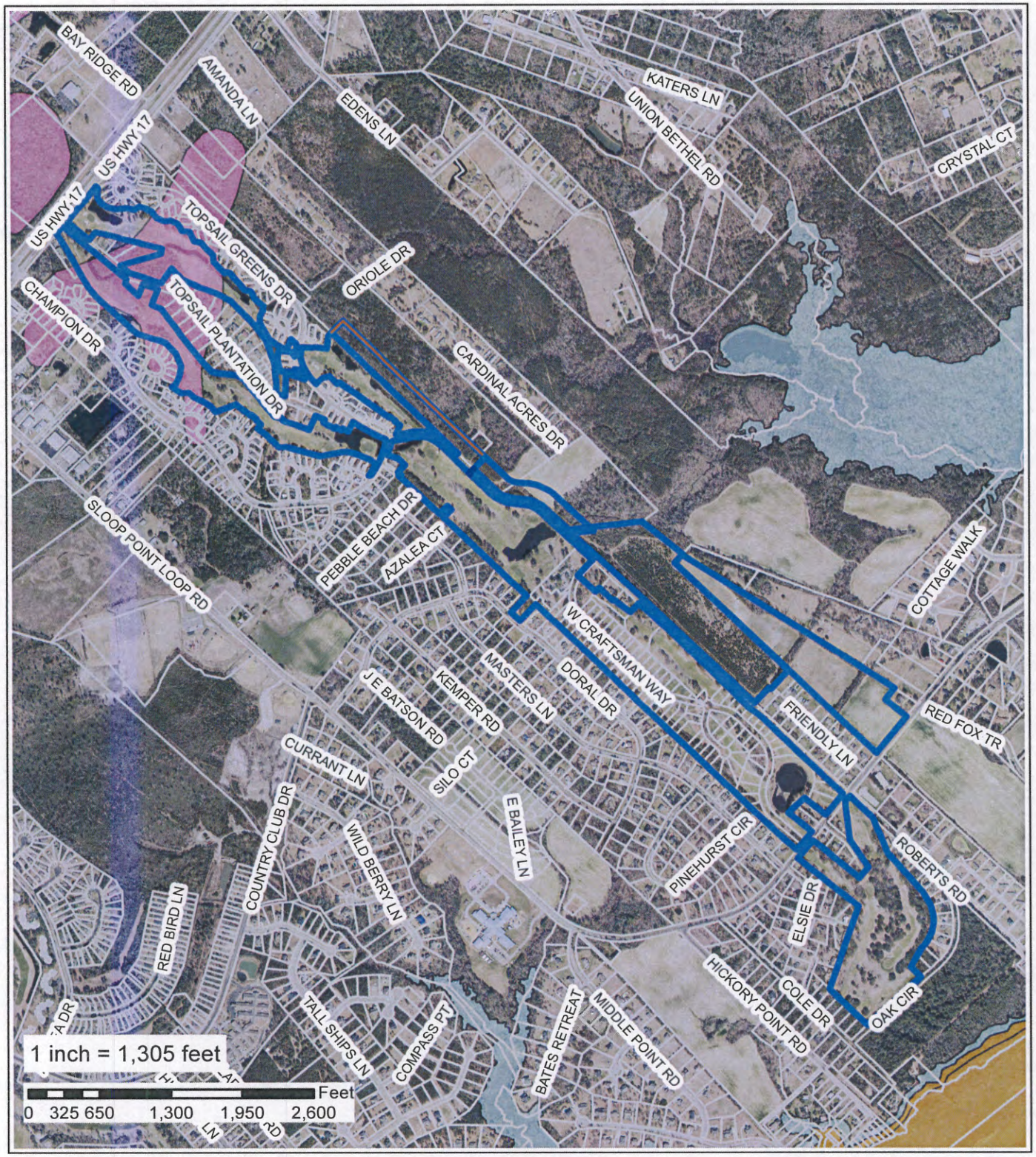
Wyndwater

Legend

Subject Parcel

N

2012 AERIAL



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Signature Top Sail NC, LTD

Owners:
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J L Morris Enterprises of Hampstead Inc.,
Morris Jeffrey Let al,
and Signature Top Sail NC, LTD

Master
Development Plan
Revision

Case Number:
147-2016

Wyndwater

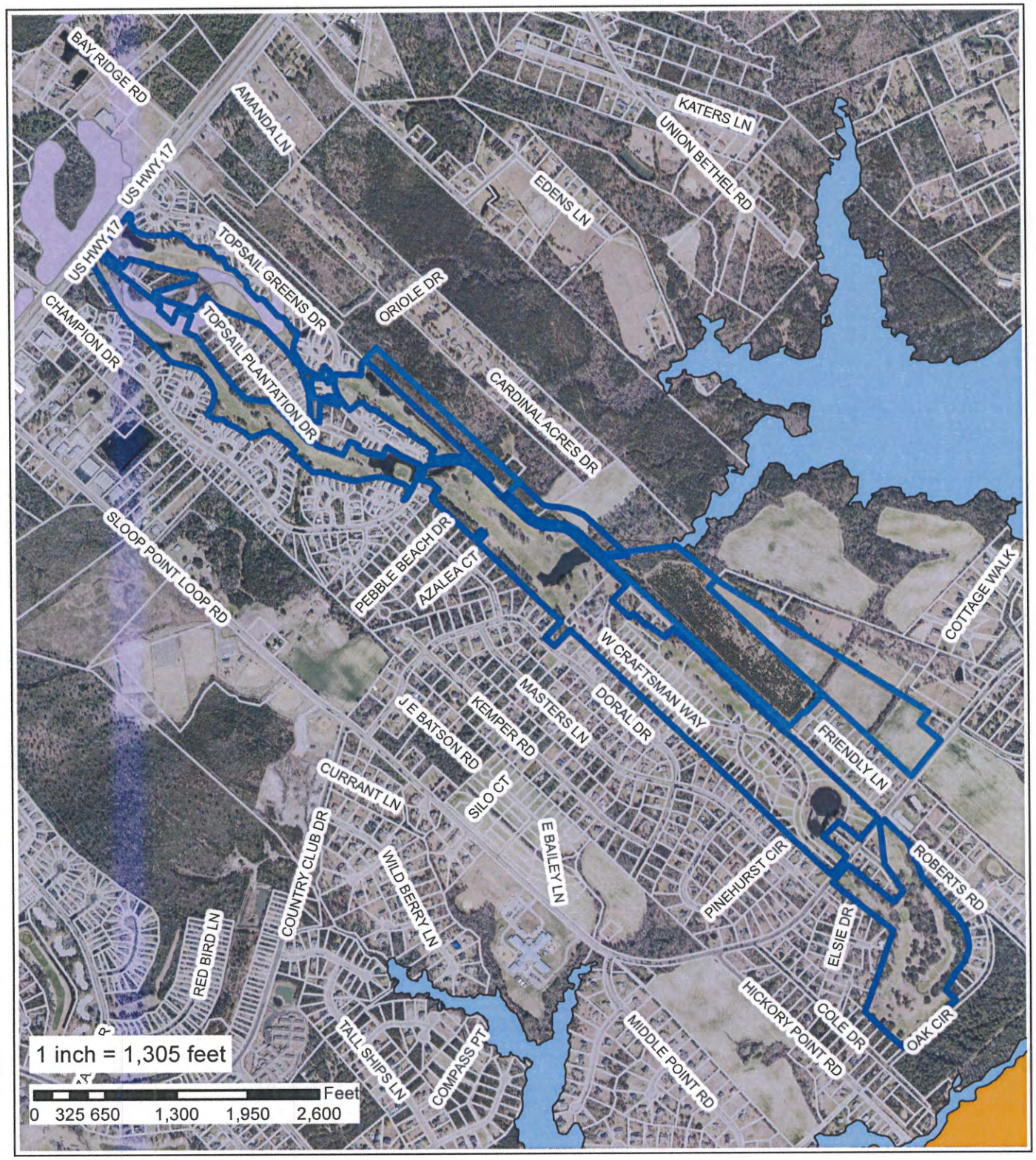
Subject Property

Flood Hazard Areas

- A
- AE
- AEFW
- SHADED X
- VE

N

Flood Zones



Applicant:
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Owners:
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Ruth C. Kalmar Lewis et al,
J L Morris Enterprises of Hampstead Inc.,
Morris Jeffrey Let al,
and Signature Top Sail NC, LTD

Master
Development Plan
Revision

Case Number:
147-2016

Wyndwater

Legend

Subject Property

N

Preliminary Flood Zones

Executive Summary

Pender County is located just north of New Hanover County and the City of Wilmington. The Wilmington Urban Area Metropolitan Planning Organization (WMPO) recently became a Transportation Management Area (TMA); the expanded boundaries that resulted from this new designation now include a larger portion of southern Pender County. As the WMPO area of Pender County (hereafter "CSP Area") continues to develop, the WMPO and Pender County commissioned this Pender County Collector Street Plan to help program new collector streets in the CSP area.

Collector streets are defined as streets that connect neighborhoods and local roads to the arterial roads. There are some existing collector streets in the CSP area, but higher levels of traffic and substantial new development is putting these roads and the major arterials in the area under increasing strain.

With new development adding further pressure to the existing roadway network in the CSP study area, the need for a Collector Street Plan that prioritizes roadway investments, is based on community input, and focuses new roadway construction in areas away from sensitive natural features cannot be overstated.

Mission Statement and Purpose

The primary goal of the Pender County Collector Street Plan is to guide investment in new collector streets with the ultimate intention of improving connectivity, focusing land development in suitable areas, encouraging all modes of transportation, maintaining levels-of-service on existing roadways, promoting safety, ensuring that significant natural areas are conserved, and providing a safe and high-quality transportation system for existing and future residents, businesses, and visitors. This plan provides substantial background information on southern Pender County, details the public outreach process undertaken as part of the project, and provides a number of recommendations for new collector streets, existing roads that should be added to the collector street network, and roads that will require upgrades to meet collector street standards.

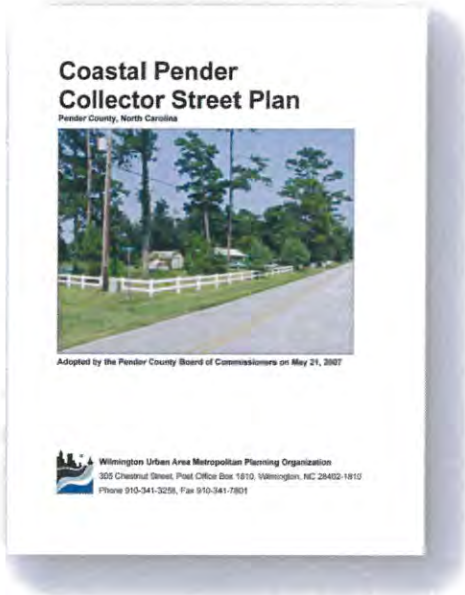
Steering Committee Members during a Project Meeting.

The final recommendations for this project include a collector street map, cross-sections of roadway types, policy strategies, and a summary of potential funding sources and implementation actions.

History and Existing Conditions

Pender County has a rich cultural history, supporting diverse Native American groups and European settlers. In the CSP area, multiple early plantations were constructed, with farming, fishing, and other

professions continuing to flourish in the area, even to the present day. Currently, Pender County remains a predominantly rural county, though the CSP area is rapidly developing with new housing developments, industry, and shopping amenities. In terms of transportation, many people living in the CSP area commute to work elsewhere, often to Wilmington, but also to Jacksonville, other areas of Pender County, and to counties to the west. Employment in educational services, health care and social assistance, retail trade, and construction are the most notable employment categories in the CSP area. Employment is focused in the areas along US 17 in the CSP area, though some noteworthy employment nodes are also located along US 117, NC-133, and US 421.

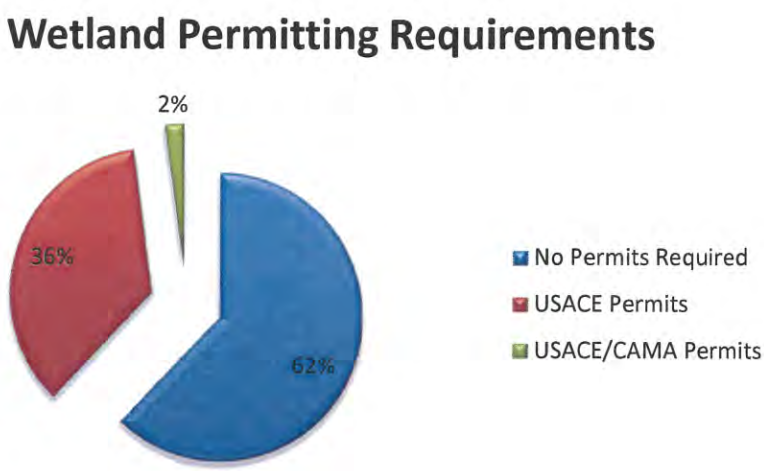


Previous Planning Efforts

- A number of plans were examined in detail to provide a robust understanding of the study area and the existing planning framework, most notably the precursor to the current planning effort, the 2007 Coastal Pender Collector Street Plan. Additionally, the following plans were also examined
- 2010 Pender County Comprehensive Parks and Recreation Master Plan,
- 2012 US 17/NC 210 Corridor Study,
- Cape Fear Transportation 2040 (Metropolitan Transportation Plan),
- 2010 Pender County Comprehensive Land Use Plan.

Environmental Conditions

Pender County, as a coastal county, includes substantial areas of wetlands. Additionally, the County is home to sensitive natural areas, including habitat for the Red Cockaded Woodpecker and the Venus Fly Trap. It was very important to consider wetlands and sensitive natural areas in programming collector streets. Indeed, 38 percent of the study area requires a permit to develop. Some areas in the vicinity of the Intracoastal Waterway, in particular, require both United States Army Corps of



Engineers (USACE) permits as well as Coastal Area Management Act (CAMA) permits to develop. It is also important to ensure that appropriate mitigation measures are in place to treat stormwater runoff. Appendix D provides an overview of applicable stormwater Best Management Practices (BMPs) for mitigating runoff from roadways.

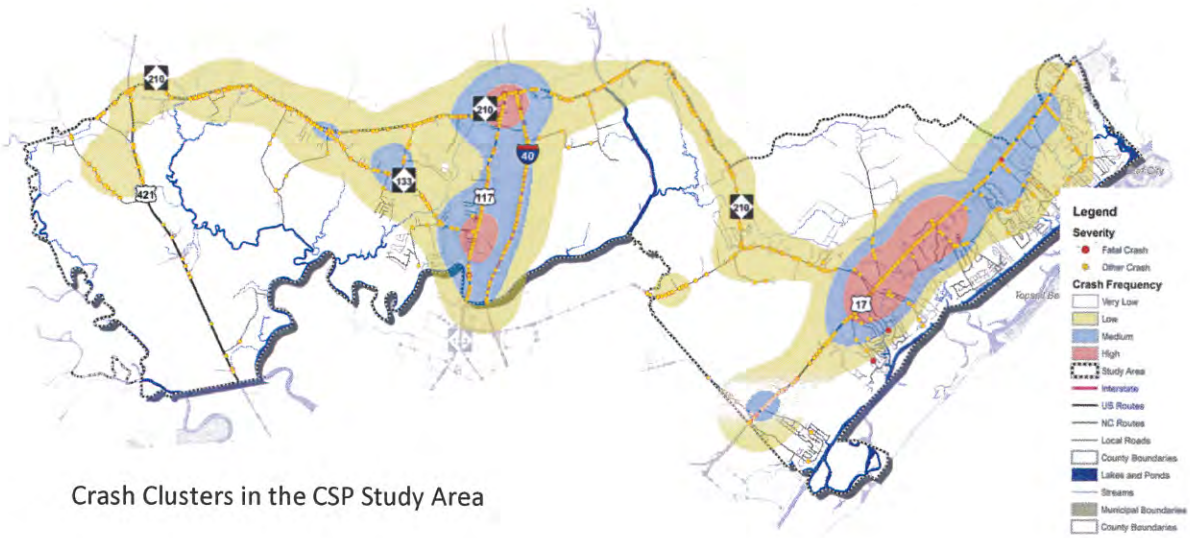
Existing Transportation Conditions

Several major arterials traverse the CSP study area, including US 17, US 117, US 421, and NC-210. Interstate 40 also bisects the study area. Many of these roadways are not currently at capacity, but are likely to experience increasing congestion as development continues to occur in the study area. There are two major roadway projects in the CSP study area, US 5732 and R 3300. US 5732 is a funded STIP project to improve access management along US 17 from Washington Acres Road to Sloop Point Loop Road, while R 3300 is the Hampstead Bypass. The Hampstead Bypass is currently unfunded.

US 17 in the CSP study area

Some collector streets are also extant in the CSP study area, including NC-133, Washington Acres Road, Country Club Drive, and Hoover Road, among others. Naturally, a system of local roads provides access to residents and businesses across the CSP study area. Pedestrian and bicycle facilities are generally not present to a large degree in the CSP study area, with some developer-built sidewalks present in some areas. However, there are plans for three rails-to-trails multi-use paths, the Coastal Pender Rail Trail, the Central Pender Rail Trail, and the East Coast Greenway, while two other trails, the Mountains-to-Sea Trail and Coastal Pender Greenway, are also planned. In terms of public transportation, no existing facilities can be found in the CSP study area, though three park-and-ride locations and transit stop amenity upgrades are planned in the WMPO Cape Fear Transportation 2040 plan.

With regard to transportation safety in the CSP study area, motor vehicle crashes are clustered along major arterial roads, with significant clusters along US 17, near NC-210 and US 117, and at US 117 and

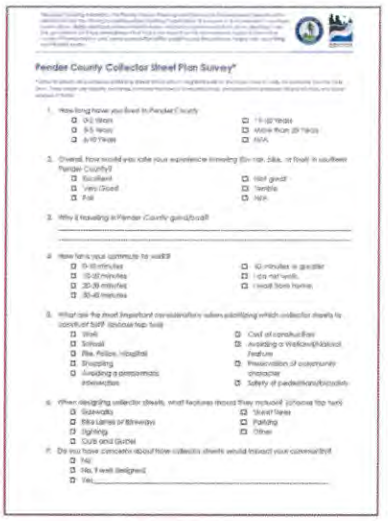


Crash Clusters in the CSP Study Area

NC-133. The graphic below provides further detail.

Public Input

A key component of this plan was outreach to the public. It was very important to get feedback from residents, business owners, and visitors to the CSP study area. The Steering Committee for the project met four times, while two general public meetings were also held. A survey was also created to solicit feedback from people. Over 110 people responded, providing the project team with a great deal of useful data. Generally, the public wants to see pedestrian and bicycle amenities on collector streets, are not concerned about the impact of collector streets if designed well, and rate wetlands as the most important features to avoid.


Pender County Collector Street Plan Survey*

Survey Document

Recommendations

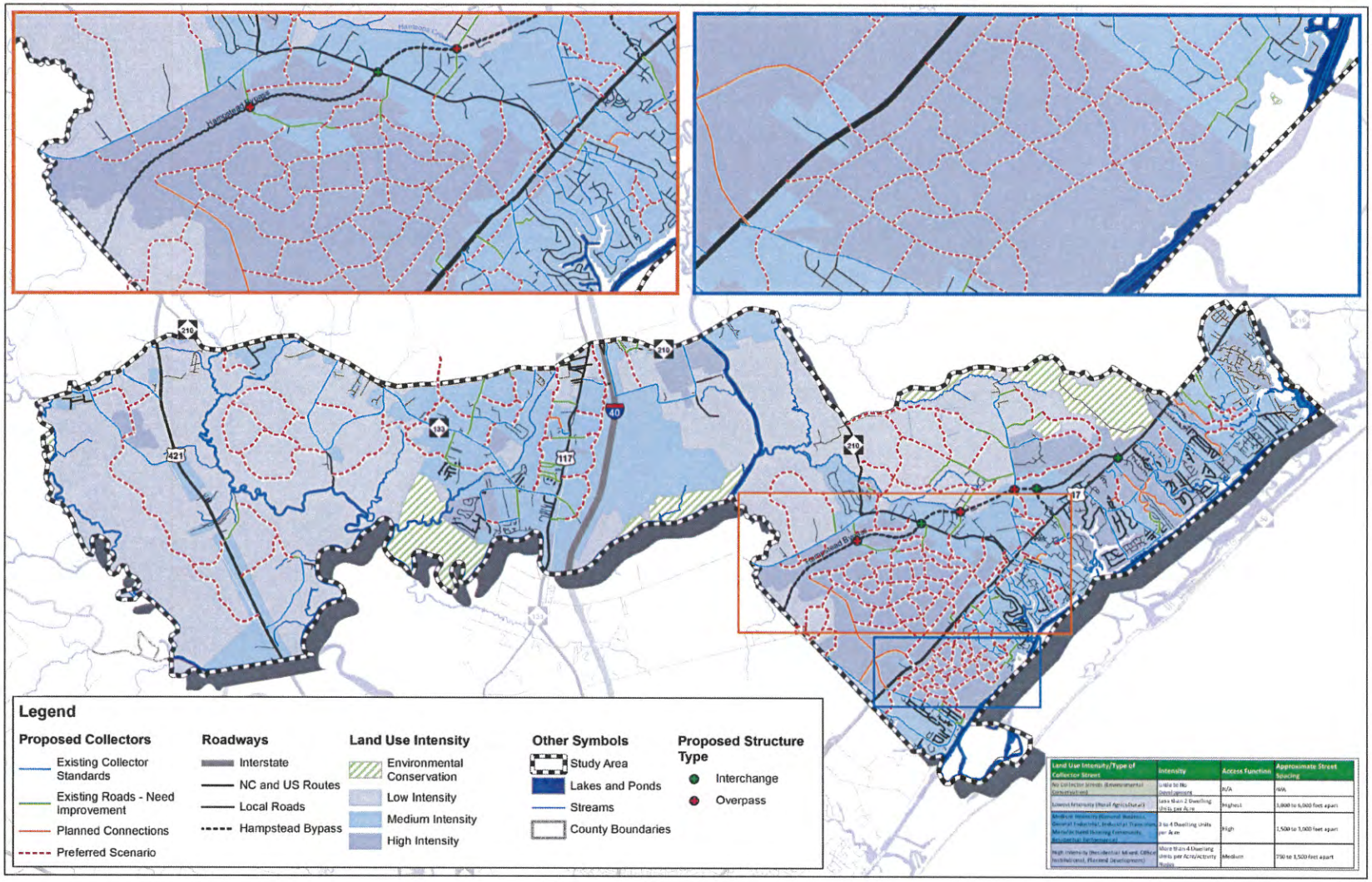
Using data from the public outreach and from the thorough examination of existing plans, while also remaining sensitive to the needs of emergency/school vehicles, the project team prepared a recommended collector street network for the CSP study area. Using spacing standards, which provide a metric for how many collector streets to provide based on the intensity of land use in an area, the project team assigned collector streets to specific locations in the CSP study area. Particular respect was given to avoiding sensitive natural areas, floodplains, and wetlands, while still ensuring that future development provides adequate back access and connectivity. The map on the following page displays the alignments, while Appendix B provides detailed aerial maps of the entire CSP study area.

