CITY OF SCOTTSDALE

Water and Wastewater Study
Combined

WATER BASIS OF DESIGN

Proposed Whataburger
7134 E Thomas Road
Scottsdale, AZ 85251

FINAL Basis of Design Report

☐ **APPROVED**

☑ **APPROVED AS NOTED**

☐ **REVISE AND RESUBMIT**

CITY OF SCOTTSDALE

SCOTTSDALE WATER
9379 E San Salvador Dr.
Scottsdale, AZ 85258

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 ldillon **DATE** 4/21/2020

Address comments below and marks ups on site plan on the submitted plans:

1) Is the building going to have a riser room? Refer to Scottsdale typical riser detail
2) Is PVC acceptable for private water service line?
3) Maintain 6 ft min clearance between sewer and water. Conflict with fire sprinkler line and proposed sewer. DS&PM 6-1.415
4) Where currently shown tapping into ACP main for new fire line replace section of ACP pipe with DIP and use reducing tee w/valve.DS&PM 6-1.408
5) No adjacent hydrants are available and no new hydrants shown. Confirm with fire department if a new site hydrant is required. DS&PM 6-1.502
6) A new conforming RPP backflow preventer (BFP) must be installed adjacent to and after the meter. Connect BFP to meter using copper type K. DS&PM 6-1.417

Prepared for:

Whataburger
300 Concord Plaza Drive
San Antonio, Texas 78216

Prepared by:

Kimley-Horn and Associates, Inc.
1001 West Southern Avenue
Mesa, Arizona 85210

291394000
27 March 2020

Final Water Basis of Design

WHATABURGER SCOTTSDALE

MARCH 27, 2020

Prepared By:

Kimley»Horn

4-DR-2020
3/31/2020

Contents

Tables

Appendices

INTRODUCTION

INTENT

The purpose of this water report is to support the water system for the proposed Whataburger restaurant development located on the northeast corner of Thomas Road and 71st Street in Scottsdale, Arizona. This report presents the basis of design criteria that will be used for the engineering design of the proposed development utilizing current water design standards and guidelines set forth by the City of Scottsdale, Arizona.

PROJECT DESCRIPTION

Whataburger Scottsdale is located within Section 27 of Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is bound to the south by Thomas Road and to the west by 71st Street. Existing commercial developments surround the site. See **Appendix A: Site Location Map**

Whataburger Scottsdale is a proposed 1.41-acre commercial development. The existing zoning of the project is C-3.

DISTRIBUTION SYSTEM DESCRIPTION

EXISTING DISTRIBUTION SYSTEM

The site is surrounded by existing commercial development. Per the City of Scottsdale Quarter Section Map 15-44 there is an existing 24-inch DIP waterline and 8-inch ACP waterline in Thomas Road directly south of the site and an existing 8-inch ACP waterline in 71st Street directly west of the site.

According to Figure 6.1-3 of the City of Scottsdale Design Standards and Policies Manual (DS&PM), the site is located in Pressure Zone 1 with existing ground elevation ranging from 1250 feet in the south to 1330 feet in the north.

PROPOSED DISTRIBUTION SYSTEM

The proposed Whataburger site is in pressure zone 1. The water system will tap into the existing metered service off Thomas Road for domestic service off the 8-inch ACP water main in Thomas Road. The proposed on-site distribution will consist of a 2-inch SCH 40 PCV water line that will provide potable water. Fire service for the proposed Whataburger will tap the existing 8-inch ACP main in 71st Street. A new backflow meter will be installed. Refer to **Appendix B** for the Proposed Water System Layout Exhibit.

BASIS OF DESIGN

DESIGN METHODOLOGY

The WaterCAD v8i water system modeling software distributed by Haestad Methods, Inc. was used to model the proposed water network. A fire flow test was performed to determine the residual and static pressures of the existing system. The fire flow test was performed on existing hydrants along Thomas Road to the south of the site. See **Appendix D** for complete fire flow test results.

According to Section 6-1.406 of the DSPM, distribution systems shall be designed with a minimum residual pressure of 50 psi and a maximum static pressure of 120 psi. For fire flow scenarios, a minimum design pressure of 30 psi at Finished Floor Elevation is required.

WATER SYSTEM ANALYSIS

The proposed water distribution system for the project is modeled under 4 design scenarios. Average Day, Max Day, Peak Hour and Max Day plus Fire Flows scenarios are modeled. Average Day Demands are based on Figure 6.1-2 in the DS&PM, with peaking factors per section 6-1.404. A fire flow of 1,000 gpm per section 6-1.501 of the DS&PM was used. See **Table 1** below for a summary of water demands.

Table 1 Water Demands

Land Use	Building SF	Average Daily Demand (gpd/SF)	Average Daily Flow (gpd)	ADF (gpm)	Max Day Flow (gpd)	MDF (gpm)	Peak Hour Flow (gpd)	PHF (gpm)
Restaurant	3,583	1.3	4,658	3.24	9,316	6.47	16,303	11.32

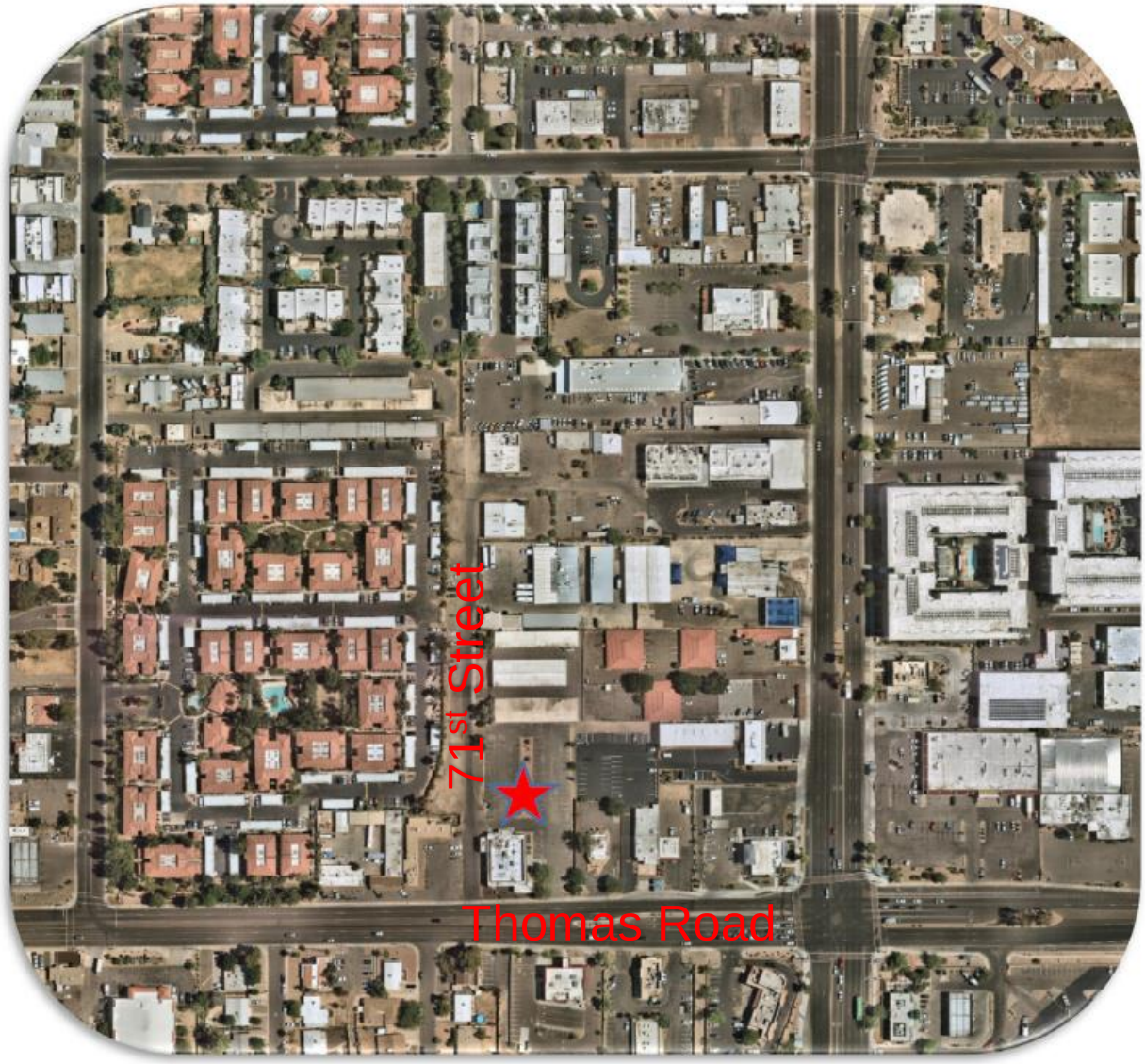
Average Day, Max Day, and Peak Hour Demands are applied at hydraulic model node for the building. Fire flow demands are applied to all junctions within the project boundary.

RESULTS

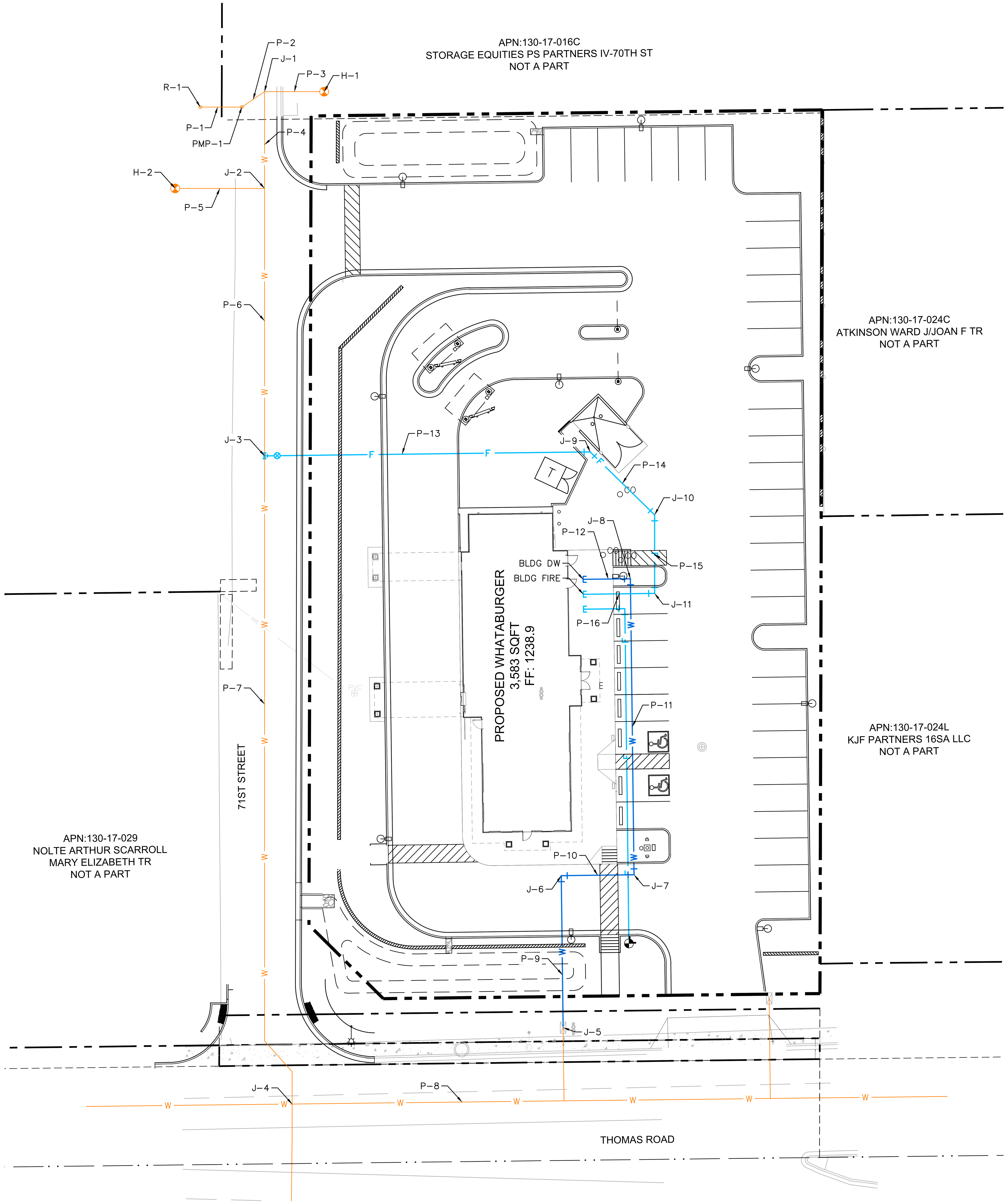
Based on the fire flow tests performed and the results of the WaterCAD analysis, the proposed water system is capable of providing the required domestic flows at pressures ranging from 72 psi to 89 psi in the average day, max day, and peak hour scenarios. The fire flow pressures meet the minimum requirement of 30 psi, ranging from 30 psi to 62 psi.

Refer to **Appendix C** for the WaterCAD results.

Appendix A – Site Location Map



Appendix B – Proposed Water System Layout



LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED FIRE LINE

Refer to notes on more detailed utility plan provided separately but appended here.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

REV	DESCRIPTION	BY	DATE	APPR

Kimley»Horn © 2020
1001 W Southern Ave, Suite 131
Mesa, Arizona 85210 (480) 207-2666

WHATABURGER

WHATABURGER RESTAURANT
WATER LAYOUT EXHIBIT
7134 E THOMAS ROAD
SCOTTSDALE, AZ 85251

PROJECT No.
291394000
SCALE (H): 1"=20'
SCALE (V): NONE
DRAWN BY: MEN/PAR
DESIGN BY: PAR/HDR
CHECK BY: HDR
DATE: 3/27/20

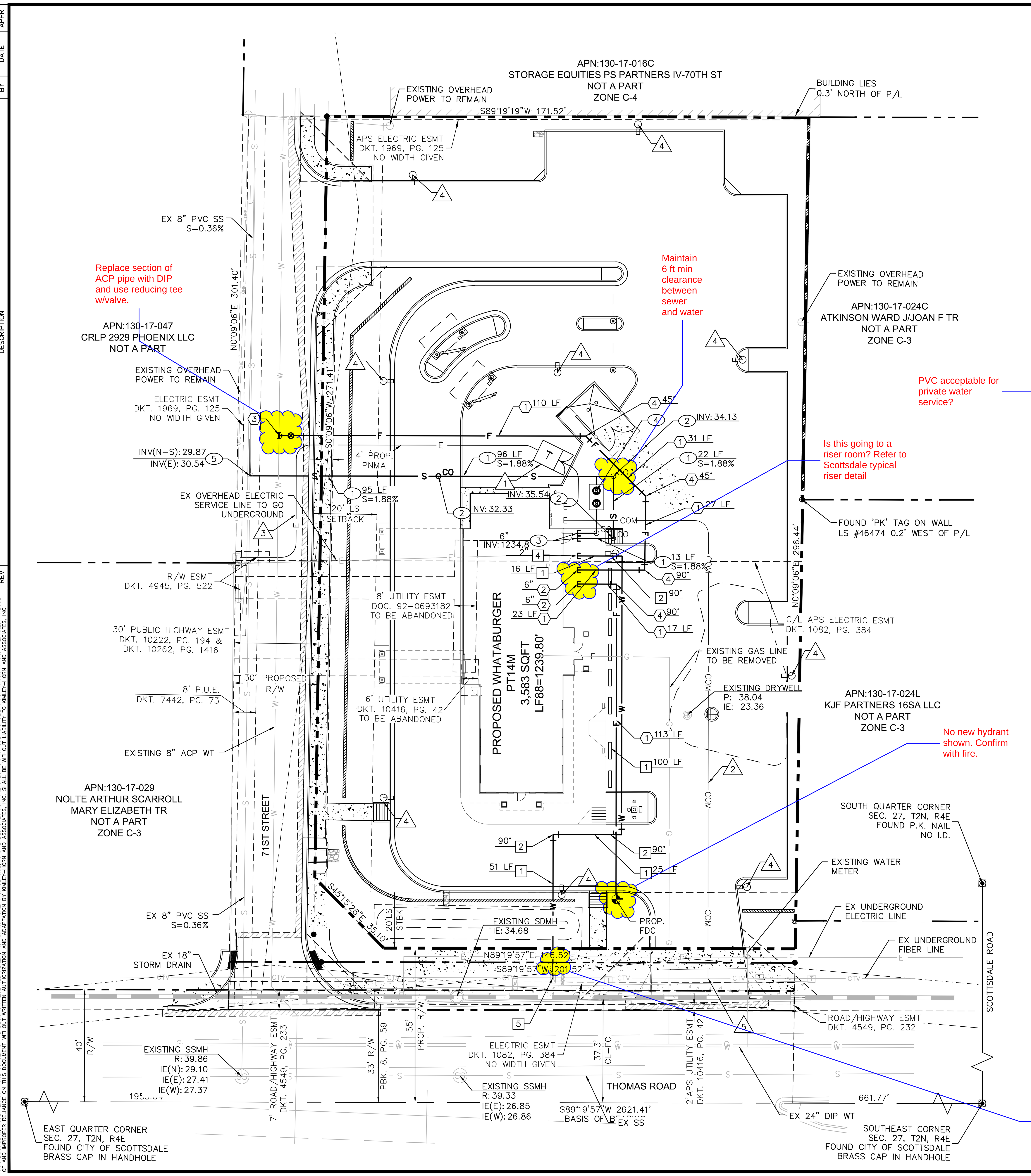
Registered Professional Engineer (Civil)
CERTIFICATE NO. 47693
HEATHER ROBERTS
Date Signed 03/09/20
ARIZONA, U.S.A.
Exp. Date 03/31/20

Water Layout.dwg

01 OF 01 SHEETS

4-DR-2020
3/31/2020

Sheet added by LDillon, submitted at same time as this report as separate case file as 4_DR_2020_V2_Utility Plan.pdf



LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- EASEMENT LINE
- EXISTING SANITARY SEWER MAIN
- EXISTING PUBLIC WATER MAIN
- EXISTING GAS LINE
- EXISTING COMMUNICATION LINE
- EXISTING ELECTRIC LINE
- EXISTING STORM DRAIN
- PROPOSED DOMESTIC WATER MAIN
- PROPOSED SEWER MAIN
- PROPOSED FIRE LINE
- PROPOSED ELECTRIC LINE
- PROPOSED COMMUNICATION LINE
- PROPOSED FIRE DEPARTMENT CONNECTION
- EXISTING DRYWELL
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED GREASE TRAP

DOMESTIC WATER NOTES

1. INSTALL 2" SCH 40 PVC DOMESTIC WATER SERVICE, LENGTH PER PLAN.
2. INSTALL BEND WITH RESTRAINED JOINTS PER MAG STD DET 303, ANGLE PER PLAN.
4. BUILDING DOMESTIC WATER CONNECTION, REF MEP PLANS FOR CONTINUATION.
5. CONNECT TO EXISTING METERED SERVICE.

