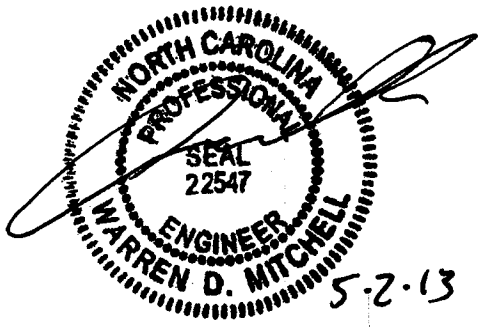
STORMWATER MANAGEMENT PLAN

FOR

Uhaul Chapel Hill

Chatham County, NC

May 2, 2013



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The design of all stormwater management facilities and practices will control and treat the runoff from the 1 year- 1 hour storm over the total drainage area for the proposed development and provide the same level of treatment for some of the existing facility that will drain to the new – proposed wet ponds. The designs and plans are sufficient to comply with applicable standards and policies found in the NCDENR Stormwater BMP Design Manual, and that the designs and plans ensure compliance with the County's Stormwater Ordinance

INTRODUCTION

This report is being prepared to satisfy the requirements of the Chatham County Stormwater Ordinance for a proposed Conditional Zoning District Regional Business. Ironclad Self Storage CUP was originally approved in 2003 and modified in 2006. In 2013, 5.0 acres were added to the project and that CUP was approved on April 16, 2012. The existing project is 10.4 acres and owned by the applicant, Uhaul (Amerco Real Estate Company).

The purpose of this application is to add a 0.64 acre lot on Vickers Road recently purchased by the applicant in December 2012. The second element of the project is to expand the impervious surface on the existing 10.4 acres using a non-contiguous 5.0 acre parcel on Charlie Perkins Road in Chatham County. The parcel is located in the same watershed as the self-storage facility. This 'sacrificial' parcel will forever be restricted from any development and zero impervious surface can be added to that parcel.

All previously approved uses from the 2012 CUP approval will remain. The boat and RV storage area previously contained pervious parking spaces (no paving, no gravel). This new proposal will add covered parking to the boat and RV spaces and the driveways inside that area will remain gravel.

SITE ANALYSIS

Two stormwater wet ponds were approved for the facility on April 16, 2012. These ponds have been constructed and are serving as sediment basins. Once the site is complete and all areas stabilized, the sediment basins will be converted over to their final size and shape as permanent wet detention basins. Pond #1 receives 4.9 acres of runoff area and Pond #2 receives 1.8 acres of runoff. The 0.64 acre Andrews Heirs parcel has always drained into Pond #1. We made the area of pond #1 slightly larger to accommodate the increased impervious area with this application. The area for Pond #2 did not increase but additional impervious area is being added to that pond. We increased the size of Pond #2 also to accommodate the additional runoff due to the additional impervious area.

PROPOSED DRAINAGE DESIGN

We are using wet detention basins to manage the stormwater. The wet detention basin will provide a minimum of 90% TSS to meet the water quality requirement and also provide the detention for the 10-year event detention requirement. Included at the back of the report is the output from the Hydraflow computer program analysis. The basins were sized to control the peak runoff from the post developed conditions for the 10-year storm event (including the 1,2, and 5 year event also). This controlled the size / surface area of the basins. Our SA/DA calculation for the basins shows that the proposed size of the basins meets the minimum surface area required to achieve 90% TSS.

Hydraflow Table of Contents

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	----	5.242	7.610	----	11.39	14.52	18.84	22.35	25.99	Existing Drainage Area 1
2	SCS Runoff	----	13.77	17.33	----	22.56	26.66	32.11	36.45	40.89	Proposed Drainage Area 1
3	Reservoir	2	0.139	0.170	----	1.195	4.901	16.65	18.11	19.02	Route through Pond #1
5	SCS Runoff	----	1.523	2.248	----	3.403	4.370	5.708	6.801	7.936	Existing Drainage Area 2
6	SCS Runoff	----	5.449	6.858	----	8.927	10.55	12.71	14.42	16.18	Proposed Drainage Area 2
7	Reservoir	6	0.073	0.085	----	0.413	1.486	6.494	10.46	13.61	Route through Pond 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	5.242	2	728	18,891	----	----	----	Existing Drainage Area 1
2	SCS Runoff	13.77	2	720	36,564	----	----	----	Proposed Drainage Area 1
3	Reservoir	0.139	2	1442	19,771	2	528.33	30,934	Route through Pond #1
5	SCS Runoff	1.523	2	732	6,457	----	----	----	Existing Drainage Area 2
6	SCS Runoff	5.449	2	720	14,467	----	----	----	Proposed Drainage Area 2
7	Reservoir	0.073	2	1190	9,889	6	527.07	11,527	Route through Pond 2

