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THE TOWN OF KILL DEVIL HILLS
NORTH CAROLINA

PLANNING DEPARTMENT

February 15, 2022

Memorandum

To: Planning Board

From: Ryan Lang, Senior Planner *RL*

Subject: **SITE PLAN REVIEW**— 100 East Fifth Street — Proposed Cluster Home Development — Including 11 “4-Bedroom” and 2 “3-Bedroom” Residential Units and Community Pool with Pool Building.

Enclosed is a site plan review submittal by Mike Robinson, PE for the proposed construction of a 11 4-bedroom and 2 3-bedroom unit Cluster Home Development, community pool, pool building, drive isle, and associated site improvements at 100 East Fifth Street in the Commercial Zone. The proposed cluster home development is a permitted use in the Commercial Zone. Attached you will find a commercial site plan application, proposed site plan, proposed architectural plans, willingness to serve from KDHWWTP, and applicant’s response to Staff’s Tech 2 comments.

The applicant has addressed most of staffs initial technical review comments; however, the following conditions remain to be addressed:

Planning

1. Proposed Architecturals for Pool Building does not meet the requirements of 153.186 Commercial Building Exterior. Roof Height is required to be 6 feet from top plate to the ridge. Roof slope, roof overhang, and materials used for building construction are not identified.
2. Remove bold property lines from Lot 525, Avalon Beach Annex 1 on Site Plan.
3. Construction entrance detail corrected to 50’ depth.

Town Engineer

All street drainage designs shall be reviewed and approved by Public Services and Town Engineer prior to construction.

Note: For the portion(s) lying on private property, a permanent drainage easement, with KDH as grantee, of appropriate width is required. We suggest that the outer (generally northern) edge of the easement be at least 3' beyond the CL of the new 15" sock drain. It is preferable to keep a constant width of easement, parallel to the E Fifth Street RW line. To promote that goal and still keep the width of the easement from becoming excessive, the sock drain between DI's 4 and 5 could be laid parallel/concentric to the RW line, rather than "cutting the corner."

Public Services

Solid Waste

Provide heavy duty permeable pavement specifications that will handle biweekly traffic from Town commercial refuse vehicles or provide heavy duty concrete service drive from E. Fifth St. through the dumpster site area and exit back on to E. Fifth St.

Streets

A stub out pipe on the eastern most drainage structure at New Bern St. should be provided for future drainage connection from New Bern St.

Water System

- a. Plan revisions note the requirement for the Architect to provide the meter sizing form for each unit and the pool site to verify that that the proposed 5/8x3/4 services area adequately sized. Once this the sizing forms are provided, public services will provide requirements regarding the meter sizes for the units and provide anticipated water fees.
- b. Service for the fire sprinkler systems shall be provided via a dedicated fire line with a RPZ located at the property line.

Staff recommends that the Planning Board forward the plan to the Board of Commissioners with a favorable recommendation after the above listed conditions have been addressed.

Town of Kill Devil Hills Planning and Inspections
Commercial Site Plan Review Application*



Applicant

Name: Fifth Street KDH, LLC
 Address: c/o Eddie Goodrich
P.O. Box 3629, Kill Devil Hills, NC 27948
 Phone: 252-475-0874
 Fax: _____
 Cell: _____

Property Owner

Name: Applicant is contract purchaser of tract
 Address: _____
 Phone: _____
 Fax: _____
 Cell: _____

Property Location

Address: 0 East Fifth Street Lot, Block: A portion of Tract 4
 Subdivision: Wright's Shores Pin#: 9884 06 391318

Zoning District: Commercial LI-1 LI-2 OIR
 Total Lot Size: 64,787 Sq. Ft. Disturbed Area: 64,000 Sq. Ft.

Contractor

Company Name: TSD License Number: _____
 Name: _____ Phone: _____
 Address: _____ Cell: _____
 Fax: _____

Town Privilege License Number: _____

Construction Information

Type of Construction: _____
 Assembly Business Educational Factory/Industrial High Hazard
 Institutional Mercantile Residential Storage Utility/Misc.
 New Construction Addition Repair/Replace Remodel Other: _____

Square Footage Proposed:

Interior Space: 26,500 Sq. Ft. Covered Deck(s): 2,000 Sq. Ft. Storage: N/A Sq. Ft.
 Garage: N/A Sq. Ft. # of Bedrooms: 39 # of Open Deck(s): 2 PER BLDG
 Proposed Square Footage: 29,105 + Existing Square Footage: 0 = 29,105 Total Sq. Ft.
 % Impervious Coverage: 40 + % Pervious Coverage: 4.9 = 44.9 Total % Coverage
 # of Parking Spaces: Existing: 0 Proposed: 39 Total: 39
 Septic Tank Permit #: KDHWWTP Construction Type: FRAME (PILING)

Estimated Construction Cost (including labor and materials): _____

Flood Information

Flood Zone: VE AE X Base Flood Elevation: RFPE = 8.0'
 Proposed First Floor Elevation: 15.5' +/- Sq. Ft Below Base Flood Elevation: N/A
SLABS = 7.5' MIN.

*This form is designed as a guide for Commercial Site Plan Review.
 Additional plans and information will be required prior to building permits.

Project Description

CLUSTER HOME DEVELOPMENT WITH 13 - 3 BEDROOM RESIDENTIAL

UNITS INCLUDING COMMUNITY POOL

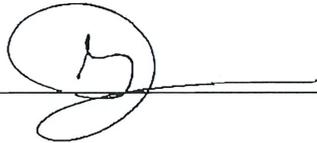
Required Site Plan Information Checklist:

- Permit Application (Completed)
- Site Plan Including the following
 - Submittal Requirements:
 - Vicinity Map
 - 5 15 Copies of Site Plan & Building Plan Elevations – Front, Side, and Rear
 - Tentative Health Department Approval
 - Site Plan Development Review Fee Paid in Full
 - Existing Conditions:
 - Boundary of Entire Lot
 - Width and Location of Existing Right of Ways
 - Nature, Purpose, Locations, and Size of Existing Easements
 - Iron Pins and Concrete Monuments
 - Scale (1" = 50" Minimum)
 - North Arrow
 - Streets Including Width of Pavement
 - All Underground Utilities, Gas/Propane Below or Above Grade
 - Dare Co. Register of Deeds Map Book/Subdivision Ref.
 - Street Address
 - Present Recorded Owner, Developer, Engineer contacts
 - Adjacent Property Owners, Adj. Use & Zone
 - Corp. of Engineers Report / Wetland Study
 - NFIP Flood Zone (ref: Elevation Datum (NAVD 1988))
 - Minimum, Lot Size indicated
 - Proposed Improvements:
 - Zoning Use Compliance/Setbacks labeled
 - Landscaping Plan / Buffers / Screening (per section 153.073)
 - N/A Lighting Plan - photometric showing point output (section 153.074)
 - Sedimentation & Erosion Control Plan including details
 - Disturbed Areas delineated & areas calculated
 - N/A Location of Sidewalks on the Croatan Highway and Curbs
 - Location of Sewer Facilities and Drain field
 - Proposed Building Type, # of Floors and dimensions, floor area ratio, Height
 - Existing and Finished Grades of Entire Site
 - PENDING Storm Water Management Plan including calculations
 - Total Units and Density per Acre (Multi-Family) or floor area ratio (in OIR)
 - Lot Size and Lot Coverage Calculation
 - Utility Plan indicating location & sizes of proposed improvements
 - PENDING Water Service Sizing Checklist
 - Layout, Size and Number of Parking Spaces including handicap w/ setbacks (Each Space Numbered)
 - Fire Lane and Driveways
 - N/A Loading Zone (Commercial Sites)
 - Mail Delivery Cluster Sites (Multi-Family)

- Proposed First Floor Elevation
- Dumpster Pad Location
- Proposed Sign Location
- Sight triangle shown
- Commercial Building Plans showing architectural compliance
- Plans to N.C.D.O.T. (if required)
- NC Engineer/Land Surveyor Seal on Site Plan

*** The items listed in the Site Plan portion of the above checklist represent information that must be indicated on any site plan submitted for review by the Kill Devil Hills Planning Department, Planning Board, and Board of Commissioners. All of the above required documents shall be submitted on or before the 3rd Tuesday of each month. Upon completion of review, the Planning Board shall transmit its recommendations to the Board of Commissioners. The Board of Commissioners shall review site plans on the second Monday of each month.

Signature of Applicant:

A handwritten signature in black ink, consisting of a large, stylized letter 'S' followed by a horizontal line extending to the right.

(Date) 10-19-21

January 27, 2022

Memorandum Response
January 31, 2022 Submittal for Planning Board review

From: Michael Robinson, P.E., P.L.S.

To: Ryan Lang, Senior Planner

Subject: **SITE PLAN TECHNICAL REVIEW 2** —100 East Fifth Street in the Commercial Zone —
Proposed Cluster Home Development —Including 11 “3-Bedroom” and 2 “4-Bedroom”
Residential Units and Community Pool

Planning --- Ryan Lang (252-449-5315)

Sheet 1:

1. Provide Density Calculation. Maximum density allowed for Cluster Home Development is 18 units per acre. **Density added to notes on sheet 1 (8.7 units/acre)**
2. Proposed Lot Coverage identified on site listed as 37, 699 sq. ft. (57.8%), *General Notes* has total coverage listed as 35,653 sq. ft. (55.0%). Clarify actual lot coverage adjusted and unadjusted. **Text corrected, coverage is 44.4 adjusted and 55.1 unadjusted**
3. Plantings of Trees and Shrubs cannot encroach on neighboring property. Consider moving the proposed 6' Fence setback from 3' to 5'. **Done**

Sheet 6:

1. Extend proposed silt fence to edge of western construction entrance. **Done**

Sheet 8:

1. Revise construction entrance detail, 50' deep and “5th Street”. **Detail corrected**
2. List number of plantings provided. **Additional planting may be added but the minimum will be met. See notes on Sheet 8 (lower left)**
3. Revise Landscape Buffer Table: Property Corner D to A “Dense Vegetative Screen along North Property Line with Fence Buffer between incompatible uses.” **Done**
1. Provide Proposed Architectural and Floor Plan for Bath House and Pool Mechanical Building. **Included with this submittal**

Town Engineer --- Peter Burkheimer, PE (757-478-5970)

