



Water Study

FINAL Basis of Design Report

APPROVED

APPROVED AS NOTED

REVISE AND RESUBMIT



Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance. For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY Idillon

DATE 10/31/2019

Address comments below and throughout in final BODs and apply relevant items to stipulations:

- 1) Phase 1: new 8" line required on Camelback Rd (Hayden to Parkway Ave) as shown herein
- 2) Phase 1 Replacement of 6"line on 78th street required with new 8" required as shown herein.
- 3) Phase 2: line replacement of existing 6-inch with 8-inch required
- 4) Any existing lines will be fully removed to accommodate new larger required lines. Any existing services on these lines will need to be reinstated per current City standards.

Gentry on the Green Master Water Basis of Design Report

Job No. 19001704

Prepared for:
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Seth Jared Gardner

October 2019



GENTRY ON THE GREEN
MASTER WATER BASIS OF DESIGN REPORT
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- C. Hydraulic Model Results
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1.0 INTRODUCTION

The Gentry on the Green development (the “Project”), is a proposed multi-use development that includes residential and commercial use. The Project’s site is currently developed as three separate apartment complexes. The Project is located in the southeast quarter of Section 23, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Scottsdale, Arizona (See Vicinity Map in Appendix A). The Project is approximately 42 acres and is phased into two phases (See Phasing Exhibit in Appendix A). Phase 1 is approximately 27 acres and includes 1,214 dwelling units, 31,000 square feet of commercial/retail development, and 10,000 square feet of restaurant. Phase 2 is approximately 15 acres and includes 270 dwelling units, 250 healthcare beds, and 150 hotel rooms. Phase 2 is based on a conceptual land use matrix for the purpose of determining conceptual infrastructure/traffic generation for Phase 2 and is subject to change. Refer to Appendix B for the demand calculations.

2.0 EXISTING WATER DISTRIBUTION SYSTEM

The Project is located within the service area boundary of the City of Scottsdale. The water infrastructure that will support this project is an existing 12-inch main in Hayden Road and an 8-inch line in Camelback Road. Portions of Parkway Avenue and 78th Street have a 6-inch water line that supply water within the same pressure zone. Exhibit 2 in Appendix B illustrates the existing water lines around the project area. Phase 1A and Phase 1B are located at the northeast portion of the Project. Refer to the Phasing Exhibit in Appendix A. These phases currently connect to a 12-inch DIP water main on Hayden Road via an 8-inch DIP water line loop. This water line loop does not connect to Phase 1D or Phase 2 that make up the south and the west portions of the Project. Phase 1D and Phase 2 connect to the 6-inch mains on 78th Street and Parkway Avenue, which connect to a 12-inch AC pipe on Indian School Road. Refer to Appendix A for the Water and Sewer Quarter Section Exhibit.

The existing Phase 1 site includes 475 dwelling units, open space, and approximately 17,100 square feet of commercial space. The existing Phase 2 site includes 354 dwelling units and open space.

Two fire hydrant flow tests were performed. One test was performed at the southwest corner of Camelback Road & Hayden Road to the west of the existing wash. There are three existing apartment complexes on the Phase 1 site that were active while the fire flow test was performed and will be replaced with new land uses. Another test was performed on Montecito Avenue in between N. 78th Street and N. Parkway Avenue. Refer to Exhibit E for the fire hydrant flow test results.

3.0 PROPOSED WATER SYSTEM

The design of the proposed water distribution system is based on Bulletin 10 (ADEQ), the City of Scottsdale Design Standards & Policies Manual (DSPM), 2016 International Fire Code and sound engineering principles. Design requirements used are listed below:

- High Density Residential (HDR) average day demand or 0.270 gallons per minute per unit.
- Commercial and Retail average day demand is 0.00111 gallons per minute per sq. ft.
- Healthcare average day demand is 0.347 gallons per minute per room. This is derived from an assumption of 2 beds per room.
- Restaurant average day demand (ADD) is 0.00181 gallons per minute per sq. ft.
- Hotel average day demand is 0.63 gallons per minute per room.
- Developed Open Space average day demand (ADD) is 2.49 gallons per minute per acre.
- Fire Flow Demand is based in 2018 International Fire Code (2018 IFC).
- Maximum Day Demand (MDD) is 2 times the ADD for HDR, Commercial, Retail, Office, Healthcare and Hotel land uses.
- Maximum Day Demand is 3 times the ADD for Restaurant land uses.
- Peak Hour Demand is 3.5 times the ADD for HDR, Commercial, Retail, Office and Healthcare land uses.
- Peak Hour Demand (PHDD) is 4.5 times the ADD for Hotel land uses.
- Peak Hour Demand (PHDD) is 6 times the ADD for Restaurant land uses.
- Minimum residual pressure at the worst-case hydrant node for MDD plus Fire Flow scenario is 30 psi. with a simultaneous minimum of 15psi at all domestic demand nodes.
- Minimum pressure at the highest finished floor during MDD plus Fire Flow is 15 psi. The tallest building is four stories tall therefore, the Maximum finished floor to ground height is assumed as 40 feet.
- Minimum of 50 psi must be maintained at the highest proposed finished floor elevation to be serviced.
- Due to unknown factors regarding the final plumbing layout, a loss of 10 psi is assumed for the meter, back flow preventor and minor pipe losses throughout the

buildings. The Minimum service pressure for the building nodes will be set at 60 psi for this project. Any service connection node that drops below this threshold may need a booster pump.

The proposed phasing plan allows construction of Phase 1A while maintaining water service to the existing apartments in Phase 1B through Phase 1C.

The fire hydrant flow test at the southwest corner of Camelback Road and Hayden Road resulted in higher pressure and available flow when compared to the hydrant flow test performed at E. Montecito Avenue. This is to be expected as the fire hydrant at E. Montecito Avenue is supplied by 6-inch water lines, some of which is proposed to be replaced by these improvements. The water line loop that services the proposed Building A and Building B area has more available flow than the water system in 78th Street to the west. In the current conditions these two systems are not connected near Camelback Road. However, these two systems are within the same pressure zone and are connected within the Indian School Road system.

3.1 PHASE 1 IMPROVEMENTS

The proposed design will connect the existing system on the west side of 78th Street to the system that comes off of Hayden Road. The proposed design includes the removal of an 8-inch pipe running east-west across the middle of the Building A and Building B and the removal of a 6-inch pipe running along the south side of the proposed paseo. The design also proposes a new 8-inch water line in Camelback Road and in between Building A and Building B. The proposed improvements will connect to the onsite existing waterline loop and will extend to the south to include Building C and Building D. It is also proposed that the 6-inch water line in 78th Street be replaced with an 8-inch water line and tied into the proposed water line in Camelback Road and within the site. The remainder of the 6-inch water line on the southside of Building C and Building D is to be removed and replaced with 8-inch water line.

3.2 PHASE 2 IMPROVEMENTS

When Phase 2 develops an 8-inch water line will be installed in Parkway Avenue, extending from the southern property boundary up to the existing water line in Camelback Road. 8-inch water lines will also be installed throughout the Phase 2 development, generally running east-west, that will connect the Parkway Avenue system with the 78th Avenue system. These improvements will create and complete a loop around and through the Phase 2 development.

4.0 HYDRAULIC MODEL

WaterCAD v8i by Bentley was used to verify that fire flow that complies with the City of Scottsdale's requirements is available for the Project. The Phase 1 improvements were

modeled separately from the Phase 2 total buildout. The Phase 1 model includes the existing portions of the Phase 2 area. See Appendix B for results.

4.1 BOUNDARY CONDITIONS

The Water Model Layout (Exhibit 2) provides a computer-model schematic of the proposed water system and the existing main that it connects to. This boundary condition is modeled as a reservoir and pump supplying water to the system at the location at which the fire flow test was performed. The pump curve definition is produced from the fire hydrant flow test that was performed at the northeast corner of the site. See Appendix D. In accordance with The City of Scottsdale design standards these test results were de-rated in the model. The maximum pressure was set to 72 psi and the resultant flow rates were reduced by 10%, in accordance with the city of Scottsdale design standards.

4.2 PHYSICAL PARAMETERS

Physical parameters used in the WaterCAD model include a Hazen Williams roughness "C" coefficient of 140 for Asbestos Cement pipe (ACP) and a roughness "C" coefficient of 130 for Ductile Iron pipe (DIP). New water lines were assumed to be DIP while the existing water lines are ACP. Node elevations are obtained from onsite topography. Much of the 8-inch ACP is being replaced with DIP. Proposed pipe sizes used in this model are 8-inch in diameter. The nodes at which the domestic demands are applied are raised by 40-feet to account for the height from the ground to maximum finished floor. Landscape demands are applied at ground level.

4.3 WATER DEMAND SCENARIOS

Average Day Demand, Max Day Demand and Peak Hour Demand scenarios were analyzed for Phase 1 and for Phase 1 and 2 combined. Fire flow was modeled to include the Max Day Demand and Fire Flow Demand. The Phase 1 demands are based on the latest available site plan. The Phase 2 demands are based on projected land uses, square footage and dwelling unit counts for the future site. Phase 2 is modeled with an 8-inch water line running through the site with a node at the mid-point of the line. The demands are applied at that node. Future modeling will be required to ensure an appropriate water layout is achieved.

4.4 FIRE FLOW DEMAND

Fire flow demands for the site are based on Appendix B of the 2018 International Fire Code. The proposed building type is anticipated to be Type V-B. For this project, all buildings are assumed to be larger than 85,101 square feet, therefore the required fire flow will be 8,000gpm in accordance with Table B105.1(2). These structures are anticipated to utilize an approved automatic sprinkler system, therefore a reduction

in fire flow of 75% will be used to reduce the fire flow demands (2,000gpm), in accordance with Table B105.2. Fire flow demands were modeled by adding the fire flow demand at the worst-case location. For the Phase 1 and Phase 2 improvements the worst-case location was found to be Node J-17.

4.5 MODELING RESULTS

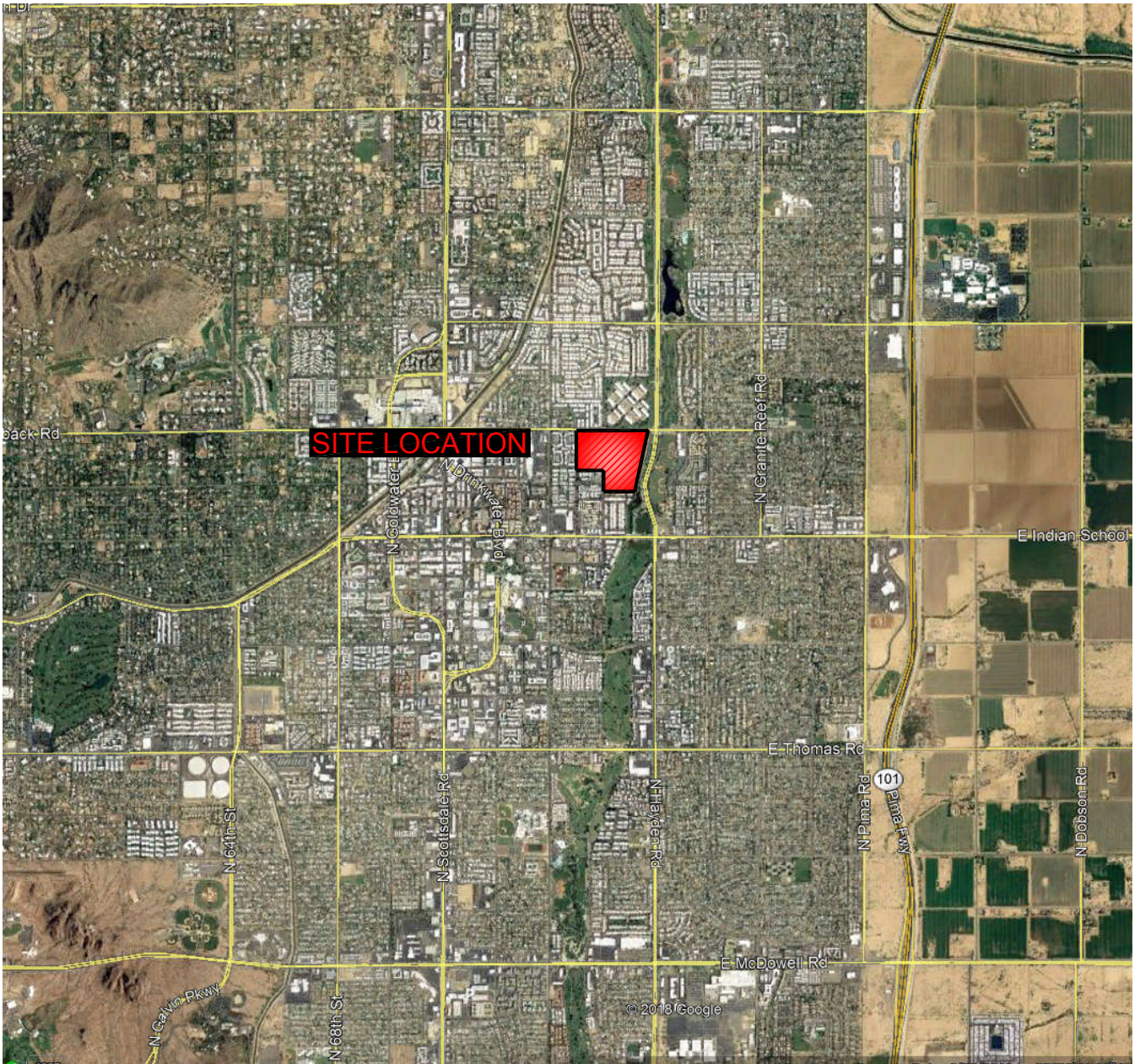
Two physical models (Phase 1 and Phase 2) were run in 4 scenarios each (Average Day Demand, Max Day Demand, Peak hour Demand and Max Day plus Fire Flow). The results of the water model analysis show that the proposed water system provides adequate water supply and fire flow for both Phase 1 and Phase 2. The results from the modeling indicate that the pressure at the worst-case location is greater than 30 psi during fire flow and maintain a simultaneous minimum pressure of 15 psi at all other domestic demand nodes. Refer to Appendix C for the modeling results for the scenarios.

5.0 CONCLUSION

The proposed pipe sizes and estimated pressures are based upon the best available information at the time of this computer analysis. Based on the model runs included in Appendix C, the proposed water system has pipe sizes and other water system appurtenances that will adequately supply the projected maximum day demands and required fire flows for the development. The proposed improvements will maintain a pressure greater than 30 psi at the worst-case location during fire flow and maintain a simultaneous minimum pressure of 15 psi at all other domestic demand nodes. However, pressures at the highest proposed finished floors do not maintain the minimum domestic service pressure (60 psi) at the building connections. Booster pumps may be needed in order to supply the minimum service pressure during Average, Maximum and Peak hour demands.

