

**STORM DRAINAGE CHART**

FROM	TO	TYPE/NO	GRATE TYPE	DA (IN)	LENGTH (FT)	SLOPE (%)	Q10 (CFS)	UPSTREAM INVERT	DRAINAGE INVERT
CB14	CB12	CB 14/473.87	F	15	45	0.87	4.6	458.90	458.50
CB13	CB12	CB 13/473.82	G	15	33	0.91	5.7	458.90	458.50
CB12	CB11	CB 12/473.58	E	15	27	2.95	10.7	468.40	457.50
CB11	FES10	CB 11/473.58	E	15	178	0.56	12.5	467.40	457.50
CB26	CB25	CB 26/480.15	O	15	27	0.74	1.3	475.10	474.90
CB25	CB24	CB 25/480.15	F	15	158	0.44	3.2	474.20	474.00
CB24	CB21A	CB 24/463.38	E	10	278	0.72	6.6	472.80	471.80
CB23A	CB23	CB 23A/479.39	O	15	61	0.59	2.2	474.40	474.10
CB23	CB22	CB 23/479.03	O	15	27	0.74	5.6	473.60	473.20
CB22	CB21	CB 22/479.03	O	15	31	1.81	7.3	473.20	473.00
CB21A	CB21	CB 21A/481.60	O	15	158	0.77	5.6	471.90	470.80
CB21	FES20	CB 21/479.18	O	15	250	5.16	12.8	470.40	457.50
CB31	FES30	CB 31/471.68	E	15	154	7.14	3.3	470.00	457.50
CB42	CB41	CB 42/462.83	F	15	27	0.74	3.5	463.20	463.00
CB41	FES40	CB 41/462.83	O	15	205	1.37	4.5	462.80	457.50
CB52	CB51	CB 52/442.69	F	15	27	0.74	0.9	443.20	442.50
CB51	CB 52	CB 51/442.69	F	15	171	0.53	2.6	440.30	435.40
CB 67	CB 66	CB 67/450.91	F	15	27	0.74	1.1	455.10	454.00
CB 66	CB 64	CB 66/450.91	F	15	238	2.32	3.6	454.70	439.90
CB 65	CB 64	CB 65/444.92	F	15	27	0.74	2.9	440.10	439.80
CB 64	VI 63	CB 64/444.70	O	10	31	1.29	7.5	439.00	439.20
VI 63	CB 61	VI 63/441.75	N/A	24	61	1.48	20.0	439.20	437.80
VI 62	CB 61	VI 62/444.28	O	15	42	1.87	5.8	439.10	435.40
CB 61	FES60	CB 61/444.08	O	21	39	2.82	28.0	437.00	435.50
FES61	FES60	FES 61/N/A	N/A	48	172	1.40	0.16	435.40	437.00

NOTES:  
 - ALL CONSTRUCTION IS TO BE IN ACCORDANCE WITH CURRENT TOWN OF CARY STANDARD SPECIFICATIONS AND DETAILS.  
 - RIM ELEVATION GIVEN FOR CB IS TOP OF CURB (100 STD 8.03)  
 - AND TOP OF BLOCK WEIR FOR 100 STD 8.01 YL  
 - ALL PIPE IS TYPE II RCP UNLESS NOTED OTHERWISE  
 - \* INDICATES Q25