1. This submittal is responsive to our previous comments and we have no significant comments, other than #3 below.
2. There are a couple of very minor points of the plans that it would be good to address:
 - a. We believe that "Developer Conditions" note 5.B in the lower right corner of Sheet 1 is a holdover from some other project and should be deleted. **It was intended to list site conditions and misc requirements from Town Review, text amended**
 - b. Sheet 8; on Gravel Construction Entrance detail, change "Virginia Dare Trail" to "Public Street". **Done**
 - c. Sheet 8, Stormwater Calculations: We recommend revising the calculations of storage volume and associated cross section to reflect Interstitial Storage depth of 2.5', from the top elevation of 7.0 down to elevation 4.5. The resulting volume reduction still leaves the project well over the required "managed" volume of a 4.3" rain event. And the 0.20 porosity is conservative. Further, with the groundwater managed down by the "sock drain" system, as discussed below, effective interstitial storage will not be confined within downward vertical projections of the top-of-bank lines. **Calculations adjusted**
 - d. It may be feasible to delete the silt fence along E Fifth Street, as the developing property is lower in elevation...at least through the initial phases of development. **I defer to Ryan**
3. The sidewalk in the N Croatan Highway right of way may be reduced to 5' in width. Also, it should be reconfigured to suit a future crosswalk in FRONT of the STOP bar. That will set up the future crosswalk to cross E Fifth Street approximately perpendicularly and properly intersect the existing east-west crosswalk on the south side of the intersection. **Sidewalk modified as noted and future crosswalk added.**
4. As noted in previous comments and acknowledged by the applicant's engineer, the matter of the flow of public stormwater, first westward along the north side of E Fifth Street, then northward along the east side of the RW of N Croatan Highway, is a challenge that we aren't quite done with. **I addressed all the comments below, some conceptually, but there will be some fine tuning and we will need additional survey data.**
 - a. We believe an in-person meeting with Town Engineer, Public Services Director and Assistant Director and applicant's Engineer can resolve this.
 - b. We believe what is depicted on this submittal is close to the right concept: A 15" "sock drain" along the entire route.
 - c. We believe this pipe should begin at existing structure ...2134 at the northeast corner of the intersection of N Croatan Highway and E Durham Street, tying in at its existing invert of 4.30± and extending along the route described above, a total length of about 940' and ending at a structure in the south corner of the intersection of E Fifth Street and New Bern Street. Additional topography is needed to confirm the location of existing

structure and pipes in that intersection and thus set the alignment and terminus of the new pipe.

- d. We recommend this be laid as flat as practical, and no steeper than 0.05%, resulting in an invert at the upstream end of about 4.77±. Lowering the slope to 0.02%, with an upstream invert of 4.49±, would be even better.
- e. Keeping the sock drain low in this manner will maximize the management of the groundwater elevation in this area, which will enhance and maximize the performance of the project's on-site infiltration-based stormwater management system. At times several days after the last significant rain event, the water table would be down around 4.5 to 4.8, nearly 2' lower than the 6.5 bottom elevation of the on-site basins. It could even be argued that the on-site stormwater management system might not even work properly, under certain antecedent precipitation conditions, without the sock drain's groundwater management effect.
- f. This groundwater management effect will also mitigate any effects upon the existing lots to the immediate north, which front on E Durham Street; some of their rear lot elevations are a little lower than the proposed bottom of this project's on-site basins.
- g. Also, an upstream invert around 4.5 to 4.7 lends itself better to making DI #7 "constructable." As currently shown, it has a Rim of 6.00 and an invert of 5.50. There are street grade in that vicinity now as low as 6.30, so a Rim of something like 5.50 to 5.70 is appropriate. It may even be appropriate to reduce the "sock drain" diameter upstream of DI #5 to 12". DI #7 could also be built with a sloping grate, perhaps 6.27 over the pipe end, sloping down to 5.60 away from the pipe end.
- h. It appears feasible to eliminate DI #6 and curve the pipe horizontally. Regarding the note regarding adjustments to avoid conflicts, we don't recommend the "...and dipped vertically..." provision. If such a dip became absolutely unavoidable, we would recommend a DI adjacent, to aid in cleaning out the inevitable sediment accumulation.
- i. It appears that the profile we recommend will easily clear above the gravity sanitary sewer collection system.
- j. As it will be carrying flow from public streets New Bern Street and E Fifth Street along its entire extent, we recommend that this be a publicly-maintained system. A drainage easement, in form acceptable to the Town Attorney, would be required. The easement should extend outward from the edge of the existing public right of way to a line at least 3' outboard of the centerline of the pipe, and sufficient to contain all DI's.

Public Services — Derek Dail (252-480-4085)

Solid Waste

1. The number of bedrooms has increased since the last application to a total of 50. The site will require a minimum of three dumpsters and the dumpster site should be built to accommodate four dumpsters for future expansion. **Dumpster pad modified**

Streets

1. On the sock drain notes, remove all references regarding dipping the pipe vertically, horizontal curves are generally ok when necessary. **Done**
2. Public Services acknowledges that the stormwater along US 158 is not final per the plan sheet notes and will be available to review the drainage and share any available information with the Engineer. **Agreed**

Water System

1. The plans propose 1-inch water services for each unit. The architect is requested to provide the water meter service sizing form for each base model. **Note added to Sheets 3 and 4**
2. The water service serving the pool amenity site will require a RPZ installed downstream of the water service located near the right-of-way line. **RPZ added, size to be determined**
3. Provide the water meter sizing form for the swimming pool amenity for service sizing.
4. Developer conditions note 4 on sheet 1 references that *the houses will be equipped with a 13D fire suppression system due to accessibility*. It is public services preference that if the units are to be sprinkled that they be serviced off a dedicated fire line on the property. Fire department has concerns with us shutting off water for nonpayment in the event the sprinkler is needed during a fire. **I would like to discuss this. A typical residential system operates off the same potable line serving the building which helps to keep costs low. The system, as I understand it, is not really installed to put out a fire, just give the occupants some time to exit. Not my field of expertise so a meeting to discuss may be appropriate.**

Wastewater – Most of these comments were addressed with plan notes, but will remain as comments until received.

1. A copy of the Willingness to Serve from KDHWTP needs to be provided. **Noted**
2. If required, a copy of the NCDEQ Wastewater Extension (Fast Track) permit will need to be provided prior to issuance of a building permit. **Note added to sheet 1**

Fire Marshal --- John Risoldi (252-449-5227)

1. A minimum of 2 more fire hydrants shall be installed on the site **Two hydrants added, one across from unit 108 and one adjacent to unit 126.**
2. Fire sprinkler plans shall be submitted and approved prior to installation **Note added to sheet 1 upper left**
3. Fire sprinkler installation falls under the building permit for each unit **Note added to sheet 1 upper left**
4. Accessibility is the requirement for a NFPA 13 D fire sprinkler system **Note added to sheet 1 upper left**

KDHWTP, LLC
P.O. Box 3629
Kill Devil Hills, NC 27948
NCUC W-1160

Willingness to Serve

October 28, 2021

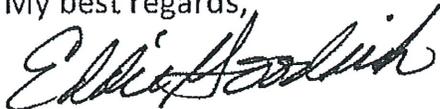
Fifth Street KDH, LLC
200 E. Blackman St.
Nags Head, NC 27959

Re: Fifth Street Cluster Housing Project PIN 988406391318

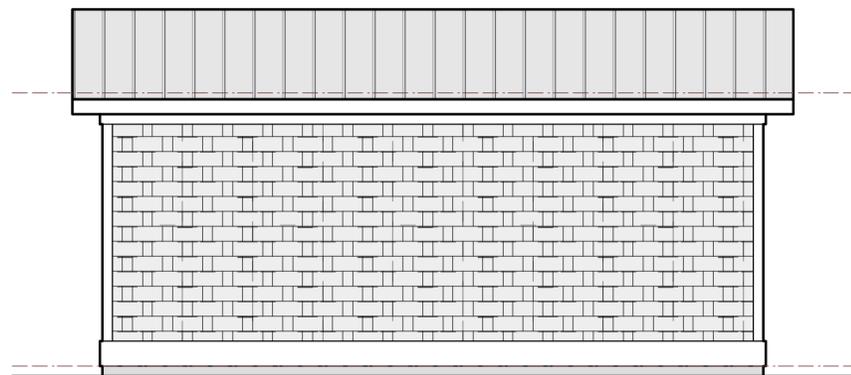
To whom it may concern:

The Public Utility currently has sufficient sewer capacity available and we are Willing to Serve the above referenced property with 7800 gpd of sewer capacity for 13 cluster housing units.

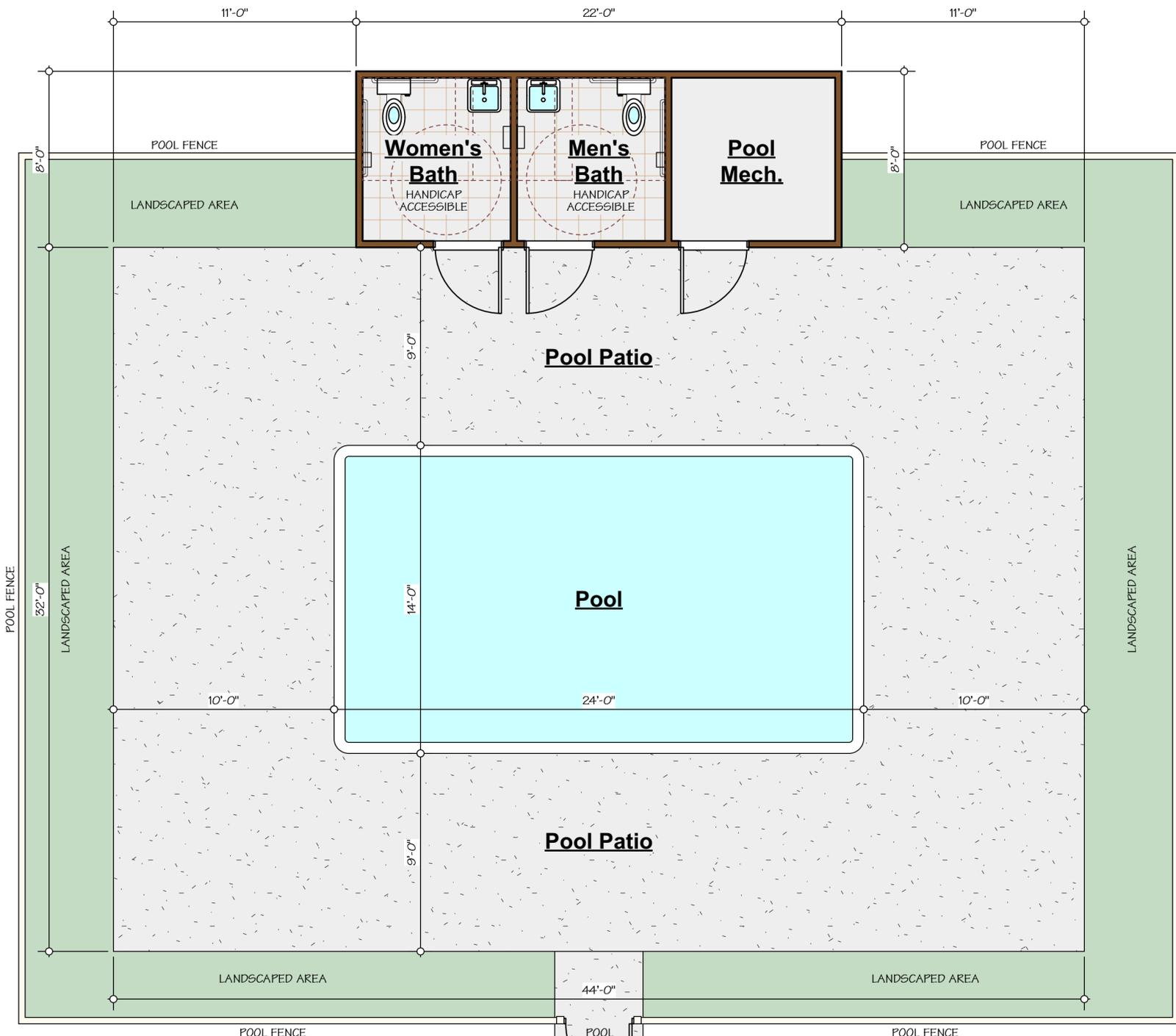
My best regards,



Eddie Goodrich
Member Manager



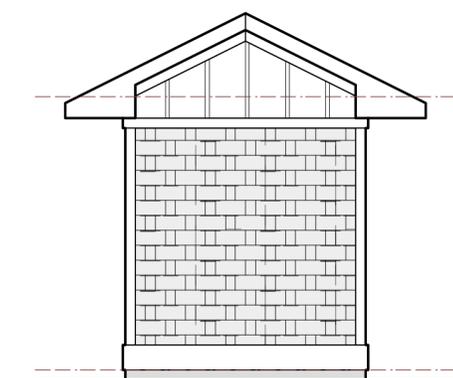
**BATH HOUSE
REAR ELEVATION**
SCALE: 1/4" = 1'-0"



