

**Drainage Reports**

**Abbreviated Water & Sewer Need Reports**

**Water Study**

**Wastewater Study**

**Stormwater Waiver Application**



## PRELIMINARY WATER REPORT

FOR

**"DISTRICT AT THE QUARTER"**

**NEC OF N. GREENWAY HAYDEN LOOP & N. DIAL BLVD  
SCOTTSDALE, MARICOPA COUNTY, ARIZONA**

PREPARED FOR:

**KAPLAN ACQUISITIONS, LLC  
7150 EAST CAMELBACK ROAD, SUITE 444  
SCOTTSDALE, MARICOPA COUNTY, ARIZONA 85251**



*Bradley Lingvai*  
Expires: 6/30/2018

PREPARED BY:

**BIG RED DOG ENGINEERING | CONSULTING, INC.  
2021 E. 5<sup>TH</sup> STREET SUITE 110  
AUSTIN, TEXAS 78702  
ARIZONA ENGINEERING FIRM NO. 19744  
BRD H001.008**

AUGUST 2016



H001.008

June 1, 2016

City of Scottsdale  
Planning and Development  
7447 E Indian School Rd  
Scottsdale, AZ 85251

*Accepted for*  
**City of Scottsdale  
Water Resources Administration  
9379 E. San Salvador  
Scottsdale, AZ 85258**

RE: Preliminary Engineering Reports  
District At Quarter  
NEC Greenway Hayden Loop & N Dial Blvd  
Scottsdale, Maricopa County, Arizona

*Doug Mann 10.13.16*

To Whom It May Concern:

Please let this letter and enclosed report serve as our formal Preliminary Basis of Design for the proposed development, District at the Quarter, at the northeast corner of N Greenway Hayden Loop and N Dial Boulevard. The proposed development will include the demolition of the existing structures followed by the construction of a  $\pm$  620 unit multi-story apartment complex which will be composed of (2) buildings wrapped around (2) structural parking garages along with all associated grading, drainage, utility, landscape, and hardscape improvements.

The subject site is currently zoned Industrial Park (I-1) and is in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently under as application numbers 3-GP-2016 and 8-ZN-2016.

The 1<sup>st</sup> round of comments from the aforementioned cases have been received by the owner and design team and have been addressed accordingly. From our correspondence, it is our understanding that the preliminary reports which were previously submitted by a different engineer did not receive any comments. However, since the reports have been submitted, the owner has changed architects and engineers on the design team. Because of this, and since the site plan has changed to address the aforementioned comments (including changing from a podium style deal to a wrap-style deal), we have prepared new reports under Big Red Dog.

Please feel free to contact me at 832-730-1901 or at [Patrick.Byrne@BIGREDDOG.com](mailto:Patrick.Byrne@BIGREDDOG.com) if you have any questions or concerns in regards to the information contained herein.. We appreciate you working with us as we move forward with the associated development.

Sincerely,

**BIG RED DOG Engineering | Consulting**  
Texas Engineering Firm No. F-15415

Patrick Byrne  
Principal



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## A. INTRODUCTION

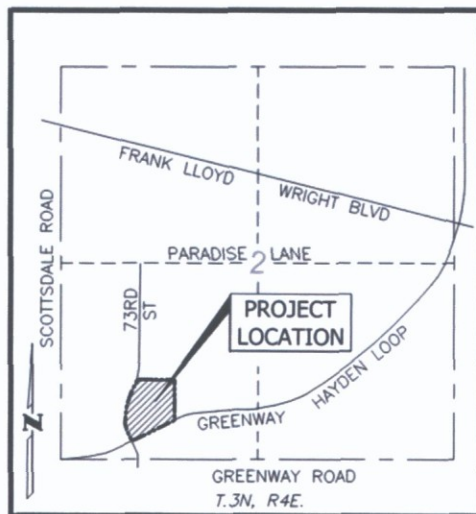
H001.008

### 1. Site Location / Description

The subject site associated with this Preliminary Water Report is for a proposed development, District at the Quarter, located at the northeast corner of N. Greenway Hayden Loop and N. Dial Blvd., in the Full Purpose Limits of the City of Scottsdale, AZ (see vicinity map and aerial below). The ±8.84 acre site is currently developed with a ±129,689 SF Office Building / Warehouse space, with associated utilities, desert landscaping, roadways and 4 retention ponds located throughout the site.