Cross-Sections

A series of cross-sections were developed as part of this plan, ranging from a rural cross-section (best suited to areas with sparse development) to a neighborhood cross-section (designed to accommodate automobiles, pedestrians, and bicyclists in a more densely populated area). Using colors, each cross-section was assigned to a specific group, based on the intensity of land use in the area. If the roadway is programmed to be constructed by a developer, they may increase the cross-section to any higher level designation (group), but must construct collector streets to the minimum standards, in accordance with NCDOT standards and to the specifications provided in the cross-sections. More information and greater detail is provided in the Design Requirements section of this

Example Color-Coded Cross-Section

document. These cross-sections embody the desire of Pender County residents to see a Complete Streets design focus, i.e. a desire to include all users of the transportation system in street design, in any new streets constructed in the CSP study area.



Land Use Intensity/Type of Collector Street	Intensity	Access Function	Approximate Street Spacing
No Collector Streets (Environmental Conservation)	Little to No Development	N/A	N/A
Lowest Intensity (Rural Agricultural)	Less than 2 Dwelling Units per Acre	Highest	3,000 to 6,000 feet apart
Medium Intensity (General Business, General Industrial, Institutional, Transitional, Manufactured Housing Community, Residential Settlement A)	2 to 4 Dwelling Units per Acre	High	1,500 to 3,000 feet apart
High Intensity (Residential Mixed, Office Institutional, Planned Development)	More than 4 Dwelling Units per Acre/Activity Nodes	Medium	750 to 1,500 feet apart

Policy Strategies

In order to enact the recommendations and ensure that the proposed collector street connections are designed to a high quality standard, the project team prepared documentation of 11 policy measures. Each of these tables included a description of the policy, target performance measures, sample language, and a comments section. The policies examined as part of this plan can be found in the Policy Strategies section of this document and are listed below.

- Stormwater/Green Streets Policy Requirements
- Street Spacing and Access Standards
- Traffic Impact Studies Requirement
- NCDOT Complete Streets Design Manual
- Environmental Conservation Policy
- Tri-Party Agreement
- General Connectivity
- Stub-Out Requirements
- Bicycle and Pedestrian Accommodation
- Right-of-Way (ROW) Preservation
- "Paper Street" Reservation

In addition to examining policy measures, the project team also provided some design guidance with respect to a problematic intersection, NC-210 and Island Creek Road. This analysis follows the policy discussion section.

Funding and Action Plan

The final sections of this plan present an overview of some possible funding measures that Pender County can consider to support collector street construction and provide an action plan for implementing this plan. The funding options suggested as part of this planning effort include transportation bonds, impact fees, TIGER grants, private grants, and FAST Act funding. As Pender County does not build roads, it is anticipated that many of these collector streets will be constructed by the development community as available land continues to be developed in the CSP study area.

The Action Plan section provides a broad timescale for plan implementation. The following actions are programmed for the upcoming decade.

Action	Responsible Party	Timing
Adopt Pender County Collector Street Plan	Pender County Commissioners	Spring 2016
Research and Apply for FAST Transportation Funding (in coordination with the WMPO)	WMPO, Pender County Planning and Community Development Department	Ongoing
Pursue Funding to Implement Collector Street Recommendations (local, state, private)	Pender County Planning and Community Development Department	Ongoing
Pursue Grants, including TIGER and SRTS, to implement marquee projects, pedestrian and bicycle facilities	WMPO, Pender County Planning and Community Development Department	Ongoing
Adopt Policy Measures into County Ordinances	Pender County Planning and Community Development Department	Spring 2017
Develop Bicycle and Pedestrian Plan to Reflect Collector Street Plan Recommendations	WMPO, Pender County Planning and Community Development Department	2018-2020

Contents

Appendices 2
Acknowledgements 3
Pender County Collector Street Plan Steering Committee 3
Pender County Planning and Community Development Department 3
Wilmington Urban Area Metropolitan Planning Organization 3
Special Thanks to 3
Consultant Team 3
Introduction 4
What are Collector Streets? 4
Mission Statement and Purpose 5
Report Contents ..... **Error! Bookmark not defined.**
Existing Conditions 6
Background 6
History 7
Demographics 9
Commuting 10
Future Growth 11
Previous Planning Efforts 12
Environmental Conditions 17
Existing Transportation Conditions 19
Public Input 29
Meeting Summaries 30
Public Outreach 30
Survey 30
Conclusion ..... **Error! Bookmark not defined.**
Recommendations 33
Emergency/School Vehicles 33
Connectivity/VMT Reduction 33
Spacing Standards 34

Recommended Plan 35
Design Requirements 39
Cross-Sections 39
Cross-Section Categories 39
Land Use Intensity 39
Policy Strategies 49
Island Creek Road and NC-210 60
Funding 60
Action Plan 62
Sources 63

Appendices

Appendix A: Map Book
Appendix B: Detailed Connections Section
Appendix C: Wetlands Information
Appendix D: Green Streets Strategy Best Management Practices and Policy Guidelines
Appendix E: Survey Summary
Appendix F: Tri-Party Agreement

Acknowledgements

The development of the Pender County Collector Street Plan was a collaborative process involving numerous stakeholders, including the Pender County Collector Street Plan Steering Committee members, the Pender County Planning and Community Development Department, the Wilmington Urban Area Metropolitan Planning Organization, and members of the general public. We profoundly thank everyone involved for making this a successful project.

Pender County Collector Street Plan Steering Committee

David Piepmeyer, Pender County Commissioner
Hiram Williams, Chairman, Pender County Planning Board
Sonya Edens, Pender County Planning Board
Patrick Riddle, Division Planning Engineer, NCDOT
Adam Snipes, Transportation Engineer, NCDOT
Robert Vause, District Engineer, NCDOT
Karen Collette, Division 3 Engineer, NCDOT
Tommy Batson, Fire Marshal, Pender County
Ellen Cornette, Citizen
Bobbie Pufpaff, Citizen
Kevin Reynolds, Citizen
Chuck Strickland, Citizen

Pender County Planning and Community Development Department

Kyle Breuer, Planning Director
Megan O'Hare, Senior Planner

Wilmington Urban Area Metropolitan Planning Organization

Mike Kozlosky, Executive Director
Suraiya Montsinger, Senior Transportation Planner
Josh Lopez, Associate Transportation Planner
Beth Doliboa, Associate Transportation Planner

Consultant Team

Mike Rutkowski, P.E., AICP
Max Bushell, AICP
Scott Lane, AICP
Michelle Peele

Special Thanks to...

The citizens of Pender County for attending public meetings and providing valuable input.

Introduction

The Wilmington Urban Area Metropolitan Planning Organization (WMPO), in partnership with the Pender County Planning and Community Development Department, has commissioned this Collector Street Plan to determine future roadway connectivity needs in the southern portions of Pender County. The study area map is presented in Figure 1 below.

What are Collector Streets?

Collector streets are defined as streets that connect neighborhoods and local roads to the arterial roads. A few existing examples of collector streets in the study area are Country Club Drive, Sloop Point Loop Road, NC-133, and Hoover Road. These streets are typically two lanes, not more than two to three miles long, have speed limits between 25 and 45 mph, and carry lower volumes of traffic.

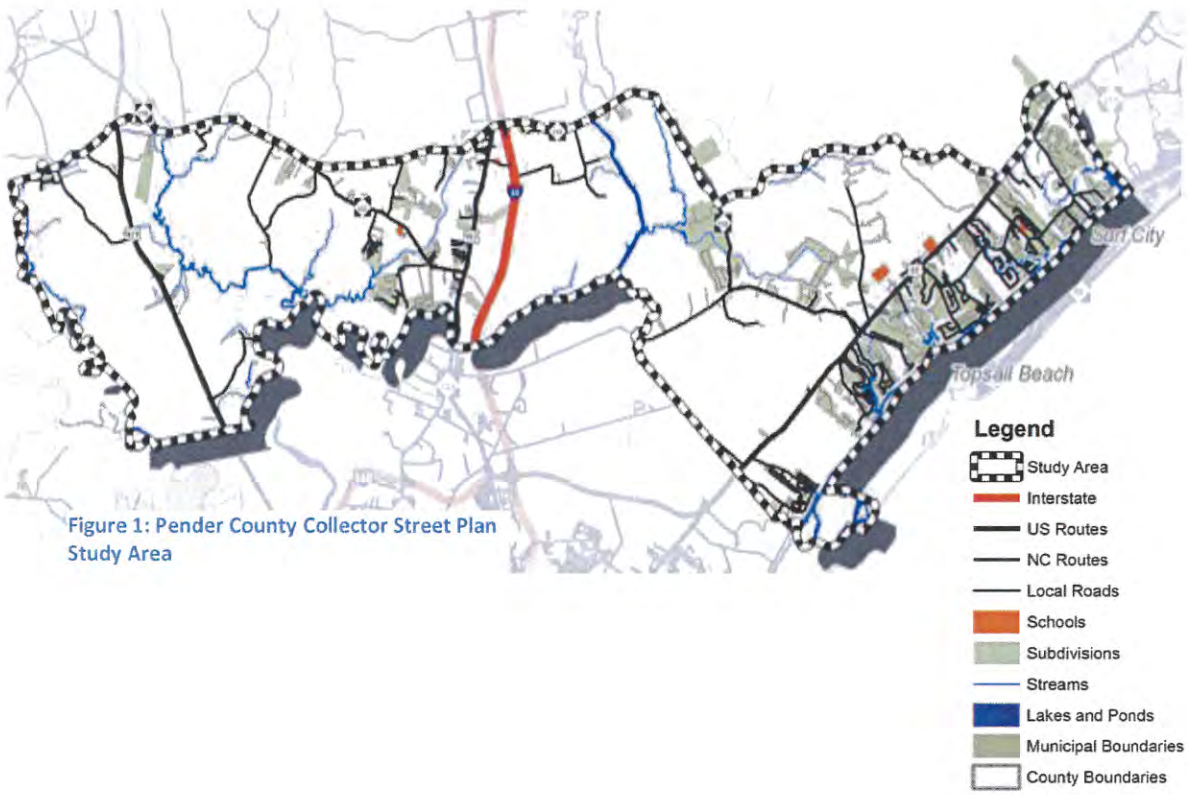


Figure 1: Pender County Collector Street Plan Study Area

Collector streets serve a number of important functions within the street network. They are very important in reducing congestion on arterial roads by equitably distributing the traffic burden so that shorter, local trips use the collector street system and long-distance trips remain on the arterial streets. Another important benefit is providing enhanced mobility opportunities for all users of the roadway, including emergency service providers, pedestrians, joggers, bicyclists, school buses, and municipal services. Pender County does not own or maintain roadways. Roads are either public and maintained by NCDOT or the roadways are private and maintained by private entities. Therefore, this plan is an important step toward ensuring that the development community that does build roads maintains appropriate connectivity across the study area.

Mission Statement and Purpose

The primary goal of the Pender County Collector Street Plan is to guide investment in new collector streets with the ultimate intention of improving connectivity, focusing land development in suitable areas, encouraging all modes of transportation, maintaining levels-of-service on existing roadways, promoting safety, ensuring that significant natural areas are conserved, and providing a safe and high-quality transportation system for existing and future residents, businesses, and visitors.

To achieve these goals, the Steering Committee, Pender County, and WMPO planners agreed on the following guiding principles and objectives for the Pender County Collector Street Plan.

- Develop a realistic and feasible network of collector streets that support the local street and arterial system
- Work with the development community to ensure proper connectivity and collector street design
- Be sensitive to environmental issues and "build in" context sensitive design approaches where applicable
- Integrate multimodal design features into the street design that support walkability and bikability

Existing Conditions

This section provides an overview of the project and information on the history, demographics, future growth, previous planning efforts, environmental conditions, and transportation in southern Pender County.

Background

The WMPO, whose jurisdiction includes seven (7) municipalities and three counties, is the primary organization responsible for regional transportation planning in the Wilmington metropolitan area. The portion of Pender County that is the focus of this collector street planning effort corresponds to the WMPO jurisdiction boundaries in Pender County. This area includes the unincorporated areas of Hampstead, Scotts Hill, and Rocky Point and parts of the Topsail, Long Creek, Holly, and Grady townships. The Pender County Collector Street Plan (CSP) study area encompasses 152 square miles. This CSP is a follow-up to the 2007 Coastal Pender Collector Street Plan and reflects the new boundary for the WMPO jurisdiction due to the designation of Wilmington as a Transportation Management Area (i.e. an urbanized area of over 200,000 people).

Growth is expected to continue in the study area, with much of the development in recent years centered around the Topsail Township and unincorporated Hampstead area (also unincorporated Scotts Hill). There is residential development along US 17, NC-210, and US 117. Industrial growth is planned along US 421 within the study area as well.

While rural land uses still dominate the outer reaches of the WMPO jurisdiction, significant infrastructure projects such as the proposed Hampstead Bypass and sewer investments will likely continue to spur growth to the west of US 17 in the Topsail Township of the study area. Additionally, the aforementioned industrial growth on US 421 will likely also serve as a catalyst for further development in the CSP study area.

Residential Suburban Development in the CSP Study Area.

This area is transitioning from primarily rural land uses to more suburban residential, commercial, and industrial development. As this occurs, the transportation network, which is comprised mostly of two-lane farm to market roads, will come under increasing strain. In order to accommodate future growth and allow for the efficient movement of people and goods in the CSP study area, a well-planned collector street system should be implemented. Collector streets serve as the conduit through which

people leave their homes on local streets and reach the major mobility carrying arterial streets, such as US 17, NC-210, US 117, and US 421. By planning a collector street network and working with the development community prior to significant land development in the area, traffic congestion can be more effectively managed in the long term, avoiding costly street reconstruction and widening projects. Additionally, the provision of collector streets can help direct growth to locations that are adequately serviced by roadway infrastructure, ultimately leading to the better use of public infrastructure investment dollars.

History

Settlement

European explorers first arrived in Pender County in 1524, reporting a surplus of wild game in the area. The county was gradually settled and in 1663, the Barbados commissioners explored and founded a community along the northeast branch of the Cape Fear River, naming the area Rocky Point. The town still exists today and retains the same name. Over the next fifty years, the population gradually increased and by 1725 the area was almost entirely settled. Officially, what we now know as Pender County was still part of New Hanover County until 1875.

Sloop Point Plantation: Courtesy of the Pender County Public Library.

The first European settlers of the area were Welsh, who came to settle the bottom land and take advantage of the tidal river transportation, though German and English settlers soon followed. The approximately 150 year period between 1725 and the United States Civil War saw sustained, if gradual, population growth in the area and commercial success. Large plantations were constructed during this period of prosperity, including the Sloop Point and the Belvidere plantations; the Sloop Point plantation house is still standing, while the Belvidere plantation house has since been demolished.

Migration continued unabated through the Revolutionary War. Between 1763 and 1775, nearly 20,000 Scots moved to the Cape Fear region, augmenting the already diverse population in the area. However, in the early 1800s, technological advances in New England and settlement of cheap land to the west led people to leave eastern North Carolina, accounting for the slow pace of growth in the area. The advent of the railroad in 1840 changed this dramatically and led to a resurgence of both population and economic development in Pender County.

Revolutionary and Civil Wars

Residents of Pender County played an important role in both the Revolutionary and United States Civil Wars, fighting and winning a crucial battle against the Scottish Highlanders at Moores Creek, just northeast of Montague in 1776. In the United States Civil War, the area sent nearly 4,000 troops to war and was home to the youngest Confederate General, William D. Pender, after whom the County is named. He was killed in the Battle of Gettysburg in 1863.

Following the Civil War, the local plantation system declined, though much of the population continued to work in farming, clamming, fishing, and salt making among other professions. During the tumultuous Reconstruction era, local political machinations led to the formal creation of the County from the northeastern area of New Hanover County. The first Pender County seat was Watha, but was later moved to Burgaw, named after the local Native American tribe.

Transportation through the Years

Prior to the 19th Century, transportation in Pender County was restricted primarily to waterways, with Wilmington achieving important status as a trading hub at the terminus of the Cape Fear River, the only river in the state directly accessible to the ocean. Gradually, however, roads become more and more important as farmers needed a more direct link to markets for their goods. The first roads were cleared to provide access to river wharfs, but as time passed, more and more roads were constructed, eventually becoming the ideal mode of transportation for most Pender County residents.

Rocky Point Railyard: Courtesy of the Pender County Public Library.

In 1836, construction on the railroad line between Wilmington and Weldon in Halifax County began, connecting rural eastern North Carolina counties with Washington D.C. and New York. The development of the railroad had major impacts on life in Pender County, opening new markets for agricultural goods and facilitating passenger travel. Additionally, plank roads began to be constructed during this time. Plank roads are the precursor to asphalt roadways. Initially, these roads provided better access to railroads, but soon became important pieces of transportation infrastructure in their own right.

Into the 20th century, roads continued to be the most important infrastructure, while the railroad system gradually became obsolete. Passenger service was discontinued in 1939, though freight lines still operated on the Pender County railroad until the 1980s. In the early 20th Century, old plank roads, such as the Holly Shelter Plank Road, Duplin Road, and Clinton Road, were improved substantially, becoming US 17, US 117, and US 421, respectively. Over the course of the century, these roads were further

improved, while the interstate highway system was also constructed. Interstate 40 was originally planned to end in Morehead City, but the plans were revised and the interstate terminated in Wilmington instead.

The Current Day

In the current day, Pender County's economy is predominantly comprised of farming and manufacturing enterprises. Agricultural products include blueberries, strawberries, tobacco, soybeans, and livestock, while factories produce clothing, food and pressure sensitive labels.

Pender County is located on the coastal plain in Southeastern North Carolina and includes six towns and seven communities. The incorporated Town of Burgaw, located to the north, is the county seat and the location of many of the County government buildings. With a land area of 869.79 square miles, Pender County is the fifth-largest county in North Carolina by land area.

The Cape Fear River forms the southern bounds and then traverses the study area east of I-40, while the Black River serves as the western study area boundary. The NE Cape Fear River and six creeks, including Long Creek, Morgan's Creek, Turkey Creek, Harrison Creek, Godfrey Creek, and Cross Creek make up the other significant water features in the area. The study area abuts the Intracoastal Waterway on the eastern side.

The CSP study area contains five significant highway facilities. Both NC-210 and NC-133 provide east-west mobility and access across the study area, while US 421, US 117, and US 17 serve as north-south roadways. Interstate 40 also bisects the County on a north-south axis. Collectors and local roads provide access to shopping, business, and residential land uses in the study area.

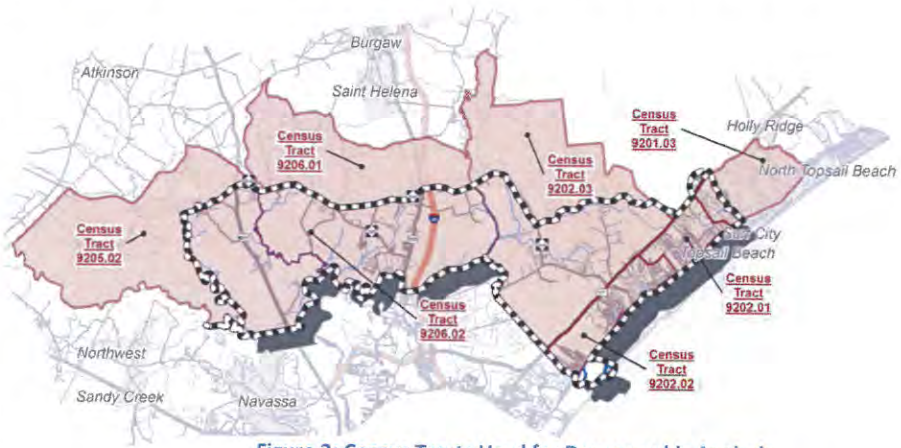


Figure 2: Census Tracts Used for Demographic Analysis

Demographics

The Pender County Collector Street Plan (CSP) study area does not exactly correspond to United State Census Block Group or Census Tract boundaries. For ease of analysis and understanding, Census Tracts and Pender County as a whole are used to calculate demographics. Census data from the 2010 Decennial Census was used to determine population statistics for the Census Tracts referenced in Figure 2. Overall, 30,505 people reside in these Census Tracts, with 85.26 percent identifying as white, 8.8 percent identifying as African-American, 0.6 percent identifying as Native American, and 0.5 percent as Asian. People identifying as belonging to some other race account for 2.8 percent of the population of the study area, while 1.9 percent identify as belonging to two or more races. Approximately 5.5 percent of people are Hispanic or Latino in this area.

