

**DETENTION CALCULATION SUMMARY**

Description	Rational Method Storm Event (cfs)			
	Q1 Storm	Q2 Storm	Q5 Storm	Q10 Storm
Pre-R-40 Discharge	2.37	4.53	5.18	5.68
Post Discharge	6.52	8.31	9.49	10.42
Attenuation Required	4.15	3.78	4.31	4.74
Discharge Into BMP	6.58	8.38	9.58	10.51
Discharge Out of BMP	0.03	0.04	0.04	0.04
Attenuation Provided	6.55	8.34	9.54	10.47
Comments	OK	OK	OK	OK

Description	SCS Method Storm Event (cfs)			
	Q1 Storm	Q2 Storm	Q5 Storm	Q10 Storm
Pre-R-40 Discharge	6.87	11.56	16.63	20.18
Post Discharge	9.91	12.81	17.91	21.47
Attenuation Required	3.04	1.25	1.28	1.29
Discharge Into BMP	7.43	9.39	12.81	15.17
Discharge Out of BMP	4.35	7.16	10.93	11.53
Attenuation Provided	3.06	2.23	1.88	3.64
Comments	OK	OK	OK	OK

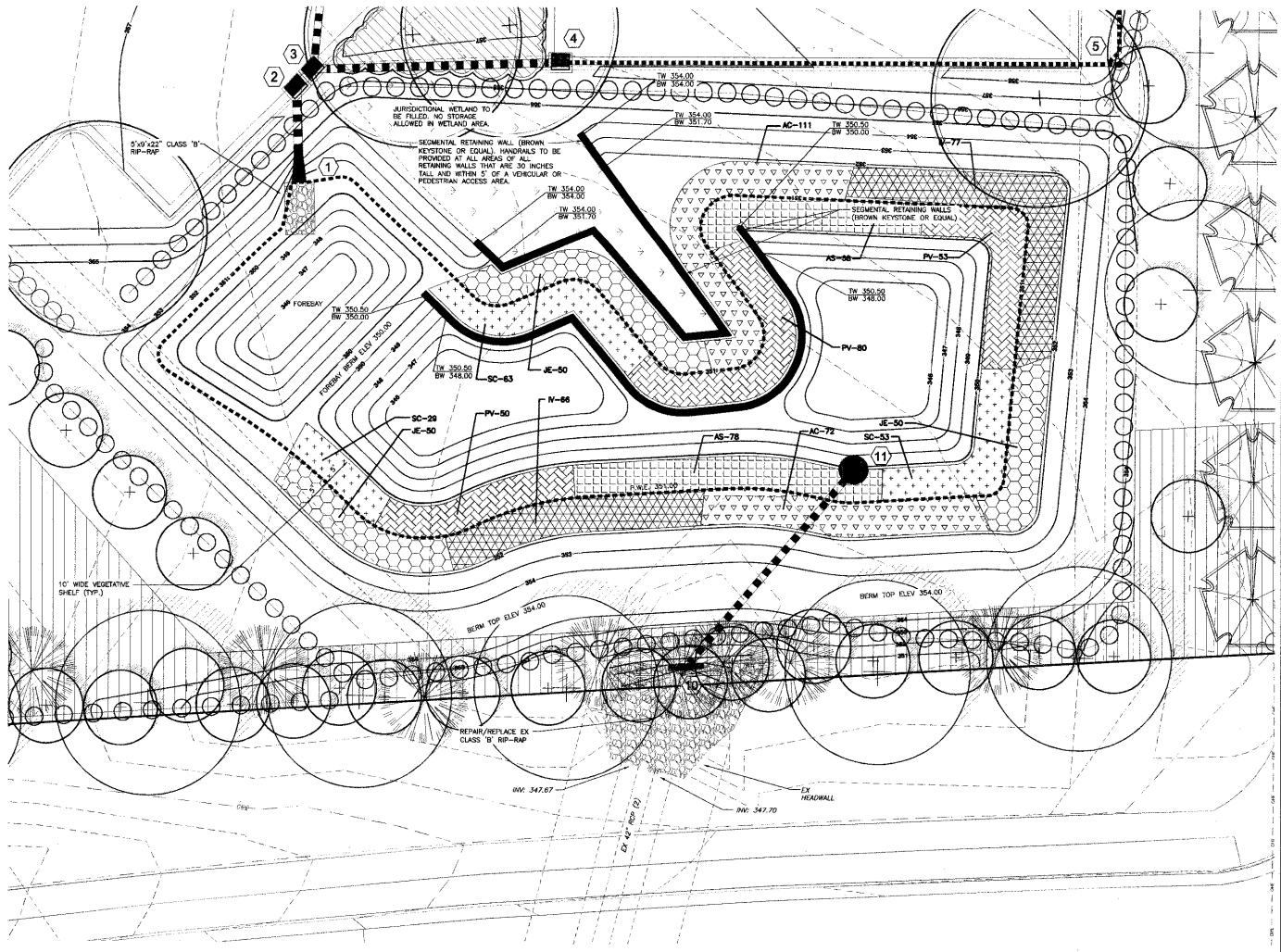
The proposed attenuation provided by the wetpond provides enough stormwater attenuation so that the Q1 post-developed discharge does not exceed the pre-developed discharge, and the Q2, Q5 and Q10 post-developed discharge does not exceed the R-40 zoning discharge.

