Wake County Environmental Services Department
Water Quality Division, Watershed Management Section
336 Fayetteville St. • P.O. Box 550 • Raleigh, NC 27602
TEL 919 856-7400 • FAX 919 743-4772

WMCPDR – ROLESVILLE, WENDELL, ZEBULON WATERSHED MANAGEMENT CONSTRUCTION PLAN DISAPPROVAL AND REVIEW COMMENTS

Project Name	Broadmoor	**Watershed**	Lower Neuse River	**Jurisdiction**	Rolesville
Date Received	01/14/2025	**Date Processing Initiated**	01/14/2025	**Disturbed Acreage**	73
S&E Permit Number	SEC-139136-2025	**S&E Plan Review Fee**	$18,250 PAID	**S&E Permit Fee**	$18,250 PENDING
SW Permit Number	SWF-139473-2025	**SW Plan Review Fee**	$2,500 PAID	**SW Permit Fee**	$2,500 PENDING

Financial Responsible Party (FRP):

Name: Pulte Home Company, LLC
Address: 1225 Crescent Green, Suite 250, Cary, NC 27511
Phone: 919-816-1100
Email: scott.cobb@pultegroup.com

Engineer:

Name: WitherRavenel, Inc. – Terrence Cook
Address: 167 E Chatham Street, Suite 210, Cary, NC 27511
Phone: 919-469-3340
Email: tcook@withersravenel.com

Plan Date/Revision Date: **03/05/2025**

Review Status: 03/20/2025	☒	**Construction Plan Not Approved and Incomplete (Items 1-4 required to be a complete submittal)**
	☒	**Construction Plan Not Approved and requires additional information**

Construction Plan Review Comments

Items marked with an "X" were noted as either insufficient or not provided. Engineer comments are in **RED** and provide the necessary requirements for construction plan approval.
References for Erosion and Sediment Control: *Wake County Unified Development Ordinance (UDO) Article 10*
References for Stormwater Management are as follows:
ROLESVILLE: *Town of Rolesville Land Development Ordinance Appendix B: Flood Damage Prevention and Stormwater Management, Section 1.2 Stormwater Management* effective June 1, 2021.
WENDELL: *Town of Wendell Unified Development Ordinance (UDO) Chapter 6: Environmental Protection*, adopted 7/26/10.
ZEBULON: *Town of Zebulon, NC Code of Ordinances: Chapter 151*

☐	**1.**	Erosion Control and Stormwater Joint Application (Required to initiate processing)
☒	**2.**	Review Fees (Required to initiate processing) RESUBMITTALS: The first resubmittal is free, but all subsequent Stormwater resubmissions require a $150 Resubmission Fee and Erosion Control resubmissions require a $75 Resubmission Fee.
☒	**3.**	Notarized Wake County Financial Responsibility/Ownership Form (Required to initiate processing)