Due to the substantial population changes in Pender County, Census Tract boundaries were significantly altered between the 2000 and 2010 Decennial Censuses. As such, comparing population in our specific study area between these two time periods lacks utility for this project. However, in comparing between the 2010 Census and the 2013 American Community Survey, Census tract boundaries remained the same. Overall, the area has seen some population growth, with an estimated population of 31,533 in 2013. Of the workers aged 16 or over in the selected Census Tracts, almost 80 percent travel to work by driving alone, while 15.6 percent carpool, and less than 1 percent walk, bike, or take public transportation. The median household income for these Census Tracts ranges from $41,867 to $68,152, with an average median household income across all Census Tracts of $48,951. The highest median income is in Census Tract 92.02, which contains the unincorporated community of Hampstead.

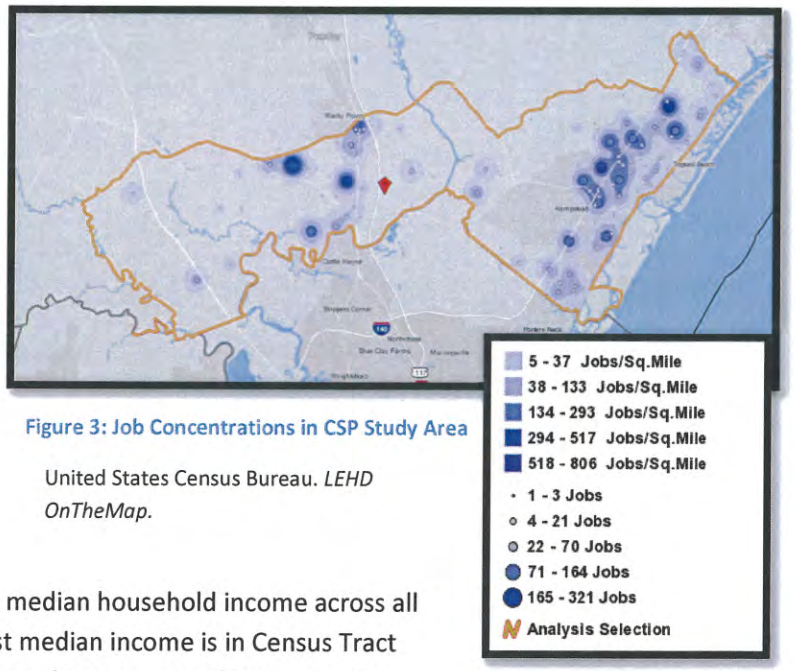


Figure 3: Job Concentrations in CSP Study Area

United States Census Bureau. *LEHD OnTheMap.*

Commuting

In examining primary jobs and commuting patterns, the exact CSP study area boundary was used. Overall, jobs are mostly congregated around the Topsail Township and the more densely populated areas to the east and west of US 17, while areas along US 117, US 421 and NC-133 are also job centers in Pender County, as indicated in Figure 3.

There are 973 people who both live and work in the study area. Less people are commuting to the study area to work from other places at 2,266, while more people live in the study area, but work elsewhere at 10,230 (Figure 4). With this in mind, it is clear that the CSP study area supports a large commuting residential population. Figure 4 indicates that 83 percent of the working population of the CSP study

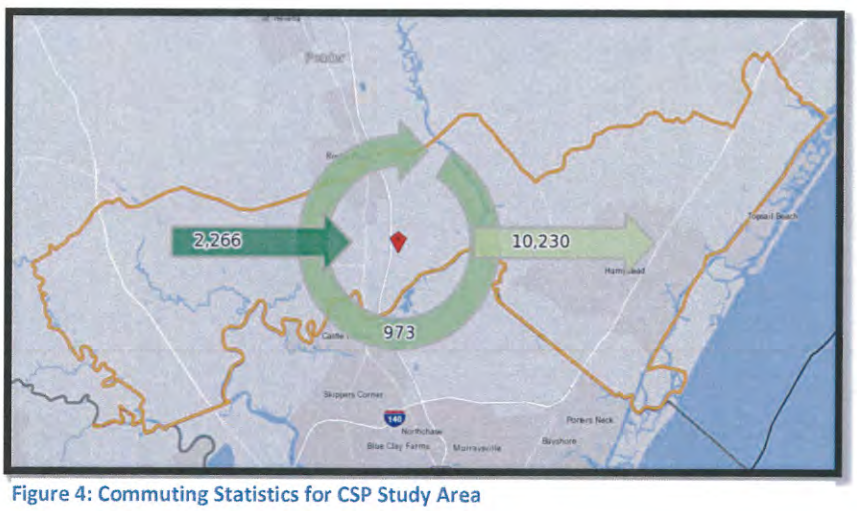
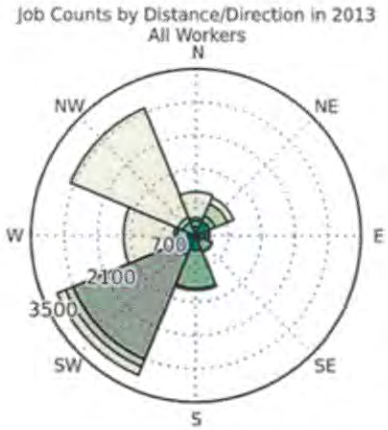


Figure 4: Commuting Statistics for CSP Study Area

area commutes more than 10 miles to work, with nearly half traveling between 10 and 24 miles to the major urban and employment center of Wilmington, NC. Jacksonville and area military bases are also large employers and represent significant employment destinations for residents of the study area. A significant portion, accounting for 39.4 percent of people, are also commuting northwest from the CSP study area, likely to industrial and commercial centers in the interior of Pender County and in nearby counties. These commuting trips are predominantly for distances of 50 miles or more. Across the CSP study area, average commute times ranged from 25 to 31 minutes (see Figure 5). Overall, these commuting patterns reflect the fact that the study area serves as the location for many homes, but for substantially fewer employers. With such a large commuting population and further development forecast in the area, it will be very important to maintain major mobility carriers at relatively uncongested levels.



Jobs by Distance - Home Census Block to Work Census Block	2013 Count	2013 Share
Total Primary Jobs	11,203	100.0%
Less than 10 miles	1,839	16.4%
10 to 24 miles	4,212	37.6%
25 to 50 miles	733	6.5%
Greater than 50 miles	4,419	39.4%

Figure 5: Commuting Distances in the CSP Study Area

Of the 3,239 primary jobs in the study area, 21.6 percent are held by people aged 29 or younger, 57 percent by people aged 30 to 54, and 21.4 percent by people aged 55 or older. The most prevalent type of employment in the CSP study area is educational services, which accounts for 20.7 percent of all jobs. Other major job sectors include health care and social assistance (11 percent), retail trade (10.7 percent), construction (9.6 percent), and accommodation and food service (8.9 percent). Agriculture, Forestry, Fishing, and Hunting, historically the leading employment sector in Pender County, now only accounts for 6.2 percent of all jobs.

The most prevalent type of employment in the CSP study area is educational services, which accounts for 20.7 percent of all jobs.

Future Growth

According to the North Carolina Office of State Budget and Management, Pender County as a whole is projected to grow by 11,201 people between 2010 and 2020, roughly a 22 percent increase. The rate of growth continues the existing trend in Pender County between 2010 and 2014, a period which experienced growth in excess of 5.8 percent overall. Looking further into the future, Pender County is forecast to grow by a further 18 percent between 2020 and 2030.

As the County is growing at a rapid rate, much of the projected growth is likely to fall in areas of Pender County close to the Atlantic coastline and in proximity to existing community nodes and metropolitan areas. The CSP study area will likely see a substantial population boost as the Wilmington metropolitan area continues to expand, while Jacksonville and area military bases will also continue to spur growth in this area. Residential growth will also likely continue along the major highways in the study area. These

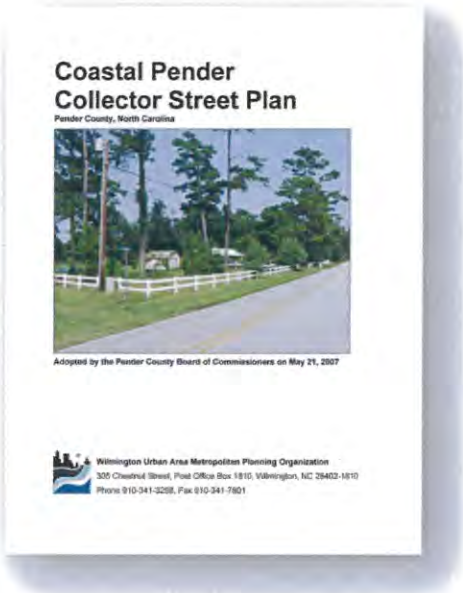
areas are particularly ripe for development due to the appeal of a rural living with quick access to Wilmington on US Routes and Interstate 40.

In many cases, rapid land development can leave transportation planners with few options to improve the transportation networks in an area. Constructing new roads or widening existing roads after surrounding parcels have developed is often a controversial and costly process. With new development adding further pressure to the existing roadway network in the CSP study area, the need for a Collector Street Plan that prioritizes roadway investments, is based on community input, and focuses new roadway construction in areas away from sensitive natural features cannot be overstated.

Previous Planning Efforts

The first step in the planning process was to gather existing planning documents. A number of plans were examined including;

- 2007 Coastal Pender Collector Street Plan,
- 2010 Pender County Comprehensive Parks and Recreation Master Plan,
- 2012 US 17/NC 210 Corridor Study,
- Cape Fear Transportation 2040 (Metropolitan Transportation Plan), and
- 2010 Pender County Comprehensive Land Use Plan.



2007 Coastal Pender Collector Street Plan

The Coastal Pender County Collector Street Plan is the guiding document for the planning of new collector streets within a small area of coastal Pender County. The plan expounds on the background, history, demographics, and future growth potential within the study area, while also detailing the previous plans and studies relating to collector streets. This plan created specific recommendations for new collector streets based on public outreach and also suggested implementation strategies.

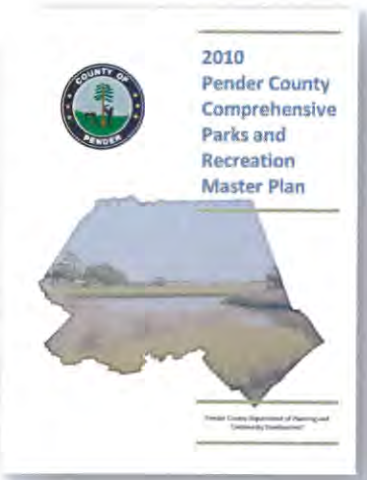
Relationship to the Pender County Collector Street Plan Project

This plan serves as a precursor to the current Pender County Collector Street Plan effort. The current planning effort encompasses the entire Wilmington Urban Area Metropolitan Planning Organization jurisdiction within Pender County, a much larger area than the area examined in the 2007 Coastal Pender Collector Street Plan. This larger area is the result of the WMPO designation as a Transportation Management Area, which expanded the WMPO's boundaries to encompass larger areas of Pender County. The 2007 Coastal Pender Collector Street Plan only addresses collector streets in a small area of north of the New Hanover County line focused on the Topsail Township and the community of Hampstead. This plan is bounded by the Holly Shelter Game Lands on the west and Sloop Point Loop Road in the north and represents a significant population node in Pender County.

The recommendations of this plan include a number of new collector streets as well as new arterials. While some collector streets are proposed in areas between US 17 and the Intracoastal Waterway to improve the current road network, the majority of recommended new collector roadways are located between US 17 and the study area boundary to the west due to land available for development in these areas. Some existing roads are extended to make new connections, such as Godfrey Creek Road, Holiday Drive, and Wolf Pond Road, while a large number of new collector roads are recommended in the areas between Island Creek Road and US 17. These recommendations will be re-evaluated as part of this planning effort and will serve as the basis for recommendations in the 2016 Pender County Collector Street Plan. However, the lack of an environmental analysis component in the 2007 Coastal Pender Collector Street plan requires that any recommendations from this plan be vetted extensively to ensure that construction is feasible before inclusion in the current planning effort.

2010 Pender County Comprehensive Parks and Recreation Master Plan

The 2010 Pender County Comprehensive Parks and Recreation Master Plan provides a framework for the development of future parks and recreation opportunities in Pender County and also catalogs existing facilities and supportive programs. A substantial public outreach effort was conducted as part of the Plan, which helped identify critical parks and recreation needs and provided insight into the desires of Pender County citizens with regard to recreation opportunities, particularly with respect to the provision of pedestrian and bicycle facilities. The Plan also recommended new park and recreation facilities and identified funding solutions while also addressing proposed bicycle and pedestrian facilities in Pender County.



Relationship to the Pender County Collector Street Plan Project

This Plan recommends numerous parks and greenway facilities in the Pender County Collector Street Plan (CSP) Study Area. Two waterway access areas are proposed in the plan. The first water access, at the terminus of Lewis Road, has been completed and another in the Scotts Hill area has yet to be completed. Additionally, this plan recommends a number of new parks including the Scotts Hill Community Park in the Scotts Hill area, the Island Creek Neighborhood Park in the vicinity of the intersection of NC Highway 210 and Island Creek Road, and the Rocky Point Regional Park near the Heide Trask High School in Rocky Point just outside the CSP Study Area. Other possible parks include the Cape Fear Neighborhood Park near the Cape Fear Elementary School east of Rocky Point on NC-133, the Long Creek Community Park situated at the terminus of Montague Road at NC-210, and the Sand Ridge Neighborhood Park along US 421. The Sand Ridge Neighborhood Park would serve as a trailhead for the West Pender Rail-Trail. If implemented, these proposed new parks would be likely to generate pedestrian, bicycle, or vehicular traffic on mainline roads and may necessitate other access via new collector streets.

This Plan also identifies recommended bicycle and pedestrian projects in the Study Area. The proposed Coastal Pender Greenway would utilize the Duke Energy's easement, extending from NC-210 near Island Creek Road north to NC-210 near Surf City, ultimately connecting pedestrian and bicycle facilities in Surf City to facilities in New Hanover County. The Coastal Pender Rail-Trail, the Central Pender Rail-Trail, and the West Pender Rail-Trail are also recommended, the first along US 17, the second along the rail corridor parallel to US 117, and the third running parallel to US 421 as indicated in Figure 21.

2012 US 17/NC-210 Corridor Study

US 17 and NC-210 are both vital mobility carriers within the Pender County Collector Street Plan (CSP) study area. This study was convened to identify near-term strategies to address safety and mobility issues on US 17 and NC-210. Ultimately, the goal of this study was to address safety and mobility deficiencies on US 17 and NC-210 in Hampstead and identify strategies to reduce the rate of injuries and fatalities in traffic crashes, reduce delay, and improve the road for pedestrians and bicyclists. Both crashes and pedestrian and bicycle mobility are key issues on this corridor. In fact, a pedestrian facility is planned on US 17 between Washington Acres and Sloop Point Loop, which will support safe pedestrian travel along the corridor. Planning and environmental studies on US 17 resulting from this plan has been programmed in the State Transportation Improvement Program (U-5732 – Superstreet Conversion).

Relationship to the Pender County Collector Street Plan Project

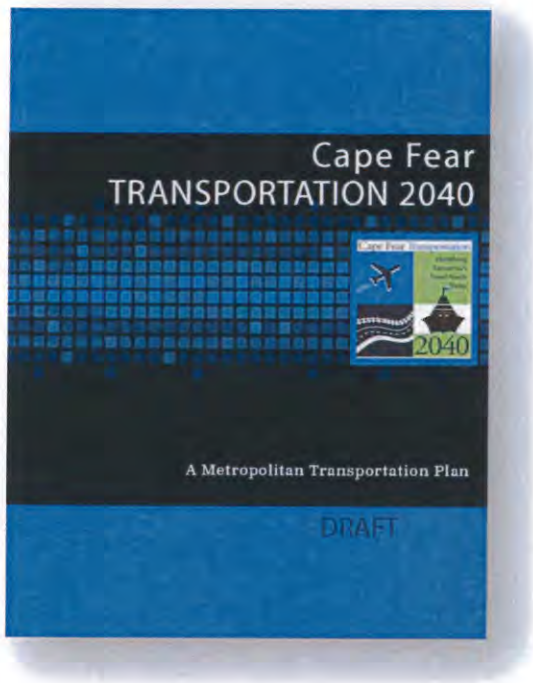
As both US 17 and NC-210 are key roads within the CSP, the proposed improvements will have a tangible effect on traffic volumes as well as access management, including a reduction in left turn volume. It is possible that by reducing left turning movements on US 17, the demand for cross-access via collector streets will become even more important, particularly in the areas east of US 17. These proposed roadways are included in this plan as priority new collectors.

Cape Fear Transportation 2040

The Cape Fear Transportation 2040 plan, prepared by the WMPO, is the Metropolitan Transportation Plan for the Wilmington Urban Area. This plan is designed to present a fiscally-constrained vision of transportation projects within a twenty-year time horizon. This plan includes a substantial public outreach effort and addresses six areas of transportation; aviation, bicycle and pedestrian, ferry and water transportation, freight and rail, mass transportation, and roadways. A robust public involvement process provided the basis for many of the recommended projects and policies.

Relationship to the Pender County Collector Street Plan Project

This plan prioritizes improvements within the CSP study area and also provides some information about growth in the Pender County portion of the WMPO area. Notably, employment is forecast to grow substantially in area west of US 421, while population is forecast to grow across the entire CSP study area.



No ferry and water projects are identified in the Pender County area, while only one freight/rail project extends to the study area, namely a rail line extension from Invista to Pender Commerce Park, located along US 421 in the CSP study area (FR-6).

Three bicycle and pedestrian projects within the CSP study area are identified, including proposed sidewalks along Jenkins Road from US 17 to Saint Johns Church Road (BP-70), Saint Johns Church Road from Jenkins Road until it ends (BP-72), and Masters Lane from Doral Drive to Sloop Point Loop Road (BP-73). These improvements were included in this study.

Some mass transit improvements are forecast for the CSP study area, mostly in the form of Park and Ride locations, but also in the form of transit stop improvements in the Topsail Township. The Park and Ride locations are located at US 421 and Cowpen Landing Road (MT-128), and US17 at NC-210 in the shopping center parking lot (MT-39), and US 17 at Sidbury Road (MT-75). Transit stop improvements are located at US 17 at NC-210 (MT-18), US 117/NC-133 at Old Blossom Ferry Road (MT-120), and US 421 at Blueberry Road (MT-121). These improvements were examined as part of this study.

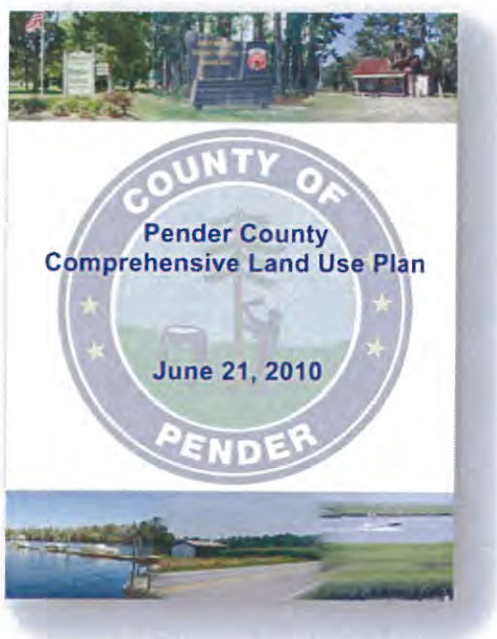
Major roadway improvements are also proposed as part of this plan. These improvements include a superstreet on US 17 between Washington Acres Road and Sloop Point Loop Road (R-12); improvements to NC-210 between Island Creek Road and US 17 (R-36); the Hampstead Bypass, which stretches from Porters Neck Road to Sloop Point Road (R-38); and intersection improvements at Country Club Drive/Doral Drive and Sloop Point Loop Road (R-39). Any roadway improvements should align with the proposed cross-sections as detailed in this plan.

This plan also details information about environmental justice in the CSP area. There are substantial areas with low income populations and populations without access to vehicles in the CSP, mostly along the northern edge of the study area boundary.

2010 Pender County Comprehensive Land Use Plan

The 2010 Pender County Comprehensive Land Use Plan is the main planning document for land use planning in the County and provides guidance to support orderly growth and development. Over the course of the planning process, two main steps were realized by local planners and citizens. The first was to prepare a comprehensive land use planning document that sets goals and policies for the future, while the second was to update regulatory standards, procedures, and combine freestanding ordinances into a unified development ordinance. Overall, the planning process was designed to promote consensus among stakeholders to build broad support for established goals, provide the basis for development of design standards and regulations, and establish the need for coordination among County departments and with other units of government.

Conforming to ten key smart growth tenets, this plan advocates for a mix of land uses; compact building design; a range of housing choices and opportunities; walkable communities; distinctive and attractive communities with a strong sense of place; preserving open space, environmental areas, and farmland; strengthening development towards existing communities; providing a variety of transportation choices; making decisions fair, predictable, and cost effective; and encouraging collaboration from citizens and stakeholders. This plan addresses growth management, infrastructure, development patterns/community appearance, housing and community development, natural resources, historic and cultural preservation, parks and recreation, open space, waterway access, agricultural preservation, hazard mitigation, economic development, small area plans, and the procedures for amending the Comprehensive Plan. This plan also presents a series of important maps, most notably the future land use maps for different areas of the County.



Relationship to the Pender County Collector Street Plan Project

As the main document directing development in Pender County, the plan advocates for development around existing communities, the preservation of rural and agricultural lands, and the avoidance of areas subject to floods, wetlands, high winds, or wildfires. In addition, water and sewer should not be extended to areas designated as rural growth areas as identified in the 2010 Comprehensive Land Use Plan. Any proposed collector streets were vetted carefully in light of these recommendations. Also, this effort used zoning designations to help identify collector street spacing standards based on the level/density of planned future development. These standards are discussed in greater detail in subsequent sections.

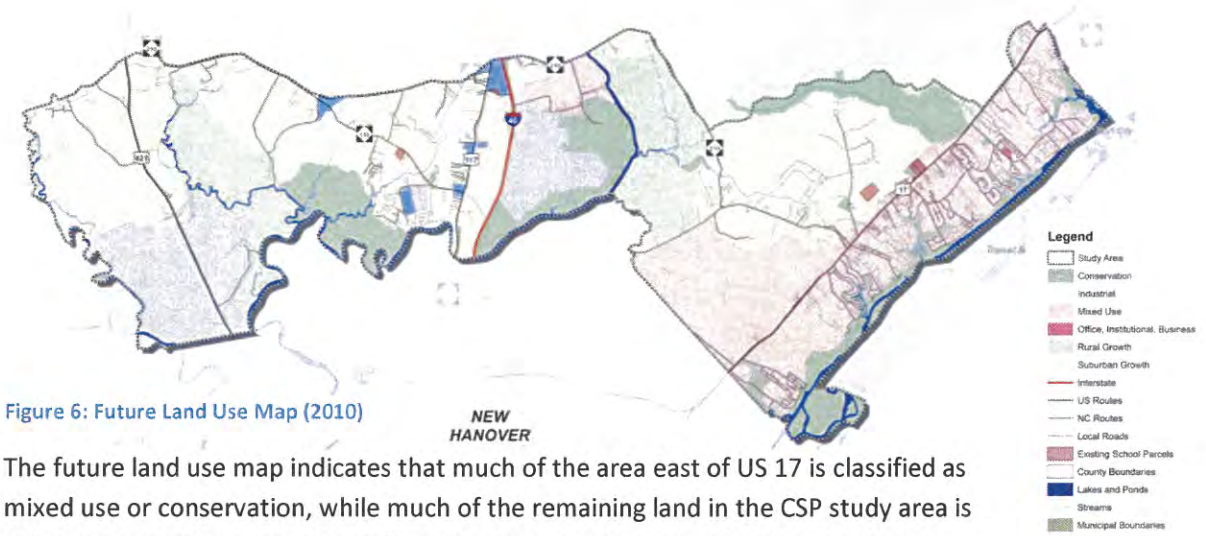


Figure 6: Future Land Use Map (2010)

The future land use map indicates that much of the area east of US 17 is classified as mixed use or conservation, while much of the remaining land in the CSP study area is slated for rural or suburban growth, with some areas reserved for conservation purposes, particularly close to the NE Cape Fear River. The land uses in three Small Area Plan geographies are also presented in this document. The Coastal Pender Small Area Plan is primarily noted as mixed use, though an area of suburban growth is indicated to the west of US 17, north of NC-210, and bounded by the Holly Shelter Game lands in the north. The Rocky Point Small Area Plan is centered approximately on the interchange of NC-210 and I-40 and US 117. Land uses are varied in this area, with industrial areas in the southeast, rural growth in the northeast, mixed use in the northwest, and suburban growth with some conservation areas in the southwest. The US 421 South Corridor Small Area Plan is a linear planning area running along US 421 north from the New Hanover County border. The southern portion of the planning area is consumed by a large industrial parcel, while the middle section is designated as a suburban growth area. Farther north, the area is slated to develop as a mixed use area. The future land use map is located in Figure 6.

Any proposed collector streets should support the land uses indicated in this plan. This plan is scheduled for an update in coming years.

Environmental Conditions

Pender County is also known as one of the few natural habitats for the Venus Fly Trap, which is found only in the Carolina Bay region within a seventy-five mile radius of Wilmington. Red Cockaded Woodpeckers are prevalent in this area as well. Pender County contains some notable conservation areas, including the southern portion of the Holly Shelter Game Lands, parts of the Cape Fear River Wetlands Game Lands, and areas of the North Carolina Coastal Land Trust Preserves.

Venus Fly Trap, Pender County: Courtesy of the Pender County Public Library.

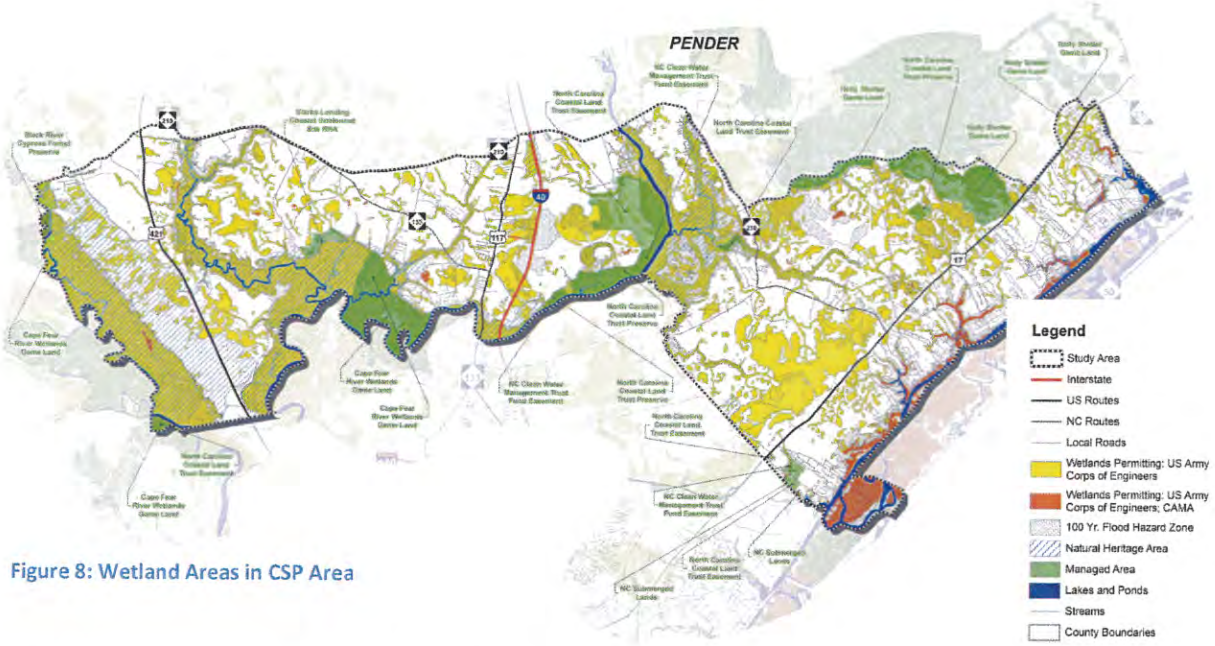


Figure 8: Wetland Areas in CSP Area

As a coastal county, Pender County has significant environmental features that have the potential to limit development. In particular, substantial parts of the County are covered by wetland areas. Though buildable in some cases, these areas often require United States Army Corps of Engineers (US ACE) permits and/or North Carolina Coastal Area Management Act (CAMA) impact permits, which can make development more complex and more time-consuming. These lands also support a diverse array of wildlife and serve other important functions including water filtration and flood protection. Appendix B indicates those wetlands that will likely not require permitting to develop, the wetlands which require a US ACE permit, and those that require both a US ACE and CAMA permit to develop, while 7 indicates the location of these areas within the study area. This map is also located in Appendix A, the map book for this document. Figure8 indicates the percentage of the study area that requires permitting to build.

With population increasing substantially in Pender County, sensitive environmental areas are under increasing pressure from development; it is fundamentally important to protect, manage, and minimize impacts to important environmental areas to ensure that the natural legacy in Pender County is maintained for future generations.

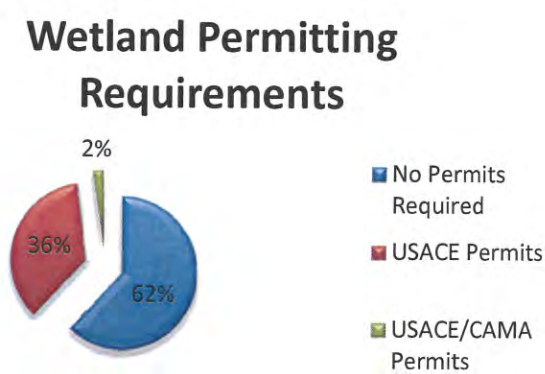


Figure 7: Wetland Permit Requirements

Additionally, irrespective of whether developable lands support uses that are rural or urban in character, Pender County residents expect clean water, while federal and State regulations mandate that land remain unpolluted and air quality is maintained at an acceptable level, as determined by North Carolina

standards. Meeting the twin goals of providing clean water and air and reducing pollution will require that sensitive natural areas be preserved from development, whether it is public or privately funded.

The careful examination of environmental permitting requirements and conservation areas indicates the challenge the County faces in constructing new collector street connections. In order to fulfill the County's commitment to preserving sensitive natural areas, collector streets must be developed in such a way as to avoid these areas or to mitigate the impact of new road construction to ensure that these connections are developed with the least environmental disturbance.

NCDOT Crews Prepare for a Tropical Storm, Flickr: NCDOTcommunications 2004.

Existing Transportation Conditions

Arterial Streets

Referencing NCDOT Geographic Information Systems (GIS) data for Pender County, there are a number of roadways that fall into the category of arterial roads in the CSP study area. Arterials are defined as roads that provide the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control. Essentially, the primary function of these roads is to support mobility between destinations. These roads provide less accessibility to nearby properties, though some arterials do support access to adjacent land uses. With regard to functional classification, these roadways fall between collector streets and interstates.

In the CSP study area, three US routes and two NC routes constitute the arterial system. One interstate, I-40, is also present in the study area running north-south. US 17, US 117, and US 421 all provide north-south access as well, while NC-210 provides east-west mobility across the study area

US 17

US 17 begins in Punta Gorda, Florida and snakes up the eastern coastline north to Winchester, Virginia. US 17 provides mobility in a north-south direction from Wilmington in the south towards Jacksonville in the north, running parallel to the Intracoastal Waterway. It is duplexed with NC-210 between Hampstead and Surf City and runs for 12.6 miles within the project study area. Beginning at Sidbury Road on the southern edge of the CSP study area and continuing as far north as Pearson Lane, US 17 is a four-lane divided full-access facility, configured by NCDOT as a "superstreet". The "superstreet" facility includes signalized left-turn facilities, U-turn crossovers, and bulb-outs to allow for tractor-trailer U-turn movements. Left-turning movements from driveways and cross-streets are mostly restricted, but are allowed at certain locations. North of Washington Acres Road, US 17 becomes a five-lane, undivided facility with a two-way, left-turn lane through Lodge Road, before the roadway reverts back to a four-

lane, divided section with unrestricted median breaks at most major roadway cross-street intersections. There are currently 11 signals along US 17 in the CSP study area, of which three are signalized left turns and seven are fully signalized. These signalized left turns are located at Sidbury Road, at Scotts Hill Loop Road in the northbound direction only, and at a bulbout approximately 1/3 of a mile north of Scotts Hill Loop Road in the southbound direction only. The fully signalized intersections are located at NC-210/Dan Owen Drive, at Hoover Road, at the Bailey Shoppes commercial amenities approximately 2,000 feet north of the Hoover Road intersection, at Jenkins/Country Club Drive, at the Hampstead Town Center located approximately 1,400 feet north of Country Club Drive, at Vista Lane/Topsail Middle and High School access, and at Sloop Point Loop Road. One emergency traffic signal is in operation at the Hampstead Volunteer Fire Department.

US 17 in the Pender County Collector Street Plan Study Area

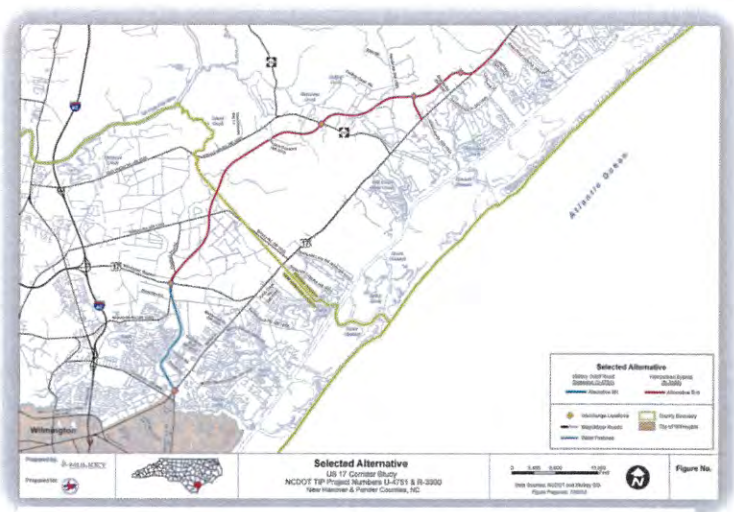
There is a funded STIP project to convert existing US 17 to a superstreet (U 5732), which will implement important access management upgrades along US 17 from Washington Acres Road to Sloop Point Loop Road, ultimately reducing traffic congestion in this area.

Running parallel and occasionally joining I-95, US 17 runs for 1,206.47 miles and has been in existence since 1926. Volumes along US 17 range from 38,000 vehicles per day (vpd) in the southern portion of the CSP study area to 36,000 vpd in Hampstead and 28,000 vpd leading to the split with NC-210 just north of the CSP study area boundary.

This roadway is also used as a primary hurricane evacuation route and serves the military between Camp Lejeune, the Port of Wilmington, and Military Ocean Terminal at Sunny Point.

Hampstead Bypass (R 3300)

The Hampstead Bypass was originally identified in the 1997 Thoroughfare Plan for Pender County as a proposed principal arterial, running parallel to US 17. Beginning just south of Sloop Point Loop Road and rejoining US 17 at Porters Neck



Proposed Hampstead Bypass Alignment

with the existing and planned portions of the I-140 bypass around the City of Wilmington. The Hampstead Bypass would provide higher speed controlled access around the unincorporated community of Hampstead. This roadway is recommended to improve not only traffic carrying capacity, but also to improve safety in this heavily traveled corridor.

The STIP identifies this project as R-3300. As of September 2015, the final environmental document for this project, the State Record of Decision (SROD) has been completed and indicates that the selected alternative is M1+E-H. This project is currently unfunded.

US 117

US 117 is a two-lane arterial road with occasional turn lanes that traverses the study area just to the west of I-40 in a north-south direction. Running from Wilmington to Wilson, US 117 runs for 114 miles and is contained completely within the state of North Carolina. Within the CSP study area, US 117 provides access to some adjacent land uses over its 5.38 mile span.

There are two signalized intersections along this portion of US 117, one at NC-133 and one at the intersection with NC-210. Some commercial development is present at the NC-210 and US 117 intersection. Volumes along US 117 ranged between 7,100 vpd south of NC-210 and 12,000 vpd north of NC-210 in the CSP study area.

US 421

US 421 is another north-south route through the CSP study area, passing through the western portion of the study area. As a spur route of US 21, US 421 traverses four states, Indiana, Kentucky, Virginia, and North Carolina, running for 941 miles from Wilmington, NC to Michigan City, Indiana. US 421 travels for 8.05 miles within the CSP study area, entirely as a four-lane divided facility with no signalized intersections along the portion within the study area. There is relatively little adjacent development along US 421 in this area. However, the Pender County Commerce Park is located along this corridor and is slated for future industrial development. A water facility and wastewater treatment plant and a seafood-processing plant are already located in the park. It is anticipated the Park will see additional development. A discontinued rail line also runs adjacent to US 421. Volumes along US 421 decrease as US 421 continues northward, with volumes of 4,300 vpd close to the New Hanover County line gradually decreasing to 4,900 vpd north of NC-210. However, US 421 does serve as an important freight route, accommodating significant volumes of truck traffic as well as mobility needs for freight and military to and from the Port at Morehead City.

NC-210

NC-210 serves east-west traffic along the north boundary of the CSP study area. Beginning at US 17 in the east, NC-210 runs for approximately 23.5 miles within the study area, not including the portion that is duplexed with US 17 running north between Hampstead and Surf City. The ultimate terminus is just east of Selma/Smithfield, while the

Typical Cross-Section on NC-210

terminus in the CSP study area is just shy of the intersection with US 421, commonly known as Johnson's Corner. NC-210 is a two-lane facility for the entirety of the portion in the study area and provides access from homes and subdivisions along the roadway to commercial amenities and other major arterials and highways. Some major agricultural holdings are present in the western portion of the study area along NC-210. The roadway crosses the NE Cape Fear River close to the interchange with I-40.

There are three signals along NC-210 in the CSP study area, located at the US 117 and NC-210, theinterchange of I-40 and NC-210, and at NC-210 and US 17. In contrast to other routes in the study area which do not meander, NC-210 makes sharp turns along the route, most notably at the intersections with Island Creek Road and NC-133. Volumes along NC-210 vary between 1,900 vpd near US 421 and 7,800 vpd near Hampstead.

Interstate40

I-40 is a major Interstate Highway that traverses the southern United States beginning in Wilmington and terminating in Barstow, California. Within the CSP study area, I-40 runs northward for 5.5 miles. As an Interstate facility it is controlled access, there are no signalized intersections, though there is one interchange, with NC-210, in the CSP study area. I-40, as an interstate facility, carries substantially more traffic than other roadways in the CSP study area, though not as much as US 17, at 24,000 vpd.

Existing Collector Streets

Collector streets are defined as streets that connect neighborhoods to the major arterial roads. These streets are typically two lanes, not more than two to three miles long, with speed limits between 35 and 45 mph, and lower volumes of traffic. The CSP study area is generally lacking in collector streets, though some streets that fit this criteria are in fact present, predominantly in the vicinity of the unincorporated community of Hampstead. Streets such as Sidbury Road, Scotts Hill Loop, Washington Acres Road, Factory Road, Hoover Road, Country Club Drive, Sloop Point Road, and Sloop Point Loop Road are emblematic of typical collector streets found in the CSP study area.

NC-133

NC-133 is the only NC Route designated as a collector street in the CSP study area. Linking US 117 and NC-210, NC-133 only runs for approximately 4.9 miles in the study area. With its genesis in Oak Island, NC-133 runs northward, eventually duplexing with US 117 before extending westward to its terminus at NC-210. NC-133 does include one signalized intersection in the CSP study area, at US 117. This roadway provides access for residences to major roads. Additionally, there are some agricultural lands only accessible via NC-133. Volumes along NC-133 equate to 9,100 vpd.

Local Streets

Local streets, as one would expect, are not used for long distance travel. Their primary function is to provide access to adjacent properties and they often include pedestrian amenities in the form of

Typical Local Street in the CSP Study Area

sidewalks within the right-of-way. Local streets also funnel traffic to the collector and arterial systems and form the basis of the functional classification system.

For the most part, local streets are designed to minimize through traffic. However, local streets will also often provide important connectivity to neighborhood land uses, particularly for non-motorized modes. In the CSP study area, there are a number of local roads. Many of these streets are maintained by NCDOT, which identifies these roads with a Secondary Route number, while some of the private roads are maintained by Homeowner's Associations (HOAs). Pender County does not own or maintain any roadway facilities.

Functional Classification

The Wilmington Urban Area MPO member jurisdictions refer to the functional classification of roadways in their land development codes and regulations in an effort to better coordinate land use and transportation planning. The WMPO reviewed the federal functional classification of all roadway elements in the WMPO Planning Area Boundary following the decennial census and the organization's

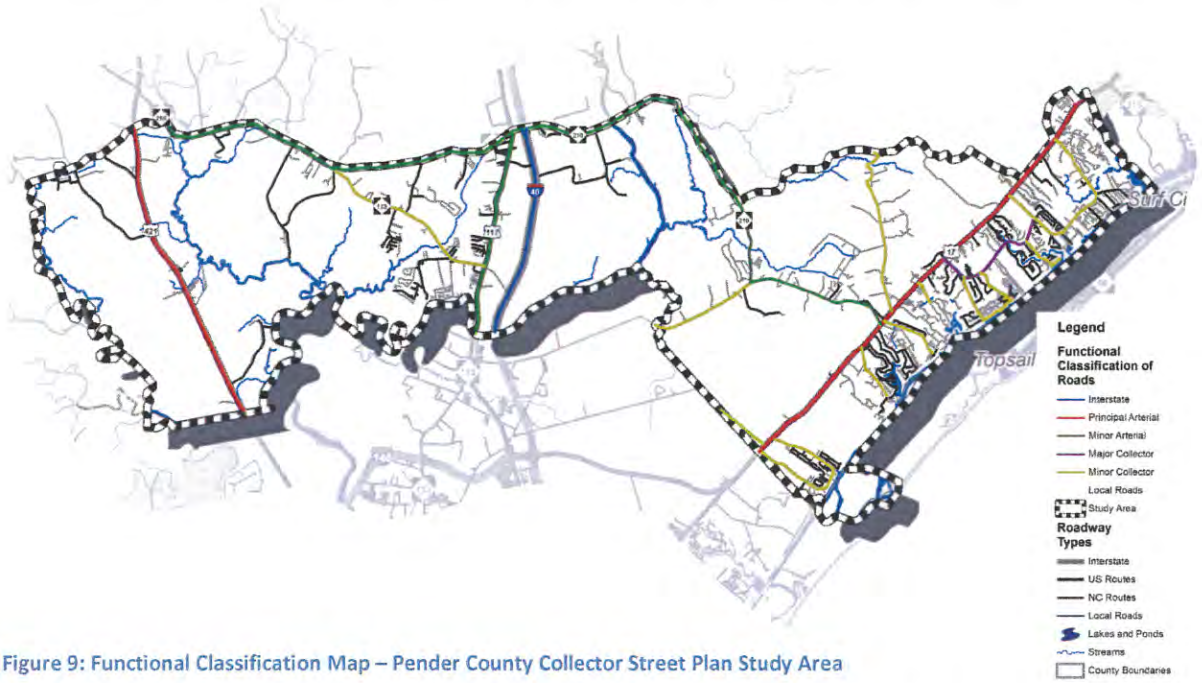


Figure 9: Functional Classification Map – Pender County Collector Street Plan Study Area

Transportation Advisory Committee proposed changes to the federal functional classification of WMPO Planning Area Boundary's roadways. However, several of the proposed changes were not accepted by the NCDOT due to statewide constraints that were not directly related to the functional nature of existing conditions in the WMPO Planning Area Boundary roadway network. Therefore, the Transportation Advisory Committee adopted the "Wilmington Urban Area MPO's Local Functional Classification Maps" for member jurisdictions to refer to for non-federal local planning purposes on August 26, 2015. Figure 9 details these roads within the CSP study area.

