

# PRIVATE SEWAGE COLLECTION SYSTEM OPERATION AND MAINTENANCE PLAN

For

## *Baseline Road Improvements*

Southeast of the Intersection of Baseline Road & 59<sup>th</sup> Avenue  
City of Phoenix, Arizona

Prepared for

***59<sup>th</sup> and Baseline, LLC.***

4835 E Cactus Rd Ste. 325  
Scottsdale, Arizona 85254



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Civil & Environmental Consultants, Inc.

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**ABBREVIATIONS**

ADEQ	Arizona Department of Environmental Quality
ADOSH	Arizona Division of Occupational Safety and Health
ASTM	American Society for Testing and Materials
CCTV	Closed Circuit Television
MAG	Maricopa Association of Governments
MCESD	Maricopa County Environmental Services Department
NFPA	National Fire Protection Association
OSHA	United States Occupational Safety and Health Administration
PUE	Public Utility Easement
PVC	Polyvinyl Chloride Pipe
SDR	Standard Dimension Ratio
UPC	Uniform Plumbing Code
IFC	International Fire Code

## **1.0 Description of the Sewage Collection System**

### **1.1 Introduction**

Sewer facilities for this project consist of public sewer facilities owned, operated, and maintained by the City of Phoenix and private sewer facilities owned, operated, and maintained by the owner. A Vicinity Map is shown on the following page.

### **1.2 Public Sewer Facilities**

A 24" VCP public sanitary sewer is located in Baseline Road and in 59<sup>th</sup> Avenue at the intersection. The City of Phoenix owns, operates, and maintains the sewer facilities within Baseline Road and 59<sup>th</sup> Avenue.

### **1.3 Private Sewer Facilities**

An eight-inch (8) DIP public sewer line will be constructed within Baseline Road and will extend 48 feet to the east of the existing manhole in the intersection of Baseline Road and 59<sup>th</sup> Avenue. A new manhole will be constructed at the end of this line and another eight-inch (8) DIP public sewer line will connect to that manhole and extend south for 11 feet where another manhole will be built at its termination. A third eight-inch (8) public sewer line will connect to this manhole and extend east for 289 feet. These lines will all be constructed with a slope of 0.038 ft/ft.

An eight-inch (8) DIP private sewer line will connect to the 289-foot sewer line via manhole and will extend for 84 feet toward the south at a slope of 0.038 ft/ft where another manhole will be constructed. A six-inch (6) private sewer line will be constructed from that manhole within a proposed 16-foot private sewer easement and will extend east for 245 feet at a slope of 0.01 ft/ft along the north edge of the property.

## **2.0 Regulatory Ordinances and Permits**

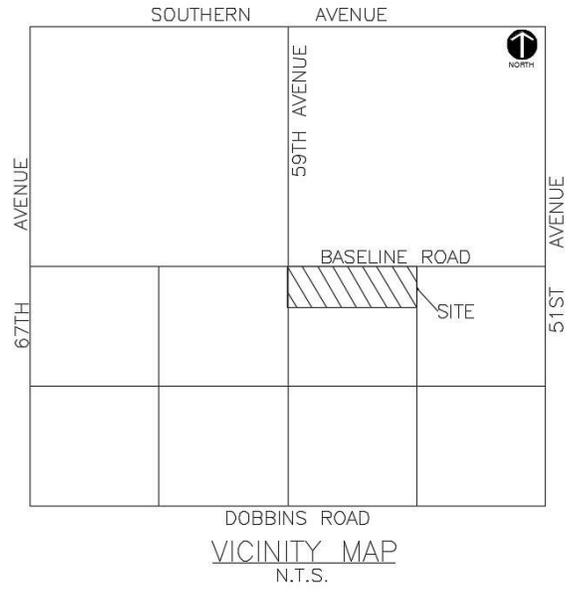
### **2.1 Public Sewer Ordinance**

The private sewage collection system discharges into the City of Phoenix public system. The City of Phoenix has restrictions on substances that can be discharged into their sanitary sewer system and the owner must abide by these restrictions. Refer to the City of Phoenix Water and Sewer Design Manual when considering discharge of any substance other than normal domestic sewage (wastewater).