APPENDIX A
EXHIBITS

k:\19001704\project_documents\engineering-planning-power_and_energy\reports\water\exhibits\19001704 - exh. 1 vicinity map.dwg Saved: 5/16/2019 12:59 PM Plot date: 5/16/2019 12:59 PM



LEGEND

GENTRY ON THE GREEN



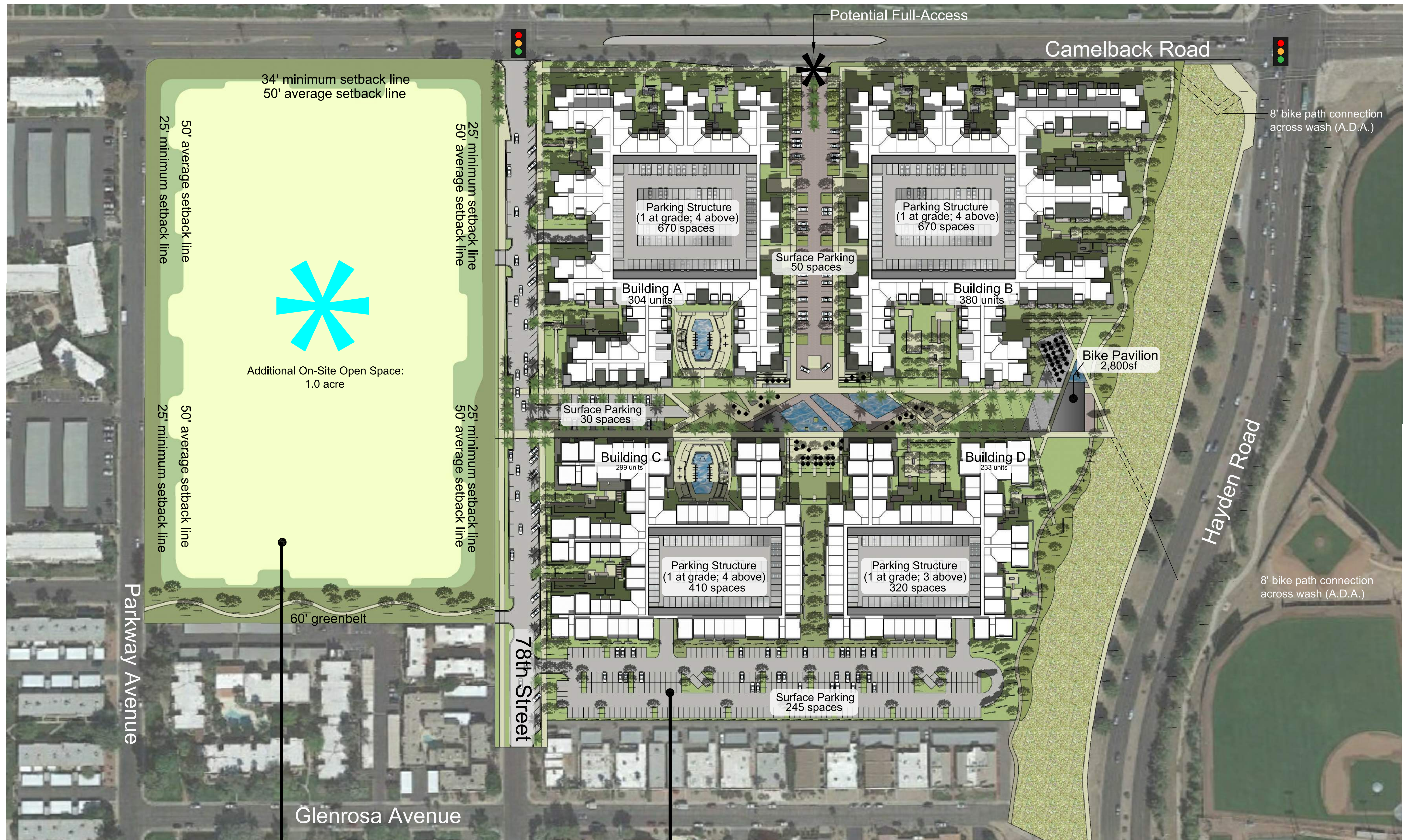
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EXHIBIT 1 - VICINITY MAP

GENTRY ON THE GREEN

SCOTTSDALE, AZ



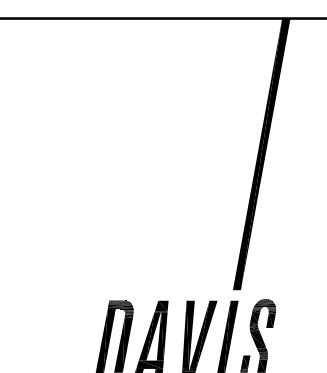
Phase Two
 Site Area: 14.97 gross acres

Phase One
 Site Area: 26.53 gross acres
 Residential Unit Total: 1,214 units
 Total Non-Residential Area: 21,000sf
 Total Retail Area: 20,000sf
 Total Retail Patio Area: 2,800sf
 Total Non-Residential / Retail Area: 43,800sf
 Total Parking Required: 1,950 spaces [per zoning ordinance]
 Total Parking Provided: 2,471 spaces [includes 78th street parking]

Site Plan



18160- 8/9/19



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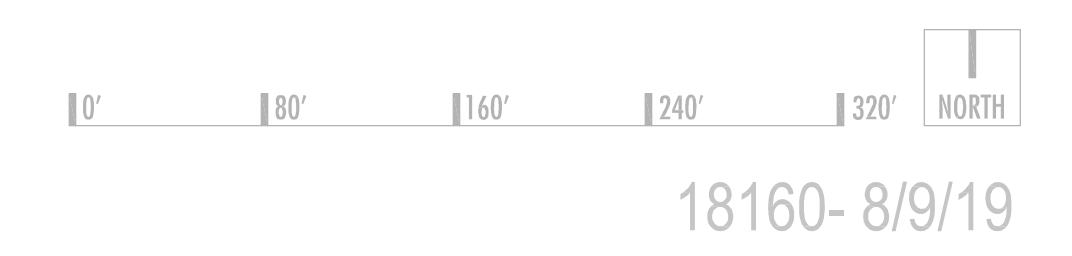


Phase Two

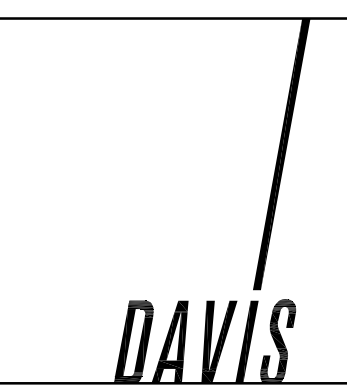
Phase One

- Phase 1A
- Phase 1B
- Phase 1C
- Phase 1D
- Phase 1E
- The Paseo

Phasing Exhibit

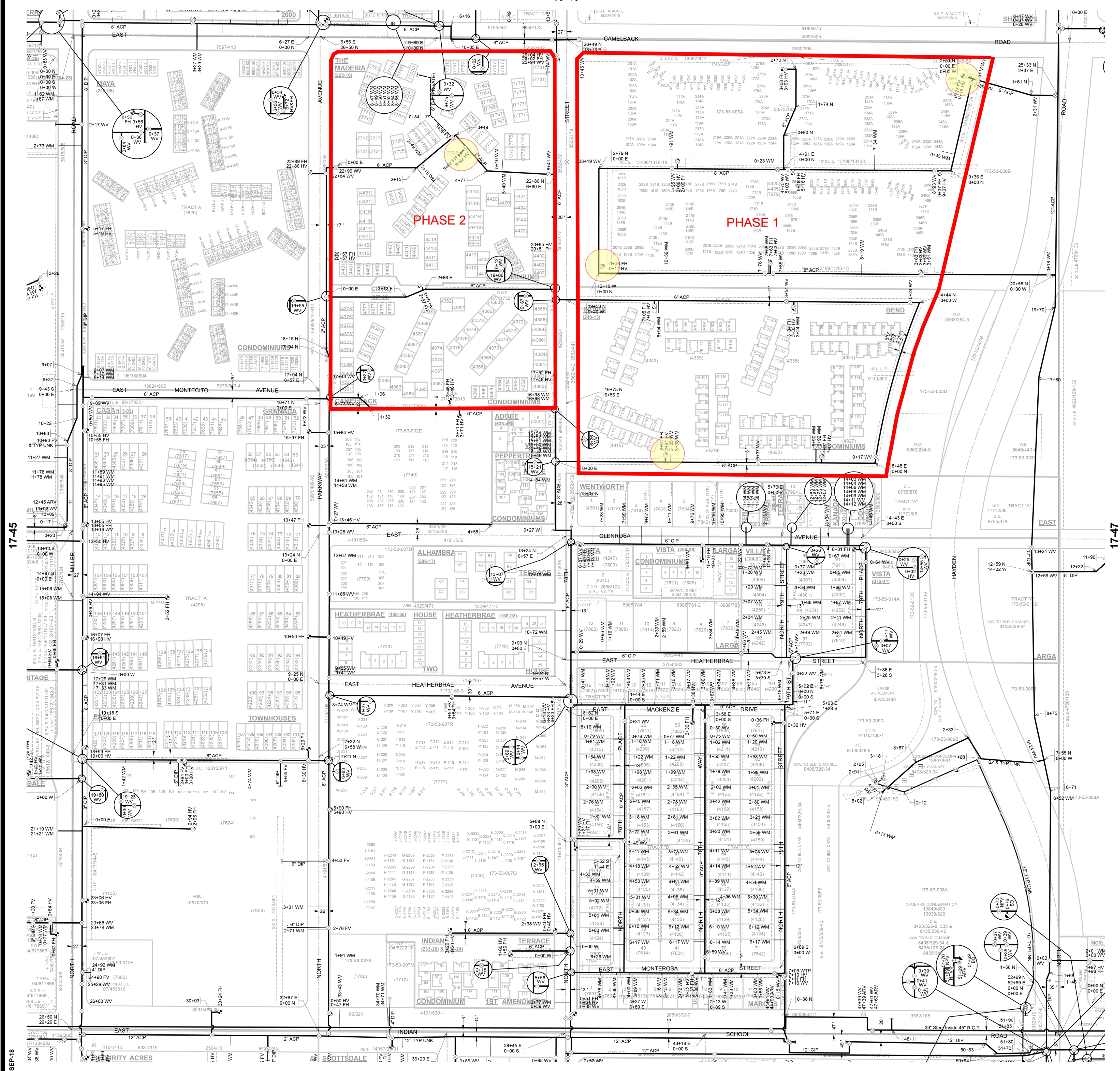


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LEGEND:

- Air Release Valve
- Non-potable Air Release Valve
- Blowoff
- Cap
- Cathodic Protection
- Fill Drain
- Fire Hydrant
- Non-GPS Point
- Pressure Reducing Valve
- Pump
- Reducer
- Sample Station
- Water Manhole
- Non-Potable Manhole
- Well
- Valve
- Non-potable Valve
- Vault
- Water Main
- Non-Potable Main
- Fire / Private Main
- Non-Scottsdale Main

VICINITY MAP

NORTH

SCALE: 1" = 100'
 0 50 100 200
 The map scale of 1" = 100' is based on a full size print of 30" x 36"

WATER QUARTER SECTION MAP
17-46
 SE 1/4 SEC. 23 T2N R4E

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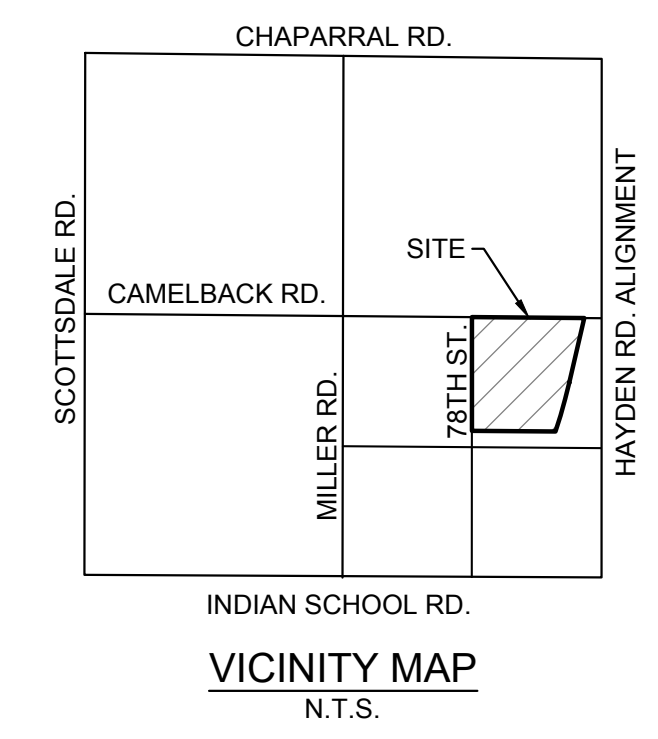
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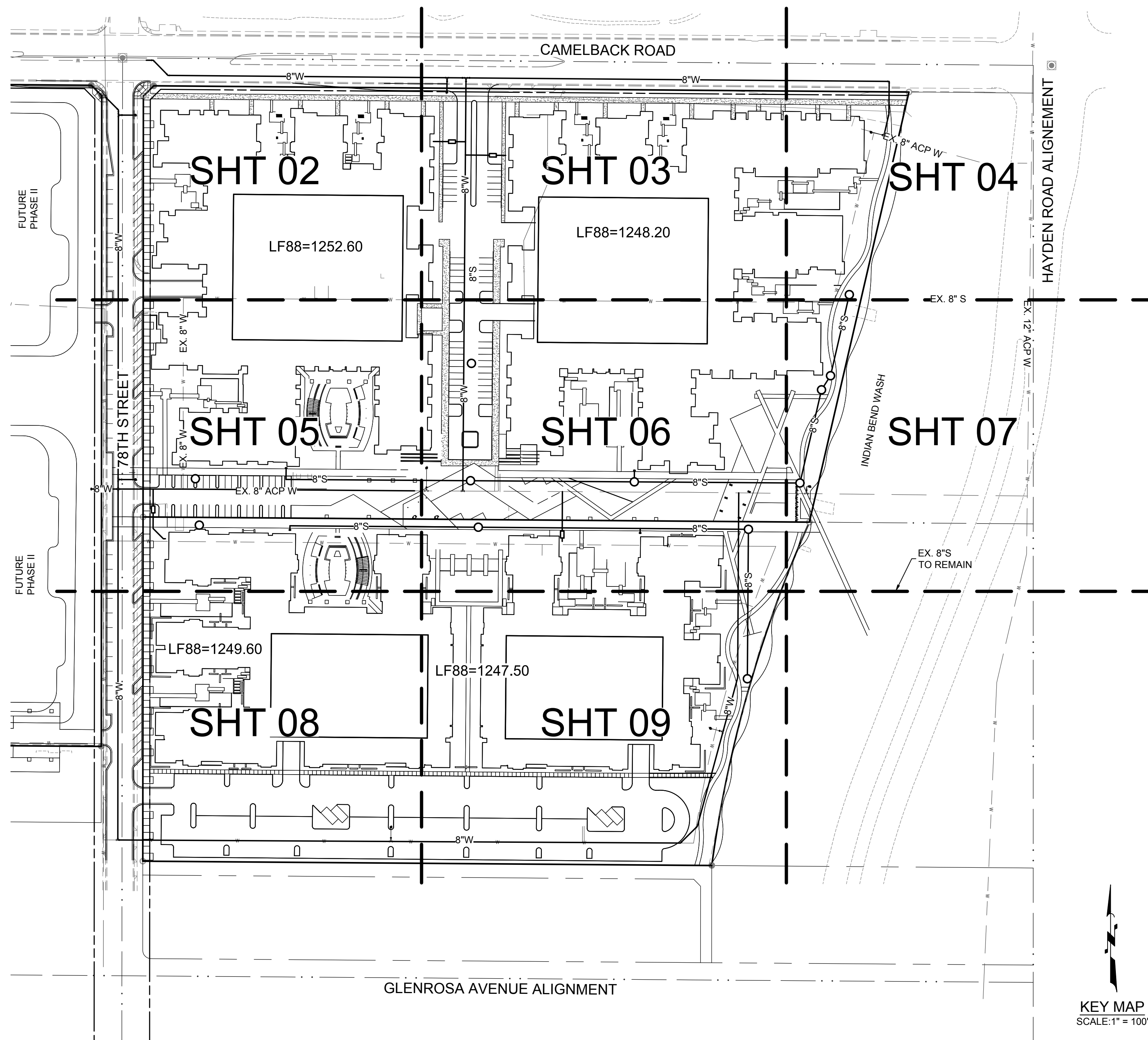
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|--|---------------------------------|----------------------------|-------------------------|
| | MATCHLINE | EX. | EXISTING |
| | BOUNDARY LINE | ELEC | ELECTRIC |
| | LOT LINE | BFP | BACKFLOW PREVENTION |
| | CENTER LINE | G | GAS |
| | EASEMENT | WTR | WATER |
| | RIGHT-OF-WAY | SWR | SEWER |
| | EXISTING CONTOUR | P | PAVEMENT |
| | PROPOSED CONTOUR | R/W | RIGHT-OF-WAY |
| | RETAINING WALL | CL | CENTER LINE |
| | WATER LINE | B/C | BACK OF CURB |
| | FIRE HYDRANT | S/W | SIDEWALK |
| | WATER VALVE | C&G | CURB & GUTTER |
| | AIR RELEASE VALVE | E/P | EDGE OF PAVEMENT |
| | WATER METER BOX | PUE | PUBLIC UTILITY EASEMENT |
| | REDUCER | CB | CATCH BASIN |
| | SEWER LINE | MH | SEWER MANHOLE |
| | SEWER MANHOLE | SD | STORM DRAIN |
| | FLOW DIRECTION | SD MH | STORM DRAIN MANHOLE |
| | GRADE BREAK | | |
| | STREET SIGN POST | | |
| | STREET LIGHTS | | |
| | DRYWELL | | |
| | STORM DRAIN | | |
| | EXISTING GAS MANHOLE | | |
| | EXISTING SANITARY SEWER MANHOLE | | |
| | EXISTING ELECTRICAL PULL BOX | | |
| | EXISTING TELEPHONE PEDISTAL | | |
| | EXISTING GUY WIRE | | |
| | EXISTING POWER POLE | | |
| | EX. W | EXISTING WATER | |
| | EX. S | EXISTING SEWER | |
| | EX. G | EXISTING GAS | |
| | OHE | EXISTING OVERHEAD ELECTRIC | |

