STORMWATER MANAGEMENT REPORT

FOR

Pulte Homes Stuart Ocean

SE Ocean Boulevard,
Stuart, FL 34996

September 20, 2019
December 5, 2019
Revised: January 16, 2020

Justin Thompson, P.E.
Florida License No. 84595
Bowman Consulting Group, LTD.
Board of Professional Engineers –
Certificate of Authorization No. 30462

PROJECT #010655-01-001

13450 W Sunrise Blvd, Suite 320
Sunrise, FL 33323
954.314.8480
www.bowmanconsulting.com

Stormwater Management Report

Pulte Homes Stuart Ocean, SE Ocean Blvd, Stuart Fl

Table of Contents

Introduction……1

Project Information……1

Site Conditions……1

Land Use Calculations……2

Soil Storage and Runoff Calculations……3

Methodology……4

Pre Vs. Post……5

Conclusion……6

Appendix……7

Justin Thompson, P.E.
Florida License No. 84595
Bowman Consulting Group, LTD.
Board of Professional Engineers –
Certificate of Authorization No. 30462

Introduction

Project Information

The project area consists of two (2) parcels of land, and two satellite parcels south of the project area known as Parcel A and B, abutting the Kingswood Condominium apartments on SE Ocean Boulevard in the City of Stuart, Martin County, Florida. The folio numbers are 02-38-41-000-000-00050-9 and 02-38-41-000-000-00020-6, which contains +/- 11.03 acres, and is currently zoned R-3 Residential (Multi-Family/Duplex). The proposed project consists of an eighty (80) unit townhome residential community development with pedestrian trails, lush landscaped tree preservation areas and lake area for drainage purposes.

Site Conditions

Existing Conditions

The existing +/- 11.03-acre site is currently vacant consisting of an existing private asphalt road that traverses the site connecting the communities south of the project area to SE Ocean Boulevard. There are two (2) existing lift stations, connecting to existing private force mains, that services the abutting communities service by the City of Stuart Utilities. The site is approximately eighty-nine percent (89%) pervious and 11% impervious, generating a Runoff Curve Number (RCN) of 74.

Proposed Conditions

The proposed improvements include demolishing the existing site, and private asphalt road, to construct an eighty (80) unit townhome residential community development, with pedestrian trials and lush landscaped preservation areas. A new drainage system will be constructed consisting of catch basins, to keep runoff from leaving the site, that will be directed to detention areas onsite to meet water quality requirements. A wet retention pond is proposed to provide attenuation of the larger storm events including the 100 year storm event. Under proposed conditions, the site will be forty-three percent (43%) impervious and fifty-seven percent (57%) pervious grass and open space, which generates an RCN of 74.

Water Table

The geotechnical report enclosed describes the water table elevations encountered during the soil borings and exfiltration rate studies done on the site. On average, the water table was encountered at a depth of two and a half (2.5') to seven and a half (7.5') feet below ground surface, or elevation 3.0' (NGVD).

Flood Elevations

The FEMA FIRM 12085C0154H indicates the site to be in FEMA Flood Zone X, which has determined areas to be outside the 0.2% annual chance floodplain. FEMA panel number 12085C0154H has been enclosed for reference.

Land Use Calculations

Existing Conditions

Area Description	Square Feet	Acreage	%
Building	-	-	-
Sidewalk / Paving	52,771	1.21	11
Grass / Open Area	428,332	9.83	89
Total Area	**481,103**	**11.04**	**100**

Proposed Conditions

Area Description	Square Feet	Acreage	%
Building	83,230	1.91	17
Sidewalk / Paving / Rear Patios	58,463	1.34	12
Vehicular Use Area	66,670	1.53	14
Native Pres./Dry Ret./Other Grass	232,255	5.33	49
Wet Pond	40,485	0.93	8
Total Area	**481,103**	**11.04**	**100**

Soil Storage and Runoff Calculations:

Existing Conditions

The existing soils are comprised of an even mix of class A and D soils; therefore, flatwoods soils will be used. According to the SFWMD Manual, Page F-1, a depth to the water table of 3.0' corresponds to a developed available storage of 4.05".

%Impervious = $\frac{1.21}{11.04}$

%Impervious = 0.11

$$S = S_{Uncomp}(1 - \%\ Impervious)$$
$$S = 4.05"(1 - 0.11)$$
$$\therefore \boldsymbol{S = 3.60}$$

$$CN = \frac{1000}{S + 10}$$

$$CN = \frac{1000}{(3.60 + 10)}$$

$$\therefore \boldsymbol{CN = 73.53}$$

Proposed Conditions

The existing soils are comprised of an even mix of class A and D soils; therefore, flatwoods soils will be used. Due to the site being raised considerably from existing conditions, a depth to water table of 4.0' will be used. According to the SFWMD Manual, Page F-1, a depth to the water table of 4.0' corresponds to a developed available storage of 6.75".

%Impervious = $\frac{4.78}{11.04}$

%Impervious = 0.43

$$S = S_{Comp}(1 - \%\ Impervious)$$
$$S = 6.75"(1 - 0.48)$$
$$\therefore \boldsymbol{S = 3.85}$$

$$CN = \frac{1000}{S + 10}$$

$$CN = \frac{1000}{(3.85 + 10)}$$

$$\therefore \boldsymbol{CN = 72.20}$$

Stage/Storage

Tabulation

"SITE"
NODE

	PONDS					SITE						
WSEL	Area (ft^2)	Average Area (ft^2)	Change in Head (ft)	Change in Volume (ft^3)	Total Volume (ft^3)	Area (ft^2)	Average Area (ft^2)	Change in Head (ft)	Change in Volume (ft^3)	Total Volume (ft^3)	Total Σ Volume (ft^3)	Total Volume (ac-ft)
3.00	40,484				0	0				0	0	0.00
		47,244	1.00	47,244			0	0.00	0			
4.00	54,003				47,244	0				0	47,244	1.08
		58,426	1.00	58,426			0	1.00	0			
5.00	62,849				105,670	0				0	105,670	2.43
		67,846	1.00	67,846			0	1.00	0			
6.00	72,842				173,515	0				0	173,515	3.98
		78,181	1.00	78,181			29,563	1.00	29,563			
7.00	83,519				251,696	59,125				29,563	281,258	6.46
		83,519	1.00	83,519			245,185	1.00	245,185			
8.00	83,519				335,215	431,244				274,747	609,962	14.00

METHODOLOGY

Water Quality

Per South Florida Water Management District design criteria for commercial properties, water quality treatment is required for wet detention areas. The wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater. The required water quality volume of 0.97 ac-ft will be met in the proposed on-site retention ponds, which provide 4.845ac-ft. of storage.

- **1 in. x Site**

  $\left(1\ in.\ \times\ 11.04\ ac.\ \div 12\ \frac{in}{ft}\right) = 0.92\ ac.-ft$

  ∴ 0.92 ac.-ft. Required Water Quality

- **2.5 in. x (% Impervious)**
  - Site Area for Water Quality Calculations

    = (Total Site – Roof Area)

    $= (11.04\ ac - 1.91\ ac)$

    $= 9.13\ ac$
  - Impervious Area for Water Quality Calculations

    = (Site Area for Water Quality – Pervious)

    $= (9.13\ ac - 5.33\ ac)$

    $= 3.80\ ac$
  - Percentage of Impervious for Water Quality Calculations

    = (Impervious Area for WQ / Site Area for WQ) × 100%

    $= (3.80\ ac.\ \div\ 9.13\ ac) \times 100\% = 42\%$

    $= (2.5\ in.\ \times 0.42) = 1.05\ inches\ to\ be\ treated$
  - Inches to Be Treated × Total Site Area = Treatment Volume

    $= (1.05\ in.\ \times 11.04\ ac.) = 11.59 ac.-in.$

    $= \left(11.59\ ac.-in.\ \div\ 12\ \frac{in}{ft}\right) = 0.966\ ac.-ft.$

    ∴ 0.966 ac.-ft. Required Water Quality

- **0.966 ac.-ft. > 0.92 ac.-ft.**
  0.966 ac.-ft ← Controls

Water Quality Treatment Required = 0.97 ac-ft
Water Quality Treatment Provided = 1.08 ac-ft @ elevation 4.00 NAVD

Pre vs. Post Analysis

A Pre vs. Post analysis has been performed to model the existing conditions and compare it to the proposed conditions. Please see Appendix B for the Stage Storage tabulations and ICPR Model outputs. Cascade Models account for the difference as follows:

SFWMD Rainfall Used for Modeling Purposes

Storm Event	Rainfall (Inches)
10-year, 1-day	7
25-year, 3-day	11.5
100-year, 3-day	14

Maximum Stage

Storm Event	Pre (NGVD)	Post (NGVD)
10-year - 1-day	5.82’	5.69’
25-year - 3-day	6.61’	6.78’
100-year – 3day	6.98’	7.16’

CONCLUSION

In summary, the proposed dry detention areas and wet retention pond will provide adequate storm water management to construct the proposed eighty (80) unit townhome residential community development. Water quality volume is being met by providing 0.97 ac-ft of storage volume. In addition, the ICPR model run for the 10-Year, 1-day and the 25-Year, 3-Day storm events demonstrate that staging is not increased over all storm events.

