Engineering Report for Proposed Stormwater Improvements in the George Street Drainage Area

PREPARED FOR: City of Key West

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DATE: November 29, 2011

PROJECT NUMBER: 389709

Introduction

The City of Key West (City) has received Federal Emergency Management Agency (FEMA) hazard mitigation grant program (HMGP) funding (HMGP DR-1609-110-R) to address stormwater flooding in the George Street drainage area (the project) in Key West, Florida. The project is organized into two phases, each with an associated set of deliverables. Phase I deliverables include an engineering study, design of project components, and associated permitting activities. Phase II deliverables relate to construction of the project.

As part of the Phase I requirements, this Engineering Report addresses the hydraulic analysis of stormwater modifications in the George Street outfall drainage basin area and includes the following elements:

- A narrative of the drainage problem with the frequency of event causing the flooding, and an estimate of the damages (in dollars) due to flooding. The narrative will include a description of how the modified stormwater system will solve the problem and how much residual damage (in dollars) will occur after the new proposed level of protection.
- A site map showing the location of proposed project components and their location relative to the areas of historic damage within the contributing watershed.

- Hydrologic and/or hydraulic calculations or models that support the proposed mitigation by demonstrating the decrease in future flood levels and associated future flood damages.

Existing Drainage System and Flooding Problem

There are multiple low lying areas within the City's existing gravity drainage system that flood during rain events. One of these areas are located within the George Street drainage basin, depicted in Exhibit 1. The gravity drainage system within the George Street drainage area consists of 12-, 18-, and 24-inch PVC pipes, manholes, and an existing outfall located at the end of George Street, draining to Garrison Bight (a harbor and boat basin). Flooding typically occurs in the basin even during minor events. Areas of more severe flooding are concentrated in the northern portion of the drainage basin. Flooding can also be exasperated by street runoff from higher topography to the west of this area. There are drainage facilities to the west that include catch basins and gravity drainage wells that are overwhelmed or bypassed (primarily due to clogging) during larger storms, with this overflow eventually draining to the lower elevations in the George Street area. This extra water causes standing water for a longer period of time than would otherwise occur. This project will address only the runoff from the George Street drainage area and future projects will address runoff from outside this basin.

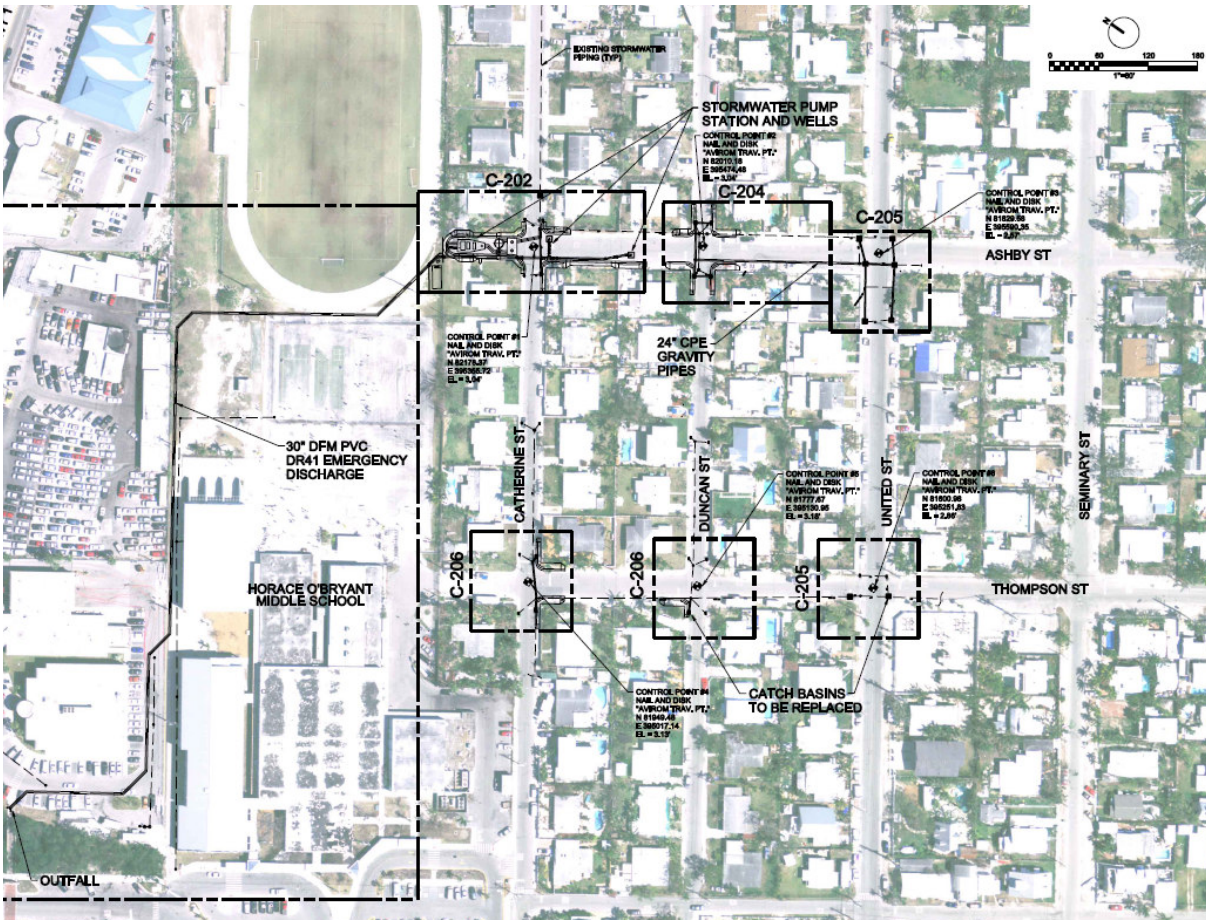
EXHIBIT 1
George Street Drainage Area Evaluated in this Project (Project Basin)

Source: Google Earth

Proposed Project Components

The City will construct a pump station located near the lowest elevation along Ashby Street, just north of Catherine Street, to reduce flooding during large rain events. The pump station would be routed to two pressurized drainage wells. The pressurized system will also have a piped connection to a new outfall at Jose Marti Pond (located west of the drainage basin) and would operate under emergency conditions (to be defined through the permitting process). An emergency generator for the pump station would be included in the project. This project also includes replacing selected drainage infrastructure that is described further below. A schematic diagram of the basin's proposed stormwater infrastructure is shown in Exhibit 2. The existing outfall would remain as is, but the volume of stormwater discharging to receiving waters from the George Street Drainage Area will be greatly reduced by this project.

EXHIBIT 2
George Street Drainage Basin Proposed Infrastructure



The drainage system improvements will include about 400 linear feet of 24-inch diameter PVC gravity pipe, 17 new inlets, a box with a flashboard weir along Catherine Street, and roughly 1,200 linear feet of 30-inch PVC force main to a new headwall at Jose Marti pond.

The new stormwater pump station will include a water quality treatment vortex unit and a permanent stand-by generator elevated above the 100 year flood elevation. Stormwater improvements will also include two 120-foot injection wells located near the pump station. The weir box (located on Catherine Street, between Ashby and George Streets) is to limit the backwater to the pump station during high-tide.

Hydrologic/Hydraulic Analysis

Hydrologic and hydraulic analyses were conducted in support of the proposed improvements in the George Street drainage basin. ICPR (Version 3.10, SP4) was utilized to simulate flood events within the George Street drainage area. This is a computer model approved by FEMA for evaluating flood profiles, and is a link-node type of simulation program. The simulations included an existing condition and post-project scenario. A summary of the modeling efforts and results, comparing existing and the proposed project's post-project conditions, are presented in this report. Please refer to Attachments A and B for the model input and output files, respectively.

The basin hydrology and drainage facility information was developed based on a recent stormwater plan developed by Perez Engineering (2006). The basin delineation, pipe diameters, and invert elevations were derived from their modeling efforts. Their model formed the basis of the existing conditions model. Modifications for the proposed project were made to their model

Hydrology

Basins

For the purposes of this analysis, the George Street drainage basin and adjacent basins[1] were divided in sixteen sub-basins, listed in Exhibit 3. Runoff from each basin is estimated and sent to a node in the model. The time of concentration (TC), area, and curve numbers were calculated for each of the sub-basins, and were inputted into the model.

EXHIBIT 3
Basin Data Table

Basin Location	Node	TC (minutes)	Area (acres)	Curve Number
Catherine and Thompson	2820	19.6	5.118	91.01
Catherine and Ashby	3020	17.8	3.125	90.86
Catherine and George	3000	20.5	3.01	91.33
United and George	3010	19.6	2.292	91.33
United and Ashby	3030	15	3.212	90.94

[1] Western basins are those that drain into Jose Marti Pond. They are not considered part of the George Street drainage area served by the proposed pump station.

EXHIBIT 3
Basin Data Table

Basin Location	Node	TC (minutes)	Area (acres)	Curve Number
Seminary and Ashby	3040	17.6	6.997	91.03
Seminary and Thompson	2830	26.5	13.683	91.63
Western Basin 1	Pond	16.9	2.583	90.89
Western Basin 2	Pond	14.6	0.351	90.92
Western Basin 3	Pond	17.7	1.714	91.07
Western Basin 4	Pond	19.2	2.08	91.7
Western Basin 5	Pond	18	1.945	91.07
Western Basin 6	Pond	13.2	1.769	91.07
Western Basin 7	Pond	20.04	3.031	91.07
Western Basin 8	Pond	18.8	3.481	90.99
Western Basin 9	Pond	18.8	4.349	90.53

Western basins are those that drain into Jose Marti Pond. They are not considered part of the George Street drainage area served by the proposed pump station.

Design Storms

All of the simulations were run using five different design storms, with recurrence intervals of between 5 and 100 years, and durations of 24 and 72 hours. The FEMA base flood is defined as the 100-year, 72-hour storm with a precipitation of 17 inches. The design storms and their associated rainfall amounts are presented in Exhibit 4.

EXHIBIT 4
Design Storms Simulated

Frequency (years)	Duration (hours)	Precipitation (inches)	Rainfall Histogram
5	24	6	FLMOD
10	24	7	FLMOD
25	24	9	FLMOD
25	72	12	SFWMD72
100	72	17	SFWMD72

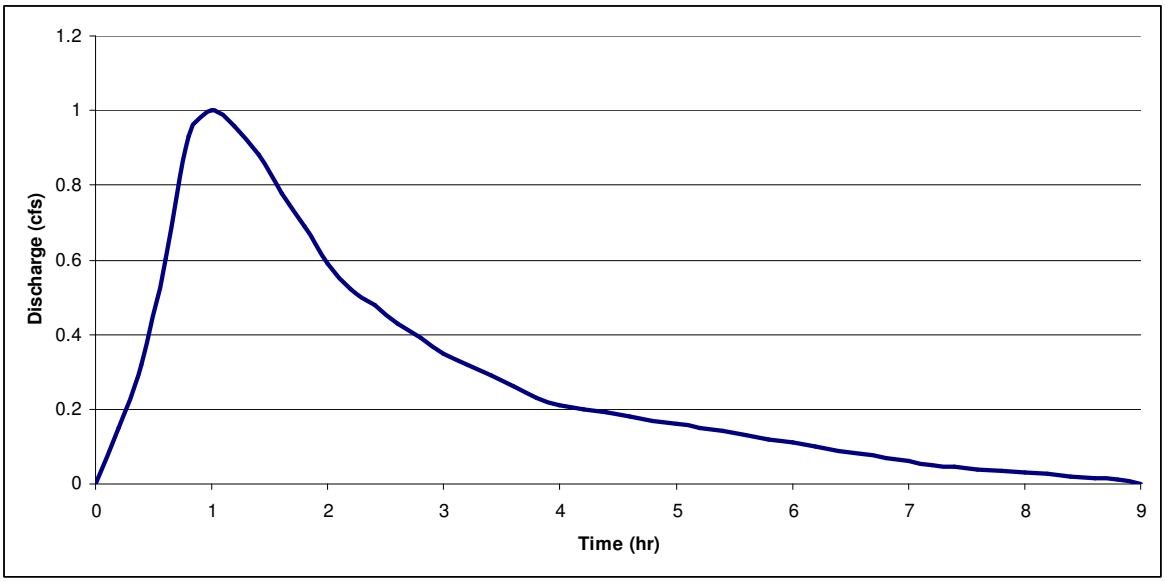
FLMOD is a 24-hour distribution adopted for use by the Florida stormwater agencies.

SFWMD72 is to be used for 72-hour storms and is the common regulatory distribution to be used for local permitting.

Runoff Hydrographs

An SCS unit hydrograph with a peaking factor of 256 (per South Florida Water Management District, SFWMD, rules) was used for all drainage basins and storm events. A graph of this unit hydrograph is shown below in Exhibit 5.

EXHIBIT 5
SCS Unit Hydrograph 256



Nodes are used to simulate the storage of stormwater on the basin surface (ponds), in manholes and in the streets, until the conveyance can drain the runoff. The nodes used in this modeling effort are described in Exhibit 6. A nodal diagram is furnished as Attachment C. All elevations are expressed in SFWMD's standard National Geodetic Vertical Datum of 1929 (NGVD29). The plunge factor increases the pipe's head loss coefficient at the node in the ICPR model. Boundary elevations are discussed further below.

EXHIBIT 6
Node Data Table

Node Location	Name	Type	Initial Stage (ft, NGVD 29)	Warning Stage (ft, NGVD 29)	Plunge Factor
Catherine and Thompson	2820	Stage/Area	1.1	3.05	1.3
Seminary and Thompson (west of interchange)	2830	Stage/Area	1.1	2.88	1.3
Seminary and Ashby	3040	Manhole: 1/2 Diam Grooved	1.1	2.83	1.3
United and Ashby (lowest intersection)	3030	Stage/Area	1.1	2.49	1.3
Catherine and Ashby (pump	3020	Stage/Area	1.1	2.97	1.3

EXHIBIT 6
Node Data Table

Node Location	Name	Type	Initial Stage (ft, NGVD 29)	Warning Stage (ft, NGVD 29)	Plunge Factor
station location)					
United and George	3010	Manhole: 1/2 Diam Grooved	1.1	3.24	1.3
Catherine and George	3000	Stage/Area	1.1	2.97	1.3
Garrison Bight, MHW	Bound	Time/Stage	1.1	999	1
Pump station at north end of Ashby*	PS	Stage/Area	1.1	2.6	1
Storage prior to pump station, wet well and vortex*	WQB	Stage/Area	1.1	2	1.3
South side of Roosevelt Road*	CheckBox	Manhole: Flat Floor	1.1	2.5	1
Duncan and Ashby*	DuncAsh	Manhole: Flat Floor	1.1	3.04	1
United and Thompson	UnitedThompson	Stage/Area	1.1	2.8	1.3
Inlet box prior to pump station, low flow diversion to vortex*	WQBa	Stage/Area	1.1	2.5	1
Jose Marti Pond	Pond	Stage/Area	1.1	3	1
Manhole between Catherine/Thompson intersection and Jose Marti Pond	cat-thom	Manhole: 1/2 Diam Grooved	1.1	0	1.3
Seminary and Thompson (east of interchange)	2830b	Stage/Area	1.1	2.88	1.3
Weir box (east Catherine) west*	WBox-ECat	Stage/Area	1.1	3	1
Weir box (east Catherine) east*	WBox-ECatb	Stage/Area	1.1	3	1
Wells*	Groundwater	Time/Stage	0.5	0	1

*Proposed project component.

Garrison Bight (a marina) is the tailwater boundary for all modeling scenarios. Jose Marti Pond is hydraulically connected to Garrison Bight also (open culverts). The tailwater elevation utilized was 1.10 feet NGVD29, the Mean High Water Level (MHW) for Garrison Bight. This data was attained was obtained using NOAA's tide data found online for Station 8724580, Key West, FL (NOAA 2009).

Conveyance of Stormwater

A table of existing and proposed pipes is provided as Exhibit 7. The existing pipes are 12 and 24 inches in diameter. The proposed PVC drainage force main, downstream of the proposed pump station, has a 30-inch diameter to facilitate a pressurized flow at lower velocities to keep losses low. Flow on basin's surface—primarily through the streets, was

simulated as channel flow using a typical trapezoidal cross-section. A summary of these channels is presented in Exhibit 8.

EXHIBIT 7
Table of Pipes

Name	From Node	To Node	Flow Direction	Length (feet)	Diameter (inches)	Upstream Invert (feet, NGVD 29)	Downstream Invert (feet, NGVD 29)
P3010	3010	3000	Both	375	24	-2	-2.64
WQBtoPS*	WQB	PS	Positive	50	36	-3	-3.2
P3020	3020	3000	Both	420	24	-1.56	-2.64
P3030*	DuncAsh	3020	Both	200	12(24*)	-1.53(-3)	-1.56(-6)
DuncAsh	3030	3020	Both	200	24	-1.53	-1.56
P3040	3040	3030	Both	250	24	-1.51	-1.53
P2820	UnitedThompson	2820	Both	400	24	-1.5	-1.79
P2830*	2830	3040	Both	400	12	-1.47	-1.51
P3000WQ1*	3000	CheckBox	Both	320	24	-2.65	-2.7
P2820b	2830	UnitedThompson	Both	250	24	-1.47	-1.5
P3030eastPS	3020	WQBa	Both	20	36	-2	-3
ChecktoBound*	CheckBox	Bound	Both	400	30	-3.6	-3.64
Culvert1	Pond	Bound	Both	80	60	-2.9	-2
2820 to 2810	2820	cat-thom	Both	400	36	-1.79	-2.52
2810 to pond	cat-thom	Pond	Both	450	42	-2.42	-4.36
PSlowflow	WQBa	WQB	Both	10	30	-5.55	-5.6
P3020b	WBox-ECatb	3000	Both	200	24	-2.5	-2.64

*Proposed project component.
Salt water barrier not included at proposed weir box along Catherine Street (Pipe 3020)

EXHIBIT 8
Table of Channels

Name	From Node	To Node	Length (feet)	Upstream Invert (feet, NGVD 29)	Downstream Invert (feet, NGVD 29)
3010to3000	3010	3000	375	3.24	2.97
3020to3000	3020	3000	425	2.97	2.97
3040to3030	3040	3030	250	2.83	2.49
3030to3020	3030	3020	375	2.49	2.97
2830to3040	2830	3040	400	2.88	2.83
2820to3020	3020	2820	400	3.05	2.97
2820toUT	2820	UnitedThompson	400	3.05	2.8
WQBtoBOUND	3000	CheckBox	600	3	3.4
2830toUT	2830	UnitedThompson	260	2.94	2.8
UTto3030	UnitedThompson	3030	400	2.8	2.49
3010to3030	3010	3030	400	3.25	2.49

Pump Station

The proposed pump station will be located near the intersection of Catherine Street and Ashby Street, where there is room for the pump station and generator at the end of the dead end street and by the Horace O'Bryant Middle School. The proposed pump station was modeled with two 15 cfs pumps, using the operating table shown in Exhibit 9. This flow rate was selected because it is approximately the same peak capacity of the existing gravity outfall when it is able to flow freely. This flow rate is also similar to those pumps used for existing pressurized injection wells installed on the island.

EXHIBIT 9
Pump Station Operating Table

Pump	On Elevation	Off Elevation
Pump 1	0.5	-4.0
Pump 2	1.0	-5.0

Elevation datum: NGVD29

Sediment Removal Structure

To improve stormwater quality prior to discharging at the outfall, a vortex sediment separator will be utilized to assist in large sediment and trash removal. The vortex is specified to handle the 30 cfs design flow of the pump station. An inlet structure to the

vortex box will be a double-chambered box, with a weir separating the chambers. The weir is modeled with a rectangular opening of 10 feet wide by 2 feet deep. The invert and control elevation of the weir is at 0.5 feet NGVD29. Low flows will be directed through the vortex unit first and weir overflow will bypass the vortex and drain to the wet well.

Simulation Results

The greatest improvements in drainage will result from the reduction in flooding duration. The pump station will drain the basin more rapidly, especially during the higher storms which may be blocked by high tides. Residential drainage improvements in coastal areas are often difficult to achieve for the large design storms typically used in FEMA benefit analyses because of the low landscape and high tide elevations. The proposed project will greatly improve drainage for the smaller 5-year storm, moreso than for the larger storms. However, most benefits are measured by FEMA in the reduction of the 100-year peak flood elevations.

The results of the model simulations are presented in Exhibit 10. Overall, the proposed project improvements would help to reduce flooding problems in the George Street drainage basin. The greatest expected reductions in flood elevations occur near the areas along Catherine Street, between Ashby and George Streets, with stage reductions ranging between 0.7-foot to 1.75-foot in areas near the pump station. Moderate improvements are seen moving southward along Ashby and George Streets, near the intersection of United Street, with stage reductions ranging from about 0.2-foot to approximately 0.7-foot near the United/George intersection for the 5-year, 24-hour synthetic storm event. Small improvements to peak stages are expected in western areas of the basin along Thompson Street, and southern areas of the basin along Seminary Street.

With regard to the design storms, the greatest improvements are expected with the 5-year storm, having a precipitation of 6 inches over a 24-hour period. For this storm, the anticipated average stage reduction over the entire basin is approximately 0.5-foot, as listed in Exhibit 11. A 0.46-foot improvement was simulated for the 10-year, 24-hour storm; 25-year, 24-hour and 25-year, 72-hour storms averaged a 0.4-foot stage reduction; and the 100-year, 72-hour storm will see a stage decrease of about 0.25-foot.

EXHIBIT 10

Simulation Results for Various Design Storms

Location	Simulation	Warning Stage	Proposed Project		Existing Conditions		Difference w/ Project
			Max. Stage	Depth of Flooding[2]	Max. Stage	Depth of Flooding[3]	
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Catherine and Ashby	5-yr, 24-hr	2.97	1.42	-1.55	3.17	-0.20	1.75
Pump Station (PS) location	10-yr, 24-hr	2.97	1.54	-1.43	3.24	-0.27	1.70
	25-yr, 24-hr	2.97	1.86	-1.11	3.37	-0.40	1.51

[2] Negative value indicates that maximum flood stage occurs below street level.

[3] Negative value indicates that maximum flood stage occurs below street level.