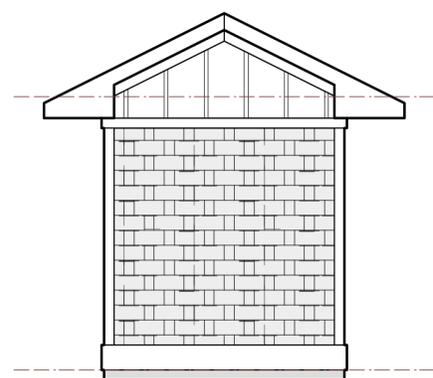
POOL & BATH HOUSE PLAN
SCALE: 1/4" = 1'-0"

AREA SCHEDULE

POOL & POOL PATIO	1,408 SQ.FT.
BATH HOUSE	176 SQ.FT.
TOTAL AREA	1,584 SQ.FT.



**BATH HOUSE
RIGHT SIDE ELEVATION**
SCALE: 1/4" = 1'-0"



**BATH HOUSE
LEFT SIDE ELEVATION**
SCALE: 1/4" = 1'-0"



**BATH HOUSE
FRONT ELEVATION**
SCALE: 1/4" = 1'-0"

POOL & BATH HOUSE
PLANNING BOARD REVIEW
PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

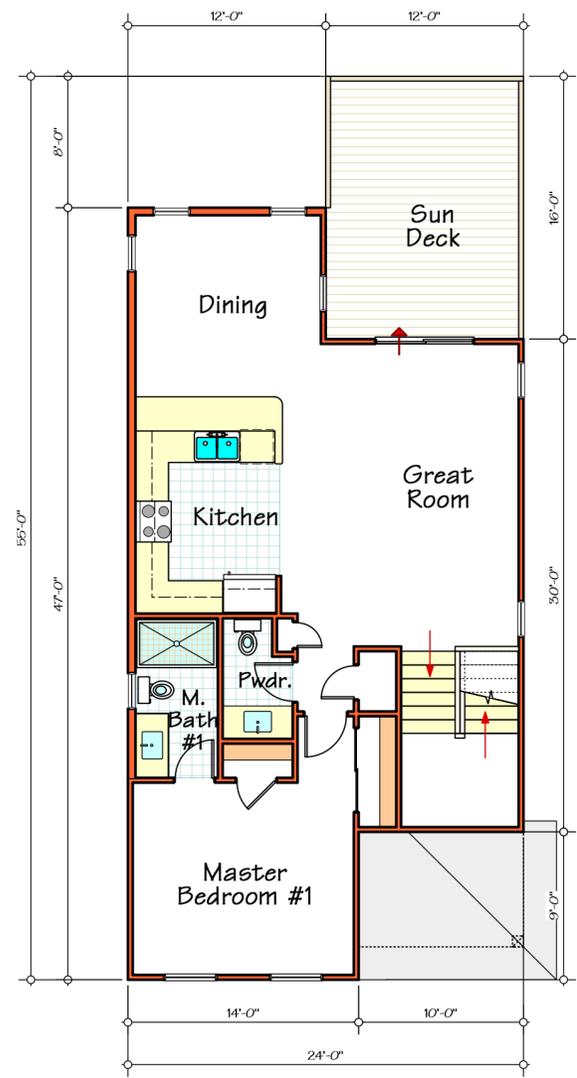
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Point Harbor, NC 27964
florezdesignstudios.com
Tel: 252-491-8000 Fax: 252-491-9975
Email: florezdesignstudios@gmail.com

Design Concepts for
**Fifth Street
Cottage Court**

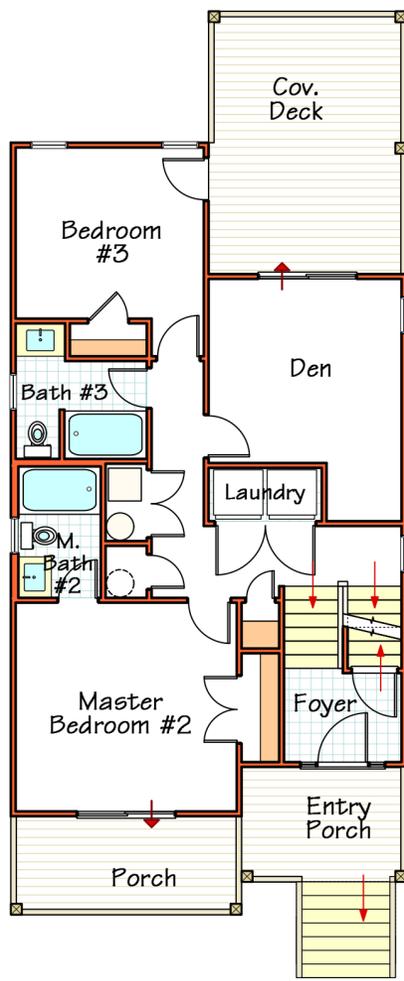
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DATE: JAN 28, 2022

SHEET NO.
1

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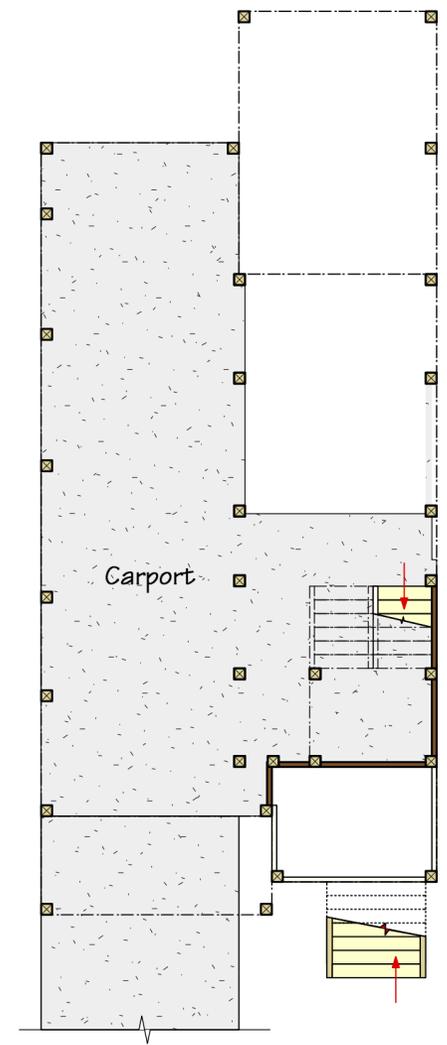


SECOND FLOOR PLAN



FIRST FLOOR PLAN

THREE BEDROOM UNIT



GROUND FLOOR PLAN

AREA SCHEDULE	
FIRST FLOOR	832 SQ.FT.
SECOND FLOOR	904 SQ.FT.
TOTAL HEATED AREA	1,736 SQ.FT.
COVERED ENTRY PORCH	70 SQ.FT.
FIRST FLOOR COV. PORCH	84 SQ.FT.
FIRST FLOOR DECK	192 SQ.FT.
SECOND FLOOR DECK	192 SQ.FT.
CROW'S NEST DECK - WEATHERPRO	192 SQ.FT.
TOTAL COVERED PORCHE/DECKS PER UNIT	154 SQ.FT.

**PLANNING BOARD REVIEW
DRAWING N.T.S.**

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Design Concepts for Fifth Street Cottage Court	DRAWN BY: BD	SHEET NO.
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RIGHT ELEVATION



REAR ELEVATION



LEFT ELEVATION



FRONT ELEVATION

THREE BEDROOM UNIT

PLANNING BOARD REVIEW
DRAWING N.T.S.

