3 engineering

The Toy Barn at the Airpark
Sewer Design Report

3 engineering Job #: 5008
July 11, 2017
COS# 314-PA-17

Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona

By: _____
Date: 8/3/17

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planning civil engineering surveying

THE TOY BARN AT THE AIRPARK

SEWER DESIGN REPORT

Prepared for:

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Expires 12/31/2018
Matthew J. Mancini, P.E.

July 11, 2017

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Job Number 5008

Table of Contents

Tables

Appendices

Exhibits

1. Introduction

The purpose of this sewer report is to present the existing and proposed sewer plan for the project, The Toy Barn at the Airpark (Site). It is our opinion the proposed sewer concept is in accordance with the City of Scottsdale's Design Standards & Policies Manual (Ref. 1).

The Site, is located in Section 2, Township 3 North, Range 4 East of the Gila and Salt River Meridian, Maricopa County, Arizona within the City of Scottsdale, Arizona. The Site is located North of E. Greenway Road, and East of 78th Street, Scottsdale, Arizona 85254 (APN 215-47-003R). The Site is bound on the north and east by existing commercial development and an office building, respectively, on the south by Greenway Road, and on the west by 78th Street. See Appendix A for a Vicinity Map.

The Site is zoned I-1. The Site currently exists as a vacant un-developed parcel. The intent of this project is to construct 18 Garage Storage Condominiums and a Clubhouse, including new site utility, drainage, and circulatory infrastructure.

2. Design Documentation

Manning's Equation was used to model and analyze the proposed sewer system for compliance with the City of Scottsdale design requirements. Demands were calculated using the City of Scottsdale Design Standards Manual for Water and Wastewater Systems. It is our opinion that this report is in accordance with the City of Scottsdale's Design Standards & Policies Manual.

3. Existing Conditions

The Site currently exists as a vacant un-developed parcel. See Appendix A for a vicinity map. The existing topography slopes from northeast to southwest at approximately 1/2 percent (0.5 %).

The Site is bounded on the north and east by an existing office building and commercial development, on the south by E. Greenway Road, and on the west by 78th Street. There is an existing 8" V.C.P. sewer line in E. Greenway Road which will service the project. See Exhibit SE1 Sewer Plans for sewer line layouts.

4. Proposed Conditions

The project consists of an 18 Unit Garage Storage and Clubhouse project on 1.3 acres. The on-site sewer system will be private. The on-site sewer system will tie into the public system with a 6-inch service tap into a new manhole connection at the site entrance. Onsite sewer consists 6" private sewer lines that are designed at 1.0% slopes. See Exhibit SE1 for the proposed sewer design.

5. Computations

The following demand criteria were used in determining the system demands for the proposed site.

1. 18 Storage Units w/ clubhouse = approximately 25,190 sf
2. 0.5 gal/day per sf (using commercial use)
3. Design Flow = Peak Flow = Q Peak = Q avg x 3.0

TABLE 1: ON-SITE SEWER DEMANDS	
Number of Units 18 w/ clubhouse (total square footage)	25,190 sf Bldg A (7,500 sf) Bldg B (10,190 sf) Bldg C (7,500 sf)
Avg. daily demand	12,595 gpd
Design Flow Rate (peaking factor – use 3.0 for industrial)	37,785 gpd

Average daily demand: 25,190 sf x .5 gpd/sf = 12,595 gpd
= 12,595 gpd/1440 mpd = 8.75 gpm

Peak Factor = 3.0

Design flow rate = 3.0 x 12,595 gpd = 37,785 gpd
= 37,785 gpd/1440 mpd = 26.25 gpm