EXHIBIT 10
Simulation Results for Various Design Storms

Location	Simulation	Warning Stage	Proposed Project		Existing Conditions		Difference w/ Project
			Max. Stage	Depth of Flooding[2]	Max. Stage	Depth of Flooding[3]	
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
	25-yr, 72-hr	2.97	1.91	-1.06	3.37	-0.40	1.46
	100-yr, 72-hr	2.97	2.88	-0.09	3.56	-0.59	0.68
Duncan and Ashby	5-yr, 24-hr	3.04	2.14	-0.90	3.17	-0.13	1.03
	10-yr, 24-hr	3.04	2.26	-0.78	3.25	-0.21	0.99
	25-yr, 24-hr	3.04	2.50	-0.54	3.37	-0.33	0.87
	25-yr, 72-hr	3.04	2.50	-0.54	3.38	-0.34	0.88
	100-yr, 72-hr	3.04	3.21	0.17	3.56	-0.52	0.35
United and Ashby	5-yr, 24-hr	2.49	2.98	0.49	3.22	-0.73	0.24
	10-yr, 24-hr	2.49	3.11	0.62	3.29	-0.80	0.18
	25-yr, 24-hr	2.49	3.27	0.78	3.40	-0.91	0.13
	25-yr, 72-hr	2.49	3.28	0.79	3.41	-0.92	0.13
	100-yr, 72-hr	2.49	3.49	1.00	3.59	-1.10	0.10
Seminary and Ashby	5-yr, 24-hr	2.83	3.17	0.34	3.25	-0.42	0.08
	10-yr, 24-hr	2.83	3.23	0.40	3.32	-0.49	0.09
	25-yr, 24-hr	2.83	3.35	0.52	3.43	-0.60	0.08
	25-yr, 72-hr	2.83	3.35	0.52	3.44	-0.61	0.09
	100-yr, 72-hr	2.83	3.53	0.70	3.61	-0.78	0.08
George and N. Roosevelt	5-yr, 24-hr	2.50	1.42	-1.08	1.67	0.83	0.25
	10-yr, 24-hr	2.50	1.47	-1.03	1.69	0.81	0.22
	25-yr, 24-hr	2.50	1.55	-0.95	1.74	0.76	0.19
	25-yr, 72-hr	2.50	1.56	-0.94	1.75	0.75	0.19
	100-yr, 72-hr	2.50	1.67	-0.83	1.88	0.62	0.21
Catherine and George	5-yr, 24-hr	2.97	2.16	-0.81	2.99	-0.02	0.83
	10-yr, 24-hr	2.97	2.35	-0.62	3.06	-0.09	0.71
	25-yr, 24-hr	2.97	2.63	-0.34	3.24	-0.27	0.61
	25-yr, 72-hr	2.97	2.65	-0.32	3.25	-0.28	0.60
	100-yr, 72-hr	2.97	2.99	0.02	3.54	-0.57	0.55
United and George	5-yr, 24-hr	3.24	2.44	-0.80	3.12	0.12	0.68
	10-yr, 24-hr	3.24	2.74	-0.50	3.21	0.03	0.47
	25-yr, 24-hr	3.24	3.15	-0.09	3.35	-0.11	0.20
	25-yr, 72-hr	3.24	3.17	-0.07	3.35	-0.11	0.18

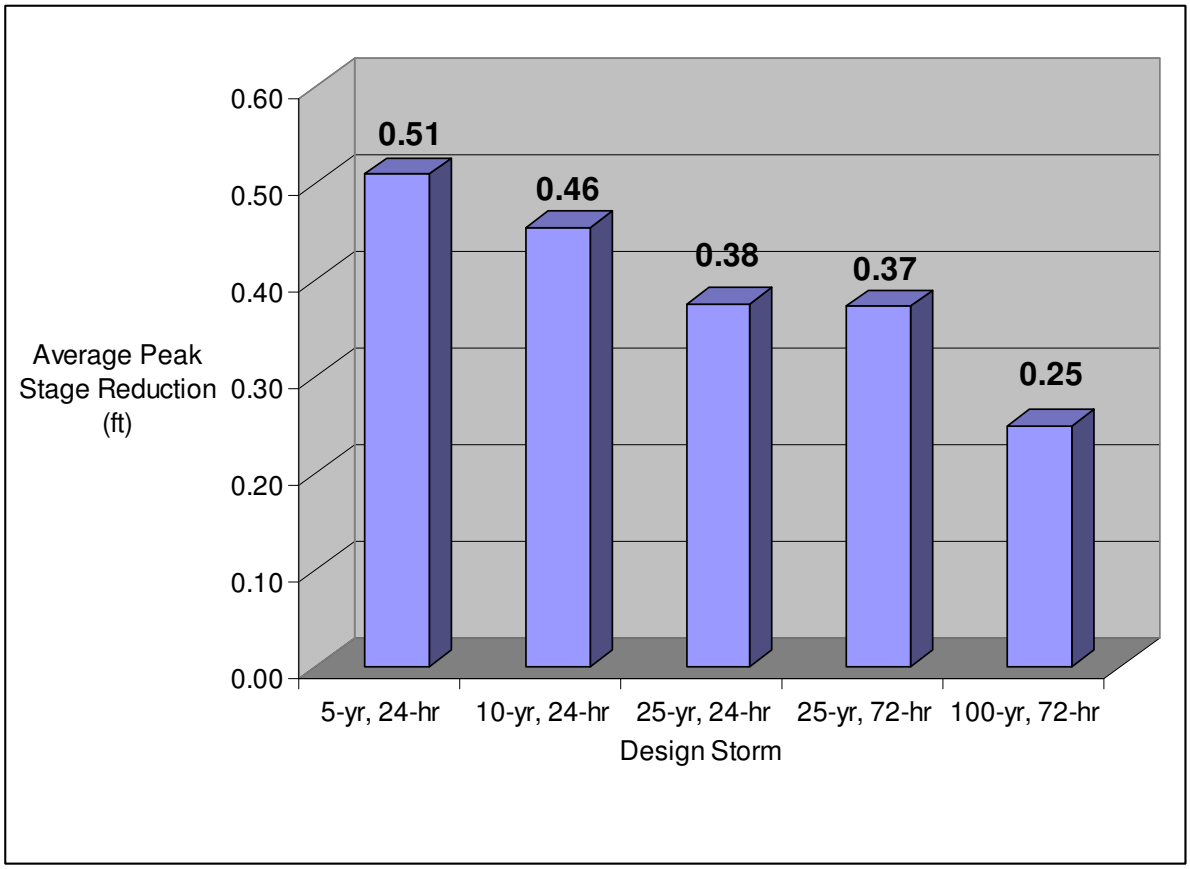
EXHIBIT 10
Simulation Results for Various Design Storms

Location	Simulation	Warning Stage	Proposed Project		Existing Conditions		Difference w/ Project
			Max. Stage	Depth of Flooding[2]	Max. Stage	Depth of Flooding[3]	
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
	100-yr, 72-hr	3.24	3.40	0.16	3.58	-0.34	0.18
Catherine and Thompson	5-yr, 24-hr	3.05	2.21	-0.84	2.21	0.84	0.00
	10-yr, 24-hr	3.05	2.43	-0.62	2.44	0.61	0.01
	25-yr, 24-hr	3.05	2.81	-0.24	2.84	0.21	0.03
	25-yr, 72-hr	3.05	2.87	-0.18	2.91	0.14	0.04
	100-yr, 72-hr	3.05	3.18	0.13	3.37	-0.32	0.19
United and Thompson	5-yr, 24-hr	2.80	2.98	0.18	3.20	-0.40	0.22
	10-yr, 24-hr	2.80	3.11	0.31	3.27	-0.47	0.16
	25-yr, 24-hr	2.80	3.28	0.48	3.40	-0.60	0.12
	25-yr, 72-hr	2.80	3.28	0.48	3.41	-0.61	0.13
	100-yr, 72-hr	2.80	3.49	0.69	3.59	-0.79	0.10
Seminary and Thompson	5-yr, 24-hr	2.88	3.29	0.41	3.30	-0.42	0.01
west of interchange	10-yr, 24-hr	2.88	3.34	0.46	3.36	-0.48	0.02
	25-yr, 24-hr	2.88	3.44	0.56	3.47	-0.59	0.03
	25-yr, 72-hr	2.88	3.44	0.56	3.47	-0.59	0.03
	100-yr, 72-hr	2.88	3.58	0.70	3.63	-0.75	0.05
Seminary and Thompson	5-yr, 24-hr	2.88	3.28	0.40	3.30	-0.42	0.02
east of interchange	10-yr, 24-hr	2.88	3.34	0.46	3.36	-0.48	0.02
	25-yr, 24-hr	2.88	3.44	0.56	3.46	-0.58	0.02
	25-yr, 72-hr	2.88	3.44	0.56	3.47	-0.59	0.03
	100-yr, 72-hr	2.88	3.58	0.70	3.63	-0.75	0.05
Leon and Catherine	5-yr, 24-hr	-	1.67	-	1.67	-	0.00
(Out of Drainage Area)	10-yr, 24-hr	-	1.80	-	1.81	-	0.01
	25-yr, 24-hr	-	2.08	-	2.09	-	0.01
	25-yr, 72-hr	-	2.12	-	2.14	-	0.02
	100-yr, 72-hr	-	2.52	-	2.54	-	0.02
Jose Marti (JM) Pond	5-yr, 24-hr	-	1.38	-	1.38	-	0.00
(Out of Drainage Area)	10-yr, 24-hr	-	1.47	-	1.47	-	0.00
	25-yr, 24-hr	-	1.68	-	1.68	-	0.00

EXHIBIT 10
Simulation Results for Various Design Storms

Location	Simulation	Warning Stage	Proposed Project		Existing Conditions		Difference w/ Project
			Max. Stage	Depth of Flooding[2]	Max. Stage	Depth of Flooding[3]	
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
	25-yr, 72-hr	-	1.72	-	1.72	-	0.00
	100-yr, 72-hr	-	2.16	-	2.17	-	0.01
Garrison Bight	5-yr, 24-hr	-	1.10	-	1.10	-	0.00
(Boundary Condition, constant)	10-yr, 24-hr	-	1.10	-	1.10	-	0.00
	25-yr, 24-hr	-	1.10	-	1.10	-	0.00
	25-yr, 72-hr	-	1.10	-	1.10	-	0.00
	100-yr, 72-hr	-	1.10	-	1.10	-	0.00

EXHIBIT 11
Average Basin Stage Reduction with Proposed Project



Estimate of Project Costs and Damages

There are significant costs associated with the previously described flooding problem and the proposed mitigation; however, the proposed improvements are anticipated to also provide some level of benefit to those within the drainage basin. Using FEMA's Benefit Cost Analysis Software version 4.5.5 (BCA), this section quantifies the benefits (in dollars) yielded through the project and compares these benefits against estimated project cost in the form of a benefit-cost ratio (BCR).

Methodology

Finish floor elevations (FFE) were surveyed for a representative sample of homes within the drainage basin. Building replacement values (BRV) for these properties were then researched on the Monroe County Property Appraiser's website. A listing and map of these homes are provided in Exhibits 12 and 13, respectively.

EXHIBIT 12

Surveyed Residences Representative in Low Areas of George Street Basin

Address	Total Living Area (SF)	BRV ($)	FFE (NGVD 29)
1708 Catherine Street	915	110,740	2.76
1704 Duncan Street	1,104	127,716	2.93
1200 George Street	1,447	139,704	2.86
1611 United Street	765	103,637	1.95
1615 United Street	1,437	186,401	2.24
1616 United Street	1,215	125,709	3.83
1605 United Street	1,292	143,183	3.90
1611 Seminary Street	1,199	143,244	3.36
1619 Seminary Street	1,040	97,895	4.15
1225 Ashby Street	1,096	126,680	4.83
1106 Ashby Street	1,008	93,743	2.60
1300 Ashby Street	1,760	190,161	3.46

EXHIBIT 13
Map of Surveyed Residences

Source: Google Earth

BCA calculates the BCR on a per-structure basis, and then calculates a project BCR based on the structures associated with the project. Because only a representative sample of the properties were surveyed and the whole basin collects runoff like a bowl during large events, parcels within the drainage basin having similar FFE were grouped into three regions (each considered a "structure" for input into BCA) for which average features of the parcels in that region—FFE, BRV, total living area, flood depth, etc.—were calculated. These regions were delineated, and averages were determined based on survey elevation data, visual inspection of the properties, and engineering judgment. Property data—including the total living area, BRV, the average FFE per area, and number of parcels in each region—are

shown in Exhibit 14. Exhibit 15 shows pre- and post-project flood depths for each region. Exhibit 16 depicts of the region boundaries.

EXHIBIT 14
Property/Area Data

Address	Region	Approximate Number of Parcels	Average FFE Per Region[1] (ft NGVD29)	Average BRV[2] ($/SF)	Total Approximate Living Area[3] (SF)	Total Building Value[4] ($ million)	Monthly Displacement Costs[5] ($)
1611 United Street	Region 1	70	2.6	102	77,887	7.9	188,390
1615 United Street							
1106 Ashby Street							
1708 Catherine Street							
1200 George Street							
1704 Duncan Street							
1611 Seminary Street	Region 2	60	3.6	97	81,990	8.0	198,315
1300 Ashby Street							
1616 United Street							
1605 United Street							
1619 Seminary Street	Region 3	90	4.5	102	96,120	9.8	232,492
1225 Ashby Street							
Total		**220**			**255,997**	**25.7**	**619,197**

1. Average FFE of surveyed properties in region.
2. Average building replacement value per square foot of living area of surveyed properties within region.
3. Approximation of total living area of all structures within region (calculated by multiplying the number of parcels in the region by the average of the total living area for each of the surveyed structures).
4. Approximation of the combined building value of all structures within the region (calculated by multiplying (2) average BRV by (3) total approximate living area).
5. Calculated by multiplying (3) total approximate living area by $2.42/SF/month (standard displacement cost adjusted for cost of living in Key West).

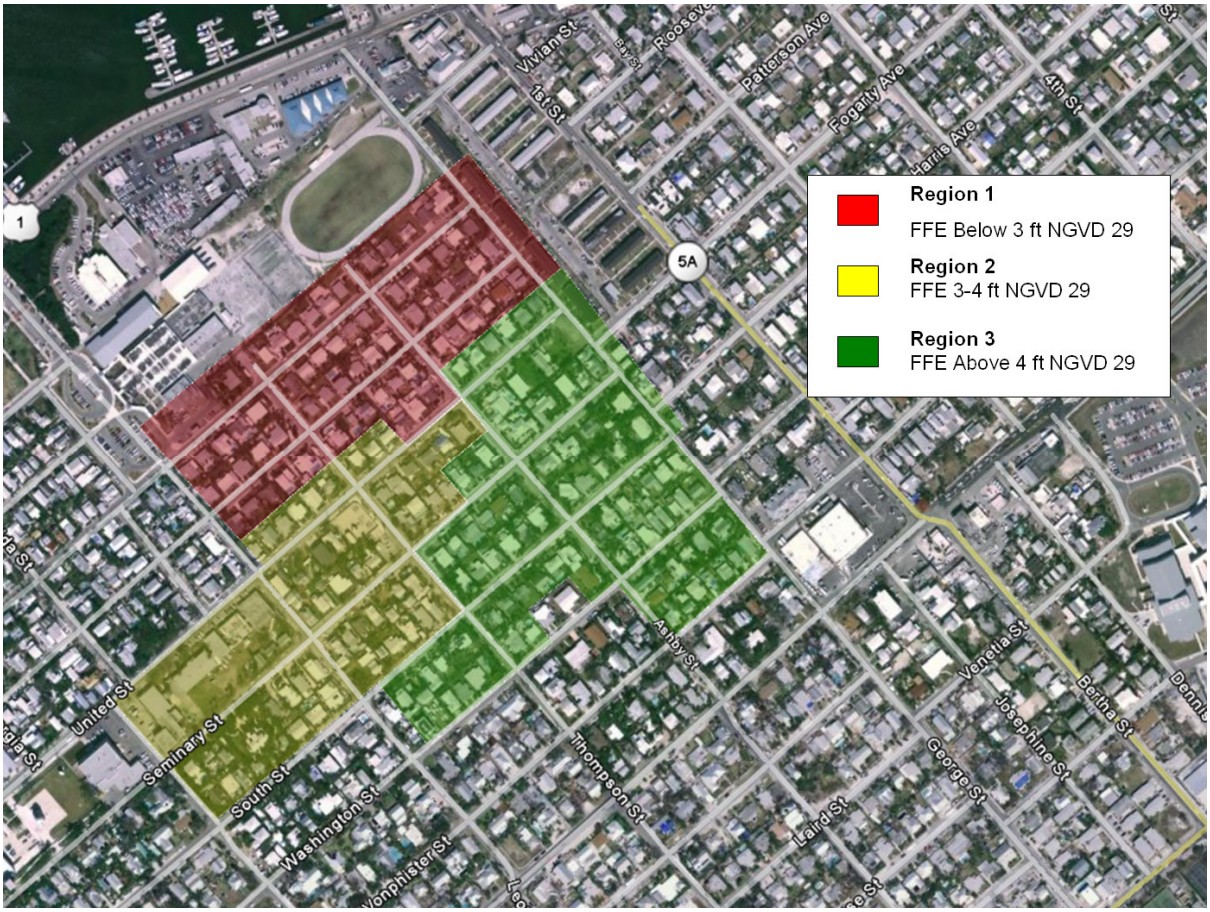
EXHIBIT 15

Region	Storm Event	Post-mitigation	Pre-mitigation	Improvement (ft)
1	5-yr, 24-hr	1.98	2.89	0.90
	10-yr, 24-hr	2.15	3.00	0.85
	25-yr, 24-hr	2.45	3.21	0.76
	25-yr, 72-hr	2.48	3.23	0.75
	100-yr, 72-hr	3.07	3.51	0.44
2	5-yr, 24-hr	3.13	3.26	0.12
	10-yr, 24-hr	3.03	3.31	0.27
	25-yr, 24-hr	3.36	3.43	0.08
	25-yr, 72-hr	3.36	3.44	0.08
	100-yr, 72-hr	3.54	3.61	0.07
3	5-yr, 24-hr	3.47	3.60	0.13
	10-yr, 24-hr	2.99	3.27	0.28
	25-yr, 24-hr	3.25	3.39	0.14
	25-yr, 72-hr	3.26	3.40	0.14
	100-yr, 72-hr	3.47	3.60	0.13

Flood Elevations and Improvements By Region

Region	Storm Event	Pre-mitigation	Post-mitigation	Improvement (ft)
1	5-yr, 24-hr	2.73	1.88	0.85
	10-yr, 24-hr	3.15	2.46	0.69
	25-yr, 72-hr	2.88	2.09	0.79
	100-yr, 72-hr	3.53	3.04	0.49
2	5-yr, 24-hr	3.31	3.12	0.19
	10-yr, 24-hr	3.48	3.35	0.13
	25-yr, 72-hr	3.37	3.21	0.16
	100-yr, 72-hr	3.63	3.54	0.09
3	5-yr, 24-hr	3.07	2.68	0.39
	10-yr, 24-hr	3.38	3.24	0.14
	25-yr, 72-hr	3.22	2.90	0.33
	100-yr, 72-hr	3.62	3.47	0.15

EXHIBIT 16
Delineation of Regions used in the BCA (Each Region grouped as a *Structure* in BCA)



Source: Google Earth

Project Cost Estimate

This estimated project cost for the proposed improvements is approximately $3.7 million, based on Phase I costs, the lowest contractor bid plus allowances, and fees for engineering services during construction. A breakdown of the construction costs is presented in Attachment D. The total annual operations and maintenance costs of the proposed improvements are estimated at $15,000, based on operations and maintenance costs of similar systems within the City.

Estimate of Damages

The damages before and after the proposed project were evaluated using BCA. Utilizing the Drainage Improvement module, the following data were entered into the software:

- FFE for each region or "structure"

- Flood depths for the 5-year, 10-year, 25-year, and 100-year storm events,[4] before and after mitigation (determined through modeling)
- Project useful life (estimated at 50 years per FEMA guidelines)
- Project cost and annual maintenance costs
- Structure information, including the information provided in Exhibit 14

The following assumptions were also made during this analysis:

- Project costs were divided among regions according to number of parcels within region
- FEMA standard displacement costs adjusted for local cost of living

BCA utilizes a depth-damage function (DDF), provided by FEMA Federal Insurance Administration (FIA), that calculates building, contents, displacement, and loss of function damages, before mitigation (i.e., non-functioning pump station) and after mitigation, for incremental flood depths over the FFE. By calculating the difference in damages before and after mitigation for different flood depth increments, BCA calculates the overall project benefits and BCR. Project benefits, costs, and benefit-cost ratios for each region, and for the overall project, are shown in Exhibit 17.

EXHIBIT 17
Project Benefits and Costs

	Region 1	Region 2	Region 3	Overall Project
Present Value of Mitigation Benefits	$8,737,274	$2,319,200	($68,029)	$10,988,445
Present Value of Mitigation Costs	$1,258,820	$1,078,987	$1,618,472	$3,956,279
Benefit-Cost Ratio	6.94	2.15	-0.04	2.78

Conclusion

Based on the hydraulic and hydrologic modeling, the proposed project is anticipated to provide improved flood relief within the drainage basin during times of high rainfall and flooding. The greatest improvements in drainage result from the reduction in flooding duration, as the wells and proposed emergency outfall will more rapidly drain the basin. The proposed project will improve drainage for smaller storm events more than for the larger storms.

The project, however, is not expected to fully remediate the flooding problem. There will continue to be flooding of roads and residences, but the depth and duration of potential flooding is reduced, which should allow a greater ease of access for municipal and emergency vehicles. With a BCR of 2.78, however, the project appears to be financially feasible, and is anticipated to be a good investment for the City of Key West.

[4]The emergency outfall is anticipated to be utilized when existing well cannot accommodate flow.

