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 scan DATE 8/5/2022

FINAL WATER BASIS OF DESIGN REPORT

Sonoran Sky

North of the E Paraiso Drive and N Calle Miramonte Intersection
Scottsdale, Arizona

Case# 3-PP-2006#3

1st Submittal: September 2021

2nd Submittal: December 2021

3rd Submittal: April 2022

Prepared for:

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8767 E Via De Ventura
#390
Scottsdale, Arizona 85258

Prepared by:

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291245004
April 2022

FINAL
WATER BASIS OF DESIGN REPORT

SONORAN SKY
NORTH OF THE E PARAISO DRIVE AND N CALLE MIRAMONTE INTERSECTION
SCOTTSDALE, ARIZONA

APRIL 2022

Prepared By:

Kimley»Horn

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INTRODUCTION

SITE LOCATION

This Final Water Basis of Design Report (WaterBOD) has been prepared for the proposed Sonoran Sky single family development located north of the intersection of E Paraiso Drive and N Calle Miramonte in Scottsdale, Arizona (development). The development is bound to the east and west by undeveloped desert, to the north by the Sereno Canyon Subdivision, and to the south by E Paraiso Drive. The development is located within Section 14 of Township 4 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. Refer to Figure 1 for the Vicinity Map.

PROJECT SIZE AND TYPE

The development is a proposed 13-unit single family residential subdivision. The proposed buildings are one-story units. The development is approximately 41 acres.

PURPOSE AND OBJECTIVES

This report presents the basis of design criteria that will be used for engineering design of the proposed development. This report establishes a water service plan for the development of the site.

- Demonstrate compliance with the City's Design Standards & Polices Manual (DSPM).
- Identify a water system layout for the proposed development.
- Determination of the water demand generated by the development.
- Modeling and Analysis of the proposed water system.

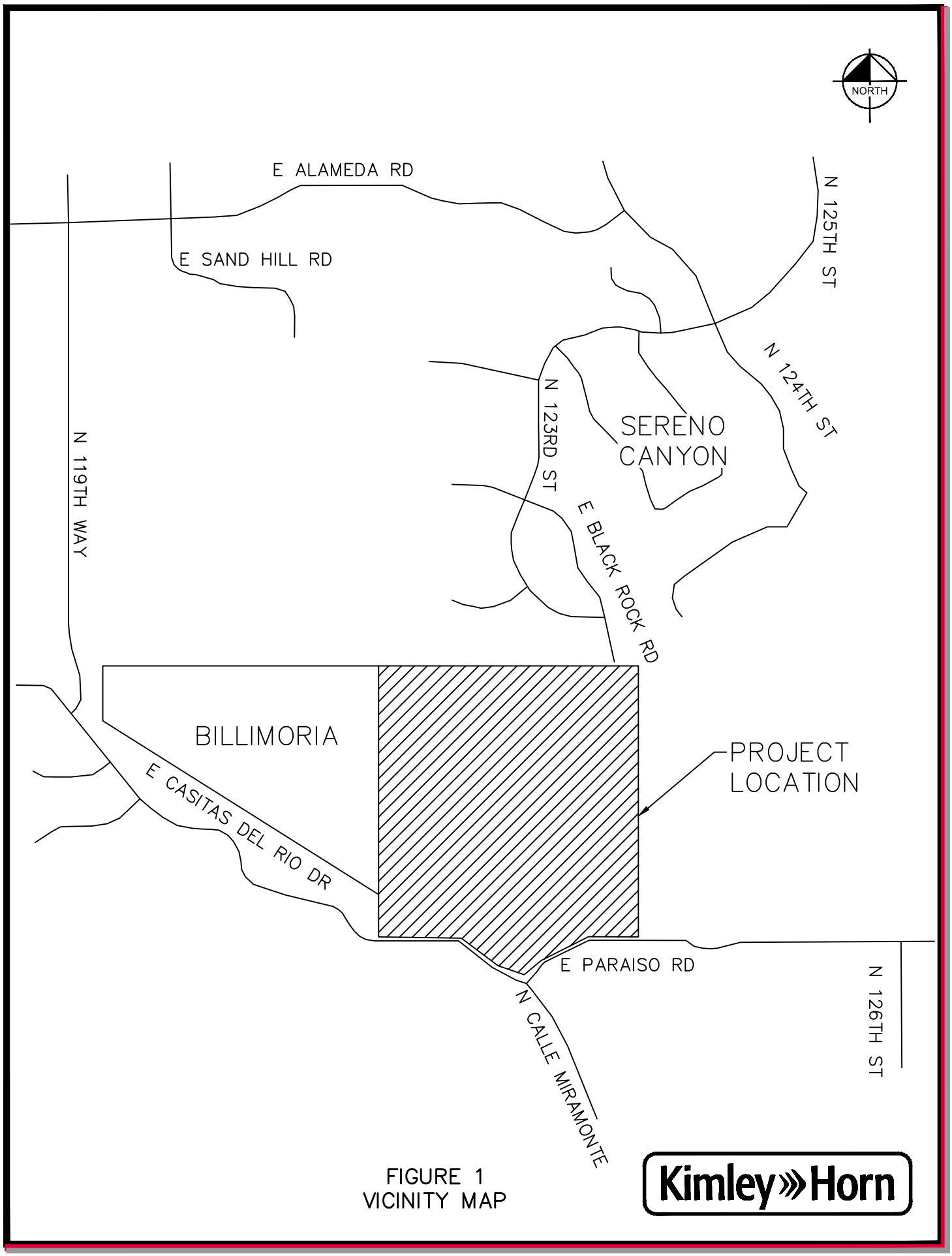


FIGURE 1
VICINITY MAP

Kimley»Horn

K:\EAV_Civil\291245004 - Sonoran Sky\Reports\Sewer BOD\Figures\V-MAP.dwg Sep 09, 2021 Katie.Sinclair
XREFS:

WATER SYSTEM DESCRIPTION

EXISTING WATER SYSTEM

The existing site is undeveloped natural desert. There is a ridgeline running from the southeast corner of the site to the northwest corner. The northeast portion of the site slopes to the north, and the southwest portion of the site slopes to the west. There are several large rock structures on the site. Existing grade elevations on the site range from approximately 2817-2970. Based on elevations, the existing site is in the boundary between pressure zones 14 and 13. Based on a review of the City Quarter Section Maps, there is an existing 8-inch D.I.P. water line in Paraiso Drive. This existing water line is located in pressure zone 14, being controlled by an existing booster station (BPS 144) located south of Paraiso Drive, southwest of the site. The approved Sereno Canyon Phase 3 – Parcel D utility plans are under construction and will extend a pressure zone 13, 8-inch DIP waterline along Black Rock Road to the northeast corner of the site.

PROPOSED WATER SYSTEM

The proposed development consists of 13 single family residential units. This development will be served by an 8-inch D.I.P. public water line within 40' roadway tract and water sewer facilities easement. The development will utilize two pressure reducing valves (PRVs) and operate in an isolated pressure zone between 13 and 14.

The proposed water system will be served by two connections to existing water lines. The first connection will be west of the Casitas Del Rio Drive and Paraiso Drive intersection and an 8-inch D.I.P. waterline in pressure zone 14 will extend north to the proposed water system, with a PRV before the onsite system. The second connection is into the existing 8-inch water line that is in pressure zone 13 in Black Rock Road. A PRV will be installed at this connection to meet the pressure requirements of the existing Sereno Canyon Parcel D, which operates in pressure zone 13. An 8-inch waterline stub will be provided off the western cul-de-sac, and extended to the property line, for a potential future connection by the adjacent property. A PRV may be required by that development when they connect. Refer to Figure 2 for the proposed water layout.

7.5 hp, 50 GPM

BOOSTER STATION 144 UPGRADES

Booster Station 144 is located just southwest of the site, on Paraiso Drive. This booster station serves the existing Estates at Miramonte Subdivision and generates Pressure Zone 14. City of Scottsdale staff has provided information about the existing booster station. BPS 144 consists of two 50 hp vertical turbine pumps for domestic service and redundance, and a larger 60 hp vertical turbine pump for fire service.

The Miramonte Subdivision has a large elevation gain from the booster station at approximately 2865 feet to the highest home sites at over 3000 feet. To accommodate this large elevation head the turbines have design heads in the range of 250-350 feet. Refer to Appendix A for BPS 144 information.

A fire flow test was performed on hydrants inside the Miramonte Subdivision, which resulted in negative pressure at the high end of the site. The City of Scottsdale performed an additional test, while

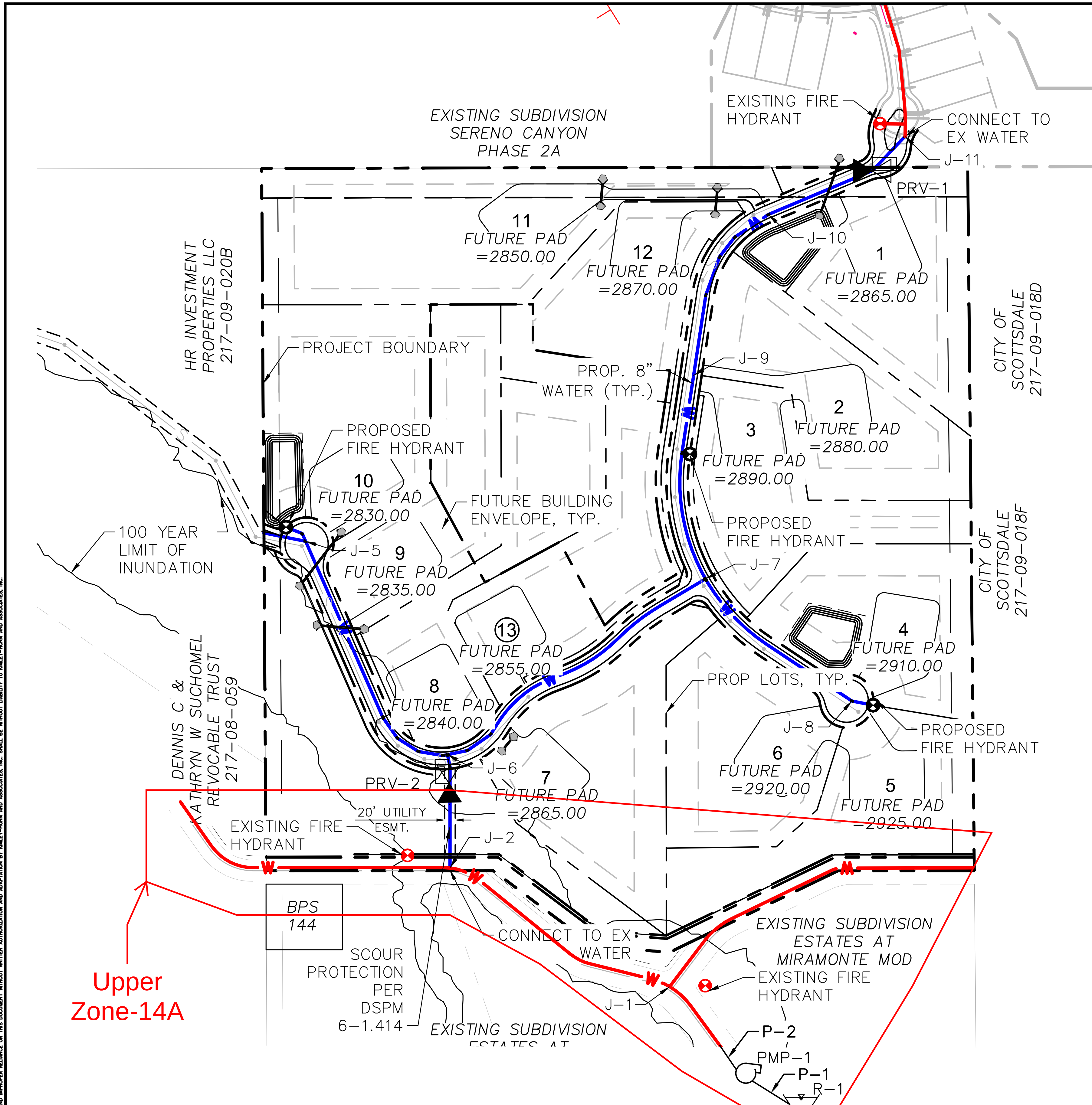
monitoring the booster pump station and was able to maintain positive pressure, but with a limited flow. The existing fire pump is only able to provide a maximum flow of around 600 GPM. The City of Scottsdale DSPM follows the International Fire Code for required fire flow per single family structure size, in square feet. The anticipated maximum structure size for homes in Sonoran Sky is 6,000 sq-ft. Per IFC Table B105.1, this requires a flow of 2,000 GPM, which can be reduced by 50% for fully sprinklered homes to 1,000 GPM, which is required in Scottsdale.

Upgrades to the existing fire flow pump will be required to serve the proposed Sonoran Sky development. It should be noted that the existing pump does not provide adequate fire protection for the Miramonte Subdivision, per current City or IFC standards. The proposed upgrades will be a benefit to the existing and future homes in the Miramonte Subdivision.

The proposed fire pump is a 95 hp Fairbanks vertical turbine pump, with a design flow of 1,000 gpm at 300 ft head. This proposed pump will require a replacement or upsizing of the existing can, as well as associated electrical improvements including replacement of break, conduit, disconnect and changing overload settings in control panel. Updates to the programing may be required.

See Appendix C for proposed pump information.

City staff has indicated that the downstream systems and booster pump station has the supply to match this increased fire flow. No further evaluation of the downstream system is included as part of this report.



EXISTING SUBDIVISION SERENO CANYON PHASE 2A
EXISTING FIRE HYDRANT
CONNECT TO EX WATER
J-11
PRV-1
J-10
11 FUTURE PAD =2850.00
12 FUTURE PAD =2870.00
1 FUTURE PAD =2865.00
HR INVESTMENT PROPERTIES LLC 217-09-020B
PROJECT BOUNDARY
PROP. 8" WATER (TYP.)
J-9
2 FUTURE PAD =2880.00
3 FUTURE PAD =2890.00
CITY OF SCOTTSDALE 217-09-018D
PROPOSED FIRE HYDRANT
10 FUTURE PAD =2830.00
FUTURE BUILDING ENVELOPE, TYP.
100 YEAR LIMIT OF INUNDATION
J-5
9 FUTURE PAD =2835.00
PROPOSED FIRE HYDRANT
J-7
CITY OF SCOTTSDALE 217-09-018F
13 FUTURE PAD =2855.00
4 FUTURE PAD =2910.00
8 FUTURE PAD =2840.00
PROP LOTS, TYP.
DENNIS C & KATHRYN W SUCHOMEL REVOCABLE TRUST 217-08-059
J-8
PROPOSED FIRE HYDRANT
6 FUTURE PAD =2920.00
J-6
PRV-2
7 FUTURE PAD =2865.00
5 FUTURE PAD =2925.00
20' UTILITY ESMT.
EXISTING FIRE HYDRANT
J-2
BPS 144
CONNECT TO EX WATER
EXISTING SUBDIVISION ESTATES AT MIRAMONTE MOD
EXISTING FIRE HYDRANT
SCOUR PROTECTION PER DSPM 6-1.414
J-1
P-2
PMP-1
P-1
R-1
EXISTING SUBDIVISION ESTATES AT
Upper Zone-14A

LEGEND

Symbol	Description
W (red line)	EX. WATER LINE
(red hydrant)	EX. FIRE HYDRANT
W (blue line)	PROP. WATER LINE
(hydrant)	PROP. FIRE HYDRANT
J-1	WATERCAD JUNCTION AND LABEL
P-1	WATERCAD PIPE AND LABEL
PMP-1	WATER MODEL CALIBRATION PUMP (PUMP CURVE PER FIRE FLOW TEST)
R-1	WATERCAD CALIBRATION RESERVOIR
PRV-1	WATERCAD PRESSURE REDUCING VALVE

