
# Wastewater Study

WOOD PATEL

**WASTEWATER COLLECTION SYSTEM**
**BASIS OF DESIGN REPORT**
**FOR**
**7th DAY ADVENTIST – SCOTTSDALE & SUTTON**

November 26, 2019
WP# 194966


EXPIRES 03-31-22

5-GP-2019
12/02/2019

WOOD PATEL

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November 26, 2019

City of Scottsdale
Planning and Development
7447 East Indian School Road
Scottsdale, Arizona 85257

480.312.5319

Re: **7th Day Adventist – Scottsdale & Sutton**
Wastewater Collection System Basis of Design Report
WP# 194966

To Whom It May Concern:

This Wastewater Collection System Basis of Design Report is prepared for Ryan A+E, Inc., and submitted to the City of Scottsdale. 7th Day Adventist – Scottsdale & Sutton (Site) consists of portions of two (2) adjacent parcels totaling an area of approximately 2,148,604 square-feet, or 49.3± acres, located at the northeast corner of North Scottsdale Road and Sutton Road in Scottsdale, Arizona. More specifically, the Site is located in a portion of Section 11, Township 3 North, Range 4 East and a portion of the north half of Section 14, Township 3 North, Range 4 East of the Gila and Salt River Meridian. The Site is located within Assessor Parcel Number 215-56-333A and a portion of 175-04-002A. Refer to the *Vicinity Map* at the back of this report. The Site is bounded by existing Thunderbird Road/Redfield Road to the north, East Sutton Drive on the south, North Miller Road on the east and North Scottsdale Road on the west. The project will include construction of airport hangars, industrial buildings, office buildings, residential townhomes, and single family homes. Proposed improvements include associated landscape, hardscape, paving and utility services. The airport hangars will include 84,250 square-feet of hangar space. The industrial will include 147,270 square-feet. The office buildings will include 508,100 square-feet. The residential townhomes will include 18 multi-family dwelling units and 6 single family dwelling units.

Wastewater flowing from the proposed Site will discharge at two (2) locations to the existing 8-inch VCP sewer line on Sutton Drive and at one (1) location to the existing 12-inch VCP sewer line in Thunderbird Road/Redfield Road. Both sewer lines slope to the west to discharge to the 24-inch VCP sewer line in Scottsdale Road.

The design criteria used to estimate wastewater flows and evaluate system hydraulics are based on Wood, Patel & Associates, Inc.'s (WOODPATEL) understanding of the requirements listed in the City of Scottsdale's *Design Standards and Policies manual,* 2018. The following is a summary of the primary design criteria utilized:

- Average Day Wastewater Demand, Office: ..... 0.4 gpd/sf
- Average Day Wastewater Demand, Commercial (Retail)..... 0.5 gpd/sf
- Average Day Wastewater Demand, Multi-Family Residential ..... 140 gpd/DU
- Peaking Factor ..... [1+12/(4+P1/2)] X ADD
- Maximum d/D Ratio at Peak Flow..... (12" dia. or less): 0.65
- Minimum Mean Full Flow Velocity ..... 2.50 fps
- Maximum Peak Full Flow Velocity ..... 10.0 fps
- Minimum Pipe Diameter, Public Wastewater Line..... 8 inches

Abbreviations: gpd = gallons per day; sf = square feet; ADD = average day demand; fps = feet per second; DU = dwelling unit; P = population

Based on the above design criteria, the projected average day flow for the proposed Site is approximately 321,280 gallons per day (gpd), or 223.12 gallons per minute (gpm). The peak flow is projected to be 966,960 gpd based on population and peaking factor shown in *Calculations* at the back of this report. The anticipated discharge to the existing 12-inch sewer on Redfield Road is 134,400 gpd with the other 186,880 gpd discharging to the existing 6-inch sewer on Sutton Drive. Analysis of the proposed sewer lines confirms they will have sufficient capacity to convey the peak flow of 1,443,045 gpd. The proposed sewer slopes, projected flow velocities, and pipe flow capacities are summarized on the attached spreadsheets.

It is assumed the infiltration and inflow from wet weather has been accounted for in the published design flow rates for the development and the maximum d/D. Therefore, those flows have not been added into the calculations. The proposed sanitary sewer collection system is designed to have adequate capacity to serve the proposed development.

Thank you for your review of the Wastewater Collection System Basis of Design Report provided for 7th Day Adventist - Scottsdale & Sutton. Feel free to contact me if you have any questions.

Sincerely,

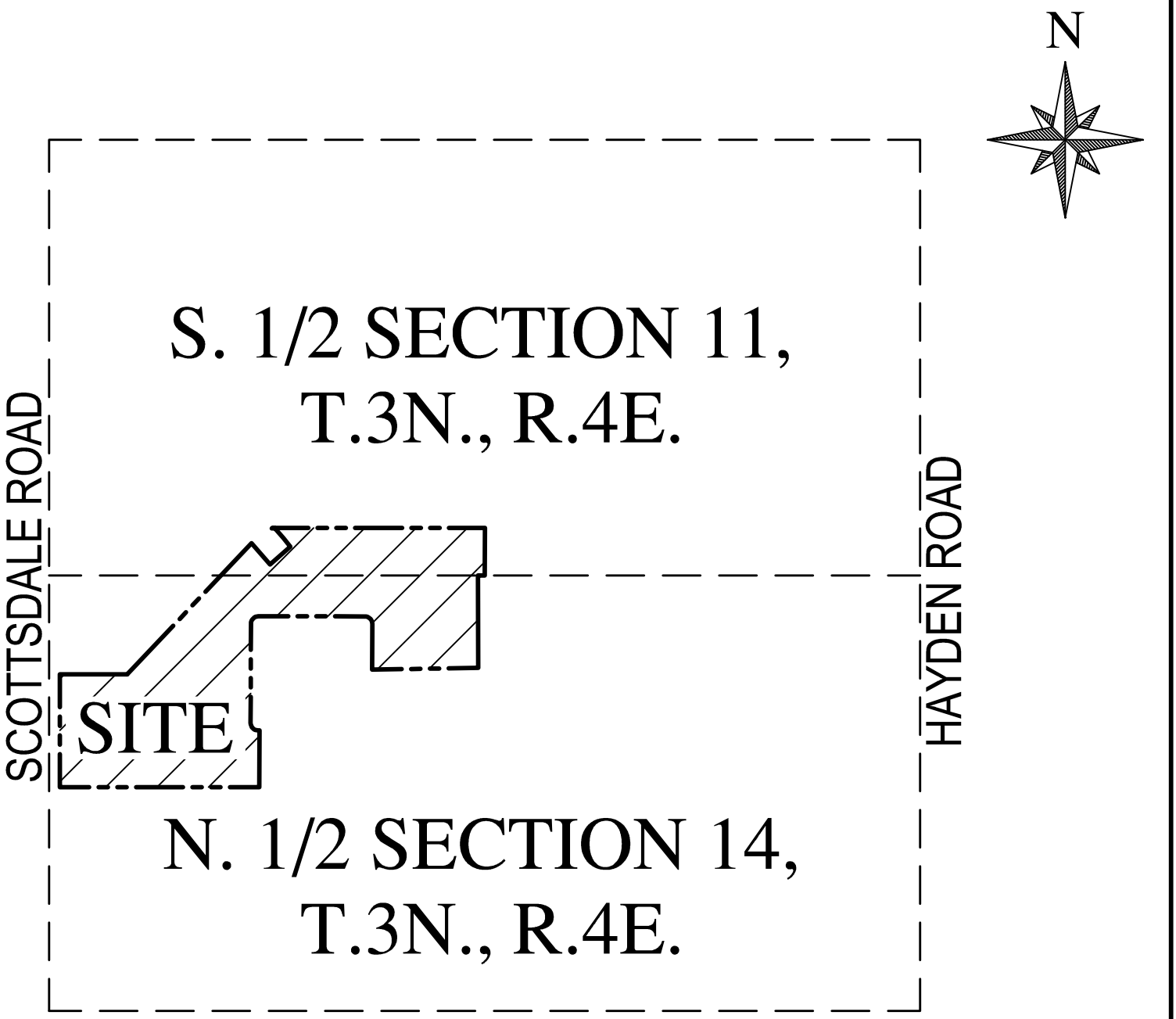
**Wood, Patel & Associates, Inc.**

Anthony J. Beuché, PE
Project Manager

AJB/se

se
Y:\WP\Reports\Commercial\194966 7th Day Adventist - Scottsdale & Sutton Wastewater BOD.docx

**VICINITY MAP**




# VICINITY MAP

N.T.S.

**NOT**
**FOR**
**CONSTRUCTION**
**OR RECORDING**

WOOD PATEL

**SEVENTH-DAY**

**VICINITY MAP EXHIBIT**

| | | | | | |
|---|---|---|---|---|---|
| DATE | 07/26/2019 | SCALE | N.T.S. | SHEET | ## OF ## |
| JOB NO. | 194966 | DESIGN | TB | CHECK | LB |
| | | DRAWN | JO | RFI # | |

Z:\2019\194966\Project Support\Reports\Sewer BOD\Exhibits\4966-S-EXHIBITS-CON.d

5-GP-2019
12/02/2019

**HYDRAULIC CALCULATIONS**

WOOD/PATEL
MISSION: CLIENT SERVICE®

CIVIL ENGINEERS * HYDROLOGISTS * LAND SURVEYORS * CONSTRUCTION MANAGERS

# TABLE 1 - WASTEWATER DESIGN CRITERIA

**Project:** SEVENTH DAY
**Location:** Scottsdale , Arizona
**References:** City of Scottsdale Design Standards and Policies Manual
Arizona Administrative Code, Title 18, Chapter 9

**Project Number:** 194966
**Project Engineer:** Anthony J. Beuche, P.E

| RESIDENTIAL WASTEWATER DEMANDS | | | |
|---|---|---|---|
| LAND USE | AVERAGE DAY DEMAND (ADD) | | POPULATION[1] |
| | VALUE | UNITS | |
| Single Family Residential | 100 | gpd/DU | 1 Persons per DU |
| Multi-Family Residential | 100 | gpd/DU | 1 Persons per DU |

| NON-RESIDENTIAL WASTEWATER DEMANDS | | | |
|---|---|---|---|
| LAND USE | AVERAGE DAY DEMAND (ADD) | | POPULATION[1] |
| | VALUE | UNITS | |
| Commercial/Retail | 0.50 | gpd/sf | 0.005 Persons per 1,000 sf |
| Office | 0.40 | gpd/sf | 0.004 Persons per 1,000 sf |
| Restaurant | 1.20 | gpd/sf | 0.012 Persons per 1,000 sf |
| High Density Condominium | 140 | gpd/ unit | 1.4 Persons per 1,000 sf |
| Resort Hotel (includes site amenities) | 380 | gpd/room | 3.8 Persons per Student |
| School: without cafeteria | 30 | gpd/student | 0.3 Persons per Room |
| School: with cafeteria | 50 | gpd/student | 0.5 Persons per Room |
| Cultural | 0.10 | gpd/sf | 0 Persons per Room |
| Clubhouse for Subdivision Golf Course | 100 | gpd/parton*2 patron per du per day | 1 Persons per Bed |
| Fitness Center/Spa/Health Club | 0.80 | gpd/sf | Note 2 |

| HYDRAULIC MODELING CRITERIA | | |
|---|---|---|
| DESCRIPTION | | VALUE[3] |
| **PEAK FLOW** | | |
| Peak Flow = Peaking Factor (PF) x ADD | | $[1+14/(4+P^{1/2})]$ x ADD |
| (PF is based on upstream population, P = Population/1,000) | | |
| **HYDRAULICS** | | |
| Minimum Pipe Diameter (in) | | 8 |
| Manning's "n" value | | 0.013 |
| Maximum d/D ratio at peak flow | | 0.65 |

| PIPE SIZE | MEAN VELOCITY[2] | | DESIGN SLOPE[2] | |
|---|---|---|---|---|
| (in) | Minimum (ft/sec) | Maximum (ft/sec) | Minimum (%) | Maximum (%) |
| 8 | 2.1 | 10.0 | 0.380 | 6.980 |
| 10 | 2.2 | 10.0 | 0.306 | 5.121 |
| 12 | 2.3 | 10.0 | 0.256 | 3.919 |
| 15 | 2.4 | 10.0 | 0.205 | 2.880 |

**Notes:**
1. Based on Arizona Administrative Code, Title 18, Chapter 9 value of 100 gallons per capita per day.
2. Per Arizona Administrative Code, Title 18, Chapter 9
3. Per City of Scottsdale Design Standards and Policies Manual

# WASTEWATER DEMANDS

**Project:** SEVENTH DAY
**Location:** Scottsdale , Arizona
**References:** City of Scottsdale Design Standards and Policies Manual
Arizona Administrative Code, Title 18, Chapter 9

**Project Number:** 194966
**Project Engineer:** Anthony J. Beuche, P.E.

| UPSTREAM NODE | DOWNSTREAM NODE | BUILDING USE | NUMBER OF UNITS[1] | ADF PER APPLICABLE UNIT | ADD PER BUILDING USE (GPD) | SEWER NODE ADD (GPD) | TOTAL ADD (GPD) | POPULATION[2] | PEAKING FACTOR | TOTAL PEAK FLOW (GPD) |
|---|---|---|---|---|---|---|---|---|---|---|
| PROP MH 1 | PROP MH 2 | Industrial | 147,270 | 0.50 | 73,635 | 73,635 | 73,635 | 736 | 3.00 | 220,905 |
| PROP MH 1 | PROP MH 2 | Airport | 84,250 | 0.50 | 42,125 | 42,125 | 115,760 | 421 | 3.00 | 347,280 |
| PROP MH 1 | PROP MH 2 | Office | 46,600 | 0.40 | 18,640 | 18,640 | 134,400 | 186 | 3.00 | 403,200 |
| **Total Outfall #1** | | | | | | **134,400** | **134,400** | | | **403,200** |
| PROP MH 3 | PROP MH 4 | Office | 436500 | 0.4 | 174,600 | 174,600 | 174,600 | 1,746 | 3 | 523,800 |
| **Total Outfall #2** | | | | | **174,600** | **174,600** | **174,600** | | | **523,800** |
| PROP MH 5 | PROP MH 6 | High Density | 12 | 140 | 1,680 | 1,680 | 1,680 | 17 | 4.50 | 7,560 |
| PROP MH 5 | PROP MH 6 | Single Family | 6 | 100 | 600 | 600 | 2,280 | 6 | 4.00 | 9,960 |
| PROP MH 5 | PROP MH 6 | Office | 25000 | 0.4 | 10,000 | 10,000 | 12,280 | 100 | 3.00 | 39,960 |
| **Total Outfall #3** | | | | | **12,280** | **12,280** | **12,280** | | | **39,960** |
| **Total of All Outfalls** | | | | | | | **321,280.0** | | | **966,960.0** |

**Notes:**
1. Square footage per building and building use provided by architect.
2. Population is assumed to be one guest per room.

WOOD/PATEL
MISSION: CLIENT SERVICE®

CIVIL ENGINEERS * HYDROLOGISTS * LAND SURVEYORS * CONSTRUCTION MANAGERS

# CALCULATED PIPE CAPACITIES

**Project:** SEVENTH DAY
**Location:** Scottsdale , Arizona
**References:** City of Scottsdale Design Standards and Policies Manual
ADEQ Bulletin No. 11

**Project Number:** 194966
**Project Engineer:** Anthony J. Beuche, P.E.

| | | | | | | PEAK FLOW RESULTS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM NODE | TO NODE | PIPE SIZE | MODELED PIPE SLOPE | PIPE CAPACITY | | PEAK FLOW | PEAK FLOW | d/D | VELOCITY | SURPLUS CAPACITY | PERCENT OF CAPACITY |
| | | (in) | (ft/ft) | (gpd) | (gpm) | (gpd) | (gpm) | | (ft/sec) | (gpd) | (%) |
| PROP MH 1 | PROP MH 2 | 12 | 0.0073 | 1,979,877 | 1,375 | 403,200.00 | 280.00 | .30 | 3.10 | 1,576,677 | 20.4% |
| **Outfall #2 - South** | | | | | | | | | | | |
| PROP MH 3 | PROP MH 4 | 8 | 0.0152 | 970,260 | 674 | 523,800.00 | 363.75 | .52 | 4.40 | 446,460 | 54.0% |
| **Outfall #3 - East** | | | | | | | | | | | |
| PROP MH 5 | PROP MH 6 | 8 | 0.0205 | 1,128,210 | 783 | 7,560.00 | 5.25 | .07 | 1.60 | 1,120,650 | 0.7% |

**WASTEWATER EXHIBIT**

# LEGEND

- EXISTING SEWER PIPE
- PROPOSED SEWER PIPE
- EXISTING SEWER MANHOLE
- PROPOSED SEWER MANHOLE
- PROPERTY LINE

N

0 200 400

Horz. 1 in. = 200 ft.

E. REDFIELD ROAD

E. THUNDERBIRD ROAD

N. SCOTTSDALE ROAD

N. MILLER ROAD

E. SUTTON DRIVE

PROP. MH 2
INV 12.60

PROPERTY LINE

PROP. 12" SEWER
S=0.70%

PROP. MH
INV 18.00

PROP. MH
INV 14.33

PROP. MH
INV 21.54

PROP. MH 1
INV 23.08

EX. 12" SEWER

PROP. 12" SEWER
S=0.73%

AV_UP TO 60'

INDUSTRIAL

OFFICE/INDUSTRIAL
EMP_UP TO 60'

EXISTING
PARK & ROAD

PROP. 8" SEWER
S=0.50%

PROP. MH
INV 23.60

PROPERTY LINE

EMP_UP TO 60'

EXISTING SEVENTH
DAY ADVENTIST
CAMPUS

CAMPUS BALLFIELD
& OUTDOOR PLAY

PROPERTY LINE

PROP. MH
INV 18.78

PROP. MH 3
INV 21.50

PROP. MH
INV 21.15

PROP. MH 5
INV 22.90

AMU-R_UP TO 60'

PROP. 8" SEWER
S=1.52%

PROP. MH
INV 18.53

PROP. 8" SEWER
S=2.05%

EX. 24" SEWER

PROPERTY LINE

PROP. MH
INV 7.68

RELOCATED
CAM
RESIDE

PROP. MH
INV 12.19

PROP. MH
INV 12.92

PROP. MH 4
INV 6.06

PROP. MH
INV 10.55

PROP. MH 6
INV 8.26

EX. 8" SEWER

EX. 8" SEWER

**NOT**
**FOR**
**CONSTRUCTION**
**OR RECORDING**

WOOD PATEL

**SEVENTH-DAY**

SEWER LINE EXHIBIT

| | | | | | |
|---|---|---|---|---|---|
| DATE | 11/14/2019 | SCALE | 1" = 200' | SHEET | 1 OF 1 |
| JOB NO. | 194966 | DESIGN | TB | DRAWN | JO |

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5-GP-2019
12/02/2019

-There are inconsistencies in your data tables and your report content. Please revise AHB 9/10/19
- Some of your tabulated ADD values are incorrect. See DSPM FIG 7-1.2 AHB 9/10/19
-You state an incorrect d/D value in one of your tables.DSMP 7-1.404 AHB 9/10/19
-Did not appear to include all building types in your demand calculations. DSPM 7-1.403
-There are inconsistencies in your tables and your report text as to the number of connections to which pipes AHB 9/10/19
-How are you determining your INV elevations? AHB 9/10/19
- May need an interceptor for the air plane hangars. DSPM 7-1.411 AHB 9/10/19

WOOD PATEL

PRELIMINARY Basis of Design Report
❑ ACCEPTED
❑ ACCEPTED AS NOTED
✖ REVISE AND RESUBMIT

Reviewed by carollo
On behalf of the Scottsdale Water Resources Planning and Engineering Department

DISCLAIMER: If accepted, the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (Typically during the DR and PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments )both separate and included herein). The final report shall be submitted and approved prior to the plan review submission. For questions and clarifications contact the Water Resources Planning and Engineering Department at 480-321-5685

REVIEWER: Andrew Buell
EMAIL: abuell@carollo.com
DATE
09/11/2019

# WASTEWATER COLLECTION SYSTEM
# BASIS OF DESIGN REPORT
# FOR
# 7th DAY ADVENTIST – SCOTTSDALE & SUTTON

August 6, 2019
WP# 194966

No expiration date on the seal


5-GP-2019
12/02/2019

WOOD PATEL

2051 W Northern Ave #100
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Robert D. Gofonia, PE, RLS

August 2, 2019

City of Scottsdale
Planning and Development
7447 East Indian School Road
Scottsdale, Arizona 85257

480.312.5319

Re: **7th Day Adventist – Scottsdale & Sutton**
Wastewater Collection System Basis of Design Report
WP# 194966

To Whom It May Concern:

This Wastewater Collection System Basis of Design Report is prepared for Ryan A+E, Inc., and submitted to the City of Scottsdale. 7th Day Adventist – Scottsdale & Sutton (Site) consists of portions of two (2) adjacent parcels totaling an area of approximately 2,148,604 square-feet, or 49.3± acres, located at the northeast corner of North Scottsdale Road and Sutton Road in Scottsdale, Arizona. More specifically, the Site is located in a portion of Section 11, Township 3 North, Range 4 East and a portion of the north half of Section 14, Township 3 North, Range 4 East of the Gila and Salt River Meridian. The Site is located within Assessor Parcel Number 215-56-333A and a portion of 175-04-002A. Refer to the *Vicinity Map* at the back of this report. The Site is bounded by existing Thunderbird Road/Redfield Road to the north, East Sutton Drive on the south, North Miller Road on the east and North Scottsdale Road on the west. The project will include construction of airport hangars, industrial buildings, office buildings, residential townhomes, and single family homes. Proposed improvements include associated landscape, hardscape, paving and utility services. The airport hangars will include 76,250 square-feet of hangar space. The industrial will include 184,450 square-feet. The office buildings will include 636,650 square-feet. The residential townhomes will include 18 multi-family dwelling units and 6 single family dwelling units.

Wastewater flowing from the proposed Site will discharge at two (2) locations to the existing 8-inch VCP sewer line on Sutton Drive and at one (1) location to the existing 12-inch VCP sewer line in Thunderbird Road/Redfield Road. Both sewer lines slope to the west to discharge to the 24-inch VCP sewer line in Scottsdale Road. A portion of the existing 8-inch VCP sewer is proposed to be upsized to a 12-inch sewer line

The design criteria used to estimate wastewater flows and evaluate system hydraulics are based on Wood, Patel & Associates, Inc.'s (WOODPATEL) understanding of the requirements listed in the City of Scottsdale's *Design Standards and Policies manual,* 2018. The following is a summary of the primary design criteria utilized:

- Average Day Wastewater Demand, Office: ..... 0.4 gpd/sf
- Average Day Wastewater Demand, Commercial (Retail)..... 0.5 gpd/sf
- Average Day Wastewater Demand, Multi-Family Residential ..... 140 gpd/DU
- Peaking Factor ..... [1+12/(4+P1/2)] X ADD
- Maximum d/D Ratio at Peak Flow..... (12" dia. or less): 0.65
- Minimum Mean Full Flow Velocity ..... 2.50 fps
- Maximum Peak Full Flow Velocity ..... 10.0 fps
- Minimum Pipe Diameter, Public Wastewater Line..... 8 inches

Abbreviations: gpd = gallons per day; sf = square feet; ADD = average day demand; fps = feet per second; DU = dwelling unit; P = population

Based on the above design criteria, the projected average day flow for the proposed Site is approximately 387,530 gallons per day (gpd), or 269.12 gallons per minute (gpm). The peak flow is projected to be 1,443,045 gpd based on population and peaking factor shown in *Calculations* at the back of this report. The anticipated discharge to the existing 12-inch sewer on Redfield Road is 130,350 gpd with the other 257,180 gpd discharging to the existing 6-inch sewer on Sutton Drive. Analysis of the proposed sewer lines confirms they will have sufficient capacity to convey the peak flow of 1,443,045 gpd. The proposed sewer slopes, projected flow velocities, and pipe flow capacities are summarized on the attached spreadsheets.

It is assumed the infiltration and inflow from wet weather has been accounted for in the published design flow rates for the development and the maximum d/D. Therefore, those flows have not been added into the calculations. The proposed sanitary sewer collection system is designed to have adequate capacity to serve the proposed development.

Thank you for your review of the Wastewater Collection System Basis of Design Report provided for 7th Day Adventist - Scottsdale & Sutton. Feel free to contact me if you have any questions.

Sincerely,

No expiration date on the seal

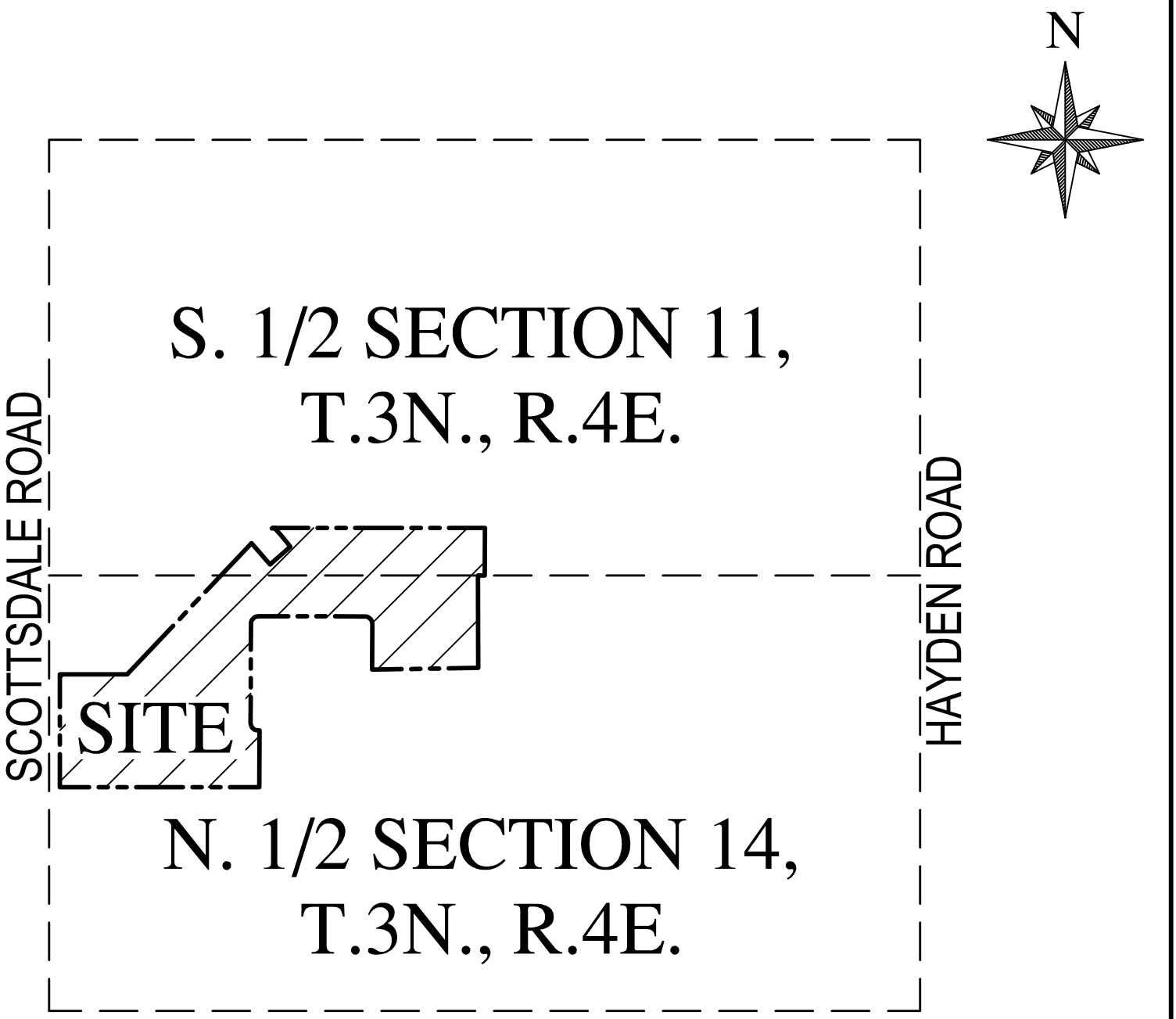
**Wood, Patel & Associates, Inc.**


Anthony J. Beuché, PE
Project Manager

AJB/se

se
Y:\WP\Reports\Commercial\194966 7th Day Adventist - Scottsdale & Sutton Wastewater BOD.docx

**VICINITY MAP**




# VICINITY MAP

N.T.S.

**NOT**
**FOR**
**CONSTRUCTION**
**OR RECORDING**

WOOD PATEL

**SEVENTH-DAY**

**VICINITY MAP EXHIBIT**

| | | | | | |
|---|---|---|---|---|---|
| DATE | 07/26/2019 | SCALE | N.T.S. | SHEET | ## OF ## |
| JOB NO. | 194966 | DESIGN | TB | CHECK | LB |
| | | DRAWN | JO | RFI # | |

Z:\2019\194966\Project Support\Reports\Sewer BOD\Exhibits\4966-S-EXHIBITS-CON.d

5-GP-2019
12/02/2019

**HYDRAULIC CALCULATIONS**

WOOD/PATEL
MISSION: CLIENT SERVICE®

CIVIL ENGINEERS * HYDROLOGISTS * LAND SURVEYORS * CONSTRUCTION MANAGERS

# TABLE 1 - WASTEWATER DESIGN CRITERIA

**Project:** SEVENTH DAY
**Location:** Scottsdale , Arizona
**References:** City of Scottsdale Design Standards and Policies Manual
Arizona Administrative Code, Title 18, Chapter 9

**Project Number:** 194966
**Project Engineer:** Anthony J. Beuche, P.E

**RESIDENTIAL WASTEWATER DEMANDS**

| LAND USE | AVERAGE DAY DEMAND (ADD) | | POPULATION[1] |
|---|---|---|---|
| | VALUE | UNITS | |
| Single Family Residential | | gpd/DU | 0 Persons per DU |
| Multi-Family Residential | | gpd/DU | 0 Persons per DU |

**NON-RESIDENTIAL WASTEWATER DEMANDS**

| LAND USE | AVERAGE DAY DEMAND (ADD) | | POPULATION[1] |
|---|---|---|---|
| | VALUE | UNITS | |
| Commercial/Retail | 0.5 | gpd/sf | 0.005 Persons per 1,000 sf |
| Office | 0 | gpd/sf | 0 Persons per 1,000 sf |
| Restaurant | 1 | gpd/sf | 0.01 Persons per 1,000 sf |
| High Density Condominium | 140 | gpd/ unit | 1.4 Persons per 1,000 sf |
| Resort Hotel (includes site amenities) | 380 | gpd/room | 3.8 Persons per Student |
| School: without cafeteria | 30 | gpd/student | 0.3 Persons per Room |
| School: with cafeteria | 50 | gpd/student | 0.5 Persons per Room |
| Cultural | 0 | gpd/sf | 0 Persons per Room |
| Clubhouse for Subdivision Golf Course | 100 | gpd/parton*2 patron per du per day | 1 Persons per Bed |
| Fitness Center/Spa/Health Club | 1 | gpd/sf | Note 2 |

**HYDRAULIC MODELING CRITERIA**

| DESCRIPTION | VALUE[3] |
|---|---|
| **PEAK FLOW** | |
| Peak Flow = Peaking Factor (PF) x ADD<br>(PF is based on upstream population, P = Population/1,000) | $[1+14/(4+P^{1/2})]$ x ADD |
| **HYDRAULICS** | |
| Minimum Pipe Diameter (in) | 8 |
| Manning's "n" value | 0.013 |
| Maximum d/D ratio at peak flow | 0.75 |

some of these values are incorrect. DSPM FIG 7-1.2

0.65

| PIPE SIZE | MEAN VELOCITY[2] | | DESIGN SLOPE[2] | |
|---|---|---|---|---|
| (in) | Minimum (ft/sec) | Maximum (ft/sec) | Minimum (%) | Maximum (%) |
| 8 | 2.1 | 10.0 | 0.380 | 6.980 |
| 10 | 2.2 | 10.0 | 0.306 | 5.121 |
| 12 | 2.3 | 10.0 | 0.256 | 3.919 |
| 15 | 2.4 | 10.0 | 0.205 | 2.880 |

Overall I do not understand the purpose of this page

**Notes:**

1. Based on Arizona Administrative Code, Title 18, Chapter 9 value of 100 gallons per capita per day.
2. Per Arizona Administrative Code, Title 18, Chapter 9
3. Per City of Scottsdale Design Standards and Policies Manual

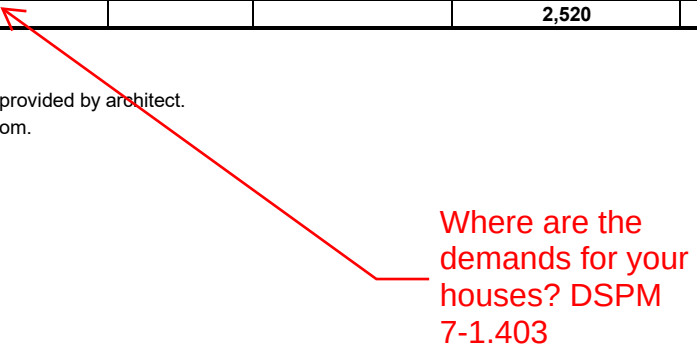
# WASTEWATER DEMANDS

**Project:** SEVENTH DAY
**Location:** Scottsdale , Arizona
**References:** City of Scottsdale Design Standards and Policies Manual
Arizona Administrative Code, Title 18, Chapter 9

**Project Number:** 194966
**Project Engineer:** Anthony J. Beuche, P.E.

| UPSTREAM NODE | DOWNSTREAM NODE | BUILDING USE | NUMBER OF UNITS[1] | ADF PER APPLICABLE UNIT | ADD PER BUILDING USE (GPD) | SEWER NODE ADD (GPD) | TOTAL ADD (GPD) | POPULATION[2] | PEAKING FACTOR | TOTAL PEAK FLOW (GPD) |
|---|---|---|---|---|---|---|---|---|---|---|
| PROP MH 1 | PROP MH 2 | Industrial | 184,450 | 0.50 | 92,225 | 92,225 | 92,225 | 922 | 3.00 | 276,675 |
| PROP MH 1 | PROP MH 2 | Airport | 76,250 | 0.50 | 38,125 | 38,125 | 130,350 | 381 | 3.00 | 391,050 |
| **Total Outfall #1** | | | | | | **130,350** | **130,350** | | | **667,725** |
| PROP MH 3 | PROP MH 4 | Office | 636650 | 0.4 | 254,660 | 254,660 | 254,660 | 2,547 | 3 | 763,980 |
| **Total Outfall #2** | | | | | **254,660** | **254,660** | **254,660** | | | **763,980** |
| PROP MH 5 | PROP MH 6 | High Density | 18 | 140 | 2,520 | 2,520 | 2,520 | 25 | 4.50 | 11,340 |
| **Total Outfall #3** | | | | | **2,520** | **2,520** | **2,520** | | | **11,340** |
| **Total of All Outfalls** | | | | | | | **387,530.0** | | | **1,443,045.0** |

**Notes:**
1. Square footage per building and building use provided by architect.
2. Population is assumed to be one guest per room.



WOOD/PATEL
MISSION: CLIENT SERVICE®

CIVIL ENGINEERS * HYDROLOGISTS * LAND SURVEYORS * CONSTRUCTION MANAGERS

# CALCULATED PIPE CAPACITIES

**Project:** SEVENTH DAY
**Location:** Scottsdale , Arizona
**References:** City of Scottsdale Design Standards and Policies Manual
ADEQ Bulletin No. 11

**Project Number:** 194966
**Project Engineer:** Anthony J. Beuche, P.E.

| FROM NODE | TO NODE | PIPE SIZE | MODELED PIPE SLOPE | PIPE CAPACITY | | PEAK FLOW RESULTS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | PEAK FLOW | PEAK FLOW | d/D | VELOCITY | SURPLUS CAPACITY | PERCENT OF CAPACITY |
| | | (in) | (ft/ft) | (gpd) | (gpm) | (gpd) | (gpm) | | (ft/sec) | (gpd) | (%) |
| PROP MH 1 | PROP MH 2 | 12 | 0.0073 | 1,979,877 | 1,375 | 667,725.00 | 463.70 | .40 | 3.50 | 1,312,152 | 33.7% |
| **Outfall #2 - South** | | | | | | | | | | | |
| PROP MH 3 | PROP MH 4 | 12 | 0.0113 | 2,436,771 | 1,692 | 763,980.00 | 530.54 | .39 | 4.30 | 1,672,791 | 31.4% |
| **Outfall #3 - East** | | | | | | | | | | | |
| PROP MH 5 | PROP MH 6 | 8 | 0.0181 | 1,060,517 | 736 | 11,340.00 | 7.88 | .07 | 1.60 | 1,049,177 | 1.1% |

These are not labeled on the WW exhibit

Assuming these are your 3 connections to the existing sewer, as stated in the introduction you have 1 connection to the 12" and 2 to the 8". I believe these values are backwards

**WASTEWATER EXHIBIT**

## LEGEND

- EXISTING SEWER PIPE
- PROPOSED SEWER PIPE
- EXISTING SEWER MANHOLE
- PROPOSED SEWER MANHOLE
- PROPERTY LINE

N

0 200 400

Horz. 1 in. = 200 ft.

Possibly will need an interceptor for the Hangars. DSPM 7-1.411

E. REDFIELD ROAD

E. THUNDERBIRD ROAD

N. SCOTTSDALE ROAD

N. MILLER ROAD

E. SUTTON DRIVE

PROP. MH INV 12.60

PROP. MH INV 14.33

PROP. MH INV 18.00

PROP. MH INV 21.54

PROP. MH INV 23.08

PROP. 12" SEWER S=0.70%

PROP. 12" SEWER S=0.73%

PROP. 8" SEWER S=0.50%

PROP. MH INV 23.60

PROPERTY LINE

EX. 12" SEWER

Slope?

PROP. MH INV 23.70

PROPERTY LINE

PROP. MH INV 16.50

PROP. MH INV 21.15

PROP. MH INV 18.50

PROP. MH INV 17.27

PROP. 8" SEWER S=1.81%

PROPERTY LINE

PROP. 8" SEWER S=1.00%

EX. 24" SEWER

PROP. 12" SEWER S=1.00%

PROP. MH INV 13.40

PROP. MH INV 16.30

PROP. MH INV 8.90

PROP. MH INV 11.51

PROP. MH INV 6.06

PROP. MH INV 11.00

PROP. MH INV 12.19

PROP. MH INV 12.92

PROP. MH INV 8.26

PROP. 12" SEWER

EX. 8" SEWER

-None of your MH have numbers
-How are you determining your INV values?
-Why are you up-sizing from 8" to 12"

**NOT FOR CONSTRUCTION OR RECORDING**

WOOD PATEL

**SEVENTH-DAY**

SEWER LINE EXHIBIT

| | | | | | |
|---|---|---|---|---|---|
| DATE | 07/25/2019 | SCALE | 1" = 200' | SHEET | 1 OF 1 |
| JOB NO. | 194966 | DESIGN | TB | DRAWN | JO |

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5-GP-2019
12/02/2019