



EX COMFORT INN  
4197 MARLANE DR  
GROVE CITY

STORM WATER MANAGEMENT REPORT

September, 2017

Prepared for: Prestige Hotels, LLC

Prepared by: Willis Engineering & Surveying  
12512 West Bank Dr.  
Millersport, OH 43046

## Table of Contents

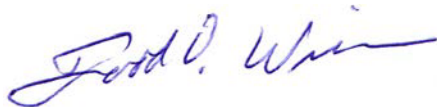
1. Certification
  2. Introduction and Assumptions
  3. Pre/Post Runoff Calculations
  4. Stormwater Detention Calculations
  5. Water Quality Calculations
  6. Storm Sewer Calculations
- Appendix A- Hydrocad Calculations
- Appendix B-Drainage Maps

## 1. Certification

This report and design calculations meets the requirements of the City of Grove City's Storm Water Manual Dated May 25, 2016, with the following exceptions.

A. The City of Grove City Storm Water Manual limits the minimum orifice size of the outlet control structure to 4" for Water Quality Control. The design requirement for storage, per the Grove City manual, requires a 1.75" dia. orifice.

Therefore to meet the requirements for Water Quantity, the orifice size of the Outlet Control Structure will remain 1.75".

A handwritten signature in blue ink, reading "Todd D. Willis". The signature is written in a cursive style with a long horizontal stroke at the end.

Certified by Todd D. Willis, PE, PS  
Date: 9-28-2017

## 1. Introduction and Assumptions

The Ex Comfort Inn parcel has an existing storm sewer system in the parking lot that collects runoff from the north adjoining parcel, the existing building and existing parking lot. This runoff will not be changed. One catch basin will be removed and runoff will be directed to downstream catch basin which has capacity for the additional flow. The placement of the additional building is within the existing parking lot and there is no change to the impervious surface.

The additional parking lot being added to the south is designed with an independent storm sewer system and the runoff quantity & quality will be controlled. Control of runoff quality is required since this disturbed area is part of a larger development. Runoff from the new parking lot will be conveyed to the proposed 15" storm sewer along Rumsfield Drive being constructed as part of the Comfort Suites project. This system has capacity for the propose runoff, including the eastern, proposed, Comfort Suites and the future development of the remnant parcel to the south.

## 2. Pre/Post Runoff Calculations

Refer to Appendix A, Hydrocad Calculations. The SCS Method was used for comparing the pre and post conditions of the site. The pre-developed site is 0.30 acres and was characterized as Open Space Good (HSG c), with a curve number of 74.

The post condition site was characterized as Open Space Good (HSG D), 0.05 acres and impervious Parking Lots, 0.25 acres. The resulting Curve No. is 95.

Runoff from the, pre-development condition is 0.007 AC-FT for the 1-YR Event.  
Runoff from the, post-development condition is 0.034 AC-FT for the 1-YR Event.

This results in a 485% increase in runoff volume and a 50-YR Critical Storm.

## 3. Stormwater Detention Calculations

Refer to Appendix A, Hydrocad Calculations. The detention storage is designed as parking lot storage. The parking lot storage is controlled by a 1.75" dia. orifice in CB-50 which detains runoff to elevation 781.98, 1 ft of depth in the parking lot. The overflow for the parking lot storage is along the south side of the parking lot in 1 ft openings in the curb.

<b>STORM EVENT</b>	<b>POND DISCHARGE(CFS)</b>	<b>ALLOWABLE (CFS)</b>	<b>WS ELEV.</b>	<b>STORAGE VOL. CU. FT.</b>
1-yr	0.16	0.17	780.55	480
2-yr	0.16	0.17	780.63	664
5-yr	0.16	0.17	780.72	947
10-yr	0.16	0.17	780.78	1195
25-yr	0.17	0.17	780.86	1561
50-yr	0.17	0.17	780.92	1880
100-yr	0.17	1.53	780.98	2237

#### **4. Water Quality Calculations**

Water Quality is controlled by a proprietary device, known as a hydrodynamic separator. The runoff coefficient was determined to be 0.70.

#### **5. Storm Sewer Calculations**

The storm sewer system is controlled by the Orifice in CB-51 which discharges 0.16 CFS and 0.16 CFS for the 2-YR & 5-YR events. The system outlets at CB-10 of the Comfort Suites project which is routing 0.05 CFS for the 2-YR & 5-YR events.

The total discharge for the proposed 15" storm downstream of CB-10 is 0.21 CFS for the 2-YR & 5-YR events. The capacity of the proposed 15" storm is 3.90 CFS.

## APPENDIX A

**Ex Comfort Inn Grove City SCS**

Type II 12-hr 1-Year Rainfall=1.88"

Prepared by {enter your company name here}

Printed 9/28/2017

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Page 1

**Summary for Subcatchment 2S: PRE-DEV**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.17 cfs @ 5.99 hrs, Volume= 0.007 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type II 12-hr 1-Year Rainfall=1.88"

Area (ac)	CN	Description
0.300	74	>75% Grass cover, Good, HSG C
0.300	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, MIN</b>

**Ex Comfort Inn Grove City SCS**

Type II 12-hr 2-Year Rainfall=2.25"

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Page 2

**Summary for Subcatchment 2S: PRE-DEV**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.29 cfs @ 5.98 hrs, Volume= 0.012 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type II 12-hr 2-Year Rainfall=2.25"

Area (ac)	CN	Description
0.300	74	>75% Grass cover, Good, HSG C
0.300	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, MIN</b>



**Ex Comfort Inn Grove City SCS**

Type II 12-hr 5-Year Rainfall=2.79"

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Page 3

**Summary for Subcatchment 2S: PRE-DEV**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.49 cfs @ 5.97 hrs, Volume= 0.019 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type II 12-hr 5-Year Rainfall=2.79"

Area (ac)	CN	Description
0.300	74	>75% Grass cover, Good, HSG C
0.300	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, MIN</b>

**Ex Comfort Inn Grove City SCS**

Type II 12-hr 10-Year Rainfall=3.24"

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Page 4

**Summary for Subcatchment 2S: PRE-DEV**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.69 cfs @ 5.97 hrs, Volume= 0.027 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type II 12-hr 10-Year Rainfall=3.24"

Area (ac)	CN	Description
0.300	74	>75% Grass cover, Good, HSG C
0.300	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, MIN</b>

**Ex Comfort Inn Grove City SCS**

Type II 12-hr 25-Year Rainfall=3.88"

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Page 5

**Summary for Subcatchment 2S: PRE-DEV**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.98 cfs @ 5.96 hrs, Volume= 0.038 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type II 12-hr 25-Year Rainfall=3.88"

Area (ac)	CN	Description
0.300	74	>75% Grass cover, Good, HSG C
0.300	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, MIN</b>

**Ex Comfort Inn Grove City SCS**

Type II 12-hr 50-Year Rainfall=4.42"

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Page 6

**Summary for Subcatchment 2S: PRE-DEV**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.24 cfs @ 5.96 hrs, Volume= 0.048 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type II 12-hr 50-Year Rainfall=4.42"

Area (ac)	CN	Description
0.300	74	>75% Grass cover, Good, HSG C
0.300	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, MIN</b>

**Ex Comfort Inn Grove City SCS**

Type II 12-hr 100-Year Rainfall=5.00"

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Page 7

**Summary for Subcatchment 2S: PRE-DEV**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.53 cfs @ 5.96 hrs, Volume= 0.059 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type II 12-hr 100-Year Rainfall=5.00"

Area (ac)	CN	Description
0.300	74	>75% Grass cover, Good, HSG C
0.300	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, MIN</b>

**Ex Comfort Inn Grove City SCS**

Type II 12-hr 1-Year Rainfall=1.88"

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Page 1

**Summary for Subcatchment 1S: POST-DEV**

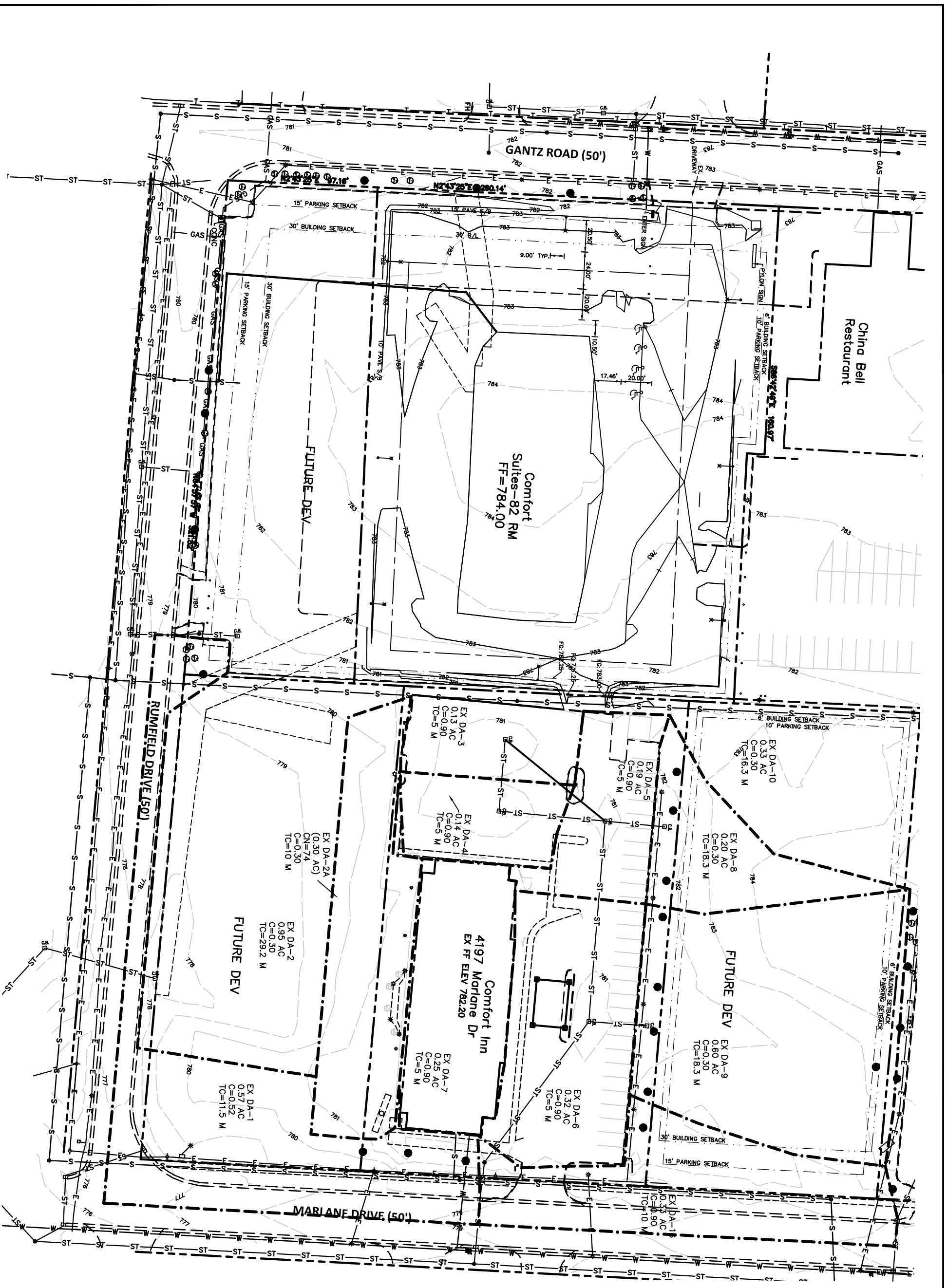
Runoff = 0.84 cfs @ 5.95 hrs, Volume= 0.034 af, Depth= 1.37"


Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs  
Type II 12-hr 1-Year Rainfall=1.88"

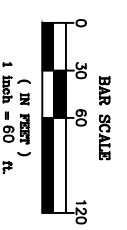
Area (ac)	CN	Description
0.250	98	Paved parking, HSG C
0.050	80	>75% Grass cover, Good, HSG D
0.300	95	Weighted Average
0.050	80	16.67% Pervious Area
0.250	98	83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, MIN</b>