NORTH

GRAPHIC SCALE IN FEET

0 100 200 400

NO.	REVISION	DATE

Kimley»Horn

C 2022 KIMLEY-HORN AND ASSOCIATES, INC.
1001 West Southern Avenue, Suite 131
Mesa, Arizona 85210 (480) 207-2666

SCALE (H): 1"=200'
SCALE (V): NONE
DESIGNED BY: DJR
DRAWN BY: DJR
CHECKED BY: ZJH
DATE: APR 2022

SONORAN SKY
FINAL WATER BOD
FIGURE 2 - WATER SYSTEM LAYOUT
SCOTTSDALE, ARIZONA

PROJECT NO. 291245004
DRAWING NAME
1 OF 1

BASIS OF DESIGN

DESIGN CRITERIA

The design criteria for the development is based on the City of Scottsdale Design Standards and Policies Manual (DS&PM). Average daily demands for the proposed use and peaking factors were used to determine the proposed peak flows generated on site. Fire Flows are based on IFC Table B105.1. A 1,000 GPM fire flow (after 50% reduction for fully sprinklered home) is required for a maximum home size of 6,200 sq-ft.

See Table 1 below for a summary of the design criteria used.

Table 1. Water Design Criteria

WATER DESIGN CRITERIA		
Water Demands		
Land Use	Average Daily Flow (gpm)	
Prop. Development (<2 DU/ac Residential)	0.69	per unit
Water Design Criteria		
Peaking Factors		
Maximum Day	2.0	
Peak Hour	3.5	
Fire Flow		
Single Family Residential	1000	GPM
Max Allowable Home Size	6,200	Sq-Ft
Pressure Requirements		
Residual @ Highest Finished Floor Elevation	50-120	PSI
Fire Flow @ Hydrant Tee or Riser	30	PSI

The proposed development generates a peak demand of approximately 31.4 gpm. See Table 2 below for a summary of the existing and proposed flows generated on site.

Table 2. Water Demand Calculations

Water Demand Calculations					
Use	Units/ Rooms (#)	Unit Demand (gpm)	Average Daily Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)
Sonoran Sky	13	0.69	8.97	17.94	31.4

WATER SYSTEM ANALYSIS

The WaterCAD v8i water system modeling software distributed by Haestad Methods, Inc. was used to model the proposed water network.

The proposed water distribution system is modeled under four design scenarios. Average Day, Max Day, Peak Hour, and Max Day plus Fire Flow. Domestic demands based on the calculated demands from Table 2 were placed on the corresponding WaterCAD design Nodes.

A pump curve from the existing BPS 144 domestic pumps was used as the design for the Average Day, Max Day and Peak Hour scenarios. For the Max Day plus Fire Flow Scenario, the proposed upgrades fire pump was used.

upgraded

See Table 3 below for WaterCAD Junction Demands.

Table 3. WaterCAD Node Summary

WaterCAD Node	Existing/Proposed Ground Elevation	WaterCAD Elevation	Units	Average Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)	Fire Flow Demand (gpm)
J-1	2,886	2,886	0	0	0	0	1000
J-2	2,854	2,854	0	0	0	0	1000
J-5	2,835	2,835	2	1.38	2.76	4.83	1000
J-6	2,853	2,853	3	2.07	4.14	7.25	1000
J-7	2,918	2,918	0	0	0	0	1000
J-8	2,922	2,922	3	2.07	4.14	7.25	1000
J-9	2,897	2,897	2	1.38	2.76	4.83	1000
J-10	2,875	2,875	3	2.07	4.14	7.25	1000
J-11	2,860	2,860	0	0	0	0	1000
			13	8.97	17.94	31.4	

Demands are placed at the highest finished floor of the proposed building. For the Average Day, Max Day and Peak hour, the minimum residual pressure in the system should be maintained between above 50 PSI at the highest finished floor and below 120 PSI in the system. For the Fire Flow scenario, the required fire flow is applied to all nodes independently. In the Fire Flow scenario, the minimum residual pressure in the network should be maintained above 30 PSI at the hydrant tee and 15 PSI at the highest finished floor.

ANALYSIS RESULTS

Results from the water model indicated the proposed system is able to provide the required domestic and fire flows at or above the minimum required pressures. On-site water pressure in the three modeled scenarios are approximately 100-140 PSI at the highest finished floor of the proposed development. The pressure at the lowest elevation of the site exceeded 120 PSI and is in the range of 130-140 PSI adjacent to lots 9-10. While this is above the typical required pressure ranges, it would only be for two lots and approximately 400' of pipe. We would request that this be accepted as the alternative would require an additional PRV, which is a significant burden to serve only two lots. Each home in Scottsdale is required to provide an individual PRV at the service connection, so that the pressure in the homes would still operate in a typically accepted range. The main lines would be D.I.P.

Provide more explanation on the need for an additional PRV.
Does this mean a third PRV is needed to control pressures?

class 350 and would be fully restrained along the areas of pressure greater than 120 PSI for additional stability.

