CAPITAL IMPROVEMENT PLAN

Stormwater, Sanitary Sewer, Water and Irrigation Systems

University at Albany (Uptown Campus)

Prepared for:

The State University Construction Fund and the University at Albany

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COMMITMENT & INTEGRITY DRIVE RESULTS

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EXECUTIVE SUMMARY

This report contains a Capital Improvement Plan (CIP) for the sanitary sewer, storm sewer, water, and irrigation systems at the University at Albany uptown campus. A comprehensive methodology and analysis of the prioritization of improvements for the four utilities is presented with the final prioritization of projects and an implementation plan, which takes into account the currently anticipated projects at the University at Albany campus.

To develop the CIP, Woodard & Curran conducted a Condition Assessment and Capacity Assessment for each of the four utilities. Each assessment highlighted portions of the systems that are in need of capital improvements; these assessments are included as appendices to this report. Given these assessments, capital improvements were identified, ranked for priority relative to other capital improvements, and reviewed along with the University's current construction plan. An Implementation Plan was produced at the end of the process. In total, approximately $17.4 million worth of capital improvements were identified, divided between the systems as follows:

- Sanitary Sewer System - $2.3 million;
- Storm Sewer System - $8.9 million;
- Water System - $4.9 million; and
- Irrigation System - $1.2 million.

These totals include allowances for engineering, permitting, and legal costs.

Capital improvement projects that have been identified include repair, replacement, and increasing the capacity of sanitary sewer, storm sewer, water, and irrigation system infrastructure. With these capital improvements in place, the University at Albany will have the sanitary sewer, storm sewer, water, and irrigation infrastructure in place to allow for continued growth and fulfillment of its mission.

Woodard & Curran also developed Design Guidelines and an Inspection and Maintenance Plan for the sanitary sewer, storm sewer, water, and irrigation systems. These reports provide SUCF and the University at Albany with a design basis for the capital improvements of these infrastructure systems, and a plan for proactively maintaining the condition of the systems and identifying future capital improvement needs in a timely manner. They are referred to within this document, but have been submitted separately to SUCF and the University at Albany.

1. INTRODUCTION

1.1 BACKGROUND

Woodard & Curran was retained by the State University Construction Fund (SUCF) as part of Program Study 08134 to determine a list of highest priority infrastructure improvement projects for the sanitary sewer, storm sewer, water, and irrigation systems at the University at Albany.

To develop the CIP, Woodard & Curran conducted a Condition Assessment and Capacity Assessment for each of the four utilities that were examined as part of this study. These assessments are attached as appendices to this report and are summarized below.

1.1.1 Condition Assessment

The intent of the Condition Assessment was to examine the sanitary sewer, storm sewer, water and irrigation systems and characterize associated structures or components as Excellent, Good, Fair or Poor. These condition ratings were used to plan the need and timing of improvements to the systems.

Camera inspections of the sanitary and storm sewer were conducted as part of the Condition Assessment of the sanitary sewer and storm sewer systems. The camera inspections began on July 18, 2007 and were completed on August 20, 2007 by Savin Engineers, PC, of Pleasantville, NY. During the Savin Engineering camera inspections, approximately 8,855 ft of sanitary sewer pipe and 9,231 ft of storm sewer pipe were inspected.

Field inspections of sanitary sewer manholes, catch basins, drainage manholes, drain inlets, and other storm sewer appurtenances were also conducted as part of the Condition Assessment of the sanitary sewer and storm sewer systems. The field inspections began on June 12, 2007 and were completed on August 14, 2007 by a team of Woodard & Curran employees. During the inspections, 126 sanitary sewer manholes, 519 catch basins, 123 drainage manholes, 298 drain inlets, and 34 other storm sewer appurtenances were inspected.

Water tower inspections reports prepared by Schafer Engineering Associated (SEA) and KTA-Tator Engineering Services were reviewed as part of the Condition Assessment of the water tower. The SEA visual inspection of the water tower was conducted on October 31, 2005 and November 1, 2005. The Office of General Services (OGS) reports, conducted on May 31, 2006, focusing on the exterior and interior coatings of the water tower tank were also reviewed.

Conversations with both University staff and industry references about the water distribution systems were conducted as part of the Condition Assessment of the water distribution system.

The irrigation system was assessed by Northern Designs, LLC, of North Haven, Connecticut. Their evaluation consisted of several visits to the campus to do GPS mapping of the existing irrigation systems. In addition, data pertaining to the irrigation system was obtained from on-site observations, discussions with University of Albany maintenance staff and review of the Universities construction plan archives

The full Condition Assessment can be found in Appendix A.

1.1.1.1 Sanitary Sewer System

The condition of the sanitary sewer system manholes and selected sanitary sewer system pipes was assessed. The sanitary sewer system pipes contained many blockages due to debris, grease, and roots, with several pipe sags and breaks. Much of the sanitary sewer system is composed of vitrified clay pipe, a material not used in modern sanitary sewer construction. Most of the sanitary sewer manholes were in Good to Excellent condition, but a significant number were in Fair condition, and only a few in Poor condition. The inspection results are summarized in Figure 1-1 and Table 1-1.

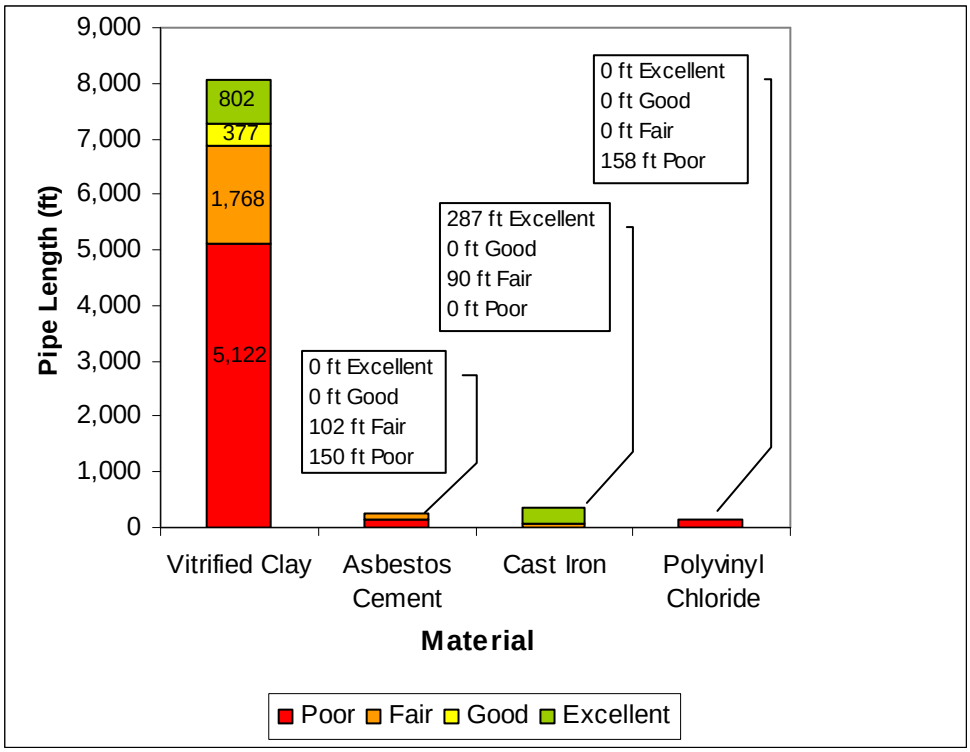


Figure 1-1: Sanitary Sewer Pipe Conditions

Table 1-1: Sanitary Sewer Manhole Conditions

Structural Condition		Sediment		Hydraulic Condition		Overall Condition	
Good	85	None	25	Good	90	Excellent	5
Damaged Functional	40	Partial	85	Damaged Functional	34	Good	65
Damaged Non-Functional	1	Substantial	15	Damaged Non-Functional	1	Fair	48
		Full	1	Blocked	1	Poor	8

1.1.1.2 Storm Sewer System

The condition of the storm sewer system features (catch basins, manholes, drain inlets and appurtenances) as well as selected storm sewer system pipes was assessed. The storm sewer system pipes contained many blockages due to debris and roots, with several cracks, breaks, and pipe misalignments. Almost half of the inspected storm sewer pipes were rated Fair to Poor. Most of the storm sewer features were in Good to Excellent condition, but a significant number were in Fair condition, and several in Poor condition. The inspection results are summarized in Figure 1-2 and Tables 1-2 through 1-5 below.

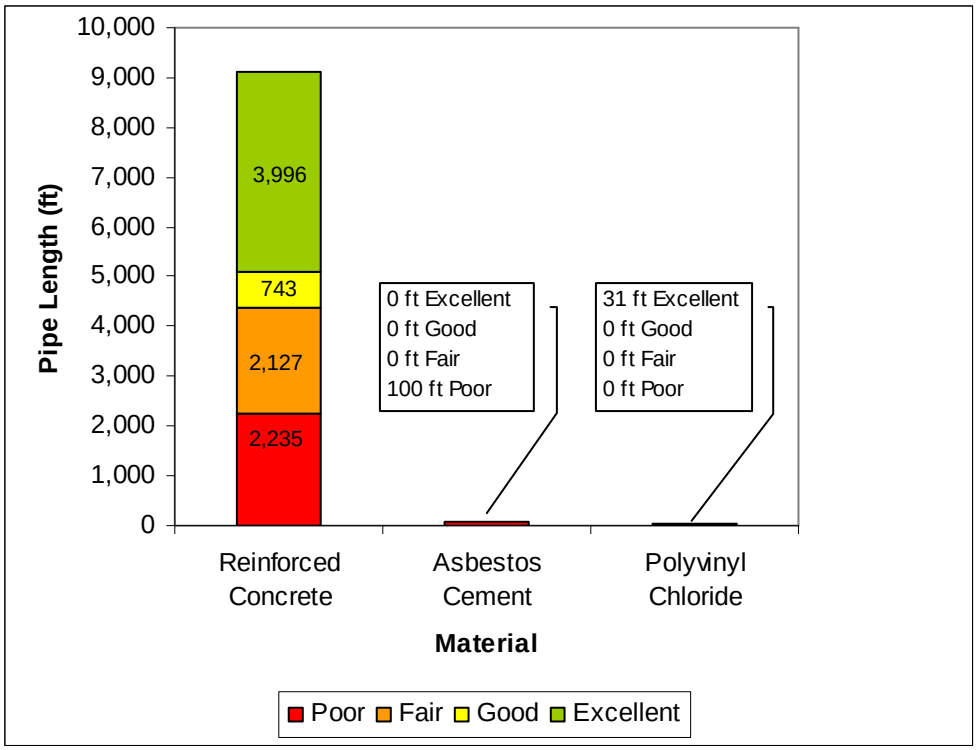


Figure 1-2: Storm Sewer Pipe Conditions

Table 1-2: Storm Sewer Catch Basin Conditions

Structural Condition		Sediment		Hydraulic Condition		Overall Condition	
Good	391	None	52	Good	190	Excellent	3
Damaged Functional	123	Partial	284	Damaged Functional	310	Good	226
Damaged Non-Functional	5	Substantial	162	Surcharging	2	Fair	232
		Full	21	Damaged Non-Functional	8	Poor	58
				Blocked	9		

Table 1-3: Storm Sewer Drainage Manhole Conditions

Structural Condition		Sediment		Hydraulic Condition		Overall Condition	
Good	91	None	16	Good	62	Excellent	4
Damaged Functional	32	Partial	87	Damaged Functional	61	Good	67
Damaged Non-Functional	0	Substantial	19	Surcharging	0	Fair	46
		Full	1	Damaged Non-Functional	0	Poor	6
				Blocked	0		

Table 1-4: Storm Sewer Drain Inlet Conditions

Structural Condition		Sediment		Hydraulic Condition		Overall Condition	
Good	250	None	78	Good	162	Excellent	1
Damaged Functional	48	Partial	142	Damaged Functional	100	Good	157
Damaged Non-Functional	0	Substantial	52	Surcharging	1	Fair	78
		Full	26	Damaged Non-Functional	20	Poor	62
				Blocked	15		

Table 1-5: Storm Sewer Appurtenance Conditions

Structural Condition		Sediment		Hydraulic Condition		Overall Condition	
Good	32	None	17	Good	26	Excellent	7
Damaged Functional	2	Partial	13	Damaged Functional	3	Good	22
Damaged Non-Functional	0	Substantial	4	Surcharging	0	Fair	4
		Full	0	Damaged Non-Functional	4	Poor	1
				Blocked	1		

1.1.1.3 Water System

Past reports determined that the water tower was in overall good condition, but several issues were found. Surface corrosion and pitting on welds were found on several structural elements such as gusset plates, braces, triangle stiffener plates, flange plates, tube braces, framed connections, cable braces, turnbuckles and radial beams. Corrosion was also found on exterior non-structural features such as hatches, vent pipes, speaker attachments, conduit and grating. The cables of the tower were reported to have variable tension. The coatings on the exterior of

the tank roof were determined to be in fair condition with a localized corrosion on 10% of the roof. The coating on the interior of the tank was determined to be in poor condition. The tank's exterior stiffener ribs and bell tower structure exhibited 10% corrosion. The tank's exterior had areas where layers of paint beneath the top coating were exposed consisting of 10% of the total shell. The tank ladders and railings were reported to be non-compliant with OSHA standards. The exterior water tank face, up to the top of the water tank, and the tank shell coatings, were determined to be in good condition.

In addition to the findings of past reports, additional water system condition assessment activities included observations during Woodard & Curran field visits, conversations with University staff, a review of water industry guidance, and general observations regarding the quality of water supplied to the University system. While not subject to the same level of inspection performed on the buried infrastructure in the sanitary sewer and storm sewer systems, some fire hydrants in poor condition were observed during Woodard & Curran field visits. Some of these hydrants were observed to minimally require some service to correct issues such as broken operating nuts or leaks. Conversations with University staff indicate that the water tank may overflow during decreased demand periods. Using water industry guidance, it was determined that the water mains on campus are approximately 50% through their expected lifespan. While the water supplied by the City of Albany to the University is generally of good quality, some deterioration of water quality could occur in the University's distribution system given the additional length of pipe that the water needs to pass through. Water quality monitoring is recommended as part of the Inspection and Maintenance Plan.

1.1.1.4 Irrigation System

The condition of the irrigation system features (sprinkler heads, control systems, pumps, and piping) as well as its water supply were assessed. The water for the system is supplied by an on-site lake, the potable water supply from the University's building water supply, and two wells. These supply sources appear to be adequately meeting current demands.

There is no central control system, and therefore the operation of the systems zones is partly manual and partly automated. Some of the sprinkler heads are clogged or throwing water onto pavement, and in certain areas sprinklers are poorly spaced resulting in losses of water and irregular spray coverage.

Newer piping and lateral piping appear to be in good condition, however, the older main piping has significant leakage. Consequently, the irrigation pumps need to cycle frequently to maintain the system pressure. The age of the system, lack of appropriate valving and modern system controls, complicate system trouble-shooting, making areas of water loss difficult to locate.

The existing irrigation system installed at University Field, Intramural Fields, Practice Fields and Baseball Fields is outdated and inefficiently designed. The existing irrigation system installed at the Boor Sculpture Studio, Life Sciences, Science Library, University Hall, University Police, Artificial Turf Fields (Lacrosse & Field Hockey) and Empire Commons although functional should each be audited for water conservation.

1.1.2 Capacity Assessment

The capacity of the sanitary sewer, storm sewer, water, and irrigation systems were assessed using modeling and flow measurement. The results of these capacity assessments are described below.

1.1.2.1 Sanitary Sewer System

Based on model results, the northern interceptor has additional flow capacity available. Based on flow metering data, the maximum observed instantaneous flow rate through the interceptor with the current poor condition of pipes was 0.082 MGD and the average daily flow was 0.03 MGD, which are both significantly less than modeled flow capacities for Sectors I-III (0.47 – 1.62 MGD.) The capacity model assumed that the pipes are in good condition. Since the pipes in the northern interceptor are, in poor condition, the actual current flow capacity is most likely less than the modeled capacity.

The southern interceptor has limited additional available flow capacity because of pipe blockages of up to 90% in some locations. The maximum instantaneous water depth ratio for the southern interceptor measured at a location south of Indian Quad was 0.753, which is approaching the maximum recommended value of 0.90.

Flow metering data indicated that there were lower flows at the end of the southern interceptor, than at the flow metering location just south of Indian Quad. The maximum observed instantaneous flow at this location was 0.936 MGD whereas the downstream observed maximum instantaneous flow at the end of the southern interceptor was 0.535 MGD. Flow meter calibration and installation data were checked to verify that flow meters were functioning correctly. The Condition Assessment indicated that there were issues such as root blockages and sags between the two locations. However, this would not account for the difference in metered flows between the two locations. We recommend that flow metering continues as a regular part of inspection and maintenance work to clarify this issue.

1.1.2.2 Storm Sewer System

The capacity of the storm sewer system was assessed by developing a model using the SewerGEMs modeling software. This modeling software estimates the stormwater generated during a rainfall event and the quantity and hydraulic grade line of flow through the system.

Model results indicate that there are four areas with limited capacity. Results indicated that the area including State Gold Lot and Collins Circle the Colonial Quad area, and the Dutch Gold Lot area could experience ponding. The area near University Drive West closest to the entrance of Western Avenue could experience overflow from structures, consequently impacting traffic. It is recommended that the above areas be investigated further to evaluate the necessity and measures required to improve the capacity of the subsystems in these areas.

1.1.2.3 Water System

The capacity of the water system was assessed using the GIS-based water network modeling software, Infowater®. The fire flow availability at fire hydrants across the campus during peak system demands was used to assess the capacity of the water system. The following three peak demand scenarios were modeled:

- Peak hour demands during current demand conditions;
- Peak hour demands for an expanded demand scenario that includes demands from anticipated building projects over the next five years; and

- Peak hour demands for the expanded demand scenario, with the addition of a second water supply source.

Model simulation results indicated that the available hydrant flow at hydrants varies greatly across the campus. In the current demand scenario, the available fire flows ranged from 871 gpm to 11,648 gpm. For the expanded demand scenario, the available flow generally decreased and ranged from 710 gpm to 7,752 gpm. For the third demand scenario with a second water supply source, the available fire flow generally increased, and ranged from 921 gpm to 13,018 gpm. The highest available fire flows were located at hydrants in close proximity to the 12-inch water main loop that runs around the academic podium. The hydrant with the lowest available fire flow was the hydrant near the Chemistry Building, a hydrant supplied off a 4-inch diameter service lateral. The next lowest available flows were located in Freedom Quad, the area furthest from the existing water supply source, and in an area served by a long length of 8-inch water main. The modeled results also determined that the Alumni House and Freedom Quad experience the lowest pressures in the system during fire flows and may need either larger diameter pipes or booster pumps to increase the supply pressure in these locations

1.1.2.4 Irrigation System

The capacity of the stormwater pond used for the majority of the campus irrigation system was assessed by calculating the irrigation demand, which is a function of the type of plant material being irrigated, the rainfall conditions, the evapotranspiration potential, the irrigation water supply capacity, and the efficiency of the irrigation system. This irrigation demand was compared to the capacity pond.

It is estimated that an area of approximately 100 acres of mixed turf and plant material, or 75 acres of turf only, could be irrigated with the current irrigation system. Currently, approximately 45 acres are outfitted for irrigation. If the current pond dredging activities take place at the proposed magnitude, approximately 9.1 million gallons of storage is available. During drought conditions in the month of July, if the maximum potential area of turf is irrigated (75 acres), the stormwater pond would be able to provide fewer than 19 days of irrigation capacity. During similar conditions in June and August, the pond could provide fewer than 20 and 22 days of irrigation water supply, respectively. The actual number of days of irrigation supply available will be dependent on the usable water from the retention pond including factors such as intake elevation and turbidity. Therefore, there is adequate capacity in this system.

1.2 PURPOSE

In this report is a list of needed capital improvement plan items derived from the Condition and Capacity Assessments, a scoring system used to prioritize plan items, and a project implementation plan. This information should be used by the State University Construction Fund and the University at Albany as a planning tool for the rehabilitation of the sanitary sewer, storm sewer, water, and irrigation infrastructure at the University at Albany. As discussed in the Inspection and Maintenance Plan prepared for the University at Albany by Woodard & Curran, ongoing maintenance and re-inspection of the infrastructure features should occur. This report represents items developed based on our observations and field work completed as part of this project. The actual condition and capacity of the infrastructure items may have changed since the time of our investigations.

2. METHOD

2.1 OVERVIEW

The Capital Improvement Plan for the University at Albany was developed to balance the need for capital improvements across the campus and the risk associated with the infrastructure in need of improvement with the planned construction projects across the campus and the available funding for the improvements. The development of the Capital Improvement Plan was thus conducted in three steps:

1. Creation of a list of needed capital improvements (Section 2.2);
2. Prioritization of needed capital improvements (Section 2.3); and
3. Development of an Implementation Plan (Section 2.4).

These steps are discussed below.

2.2 CREATION OF CAPITAL IMPROVEMENT ISSUES LIST

The improvement issues list was developed using input from discussions with staff at the University at Albany and draft conclusions drawn from the Condition and Capacity Assessments developed by Woodard & Curran. Major maintenance items were also identified during this process. While these items are not capital improvements and are therefore not the subject of this report, they are mentioned as notes in the Implementation Plan as action items. The maintenance items are discussed in more detail in the Condition and Capacity Assessment reports.

The improvement items list is presented in Section 3.1.

2.3 PRIORITIZATION METHOD

The purpose of prioritization of improvement items is to guide the order in which items should be addressed. The prioritization method assigns a rank to each of the capital improvement items based on the condition, risk, and opportunity cost associated with the issue. The opportunity cost for an improvement issue is higher if there is an opportunity to reduce labor or material costs by grouping work, an opportunity to avoid compliance failures, long-term asset management opportunities, or the opportunity to raise profile.

The prioritization method assigns each improvement item a weight for each of the categories listed above, and then multiplies the weights resulting in a total overall score. Opportunity cost is weighted less than condition and risk to reflect the relatively smaller impact of opportunity cost on the ranking of a project. The improvement item with the highest total score is the project with the highest ranking. Below is a detailed explanation of the steps of the prioritization method.

2.3.1 Assignment of Condition Weight

Each item is given a weight based on its assigned condition. The final calculation of prioritization score is multiplicative and the highest overall score equates to the highest ranking. Therefore, the weight given for an issue in 'poor' condition is ten and an issue with a condition of 'excellent' is given a weight of one. The weights for items in 'fair' and 'good' condition are proportioned evenly between one and ten. Table 2-1 provides condition weight assignments.

Table 2-1: Condition Weights

Condition	Weight
Poor	10
Fair	7
Good	4
Excellent	1

2.3.2 Assignment of Risk Weight – Based on Failure Mode and Effects Analysis (FMEA)

The FMEA risk analysis tool is a typical tool used in industry to assess risk, which takes into account the: 1.) severity of failure, 2.) likelihood of failure, and 3.) amount of risk prevention (detection). Expanding on this last element, if an improvement item is frequently inspected, an impending failure will be detected and the failure can be averted. If an improvement item is infrequently inspected, it is unlikely that the impending failure will be detected and the failure will not be averted. Improvement items which are rarely inspected pose a higher risk, and are given a higher ranking. An issue is assigned the maximum applicable weight from each category and the weights are multiplied together. The highest score has the highest overall risk. Tables 2-2, 2-3 and 2-4 provide the weight assignments for these three categories, respectively..

Table 2-2: Risk – Severity

Severity	Weight
Failure could result in fatalities	5
Failure could result in injuries	4
Failure could result in multiple system failures - very costly	3
Failure could result in single system failure, will not affect other systems - costly	2
Failure could result in single system not working well, reducing efficiency	1

Table 2-3: Risk – Likelihood

Likelihood of Failure	Weight
Within 1 year	5
Within 5 years	4
Within 10 years	3
Within 15 years	2
Within 20 years	1

Table 2-4: Risk – Risk Prevention

Risk Prevention / Detection	Weight
No possibility of risk prevention	4
Very little risk prevention	3
Some risk prevention	2
Regular risk prevention	1

2.3.3 Assignment of Opportunity Cost Weight

In order to account for opportunity cost, an opportunity cost weight is assigned to each issue. Opportunity costs represent a "bonus" that can be considered, but do not carry the same weight as condition and risk. As such, they are weighted an order of magnitude less than the condition and risk score assignments.

Opportunity costs include bundled costs of labor, bundled costs of materials, raising public profile, long-term asset management opportunities, savings on accessing the area in the future, and avoiding litigation, fines, and compliance or regulation issues. The magnitude of the opportunity costs can vary depending on the consequences of system failure or size of the improvement being considered. To account for this variation, the scoring system assigns the opportunity cost based on the magnitude of impact, not the type of impact. See Table 2-5.

Table 2-5: Opportunity Costs

Opportunity Costs	Weight
Large Effect	1.5
Medium Effect	1.3
Small Effect	1.1
No Effect	1.0

2.3.4 Calculation of Total Score

The prioritization score is calculated by multiplying the Condition Weight, the Severity Weight, the Likelihood of Failure Weight, the Risk Prevention/Determination Weight, and the Opportunity Cost Weight together. The lowest possible result (lowest ranking capital improvement) is one (1 x 1 x 1 x 1 x 1.0), and the highest possible result (highest ranking capital improvement) is 1500 (10 x 5 x 5 x 4 x 1.5).

2.4 IMPLEMENTATION PLAN

The next step in the development of the Capital Improvement Plan was to examine the list of planned campus construction projects to identify synergies that could be realized by coordinating capital improvements for the water, sanitary sewer, storm water, and irrigation systems with the pre-existing planned projects. The final step was to develop an Implementation Plan. This plan was developed in a way that maintained the importance of the weighting scheme described above by identifying the "Immediate Need" projects and addressing these needs in the first year of the Implementation Plan, with the remaining projects being staged as a balance between their rankings and the planned campus construction projects.

2.4.1 Planned Campus Construction Projects

A list of planned campus construction projects was obtained by the University at Albany Office of Campus Planning. These projects were grouped into years by their estimated start date. The list is summarized in Table 2-6.

Table 2-6: Planned Campus Construction Projects

Year	Project	Start	End
Year 1	Pond Enhancement	2008	2009
Year 2	State Quad Renovation	2009	2010
	State Quad Parking	2009	2010
	Renovate Health Center	2009	2010
	Service Building A Renovation	2009	2010
	Grounds Building	2009	2010
Year 3	School of Business	2010	2012
	Campus Center Addition	2010	2012
	Campus Center Renovation	2010	2012
	Dutch Quad Renovation	2010	2011
	Water Tower and Foundation Renovation	2010	2011
	Student Housing	2010	2012
	Connector Road	2010	2011
	Multi-use Stadium	2010	2012
Year 4	Relocate Data Center	2011	2012
	Library Renovation	2011	2012
	Science Surge Building	2011	2013
Year 5	Parking Structure	2012	2013
	Fine Arts Studio	TBD	TBD
	Purple Path Phase 2	TBD	TBD
	Northern Landscape Improvement	TBD	TBD
	Southern Landscape Improvement	TBD	TBD
	Construct Storage Structure	TBD	TBD

2.4.2 Identification of Priority Capital Improvement Plan Projects

The top priority projects were identified using the prioritization rankings as a basis. These top priority projects are planned to be implemented toward the beginning of the Implementation Plan. Priority Projects were defined as projects with a ranking score of greater than 250 points, derived as follows:

- Condition – Poor: 10
- Severity – Average Severity: 2.5
- Likelihood – Within 1 Year: 5
- Detection – Average Detection: 2
- 10 x 2.5 x 5 x 2 = 250 = Immediate Priority Cut-Off Score

2.4.3 Geographic Analysis of Capital Improvements and Final Development

The locations of the planned campus construction projects were compared and overlaid with the locations of the proposed Capital Improvement Plan projects. The campus was sectioned into areas representing the years of planned campus construction projects, and in the Implementation Plan, Capital Improvement Plan projects within these areas were assigned to the same year. Priority Projects were reviewed and temporary measures were incorporated into the first year of the Implementation Plan in order to manage these issues until they are addressed more fully in later years, when construction is planned for their assigned area. Lastly, the major maintenance issues were reviewed and incorporated as notes into the Implementation Plan as necessary.

3. CAPITAL IMPROVEMENT PLAN

3.1 CAPITAL IMPROVEMENTS

The list of capital improvement projects and the weights associated with them can be found in Tables 3-1 through 3-4, by system.

Table 3-1: Capital Improvements – Sanitary Sewer System

	Issue	Condition		Risk						Opportunity Cost		Total Score
				Severity		Likelihood		Detection				
Sanitary Sewer System												
S1.	Replace sanitary sewer pipe of unsuitable material (vitrified clay or asbestos cement, approximately 11,000 LF)	Poor	10	Single system failure	2	Within 1 year	5	Infrequently inspected	3	Large Impact: Opportunity for bundling of materials and labor costs, avoid compliance and regulation issues	1.5	***450***
S2.	Replace 8 sanitary sewer manholes in poor condition.	Poor	10	Single system failure	2	Within 1 year	5	Somewhat frequently inspected	2	Large Impact: Opportunity for bundling of materials and labor costs, avoid compliance and regulation issues	1.5	***300***
S3.	Replace 158 ft of sanitary sewer pipe in poor condition (non-vitrified clay or asbestos cement)	Poor	10	System not working well	1	Within 1 year	5	Infrequently inspected	3	Large Impact: Opportunity for bundling of materials and labor costs, avoid compliance and regulation issues	1.5	***225***
S4	Replace 48 manholes in fair condition	Fair	7	Single system failure	2	Within 5 years	4	Somewhat frequently inspected	2	Large Impact: Opportunity for bundling of materials and labor costs, avoid compliance and regulation issues	1.5	***168***
S5.	Replace 90 ft of sanitary sewer pipe in fair condition	Fair	7	System not working well	1	Within 5 years	4	Infrequently inspected	3	Large Impact: Opportunity for bundling of materials and labor costs, avoid compliance and regulation issues	1.5	***126***
S6.	Increase flow capacity of southern interceptor	Good	4	Single system failure	2	Within 10 years	3	Infrequently inspected	3	Large Impact: Opportunity for bundling of materials and labor costs, avoid compliance and regulation issues	1.5	***108***

Table 3-2: Capital Improvements – Storm Sewer System

	Issue	Condition		Risk						Opportunity Cost		Total Score
				Severity		Likelihood		Detection				
Storm Sewer System												
D1.	Replace 2,335 ft of storm sewer pipe in poor condition	Poor	10	Single system failure	2	Within 1 year	5	Infrequently inspected	3	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***390***
D2.	Replace 2,127 ft of storm sewer pipe in fair condition	Fair	7	Single system failure	2	Within 5 years	4	Infrequently inspected	3	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***218***
D3.	Replace 58 catch basins, 6 manholes, 62 drain inlets, and 1 appurtenance in poor condition	Poor	10	System not working well	1	Within 1 year	5	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***130***
D4.	Replace 232 catch basins, 46 manholes, 78 drain inlets, and 4 appurtenances in fair condition	Fair	7	System not working well	1	Within 5 years	4	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***73***
D5.	Increase flow capacity in Dutch Gold Lot area	Fair	7	System not working Well	1	Within 5 years	4	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***73***
D6.	Increase flow capacity in University Drive West area, near the entrance of Western Ave.	Fair	7	System not working Well	1	Within 5 years	4	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***73***
D7.	Increase flow capacity in State Quadrangle and State Gold Lot areas	Fair	7	System not working Well	1	Within 5 years	4	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***73***
D8.	Increase flow capacity in Colonial Quadrangle area	Fair	7	System not working Well	1	Within 5 years	4	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***73***

Table 3-3: Capital Improvements – Water System

Issue		Condition		Risk						Opportunity Cost		Total Score
				Severity		Likelihood		Detection				
Water System												
W1.	Replace fire hydrants in poor condition	Poor	10	Significant Health and Safety Issue	5	Within 1 year	5	Somewhat frequently inspected	2	Large Impact: Avoid compliance and regulation issues	1.5	***750***
W2.	Remove the water tower's interior ladder and replace non-OSHA compliant railings	Poor	10	Injury	4	Within 1 year	5	Somewhat frequently inspected	2	Large Impact: Avoid compliance and regulation issues	1.5	***600***
W3.	Recoat the interior of the water tower	Poor	10	Multiple system failure	3	Within 5 years	4	Infrequently inspected	3	Large Impact: Opportunity for bundling of materials and labor costs, avoid compliance and regulation issues	1.5	***540***
W4.	Replace 220 feet of pipeline to fire hydrants that are less than 6"	Poor	10	Injury	4	Within 5 years	4	Somewhat frequently inspected	2	Large Impact: Avoid compliance and regulation issues	1.5	***480***
W5.	Spot recoat the exterior of water tower	Poor	10	Multiple system failure	3	Within 5 years	3	Infrequently inspected	3	Large Impact: Opportunity for bundling of materials and labor costs, avoid compliance and regulation issues	1.3	***351***
W6.	Repair joint welds on water tower (betweens beams, braces, gussets and stiffeners)	Fair	7	Injury	4	Within 10 years	3	Infrequently inspected	3	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***328***
W7.	Replace the corroded turnbuckle connections on the water tower	Fair	7	Injury	4	Within 10 years	3	Infrequently inspected	3	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***328***
W8.	Replace valves that do not close in the direction specified by University Standards	Fair	7	Injury	4	Within 1 year	5	Somewhat frequently inspected	2	No Impact	1.0	***280***
W9.	Replace vent screen on water tower	Good	4	Injury	4	Within 10 years	3	Infrequently inspected	3	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***187***
W10.	Increase the back-up water supply pressure	Fair	7	Multiple system failure	3	Within 5 years	4	Somewhat frequently inspected	2	No Impact	1.0	***168***
W11.	Replace corroded non-structural accessories and framed connections on water tower that are in poor condition	Poor	10	System not working well	1	Within 10 years	3	Infrequently inspected	3	Small Impact: Opportunity for bundling of materials and labor costs	1.1	***99***
W12.	Recoat the entire exterior of water tower	Good	4	System not working well	1	Within 10 years	3	Infrequently inspected	3	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***47***
W13.	Install meters and verify backflow protection	Good	4	System not working well	1	Within 10 years	3	Infrequently inspected	3	Small Impact: Increased efficiency in system	1.1	***40***
W14.	Repair water tower foundation	Good	4	System not working well	1	Within 20 years	2	Infrequently inspected	3	Medium Impact: Opportunity for bundling of materials and labor costs	1.3	***31***

Table 3-4: Capital Improvements – Irrigation System

	Issue	Condition		Risk						Opportunity Cost		Total Score
				Severity		Likelihood		Detection				
Irrigation System												
I1.	Repair existing irrigation main lines or replace with High Density Polyethylene piping	Poor	10	System not working well	1	Within 5 years	4	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs, increased efficiency in system	1.3	***104***
I2.	Install new automatic irrigation system on University Field	Fair	7	System not working well	1	Within 10 years	3	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs, increased efficiency in system	1.3	***55***
I3.	Install new automatic irrigation system on Intramural fields and softball fields	Fair	7	System not working well	1	Within 10 years	3	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs, increased efficiency in system	1.3	***55***
I4.	Install new automatic irrigation system on lower practice fields and baseball fields	Fair	7	System not working well	1	Within 10 years	3	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs, increased efficiency in system	1.3	***55***
I5.	Install irrigation central control system for entire campus, including flow meters and moisture sensors on individual systems	Fair	7	System not working well	1	Within 10 years	3	Somewhat frequently inspected	2	Small Impact: Increased efficiency in system	1.1	***46***
I6.	Replace existing irrigation controllers with controllers compatible with new central control system	Fair	7	System not working well	1	Within 10 years	3	Somewhat frequently inspected	2	Small Impact: Increased efficiency in system	1.1	***46***
I7.	Install new pump station with a higher efficiency	Fair	7	System not working well	1	Within 10 years	3	Somewhat frequently inspected	2	Small Impact: Increased efficiency in system	1.1	***46***
I8.	Connect existing potable water irrigation (Boor Sculpture Studio, Life Sciences, Science Library, University Hall and University Police) systems to the lake water supply	Good	3	System not working well	1	Within 10 years	3	Somewhat frequently inspected	2	Medium Impact: Opportunity for bundling of materials and labor costs, increased efficiency in system, reduce water consumption and costs	1.3	***23***
I9.	Install weather station	Good	3	System not working well	1	Within 10 years	3	Somewhat frequently inspected	2	Small Impact: Increased efficiency in system	1.1	***20***

3.1.1 Priority Projects

The Priority Projects, with ranked scores above 250, are as follows:

- S1 – Replacement of sanitary sewer pipe of unsuitable material;
- S2 – Replacement of sanitary sewer manholes in poor condition;
- D1 – Replacement of storm sewer pipe in poor condition;
- W1 – Replacement of fire hydrants in poor condition;
- W2, W3, W5, W6, and W7 – Water tower repairs;
- W4 – Replacement of undersized fire hydrant service connections; and
- W8 – Replacement of water valves that close in the wrong direction.

3.2 IMPLEMENTATION PLAN

Using the method described in Section 2, ranked capital improvements were merged into an Implementation Plan. This plan is presented below, by year, with the proposed capital improvement projects divided by utility system. The ranking scores are also presented with the capital improvement items. Where one of the capital improvements presented in Section 3.1 is implemented across several years, the capital improvement project is listed in more than one implementation plan year, noted as (a), (b), (c), or (d). The locations of the proposed capital improvements and the proposed campus construction projects, are shown in Figures 3-1 through 3-5. In all years of this plan, infrastructure should be re-inspected as recommended in the Inspection and Maintenance Plan prepared for the University at Albany by Woodard & Curran.

The Priority Projects are each addressed, at least in part, during Year 1 – 2008/2009 to mitigate the risk to the University until more comprehensive rehabilitation or replacement is scheduled during subsequent plan years.

3.2.1 Year 1 – 2008/2009

Proposed Campus Construction Projects

The only campus construction anticipated during Year 1 – 2008/2009 is the dredging of the storm water pond used for irrigation water supply. No other major capital improvements are planned in this area for Year 1 – 2008/2009.

Capital Improvement Plan Items

Sanitary Sewer System

S1. Sanitary Sewer Pipe Replacement (450pts) – Replacement of sanitary sewer pipes in poor condition or of unsuitable material is scheduled for Years 2, 3, 4, and 5, coinciding with anticipated construction projects. Those areas where breaks, sagging, root intrusion, grease, or debris were found during the sanitary sewer inspections should be cleaned and, where appropriate, slip-lined to prevent exfiltration from the sanitary sewer system (e.g., – breaks and sags) until they are replaced in future years. Additional segments of the sanitary sewer system pipes should be inspected as recommended in the Inspection and Maintenance Plan prepared for the University at Albany by Woodard & Curran.

S2. Replace Sanitary Sewer Manholes in Poor Condition (300pts) – Replacement of sanitary sewer manholes in poor condition is scheduled for Years 2, 3, 4, and 5, coinciding with anticipated construction projects. The manholes determined to be in poor condition should be inspected in more detail and repaired or rehabilitated, possibly including installing an epoxy liner, to prevent exfiltration from the sanitary sewer system until these manholes are replaced in future years.

Storm Sewer System

D1. Storm Sewer Pipe Replacement (390pts) – Replacement of storm sewer pipes in poor condition is scheduled for Years 2, 3, 4, and 5, coinciding with anticipated construction projects. Those areas where breaks, sagging, root intrusion, or debris were found during the storm sewer inspections should be cleaned and, where appropriate, slip-lined to prevent infiltration or exfiltration from the storm sewer system (e.g., – breaks and sags) until they are replaced in future years. Additional segments of the storm sewer system pipes should be inspected as recommended in the Inspection and Maintenance Plan prepared for the University at Albany by Woodard & Curran.

Water System

W1. Fire Hydrant Repairs (750pts) – While not inspected as part of this study, fire hydrants on the campus were encountered that had loose or broken operating nuts, leaked, were buried too deeply, or had other limitations on their performance. A thorough review of all fire hydrants for operability and repair should be conducted with items remedied during Year 1 – 2008/2009.

W2, W3, W5, W6, W7, W9, W11, W12, and W14. Water Tower Repairs (up to 600pts) – Since it has been several years since the water tower was last inspected and the water tower repairs are not scheduled until Year 3 – 2010/2011, a re-inspection of the water tower should be conducted to reassess the risk of issues during Year 1 – 2008/2009.

W4. Replacement of Fire Hydrant Lines Smaller than 6" (480pts) – While not inspected as part of this study, it appears that some fire hydrants on the campus are supplied with water lines smaller than 6 inches in diameter. These should be identified based on the campus mapping and replaced during Year 1 – 2008/2009.

W8. Replacement of Water Valves in Fair Condition (280pts) – The water valves in the system were not inspected for operability as part of this study. It is known that at least one water system valve on the campus does not open in the standard direction desired by the University at Albany. This valve, and others identified during the valve exercising program identified in the Inspection and Maintenance Plan prepared for the University at Albany, should be repaired or replaced during Year 1 – 2008/2009.

Irrigation System

The pond used for irrigation water is being dredged in Year 1 – 2008/2009. This will increase the water supply available for irrigation.

Major Maintenance Items

Project S1. Sanitary Sewer Replacement is focused on repairs and rehabilitation of the southern interceptor. This project is listed above, under Capital Improvement Plan Items, to track its status, but the interim repairs and rehabilitation may be considered a maintenance item.

Cleaning of storm system catch basins and drain inlets should occur at an accelerated pace. Many of the storm sewer catch basins and drain inlets were found to be clogged with debris and sediment, leading to a poorer condition assessment than may be appropriate if the feature were clean. A re-evaluation of the feature conditions should occur once they are cleaned.

A comprehensive water audit of the irrigation systems and a hydraulic evaluation of the main line irrigation pipes should be conducted in preparation for planned system improvements.

3.2.2 Year 2 – 2009/2010

Proposed Campus Construction Projects

In Year 2 – 2009/2010, the following campus construction projects are proposed:

- State Quadrangle Renovation;

- State Quadrangle Parking;
- Health Center Renovation;
- Grounds Building; and
- Service Building A Renovation.

These projects are generally located on the northern portion of campus, stretching from the eastern border (State Quadrangle Parking) to western side of West Campus Drive (Health Center Renovation), down to Service Building A.

Capital Improvement Plan Items

Sanitary Sewer System

S1(a). Sanitary Sewer Pipe Replacement (up to 450pts) – A partial replacement, approximately 3,800 linear feet, of the sanitary sewer pipe found to be in poor condition is proposed for Year 2 – 2009/2010. The portion of the sanitary sewer system in the northern part of campus should be replaced to address issues with unsuitable material, low slopes, sagging, root intrusion, grease, or debris should be rehabilitated or replaced.

S2(a). Replace Sanitary Sewer Manholes in Poor Condition (300pts) – One sanitary sewer system in the Year 2 – 2009/2010 area was determined to be in poor condition during the condition assessment activities. This sanitary sewer manhole should be rehabilitated or replaced.

S4(a). Replace Sanitary Sewer Manholes in Fair Condition (168pts) – Approximately 15 sanitary sewer manholes found to be in fair condition in the Year 2 – 2009/2010 area should be rehabilitated or replaced.

Storm Sewer System

D1(a). Storm Sewer Pipe Replacement (390pts) – Partial replacement, approximately 927 linear feet, of the storm sewer infrastructure found to be in poor condition is proposed for Year 2 – 2009/2010. The portions of the storm sewer system pipes in the northern part of campus should be replaced to address issues with low slopes, sagging, root intrusion, and debris should be rehabilitated or replaced.

D2(a). Storm Sewer Pipe Replacement (218pts) – Partial replacement, approximately 1,158 linear feet, of the storm sewer pipes found to be in fair condition is proposed for Year 2 – 2009/2010. The portions of the storm sewer system pipes in the northern part of campus should be replaced to address issues with low slopes, sagging, root intrusion, and debris should be rehabilitated or replaced.

D3(a). Storm Sewer Poor Features Replacement (130pts) – Approximately 36 storm sewer features in this area were found to be in poor condition and should be rehabilitated or replaced in Year 2 – 2009/2010. This should occur after cleaning and re-inspection of the features.

D4(a). Storm Sewer Fair Features Replacement (73pts) – Approximately 81 storm sewer features in this area were found to be in fair condition and should be rehabilitated or replaced in Year 2 – 2009/2010. This should occur after cleaning and re-inspection of the features.

D7. State Quadrangle and State Gold Lot Storm Sewer Capacity Increase (73pts) – With the planned construction in this area, an increase in the capacity of the storm sewer system in the vicinity of State Quadrangle and State Gold

Lot area should be considered to mitigate the surcharging in catch basins and manholes predicted to occur during large storm events. This should occur during Year 2 – 2009/2010.

D8. Colonial Quadrangle Storm Sewer Capacity Increase (73pts) – With the planned construction in this area, an increase in the capacity of the storm sewer system in the Colonial Quad area should be considered to mitigate the surcharging in catch basins and manholes predicted to occur during large storm events. This should occur during Year 2 – 2009/2010.

Water System

Assuming that all of the water system projects planned for Year 1 – 2008/2009 were completed, no further water system projects are scheduled for Year 2 – 2009/2010.

Irrigation System

I1. Repair/replace existing irrigation main lines (104pts) – Replacement or repair of the irrigation main piping will conserve water and decrease the cycling and wear on the pumps. This should be done before new irrigation systems are installed. This should occur in Year 2 – 2009/2010.

I5. Installation of central control system (46pts) – Installation of a central control system for the entire campus, including flow meters and moisture sensors on individual systems, will increase the efficiency of the system. This should occur in Year 2 – 2009/2010.

I6. Installation of irrigation controllers (46pts) – Installation of irrigation controllers that are compatible with the new central control system should happen when the new central control system is installed. When the irrigation controllers are installed, it will increase the efficiency of the system. This should occur in Year 2 – 2009/2010.

I9. Installation of weather station (20pts) – Installation of a weather station should happen when the new central control system is installed to maximize the efficiency of the new system. This should occur in Year 2 – 2009/2010.

Major Maintenance Items

Continued implementation of the Inspection and Maintenance Plan, including re-inspection of infrastructure, will verify that the current rankings are appropriate. Adjustments to this plan should be made as necessary. Regular updates to campus infrastructure mapping and condition assessments should occur as needed.

3.2.3 Year 3 – 2010/2011

Proposed Campus Construction Projects

In Year 3 – 2010/2011, the following campus construction projects are proposed:

- School of Business
- Campus Center Addition
- Campus Center Renovation
- Dutch Quad Renovation

- Water Tower and Foundation Renovation
- Student Housing
- Connector Road
- Multi-use Stadium

These projects are located around the Academic Podium, and in the southeast corner of campus.

Capital Improvement Plan Items

Sanitary Sewer System

S1(b), S3, and S5 Sanitary Sewer Replacement (450pts) – A partial replacement, approximately 6,048 linear feet, of the sanitary sewer system where poor conditions were found is proposed to be replaced in Year 3 – 2010/2011. The portion of the sanitary sewer system in the southern part of campus should be replaced to address issues with unsuitable material, low slopes, sagging, and root intrusion, in addition to sanitary sewer manholes found to be in poor condition in this area, should be rehabilitated or replaced. This replacement includes those portions of the southern interceptor repaired during Year 3 – 2010/2011.

S2(b). Replace Sanitary Sewer Manholes in Poor Condition (300pts) – Approximately 5 sanitary sewer system features in this area were found to be in poor condition during the condition assessment activities and should be replaced or rehabilitated during Year 3 – 2010/2011. This should occur after cleaning and re-inspection of the features.

S4(b). Replace Sanitary Sewer Manholes in Fair Condition (168pts) – Approximately 25 sanitary sewer manholes in this area were found to be in fair condition and should be rehabilitated or replaced in Year 3 – 2010/2011. This should occur after cleaning and re-inspection of the features.

S6. Increase Capacity of Southern Interceptor (108pts) – Concurrent with the sanitary sewer pipe replacement in project S1(b), an increase in the capacity of the southern interceptor should be considered for implementation during Year 3 – 2010/2011.

Storm Sewer System

D1(b). Storm Sewer Pipe Replacement (390pts) – Partial replacement, approximately 1,408 linear feet, of the storm sewer infrastructure found to be in poor condition is proposed for Year 3 – 2010/2011. The portions of the storm sewer system pipes in the northern part of campus should be rehabilitated or replaced to address issues with low slopes, sagging, root intrusion, and debris.

D2(b). Storm Sewer Pipe Replacement (218pts) – Partial replacement, approximately 749 linear feet, of the storm sewer pipes found to be in fair condition is proposed for Year 3 – 2010/2011. The portions of the storm sewer system pipes in the northern part of campus should be rehabilitated or replaced to address issues with low slopes, sagging, root intrusion, and debris.

D3(b). Storm Sewer Poor Features Replacement (130pts) – Approximately 47 storm sewer features in this area were found to be in poor condition and should be rehabilitated or replaced in Year 3 – 2010/2011. This should occur after cleaning and re-inspection of the features.

D4(b). Storm Sewer Fair Features Replacement (73pts) – Approximately 180 storm sewer features in this area were found to be in fair condition and should be rehabilitated or replaced in Year 3 – 2010/2011. This should occur after cleaning and re-inspection of the features.

D5. Dutch Gold Lot Storm Sewer Capacity Increase (73pts) – An increase in the capacity of the storm sewer system in Dutch Gold Lot should be considered to mitigate the surcharging in catch basins and manholes predicted to occur during large storm events. This should occur during Year 3 – 2010/2011.

D6. University Drive West Storm Sewer Capacity Increase (73pts) – An increase in the capacity of the storm sewer system along University Drive West near the entrance of Western Avenue should be considered to mitigate the surcharging in catch basins and manholes predicted to occur during large storm events. This should occur during Year 3 – 2010/2011.

Water System

W2, W3, W5, W6, W7, W9, W11, W12, and W14. Water Tower Repairs (up to 600pts) – The repairs to the water tower are proposed for Year 3 – 2010/2011.

W10. Increase the Back-up Water Supply Pressure (168pts) – While the water modeling performed for the water system capacity assessment showed that sufficient capacity is available to meet domestic demands, the model also shows that the pressure fluctuations in the system are largely a function of the supply pressure variations. To remedy this issue and minimize the fluctuations in pressure in the system, booster pump stations at the Washington Avenue supply point should be considered to enhance the viability of supply to meet the pressures and flows, for domestic and fire service purposes, required by the campus. This is proposed to occur during Year 3 – 2010/2011.

Irrigation System

I2. Installation of new irrigation system on University Field (55pts) – Installation of a new automatic irrigation system on University field will increase the efficiency of irrigation on this field. This should occur in Year 3 – 2010/2011.

I3. Installation of new irrigation system on Intramural fields and softball fields (55pts) – Installation of a new automatic irrigation system on the Intramural fields and softball fields will increase the efficiency of irrigation on these fields. This should occur in Year 3 – 2010/2011.

I4. Installation of new irrigation system on lower practice fields and baseball fields (55pts) – Installation of a new automatic irrigation system on the lower practice fields and baseball fields will increase the efficiency of irrigation on these fields. This should occur in Year 3 – 2010/2011.

I7. Installation of new pump station (46pts) – Installation of a new pump station with a higher efficiency will increase the efficiency of the entire irrigation system. This should occur in Year 3 – 2010/2011.

I8(a).Connection of existing irrigation systems to lake water supply (23pts) – The connection of the Science Library, University Hall, and University Police irrigation systems to the lake water supply will conserve water and reduce irrigation costs. This project is optional and should occur in Year 3 – 2010/2011.

Major Maintenance Items

Continued implementation of the Inspection and Maintenance Plan, including re-inspection of infrastructure, will verify that the current rankings are appropriate. Adjustments to this plan should be made as necessary. Regular updates to campus infrastructure mapping and condition assessments should occur as needed.

3.2.4 Year 4 – 2011/2012

Proposed Campus Construction Projects

In Year 4 – 2011/2012, the following campus construction projects are proposed:

- Relocation of Data Center
- Library Renovation
- Science Surge Building

These projects are generally located around the academic podium, and south of Service Building C.

Capital Improvement Plan Items

Sanitary Sewer System

S1(c). Sanitary Sewer Replacement (450pts) – A partial replacement, approximately 1,400 linear feet, of the sanitary sewer system where poor conditions were found is proposed to be replaced in Year 4 – 2011/2012. The portion of the sanitary sewer system in the southern part of campus should be rehabilitated or replaced to address issues with unsuitable material, low slopes, sagging, and root intrusion, in addition to sanitary sewer manholes found to be in poor condition in this area,. This replacement includes those portions of the southern interceptor repaired during Year 3 – 2010/2011.

S2(c). Replace Sanitary Sewer Manholes in Poor Condition (300pts) – One sanitary sewer system found to be in poor condition during the condition assessment activities should be replaced or rehabilitated during Year 4 – 2011/2012. This should occur after cleaning and re-inspection of the features.

S4(c). Replace Sanitary Sewer Manholes in Fair Condition (168pts) – Approximately 5 sanitary sewer manholes found to be in fair condition should be rehabilitated or replaced in Year 4 – 2011/2012. This should occur after cleaning and re-inspection of the features.

Storm Sewer System

D2(c). Storm Sewer Pipe Replacement (218pts) – Partial replacement, approximately 220 linear feet, of the storm sewer pipes found to be in fair condition is proposed for Year 4 – 2011/2012. The portions of the storm sewer system pipes in the northern part of campus should be rehabilitated or replaced to address issues with low slopes, sagging, root intrusion, and debris.

D3(c). Storm Sewer Poor Features Replacement (130pts) – Approximately 29 storm sewer features found to be in poor condition in this area, should be rehabilitated or replaced in Year 4 – 2011/2012. This should occur after cleaning and re-inspection of the features.

D4(c). Storm Sewer Fair Features Replacement (73pts) – Approximately 78 storm sewer features found to be in poor condition in this area, should be rehabilitated or replaced in Year 4 – 2011/2012. This should occur after cleaning and re-inspection of the features.

Water System

W13. Install Meters and Verify Backflow Protection (40pts) – To plan for future expansion needs, identify water conservation opportunities, and take steps to protect the water quality in the University at Albany's water distribution system, usage meters should be installed strategically across the campus and the proper installation and functioning of backflow prevention devices should be confirmed. This should be done during Year 4 – 2011/2012.

Irrigation System

I8(b). Connection of existing irrigation systems to lake water supply (23pts) – The connection of the Bohr Sculpture Studio and Life Sciences Building irrigation systems to the lake water supply will conserve water and reduce irrigation costs. This project is optional and should occur in Year 4 – 2011/2012.

Major Maintenance Items

Continued implementation of the Inspection and Maintenance Plan, including re-inspection of infrastructure, will verify that the current rankings are appropriate. Adjustments to this plan should be made as necessary. Regular updates to campus infrastructure mapping and condition assessments should occur as needed.

3.2.5 Year 5 – 2012/2013

Proposed Campus Construction Projects

In Year 5 – 2012/2013, the following campus construction projects are proposed:

- Parking Structure
- Fine Arts Studio
- Purple Path Phase 2
- Northern Landscape Improvement
- Southern Landscape Improvement
- Construct Storage Structure

These projects are spread across the whole campus. The only capital improvements specifically retained for this phase of the Capital Improvement Plan are those structures directly around the proposed Parking Structure and Fine Arts Studio. It is our understanding that neither of these projects has been allocated funding. Therefore, the Capital Improvement Plan Items listed below may be more likely to be completed if they are shifted into Year 3 – 2010/2011, with the other major infrastructure projects if funding for these projects is not obtained by that point.

Capital Improvement Plan Items

Sanitary Sewer System

S2(d). Replace Sanitary Sewer Manholes in Poor Condition (300pts) – One sanitary sewer system in this area was found to be in poor condition during the condition assessment activities and should be replaced or rehabilitated during Year 5 – 2012/2013. This should occur after cleaning and re-inspection of the features.

S4(d). Replace Sanitary Sewer Manholes in Fair Condition (168pts) – Approximately 3 sanitary sewer manholes in this area were found to be in fair condition and should be rehabilitated or replaced in Year 5 – 2012/2013. This should occur after cleaning and re-inspection of the features.

Storm Sewer System

D3(d). Storm Sewer Poor Features Replacement (130pts) – Approximately 10 storm sewer features found to be in poor condition in this area, should be rehabilitated or replaced in Year 5 – 2012/2013. This should occur after cleaning and re-inspection of the feature.

D4(d). Storm Sewer Fair Features Replacement (73pts) – Approximately 16 storm sewer features found to be in poor condition in this area, should be rehabilitated or replaced in Year 5 – 2012/2013. This should occur after cleaning and re-inspection of the features.

Water System

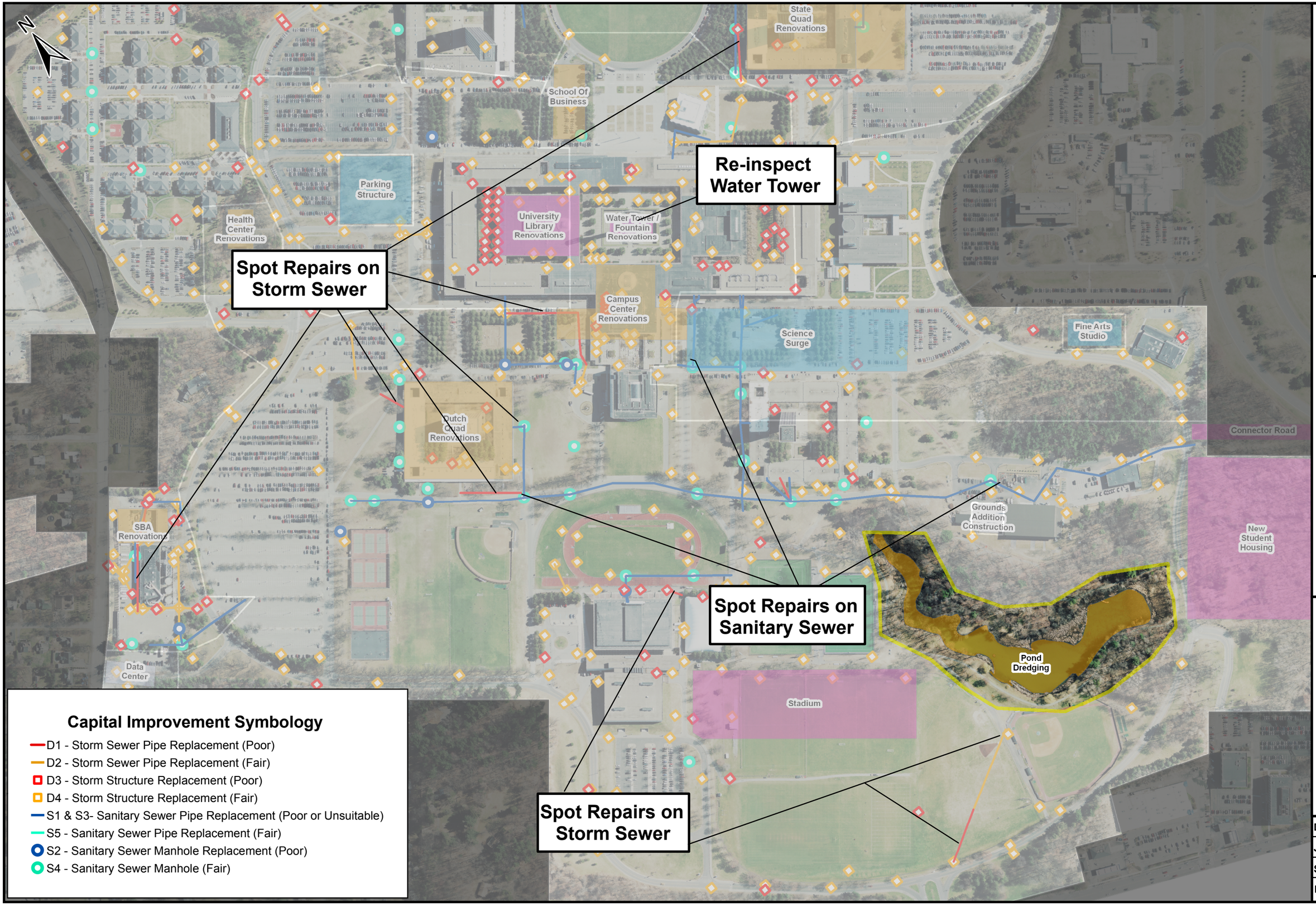
Assuming all capital improvement plan items listed previously have been completed, no additional capital improvement plan items are anticipated for Year 5 – 2012/2013.

Irrigation System

Assuming all capital improvement plan items listed previously have been completed, no additional capital improvement plan items are anticipated for Year 5 – 2012/2013.

Major Maintenance Items

Continued implementation of the Inspection and Maintenance Plan, including re-inspection of infrastructure, will verify that the current rankings are appropriate. Adjustments to this plan should be made as necessary. Regular updates to campus infrastructure mapping and condition assessments should occur as needed.



Capital Improvement Symbology

- D1 - Storm Sewer Pipe Replacement (Poor)
- D2 - Storm Sewer Pipe Replacement (Fair)
- D3 - Storm Structure Replacement (Poor)
- D4 - Storm Structure Replacement (Fair)
- S1 & S3- Sanitary Sewer Pipe Replacement (Poor or Unsuitable)
- S5 - Sanitary Sewer Pipe Replacement (Fair)
- S2 - Sanitary Sewer Manhole Replacement (Poor)
- S4 - Sanitary Sewer Manhole (Fair)

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Year 1 - 2008/2009 Capital Improvements

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University at Albany
Capital Improvement Plan

Feet: 0, 100, 200, 400, 600, 800

Date: November 2008
Job#: 213564
Scale: 1" = 200'
Figure: 3-1

Repair / Replace Main line Irrigation Pipes (I1), Install Central Irrigation Controller (I5), Weather Station (I9), and Compatible Controls (I6) throughout campus.

State Quad Parking Expansion

State Quad Renovations

School Of Business

Parking Structure

Health Center Renovations

University Library Renovations

Water Tower / Fountain Renovations

Campus Center Renovations

Science Surge

Dutch Quad Renovations

SBA Renovations

Data Center

Capital Improvement Symbology

- D1 - Storm Sewer Pipe Replacement (Poor)
- D2 - Storm Sewer Pipe Replacement (Fair)
- D3 - Storm Structure Replacement (Poor)
- D4 - Storm Structure Replacement (Fair)
- S1 & S3- Sanitary Sewer Pipe Replacement (Poor or Unsuitable)
- S5 - Sanitary Sewer Pipe Replacement (Fair)
- S2 - Sanitary Sewer Manhole Replacement (Poor)
- S4 - Sanitary Sewer Manhole (Fair)

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Year 2- 2009/2010 Capital Improvements

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University at Albany Capital Improvement Plan

Feet: 0, 175, 350, 700

Date: November 2008

Job #213564

Scale: 1" = 350'

Figure: 3-2

N

School Of Business

Parking Structure

Health Center Renovations

University Library Renovations

Water Tower / Fountain Renovations

Campus Center Renovations

Science Surge

Fine Arts Studio

Connector Road

Dutch Quad Renovations

SBA Renovations

Data Center

Grounds Addition Construction

New Student Housing

Pond Dredging

Stadium

Connect Irrigation Systems To Pond Supply (I8a)

Upgrade Pump Station (I7)

Install New Irrigation Systems (I2, I3, I4)

Capital Improvement Symbology

- D1 - Storm Sewer Pipe Replacement (Poor)
- D2 - Storm Sewer Pipe Replacement (Fair)
- D3 - Storm Structure Replacement (Poor)
- D4 - Storm Structure Replacement (Fair)
- S1 & S3- Sanitary Sewer Pipe Replacement (Poor or Unsuitable)
- S5 - Sanitary Sewer Pipe Replacement (Fair)
- S2 - Sanitary Sewer Manhole Replacement (Poor)
- S4 - Sanitary Sewer Manhole (Fair)

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Year 3 - 2010/2011 Capital Improvements

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University at Albany
Capital Improvement Plan

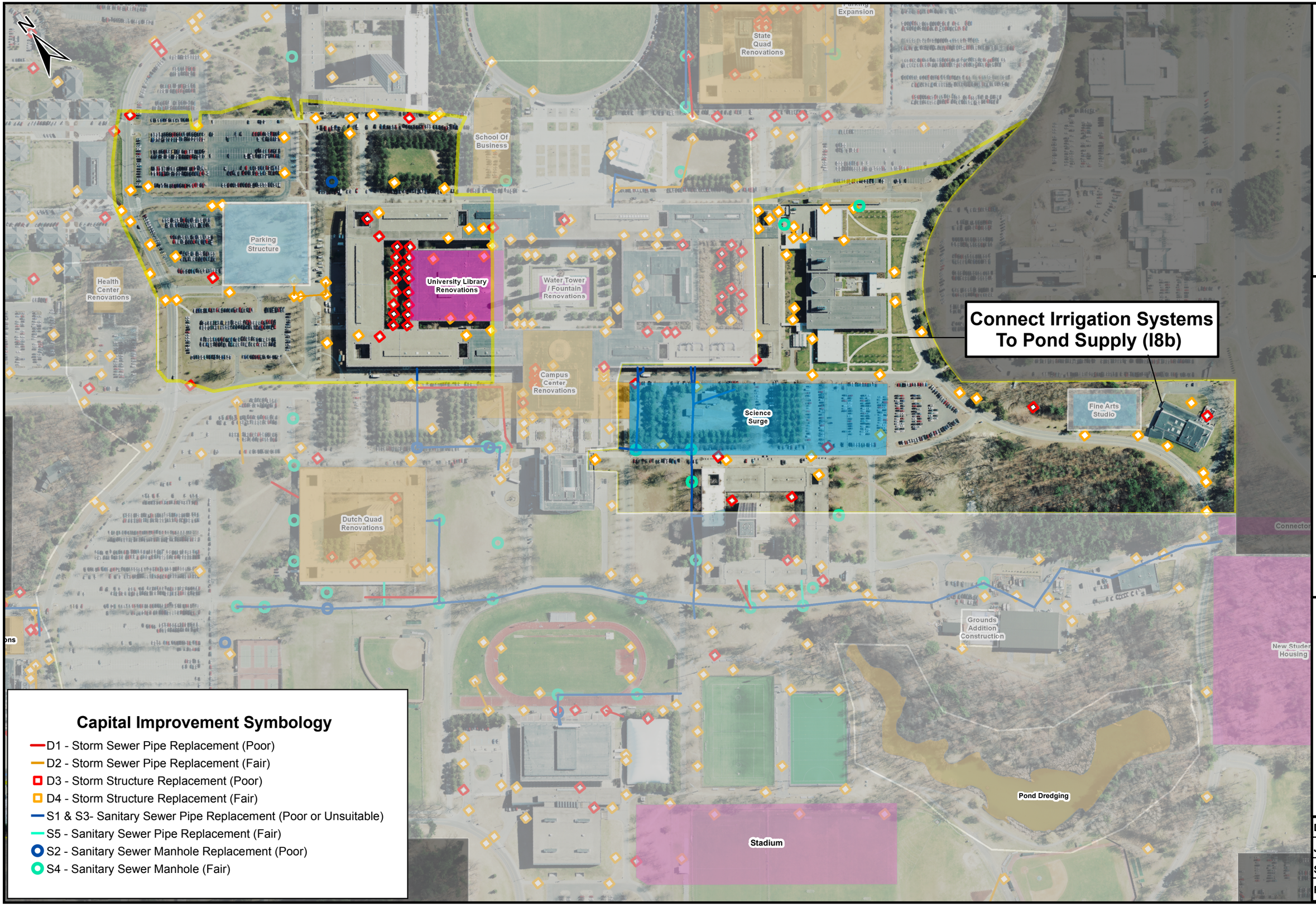
Feet
0 175 350 700

Date: November 2008

Job #213564

Scale: 1" = 350'

Figure: 3-3



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Year 4 - 2011-2012 Capital Improvements

Drawn By: AF

Checked By: SCR

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University at Albany Capital Improvement Plan

Feet: 0, 75, 150, 300, 450, 600

Date: November 2008

Job #213564

Scale: 1" = 300'

Figure: 3-4

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Year 5 - 2012/2013 Capital Improvements

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University at Albany Capital Improvement Plan

Feet: 0 50 100 200 300

Date: November 2008

Job #213564

Scale: 1" = 250'

Figure: 3-5

3.3 CAPITAL IMPROVEMENT PLAN PROJECT COSTS

The estimated costs for the proposed capital improvements were developed to provide SUCF and the University at Albany with a basis for allocating funds for capital improvements. These cost estimates are conceptual in nature, based on industry cost information and past experience with similar projects. These cost estimates are not based on actual design documents, rather on a conceptual generalized scope. The "Construction Totals" for the capital improvement includes materials, equipment, installation, contractor's requirements, profit and overhead. The "Engineering, Permitting, Legal and other Costs" are are assumed to be 20% of the construction cost, as requested by SUCF. The "Project Total" costs are base costs plus soft costs.

The summary of costs for the proposed capital improvement plan items is provided in Table 3-5.

In total, approximately $17.4 million worth of capital improvements were identified. When these costs are considered by utility, including the "Engineering, Permitting, Legal, and other Costs" the total costs are:

- Sanitary Sewer System - $2.3 million;
- Storm Sewer System - $8.9 million;
- Water System - $4.9 million; and
- Irrigation System - $1.2 million.

Table 3-5: Capital Improvement Plan Cost Estimate

Capital Improvement Plan - Individual Water System Projects

SUCF SUNY- Albany

	Project	Unit Cost	Unit		Y1	Y2	Y3	Y4	Y5	Subtotal
Water System										
W1.	Replace fire hydrants in poor condition	$ 3,000	EA	Quantity	1	0	0	0	0	$ 3,000
				Cost	$ 3,000	$ -	$ -	$ -	$ -	
W2.	Remove the water tower's interior ladder and replace non-OSHA compliant railings (and other Water Tower Work)	$ 1,100,000	EA	-	$ -	$ -	$ 1,100,000	$ -	$ -	$ 1,100,000
W3.	Recoat the interior of the water tower	Included in W2								$ -
W4.	Replace 220 feet of pipeline to fire hydrants that are less than 6"	$ 120	LF	Quantity	220	0	0	0	0	$ 26,400
				Cost	$ 26,400	$ -	$ -	$ -	$ -	
W5.	Spot recoat the exterior of water tower	Included in W2								$ -
W6.	Repair joint welds on water tower (betweens beams, braces, gussets and stiffeners)	Included in W2								$ -
W7.	Replace the corroded turnbuckle connections on the water tower	Included in W2								$ -
W8.	Replace valves that do not close in the direction specified by University Standards	$ 4,000	EA	-	$ 4,000	$ -	$ -	$ -	$ -	$ 4,000
W9.	Replace vent screen on water tower	Included in W2								$ -
W10.	Increase the back-up water supply pressure	$ 2,600,000	EA	-	$ -	$ -	$ 2,600,000	$ -	$ -	$ 2,600,000
W11.	Replace corroded non-structural accessories and framed connections on water tower that are in poor condition	Included in W2								$ -
W12.	Recoat the entire exterior of water tower	Included in W2								$ -
W13.	Install meters and verify backflow protection	$ 18,000	EA	Quantity	0	0	0	20	0	$ 360,000
				Cost	$ -	$ -	$ -	$ 360,000	$ -	
W14.	Repair water tower foundation	Included in W2								$ -
	WATER SYSTEM TOTALS				*$ 33,400*	*$ -*	*$ 3,700,000*	*$ 360,000*	*$ -*	*$ 4,093,400*
Sanitary Sewer System										
S1.	Replace sanitary sewer pipe of unsuitable material (vitrified clay or asbestos cement, approximately 11,000 LF)	$ 100	LF	Quantity	0	3,800	5,800	1,400	0	$ 1,100,000
				Cost	$ -	$ 380,000	$ 580,000	$ 140,000	$ -	
S2.	Replace 8 sanitary sewer manholes in poor condition.	$ 14,000	EA	Quantity	0	1	5	1	1	$ 112,000
				Cost	$ -	$ 14,000	$ 70,000	$ 14,000	$ 14,000	
S3.	Replace 158 ft of sanitary sewer pipe in poor condition (non-vitrified clay or asbestos cement)	Included in S1								$ -
S4.	Replace 48 manholes in fair condition	$ 14,000	EA	Quantity	0	5	25	15	3	$ 672,000
				Cost	$ -	$ 70,000	$ 350,000	$ 210,000	$ 42,000	
S5.	Replace 90 ft of sanitary sewer pipe in fair condition	$ 100	LF	Quantity	0	0	90	0	0	$ 9,000
				Cost	$ -	$ -	$ 9,000	$ -	$ -	
S6.	Increase flow capacity of southern interceptor	Included in S1								$ -
	SANITARY SEWER SYSTEM TOTALS				*$ -*	*$ 464,000*	*$ 1,009,000*	*$ 364,000*	*$ 56,000*	*$ 1,893,000*
Storm Sewer System										
D1.	Replace 2,335 ft of storm sewer pipe in poor condition	$ 110	LF	Quantity	0	927	1,408	0	0	$ 256,850
				Cost	$ -	$ 101,970	$ 154,880	$ -	$ -	
D2.	Replace 2,127 ft of storm sewer pipe in fair condition	$ 110	LF	Quantity	0	1,158	749	220		$ 233,970
				Cost	$ -	$ 127,380	$ 82,390	$ 24,200	$ -	
D3.	Replace 58 catch basins, 6 manholes, 1 appurtenance (65 total) in poor condition	$ 14,000	EA	Quantity	0	26	19	10	9	$ 994,600
				Cost	$ -	$ 364,000	$ 266,000	$ 140,000	$ 126,000	
	Replace 62 drain inlets in poor condition	$ 1,700	EA	Quantity	0	10	28	19	1	
				Cost	$ -	$ 17,000	$ 47,600	$ 32,300	$ 1,700	
D4.	Replace 232 catch basins, 46 manholes, and 4 appurtenances (282 total) in fair condition	$ 14,000	EA	Quantity	0	75	125	61	16	$ 4,010,600
				Cost	$ -	$ 1,050,000	$ 1,750,000	$ 854,000	$ 224,000	
	Replace 78 drain inlets in fair condition	$ 1,700	EA	Quantity	0	6	55	17	0	
				Cost	$ -	$ 10,200	$ 93,500	$ 28,900	$ -	
D5.	Increase flow capacity in Dutch Gold Lot area	$ 500,000	LS	-	$ -	$ -	$ 500,000	$ -	$ -	$ 500,000
D6.	Increase flow capacity in University Drive West area, near the entrance of Western Ave.	$ 500,000	LS	-	$ -	$ -	$ 500,000	$ -	$ -	$ 500,000
D7.	Increase flow capacity in State Quadrangle and State Gold Lot areas	$ 500,000	LS	-	$ -	$ 500,000	$ -	$ -	$ -	$ 500,000
D8.	Increase flow capacity in Colonial Quadrangle area	$ 500,000	LS	-	$ -	$ 500,000	$ -	$ -	$ -	$ 500,000
	STORM SEWER SYSTEM TOTALS				*$ -*	*$ 2,670,550*	*$ 3,394,370*	*$ 1,079,400*	*$ 351,700*	*$ 7,496,020*
Irrigation System										
I1.	Repair existing irrigation main lines or replace with High Density Polyethylene piping	$ 300,000	EA	-	$ -	$ 300,000	$ -	$ -	$ -	$ 300,000
I2.	Install new automatic irrigation system on University Field	$ 55,000	EA	-	$ -	$ -	$ 55,000	$ -	$ -	$ 55,000
I3.	Install new automatic irrigation system on Intramural fields and softball fields	$ 125,000	EA	-	$ -	$ -	$ 125,000	$ -	$ -	$ 125,000
I4.	Install new automatic irrigation system on lower practice fields and baseball fields	$ 225,000	EA	-	$ -	$ -	$ 225,000	$ -	$ -	$ 225,000
I5.	Install irrigation central control system for entire campus, including flow meters and moisture sensors on individual systems	$ 45,000	EA	-	$ -	$ 45,000	$ -	$ -	$ -	$ 45,000
I6.	Replace existing irrigation controllers with controllers compatible with new central control system	$ 80,000	EA	-	$ -	$ 80,000	$ -	$ -	$ -	$ 80,000
I7.	Install new pump station with a higher efficiency	$ 90,000	EA	-	$ -	$ -	$ 90,000	$ -	$ -	$ 90,000
I8.	Connect existing potable water irrigation (Boor Sculpture Studio, Life Sciences, Science Library, University Hall and University Police) systems to the lake water supply	$ 20,000	EA	Quantity	0	0	3	2	0	$ 100,000
				Cost	$ -	$ -	$ 60,000	$ 40,000	$ -	
I9.	Install weather station	$ 45,000	EA	-	$ -	$ 45,000	$ -	$ -	$ -	$ 45,000
	IRRIGATION SYSTEM TOTALS				*$ -*	*$ 470,000*	*$ 555,000*	*$ 40,000*	*$ -*	*$ 1,020,000*
	CONSTRUCTION TOTALS				**$ 33,400**	**$ 3,604,550**	**$ 8,658,370**	**$ 1,843,400**	**$ 407,700**	**$ 14,502,420**
	Engineering, Permitting, Legal and other Costs	**20%**			**$ 6,680**	**$ 720,910**	**$ 1,731,670**	**$ 368,680**	**$ 81,540**	**$ 2,900,480**
	PROJECT TOTALS				**$ 40,080**	**$ 4,325,460**	**$ 10,390,040**	**$ 2,212,080**	**$ 489,240**	**$ 17,402,900**

APPENDIX A: CONDITION ASSESSMENT

APPENDIX B: CAPACITY ASSESSMENT