



Piedmont Land Design, PLLC

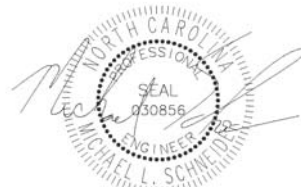
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Downstream Impact Analysis

for

Weaver's Pointe Subdivision

Zebulon North Carolina



04-17-24

Prepared by:

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8522-204 Six Forks Rd.
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Project Narrative

The proposed residential project is located on a 43.10 acre vacant, mostly wooded lot. The proposed development includes construction of 87 single family residential properties. The site is located in Zebulon, NC approximately 2.80 miles northeast of US 64 at coordinates 35° 51' 44.5644" N 78° 20' 4.2756" W. The site is located in the Neuse River watershed basin . The proposed development provides two wet detention SCMs for water quantity and quality treatment.

Downstream Impact Analysis

Requirements:

Per Zebulon ordinance 151.36, the following is required:

(A) Downstream impact analysis.

(1) The downstream impact analysis must be performed in accordance with the “10% rule,” and a copy of the analysis must be provided with the permit application. The purpose of the downstream impact analysis is to determine if the project will cause any impacts on flooding or channel degradation downstream of the project site. The analysis must include the assumptions, results and supporting calculations to show safe passage of post-development design flows downstream. This analysis shall be performed at the outlet(s) of the site, and downstream at each tributary junction to the point(s) in the conveyance system where the area of the portion of the site draining into the system is less than or equal to 10% of the total drainage area above that point.

(2) The typical steps in the application of the 10% rule are:

(a) Using a topographic map, determine the point downstream where the proposed site equals 10% of the total drainage area, called the 10% point. Identify all tributary junctions between the downstream site boundary and the 10% point. All points identified, as well as the outlet of the site, are known as 10% rule comparison points.

(b) Using a hydrologic model with existing land uses, determine the pre-development peak runoff rate (cfs) for the ten-year design storm event at each comparison point.

(c) Insert the proposed site design and proposed BMPs into the land uses and determine the post-development peak runoff rate for the ten-year design storm at each comparison point.

(d) If the post-development peak discharge rate is equal to or less than pre-development conditions at all comparison points, no further analysis is required

Methodolgy:

There are a total of five discharge points at the property boundary. At each of these locations, we are reducing the 10-year post-developed peak flow compared to the 10-year pre-developed peak flow. Stormwater SCM's are provided at two of the discharge points to accomplish this. Per Zebulon irdinance 151.36 (A)(2)(d), no further analysis is required.

Stormwater Runoff Summary

For the complete stormwater calculations, please see the Stormwater Management Report for Weaver's Point Subdivision. Below are the results of the pre and post-development peak flows for Discharge Point #1-#5.

Discharge Point #1

Stormwater Runoff Results

Storm Event	Pre-Development	Post-Development with Detention
1-Year	10.05 cfs	8.34 cfs
10-Year	33.66 cfs	30.41 cfs

Discharge Point #2

Stormwater Runoff Results

Storm Event	Pre-Development	Post-Development with Detention
1-Year	9.56 cfs	4.48 cfs
10-Year	32.03 cfs	31.07 cfs

Discharge Point #3

Stormwater Runoff Results

Storm Event	Pre-Development	Post-Development
1-Year	1.46 cfs	1.36 cfs
10-Year	4.88 cfs	3.31 cfs

Post-developed flow is less than pre-developed flow.

Discharge Point #4

Stormwater Runoff Results

Storm Event	Pre-Development	Post-Development
1-Year	4.94 cfs	3.33 cfs
10-Year	16.55 cfs	8.76 cfs

Post-developed flow is less than pre-developed flow.

Discharge Point #5

Stormwater Runoff Results

Storm Event	Pre-Development	Post-Development
1-Year	2.48 cfs	2.44 cfs
10-Year	8.32 cfs	6.30 cfs

Post-developed flow is less than pre-developed flow.

PRELIMINARY
NOT FOR CONSTRUCTION

PURDY FAMILY, LLC PROPERTY

2620 ZEBULON RD
ZEBULON, NC

ISSUED: PROGRESS

REVISIONS:

DRAWN BY: JET

CHECKED BY: MLS

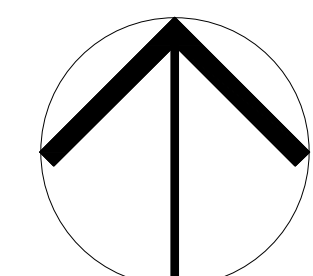
PROJECT: FDCWP9

PRE-DEVELOPED
DRAINAGE AREA MAP

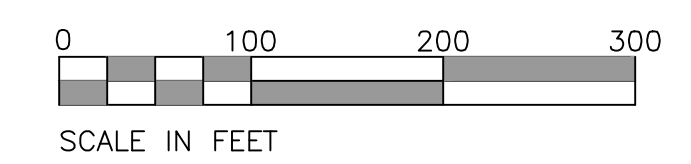
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GENERAL NOTES

1. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWN OF ZEBULON AND THE STATE OF NORTH CAROLINA STANDARDS AND SPECIFICATIONS.
2. CONTRACTOR SHALL HAVE NORTH CAROLINA ONE CALL (1-800-632-4949) LOCATE ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
3. CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONFLICTS PRIOR TO BEGINNING CONSTRUCTION.
4. CONTRACTOR IS RESPONSIBLE FOR REMOVING OR RELOCATING ALL UTILITIES IN CONFLICT WITH NEW CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES PRIOR TO DISTURBANCE.



NORTH



PLD

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PURDY FAMILY, LLC PROPERTY

2620 ZEBULON RD
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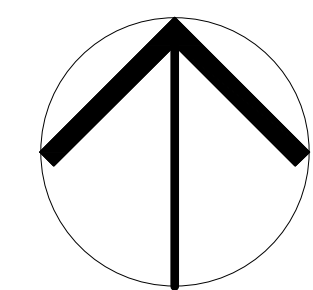
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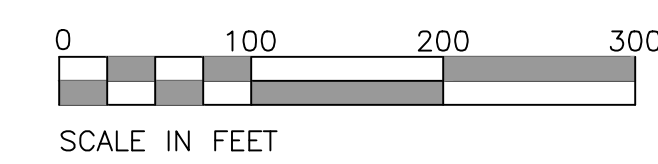
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STORM SEWER
DRAINAGE AREA MAP

DWG. NO. DA.4



NORTH



SCALE IN FEET

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