The proposed development will include the demolition of all existing structures followed by the construction of a ±620 unit multi-story apartment complex which will be composed of (2) buildings wrapped around (2) structural parking garages along with all associated grading, drainage, utility, landscape, and hardscape improvements.

The subject site is currently zoned Industrial Park (I-1) and is in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently underway as application numbers 3-GP-2016 and 8-ZN-2016.



### 2. Purpose / Objective

The purpose of this Preliminary Water Report is to identify and analyze the existing and proposed water demand and system conditions and characteristics as they relate to the proposed development.



## B. DESIGN DOCUMENTATION

### 1. Design Criteria

District at the Quarter is to be designed to meet the requirements of the following:

- *City of Scottsdale Design Standard and Policies Manual (2010)*
- *MAG Uniform Standard Specifications for Public Work Construction (2016 Rev. to 2015 Ed.)*
- *City of Scottsdale Supplement to MAG Uniform Standard Specifications for Public Work Construction (2015)*
- *International Fire Code (2012)*

### 2. Methodology & Software

The proposed water system for District at the Quarter was modeled using WaterCAD version 8i. The model was set up and analyzed based on the impact of the proposed water demand on the existing conditions observed from the existing conditions fire flow test. The proposed water system (Phase II) is designed to be looped and running along the northern and eastern property lines under the proposed fire lane within a proposed 20' public water line easement per COS requirement. The proposed water system is to be connected to the existing 12" PVC water line located at the south of the site and the existing 12" APC water line located west of the site.

The proposed development, District at the Quarter, consists of two 4-stories buildings; Building I is 107,982 sf and Building II is 124,021 sf. The area of the largest building is used to calculate the fire flow area. The fire flow area was calculated bases on the sum of the floor areas of all floors and the calculated fire flow area was used to determine the fire flow demand by referencing the 2012 IFC – B105.1. The **Table 1.0** below provides the Fire Flow Calculation.

**Table 1.0 – Fire Flow Calculation**

		Description
Building I		107,982 SF
Building II		124,021 SF
Largest Building		Building II
<b>Building II</b>		
Floor Level	Building Construction Type	Floor Area
1 <sup>st</sup> Floor	I-A	27,150 SF
2 <sup>nd</sup> Floor	I-A	27,150 SF
3 <sup>rd</sup> Floor	I-A	27,150 SF
4 <sup>th</sup> Floor	I-A	27,150 SF
1 <sup>st</sup> Floor	V-A	96,871 SF
2 <sup>nd</sup> Floor	V-A	96,871 SF
3 <sup>rd</sup> Floor	V-A	96,871 SF
4 <sup>th</sup> Floor	V-A	96,871 SF
Total Fire Flow Area =		496,084 SF
Fire Flow Demand (2012 IFC – B105.1) =		8,000 gpm
Fire Flow Demand (75% Allowed Reduction) =		2,000 gpm





A pump (PMP-1) is set up to replicate the existing water pressure on the project site based on the Hydrant Flow Test Report by Arizona Flow Testing, LLC in the water model. Four different simulations of the water model were generated as required by the COS DSPM (2010). The **Table 2.0** below provides the description of each simulation. The *Reports and Diagrams* have been included in the Appendix as **Exhibit 2**.

**Table 2.0 – Water Model Simulations**

	<u>Description</u>
<b>Average Day Demand</b>	Calculated the Average Day Demand of the entire site using Figure 6.1-2 COS DSPM (2010). The demand is assigned to the junction, J-5, which is the furthest junction from the water source.
<b>Maximum Day Demand</b>	Calculated the Maximum Day Demand of the entire site using 2 times the Average Day Demand. The demand is assigned to the junction, J-5, which is the furthest junction from the water source.
<b>Peak Hour Demand</b>	Calculated the Peak Hour Demand of the entire site using 3.5 times the Average Day Demand. The demand is assigned to the junction, J-5, which is the furthest junction from the water source.
<b>Maximum Day Demand with Fire Flow</b>	Calculated the Maximum Day Demand with Fire Flow of the entire site using the Maximum Day Demand plus the Fire-Flow Demand for the largest building. . The demand is assigned to the junction, J-5, which is the furthest junction from the water source.

### C. EXISTING CONDITIONS

#### 1. Zoning / Land Use

The 8.84 acre site is currently zoned (I-1) Industrial Park district and is currently developed with a ± 129,689 SF office building / warehouse, with all associated parking, desert landscaping , utilities, and Stormwater retention ponds. The site is currently in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently underway as applications numbers 3-GP-2016 and 8-ZN-2016.