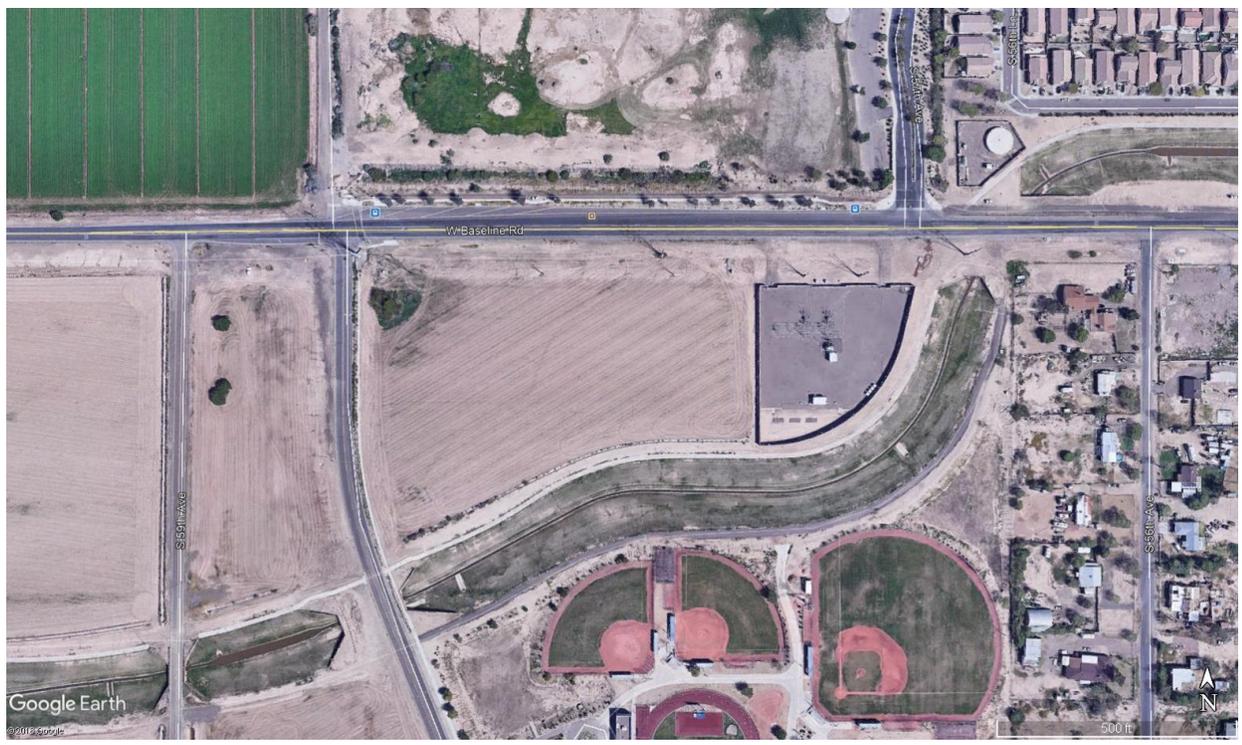
Vicinity Map

### **2.2 Aquifer Protection Permit**

The Arizona Department of Environmental Quality (ADEQ) through the Maricopa County Environmental Services Department (MCESD) permits the private sewage collection system under a Type 4 general aquifer protection permit – APP 4.01. This permit is issued under the Arizona Administrative Code, Title 18, Chapter 9, Part E (R18-9-E301, 4.01). The owner is responsible for compliance with this permit.



Aerial Map



### 3.0 Components and Construction of the Sewage Collection System

#### 3.1 General

The sewage collection system consists of building connections, main sewers, manholes, and onsite building sewer cleanouts where applicable. Private sewage flows will consist of gravity lines.

#### 3.2 Uniform Standard Specifications and Details for Public Works Construction

The Maricopa Association of Governments (MAG) publishes standard specifications and details for design and construction of sewage collection systems. Most municipalities in the Phoenix metropolitan area use these standards. The City of Phoenix also issues a supplement to the MAG specifications. These supplemental details supersede the MAG standard details and must be followed. The City of Phoenix supplement and the MAG specifications and details can be obtained free over the Internet at the websites shown below. Hard copies can also be purchased at each office.

Maricopa Association of Governments 302 North 1 <sup>st</sup> Avenue, Suite 300 Phoenix, Arizona 85003	Phone: 602/254-6300 Fax: 602/254-6490 <a href="http://www.mag.maricopa.gov/display.cms">http://www.mag.maricopa.gov/display.cms</a>
City of Phoenix Phoenix City Hall 200 W. Washington Street Phoenix, Arizona 85003	Phone: 602/262-6011 <a href="http://www.phoenix.gov/STREETS/magsuppl.html">http://www.phoenix.gov/STREETS/magsuppl.html</a>

#### 3.4 Main Sewers

The public sewer main in Baseline Road is 8 inches in diameter and is made up of ASTM D-3034, SDR-35 PVC pipe and fittings. This public main sewer line is built per UPC standards with a minimum slope of 0.38%.

The private sewer main in the drive will transport sewage from the site to the public sewer. The main sewer on this project is 6 inches in diameter and is made of ASTM D-3034, SDR-35 PVC pipe and fittings. This private main sewer line is built per UPC standards with a minimum slope of 1.0%.

#### 3.5 Manholes

Manholes are used where a main sewer changes direction or where several main sewers are connected together. Manholes are also used at the end of the main sewer if a cleanout is not allowed. Manholes allow access to the sewers for inspection and cleaning. Manhole depths vary, but are approximately five (5) to eight (8) feet deep on this project. City of Phoenix Standard Detail P-1430, with no steps, four (4) foot diameter manhole, and flexible pipe connections was used.

#### 3.6 Cleanouts

Cleanouts in sewer lines are anticipated for future construction if the runs are greater than 100-feet to a building. Cleanouts allow access to the building sewer line for maintenance.

## **4.0 Sewage Collection System Operation and Maintenance**

### **4.1 Use of a Professional**

Operation and maintenance of a sewage collection system requires a knowledgeable individual using proper tools and equipment, and using safe procedures. It is strongly recommended that the Association and unit owners hire a licensed person or firm skilled in the operation and maintenance of a sewage collection system when work is required.

### **4.2 Inspection**

Sewage collection system problems can result from a variety of reasons, such as: improper installation; accumulation of grease, debris, and trash resulting in stoppages or restrictions; and pipe or manhole deterioration from hydrogen sulfide or rapid root growth. Regular inspections of the system can help catch problems in an early stage in order to minimize effects of the problem. Closed circuit television (CCTV) inspection is one method to provide positive and reliable answers to collections system problems. Smoke testing can be used to identify problems with inflow and illegal connections, and to locate broken sewers. Dye testing can be used to identify problems with inflow and illegal connections.

### **4.3 Cleaning and Flushing**

Stoppages in the collections system must be prevented from completely blocking wastewater flow resulting in backing up and overflowing into streets or buildings. Stoppages can be cleared or prevented and sewers can be cleaned using hydraulic or mechanical means. Hydraulic cleaning equipment uses water under pressure. This results in velocities high enough to wash away most grit, grease, and debris found in the sewer.

There are several types of mechanical cleaning methods, such as bucket machines, power rodders, sewer balls, kites or bags, and hand rods. Mechanical cleaning is generally used if hydraulic cleaning is not possible.

### **4.4 Hydrogen Sulfide Control**

Odor control in the collection system is generally achieved by cleaning the sewers, as discussed above. There are times, however, when chemicals must be applied to control odors.

### **4.5 Underground Repairs**

There will be times when stoppages cannot be corrected by flushing or cleaning, and the only method to correct the problem is by underground repair. Proper safety procedures and equipment must be used at all times during underground work. In addition, proper bedding, backfill, and compaction must be used for the repair. MAG Specification Section 601 defines what was required during the original construction and is a good guide to follow for repairs.

### **4.6 Blue Stake Services**

Arizona Blue Stake was established as a one-call notification system to assist excavators with the statutory requirements to notify underground facility owners prior to excavation. This damage prevention service is provided free of charge to any individual or company planning to excavate within a public right-of-way or easement. By participating in the program and getting underground facilities located, one can:

- Comply with state law
- Avoid injuries
- Prevent costly damages and interruptions of facility services
- Save time and money
- Avoid hazards
- Eliminate construction delays

Notice is given to Arizona Blue Stake by calling 602-263-1100. However, the Arizona Blue Stake service does not locate utilities that are outside of public rights-of-way or easements. A private person or entity must be retained to perform location work in these areas.

## **5.0 Safety**

### **5.1 Safety and Health Agencies**

The United States Occupational Safety and Health Administration (OSHA) and the State of Arizona Division of Occupational Safety and Health (ADOSH) establish guidelines and requirements for safety in the workplace. These guidelines must be incorporated into a safety program for work on the sewage collection system.

### **5.2 Hazardous Area Classification**

NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collections Facilities defines ventilation rates, use of combustible gas detection and alarming, and hazardous area classifications. The private sewage collection system for this project is classified as Class I, Division 2, Group D, within non-ventilated enclosed spaces. Safety measures for work in a hazardous atmosphere must be followed. However, enclosed spaces when continuously ventilated at twelve (12) air changes per hour are unclassified. Also refer to the International Fire Code as currently adopted by most municipalities in Maricopa County, Arizona.

### **5.3 Excavation**

Many hazards exist when an excavation is required. Items to consider include, but are not limited to: fall protections; sloping of excavation; sheeting and shoring; proper placement of excavated soil; damage to buried utilities; buildup of toxic and flammable gases; confined space considerations; pedestrian safety; and traffic safety.

### **5.4 Traffic and Pedestrian**

Traffic and pedestrian safety must be maintained whenever working on the sewage collection system. Items to consider include, but are not limited to barricades, detours, traffic cones, warning and routing flags, and signage.

### **5.5 Manholes**

Entry and work procedures following guidelines of OSHA and ADOSH must be established and followed. A manhole is a confined space! Many accidents occur in and around manholes. Causes of manhole accidents include, but are not limited to: atmospheric (explosive or flammable, toxic, depletion or elimination of breathable oxygen); physical injury (slips, falls, falling objects, sharp objects, bumps, and structural failures); infection and disease, insects, snakes, and vermin; toxic exposure; and drowning.

Safety equipment to have and use, includes, but is not limited to: safety harness with lifeline, tripod, and winch; portable atmospheric testing and alarm equipment; ventilation blower with hose; hard hats; protective clothing; portable safety enclosure; first aid kit; and cellular telephone.

