Harnett COUNTY NORTH CAROLINA

Planning Department

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11/23/15
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Re: construction in the floodway and flood hazard area (#09-50022161)

Mr Spears:

I do not think we had a chance to talk about your project when you first started your permitting process, so I just wanted to provide you some information for safer floodplain development. I believe you are aware that an Elevation Certificate is required to ensure your house and utilities are at a safe elevation away from flood waters. However, this lot is also located in the Floodway, thus an engineering study is required that would show a "no impact" on flood waters or no increase in floodway widths. This study must be performed by a Professional Engineer based on the State's model.

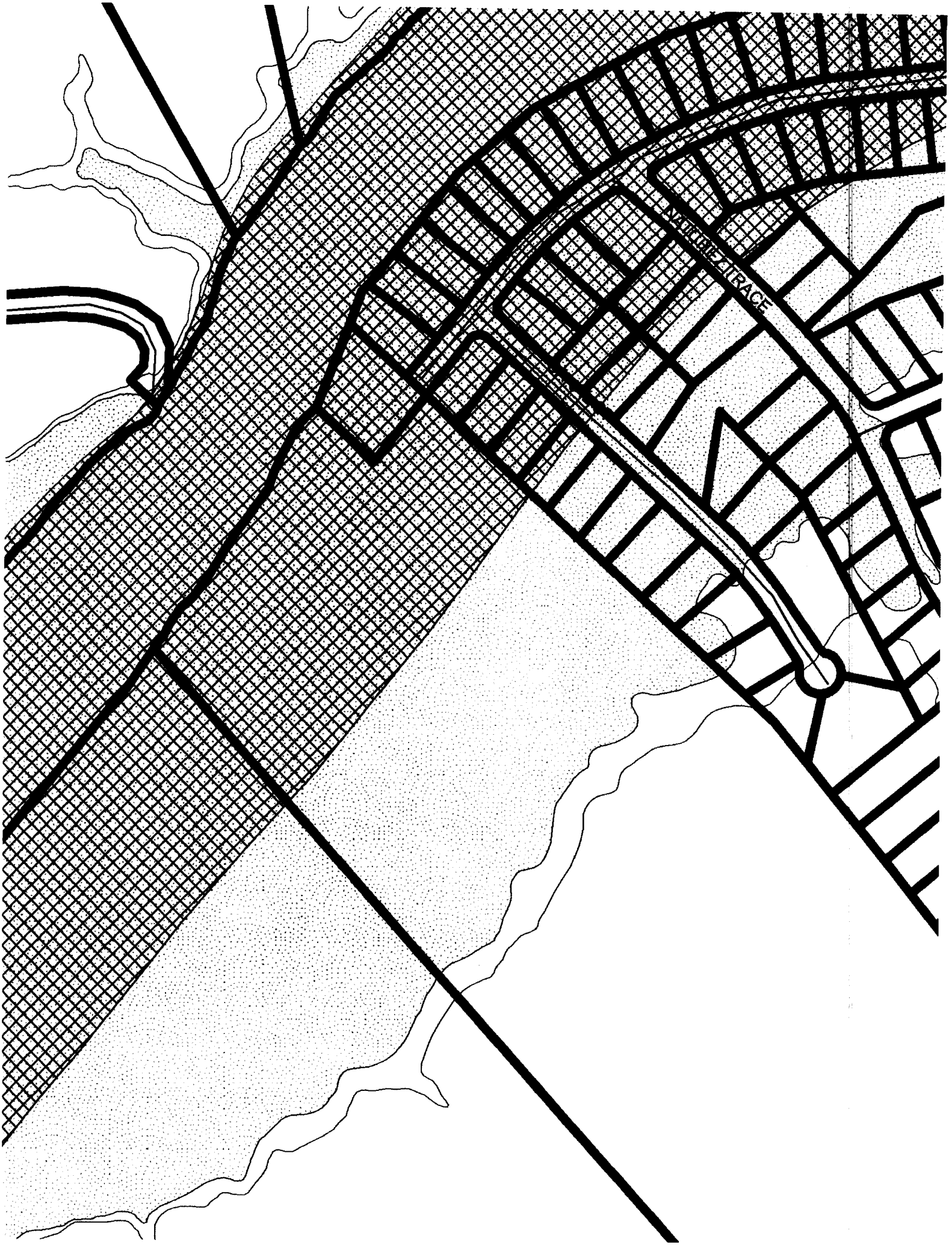
Below are a few basic definitions. Also included is a State Floodplain Mgmt contact sheet and other explanatory documents.

- "Floodplain" or "Flood Prone Area" means any land area susceptible to being inundated by water from any source.
- "Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot.
- "Non-Encroachment Area" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot as designated in the Flood Insurance Study report.

Please contact me (910-893-7525, x4) if you have any questions.

Thank you for your cooperation,

Jay Sikes, Sr. Planner


WATERFRONT PLACE

Required "No Impact" Certification

- Floodways and non-encroachment areas can be dangerous because water may flow very fast.
- "No Impact" means no increase in flood elevations greater than 0.00 ft, no increase in floodway or non-encroachment area widths, and no decrease in flood elevations of more than 0.1 ft.
- An engineer must evaluate the hydraulic impact of proposed development. A "no impact" certification with supporting documentation is required and must be signed, sealed and dated by a registered professional engineer.
- Check with your community for guidance before you decide to work in a floodway.

ENGINEERING "NO IMPACT" CERTIFICATION (example)

This is to certify that I am a duly qualified engineer licensed to practice in the State of North Carolina. It is to further certify that the attached technical data supports the fact that proposed (Name of Development) will not impact the 100-year flood elevations, floodway elevations and floodway widths on (Name of Stream).

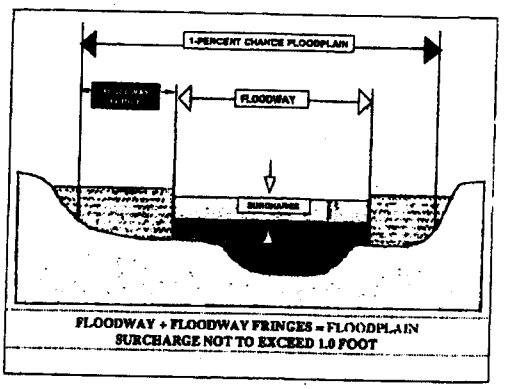
National Flood Insurance Program

Signature _____ Seal _____

The engineering analysis must be based on technical data obtained from the state or FEMA.
Save time and money – don't build in the floodway!

Floodway and Encroachment Requirements (Continued)

Floodway Schematic



Visual 2.17

This view shows one cross section.

- Note the surcharge area on the visual.
- The 1-foot increase is on top of the BFE. As the area outside of the floodway develops, the actual elevation of the base flood will increase. Communities may wish to adopt a freeboard to account for this increase.

Are there any terms in this schematic that you'd like to review?

Floodway Designation

- A hydraulic computer model (usually HEC-2 or HEC-RAS) identifies the floodplain and floodway.
- The model squeezes the floodplain by removing equal amounts of conveyance from the ends of each cross section.
- FEMA sets the floodway boundary when one cross section rises to the allowable one-foot surcharge.

Visual 2.18

Floodway and Encroachment Requirements (Continued)

Note that the floodway fringe in the schematic roughly corresponds to the amounts of conveyance removed by the model.

Floodway Purpose

- Allow part of the floodplain to be developed.
- Preserve ability to convey flood discharges.
- 1 foot rise = compromise to balance property owner rights with protection of adjacent and upstream property owners.

Visual 2.19

Floodway Encroachments

- Encroachments = Fill, new construction, substantial improvements, other development.
- Prohibited unless hydrologic and hydraulic analyses demonstrate no increase in flood levels.
- Variance requests for floodway development that increase flood levels must be denied.

Visual 2.20

Notes:

Floodway and Encroachment Requirements (Continued)

"Any Increase"

- Any increase = zero increase.
- Small increases from individual developments could have cumulative impact.
- Increase = current model BFE compared to proposed development model BFE.

Visual 2.21

The hydraulic analysis for the proposed development must use the same model used for the current Flood Insurance Study, if available.

- Most communities require that the permit applicant hire a registered professional engineer to perform the no-rise analysis and submit a no-rise certification.
- The study must be consistent with the technical criteria contained in *Guidelines and Specifications for Flood Hazard Mapping Partners,* Appendix C *Detailed Hydraulic Analyses* (FEMA, April 2003).

Meeting the "No Rise" Requirement

- Any development will generally increase flood elevations.
- Design or modify development so that no obstructions are placed in the floodway.

Visual 2.22

Notes:

Floodway and Encroachment Requirements (Continued)

Meeting the "No Rise" Requirement (Continued)

- Other options:
  - Replace existing structures with same size structures at exact same locations.
  - Span the floodway.
  - Demonstrate no rise with a hydraulic study.
  - Compensate for rise by modifying the floodway to replace lost flood conveyance.

Visual 2.23

- Existing structures include buildings, bridges, and culverts.
- Before floodway boundaries can be changed, a community must apply for and obtain a floodway revision from FEMA through the Letter of Map Revision (LOMR) process.

No-Rise Hydraulic Analysis

Steps:

- Obtain a copy of the effective model used to develop the floodway.
- Duplicate results of the effective model.
- Make necessary corrections, such as new cross sections at development site.
- Modify Existing Conditions model to obtain Proposed Conditions model.
- Compare results for increased elevations at existing or new cross sections.

Visual 2.24

Notes:

Floodway and Encroachment Requirements (Continued)

No-Rise Hydraulic Analysis (Continued)

- If no increase in elevations, prepare and submit to the community:
  - No-rise certification.
  - Supporting technical documentation.
- If elevations increase:
  - Redesign development to avoid the floodway.
  - Compensate for loss of conveyance.
  - Revise the floodway.

Visual 2.25

- Some communities require submission of a no-rise certification form.
- The certification must be accompanied by documentation to support the finding, including results of the hydraulic study.

No-Rise Certification: Review Points

- Experience of certifying engineer in hydrologic and hydraulic studies.
- Same hydraulic model as for floodway development, if available.
- Analysis consistent with basic hydraulic principles (for example, smooth transition in flood flows between cross sections).

Visual 2.26

Notes:

Floodway and Encroachment Requirements (Continued)

No-Rise Certification: Review Points (Continued)

- Added cross sections surveyed to model development impacts.
- Land use/hydraulic assumptions realistic (for example, roughness coefficients reflect actual conditions).
- No cumulative impact if other property owners do similar developments.

Visual 2.27

IF BFEs Available, But No Floodways

- A hydraulic analysis is required for each development in the floodplain.
- No more than a 1-foot rise in flood stage is acceptable from the cumulative effect of:
  - The development under review.
  - All other existing and anticipated development.

Visual 2.28

- Rivers and streams with BFEs but without floodways also require encroachment analyses. Costs of analyses can be minimized by avoiding development in the entire floodplain, limiting development to backwater areas, or establishing setbacks.
- Hydraulic studies must assume equal encroachments by all property owners, and all documentation related to an analysis must be maintained.
- Floodway revisions and development proposals that exceed the one-foot standard require Letters Of Map Change (LOMCs), which are examined in detail in another Advanced Floodplain Management module.
- Job Aid 2-2, The Floodway, provides detailed information on encroachment analyses and proposals that require LOMCs.