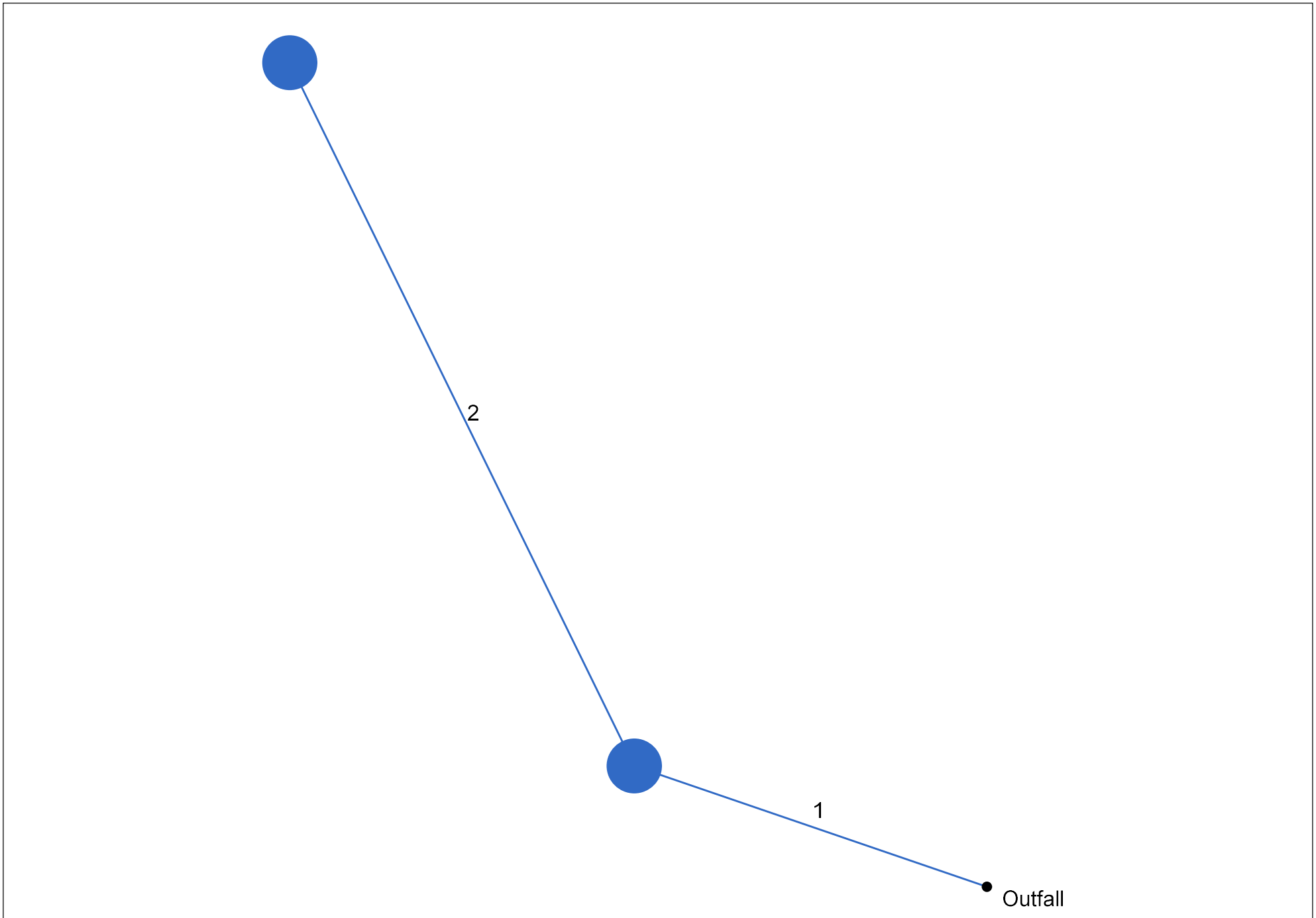
Appendix

Appendix

ICPR Model

Storm Pipe Analysis

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: Model.stm	Number of lines: 2	Date: 12/5/2019

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		24.73	24	Cir	28.0	3.00	3.00	0.000	4.87*	5.24*	0.72	5.96	End	Manhole
2		0.07	24	Cir	59.0	3.00	3.00	0.000	5.96*	5.96*	0.00	5.96	1	DropGrate

Project File: Model.stm | Number of lines: 2 | Run Date: 12/5/2019

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown).

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	24	24.73	3.00	4.87	1.87	3.05	8.10	1.02	5.89	1.033	28.0	3.00	5.24	2.00	3.14	7.87	0.96	6.20	1.196	1.115	0.312	0.75	0.72
2	24	0.07	3.00	5.96	2.00	3.14	0.02	0.00	5.96	0.000	59.0	3.00	5.96	2.00	3.14	0.02	0.00	5.96	0.000	0.000	0.000	1.00	0.00

Project File: Model.stm | Number of lines: 2 | Run Date: 12/5/2019

; c = cir e = ellip b = box

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		30.74	24	Cir	28.0	3.00	3.00	0.000	4.87*	5.44*	1.12	6.55	End	Manhole
2		0.08	24	Cir	59.0	3.00	3.00	0.000	6.55*	6.55*	0.00	6.55	1	DropGrate

Project File: Model.stm

Number of lines: 2

Run Date: 12/5/2019

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown).

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	24	30.74	3.00	4.87	1.87	3.06	10.05	1.57	6.44	1.596	28.0	3.00	5.44	2.00	3.14	9.78	1.49	6.93	1.847	1.721	0.482	0.75	1.12
2	24	0.08	3.00	6.55	2.00	3.14	0.03	0.00	6.55	0.000	59.0	3.00	6.55	2.00	3.14	0.03	0.00	6.55	0.000	0.000	0.000	1.00	0.00

Project File: Model.stm | Number of lines: 2 | Run Date: 12/5/2019

; c = cir e = ellip b = box

ICPR Model - Existing

Manual Basin: Watershed

Scenario: Scenario1
Node: Existing Site
Hydrograph Method: Santa Barbara Urban Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 999999.00 cfs
Time Shift: 0.0000 hr
Area: 11.0300 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
1.2100	Impervious	A/D	A		
9.8200	Pervious	A/D	A		

Comment:

Node: Existing Site

Scenario: Scenario1
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 3.00 ft
Warning Stage: 5.35 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
3.00	0.00	0
4.00	0.38	16553
5.00	1.49	64904
6.00	4.99	217364
7.00	10.53	458687

Comment:

Simulation: 100YR-72HR

Scenario: Scenario1
Run Date/Time: 12/5/2019 9:47:36 AM
Program Version: ICPR4 4.03.02.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