**WET DETENTION BASIN CONSTRUCTION SEQUENCE**

- UNDER NO CIRCUMSTANCES SHALL THE WET DETENTION BASIN BE FINALIZED AND PLANTED PRIOR TO COMPLETION OF CONSTRUCTION AND STABILIZATION OF ALL AREAS WHICH DRAIN TO IT.
- IF WET DETENTION BASIN IS TO BE USED AS A SEDIMENT BASIN DURING CONSTRUCTION, ROUGH GRAD PER PLANS, FILL PLACEMENT AND OUTLET STRUCTURE CONSTRUCTION SHALL BE IN COMPLIANCE WITH DETAILS AND WET DETENTION BASIN CONSTRUCTION NOTES HEREON. IF THE WET DETENTION BASIN HAS BEEN PREVIOUSLY ROUGH GRADED AND/OR USED AS A SEDIMENT BASIN, REMOVE AND DEPOSIT DEBRIS DEPOSITS WITHIN THE BASIN AREA.
- ROUGH GRADE WET DETENTION BASIN AS NECESSARY AFTER SEDIMENT REMOVAL AND TO FINALIZE BASIN GRADES. ALL FILL PLACEMENT SHALL BE IN COMPLIANCE WITH THE SPECIFICATION IN THE CONSTRUCTION NOTES ON THIS SHEET.
- AFTER ROUGH GRADING WET DETENTION BASIN, BEGIN FINE GRADING TO CONSTRUCT FOREBAY BERM AND MAIN CHANNEL. GRADING TOLERANCE FOR THE WET DETENTION BASIN SHALL BE +/- 0.20 FEET FROM GRADDES SHOWN ON THIS PLAN.
- IN CONJUNCTION WITH GRADING AND FILL PLACEMENT, CONSTRUCT OUTLET STRUCTURES TO BRING IT INTO COMPLIANCE WITH THESE PLANS. IF OUTLET STRUCTURES WERE CONSTRUCTED WITH ROUGH GRADING WHEN USING THE WET DETENTION BASIN AS SEDIMENT BASIN, SKIP TO NEXT STEP.
- WHEN FINE GRADING AND OUTLET STRUCTURE IS COMPLETE, CALL SURVEYOR AND ENGINEER FOR AS-BUILT SURVEY AND EVALUATION.
- IF SURVEYOR AND ENGINEER DETERMINE THAT GRADING IS NOT IN COMPLIANCE WITH THESE DRAWINGS, MAKE CORRECTIONS AS REQUIRED BY THE ENGINEER AND REPEAT PREVIOUS STEP. OTHERWISE PROCEED TO NEXT STEP.
- UPON NOTIFICATION FROM THE ENGINEER THAT THE CONSTRUCTED WET DETENTION BASIN IS IN COMPLIANCE WITH THESE DRAWINGS, PROVIDE LANDSCAPING IN COMPLIANCE WITH THE PLAN SHOWN ON THIS SHEET AND ANY ADDITIONAL SPECIFICATIONS FROM THE OWNER. IF TIMING IS SUCH THAT PLANTINGS WOULD OCCUR IN SUMMER MONTHS, COORDINATE WITH THE ENGINEER, OWNER, AND THE LOCAL MUNICIPALITY ABOUT DELAYING PLANTINGS UNTIL FALL OR EARLY WINTER FOR MAXIMUM SURVIVABILITY OF PLANTINGS.
- SEED ALL DISTURBED AREAS PER THE SEEDING SCHEDULE SHOWN IN THESE PLANS.
- CALL TOWN OF CARY STORMWATER INSPECTOR FOR APPROVAL OF STABILIZATION.
- CONTRACTOR SHALL WATER NEW PLANT MATERIAL PLANTED IN THE CONSTRUCTED WET DETENTION BASIN DAILY UNTIL COMPLETION OF OTHER SITE RELATED CONSTRUCTION. AFTER THE FULL SCOPE OF THE CONTRACTOR'S WORK IS COMPLETED, IT SHALL BE THE OWNER'S RESPONSIBILITY TO WATER PLANTS DAILY UNTIL PLANTS HAVE BECOME WELL ESTABLISHED AND WATERING IS NO LONGER NECESSARY.