CONCEPTUAL WATER & SEWER PLAN FOR PHASE I OF GENTRY ON THE GREEN SCOTTSDALE, ARIZONA



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SHEET INDEX

SHEET No.	DESCRIPTION
01	COVER SHEET
02	WATER & SEWER PLAN
03	WATER & SEWER PLAN
04	WATER & SEWER PLAN
05	WATER & SEWER PLAN
06	WATER & SEWER PLAN
07	WATER & SEWER PLAN
08	WATER & SEWER PLAN
09	WATER & SEWER PLAN

KEY MAP
SCALE: 1" = 100'

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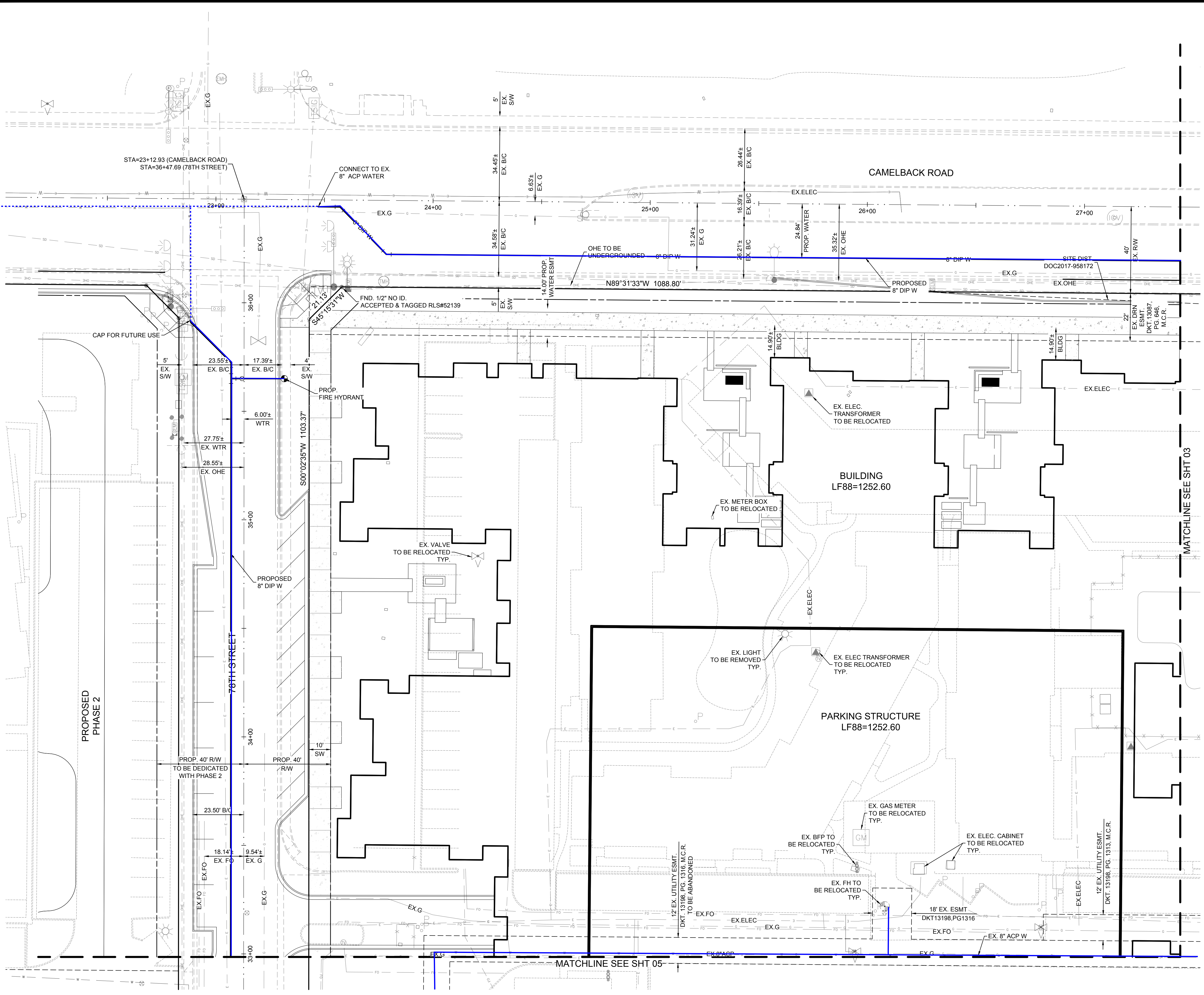
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DR. A. CABALLERO
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WATER & SEWER PLAN
 CONCEPTUAL WATER & SEWER PLAN
PHASE I OF GENTRY ON THE GREEN
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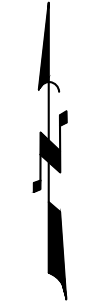
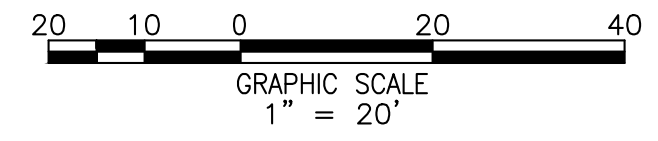
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02 OF 09

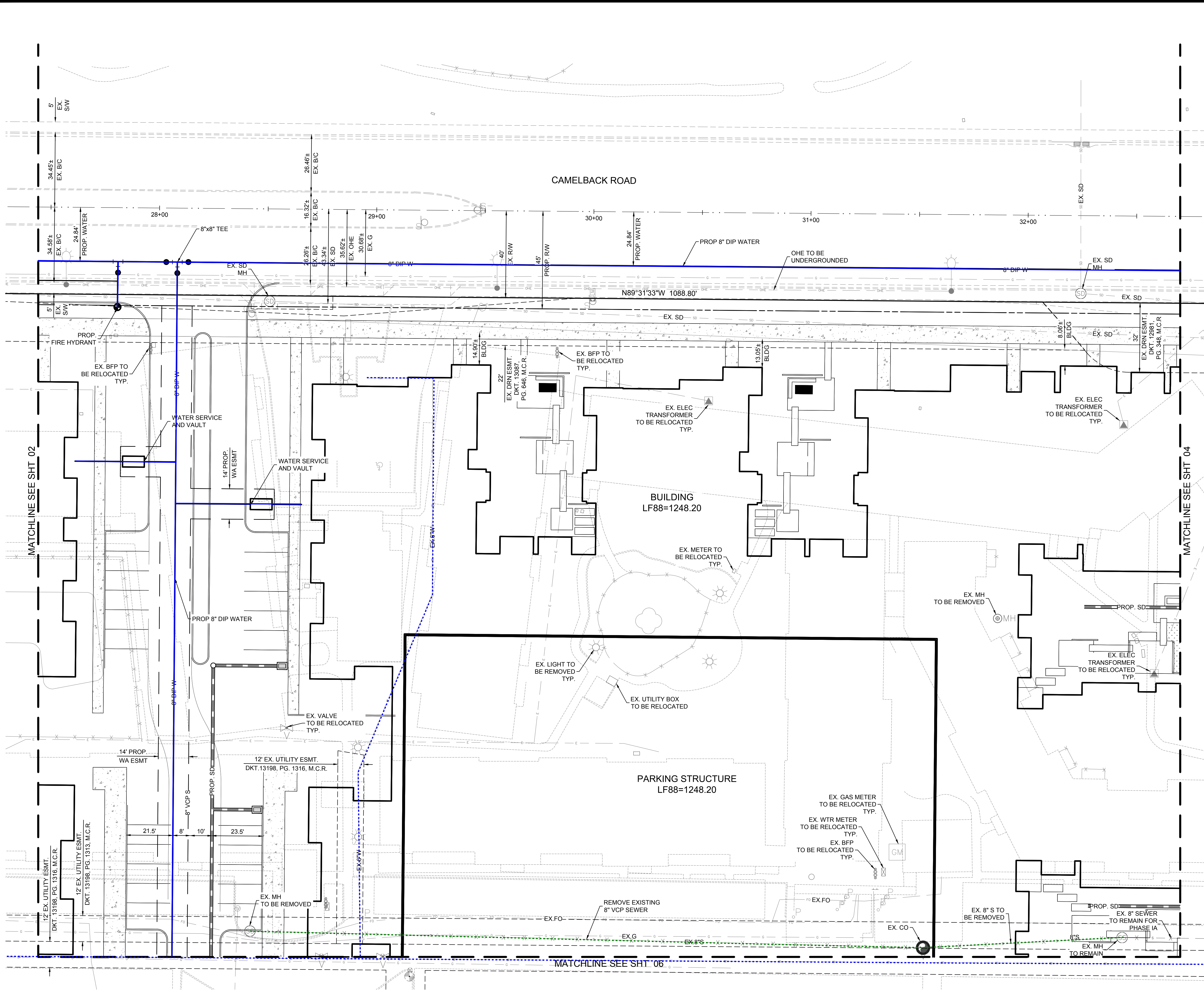
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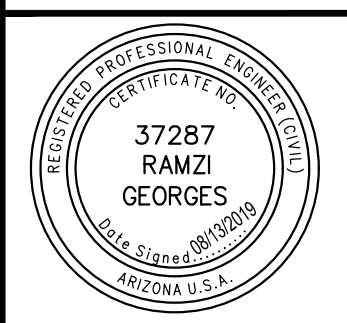


WATER & SEWER PLAN
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 SCOTTSDALE, ARIZONA



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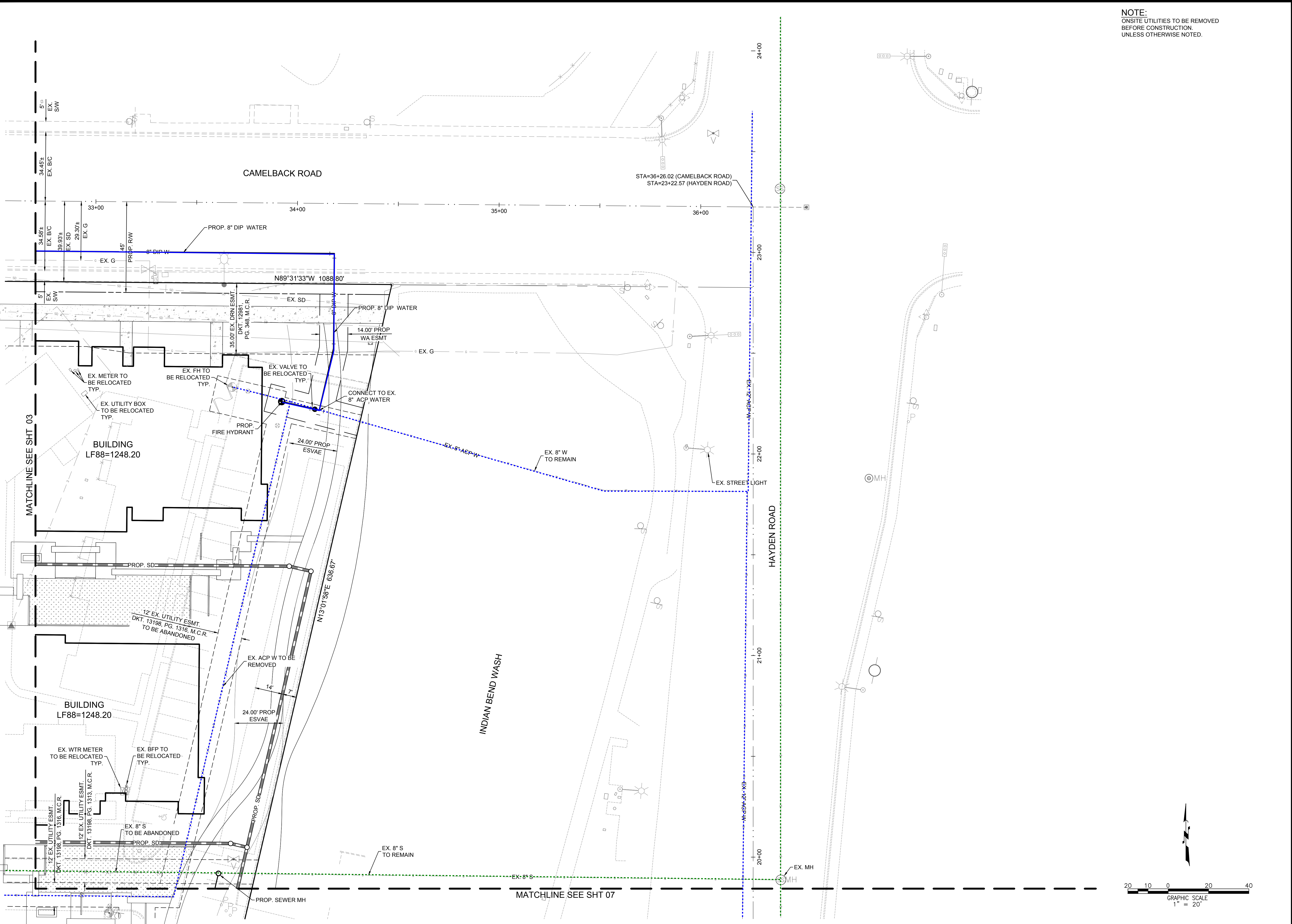


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 SCOTTSDALE, ARIZONA



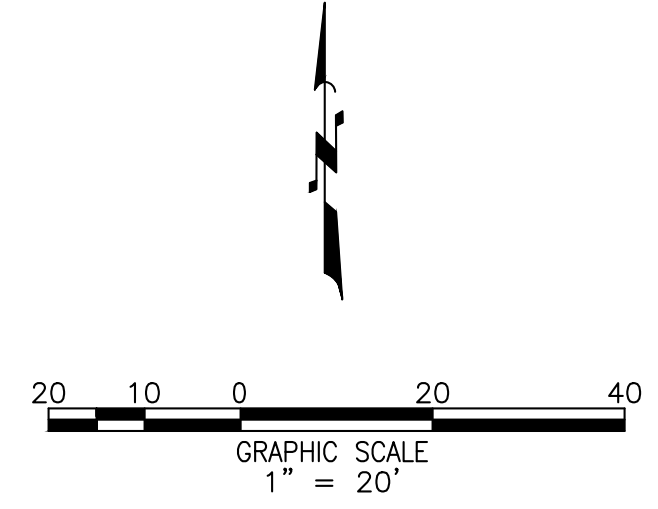
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NO.	DATE	DESCRIPTION

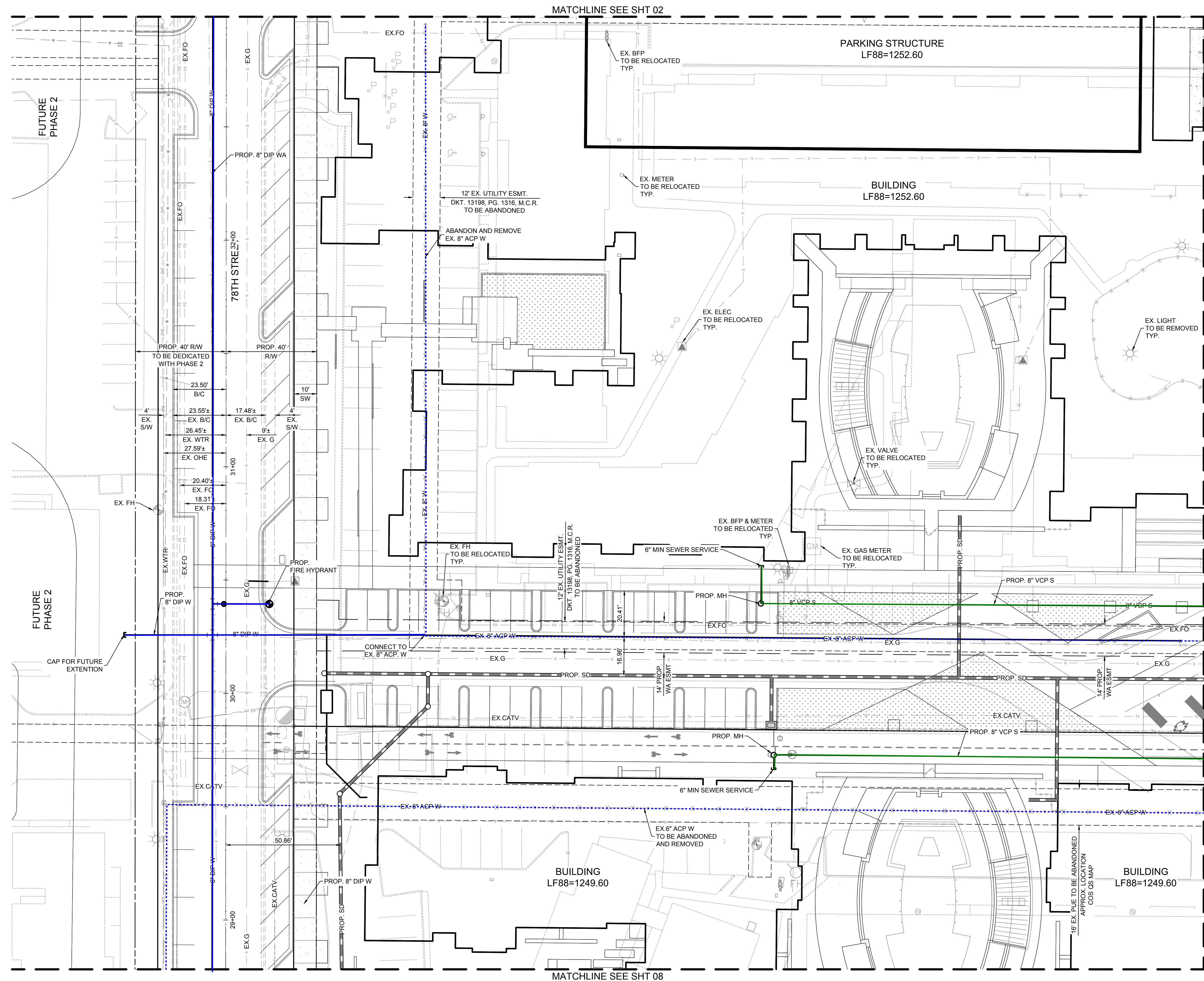


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 FILE NO. 19001704-04-UT03
04

SHEET NO.
04 OF 09



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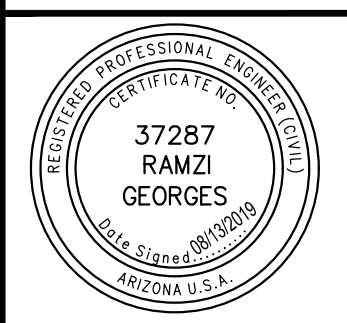
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WATER & SEWER PLAN
CONCEPTUAL WATER & SEWER PLAN
PHASE I OF GENTRY ON THE GREEN
SCOTTSDALE, ARIZONA

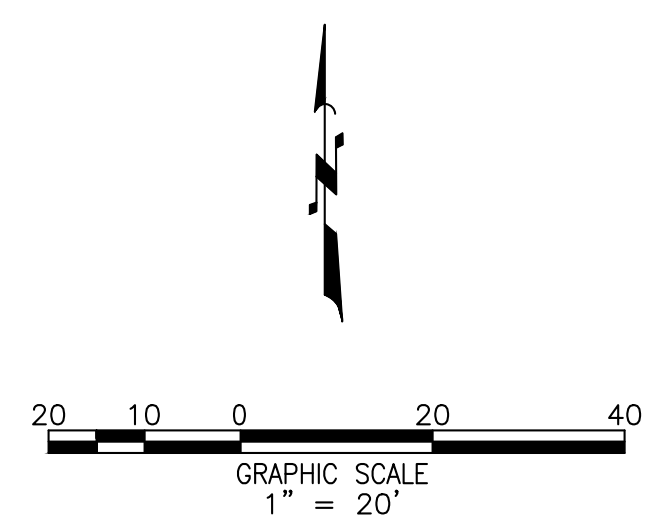


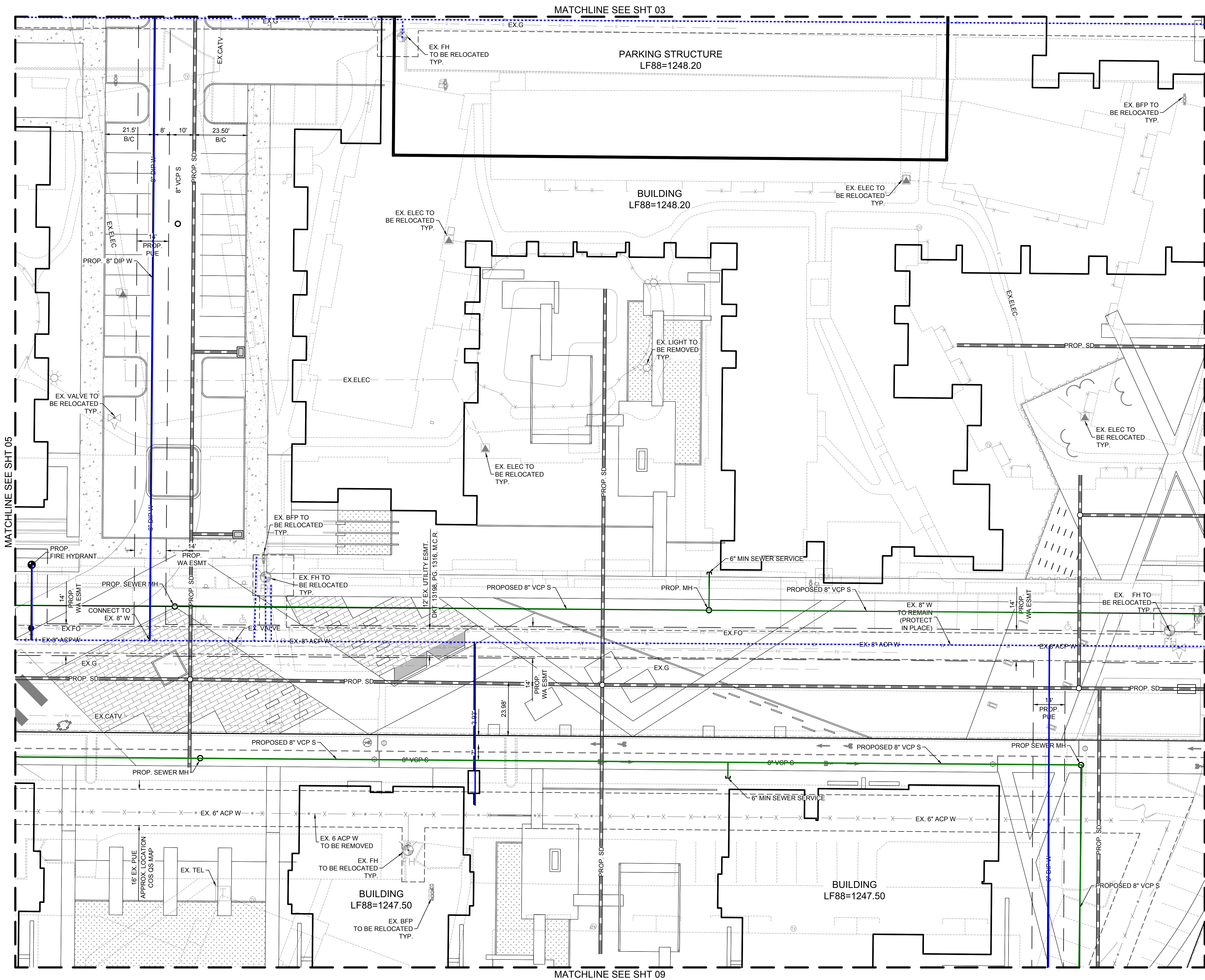
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DR. A. CABALLERO
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FILE NO. 19001704-05-UT04
05

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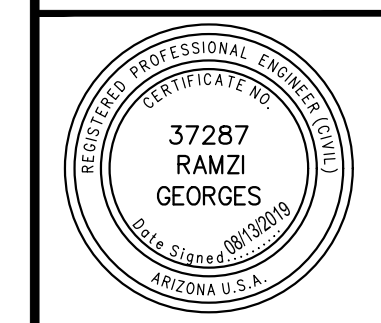


WATER & SEWER PLAN
CONCEPTUAL WATER & SEWER PLAN
PHASE I OF GENTRY ON THE GREEN
SCOTTSDALE, ARIZONA



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NO.	DESCRIPTION

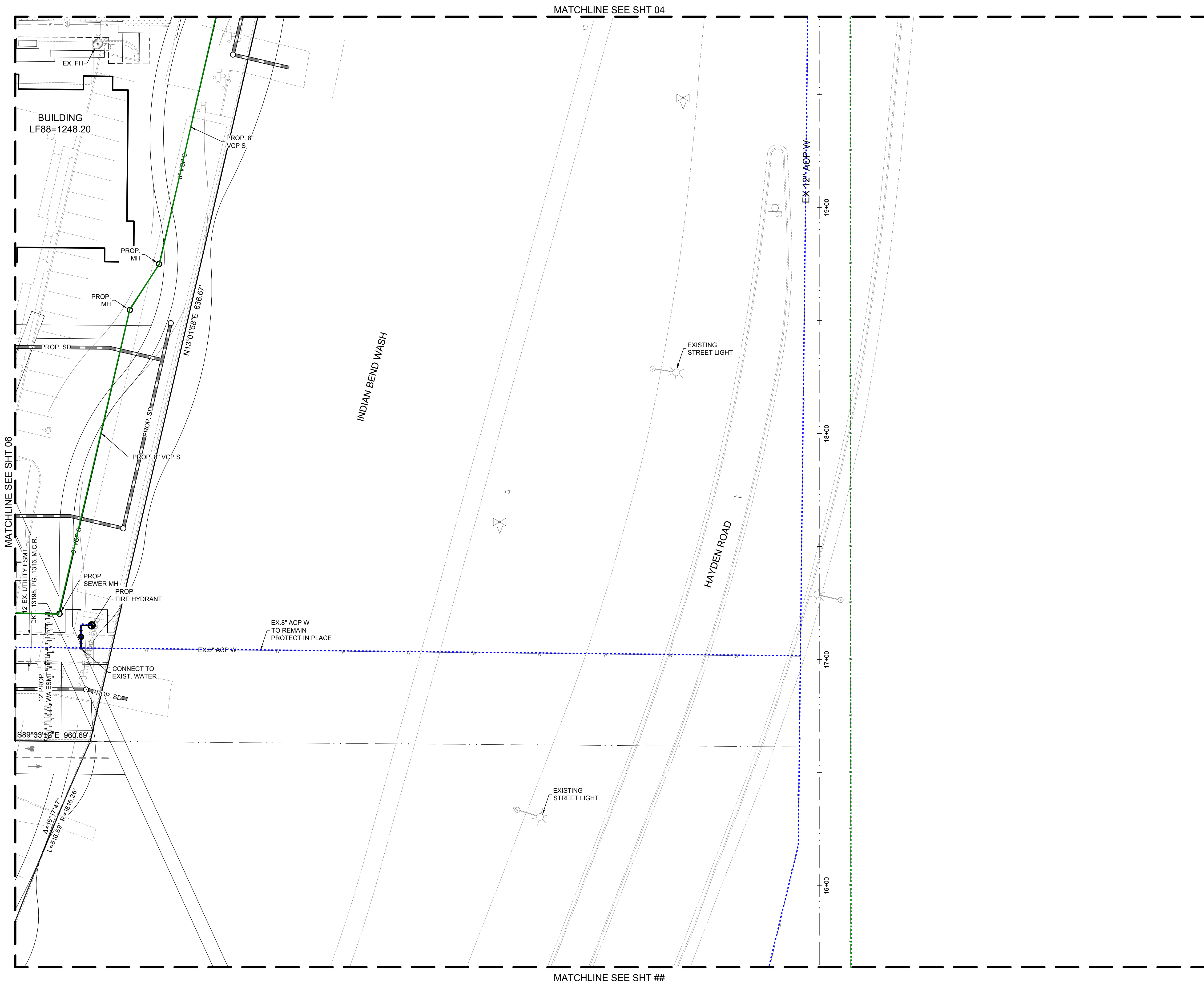


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FILE NO. 19001704-06-UT05
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MATCHLINE SEE SHT 04

MATCHLINE SEE SHT #

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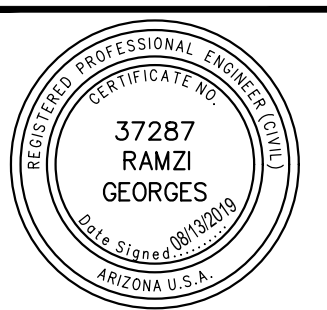
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WATER & SEWER PLAN
CONCEPTUAL WATER & SEWER PLAN
PHASE I OF GENTRY ON THE GREEN
SCOTTSDALE, ARIZONA

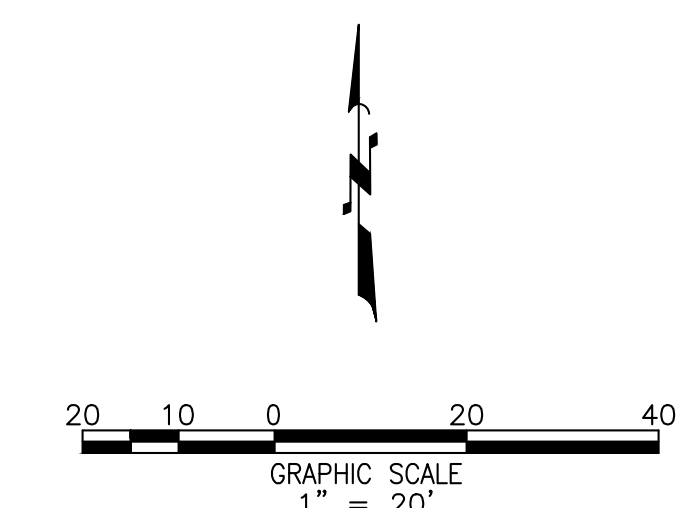


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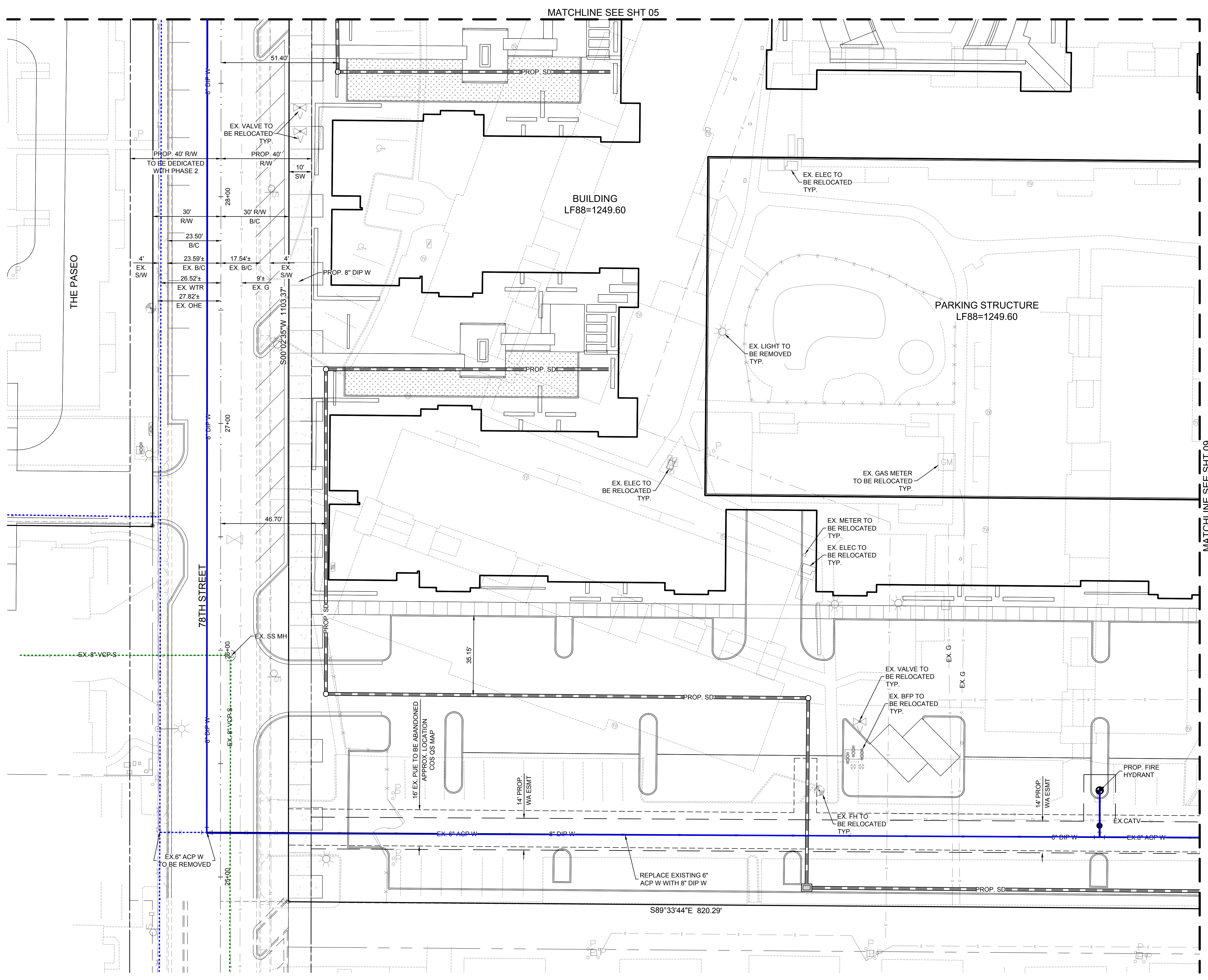
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FILE NO. 19001704-07-UT06
07

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8119001704 - wiscente-ghn-conceptualwsgplan-ws-conceptwater & sewer 19001704-08-ud7.dwg Plotdate: 10/1/2019



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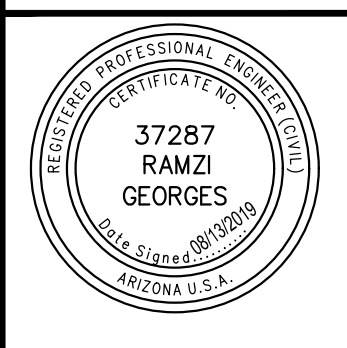


WATER & SEWER PLAN
CONCEPTUAL WATER & SEWER PLAN
PHASE I OF GENTRY ON THE GREEN
SCOTTSDALE, ARIZONA



REVISIONS:

NO.	DESCRIPTION

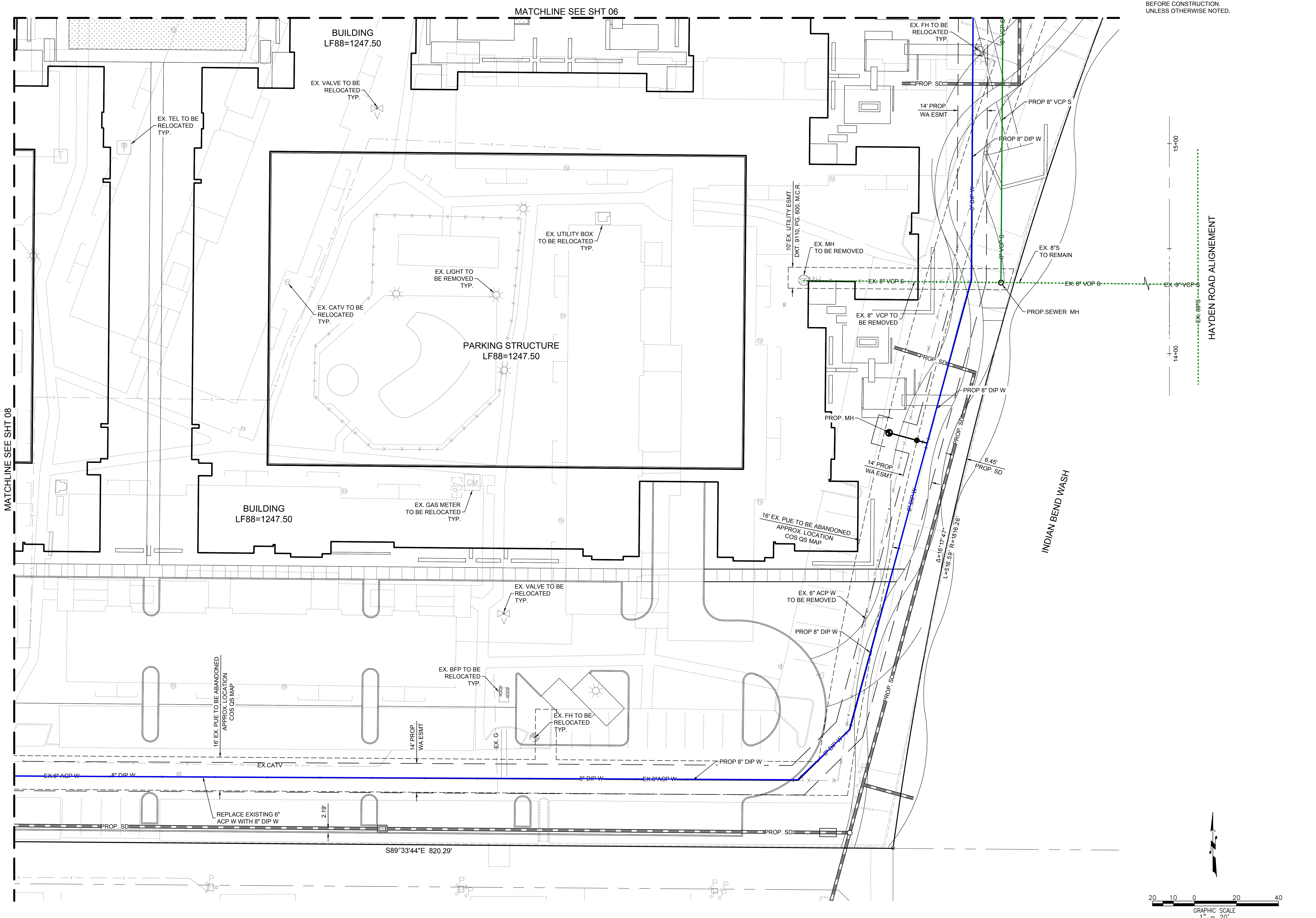


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FILE NO. 19001704-08-UT07
08

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WATER & SEWER PLAN
 CONCEPTUAL WATER & SEWER PLAN
PHASE I OF GENTRY ON THE GREEN
 SCOTTSDALE, ARIZONA



REVISIONS:

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 DR. A. CABALLERO
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 FILE NO. 19001704-09-UT08
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PROJECT NUMBER

APPENDIX B
WATER DEMAND CALCULATIONS



TABLE 1						
Phase 1 Proposed						
Gentry on the Green Water Demand Table						
Land Use	Unit (Area or Dwelling Units)	ADD¹ (gpm per unit)	ADD (gpm)	MDD (gpm)	PHD (gpm)	Fire Flow² (gpm)
Building A	(85,101+ sq.ft.) ²					2,000
HDR	380	0.27000	102.6	205.2	359.1	
Restaurant	5,000	0.00181	9.1	18.1	31.7	
Retail	5,000	0.00111	5.6	11.1	19.4	
Building A Total Demand			117.2	234.4	410.2	2,000
Building B	(85,101+ sq.ft.) ²					2,000
HDR	302	0.27000	81.5	163.1	285.4	
Club/Fitness	10,500	0.00111	11.7	23.3	40.8	
Building B Total Demand			93.2	186.4	326.2	2,000
Building C	(85,101+ sq.ft.) ²					2,000
HDR	299	0.27000	80.7	161.5	282.6	
Restaurant	5,000	0.00181	9.1	18.1	31.7	
Retail	5,000	0.00111	5.6	11.1	19.4	
Building C Total Demand			95.3	190.7	333.7	2,000
Building D	(85,101+ sq.ft.) ²					2,000
HDR	233	0.27000	62.9	125.8	220.2	
Club/Fitness	10,500	0.00111	11.7	23.3	40.8	
Building D Total Demand			74.6	149.1	261.0	2,000
Open Space	8.5 acres	2.49	21.2	21.2	21.2	
Phase 1 Total Demand			401.5	781.7	1,352.2	2,000

Note 1: Water Demands are based on a conceptual site plan. The site plan is subject to change throughout the design process.

Note 2: Buildings A - D are anticipated to be Type V-B construction, Per Table B105.1(2) of the 2018 IFC, Buildings larger than 86,101sf require 8,000gpm for fire protection. These buildings will utilize an automatic sprinkler system and therefore the minimum fire flow will be 25% of the value in Table B105.1(2) or 2,000 gpm.

Calculations

1) Average Day Demand (gpm/Unit) =
Unit

Peaking Factors

2) Maximum Day Demand (MDD) = ADD

3) Peak Hour Demand (PHD) = ADD x

HDR	Restaurant	Retail	Club / Fitness	Open Space
0.27	0.00181	0.00111	0.00111	2.49
Dwelling Unit	Square Foot	Square Foot	Square Foot	Acre
2.0	3.0	2.0	2.0	1.0
3.5	6.0	3.5	3.5	1.0

Average Day Demand (ADD) based on City of Scottsdale Design Standards & Policies Manual, Figure 6-1.2.



TABLE 2						
Phase 2 Proposed						
Gentry on the Green Water Demand Table						
Land Use	Unit (Area or Dwelling Units)	ADD ¹ (gpm per unit)	ADD (gpm)	MDD (gpm)	PHD (gpm)	Fire Flow ² (gpm)
HDR	270 DUs	0.27000	72.9	145.8	255.2	2,000
Healthcare ⁴	250 beds	0.34700	86.8	173.5	303.6	2,000
Open Space	4.7 acres	2.49000	11.8	11.8	11.8	
Hotel	150 rooms	0.63000	94.5	189.0	425.3	2,000
Phase 2 Total Demand			265.9	520.1	995.8	2,000
<p>Note 1: Water Demands for Phase 2 are based on a conceptual matrix. The site plan is undetermined at the time of modeling and is subject to change throughout the design process.</p> <p>Note 2: Phase 2 Building square footage is unknown at this time but are anticipated to be Type V-B construction. Per Table B105.1(2) of the 2018 IFC, Buildings larger than 86,101sf require 8,000gpm for fire protection. These buildings will utilize an automatic sprinkler system and therefore the minimum fire flow will be 25% of the value in Table B105.1(2) or 2,000 gpm.</p>						

Calculations

1) Average Day Demand (gpm/Unit) =
Unit

Peaking Factors

2) Maximum Day Demand (MDD) = ADD x

3) Peak Hour Demand (PHD) = ADD x

Average Day Demand (ADD) based on City of Scottsdale Design Standards & Policies Manual, Figure 6-1.2.

Unit flow for Healthcare is based on the AAC Title 18, Chapter 9

	HDR	Healthcare	Hotel	Open Space
	0.27	0.34700	0.63000	2.49
Dwelling Unit		Bed	Room	Acre
	2.0	2.0	2.0	1.0
	3.5	3.5	4.5	1.0



TABLE 3						
Phase 2 Existing Demand (for Modeling Purposes)						
Gentry on the Green Water Demand Table						
Land Use	Unit (Area or Dwelling Units)	ADD (gpm per unit)	ADD (gpm)	MDD (gpm)	PHD (gpm)	Fire Flow (gpm)
HDR	354 DUs	0.27	95.6	191.2	334.5	1,500
Open Space	2.8 acres	2.49	6.9	6.9	6.9	
Phase 2 Existing Demand¹			102.5	198.0	341.4	1,500

Note 1: Water demands are equally spread between nodes J-19, J-22 & J-23

Calculations

1) Average Day Demand (gpm/Unit) =
Unit

Peaking Factors

2) Maximum Day Demand (MDD) = ADD x

3) Peak Hour Demand (PHD) = ADD x

Average Day Demand (ADD) based on City of Scottsdale Design Standards & Policies Manual, Figure 6-1.2.

Unit flow for Healthcare is based on the AAC Title 18, Chapter 9

4) ADD based on Arizona Administrative Code Title 18 Chapter 9 Unit Design Flows for wastewater







	HDR	Open Space
	0.27	2.49
Dwelling Unit		Acre
	2.0	1.0
	3.5	1.0

APPENDIX C

APPENDIX C.1
HYDRAULIC MODEL RESULTS FOR:
PHASE 1
AVERAGE DAY
MAX DAY
PEAK DAY
MAX DAY PLUS FIRE FLOW

EXHIBIT 2: PHASE 1 WATER MODEL LAYOUT

LEGEND

6-in W		EX. 6-in W	
8-in W		EX. 8-in W	
12-in W		EX. 12-in W	

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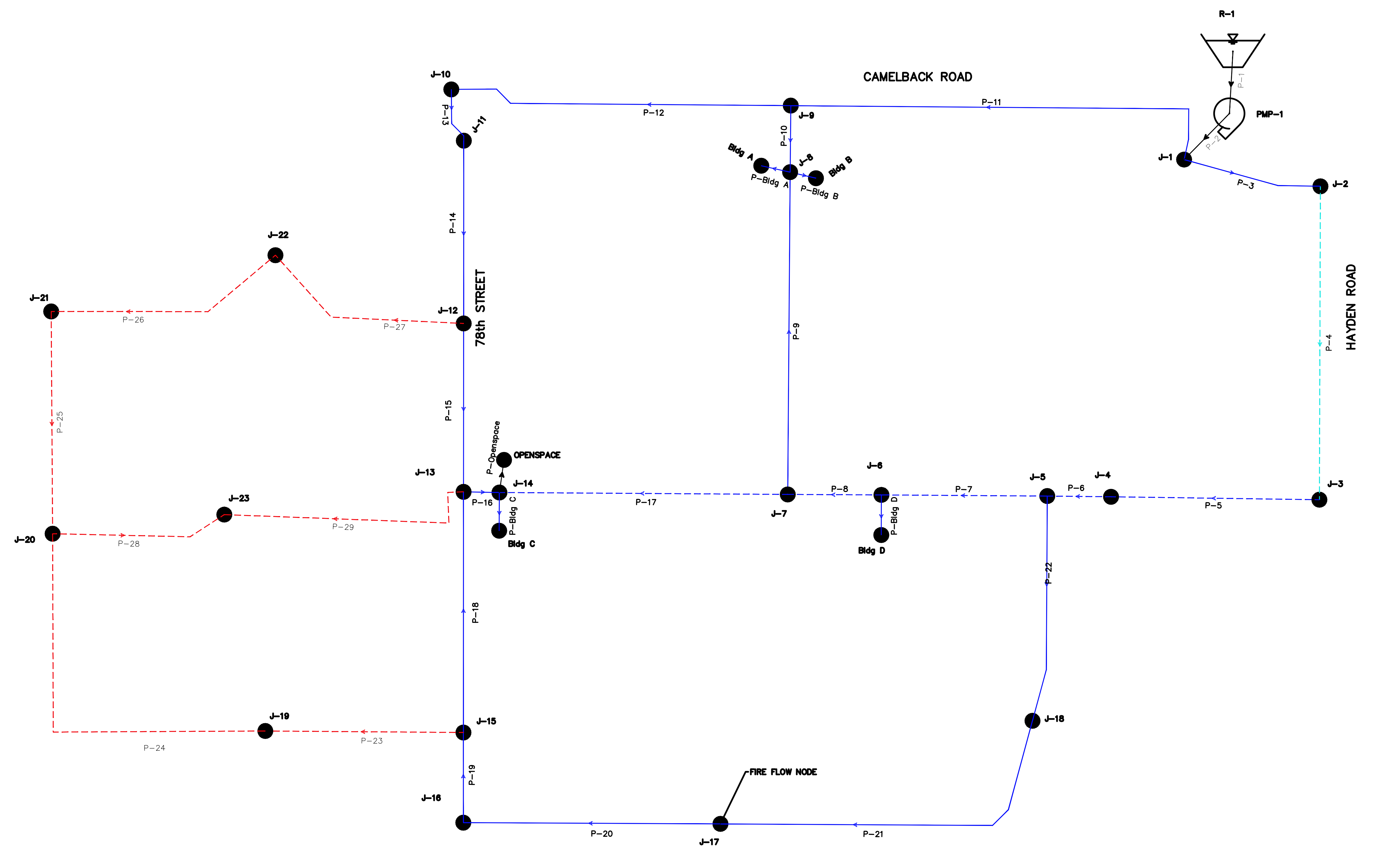
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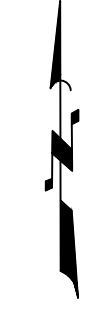
EXHIBIT 2: WATER MODEL LAYOUT
 PROJECT: GENTRY ON THE GREEN PHASE 1A
 CITY OF SCOTTSDALE, ARIZONA

811
 Know what's below.
 Call before you dig.

REVISIONS:

PM. R. GEORGES
 DR. N. CRONAN
 JOB NO. 19001704
 FILE NO.