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	☒	**a.**	The application must include the owner's notarized written consent for the applicant to submit an erosion and sedimentation control plan and to conduct the anticipated land-disturbing activity if the applicant is not the owner of the land to be disturbed [10-30-2-(B)-(2)-(c)] -The letter of consent should be the property owner giving permission to the FRP to submit for permit and conduct land disturbing activities. All owners should give Pulte Home Company, LLC this permission not WithersRavenel.
☒	**4.**	Other documents:	
	☒	**a.**	Engineering Approval: Copy of approval notification for projects in a municipality's zoning jurisdiction -Provide Rolesville CD approval when received
	☒	**b.**	401/404 Documentation (Buffer determination letters, PCN application, comments, and approval) ***Recommendation: Provide Jurisdictional Dam Hazard Classification from NCDEQ if the dams are not already on the state's inventory.**
	☒	**c.**	NCDOT Approval (Temporary Construction Entrances, Encroachment Agreements)
	☐	**d.**	Encroachment agreement(s) completed, signed and notarized for all off-site construction
☒	**5.**	Cover letter stating the purpose of the submission, describing site drainage, stormwater management objectives, and how the proposed stormwater management plan will meet the objectives and be implemented RESUBMITTALS: A letter detailing any changes, comments, proposed solutions to review comments, etc.	
☐	**6.**	Copy of the USGS Quad Map with delineated project limits	
☐	**7.**	Copy of the Wake County Soil Survey map with delineated project limits from 1970 manuscript	
☒	**8.**	One (1) electronic copy of a complete set of construction drawings for 1st resubmission, number (#) copies for final approval.	
☒	**9.**	One (1) electronic copy of the Municipal Stormwater Design Tool (click here); submit Excel workbook (Site Data Sheet, Drainage Area Sheets, Site Summary Sheet, BMP Sheets, and BMP Summary sheet) -Municpal tool in report is missing several sheets such as BMP sheets -There is a second DA4_BMP sheet, provide clarification. -Please address Post BMP discharge exceeding pre-development peak flow in BMP Summary sheets	
☐	**10.**	Drainage Area Maps with stormwater discharge points and Tc flow paths (existing/post construction/post BMP)	
☐	**11.**	Drainage Area Map showing drainage areas to erosion control devices (can delineate on plan sheets)	
☐	**12.**	Stormwater and Erosion Control Calculations:	
	☐	**a.**	Sediment basin design (See website for Wake County Design Criteria)
	☐	**b.**	Ditches, swales, and channels: Q10/V10. Tractive force (shear stress), capacity and geometry
	☐	**c.**	Dissipaters: Q10 velocities, stone size and dimensions
	☐	**d.**	Velocity calculations for stormwater runoff at points of discharge resulting from a 10-year storm after development were not provided or do not comply

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	☒	**e.**	Support data for all stormwater practice designs, such as inflow/outflow rates, stage/storage data, hydrographs, outlet designs, infiltration rates, water elevations, design output, summary, etc. **Recommendation: Provide 100-year-storm calculations to the pond to ensure pond can retain 100-year storm.**
	☒	**f.**	Signature, Date and Professional Seal: for all Stormwater design management proposals, i.e., calculations, BMP designs, operations/maintenance/budget/as built/inspections/manuals -Preliminary mark will need to be removed
☒	**13.**	Draft Stormwater Agreement and draft Maintenance Agreement ***Did not see this in 03/05/2025 submittal**	
☒	**14.**	Proposed Site Plan:	
	☐	**a.**	Combined Erosion Control, Stormwater and Floodplain Approval Block (Cover Sheet)
	☐	**b.**	Location/Vicinity Map
	☒	**c.**	North arrow, graphic scale, drafting version date, legend and professional seal -Provide legend to EC/SW measures in plan
	☐	**d.**	Existing and proposed contours: plan and profiles for roadways
	☒	**e.**	Boundaries of tract: including project limits -For roadway, improvements should be shown if included in LOD or LOD should be moved to exclude the entire roadway. If included do not grey out as it makes it harder to see improvements clearly. ***Recommendation: Limit areas shown outside LOD in plans. Minor occurrences are fine but an example of what we mean is in sheets C7.12 and C7.14 where roughly half the viewport is areas not in LOD.** ***Recommendation: Provide layouts that do not cut thru sediment basins and can show the entire basin in one piece.**
	☒	**f.**	Table with impervious calculations - existing and proposed impervious surfaces: roads, well lots, recreation sites, single family residences, etc. (consistent with the Municipal Stormwater Design Tool inputs) -Revise Impervious table to only show impervious areas.
	☐	**g.**	Proposed improvements: roads, buildings, parking areas, grassed, landscaped and natural areas
	☐	**h.**	Lot lines, lot numbers, road names, and impervious limit on each lot rounded to nearest whole number
	☐	**i.**	Utilities: community water and sewer, plan/profiles, easements and sediment controls
	☐	**j.**	Stormwater Network: inlets, culverts, swales, ditches, channels and drainage easements

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	☒	**k.**	TEMPORARY SEDIMENT CONTROLS: locations and dimensions of gravel entrances, diversion ditches, silt fence, sediment basins, inlet protection, etc. **General comments** -Provide Stream Crossing design and sequence, provide staging information. Only sewer crossing was detail. -Provide silt fence behind back of curb once they are installed **EC Stage 1** -In areas of concentrated flow just a check dam is fine, don't double up with a check dam and outlet -Provide SEC to roadway improvements -Basins are too deep (the ones that will be conveted), provide clay line to be maintained throughout project. -Provide erosion control blanket on all perimeter slopes with a height/depth of 8 ft. or larger. -Show SEC measure in roadway improvements KHA road widening (minimum 2 phases). Such as check dams/wattles in existing swales. -In C7.04 provide anchoring for bent pipe -In C-7.09 no protection for the culverts for temporary pipes -Baffles should be uniformly spaced ***Recommendation: For work adjacent to wetlands super silt fence may be appropriate** ***Recommendation: Turbidity curtains in freshwater pond** **EC Stage 2** -Incorporate phase 1 erosion control review comments into final phase erosion control design sheets if Applicable
	☐	**l.**	Sediment Basin Dewatering Bags: Provide a dewatering bag and location pad adjacent to all sediment basins for maintenance and closeout. Label the bag and pad with dimensions.
	☐	**m.**	Stream Culvert Construction Phasing: Provide a detailed construction sequence for installation of culverts at streams and show the stream crossing(s) on the erosion control plan sheets. Include all applicable details related to managing the stream flow during the culvert installation (silt bags, pumparound, impervious dikes, etc.).
	☐	**n.**	Stream Protection: Design temporary sediment storage during the construction phase of stream culvert installation on all four-corners of the stream crossing (where applicable) and show on the erosion control plan sheets. Provide erosion control blankets on all permanent slopes of culvert at stream crossing.
	☐	**o.**	PERMANENT EROSION CONTROLS: locations and dimensions of dissipaters, ditch linings, armoring, level spreaders, retaining walls, etc.
	☐	**p.**	DETAILED COMMENTS REGARDING PERMANENT SEDIMENT CONTROLS:
	☒	**q.**	Location and requirements for stockpiles (see website for Stockpile Requirements) -Per NCG01 Ground stabilization stockpile should be 50' from sediment basin **EARTHEN STOCKPILE MANAGEMENT** 1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
	☒	**r.**	Wake County Construction Sequence (Provide project specific details as needed). -Provide stream/wetland crossing sequence.

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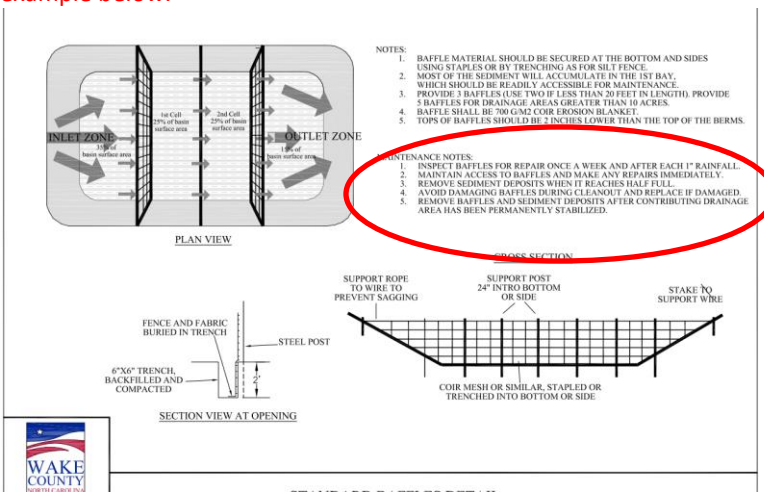
	☒	**s.**	Wake County Construction Details -Please use current Wake County Details as there are details without maintenance notes for EC, see example below.  -Provide asphalt crossing the emergency spillway detail for SCM#2
	☐	**t.**	Wake County Stabilization Guidelines
	☐	**u.**	Wake County Basin Removal Sequence -Wake County must grant permission to convert the sediment basin over to stormwater use prior to completing any related work (construction sequence or note elsewhere on the plan should indicate this).
	☐	**v.**	Show all Riparian Buffers (Neuse: [15A NCAC 2B .0714])
	☐	**w.**	Delineation of current FEMA boundaries (floodway, non-encroachment areas, flood fringe and future/0.2%)
	☐	**x.**	PERMANENT STORMWATER MANAGEMENT STRUCTURES: locations and types of all proposed stormwater management structures *(grass swale, wet/dry detention basin, filtering/infiltration basin, bioretention, etc.)*
	☐	**y.**	DETAILED COMMENTS REGARDING PERMANENT STORMWATER MANAGEMENT:

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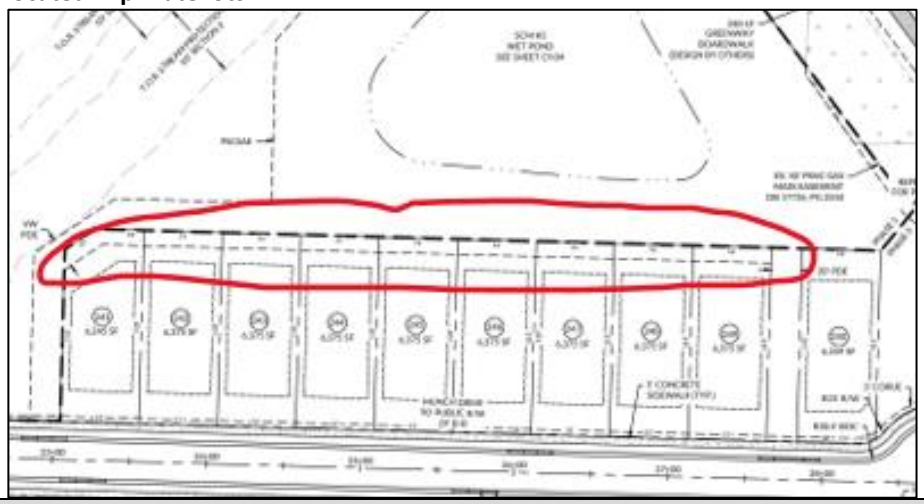
	☒	**z.**	Proposed stormwater easements, access lanes and backwater easements. Provide and label minimum 20 ft. Access easement and 10 ft. Maintenance easement from toe of stormwater pond embankment. ***Recommendation: Confirm with the Town of Rolesville if access and maintenance easements can be located in private lots.** 

Standards and Requirements

Items marked with an "X" note relevant standards to be applied to the proposed development. Notes in **RED** provide review comments and/or any required elements to comply with standard.
Ordinance references are shown in brackets.

☒	**15.**	**Stormwater Review Required** – All residential subdivision development must submit a plan to comply with the applicable municipalities' stormwater ordinance. Office, institutional, commercial or industrial development that disturbs greater than 20,000 square feet is required to comply with the stormwater management regulations. Development and redevelopment that disturb less than 20,000 square feet are not exempt if such activities are part of a larger common plan of development or sale, even though multiple, separate or distinct activities take place at different times on different schedules. **Rolesville** [1.2.1.(E)], **Wendell** [6.5(F)], **Zebulon** [151.05]
☒	**16.**	**Stormwater Permit** – is required for all development and redevelopment unless exempt pursuant to the Code of Ordinances. A permit may only be issued subsequent to a properly submitted, reviewed and approved stormwater management plan and permit application. **Rolesville** [1.2.3.(B)(2)], **Wendell** [6.5(F)(3)], **Zebulon** [151.21(A)] Note: A permit may not be required if there are no post-construction requirements (i.e. SCMs).
☒	**17.**	**SCMs** – For projects requiring stormwater treatment for quality and/or quantity control, the applicant must 1) comply with the NC Stormwater Design Manual **Rolesville** [1.2.4.(B)(2)], **Wendell** [6.5(N)(2)], **Zebulon** [151.07] 2) as well as *Completion of Improvements and Maintenance,* prior to issuance of a certificate of compliance or occupancy. **Rolesville** [1.2.5], **Wendell** [6.5(O)], **Zebulon** [151.50 – 151.56]
☐	**18.**	**Standards Based on Project Density** – In accordance with the definitions, projects are identified as Ultra Low-Density (15%or less Built-Upon Area, referred to as BUA, and less than one dwelling unit per acre), Low-Density (more than 15% BUA and no more than 24% BUA), and High-Density (24% or more BUA). **Rolesville** [7.5.4], **Wendell** [6.5(E)], **Zebulon** [151.10]