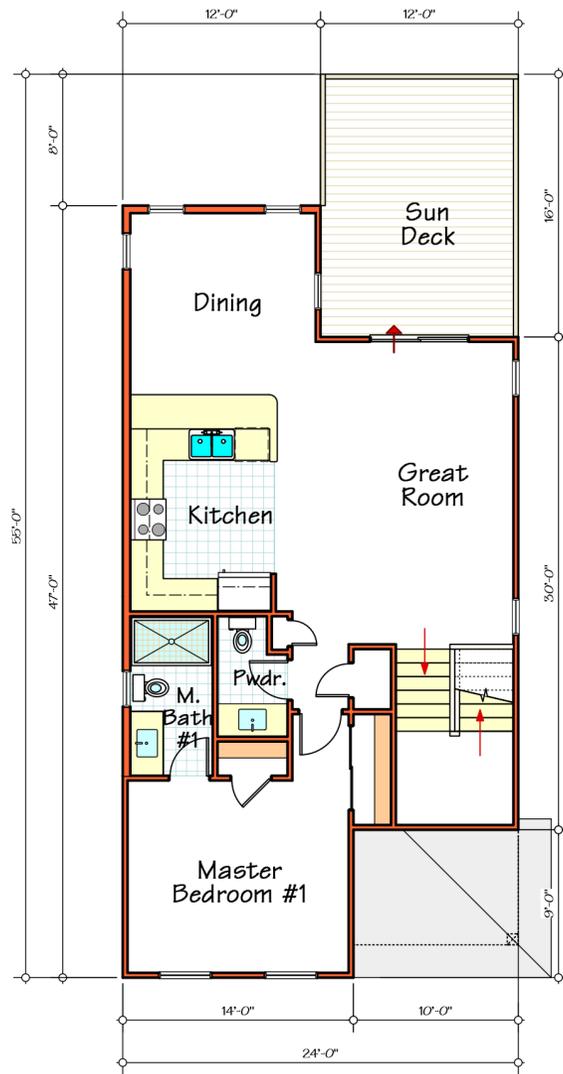
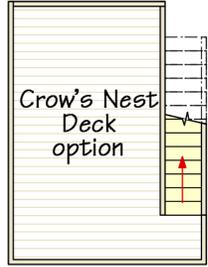
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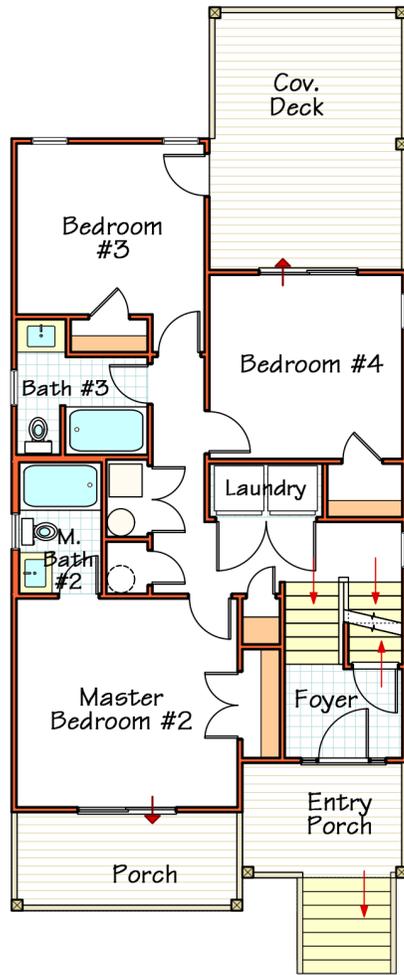
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Design Concepts for
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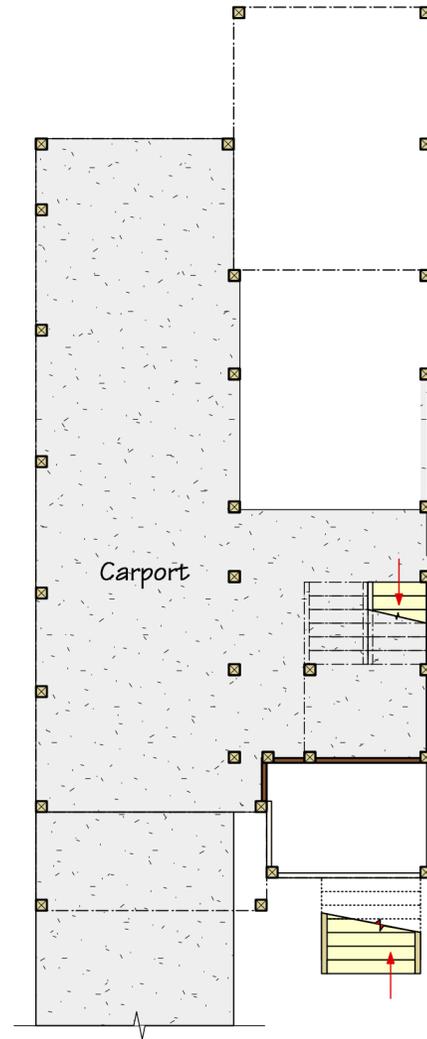
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DATE: JAN 18, 2022	2



SECOND FLOOR PLAN



FIRST FLOOR PLAN



GROUND FLOOR PLAN

FOUR BEDROOM UNIT

AREA SCHEDULE	
FIRST FLOOR	832 SQ.FT.
SECOND FLOOR	904 SQ.FT.
TOTAL HEATED AREA 1,736 SQ.FT.	
COVERED ENTRY PORCH	70 SQ.FT.
FIRST FLOOR COV. PORCH	84 SQ.FT.
FIRST FLOOR DECK	192 SQ.FT.
SECOND FLOOR DECK	192 SQ.FT.
CROW'S NEST DECK - WEATHERPRO	192 SQ.FT.
TOTAL COVERED PORCHE/DECKS PER UNIT	154 SQ.FT.

**PLANNING BOARD REVIEW
DRAWING N.T.S.**

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Design Concepts for Fifth Street Cottage Court		DRAWN BY: BD	SHEET NO.
		DATE: JAN 18, 2022	1

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RIGHT ELEVATION



REAR ELEVATION



LEFT ELEVATION



FRONT ELEVATION

FOUR BEDROOM UNIT

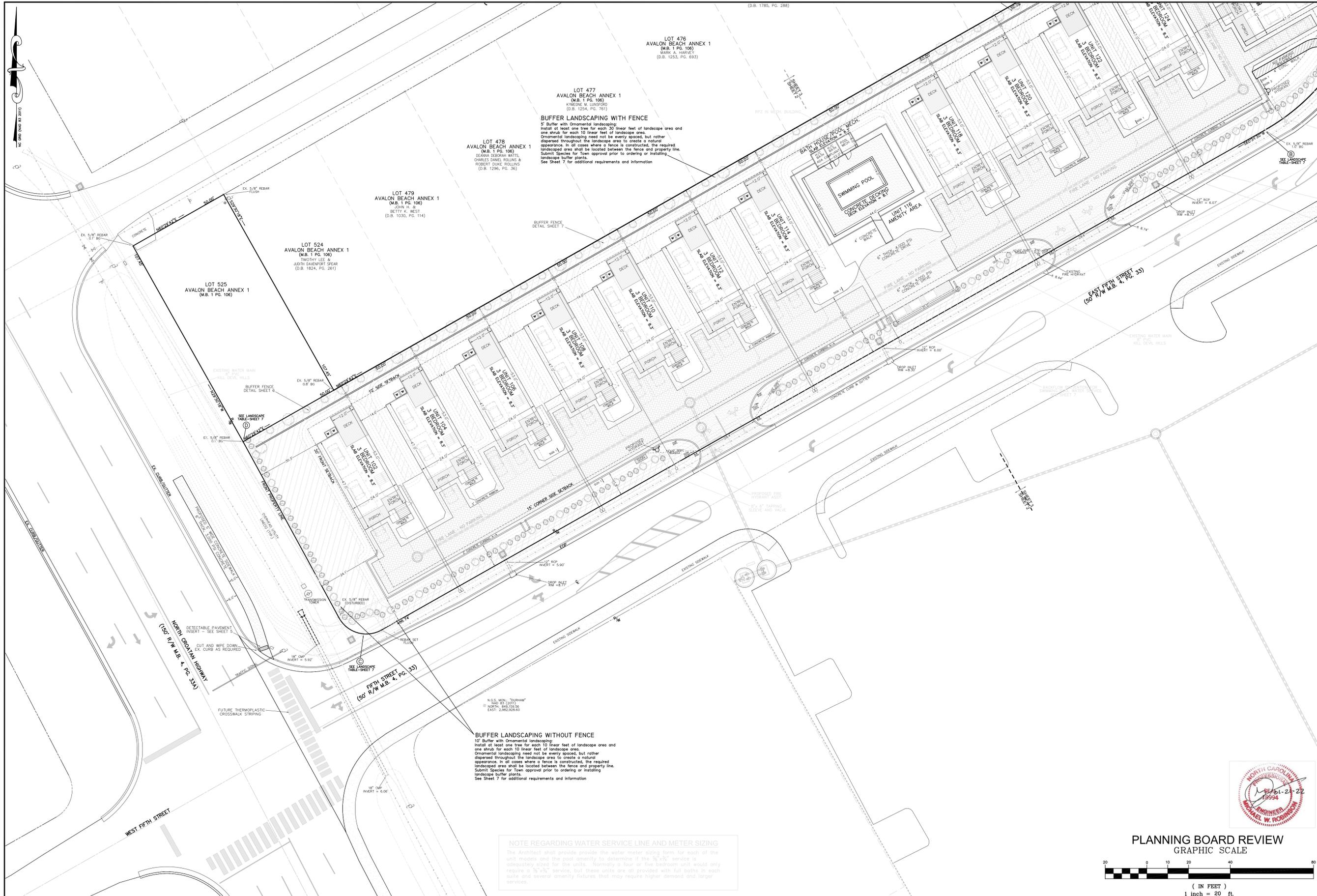
PLANNING BOARD REVIEW
DRAWING N.T.S.

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Design Concepts for
Fifth Street
Cottage Court

DRAWN BY: BD	SHEET NO.
DATE: JAN 18, 2022	2



(D.B. 1785, PG. 288)

LOT 476
AVALON BEACH ANNEX 1
(M.B. 1 PG. 100)
MARK A. HARVEY
(D.B. 1253, PG. 693)

LOT 477
AVALON BEACH ANNEX 1
(M.B. 1 PG. 106)
KNEIGE M. LINDFORD
(D.B. 1254, PG. 761)

LOT 478
AVALON BEACH ANNEX 1
(M.B. 1 PG. 106)
DEANNA DEBORAH WATTS,
CHARLES DANIEL ROLLINS &
ROBERT DUKE ROLLINS
(D.B. 1296, PG. 36)

LOT 479
AVALON BEACH ANNEX 1
(M.B. 1 PG. 106)
SARA H. &
BETTY K. WEST
(D.B. 1030, PG. 114)

LOT 524
AVALON BEACH ANNEX 1
(M.B. 1 PG. 106)
TIMOTHY LEE &
JUDITH DAVENPORT SPEAR
(D.B. 1824, PG. 261)

LOT 525
AVALON BEACH ANNEX 1
(M.B. 1 PG. 106)

BUFFER LANDSCAPING WITHOUT FENCE
10' Buffer with Ornamental Landscaping.
Install at least one tree for each 10 linear feet of landscape area and one shrub for each 10 linear feet of landscape area.
Ornamental landscaping need not be evenly spaced, but rather dispersed throughout the landscape area to create a natural appearance. In all cases where a fence is constructed, the required landscaped area shall be located between the fence and property line. Submit Species for Town approval prior to ordering or installing landscape buffer plants.
See Sheet 7 for additional requirements and information

NOTE REGARDING WATER SERVICE LINE AND METER SIZING
The Architect shall provide provide the water meter sizing form for each of the unit models and the pool amenity to determine if the 3/4" service is adequate sized for the units. Normally a four or five bedroom unit would only require a 3/4" service, but these units are all provided with full baths in each suite and several amenity fixtures that may require higher demand and larger services.