Works Cited

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ATTACHMENT A

ICPR Model Input Files

==========
==== Basins
==========

Name: 2705 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	18.80
Area(ac):	4.349	Time Shift(hrs):	0.00
Curve Number:	90.53	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: 2810 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	20.04
Area(ac):	3.031	Time Shift(hrs):	0.00
Curve Number:	91.07	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: 2847 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	13.20
Area(ac):	1.769	Time Shift(hrs):	0.00
Curve Number:	91.07	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: 2850 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	16.90
Area(ac):	2.583	Time Shift(hrs):	0.00
Curve Number:	90.89	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: 2852 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	18.00
Area(ac):	1.945	Time Shift(hrs):	0.00
Curve Number:	91.07	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: 2855 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	19.20
Area(ac):	2.080	Time Shift(hrs):	0.00
Curve Number:	91.70	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: 2860 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	14.60
Area(ac):	0.351	Time Shift(hrs):	0.00
Curve Number:	90.92	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: 2865 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	17.70
Area(ac):	1.714	Time Shift(hrs):	0.00
Curve Number:	91.07	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: 800 Node: Pond Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	18.80
Area(ac):	3.481	Time Shift(hrs):	0.00
Curve Number:	90.99	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: B2820 Node: 2820 Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	19.60
Area(ac):	5.118	Time Shift(hrs):	0.00
Curve Number:	91.01	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: B2830 Node: 2830 Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	26.50
Area(ac):	13.683	Time Shift(hrs):	0.00
Curve Number:	91.63	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: B3000 Node: 3000 Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph:	Uh256	Peaking Factor:	256.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	6.000	Time of Conc(min):	20.50
Area(ac):	3.010	Time Shift(hrs):	0.00
Curve Number:	91.33	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: B3010 Node: 3010 Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Flmod Storm Duration(hrs): 24.00
Rainfall Amount(in): 6.000 Time of Conc(min): 19.60
Area(ac): 2.292 Time Shift(hrs): 0.00
Curve Number: 91.33 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: B3020 Node: 3020 Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Flmod Storm Duration(hrs): 24.00
Rainfall Amount(in): 6.000 Time of Conc(min): 17.80
Area(ac): 3.125 Time Shift(hrs): 0.00
Curve Number: 90.86 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: B3030 Node: 3030 Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Flmod Storm Duration(hrs): 24.00
Rainfall Amount(in): 6.000 Time of Conc(min): 15.00
Area(ac): 3.212 Time Shift(hrs): 0.00
Curve Number: 90.94 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: B3040 Node: 3040 Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Flmod Storm Duration(hrs): 24.00
Rainfall Amount(in): 6.000 Time of Conc(min): 17.60
Area(ac): 6.997 Time Shift(hrs): 0.00
Curve Number: 91.03 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

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==== Nodes

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Name: 2820 Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 3.050

Type: Stage/Area

Stage(ft)	Area(ac)
-2.000	0.0010
3.030	0.0010
3.460	5.1200
99.000	5.1200

Name: 2830 Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 2.880

Type: Stage/Area

Stage(ft)	Area(ac)
-2.000	0.0010
2.690	0.0010
2.700	0.1300
3.000	1.2200
4.000	10.4500
5.000	12.6100
5.270	13.6800
99.000	13.6800

Name: 2830b Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 2.880

Type: Stage/Area

Stage(ft)	Area(ac)
-2.000	0.0010
2.690	0.0010
2.700	0.1300
99.000	0.1300

Name: 3000 Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 2.970

Type: Stage/Area

Stage(ft)	Area(ac)
-3.000	0.0010
2.510	0.0010
2.520	0.0500
3.000	0.8700
4.000	3.0100
4.050	3.0100
99.000	3.0100

Name: 3010 Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Plunge Factor: 1.30 Warn Stage(ft): 3.240

Type: Manhole, 1/2 Diameter Grooved

Stage(ft)	Area(ac)
-3.000	0.0010
3.080	0.0010
3.090	0.2600
4.000	2.2800
4.220	2.2900
99.000	2.2900

Name: 3020 Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 2.970

Type: Stage/Area

Stage(ft)	Area(ac)
-2.000	0.0010
3.130	0.0010
3.190	3.1300
99.000	3.1300

Name: 3030 Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 2.490

Type: Stage/Area

Stage(ft)	Area(ac)
-2.000	0.0010
2.490	0.0010
2.500	0.1900
3.000	2.3400

3.200	3.2100
99.000	3.2100

Name: 3040 Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Plunge Factor: 1.30 Warn Stage(ft): 2.830

Type: Manhole, 1/2 Diameter Grooved

Stage(ft)	Area(ac)
-2.000	0.0010
2.820	0.0010
2.830	0.1400
3.000	0.6600
4.000	6.5100
4.310	7.0000
99.000	7.0000

Name: Bound Base Flow(cfs): 0.000 Init Stage(ft): 1.100

Group: BASE Warn Stage(ft): 999.000

Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	1.100
920.00	1.100

Name: cat-thom Base Flow(cfs): 0.000 Init Stage(ft): 0.940

Group: BASE Plunge Factor: 1.30 Warn Stage(ft): 0.000

Type: Manhole, 1/2 Diameter Grooved

Stage(ft)	Area(ac)
0.000	0.0100
2.850	0.0100
2.860	0.0400
3.000	0.1900
4.000	2.5500
4.290	3.0300
99.000	3.0300

Name: CheckBox Base Flow(cfs): 0.000 Init Stage(ft): 1.100

Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 2.500

Type: Manhole, Flat Floor

Stage(ft)	Area(ac)
-4.500	0.0011
2.500	0.0011

Name: DuncAsh Base Flow(cfs): 0.000 Init Stage(ft): 1.100

Group: BASE Plunge Factor: 1.00 Warn Stage(ft): 3.040

Type: Manhole, Flat Floor

Stage(ft)	Area(ac)
-7.000	0.0010
3.000	0.0010

Name: Groundwater Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 0.000

Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	0.500
900.00	0.500

Name: Pond Base Flow(cfs): 0.000 Init Stage(ft): 1.100

Group: BASE Warn Stage(ft): 3.000

Type: Stage/Area

Stage(ft)	Area(ac)
-7.000	0.0140
-6.000	0.0990
-4.000	0.4950
-1.000	0.5750
2.300	0.7000
3.000	1.5000

Name: PS Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 2.600

Type: Stage/Area

Stage(ft)	Area(ac)
-10.000	0.0018
2.600	0.0018

Name: UnitedThompson Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 2.800

Type: Stage/Area

Stage(ft)	Area(ac)
-2.000	0.0010
2.800	0.0010
3.000	1.0000

Name: WBox-ECat Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 3.000

Type: Stage/Area

Stage(ft)	Area(ac)
-3.000	0.0010
3.000	0.0010

Name: WBox-ECatb Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 3.000

Type: Stage/Area

Stage(ft)	Area(ac)
-3.000	0.0010
3.000	0.0010

Name: WQB Base Flow(cfs): 0.000 Init Stage(ft): 0.000

Group: BASE Warn Stage(ft): 2.000

Type: Stage/Area

Stage(ft)	Area(ac)
-15.000	0.0015
2.500	0.0015

Name: WQBa Base Flow(cfs): 0.000 Init Stage(ft): 0.500

Group: BASE Warn Stage(ft): 2.500

Type: Stage/Area

Stage(ft)	Area(ac)
-6.000	0.0020
2.500	0.0020

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Cross Sections

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Name: X2L-RD Group: BASE

Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
-20.000	2.000	0.000000
-0.100	0.500	0.150000
0.000	0.000	0.015000
12.000	0.240	0.015000
24.000	0.000	0.015000
24.000	0.500	0.015000
44.000	2.000	0.150000

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Operating Tables

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Name: PUMP Group: BASE

Type: Rating Curve

Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
-7.000	14.00
10.000	16.00

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==== Pipes
==========

Name: 2810 to pond From Node: cat-thom Length(ft): 450.00

Group: BASE To Node: Pond Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
			Solution Algorithm:	Automatic
Geometry:	Circular	Circular	Flow:	Both
Span(in):	42.00	42.00	Entrance Loss Coef:	0.50
Rise(in):	42.00	42.00	Exit Loss Coef:	0.00
Invert(ft):	-2.420	-4.360	Bend Loss Coef:	0.90
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 2820 to 2810 From Node: 2820 Length(ft): 400.00

Group: BASE To Node: cat-thom Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
			Solution Algorithm:	Automatic
Geometry:	Circular	Circular	Flow:	Both
Span(in):	36.00	36.00	Entrance Loss Coef:	0.50
Rise(in):	36.00	36.00	Exit Loss Coef:	0.00
Invert(ft):	-1.790	-2.520	Bend Loss Coef:	0.90
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: ChecktoBound From Node: CheckBox Length(ft): 400.00

Group: BASE To Node: Bound Count: 1

Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	30.00	30.00	Entrance Loss Coef: 0.80
Rise(in):	30.00	30.00	Exit Loss Coef: 1.00
Invert(ft):	-3.600	-3.640	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: Culvert1 From Node: Pond Length(ft): 80.00

Group: BASE To Node: Bound Count: 2

Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	60.00	60.00	Entrance Loss Coef: 0.50
Rise(in):	60.00	60.00	Exit Loss Coef: 1.00
Invert(ft):	-2.900	-2.000	Bend Loss Coef: 0.00
Manning's N:	0.022000	0.022000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular CMP: Headwall

Downstream FHWA Inlet Edge Description:
Circular CMP: Projecting

Name: P2820 From Node: UnitedThompson Length(ft): 400.00

Group: BASE To Node: 2820 Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
			Solution Algorithm:	Automatic
Geometry:	Circular	Circular	Flow:	Both
Span(in):	24.00	24.00	Entrance Loss Coef:	0.50
Rise(in):	24.00	24.00	Exit Loss Coef:	0.00
Invert(ft):	-1.500	-1.790	Bend Loss Coef:	0.90
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P2820b From Node: 2830 Length(ft): 250.00

Group: BASE To Node: UnitedThompson Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
			Solution Algorithm:	Automatic
Geometry:	Circular	Circular	Flow:	Both
Span(in):	24.00	24.00	Entrance Loss Coef:	0.50
Rise(in):	24.00	24.00	Exit Loss Coef:	0.00
Invert(ft):	-1.470	-1.500	Bend Loss Coef:	0.90
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P2830 From Node: 2830b Length(ft): 400.00

Group: BASE To Node: 3040 Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
			Solution Algorithm:	

Automatic

Geometry:	Circular	Circular	Flow: Both
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00
Invert(ft):	-1.470	-1.510	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3000WQ1 From Node: 3000 Length(ft): 320.00

Group: BASE To Node: CheckBox Count: 1

Friction Equation: Average

Conveyance

Solution Algorithm: Automatic

	UPSTREAM	DOWNSTREAM	
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.50
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	-2.650	-2.700	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3010 From Node: 3010 Length(ft): 375.00

Group: BASE To Node: 3000 Count: 1

Friction Equation: Average

Conveyance

Solution Algorithm: Automatic

	UPSTREAM	DOWNSTREAM	
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.50
Rise(in):	24.00	24.00	Exit Loss Coef: 0.00
Invert(ft):	-2.000	-2.640	Bend Loss Coef: 0.00

```
  Manning's N: 0.013000       0.013000                  Outlet Ctrl Spec: Use dc
or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                    Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


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         Name: P3020              From Node: 3020              Length(ft): 220.00

        Group: BASE                 To Node: WBox-ECat              Count: 1

                                                          Friction Equation: Average
Conveyance
               UPSTREAM       DOWNSTREAM                Solution Algorithm:
Automatic
     Geometry: Circular       Circular                                Flow: Both
     Span(in): 24.00          24.00                  Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                      Exit Loss Coef: 0.00
   Invert(ft): -1.560         -2.500                     Bend Loss Coef: 0.90
  Manning's N: 0.013000       0.013000                  Outlet Ctrl Spec: Use dc
or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                    Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


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         Name: P3020b             From Node: WBox-ECatb        Length(ft): 200.00

        Group: BASE                 To Node: 3000                   Count: 1

                                                          Friction Equation: Average
Conveyance
               UPSTREAM       DOWNSTREAM                Solution Algorithm:
Automatic
     Geometry: Circular       Circular                                Flow: Both
     Span(in): 24.00          24.00                  Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                      Exit Loss Coef: 0.00
   Invert(ft): -2.500         -2.640                     Bend Loss Coef: 0.90
  Manning's N: 0.013000       0.013000                  Outlet Ctrl Spec: Use dc
or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                    Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3030		From Node: 3030		Length(ft): 200.00
Group: BASE		To Node: DuncAsh		Count: 1
			Friction Equation:	Average
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Automatic
Geometry:	Circular	Circular	Flow:	Both
Span(in):	24.00	24.00	Entrance Loss Coef:	0.50
Rise(in):	24.00	24.00	Exit Loss Coef:	0.00
Invert(ft):	-3.000	-6.000	Bend Loss Coef:	0.90
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3030b		From Node: DuncAsh		Length(ft): 200.00
Group: BASE		To Node: 3020		Count: 1
			Friction Equation:	Average
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Automatic
Geometry:	Circular	Circular	Flow:	Both
Span(in):	24.00	24.00	Entrance Loss Coef:	0.50
Rise(in):	24.00	24.00	Exit Loss Coef:	0.00
Invert(ft):	-1.000	-3.000	Bend Loss Coef:	0.90
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3030eastPS	From Node: 3020	Length(ft): 20.00	
Group: BASE	To Node: WQBa	Count: 1	
		Friction Equation: Average Conveyance	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	36.00	36.00	Entrance Loss Coef: 0.50
Rise(in):	36.00	36.00	Exit Loss Coef: 0.00
Invert(ft):	-2.000	-3.000	Bend Loss Coef: 0.90
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3040	From Node: 3040	Length(ft): 250.00	
Group: BASE	To Node: 3030	Count: 1	
		Friction Equation: Average Conveyance	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.50
Rise(in):	24.00	24.00	Exit Loss Coef: 0.00
Invert(ft):	-1.510	-1.530	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: PSlowflow	From Node: WQBa	Length(ft): 10.00	
Group: BASE	To Node: WQB	Count: 1	
		Friction Equation: Average Conveyance	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	30.00	30.00	Entrance Loss Coef: 0.50
Rise(in):	30.00	30.00	Exit Loss Coef: 1.00
Invert(ft):	-5.550	-5.600	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: WQBtoPS	From Node: WQB	Length(ft): 10.00	
Group: BASE	To Node: PS	Count: 1	
		Friction Equation: Average Conveyance	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Positive
Span(in):	30.00	30.00	Entrance Loss Coef: 0.50
Rise(in):	30.00	30.00	Exit Loss Coef: 1.00
Invert(ft):	-3.050	-3.100	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

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==== Channels

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          Name: 2820to3020          From Node: 3020              Length(ft): 400.00

         Group: BASE                  To Node: 2820                   Count: 1


                UPSTREAM       DOWNSTREAM                  Friction Equation:
Automatic
      Geometry: Irregular      Irregular                 Solution Algorithm:
Automatic
    Invert(ft): 3.050          2.970                                 Flow: Both
 TClpInitZ(ft): 99.000         99.000                  Contraction Coef: 0.100
   Manning's N:                                            Expansion Coef: 0.300
  Top Clip(ft):                                       Entrance Loss Coef: 0.000
  Bot Clip(ft):                                           Exit Loss Coef: 0.000
     Main XSec: X2L-RD          X2L-RD                   Outlet Ctrl Spec: Use dc
or tw
  AuxElev1(ft): 0.000           0.000                    Inlet Ctrl Spec: Use dc
     Aux XSec1:                                         Stabilizer Option: None
  AuxElev2(ft): 0.000           0.000
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft):
  LtSdSlp(h/v):
  RtSdSlp(h/v):



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          Name: 2820toOUT           From Node: 2820              Length(ft): 400.00

         Group: BASE                  To Node: UnitedThompson         Count: 1


                UPSTREAM       DOWNSTREAM                  Friction Equation:
Automatic
      Geometry: Irregular      Irregular                 Solution Algorithm:
Automatic
    Invert(ft): 3.050          2.800                                 Flow: Both
 TClpInitZ(ft): 99.000         99.000                  Contraction Coef: 0.100
   Manning's N:                                            Expansion Coef: 0.300
  Top Clip(ft):                                       Entrance Loss Coef: 0.000
  Bot Clip(ft):                                           Exit Loss Coef: 0.000
     Main XSec: X2L-RD          X2L-RD                   Outlet Ctrl Spec: Use dc
or tw
  AuxElev1(ft): 0.000           0.000                    Inlet Ctrl Spec: Use dc
     Aux XSec1:                                         Stabilizer Option: None
  AuxElev2(ft): 0.000           0.000
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft):
  LtSdSlp(h/v):
  RtSdSlp(h/v):



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Name: 2830to3040 From Node: 2830b Length(ft): 400.00

Group: BASE To Node: 3040 Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic
Invert(ft):	2.880	2.830	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	X2L-RD	X2L-RD	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Name: 2830toUT From Node: 2830 Length(ft): 260.00

Group: BASE To Node: UnitedThompson Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic
Invert(ft):	2.940	2.800	Flow:	Both
TClpInitZ(ft):	99.000	99.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	X2L-RD	X2L-RD	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Name: 3010to3000 From Node: 3010 Length(ft): 375.00

Group: BASE To Node: 3000 Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Average Conveyance
Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic
Invert(ft):	3.240	2.970	Flow:	Both
TClpInitZ(ft):	99.000	99.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	X2L-RD	X2L-RD	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Name:	3010to3030	From Node:	3010	Length(ft):	400.00
Group:	BASE	To Node:	3030	Count:	1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic
Invert(ft):	3.250	2.490	Flow:	Both
TClpInitZ(ft):	99.000	99.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	X2L-RD	X2L-RD	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Name:	3020to3000	From Node:	3020	Length(ft):	425.00
Group:	BASE	To Node:	3000	Count:	1

	UPSTREAM	DOWNSTREAM	
			Friction Equation:

Average Conveyance

Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic
Invert(ft):	2.970	2.970	Flow:	Both
TClpInitZ(ft):	99.000	99.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	X2L-RD	X2L-RD	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Name:	3030to3020	From Node:	3030	Length(ft):	375.00
Group:	BASE	To Node:	3020	Count:	1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic
Invert(ft):	2.490	2.970	Flow:	Both
TClpInitZ(ft):	99.000	99.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	X2L-RD	X2L-RD	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Name:	3040to3030	From Node:	3040	Length(ft):	250.00
Group:	BASE	To Node:	3030	Count:	1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic

Invert(ft):	2.830	2.490	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	X2L-RD	X2L-RD	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Name:	UTto3030	From Node:	UnitedThompson	Length(ft):	400.00
Group:	BASE	To Node:	3030	Count:	1

	UPSTREAM	DOWNSTREAM		
Friction Equation:				Automatic
Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic
Invert(ft):	2.800	2.490	Flow:	Both
TClpInitZ(ft):	99.000	99.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300
Top Clip(ft):			Entrance Loss Coef:	0.000
Bot Clip(ft):			Exit Loss Coef:	0.000
Main XSec:	X2L-RD	X2L-RD	Outlet Ctrl Spec:	Use dc or tw
AuxElev1(ft):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Aux XSec1:			Stabilizer Option:	None
AuxElev2(ft):	0.000	0.000		
Aux XSec2:				
Top Width(ft):				
Depth(ft):				
Bot Width(ft):				
LtSdSlp(h/v):				
RtSdSlp(h/v):				

Name:	WQBtoBOUND	From Node:	3000	Length(ft):	600.00
Group:	BASE	To Node:	CheckBox	Count:	1

	UPSTREAM	DOWNSTREAM		
Friction Equation:				Automatic
Geometry:	Irregular	Irregular	Solution Algorithm:	Automatic
Invert(ft):	3.000	3.400	Flow:	Both
TClpInitZ(ft):	9999.000	9999.000	Contraction Coef:	0.100
Manning's N:			Expansion Coef:	0.300

```
  Top Clip(ft):                                      Entrance Loss Coef: 0.000
  Bot Clip(ft):                                          Exit Loss Coef: 0.000
     Main XSec: X2L-RD         X2L-RD                 Outlet Ctrl Spec: Use dc
or tw
  AuxElev1(ft): 0.000          0.000                    Inlet Ctrl Spec: Use dc
     Aux XSec1:                                      Stabilizer Option: None
  AuxElev2(ft): 0.000          0.000
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft):
  LtSdSlp(h/v):
  RtSdSlp(h/v):
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==== Drop Structures

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```
         Name:                      From Node:                   Length(ft): 0.00

        Group: BASE                   To Node:                        Count: 1


               UPSTREAM       DOWNSTREAM                Friction Equation:
Automatic
     Geometry: Circular       Circular                 Solution Algorithm: Most
Restrictive
     Span(in): 0.00           0.00                                  Flow: Both
     Rise(in): 0.00           0.00                  Entrance Loss Coef: 0.000
   Invert(ft): 0.000          0.000                     Exit Loss Coef: 1.000
  Manning's N: 0.000000       0.000000               Outlet Ctrl Spec: Use dc
or tw
 Top Clip(in): 0.000          0.000                    Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall
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==== Weirs

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```
         Name: ThomSem             From Node: 2830
        Group: BASE                  To Node: 2830b
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 9999.00
```

Invert(ft): 2.940
Control Elevation(ft): 2.940
TABLE
Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 2.800
Orifice Discharge Coef: 0.600

Intersection of Thompson and Seminary, overflow across intersection

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Name: W3020 From Node: WBox-ECat
Group: BASE To Node: WBox-ECatb
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Rectangular

Span(in): 54.00
Rise(in): 30.00
Invert(ft): 1.100
Control Elevation(ft): 1.100
TABLE
Bottom Clip(in): 7.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

Name: WBBa From Node: WQBa
Group: BASE To Node: WQB
Flow: Both Count: 1
Type: Vertical: Mavis Geometry: Rectangular

Span(in): 120.00
Rise(in): 24.00
Invert(ft): 0.500
Control Elevation(ft): 0.500
TABLE
Bottom Clip(in): 0.000
Top Clip(in): 0.000
Weir Discharge Coef: 3.100
Orifice Discharge Coef: 0.600

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Rating Curves

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Name: PStoWells From Node: PS Count: 1

Group: BASE To Node: Groundwater Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	PUMP	0.500	-4.000
#2:	PUMP	1.000	-5.000

#3:	0.000	0.000
#4:	0.000	0.000

==========
==== Hydrology Simulations
==========

Name: Dpond-100y24h
Filename: \\GAINESVILLE\PROJ\KEYWESTFLCITYOF\389709GEORGESTREETDR\FIRSTGEO\ICPR\Dpond-100y24h.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 12.00

Time(hrs)	Print Inc(min)
24.000	5.00

Name: Dpond-100y72h
Filename: \\GAINESVILLE\PROJ\KEYWESTFLCITYOF\389709GEORGESTREETDR\FIRSTGEO\ICPR\Dpond-100y72h.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 17.00

Time(hrs)	Print Inc(min)
72.000	5.00

Name: Dpond-10yr24h
Filename: \\GAINESVILLE\PROJ\KEYWESTFLCITYOF\389709GEORGESTREETDR\FIRSTGEO\ICPR\Dpond-10yr24h.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 7.00

Time(hrs)	Print Inc(min)
24.000	5.00

Name: Dpond-25y24h
Filename:
\\GAINESVILLE\PROJ\KEYWESTFLCITYOF\389709GEORGESTREETDR\FIRSTGEO\ICPR\Dpond-25y24h.R
32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 9.00

Time(hrs)	Print Inc(min)
24.000	5.00

Name: Dpond-25y72h
Filename:
\\GAINESVILLE\PROJ\KEYWESTFLCITYOF\389709GEORGESTREETDR\FIRSTGEO\ICPR\Dpond-25y72h.R
32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 12.00

Time(hrs)	Print Inc(min)
72.000	5.00

Name: Dpond-2yr24h
Filename:
\\GAINESVILLE\PROJ\KEYWESTFLCITYOF\389709GEORGESTREETDR\FIRSTGEO\ICPR\Dpond-2yr24h.R
32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 4.50

Time(hrs)	Print Inc(min)
24.000	5.00

Name: Dpond-5yr24h
Filename:
\\GAINESVILLE\PROJ\KEYWESTFLCITYOF\389709GEORGESTREETDR\FIRSTGEO\ICPR\Dpond-5yr24h.R
32

```
      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 6.00

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.00

================================================================================
======
==== Routing Simulations
================================================================
================================================================================
======

         Name: Dpond-100yr24hr     Hydrology Sim: Dpond-100y24h
     Filename:
\\gainesville\Proj\KeyWestFlCityOf\389709GeorgeStreetDr\FirstGeo\ICPR\Dpond-100yr24h
r.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 15.000
        Start Time(hrs): 0.000                    End Time(hrs): 36.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 30.0000
        Boundary Stages:                         Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
10.000          15.000
15.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