FIRELINE NOTES

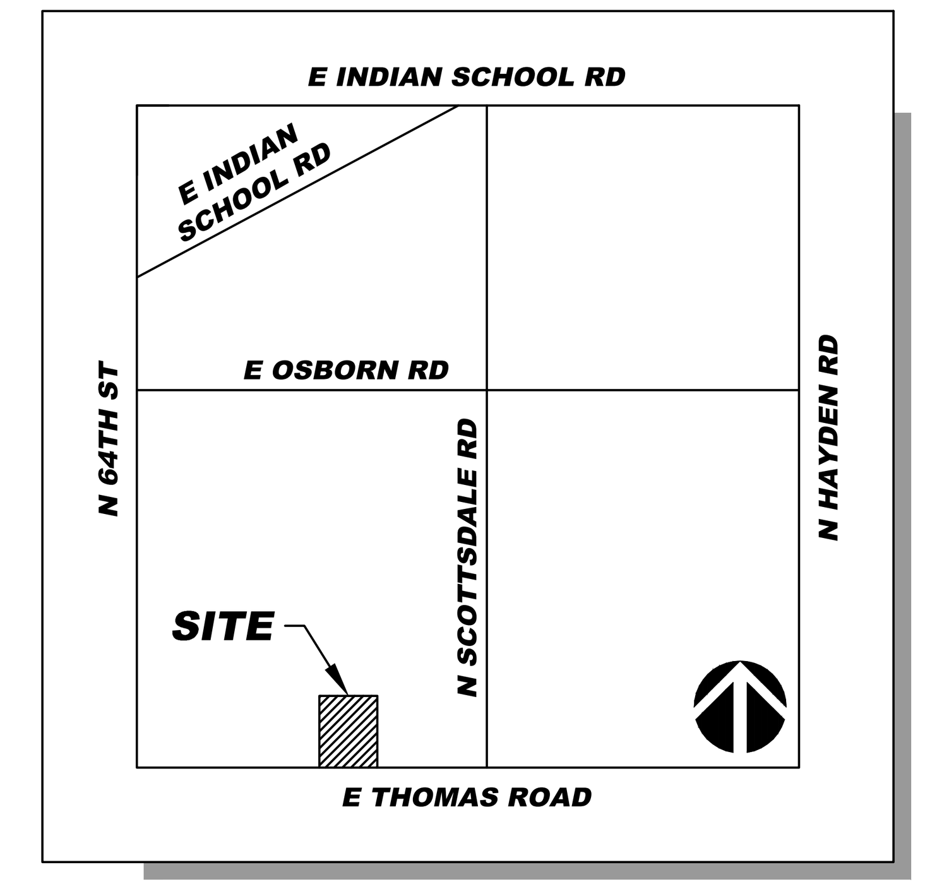
1. INSTALL 6" CLASS 350 DIP WATER MAIN POLYWRAPPED WITH TRACER WIRE, LENGTH PER PLAN, MINIMUM 3' COVER. BEDDING AND BACKFILL PER COS STD DET 2201.
2. BUILDING FIRELINE CONNECTION. INSTALL FIRELINE RISER AND BACKFLOW PREVENTOR PER COS STD DET 2369 IN FIRE RISER ROOM. REF FIRE SPRINKLER PLANS FOR CONTINUATION.
3. INSTALL 8" X 6" TS&V
4. INSTALL BEND WITH RESTRAINED JOINTS PER MAG STD DET 303, ANGLE PER PLAN.

SEWER NOTES

1. INSTALL 6" SDR 35 PVC PRIVATE SEWER MAIN, LENGTH AND SLOPE PER PLAN.
2. INSTALL SEWER CLEANOUT PER MAG STD DET 441, INVERT PER PLAN.
3. CONNECT TO BUILDING SEWER AT TWO-WAY CLEANOUT, INVERT PER PLAN. REF MEP PLANS FOR CONTINUATION.
4. PROPOSED 1500 GALLON GREASE INTERCEPTOR
5. 6" SEWER SERVICE LATERAL PER MAG 440-3

DRY UTILITY CONSTRUCTION NOTES

1. PROPOSED TRANSFORMER LOCATION, REF APS PLANS FOR TRANSFORMER DETAILS.
2. INSTALL CENTURYLINK TELECOM ROUTING. CONTRACTOR SHALL JOINT TRENCH WITH APS WHERE FEASIBLE AND PROVIDE CONDUIT (2-4"), BEDDING, SHADING, AND BACKFILL. REFER TO CENTURYLINK PLANS FOR CONSTRUCTION INFORMATION.
3. INSTALL APS POWER ROUTING. REFER TO APS PLANS FOR CONSTRUCTION INFORMATION.
4. PROPOSED SITE LIGHT
5. CONNECT TO EXISTING



VICINITY MAP

MARICOPA COUNTY
N.T.S.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

Kimley»Horn © 2020
1001 W Southern Ave, Suite 131
Mesa, Arizona 85210 (480) 207-2666

WHATABURGER

WHATABURGER RESTAURANT
UTILITY PLAN
7134 E THOMAS ROAD
SCOTTSDALE, AZ 85251

PROJECT No. 291394000
SCALE (H): 1"=20'
SCALE (V): ---
DRAWN BY: MEN/PAR
DESIGN BY: PAR/HDR
CHECK BY: HDR
DATE: 03/09/2020

Registered Professional Engineer (Civil) CERTIFICATE NO. 47693 HEATHER ROBERTS Date Signed 03/09/20 ARIZONA, U.S.A. Exp. Date 03/31/20

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C07
07 OF 10 SHEETS

4-DR-2020
3/31/2020

Appendix C – WaterCAD Analysis Results

Average Day

Max Day

Peak Hour

Max Day Plus Fire Flow

Model Pump Curve

FlexTable: Junction Table

Active Scenario: Average Day

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	39.68	0.00	206.32	72
J-9	39.43	0.00	206.32	72
J-10	39.17	0.00	206.32	72
J-11	38.87	0.00	206.32	72
BLDG FIRE	39.72	0.00	206.32	72
J-1	40.00	0.00	206.32	72
J-2	19.03	0.00	206.32	81
J-4	39.30	0.00	206.32	72
J-5	39.30	0.00	206.32	72
J-6	39.40	0.00	206.30	72
J-7	39.40	0.00	206.30	72
J-8	38.80	0.00	206.27	72
BLDG DW	39.72	3.24	206.27	72