With the updated fire pump, the available Fire Flow in the Max Day is above 1,000 gpm at a residual pressure of 30 PSI. See Appendix B – WaterCAD Output complete analysis results. Appendix A – BPS 144 Pump Information

Appendix B – WaterCAD Output

- *Pump Supply Curve* not included
- *Average Day*
- *Max Day*
- *Peak Hour*
- *Max Day + Fire Flow*

FlexTable: Junction Table

Active Scenario: Average Day

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-1	2,868.00	0.0	3,197.15	142	Zone - 14
J-2	2,864.00	0.0	3,197.15	144	Zone - 14
J-5	2,840.00	1.4	3,039.07	86	Zone - 13A
J-6	2,853.00	2.1	3,039.07	81	Zone - 13A
J-7	2,918.00	0.0	3,039.07	52	Zone - 13A
J-8	2,922.00	2.1	3,039.07	51	Zone - 13A
J-9	2,897.00	1.4	3,039.07	61	Zone - 13A
J-10	2,875.00	2.1	3,039.07	71	Zone - 13A
J-11	2,860.00	0.0	3,039.07	77	Zone - 13A

Lowest finished floor elevation is 2830. Pressure at this elevation is 90.4 PSI.

FlexTable: Pipe Table

Active Scenario: Average Day

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	104	J-1	J-2	8.0	130.0	9.0	0.06	0.000
P-4	522	J-5	J-6	8.0	130.0	-1.4	0.01	0.000
P-6	596	J-6	J-7	8.0	130.0	5.5	0.04	0.000
P-7	401	J-7	J-8	8.0	130.0	2.1	0.01	0.000
P-8	407	J-7	J-9	8.0	130.0	3.5	0.02	0.000
P-9	332	J-9	J-10	8.0	130.0	2.1	0.01	0.000
P-10	322	J-10	J-11	8.0	130.0	0.0	0.00	0.000
P-12	25	R-2	PMP-2	42.0	130.0	9.0	0.00	0.000
P-13	32	PMP-2	J-1	42.0	130.0	9.0	0.00	0.000
P-5(1)	25	J-6	PRV-2	8.0	130.0	-9.0	0.06	0.000
P-5(2)	183	PRV-2	J-2	8.0	130.0	-9.0	0.06	0.000

FlexTable: PRV Table

Active Scenario: Average Day

Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)
PRV-2	2,854.10	6.0	0.000	3,038.94	80	9.0	3,197.15	3,039.07	158.07

FlexTable: Pump Table

Active Scenario: Average Day

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Design) (gpm)	Flow (Total) (gpm)	Head (Design) (ft)	Pump Head (ft)
PMP-2	2,868.00	2,868.00	3,197.15	50.0	9.0	274.00	329.15

FlexTable: Junction Table

Active Scenario: Max Day

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-1	2,868.00	0.0	3,191.62	140	Zone - 14
J-2	2,864.00	0.0	3,191.62	142	Zone - 14
J-5	2,840.00	2.8	3,039.07	86	Zone - 13A
J-6	2,853.00	4.1	3,039.07	81	Zone - 13A
J-7	2,918.00	0.0	3,039.07	52	Zone - 13A
J-8	2,922.00	4.1	3,039.07	51	Zone - 13A
J-9	2,897.00	2.8	3,039.07	61	Zone - 13A
J-10	2,875.00	4.1	3,039.07	71	Zone - 13A
J-11	2,860.00	0.0	3,039.07	77	Zone - 13A

FlexTable: Pipe Table

Active Scenario: Max Day

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	104	J-1	J-2	8.0	130.0	17.9	0.11	0.000
P-4	522	J-5	J-6	8.0	130.0	-2.8	0.02	0.000
P-6	596	J-6	J-7	8.0	130.0	11.0	0.07	0.000
P-7	401	J-7	J-8	8.0	130.0	4.1	0.03	0.000
P-8	407	J-7	J-9	8.0	130.0	6.9	0.04	0.000
P-9	332	J-9	J-10	8.0	130.0	4.1	0.03	0.000
P-10	322	J-10	J-11	8.0	130.0	0.0	0.00	0.000
P-12	25	R-2	PMP-2	42.0	130.0	17.9	0.00	0.000
P-13	32	PMP-2	J-1	42.0	130.0	17.9	0.00	0.000
P-5(1)	25	J-6	PRV-2	8.0	130.0	-17.9	0.11	0.000
P-5(2)	183	PRV-2	J-2	8.0	130.0	-17.9	0.11	0.000

FlexTable: PRV Table

Active Scenario: Max Day

Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)
PRV-2	2,854.10	6.0	0.000	3,038.94	80	17.9	3,191.62	3,039.07	152.54

FlexTable: Pump Table

Active Scenario: Max Day

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Design) (gpm)	Flow (Total) (gpm)	Head (Design) (ft)	Pump Head (ft)
PMP-2	2,868.00	2,868.00	3,191.62	50.0	17.9	274.00	323.62

FlexTable: Junction Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Zone
J-1	2,868.00	0.0	3,176.47	133	Zone - 14
J-2	2,864.00	0.0	3,176.46	135	Zone - 14
J-5	2,840.00	4.8	3,039.07	86	Zone - 13A
J-6	2,853.00	7.2	3,039.07	81	Zone - 13A
J-7	2,918.00	0.0	3,039.07	52	Zone - 13A
J-8	2,922.00	7.2	3,039.07	51	Zone - 13A
J-9	2,897.00	4.8	3,039.06	61	Zone - 13A
J-10	2,875.00	7.2	3,039.06	71	Zone - 13A
J-11	2,860.00	0.0	3,039.06	77	Zone - 13A