--------------------------------------------------------------------------------
----------------
         Name: Dpond-100yr72hr     Hydrology Sim: Dpond-100y72h
     Filename:
\\gainesville\Proj\KeyWestFlCityOf\389709GeorgeStreetDr\FirstGeo\ICPR\Dpond-100yr72h
r.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 15.000
        Start Time(hrs): 0.000                    End Time(hrs): 110.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 30.0000
        Boundary Stages:                         Boundary Flows:
```

Time(hrs)	Print Inc(min)
50.000	15.000
70.000	5.000
150.000	15.000

Group	Run
BASE	Yes

Name: Dpond-10yr24hr- Hydrology Sim: Dpond-10yr24h
Filename: \\gainesville\Proj\KeyWestFlCityOf\389709GeorgeStreetDr\FirstGeo\ICPR\Dpond-10yr24hr-.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 15.000
Start Time(hrs): 0.000 End Time(hrs): 36.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 30.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
10.000	15.000
15.000	5.000
48.000	15.000

Group	Run
BASE	Yes

Name: Dpond-25yr24hr- Hydrology Sim: Dpond-25y24h
Filename: \\gainesville\Proj\KeyWestFlCityOf\389709GeorgeStreetDr\FirstGeo\ICPR\Dpond-25yr24hr-.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 15.000
Start Time(hrs): 0.000 End Time(hrs): 36.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 30.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
10.000	15.000
15.000	5.000
48.000	15.000

Group	Run
BASE	Yes

Name: Dpond-25yr72hr- Hydrology Sim: Dpond-25y72h
Filename:
\\gainesville\Proj\KeyWestFlCityOf\389709GeorgeStreetDr\FirstGeo\ICPR\Dpond-25yr72hr-.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 15.000
Start Time(hrs): 0.000 End Time(hrs): 110.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 30.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
50.000	15.000
70.000	5.000
150.000	15.000

Group	Run
BASE	Yes

Name: Dpond-2yr24h-pc Hydrology Sim: Dpond-2yr24h
Filename:
\\gainesville\Proj\KeyWestFlCityOf\389709GeorgeStreetDr\FirstGeo\ICPR\Dpond-2yr24h-pc.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 15.000
Start Time(hrs): 0.000 End Time(hrs): 36.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 30.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
10.000	15.000
15.000	5.000
48.000	15.000

Group	Run
BASE	Yes

Name: Dpond-5yr24h-pc Hydrology Sim: Dpond-5yr24h
Filename:
\\gainesville\Proj\KeyWestFlCityOf\389709GeorgeStreetDr\FirstGeo\ICPR\Dpond-5yr24h-pc.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 15.000
Start Time(hrs): 0.000 End Time(hrs): 36.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 30.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
10.000	15.000
15.000	5.000
48.000	15.000

Group	Run
BASE	Yes

ATTACHMENT B

ICPR Model Output Files

Attachment B Basin

Simulation	Basin	Group	Time Max	Flow Max	Volume
			hrs	cfs	in

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
Dpond-100y24h	2705	BASE	12.12	23.50	10.824	170877
Dpond-100y24h	2810	BASE	12.11	15.87	10.890	119817
Dpond-100y24h	2847	BASE	12.06	11.19	10.894	69957
Dpond-100y24h	2850	BASE	12.09	14.68	10.872	101937
Dpond-100y24h	2852	BASE	12.12	10.78	10.895	76922
Dpond-100y24h	2855	BASE	12.12	11.19	10.972	82843
Dpond-100y24h	2860	BASE	12.07	2.13	10.873	13854
Dpond-100y24h	2865	BASE	12.11	9.57	10.894	67781
Dpond-100y24h	800	BASE	12.12	18.86	10.882	137510
Dpond-100y24h	B2820	BASE	12.11	27.07	10.887	202265
Dpond-100y24h	B2830	BASE	12.19	62.68	10.962	544467
Dpond-100y24h	B3000	BASE	12.12	15.61	10.923	119351
Dpond-100y24h	B3010	BASE	12.11	12.14	10.928	90918
Dpond-100y24h	B3020	BASE	12.10	17.35	10.865	123247
Dpond-100y24h	B3030	BASE	12.10	19.25	10.878	126837
Dpond-100y24h	B3040	BASE	12.12	39.05	10.887	276516
Dpond-100y72h	2705	BASE	60.07	25.77	15.798	249402
Dpond-100y72h	2810	BASE	60.07	17.41	15.867	174574
Dpond-100y72h	2847	BASE	60.04	12.11	15.869	101905
Dpond-100y72h	2850	BASE	60.05	16.02	15.847	148588
Dpond-100y72h	2852	BASE	60.08	11.78	15.872	112061
Dpond-100y72h	2855	BASE	60.07	12.22	15.951	120439
Dpond-100y72h	2860	BASE	60.05	2.32	15.851	20197
Dpond-100y72h	2865	BASE	60.06	10.43	15.869	98733
Dpond-100y72h	800	BASE	60.07	20.65	15.859	200392
Dpond-100y72h	B2820	BASE	60.06	29.63	15.864	294719
Dpond-100y72h	B2830	BASE	60.12	68.32	15.940	791714
Dpond-100y72h	B3000	BASE	60.09	17.16	15.903	173758
Dpond-100y72h	B3010	BASE	60.06	13.28	15.906	

132334					
Dpond-100y72h	B3020	BASE	60.08	18.95	15.843
179717					
Dpond-100y72h	B3030	BASE	60.03	20.96	15.855
184859					
Dpond-100y72h	B3040	BASE	60.07	42.78	15.861
402862					
Dpond-10yr24h	2705	BASE	12.12	13.14	5.881
92843					
Dpond-10yr24h	2810	BASE	12.16	8.91	5.942
65377					
Dpond-10yr24h	2847	BASE	12.06	6.29	5.944
38172					
Dpond-10yr24h	2850	BASE	12.09	8.23	5.924
55544					
Dpond-10yr24h	2852	BASE	12.12	6.06	5.945
41973					
Dpond-10yr24h	2855	BASE	12.12	6.31	6.016
45426					
Dpond-10yr24h	2860	BASE	12.07	1.19	5.926
7550					
Dpond-10yr24h	2865	BASE	12.11	5.38	5.944
36985					
Dpond-10yr24h	800	BASE	12.12	10.58	5.934
74985					
Dpond-10yr24h	B2820	BASE	12.15	15.19	5.938
110315					
Dpond-10yr24h	B2830	BASE	12.19	35.27	6.008
298390					
Dpond-10yr24h	B3000	BASE	12.16	8.78	5.972
65256					
Dpond-10yr24h	B3010	BASE	12.15	6.83	5.975
49711					
Dpond-10yr24h	B3020	BASE	12.10	9.72	5.919
67138					
Dpond-10yr24h	B3030	BASE	12.10	10.82	5.930
69139					
Dpond-10yr24h	B3040	BASE	12.12	21.93	5.938
150832					
Dpond-25y24h	2705	BASE	12.12	17.31	7.852
123952					
Dpond-25y24h	2810	BASE	12.11	11.70	7.915
87088					
Dpond-25y24h	2847	BASE	12.06	8.26	7.918
50848					
Dpond-25y24h	2850	BASE	12.09	10.82	7.897
74043					
Dpond-25y24h	2852	BASE	12.12	7.96	7.919
55910					
Dpond-25y24h	2855	BASE	12.12	8.27	7.993
60354					
Dpond-25y24h	2860	BASE	12.07	1.57	7.899
10064					
Dpond-25y24h	2865	BASE	12.11	7.06	7.918
49266					
Dpond-25y24h	800	BASE	12.12	13.91	7.907
99919					
Dpond-25y24h	B2820	BASE	12.15	19.97	7.912
146984					
Dpond-25y24h	B2830	BASE	12.19	46.29	7.984
396561					
Dpond-25y24h	B3000	BASE	12.12	11.52	7.947
86833					

Dpond-25y24h	B3010	BASE	12.15	8.97	7.950
66147					
Dpond-25y24h	B3020	BASE	12.10	12.79	7.891
89511					
Dpond-25y24h	B3030	BASE	12.10	14.21	7.903
92147					
Dpond-25y24h	B3040	BASE	12.12	28.81	7.912
200954					
Dpond-25y72h	2705	BASE	60.07	18.05	10.824
170884					
Dpond-25y72h	2810	BASE	60.07	12.21	10.891
119830					
Dpond-25y72h	2847	BASE	60.04	8.49	10.893
69949					
Dpond-25y72h	2850	BASE	60.05	11.23	10.871
101932					
Dpond-25y72h	2852	BASE	60.08	8.26	10.895
76921					
Dpond-25y72h	2855	BASE	60.07	8.57	10.972
82844					
Dpond-25y72h	2860	BASE	60.05	1.62	10.875
13856					
Dpond-25y72h	2865	BASE	60.06	7.31	10.893
67772					
Dpond-25y72h	800	BASE	60.07	14.47	10.883
137516					
Dpond-25y72h	B2820	BASE	60.06	20.77	10.887
202260					
Dpond-25y72h	B2830	BASE	60.12	47.93	10.962
544454					
Dpond-25y72h	B3000	BASE	60.09	12.04	10.925
119373					
Dpond-25y72h	B3010	BASE	60.06	9.31	10.927
90915					
Dpond-25y72h	B3020	BASE	60.08	13.29	10.867
123275					
Dpond-25y72h	B3030	BASE	60.03	14.69	10.878
126836					
Dpond-25y72h	B3040	BASE	60.07	29.99	10.886
276493					
Dpond-2yr24h	2705	BASE	12.12	7.87	3.448
54429					
Dpond-2yr24h	2810	BASE	12.16	5.37	3.502
38534					
Dpond-2yr24h	2847	BASE	12.09	3.80	3.504
22500					
Dpond-2yr24h	2850	BASE	12.09	4.95	3.485
32681					
Dpond-2yr24h	2852	BASE	12.12	3.65	3.504
24740					
Dpond-2yr24h	2855	BASE	12.12	3.83	3.569
26944					
Dpond-2yr24h	2860	BASE	12.07	0.72	3.488
4444					
Dpond-2yr24h	2865	BASE	12.11	3.24	3.504
21800					
Dpond-2yr24h	800	BASE	12.12	6.37	3.495
44163					
Dpond-2yr24h	B2820	BASE	12.15	9.16	3.498
64984					
Dpond-2yr24h	B2830	BASE	12.19	21.35	3.561
176860					
Dpond-2yr24h	B3000	BASE	12.16	5.31	3.529

38563					
Dpond-2yr24h	B3010	BASE	12.15	4.13	3.531
29377					
Dpond-2yr24h	B3020	BASE	12.10	5.85	3.481
39490					
Dpond-2yr24h	B3030	BASE	12.10	6.53	3.491
40700					
Dpond-2yr24h	B3040	BASE	12.12	13.23	3.499
88868					
Dpond-5yr24h	2705	BASE	12.12	11.04	4.902
77387					
Dpond-5yr24h	2810	BASE	12.16	7.50	4.961
54583					
Dpond-5yr24h	2847	BASE	12.06	5.30	4.963
31870					
Dpond-5yr24h	2850	BASE	12.09	6.92	4.943
46348					
Dpond-5yr24h	2852	BASE	12.12	5.10	4.963
35043					
Dpond-5yr24h	2855	BASE	12.12	5.32	5.033
37999					
Dpond-5yr24h	2860	BASE	12.07	1.01	4.945
6301					
Dpond-5yr24h	2865	BASE	12.11	4.53	4.963
30879					
Dpond-5yr24h	800	BASE	12.12	8.90	4.953
62590					
Dpond-5yr24h	B2820	BASE	12.15	12.79	4.957
92086					
Dpond-5yr24h	B2830	BASE	12.19	29.73	5.024
249550					
Dpond-5yr24h	B3000	BASE	12.16	7.40	4.990
54525					
Dpond-5yr24h	B3010	BASE	12.15	5.76	4.992
41537					
Dpond-5yr24h	B3020	BASE	12.10	8.18	4.938
56018					
Dpond-5yr24h	B3030	BASE	12.10	9.11	4.949
57701					
Dpond-5yr24h	B3040	BASE	12.12	18.47	4.957
125914					

Attachment B Node

Name	Simulation	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Inflow cfs	Max Outflow cfs
2820Dpond	100yr24hr	3.14	3.05	0.0173	63766	26.36	23.81
2820Dpond	100yr72hr	3.18	3.05	0.0173	87212	27.85	23.81
2820Dpond	10yr24hr-	2.43	3.05	0.0173	378	21.44	21.40
2820Dpond	25yr24hr-	2.81	3.05	0.0173	913	23.45	23.22
2820Dpond	25yr72hr-	2.87	3.05	0.0173	987	23.65	23.40
2820Dpond	2yr24h-pc	1.87	3.05	0.0173	163	17.13	17.12
2820Dpond	5yr24h-pc	2.21	3.05	0.0173	163	19.93	19.91
2830Dpond	100yr24hr	3.56	2.88	-0.0208	281744	62.29	35.21
2830Dpond	100yr72hr	3.58	2.88	-0.0215	290648	67.85	36.89
2830Dpond	10yr24hr-	3.34	2.88	-0.0226	194830	35.11	19.77
2830Dpond	25yr24hr-	3.44	2.88	-0.0219	233876	46.04	25.95
2830Dpond	25yr72hr-	3.44	2.88	-0.0233	233468	47.60	25.79
2830Dpond	2yr24h-pc	3.17	2.88	-0.0223	124274	21.30	12.43
2830Dpond	5yr24h-pc	3.29	2.88	-0.0231	171436	29.61	16.80
2830bDpond	100yr24hr	3.56	2.88	-0.0092	11415	12.43	12.14
2830bDpond	100yr72hr	3.58	2.88	-0.0092	11545	13.02	12.67
2830bDpond	10yr24hr-	3.34	2.88	-0.0094	10491	6.48	6.45
2830bDpond	25yr24hr-	3.44	2.88	-0.0093	10748	8.88	8.79
2830bDpond	25yr72hr-	3.44	2.88	-0.0095	10744	8.82	8.72
2830bDpond	2yr24h-pc	3.17	2.88	-0.0094	10399	3.49	2.43
2830bDpond	5yr24h-pc	3.28	2.88	-0.0094	10488	5.15	5.13
3000Dpond	100yr24hr	2.91	2.97	0.0220	32845	16.50	12.12
3000Dpond	100yr72hr	2.99	2.97	0.0220	39608	18.59	12.39
3000Dpond	10yr24hr-	2.35	2.97	0.0220	158	10.09	10.07
3000Dpond	25yr24hr-	2.63	2.97	0.0220	10141	12.19	11.15
3000Dpond	25yr72hr-	2.65	2.97	0.0220	12114	12.64	11.25

3000Dpond-2yr24h-pc	1.89	2.97	0.0220	158	8.05
8.04					
3000Dpond-5yr24h-pc	2.16	2.97	0.0220	158	9.30
9.29					
3010Dpond-100yr24hr	3.36	3.24	0.0080	42623	12.04
7.57					
3010Dpond-100yr72hr	3.40	3.24	0.0080	48941	13.27
8.01					
3010Dpond-10yr24hr-	2.74	3.24	0.0080	1335	6.78
6.60					
3010Dpond-25yr24hr-	3.15	3.24	0.0080	18301	8.90
8.44					
3010Dpond-25yr72hr-	3.17	3.24	0.0080	20046	9.31
8.57					
3010Dpond-2yr24h-pc	2.04	3.24	0.0080	885	4.10
4.07					
3010Dpond-5yr24h-pc	2.44	3.24	0.0080	1334	5.71
5.61					
3020Dpond-100yr24hr	2.64	2.97	-0.0149	5219	26.39
27.69					
3020Dpond-100yr72hr	2.88	2.97	-0.0149	6766	27.53
27.93					
3020Dpond-10yr24hr-	1.54	2.97	-0.0149	1263	19.04
22.55					
3020Dpond-25yr24hr-	1.86	2.97	-0.0149	1264	21.13
24.94					
3020Dpond-25yr72hr-	1.91	2.97	-0.0149	1265	21.67
24.89					
3020Dpond-2yr24h-pc	1.41	2.97	-0.0149	674	16.17
24.78					
3020Dpond-5yr24h-pc	1.42	2.97	-0.0149	623	17.94
24.85					
3030Dpond-100yr24hr	3.46	2.49	0.0320	163660	43.96
22.69					
3030Dpond-100yr72hr	3.49	2.49	0.0320	164339	47.97
22.73					
3030Dpond-10yr24hr-	3.11	2.49	0.0320	139226	25.23
13.25					
3030Dpond-25yr24hr-	3.27	2.49	0.0320	159926	32.49
17.11					
3030Dpond-25yr72hr-	3.28	2.49	0.0320	159976	33.21
17.17					
3030Dpond-2yr24h-pc	2.74	2.49	0.0320	66179	14.66
11.63					
3030Dpond-5yr24h-pc	2.98	2.49	0.0320	113503	21.04
12.32					
3040Dpond-100yr24hr	3.50	2.83	0.0103	166787	42.60
28.57					
3040Dpond-100yr72hr	3.53	2.83	-0.0103	174537	47.41
30.07					
3040Dpond-10yr24hr-	3.23	2.83	-0.0108	95714	22.83
17.31					
3040Dpond-25yr24hr-	3.35	2.83	-0.0107	126387	30.96
21.61					
3040Dpond-25yr72hr-	3.35	2.83	-0.0112	126641	32.60
21.58					
3040Dpond-2yr24h-pc	3.06	2.83	0.0103	52954	12.30
9.57					
3040Dpond-5yr24h-pc	3.17	2.83	0.0103	79804	18.47

14.91						
	BoundDpond-100yr24hr	1.10	999.00	0.0000	396	143.74
0.00						
	BoundDpond-100yr72hr	1.10	999.00	0.0000	396	152.76
0.00						
	BoundDpond-10yr24hr-	1.10	999.00	0.0000	396	94.38
0.00						
	BoundDpond-25yr24hr-	1.10	999.00	0.0000	396	116.16
0.00						
	BoundDpond-25yr72hr-	1.10	999.00	0.0000	396	119.73
0.00						
	BoundDpond-2yr24h-pc	1.10	999.00	0.0000	396	63.61
0.00						
	BoundDpond-5yr24h-pc	1.10	999.00	0.0000	396	82.41
0.00						
	cat-thomDpond-100yr24hr	2.41	0.00	0.0028	505	27.81
27.89						
	cat-thomDpond-100yr72hr	2.52	0.00	0.0028	505	28.86
28.91						
	cat-thomDpond-10yr24hr-	1.80	0.00	0.0028	505	21.40
21.37						
	cat-thomDpond-25yr24hr-	2.08	0.00	0.0028	505	23.22
23.17						
	cat-thomDpond-25yr72hr-	2.12	0.00	0.0028	505	23.40
23.33						
	cat-thomDpond-2yr24h-pc	1.47	0.00	0.0028	505	17.12
17.11						
	cat-thomDpond-5yr24h-pc	1.67	0.00	0.0028	505	19.91
19.89						
	CheckBoxDpond-100yr24hr	1.64	2.50	-0.0236	154	12.12
12.12						
	CheckBoxDpond-100yr72hr	1.67	2.50	-0.0236	154	12.39
12.39						
	CheckBoxDpond-10yr24hr-	1.47	2.50	-0.0236	154	10.07
10.07						
	CheckBoxDpond-25yr24hr-	1.55	2.50	-0.0236	154	11.15
11.15						
	CheckBoxDpond-25yr72hr-	1.56	2.50	-0.0236	154	11.25
11.25						
	CheckBoxDpond-2yr24h-pc	1.34	2.50	-0.0236	154	8.04
8.04						
	CheckBoxDpond-5yr24h-pc	1.42	2.50	-0.0236	154	9.29
9.29						
	DuncAshDpond-100yr24hr	3.09	3.04	-0.0733	133	12.63
12.64						
	DuncAshDpond-100yr72hr	3.21	3.04	-0.0733	133	12.64
12.64						
	DuncAshDpond-10yr24hr-	2.26	3.04	-0.0733	133	12.58
12.59						
	DuncAshDpond-25yr24hr-	2.50	3.04	-0.0733	133	12.64
12.64						
	DuncAshDpond-25yr72hr-	2.50	3.04	-0.0733	133	12.64
12.65						
	DuncAshDpond-2yr24h-pc	2.07	3.04	-0.0733	133	11.63
11.63						
	DuncAshDpond-5yr24h-pc	2.14	3.04	-0.0733	133	12.32
12.32						
	GroundwaterDpond-100yr24hr	0.50	0.00	0.0000	0	29.92

0.00						
GroundwaterDpond-100yr72hr	0.50	0.00	0.0000	0	29.98	
0.00						
GroundwaterDpond-10yr24hr-	0.50	0.00	0.0000	0	29.88	
0.00						
GroundwaterDpond-25yr24hr-	0.50	0.00	0.0000	0	29.88	
0.00						
GroundwaterDpond-25yr72hr-	0.50	0.00	0.0000	0	29.87	
0.00						
GroundwaterDpond-2yr24h-pc	0.50	0.00	0.0000	0	29.88	
0.00						
GroundwaterDpond-5yr24h-pc	0.50	0.00	0.0000	0	29.88	
0.00						
PondDpond-100yr24hr	2.02	3.00	0.0013	30244	139.26	
131.91						
PondDpond-100yr72hr	2.16	3.00	0.0014	30420	149.30	
140.71						
PondDpond-10yr24hr-	1.47	3.00	0.0003	29460	86.16	
84.30						
PondDpond-25yr24hr-	1.68	3.00	0.0004	29768	108.66	
105.04						
PondDpond-25yr72hr-	1.72	3.00	0.0005	29825	112.95	
108.52						
PondDpond-2yr24h-pc	1.26	3.00	-0.0003	29139	55.96	
55.57						
PondDpond-5yr24h-pc	1.38	3.00	0.0003	29320	74.23	
73.13						
PSDpond-100yr24hr	1.16	2.60	-0.0655	114	30.00	
29.92						
PSDpond-100yr72hr	1.40	2.60	-0.0654	114	30.07	
29.98						
PSDpond-10yr24hr-	1.00	2.60	-0.0655	114	24.35	
29.88						
PSDpond-25yr24hr-	1.00	2.60	-0.0654	114	28.24	
29.88						
PSDpond-25yr72hr-	1.00	2.60	-0.0654	114	28.72	
29.87						
PSDpond-2yr24h-pc	1.00	2.60	-0.0654	114	24.11	
29.88						
PSDpond-5yr24h-pc	1.00	2.60	-0.0654	114	24.18	
29.88						
UnitedThompsonDpond-100yr24hr	3.46	2.80	0.0075	158791	19.63	
12.47						
UnitedThompsonDpond-100yr72hr	3.49	2.80	0.0075	166677	20.33	
12.20						
UnitedThompsonDpond-10yr24hr-	3.11	2.80	0.0075	78769	13.30	
11.68						
UnitedThompsonDpond-25yr24hr-	3.28	2.80	0.0075	116230	16.42	
12.44						
UnitedThompsonDpond-25yr72hr-	3.28	2.80	0.0075	116713	16.34	
12.40						
UnitedThompsonDpond-2yr24h-pc	2.63	2.80	0.0075	3347	10.10	
10.29						
UnitedThompsonDpond-5yr24h-pc	2.98	2.80	-0.0078	48169	11.66	
11.22						
WBox-ECatDpond-100yr24hr	2.74	3.00	-0.0070	124	1.72	
0.00						
WBox-ECatDpond-100yr72hr	2.92	3.00	-0.0070	124	1.72	
0.00						

WBox-ECatDpond-10yr24hr-	1.71	3.00	-0.0070	124	1.72
0.00					
WBox-ECatDpond-25yr24hr-	2.18	3.00	-0.0070	124	1.72
0.00					
WBox-ECatDpond-25yr72hr-	2.22	3.00	-0.0070	124	1.72
0.00					
WBox-ECatDpond-2yr24h-pc	1.42	3.00	-0.0070	124	1.72
0.00					
WBox-ECatDpond-5yr24h-pc	1.44	3.00	-0.0070	124	1.72
0.00					
WBox-ECatbDpond-100yr24hr	2.77	3.00	0.0093	123	0.00
0.77					
WBox-ECatbDpond-100yr72hr	2.94	3.00	0.0093	123	0.00
0.73					
WBox-ECatbDpond-10yr24hr-	2.18	3.00	0.0093	123	0.00
0.79					
WBox-ECatbDpond-25yr24hr-	2.32	3.00	0.0093	123	0.00
0.77					
WBox-ECatbDpond-25yr72hr-	2.34	3.00	0.0093	123	0.00
0.74					
WBox-ECatbDpond-2yr24h-pc	1.88	3.00	0.0093	123	0.00
0.82					
WBox-ECatbDpond-5yr24h-pc	2.08	3.00	0.0093	123	0.00
0.81					
WQBDpond-100yr24hr	2.09	2.00	0.0918	114	31.67
30.00					
WQBDpond-100yr72hr	2.33	2.00	0.0918	114	32.52
30.07					
WQBDpond-10yr24hr-	1.24	2.00	0.0918	114	23.94
24.35					
WQBDpond-25yr24hr-	1.32	2.00	0.0918	114	27.96
28.24					
WQBDpond-25yr72hr-	1.35	2.00	0.0918	114	28.46
28.72					
WQBDpond-2yr24h-pc	1.23	2.00	0.0918	114	22.06
24.11					
WQBDpond-5yr24h-pc	1.24	2.00	0.0918	114	22.06
24.18					
WQBaDpond-100yr24hr	2.19	2.50	-0.0462	115	30.11
31.67					
WQBaDpond-100yr72hr	2.42	2.50	-0.0462	115	30.21
32.52					
WQBaDpond-10yr24hr-	1.30	2.50	-0.0462	115	23.85
23.94					
WQBaDpond-25yr24hr-	1.47	2.50	-0.0462	115	27.81
27.96					
WQBaDpond-25yr72hr-	1.50	2.50	-0.0462	115	28.34
28.46					
WQBaDpond-2yr24h-pc	1.29	2.50	-0.0462	115	25.09
22.06					
WQBaDpond-5yr24h-pc	1.30	2.50	-0.0462	115	25.05
22.06					

Attachment B Links

Time	Max Name	Max Time	Group	Simulation	Max Time Flow	Max Flow	Max Delta Q	Max US Stage	US Stage	Max DS Stage	DS Stage
					hrs	cfs	cfs		hrs	ft	hrs	ft
	2810 to pond		BASED	pond-100yr24hr	12.90	27.89	-17.844					
12.24		2.41							12.22	2.02		
	2820 to 2810		BASED	pond-100yr24hr	12.89	27.81	-18.597					
12.49		3.14							12.24	2.41		
	2820to3020		BASED	pond-100yr24hr	0.00	0.00	-0.001					
12.49		3.11							12.49	3.14		
	2820toUT		BASED	pond-100yr24hr	12.19	0.01	-0.008					
13.31		3.32							13.31	3.46		
	2830to3040		BASED	pond-100yr24hr	12.73	11.67	0.132					
12.96		3.56							13.19	3.50		
	2830toUT		BASED	pond-100yr24hr	12.76	17.89	0.021					
12.92		3.56							13.31	3.46		
	3010to3000		BASED	pond-100yr24hr	12.61	0.33	0.001					
12.61		3.36							12.61	3.05		
	3010to3030		BASED	pond-100yr24hr	12.47	0.25	-0.045					
13.30		3.41							13.30	3.46		
	3020to3000		BASED	pond-100yr24hr	0.00	0.00	0.000					
13.03		2.64							12.57	2.91		
	3030to3020		BASED	pond-100yr24hr	13.30	13.77	0.012					
13.30		3.46							13.30	3.31		
	3040to3030		BASED	pond-100yr24hr	12.48	23.59	0.032					
13.19		3.50							13.30	3.46		
	ChecktoBound		BASED	pond-100yr24hr	12.57	12.12	-2.583					
12.57		1.64							0.00	1.10		