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**SITE PLAN
PRELIMINARY**

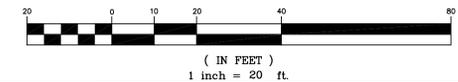


NO.	DATE	REVISIONS DESCRIPTION

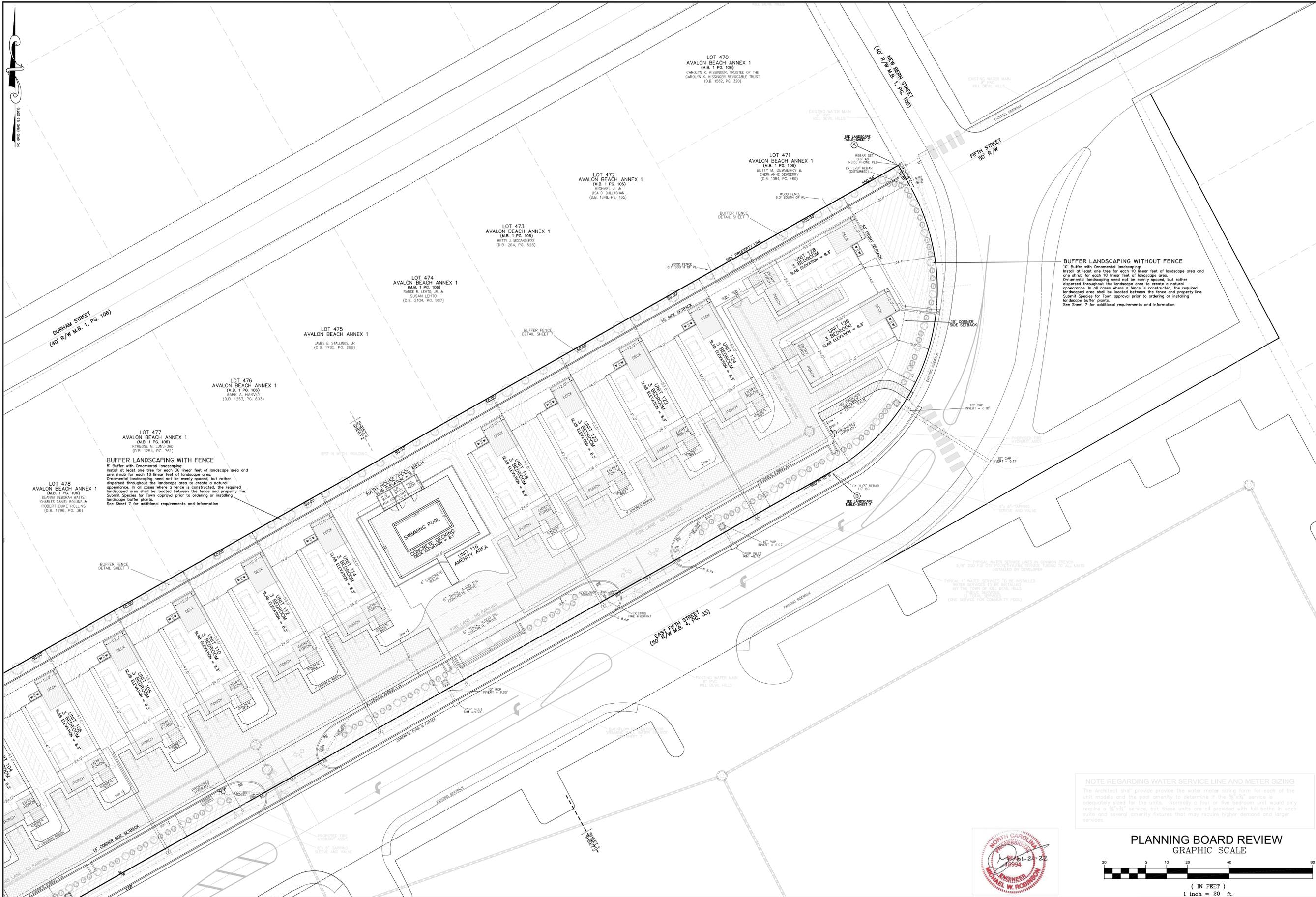
PROJECT: **FIFTH STREET COTTAGES**
NORTH CAROLINA
DARE COUNTY
KILL DEVIL HILLS
A PORTION OF TRACT 4, WRIGHT'S SHORES



PLANNING BOARD REVIEW
GRAPHIC SCALE



DATE: 01-31-22	SCALE: 1"=20'
DESIGNED: MWR	DRAWN: MWR
SHEET: 2	OF 9
CAD FILE: fifth street cottage court-kth-base.dwg	
PROJECT NO: 051121	



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**SITE PLAN
PRELIMINARY**



NO.	DATE	DESCRIPTION

FIFTH STREET COTTAGES
NORTH CAROLINA
DARE COUNTY
KILL DEVIL HILLS

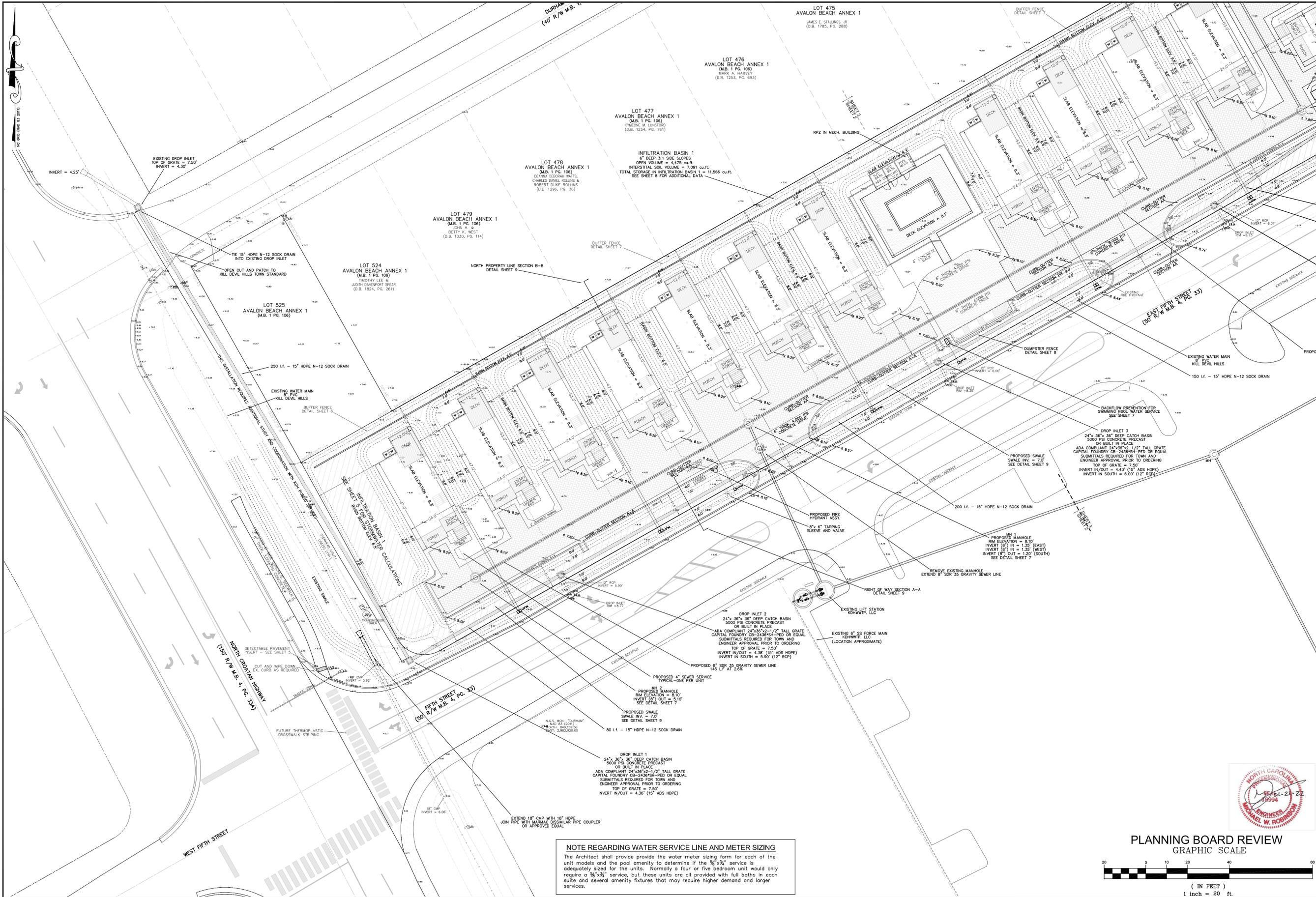
A PORTION OF TRACT 4, WRIGHT'S SHORES

PROJECT:	DATE:	SCALE:
Fifth Street Cottage Court - 4th - Base.dwg	01-31-22	1"=20'
DESIGNED:	DRAWN:	
MWR	MWR	
SHEET:	OF	
3	9	
CAD FILE:		
PROJECT NO:		
051121		

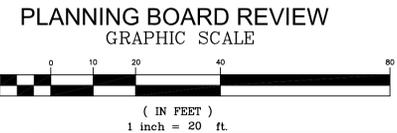


PLANNING BOARD REVIEW
GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.



NOTE REGARDING WATER SERVICE LINE AND METER SIZING
 The Architect shall provide provide the water meter sizing form for each of the unit models and the pool amenity to determine if the 3/4" service is adequately sized for the units. Normally a four or five bedroom unit would only require a 3/4" service, but these units are all provided with full baths in each suite and several amenity fixtures that may require higher demand and larger services.