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	☐	**Standards for Ultra-Low and Low-Density Projects:** • Use of vegetated conveyances to maximum extent practicable • Location of development and redevelopment outside Riparian Buffer and Flood Protection Zones • Recorded deed restrictions or protective covenants to ensure future development maintains consistency with approved project plans • Permanent SCMs (Stormwater Control Measures) are to be designed in accordance with and as specified in the North Carolina Department of Environmental Quality's Design Manual. • For Low-Density only, no net increase in peak flow leaving the site from the pre- development conditions for the 1 yr-24hr storm. Runoff volume drawdown time shall be a minimum of 48 hours, but not more than 120 hours. • Residential runoff after development must not exceed the Target Curve Numbers listed in the chart "Maximum Composite Curve Number, by Soil Group". • Ultra-Low and Low-Density projects may be eligible for target curve number credits. **Wendell Only**: Nitrogen export limited to 3.6 pounds per acre per year unless project achieves classification as an LID Project. **Rolesville** [1.2.4(A)(1-3)], **Wendell** [6.5(M)(1)], **Zebulon** [151.35(A-C)]
	☐	**Standards for High-Density Projects:** • Measures shall control and treat runoff from the first inch of rain. Runoff volume drawdown time shall be a minimum of 48 hours, but not more than 120 hours. • Structural measures shall be designed to have a minimum of 85 % average annual removal for Total Suspended Solids (TSS) • Permanent SCMs (Stormwater Control Measures) are to be designed in accordance with and as specified in the North Carolina Department of Environmental Quality's Design Manual. • No net increase in peak flow leaving the site from the pre -development conditions for the 1 yr-24hr storm. Runoff volume drawdown time shall be a minimum of 48 hours, but not more than 120 hours. • Location of development and redevelopment outside Riparian Buffer and Flood Protection Zones **Rolesville** [1.2.4(A)(4)], **Wendell** [6.5(M)(4)], **Zebulon** [151.35(D)]
	☐	**Low Impact Development (LID) Classification:** • All development or redevelopment may be submitted for LID classification • Development must mimic the pre-developed hydrologic conditions of the site, as defined as "woods in good condition" for the 2-yr, 24 hr storm, within 10%. • Techniques required to achieve LID classification ➢ Natural site design ➢ Bio-retention systems or on-site infiltration (at least one must be used) ➢ At least **two** other techniques from the list provided in Rolesville [1.2.4.(B)(5)(e)], and **Zebulon** [151.36(E)(5)] ➢ At least **one** other technique from the list provided in **Wendell** [6.5(N)(5)(e)]

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☒	**19.**	**Downstream Impact Analysis** – Required analysis using the "10% rule" drainage area evaluation of the 10-year, 24-hour peak flow of the pre/post development to determine if the project will have any impacts on flooding or channel degradation downstream of the project site in accordance with **Rolesville** [1.2.4.(B)(1)] **Wendell** [6.5(N)(1)], **Zebulon** [151.36(A)]. -Per Rolesville LDO, for an increase in the Downstream impact analysis there are three options: 1. Revise the site plan for the proposed site to incorporate better use of natural features, design additional structural control facilities, reduce impervious cover, or alter timing of peak flows to lower post-Development flows at each comparison point to pre-Development levels. 2. Obtain a flow easement from downstream property owners through the ten percent point where the post-Development peak discharge rate is higher than the pre-Development peak discharge rate. 3. Work with the Town to determine other acceptable approaches to reduce the peak discharge rate for the ten-year storm. For further information on the ten percent rule, refer to the Stormwater Manual, available online. Provide any relevant information in next resubmittal on how this requirement was addressed