#### 2. Topography / Vegetation/ Landforms

The site is currently fully developed and operating as a 129,689 SF mixed office/warehouse building with all associated parking, desert landscape areas, utilities, and Stormwater retention ponds. The site currently drains from the northeast to the southwest, and eventually into one of four retention ponds located throughout the property.

#### 3. Location / Description of Utilities

The City of Scottsdale is the water provider for the subject site. There is an existing 12” APC water line located west of the site within N. Dial Boulevard and an existing 12” PVC water line located at the south of the site within E. Greenway Hayden Loop. The 12” APC domestic water service lead for the existing development is connecting to the 12” ACP water line within N. Dial Boulevard. There are existing water valves on both existing water lines which help minimize the water stoppage area during construction. Reference the *Existing Conditions* in the Appendix as **Exhibit 3**.



**4. Fire Flow Results**

A hydrant flow test was performed by Arizona Flow Testing, LLC on December 8, 2015. The flow test was being conducted at the northeast corner of North Greenway Hayden Loop and N. Dial Boulevard. The **Table 1.0** below provides the flow test data with 12 PSI safety factor. The *Hydrant Flow Test Report* is included in the Appendix as **Exhibit 4**.

**Table 1.0 – Flow Test Data (with 12 PSI Safety Factor)**

Static Pressure =	72.0 PSI
Residual Pressure =	48.0 PSI
Flowing GPM =	2,866 GPM
Maximum Day Demand with Fire Flow =	4,351 GPM

**D. PROPOSED CONDITIONS**

**1. Utility Layout**

The proposed project will be constructed in phases (Phase I and Phase II). Each phase is being designed to function independently in regards to all utility services.

Phase I will include the building and garage at the southwest corner of the site. Water service is available to Phase I of the project from the existing 12" APC water line within N Dial Boulevard and/or an existing 12" PVC water line within E Greenway Hayden Loop. No public water lines are proposed with Phase I with exception to a hydrant at the southeast corner of the proposed building. This hydrant will insure the proposed fire lane which will be built as part of Phase I will comply with fire hydrant spacing requirements (1 hydrant every 700 LF). This aforementioned hydrant will obtain service from the 12" PVC water line within E Greenway Hayden Loop and will be located within an easement accordingly. With the addition of this hydrant, as well as the existing hydrants along E Greenway Hayden Loop and N Dial Blvd, there will be adequate fire protection for all of Phase I.

In order to comply with hydrant spacing requirements, Phase II will require a 12" ductile iron public water line be extended within the fire lane on the north and east sides of the development. Two connections will be proposed to form a loop from the existing mains within the ROW. The first connection will be to the existing 12" PVC pipe near the southeast corner of the site within Greenway Hayden Loop and the second connection will be the existing 12" ACP located at the northwest corner of the site within N. Dial Boulevard. The proposed 12" water line will be located within a proposed 20' water line easement along with proposed 8" sanitary sewer line.

There will be two water line connections for the proposed development, District at the Quarter, and the proposed water line is designed to be 12" Ductile Iron Pipe. The first connection is to the existing 12" PVC Pipe located at the southeast corner of the site on Greenway Hayden Loop and the





second connection is to the existing 12" ACP Pipe located at the northwest corner of the site on N. Per Section B.2, the area of the largest building (Building II) is used to calculate the fire flow area. The fire flow area was calculated bases on the sum of the floor areas of all doors and the calculated fire flow area was used to determine the fire flow demand by referencing the 2012 IFC – B105.1.

The final submittal will provide the service connections, domestic and landscape meter, fire riser room, and the locations and size of the fire line. The *Preliminary Water Line Plan* has been included in the Appendix as **Exhibit 5**.

**2. Water Zone**

The project site is located within Pressure Zone 3 per Figure 6.1-3 Pressure Zone Map in the COS DSPM (2010).

**3. Maintenance**

The proposed water system is designed to be public and the City of Scottsdale is to be fully responsible for any maintenance for the system. Once meter locations are proposed and finalized, the project owner will be responsible for all improvements after the associated water meters.

**E. COMPUTATIONS**

**1. Water Demand for Existing Development**

The land use for existing development is considered as industrial and office use. Based on Figure 6.1-2 in the COS DSPM (2010), the demand for the industrial use is 1,027  $\frac{gpd}{acre}$  and the demand for the office use is 0.6  $\frac{gpd}{sf}$ .

**Average Day Demand**

Figure 6.1-2 COS DSPM (2010)

$$\begin{aligned} &= \left( \frac{gpd}{acres} \times acres \right) + \left( \frac{gpd}{sf} \times sf \right) \\ &= (1,027 \times 8.34) + (0.6 \times 129,689) \\ &= \mathbf{86,892\ gpd\ or\ 60.34\ gpm} \end{aligned}$$

**Maximum Day Demand**

Section 6-1.404 COS DSPM (2010)

$$\begin{aligned} &= 2 \times \text{Average Day Demand (gpd)} \\ &= 2 \times 86,892 \\ &= \mathbf{173,784\ gpd\ or\ 120.68\ gpm} \end{aligned}$$

**Peak Hour Demand**

Section 6-1.404 COS DSPM (2010)

$$\begin{aligned} &= 3.5 \times \text{Average Day Demand (gpd)} \\ &= 3.5 \times 86,892 \\ &= \mathbf{304,122\ gpd\ or\ 211.20\ gpm} \end{aligned}$$



**Maximum Day Demand with Fire Flow**

Fire Flow  
 (75% Allowed deduction per 2012 IFC – B105.2)  
 (Type IB Building)

$$= \text{Fire Flow (gpm)} \times 75\%$$

$$= 6,000 \times 75\%$$

$$= \mathbf{1,500 \text{ gpm}}$$

**Maximum Day Demand with Fire Flow**

$$= \text{Maximum Day Demand (gpm)} + \text{Fire Flow(gpm)}$$

$$= 121 + 1,500$$

$$= \mathbf{1,621 \text{ gpm}}$$

**2. Water Demand for Proposed Development**

The proposed development, District at the Quarter, consist a multi-family apartment with 620 units, 5,000 SF of restaurant and 14,873 SF of commercial. The land use is considered as “High Density Condominium/Residential”, “Restaurant” and the demand is 185.3  $\frac{\text{gal}}{\text{unit}}$  based on Figure 6.1-2 in the COS DSPM (2010).

**Average Day Demand**

Figure 6.1-2 COS DSPM (2010)

$$= \left( \frac{\text{gpd}}{\text{unit}} \times \text{units} \right) + \left( \frac{\text{gpd}}{\text{sf}} \times \text{sf} \right) + \left( \frac{\text{gpd}}{\text{sf}} \times \text{sf} \right)$$

$$= (185.3 \times 620) + (1.3 \times 5,000) + (0.8 \times 14,873)$$

$$= \mathbf{133,284 \text{ gpd or } 92.58 \text{ gpm}}$$

**Maximum Day Demand**

Section 6-1.404 COS DSPM (2010)

$$= 2 \times \text{Average Day Demand (gpd)}$$

$$= 2 \times 133,284$$

$$= \mathbf{266,568 \text{ gpd or } 185.15 \text{ gpm}}$$

**Peak Hour Demand**

Section 6-1.404 COS DSPM (2010)

$$= 3.5 \times \text{Average Day Demand (gpd)}$$

$$= 3.5 \times 133,284$$

$$= \mathbf{466,494 \text{ gpd or } 324.02 \text{ gpm}}$$

**Maximum Day Demand with Fire Flow**

Fire Flow  
 (75% Allowed deduction per 2012 IFC – B105.2)



(Type IA and V-A Building)  
 = Fire Flow (gpm) × 75%  
 = 8,000 × 75%  
 = **2,000 gpm**

Maximum Day Demand with Fire Flow

= Maximum Day Demand (gpm) + Fire Flow(gpm)  
 = 185 + 2,000  
 = **2,185 gpm**

**Table 3.0 - Demand Comparison: Existing Development vs. Proposed Development**

	<u>Existing Development</u> (gpm)	<u>Proposed Development</u> (gpm)
Average Day Demand	60.34	92.58
Maximum Day Demand	120.68	185.15
Peak Hour Demand	211.20	324.02
Maximum Day Demand with Fire Flow	1,622.00	2,185.15

## F. SUMMARY

The proposed water system for the District at the Quarter is designed to meet all the city’s design standards and policies. Phase I of the development will include the installation of (1) new fire hydrant and the associated service taps/meters. Phase II will include the installation of a second hydrant as well as ± 1035 LF of 12” Ductile Iron Pipe which will form a loop between the 12” PVC water line within North Greenway Hayden Loop and the 12” APC water line located within N. Dial Blvd. The water model hydraulic results show all pressures and head losses meet the City of Scottsdale’s Design and Policy Requirements.

**Table 2.0 - Water Model Hydraulic Results**

	<u>Proposed Condition</u>	<u>City of Scottsdale</u> <u>Design Requirements</u>	<u>Criteria Met</u> <u>(Y or N)</u>
Minimum Residual Pressure (Average Day Demand)	70 psi	50 psi (Min.)	Y
Maximum Static Pressure (Average Day Demand)	74 psi	120 psi (Max.)	Y
Minimum Pressure (Maximum Day Demand with Fire Flow)	54 psi	30 psi (Min.)	Y
Maximum Headloss (Maximum Day Demand with Fire Flow)	8.69 ft / 1,000 ft	10 ft / 1,000 ft	Y



In summary, due to the change in use from office space to dense residential, the proposed water demand for the District at the Quarter is higher than the existing conditions. However, the proposed water system is designed to meet the pressure requirements in Section 6-1.406 COS DSPM (2010).

## H. References

- City of Scottsdale Design Standard and Policies Manual – January 2010
- MAG Uniform Standard Specifications for Public Work Construction – January 2016
- City of Scottsdale Supplement to MAG Uniform Standard Specifications for Public Work Construction - 2015
- International Fire Code - 2012





## Aerial Map | 1









## Existing Conditions | 2



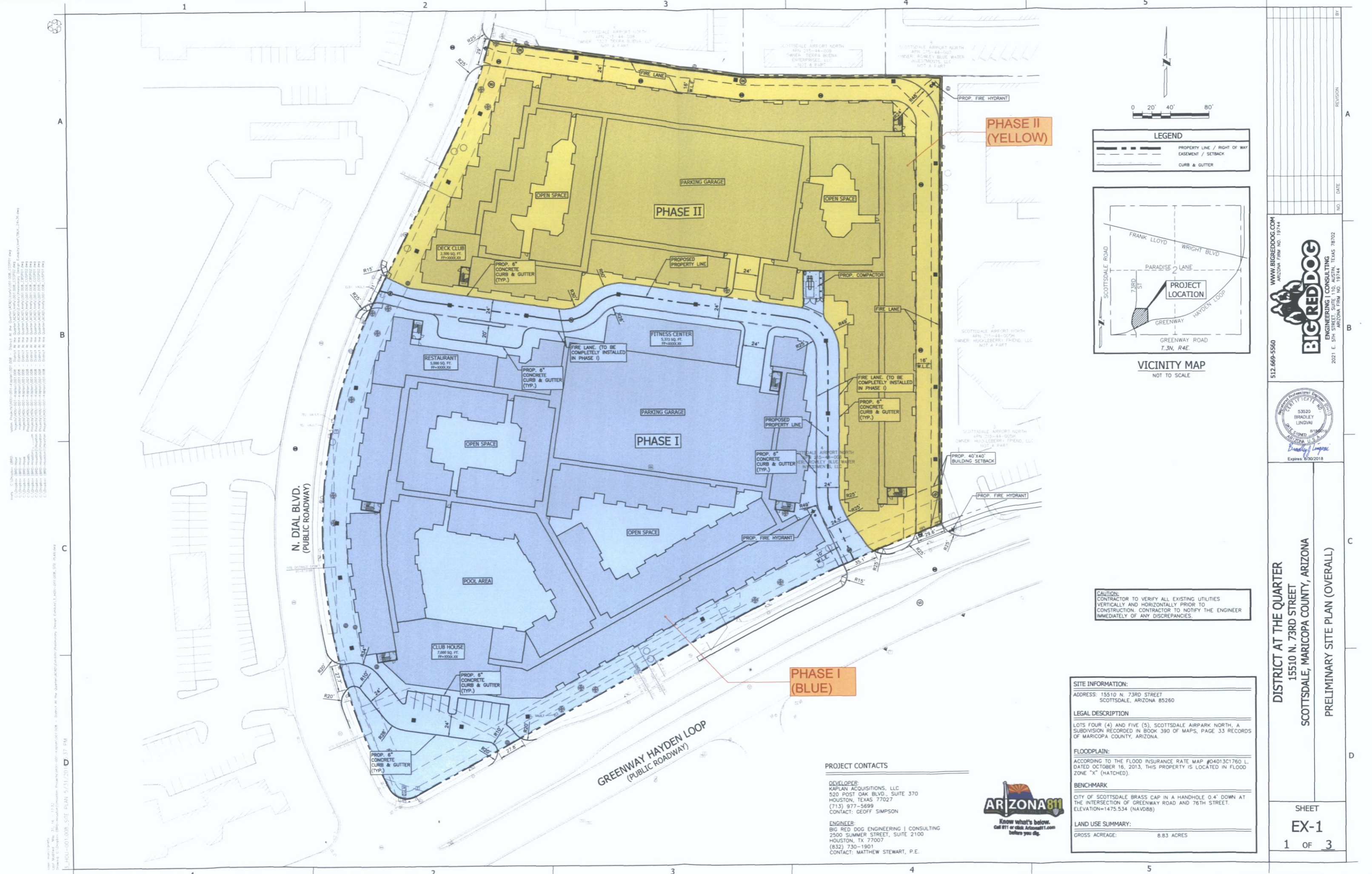






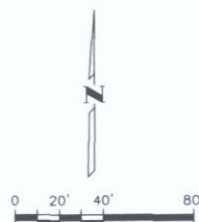
## Overall Site Plan & Phasing Plan | 3





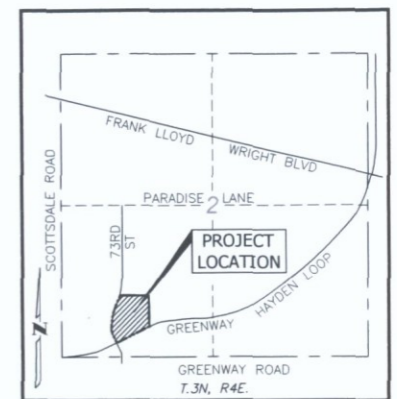
**PHASE II (YELLOW)**

**PHASE I (BLUE)**



**LEGEND**

	PROPERTY LINE / RIGHT OF WAY