	Culvert1		BASED	pond-100yr24hr	12.22	131.91	-3.183					
12.22		2.02							0.00	1.10		
	P2820		BASED	pond-100yr24hr	15.84	12.48	-1.347					
13.31		3.46							12.49	3.14		
	P2820b		BASED	pond-100yr24hr	17.65	9.46	-0.545					
12.92		3.56							13.31	3.46		
	P2830		BASED	pond-100yr24hr	18.19	2.28	0.115					
12.96		3.56							13.19	3.50		
	P3000WQ1		BASED	pond-100yr24hr	12.57	12.12	-8.345					
12.57		2.91							12.57	1.64		
	P3010		BASED	pond-100yr24hr	13.67	9.34	-1.429					
12.61		3.36							12.57	2.91		
	P3020		BASED	pond-100yr24hr	0.00	1.72	1.301					
13.03		2.64							12.96	2.74		
	P3020b		BASED	pond-100yr24hr	11.62	0.77	-1.743					
12.93		2.77							12.57	2.91		
	P3030		BASED	pond-100yr24hr	16.25	12.63	-9.782					
13.30		3.46							13.08	3.09		
	P3030b		BASED	pond-100yr24hr	16.24	12.64	10.175					
13.08		3.09							13.03	2.64		
	P3030eastPS		BASED	pond-100yr24hr	12.71	30.11	16.608					
13.03		2.64							13.04	2.19		
	P3040		BASED	pond-100yr24hr	11.85	7.58	-2.229					
13.19		3.50							13.30	3.46		
	PSlowflow		BASED	pond-100yr24hr	0.00	22.06	22.062					
13.04		2.19							13.05	2.09		
	PStoWells		BASED	pond-100yr24hr	13.04	29.92	29.779					
13.04		1.16							0.00	0.50		
	ThomSem		BASED	pond-100yr24hr	12.68	12.43	0.011					
12.92		3.56							12.96	3.56		
	UTto3030		BASED	pond-100yr24hr	12.21	1.52	-0.245					

13.31	3.46	13.30	3.46				
	W3020		BASEDpond-100yr24hr	14.03	0.00	0.050	
12.96	2.74	12.93	2.77				
	WBBa		BASEDpond-100yr24hr	12.74	21.04	1.602	
13.04	2.19	13.05	2.09				
	WQBtoBOUND		BASEDpond-100yr24hr	0.00	0.00	0.000	
12.57	2.91	12.57	1.64				
	WQBtoPS		BASEDpond-100yr24hr	13.10	30.00	7.404	
13.05	2.09	13.04	1.16				
	2810 to pond		BASEDpond-100yr72hr	61.08	28.91	-17.844	
60.17	2.52	60.15	2.16				
	2820 to 2810		BASEDpond-100yr72hr	61.08	28.86	-18.597	
60.43	3.18	60.17	2.52				
	2820to3020		BASEDpond-100yr72hr	0.00	0.00	-0.001	
60.43	3.13	60.43	3.18				
	2820toUT		BASEDpond-100yr72hr	60.13	0.07	-0.039	
61.27	3.34	61.23	3.49				
	2830to3040		BASEDpond-100yr72hr	60.62	12.21	0.139	
60.93	3.58	61.15	3.53				
	2830toUT		BASEDpond-100yr72hr	60.66	19.03	0.021	
60.89	3.58	61.23	3.49				
	3010to3000		BASEDpond-100yr72hr	60.95	0.63	0.001	
60.95	3.40	60.95	3.07				
	3010to3030		BASEDpond-100yr72hr	60.35	0.50	-0.057	
61.24	3.44	61.24	3.49				
	3020to3000		BASEDpond-100yr72hr	0.00	0.00	0.002	
60.88	2.98	60.61	2.99				
	3030to3020		BASEDpond-100yr72hr	61.24	15.64	0.010	
61.24	3.49	61.21	3.33				
	3040to3030		BASEDpond-100yr72hr	60.35	24.93	0.036	
61.15	3.53	61.24	3.49				
	ChecktoBound		BASEDpond-100yr72hr	60.61	12.39	-2.583	
60.61	1.67	0.00	1.10				
	Culvert1		BASEDpond-100yr72hr	60.15	140.71	-3.183	
60.15	2.16	0.00	1.10				
	P2820		BASEDpond-100yr72hr	63.80	12.46	-1.347	
61.23	3.49	60.43	3.18				
	P2820b		BASEDpond-100yr72hr	65.75	9.47	-0.545	
60.89	3.58	61.23	3.49				
	P2830		BASEDpond-100yr72hr	66.28	2.28	0.115	
60.93	3.58	61.15	3.53				
	P3000WQ1		BASEDpond-100yr72hr	60.61	12.39	-8.345	
60.61	2.99	60.61	1.67				
	P3010		BASEDpond-100yr72hr	61.98	9.79	-1.429	
60.95	3.40	60.61	2.99				
	P3020		BASEDpond-100yr72hr	0.00	1.72	1.192	
61.00	2.88	60.96	2.92				
	P3020b		BASEDpond-100yr72hr	59.60	0.73	-1.743	
60.94	2.94	60.61	2.99				
	P3030		BASEDpond-100yr72hr	64.40	12.64	-9.782	
61.24	3.49	61.05	3.21				
	P3030b		BASEDpond-100yr72hr	64.39	12.64	10.175	
61.05	3.21	61.00	2.88				
	P3030eastPS		BASEDpond-100yr72hr	60.72	30.21	16.608	
61.00	2.88	61.04	2.42				
	P3040		BASEDpond-100yr72hr	59.77	7.64	-2.229	
61.15	3.53	61.24	3.49				
	PSlowflow		BASEDpond-100yr72hr	0.00	22.06	22.062	
61.04	2.42	60.95	2.33				
	PStoWells		BASEDpond-100yr72hr	61.00	29.98	29.779	
61.00	1.40	0.00	0.50				
	ThomSem		BASEDpond-100yr72hr	60.57	13.02	0.012	
60.89	3.58	60.93	3.58				

UTto3030		BASEDpond-100yr72hr	61.18	2.25	0.191		
61.23	3.49	61.24	3.49				
W3020		BASEDpond-100yr72hr	0.00	0.00	0.074		
60.96	2.92	60.94	2.94				
WBBa		BASEDpond-100yr72hr	60.83	22.37	2.051		
61.04	2.42	60.95	2.33				
WQBtoBOUND		BASEDpond-100yr72hr	0.00	0.00	0.000		
60.61	2.99	60.61	1.67				
WQBtoPS		BASEDpond-100yr72hr	60.72	30.07	7.448		
60.95	2.33	61.00	1.40				
2810 to pond		BASEDpond-10yr24hr-	12.17	21.37	-17.844		
12.18	1.80	12.19	1.47				
2820 to 2810		BASEDpond-10yr24hr-	12.17	21.40	-18.597		
12.17	2.43	12.18	1.80				
2820to3020		BASEDpond-10yr24hr-	0.00	0.00	0.000		
12.20	1.54	12.17	2.43				
2820toUT		BASEDpond-10yr24hr-	0.00	0.00	0.001		
13.38	3.09	13.38	3.11				
2830to3040		BASEDpond-10yr24hr-	12.90	5.89	0.098		
12.89	3.34	12.81	3.23				
2830toUT		BASEDpond-10yr24hr-	12.96	7.10	0.003		
12.88	3.34	13.38	3.11				
3010to3000		BASEDpond-10yr24hr-	0.00	0.00	0.000		
12.21	2.74	12.19	2.35				
3010to3030		BASEDpond-10yr24hr-	0.00	0.00	0.000		
12.21	2.74	13.38	3.11				
3020to3000		BASEDpond-10yr24hr-	0.00	0.00	0.000		
12.20	1.54	12.19	2.35				
3030to3020		BASEDpond-10yr24hr-	13.38	0.75	0.000		
13.38	3.11	13.38	3.08				
3040to3030		BASEDpond-10yr24hr-	12.63	11.41	0.004		
12.81	3.23	13.38	3.11				
ChecktoBound		BASEDpond-10yr24hr-	12.19	10.07	-2.583		
12.19	1.47	0.00	1.10				
Culvert1		BASEDpond-10yr24hr-	12.19	84.30	-3.183		
12.19	1.47	0.00	1.10				
P2820		BASEDpond-10yr24hr-	13.95	12.25	-1.347		
13.38	3.11	12.17	2.43				
P2820b		BASEDpond-10yr24hr-	15.39	9.51	-0.545		
12.88	3.34	13.38	3.11				
P2830		BASEDpond-10yr24hr-	15.87	2.32	0.115		
12.89	3.34	12.81	3.23				
P3000WQ1		BASEDpond-10yr24hr-	12.19	10.07	-8.345		
12.19	2.35	12.19	1.47				
P3010		BASEDpond-10yr24hr-	12.24	6.60	-1.429		
12.21	2.74	12.19	2.35				
P3020		BASEDpond-10yr24hr-	0.00	1.72	1.192		
12.20	1.54	12.20	1.71				
P3020b		BASEDpond-10yr24hr-	11.78	0.79	-1.743		
12.19	2.18	12.19	2.35				
P3030		BASEDpond-10yr24hr-	13.78	12.58	-9.782		
13.38	3.11	12.34	2.26				
P3030b		BASEDpond-10yr24hr-	13.78	12.59	10.175		
12.34	2.26	12.20	1.54				
P3030eastPS		BASEDpond-10yr24hr-	12.17	23.85	16.608		
12.20	1.54	11.89	1.30				
P3040		BASEDpond-10yr24hr-	12.01	7.53	-2.229		
12.81	3.23	13.38	3.11				
PSlowflow		BASEDpond-10yr24hr-	0.00	22.06	22.062		
11.89	1.30	11.89	1.24				
PStoWells		BASEDpond-10yr24hr-	11.89	29.88	-29.775		
11.89	1.00	0.00	0.50				
ThomSem		BASEDpond-10yr24hr-	12.81	6.48	-0.010		

12.88	3.34	12.89	3.34			
	UTto3030		BASEDpond-10yr24hr-	12.36	0.15	-0.033
13.38	3.11	13.38	3.11			
	W3020		BASEDpond-10yr24hr-	0.00	0.00	-0.009
12.20	1.71	12.19	2.18			
	WBBa		BASEDpond-10yr24hr-	12.20	11.97	0.624
11.89	1.30	11.89	1.24			
	WQBtoBOUND		BASEDpond-10yr24hr-	0.00	0.00	0.000
12.19	2.35	12.19	1.47			
	WQBtoPS		BASEDpond-10yr24hr-	12.18	24.35	7.963
11.89	1.24	11.89	1.00			
	2810 to pond		BASEDpond-25yr24hr-	12.18	23.17	-17.844
12.20	2.08	12.21	1.68			
	2820 to 2810		BASEDpond-25yr24hr-	12.17	23.22	-18.597
12.19	2.81	12.20	2.08			
	2820to3020		BASEDpond-25yr24hr-	0.00	0.00	0.000
12.18	1.86	12.19	2.81			
	2820toUT		BASEDpond-25yr24hr-	0.00	0.00	-0.001
13.41	3.21	13.41	3.28			
	2830to3040		BASEDpond-25yr24hr-	12.84	8.27	0.130
12.89	3.44	13.07	3.35			
	2830toUT		BASEDpond-25yr24hr-	12.86	11.48	0.004
12.88	3.44	13.41	3.28			
	3010to3000		BASEDpond-25yr24hr-	0.00	0.00	0.000
12.36	3.15	12.28	2.63			
	3010to3030		BASEDpond-25yr24hr-	0.00	0.00	-0.001
13.41	3.27	13.41	3.27			
	3020to3000		BASEDpond-25yr24hr-	0.00	0.00	0.000
12.18	1.86	12.28	2.63			
	3030to3020		BASEDpond-25yr24hr-	13.41	5.12	0.001
13.41	3.27	13.41	3.20			
	3040to3030		BASEDpond-25yr24hr-	12.54	16.10	0.006
13.07	3.35	13.41	3.27			
	ChecktoBound		BASEDpond-25yr24hr-	12.28	11.15	-2.583
12.28	1.55	0.00	1.10			
	Culvert1		BASEDpond-25yr24hr-	12.21	105.04	-3.183
12.21	1.68	0.00	1.10			
	P2820		BASEDpond-25yr24hr-	14.76	12.48	-1.347
13.41	3.28	12.19	2.81			
	P2820b		BASEDpond-25yr24hr-	16.47	9.47	-0.545
12.88	3.44	13.41	3.28			
	P2830		BASEDpond-25yr24hr-	17.00	2.30	0.115
12.89	3.44	13.07	3.35			
	P3000WQ1		BASEDpond-25yr24hr-	12.28	11.15	-8.345
12.28	2.63	12.28	1.55			
	P3010		BASEDpond-25yr24hr-	12.57	8.44	-1.429
12.36	3.15	12.28	2.63			
	P3020		BASEDpond-25yr24hr-	0.00	1.72	1.192
12.18	1.86	12.21	2.18			
	P3020b		BASEDpond-25yr24hr-	11.70	0.77	-1.743
12.24	2.32	12.28	2.63			
	P3030		BASEDpond-25yr24hr-	15.08	12.64	-9.782
13.41	3.27	12.52	2.50			
	P3030b		BASEDpond-25yr24hr-	15.07	12.64	10.175
12.52	2.50	12.18	1.86			
	P3030eastPS		BASEDpond-25yr24hr-	12.18	27.81	16.608
12.18	1.86	12.18	1.47			
	P3040		BASEDpond-25yr24hr-	11.93	7.55	-2.229
13.07	3.35	13.41	3.27			
	PSlowflow		BASEDpond-25yr24hr-	0.00	22.06	22.062
12.18	1.47	12.18	1.32			
	PStoWells		BASEDpond-25yr24hr-	11.80	29.88	29.778
11.80	1.00	0.00	0.50			

ThomSem		BASEDpond-25yr24hr-	12.78	8.88	-0.011	
12.88	3.44	12.89	3.44			
UTto3030		BASEDpond-25yr24hr-	13.44	0.55	-0.118	
13.41	3.28	13.41	3.27			
W3020		BASEDpond-25yr24hr-	0.00	0.00	-0.010	
12.21	2.18	12.24	2.32			
WBBa		BASEDpond-25yr24hr-	12.19	15.82	0.957	
12.18	1.47	12.18	1.32			
WQBtoBOUND		BASEDpond-25yr24hr-	0.00	0.00	0.000	
12.28	2.63	12.28	1.55			
WQBtoPS		BASEDpond-25yr24hr-	12.19	28.24	6.065	
12.18	1.32	11.80	1.00			
2810 to pond		BASEDpond-25yr72hr-	60.17	23.33	-17.844	
60.13	2.12	60.13	1.72			
2820 to 2810		BASEDpond-25yr72hr-	60.09	23.40	-18.597	
60.12	2.87	60.13	2.12			
2820to3020		BASEDpond-25yr72hr-	0.00	0.00	0.000	
60.11	1.91	60.12	2.87			
2820toUT		BASEDpond-25yr72hr-	0.00	0.00	-0.001	
61.34	3.21	61.34	3.28			
2830to3040		BASEDpond-25yr72hr-	60.76	8.20	0.139	
60.82	3.44	61.02	3.35			
2830toUT		BASEDpond-25yr72hr-	60.78	11.41	0.004	
60.81	3.44	61.34	3.28			
3010to3000		BASEDpond-25yr72hr-	0.00	0.00	0.000	
60.27	3.17	60.20	2.65			
3010to3030		BASEDpond-25yr72hr-	0.00	0.00	-0.001	
61.34	3.27	61.34	3.28			
3020to3000		BASEDpond-25yr72hr-	0.00	0.00	0.000	
60.11	1.91	60.20	2.65			
3030to3020		BASEDpond-25yr72hr-	61.34	5.21	0.001	
61.34	3.28	61.34	3.20			
3040to3030		BASEDpond-25yr72hr-	60.42	15.96	0.006	
61.02	3.35	61.34	3.28			
ChecktoBound		BASEDpond-25yr72hr-	60.20	11.25	-2.583	
60.20	1.56	0.00	1.10			
Culvert1		BASEDpond-25yr72hr-	60.13	108.52	-3.183	
60.13	1.72	0.00	1.10			
P2820		BASEDpond-25yr72hr-	62.71	12.50	-1.347	
61.34	3.28	60.12	2.87			
P2820b		BASEDpond-25yr72hr-	64.43	9.48	-0.545	
60.81	3.44	61.34	3.28			
P2830		BASEDpond-25yr72hr-	64.92	2.34	0.115	
60.82	3.44	61.02	3.35			
P3000WQ1		BASEDpond-25yr72hr-	60.20	11.25	-8.345	
60.20	2.65	60.20	1.56			
P3010		BASEDpond-25yr72hr-	60.48	8.57	-1.429	
60.27	3.17	60.20	2.65			
P3020		BASEDpond-25yr72hr-	0.00	1.72	1.192	
60.11	1.91	60.13	2.22			
P3020b		BASEDpond-25yr72hr-	59.65	0.74	-1.743	
60.15	2.34	60.20	2.65			
P3030		BASEDpond-25yr72hr-	63.01	12.64	-9.782	
61.34	3.28	60.40	2.50			
P3030b		BASEDpond-25yr72hr-	63.00	12.65	10.175	
60.40	2.50	60.11	1.91			
P3030eastPS		BASEDpond-25yr72hr-	60.10	28.34	16.608	
60.11	1.91	60.11	1.50			
P3040		BASEDpond-25yr72hr-	59.85	7.59	-2.229	
61.02	3.35	61.34	3.28			
PSlowflow		BASEDpond-25yr72hr-	0.00	22.06	22.062	
60.11	1.50	60.11	1.35			
PStoWells		BASEDpond-25yr72hr-	59.73	29.87	29.778	

59.73	1.00	0.00	0.50				
	ThomSem		BASEDpond-25yr72hr-	60.69	8.82	-0.014	
60.81	3.44	60.82	3.44				
	UTto3030		BASEDpond-25yr72hr-	61.42	0.53	0.120	
61.34	3.28	61.34	3.28				
	W3020		BASEDpond-25yr72hr-	0.00	0.00	0.012	
60.13	2.22	60.15	2.34				
	WBBa		BASEDpond-25yr72hr-	60.10	16.31	0.954	
60.11	1.50	60.11	1.35				
	WQBtoBOUND		BASEDpond-25yr72hr-	0.00	0.00	0.000	
60.20	2.65	60.20	1.56				
	WQBtoPS		BASEDpond-25yr72hr-	60.10	28.72	6.052	
60.11	1.35	59.73	1.00				
	2810 to pond		BASEDpond-2yr24h-pc	12.18	17.11	-17.844	
12.18	1.47	12.18	1.26				
	2820 to 2810		BASEDpond-2yr24h-pc	12.17	17.12	-18.597	
12.17	1.87	12.18	1.47				
	2820to3020		BASEDpond-2yr24h-pc	0.00	0.00	0.000	
12.10	1.41	12.17	1.87				
	2820toUT		BASEDpond-2yr24h-pc	0.00	0.00	0.000	
12.17	1.87	12.67	2.63				
	2830to3040		BASEDpond-2yr24h-pc	12.91	1.83	0.031	
12.85	3.17	12.62	3.06				
	2830toUT		BASEDpond-2yr24h-pc	12.85	1.32	0.000	
12.85	3.17	12.85	2.93				
	3010to3000		BASEDpond-2yr24h-pc	0.00	0.00	0.000	
12.18	2.04	12.18	1.89				
	3010to3030		BASEDpond-2yr24h-pc	0.00	0.00	0.000	
12.18	2.04	12.86	2.74				
	3020to3000		BASEDpond-2yr24h-pc	0.00	0.00	0.000	
12.10	1.41	12.18	1.89				
	3030to3020		BASEDpond-2yr24h-pc	0.00	0.00	0.000	
12.86	2.74	12.10	1.41				
	3040to3030		BASEDpond-2yr24h-pc	12.73	2.50	-0.105	
12.62	3.06	12.86	2.74				
	ChecktoBound		BASEDpond-2yr24h-pc	12.18	8.04	-2.583	
12.18	1.34	0.00	1.10				
	Culvert1		BASEDpond-2yr24h-pc	12.18	55.57	-3.183	
12.18	1.26	0.00	1.10				
	P2820		BASEDpond-2yr24h-pc	13.25	10.29	-1.347	
12.67	2.63	12.17	1.87				
	P2820b		BASEDpond-2yr24h-pc	13.98	9.60	-0.545	
12.85	3.17	12.67	2.63				
	P2830		BASEDpond-2yr24h-pc	14.08	2.39	0.115	
12.85	3.17	12.62	3.06				
	P3000WQ1		BASEDpond-2yr24h-pc	12.18	8.04	-8.345	
12.18	1.89	12.18	1.34				
	P3010		BASEDpond-2yr24h-pc	12.20	4.07	-1.429	
12.18	2.04	12.18	1.89				
	P3020		BASEDpond-2yr24h-pc	0.00	1.72	1.192	
12.10	1.41	12.10	1.42				
	P3020b		BASEDpond-2yr24h-pc	11.94	0.82	-1.743	
12.18	1.88	12.18	1.89				
	P3030		BASEDpond-2yr24h-pc	13.12	11.63	-9.782	
12.86	2.74	12.10	2.07				
	P3030b		BASEDpond-2yr24h-pc	13.11	11.63	10.175	
12.10	2.07	12.10	1.41				
	P3030eastPS		BASEDpond-2yr24h-pc	12.47	25.09	16.608	
12.10	1.41	12.10	1.29				
	P3040		BASEDpond-2yr24h-pc	13.74	8.63	-2.229	
12.62	3.06	12.86	2.74				
	PSlowflow		BASEDpond-2yr24h-pc	0.00	22.06	22.062	
12.10	1.29	12.10	1.23				

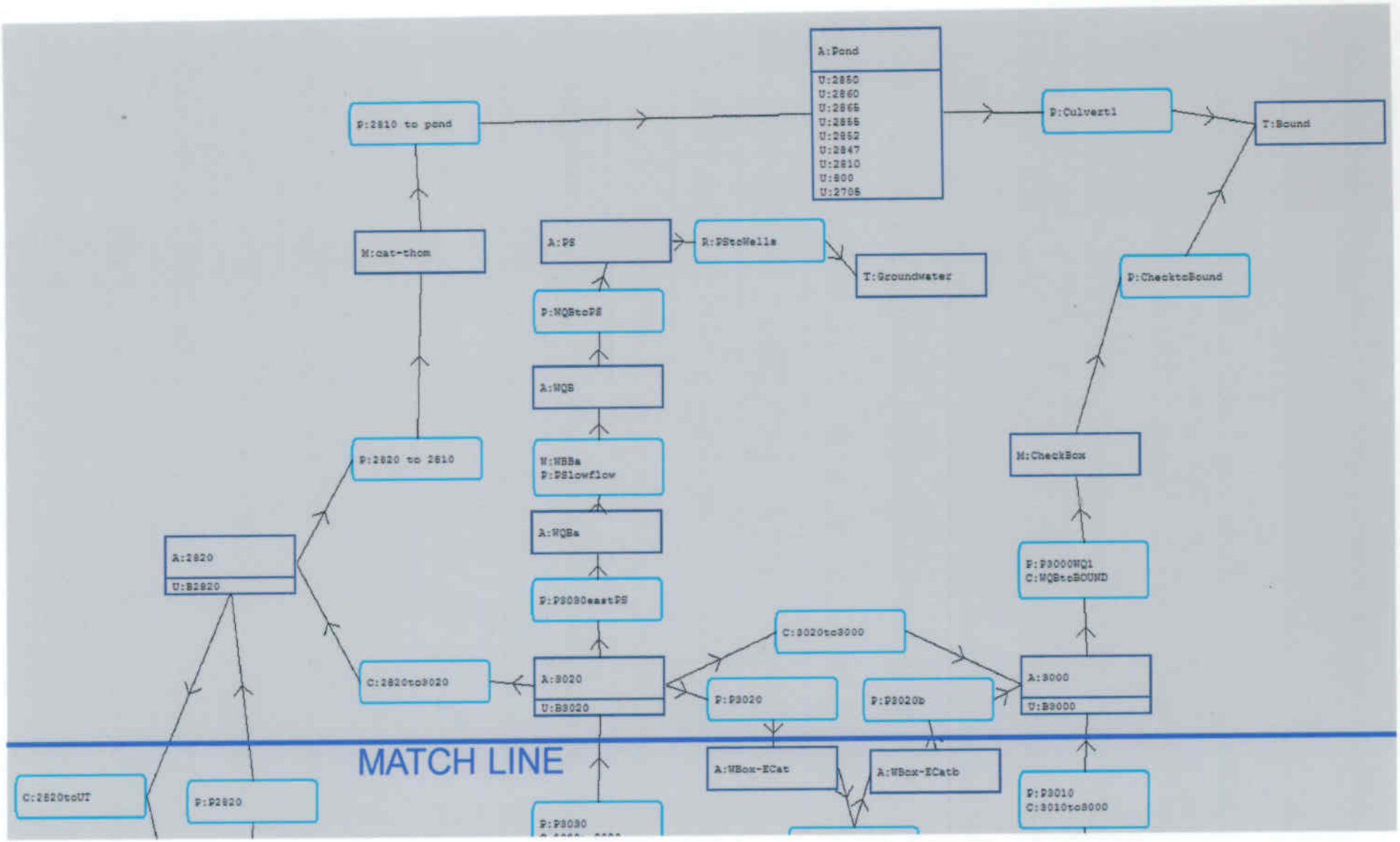
PStoWells		BASEDpond-2yr24h-pc	12.10	29.88	-29.774		
12.10	1.00	0.00	0.50				
ThomSem		BASEDpond-2yr24h-pc	12.35	3.49	-0.008		
12.85	3.17	12.85	3.17				
UTto3030		BASEDpond-2yr24h-pc	0.00	0.00	0.000		
12.67	2.63	12.86	2.74				
W3020		BASEDpond-2yr24h-pc	0.00	0.00	-0.012		
12.10	1.42	12.18	1.88				
WBBa		BASEDpond-2yr24h-pc	12.10	10.38	0.948		
12.10	1.29	12.10	1.23				
WQBtoBOUND		BASEDpond-2yr24h-pc	0.00	0.00	0.000		
12.18	1.89	12.18	1.34				
WQBtoPS		BASEDpond-2yr24h-pc	12.10	24.11	7.914		
12.10	1.23	12.10	1.00				
2810 to pond		BASEDpond-5yr24h-pc	12.18	19.89	-17.844		
12.19	1.67	12.19	1.38				
2820 to 2810		BASEDpond-5yr24h-pc	12.17	19.91	-18.597		
12.18	2.21	12.19	1.67				
2820to3020		BASEDpond-5yr24h-pc	0.00	0.00	0.000		
11.95	1.42	12.18	2.21				
2820toUT		BASEDpond-5yr24h-pc	0.00	0.00	0.000		
12.18	2.21	13.23	2.98				
2830to3040		BASEDpond-5yr24h-pc	12.91	4.54	0.076		
12.88	3.28	12.68	3.17				
2830toUT		BASEDpond-5yr24h-pc	12.88	4.82	0.002		
12.88	3.29	12.88	3.02				
3010to3000		BASEDpond-5yr24h-pc	0.00	0.00	0.000		
12.20	2.44	12.18	2.16				
3010to3030		BASEDpond-5yr24h-pc	0.00	0.00	0.000		
12.20	2.44	13.21	2.98				
3020to3000		BASEDpond-5yr24h-pc	0.00	0.00	0.000		
11.95	1.42	12.18	2.16				
3030to3020		BASEDpond-5yr24h-pc	13.21	0.00	0.000		
13.21	2.98	13.21	2.98				
3040to3030		BASEDpond-5yr24h-pc	12.61	8.59	0.003		
12.68	3.17	13.21	2.98				
ChecktoBound		BASEDpond-5yr24h-pc	12.18	9.29	-2.583		
12.18	1.42	0.00	1.10				
Culvert1		BASEDpond-5yr24h-pc	12.19	73.13	-3.183		
12.19	1.38	0.00	1.10				
P2820		BASEDpond-5yr24h-pc	13.74	11.78	-1.347		
13.23	2.98	12.18	2.21				
P2820b		BASEDpond-5yr24h-pc	14.80	9.53	-0.545		
12.88	3.29	13.23	2.98				
P2830		BASEDpond-5yr24h-pc	15.10	2.36	0.115		
12.88	3.28	12.68	3.17				
P3000WQ1		BASEDpond-5yr24h-pc	12.18	9.29	-8.345		
12.18	2.16	12.18	1.42				
P3010		BASEDpond-5yr24h-pc	12.23	5.61	-1.429		
12.20	2.44	12.18	2.16				
P3020		BASEDpond-5yr24h-pc	0.00	1.72	1.192		
11.95	1.42	12.19	1.44				
P3020b		BASEDpond-5yr24h-pc	11.83	0.81	-1.743		
12.18	2.08	12.18	2.16				
P3030		BASEDpond-5yr24h-pc	13.49	12.32	-9.782		
13.21	2.98	12.34	2.14				
P3030b		BASEDpond-5yr24h-pc	13.48	12.32	10.175		
12.34	2.14	11.95	1.42				
P3030eastPS		BASEDpond-5yr24h-pc	12.79	25.05	16.608		
11.95	1.42	11.95	1.30				
P3040		BASEDpond-5yr24h-pc	12.07	7.51	-2.229		
12.68	3.17	13.21	2.98				
PSlowflow		BASEDpond-5yr24h-pc	0.00	22.06	22.062		

Attachment B Links

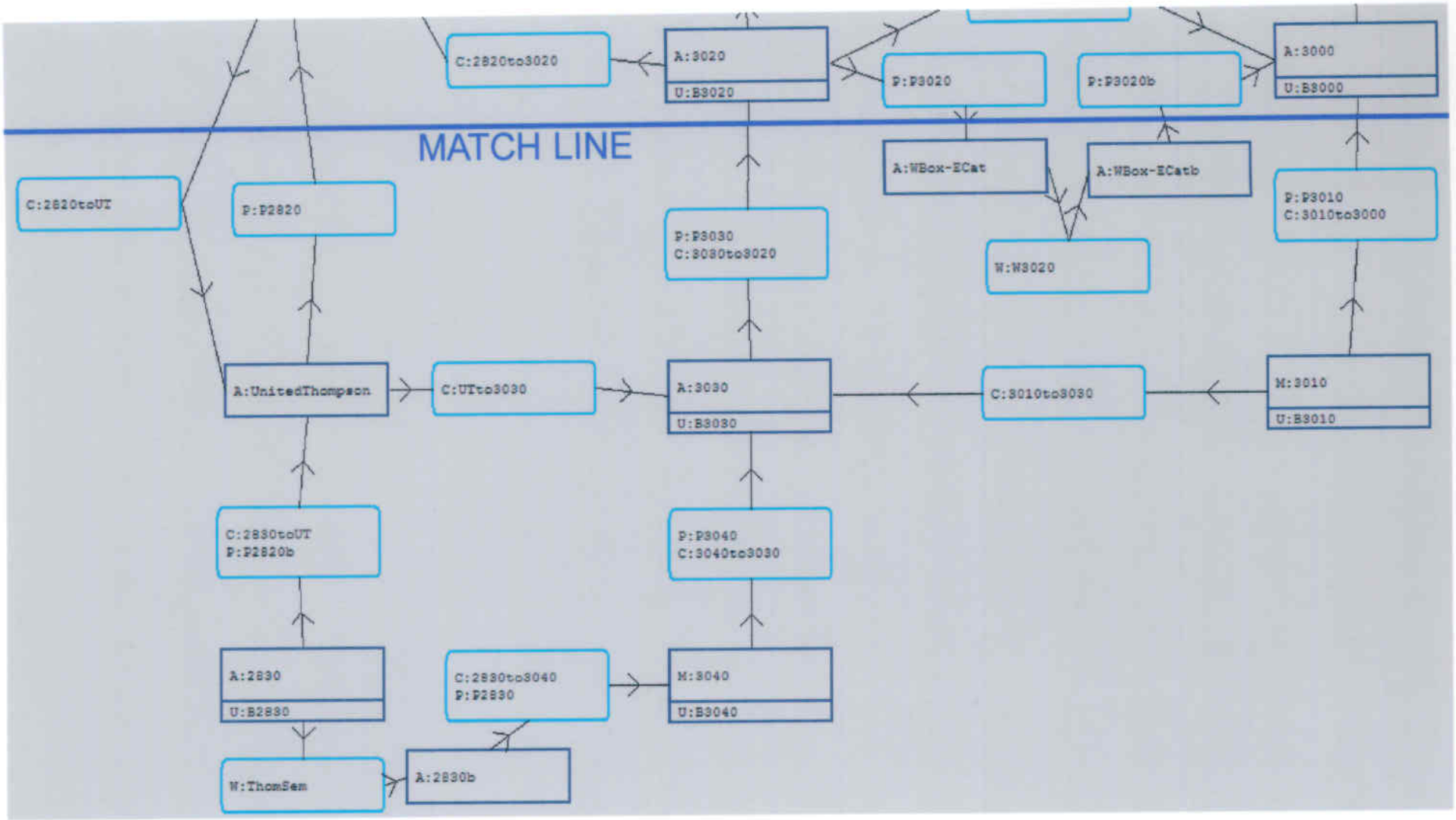
11.95	1.30	11.95	1.24				
	PStoWells		BASEDpond-5yr24h-pc	11.95	29.88	-29.775	
11.95	1.00	0.00	0.50				
	ThomSem		BASEDpond-5yr24h-pc	12.81	5.15	-0.009	
12.88	3.29	12.88	3.28				
	UTto3030		BASEDpond-5yr24h-pc	12.44	0.03	-0.010	
13.23	2.98	13.21	2.98				
	W3020		BASEDpond-5yr24h-pc	0.00	0.00	-0.009	
12.19	1.44	12.18	2.08				
	WBBa		BASEDpond-5yr24h-pc	11.95	10.51	0.953	
11.95	1.30	11.95	1.24				
	WQBtoBOUND		BASEDpond-5yr24h-pc	0.00	0.00	0.000	
12.18	2.16	12.18	1.42				
	WQBtoPS		BASEDpond-5yr24h-pc	11.95	24.18	7.944	
11.95	1.24	11.95	1.00				

ATTACHMENT C

ICPR Nodal Diagram



Nodal Diagram, Sheet 1 of 2



Nodal Diagram, Sheet 2 of 2

ATTACHMENT D

Construction Costs

NOTE TO BIDDER: Use preferably BLACK ink for completing this Bid form.

BID FORM

To: The City of Key West

Address: 525 Angela Street, Key West, Florida 33040

Project Title: ITB #12-005/George Street Stormwater Basin Improvements

CH2M HILL Project No.: 427475

City of Key West Project No.: ST 0802

Bidder's person to contact for additional information on this Bid:

Name: Ronald F. Davoli, President/CEO

Telephone: 407-321-8410

BIDDER'S DECLARATION AND UNDERSTANDING

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official of the Owner, and that the Bid is made without any connection or collusion with any person submitting another Bid on this Contract.

The Bidder further declares that he has carefully examined the Contract Documents for the construction of the project, that he has personally inspected the site, that he has satisfied himself as to the quantities involved, including materials and equipment, and conditions of work involved, including the fact that the description of the quantities of work and materials, as included herein, is brief and is intended only to indicate the general nature of the Work and to identify the said quantities with the detailed requirements of the Contract Documents, and that this Bid is made according to the provisions and under the terms of the Contract Documents, which Documents are hereby made a part of this Bid.

The Bidder further agrees, as evidenced by signing the Bid, that if awarded a Contract, the Florida Trench Safety Act and applicable trench safety standards will be complied with.

CONTRACT EXECUTION AND BONDS

The Bidder agrees that if this Bid is accepted, he will, within 10 days, not including Sundays and legal holidays, after Notice of Award, sign the Contract in the form annexed hereto, and will at that time, deliver to the Owner examples of the Performance Bond and Payment Bond required herein, and evidence of holding required licenses and certificates, and will, to the extent of his Bid, furnish all machinery, tools, apparatus, and other means of construction and do the Work and furnish all the materials necessary to complete all work as specified or indicated in the Contract Documents.

CERTIFICATES OF INSURANCE