FlexTable: Pipe Table

Active Scenario: Average Day

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Pressure Loss (psi)
P-14	30	J-9	J-10	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-15	26	J-10	J-11	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-16	24	J-11	BLDG FIRE	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-3	20	H-1	J-1	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-4	59	J-1	J-2	8.0	Asbestos Cement	140.0	3.24	0.02	0.00	0.0
P-6	63	J-2	J-3	8.0	Asbestos Cement	140.0	3.24	0.02	0.00	0.0
P-5	63	H-2	J-2	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-2	17	J-1	PMP-1	120.0	Ductile Iron	130.0	-3.24	0.00	0.00	0.0
P-1	22	PMP-1	R-1	120.0	Ductile Iron	130.0	-3.24	0.00	0.00	0.0
P-13	109	J-3	J-9	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-7	192	J-3	J-4	8.0	Asbestos Cement	140.0	3.24	0.02	0.00	0.0
P-8	100	J-4	J-5	8.0	Asbestos Cement	140.0	3.24	0.02	0.00	0.0
P-9	51	J-5	J-6	2.0	PVC	150.0	3.24	0.33	0.01	0.0
P-10	20	J-6	J-7	2.0	PVC	150.0	3.24	0.33	0.01	0.0
P-11	83	J-7	J-8	2.0	PVC	150.0	3.24	0.33	0.02	0.0
P-12	13	J-8	BLDG DW	2.0	PVC	150.0	3.24	0.33	0.00	0.0

FlexTable: Pump Table

Active Scenario: Average Day

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	40.00	Fire Flow Test	On	40.00	206.32	3.24	166.32

FlexTable: Reservoir Table

Active Scenario: Average Day

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	40.00	3.24	40.00

FlexTable: Junction Table

Active Scenario: Max Day

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	39.68	0.00	206.32	72
J-9	39.43	0.00	206.32	72
J-10	39.17	0.00	206.32	72
J-11	38.87	0.00	206.32	72
BLDG FIRE	39.72	0.00	206.32	72
J-1	40.00	0.00	206.32	72
J-2	19.03	0.00	206.32	81
J-4	39.30	0.00	206.32	72
J-5	39.30	0.00	206.32	72
J-6	39.40	0.00	206.26	72
J-7	39.40	0.00	206.24	72
J-8	38.80	0.00	206.15	72
BLDG DW	39.72	6.47	206.14	72

FlexTable: Pipe Table

Active Scenario: Max Day

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Pressure Loss (psi)
P-14	30	J-9	J-10	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-15	26	J-10	J-11	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-16	24	J-11	BLDG FIRE	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-3	20	H-1	J-1	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-4	59	J-1	J-2	8.0	Asbestos Cement	140.0	6.47	0.04	0.00	0.0
P-6	63	J-2	J-3	8.0	Asbestos Cement	140.0	6.47	0.04	0.00	0.0
P-5	63	H-2	J-2	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-2	17	J-1	PMP-1	120.0	Ductile Iron	130.0	-6.47	0.00	0.00	0.0
P-1	22	PMP-1	R-1	120.0	Ductile Iron	130.0	-6.47	0.00	0.00	0.0
P-13	109	J-3	J-9	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-7	192	J-3	J-4	8.0	Asbestos Cement	140.0	6.47	0.04	0.00	0.0
P-8	100	J-4	J-5	8.0	Asbestos Cement	140.0	6.47	0.04	0.00	0.0
P-9	51	J-5	J-6	2.0	PVC	150.0	6.47	0.66	0.05	0.0
P-10	20	J-6	J-7	2.0	PVC	150.0	6.47	0.66	0.02	0.0
P-11	83	J-7	J-8	2.0	PVC	150.0	6.47	0.66	0.09	0.0
P-12	13	J-8	BLDG DW	2.0	PVC	150.0	6.47	0.66	0.01	0.0

FlexTable: Pump Table

Active Scenario: Max Day

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	40.00	Fire Flow Test	On	40.00	206.32	6.47	166.32

FlexTable: Reservoir Table

Active Scenario: Max Day

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	40.00	6.47	40.00

FlexTable: Junction Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	39.68	0.00	206.31	72
J-9	39.43	0.00	206.31	72
J-10	39.17	0.00	206.31	72
J-11	38.87	0.00	206.31	72
BLDG FIRE	39.72	0.00	206.31	72
J-1	40.00	0.00	206.31	72
J-2	19.03	0.00	206.31	81
J-4	39.30	0.00	206.31	72
J-5	39.30	0.00	206.31	72
J-6	39.40	0.00	206.16	72
J-7	39.40	0.00	206.10	72
J-8	38.80	0.00	205.85	72
BLDG DW	39.72	11.32	205.81	72

FlexTable: Pipe Table

Active Scenario: Peak Hour

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Pressure Loss (psi)
P-14	30	J-9	J-10	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-15	26	J-10	J-11	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-16	24	J-11	BLDG FIRE	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-3	20	H-1	J-1	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-4	59	J-1	J-2	8.0	Asbestos Cement	140.0	11.32	0.07	0.00	0.0
P-6	63	J-2	J-3	8.0	Asbestos Cement	140.0	11.32	0.07	0.00	0.0
P-5	63	H-2	J-2	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-2	17	J-1	PMP-1	120.0	Ductile Iron	130.0	-11.32	0.00	0.00	0.0
P-1	22	PMP-1	R-1	120.0	Ductile Iron	130.0	-11.32	0.00	0.00	0.0
P-13	109	J-3	J-9	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-7	192	J-3	J-4	8.0	Asbestos Cement	140.0	11.32	0.07	0.00	0.0
P-8	100	J-4	J-5	8.0	Asbestos Cement	140.0	11.32	0.07	0.00	0.0
P-9	51	J-5	J-6	2.0	PVC	150.0	11.32	1.16	0.15	0.1
P-10	20	J-6	J-7	2.0	PVC	150.0	11.32	1.16	0.06	0.0
P-11	83	J-7	J-8	2.0	PVC	150.0	11.32	1.16	0.25	0.1
P-12	13	J-8	BLDG DW	2.0	PVC	150.0	11.32	1.16	0.04	0.0