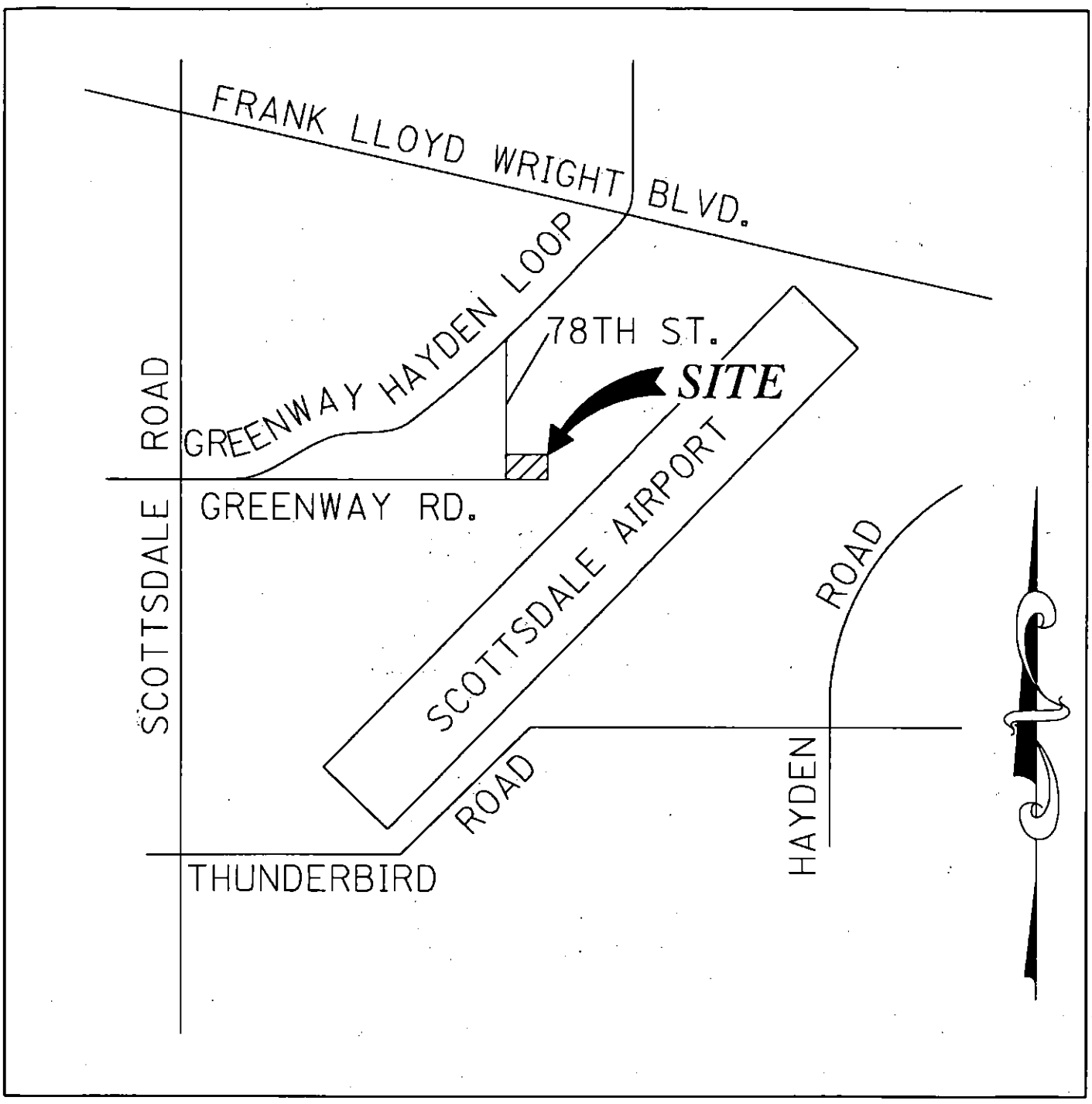
Manning's Equation was used to model and analyze the proposed 6" sewer system for compliance with the City of Scottsdale design requirements. Refer to Appendix B for loading of the sewer line and Exhibit SE1 for the sewer design.

6. ***Summary***

The Peak Flow for the proposed site is 37,785 gpd or 26.25 gpm. Based on the results from the sewer system analysis the onsite 6" system provides adequate capacity at 251.8 gpm, or 362,592 gpd.

APPENDIX A

Vicinity Map



VICINITY MAP

N.T.S.

APPENDIX B

Manning's Calculations

Manning Pipe Flow Calculator

Manning Formula Uniform Pipe Flow at Given Slope and Depth

Toy Barn at the Airpark

Sewer Capacity - 6"

Set units: m | mm | ft | in

Pipe diameter, d_o	6	in
Manning roughness, n ?	0.013	
Pressure slope S_o	.01	rise/run
Percent of (or ratio to) full depth (100% or 1 if flowing full)	100	%