Bidder agrees to furnish the Owner, before commencing the Work under this Contract, the certificates of insurance as specified in these Documents.

START OF CONSTRUCTION AND CONTRACT COMPLETION TIMES

The Bidder agrees to begin work within 10 calendar days after the date of the Notice to Proceed and to achieve Substantial Completion within 425 calendar days from the date when the Contract Times commence to run as provided in paragraph 2.03.A of the General Conditions, and Work will be completed and ready for final payment and acceptance in accordance with paragraph 14.07 of the General Conditions within 455 calendar days from the date when the Contract Times commence to run.

LIQUIDATED DAMAGES

In the event the Bidder is awarded the Contract, Owner and Bidder recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in paragraph Start of Construction and Contract Completion Times above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. Owner and Bidder also recognize the delays, expense, and difficulties involved in proving in a legal or other dispute resolution proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Bidder agree that as liquidated damages for delay (but not as a penalty) Bidder shall pay Owner $3,000.00 per day for each day that expires after the time specified for substantial completion.

After Substantial Completion, if Bidder neglects, refuses, or fails to complete the remaining Work within the Contract Times or any Owner-granted extension thereof, Bidder shall pay Owner $1,000.00 for each day that expires after the time specified in paragraph Start of Construction and Contract Completion Times, above for completion and readiness for final payment. Liquidated damages shall run concurrent.

Owner will recover such liquidated damages by deducting the amount owed from the final payment or any retainage held by Owner.

ADDENDA

The Bidder hereby acknowledges that he has received Addenda No's. 1, 2, ____, _____, ____, (Bidder shall insert No. of each Addendum received) and agrees that all addenda issued are hereby made part of the Contract Documents, and the Bidder further agrees that his Bid(s) includes all impacts resulting from said addenda.

SALES AND USE TAXES

The Bidder agrees that all federal, state, and local sales and use taxes are included in the stated Bid Prices for the Work. Cash allowances DO NOT include any sales and use tax. Equipment allowance includes taxes as shown in Equipment Suppliers' Bid.

PUBLIC ENTITY CRIMES

"A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list."

COMBINED UNIT PRICE AND LUMP SUM WORK

The Bidder further proposes to accept as full payment for the Work proposed herein the amounts computed under the provisions of the Contract Documents. For unit price bid items, the estimate of quantities of work to be done is tabulated in the Proposal and, although stated with as much accuracy as possible, is approximate only and is assumed solely for the basis of calculation upon which the award of Contract shall be made. For lump sum bid items, it is expressly understood that the amounts are independent of the exact quantities involved. The Bidder agrees that the amounts for both unit price and lump sum work represent a true measure of labor and materials required to perform the Work, including all allowances for overhead and profit for each type of work called for in these Contract Documents. The amounts shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.

UNIT PRICE SCHEDULE

Unit prices have been computed in accordance with Paragraph 11.03.C of the General Conditions and Section 01025, Measurement and Payment, Paragraph 1.07B.

Bidder acknowledges that estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Prices Bid items will be based on actual quantities, determined as provided in the Contract Documents.

CONTINGENCY ALLOWANCE

Bidder further agrees that the amount shown is an estimated amount to be included in the Total Base Bid for unforeseen conditions and conflicts. Bidder further acknowledges that payment will be based on actual costs as determined in conformance with the Contract Documents and as authorized by Change Order. The Owner will negotiate with the Contractor how each Contingency Allowance will be spent prior to performing the work.

BUILDING PERMIT ALLOWANCE

Bidder further acknowledges that this amount shown is an estimated amount to be included in the Total Base Bid for the Building Permit required by the City of Key West and any Regulatory Agency Permit(s). Bidder acknowledges that payment will be based on actual cost for the permit(s).

KEY ENERGY SERVICE ALLOWANCE

Bidder further agrees that the amount shown is an estimated amount to be included in the Total Base Bid to cover payment to Key Energy Service for electrical service. Bidder further acknowledges that payment will be based on actual amount paid as indicated by appropriate invoice.

UNIT PRICE BID SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Bid Unit Price	Extended Bid Unit Price
1	**General**				
1.1	Performance and Payment Bonds	1	EA	$25,000.00	$25,000.00
1.2	Mobilization	1	LS	$90,000.00	$90,000.00
1.3	Demobilization	1	LS	$20,000.00	$20,000.00
1.4	General and Supplementary Conditions	1	LS	$150,000.00	$150,000.00
1.5	MOT	1	LS	$20,000.00	$20,000.00
1.6	Certified AutoCad As-built	1	LS	$2,000.00	$2,000.00
1.7	Surveyor	1	LS	$3,500.00	$3,500.00
2	**Trench Excavation, Backfill and Storm Pipe**				
2.1	24-inch PVC SDR 41 Storm Pipe				
2.1.1	4 to 6 Feet Deep	100	LF	$330.00	$33,000.00
2.1.2	6 to 8 Feet Deep	70	LF	$350.00	$24,500.00

UNIT PRICE BID SCHEDULE					
Item No.	Description	Estimated Quantity	Unit	Bid Unit Price	Extended Bid Unit Price
2.2	**30-inch PVC SDR 51 Storm Pipe**				
2.2.1	4 to 6 Feet Deep	1,180	LF	$400.00	$472,000.00
2.2.2	6 to 8 Feet Deep	300	LF	$410.00	$123,000.00
2.2.3	8 to 10 Feet Deep	100	LF	$450.00	$45,000.00
2.3	**24-inch CLDI Storm Pipe**				
2.3.1	4 to 6 Feet Deep	55	LF	$260.00	$14,300.00
2.4	**18-inch CPE Storm Pipe**				
2.4.1	4 to 6 Feet Deep	210	LF	$200.00	$42,000.00
2.5	**24-inch CPE Storm Pipe**				
2.5.1	4 to 6 Feet Deep	100	LF	$240.00	$24,000.00
2.5.2	6 to 8 Feet Deep	70	LF	$250.00	$17,500.00
2.6	**30-inch CPE Storm Pipe**				
2.6.1	4 to 6 Feet Deep	20	LF	$290.00	$5,800.00
2.6.2	6 to 8 Feet Deep	20	LF	$315.00	$6,300.00
2.7	**36-inch CPE Storm Pipe**				
2.7.1	4 to 6 Feet Deep	75	LF	$360.00	$27,000.00
3	**Catch Basins, Inlets, and Manholes**				
3.1	Type J-8 MH	4	EA	$6,000.00	$24,000.00
3.2	Inlet Type F	7	EA	$5,000.00	$35,000.00
4	**Pump Station with Diversion Structure and Vortex Unit**	1	LS	$1,021,300.00	$1,021,300.00
5	**Stormwater Wells**				
5.1	Installation of Wells	2	EA	$45,000.00	$90,000.00
5.2	Wellhead Structure	2	EA	$22,500.00	$45,000.00
5.3	Well Testing	2	EA	$1,000.00	$2,000.00

UNIT PRICE BID SCHEDULE					
Item No.	**Description**	**Estimated Quantity**	**Unit**	**Bid Unit Price**	**Extended Bid Unit Price**
6	**Dewatering**	1	LS	$60,000.00	$60,000.00
7	**Florida Trench Safety Act Compliance**	1	LS	$3,500.00	$3,500.00
8	**Pavement**				
8.1	Pavement Removal and Replacement	2500	SY	$36.00	$90,000.00
8.2	Pavement 70 Mils Thermoplastic Stripping	500	LF	$6.00	$3,000.00
9	**Concrete**				
9.1	Sidewalk (4-inch depth)	7000	SF	$7.50	$52,500.00
9.2	Driveway (6-inch depth)	700	SF	$9.00	$6,300.00
9.3	FDOT Type F Curb, Mod (4") (Valley Gutter and Type D Included)	1700	LF	$20.00	$34,000.00
9.4	Water Meter Box Replacement	1	EA	$1,000.00	$1,000.00
10	**Buried V-405 Valves**				
10.1	24-inch Valve	1	EA	$20,000.00	$20,000.00
10.2	30-inch Valve	1	EA	$30,000.00	$30,000.00
11	**2-inch Manual Air Release Assembly**	3	EA	$2,500.00	$7,500.00
12	**Pipeline Abandonment**	1	LS	$18,000.00	$18,000.00
13	**Demolition**	1	LS	$21,000.00	$21,000.00
14	**Water Service Removal and Replacement**	10	EA	$400.00	$4,000.00
15	**Sanitary Sewer Service Removal and Replacement**	10	EA	$600.00	$6,000.00
16	**Emergency Generator with Concrete Platform**	1	LS	$200,000.00	$200,000.00
17	**Outfall Structure at Pond**	1	LS	$18,000.00	$18,000.00
18	**Soft Digs**	20	EA	$500.00	$10,000.00
				Total of All Extended Bid Unit Prices	**$** 2,947,000.00

Contingency Allowance $200,000.00

Building Permit Allowance $50,000.00

Key Energy Service Allowance $45,000.00

The Bidder agrees to accept as full payment for the Work proposed under this Project, as herein specified and as shown on the Drawings, the following Total Base Bid amount:

Three Million Two Hundred Forty Two Thousand Dollars

(Amount written in words has precedence)

and No Cents $ 3,242,000.00

TOTAL BASE BID $ 3,242,000.00

SUBCONTRACTORS

The Bidder further proposes that the following subcontracting firms or businesses will be awarded subcontracts for the following portions of the Work in the event that the Bidder is awarded the Contract:

Morris & Associates, Inc. (Painting)
Name

800 Citrus Avenue | Howey In The Hills | FL | 34737
Street | City | State | Zip

WellMasters, Inc. (Wells)
Name

1635 Industrial Park Road | Mulberry | FL | 33860
Street | City | State | Zip

Nearshore Electric, Inc. (Electric)
Name

5680 1st Avenue # 3 | Stock Island | FL | 33040
Street | City | State | Zip

RPM of the Keys, LLC dba Affordable Asphalt (Paving)
Name

Post Office Box 1632 | Islamorada | FL | 33036
Street | City | State | Zip

Surety

Western Surety Company whose address is

P.O. Box 946640 | Maitland | Florida 32794
Street | City | State | Zip

Bidder

The name of the Bidder submitting this Bid is Wharton-Smith, Inc.

_____ doing business at

750 Monroe Road | Sanford | Florida. 32771
Street | City | State | Zip

which is the address to which all communications concerned with this Bid and with the Contract shall be sent.

The names of the principal officers of the corporation submitting this Bid, or of the partnership, or of all persons interested in this Bid as principals are as follows:

Please see attached Corporate Officers List

If Sole Proprietor or Partnership

IN WITNESS hereto the undersigned has set his (its) hand this ___ day of _____ 20___.

N/A
Signature of Bidder

Title

If Corporation

IN WITNESS WHEREOF the undersigned corporation has caused this instrument to be executed and its seal affixed by its duly authorized officers this 29 day of November 20 11.

(SEAL)

Wharton-Smith, Inc.
Name of Corporation

By: [signature]

Title: Ronald F. Davoli, President/CEO

Attest: [signature]
Secretary
William C. Robinson, Jr., Corporate Secretary

END OF SECTION

FLORIDA BID BOND

BOND NO. 112911KeyWest

AMOUNT: $ 5% of Amount Bid

KNOW ALL MEN BY THESE PRESENTS, that Wharton-Smith, Inc.

hereinafter called the Contractor (Principal), and Western Surety Company

a corporation duly organized and existing under and by virtue of the laws of the State of South Dakota ~~Florida~~, hereinafter called the Surety, and authorized to transact business within the State of Florida, as Surety, are held and firmly bound unto The City of Key West as Owner

(Obligee), in the sum of: Five Percent of the Amount Bid

DOLLARS ($ 5%), for the payment for which we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the Principal is herewith submitting his or its Bid Proposal for Construction of the George Street Stormwater Basin Improvements, Key West, Florida, said Bid Proposal, by reference thereto, being hereby made a part hereof.

WHEREAS, the Principal contemplates submitting or has submitted a bid to the Obligee for the furnishing of all labor, materials (except those to be specifically furnished by the Owner), equipment, machinery, tools, apparatus, means of transportation for, and the performance of the work covered in the Proposal and the detailed Drawings and Specifications, entitled:

GEORGE STREET STORMWATER BASIN IMPROVEMENTS

WHEREAS, it was a condition precedent to the submission of said bid that a cashier's check, certified check, or bid bond in the amount of 5 percent of the base bid be submitted with said bid as a guarantee that the Bidder would, if awarded the Contract, enter into a written Contract with the Owner for the performance of said Contract, within 10 working days after written notice having been given of the award of the Contract.

NOW, THEREFORE, the conditions of this obligation are such that if the Principal within 10 consecutive calendar days after written notice of such acceptance, enters into a written Contract with the Obligee and furnishes the Performance and Payment Bonds, each in an amount equal to 100 percent of the awarded base bid, satisfactory to the Owner, then this obligation shall be void; otherwise the sum herein stated shall be due and payable to the Obligee and the Surety herein agrees to pay said sum immediately upon demand of the Obligee in good and lawful money of the United States of America, as liquidated damages for failure thereof of said Principal.

Signed and sealed this 29th day of November, 2011.

Wharton-Smith, Inc.
Principal

By: _____
Ronald F. Davoli, President/CEO

Western Surety Company
Surety

By: _____
Attorney-In-Fact & Florida Licensed Resident Agent
April L. Lively Inquiries: (407) 834-0022

END OF SECTION

Western Surety Company

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

J W Guignard, Bryce R Guignard, M Gary Francis, April L Lively, Paul J Ciambriello, Jennifer L McCarta, Margie L Morris, Peggy Snow, Allyson Foss, Individually

of Longwood, FL, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law printed on the reverse hereof, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Senior Vice President and its corporate seal to be hereto affixed on this 23rd day of August, 2010.

WESTERN SURETY COMPANY

Paul T. Bruflat, Senior Vice President

State of South Dakota
County of Minnehaha } ss

On this 23rd day of August, 2010, before me personally came Paul T. Bruflat, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is the Senior Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires
November 30, 2012

D. KRELL
NOTARY PUBLIC
SOUTH DAKOTA

D. Krell, Notary Public

CERTIFICATE

I, L. Nelson, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law of the corporation printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 29th day of November, 2011.

WESTERN SURETY COMPANY

L. Nelson, Assistant Secretary

Form F4280-09-06

ANTI-KICKBACK AFFIDAVIT

STATE OF FLORIDA)
: SS
COUNTY OF MONROE)

I, the undersigned hereby duly sworn, depose and say that no portion of the sum herein bid will be paid to any employees of the City of Key West as a commission, kickback, reward or gift, directly or indirectly by me or any member of my firm or by an officer of the corporation.

By: _____

Ronald F. Davoli, President/CEO

Sworn and subscribed before me this
29 day of November, 20 11

_____
NOTARY PUBLIC, State of Florida
at Large

DAWN K. BRAGG
MY COMMISSION # EE012887
EXPIRES October 24, 2014
(407) 398-0153 FloridaNotaryService.com

My Commission Expires: October 24, 2014

END OF SECTION

SWORN STATEMENT UNDER SECTION 287.133(3)(A)
FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid or Proposal for George Street Stormwater Basin Improvements, City of Key West, Florida

2. This sworn statement is submitted by Wharton-Smith, Inc.
(name of entity submitting sworn statement)

whose business address is 750 Monroe Road, Sanford, FL 32771

and (if applicable) its Federal Employer

Identification Number (FEIN) is 59-2392802

(If the entity has no FEIN, include the Social Security Number of the individual signing this

sworn statement N/A

3. My name is Ronald F. Davoli
(please print name of individual signing)

and my relationship to the entity named above is President/CEO

4. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including but not limited to, any bid or contract for goods or services to be provided to any public or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, material misrepresentation.

5. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication guilt, in any federal or state trial court of record relating to charges brought by indictment information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means

    1. A predecessor or successor of a person convicted of a public entity crime; or

    2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

7. I understand that a "person" as defined in Paragraph 287.133(1)(8), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies).

_X_ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND (Please indicate which additional statement applies.)

_____ There has been a proceeding concerning the conviction before a hearing of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

_____ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

_____ The person or affiliate has not been put on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

(signature) Ronald F. Davoli, President/CEO

November 29, 2011
(date)

STATE OF Florida

COUNTY OF Seminole

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

Ronald F. Davoli who, after first being sworn by me, affixed his/her
(name of individual signing)

signature in the space provided above on this 29 of November, 2011, 2009.

My commission expires:

DAWN K. BRAGG
MY COMMISSION # EE012887
EXPIRES October 24, 2014
(407) 398-0153 FloridaNotaryService.com

NOTARY PUBLIC

CITY OF KEY WEST INDEMNIFICATION FORM

The Contractor shall indemnify and hold harmless the City of Key West, its officers, and employees, from liabilities, damages, losses and costs, including, but not limited to reasonable attorney's fees, to the extent caused by the negligence, recklessness or intentional wrongful misconduct of Contractor and persons employed or utilized by Contractor in the performance of this agreement. Except as specifically provided herein, this agreement does not require Contractor to indemnify the City of Key West, its employees, officers, directors, or agents from any liability, damage, loss, claim, action or proceeding.

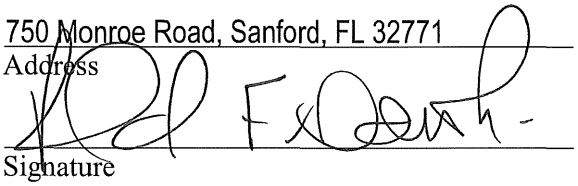
These indemnifications shall survive the term of this agreement. In the event that any action or proceeding is brought against the City of Key West by reason of such claim or demand, Contractor shall, upon written notice from the City of Key West, resist and defend such action or proceeding by counsel satisfactory to the City of Key West.

The indemnification provided above shall obligate Contractor to defend at its own expense to and through appellate, supplemental or bankruptcy proceeding, or to provide for such defense, at the City of Key West's option, any and all claims of liability and all suits and actions of every name and description covered above which may be brought against the City of Key West whether performed by Contractor, or persons employed or utilized by Contractor.