**GRAVEL & RIP RAP FILTER BASIN DESIGN**

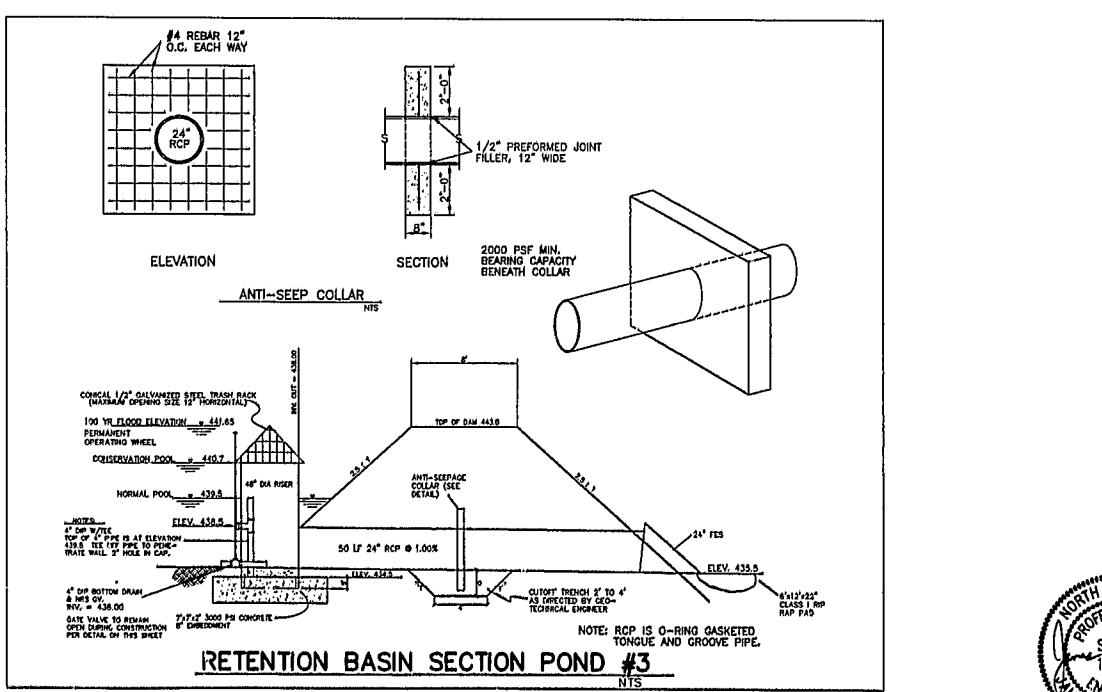
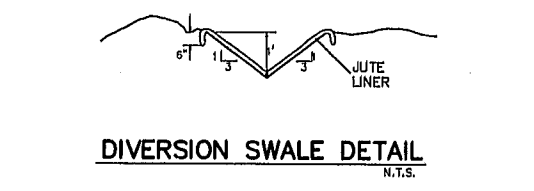
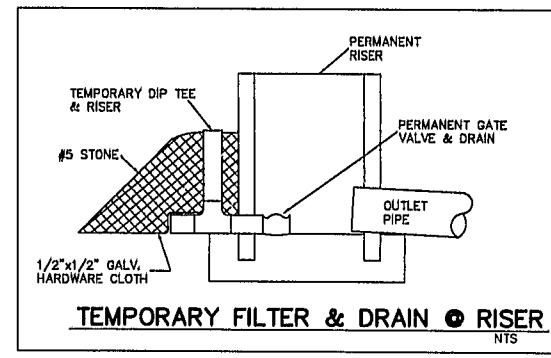
BASIN #	DENuded DRAINAGE AREA (AC)	DENuded AREA (AC)	BASIN DIMENSIONS				WEIR LENGTH (FT)	VOLUME PROVIDED (CF)	CLEANOUT FREQ (MONTHS)	VOLUME REQUIRED (CF)
			DEPTH (FT)	LENGTH (FT)	WIDTH (FT)	LENGTH (FT)				
60	0.2	2.6	4.5	17	8.5	8	506	12	432	
LOT 156	0.97	1.0	5.0	30	15.0	4	1800	12	1746	

NOTE: 1' OF FREEBOARD IS PROVIDED FOR EACH BASIN.

**VELOCITY DISSIPATOR DESIGN**

OUTLET #	PPE DIA (INCHES)	VELOCITY (FT/SEC)	LENGTH (FT)	OUTLET WIDTH (FEET)	DISBURSEMENT WIDTH (FEET)	RIP RAP THICKNESS (INCHES)	RIP RAP CLASS
10	15	18.0	7.5	4	7	22	B
20	15	13.4	7.5	4	7	22	B
30	15	10.8	7.5	4	7	22	B
40	18	7.3	9	4.5	8	22	B
60	48	14.0	40	4	BANK-BANK	27	E

ALL DISSIPATORS SHALL HAVE FABRIC UNDERLINERS.



