November 11, 2024

Jennie Turner, Assistant Planning Director
County of Currituck
Planning & Community Development
153 Courthouse Rd.
Currituck, NC 27929

RE: **University Park PH. III Shell Building**
       Major Site Plan Application
       Parcel Identification No. 0131000097A0000
       138 West Mobile Road, Harbinger, Currituck County, NC

Dear Ms. Turner:

On behalf of University Park, LLC, WithersRavenel hereby submits for your review the enclosed application package for University Park PH. III Shell Building Major Site Plan Application.

The following digital documents are included and shall be considered part of this submittal package:

1. One (1) copy of the signed Major Site Plan Application and Submittal Checklist;
2. One (1) Copy of the Stormwater SW-002 Form;
3. One (1) Copy of the Stormwater SW-003 Form;
4. One (1) Copy of the WithersRavenel SW-003 Calculations Sheet.
5. One (1) copy of the Site Plan;
6. One (1) copy of the Lighting Specifications;
7. One (1) copy of the Architectural Elevations;

It is acknowledged that an invoice for $5,500 (stormwater fee) and $400 ($400 minimum Major Site Plan Application Fee) will need to be paid online after an initial review of completeness. Please review the attached site plan and do not hesitate to contact me at 252.491.8147 if you have any questions, comments or requests for additional information.

Sincerely,
WithersRavenel

Michael W. Strader, P.E.
Senior Technical Consultant

Major Stormwater Plan Form SW-002

Review Process

Currituck County
Planning and Community Development
153 Courthouse Road, Suite 110
Currituck, NC 27929

Phone: 252.232.3055
Fax: 252.232.3026

Website: http://www.co.currituck.nc.us/planning-community-development.cfm

Currituck County
Engineering Department
153 Courthouse Road, Suite 302
Currituck, NC 27929

Phone: 252.232.6035

General

Major stormwater plan approval is required for:
- Major subdivisions.
- Major site plans - development or expansion on a nonresidential, multi-family, or mixed use lot by 5,000 square feet or more of impervious coverage or resulting in 10% or more total impervious coverage.

Step 1: Application Submittal

The applicant must submit a complete application packet consisting of the following:
- Completed Currituck County Minor Stormwater Plan Form SW-002 (unless submitting a major subdivision or major site plan).
- Completed Rational Method Form SW-003 or NRCS Method Form SW-004.
- Stormwater management plan drawn to scale. The plan shall include the items listed in the major stormwater plan design standards checklist.
- Alternative stormwater runoff storage analysis and/or downstream drainage capacity analysis, if applicable.
- NCDENR permit applications, if applicable.
- Number of Copies Submitted:
  - 3 Copies of required plans
  - 3 Hard copies of ALL documents
  - 1 PDF digital copy (ex. Compact Disk – e-mail not acceptable) of all plans AND documents.

On receiving an application, staff shall determine whether the application is complete or incomplete. A complete application contains all the information and materials listed above, and is in sufficient detail to evaluate and determine whether it complies with appropriate review standards. An application for major stormwater plan must be submitted and approved prior altering an existing drainage system, performing any land disturbing activity or, before construction documents are approved.

Step 2: Staff Review and Action

Once an application is determined complete staff shall approve, approve subject to conditions or disapprove the application.

Major Stormwater Plan
Form SW-002

Contact Information

APPLICANT:

Name: University Park, LLC

Address: 108 Amherst Drive

Powells Point, NC 27966

Telephone: 252-562-2485

E-Mail Address: nbibeau@aol.com

PROPERTY OWNER:

Name: University Park, LLC

Address: 108 Amherst Drive

Powells Point, NC 27966

Telephone: 252-562-2485

E-Mail Address: nbibeau@aol.com

Property Information

Physical Street Address: 138 W. Mobile Road, Harbinger, NC 27941

Parcel Identification Number(s): North west corner of the lot

FEMA Flood Zone Designation: ZONE X

Request

Project Description: Construction of a shell building and associated improvements

Total land disturbance activity: 17,421 SF   sf

Maximum lot coverage: 450,678 SF   sf

Calculated volume of BMPs: 2,476 SF   sf

Proposed lot coverage: 7,146 SF   sf

TYPE OF REQUEST

- ☐ Major subdivision (10-year, 24-hour rate)
- ☒ Major site plan (5-year, 24-hour rate)

METHOD USED TO CALCULATE PEAK DISCHARGE

- ☒ Rational Method
- ☐ NRCS Method (TR-55 and TR-20)
- ☐ Simple volume calculation for small sites (less than 10 acres)
- ☐ Alternative stormwater runoff storage analysis
- ☐ Downstream drainage capacity analysis

I hereby authorize county officials to enter my property for purposes of determining compliance. All information submitted and required as part of this process shall become public record.

_____
Property Owner(s)/Applicant

11/6/24
_____
Date

The table below depicts the design standards of the major stormwater plan application. Please make sure to include all applicable listed items to ensure all appropriate standards are reviewed.

Major Stormwater Plan
Design Standards Checklist

Date Received: _____

Project Name: _____

Applicant/Property Owner: _____

	Minor Stormwater Plan Design Standards Checklist		
	General		
1	Property owner name and address.	X	ALL SHEETS
2	Site address and parcel identification number.	X	ALL SHEETS
3	North arrow and scale to be 1" = 100' or larger.	X	ALL SHEETS
	Site Features		
4	Scaled drawing showing existing and proposed site features: Property lines with dimensions, acreage, streets, easements, structures (dimensions and square footage), fences, bulkheads, septic area (active and repair), utilities, vehicular use areas, driveways, and sidewalks.	X	ALL SHEETS
5	Approximate location of all designated Areas of Environmental Concern (AEC) or other such areas which are environmentally sensitive on the property, such as Maritime Forest, CAMA, 404, or 401 wetlands as defined by the appropriate agency.	N/A	
6	Existing and proposed ground elevations shown in one foot intervals. All elevation changes within the past six months shall be shown on the plan.	X	SHEET 3
8	Limits of all proposed fill, including the toe of fill slope and purpose of fill.	X	SHEET 3
9	Square footage of all existing and proposed impervious areas (structures, sidewalks, walkways, vehicular use areas regardless of surface material), including a description of surface materials.	X	SHEET 3
10	Existing and proposed drainage patterns, including direction of flow.	X	SHEET 3
11	Location, capacity, design plans (detention, retention, infiltration), and design discharge of existing and proposed stormwater management features.	X	SHEET 3
12	Elevation of the seasonal high water level as determined by a licensed soil scientist.	X	
13	Plant selection.	X	SHEET 3
	Permits and Other Documentation		
14	NCDENR stormwater permit application (if 10,000sf or more of built upon area).	N/A	
15	NCDENR erosion and sedimentation control permit application (if one acre or more of land disturbance).	N/A	
16	NCDENR coastal area management act permit application, if applicable.	N/A	
17	Stormwater management narrative with supporting calculations.	X	SHEET 3
18	Rational Method Form SW-003 or NRCS Method Form SW-004	X	
19	Alternative stormwater runoff storage analysis and/or downstream drainage capacity analysis, if applicable	N/A	
20	Design spreadsheets for all BMPs (Appendix F – Currituck County Stormwater Manual).	X	
21	Detailed maintenance plan for all proposed BMPs.	X	SHEET 4

	Certificate	
22	The major stormwater plan shall contain the following certificate: I, _Norm̃ß·Scı̃_ owner/agent hereby certify the information included on this and attached pages is true and correct to the best of my knowledge. On the plan entitled _____, stormwater drainage improvements shall be installed according to these plans and specifications and approved by Currituck County. Yearly inspections are required as part of the stormwater plan. The owner is responsible for all maintenance required. Currituck County assumes no responsibility for the design, maintenance, or performance of the stormwater improvements. Date: _11/6/24_ Owner/Agent: _____	

Major Stormwater Plan Submittal Checklist

Staff will use the following checklist to determine the completeness of your application. Please make sure all of the listed items are included. Staff shall not process an application for further review until it is determined to be complete.

Major Stormwater Plan Form SW-002
Submittal Checklist

Date Received: _____

Project Name: _____

Applicant/Property Owner: _____

	Major Stormwater Plan Form SW-002 Submittal Checklist	
1	Completed Major Stormwater Plan Form SW-002	X
2	Completed Rational Method Form SW-003 or NRCS Method Form SW-004	X
3	Stormwater plan	X
4	NCDENR permit applications, if applicable	N/A
5	3 copies of plans	X
6	3 hard copies of ALL documents	X
7	1 PDF digital copy of all plans AND documents (ex. Compact Disk — e-mail not acceptable)	X

Comments

_____

_____

_____

Rational Method Peak Flow
Form SW-003

Project Information

Project Location: 138 W. Mobile Road, Harbinger, NC 27941

Parcel Identification Number(s): 0131000097A0000

Drainage area: 0.40   ac

Average Slope: 3.0 %   %

Maximum Slope Length: 144   ft

Calculations

*The Rational Method may only be used where development will impact less than 10 acres

Time of Concentration (Tc) (Use additional sheets if necessary)	Pre-	Post-	
Sheet Flow			
Manning's roughness, n (Table 2-4)	0.1	0.011	
2-year, 24-hour Rainfall, P	4.0	6.0	in
Slope, S	3%	1.0%	ft/ft
Length of Sheet Flow, L (<=300 feet)	130	26	ft
Total Time for Sheet Flow	6.65	0.4	**min**
Shallow Concentrated Flow	N/A	N/A	
Surface Paved (P) or Unpaved (U)	N/A	N/A	
Length of flow, L	N/A	N/A	ft
Slope, S	N/A	N/A	ft/ft
Average Velocity, V (Table 2-3)	N/A	N/A	ft/min
Total Time for Shallow Concentrated Flow	N/A	N/A	**min**
Channel Flow			
Pipe (P) or Channel (C)	N/A	C	
If pipe: Diameter, D	N/A	N/A	in
If channel: Bottom Width, w	N/A	0.0	ft
If channel: side slope 1 (___:1)	N/A	3	
If channel: side slope 2 (___:1)	N/A	3	
Cross sectional flow area, A	N/A	0.480	sq ft
Wetted perimeter, Wp	N/A	2.53	ft
Hydraulic radius, $R = A/W_p$	N/A	.19	ft

Time of Concentration (Tc)
(Use additional sheets if necessary)

	Pre-	Post-	
Channel slope, S	N/A	1.5%	ft/ft
Manning's roughness, n (Table 2-4)	N/A	0.035	
Channel velocity	N/A	2.0	ft/sec
Length of Flow, L	N/A	121	ft/sec
Total Time for Channel Flow	N/A	1.0	min
Total Time of Concentration, Tc	6.65	2.09	min

(5 min)

Pre-development Conditions

Land Use Description	C	Area (acres)	C*A
Woods	0.2	0.40	0.08
Total			

Intensity for 2-year, 24-hour storm (Table 2-5)   5.66   in/hr
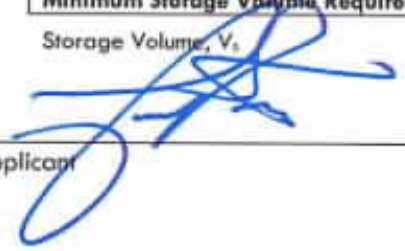
Pre-development peak flow, $Q = CiA$ 0.45   cfs

Post-development Conditions

Land Use Description	C	Area (acres)	C*A
Shell building and vehicular area	0.95	0.16	0.152
Grassed Area	0.25	0.24	0.06
Totals			

Area-weighted C: 0.54

Intensity for 10-year, 24-hour storm (Table 2-5)   6.82 (5 YEAR)   in/hr

Post-development peak flow, $Q = CiA$ 1.47   cfs

Minimum Storage Volume Required – Refer to Section 2.4.4 for Volume Calculations

Storage Volume, V_s 1,539.32   ft³

_____   11/6/24
Applicant   Date

Project Name:	University Park Shell Building
Quible Project Number:	P23058
Date:	4/5/2024

Supplemental Currituck County Stormwater Calculations *(Associated with Forms SW-002 and SW-003)*

Step 1:	Drainage Area		17,421.00	square feet
			0.40	acres

Step 2: Determine Runoff Coefficient

$C =$ 0.20

Step 3: Determine Time of Concentration

Sheet Flow

$$Tc_1 = \frac{0.42(nL)^{0.8}}{P^{0.5}S^{0.4}}$$

$n =$	0.1	(woods)
$L =$	130	feet
$P =$	4	inch
$S =$	0.030	ft/ft
$Tc_1 =$	6.6	mins

Shallow Concentrated Flow

$L =$	N/A	feet
$S =$	N/A	ft/ft
	unpaved	
$V_{unpaved} =$	#VALUE!	fpm
$Tc2 =$	#VALUE!	mins

Channel Flow

(n/a)

$Tc = Tc1 + Tc2$

$Tc =$ 6.6 mins

Step 4: Determine Peak Rainfall Intensity

Time of Concentration

T (yrs)	5 mins	10 mins	15 mins	30 mins	1 hr	2 hr
2	6.06	4.84		4.06	2.8	1.03
5	6.82	5.46		4.6	3.27	2.1	1.26
10	7.82	6.26		5.28	3.82	2.49	1.51

$I =$ 5.66 in/hr

Interpolation Formula =

$$y_2 = \frac{(x_2 - x_1)(y_3 - y_1)}{(x_3 - x_1)} + y_1$$

1

2

3

$y_2 =$ 5.66

Step 5: Determine the 2-year Pre-Development peak discharge, Q

$Q = CIA$

$Q\,2 =$ 0.45 cfs

Step 6: Determine the weighted runoff coefficient, Cw for post-development

		C - Value
Impervious Area =	7,146.00 sq.ft.	0.95
Open Area =	10,275.00 sq.ft.	0.25
Total =	17,421.00 sq.ft.	

Cw = 0.54

Step 7: Determine Time of Concentration for post-development

Sheet Flow

$$Tc_1 = \frac{0.42(nL)^{0.8}}{P^{0.5} S^{0.4}}$$

n =	0.011	(smooth pavement)
L =	26.00	feet
P =	6	inch *(From Currituck County SW-003)*
S =	0.010	ft/ft
Tc_1 =	0.4	mins

Shallow Concentrated Flow

Tc_2 =

L = N/A	ft
unpaved	
Slope = N/A	ft/ft

Paved Areas $V = 1302(S^{0.53})$

Unpaved Areas $V = 972(S^{0.53})$

V = #VALUE! ft/min

Tc_2 = #VALUE! mins

Channel Flow

Width	0
Slope	3
Area	0.48
Wp	2.53
R	0.19
S	1.5%
n	0.035
Velocity	2
L	121
Tc3=	60.5

Tc = Tc1 + Tc2

Tc = 5.0 mins   *5 min minimum Tc (worst case scene

Step 8: Determine Peak Rainfall Intensity

			Time of Concentration			
T (yrs)	5 mins	10 mins	15 mins	30 mins	1 hr	2 hr
2	6.06	4.84		4.06	2.8	1.03
5	6.82	5.46		4.6	3.27	2.1	1.26
10	7.82	6.26		5.28	3.82	2.49	1.51

I5 = 6.82

Step 9: Determine the 5-year Post-Development peak discharge, Q

$Q = CIA$

$Q5 =$ | 1.47 | cfs

Step 10: Determine the weighted curve number, CN, for the post-development conditions.

Hydrologic Soil Type: B & A/D *(From NRCS Soils Report)*

Land Use	CN	Area
Impervious Area	84	7,146.00
Open Space	49	10,275.00
Total =		17,421.00
$CN_W =$		63.36

Step 11: Determine the 5-year post-development runoff depth, Q

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)} \qquad S = \frac{1000}{CN} - 10$$

P =	5	in
S =	5.78	
Q =	1.53	in

Step 12: Determine the Runoff Volume, V_r

$$V_r = \frac{Q}{12} \cdot A$$

Q =	1.53	in
A =	0.40	acres
$V_r =$	0.05	ac-ft

Step 13: Determine the Required Storage Volume, V_s

$$V_s = 1613.33 \cdot V_r \cdot (1 - \frac{Q_{2\_pre}}{Q_{10\_post}})$$

$V_r =$	0.05	ac-ft
$Q_{2\text{-pre}} =$	0.45	cfs
$Q_{5\text{-post}} =$	1.47	cfs
$V_s =$	57.01	CY
	1,539.32	CF

Project Name:	University Park Shell Building
Quible Project Number:	P22090.2
Date:	4/5/2024

Supplemental Currituck County Stormwater Calculations *(Associated with Forms SW-002 and SW-003)*