Pedestrian and Bicycle

Pedestrian and bicycle facilities are very limited in the CSP study area. There are isolated pockets of developer-built sidewalk present, most notably in the neighborhoods along Crown Pointe Drive, East and West Island View Drive, and in the Avendale neighborhood off of NC-210, but overall, only approximately 8 miles of sidewalk are currently built. However, new developments are adding sidewalks, as a recommendation of the 2007 Collector Street Plan. This accounts for roughly 4 percent of the total roadway mileage in the study area. There are no crosswalks or pedestrian signals at signalized intersections, though some off-road hiking and biking trails are present in the Holly Shelter Game Land. Further bicycle and pedestrian installations are currently programmed, including a Safe Routes to School and DA funded project, but have not yet been constructed.

In terms of bicycle facilities, there are no dedicated facilities in the CSP study area, though there is one bicycle route, the NC 3: Ports of Call route. NC 3 runs along the coastline from Norfolk, Virginia to North Myrtle Beach, South Carolina and passes along both the Pamlico and Albemarle Sounds. Within the CSP study area, NC 3, also known as the "Venus Flytrap" section, runs along Island Creek Road, NC-210, and north via US 17. Other pedestrian and bicycle facilities are programmed in the study area, including the Mountains-To-Sea Trail, the Coastal Pender Greenway, the Coastal Pender Rail Trail, the Central Pender Rail Trail, and the East Coast Greenway identified on the Bicycle and Pedestrian Facilities Map, located in the mapbook for this document. However, the exact alignments for these trails has not yet been determined. Additionally, Cape Fear Transportation 2040 (Metropolitan Transportation Plan) recommends three pedestrian and bicycle projects in the CSP study area, one along Jenkins Road from US 17 to St Johns Church Road and the other on Master Lane from Doral Drive to Sloop Point Loop Road.

Public Transportation

The Cape Fear Public Transportation Authority, which is also known as Wave Transit, provides a variety of public transportation options to residents of the Cape Fear region. However, no fixed transit routes penetrate the CSP study area. Transit service is offered to the CSP study area by the Pender Adult Services Transportation, allowing anyone to ride, though focused primarily on people aged 65 or older and individuals with disabilities. Service begins at the Cape Fear Community College North Campus and continues north on US 17 to the Topsail Senior Center, then doubles back and travels along NC-210 and

Excerpt from the NC Bicycle Route Brochure. Courtesy of http://www.ncdot.gov/travel/mappubs/bikemaps/.

US 117 north to Burgaw and Wallace. As a deviated fixed route service, passengers can be picked up or dropped off within 15 miles of any of four fixed stop locations.

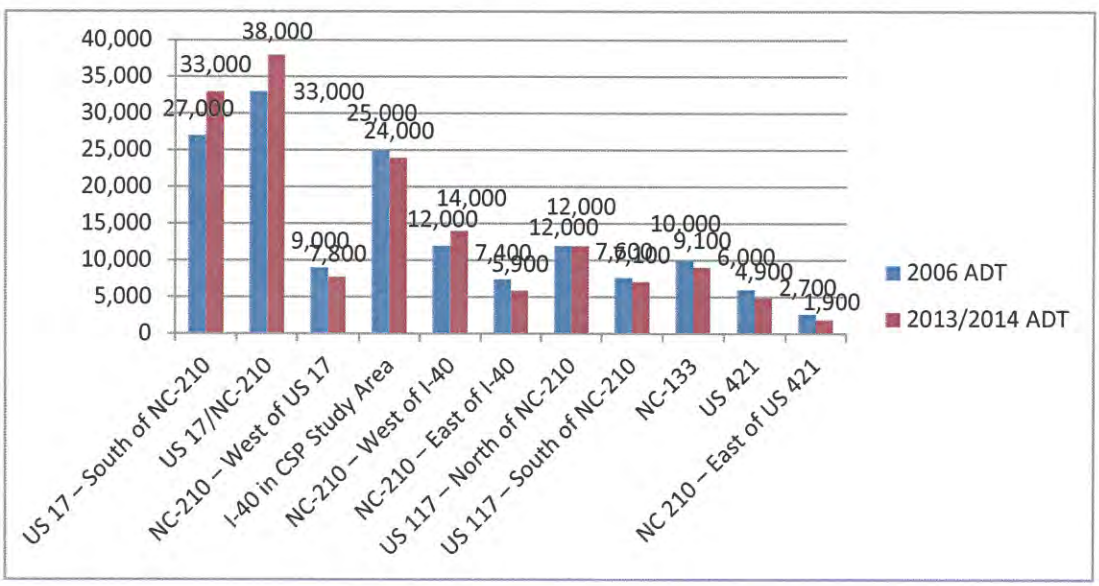
Cape Fear Transportation 2040 proposes three park and ride locations in the PC CSP study area, at US 17 and NC-210, US 17 and Sidbury Road, and US 421 and Cowpen Landing Road. These locations, designed to accommodate 8-20 parking spaces and serve people wishing to access vanpools and carpools, will be contain dedicated spots and signage. Additionally, Cape Fear Transportation 2040 calls for stop amenity upgrades at three locations, US 117/NC-133 at Old Blossom Ferry Road, US 421 at Blueberry Road, and US 17 at NC-210.

Traffic and Safety

The North Carolina Department of Transportation provides annual traffic counts for most streets within the CSP study area. Traffic counts represent a yearly average amount of traffic on that roadway segment and are collected annually for most interstates and NC routes and biannually for secondary routes. The following table (Table 1) provides further detail with regard to certain roadways in the CSP study area.

Table 1: Selected AADT Comparisons

Roadway Name	2006 ADT	2013/2014 ADT	Percent Change
US 17 – South of NC-210	27,000	33,000	22.2%
US 17/NC-210	33,000	38,000	15.2%
NC-210 – West of US 17	9,000	7,800	-13.3%
I-40 in CSP Study Area	25,000	24,000	-4.2%
NC-210 – West of I-40	12,000	14,000	16.7%
NC-210 – East of I-40	7,400	5,900	-20.2%
US 117 – North of NC-210	12,000	12,000	0%
US 117 – South of NC-210	7,600	7,100	-6.6%
NC-133	10,000	9,100	-9%
US 421	6,000	4,900	-18.3%
NC 210 – East of US 421	2,700	1,900	-29.6%



Judging from the changes in ADT between 2006 and counts conducted in 2013/2014, traffic has increased substantially on NC-210 and on US 17 and is reduced on roads within the study area west of I-40. Indeed, even I-40 has a lower ADT, though not by a substantial amount. This is likely due to the growth and development around the Topsail Township and further development between US 17 and the Intracoastal Waterway. As new subdivisions are constructed in that area and on undeveloped parcels along NC-210 between I-40 and US 17, traffic is likely to continue to increase. Transportation improvements are also likely to focus on these areas. These AADTs may also reflect a difference in population and housing type in the Topsail Township area and with the planned developments in the Scotts Hill area.

It is also important to note that new developments are required to conduct a Traffic Impact Study for any new development forecast to generate more than 100 trips in the AM or PM peak hour.

In terms of safety, an analysis of crash types and severities was conducted for the entire CSP study area using crash data from the three year period between

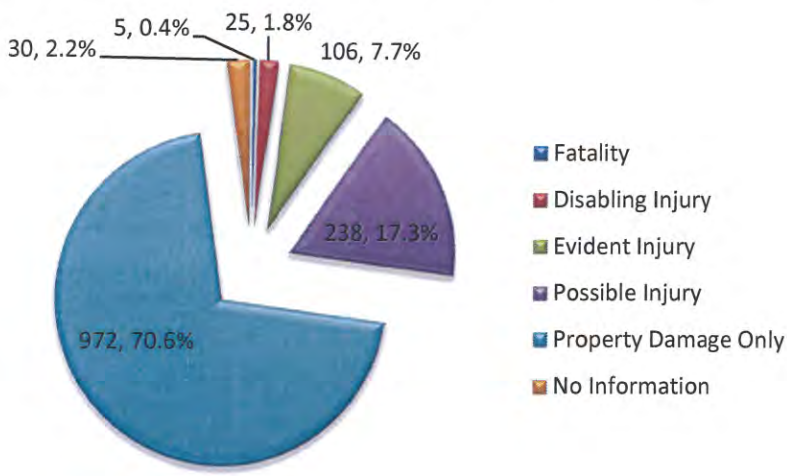


Figure 10: Crash Severities

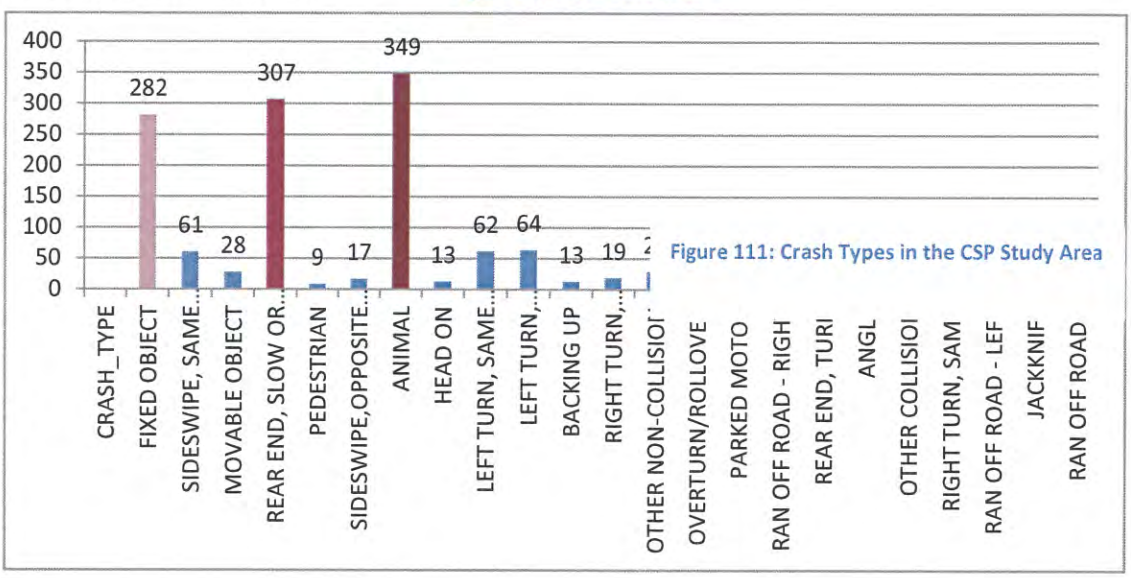


Figure 111: Crash Types in the CSP Study Area

2011 and 2013. Overall, 1,376 crashes occurred during that time, with 5 crashes (0.4%) resulting in a fatality. A further 25 crashes (1.8%) resulted in a disabling injury, while 106 crashes (7.7%) resulted in an evident injury, 238 crashes (17.3%) resulted in a possible injury, and 972 crashes (70.6%) resulted in property damage only. Figure 10 provides this information. There were 30 crashes (2.2%) with no severity information. The majority of crashes occurred during daylight conditions (61.2%), while 36.7% occurred during dark conditions on roadways without lighting. The remaining percent (3.5%) occurred either during dark conditions on roadways with lighting, at dusk, or at dawn. In terms of crash type, **Error! Reference source not found.** indicates that the most prevalent crash type was a collision with an animal (349, 25%), followed by Rear End, Slow or Stop (307, 22%) and Fixed Object (282, 20%).

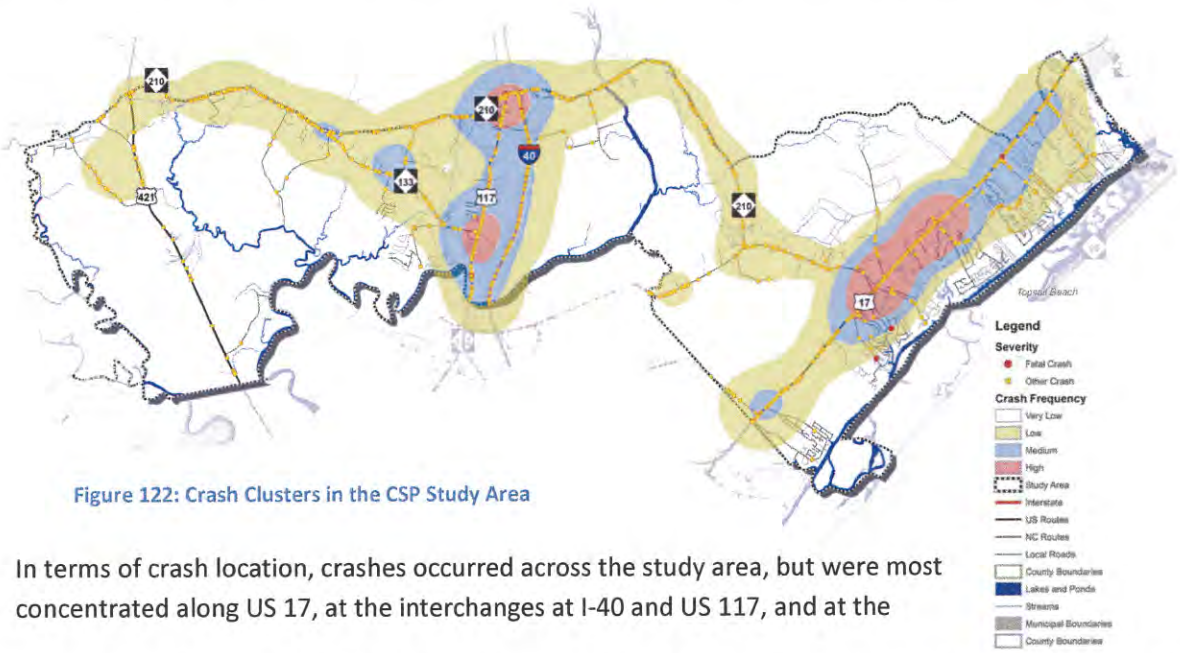


Figure 122: Crash Clusters in the CSP Study Area

In terms of crash location, crashes occurred across the study area, but were most concentrated along US 17, at the interchanges at I-40 and US 117, and at the intersection of US 117 and NC-133. With the exception of the southern portion of US 421, all major US, NC, and Interstate routes experienced higher concentrations of crashes than other roads. US 17, in particular, had the highest concentration of crashes, including two fatal crashes along the roadway. Figure provides further detail. With new signal timing projects occurring along US 17 and the proposed (but currently unfunded) implementation of the Hampstead Bypass, it is possible that there will be a reduction of crashes in this area as these projects will ultimately reduce traffic volumes on the roadway and streamline traffic flows through the corridor.

TIA Section

The 2007 Coastal Pender County Collector Street Plan and the current Pender County UDO (Unified Development Ordinance, revised December 2015) speaks to the requirements for a Traffic Impact Analysis (TIA) for various kinds of development types in Section 6.1 (for example). The emphasis on TIAs in the role of determining land use suitability and infrastructure needs for transportation is crucial: the TIA represents a concrete linkage between land use and transportation. The familiar, letter-based system for evaluating performance is based on vehicular delays, typically as they move through an

intersection. The amount of vehicular delay that is incurred goes up as more trips are added from new development, but delay can be reduced by redistributing traffic through a more-connected network or making other street improvements. An important part of that network is the construction of collector streets, which form a valuable second tier of streets that balance land accessibility with local mobility needs in a community.

Any new development that is anticipated to generate more than 100 trips in any hour of the day has to prepare and submit a detailed traffic impact analysis so that staff, decision-makers, and the interested public can review the anticipated traffic impacts. Projects that have an impact on the street network can also include mitigation efforts like changes in land use type/intensity or off-site improvements. These mitigation efforts are an important part of the development process, and help manage the negative consequences to valuable roadway capacity in places that are developing faster than publicly funded roadway projects can be built to handle the extra need. The policy section of this report describes some suggested changes and improvements to the TIA process and documentation, but it is the explicit intent of Pender County to continue to enforce the requirements for TIAs for every applicable development project going forward.

It is also important to note that new developments are required to conduct a Traffic Impact Study for any new development forecast to generate more than 100 trips in the AM or PM peak hour, as per the 2007 Coastal Pender County Collector Street Plan and the Unified Development Ordinance. It is Pender County's intention to continue to enforce this measure.

Land Use/Zoning

The future land use map provides a bold vision for the CSP study area. Substantial portions of the study area are designated as mixed use and suburban growth, while rural growth and conservation areas account for proportionally less. Additionally, there is some industrial growth, mostly in the southern portion around US 421 and along the east side of I-40. **Error! Reference source not found.** indicates the proposed land uses by percent of the study area. The mixed use areas are predominantly located in the more developed areas along US 17, while suburban growth is concentrated near the Holly Shelter Game Land, just northwest of Hampstead, as well as in areas along the northern portion of US 421 and in areas west of I-40.

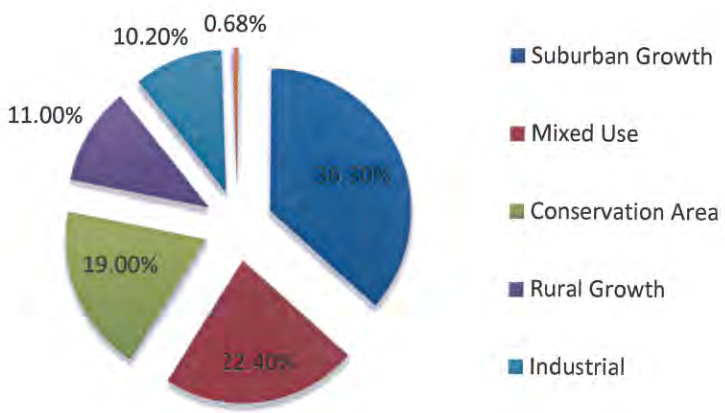


Figure 13: Future Land Uses (2010)

These land use categories are very important with regard to the development of a Collector Street Plan, though street spacing standards will be based on current zoning with some consideration of future land use. In terms of current zoning, the existing zoning map paints a vastly different picture of the CSP study area. Much of the area is dominated by Rural Agricultural, which accounts for 52.8 percent, while 22.5 percent is Residential and 10.8 percent is Planned Development. The remaining categories, such as General Industrial (6.6 percent), Environmental Conservation (5.3 percent), General Business (1.2 percent), Office and Institutional (0.6 percent), and Manufactured Housing Community (0.1 percent), all account for a total of 13.8 percent, a small portion of the study area. The existing zoning map (Figure 14) is included below.

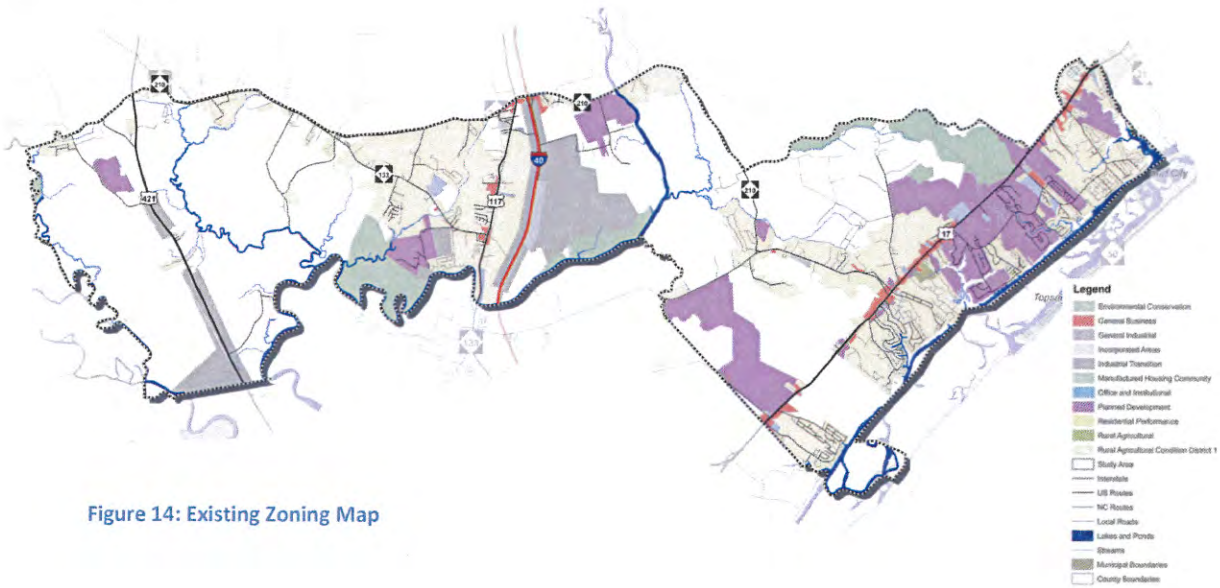


Figure 14: Existing Zoning Map

Public Input

Public outreach is vital to ensuring that a planning process reflects local wishes and desires and ultimately receives support from elected officials and the public. To ensure that public opinion played an important role in shaping this project, a Steering Committee was convened at the outset of this process. Over the course of this project, four Steering Committee meetings and two public outreach meetings were held. Pender County and WMPO staff also

Figure 14: Steering Committee Members at Work

presented to local officials and at public meetings.

Meeting Summaries

The Steering Committee was composed of seventeen members, including community members, elected and appointed officials as well as staff from the WMPO, Pender County, and NCDOT. The 17 Steering Committee members provided important oversight and input to the process of developing the preferred collector street scenario. Using paper maps and markers, Steering Committee members indicated areas on the map in need of greater connectivity and helped revise the collector street alignments. The Steering Committee also provided important feedback on the proposed roadway cross-sections and helped prioritize policy measures for inclusion in this plan. As a result of the Steering Committee's active participation in the project, key stakeholders were able to provide important input into this planning process. With their support, this Pender County Collector Street Plan will have broad buy-in from the public, multiple agencies, as well as, elected officials.

Figure 16: Public Outreach Meeting at Heide Trask Senior High School.

