

THE PRESERVE AT SOMERS SUBDIVISION
 REVIEW OF STORMWATER MANAGEMENT SYSTEM
 PREPARED BY AKRF ENGINEERING, P.C.
 25-Jun-06

TABLE 1 - SUMMARY OF FINDINGS

Biofilter Basin/ Structure #	Location	Construction Phase (2)	As-built Date	Original Design (per construction drawings)			As-built/Observed			Difference in Volume (cf)	Permanent Pool Depth (ft) (1)	Outfall/ inlet pipe connections			Site Investigation Observations (4/27/06 and 5/9/06)	Noted problems/concerns or revisions to original design
				1st Basin volume (cf)	2nd Basin volume (cf)	Total Basin Volume (cf)	1st Basin volume (cf)	2nd Basin volume (cf)	Total Basin Volume (cf)			into basin	between basins	out of basin		
Basin #1	south of Travis at entrance drive	1	11/21/2005 (FINAL)	17,798	9,323	27,121	15,670	13,486	29,156	2,035	3.7	15" from Travis Road connects via headwall	gravel/rock spillway btwn all, low flow drain pipe btwn forebay and first basin, 2 low flow drain pipes btwn 1st and 2nd basin	underdrain from 2nd basin to south wetland and gravel/rock spillway to west wetland	Clear leaf/debris buildup at inlet from roadway, but headwall structure is ok. Forebay has shallow standing water. PVC pipe under rip rap between forebay and basin. Basin has standing water with overgrown vegetation.	Second basin relocated in 11/17/05. Additional spot elevations shown on plan on 11/29/05. Complaint on 5/3/06 from homeowner in Lot 123 that forebay and 1st basin are always full of water and never drain.
Basin #2	south of Travis Road (Lot 120-121)	1	11/21/2005 (FINAL)	NA	NA	17,296	NA	NA	18,425	1,129	4.4	15" from Travis Road connects via headwall	no pipe connections, only gravel/rock spillway	underdrain from basin to south wetland and gravel/rock spillway to east	Inlet pipe in from roadway - clear leaf/debris buildup at inlet rip-rap but structure is ok. Small pond of standing water	
Basin #3	north of Travis Road (Lots 126-127)	1	11/21/2005 (FINAL)	NA	NA	55,740	NA	NA	56,813	1,073	2.8	15" from Travis Road and 15" from Chambers via headwall, 8" PVC house drain from Lot 126	underdrain connection between basin at narrow bend	only overflow into small wetland area btwn pond	Inlet to pond from street needs to be cleaned - debris and growth in forebay. Side inlet (outfall from Chambers Drive) is ok - debris to be cleaned. Footing drains/house drain connection to pond at high elev on berm with PVC pipe outlet.	Spring 2005 report of flooding but none since then. Flooding issues alleviated by regrading to create more volume in pond. As-built note: updated Bio-basin 3 on 5/18/05
Basin #4	north of Travis Road, southeast of Chambers Drive (Lot 138)	1	11/21/2005 (FINAL)	NA	NA	33,005	NA	NA	37,628	4,623	3.1	18" from Travis to 2nd basin, 18" from Chambers to 1st basin via headwall	no visible pipe connection, only gravel/rock spillway	no overflow, only underdrain from 2nd basin to east wetland near Travis Road bridge	The back forebay has small standing pond with wetland vegetation. Back headwall structure ok. First pond near Travis is long and near outfall acts as a forebay. Outfall area wet with wetland vegetations. Good perimeter plantings and plantings within and around pond look mature.	Correspondence on 2/13/06 from Wetland Mitigation, Inc. stated Basin 4 redone on April 14&15 3005 and regarded on 11/28/05