FlexTable: Pipe Table

Active Scenario: Peak Hour

Label	Length (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	104	J-1	J-2	8.0	130.0	31.4	0.20	0.000
P-4	522	J-5	J-6	8.0	130.0	-4.8	0.03	0.000
P-6	596	J-6	J-7	8.0	130.0	19.3	0.12	0.000
P-7	401	J-7	J-8	8.0	130.0	7.2	0.05	0.000
P-8	407	J-7	J-9	8.0	130.0	12.1	0.08	0.000
P-9	332	J-9	J-10	8.0	130.0	7.2	0.05	0.000
P-10	322	J-10	J-11	8.0	130.0	0.0	0.00	0.000
P-12	25	R-2	PMP-2	42.0	130.0	31.4	0.01	0.000
P-13	32	PMP-2	J-1	42.0	130.0	31.4	0.01	0.000
P-5(1)	25	J-6	PRV-2	8.0	130.0	-31.4	0.20	0.000
P-5(2)	183	PRV-2	J-2	8.0	130.0	-31.4	0.20	0.000

FlexTable: PRV Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)
PRV-2	2,854.10	6.0	0.000	3,038.94	80	31.4	3,176.46	3,039.07	137.39

FlexTable: Pump Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Design) (gpm)	Flow (Total) (gpm)	Head (Design) (ft)	Pump Head (ft)
PMP-2	2,868.00	2,868.00	3,176.47	50.0	31.4	274.00	308.47

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: Max Day + Fire Flow

Label	Elevation (ft)	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Zone
J-1	2,868.00	1,000.0	1,484.3	53	30	J-8	Zone - 14
J-2	2,864.00	1,000.0	1,475.2	55	30	J-8	Zone - 14
J-5	2,840.00	1,000.0	1,456.8	57	30	J-8	Zone - 13A
J-6	2,853.00	1,000.0	1,457.1	60	30	J-8	Zone - 13A
J-7	2,918.00	1,000.0	1,409.5	32	30	J-8	Zone - 13A
J-8	2,922.00	1,000.0	1,379.3	30	38	J-7	Zone - 13A
J-9	2,897.00	1,000.0	1,409.5	35	30	J-8	Zone - 13A
J-10	2,875.00	1,000.0	1,409.5	39	30	J-8	Zone - 13A
J-11	2,860.00	1,000.0	1,409.3	41	30	J-8	Zone - 13A

Appendix C – Fire Pump Upgrade

Customer Technical Offer

Customer	HENNESY MECHANICAL SALES, LLC	Size / Stages	12G - 6 stage / 6
Item number	001	Pump speed	1770 rpm
Customer reference		Quote number	12012021JP

Pump

Qty	Description
1	*12G - 6 stage*

Pump information

Pump parameters

ANSI / NSF61 & 372 Certified?: No

Pump parameters

Configuration: Complete pump

Replacement Pump: Fairbanks Nijhuis Replacement

Replacement Pump Type: Replacement Pump

Enter Pentair Serial Number: 1512879

Pentair Serial Number: 1512879

Hold For Approval: Yes

Record Submittal: Yes

Pump size and number of stages: 12G - 6 stage

Flow: 1000 USgpm

Head: 300 ft

Speed: 1770 RPM

Max H.P.(rated diameter): 96.78 hp

Bottom of Baseplate To CL Disch. Head Nozzle Height: 8.75 in

Head measured at: Bowl

Length strategy: Pump length without soleplate and No strainer

Pump length: 205.7 in

Overall Length: 205.75 in

Bowl to bowl connection: Flanged

Minimum Clearance below suction bell lip/case: 0.00 in

Sump depth: 205.75 in

Bowl material: Cast Iron A48 Class 30 Epoxy Coated Interior

Replacement Pump: Alert: Pricing is for budgetory purpose, AE review and approval is required prior to ordering the pump. Pricing may vary upon AE review.

Need verification from the manufacturer that Fairbank Nijhuis pumps are a replacement for and matches the the specifications of the old Fairbank Morse pump line that is included in Scottsdale's Approved Product List.

Bowl

Bowl assembly

Bowl model: 12G

Potable water service?: Yes

Impeller material: 316 SS

Bowl O-Ring Dry-pit: None

Impeller wear ring material: 316 SS

Bowl wear ring material: 416 SS

Keyed impeller: None

Impeller collet material: Stainless steel (A582 S416)

Bowl shaft diameter: 1-15/16"

Bowl shaft material: 416 SS (A582 Type 416)

Bowl shaft coupling material: 416 SS (A582 Type 416)