The Contractor's obligation under this provision shall not be limited in any way by the agreed upon Contract Price as shown in this agreement, or the Contractor's limit of or lack of sufficient insurance protection.

CONTRACTOR: Wharton-Smith, Inc. SEAL:

750 Monroe Road, Sanford, FL 32771
Address



Signature

Ronald F. Davoli
Print Name

President/CEO
Title

DATE: November 29, 2011

BIDDER'S CHECKLIST

(Note: The purpose of this checklist is to serve as a reminder of major items to be addressed in submitting a bid and is not intended to be all inclusive. It does not alleviate the Bidder from the responsibility of becoming familiar with all aspects of the Contract Documents and proper completion and submission of his bid.)

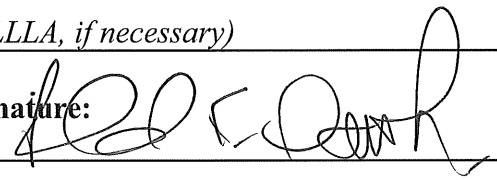
1.	All Contract Documents thoroughly read and understood.	[X]
2.	All blank spaces in Proposal filled in, using black ink.	[X]
3.	Total and unit prices added correctly.	[X]
4.	Addenda acknowledged.	[X]
5.	Subcontractors are named as indicated in the Proposal.	[X]
6.	Experience record included.	[X]
7.	Bid signed by authorized officer.	[X]
8.	Bid Bond completed and executed, including power-of-attorney dated the same date as Bid Bond.	[X]
9.	Bidder familiar with federal, state, and local laws, ordinances, rules and regulations affecting performance of the work.	[X]
10.	Bidder, if successful, able to obtain and/or demonstrate possession of required licenses and certificates within (10) ten calendar days after receiving a Notice of Award.	[X]
11.	Bid Documents submitted shall contain Bid Form, Bid Security, Experience Record, Anti-Kickback Affidavit, Public Entity Crimes, Key West Indemnification Form, Disclosure of Lobbying Activities, Non-Collusion Declaration and Compliance, Florida Trench Safety Act Compliance and Suspension and Debarment Certificate.	[X]
12.	Bid Documents submitted in sealed envelope and addressed and labeled in conformance with the instructions in the Invitation to Bid.	[X]
13.	Bidder must provide satisfactory documentation of State Licenses.	[X]

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

1. Type of Federal Action: [X] (a.) contract b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	**2. Status of Federal Action:** [X] (a.) bid/offer/application b. initial award c. post-award	**3. Report Type:** [X] (a.) initial filing b. material change **For Material Change Only:** year_____ quarter_____ date of last report_____

4. Name and Address of Reporting Entity: ☐ Prime ☒ Subawardee Tier Contractor, *if known:* Wharton-Smith, Inc. 750 Monroe Road Sanford, FL 32771 **Congressional District,** *if known:*	**5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime:** City of Key West 3126 Flagler Avenue Key West, FL 33040 **Congressional District,** *if known:*
6. Federal Department/Agency: FEMA	**7. Federal Program Name/Description:** CFDA Number, *if applicable:* _____
8. Federal Action Number, *if known:*	**9. Award Amount,** *if known:* **$**

10. a. Name and Address of Lobbying Entity *(if individual, last name, first name, MI):*	**b. Individuals Performing Services** *(including address if different from No. 10a) (last name, first name, MI):*
(attach Continuation Sheet(s) SF-LLLA, if necessary)	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.	**Signature:**  **Print Name:** Ronald F. Davoli **Title:** President/CEO **Telephone No.:** 407-321-8410 **Date:** November 29, 2011
Federal Use Only:	Authorized for Local Reproduction Standard Form – LLL (Rev 7 – 97)

FORM DEP 55-221 (01/01)

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. **Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.**

2. **Identify the status of the covered Federal action.**

3. **Identify the appropriate classification of this report. If this is a follow up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by the reporting entity for this covered Federal action.**

4. **Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.**

5. **If the organization filing the report in item 4 checks "Subawardee", then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.**

6. **Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.**

7. **Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.**

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).

11. The certifying official shall sign and date the form, print his/her name, title and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

Form DEP 55-221 (01/01)

NON-COLLUSION DECLARATION AND COMPLIANCE WITH 49 CFR §29.

ITEM/SEGMENT NO.:_____
F.A.P. NO.:
PARCEL NO.:
COUNTY OF:
BID LETTING OF:_____ ,_____

I, Ronald F. Davoli (NAME), hereby declare that I am President/CEO (TITLE) of Wharton-Smith, Inc. (FIRM) Of Sanford, Florida (CITY AND STATE) and that I am the person responsible within my firm for the final decision as to the price(s) and amount of this Bid on this State Project.

I further declare that:

1. The prices(s) and amount of this bid have been arrived at independently, without consultation, communication or agreement, for the purpose of restricting competition with any other contractor, bidder or potential bidder.

2. Neither the price(s) nor the amount of this bid have been disclosed to any other firm or person who is a bidder or potential bidder on this project, and will not be so disclosed prior to the bid opening.

3. No attempt has been made or will be made to solicit, cause or induce any other firm or person to refrain from bidding on this project, or to submit a bid higher than the bid of this firm, or any intentionally high or non-competitive bid or other form of complementary bid.

4. The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary bid.

5. My firm has not offered or entered into a subcontract or agreement regarding the purchase of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit a complementary bid on this project.

6. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value by any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting a complementary bid, or agreeing to do so, on this project.

7. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, act or other conduct inconsistent with any of the statements and representations made in this Declaration.

8. As required by Section 337.165, Florida Statutes, the firm has fully informed the Department of Transportation in writing of all convictions of the firm, its affiliates (as defined in Section 337.165(I)(a), Florida Statutes), and all directors, officers, and employees of the firm and its affiliates for violation of state or federal antitrust laws with respect to a public contract or for violation of any state or federal law involving fraud, bribery, collusion, conspiracy or material misrepresentation with respect to a public contract. This includes disclosure of the names of current employees of the firm or affiliates who were convicted of contract crimes while in the employ of another company.

9. I certify that, except as noted below, neither my firm nor any person associated therewith in the capacity of owner, partner, director, officer, principal, investigator, project director, manager, auditor, and/or position involving the administration of Federal funds:

(a) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions, as defined in 49 CFR §29.110(a), by any Federal department or agency;

(b) has within a three-year period preceding this certification been convicted of or had a civil judgment rendered against him or her for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a Federal, State or local government transaction or public contract; violation of Federal or State antitrust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property;

(c) is presently indicted for or otherwise criminally or civilly charged by a Federal, State or local governmental entity with commission of any of the offenses enumerated in paragraph 9(b) of this certification; and

(d) has within a three-year period preceding this certification had one or more Federal, State or local government public transactions terminated for cause or default..

10. I(We), certify that I(We), shall not knowingly enter into any transaction with any subcontractor, material supplier, or vendor who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this contract by any Federal Agency unless authorized by the Department.

Where I am unable to declare or certify as to any of the statements contained in the above stated paragraphs numbered (1) through (10), I have provided an explanation in the "Exceptions" portion below or by attached separate sheet.

EXCEPTIONS:

(Any exception listed above will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted, indicate to whom it applies, initiating agency and dates of agency action.

Providing false information may result in criminal prosecution and/or administrative sanctions.)

I declare under penalty of perjury that the foregoing is true and correct.

CONTRACTOR: (Seal)

BY: Ronald F. Davoli, President/CEO
NAME AND TITLE PRINTED

BY: _____
SIGNATURE
Ronald F. Davoli, President/CEO

WITNESS: _____
William C. Robinson, Jr., Corporate Secretary

WITNESS: _____
Carly Alexander, Witness

Executed on this 29 day of November, 2011

FAILURE TO FULLY COMPLETE AND EXECUTE THIS DOCUMENT MAY RESULT IN THE BID BEING DECLARED NONRESPONSIVE

FLORIDA TRENCH SAFETY ACT COMPLIANCE
Trench Excavation Safety System and Shoring

CERTIFICATION

All excavation, trenching, and related sheeting, bracing, etc. on this project shall conform to the requirements of the Florida Trench Safety Act (90-96, CS/SB 2626), which incorporates by reference, OSHA's excavation safety standards, 29 CFR 1926.650 Subpart P including all subsequent revisions or updates to the these standards.

By submission of this bid and subsequent execution of this Contract, the undersigned certifies compliance with the above mentioned standards and further stipulates that all costs associated with this compliance are detailed below as well as included in their lump sum bid amount.

Summary of Costs:

Trench Safety Measure	Units	Quantity	Unit Cost	Extended Cost
A. Trench Box	LS	1	$3,500	$3,500
B. N/A	N/A	N/A	N/A	N/A

Signature Ronald F. Davoli, President/CEO

November 29, 2011
Date

STATE OF Florida

COUNTY OF Seminole

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

Ronald F. Davoli, who, after first being sworn by me affixed his /her signature in the space,

provided above on the 29 day of November, 2011.

Notary Public

DAWN K. BRAGG
MY COMMISSION # EE012887
EXPIRES October 24, 2014
(407) 398-0153 FloridaNotaryService.com
(Seal)

MY COMMISSION EXPIRES: October 24, 2014

SUSPENSION AND DEBARMENT CERTIFICATION

CERTIFICATION REGARDING DEBARMENTS, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION-LOWER TIER FEDERALLY FUNDED TRANSACTIONS

1. The undersigned hereby certifies that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. The undersigned also certifies that it and its principals:
(a) Have not within a three-year period preceding this certification been convicted of or had a civil judgment rendered
against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State anti-trust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.
(b) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 2.(a) of this Certification; and
(c) Have not within a three-year period preceding this certification had one or more public transactions (Federal, State or local) terminated for cause or default.

3. Where the undersigned is unable to certify to any of the statements in this certification, an explanation shall be attached to this certification.

Dated this 29 day of November, 2011.

By _____
Authorized Signature/Contractor

Ronald F. Davoli, President/CEO
Typed Name/Title

Wharton-Smith, Inc.
Contractor's Firm Name

750 Monroe Road, Sanford, FL 32771
Street Address

_____
Building, Suite Number

_____
City/State/Zip Code

407-321-8410
Area Code/Telephone Number

427475

00 44 04

City of Key West
George Street Stormwater Basin Improvements
Current/Recent Similar Projects

Job #	Project Description	Project Location	Contract Amount	Start Date	Completion Date	Owner	Owner Contact	Owner Contact Phone	Engineer	Engineer Contact	Engineer Contact Phone
03-016	Pinellas Park PS 5, 6, 7 & 8	Pinellas Park, FL	$1,243,068	04/2003	04/2004	City of Pinellas Park	Keith Sabiel	727-541-0774	PBS&J	Bill Johnson	813-282-7275
04-070	Key West Distribution Pump Station	Key West, FL	$5,572,000	1/10/2005	3/14/2007	Florida Keys Aqueduct Authority	Omar Lopez	305-296-2454	CH2M HILL	Andrew Smyth	305-294-1645
05-010	Stock Island Pump Station Improvements	Stock Island, Florida Keys	$2,137,000	7/13/2005	9/25/2006	Florida Keys Aqueduct Authority	Omar Lopez	305-296-2454	CH2M HILL	Andrew Smyth	305-294-1645
08-003	Dixie Park WWTP Master Pump Station	Stuart, FL	$872,000	4/1/2008	10/1/2008	Martin County Utilities	Darrell Schuler	772-223-7957	Kimley-Horn & Associates	Mark Miller	772-345-3800
08-050	Master Lift Station at Martin Downs WWTP	Stuart, FL	$2,742,000	9/16/2008	7/13/2009	Martin County Utilities	Ted Robbins	772-223-7943	AECOM (formerly Boyle Engineering)	Christina Miranda	772-286-3833

AC# 5016102

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

SEQ# L10062900597

DATE	BATCH NUMBER	LICENSE NBR
06/29/2010	098183894	CGC032669

The GENERAL CONTRACTOR
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2012

SMITH, GEORGE E
WHARTON-SMITH INC
750 MONROE ROAD
SANFORD FL 32771

CHARLIE CRIST
GOVERNOR

CHARLIE LIEM
INTERIM SECRETARY

DISPLAY AS REQUIRED BY LAW

AC# 4996895

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

SEQ# L10061601088

DATE	BATCH NUMBER	LICENSE NBR
06/16/2010	098177161	CUC056506

The UNDERGROUND UTILITY & EXCAVATION CO
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2012

DAVOLI, RONALD FRANK
WHARTON-SMITH INC
750 COUNTY RD 15
P O BOX 471028
LAKE MONROE FL 32747-1028

CHARLIE CRIST
GOVERNOR

CHARLIE LIEM
INTERIM SECRETARY

DISPLAY AS REQUIRED BY LAW

AC# 5016175

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

SEQ# L10062900670

DATE	BATCH NUMBER	LICENSE NBR
06/29/2010	098183897	PCC048385

The POLLUTANT STORAGE SYSTEMS CONTRACTOR
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2012

SMITH, GEORGE E
WHARTON-SMITH INC
750 MONROE ROAD
SANFORD FL 32771

CHARLIE CRIST
GOVERNOR

CHARLIE LIEM
INTERIM SECRETARY

DISPLAY AS REQUIRED BY LAW

SEMINOLE COUNTY BUSINESS TAX RECEIPT

RAY VALDES, SEMINOLE COUNTY TAX COLLECTOR

PO Box 630 ▪ Sanford, FL 32772-0630 ▪ Telephone: 407-665-1000

www.seminoletax.org

VALID THROUGH 09/30/12

WHARTON-SMITH INC
750 MONROE RD
SANFORD, FL 32771

Account #:022717

GEORGE E SMITH (PRES)

REGULATED
State Lic.# - CG C032669
Qualifier- GEORGE E SMITH

Receipt #: 1S172011070701528 **Amount Paid: $ 45.00** **Date Paid: 07/07/2011**

State of Florida

Board of Professional Engineers

Wharton-Smith, Inc.

Is authorized under the provisions of Section 471.023, Florida Statutes, to offer engineering services to the public through a Professional Engineer, duly licensed under Chapter 471, Florida Statutes.

Certificate of Authorization

EXPIRATION: 2/28/2013
AUDIT NO: 228201303648

CA. LIC. NO:
1813

State of Florida

Department of State

I certify from the records of this office that WHARTON-SMITH, INC. is a corporation organized under the laws of the State of Florida, filed on April 3, 1984, effective April 2, 1984.

The document number of this corporation is G94383.

I further certify that said corporation has paid all fees due this office through December 31, 2011, that its most recent annual report was filed on January 5, 2011, and its status is active.

I further certify that said corporation has not filed Articles of Dissolution.

Given under my hand and the Great Seal of Florida, at Tallahassee, the Capital, this the Seventeenth day of January, 2011

Secretary of State

Authentication ID: **800191587188-011711-G94383**

To authenticate this certificate, visit the following site, enter this ID, and then follow the instructions displayed.
https://efile.sunbiz.org/certauthver.html

CITY OF KEY WEST, FLORIDA

Business Tax Receipt

This Document is a business tax receipt
Holder must meet all City zoning and use provisions.
P.O. Box 1409, Key West, Florida 33040 (305) 809-3955

Business Name	WHARTON-SMITH INC	CtlNbr:**0014888**
Location Addr	750 CR 15	
Lic NBR/Class	**12-00018196** CONTRACTOR - CERT GENERAL CONTRACTOR	
Issue Date:	August 26, 2011 **Expiration Date**:September 30, 2012	
License Fee	$309.75	
Add. Charges	$0.00	
Penalty	$0.00	
Total	$309.75	

Comments: _____

_____

This document must be prominently displayed.

WHARTON-SMITH INC

WHARTON-SMITH INC
POB 471028

LAKE MONROE FL 32747

Oper: CWALKER Type: OC Drawer: 1
Date: 8/30/11 54 Receipt no: 99449
2012 18196
OR LIC OCCUPATIO 1 $309.75
Trans number: 2670512
CK CHECK 2529 $309.75

Trans date: 8/30/11 Time: 10:23:06

CORPORATE OFFICERS

Ronald F. Davoli, President/CEO & Treasurer 750 Monroe Road, Sanford, FL 32771	21 years
Eric Palmer, Senior Vice President Commercial 750 Monroe Road, Sanford, FL 32771	14 years
Charles A. McCurdy, Vice President Estimating 750 Monroe Road, Sanford, FL 32771	22 years
Clyde Burgess, Vice President Environmental Design Build Division 750 Monroe Road, Sanford, FL 32771	26 years
David Hayes, Vice President International/Entertainment Division 750 Monroe Road, Sanford, FL 32771	16 years
John Lyons, Vice President Commercial Pre-Construction Services 750 Monroe Road, Sanford, FL 32771	27 years
Pat Hewitt – Vice President Orlando Environmental Division 750 Monroe Road, Sanford, FL 32771	13 years
John French – Vice President Palm City Region 3547 SW Corporate Parkway, Palm City, FL 34990	10 years
William C. Robinson, Jr., Corporate Secretary/Vice President Finance 750 Monroe Road, Sanford, FL 32771	27 years
George E. Smith, Chairman of the Board 750 Monroe Road, Sanford, FL 32771	27 years

Wharton-Smith, Inc.
CONSTRUCTION GROUP

CORPORATE RESOLUTION

I, the undersigned Secretary of Wharton Smith, Inc., a corporation organized and existing under the laws of the State of Florida, do hereby certify that a meeting of the Board of Directors of said corporation, duly held on August 23, 2011 a quorum being present, the following resolution was adopted and entered upon the regular minute book of said corporation, is in accordance with the by-laws and is now in full force and effect to-wit:

The current list of qualifiers to act for the business organization in all matters connected with its contracting business has now been amended to read:

Ronald F. Davoli
George E. Smith
William C. Robinson, Jr.
John S. French
David V. Hayes
Erickson H. Palmer
Timothy S. Smith
Ted C. Hicks

I HEREBY certify that the foregoing is a true and exact copy of the resolution adopted by the Board of Directors of this Corporation, and that such resolution has not been amended, modified, or revoked and is still in force and effect.

Signed and sealed this 23rd day of August, 2011

WHARTON-SMITH, INC. CORPORATE SEAL FLORIDA 04/02/1984
(Seal of Corporation)

William C. Robinson, Jr., Secretary

George E. Smith, Director

William R. Wharton, Director

Ronald F. Davoli, Director

TASK ORDER 2-12 STM

ENGINEERING SERVICES FOR CONSTRUCTION PHASE SERVICES FOR THE STORMWATER PUMP STATION AND OUTFALL SYSTEM FOR GEORGE STREET DRAINAGE AREA

This TASK ORDER 2-12 STM is issued under the terms and conditions of the MASTER AGREEMENT TO FURNISH GENERAL ENGINEERING SERVICES TO THE CITY OF KEY WEST ("AGREEMENT") between the City of Key West ("CITY") and CH2M HILL Engineers, Inc. ("ENGINEER") executed on September 18, 2007, which is incorporated herein by this reference.

A. SCOPE OF SERVICES

Specific services which the ENGINEER agrees to furnish are summarized on the attached statement entitled TASK ORDER 2-12 STM "SCOPE OF SERVICES." The "Scope of Services" defines the work effort anticipated for the Task Order. This Task Order, when executed, shall be incorporated in and shall become an integral part of the September 18, 2007, Master Agreement.

B. TIME OF COMPLETION

Work under this Task Order will begin immediately following acceptance and completed expeditiously subject to coordination with the City of Key West staff. Work may be performed at any time as requested by the CITY within 12 months after the date of execution of this Task Order, at which time the Task Order will expire.

C. COMPENSATION

Compensation for TASK ORDER 2-12 STM, Task A and all expenses will be on a Cost Reimbursable-Per Diem basis as stipulated in Article 2, Paragraph 2.2 of the AGREEMENT. The estimated compensation is shown on the attached statement entitled TASK ORDER 2-12 STM COMPENSATION.

D. ACCEPTANCE

By signature, the parties each accept the provisions of this TASK ORDER 2-12 STM, and authorize the ENGINEER to proceed at the direction of the CITY's representative in accordance with the "SCOPE OF SERVICES." Start date for this project will be no later than ten (10) days after execution of this authorization.

For CH2M HILL Engineers, INC.

By: _____
William D. Beddow, P.E.
Vice President

_____
Andrew H. Smyth, P.E.
Key West Office Manager

For CITY OF KEY WEST

By: _____
Jim Scholl
City Manager

Dated the _____ day of _____, 20__

ATTEST: _____

TASK ORDER 2-12 STM

ENGINEERING SERVICES FOR COSNTRUCTION PHASE SERVICES FOR THE STORMWATER PUMP STATION AND OUTFALL SYSTEM FOR GEORGE STREET DRAINAGE AREA

SCOPE OF SERVICES

Project Description

The City of Key West (CITY) has received Federal Emergency Management Agency (FEMA) hazard mitigation grant program (HMGP) funding (HMGP DR-1609-110-R) to address stormwater flooding in the George Street basin area in Key West, Florida. There are multiple low lying areas within the existing gravity drainage system that flood during rain events. The CITY would like to construct a pump station that would alleviate flooding during these rain events. The pump station would be connected to the existing stormwater gravity system and would operate when stormwater reaches a predetermined elevation in the existing gravity system.

The new stormwater pump station includes an upstream sediment removal structure, a permanent stand-by generator elevated above the 100 year flood elevation, two (2) 120 foot injection wells and an emergency outfall system consisting of a force main and outfall.

As part of the grant the City was required to develop a Benefit Cost Analysis (BCA) of the project. FEMA has completed their review of the BCA and has determined that they would grant additional funding for the construction phase of the project.

During the design of the project the City and Monroe County School District (MCSD) met to discuss the installation of the emergency force main being routed through the Horace O'Byrant (HOB) school property as well as constructing the generator within the school property. Due to changes in the design and construction of the HOB project, the force main can no longer be routed through the school property.

The City has completed the alternate route of the 30" emergency outfall pipe which will be installed along Catherine Street, through the existing Leon Street easement and connecting to the outfall that has been previously designed and permitted. Additionally, the City has requested an easement from MCSD to install the generator inside HOB property at the end of Ashby Street.

The re-design, re-permitting and bid phase services have been completed under task order 11-11 STM. Additionally, the FEMA required documentation has been submitted under task order 11-11 STM. This Task order 2-12 STM is for the construction phase services of the project.

Purpose

The CITY has requested that the ENGINEER provide engineering services for the construction phase services for the stormwater pump station and outfall system for the George Street drainage basin.

Scope of Services

The scope of services provided below addresses the work to be completed for the project; and includes Task A (Construction Phase Services).

Task A – Construction Phase Services

The ENGINEER will perform limited construction phase services listed in this Task Order for a construction period that is estimated to be 15 months. The CITY will be responsible for full-time resident observation.

The ENGINEER will perform the following activities during this portion of the project.

- The ENGINEER will coordinate and conduct one pre-construction meeting and distribute meeting minutes.
- At the request of the CITY, coordinate and conduct monthly progress meetings and prepare and distribute meeting minutes; attendance at up to fifteen (15) meetings is assumed.
- At the request of the CITY, review up to ninety (90) shop drawings and other construction related submittals.
- At the request of the CITY, the ENGINEER will provide up to 80 hours to assist in the technical interpretations of the drawings, specifications, and contract documents, and evaluate requested deviations from the approved design or specifications.
- Conduct up to three (3) specialty inspections at the construction site, by the engineer.
- Conduct up to twenty four (24) specialty inspections at the construction site, by a Sr. construction inspector.
- At the request of the CITY, perform a substantial completion inspection of the project and assist in the preparation of a punch-list.
- At the request of the CITY, perform a final completion inspection of the project.
- At the request of the CITY, provide on-site start-up assistance, two (2) two-day site visits assumed
- Prepare record drawings based on mark-ups from the CONTRACTOR.

Deliverables

- One (1) copy of pre-construction meeting minutes
- One (1) copy of each progress meeting minutes
- Two (2) copies each reviewed shop drawings
- Two (2) copies each Request for Information
- One (1) copy of punch list
- One (1) full size copy, two (2) 11″ x 17″ copies, and one (1) electronic copy of record drawings

Assumptions

The following assumptions were used in the development of this Task Order

- Design and Permitting work on this project will be completed by the end of 2011.
- Bidding and Construction phase work will be completed by the end of April 2013.
- Meetings will be held in Key West and may attended by up to two (2) consultant's staff, additional consultants staff may attend via conference call.
- No land costs shall be included in cost estimating for the project. It will be assumed that all projects can be located in City rights of way.
- Legal, easement, or plat survey or acquisitions will be the responsibility of CITY; it is assumed that the City will acquire an easement from Monroe County School District for the stormwater pump station generator site.
- The City will coordinate and implement all Public involvement and FEMA activities.
- The construction services will be provided for a single construction contract.
- Any labor and expenses required to address construction claims, unforeseen subsurface considerations or additional construction time requested by the CONTRACTOR or OWNER will be considered as "Additional Services".

Obligations of the CITY

To assist meeting schedule and budget estimates contained in this proposal, the CITY will provide the following:

- The CITY will provide all legal, easement, or plat survey and/or acquisitions required for additional property necessary to complete the project.
- Facilitate access to any required facilities.
- Attendance of key personnel at meeting as requested.
- Obtain easement from Monroe County School District for stormwater pump station generator. A description of the legal easement will be provided by the surveyor under separate task.
- The City will coordinate and implement all Public involvement and FEMA activities.
- The CITY will be responsible for full-time resident observation.

Additional Services

The ENGINEER will, as directed, provide additional services that are related to the project but not included within this Scope of Services. These and other services can be provided, if desired by the CITY, as an amendment to the Task Order. Work will begin for the

Additional Services after receipt of a written notice to proceed from the CITY. Additional services may include, but are not limited to, the following:

- Additional design services if requested by the City
- Participation in any Public involvement or meetings.
- Resident observation, providing a full-time resident on-site during construction
- Additional construction phase service not included in this scope

Compensation

The estimated compensation for TASK ORDER 2-12 STM is shown on Attachment A entitled TASK ORDER 2-12 STM, COMPENSATION.

Attachment A

TASK ORDER 2-12 STM

COMPENSATION

TASK ORDER 2-12 STM COMPENSATION

Engineering Services for the Construction Phase Services for the Stormwater Pump Station and Outfall System for the George Street Drainage Area

Task	Hours	Labor	Expenses	Total Cost
Task A - Construction Phase	1744	$220,224	$34,050	$254,274
Total	**1744**	**$220,224**	**$34,050**	**$254,274**

COMPENSATION BREAKDOWN Task Order 2-12 STM						
TASK NO.	**TASK DESCRIPTION**	**HOURLY RATE**	**TOTAL HOURS**	**LABOR**	**EXPENSES**	**TOTAL COST**
A	**Construction Phase (T&M)**					
	Principal PM/Technologist	$ 172.00	120	$20,640		$20,640
	Sr. Project Manager	$ 158.00	4	$632		$632
	Project Manager	$ 148.00	166	$24,568		$24,568
	Senior Construction Inspector	$ 148.00	540	$79,920		$79,920
	Project Engineer	$ 122.00	572	$69,784		$69,784
	Tech 4	$ 93.00	66	$6,138		$6,138
	Tech 3	$ 74.00	150	$11,100		$11,100
	Sr. Project Assistant	$ 63.00	64	$4,032		$4,032
	Clerical	$ 55.00	62	$3,410		$3,410
	TRAVEL (30) - 2 Day trips to KWF				$33,100	$33,100
	PRINTING/REPROGRAPHICS/SHIPPING				$950	$950
Construction Phase SUBTOTAL			1744	$220,224	$34,050	$254,274
PROJECT TOTALS						
	TOTAL HOURS		1,744			
	TOTAL FEE ESTIMATE			$220,224	$34,050	$254,274

PROPOSAL FOR PROFESSIONAL SERVICES

Construction Administration Services

George Street Stormwater Emergency Outfall

Task Order #11-008

Prepared for

City of Key West Utilities Department

November 7, 2011

PEREZ ENGINEERING
& DEVELOPMENT, INC

1010 Kennedy Drive, Suite 400

Key West, Florida 33040

305-293-9440

BACKGROUND AND OBJECTIVES

The project proposes improvements to the City of Key West, Florida drainage system to reduce flooding and pre-treat stormwater runoff. The project consists of the installation of pumps and a vortex unit to be built in the road at North end of Ashby Street closest to HOB Middle School, emergency generator with concrete platform, associated electrical, storm pipe outfall to the Jose Marti pond, and all related work and appurtenances. Construction Administration Services will be provided for 390 work days (18 months) for the construction of the project.

SCOPE OF WORK

TASK 1 – CONSTRUCTION ADMINISTRATION SERVICES

1. We shall provide administration of the contract for construction as contained within the general conditions of the contract for construction.

2. We shall be a representation of and shall advise and consult with the CITY during construction and until final payment to the contractor is due. The CONSULTANT shall have authority to act on behalf of the CITY only to the extent provided in this AGREEMENT and as provided in the contract for construction unless otherwise modified by written instrument.

3. The CONSULTANT shall visit the site at regular intervals appropriate to the stage of construction or as otherwise agreed to by the CITY and the CONSULTANT, in writing, to become generally familiar with the progress and quality of the work completed and shall determine in general if the work is being performed in a manner indicating that the work when completed will be in accordance with the contract documents. The CONSULTANT shall keep the CITY informed of the progress and quality of the work and shall provide certification to the CITY of satisfactory completion of all phases of the work in compliance with the plans, specifications, and/or approved changes or modifications thereto.

4. The CONSULTANT shall not have control over or charge of and shall not be responsible for Building permit inspections, construction means, methods, techniques, sequences or procedures of construction or for safety precautions and programs in connection with the work, since these are solely the CONTRACTOR'S responsibility under the contract for construction. The CONSULTANT shall make every reasonable effort to ensure that the CONTRACTOR completes the work in accordance with the current approved schedule and carries out the work in accordance with the contract documents.

5. The CONSULTANT based on observations and evaluations of CONTRACTOR'S applications for payment, shall review and certify the amounts due the CONTRACTOR.

6. The CONSULTANTS certification for payment shall constitute a representation to the CITY, based on the CONSULTANTS observations at the site as provided herein and on the data comprising the CONTRACTOR'S application for payment, that the work has progressed to the point indicated and that, to the best of the CONSULTANTS knowledge, information, and belief, the quality and quantity of work is in accordance with the contract documents. The foregoing representations are subject to an evaluation of the work for conformance with the contract documents, correctable prior to completion and to specific qualifications expressed by the CONSULTANT. The issuance of the certificate of payment shall further constitute a representation that the CONSULTANT has made observations to review the quality or quantity of the work.

7. The CONSULTANT shall recommend disapproval or rejection of CONTRACTOR'S WORK to the CITY which does not conform to the contract documents. The CONSULTANT will have authority to require additional inspection or testing of the work in accordance with the provisions of the contract documents, whether or not such work is fabricated, installed or completed.

8. The CONSULTANT shall review and approve or take other appropriate action upon CONTRACTOR'S submittals such as shop drawings, product data, and samples for the purpose of checking for conformance with information given and the design concept expressed in the contract documents. The CONSULTANT shall evaluate and determine the acceptability of substitute materials and equipment proposed by CONTRACTORS.

9. The CONSULTANT shall prepare change orders and construction change directives with supporting documentation and data if deemed necessary by the CONSULTANT, for the CITY's approval and execution in accordance with the contract documents, and may authorize minor changes in the work not involving an adjustment in the contract sum or an extension of the contract time which is consistent with the intent of the contract documents.

10. The CONSULTANT shall conduct inspections to determine the date or dates of substantial completion and the date of final completion, shall receive and forward to the CITY for the CITY's review and records, written warranties and related documents required by the contract documents and assembled by the CONTRACTOR and shall issue a final certificate for payment upon compliance with the requirements of the contract documents.

11. The CONSULTANT shall interpret matters concerning performance of the CITY and CONTRACTOR under the requirements of the contract documents on written request of either the CITY or CONTRACTOR. The

CONSULTANT'S response to such requests shall be made with reasonable promptness and within any time limits agreed upon.

12. Interpretations of the CONSULTANT shall be consistent with the intent of and reasonably inferable from the contract documents and shall be in writing or in the form of drawings. When making such interpretations, the CONSULTANT shall endeavor to secure faithful performance by both the CITY and the CONTRACTOR.

13. The CITY shall be the final arbiter on matters relating to aesthetics.

14. The CONSULTANT shall render written interpretations within a reasonable time on all internal disputes between the CITY and CONTRACTOR relating to the execution of the progress of the work as provided in the contract documents.

15. The CONSULTANT'S interpretations on internal disputes are not binding on the CITY and the CITY may result to remedies afforded by this contract to resolve the issue.

COMPENSATION

Compensation shall be based on an hourly time charge billed toward an upset limit of $71,100. The upset limit is based on approximately two hours per day during construction (18 Months). The upset limit also anticipates attendance at a pre-construction meeting and progress meetings throughout the project. The fee does not include the review of shop drawings or final certifications.

FEE SUMMARY

Principal	36 Hrs	$150	$ 5,400
Engineer	90 Hrs	$80	$ 7,200
Construction Mgr.	780 Hrs	$75	$58,500
			$71,100

Jim Scholl **Date**
City Manager

Allen E. Perez, P.E. **Date**
President