 GRAPHIC SCALE
 1" = 80'

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Active Scenario: Phase 1 Ave Day Demand
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Bldg A	1,288.16	117.2	1,412.71	54
Bldg B	1,287.64	93.2	1,412.72	54
Bldg C	1,280.20	95.3	1,412.67	57
Bldg D	1,287.66	74.6	1,412.76	54
J-1	1,246.60	0.0	1,413.87	72
J-2	1,245.00	0.0	1,413.62	73
J-3	1,245.00	0.0	1,413.54	73
J-4	1,245.08	0.0	1,413.10	73
J-5	1,245.14	0.0	1,412.92	73
J-6	1,247.15	0.0	1,412.77	72
J-7	1,247.60	0.0	1,412.74	71
J-8	1,248.16	0.0	1,412.73	71
J-9	1,248.00	0.0	1,412.83	71
J-10	1,252.06	0.0	1,412.75	70
J-11	1,240.20	0.0	1,412.74	75
J-12	1,250.42	0.0	1,412.70	70
J-13	1,249.51	0.0	1,412.69	71
J-14	1,249.41	0.0	1,412.68	71
J-15	1,240.20	0.0	1,412.70	75
J-16	1,240.20	0.0	1,412.72	75
J-17	1,240.20	0.0	1,412.78	75
J-18	1,244.92	0.0	1,412.87	73
J-19	1,253.00	34.2	1,412.65	69
J-20	1,253.95	0.0	1,412.65	69
J-21	1,253.95	0.0	1,412.65	69
J-22	1,253.95	34.2	1,412.65	69
J-23	1,240.20	34.2	1,412.65	75
OPENSACE	1,249.41	21.2	1,412.68	71

Active Scenario: Phase 1 Ave Day Demand

FlexTable: Pipe Table

Label	Dia. (in)	Length (ft)	Start Node	Stop Node	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	48.0	1	R-1	PMP-1	130.0	504.0	0.09	0.000
P-2	48.0	1	PMP-1	J-1	130.0	504.0	0.09	0.000
P-3	8.0	214	J-2	J-1	140.0	245.4	1.57	0.001
P-4	12.0	480	J-3	J-2	140.0	245.4	0.70	0.000
P-5	8.0	320	J-4	J-3	140.0	245.4	1.57	0.001
P-6	8.0	98	J-5	J-4	140.0	245.4	1.57	0.002
P-7	8.0	254	J-6	J-5	140.0	170.9	1.09	0.001
P-8	8.0	144	J-7	J-6	140.0	96.3	0.61	0.000
P-9	8.0	494	J-8	J-7	130.0	24.8	0.16	0.000
P-10	8.0	102	J-9	J-8	130.0	185.6	1.18	0.001
P-11	8.0	688	J-1	J-9	130.0	258.5	1.65	0.002
P-12	8.0	530	J-9	J-10	130.0	72.9	0.47	0.000
P-13	8.0	86	J-11	J-10	130.0	72.9	0.47	0.000
P-14	8.0	280	J-11	J-12	130.0	72.9	0.47	0.000
P-15	8.0	258	J-12	J-13	140.0	37.4	0.24	0.000
P-16	8.0	55	J-13	J-14	130.0	45.0	0.29	0.000
P-17	8.0	442	J-14	J-7	140.0	71.5	0.46	0.000
P-18	8.0	369	J-15	J-13	130.0	35.9	0.23	0.000
P-19	8.0	138	J-16	J-15	130.0	74.5	0.48	0.000
P-20	8.0	394	J-16	J-17	130.0	74.5	0.48	0.000
P-21	8.0	593	J-17	J-18	130.0	74.5	0.48	0.000
P-22	8.0	347	J-5	J-18	130.0	74.5	0.48	0.000
P-23	6.0	304	J-15	J-19	140.0	38.7	0.44	0.000
P-24	6.0	606	J-19	J-20	140.0	4.5	0.05	0.000
P-25	6.0	341	J-20	J-21	140.0	1.4	0.02	0.000
P-26	6.0	375	J-21	J-22	140.0	1.4	0.02	0.000
P-27	6.0	331	J-22	J-12	140.0	35.5	0.40	0.000
P-28	6.0	273	J-20	J-23	140.0	5.9	0.07	0.000
P-29	6.0	416	J-23	J-13	140.0	28.3	0.32	0.000
P-Bldg A	8.0	45	Bldg A	J-8	130.0	117.2	0.75	0.000
P-Bldg B	8.0	41	J-8	Bldg B	130.0	93.2	0.59	0.000
P-Bldg C	8.0	59	Bldg C	J-14	130.0	95.3	0.61	0.000
P-Bldg D	8.0	61	Bldg D	J-6	130.0	74.6	0.48	0.000
P-Openspace	8.0	50	J-14	OPENSACE	130.0	21.2	0.14	0.000

Active Scenario: Phase 1 Ave Day Demand

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,246.60	1,246.60	1,413.87	504.0	167.27

Active Scenario: Phase 1 Max Day Demand
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Bldg A	1,288.16	234.4	1,409.02	52
Bldg B	1,287.64	186.4	1,409.04	53
Bldg C	1,280.20	190.7	1,408.91	56
Bldg D	1,287.66	149.1	1,409.19	53
J-1	1,246.60	0.0	1,413.04	72
J-2	1,245.00	0.0	1,412.16	72
J-3	1,245.00	0.0	1,411.89	72
J-4	1,245.08	0.0	1,410.38	72
J-5	1,245.14	0.0	1,409.75	71
J-6	1,247.15	0.0	1,409.23	70
J-7	1,247.60	0.0	1,409.12	70
J-8	1,248.16	0.0	1,409.07	70
J-9	1,248.00	0.0	1,409.42	70
J-10	1,252.06	0.0	1,409.17	68
J-11	1,240.20	0.0	1,409.13	73
J-12	1,250.42	0.0	1,409.00	69
J-13	1,249.51	0.0	1,408.97	69
J-14	1,249.41	0.0	1,408.96	69
J-15	1,240.20	0.0	1,409.01	73
J-16	1,240.20	0.0	1,409.08	73
J-17	1,240.20	0.0	1,409.28	73
J-18	1,244.92	0.0	1,409.58	71
J-19	1,253.00	66.0	1,408.85	67
J-20	1,253.95	0.0	1,408.85	67
J-21	1,253.95	0.0	1,408.85	67
J-22	1,253.95	66.0	1,408.85	67
J-23	1,240.20	66.0	1,408.84	73
OPENSACE	1,249.41	21.2	1,408.96	69

Active Scenario: Phase 1 Max Day Demand

FlexTable: Pipe Table

Label	Dia. (in)	Length (ft)	Start Node	Stop Node	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	48.0	1	R-1	PMP-1	130.0	979.8	0.17	0.000
P-2	48.0	1	PMP-1	J-1	130.0	979.8	0.17	0.000
P-3	8.0	214	J-2	J-1	140.0	475.9	3.04	0.004
P-4	12.0	480	J-3	J-2	140.0	475.9	1.35	0.001
P-5	8.0	320	J-4	J-3	140.0	475.9	3.04	0.005
P-6	8.0	98	J-5	J-4	140.0	475.9	3.04	0.006
P-7	8.0	254	J-6	J-5	140.0	333.2	2.13	0.002
P-8	8.0	144	J-7	J-6	140.0	184.1	1.18	0.001
P-9	8.0	494	J-8	J-7	130.0	55.4	0.35	0.000
P-10	8.0	102	J-9	J-8	130.0	365.4	2.33	0.003
P-11	8.0	688	J-1	J-9	130.0	504.0	3.22	0.005
P-12	8.0	530	J-9	J-10	130.0	138.6	0.88	0.000
P-13	8.0	86	J-11	J-10	130.0	138.6	0.88	0.000
P-14	8.0	280	J-11	J-12	130.0	138.6	0.88	0.000
P-15	8.0	258	J-12	J-13	140.0	70.1	0.45	0.000
P-16	8.0	55	J-13	J-14	130.0	83.2	0.53	0.000
P-17	8.0	442	J-14	J-7	140.0	128.7	0.82	0.000
P-18	8.0	369	J-15	J-13	130.0	68.0	0.43	0.000
P-19	8.0	138	J-16	J-15	130.0	142.6	0.91	0.000
P-20	8.0	394	J-16	J-17	130.0	142.6	0.91	0.000
P-21	8.0	593	J-17	J-18	130.0	142.6	0.91	0.001
P-22	8.0	347	J-5	J-18	130.0	142.6	0.91	0.001
P-23	6.0	304	J-15	J-19	140.0	74.6	0.85	0.001
P-24	6.0	606	J-19	J-20	140.0	8.6	0.10	0.000
P-25	6.0	341	J-20	J-21	140.0	2.5	0.03	0.000
P-26	6.0	375	J-21	J-22	140.0	2.5	0.03	0.000
P-27	6.0	331	J-22	J-12	140.0	68.5	0.78	0.000
P-28	6.0	273	J-20	J-23	140.0	11.1	0.13	0.000
P-29	6.0	416	J-23	J-13	140.0	54.9	0.62	0.000
P-Bldg A	8.0	45	Bldg A	J-8	130.0	234.4	1.50	0.001
P-Bldg B	8.0	41	J-8	Bldg B	130.0	186.4	1.19	0.001
P-Bldg C	8.0	59	Bldg C	J-14	130.0	190.7	1.22	0.001
P-Bldg D	8.0	61	Bldg D	J-6	130.0	149.1	0.95	0.001
P-Openspace	8.0	50	J-14	OPENSACE	130.0	21.2	0.14	0.000

Active Scenario: Phase 1 Max Day Demand

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,246.60	1,246.60	1,413.04	979.8	166.44

Active Scenario: Phase 1 MDD Plus Fire Flow

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Bldg A	1,288.16	234.4	1,356.79	30
Bldg B	1,287.64	186.4	1,356.82	30
Bldg C	1,280.20	190.7	1,350.81	31
Bldg D	1,287.66	149.1	1,355.24	29
J-1	1,246.60	0.0	1,384.86	60
J-2	1,245.00	0.0	1,377.40	57
J-3	1,245.00	0.0	1,375.13	56
J-4	1,245.08	0.0	1,361.91	51
J-5	1,245.14	0.0	1,356.27	48
J-6	1,247.15	0.0	1,355.28	47
J-7	1,247.60	0.0	1,354.98	46
J-8	1,248.16	0.0	1,356.85	47
J-9	1,248.00	0.0	1,358.51	48
J-10	1,252.06	0.0	1,354.29	44
J-11	1,240.20	0.0	1,353.62	49
J-12	1,250.42	0.0	1,351.44	44
J-13	1,249.51	0.0	1,350.55	44
J-14	1,249.41	0.0	1,350.86	44
J-15	1,240.20	0.0	1,346.13	46
J-16	1,240.20	0.0	1,343.80	45
J-17	1,240.20	2,000.0	1,337.14	42
J-18	1,244.92	0.0	1,349.09	45
J-19	1,253.00	66.0	1,346.81	41
J-20	1,253.95	0.0	1,349.35	41
J-21	1,253.95	0.0	1,349.85	41
J-22	1,253.95	66.0	1,350.40	42
J-23	1,240.20	66.0	1,349.60	47
OPENSACE	1,249.41	21.2	1,350.86	44

Active Scenario: Phase 1 MDD Plus Fire Flow

FlexTable: Pipe Table

Label	Dia. (in)	Length (ft)	Start Node	Stop Node	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	48.0	1	R-1	PMP-1	130.0	2,979.8	0.53	0.000
P-2	48.0	1	PMP-1	J-1	130.0	2,979.8	0.53	0.000
P-3	8.0	214	J-2	J-1	140.0	1,509.6	9.64	0.035
P-4	12.0	480	J-3	J-2	140.0	1,509.6	4.28	0.005
P-5	8.0	320	J-4	J-3	140.0	1,509.6	9.64	0.041
P-6	8.0	98	J-5	J-4	140.0	1,509.6	9.64	0.058
P-7	8.0	254	J-6	J-5	140.0	468.1	2.99	0.004
P-8	8.0	144	J-7	J-6	140.0	319.0	2.04	0.002
P-9	8.0	494	J-8	J-7	130.0	418.1	2.67	0.004
P-10	8.0	102	J-9	J-8	130.0	838.9	5.35	0.016
P-11	8.0	688	J-1	J-9	130.0	1,470.2	9.38	0.038
P-12	8.0	530	J-9	J-10	130.0	631.3	4.03	0.008
P-13	8.0	86	J-11	J-10	130.0	631.3	4.03	0.008
P-14	8.0	280	J-11	J-12	130.0	631.3	4.03	0.008
P-15	8.0	258	J-12	J-13	140.0	436.1	2.78	0.003
P-16	8.0	55	J-13	J-14	130.0	525.3	3.35	0.006
P-17	8.0	442	J-14	J-7	140.0	737.2	4.71	0.009
P-18	8.0	369	J-15	J-13	130.0	796.2	5.08	0.012
P-19	8.0	138	J-16	J-15	130.0	958.6	6.12	0.017
P-20	8.0	394	J-16	J-17	130.0	958.6	6.12	0.017
P-21	8.0	593	J-17	J-18	130.0	1,041.4	6.65	0.020
P-22	8.0	347	J-5	J-18	130.0	1,041.4	6.65	0.021
P-23	6.0	304	J-15	J-19	140.0	162.3	1.84	0.002
P-24	6.0	606	J-19	J-20	140.0	228.3	2.59	0.004
P-25	6.0	341	J-20	J-21	140.0	129.2	1.47	0.001
P-26	6.0	375	J-21	J-22	140.0	129.2	1.47	0.001
P-27	6.0	331	J-22	J-12	140.0	195.2	2.22	0.003
P-28	6.0	273	J-20	J-23	140.0	99.1	1.12	0.001
P-29	6.0	416	J-23	J-13	140.0	165.1	1.87	0.002
P-Bldg A	8.0	45	Bldg A	J-8	130.0	234.4	1.50	0.001
P-Bldg B	8.0	41	J-8	Bldg B	130.0	186.4	1.19	0.001
P-Bldg C	8.0	59	Bldg C	J-14	130.0	190.7	1.22	0.001
P-Bldg D	8.0	61	Bldg D	J-6	130.0	149.1	0.95	0.001
P-Openspace	8.0	50	J-14	OPENSACE	130.0	21.2	0.14	0.000

Active Scenario: Phase 1 MDD Plus Fire Flow

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,246.60	1,246.60	1,384.86	2,979.8	138.26

Active Scenario: Phase 1 Peak Hour Demand

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Bldg A	1,288.16	410.2	1,397.68	47
Bldg B	1,287.64	326.2	1,397.75	48
Bldg C	1,280.20	333.7	1,397.42	51
Bldg D	1,287.66	261.0	1,398.18	48
J-1	1,246.60	0.0	1,408.84	70
J-2	1,245.00	0.0	1,406.43	70
J-3	1,245.00	0.0	1,405.70	70
J-4	1,245.08	0.0	1,401.49	68
J-5	1,245.14	0.0	1,399.73	67
J-6	1,247.15	0.0	1,398.27	65
J-7	1,247.60	0.0	1,397.98	65
J-8	1,248.16	0.0	1,397.84	65
J-9	1,248.00	0.0	1,398.83	65
J-10	1,252.06	0.0	1,398.14	63
J-11	1,240.20	0.0	1,398.03	68
J-12	1,250.42	0.0	1,397.67	64
J-13	1,249.51	0.0	1,397.59	64
J-14	1,249.41	0.0	1,397.56	64
J-15	1,240.20	0.0	1,397.71	68
J-16	1,240.20	0.0	1,397.90	68
J-17	1,240.20	0.0	1,398.43	68
J-18	1,244.92	0.0	1,399.24	67
J-19	1,253.00	113.8	1,397.27	62
J-20	1,253.95	0.0	1,397.26	62
J-21	1,253.95	0.0	1,397.26	62
J-22	1,253.95	113.8	1,397.26	62
J-23	1,240.20	113.8	1,397.25	68
OPENSACE	1,249.41	21.2	1,397.56	64

Active Scenario: Phase 1 Peak Hour Demand

FlexTable: Pipe Table

Label	Dia. (in)	Length (ft)	Start Node	Stop Node	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	48.0	1	R-1	PMP-1	130.0	1,693.7	0.30	0.000
P-2	48.0	1	PMP-1	J-1	130.0	1,693.7	0.30	0.000
P-3	8.0	214	J-2	J-1	140.0	820.7	5.24	0.011
P-4	12.0	480	J-3	J-2	140.0	820.7	2.33	0.002
P-5	8.0	320	J-4	J-3	140.0	820.7	5.24	0.013
P-6	8.0	98	J-5	J-4	140.0	820.7	5.24	0.018
P-7	8.0	254	J-6	J-5	140.0	576.2	3.68	0.006
P-8	8.0	144	J-7	J-6	140.0	315.2	2.01	0.002
P-9	8.0	494	J-8	J-7	130.0	101.1	0.65	0.000
P-10	8.0	102	J-9	J-8	130.0	635.3	4.05	0.010
P-11	8.0	688	J-1	J-9	130.0	873.0	5.57	0.015
P-12	8.0	530	J-9	J-10	130.0	237.7	1.52	0.001
P-13	8.0	86	J-11	J-10	130.0	237.7	1.52	0.001
P-14	8.0	280	J-11	J-12	130.0	237.7	1.52	0.001
P-15	8.0	258	J-12	J-13	140.0	119.7	0.76	0.000
P-16	8.0	55	J-13	J-14	130.0	140.8	0.90	0.000
P-17	8.0	442	J-14	J-7	140.0	214.1	1.37	0.001
P-18	8.0	369	J-15	J-13	130.0	115.9	0.74	0.000
P-19	8.0	138	J-16	J-15	130.0	244.5	1.56	0.001
P-20	8.0	394	J-16	J-17	130.0	244.5	1.56	0.001
P-21	8.0	593	J-17	J-18	130.0	244.5	1.56	0.001
P-22	8.0	347	J-5	J-18	130.0	244.5	1.56	0.001
P-23	6.0	304	J-15	J-19	140.0	128.5	1.46	0.001
P-24	6.0	606	J-19	J-20	140.0	14.7	0.17	0.000
P-25	6.0	341	J-20	J-21	140.0	4.3	0.05	0.000
P-26	6.0	375	J-21	J-22	140.0	4.3	0.05	0.000
P-27	6.0	331	J-22	J-12	140.0	118.1	1.34	0.001
P-28	6.0	273	J-20	J-23	140.0	19.0	0.22	0.000
P-29	6.0	416	J-23	J-13	140.0	94.8	1.08	0.001
P-Bldg A	8.0	45	Bldg A	J-8	130.0	410.2	2.62	0.004
P-Bldg B	8.0	41	J-8	Bldg B	130.0	326.2	2.08	0.002
P-Bldg C	8.0	59	Bldg C	J-14	130.0	333.7	2.13	0.002
P-Bldg D	8.0	61	Bldg D	J-6	130.0	261.0	1.67	0.002
P-Openspace	8.0	50	J-14	OPENSACE	130.0	21.2	0.14	0.000