Bowl bearing material: Bismuth bronze alloy C89835

Dynamic balance of impellers: Standard

Bowl fastener material: Standard

Tapered Flanged Column [Col size x Tapered Col Size]: None

Suction and bowl discharge options

Suction type: Bell

Strainer type: None

Bowl Discharge case: Flanged

Pump

Qty	Description
	Bowl to Column connection: Flanged
	Column
	Column assembly
	Column length: 132.9 in
	Column type: Flanged
	Column diameter: 8"
	Column material: AWWA A53 Grade B Steel
	Column Wall Thickness: Schedule 30 Standard
	Column Sections
	Column length Criteria: 5 ft
	Column Sections (5 ft): 8" Column with Flanged Column Connection, 1-1/4" Open lineshaft, 5ft Column Section (3)
	Bearing Retainer: Standard
	Column Bolts: Standard
	Lineshaft
	Lineshaft type: Open
	Lineshaft lubrication: Product lube
	Lineshaft material: 416 SS
	Lineshaft diameter: 1-1/4"
	Lineshaft Section
	1-1/4" 416 Stainless Steel Lineshaft, 5ft Section
	Lineshaft bearing material: Neoprene Rubber
	Lineshaft Coupling Material: 416 SS
	Discharge head
	Discharge head options
	Discharge Head Type and Material: Type LS, Fabricated Steel
	End of Discharge Head Construction: Flanged
	Discharge Flange Head Rating: 300#
	Discharge Head Type and Size: 16.5 x 8 LS
	Variable Speed (Quadraped or Double Barrel Design): Not Required
	Shaft seal: Chesterton 155, Cartridge type Mechanical Seal
	Top Head Shaft Sleeve: None
	Drive Shaft Material: 416 SS
	Flanged Adjustable Coupling: Precision Non Spacer, 1.625-inch Max diameter
	Motor
	Motor details
	Motor Parameters
	Catalog: Click on "i" button to open PB500
	KW dimension (inches): 0.375"
	AH dimension (inches): 4.5"
	U dimension (inches): 0.375"
	Enter motor height dimension AG (inches): 0
	AG (inches): 0
	Coating
	Bowl Assembly Coating
	Enter maximum number of coats for Bowl Assembly: 1
	Surface Prep Bowl Assembly: SSPC-SP10, Near White Metal Blast Cleaning
	First Coat Bowl Assembly
	First Coat Coating area for Bowl Assembly: Exterior and Interior Different
	First Coat Exterior Coat Type for Bowl Assembly: Standard Tnemec N140
	First Coat Exterior Coat Color for Bowl Assembly: Standard 35GR Black
	First Coat Interior Coat Type for Bowl Assembly: Scotchkote 134
	First Coat Interior Coat Color for Bowl Assembly: Forest Green
	Column Assembly Coating
	Enter maximum number of coats for Column Assembly: 1
	Surface Prep Column Assembly: SSPC-SP10, Near White Metal Blast Cleaning

Pump

Qty	Description
	First Coat Column Assembly
	First Coat Coating area for Column Assembly: Exterior and Interior Same
	First Coat Exterior and Interior Coat Type for Column Assembly: Standard Tnemec N140
	First Coat Exterior and Interior Coat Color for Column Assembly: Black
	Discharge Head Coating
	Enter maximum number of coats for Discharge Head Assembly: 1
	Surface Prep Discharge Head: SSPC-SP6, Commercial Blast Cleaning
	First Coat Discharge Head
	First Coat Coating area for Discharge head assembly: Exterior and Interior Different
	First Coat Exterior Coat Type for Discharge head assembly: Standard Modified Alkyd Enamel
	First Coat Exterior Coat Color for Discharge head assembly: Pentair Blue
	First Coat Interior Coat Type for Discharge head assembly: Tnemec N140
	First Coat Interior Coat Color for Discharge head assembly: 35GR Black
	Nameplate
	Nameplate
	Stainless Steel Full Data Nameplate: No
	Testing
	Factory Testing- Bowl Assembly
	Hydrostatic Test (Bowl Assembly): None
	Shipping assembled pumps
	Shipping Assembled Pump
	Shipping Assembled Pumps: No
	Curve,Test logs, and Submittals
	Curve Approval, Certified Test Logs, and Submittals
	Curve Approval: No
	Certified Test Logs: No
	Submittals: Level 1 - Certified Curve, Setting Plan and Motor Data - Electronic (emailed pdf)
	Weight
	Weight
	Approx. Bowl Assembly Weight: 1135 lb / 514.83 kg
	Approx. Column and Lineshaft Assemblies Weight: 609 lb / 276.24 kg
	Approx. Discharge Head Weight: 366 lb / 166.02 kg
	Approx. Total Weight: 3710 lb / 1682.83 kg

Motor

Qty	Description
1	**Pump information**
	Pump parameters
	Pump parameters
	Variable Speed: No
	Motor
	Motor details
	Motor supplied by Pentair?: Yes
	Vendor Catalog: US Motors-PB500/FL600
	Is Motor installed in US?: Yes
	Air temperature above 104°F?: No
	Elevation above 3300 feet?: No
	Variable speed application?: No
	Voltage: 230/460V
	Enclosure: All
	Service factor: All
	Efficiency: Premium
	Driver: U.S. Motors, 100HP, 60 Hz, 1800 RPM, VSS, High thrust, 3 phase, Premium Efficiency, TEFC Enclosure, 1.00 Service factor, 230/460 Volts, 405VP Frame, 16.5 in. BD, PB500 Catalog, 7VM

Motor

Qty	Description
	Motor Parameters
	Horsepower: 100 HP
	Shaft type: Vertical solid shaft
	Synchronous speed: 1800 RPM
	Frequency: 60 hz
	Phase: Three
	Thrust: 4905.72 lbs
	Discharge head B.D. dimension (inches): 16.5"
	AK dimension (inches): 13.5"
	Motor Construction: TVS-4
	Coupling type: Non-reverse ratchet
	Class 1 Group D Hazard Location: No
	Inverter duty: No
	Extra-high thrust bearings: None
	Hardware material: Standard
	Balancing type: Standard
	Shaft ground ring: None
	Weight
	Weight
	Approx. Motor Weight: 1600 lb / 725.75 kg

Test

Qty	Description
1	Factory Hydrostatic Test- Column: None
	Factory Hydrostatic Test- Discharge Head: None

Special

Qty	Description
	Special Added Options
1	Motor adder for 50 Deg. C ambient Temp., and normally closed thermostats

Export Box

Qty	Description
1	Export Box Premium: No

PENTAIR

Customer :
Project name : Default

Pump Performance Datasheet

Encompass 2.0 - 21.4.1

Item number	: 001	Size	: 12G-SS
Service	:	Stages	: 6
Quantity	: 1	Based on curve number	: 12_TURB_2900_1800_SS Rev 180719
Quote number	: 626718	Date last saved	: 30 Nov 2021 2:23 PM