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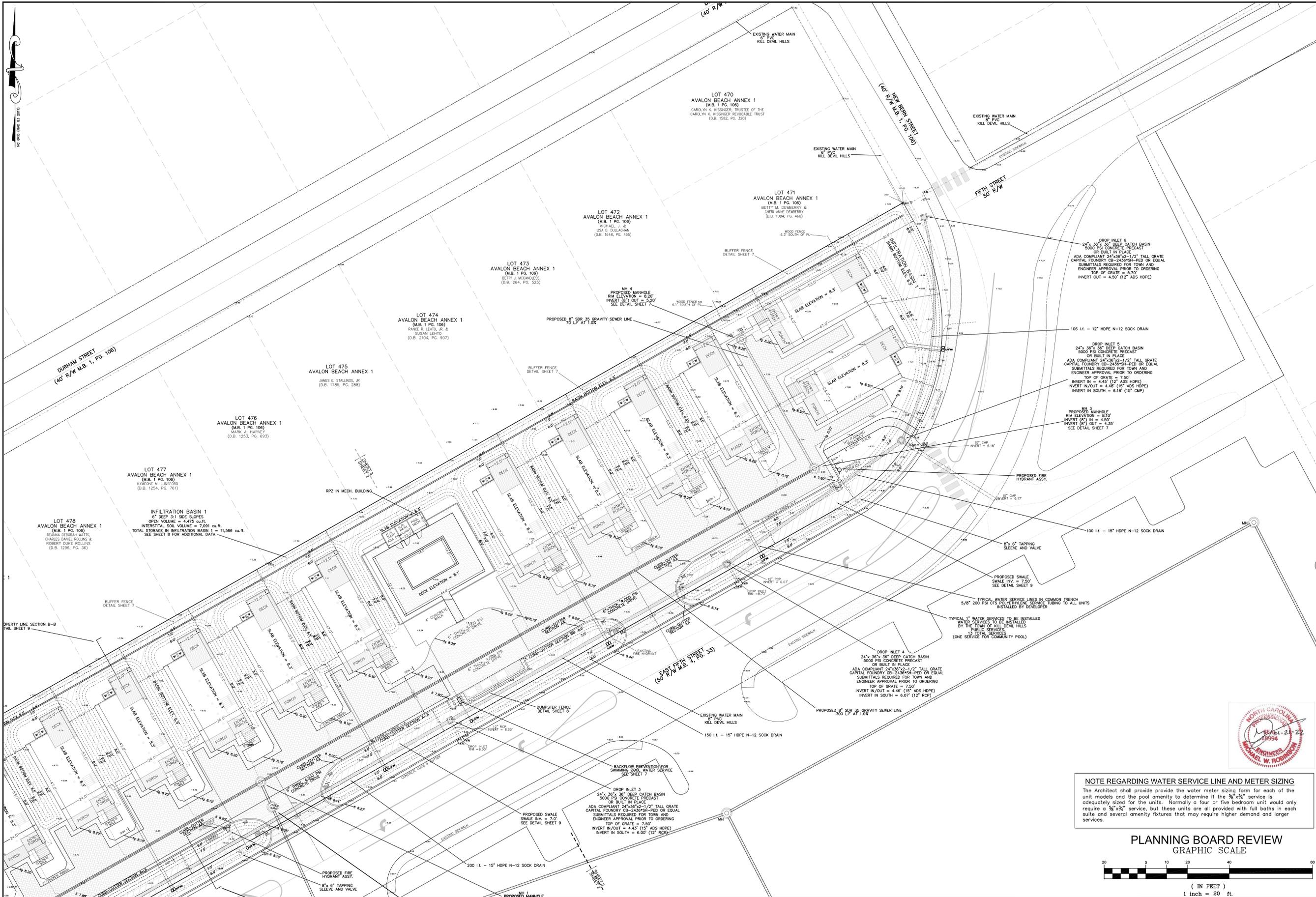
GRADING AND UTILITIES
STORMWATER MANAGEMENT



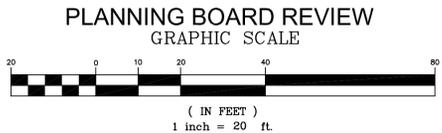
NO.	DATE	DESCRIPTION

FIFTH STREET COTTAGES
 NORTH CAROLINA
 DARE COUNTY
 KILL DEVIL HILLS
 A PORTION OF TRACT 4, WRIGHT'S SHORES

DATE: 01-31-22 SCALE: 1"=20'
 DESIGNED: MWR DRAWN: MWR
 SHEET: 4 OF 9
 CAD FILE: fifth street cottages court-kdh-base.dwg
 PROJECT NO: 051121



NOTE REGARDING WATER SERVICE LINE AND METER SIZING
 The Architect shall provide the water meter sizing form for each of the unit models and the pool amenity to determine if the 3/4"x3/4" service is adequately sized for the units. Normally a four or five bedroom unit would only require a 3/4"x3/4" service, but these units are all provided with full baths in each suite and several amenity fixtures that may require higher demand and larger services.



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**GRADING AND UTILITIES
 STORMWATER MANAGEMENT**



NO.	DATE	REVISIONS	DESCRIPTION

FIFTH STREET COTTAGES
 NORTH CAROLINA
 DARE COUNTY
 KILL DEVIL HILLS
 A PORTION OF TRACT 4, WRIGHT'S SHORES

PROJECT: 01-31-22
 SCALE: 1"=20'
 DESIGNED: MWR
 DRAWN: MWR
 SHEET: 5 OF 9
 CAD FILE: fifth street cottages court-kdh-base.dwg
 PROJECT NO: 051121

SOIL EROSION & SEDIMENTATION CONTROL PLAN NOTES:

1. SOIL EROSION & SEDIMENT CONTROL PLAN NOTES:
 - a.) AREA TO BE DISTURBED: ±110,000 sq.ft. (2.53 ac.)
 - b.) PROVIDE A GROUND COVER (TEMPORARY OR PERMANENT) ON ALL SLOPES 3:1 OR STEEPER WITHIN 7 CALENDAR DAYS AND ALL SLOPES FLATTER THAN 3:1 WITHIN 14 CALENDAR DAYS FOLLOWING COMPLETION OF ANY PHASE OF GRADING. PROVIDE A PERMANENT GROUND COVER FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS (WHICHEVER IS SHORTER) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT
 - c.) IF LAND DISTURBING ACTIVITIES OCCUR OUTSIDE THE PERMANENT VEGETATION SEEDING DATES (APR. 1 - SEP. 30) THEN TEMPORARY VEGETATION SEEDING SPECIFICATIONS SHALL BE FOLLOWED FOR PLANTING UNTIL THE NEXT APPROPRIATE PERMANENT SEEDING PERIOD, AT WHICH TIME PERMANENT VEGETATION SHALL BE ESTABLISHED ACCORDING TO PERMANENT VEGETATION SEEDING SPECIFICATIONS (SEE PERM. & TEMP. SEEDING SPECIFICATIONS ONSHEET ES2).
 - d.) IF EXCESSIVE WIND EROSION OR STORMWATER RUNOFF EROSION DEVELOPS DURING TIME OF CONSTRUCTION ANY LOCATION ON THE PROJECT SITE, ADDITIONAL SILT FENCING OR OTHER MEASURES SHALL BE INSTALLED AS DIRECTED BY ENGINEER SO AS TO PREVENT DAMAGE TO ADJACENT PROPERTY. SEE SILT FENCE DETAIL ON THIS SHEET.
 - e.) SOIL EROSION AND SEDIMENTATION CONTROLS ARE TO BE INSPECTED WEEKLY AND AFTER ANY SIGNIFICANT RAINFALL PRODUCING EVENT AND SHALL BE MAINTAINED AND REPAIRED AS NECESSARY UNTIL PERMANENT CONTROLS ARE ESTABLISHED.
 - f.) CONSTRUCTION SCHEDULE:
 - 1) OBTAIN PLAN APPROVAL AND OTHER APPLICABLE PERMITS. NO WORK SHALL BE PERFORMED IN WETLAND AREAS PRIOR TO ISSUANCE OF ALL APPLICABLE USAGE PERMITS.
 - 2) FLAG AND/OR ROUGH STAKE WORK LIMITS.
 - 3) HOLD PRECONSTRUCTION CONFERENCE (OWNER, CONTRACTOR, ENGINEER, AND APPROPRIATE GOVERNMENT OFFICIALS) AT LEAST ONE WEEK PRIOR TO START OF CONSTRUCTION ACTIVITIES.
 - 4) INSTALL SILT FENCING AT LOCATIONS SHOWN ON PLAN
 - 5) COMPLETE CLEARING AND GRUBBING PROCEDURES.
 - 6) GRADE SITE ACCORDING TO PLAN
 - 7) INSTALL INFILTRATION BASINS AND STORM SEWER. DROP INLETS TO BE PROTECTED WITH INLET PROTECTION UNTIL CONTRIBUTING DRAINAGE AREAS ARE STABILIZED. PIPE ENDS AT INFILTRATION BASINS SHALL BE PROTECTED WITH OUTLET PROTECTION.
 - 8) INSTALL PERMEABLE PAVEMENT GRAVEL BASE. BASE LAYER TO BE PROTECTED FROM SEDIMENT AT ALL TIMES. CONSTRUCTION TRAFFIC TO BE RESTRICTED TO SPECIFIC AREAS WITHIN THE BASE (STAGING / WORK AREA TO BE DEFINED BY CONTRACTOR AND CLEARLY DEMARCATED UTILIZING BARRIERS/CONES/TAPE). ONCE HEAVY BUILDING CONSTRUCTION IS COMPLETE, STAGING / WORK AREA BASE MATERIAL WILL BE INSPECTED BY ENGINEER AND IF FOUND TO BE DEGRADED, IT SHALL BE REMEDIATED AT THE EXPENSE OF THE CONTRACTOR. INSTALLATION OF PERMEABLE CONCRETE PAVEMENT SHALL NOT TAKE PLACE UNTIL ALL EARTHWORK ACTIVITIES AND ALL HEAVY BUILDING CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. INSTALLED PERMEABLE CONCRETE SHALL BE PROTECTED FROM SEDIMENT AND FROM HEAVY CONSTRUCTION EQUIPMENT AT ALL TIMES.
 - 9) ALL EROSION & SEDIMENTATION CONTROL PRACTICES WILL BE INSPECTED WEEKLY AND AFTER HEAVY RAINFALL EVENTS. NEEDED REPAIRS WILL BE MADE IMMEDIATELY.
 - 10) ONCE SITE IS FULLY STABILIZED; REMOVE INLET AND OUTLET PROTECTION, CLEAN STORM SEWER OF ANY SEDIMENT, FINE-GRADE AND SEED OR LANDSCAPE INFILTRATION BASINS.

PERMANENT VEGETATION

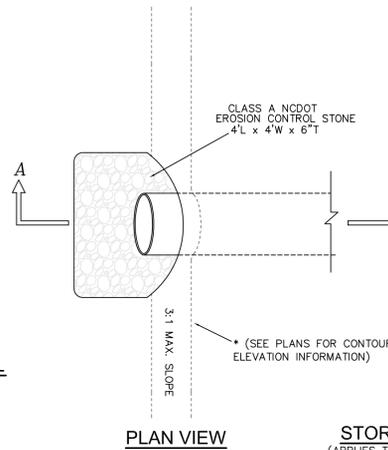
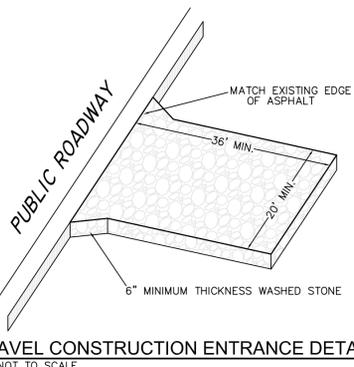
SEEDING DATES: APRIL 1 - SEPT 30	
SEED MIXTURE	APPLICATION RATES/ACRE
BAHIA	50 LBS.
COMMON BERMUDA (UNMULLED)	50 LBS.
GERMAN MILLETT	15 LBS.
FESCUE	20 LBS.
FERTILIZER	
26-13-13 @ 500 LB/ACRE	
MULCH	
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	