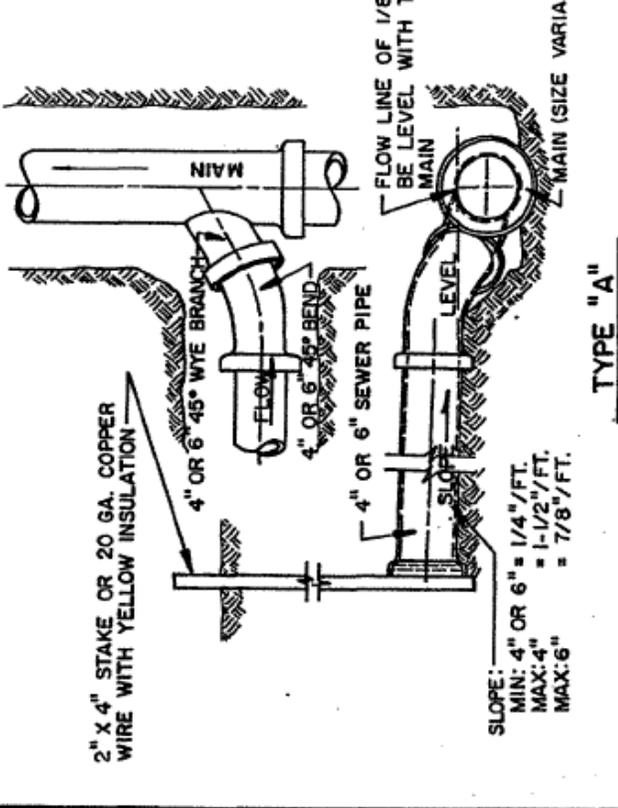
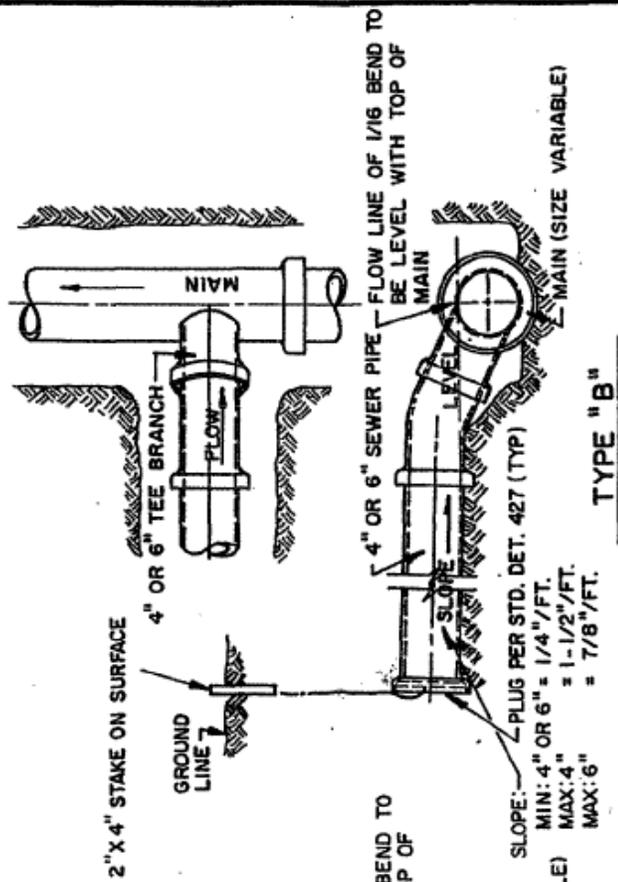
## 6.0 References

- Operation and Maintenance of Wastewater Collections Systems: A Field Study Training Program, Fifth Edition Volumes I and II, California State University Department of Civil Engineering and Office of Water Programs in cooperation with the California Water Environment Association, 1996.
- US. Department of Labor, Occupational Safety & Health Administration, [www.osha.gov](http://www.osha.gov).
- NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities, National Fire Protection Association, 1995.
- International Fire Code, 2003, International Code Council