- NOTES**
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH TOWN OF CARY STANDARD SPECIFICATIONS AND DETAILS REVISED JULY 22, 1993.
  - THE CONTRACTOR SHALL USE EXTREME CARE TO AVOID DISTURBING EXISTING STREAM CHANNEL DURING SEWER LINE CONSTRUCTION. ALL SANITARY SEWER PIPE STREAM CROSSINGS AND DISTURBANCES SHALL BE PROTECTED WITH 22" CLASS 1 RIP-RAP WITH FABRIC UNDERLINER.
  - ALL MANHOLES LOCATED OUTSIDE OF STREET RIGHT-OF-WAY SHALL HAVE A RIM ELEVATION ONE FOOT ABOVE FINISHED GRADE.
  - WATER LINE SHALL BE 2" MINIMUM OFF EDGE OF CURB UNLESS SHOWN OTHERWISE.
  - WATER MAINS SHALL BE LAID AT LEAST 10 FEET LATERALLY MEASURED EDGE TO EDGE FROM EXISTING OR PROPOSED SANITARY OR STORM SEWER UNLESS THE ELEVATIONS OF THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER WITH A HORIZONTAL SEPARATION OF AT LEAST 3 FEET.  
WHERE A WATER MAIN AND A SANITARY SEWER CROSS, AND THE VERTICAL SEPARATION IS LESS THAN 18 INCHES OR THE WATER LINE PASSES UNDER THE SANITARY SEWER, THE SEWER MAIN SHALL BE DUCTILE IRON PIPE.  
ALL WATER LINES SHALL BE DUCTILE IRON PIPE.
  - ALL WATER SERVICES SHALL BE 3/4" TYPE K COPPER AND ALL SEWER SERVICES SHALL BE 4" SCHEDULE 40 PVO.
  - CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL STRUCTURES DURING THE LIFE OF THE PROJECT.
  - CONTRACTOR SHALL CONSTRUCT DIVERSION DITCHES AS NECESSARY TO ENSURE ALL SEDIMENT IS DIRECTED INTO EROSION CONTROL MEASURES.
  - ALL CATCH BASINS SHALL BE PROTECTED WITH SILT FENCE UNLESS NOTED OTHERWISE.
  - CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHOWN ON PLANS IS ONLY AS BEST AVAILABLE INFORMATION BUT CAN BE CONSIDERED ONLY AS APPROXIMATE.
  - BENCHMARK IS RIM OF EXISTING MANHOLE AT LOT 54 IN OGBURN PHASE II, ELEV. IS 463.13
  - DENuded AREA = 7.6 ACRES
  - TOPOGRAPHIC INFORMATION FROM SURVEY BY WITHERS & RAVENEL, INC.
  - WHERE THE STATIC WATER PRESSURE IS IN EXCESS OF 80 PSI, A PRESSURE REDUCING VALVE SHALL BE PROVIDED INSIDE THE BUILDING IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLUMBING CODE.
  - CONTRACTOR SHALL CLEAR FOR PIPE AND CONSTRUCT PIPE. CONTRACTOR SHALL INSTALL SILT FENCE AND SEDIMENT BASINS AT PIPE ENDS AND DIVERSION DITCHES AND THEN BEGIN GRADING ROADWAYS.
  - IF STORM CROSS DRAINAGE CAN NOT BE INSTALLED PRIOR TO GRADING, TOC STD. 4.11 SHALL BE USED TO CROSS WET WEATHER CHANNELS.
  - CONTRACTOR SHALL ENSURE GRADING OPERATION IS CONDUCTED IN A MANNER THAT DOES NOT ALLOW ANY STORM WATER TO POND.
  - STORM WATER DISCHARGES INTO SWIFT CREEK TRIBUTARY.
  - ALL CATCH BASINS AND YARD INLETS THAT EMPTY INTO CROSS DRAINAGE STRUCTURES OR HEADWALLS SHALL BE PROTECTED WITH BLOCK AND GRAVEL FILTERS. (TOC STD. DETAIL 4.13)