TEMPORARY VEGETATION

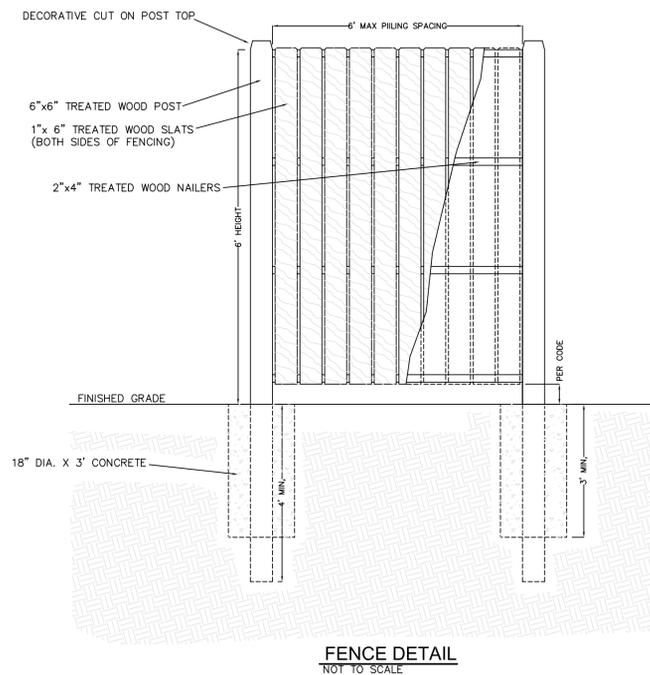
SEEDING DATES: OCT. 1 - MARCH 31	
SEED MIXTURE	APPLICATION RATES/ACRE
RYE GRAIN	175 LBS.
FERTILIZER	
10-10-10 @ 1000 LB/ACRE	
MULCH	
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	

GENERAL: FERTILIZER RATES SHOWN ARE GENERAL RECOMMENDATIONS; FREQUENCY AND AMOUNT OF FERTILIZATION CAN BEST BE DETERMINED THROUGH SITE SPECIFIC SOIL TESTING. MAINTENANCE: SATISFACTORY STABILIZATION AND EROSION CONTROL REQUIRES A COMPLETE VEGETATIVE COVER. EVEN SMALL BREACHES IN VEGETATIVE COVER CAN EXPAND RAPIDLY AND, IF LEFT UNATTENDED, CAN ALLOW SERIOUS SOIL LOSS FROM AN OTHERWISE STABLE SURFACE. A SINGLE HEAVY RAIN IS OFTEN SUFFICIENT TO GREATLY ENLARGE BARE SPOTS, AND THE LONGER REPAIRS ARE DELAYED, THE MORE COSTLY THEY BECOME. PROMPT ACTION WILL KEEP SEDIMENT LOSS AND REPAIR COST DOWN. NEW SEEDLINGS SHOULD BE INSPECTED FREQUENTLY AND MAINTENANCE PERFORMED AS NEEDED. IF RILLS AND GULLIES DEVELOP, THEY MUST BE FILLED IN, RE-SEED, AND MULCHED AS SOON AS POSSIBLE. DIVERSIONS MAY BE NEEDED UNTIL NEW PLANTS TAKE HOLD. MAINTENANCE REQUIREMENTS EXTEND BEYOND THE SEEDING PHASE. WEAK OR DAMAGED SPOTS MUST BE RELIMED, FERTILIZED, MULCHED, AND RESEED AS PROMPTLY AS POSSIBLE. REFERTILIZATION MAY BE NEEDED TO MAINTAIN PRODUCTIVE STANDS.

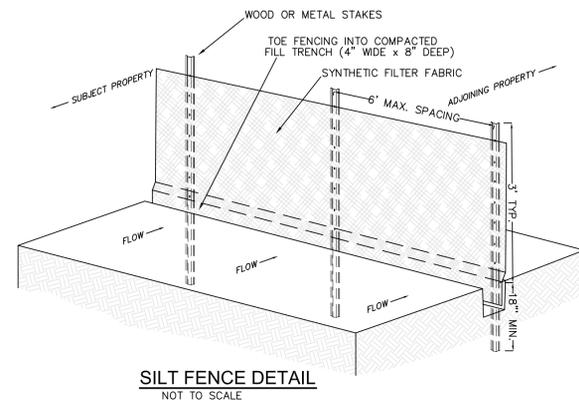
SEEDING SPECIFICATIONS



STORM PIPE OUTLET DETAIL
(APPLIES TO ALL PROPOSED STORM PIPE OUTLETS)
NOT TO SCALE



FENCE DETAIL
NOT TO SCALE



SILT FENCE DETAIL
NOT TO SCALE

STORMWATER CALCULATIONS:

STORMWATER MANAGEMENT CALCULATIONS:	
DESIGN STORM:	4.3 INCH RAINFALL EVENT OVER A 2 HOUR PERIOD
INFILTRATION RATE:	20 INCHES PER HOUR
INTERSTITIAL SOIL VOID (POROSITY):	20%
GRAVEL VOID (POROSITY):	40%
RUNOFF COEFFICIENT:	1.0
DRAINAGE AREA 1 - PARKING AND DRIVES	
DRAINAGE AREA 1: BUILT UPON AREA	Concrete Border, Curbing, Drives, Walks and Entrances = 6,049 sq.ft.
Roadway Paver Inserts	= 11,511 sq.ft.
Dumpster Pad	= 109 sq.ft.
TOTAL BUILT UPON AREA	17,669 sq.ft.
STORMWATER GENERATED DRAINAGE AREA 1 BUILT UPON AREA:	17,669 sq.ft. X 4.3/12 = 6,342 cu.ft.
TOTAL STORAGE REQUIRED IN PARKING AND DRIVE DRAINAGE AREA 1	= 6,342 cu.ft.
DRAINAGE AREA 2 - BUILDINGS AND POOL AREA	
DRAINAGE AREA 2: BUILT UPON AREA	Residential Units - 13 at 1,239 sq.ft. = 16,107 sq.ft.
Community Pool and Concrete Decking (pool surface)	= 1,131 sq.ft.
Pool Bath House and Pool Equipment Building	= 178 sq.ft.
TOTAL BUILT UPON AREA	17,414 sq.ft.
STORMWATER GENERATED DRAINAGE AREA 2 BUILT UPON AREA:	17,414 sq.ft. X 4.3/12 = 6,240 cu.ft.
TOTAL STORAGE REQUIRED IN BUILDING AND POOL DRAINAGE AREA 2	= 6,240 cu.ft.
INFILTRATION BASIN 1 - STORAGE VOLUME	
STORMWATER STORAGE VOLUME IN SWALE AND INTERSTITIAL SOILS BELOW	
OPEN SWALE	6" DEEP
4:1 SLOPES	
INTERSTITIAL SOIL STORAGE	INFILTRATION RATE = 20 INCHES PER HOUR
INTERSTITIAL SOIL VOID (POROSITY):	20%
STORMWATER STORAGE VOLUME IN SWALE:	
STORMWATER SWALE TOP AREA	= 12,100 sq.ft.
STORMWATER SWALE BOTTOM AREA	= 5,800 sq.ft.
OPEN VOLUME	= 4,475 cu.ft.
(TOP AREA + BOTTOM AREA)/2 x 0.5'	
INTERSTITIAL SOIL VOLUME	= 5,155 cu.ft.
(SWALE TOP AREA x 2.5' - OPEN VOLUME) x 0.2	
TOTAL STORAGE IN INFILTRATION BASIN 1	= 10,955 cu.ft.
PERMEABLE PAVERS - STORAGE VOLUME	
STORMWATER STORAGE VOLUME IN SWALE AND INTERSTITIAL SOILS BELOW	
TURFSTONE PAVING AREA	11,511 sq.ft.
TURFSTONE/PICP PAVER SURFACE = 0.052 cu.ft. open (0.28" thick per manufacturer cut sheet.) (0.052 cu. ft. open x 0.20 = 0.0104 cu.ft.)	
2" SAND LEVELING COURSE AT 20% VOID = 0.034 cu.ft. open (0.17 cu. ft. x 0.20 = 0.034 cu.ft.)	
7" GRADED STONE BASE AT 40% VOID = 0.233 cu.ft. open (0.98 cu. ft. x 0.40 = 0.233 cu.ft.)	
SAND SOILS TO SHWT AT 20% VOID = 0.516 cu.ft. open (2.58 cu. ft. x 0.20 = 0.516 cu.ft.)	
TOTAL STORAGE VOLUME PER SQ. FT. OF PAVING SURFACE	= 0.835 cu.ft. PER SQ. FT.
TURFSTONE PAVING AREA	= 11,511 sq.ft.
TOTAL STORAGE VOLUME IN TURFSTONE PAVING SURFACE	= 11,511 x 0.835 = 9,612 cu.ft.
TOTAL STORAGE AVAILABLE IN PARKING AND DRIVE DRAINAGE AREA 1	= 9,612 cu.ft.
STORAGE VOLUME SUMMARY	
STORMWATER STORAGE VOLUME REQUIRED AND PROVIDED FOR DESIGN STORM	
TOTAL STORAGE REQUIRED IN PARKING AND DRIVE DRAINAGE AREA 1	= 6,342 cu.ft.
TOTAL STORAGE REQUIRED IN BUILDING AND POOL DRAINAGE AREA 2	= 6,240 cu.ft.
TOTAL COMBINED STORAGE REQUIRED IN DRAINAGE AREA 2 AND DRAINAGE AREA 1	= 12,582 cu.ft.
TOTAL STORAGE PROVIDED IN INFILTRATION BASIN 1	= 10,955 cu.ft.
TOTAL STORAGE AVAILABLE IN PARKING AND DRIVE DRAINAGE AREA 1	= 9,612 cu.ft.
TOTAL COMBINED STORAGE PROVIDED IN INFILTRATION BASIN 1 AND PARKING AREA	= 20,567 cu.ft.
STORAGE PROVIDED IS 63% GREATER THAN STORAGE REQUIRED	

TOWN OF KILL DEVIL HILLS ORDINANCE CHAPTER 153 - SECTION 153.071
Whenever land-disturbing activity is undertaken on a tract comprising more than 1/2 acre, the person conducting the land-disturbing activity shall install such sedimentation and erosion control devices and practices as are sufficient to retain the sediment generated by the land-disturbing activity within the boundaries of the tract during construction upon and development of said tract and shall install otherwise provide a permanent ground cover sufficient to restrain erosion after completion of construction or development within 15 working days or 90 calendar days, whichever is shorter.