Active Scenario: Phase 1 Peak Hour Demand







FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,246.60	1,246.60	1,408.84	1,693.7	162.24

APPENDIX C.2
HYDRAULIC MODEL RESULTS FOR:
PHASE 2
AVERAGE DAY
MAX DAY
PEAK DAY
MAX DAY PLUS FIRE FLOW

EXHIBIT 2: PHASE 1 WATER MODEL LAYOUT

LEGEND

6-in W		EX. 6-in W	
8-in W		EX. 8-in W	
12-in W		EX. 12-in W	

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE: CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

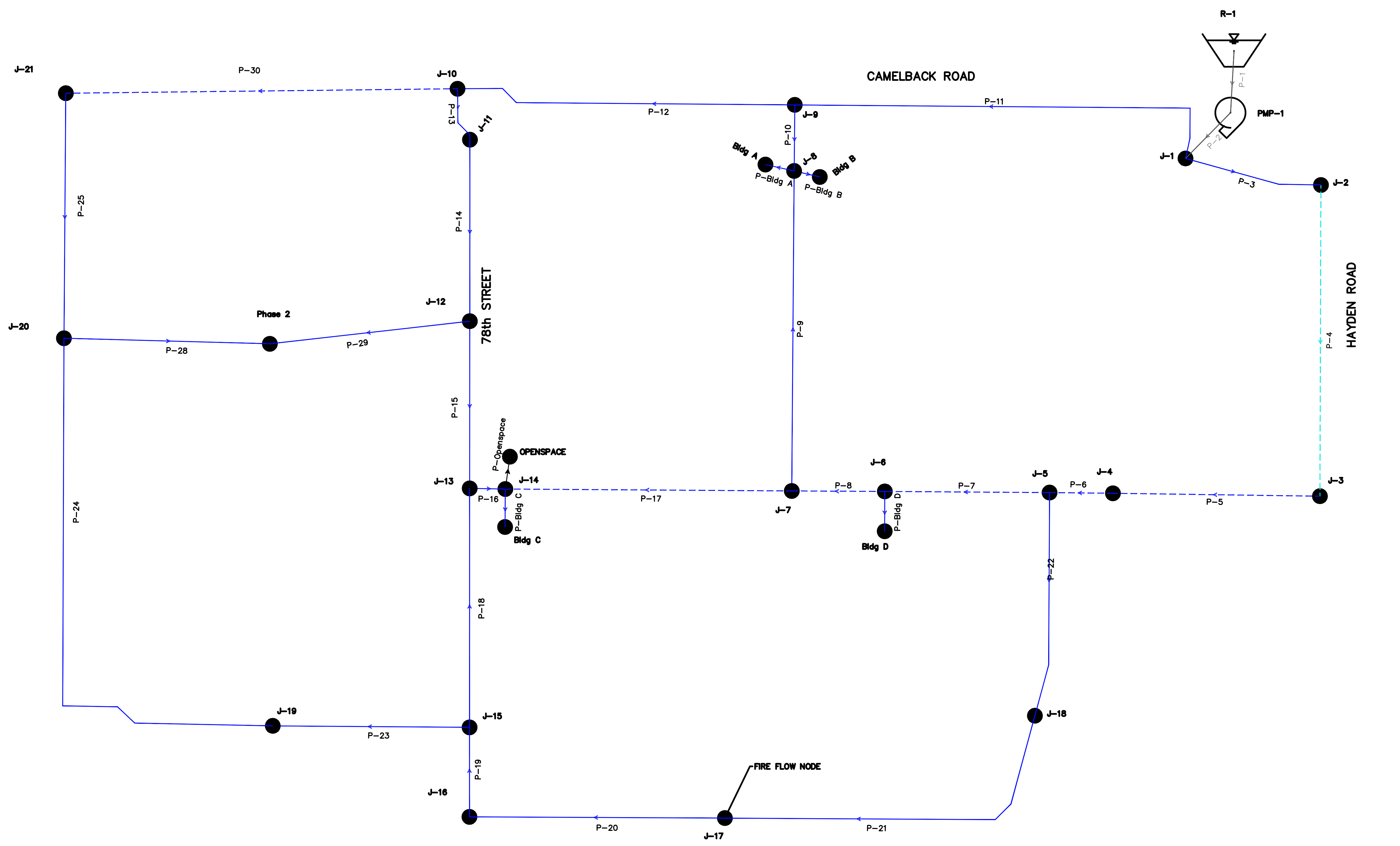
ATWELL
 866.850.4200 www.atwell-group.com
 4700 E. SOUTHERN AVENUE
 MESA, AZ 85206
 480.218.8837

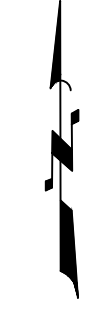
EXHIBIT 2: WATER MODEL LAYOUT
 PROJECT: GENTRY ON THE GREEN PHASE 1A
 CITY OF SCOTTSDALE, ARIZONA


811
 Know what's below.
 Call before you dig.

REVISIONS:

PM. R. GEORGES
 DR. N. CRONAN
 JOB NO. 19001704
 FILE NO.




 GRAPHIC SCALE
 1" = 80'



E:\19001704 - design-plan-correlation\project_documents\engineering\planning-power and energy\reports\water\watercor\phase 2\19001704 - gentry on the green phase 2.dwg Savedate:10/1/2019 11:23 AM
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Active Scenario: Phase 1 Ave Day Demand
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Bldg A	1,288.16	117.2	1,411.57	53
Bldg B	1,287.64	93.2	1,411.57	54
Bldg C	1,280.20	95.3	1,411.36	57
Bldg D	1,287.66	74.6	1,411.64	54
J-1	1,246.60	0.0	1,413.65	72
J-2	1,245.00	0.0	1,413.18	73
J-3	1,245.00	0.0	1,413.04	73
J-4	1,245.08	0.0	1,412.23	72
J-5	1,245.14	0.0	1,411.90	72
J-6	1,247.15	0.0	1,411.65	71
J-7	1,247.60	0.0	1,411.58	71
J-8	1,248.16	0.0	1,411.58	71
J-9	1,248.00	0.0	1,411.70	71
J-10	1,252.06	0.0	1,411.41	69
J-11	1,240.20	0.0	1,411.39	74
J-12	1,250.42	0.0	1,411.34	70
J-13	1,249.51	0.0	1,411.37	70
J-14	1,249.41	0.0	1,411.37	70
J-15	1,240.20	0.0	1,411.39	74
J-16	1,240.20	0.0	1,411.43	74
J-17	1,240.20	0.0	1,411.57	74
J-18	1,244.92	0.0	1,411.78	72
J-19	1,253.00	34.2	1,411.34	69
J-20	1,253.95	0.0	1,411.28	68
J-21	1,253.95	0.0	1,411.33	68
Phase 2	1,280.20	265.9	1,411.17	57
OPENSACE	1,249.41	21.2	1,411.37	70

Active Scenario: Phase 1 Ave Day Demand

FlexTable: Pipe Table

Label	Dia. (in)	Length (ft)	Start Node	Stop Node	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	48.0	1	R-1	PMP-1	130.0	701.6	0.12	0.000
P-2	48.0	1	PMP-1	J-1	130.0	701.6	0.12	0.000
P-3	8.0	214	J-2	J-1	140.0	340.2	2.17	0.002
P-4	12.0	480	J-3	J-2	140.0	340.2	0.97	0.000
P-5	8.0	320	J-4	J-3	140.0	340.2	2.17	0.003
P-6	8.0	98	J-5	J-4	140.0	340.2	2.17	0.003
P-7	8.0	254	J-6	J-5	140.0	222.8	1.42	0.001
P-8	8.0	144	J-7	J-6	140.0	148.2	0.95	0.000
P-9	8.0	494	J-8	J-7	130.0	0.6	0.00	0.000
P-10	8.0	102	J-9	J-8	130.0	209.8	1.34	0.001
P-11	8.0	688	J-1	J-9	130.0	361.4	2.31	0.003
P-12	8.0	530	J-9	J-10	130.0	151.5	0.97	0.001
P-13	8.0	86	J-11	J-10	130.0	80.6	0.51	0.000
P-14	8.0	280	J-11	J-12	130.0	80.6	0.51	0.000
P-15	8.0	258	J-12	J-13	140.0	69.0	0.44	0.000
P-16	8.0	55	J-13	J-14	130.0	31.1	0.20	0.000
P-17	8.0	442	J-14	J-7	140.0	147.6	0.94	0.000
P-18	8.0	369	J-15	J-13	130.0	37.8	0.24	0.000
P-19	8.0	138	J-16	J-15	130.0	117.4	0.75	0.000
P-20	8.0	394	J-16	J-17	130.0	117.4	0.75	0.000
P-21	8.0	593	J-17	J-18	130.0	117.4	0.75	0.000
P-22	8.0	347	J-5	J-18	130.0	117.4	0.75	0.000
P-23	8.0	304	J-15	J-19	130.0	79.6	0.51	0.000
P-24	8.0	902	J-19	J-20	130.0	45.4	0.29	0.000
P-25	8.0	378	J-20	J-21	130.0	71.0	0.45	0.000
P-28	8.0	318	J-20	Phase 2	130.0	116.4	0.74	0.000
P-29	8.0	311	Phase 2	J-12	130.0	149.5	0.95	0.001
P-30	8.0	604	J-10	J-21	140.0	71.0	0.45	0.000
P-Bldg A	8.0	45	Bldg A	J-8	130.0	117.2	0.75	0.000
P-Bldg B	8.0	41	J-8	Bldg B	130.0	93.2	0.59	0.000
P-Bldg C	8.0	59	Bldg C	J-14	130.0	95.3	0.61	0.000
P-Bldg D	8.0	61	Bldg D	J-6	130.0	74.6	0.48	0.000
P-Openspace	8.0	50	J-14	OPENSOURCE	130.0	21.2	0.14	0.000

Active Scenario: Phase 1 Ave Day Demand

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,246.60	1,246.60	1,413.65	701.6	167.05

Active Scenario: Phase 1 Max Day Demand
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Bldg A	1,288.16	234.4	1,404.07	50
Bldg B	1,287.64	186.4	1,404.09	50
Bldg C	1,280.20	190.7	1,403.40	53
Bldg D	1,287.66	149.1	1,404.33	50
J-1	1,246.60	0.0	1,411.32	71
J-2	1,245.00	0.0	1,409.71	71
J-3	1,245.00	0.0	1,409.21	71
J-4	1,245.08	0.0	1,406.40	70
J-5	1,245.14	0.0	1,405.23	69
J-6	1,247.15	0.0	1,404.37	68
J-7	1,247.60	0.0	1,404.12	68
J-8	1,248.16	0.0	1,404.12	67
J-9	1,248.00	0.0	1,404.56	68
J-10	1,252.06	0.0	1,403.55	66
J-11	1,240.20	0.0	1,403.50	71
J-12	1,250.42	0.0	1,403.33	66
J-13	1,249.51	0.0	1,403.44	67
J-14	1,249.41	0.0	1,403.45	67
J-15	1,240.20	0.0	1,403.49	71
J-16	1,240.20	0.0	1,403.65	71
J-17	1,240.20	0.0	1,404.11	71
J-18	1,244.92	0.0	1,404.81	69
J-19	1,253.00	66.0	1,403.31	65
J-20	1,253.95	0.0	1,403.12	65
J-21	1,253.95	0.0	1,403.30	65
Phase 2	1,280.20	520.1	1,402.75	53
OPENSACE	1,249.41	21.2	1,403.44	67

Active Scenario: Phase 1 Max Day Demand

FlexTable: Pipe Table

Label	Dia. (in)	Length (ft)	Start Node	Stop Node	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	48.0	1	R-1	PMP-1	130.0	1,367.9	0.24	0.000
P-2	48.0	1	PMP-1	J-1	130.0	1,367.9	0.24	0.000
P-3	8.0	214	J-2	J-1	140.0	661.6	4.22	0.008
P-4	12.0	480	J-3	J-2	140.0	661.6	1.88	0.001
P-5	8.0	320	J-4	J-3	140.0	661.6	4.22	0.009
P-6	8.0	98	J-5	J-4	140.0	661.6	4.22	0.012
P-7	8.0	254	J-6	J-5	140.0	435.3	2.78	0.003
P-8	8.0	144	J-7	J-6	140.0	286.2	1.83	0.002
P-9	8.0	494	J-8	J-7	130.0	7.5	0.05	0.000
P-10	8.0	102	J-9	J-8	130.0	413.3	2.64	0.004
P-11	8.0	688	J-1	J-9	130.0	706.3	4.51	0.010
P-12	8.0	530	J-9	J-10	130.0	292.9	1.87	0.002
P-13	8.0	86	J-11	J-10	130.0	155.0	0.99	0.001
P-14	8.0	280	J-11	J-12	130.0	155.0	0.99	0.001
P-15	8.0	258	J-12	J-13	140.0	137.8	0.88	0.000
P-16	8.0	55	J-13	J-14	130.0	66.8	0.43	0.000
P-17	8.0	442	J-14	J-7	140.0	278.7	1.78	0.002
P-18	8.0	369	J-15	J-13	130.0	70.9	0.45	0.000
P-19	8.0	138	J-16	J-15	130.0	226.3	1.44	0.001
P-20	8.0	394	J-16	J-17	130.0	226.3	1.44	0.001
P-21	8.0	593	J-17	J-18	130.0	226.3	1.44	0.001
P-22	8.0	347	J-5	J-18	130.0	226.3	1.44	0.001
P-23	8.0	304	J-15	J-19	130.0	155.4	0.99	0.001
P-24	8.0	902	J-19	J-20	130.0	89.4	0.57	0.000
P-25	8.0	378	J-20	J-21	130.0	137.9	0.88	0.000
P-28	8.0	318	J-20	Phase 2	130.0	227.3	1.45	0.001
P-29	8.0	311	Phase 2	J-12	130.0	292.8	1.87	0.002
P-30	8.0	604	J-10	J-21	140.0	137.9	0.88	0.000
P-Bldg A	8.0	45	Bldg A	J-8	130.0	234.4	1.50	0.001
P-Bldg B	8.0	41	J-8	Bldg B	130.0	186.4	1.19	0.001
P-Bldg C	8.0	59	Bldg C	J-14	130.0	190.7	1.22	0.001
P-Bldg D	8.0	61	Bldg D	J-6	130.0	149.1	0.95	0.001
P-Openspace	8.0	50	J-14	OPENSOURCE	130.0	21.2	0.14	0.000

Active Scenario: Phase 1 Max Day Demand

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,246.60	1,246.60	1,411.32	1,367.9	164.72