Operating Conditions

Flow, rated	: 1,000.0 USgpm
Differential head / pressure, rated (requested)	: 300.0 ft
Differential head / pressure, rated (actual)	: 300.6 ft
Suction pressure, rated / max	: 0.00 / 0.00 psi.g
NPSH available, rated	: Ample
Site Supply Frequency	: 60 Hz

Performance

Speed criteria	: Synchronous
Speed, rated	: 1770 rpm
Impeller diameter, rated	: 8.88 in
Impeller diameter, maximum	: 9.18 in
Impeller diameter, minimum	: 8.40 in
Efficiency (bowl / pump)	: 80.14 / - %
NPSH required / margin required	: 10.84 / 0.00 ft
nq (imp. eye flow) / S (imp. eye flow)	: 56 / 183 Metric units
Minimum Continuous Stable Flow	: 613.8 USgpm
Head, maximum, rated diameter	: 477.4 ft
Head rise to shutoff (bowl / pump)	: 58.82 / - %
Flow, best eff. point (bowl / pump)	: 1,003.5 / - USgpm
Flow ratio, rated / BEP (bowl / pump)	: 99.65 / - %
Diameter ratio (rated / max)	: 96.73 %
Head ratio (rated dia / max dia)	: 91.32 %
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
Selection status	: Acceptable

Liquid

Liquid type	: Water
Additional liquid description	:
Solids diameter, max	: 0.00 in
Solids diameter limit	: 0.75 in
Solids concentration, by volume	: 0.00 %
Temperature, max	: 68.00 deg F
Fluid density, rated / max	: 1.000 / 1.000 SG
Viscosity, rated	: 1.00 cP
Vapor pressure, rated	: 0.34 psi.a

Material

Material selected	: Cast Iron bowl Std impeller

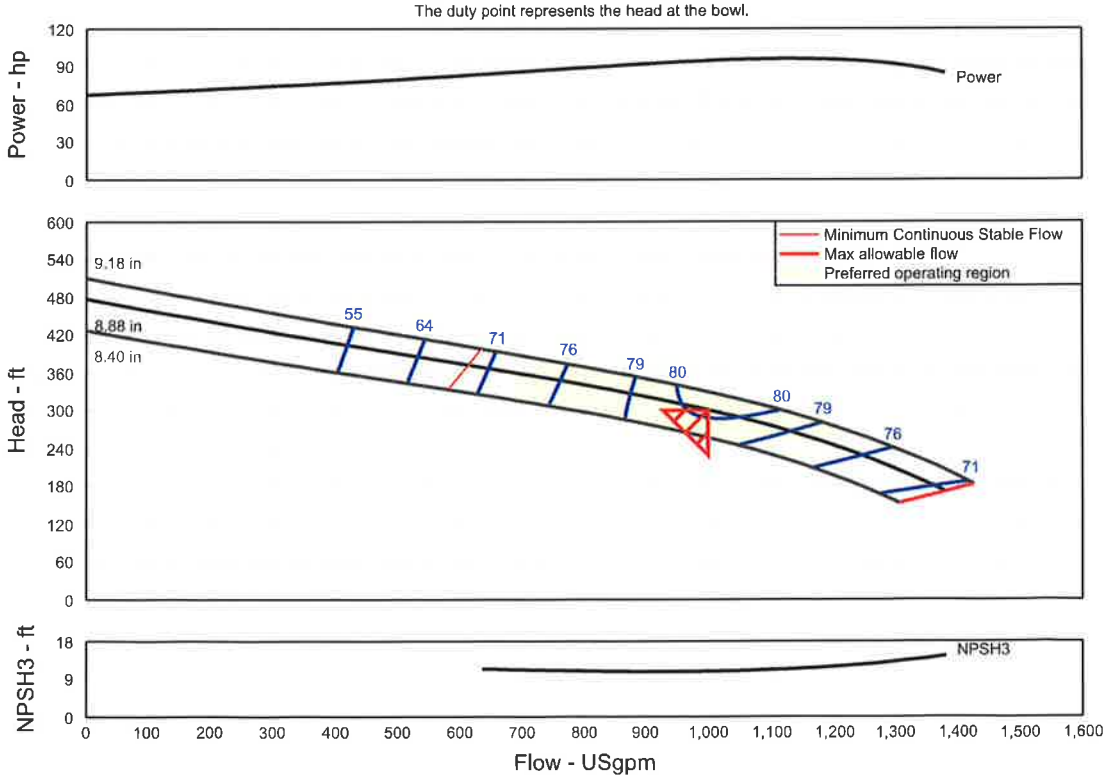
Pressure Data

Maximum working pressure	: See the Additional Data page
Maximum allowable working pressure	: See the Additional Data page
Maximum allowable suction pressure	: N/A
Hydrostatic test pressure	: See the Additional Data page

Driver & Power Data (@Max density)

Driver sizing specification	: Maximum power
Margin over specification	: 0.00 %
Service factor	: 1.15
Power, hydraulic	: 75.88 hp
Power (bowl / pump)	: 94.68 / - hp
Power, maximum, rated diameter	: 96.25 hp
Minimum recommended motor rating	: 100 hp / 74.57 kW

Bowl performance. Adjusted for construction and viscosity.
The duty point represents the head at the bowl.



PENTAIR

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