**WET DETENTION BASIN CONSTRUCTION NOTES**

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH TOWN OF CARY AND THE STATE OF NORTH CAROLINA STANDARDS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL WARRANT ALL PLANTED MATERIALS FOR A PERIOD OF 2 YEARS FROM DATE OF INSTALLATION. AT THE END OF THE FIRST YEAR AND AT THE END OF THE SECOND YEAR, THE CONTRACTOR SHALL REPLACE ALL PLANTS WHICH DO NOT SURVIVE. ANY HEALTHY PLANTS DAMAGED DURING PLANT REPLACEMENT SHALL ALSO BE REPLACED.
- SOIL BULK ELEVATION 351.50 SHALL BE TESTED BY THE USDA AGRICULTURAL EXTENSION OFFICE FOR pH WHICH MUST FALL BETWEEN 5.5 AND 7.0. TESTS SHALL ALSO BE PERFORMED FOR NUTRIENTS SUCH AS NITROGEN, PHOSPHORUS, AND POTASSIUM, AND FOR MINERALS SUCH AS CHLORIDE, IRON AND LIME. AMENDMENTS TO SOIL RECOMMENDED BY USDA SHALL BE INCORPORATED INTO SOIL TO PROMOTE VIGOROUS VEGETATION AND PLANT GROWTH. RECORDS OF TESTS AND AMENDMENTS PROVIDED BY CONTRACTOR SHALL BE PROVIDED TO THE ENGINEER.
- LANDSCAPING PLANTINGS SHOWN HEREON SHALL BE INSTALLED DURING FALL SEASON OR EARLY WINTER IF POSSIBLE FOR MAXIMUM PLANT SURVIVABILITY.
- THE CONTRACTOR OR OWNER SHALL EMPLOY A GEOTECHNICAL ENGINEER TO TEST ALL EMBANKMENTS AND FILL PLACEMENT FOR PROPER COMPACTION. PROPER COMPACTION SHALL BE PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS ON THESE PLANS, WHICHEVER IS MORE STRINGENT. EMBANKMENTS FOR BASINS SHALL BE PLACED IN 6 INCH LOOSE LAYERS AND SHALL BE COMPACTED TO A DENSITY OF NO LESS THAN 95% OF THE STANDARD PROCTOR MAXIMUM DENSITY AT A MOISTURE CONTENT OF +/- 0.2 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D699. THE CONTRACTOR SHALL TAKE PHOTOGRAPHS OF THE OUTLET STRUCTURE AT ALL PHASES OF INSTALLATION AND SHALL RETAIN WITH GEOTECHNICAL TESTING DATA. THE CONTRACTOR SHALL RETAIN ALL SHIPPING RECORDS AND SPECIFICATIONS FOR THE OUTLET STRUCTURE MATERIALS AND STRUCTURES. ALL OF THE ABOVE DATA MAY BE REQUIRED AS PART OF THE MUNICIPALITY AS-BUILT PROCESS AND SHALL BE MADE AVAILABLE TO THE ENGINEER UPON REQUEST. THE CONTRACTOR AND OWNER SHALL HAVE DOCUMENTATION OF THESE TESTS AVAILABLE UPON REQUEST.
- TOLERANCES FOR FINAL GRADES SHALL BE WITHIN +/- 0.20 FEET. THE TOWN OF CARY WILL REQUIRE AN AS-BUILT SURVEY OF THE CONSTRUCTED WET DETENTION BASIN THEREFORE STRICT ADHERENCE TO THE GRADING ON THIS PLAN AND THE TOLERANCES SPECIFIED HEREON SHALL BE REQUIRED PRIOR TO CERTIFICATION BY THE ENGINEER THAT THE WET DETENTION BASIN HAS BEEN BUILT IN COMPLIANCE WITH THESE DRAWINGS. UPON COMPLETION OF THE FINAL GRADING (PRIOR TO PLACEMENT OF ANY PLANT MATERIAL) THE CONTRACTOR SHALL CONTACT THE SURVEYOR TO SURVEY THE AS-BUILT CONSTRUCTED WET DETENTION BASIN. THE CONTRACTOR SHALL NOTIFY THE ENGINEER THAT THE CONSTRUCTED WET DETENTION BASIN HAS BEEN COMPLETED AND THE ENGINEER SHALL EVALUATE THE AS-BUILT SURVEY DATA FOR COMPLIANCE WITH THESE DRAWINGS. IF THE CONSTRUCTED WET DETENTION BASIN IS FOUND TO BE OUT OF COMPLIANCE WITH THESE DRAWINGS, THE CONTRACTOR SHALL REGRADE THE WET DETENTION BASIN AS NECESSARY TO BRING THE WET DETENTION BASIN INTO COMPLIANCE WITH THESE DRAWINGS. THE COST OF ANY ADDITIONAL SURVEY OR ENGINEERING EVALUATION REQUIRED RESULTING FROM INCOMPLETE OR INCORRECT GRADING OF THE CONSTRUCTED WET DETENTION BASIN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