Step 1: Drainage Area

17,421.00	square feet
0.40	acres

Step 2: Determine Runoff Coefficient

C = 0.20

Step 3: Determine Time of Concentration

Sheet Flow

$$Tc_1 = \frac{0.42(nL)^{0.8}}{P^{0.5}S^{0.4}}$$

n =	0.1	(woods)
L =	130	feet
P =	4	inch
S =	0.030	ft/ft
Tc_1 =	6.6	mins

Shallow Concentrated Flow

L =	N/A	feet
S =	N/A	ft/ft
	unpaved	
$V_{unpaved}$ =	#VALUE!	fpm
Tc2 =	#VALUE!	mins

Channel Flow
(n/a)

Tc = Tc1 + Tc2

Tc = 6.6 mins

Step 4: Determine Peak Rainfall Intensity
Time of Concentration

T (yrs)	5 mins	10 mins	15 mins	30 mins	1 hr	2 hr
2	6.06	4.84		4.06	2.8	1.03
5	6.82	5.46		4.6	3.27	1.26
10	7.82	6.26		5.28	3.82	1.51

I = 5.66 in/hr

Interpolation Formula =

$$y_2 = \frac{(x_2 - x_1)(y_3 - y_1)}{(x_3 - x_1)} + y_1$$

1

2

3

y_2 = 5.66

Step 5: Determine the 2-year Pre-Development peak discharge, Q

Q = CIA

Q 2 = 0.45 cfs

Step 6:   Determine the weighted runoff coefficient, Cw for post-development

			C - Value
Impervious Area =	7,146.00	sq.ft.	0.95
Open Area =	10,275.00	sq.ft.	0.25
Total =	17,421.00	sq.ft.	

Cw = 0.54

Step 7:   Determine Time of Concentration for post-development

Sheet Flow

$$Tc_1 = \frac{0.42(nL)^{0.8}}{P^{0.5}S^{0.4}}$$

n =	0.011	(smooth pavement)
L =	26.00	feet
P =	6	inch *(From Currituck County SW-003)*
S =	0.010	ft/ft
Tc_1 =	0.4	mins

Shallow Concentrated Flow

Tc_2 =

L = N/A	ft
unpaved	
Slope = N/A	ft/ft

Paved Areas V = $1302(S^{0.53})$

Unpaved Areas V = $972(S^{0.53})$

V =	#VALUE!	ft/min
Tc_2 =	#VALUE!	mins

Channel Flow

Width	0
Slope	3
Area	0.48
Wp	2.53
R	0.19
S	1.5%
n	0.035
Velocity	2
L	121
Tc3=	60.5

Tc = Tc1 + Tc2

Tc = 5.0 mins   *5 min minimum Tc (worst case scene

Step 8:   Determine Peak Rainfall Intensity

		Time of Concentration				
T (yrs)	5 mins	10 mins	15 mins	30 mins	1 hr	2 hr
2	6.06	4.84		4.06	2.8	1.03
5	6.82	5.46		4.6	3.27	2.1	1.26
10	7.82	6.26		5.28	3.82	2.49	1.51

I5 = 6.82

Step 9: Determine the 5-year Post-Development peak discharge, Q

$Q = CIA$

$Q5 = \boxed{1.47}$ cfs

Step 10: Determine the weighted curve number, CN, for the post-development conditions.

Hydrologic Soil Type: B & A/D   *(From NRCS Soils Report)*

Land Use	CN	Area
Impervious Area	84	7,146.00
Open Space	49	10,275.00
	Total =	17,421.00
	CN_W =	63.36

Step 11: Determine the 5-year post-development runoff depth, Q

$$Q = \frac{(P-0.2S)^2}{(P+0.8S)} \qquad S = \frac{1000}{CN} - 10$$

P =	5 in
S =	5.78
Q =	1.53 in

Step 12: Determine the Runoff Volume, V_r

$$V_r = \frac{Q}{12} * A$$

Q =	1.53	in
A =	0.40	acres
V_r =	0.05	ac-ft

Step 13: Determine the Required Storage Volume, V_s

$$V_s = 1613.33 * V_r * (1 - \frac{Q_{2\_pre}}{Q_{10\_post}})$$

V_r =	0.05	ac-ft
$Q_{2\text{-pre}}$ =	0.45	cfs
$Q_{5\text{-post}}$ =	1.47	cfs
V_s =	57.01	CY
	1,539.32	CF