  - ALL STORM DRAINAGE PIPE SHALL BE PROTECTED DURING CONSTRUCTION IN ACCORDANCE WITH TOC STD. DETAIL 4.12.
  - THERE IS NOT ANY FEMA FLOODPLAIN LOCATED ON THIS PROPERTY PER FIRM MAPS 3718300492E & 371830051E BOTH DATED MARCH 3, 1993.
  - CONTRACTOR SHALL PROVIDE RIP RAP LINED TAIL DITCHES AT THE STORM DRAINAGE PIPE DISCHARGE POINTS AS REQUIRED TO ENSURE POSITIVE DRAINAGE.
  - SANITARY SEWER MAINS INSTALLED WITH A DEPTH OF COVER OF 14 FEET TO 20 FEET SHALL REQUIRE SPECIAL BEDDING IN ACCORDANCE WITH CARY STANDARD 7.16. SEWER SERVICES INSTALLED WITH A DEPTH OF COVER OF 14 FEET TO 20 FEET SHALL REQUIRE CLASS 1 BEDDING FROM 4" BELOW THE SERVICE TO 4" INCHES OVER THE SERVICE LINE. SEWER MAINS AND SERVICES INSTALLED WITH A DEPTH OF COVER OVER 20 FEET SHALL REQUIRE DUCTILE IRON PIPE FOR THE ENTIRE RUN BETWEEN MANHOLES OR CLEANOUTS.
  - MINIMUM SLOPE SHALL BE 1.0% FOR 6" AND 4" SANITARY SEWER SERVICES. CLEANOUTS SHALL BE PROVIDED AS SHOWN ON THE PLANS BUT SHALL BE SPACED AT NO GREATER THAN 75 LF FOR 4" SERVICES AND 100 LF FOR 6" INCH SERVICES. ALL CLEANOUTS SHALL EXTEND A MINIMUM OF 6" INCHES ABOVE FINISH GRADE OR MEET THE OPTIONAL CLEANOUT REQUIREMENT METHODS AS SPECIFIED IN CARY STANDARD 7.01. CLEANOUTS LOCATED IN PAVED AREAS MUST HAVE CAST IRON RISERS, FITTINGS AND BRASS CAP.
  - WETLAND AREAS SHALL NOT BE CLEARED, DRAINED OR OTHERWISE IMPACTED EXCEPT AS PERMITTED BY NCEHNR & THE U.S. ARMY CORPS OF ENGINEERS.
  - WETLANDS AREAS SHALL BE CONSIDERED DRAINAGE EASEMENTS UNLESS PERMITTED FOR IMPACTS.
  - EXISTING POND SHALL BE IMPROVED TO FUNCTION AS A STORMWATER RETENTION POND IN ACCORDANCE WITH TOWN STANDARDS. REFER TO SEPARATE PLANS BY WITHERS & RAVENEL ENTITLED "DANBURY DAM #2" FOR ADDITIONAL INFORMATION. THIS RETENTION POND SHALL BE USED TO MEET THE RESERVOIR WATERSHED PROTECTION ORDINANCE FOR THIS PROJECT.

**APPROVED**  
 TEP 5/31/98  
 TM 6-1-98

**GRAPHIC SCALE**  
 ( IN FEET )  
 1 Inch = 60 ft.

**WITHERS & RAVENEL Engineering & Surveying, Inc.**  
 111 MacKenan Drive • Cary, N.C. 27511  
 919-469-3340 FAX 919-467-8008

**Revisions**

No.	Description	Date	By
A	100% FINAL REVIEW COMMENTS	4/27/98	GAS
B	100% FINAL REVIEW COMMENTS	1/29/98	GAS
C	100% FINAL REVIEW COMMENTS	3/13/98	GAS
D	100% FINAL REVIEW COMMENTS	5/13/98	GAS

**DANBURY SUBDIVISION**  
 PHASES IX-XII

**WATER, SANITARY SEWER, STORM DRAINAGE AND EROSION CONTROL**

Designer: W&R	Scale: 1"=60'	CAD File: SH13.DWG
Drawn by: GAS	Date: 8/22/97	Sheet No.:
Checked by: JEC	Job No: 67155	<b>3</b> of .

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