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1	SCS Runoff	7.610	2	728	26,844	----	----	----	Existing Drainage Area 1
2	SCS Runoff	17.33	2	720	46,559	----	----	----	Proposed Drainage Area 1
3	Reservoir	0.170	2	1442	29,537	2	529.22	39,467	Route through Pond #1
5	SCS Runoff	2.248	2	732	9,254	----	----	----	Existing Drainage Area 2
6	SCS Runoff	6.858	2	720	18,421	----	----	----	Proposed Drainage Area 2
7	Reservoir	0.085	2	1206	13,844	6	527.62	14,904	Route through Pond 2

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1	SCS Runoff	11.39	2	726	39,582	----	----	----	Existing Drainage Area 1
2	SCS Runoff	22.56	2	720	61,525	----	----	----	Proposed Drainage Area 1
3	Reservoir	1.195	2	794	44,351	2	529.56	43,098	Route through Pond #1
5	SCS Runoff	3.403	2	732	13,760	----	----	----	Existing Drainage Area 2
6	SCS Runoff	8.927	2	720	24,342	----	----	----	Proposed Drainage Area 2
7	Reservoir	0.413	2	810	19,723	6	528.02	17,420	Route through Pond 2

Hydrograph Summary Report

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Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	14.52	2	726	50,227	----	----	----	Existing Drainage Area 1
2	SCS Runoff	26.66	2	720	73,446	----	----	----	Proposed Drainage Area 1
3	Reservoir	4.901	2	736	56,271	2	529.70	44,554	Route through Pond #1
5	SCS Runoff	4.370	2	730	17,541	----	----	----	Existing Drainage Area 2
6	SCS Runoff	10.55	2	720	29,059	----	----	----	Proposed Drainage Area 2
7	Reservoir	1.486	2	740	24,440	6	528.08	17,889	Route through Pond 2

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Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	18.84	2	726	65,047	----	----	----	Existing Drainage Area 1
2	SCS Runoff	32.11	2	720	89,497	----	----	----	Proposed Drainage Area 1
3	Reservoir	16.65	2	728	72,320	2	530.00	47,645	Route through Pond #1
5	SCS Runoff	5.708	2	730	22,820	----	----	----	Existing Drainage Area 2
6	SCS Runoff	12.71	2	720	35,410	----	----	----	Proposed Drainage Area 2
7	Reservoir	6.494	2	728	30,790	6	528.25	19,055	Route through Pond 2

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1	SCS Runoff	22.35	2	726	77,254	—	—	—	Existing Drainage Area 1
2	SCS Runoff	36.45	2	720	102,393	—	—	—	Proposed Drainage Area 1
3	Reservoir	18.11	2	730	85,216	2	530.34	51,495	Route through Pond #1
5	SCS Runoff	6.801	2	730	27,179	—	—	—	Existing Drainage Area 2
6	SCS Runoff	14.42	2	720	40,512	—	—	—	Proposed Drainage Area 2
7	Reservoir	10.46	2	726	35,892	6	528.33	19,741	Route through Pond 2

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Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	25.99	2	726	90,026	----	----	----	Existing Drainage Area 1
2	SCS Runoff	40.89	2	720	115,664	----	----	----	Proposed Drainage Area 1
3	Reservoir	19.02	2	730	98,486	2	530.79	56,613	Route through Pond #1
5	SCS Runoff	7.936	2	730	31,746	----	----	----	Existing Drainage Area 2
6	SCS Runoff	16.18	2	720	45,763	----	----	----	Proposed Drainage Area 2
7	Reservoir	13.61	2	724	41,143	6	528.41	20,246	Route through Pond 2