Active Scenario: Phase 1 MDD Plus Fire Flow
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Bldg A	1,288.16	234.4	1,335.98	21
Bldg B	1,287.64	186.4	1,336.01	21
Bldg C	1,280.20	190.7	1,328.75	21
Bldg D	1,287.66	149.1	1,334.89	20
J-1	1,246.60	0.0	1,371.60	54
J-2	1,245.00	0.0	1,362.47	51
J-3	1,245.00	0.0	1,359.69	50
J-4	1,245.08	0.0	1,343.50	43
J-5	1,245.14	0.0	1,336.55	40
J-6	1,247.15	0.0	1,334.92	38
J-7	1,247.60	0.0	1,334.32	38
J-8	1,248.16	0.0	1,336.04	38
J-9	1,248.00	0.0	1,337.63	39
J-10	1,252.06	0.0	1,330.06	34
J-11	1,240.20	0.0	1,329.66	39
J-12	1,250.42	0.0	1,328.36	34
J-13	1,249.51	0.0	1,328.35	34
J-14	1,249.41	0.0	1,328.80	34
J-15	1,240.20	0.0	1,324.96	37
J-16	1,240.20	0.0	1,322.75	36
J-17	1,240.20	2,000.0	1,316.45	33
J-18	1,244.92	0.0	1,329.00	36
J-19	1,253.00	66.0	1,325.35	31
J-20	1,253.95	0.0	1,327.19	32
J-21	1,253.95	0.0	1,328.39	32
Phase 2	1,280.20	520.1	1,327.13	20
OPENSACE	1,249.41	21.2	1,328.80	34

Active Scenario: Phase 1 MDD Plus Fire Flow

FlexTable: Pipe Table

Label	Dia. (in)	Length (ft)	Start Node	Stop Node	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	48.0	1	R-1	PMP-1	130.0	3,367.9	0.60	0.000
P-2	48.0	1	PMP-1	J-1	130.0	3,367.9	0.60	0.000
P-3	8.0	214	J-2	J-1	140.0	1,682.3	10.74	0.043
P-4	12.0	480	J-3	J-2	140.0	1,682.3	4.77	0.006
P-5	8.0	320	J-4	J-3	140.0	1,682.3	10.74	0.051
P-6	8.0	98	J-5	J-4	140.0	1,682.3	10.74	0.071
P-7	8.0	254	J-6	J-5	140.0	612.6	3.91	0.006
P-8	8.0	144	J-7	J-6	140.0	463.5	2.96	0.004
P-9	8.0	494	J-8	J-7	130.0	399.3	2.55	0.003
P-10	8.0	102	J-9	J-8	130.0	820.1	5.23	0.016
P-11	8.0	688	J-1	J-9	130.0	1,685.6	10.76	0.049
P-12	8.0	530	J-9	J-10	130.0	865.5	5.52	0.014
P-13	8.0	86	J-11	J-10	130.0	477.0	3.04	0.005
P-14	8.0	280	J-11	J-12	130.0	477.0	3.04	0.005
P-15	8.0	258	J-12	J-13	140.0	39.4	0.25	0.000
P-16	8.0	55	J-13	J-14	130.0	650.9	4.15	0.008
P-17	8.0	442	J-14	J-7	140.0	862.8	5.51	0.012
P-18	8.0	369	J-15	J-13	130.0	690.3	4.41	0.009
P-19	8.0	138	J-16	J-15	130.0	930.3	5.94	0.016
P-20	8.0	394	J-16	J-17	130.0	930.3	5.94	0.016
P-21	8.0	593	J-17	J-18	130.0	1,069.7	6.83	0.021
P-22	8.0	347	J-5	J-18	130.0	1,069.7	6.83	0.022
P-23	8.0	304	J-15	J-19	130.0	240.0	1.53	0.001
P-24	8.0	902	J-19	J-20	130.0	306.0	1.95	0.002
P-25	8.0	378	J-20	J-21	130.0	388.5	2.48	0.003
P-28	8.0	318	J-20	Phase 2	130.0	82.5	0.53	0.000
P-29	8.0	311	Phase 2	J-12	130.0	437.6	2.79	0.004
P-30	8.0	604	J-10	J-21	140.0	388.5	2.48	0.003
P-Bldg A	8.0	45	Bldg A	J-8	130.0	234.4	1.50	0.001
P-Bldg B	8.0	41	J-8	Bldg B	130.0	186.4	1.19	0.001
P-Bldg C	8.0	59	Bldg C	J-14	130.0	190.7	1.22	0.001
P-Bldg D	8.0	61	Bldg D	J-6	130.0	149.1	0.95	0.001
P-Openspace	8.0	50	J-14	OPENSOURCE	130.0	21.2	0.14	0.000

Active Scenario: Phase 1 MDD Plus Fire Flow

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,246.60	1,246.60	1,371.60	3,367.9	125.00

Active Scenario: Phase 1 Peak Hour Demand

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
Bldg A	1,288.16	410.2	1,376.12	38
Bldg B	1,287.64	326.2	1,376.18	38
Bldg C	1,280.20	333.7	1,374.03	41
Bldg D	1,287.66	261.0	1,376.91	39
J-1	1,246.60	0.0	1,397.77	65
J-2	1,245.00	0.0	1,392.99	64
J-3	1,245.00	0.0	1,391.53	63
J-4	1,245.08	0.0	1,383.11	60
J-5	1,245.14	0.0	1,379.54	58
J-6	1,247.15	0.0	1,377.00	56
J-7	1,247.60	0.0	1,376.27	56
J-8	1,248.16	0.0	1,376.27	55
J-9	1,248.00	0.0	1,377.56	56
J-10	1,252.06	0.0	1,374.40	53
J-11	1,240.20	0.0	1,374.25	58
J-12	1,250.42	0.0	1,373.75	53
J-13	1,249.51	0.0	1,374.14	54
J-14	1,249.41	0.0	1,374.17	54
J-15	1,240.20	0.0	1,374.27	58
J-16	1,240.20	0.0	1,374.76	58
J-17	1,240.20	0.0	1,376.14	59
J-18	1,244.92	0.0	1,378.27	58
J-19	1,253.00	113.8	1,373.71	52
J-20	1,253.95	0.0	1,373.05	52
J-21	1,253.95	0.0	1,373.61	52
Phase 2	1,280.20	995.8	1,371.81	40
OPENSACE	1,249.41	21.2	1,374.17	54

Active Scenario: Phase 1 Peak Hour Demand

FlexTable: Pipe Table

Label	Dia. (in)	Length (ft)	Start Node	Stop Node	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	48.0	1	R-1	PMP-1	130.0	2,461.9	0.44	0.000
P-2	48.0	1	PMP-1	J-1	130.0	2,461.9	0.44	0.000
P-3	8.0	214	J-2	J-1	140.0	1,187.6	7.58	0.022
P-4	12.0	480	J-3	J-2	140.0	1,187.6	3.37	0.003
P-5	8.0	320	J-4	J-3	140.0	1,187.6	7.58	0.026
P-6	8.0	98	J-5	J-4	140.0	1,187.6	7.58	0.037
P-7	8.0	254	J-6	J-5	140.0	777.0	4.96	0.010
P-8	8.0	144	J-7	J-6	140.0	516.0	3.29	0.005
P-9	8.0	494	J-8	J-7	130.0	3.0	0.02	0.000
P-10	8.0	102	J-9	J-8	130.0	733.4	4.68	0.013
P-11	8.0	688	J-1	J-9	130.0	1,274.3	8.13	0.029
P-12	8.0	530	J-9	J-10	130.0	540.9	3.45	0.006
P-13	8.0	86	J-11	J-10	130.0	282.5	1.80	0.002
P-14	8.0	280	J-11	J-12	130.0	282.5	1.80	0.002
P-15	8.0	258	J-12	J-13	140.0	278.6	1.78	0.001
P-16	8.0	55	J-13	J-14	130.0	158.1	1.01	0.001
P-17	8.0	442	J-14	J-7	140.0	513.0	3.27	0.005
P-18	8.0	369	J-15	J-13	130.0	120.5	0.77	0.000
P-19	8.0	138	J-16	J-15	130.0	410.6	2.62	0.004
P-20	8.0	394	J-16	J-17	130.0	410.6	2.62	0.004
P-21	8.0	593	J-17	J-18	130.0	410.6	2.62	0.004
P-22	8.0	347	J-5	J-18	130.0	410.6	2.62	0.004
P-23	8.0	304	J-15	J-19	130.0	290.2	1.85	0.002
P-24	8.0	902	J-19	J-20	130.0	176.4	1.13	0.001
P-25	8.0	378	J-20	J-21	130.0	258.4	1.65	0.001
P-28	8.0	318	J-20	Phase 2	130.0	434.7	2.77	0.004
P-29	8.0	311	Phase 2	J-12	130.0	561.1	3.58	0.006
P-30	8.0	604	J-10	J-21	140.0	258.4	1.65	0.001
P-Bldg A	8.0	45	Bldg A	J-8	130.0	410.2	2.62	0.004
P-Bldg B	8.0	41	J-8	Bldg B	130.0	326.2	2.08	0.002
P-Bldg C	8.0	59	Bldg C	J-14	130.0	333.7	2.13	0.002
P-Bldg D	8.0	61	Bldg D	J-6	130.0	261.0	1.67	0.002
P-Openspace	8.0	50	J-14	OPENSOURCE	130.0	21.2	0.14	0.000

Active Scenario: Phase 1 Peak Hour Demand

FlexTable: Pump Table

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,246.60	1,246.60	1,397.77	2,461.9	151.17

APPENDIX D
HYDRANT FLOW TEST RESULTS

HYDRANT FLOW TEST SUMMARY REPORT

PROJECT LOCATION: 7979 E Camelback Rd, Scottsdale, AZ 85251 (#C57909)

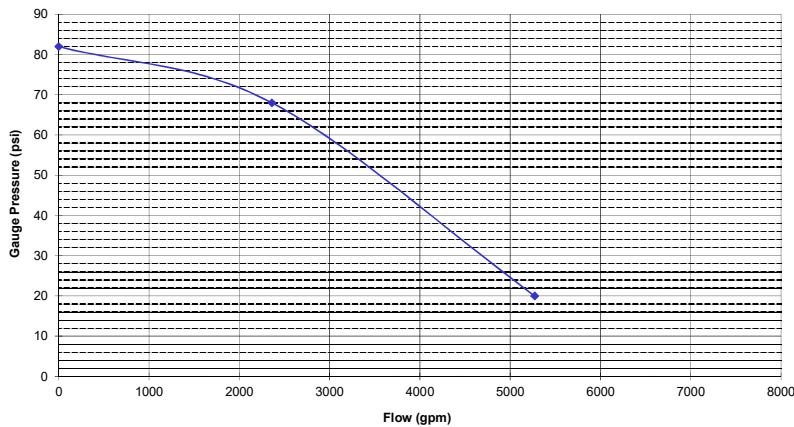
WITNESSED BY: Ray Padilla - City of Scottsdale

DATE: 04/16/19

TIME: 7:00AM

Observed Test Data								
Hydrant Designation	Hydrant Number	Flow Opening	*Static Pressure	*Residual Pressure	Pitot Pressure	**Coefficient	Coefficient Steamer use .83	Flow (GPM)
Pressure; R	Hydrant #1		82	68				
Flow, F1	Hydrant #2	4			30	0.95	0.95	2360
Flow, F2	Hydrant #2							0
TOTAL:								2360

Note: If steamer connection was used for the flow test (without stream straightener), An additional Coefficient must be used with a factor of .83. *Static and residual pressures must be adjusted for elevation change (+0.0 FT.) to site. **Use .95 Coefficient when stream straightener is utilized



Available flow @ 20 PSI
5271 GPM

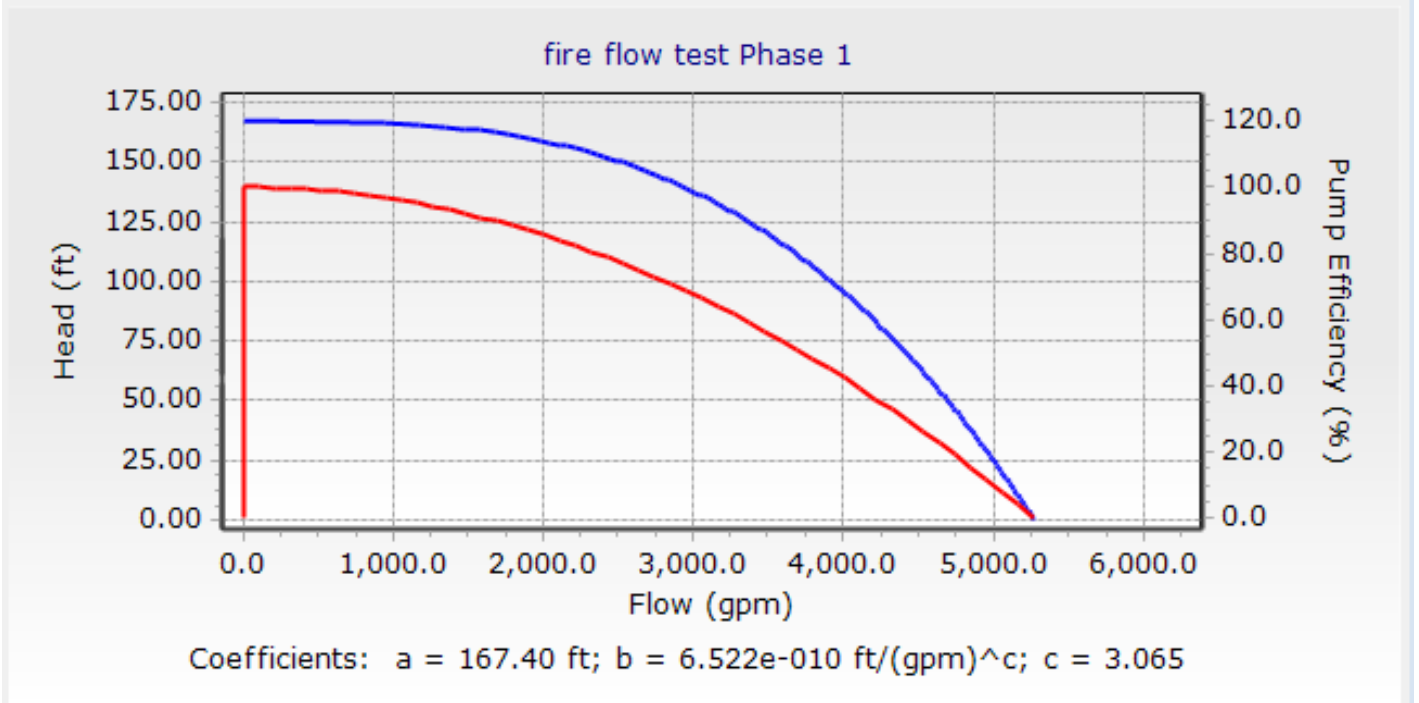


ACCEPTED BY: _____

DATE: _____

Pump Definition Detailed Report: fire flow test Phase 1

Head	Efficiency	NPSH Required	Motor	Transient	Library	Notes
Pump Definition Type: Standard (3 Point) ▼						
	Flow (gpm)	Head (ft)				
Shutoff:	0.0	167.40				
Design:	2,124.0	157.08				
Max. Operating:	4,744.0	46.20				



HYDRANT FLOW TEST

SUMMARY REPORT

for Reference Only

PROJECT LOCATION: 4365 N Parkway Ave. Scottsdale, AZ 85251 (#C57910)

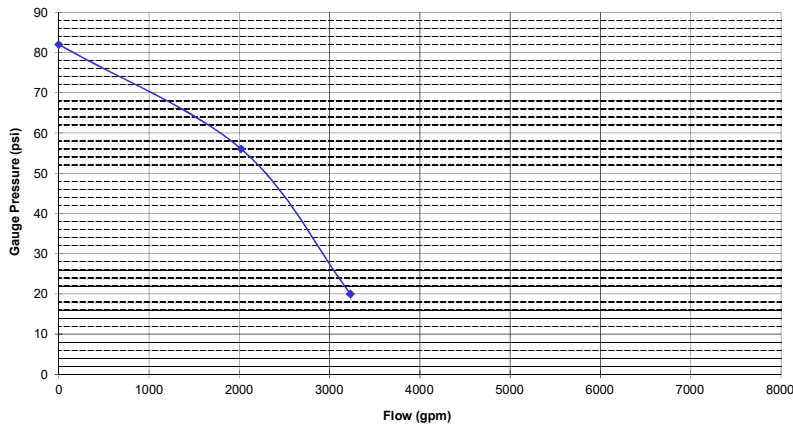
WITNESSED BY: Ray Padilla - City of Scottsdale

DATE: 04/16/19

TIME: 7:15AM

Observed Test Data								
Hydrant Designation	Hydrant Number	Flow Opening	*Static Pressure	*Residual Pressure	Pitot Pressure	**Coefficient	Coefficient Steamer use .83	Flow (GPM)
Pressure; R	Hydrant #1		82	56				
Flow, F1	Hydrant #2	4			22	0.95	0.95	2021
Flow, F2	Hydrant #2							0
TOTAL:								2021

Note: If steamer connection was used for the flow test (without stream straightener), An additional Coefficient must be used with a factor of .83. *Static and residual pressures must be adjusted for elevation change (+0.0 FT.) to site. **Use .95 Coefficient when stream straightener is utilized



Available flow @ 20 PSI
3231 GPM