- MINIMUM EROSION CONTROL MEASURES:**
1. SUBMIT SEDIMENTATION AND EROSION CONTROL PLAN ALONG WITH FINANCIAL RESPONSIBILITY FORM TO OBTAIN TOWN APPROVAL. APPROVAL REQUIRED BEFORE PROCEEDING WITH LAND DISTURBING ACTIVITIES. REFERENCE TOWN CODE 153.071 FOR ADDITIONAL INFORMATION.
 2. INSTALL SILT FENCING IN LOCATIONS NOTED ON PLAN SHEET 7. USE METAL FENCE POSTS AND TRENCH IN TOE OF FENCING IN 6" MINIMUM FOR MAXIMUM EFFICIENCY AND DURABILITY.
 3. INSTALL CONSTRUCTION ENTRANCE IN LOCATION AS SHOWN ON SHEET 7.
 4. PLACE CLEAN TYPE 1 SAND FILL TO ELEVATIONS NOTED ON STORMWATER AND GRADING PLAN SHEET 2.
 5. FILL SLOPES SHALL MAINTAIN 3:1 OR FLATTER.
 6. INSTALL CONSTRUCTION ENTRANCE PAD AS DEPICTED ON STORMWATER PLAN. LOCATION MAY BE ADJUSTED TO MEET BUILDERS NEEDS.
 7. INSTALL FINAL STABILIZATION WITHIN 15 WORKING DAYS OF FINAL COMPLETION. FULL STABILIZATION MUST BE ACCOMPLISHED WITH 90 DAYS OF PROJECT COMPLETION.
 8. IF THE PROJECT IS DELAYED INSTALL TEMPORARY STABILIZATION WITHIN 15 WORKING DAYS.
 9. FINAL STABILIZATION SHALL BE BERMUDA SOO OR OUTER BANKS COMPATIBLE SEED BLEND. IRRIGATE AS REQUIRED TO ESTABLISH A VIABLE STABILIZING CROP. SILT FENCING SHALL REMAIN IN PLACE UNTIL FULL STABILIZATION IS ACHIEVED.
 10. INSPECT ALL SEDIMENTATION AND EROSION CONTROL MEASURES DURING CONSTRUCTION PARTICULARLY FOLLOWING SIGNIFICANT STORMWATER EVENTS. REPAIR ALL EROSION GULLIES ALONG WITH SILT FENCING IMMEDIATELY.
 11. ADDITIONAL MEASURES MAY BE REQUIRED IF EXCESSIVE STORMWATER RUNOFF OR EROSION OCCURS PARTICULARLY THAT WHICH AFFECT ADJOINING PROPERTIES.

LANDSCAPE BUFFER TABLE

PROPERTY CORNER TO	PROPERTY CORNER	TYPE OF BUFFER	BUFFER WIDTH	BUFFER REQUIREMENTS	LENGTH OF PROPERTY LINE OR RIGHT OF WAY	NUMBER OF PLANTINGS REQUIRED (MIN)	SPECIES
A	B	Ornamental Landscaping along Fifth Street East R/W Buffer along right of way for commercial zone dev.	10'	1 tree per 10 l.f. of property line 1 shrub per 10 l.f. property line	169 l.f.	17 trees 17 shrubs	Use Wax Leaf Ligustrum (as shrubs), along with mix of Hollywood Junipers and Black Pines.
B	C	Ornamental Landscaping along Fifth Street North R/W Buffer along right of way for commercial zone dev.	10'	1 tree per 10 l.f. of property line 1 shrub per 10 l.f. property line	487 l.f.	49 trees 49 shrubs	Use Wax Leaf Ligustrum (as shrubs), along with mix of Hollywood Junipers and Black Pines.
C	D	Ornamental Landscaping along N. Croatan Highway Buffer along right of way for commercial zone dev.	10'	1 tree per 10 l.f. of property line 1 shrub per 10 l.f. property line	120 l.f.	12 trees 12 shrubs	Use Wax Leaf Ligustrum (as shrubs), along with mix of Hollywood Junipers and Black Pines.
D	A	Dense Vegetative Screen along North Property Line with Fence Buffer between incompatible uses.	5'	1 tree per 30 l.f. of property line 1 shrub per 10 l.f. property line	601 l.f.	21 trees 61 shrubs	Alternate groups of 4 Russian Olives and Wax Leaf Ligustrum along property line

LAWN AREAS: FINAL GROUND COVER INCLUDING BERMS AND SWALES SHALL BE SEED OR SODDED BERMUDA OR HEAT TOLERANT FESCUE TURF GRASS WITH IRRIGATION

LANDSCAPE BUFFER TABLE - NOTES

- Note 1 - Ornamental landscaping need not be evenly spaced, but rather dispersed throughout the landscape area to create a natural appearance. In all cases where a fence is constructed, the required landscaped area shall be located between the fence and property line.
- Note 2 - Dense vegetative screens shall contain shrubs at least 30 inches high at the time of installation planted two-and-one-half feet on center. The type of shrub used needs to be capable of attaining a height of at least six feet at maturity.
- Note 3 - Specific planting subject to change due to availability and landscapers preferences. All planting changes will be submitted for review and approval by the Town Planning department.
- REFER TO KILL DEVIL HILLS TOWN CODE, SECTION 153.073 "LANDSCAPING REQUIREMENTS" FOR ADDITIONAL INFORMATION

MINIMUM PLANT SIZE

Plant Material	Perimeter Landscaping Areas, Abutting Vacant Lands, Fences and Berms	All Other Planting
TREE:	Deciduous	1 1/2 inches (diam.)
	Evergreen	5 feet (hgt)
		2 inches (diam.)
SHRUB:	Deciduous	1 1/2 inches (diam.)
	Evergreen	3 feet
		5 feet
	15 inches (hgt)	24 inches (hgt)
	12 inches (hgt)	18 inches (hgt)

Important Notice!!!
Buffer Species noted on this sheet are preliminary and subject to be changed by the Landscape Installer based on plant availability and owner preference. Prior to final species selection, the contractor shall submit written landscape species and counts for approval by the Engineer and the Town of Kill Devil Hills Planning Department. The Contractor shall not proceed with ordering plant material or installing plants until written approval by Engineer and the Town Planning Department is received.
Tree and Shrub counts noted are minimum requirements

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DETAIL SHEET
PRELIMINARY



NO.	DATE	DESCRIPTION	BY

PROJECT: FIFTH STREET COTTAGES
NORTH CAROLINA
KILL DEVIL HILLS
DARE COUNTY

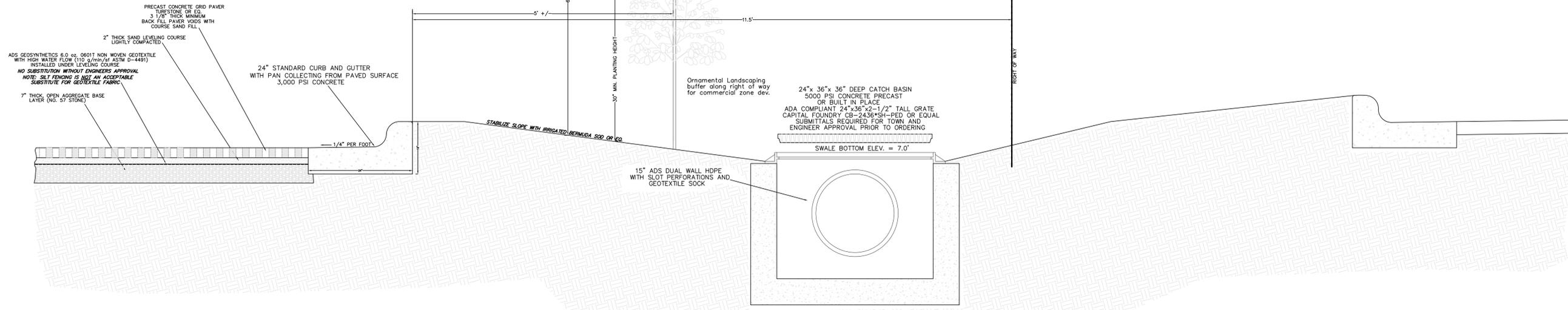
A PORTION OF TRACT 4, WRIGHT'S SHORES

DATE:	SCALE:
01-31-22	1"=20'
DESIGNED: MWR	DRAWN: MWR
SHEET: 8	OF 9
CAD FILE: c:\p\street cottage court-4th-base.dwg	PROJECT NO: 051121



BUFFER LANDSCAPING WITHOUT FENCE

10' Buffer with Ornamental landscaping:
Install at least one tree for each 10 linear feet of landscape area and one shrub for each 10 linear feet of landscape area.
Ornamental landscaping need not be evenly spaced, but rather dispersed throughout the landscape area to create a natural appearance. In all cases where a fence is constructed, the required landscaped area shall be located between the fence and property line.
Submit Species for Town approval prior to ordering or installing landscape buffer plants.
See Sheet 7 for additional requirements and information

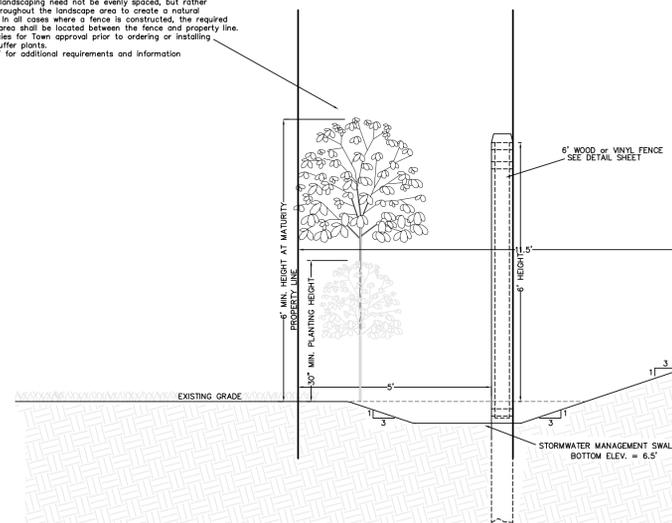


RIGHT OF WAY SECTION A-A

NOT TO SCALE

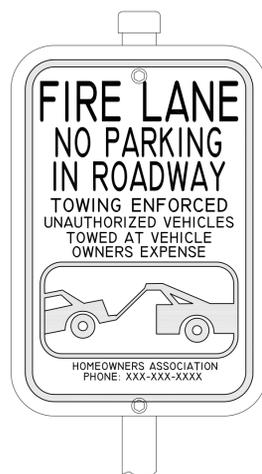
BUFFER LANDSCAPING WITH FENCE

5' Buffer with Ornamental landscaping:
Install at least one tree for each 30 linear feet of landscape area and one shrub for each 10 linear feet of landscape area.
Ornamental landscaping need not be evenly spaced, but rather dispersed throughout the landscape area to create a natural appearance. In all cases where a fence is constructed, the required landscaped area shall be located between the fence and property line.
Submit Species for Town approval prior to ordering or installing landscape buffer plants.
See Sheet 7 for additional requirements and information



NORTH PROPERTY LINE SECTION C-C

NOT TO SCALE



SIGN TYPE 1



SIGN TYPE 2

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DETAIL SHEET
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NO.	DATE	DESCRIPTION	BY

FIFTH STREET COTTAGES
NORTH CAROLINA
DARE COUNTY
A PORTION OF TRACT 4, WRIGHT'S SHORES

PROJECT: FIFTH STREET COTTAGES
KILL DEVIL HILLS
DATE: 01-31-22
SCALE: 1"=20'
DESIGNED: MWR
DRAWN: MWR
SHEET: 9 OF 9
CAD FILE: fifth street cottage court-kdh-base.dwg
PROJECT NO: 051121