Public Outreach

Two public outreach meetings were held, one at the Heide Trask Senior High School in Rocky Point and the other at the Hampstead Annex in Hampstead. Attendees provided input on where collector streets are needed in the study area, where pedestrian and bicycle facilities are desired, and which cross-sections apply to specific collector streets. Additionally, Pender County Staff sent the survey and a link to the website to every church in the study area through the Postal Service to solicit feedback as well.

Figure 15: Flyers for the Public Meeting.

Survey

Another important method to reach people in the CSP study area was the paper and online survey. Disseminated through the project website

(www.pendercollector.com) and through advertising at meetings and community events, the survey consisted of 12 questions, asking general questions such as how long the respondent has lived in Pender County, how the experience of traveling in Pender County is, and work status. The survey also provided an open-ended question, soliciting feedback from respondents about their experiences traveling, by any mode, in Pender County. Some of the responses to this question and other information from the survey is provided in Figure 17.

Overall, with 112 people responding to the survey and the active participation of members of the Steering Committee, the public outreach component of this planning process solicited substantial feedback. The importance of local champions and ensuring ownership of planning efforts cannot be overstated. Ultimately, the numerous opportunities to provide input and emphasis on citizen and stakeholder collaboration led to the development of a community-supported plan.

Survey Summary

The most important features to include on collector streets are...

- Lighting 25%
- Bike Lanes or Bikeways 24%
- Sidewalks 21%

rate traveling in Pender County as "Fair"

The most mentioned words in the survey.

7 out of 10 people are not concerned about the impact of collector streets, if they are well designed

80% think Hampstead is most in need of collector streets

39% rate wetlands as most important to avoid

27% think avoiding a problematic intersection is the most important.

Select Quotes

- Heavy traffic on US 17
- Motorists do not observer speed limits. Need that bypass around Hampstead!
- Middle lane is the problem!
- When an accident occurs there is no way to by-pass it as there are few if any roads around the accident.
- Trouble and danger entering and exiting US 17.
- No shoulders on two lane roads, ex. 210 west, no bike lanes, roads with more than 20 homes remain unpaved, "suicide" turning lanes.

Figure 17: Selected Survey Responses

Recommendations

As part of the process for recommending new collector streets for the CSP project, the project team undertook a number of steps to ensure that the proposed collector street network reflects existing conditions, land suitability, future proposed land uses, stakeholder input, ongoing roadway design projects, and other current planning processes. It was particularly important to ensure that the recommendations accommodate likely users of the facility. For instance, all collector streets should allow for the efficient movement of emergency vehicles, while only some collector streets will need to support larger vehicles, such as tractor trailer trucks or fire engines among others. It was also important to assess whether pedestrians and/or bicyclists should be accommodated and to what degree. A thorough understanding of these issues as well as how the collector street network supports connectivity between land uses was a crucial component of this planning effort. This section presents the recommended collector street connections.

Bicycle parked outside of the Jade Garden restaurant in Rocky Point

Emergency/School Vehicles

It is important to note that all roadways, and particularly collector streets, will be designed to accommodate the safe and convenient movement of emergency vehicles, including roll curb where appropriate. Additionally, every effort was made to create alignments conducive to easy and safe access by school buses.

Connectivity/VMT Reduction

Collector streets, while providing access to neighborhoods and facilitating access to the arterial network, also serve another important function, reducing need to access major corridors. With the provision of additional access points to neighborhoods, commercial centers, and schools, travelers will have additional options to access their local destinations. By allowing back access between land uses, people can reach their destinations without having to drive on major roadways.

Land Use Connectivity

Certain land uses (for instance major employment centers) generate substantial traffic at particular times of the day. Providing better access from residential neighborhoods to employment centers (especially to areas slated to develop as industrial centers) was an important consideration for this plan. There are large-scale industrial operations in the western portion of the study area; much of the collector street development in these areas is underpinned by the need to connect to industrial facilities or provide an alternate connection to reduce peak hour congestion. It is also important to provide alternative access from US 17, which has the highest population density.

Large Trip Generators

With local shopping amenities, numerous school facilities, and industrial areas in the CSP study area, it will also be important to provide access from arterial roads to these facilities. Hampstead itself is an important regional destination as well. Providing additional access to areas of high traffic is another important consideration in the development of the proposed collector street network.

School bus traffic on US 117

Spacing Standards

Spacing Standards were developed as part of a modeling exercise (conducted in 2011) to determine the ideal spacing needed for streets to maintain a Level-of-Service "D" on all roadways within a given study area. A Level-of-Service "D" constitutes acceptable conditions under which speed and freedom to maneuver are severely restricted, though traffic flow is still stable. A Level-of-Service "D" serves as a baseline in this instance. The details of the spacing standards are presented in Table 2 below. The parentheses indicate the zoning definition that corresponds to the land use intensity. The Access Function column refers to the amount of access that the collector street will provide. As land use intensity increases, there are more collector streets, allowing transportation network users to access specific areas via different routes, meaning that the access provided per collector street is lower than if the collector was the only street in a low intensity area. In the "lowest intensity" areas, each collector streets provides substantial access, more than if there were multiple collector streets nearby.

Table 2: Spacing Standards

Type of Collector Street (Zoning Designation)	Intensity	Access Function	Approximate Street Spacing
No Collector Streets (Environmental Conservation)	No Development	N/A	N/A
Lowest Intensity (Rural Agricultural)	Less than 2 Dwelling Units per Acre	Highest	3,000 to 6,000 feet apart
Medium Intensity (General Business, General Industrial, Industrial Transitional, Manufactured Housing Community, Residential Performance)	2 to 4 Dwelling Units per Acre	High	1,500 to 3,000 feet apart
High Intensity (Residential Mixed, Office Institutional, Planned Development)	More than 4 Dwelling Units per Acre	Medium	750 to 1,500 feet apart
Source: Stantec, Wake County TDM Modeling Analysis, 2011.			

Each land use type is assigned an approximate street spacing based on the density and intensity of land use development; the proposed street spacing may not exactly correspond to the ideal spacing standard, based on the presence of natural or man-made features. Figure 19 provides further detail.

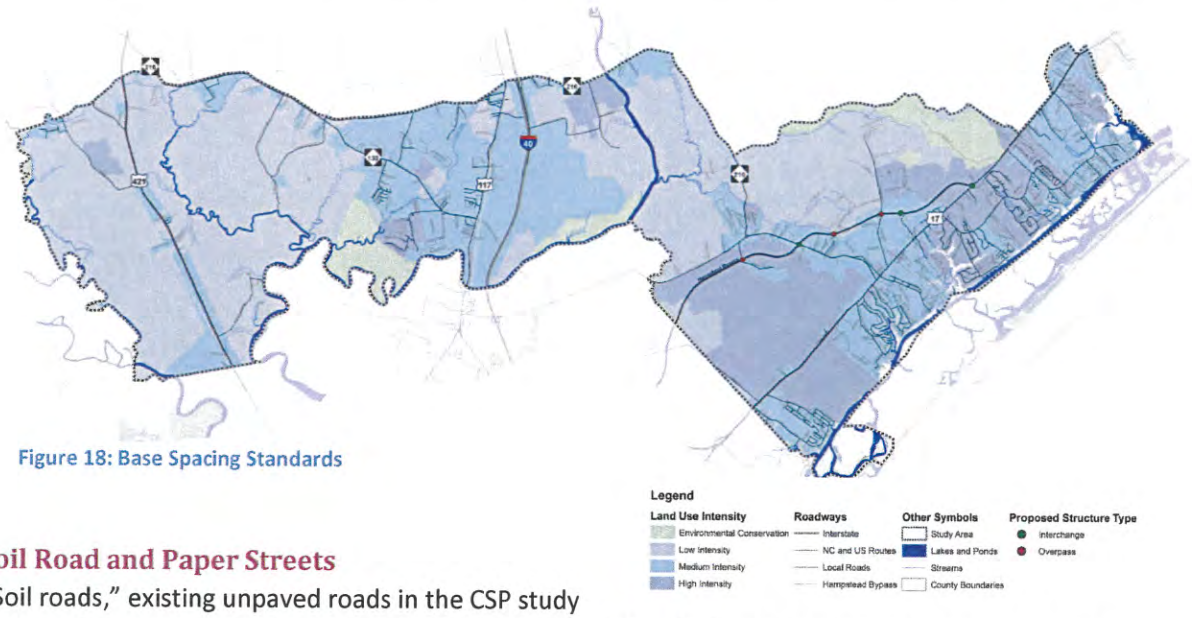


Figure 18: Base Spacing Standards

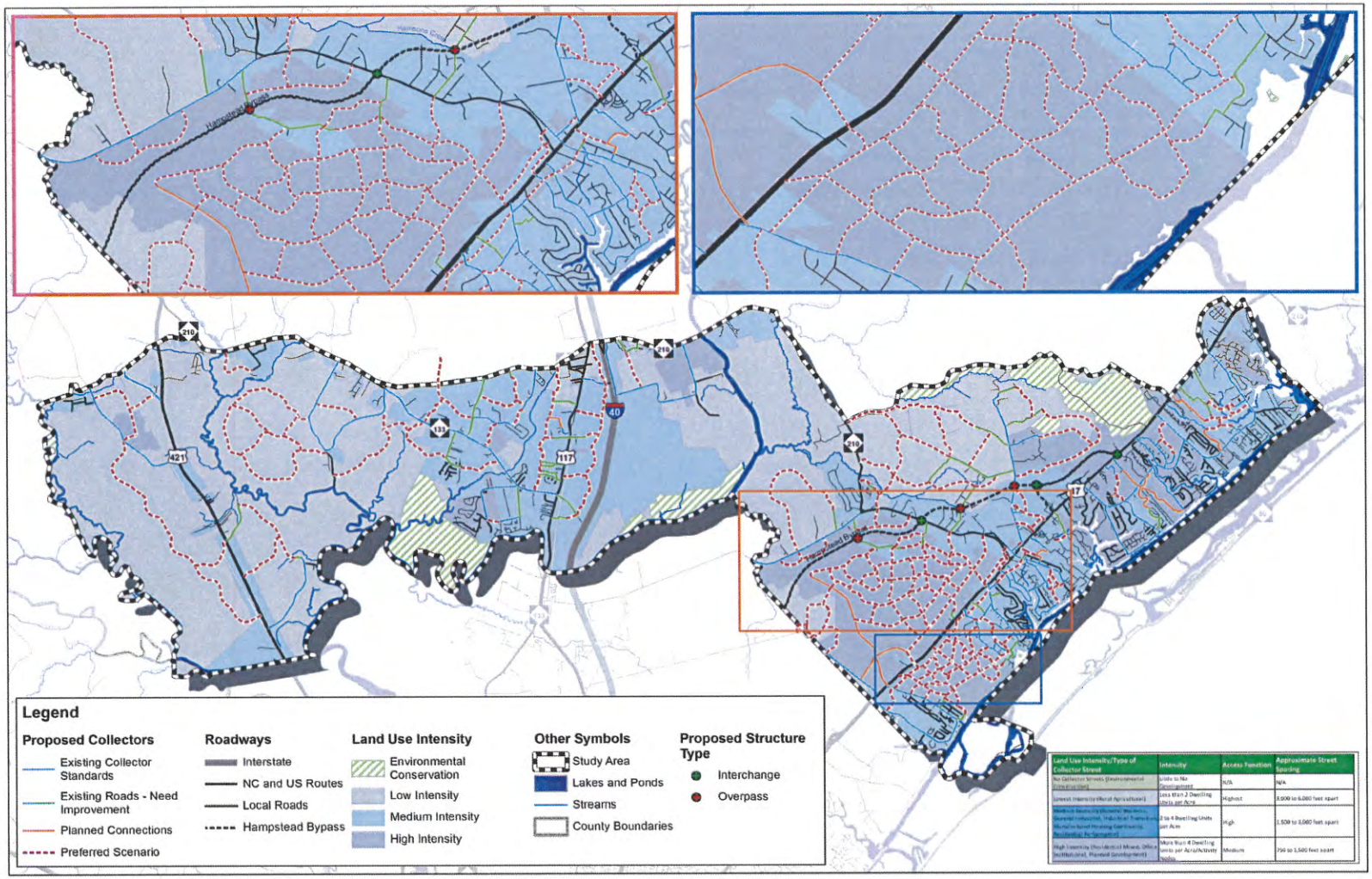
Soil Road and Paper Streets

"Soil roads," existing unpaved roads in the CSP study area, and "paper streets," platted connections that are identified as a future connection, were also considered as part of this process. If possible, an unpaved road was considered as a proposed collector street along the existing soil road. This will ultimately reduce the cost of constructing proposed collectors. In a similar vein, project planners endeavored to route collector streets through as few parcels as possible in order to mitigate right-of-way costs for parties responsible for implementing the design and construction of collector streets in the future.

Recommended Plan

With existing conditions in mind, a collector street scenario was created and refined for the CSP area. Pender County, WMPO, and the public commented on the proposed alignment, ultimately leading to a broadly accepted plan. Figure 20 provides more detail. Additionally, a pedestrian and bicycle facility map was also created as part of this planning effort. This map (Figure 21) indicates those existing signed bicycle routes, proposed multi-use trails, and collector streets designated as bike friendly connections. Discussion on Complete Streets Policies in the "text" of the plan

"Soil road" in the project study area



Land Use Intensity/Type of Collector Street	Intensity	Access Function	Approximate Street Spacing
No Collector Streets (Environmental Conservation)	Units to No Development	N/A	N/A
Lowest Intensity (Rural Agriculture)	Less than 2 Dwelling Units per Acre	Highest	3,000 to 6,000 feet apart
Medium Intensity (Rural Residential, Suburban Residential, Industrial Transition, Mixed or Sand Hinging Continuing, Residential Re-Generation)	2 to 4 Dwelling Units per Acre	High	1,500 to 3,000 feet apart
High Intensity (Residential Mixed, Office Institutional, Planned Development)	More than 4 Dwelling Units per Acre/Activity Nodes	Medium	750 to 1,500 feet apart

Figure 19: Preferred Collector Street Scenario

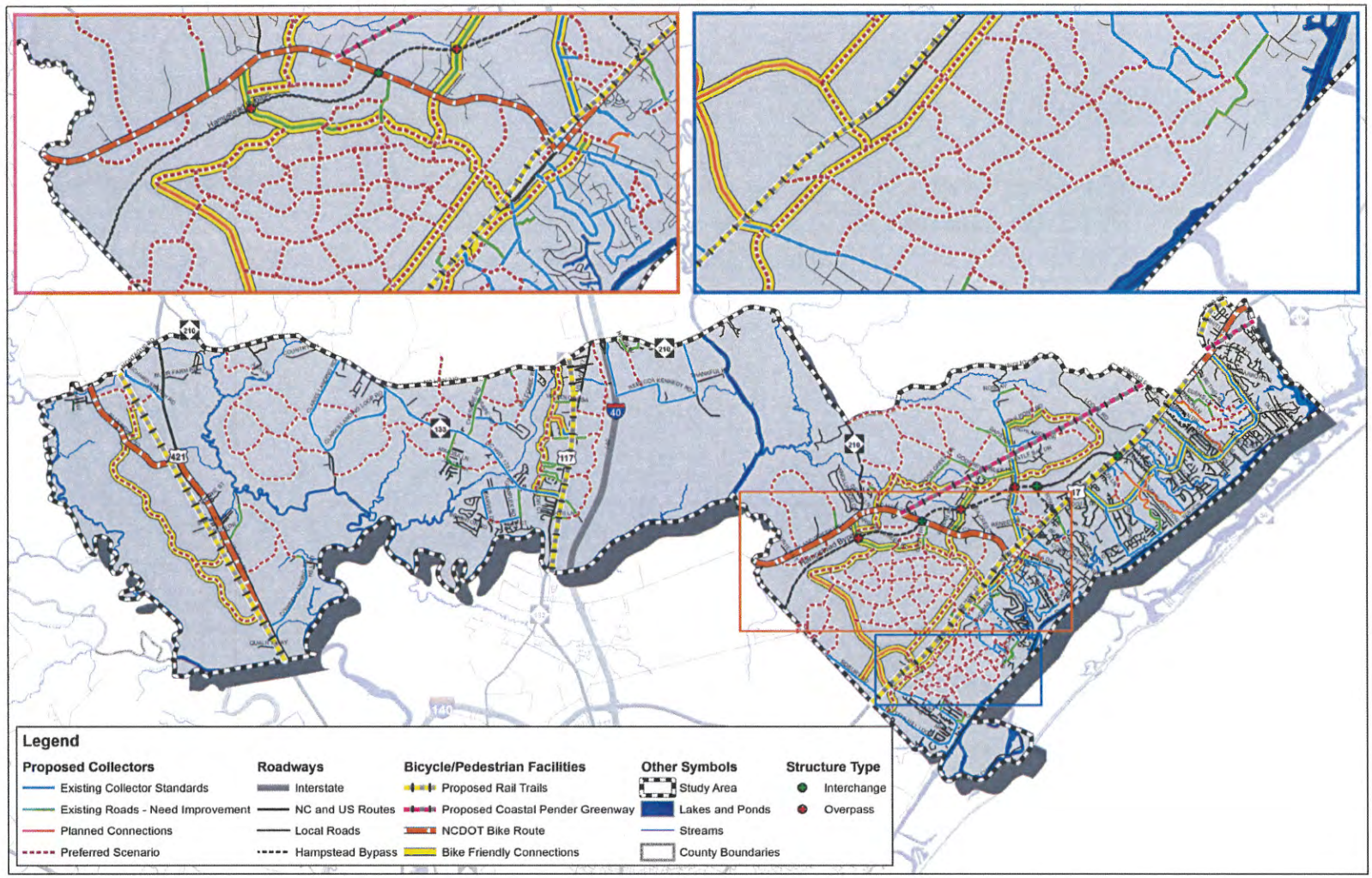


Figure 20: Proposed Pedestrian and Bicycle Facilities

Design Requirements

Cross-Sections

A series of cross-sections were developed as part of this plan, ranging from a rural cross-section (best suited to areas with sparse development) to a neighborhood cross-section (designed to accommodate automobiles, pedestrians, and bicyclists in a more densely populated area). These cross-sections are presented in the following figures and are color-coded to the collectors identified on the map. Each color does not represent one cross-section, in fact, an array of cross-sections are presented for each category for flexibility in design, while still maintaining Pender County's goals in terms of providing amenities for pedestrians and bicyclists. Each recommended cross section was designed based on the most current version of NCDOT's Complete Streets Policies. This was done to ensure that each road was built to NCDOT design standards.

Land Use Intensity

These categories are broadly linked to development intensity, which also served as the underlying information for creating the spacing standards used to program collector streets. While land use intensity can function as a determinant for the level of amenity provided for pedestrians and bicyclists, the presence of key County destinations, including schools and parks, may also necessitate the presence of a pedestrian and/or bicycle facility, regardless of land use intensity.

Cross-Section Categories

The following tables categorize the cross-sections developed as part of this plan. The requirements reflect the minimum cross-section allowed for each roadway designation. If the roadway is programmed to be constructed by a developer, they may increase the cross-section to any higher level designation, but must construct collector streets to the minimum standards, in accordance with NCDOT standards and to the specifications provided in the cross-sections. To avoid confusion, a sidewalk is defined as a recommended 5' facility, a bike lane as a recommended 5' facility, and a sidepath as a recommended 10' facility. A sidepath is the equivalent of a multi-use path for the purposes of this plan.

Figure 31 is color-coded to match a cross-section category, indicating which cross-sections categories apply to which proposed collector street. This allows flexibility in determining which cross-section is most appropriate for the context, while ensuring that pedestrian and bicycle amenities are in fact constructed as part of collector streets. It is important to keep in mind that the exact design of each of these cross-sections will ultimately be determined during the final design and platting process with input from NCDOT.

Group 1

Baseline	This facility will include: • two travel lanes and • a 2' to 4' shoulder.
Baseline with Bike Lanes	This facility will include: • two travel lanes and • two on-road bicycle lanes.
Baseline with Sidewalk	This facility will include: • two travel lanes and • a 2' to 4' shoulder and • sidewalks on one or two sides.

