

Sewer Basis of Design Report
For
Baseline Road Improvements

Southeast of the Intersection of Baseline Road & 59th Avenue
City of Phoenix, Arizona

Prepared for

59th and Baseline, LLC.
4835 E Cactus Rd Ste. 325
Scottsdale, Arizona 85254



November 26, 2018

CEC PN# 183-321



Civil & Environmental Consultants, Inc.

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1.0 INTRODUCTION

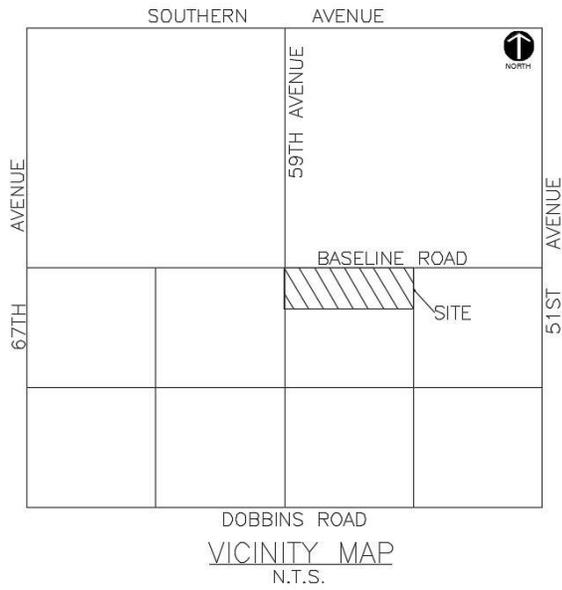
Civil and Environmental Consultants, INC. has been contracted by 59th & Baseline, LLC to perform civil engineering design services for the Sunrise and ALDI developments. The project is a combined 8.34-acre +/- proposed development that is currently undeveloped.

The project is located at the southeast corner of Baseline Road and 59th Avenue in the City of Phoenix.

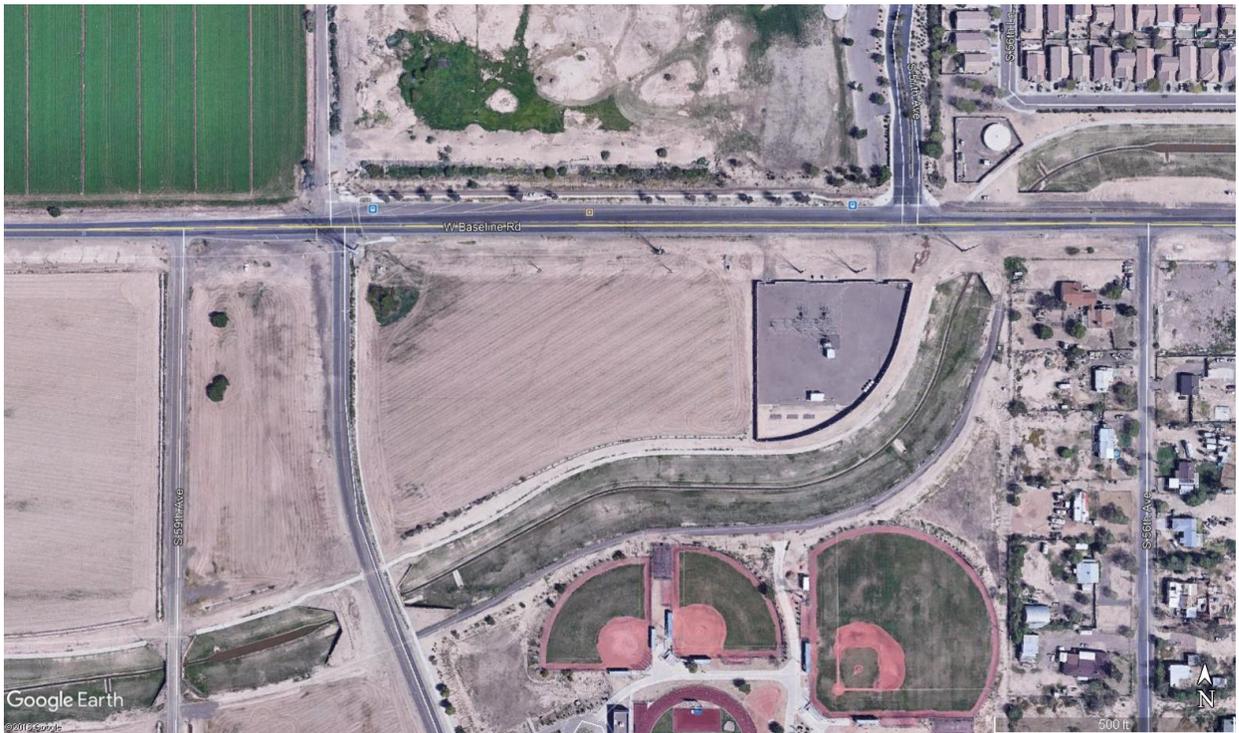
This Basis of Design report will document existing and proposed wastewater utility conditions for the proposed roadway. Refer to the Civil Improvement Plans located in Appendix C at the back of this report for existing and proposed utility line locations.

The purpose of this report is to satisfy the City of Phoenix, Maricopa County Environmental Services Department requirements regarding the basis of wastewater design for the project.