Basin #5	south of Travis Road, west of Harris Court, (Lots 109, 110, 111)	2	5/23/2005	NA	NA	41,534	NA	NA	41,650	116	5.6	15" from Travis to north forebay and 15" from Harris Ct. cul-de-sac to south forebay via headwall	2 low flow pipes connect north forebay to basin(not shown on plans), gravel/rock spillway btwn basins	underdrain and gravel/rock spillway to west wetland	Front forebay was wet with wetland vegetation growth. headwall area needs cleaning and excessive growth could block flow. Underdrain pipe connects forbay to pond (not shown on design plans)	
Basin #6	north of Travis Road, west of Tanahill Court (Lot 88)	2	5/24/2005	NA	NA	27,140	NA	NA	27,924	784	6.3	12" from Tanahill Court cul-de-sac via headwall	only gravel/rock spillway	underdrain and gravel/rock spillway to west wetland	Forebay to cleaned of debris and overgrown vegetation to flow restriction. Basin has lots of standing water and all wetland vegetations are not in good shape or dead.	Owner near basin stated water level is at highest it has ever been in a while during site visit.
Basin #7	south of Loomis Drive, west of Lots 77, 78, 88	2	5/25/2005	NA	NA	49,328	NA	NA	49,639	311	4	15" from Weeks Court and 18" from Loomis Drive via headwall	only gravel/rock spillway	underdrain and gravel/rock spillway to west wetland	Forebay near Loomis is full of water (approx. 1.5-3 ft). Planting within riprap overflow to basin is overgrown. Basin is also full of water. Underdrain should be checked. Low berm and water level in basin at top of berm along northeadwallest corner middle basin	Berm checked per town comments on 9/16/04 where berm elevations along west edge of middle basin are 564.1 & 564. As-built also notes water level of basins. North forebay@ 563.8; Middle basin@ 564.5; South basin@ 563.4 (approximately 4 ft depth from bottom of basin). Per email from Guy Gagne @ Town of Somers on 7/6/06, found a blockage in the release pipe for the basin at the rear lot 77 on Weeks court and the water level will be dropping.
Basin #8	north of Travis Road, west of Chambers Drive	1	11/21/2005 (FINAL)	21,596	12,711	34,307	21,041	13,759	34,800	493	2.5	15" from Chambers Drive, 12" overflow from Loomis Drive via headwall	1 underdrain connection, another underdrain connection from 1st basin with pipe overflow at higher elevation to 2nd basin	2nd basin underdrain to southwalled wetland	Inlet from Chambers to be cleaned - headwall structure ok. Rear forebay inlet (outfall from Loomis) headwall structure grout has cracks. Back forebay seems backed up with standing water. No water flowing over riprap.	
Basin #8A	north of Loomis Drive near site entrance	3	8/12/2005	7,401	21,596	28,997	9,175	21,310	30,485	1,488	3.8	surface water overflow from eastern back of lots	underdrain connection from 1st basin (close to Loomis Drive) to headwall overflow in 2nd basin further north	underdrain and gravel/rock spillway from north basin to west wetland	Front pond near Loomis is wet but in good condition. Back pond has more growth and has underdrain connection to adjacent wetlands.	