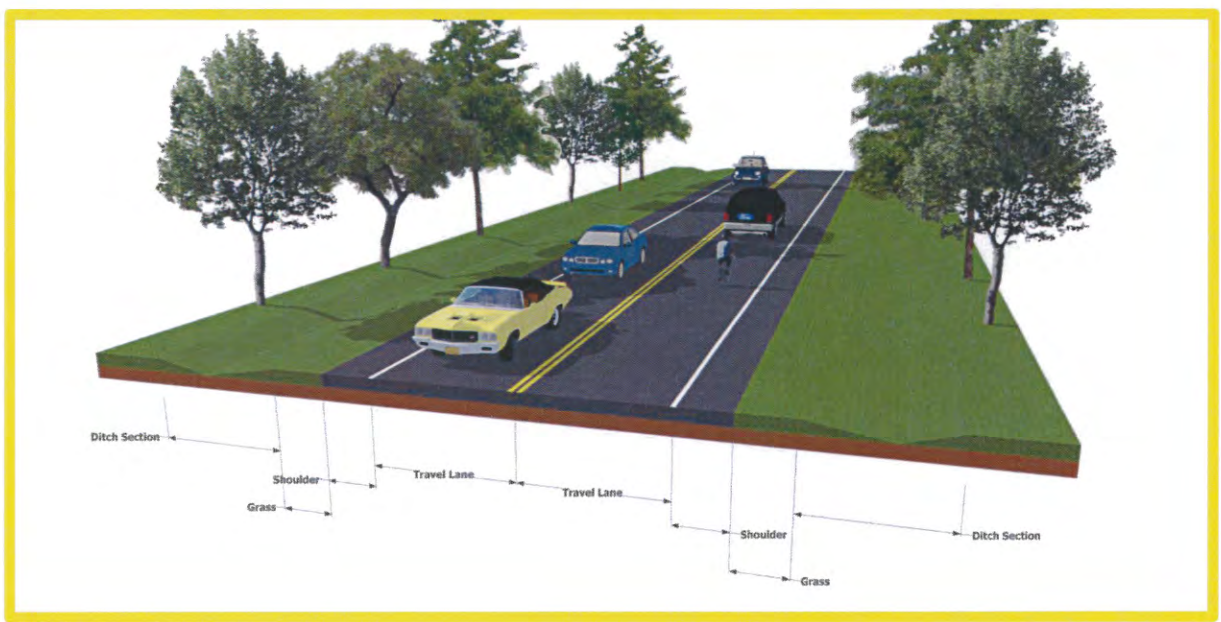


Figure 21: Baseline

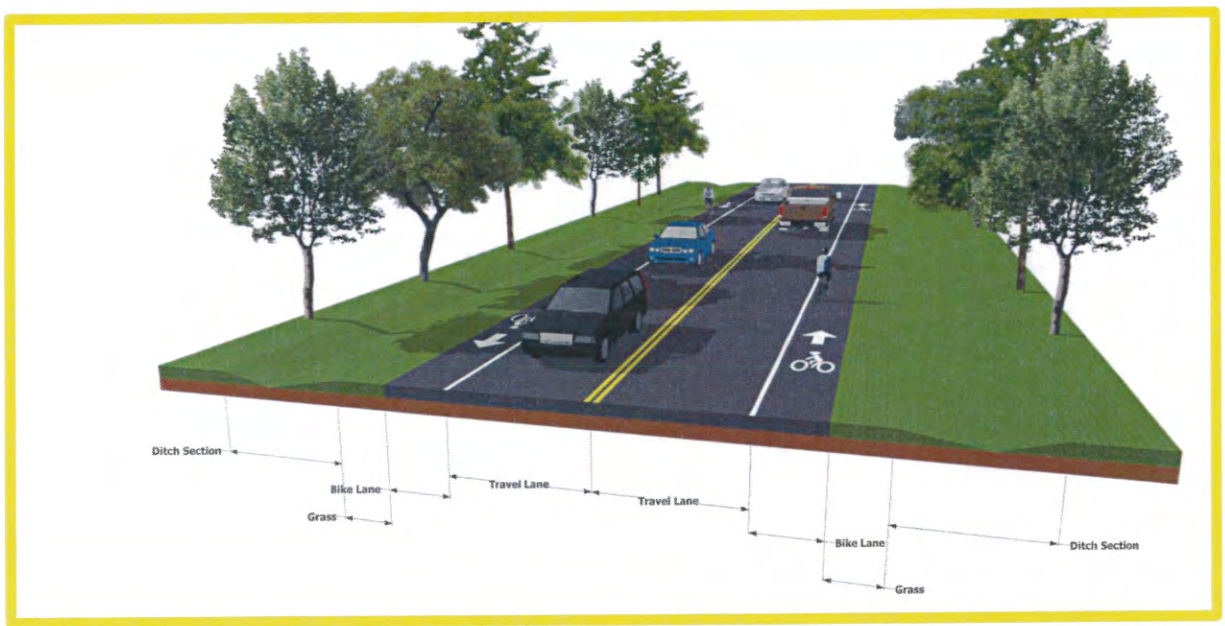


Figure 22: Baseline with Bike Lanes

Figure 23: Baseline with Sidewalk (only required on one side)

Group 2

Baseline with Sidewalk and Bike Lanes	This facility will include: • two travel lanes, • two sidewalks, and • two on-road bicycle lanes.
Baseline with Sidepath	This facility will include: • two travel lanes and • one separated sidepath.

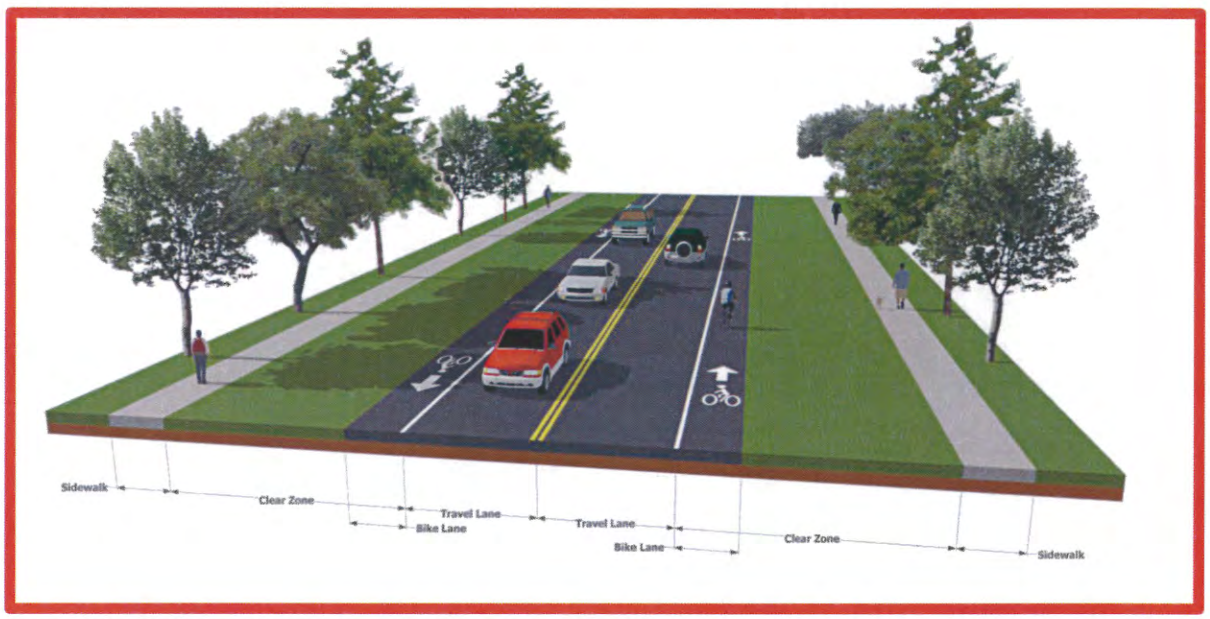


Figure 24: Baseline with Sidewalks and Bike Lanes

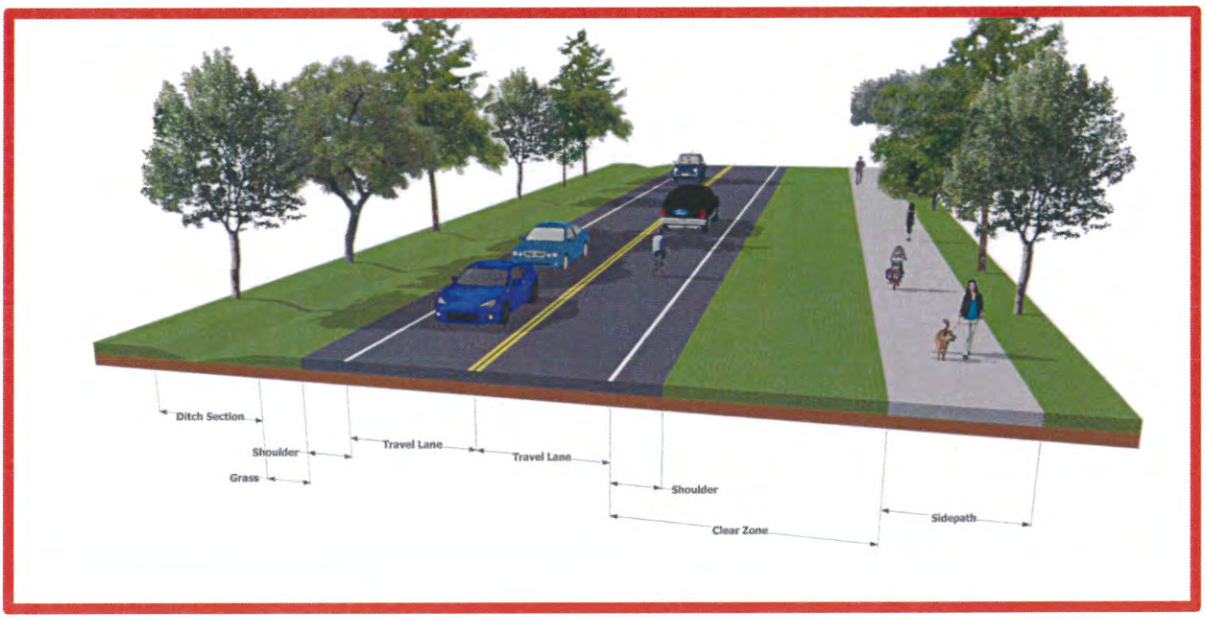


Figure 25: Baseline with Sidepath

Group 3

Residential with Sidepath (one side) **or** Sidewalk (both sides)	This facility will include: • two travel lanes and • either a sidepath on one side **or** • two sidewalks on both sides.
Baseline with Sidepath	This facility will include: • two travel lanes and • one separated sidepath.

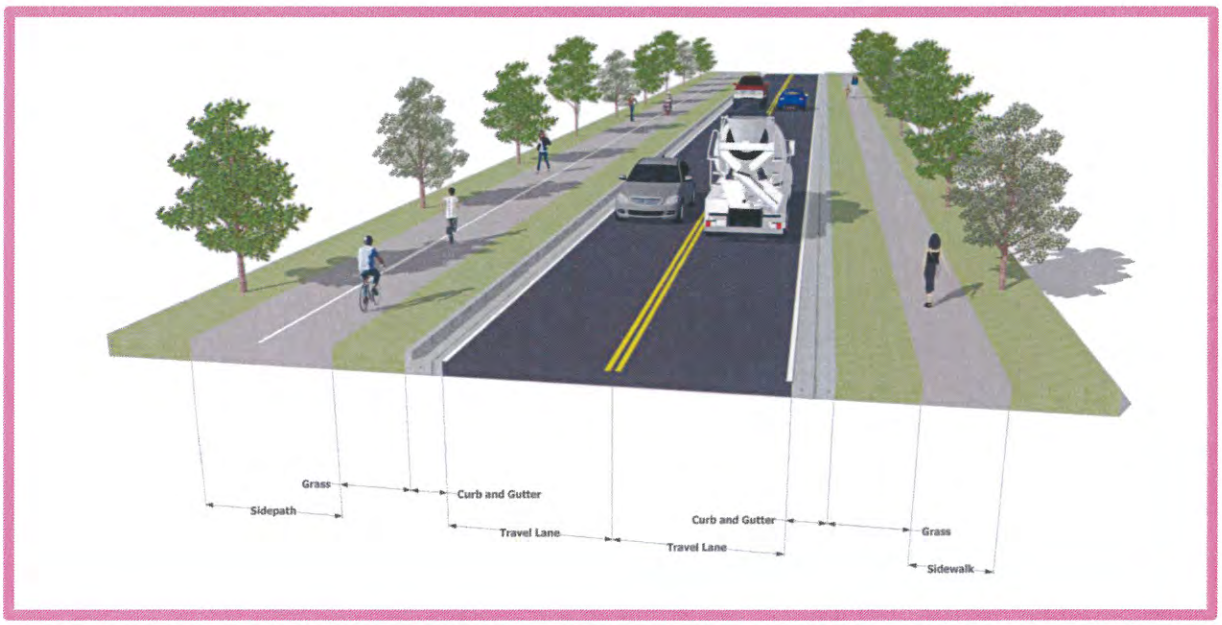


Figure 26: Residential with Sidepath (one side) or Sidewalks (both sides)

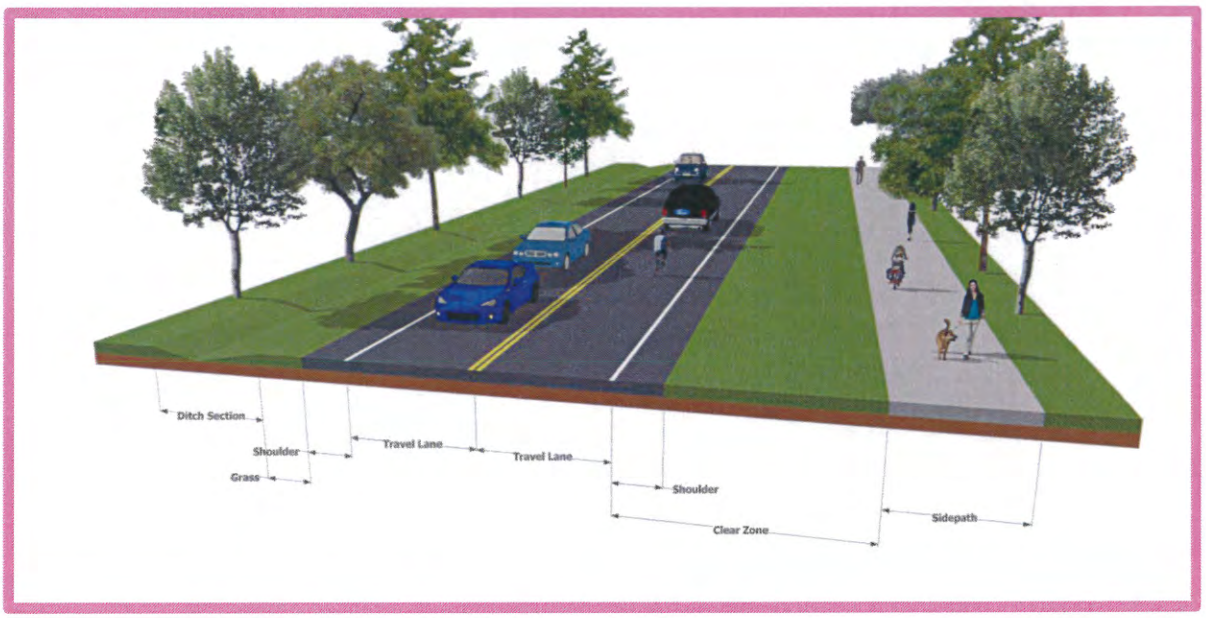


Figure 27: Baseline with Sidepath

Residential Median-Divided with Bike Lanes and Sidewalk (both sides)	This median-divided facility will include • a planted median, • two travel lanes, • two bike lanes, • and sidewalks on both sides.
Neighborhood with Bike Lanes and Sidewalks (both sides)	This facility will include: • two travel lanes, • two bike lanes, • and two sidewalks.

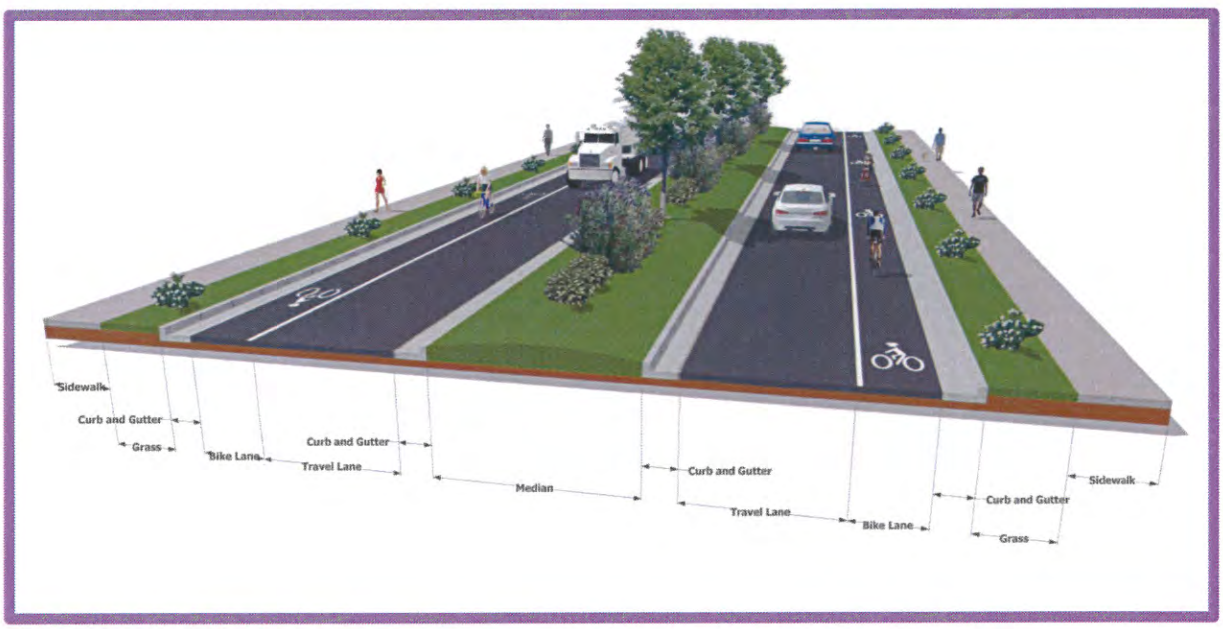


Figure 28: Residential Median-Divided with Bike Lanes and Sidewalks (both sides)

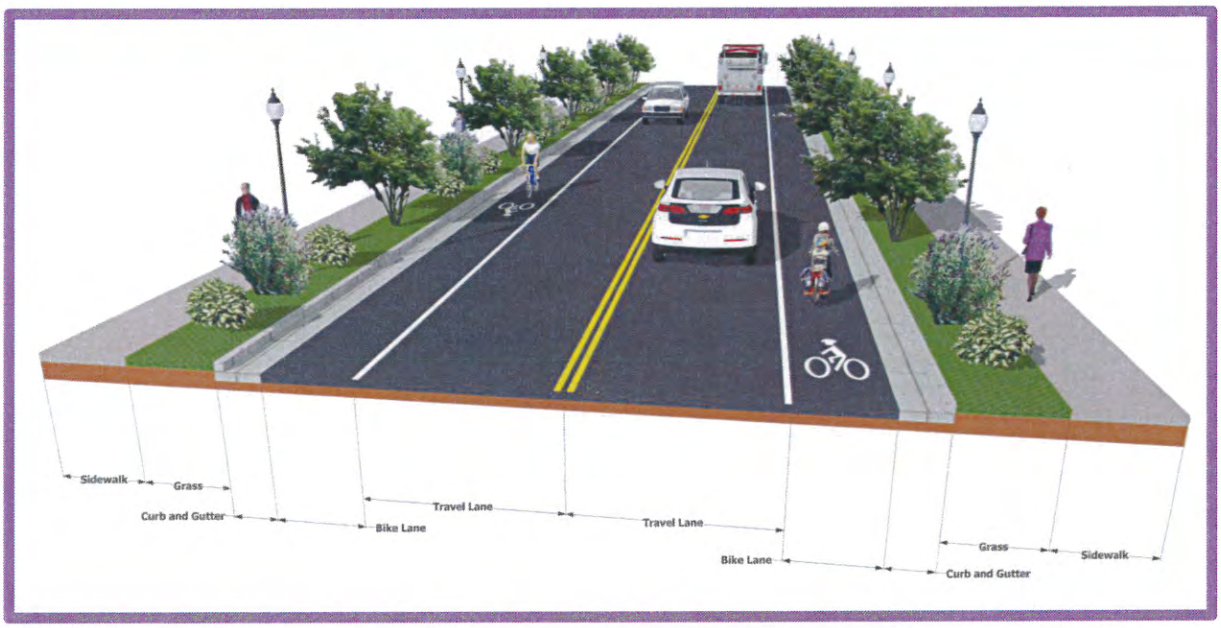


Figure 29: Neighborhood with Bike Lanes and Sidewalks (both sides)

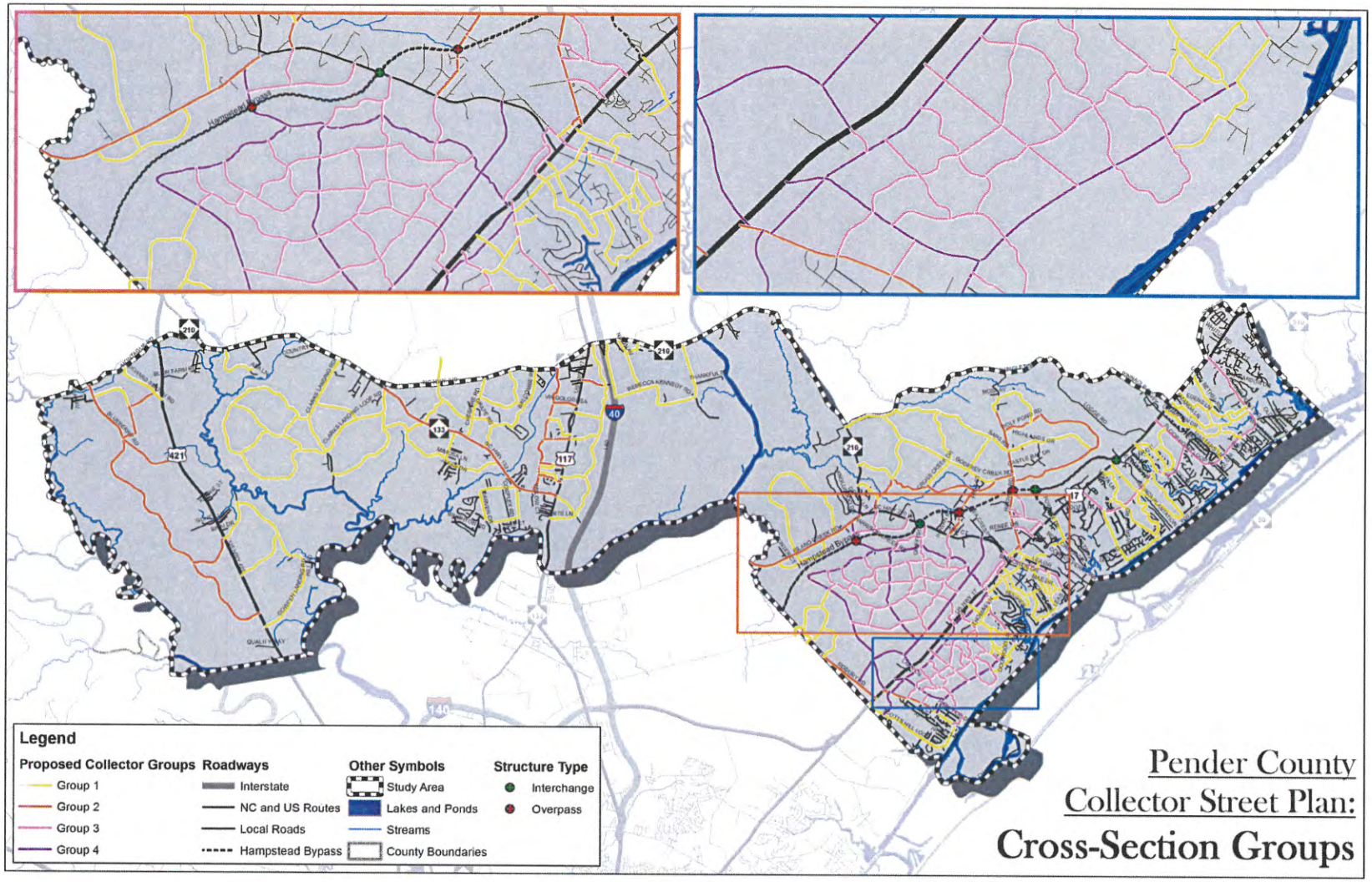


Figure 30: Proposed Cross-Sections

Policy Strategies

Each of the following tables provides further information on the proposed policy measures for Pender County, as they relate to the Pender County Collector Street Plan. The policies in Table 3 through Table 8 were evaluated by the CSP Steering Committee as most important.