## APPENDIX B







REV. NO.	DESCRIPTION

DRAWN	TDW/LP	
CHECKED	TDW	
Job No. 16288	CITY OF GROVE CITY, OHIO	

**Final Development Plan**

Project: **COMFORT INN**

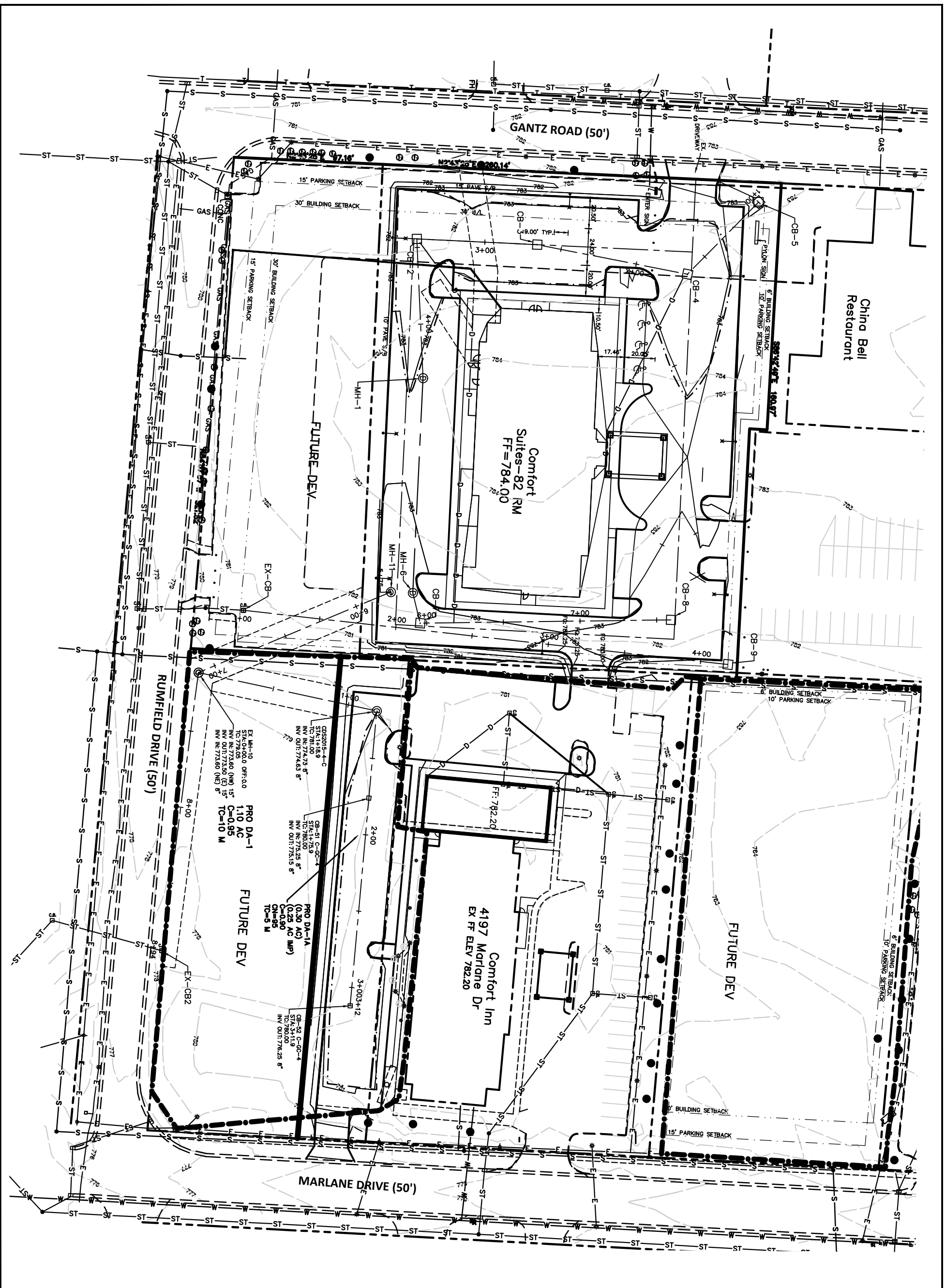
Existing Drainage Map

Scale: 1"=60'      Date: 11/16/2017

WILLIS ENGINEERING & SURVEYING  
33 W. Main St.  
N. 33rd St.  
(740) 729-4320

Sheet 1





**Final Development Plan**  
**COMFORT INN**  
 Proposed Drainage Map

Project: COMFORT INN  
 Sheet Name: Proposed Drainage Map  
 Scale: 1"=60' Date: 11/16/2017

WILLIS ENGINEERING & SURVEYING  
 33 W. Main St.  
 N. Lima, OH 43086  
 (740) 729-4030

REV. NO.	DESCRIPTION	TDW/LP
DRAWN		TDW/LP
CHECKED		TDW
Job No. 16288		
CITY OF GROVE CITY, OHIO		

BAR SCALE

1 inch = 60 ft.

N

REV. NO.	DESCRIPTION

Sheet 1