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Wake County UDO Article 10 - Erosion and Sedimentation Control Requirements (Applies to Rolesville, Wendell and Zebulon)			
☒	**20.**		**Erosion Control:** This project will require a Land Disturbance Permit if it involves greater than one acre of disturbance. **Note**: If the land disturbance is part of a common plan of development that is greater than one acre of disturbance, an Approved Erosion and Sediment Control Plan and Land Disturbance Permit are required for each individual tract or parcel disturbance within the common plan of development, regardless of land disturbance acreage in each tract/parcel.
☒	**21.**		**Minimum Standards [Article 10-20-1]** – All soil erosion and sedimentation control plans and measures must conform to the minimum applicable standards specified in *North Carolina's Erosion and Sediment Control Planning and Design Manual*. Erosion control devices must be installed to prevent any offsite sedimentation for any construction site regardless of the size of the land disturbance.
☐	**22.**		**Operation in Lakes or Natural Watercourses [Article 10-20-3]** – Land disturbing activity in connection with construction in, on, over, or under a lake of natural watercourse must minimize the extent and duration of disruption of the stream channel. Where relocation of a stream forms an essential part of the proposed activity, the relocation must minimize unnecessary changes in the stream flow characteristics.
☐	**23.**		**Standards for High Quality Water (HQW) Zones [Article 10-20-11]** Land-disturbing activities to be conducted in High Quality Water Zones must be designed as follows:
	☐	**a.**	Uncovered areas in High Quality Water (HQW) zones must be limited at any time to a maximum total area of 20 acres within the boundaries of the tract.
	☐	**b.**	**Maximum Peak Rate of Runoff** – Erosion and sedimentation control measures, structures, and devices within HQW zones must be planned, designed and constructed to provide protection from the runoff of the 25-year storm.
	☐	**c.**	**Settling Efficiency** – Sediment basins within HQW zones must be designed and constructed so that the basin will have a settling efficiency of at least 70% for the 40 micron (0.04mm) size soil particle transported into the basin by the runoff of that 2-year storm which produces the maximum peak rate of runoff.
	☐	**d.**	**Grade** – The angle for side slopes must be sufficient to restrain accelerated erosion (side slopes no steeper than two (2) horizontal to one (1) vertical if a vegetative cover is used for stabilization unless soil conditions permit a steeper slope or where the slopes are stabilized by using mechanical devices, structural devices or other acceptable ditch liners)
☐	**24.**		**Senate Bill 1020;** "SECTION 3.(h) Additional standards for land-disturbing activities in the water supply watershed":
	☐	**a.**	Erosion and sedimentation control measures, structures, and devices shall be planned, designed, and constructed to provide protection from the runoff of the 25-year storm
	☐	**b.**	Sediment basins shall be planned, designed, and constructed so that the basin will have a settling efficiency of at least seventy percent (70%) for the 40-micron size soil particle transported into the basin by the runoff of the two-year storm that produces the maximum peak rate of runoff
	☐	**c.**	Newly constructed open channels shall be planned, designed, and constructed with side slopes no steeper than two horizontal to one vertical if a vegetative cover is used for stabilization unless soil conditions permit steeper slopes or where the slopes are stabilized by using mechanical devices, structural devices, or other acceptable ditch liners.

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Neuse Riparian Buffer Rules		
☒	**25.**	Due to the location of this project, it should be noted that a rule to protect and maintain existing buffers along watercourses in the Neuse River Basin became effective on July 22, 1997. The **Neuse River Riparian Area Protection and Maintenance Rule (15A NCAC 2B .0714)** applies to all perennial and intermittent streams, lakes, ponds and estuaries in the Neuse River Basin with forest vegetation on the adjacent land or "riparian area".
North Carolina General Statute § 113A-61 (c) - Right to Appeal the Decision		
☒	**26.**	The applicant has the right to appeal this decision per North Carolina General Statute § 113A-61 (c).
Additional Suggested Changes/Comments		
☒	**27.**	Please let us know if you would like to request a meeting.

Environmental Engineer: Kevin Zelaya
Kevin Zelaya, PE

Contact Info: kevin.zelaya@wake.gov
919-856-7473