Table 3: Stormwater/Green Streets Policy Requirement

Description/Purpose	Stormwater and Green Streets Policies can help ensure stormwater Best Management Practices (BMPs) are implemented, safeguarding precious natural resources, ensuring water quality, and preventing infrastructure maintenance issues. Both the North Carolina Department of Transportation and the North Carolina Department of Natural Resources provide guidance regarding stormwater BMPs. In Pender County, shellfish areas can be negatively affected as nutrient rich runoff from roads and other impervious surfaces enters streams, rivers, and wetlands. Safely treating stormwater runoff is important in terms of maintaining critical wildlife habitats and ensuring water quality for plant, animal, and human uses.
Target Performance Measure	Pender County will implement a community education campaign regarding the importance of stormwater mitigation; develop a stormwater management and maintenance plan; and explore the possibility of providing incentives to developers for providing stormwater BMPs which will enhance the standard level of treatment. Incentives could include reducing required widths for lanes, sidepaths, or ROW; alternative materials for bike/ped facilities such as pervious pavements; and density credits for developments. All provisions should be developed and articulated in a Stormwater Management Plan.
Sample Language / Recommendation	Stormwater BMPS and Green Streets Policies are essential in mitigating pollution and maintaining water quality, particularly in sensitive natural areas. Pender County is home to significant natural resources, which can be negatively impacted by stormwater runoff. To avoid this type environmental degradation, stormwater BMPS are recommended to be implemented as appropriate to local conditions.
Comments	The measure ensures a rigorous implementation of stormwater BMPs and establishes a regulatory framework to require stormwater BMPs where appropriate. Providing stormwater BMPs around critical surface waters and watershed areas can help mitigate water quality issues.

Table 4: Street Spacing and Access Standards

Description/Purpose	This policy creates street spacing standards for collector streets to ensure adequate cross access between land uses.
Target Performance Measure	The benefits of establishing a maximum distance between collector streets (or any "through" street that connects with the rest of the street network) include: traffic relief on major roadways, more even distribution of pass-by traffic, improving emergency response access / reliability, increasing bicycling / walking propensity in an area by shortening the distance between destinations, and creating efficiencies for public (and private) service vehicles to do their jobs in less time. Several of these benefits have the secondary promise of reducing mobile source pollution. When street spacing standards are established by local governments, they often vary considerably, but a reasonable balance between the costs of construction and the desire to achieve the benefits of a tighter-grained network is ¼-mile to ½-mile for collector streets. Local streets should connect to the collector streets together to form a hierarchy of streets that serve their intended uses. Regardless, it is much easier to create a street network as new development occurs rather than "retrofit" new street connections into existing neighborhoods that often feel like more connectivity introduces more problems than it solves. (reference: *Driveway and Street Intersection Spacing*, Transportation Research Circular No. 456, 1996; Levinson, Herbert, *Street Spacing and Scale*, TRB Circular E-C019: Urban Street Symposium; and various municipal codes including West Richland, WA; Fairborn, OH; and Fuquay-Varina, NC).
Sample Language / Recommendation	Any site plan or master development plan requiring the implementation of a collector street as defined by the adopted Pender County CSP or the WMPO non-federal classification shall meet minimum spacing standards as defined by the attached table. If modifications or waiver to the spacing standards are warranted for any reason, they must be based on objective criteria, including: 1. The modification or waiver is necessary to eliminate impacts on existing drainage patterns or natural features such as riparian areas, significant trees or vegetation, or steep slopes. 2. An existing structure such as a substantial retaining wall makes widening a street or right-of-way or required placement of lines impractical or undesirable. 3. Street access to an existing lot would be eliminated without the waiver or modification. 4. Building on an existing lot would be infeasible without the waiver or modification. 5. The modification or waiver is needed to allow development of, or street access to, the property because of topographical constraints.

	6. The existing infrastructure (a) does not meet current standards, (b) is and will remain functionally equivalent to current standards, and (c) there is little likelihood that current standards will be met in the area. 7. The installation of the required improvements would likely cause unacceptable significant adverse environmental impacts and the waiver/modification would avoid such impacts. 8. There is insufficient right-of-way to allow a full width street cross-section and additional right-of-way cannot be provided. 9. There is no street or right-of-way adjacent to the property and easement access has been obtained across private property. 10. Required street frontage improvements for individual single-family dwellings could best be accomplished by planned area-wide improvements at a future date. Maximization of the number of lots or parcels in a land division is not a reason to allow a waiver or modification.
Comments	Each land use type is assigned an approximate street spacing based on the density and intensity of land use development.
Notes	

Type of Collector Street (Zoning Designation)	Intensity	Access Function	Approximate Street Spacing
No Collector Streets (Environmental Conservation)	Little to No Development	N/A	N/A
Lowest Intensity (Rural Agricultural)	Less than 2 Dwelling Units per Acre	Highest	3,000 to 6,000 feet apart
Medium Intensity (General Business, General Industrial, Industrial Transition, Manufactured Housing Community, Residential Performance)	2 to 4 Dwelling Units per Acre	High	1,500 to 3,000 feet apart
High Intensity (Residential Mixed, Office Institutional, Planned Development)	More than 4 Dwelling Units per Acre/Activity Nodes	Medium	750 to 1,500 feet apart

Table 5: Traffic Impact Studies Requirement

Description/Purpose	NCDOT requires that Traffic Impact Studies be conducted for developments forecast to generate 3,000 vehicle trips per day (vpd). Pender County would require a lower threshold, 100 vehicle trips during the AM or PM peak hour or 1,000 vpd. This policy would help ensure that the arterial system in Pender County is not unduly burdened without providing alternative access.
Target Performance Measure	Require new developments forecasted to generate over 100 trips during the AM or PM Peak hour or 1,000 vpd to conduct a Traffic Impact Study. The TIA is a useful assessment tool that can have an expanded range and different levels of considerations to make it more suitable for use on collector streets. TIA reports are a critical part of the development review and approval process, as they are the primary tool for identifying the potential net effects from a development proposal. The standard "1,000" thresholds (per day) that trigger a TIA represent a significant fraction (8%-10%) of the total capacity of a collector street. A significant increase in traffic on a collector street can reduce functional integrity and public purpose. A traffic study should consider all modes of travel including cars, transit cyclists and pedestrians.
Sample Language / Recommendation	A Traffic Impact Analysis (TIA) shall be required if one of the following apply to a specific site plan: the development generates 1,000 vehicle trips per day or 100 vehicles in the AM or PM peak hour. This requirement applies to and counts for all phases of a proposed development. Other stipulations regarding internal capture, trip generation, trip distribution, and peak hour factors will be part of the basic requirements of the TIA. It is recommended to assess and quantify the cumulative impact to the roadway network and establish processes to address additional traffic created as a result of additional development.
Comments	With substantial development likely to occur in the CSP study area of Pender County in the next decades, establishing robust measures to ensure that back access is created to new developments is of paramount concern. Traffic is already heavy on US 17 and the provision of multiple developments without adequate cross-access to other roadways in the area will only worsen existing traffic issues. This measure is a requirement.

Table 6: NCDOT Complete Streets Design Manual

Description/Purpose	The NCDOT Complete Streets Design Manual provides guidance on the design and construction of streets that accommodate all users of the transportation system, including bicyclists, pedestrians, transit users, and motorists. This policy would require implementing a Complete Streets approach in new street design and construction in areas where bicycle and pedestrian amenities are programmed in the adopted Pender County Collector Street Plan.
Target Performance Measure	Proposed collector streets should be designed to Complete Streets standards to accommodate pedestrians and bicyclists when these facilities are recommended in the adopted Pender County Collector Street Plan. It is recommended that providing incentives to developers be explored for building Complete Streets in certain cases. Incentives could include reducing required widths for lanes, sidepaths, or ROW; alternative materials for bike/ped facilities such as pervious pavements; use of curb and gutter (i.e., narrow width); utilizing multiuse path on one side of street; and density credits for developments. All provisions should be developed and articulated in a Stormwater Management Plan.
Sample Language / Recommendation	Proposed collector streets as defined by the Pender County Collector Street Plan (CSP) will adhere to the NCDOT Complete Streets Design Manual, including the design of multimodal facilities – i.e., proposed pedestrian and bicycle facilities must be designed and constructed to the applicable standard.
Comments	This measure is based on a stated desire from the public and other adopted plans in the County to include more pedestrian and bicycle amenities along roads in the CSP study area. Future construction of roadways (new or existing) should be constructed to the standards indicated in the NCDOT Complete Streets Design Manual and in the adopted Pender County Collector Street Plan on the collector roadways.
Notes	The information in this table is a requirement. Specific treatments must be implemented as they are programmed within the adopted Pender County Collector Street Plan.

Table 7: Environmental Conservation Policy

Description/Purpose	Extending outward from the need to create interconnected populations (streets and greenways) and a reduced footprint from water quality/quantity impacts is the desire to create interconnected ecologies. This practice is called "landscape ecology," a subset of conservation biology which requires the consideration of how green spaces can interconnect to provide habitat for species, green space for people, and preserve the rural character that is valued in Pender County. Large, protected areas like parks and preservation zones need to be connected with "stepping stone" areas that allow the movement of wildlife and promotion of biodiversity. It is recommended to develop a "Greenprint" that shows areas that would be preserved based on utility (or lack thereof) to private development; linkages to large, protected areas; and biologically diverse habitat (e.g., streams, older-growth forests). Future developments would incorporate these green areas into their plans as part of the requirements for open space; additional space provisions could be rewarded through clustering bonuses that allow a higher intensity of development elsewhere on the site.
Target Performance Measure	Avoid sensitive natural areas to the degree possible when programming new development or reserving road right-of-way.
Sample Language / Recommendation	In order to preserve the unique natural environment in Pender County, any new development that would require the construction of collector street as defined (alignment) by the Pender County CSP, would avoid or minimize impacts to sensitive natural areas, such as wetlands, floodplains, and areas with endangered flora/fauna. Additional justification (i.e., Corps Delineation, etc.) or other additional resource may be necessary as determined by planning staff.
Comments	In some cases, development will necessarily encroach into sensitive natural areas. Avoiding these areas is strongly recommended, though Pender County understands that it may not always be feasible or even desirable to do so.

Table 8: Tri-Party Agreement

Description/Purpose	The Tri-Party agreement is a framework for the construction and maintenance of new pedestrian and bicycle facilities along collector streets. While NCDOT would ultimately maintain the street, all maintenance and liability costs for the construction and maintenance of pedestrian and bicycle facilities would be borne by Pender County (or HOA) until the construction is complete. At that point, maintenance would be transferred to the Home Owner's Association or other qualified party, absolving both the NCDOT and Pender County from any liability or maintenance relating to the pedestrian and bicycle amenity.
Target Performance Measure	Negotiate and implement the Tri-Party agreement with NCDOT. (See steps in Appendix F). Inform effected development community/Homeowner's Associations that this agreement may be warranted for specific situations related to the implementation of bicycle or pedestrian facilities.
Sample Language / Recommendation	See Appendix F.
Comments	The Tri-Party Agreement is fundamental to constructing and maintaining pedestrian and bicycle amenities in the CSP study area. Implementing and abiding by this agreement would be a requirement in situations where bicycle and pedestrian agreements are planned to be constructed.

Table 9: General Connectivity of Collector Roadways

Description/Purpose	Connectivity requires that private entities coordinate across different properties to anticipate future, connections between adjacent properties. Providing connectivity to nearby amenities and to the arterial system is important to avoid congestion across the transportation system. This policy requires that new roadways be constructed to provide connections between the collector and arterials systems. As new development is programmed, this policy would require that collector roadways are not closed off, but are "stubbed out" to ensure that future roadway construction could tie back in to the public roadway network. Essentially, this policy stipulates that no collector street can dead end.
Target Performance Measure	Each new development needs to provide connections to another collector or arterial within the recommended spacing, or shall provide a signed stub-out to allow future connections as new development occurs. All practical connections must be included. No collector street should be disconnected without signage (i.e., Future Connection)
Sample Language / Recommendation	By definition, collector streets are not "dead-end" streets: they always connect to (1) adjacent land at a location that allows the continuation of the collector street onto the adjacent property; or (2) another collector street or another, higher-level (e.g., arterial) street. Furthermore, any new development or additions to existing developments such that the total number of dwelling units exceeds one hundred (100) shall be required to provide for vehicular access to at least two (2) public streets. However, in instances where the collector street cannot be constructed in its entirety a temporary turnaround at the end of the street 1. The temporary turnaround shall be reviewed and approved by NCDOT. 2. Stub-outs shall be adequately signed at the time of final plat recordation, with an easement recorded to the adjacent parcel, and their existence shall be noted on all subdivision plats and deed documents. 3. Stub-out streets will connect to adjacent properties in such a way as to ensure that stream crossings, floodplains and other barriers are avoided to create the continuation of the street.

Comments	Collector streets should provide numerous points of access to the surrounding collector and arterial system. This policy would recommend that developments provide connections to ensure that Efforts should be made to connect to existing street stubs and streets rights-of-way.

Table 10: Bicycle and Pedestrian Accommodation

Description/Purpose	As Pender County develops, the demand for safe, comfortable bicycle and pedestrian facilities will continue to increase. By creating a policy that requires the accommodation of non-motorized users along collector streets, particularly in areas close to residential developments, schools, or parks, the network of facilities for pedestrians and bicyclists will become a high-quality amenity in the County. Beyond health and mobility related benefits, one additional advantage of accommodatins for bike/pedestrians is preservation of capacity along the roadways with reduced vehicular use. (active modes of transportation)
Target Performance Measure	Connect key destinations, including schools, parks, commercial centers, and residential developments with pedestrian and bicycle amenities.
Sample Language / Recommendation	All proposed collector streets, as defined by the Pender County CSP, shall have accommodations for bidirectional bicycle or pedestrian facilities. In the case of Group 1 collector streets, requirements for bicycle or pedestrian accommodations will be made in accordance with existing planning documents. Other bicycle and pedestrian accommodations will be considered if afforded by existing planning documents.
Comments	The inclusion of sidewalks/pedestrian paths/bikeways on all collector streets should be viewed as a minimum standard.

Island Creek Road and NC-210

The intersection of Island Creek road and NC-210 poses a serious safety issue for motorists. Between January 1, 2011 and December 31, 2013, a total of 11 crashes occurred in the direct vicinity of this intersection. Five of the crashes correspond to the "angle" crash type, while four are defined as "rear end, slow or stop" type crashes. One "fixed object" and one "overturn/rollover" crash also occurred at this location. In order to mitigate the crash issue at this location, the proposal is to modify the existing intersection and alignment as needed and potentially; close the cut-through to through traffic, essentially creating a cul-de-sac at this location, and adding a full signal only if warranted at the intersection of what is now Island Creek Road and Dallie Futch Road. In effect, NC -210 would continue onto Island Creek Road before turning right onto Dallie Futch Road before rejoining current NC-210 north of the cut-through. Figure 32 provides more information.

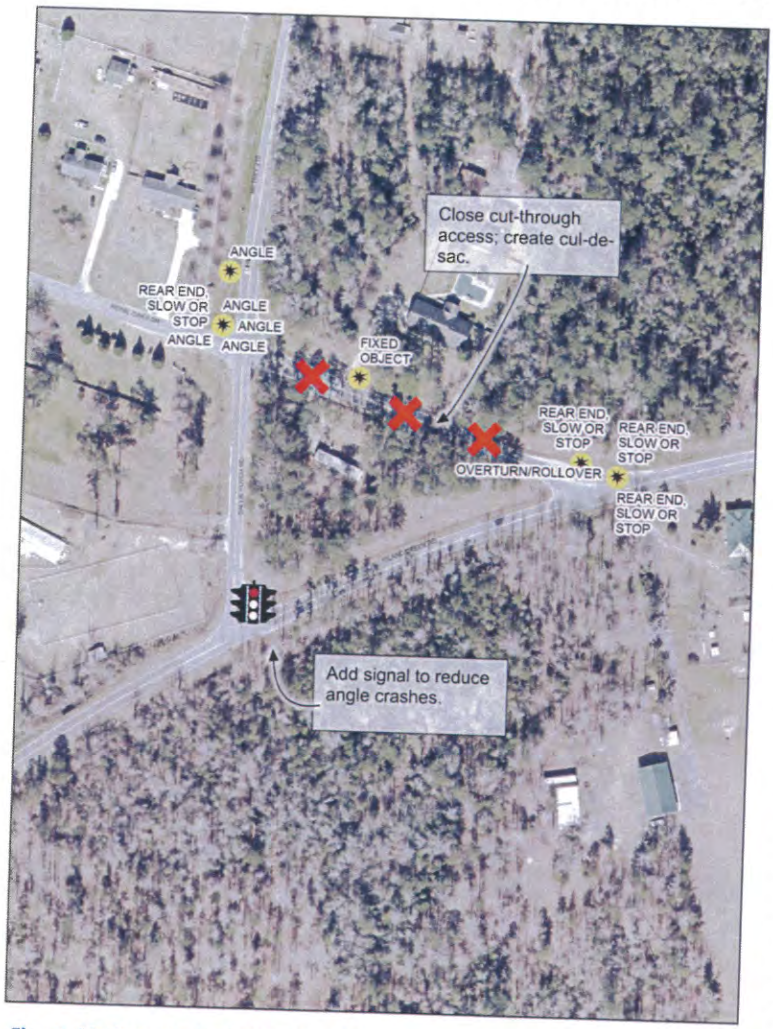


Figure 31: Proposed Infrastructure Changes

Funding

Collector streets are likely to be funded through a variety of sources. The development community may aid in constructing these facilities, while Pender County, the WMPO, and NCDOT may also have a hand in creating new collector streets. What is certain is that finding alternative funding sources will help Pender County and its residents realize this plan quickly and begin to see the results of a more robust collector street network. A few likely funding sources are detailed as potential revenue sources.

Transportation Bonds

Local roadways are often not particularly high on NCDOT Division priority lists, especially in this new era of SPOT funding. With this in mind, strategic bond measures can prove instrumental in helping gather funds to construct needed local facilities. Pedestrian and bicycle facilities, in particular, may be good

candidates for local funding sources, though voter have approved bond measures for larger road construction in other communities, both large and small.

Impact Fees

Impact fees are another way that local governments can pay for needed infrastructure. Often used for water or wastewater service, police and fire protection, and schools, impact fees can also be levied to provide funding for new infrastructure. These fees place the burden on developers and remove the burden from local taxpayers, who are often forced to pay for sometimes expensive new public services that may not directly benefit them. While levying impact fees requires approval from the North Carolina General Assembly and is not a typical funding mechanism, these fees are something that Pender County could consider.

TIGER Grants

Short for Transportation Investment Generating Economic Recovery (TIGER), these grants provide discretionary funding for projects (rail, road, port, and transit) that will have a significant impact on the Nation, a metropolitan area, or a region. Now in the 8th round of grants, this could be funding mechanism to fund a marquee project in the CSP study area.

Private Grants

Foundations and other private organizations will often provide infrastructure grants to communities. Depending on the specific grant, private money may be available, particularly to support the construction of pedestrian and bicycle facilities.

FAST Act Funding

The new Fixing America's Surface Transportation (FAST) Act could be another important funding source for Pender County. This 5-year, $305 billion, transportation bill provides substantial funding for roads and bridges, public transportation, highway and motor vehicle safety, truck and bus safety, hazardous materials, railroads, and other provisions. Depending on the State of North Carolina chooses to allocate this funding, some may be available to counties to help construct important infrastructure projects.

Ultimately, it is our assumption that many of the collector streets in Pender County will be constructed by the development community and that the funding sources mentioned above can support collector street construction, but will likely not be primary sources of funding.

Action Plan

The following steps constitute important actions that can be undertaken to implement the recommendations of this Pender County Collector Street Plan. While other funding sources may become available, these actions present a clear way forward with the ultimate goal of achieving plan implementation within a reasonable timeframe.

Action	Responsible Party	Timing
Adopt Pender County Collector Street Plan	Pender County Commissioners	Spring 2016
Research and Apply for FAST Transportation Funding (in coordination with the WMPO)	WMPO, Pender County Planning and Community Development Department	Ongoing
Pursue Funding to Implement Collector Street Recommendations (local, state, private)	Pender County Planning and Community Development Department	Ongoing
Pursue Grants, including TIGER and SRTS, to implement marquee projects, pedestrian and bicycle facilities	WMPO, Pender County Planning and Community Development Department	Ongoing
Adopt Policy Measures into County Ordinances	Pender County Planning and Community Development Department	Spring 2017
Develop Bicycle and Pedestrian Plan to Reflect Collector Street Plan Recommendations	WMPO, Pender County Planning and Community Development Department	2018-2020

As the development community will build some of the collector streets, it is important to note that Pender County will do its utmost to implement this plan, but will not be funding collector street construction directly.

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