FlexTable: Pump Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	40.00	Fire Flow Test	On	40.00	206.31	11.32	166.31

FlexTable: Reservoir Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	40.00	11.32	40.00

FlexTable: Junction Table

Active Scenario: Max + Fire Flow

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-3	39.68	0.00	206.32	72
J-9	39.43	0.00	206.32	72
J-10	39.17	0.00	206.32	72
J-11	38.87	0.00	206.32	72
BLDG FIRE	39.72	0.00	206.32	72
J-1	40.00	0.00	206.32	72
J-2	19.03	0.00	206.32	81
J-4	39.30	0.00	206.32	72
J-5	39.30	0.00	206.32	72
J-6	39.40	0.00	206.26	72
J-7	39.40	0.00	206.24	72
J-8	38.80	0.00	206.15	72
BLDG DW	39.72	6.47	206.14	72

FlexTable: Pipe Table

Active Scenario: Max + Fire Flow

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Pressure Loss (psi)
P-14	30	J-9	J-10	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-15	26	J-10	J-11	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-16	24	J-11	BLDG FIRE	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-3	20	H-1	J-1	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-4	59	J-1	J-2	8.0	Asbestos Cement	140.0	6.47	0.04	0.00	0.0
P-6	63	J-2	J-3	8.0	Asbestos Cement	140.0	6.47	0.04	0.00	0.0
P-5	63	H-2	J-2	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-2	17	J-1	PMP-1	120.0	Ductile Iron	130.0	-6.47	0.00	0.00	0.0
P-1	22	PMP-1	R-1	120.0	Ductile Iron	130.0	-6.47	0.00	0.00	0.0
P-13	109	J-3	J-9	6.0	Ductile Iron	130.0	0.00	0.00	0.00	0.0
P-7	192	J-3	J-4	8.0	Asbestos Cement	140.0	6.47	0.04	0.00	0.0
P-8	100	J-4	J-5	8.0	Asbestos Cement	140.0	6.47	0.04	0.00	0.0
P-9	51	J-5	J-6	2.0	PVC	150.0	6.47	0.66	0.05	0.0
P-10	20	J-6	J-7	2.0	PVC	150.0	6.47	0.66	0.02	0.0
P-11	83	J-7	J-8	2.0	PVC	150.0	6.47	0.66	0.09	0.0
P-12	13	J-8	BLDG DW	2.0	PVC	150.0	6.47	0.66	0.01	0.0

FlexTable: Pump Table

Active Scenario: Max + Fire Flow

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	40.00	Fire Flow Test	On	40.00	206.32	6.47	166.32

FlexTable: Reservoir Table

Active Scenario: Max + Fire Flow

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	40.00	6.47	40.00

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: Max + Fire Flow

Label	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Junction w/ Minimum Pressure (Zone)	Satisfies Fire Flow Constraints?
H-1	1,500.00	1,982.57	30	H-2	True
H-2	1,500.00	1,837.71	30	BLDG DW	True
J-3	1,500.00	(N/A)	(N/A)	(N/A)	False
J-9	1,500.00	(N/A)	(N/A)	(N/A)	False
J-10	1,500.00	(N/A)	(N/A)	(N/A)	False
J-11	1,500.00	(N/A)	(N/A)	(N/A)	False
BLDG FIRE	1,500.00	1,575.22	30	J-11	True
J-1	1,500.00	(N/A)	(N/A)	(N/A)	False
J-2	1,500.00	(N/A)	(N/A)	(N/A)	False
J-4	1,500.00	(N/A)	(N/A)	(N/A)	False
J-5	1,500.00	(N/A)	(N/A)	(N/A)	False
J-6	1,500.00	(N/A)	(N/A)	(N/A)	False
J-7	1,500.00	(N/A)	(N/A)	(N/A)	False
J-8	1,500.00	(N/A)	(N/A)	(N/A)	False
BLDG DW	1,500.00	(N/A)	(N/A)	(N/A)	False