Vicinity Map



Aerial Map



2.0 WASTEWATER STUDY – BASIS OF DESIGN

Existing Improvements

Existing public sewer lines are located in both Baseline Road and 59th Avenue and cross at the intersection. A 24” VCP sewer main runs north along 59th Avenue and connects to a 24” VCP sewer main running west in Baseline Road via manhole. The 24” VCP sewer main in Baseline Road continues west.

Proposed Improvements and Demands

The sewer needs for the project will be served by extending the 24” VCP sewer main in Baseline Road toward the east. A new 8” VCP public sewer pipe will run to the east 337 feet past the intersection. An 8” VCP private sewer pipe will then stub out of a manhole at the end of the public line to serve the property south of the line. A 138 foot stretch of 8” VCP pipe will run north from the existing manhole (01-15-210) in 59th Avenue to serve future developments north of Baseline Road.

Refer to the Civil Improvement Plans located in Appendix B at the back of this report for existing and proposed utility line locations.

Sewer demands are anticipated to be 27,274.86 gallons per day (average) and 113,278.17 gallons per day (peak). Demands for pipe sizing are based on a 12-hour day. The total peak discharge for the development will be 0.35 cfs. Proposed 8” public sewer main lines will run at 0.38% slope. Refer to Civil Improvement Plans located in Appendix B at the back of this report for proposed sewer slopes.

Below is a table showing the proposed wastewater demand calculations.

PROPOSED WASTEWATER DEMAND CALCULATIONS FOR DAILY DEMANDS							
BUILDING/ PARCEL	SQUARE FOOTAGE	AREA (ACRES)	UNIT DEMAND (GPD/1000SF)	TOTAL AVG. DAY DEMAND (GPD)	TOTAL PEAK DAY DEMAND (GPD)	TOTAL PEAK HOUR DEMAND (GPM)	TOTAL PEAK HOUR DEMAND (CFS)
SUNRISE	241,941.35	5.55	75	18,145.60	74,759.88	103.83	0.2335
PROPOSED ALDI	121,723.47	2.79	75	9,129.26	38,518.29	53.50	0.1203
TOTAL	363,664.82	8.34		27,274.86	113,278.17	157.33	0.3539
AVG. DAY DEMANDS WERE CALCULATED USING COP WATER AND WASTEWATER DESIGN STANDARDS MANUAL. PEAK FLOW BASED ON HARMON'S FORMULA.							

Full system analysis has been completed for this project and is provided in Appendix A along with an exhibit showing sewer line designations.

3.0 CONCLUSIONS

Sewer service will be provided to the proposed project by extending the sewer main in Baseline Road with a public 8" VCP sewer pipe. An 8" private VCP sewer pipe will tap into the end of the 8" public line via manhole. An 8" private VCP sewer pipe will connect to the existing manhole in the intersection of 59th Avenue and Baseline road and run north to serve future development. The sewer lines will provide adequate capacity for the estimated sewer flow of the site.

4.0 REFERENCES

Maricopa County Health Code

Arizona Department of Environmental Quality Engineering Bulletin 10

Maricopa County Association of Governments Specification Section 610.5

Maricopa County Association of Governments Standard Details

City of Phoenix Design Standards Manual for Water and Wastewater Systems

APPENDIX A

Sewer Calculation References

Hydraulic Analysis Report

Project Data

Project Title:
Designer:
Project Date: Thursday, November 1, 2018
Project Units: U.S. Customary Units
Notes:

Channel Analysis: SP#1

Notes:

Input Parameters

Channel Type: Circular
Pipe Diameter: 0.6700 ft
Longitudinal Slope: 0.0380 ft/ft
Manning's n: 0.0130
Flow: 0.1040 cfs

Result Parameters

Depth: 0.0953 ft
Area of Flow: 0.0307 ft²
Wetted Perimeter: 0.5182 ft
Hydraulic Radius: 0.0593 ft
Average Velocity: 3.3871 ft/s
Top Width: 0.4681 ft
Froude Number: 2.3305
Critical Depth: 0.1466 ft
Critical Velocity: 1.8216 ft/s
Critical Slope: 0.0065 ft/ft
Critical Top Width: 0.55 ft
Calculated Max Shear Stress: 0.2260 lb/ft²
Calculated Avg Shear Stress: 0.1405 lb/ft²

Channel Analysis: SP#2

Notes:

Input Parameters

Channel Type: Circular

Pipe Diameter: 0.6700 ft

Longitudinal Slope: 0.0038 ft/ft

Manning's n: 0.0130

Flow: 0.1563 cfs

Result Parameters

Depth: 0.2069 ft

Area of Flow: 0.0926 ft²

Wetted Perimeter: 0.7895 ft

Hydraulic Radius: 0.1173 ft

Average Velocity: 1.6883 ft/s

Top Width: 0.6191 ft

Froude Number: 0.7694

Critical Depth: 0.1807 ft

Critical Velocity: 2.0375 ft/s

Critical Slope: 0.0064 ft/ft

Critical Top Width: 0.59 ft

Calculated Max Shear Stress: 0.0491 lb/ft²

Calculated Avg Shear Stress: 0.0278 lb/ft²

APPENDIX B

Civil Improvement Plans

APPENDIX C

Backup Documentation