(1) Permanent pool elevations not shown are pending receipt of missing tables from final approved SWPPP.

(2) See Figure 1 - Construction Phasing

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Biofilter Basin/ Structure #	Location	Construction Phase ⁽²⁾	As-built Date	Original Design (per construction drawings)			As-built/Observed			Difference in Volume (cf)	Permanent Pool Depth (ft) ⁽¹⁾	Outfall/ inlet pipe connections			Site Investigation Observations (4/27/06 and 5/9/06)	Noted problems/concerns or revisions to original design
				1st Basin volume (cf)	2nd Basin volume (cf)	Total Basin Volume (cf)	1st Basin volume (cf)	2nd Basin volume (cf)	Total Basin Volume (cf)			into basin	between basins	out of basin		
Basin #9	north of Loomis Drive and Basin 8A, west of Hynard Place	3	8/12/2005	NA	NA	31,607	NA	NA	26,037	-5,570	3.2	8" from from Hynard Place via headwall	gravel/rock spillway	underdrain and gravel/rock spillway to west wetland	Overgrown and standing water within forebay. Lot of growth within rip rap overflow into basin that could be restricting flow. Riprap elevation seems high.	Design plan calls for 9" pipe overflow connection into basin and as-built shows 8" pipe. Letter from Town to R. York on 7/7/04, regarding headwall construction to be completed and that house footing drains to be adjusted and basin bottom to be checked for clogging. Email from Roger Gills to HOA on 3/14/06, stating that builder has not addressed comment 2004 comments.
Basin #10A	north of Loomis Drive, east of Lot 159	3	8/12/2005	NA	NA	21,631	NA	NA	32,132	10,501	4.8	surface channel overflow from north wetlands	gravel/rock spillway	underdrain to east wetland and overflow to south wetland	No incoming pipes outfall to ponds. Only upland overflow withing wetlands north of pond via natural swale.	Adjacent homeowner complained of pond being filled with water for over 6 months. Per email from Nick Ward-Willis on 7/12/06, the northern most basin of the 2 basin areas was always dry until Fall, 2005 and it is now filled to the rock overflow and has not drained.
Basin #10B	south of Loomis Drive, east of Lot 158	3	8/12/2005	NA	NA	36,455	NA	NA	46,721	10,266		18" from Loomis Drive and 15" from Loomis via headwall	gravel/rock spillway	8" underdrain to east wetland and gravel emergency spillway	Headwall with outfall from Loomis needs cleaning of leaves and debris buildup, headwall structure ok. Another headwall outfall observed that spills into forebay, also needs cleaning (not shown on design plans located 20 feet east of headwall S-1). Plenty of growth but fairly dry.	Second connection via headwall from Loomis constructed not shown on design plans.
Basin #11	far east of Hynard Place and Lot 183	3	8/12/2005	26,873	33,771	60,644	32,634	35,203	67,837	7,193	3.5	9" pipe from Hynard Place via headwall	gravel/rock spillway btwn forebay and 1st basin; emergency spillway and underdrain btwn 1st and 2nd basins.	gravel/rock emergency spillway to east and west wetland; underdrain to south wetland	2 outfalls near forebays; flow coming from Hynard. One outfall with lower invert elevation leads into wetlands area with overland flow. Second headwall outfalls into forebay at about 2' higher elevation. First pond has wet linear channel of water with plenty of growth. Second pond has growth near pond connection outfall and has about 6"-1' of standing water. Second pond does have underdrain connection to wetlands.	
Basin #12A	north of Loomis Drive, east of Putney Road, north of Basin 12B (back of Lots 59 - 61)	5	10/12/2005	NA	NA	18,834	NA	NA	35,784	16,950	3.6	15" from Putney Road cul-de-sac via headwall	no interconnection, small berm	underdrain connecting to Basin 12B	Standpipe left in the middle of forebay, headwall structure ok, but slight debris to be cleaned. Standing pool in forebay and basin. Silt fence around basin has not been removed.	
Basin #12B	north of Loomis Drive, east of Putney Road, Lot 58	5	10/12/2005	NA	NA	23,238	NA	NA	39,480	16,242		underdrain connection and overflow from spillway connecting from Basin 12A	no interconnection, small berm	underdrain and emergency spillway to east wetland	Corrugated standpipe located over gravel at proposed underdrain location and connection to wetlands with underpipe. 2nd basin that connects to Basin 12A via riprap overflow is a small standing pool. Bottom of basin elevation close to wetland elevation and may develop high ground water.	
Basin #13	south of Travis Road (west of emergency access and Lot 44)	2	5/23/2005	NA	NA	39,059	NA	NA	39,106	47	7.1	12" from Travis via headwall	only gravel/rock spillway	underdrain to east wetland and overflow to south wetland	headwall structure ok, but slight debris to be cleaned. Predominately dry - but basin has lots of wetland vegetations.	
Basin #14	south of Loomis Drive, west of Lots 23, 24	4	10/12/2005	NA	NA	38,538	NA	NA	30,465	-8,073	5.9	15" from Loomis Drive via headwall	low flow pipe between forebay and 1st small basin and gravel/rock spillway between all	underdrain to south/wetland wetland and gravel/rock spillway to west from 2nd larger basin	Forebay has outfall structure from Loomis - headwall structure ok - damp but no standing water. Underdrain pipe connects forbay to middle small pond (not shown on design plans). No headwall connection to large basin (as shown on design plan). Small pit full of water near front of basin. Basin is completely dry but moist crack ground.	No overflow pipe connection provided with headwall outfall between 2nd and 3rd basin as shown on design plans. Low flow pipe between forebay and 1st basin provided not shown on design or as-built plan. Letter from Town to R. York on 4/7/06, stating that easterly berm extends into property of Lot 23 and to relocate berm as per design plan and maintain required volume.

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Basin #15A	east of Travis , southeast of Stephens Ct. (south of Lot 15)	4	10/12/2005	NA	NA	34,637	NA	NA	34,800	163	4.2	18" to southheadwallest forebay, 15" to west middle spillway and 15" to northheadwallest forebay. All connections from Travis via headwall.	gravel/rock spillway from forebay to basins. Both basins are interconnected by narrow channel.	south basin has underdrain that connects to basin 15B	Two ponds interconnected. Each with own forebay with outfalls from Travis Road. An underground 24" storm pipe bisects ponds which connects wetland from across Travis and outfalls to open area with headwall east of the basin (close to nothwest side of 15B). Small forebay visible inbetween ponds near Travis with headwall outfall not shown on design plans. Inlets at north forebay to be cleaned but headwall structure ok. South forebay ok. The south basin has underdrain for drainage relief to basin 15B.	Revision from design plan was an additional outfall connection added during construction at southheadwallest corner of 2nd pond. Note on as-built: Biofilter basin filled with water as of December 2002.
Basin #15B	east of Travis, southeast of Stephens Ct, east of Basin 15A	4	10/12/2005	NA	NA	21,252	NA	NA	26,833	5,581		underdrain connection from basin 15A via pipe overflow (no headwall)	n/a	underdrain and rip rap overl flow to north wetland	Inlet from Basin 15A is only a pipe outfall to forebay without a headwall structure. Water flow visible over rip rap. Basin has standing water.	Design plan calls for headwall for underdrain connection from Basin 15A, but not shown on as-builts and not visible in field. Note on as-built: Biofilter basin filled with water as of December 2002.
Basin #16	east of Travis Rd. north of sanitary pump station (between Lots 8 & 9)	5	10/12/2005	23,849	24,846	48,695	NA	NA	16,270	-32,425	4.2	18" from Travis Road via headwall	gravel/rock spillway	emergency spillway to wetland and Basin 22	Full standing water in basin. Side berm not high enough since top of water elevation about 6-8" below top of berm. Overflow from 1st basin is riprap that needs cleaning to allow more flow. Check water elev of pond vs. riprap elevation.	Design plans show one forebay and two basins but as-builts show one basin with less total volume than design and interconnection to Basin 22. In field similar layout as shown on design plans.
Basin #17	East of Travis Road cul-de-sac and Mahopac Easment (back of Lot 1)	5	10/12/2005	NA	NA	13,327	NA	NA	13,440	113	4.2	15" from Travis Road cul-de-sac via headwall	gravel/rock spillway only	underdrain from north basin to northeast wetland area	First pond is full with standing water at least 2-3 feet deep and about 1 foot below the rip-rap overflow and the headwall pipe elevation. 2nd pond (north of 1st pond) is mostly dry but seems to have been built deeper than first pond which is not what is shown on design plans.	
Basin #18	South of Travis Road and West of Bassett Place (Lots 117, 118, 119)	1	11/21/2005 (FINAL)	NA	NA	22,480	NA	NA	22,674	194	3.4	15" from Bassett Place via headwall	n/a	underdrain to southheadwallest wetland and gravel/rock spillway	headwall structure ok and free flow out. Forebay is wet but no real standing water and lots of wetland vegetations. Fence around the forebay near the homes. Lot of wetland vegetations and growth within basin with small standing pond.	Homeowner concern of basin holding water in one area of basin for majority of time. Concern addressed with letter by Guy Gagne on 2/8/05, stating that the basin is not designed to be a dry basin and likely to be full of standing water from October-April and June-September. He mentioned that basin was inspected and meets design.
Basin #19	end of Vista Drive cul-de-sac (Lots 37, 38)	4	10/12/2005	NA	NA	32,715	NA	NA	30,405	-2,310	4.3	15" from Vista Drive cul-de-sac via headwall, surface overflow from southheadwallest swale along landscape easement	only gravel/rock spillway	underdrain to southeast and gravel/rock spillway to east wetland	headwall to forebay structure ok - clear debris - small puddle of water w/ decent living growth. Basin is generally dry. Owner say basin always dry and drains quickly after storm. Not many plantings around basin and many are dead. Owner would like to see more plantings around perimeter berm as protection or buffer.	Owner of Lot 38 stated that basin is general dry and drains quickly after storms but would like to see more perimeter plantings for protection or buffer
Basin #20	east of Travis Road and north of Vista Drive (adjacent to Lots 31, 32)	4	10/12/2005	NA	NA	12,040	NA	NA	11,260	-780		no incoming pipe connections from streets, only back of lots surface overflow		underdrain to east and gravel/rock spillway to northeast wetland	No incoming outfall from street. Basin designed to handle wetland upland overflow. Generally dry basin.	
Basin # 21A	east of Travis Rd & Stephens Ct, north of Basin 15B	4	10/12/2005	NA	NA	26,098	NA	NA	29,354	3,256		surface channeled overflow from upstream back of lots along patheadwallay	gravel/rock spillway only	underdrain connecting to Basin 21B	Need to clear growth on riprap that connects two basins to allow flow from headwall M-1 by Basin 15A to flow down path into basin. Flow from upstream headwall M-1 overflow onto rock channel adjancet to Basin 15B. The overflow doesn't follow direct path and splits creating eroded channel. Need to redirect flow or provide erosion control w/ rock.	Biofilter basin filled with water as of December 2002.

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Basin # 21B	east of Travis Rd & Stephens Ct, north of Basin 15B	4	10/12/2005	NA	NA	15,725	NA	NA	15,700	-25		surface channeled overflow from 24" pipe via headwall that connects upstream wetland west of Travis, overflow from Basin 15B and underdrain connection via headwall from Basin 21A	N/A	underdrain to southeast Mahopac Patheadwallay Easement	Pipe connection at trail adjacent to pond is not shown on design or as-built plans, but seems like overflow from pond or upstream. Not clear of connection.	Biofilter basin filled with water as of December 2002.
Basin #22	east of Travis Rd. north of sanitary pump station (back of Lots 5, 6, 7)	5	10/12/2005	NA	NA	20,920	NA	NA	45,500	24,580		surface overflow from back of lots	N/A	underdrain to southeast Mahopac Patheadwallay Easement	Check as-built plans for weir elev. vs erosion area. More standing water at north end of basin and berm at that end is not high enough (design elev. 512.75). Erosion significant along path at the low berm end of basin. Headwall at other end of path near the eroded area is underpass from the street and not from basin. Significant erosion around the rightside of headwall.	Significant difference is size and shape of basin between design plans and as-built
Basin #23	Northeast of Putney Road cul-de-sac (Lot 63)	5	10/12/2005	NA	NA	10,638	NA	NA	10,850	212		surface overflow from 2 lots, common driveway & house underdrains	N/A	underdrain to east wetland area	One small pond within Lot 63 that handles overland flow from driveway and house footing drain flow. Seems pond is created to reduce flow from upstream wetlands (behind the homes) prior to discharging into downstream wetlands. Two small ponds of water at both ends of pond where proposed low points, however completely dry by underdrain and so water does not drain from the low points. Easement runs adjacent on south end of pond which creates overland channel to connect upstream and downstream wetland areas. Town recently put in 2 - 24" pipes that runs under common driveway.	Owner complained that plantings are scarce and dying. Owner concerned that no perimeter protection around basin. Feels it is hazardous since downslopes from sidelot and driveway and need barrier for children. Also felt that horrible eye sore since no plantings installed as shown on design plans.

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 June 25, 2006

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Structure Type/#	Location	Observations:
HW A-2	north of Travis at entrance drive	Connects 7'x10' box culvert under Travis bridge Water clear flow, no erosion or structural instability Rock may need to be shifted around at base of the structure if erosion occurs and to allow for an unrestricted flow.
HW A-1	south of Travis at entrance drive	Rock at dam in good condition; helps to keep back debris/soil. Clean soil /planting buildup to keep unobstructed flow out of hw Buffer area not very well screened with natural vegetation.
HW CA-1 & CA 2	Travis Road adjacent to Basin #2 & #3	Headwalls connects under street; connecting Basin # 3 into natural wetlands east of Basin #2 Structure and flow in good condition
HW @ Loomis Entrance	Loomis Entrance	7x10 box culvert connecting two wetlands. Structure not joined/aligned well. Opening occurity at joints between structures where no tie back provided and is not aligned. Water leaking from roof of box structure Water flowing ok on botton. Bottom of culvert not sloped so areas of ponding is extnsive, but water still flows along one side of box. Frequent inspections recommended.

* HW refers to headwall structure