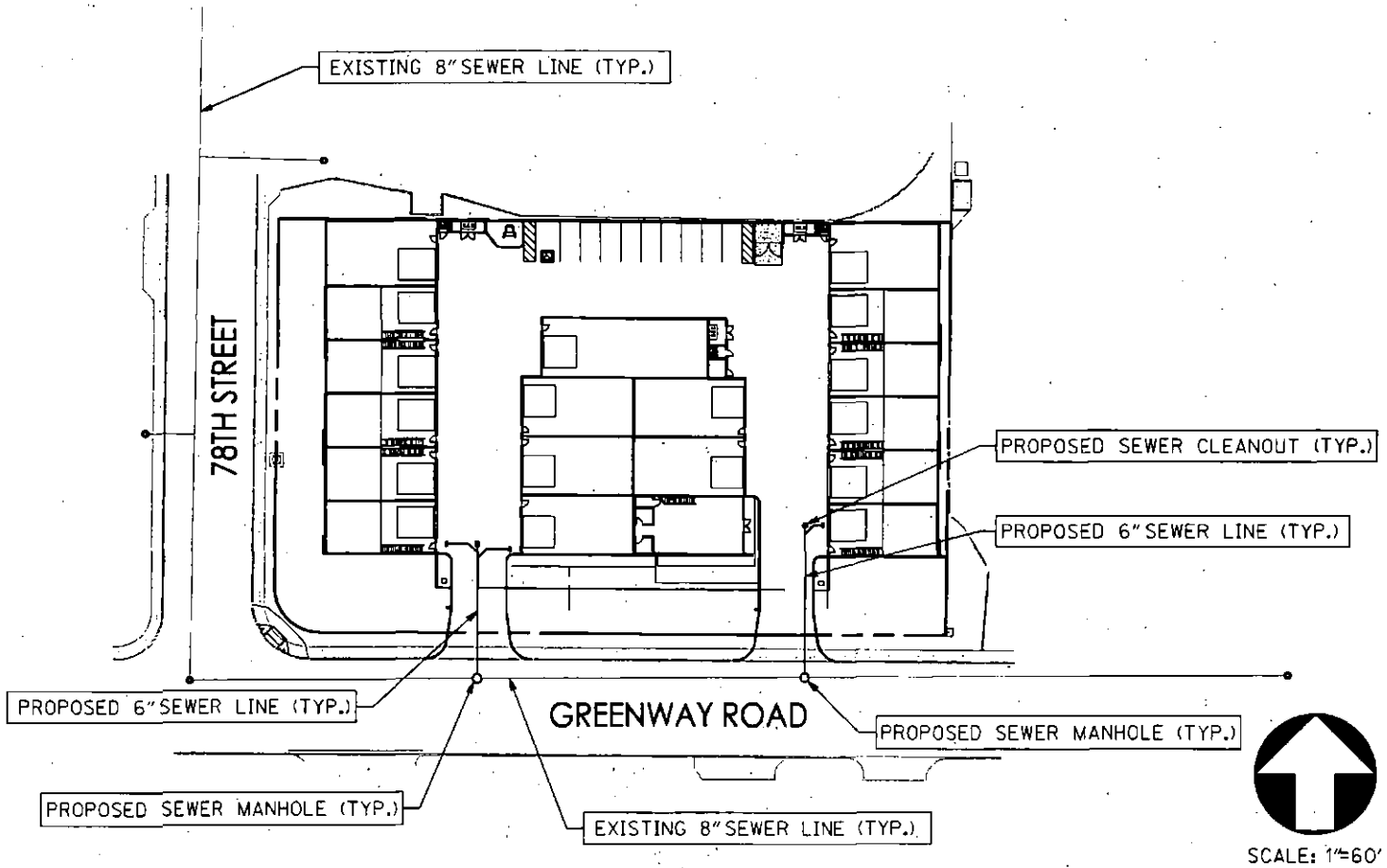
Results

Flow, Q	251.8086	gpm
Velocity, v	2.8575	ft/sec
Velocity head, h,	0.1269	ft
Flow area	0.1964	ft^2
Wetted perimeter	18.8496	in
Hydraulic radius	0.1250	ft
Top width, T	0.0000	in
Froude number, F	0.00	
Shear stress (tractive force), tau	0.3122	psf

7/11/2017

EXHIBIT 1

Sewer Design Exhibit



SE1

TOY BARN AT THE AIRPARK

7800 E. GREENWAY ROAD SCOTTSDALE, AZ 85260

SEWER EXHIBIT - SE1

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DATE:	PROJECT NO.
07/11/17	5008

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