Pump Definition Detailed Report: Fire Flow Test

Active Scenario: Peak Hour

Element Details			
ID	59	Notes	
Label	Fire Flow Test		

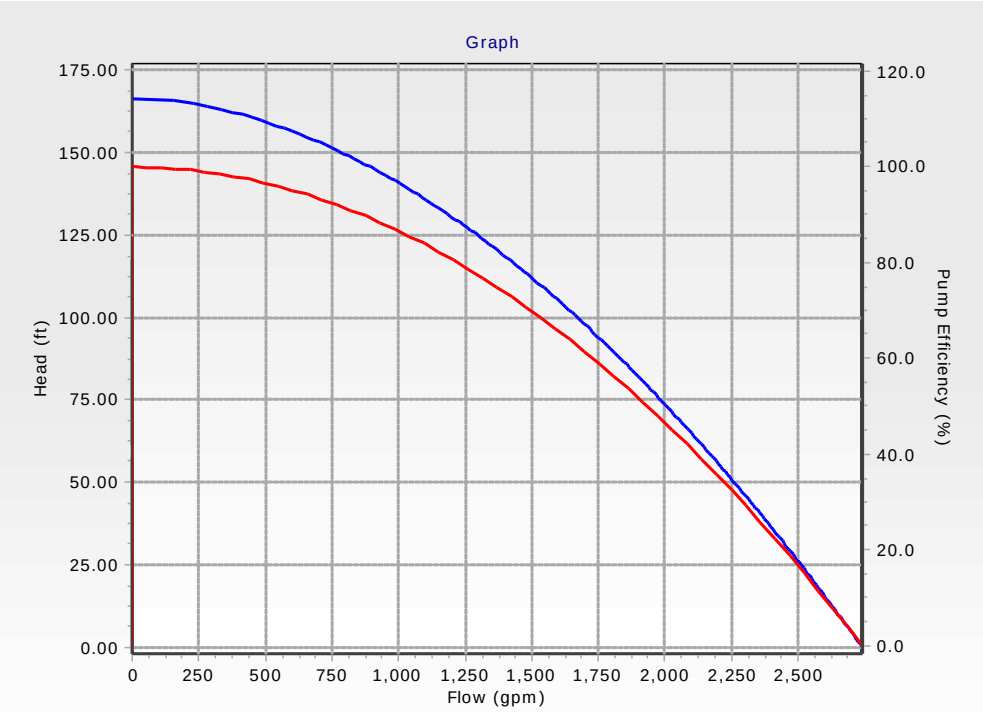
Pump Definition Type			
Pump Definition Type	Standard (3 Point)	Design Head	78.54 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	2,301 gpm
Shutoff Head	166.32 ft	Maximum Operating Head	46.20 ft
Design Flow	1,943 gpm		

Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0 gpm		

Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: Fire Flow Test

Active Scenario: Peak Hour



Appendix D – Fire Flow Test Results

Flow Test Summary

Project Name:	EJFT 20106
Project Address:	7134 E Thomas Rd, Scottsdale, AZ 85251
Date of Flow Test:	2020-03-26
Time of Flow Test:	7:40 AM
Data Reliable Until:	2020-09-26
Conducted By:	Eder Cueva & Steven Saethre (EJ Flow Tests) 602.999.7637
Witnessed By:	Ray Padilla (City of Scottsdale) 602.541.0586
City Forces Contacted:	City of Scottsdale (602.541.0586)
Permit Number:	C61729

Note Scottsdale requires a max static pressure of 72 psi for safety factor.

Raw Flow Test Data

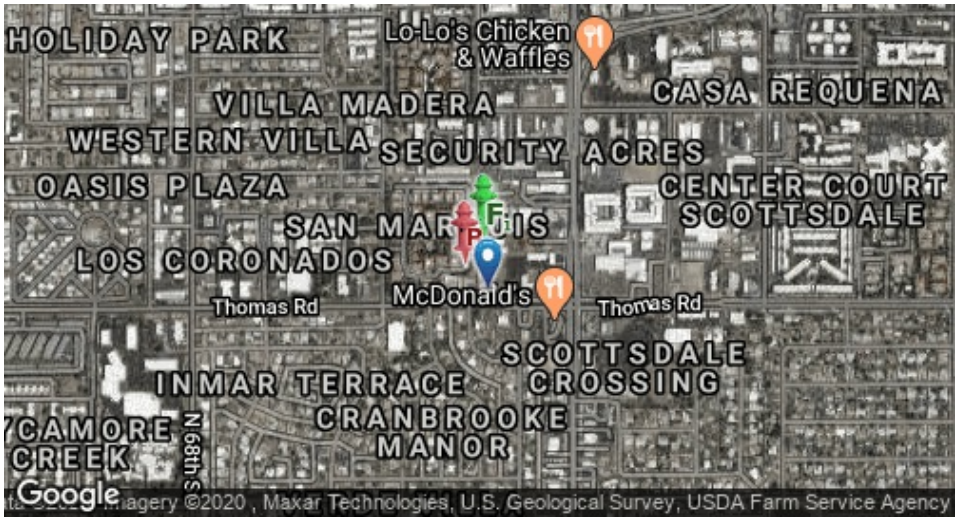
Static Pressure:	90.0 PSI
Residual Pressure:	52.0 PSI
Flowing GPM:	1,943
GPM @ 20 PSI:	2,702

Data with a 18 PSI Safety Factor

Static Pressure:	72.0 PSI
Residual Pressure:	34.0 PSI
Flowing GPM:	1,943
GPM @ 20 PSI:	2,301

Hydrant F_1

Pitot Pressure (1):	32	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	35	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches



Project Site

Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
217 ft (measured linearly)

Static-Residual Elevation
1240 ft (above sea level)

Flow Hydrant (F_1) Elevation
1241 ft (above sea level)

Elevation & distance values are approximate

Flow Test Summary

Static-Residual Hydrant

Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site

Water Supply Curve $N^{1.85}$ Graph