Hydrology [sec]	Surface Hydraulics	Groundwater [sec]

	[sec]		
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: 1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: 1
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ~SFWMD-72

		Rainfall Amount:	14.00 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 10YR-24HR

Scenario: Scenario1
Run Date/Time: 12/5/2019 9:49:21 AM
Program Version: ICPR4 4.03.02.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:	
Reference ET Folder:	
Unit Hydrograph Folder:	

Lookup Tables

Boundary Stage Set:	
Extern Hydrograph Set:	
Curve Number Set:	1
Green-Ampt Set:	
Vertical Layers Set:	
Impervious Set:	1
Roughness Set:	
Crop Coef Set:	
Fillable Porosity Set:	
Conductivity Set:	
Leakage Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FLMOD
		Rainfall Amount:	7.00 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 25YR-72HR

Scenario:	Scenario1
Run Date/Time:	12/5/2019 9:49:59 AM
Program Version:	ICPR4 4.03.02.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: 1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: 1
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global

Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	11.50 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 5YR-1HR

Scenario: Scenario1
Run Date/Time: 12/5/2019 9:51:44 AM
Program Version: ICPR4 4.03.02.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: 1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: 1
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FLMOD
		Rainfall Amount:	6.00 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Node Max Conditions [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Existing Site	100YR-72HR	5.35	6.98	0.0010	70.38	0.00	283743
Existing Site	10YR-24HR	5.35	5.82	0.0010	41.91	0.00	179157
Existing Site	25YR-72HR	5.35	6.61	0.0010	56.82	0.00	251353
Existing Site	5YR-1HR	5.35	5.60	0.0010	129.52	0.00	158016

ICPR Model - Proposed

Manual Basin: Total Site Basin

Scenario: Scenario1
Node: Total Site
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 11.0400 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
5.7100	Impervious	A			
5.3300	Pervious	A			

Comment:

Node: Total Site

Scenario: Scenario1
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 3.00 ft
Warning Stage: 8.20 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
3.00	0.00	0
4.00	1.08	47045
5.00	2.43	105851
6.00	3.98	173369
7.00	6.46	281398
8.00	14.00	609840

Comment:

Simulation: 100YR-72HR

Scenario: Scenario1
Run Date/Time: 1/16/2020 8:29:17 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000

End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: 1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: 1
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain: Global

		Opt:	
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	14.00 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 10YR-24HR

Scenario: Scenario1
Run Date/Time: 1/16/2020 8:31:43 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: 1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: 1
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FLMOD
		Rainfall Amount:	7.00 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 25YR-72HR

Scenario: Scenario1
Run Date/Time: 1/16/2020 8:32:38 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: 1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: 1
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight 0.5 dec

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False

Fact:			
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	11.50 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 5YR-1HR

Scenario: Scenario1
Run Date/Time: 1/16/2020 8:35:01 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: 1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: 1
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic
Dflt Damping (2D): 0.0050 ft
Min Node Srf Area (2D): 100 ft2
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ~FLMOD
Rainfall Amount: 6.00 in
Storm Duration: 1.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 113 ft2
Energy Switch (1D): Energy

Comment:

Curve Number: 1 [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
Impervious	A	98.0
Pervious	A	39.0

Impervious: 1 [Set]

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
Impervious	0.00	0.00	0.00	0.000	0.000
Pervious	0.00	0.00	0.00	0.000	0.000

Node Max Conditions [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Total Site	100YR-72HR	8.20	7.16	0.0010	50.94	0.00	253268
Total Site	10YR-24HR	8.20	5.69	0.0010	25.10	0.00	80236
Total Site	25YR-72HR	8.20	6.78	0.0010	39.44	0.00	190097
Total Site	5YR-1HR	8.20	5.34	0.0010	78.01	0.00	71503

Curve Number: 1 [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
Impervious	A	98.0
Pervious	A	39.0

Weir Cross Section: Cross Section 1

Scenario: Scenario1

Lid: No

Bottom Point Table

Order	Station [ft]	Elevation [ft]
0	0.00	11.00
1	300.00	11.00
2	600.00	11.00

Comment:

Node: Ground

Scenario: Scenario1
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 3.00 ft
Warning Stage: 3.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	3.00
0	0	0	999.0000	3.00

Comment:

Node: Total Site

Scenario: Scenario1
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 3.80 ft
Warning Stage: 3.80 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
3.00	0.00	0
4.00	1.08	47045
5.00	2.43	105851
6.00	3.98	173369
7.00	6.46	281398
8.00	14.00	609840

Comment:

Percolation Link: PERC

Scenario: Scenario1
From Node: Total Site
To Node: Ground
Link Count: 1
Flow Direction: Both
Aquifer Base Elevation: -50.00 ft
Water Table Elevation: 2.50 ft
Annual Recharge Rate: 0 ipy
Horizontal Conductivity: 38.000 fpd
Vertical Conductivity: 25.000 fpd
Fillable Porosity: 0.400
Layer Thickness: 0.00 ft

Surface Area Option: Vary Based on Stage/Area Table
Vertical Flow Termination: Horizontal Flow Algorithm
Perimeter 1: 4239.00 ft
Perimeter 2: 8478.00 ft
Perimeter 3: 21195.00 ft
Distance P1 to P2: 50.00 ft
Distance P2 to P3: 450.00 ft
# of Cells P1 to P2: 10
# of Cells P2 to P3: 45

Comment:

Simulation: Recovery

Scenario: Scenario1
Run Date/Time: 1/17/2020 12:23:19 AM
Program Version: ICPR4 4.03.02.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: 1
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: 1
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:

Conductivity Set:	
Leakage Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Manual Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	11.50 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	113 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Impervious: 1 [Set]

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
Impervious	0.00	0.00	0.00	0.000	0.000
Pervious	0.00	0.00	0.00	0.000	0.000

Curve Number: 1 [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
Impervious	A	98.0
Pervious	A	39.0

Sim	Node Name	Relative Time [hrs]	Stage [ft]
Recovery	Total Site	0.0000	3.80
Recovery	Total Site	1.0011	3.26
Recovery	Total Site	2.0081	3.10
Recovery	Total Site	3.0081	3.01
Recovery	Total Site	4.0081	3.00
Recovery	Total Site	5.0081	3.00
Recovery	Total Site	6.0081	3.00
Recovery	Total Site	7.0081	3.00
Recovery	Total Site	8.0081	3.00
Recovery	Total Site	9.0081	3.00
Recovery	Total Site	10.0081	3.00
Recovery	Total Site	11.0081	3.00
Recovery	Total Site	12.0081	3.00
Recovery	Total Site	13.0081	3.00
Recovery	Total Site	14.0081	3.00
Recovery	Total Site	15.0081	3.00
Recovery	Total Site	16.0081	3.00
Recovery	Total Site	17.0081	3.00
Recovery	Total Site	18.0081	3.00
Recovery	Total Site	19.0081	3.00
Recovery	Total Site	20.0081	3.00
Recovery	Total Site	21.0081	3.00
Recovery	Total Site	22.0081	3.00
Recovery	Total Site	23.0081	3.00
Recovery	Total Site	24.0081	3.00
Recovery	Total Site	25.0081	3.00
Recovery	Total Site	26.0081	3.00
Recovery	Total Site	27.0081	3.00
Recovery	Total Site	28.0081	3.00
Recovery	Total Site	29.0081	3.00
Recovery	Total Site	30.0081	3.00
Recovery	Total Site	31.0081	3.00
Recovery	Total Site	32.0081	3.00
Recovery	Total Site	33.0081	3.00
Recovery	Total Site	34.0081	3.00
Recovery	Total Site	35.0081	3.00
Recovery	Total Site	36.0081	3.00
Recovery	Total Site	37.0081	3.00
Recovery	Total Site	38.0081	3.00
Recovery	Total Site	39.0081	3.00
Recovery	Total Site	40.0081	3.00
Recovery	Total Site	41.0081	3.00