## **APPENDICES**

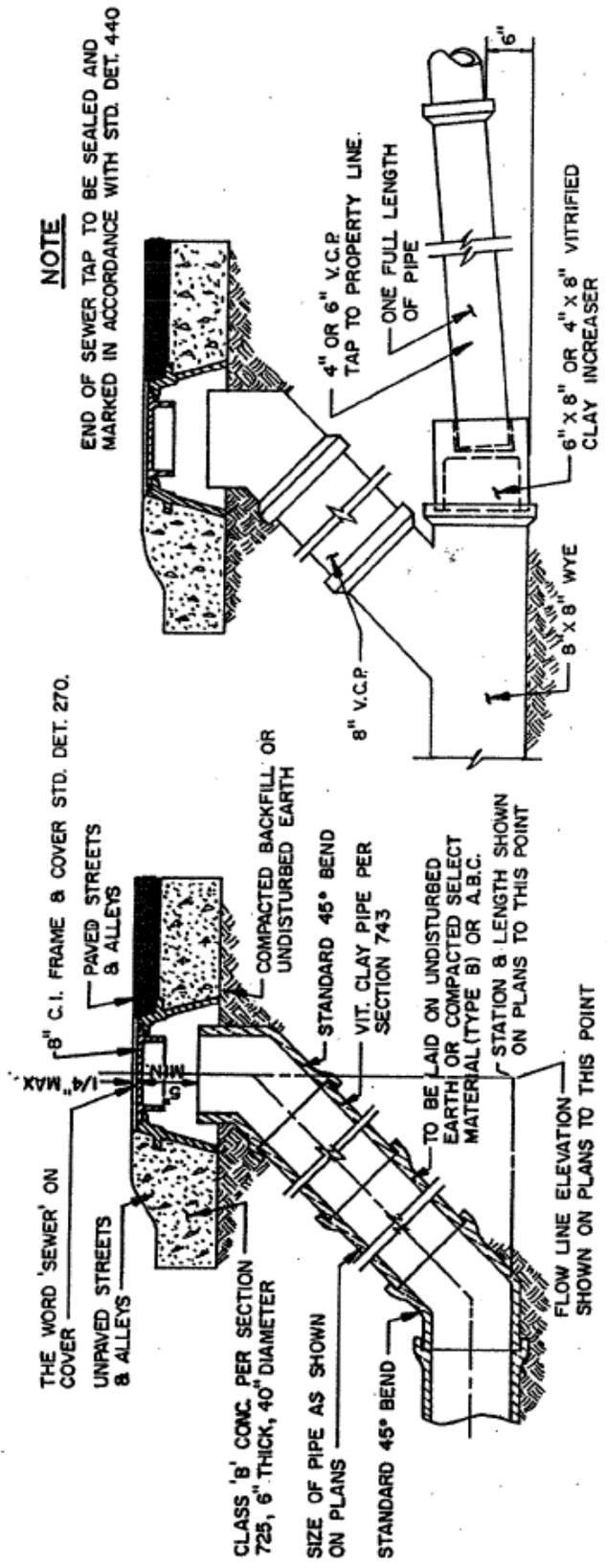
**APPENDIX A**  
**PUBLIC SEWER MAIN EXTENSION WITH**  
**PRIVATE SEWER SERVICE PLANS**

**APPENDIX B**  
**SELECTED MARICOPA ASSOCIATION OF GOVERNMENTS**  
**(MAG) STANDARD DETAILS**



**NOTES**

1. CONSTRUCTION DETAIL APPLIES WHERE CONTRACTOR BUILDS HOUSE CONNECTION. TAP EXTENDS TO PROPERTY LINE IN ALLEYS OR STREETS OR TO ESMT. LINE.
2. SIZE OF TAP SHALL BE DESIGNATED ON PLANS.
3. DETAILS SHOWN MUST BE MET FOR MINIMUM CONDITION OF LESS THAN 5'-0".
4. CONSTRUCT TAP AT MIN. SLOPE IF COVER WILL BE LESS THAN 5 FEET AT PROPERTY LINE.
5. IF DEPTH REQUIRES, MIN. SLOPE CAN BE REDUCED TO 1/8" PER FOOT PROVIDED STUB IS STAKED TO GRADE.
6. FOR DEEPER LATERAL OR TRUNK SEWER CONDITION, THE WYE AND 1/8 BEND OR THE TEE AND 1/16 BEND WILL BE ROTATED TOWARD THE VERTICAL POSITION AS REQUIRED TO OBTAIN 5'-0" COVER OVER TAP AT PROPERTY LINE OR EASEMENT LINE.
7. END OF TAP TO BE SEALED AND MARKED AS NOTED.



**NOTE**

END OF SEWER TAP TO BE SEALED AND MARKED IN ACCORDANCE WITH STD. DET. 440

**CLEANOUT INSTALLATION**

**SEWER TAP AT CLEANOUT**

DETAIL NO. 441



SEWER CLEANOUT

DETAIL NO. 441

**APPENDIX C**  
**SELECTED MARICOPA ASSOCIATION OF GOVERNMENTS**  
**(MAG) STANDARD DETAILS**