**STORM SCHEDULE**

**10-Year Design Storm**

Riser No.	Inlet No.	Rim Up	Invert Dn	Invert Dn	Pipe Length (ft)	Pipe Dia (in)	Material	Pipe Slope (%)
RISER 11	EW 10	351.70	348.34	347.50	44	15	rcp	1.00
A1 9	Y1 8	357.33	354.33	353.82	51.00	9	rcp	1.00
Y1 8	MHUB 7	357.50	353.72	352.68	78.11	15	rcp	1.01
MHUB 7	C1 3	356.00	352.65	351.27	157.14	15	rcp	1.01
A1 6	CO 5	356.60	355.60	354.60	70.40	9	rcp	1.42
CO 5	C1 4	357.60	354.00	353.00	54.39	9	rcp	1.08
C1 4	C1 3	356.90	353.40	352.98	41.73	15	rcp	1.01
C1 3	C1 2	356.90	351.17	351.13	4.00	18	rcp	1.00
C1 2	FES 1	356.90	351.03	350.67	16.00	18	rcp	1.00

**RIP-RAP APRON SCHEDULE**

Structure	d <sub>s</sub> (ft)	Velocity (ft/s)	Length (ft)	Width (ft)	Depth (ft)	Type	d <sub>50</sub>
FES #1	1.50	5.3	9	5	22	Class 'B'	6" - 19"
EW #10	1.25	6.0	7.5	4	22	Class 'B'	6" - 19"

\*Note: Apron sizing based on NYDOT Chart

**PLANT LIST**

KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	CONTAINER	SPACING	NOTE
AC	183	ACORUS CALAMUS	SWEET FLAG	4" POT	24" O.C.	FULL BUSHY CONTAINER
AS	146	ALUMINA SUBCORDULUM	WATER PLANTAIN	4" POT	24" O.C.	FULL BUSHY CONTAINER
IV	143	IRIS VIRGINICA	BLUE FLAG IRIS	4" POT	24" O.C.	FULL BUSHY CONTAINER
JE	174	JUNCUS EFFUSUS	SOFTSTEMMED RUSH	4" POT	24" O.C.	FULL BUSHY CONTAINER
PV	181	PETALOPORA VIRGINICA	ARROYO ARUM	4" POT	24" O.C.	FULL BUSHY CONTAINER
SC	144	SAURURUS CERVAIS	LEOPARD TAIL	4" POT	24" O.C.	FULL BUSHY CONTAINER

09-MU-001/09-SP-041  
APPROVED  
TOWN OF CARY

Approved by: [Signature] Date: 11/10/2009  
Planning: [Signature] Date: 11/10/2009  
Engineering: [Signature] Date: 11/10/2009



SCALE IN FEET  
0 5 10 20 30 40

**BASS NIXON & KENNEDY, INC.**  
CONSULTING ENGINEERS  
1810 CHARLETTOWN ROAD, SUITE 200, RALEIGH, NC 27607  
3319 HERITAGE TRADE DRIVE, SUITE 201, WAKE FOREST, NC 27887  
P: (919) 851-9899 F: (919) 851-9898  
FAX: (919) 851-9898  
CERTIFICATION NUMBERS: NC-01100, NC-01100, NC-01100

**CAROLINA LEGACY**  
125/151 QUARRYSTONE CIRCLE  
TOWN OF CARY, WAKE COUNTY, NORTH CAROLINA

**WET DETENTION BASIN ENLARGED PLAN AND DETAILS**

DATE: 08-13-2009  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]

NO. 1  
DATE: 11/10/09  
DESCRIPTION: PER T.O.C. COMMENTS  
NO. 2  
DATE: 11/10/09  
DESCRIPTION: PER T.O.C. COMMENTS  
NO. 3  
DATE: 11/10/09  
DESCRIPTION: PER T.O.C. COMMENTS

REVISIONS

CHEK PR.D.H.

SCALE: 1" = 10'

09-MU-001/09-SP-041

SHEET C3.2 OF 14

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION