Overall Basin Map



Intramural Fields - Basin 1

Basin Overview

This basin is the location of the Intramural Sports Complex constructed in 2007. There are two stormwater facilities serving the complex. SWMF #1, located along Eisenhower Rd, is in a regulated closed basin. SWMF #2, located on the northern portion of the site is also designed to closed basin standards due to the lack of a legal outfall. In the pre-developed condition, the property discharged across private property. On November 11, 2007 an Operating Permit (TOP091103) was issued for the facility indicating 82,027 sf of remaining impervious capacity in SWMF #1. SWMF #2 is not mentioned in the Operating Permit and there is not another operating permit on file with the City for this complex.

Basin Statistics

Total Area = 119.2 ac Site Area = 108.4 ac

SWMF #1

Total Design Impervious Area = 3.94 ac. (per capacity operating permit) Master Plan Impervious Area = 0 ac Existing Impervious Area = 2.06 ac (per capacity operating permit) Additional Future Impervious Area = 1.88 ac (per capacity operating permit)

SWMF #2 (expanded as shown) Total Design Impervious Area = 11.0 ac. Master Plan Impervious Area = 5.5 ac Existing Impervious Area = 3.1 ac (per original permit) Additional Future Impervious Area = 2.4 ac

Stormwater Design Solution

There are no improvements proposed in the 10 year Master Plan draining to SWMF #1. However, if plans change such that improvements are proposed, there is a remaining capacity of 82,027 sf of impervious area that can drain to the facility with no modifications. Improvements draining to SWMF #2 will require expansion of the existing facility. During construction SWMF #2 was overexcavated due to underlying clay material. The overexcavation increased the pond volume from 32.59 acre-feet as permitted to 38.75 acre-feet. However this additional volume does not substantially increase the capacity of the system due to its relative close proximity to the water table. The expanded facility shown is designed to contain runoff from the 1964 continuous simulation while providing capacity for an additional 7.9 acres of impervious area.



Intramural Fields During Construction

Intramural Fields - Basin 1

- Part of the Lake Munson Basin
- Basin Area = 119.2 acres
- Design Impervious Area = 11.0 acres
- Existing SWMF's designed to Closed Basin Standards
- No Outfall



Research & Development Complex – Basin 2

Basin Overview

This site located at the northeast corner of Rankin Ave. and Orange Ave. drains to a small unmapped closed basin that straddles the southeast corner of the property (i.e. the depression is not located entirely on FSU property). The site drains generally from north to south with a small offsite area to the west that drains across the property. There is also an offsite area to the east that contributes to the closed basin. Because there is no viable outfall, these offsite areas can not be bypassed.

The SCS Leon County Soil survey indicates the soils are primarily Kershaw Sand (0 – 5 percent slopes). Per the soil survey, Kershaw typically has permeability rates greater than 20 inches per hour and a water table depth of greater than 80 inches. These parameters were used along with the City of Tallahassee standard Green-Ampt infiltration parameters to create a predevelopment continuous simulation analysis the 1964 storm. A factor of safety of 10 was applied to the percolation rate published in the soil survey and the water table was assumed at 80 inches deep. The model indicated a predevelopment high water elevation of 63.40 associated with this event. It should be noted that this elevation is not completely contained on the FSU property nor does it flood Orange Avenue. It should also be noted that the 100-yr 24-hour event generated almost no predevelopment runoff due to the sandy soils.

Basin Statistics

Basin Area = 38.1 ac Site Area = 25.9 ac Total Design Impervious Area = 13.0 ac.(50% of site) Master Plan Impervious Area = 7.5 ac Additional Future Impervious Area = 5.5 ac

Stormwater Design Solution

Stormwater runoff from the proposed development shall be collected onsite and conveyed to an onsite stormwater facility designed to meet closed basin standards. The facility is designed to contain runoff from the 1964 continuous simulation without increasing highwater elevation on the neighboring properties. Final design <u>must</u> include verification of all geotechnical data, including horizontal and vertical hydraulic conductivities and water table elevations. It is also anticipated that the Master Plan improvements will need to shift north in order for the stormwater facility to be accommodated. Note that the stormwater facility as shown is designed for build out of the onsite basin to 50% impervious. If the basin were to be developed in smaller phases, a smaller facility could be constructed. This facility would need to be expanded as additional phases come online.



Aerial View of Site

Research and Development Complex - Basin 2

- Part of Lake Munson Basin
- Basin Area = 38.1 acres
- Design Impervious Area = 13.0 acres (50% of site)
- Closed Basin standards apply
- No Outfall
- Permits/Approvals Required: Environmental Resource Permit (ERP) from NWFWMD
- Master Plan improvements to be relocated out of SWMF



Academic Research & Development - Basin 3

Basin Overview

This basin is part of the West Tennessee Water Shed, within the Lake Munson Drainage Basin and is the proposed location for the Academic Research Center, Phase 1 and 2. The basin drains form Eisenhower Ave east towards the West Drainage Ditch. The West Drainage Ditch flows beneath Orange Avenue through a large box culvert, just south of the site. There is an existing offsite stormwater facility at the southwest corner of the property that discharges across onto FSU property. Future development plans must include a provision for rerouting this discharge to the West Drainage Ditch.

Basin Statistics

Basin Area = 100.1 ac Total Design Impervious Area = 55.2 ac (60% of development basin) Master Plan Impervious Area = 41.9 ac Additional Future Impervious Area 13.3 ac

Stormwater Design Solution

Stormwater runoff from the proposed development shall be collected onsite and conveyed to one of two proposed stormwater facilities that will be located generally along the western edge of the West Drainage Ditch. Due to their direct discharge into the West Drainage Ditch, the stormwater facilities are designed to provide post-development attenuation of peak stormwater discharge rates to be less than or equal to the pre-development rate for all critical duration storms with return period frequency of up to and including the 25-year storm period.

Water quality treatment will be provided via a sand filter system for the first 1-1/8 inches of runoff over the contributing basin. The filter shall be sized to recover the treatment volume in 72 hours with a minimum factor of safety of two. Design of the filter system shall occur at such time that the site is developed. As an alternative to sand filters, natural percolation through the existing soils may be utilized to recover the treatment volume provided that a geotechnical investigation indicates suitable percolation rates.

SWMF 3A is to be largely located in an area identified as 100 year flood plain per FEMA maps. SWMF 3B also encroaches into the flood plain but to a much less extent. If final design dictates these facilities remain in the flood plain, compensating excavation for fill and stormwater storage below the flood elevation must be provided. Both facilities are shown to be located outside of GIS wetland limits. Final design must include verification of the wetland limits.



West Ditch from Orange Ave. Looking North

Academic Research - Basin 3

- Part of West Tennessee Water Shed within the Lake Muson Basin
- Basin Area = 100.1 acres
- Design Impervious Area = 55.2 acres (approximately 41.9 acres shown in 10 year Master Plan)
- Offsite areas to be bypassed
- Water quality treatment for first 1.125" over the contributing area
- Critical storm attenuation to be provided up to and including 25 Year Events
- Outfall to West Drainage Ditch
- Compensating volumes to be provided for fill within floodplain



Golf Course West Ditch – Basin 4

Basin Overview

This basin is part of the West Tennessee Water Shed, within the Lake Munson Drainage Basin. The basin is located on the eastern edge of the West Drainage Ditch and slopes generally from east to west. Currently within the basin is a portion of the FSU Golf Course and Paul Dirac Drive. Wetlands and flood plain associated with the West Drainage ditch exist on the lower (western) potions of the basin.

Basin Statistics

Basin Area = 98.7 ac Master Plan Impervious Area = 0 ac Total Design Impervious Area = 0 ac Additional Future Impervious Area 0 ac

Stormwater Design Solution

Currently there is no development planned in this basin per the 10 year Master Plan. Should development plans change such that development is proposed, a stormwater facility will need to be constructed. The facility will be located along the east edge of the West Drainage Ditch and will be configured similar to the Basin 3 facilities. The facility will be designed to provide postdevelopment attenuation of peak stormwater discharge rates to be less than or equal to the pre-development rate for all critical duration storms with return period frequency of up to and including the 25-year storm period. Water quality treatment will be provided for the first 1-1/8 inches of runoff over the contributing basin.



FSU Golf Course – Aerial View

Golf Course West Basin - Basin 4

- Part of the Lake Muson Basin
- Basin Area = 98.7acres
- No improvments in 10 year Master Plan
- Future Design Parameters:
- •• Water quality treatment for first 1.125"
- Critical storm attenuation to be provided up to and including 25 Year Event
- •• Outfall to West Drainage Ditch
- •• Compensating volumes to be provided for fill within floodplain



Golf Course / Aquatic Center – Basin 5

Basin Overview

This basin is the home of the Morcom Aquatics Center and is part of a larger parcel that encompasses the FSU Golf Course and FSU Broadcast Center. An existing treatment pond located southwest of the aquatic center provides water quality treatment via a sand filter prior to discharging into the golf course closed basin pond. The "closed basin" is located entirely on golf course property. Discharge to the golf course pond occurs via a storm drain constructed across the driving range, thereby connecting the "Aquatic Center Basin" with the "Golf Course Closed Basin". In July of 2008, an Operating Permit (TOP091159) was issued for the facility indicating all of the capacity has been used.

Basin Statistics

Total Area = 47.0 ac Master Plan Impervious Area = 0 ac. Additional Future Impervious Area = 0 ac

Stormwater Design Solution

Currently there is no development planned in this basin per the 10 year Master Plan. Should development plans change such that development is proposed within the basin, the existing treatment facility and closed basin could potentially be utilized. Review of the permitted stormwater calculations indicates that the 1964 highwater elevation of the Golf Course Closed Basin is 72.37. The pop-off elevation of the basin is approximately 73. Expansion of the golf course pond would be required if the added development causes the 1964 highwater elevation to exceed the pop-off elevation. The original calculations also indicate that 2,993 cubic feet of excess treatment volume was designed into the facility. This is because the bleed down orifice elevation was set higher than the required treatment elevation. Assuming a treatment level of 1.125 inches over the contributing area, this translates to an additional 0.73 acres that could be allowed to drain to the treatment pond with no modifications. Should a larger development area be required, the facility could be expanded.



Existing Treatment Facility

Golf Course / Aquatic Center - Basin 5

- Part of the Lake Muson Basin
- Basin Area = 47.0 acres
- No impervious per 10 year Master Plan
- Water quality treatment for first 1.125"
- Critical storm attenuation to be provided up to and including 25 Year Event
- No Outfall



Tennis Courts – Basin 6

Basin Overview

This basin is located north of Orange Avenue between Pottsdamer Road and the West Drainage Ditch. The basin slopes generally from north to south, with the southern boundary being Orange Avenue. The southern portion of the basin is inundated by wetlands and flood plain. A pair of 30-inch cross drains equalizes the wetland areas on the north and south side of Orange Ave. No development is planned on the western portion of the basin (Basin 6A). The eastern portion of the basin (Basin 6B) is the proposed location of a new Tennis Complex.

Basin Statistics

Basin Area = 78.0 ac Site Area = 18.0 ac Total Design Impervious Area = 9.0 ac (Basin 6B only) Master Plan Impervious Area = 7.0 ac (Basin 6B only) Additional Future Impervious Area = 2.0 ac (Basin 6B only)

Stormwater Design Solution

Stormwater runoff from the proposed development shall be collected onsite and conveyed to a proposed stormwater facility that will be located generally upland of the onsite wetlands and flood plain. Stormwater facility construction within the flood plain is not practical due to the relatively high water table associated with the wetlands. Due to downstream flooding issues, the facility shall be designed to restrict the post development runoff rate to less than or equal to the peak predevelopment 2-year flow rate for all storms events up to and including the 25 year events. Future development plans require the size of the basin draining to the stormwater facility be expanded from the predevelopment size in order to accommodate the proposed development runoff rate. An added benefit to this approach is a reduction in size of the area draining to the corner of Orange Avenue and Pottsdamer. This area contains several residences with a known flooding history. Redirecting water towards the proposed stormwater facility will serve to lessen the flooding on the residential parcels.

Water quality treatment will be provided via a sand filter system for the first 1-1/8 inches of runoff over the contributing basin. The filter shall be sized to recover the treatment volume in 72 hours with a minimum factor of safety of two. Design of the filter system shall occur at such time that the site is developed. As an alternative to sand filters, natural percolation through the existing soils may be utilized to recover the treatment volume provided that a geotechnical investigation indicates suitable percolation rates.



Aerial View of Site

Tennis Courts - Basin 6

- Part of the Lake Muson Basin
- Basin Area = 78.0 acres
- Design Impervious Area = 9 acres (Basin 6B only) (approximately 7.0 acres in 10 year Master Plan)
- Water quality treatment for first 1.125"
- 2 year restricted discharge for development basin
- Outfall to onsite wetland area



Indoor Tennis Facility – Basin 7

Basin Overview

This basin is the location of the proposed indoor tennis facility. The facility is to be located south of the Aquatic center. Currently the basin drains to an area of known flooding at the northwest corner of Orange Avenue and Pottsdamer Road. The flooding area is partially located on FSU property and several residential lots.

Basin Statistics Total Area = 27.4 ac

Stormwater Design Solution

Stormwater runoff from the proposed development shall be collected onsite and conveyed to a proposed stormwater management facility. The retention facility has been designed by others and is currently under construction.



Aerial View of Site

Indoor Tennis Facility - Basin 7

- Part of the Lake Muson Basin
- Basin Area = 27.4 acres
- Closed Basin standards apply for future development



Innovation Park – Basin 8

Basin Overview

Innovation Park is currently operating under a master stormwater plan. Within the basin are four sub-basins with different allowable impervious areas.

- Central Basin 70% impervious
- South Basin 70% impervious (drains to central basin)
- East Basin 50% impervious
- West Basin 70% impervious in onsite SWMF

Basin Statistics

Total Area = 195.9 ac FSU Controlled Property = 60.4 ac Allowed Impervious Area = 40.1 ac (FSU property only) Existing Impervious Area = 20.6 ac (FSU property only) Remaining Impervious Area = 19.4 ac (FSU property only) Master Plan Impervious Area = 2.6 ac (central basin only)

Stormwater Design Solution

Provided the impervious area limitations established by the Operating Permit (TOP09871) are adhered to, no additional stormwater facilities need to be constructed for the Central, Southern and Eastern Basins. Each lot will be required to demonstrate adequate conveyance capacity to the appropriate stormwater facility.

Development in the Western Basin requires permitting and construction of facilities on individual lots in accordance with current City of Tallahassee rules. Currently there are no FSU controlled properties within the Western Basin.



Innovation Park – Aerial View

Innovation Park - Basin 8

- Basin Area = 195.9 acres
- IP Central/South Basin
- •• FSU Controlled Property = 49.2 acres
- •• Allowed Impervious Area = 34.5 acres
- •• Existing Impervious Area = 15.4 acres
- •• Remaining Impervious Area = 19.0 acres
- •• 10 Year Master Plan Area = 2.6 acres
- IP East Basin
- •• FSU Controlled Property = 11.2 acres
- •• Allowed Impervious Area = 5.6 acres
- •• Existing Impervious Area = 5.2 acres
- •• Remaining Impervious Area = 0.4 acres
- •• 10 Year Master Plan Area = 0.0 acres
- No FSU controlled property in IP West Basin

* Property and impervious area per 2006 GIS Data. To be verified during final design.



College of Engineering – Basin 9

Basin Overview

This basin drains to the existing College of Engineering (COE) SWMF#2. Included within the basin is a portion of the existing COE building, rear parking areas, as well as a portion of the FSU Golf Course. The existing facility is designed to closed basin standards. As designed and permitted, ff the facility were ever to fill beyond its banks, it would overflow into Pottsdamer Road and ultimately into the Innovation Park Facility. Note that SWMF #3, on the northern edge COE site is not included within this basin, but rather drains to Alumni Village (Basin 10).

The COE pond was originally designed to City closed basin rules using the 1964 rainfall continuous simulation requirements. The pond will fill up, flood Pottsdamer Road and discharge to the Innovation Park Central basin facility during single large storm events and extended wet periods. The spill elevation was set by the high point in Pottsdamer Road at approximately elevation 82.7±. The centerline low point in Pottsdamer is elevation 80.87. Therefore, flooding of Pottsdamer can get 2-feet deep or greater under certain storm conditions, which makes the road impassable. The Pottsdamer Road driveway entrances to the Don Fuqua Research Complex parking are near the pond are at elevation 81.7±. These entrances would be flooded approximately 1-foot deep under the same conditions.

On December 22, 2000 a permit was issued to address a sink hole that had opened open in SWMF #1. The work performed included filling SWMF #1 and expanding SWMF #2. Review of the stormwater model associated with the reconfigured facility indicates it was designed permitted to accept 420,659 square feet of impervious area. The newly configured facility has a 1964 highwater elevation of 82.71. It was also assumed that a pump would be installed in the facility to provide irrigation for the FSU Golf Course in order to help recover the volume.

On January 2, 2002 an Operating Permit (TOP090871) was issued for the facility indicating 126,210 sf of remaining impervious capacity.

Basin Statistics

Total Area = 66.6 ac Permitted Impervious Area = 9.657 ac (per Operating Permit) Existing Impervious Area = 6.760 ac (per Operating Permit) Remaining Capacity = 2.897 ac (per Operating Permit)

Stormwater Design Solution

Due to the previous karst issues associated with the existing stormwater facility and flooding issues within Pottsdamer Road, additional discharge to this facility is not recommended. Future development should be redirected to Alumni Village.



Existing COE Building and SWMF #2

College of Engineering - Basin 9

- Part of the Innovation Park Closed Basin
- Basin Area = 66.6 acres
- No improvements in 10 year Master Plan
- Previous karst and road flooding history dictates no additional stormwater capacity.



Alumni Village North – Basin 10

Basin Overview

This basin is bifurcated by an existing stormwater management area and a small farm pond located north of Alumni Village. For purposes of this analysis we are considering both facilities to be regulated wetland areas. The "stormwater management area" is on the eastern edge of Innovation Park and is considered part of its stormwater infrastructure. Impervious area associated with the College of Engineering (COE) is not included in the predevelopment runoff calculations because it is anticipated the existing stormwater facility located on the north side of the COE parking area will be removed and replaced with stormwater facility 10B.

Basin Statistics

Total Area = 120.0 ac Total Design Impervious Area = 36.3 ac Master Plan Impervious Area = 9.5 ac College of Engineering = 6.0 ac Total Design Impervious Area = 20.8 ac

Stormwater Design Solution

Stormwater runoff from the proposed development shall be collected onsite and conveyed to one of two proposed stormwater facilities. SWMF 10A will be located east of the existing storm water management area serving Innovation Park and north of Levy Drive. SWMF 10B will be located southwest of the existing Farm Pond in Alumni village. Both facilities are sized to provide post-development attenuation of peak stormwater discharge rates to be less than or equal to the pre-development rate for all critical duration storms with return period frequency of up to and including the 25-year storm period.

Water quality treatment will be provided via a sand filter system for the first 1-1/8 inches of runoff over the contributing basin. The filter shall be sized to recover the treatment volume in 72 hours with a minimum factor of safety of two. Design of the filter system shall occur at such time that the site is developed. As an alternative to sand filters, natural percolation through the existing soils of the treatment volume may be used provided geotechnical analysis indicates treatment volumes can be recovered with 72 hours.

SWMF 10B is to be located in an area identified as 100 year flood plain per FEMA maps. Compensating excavation for fill and stormwater storage below the flood elevation must be provided. The facility is located outside of GIS wetlands. Final design must include verification of the wetland limits.

An alternate design solution would be to expand the existing farm pond and stormwater management area north of Levy Drive. This alternative would likely require impacting wetland areas and existing stormwater permits and is out of the scope of this analysis.



Aerial View of Site FSU SOUTHWEST CAMPUS - CONCEPTUAL STORMWATER MASTER PLAN

Alumni Village North - Basin 10

- Part of Alumni Village Water Shed within the Lake Munson Basin
- Basin Area = 120.0 acres
- Design Impervious Area = 36.3 acres (approximately 9.5 acres in 10 year Master Plan)
- Offsite Areas to be bypassed
- Water quality treatment for first 1.125" over the contributing area
- Critical storm attenuation to be provided up to and including 25 Year Events
- Outfall to existing stormwater management areas
- Compensating volumes to be provided for fill within floodplain



Alumni Village South – Basin 11

Basin Overview

The basin is the southern portion of the alumni Village Water Shed, part of the Lake Munson Basin. Runoff from the site is collected through a series of inlets and conveyed to a ditch system on the southern boundary of the property, through a City of Tallahassee owned stormwater facility (TOP090022) located at James and Daniels Street and ultimately to the Central Drainage Ditch.

Basin Statistics

Total Area = 114.0 ac Total Design Impervious Area = 0 Master Plan Impervious Area = 0

Stormwater Design Solution

Currently there is no development planned in this basin per the 10 year Master Plan. Should development plans change such that development is proposed within the basin, a storm water facility will need to be constructed. The stormwater facilities must be designed to provide post-development attenuation of peak stormwater discharge rates to be less than or equal to the predevelopment rate for all critical duration storms with return period frequency of up to and including the 25-year storm period. Water quality treatment will be provided for the first 1-1/8 inches of runoff over the contributing basin. The existing City owned stormwater facility shares a common property boundary with Alumni Village and may be a good candidate for expansion to a joint City/FSU facility.



Aerial View of Site

Alumni Village South - Basin 11

- Part of Alumni Village Water Shed within the Lake Munson Basin
- Basin Area = 114.0 acres
- No improvements in 10 year Master Plan
- Future Design Parameters:
- •• Water quality treatment for first 1.125"
- Critical storm attenuation to be provided up to and including 25 Year Events
- •• Compensating volumes to be provided for fill within the floodplain