	EASEMENT / SETBACK
	CURB & GUTTER



**CAUTION:**  
CONTRACTOR TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

**SITE INFORMATION:**  
ADDRESS: 15510 N. 73RD STREET  
SCOTTSDALE, ARIZONA 85260

**LEGAL DESCRIPTION:**  
LOTS FOUR (4) AND FIVE (5), SCOTTSDALE AIRPARK NORTH, A SUBDIVISION RECORDED IN BOOK 390 OF MAPS, PAGE 33 RECORDS OF MARICOPA COUNTY, ARIZONA.

**FLOODPLAIN:**  
ACCORDING TO THE FLOOD INSURANCE RATE MAP #04013C1760 L, DATED OCTOBER 16, 2013, THIS PROPERTY IS LOCATED IN FLOOD ZONE "X" (HATCHED).

**BENCHMARK:**  
CITY OF SCOTTSDALE BRASS CAP IN A HANDHOLE 0.4' DOWN AT THE INTERSECTION OF GREENWAY ROAD AND 76TH STREET. ELEVATION=1475.534 (NAVD88)

**LAND USE SUMMARY:**  
GROSS ACREAGE: 8.83 ACRES

**PROJECT CONTACTS**

**DEVELOPER:**  
KAPLAN ACQUISITIONS, LLC  
520 POST OAK BLVD., SUITE 370  
HOUSTON, TEXAS 77027  
(713) 977-5699  
CONTACT: GEOFF SIMPSON

**ENGINEER:**  
BIG RED DOG ENGINEERING | CONSULTING  
2500 SUMMER STREET, SUITE 2100  
HOUSTON, TX 77007  
(832) 730-1901  
CONTACT: MATTHEW STEWART, P.E.



512.669.5560  
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ARIZONA FIRM NO. 19744

**BIGREDDOG**  
ENGINEERING | CONSULTING  
2021 E. 5TH STREET, SUITE 110, AUSTIN, TEXAS 78702  
ARIZONA FIRM NO. 19744



**DISTRICT AT THE QUARTER**  
15510 N. 73RD STREET  
SCOTTSDALE, MARICOPA COUNTY, ARIZONA

**PRELIMINARY SITE PLAN (OVERALL)**

SHEET  
**EX-1**  
1 OF 3

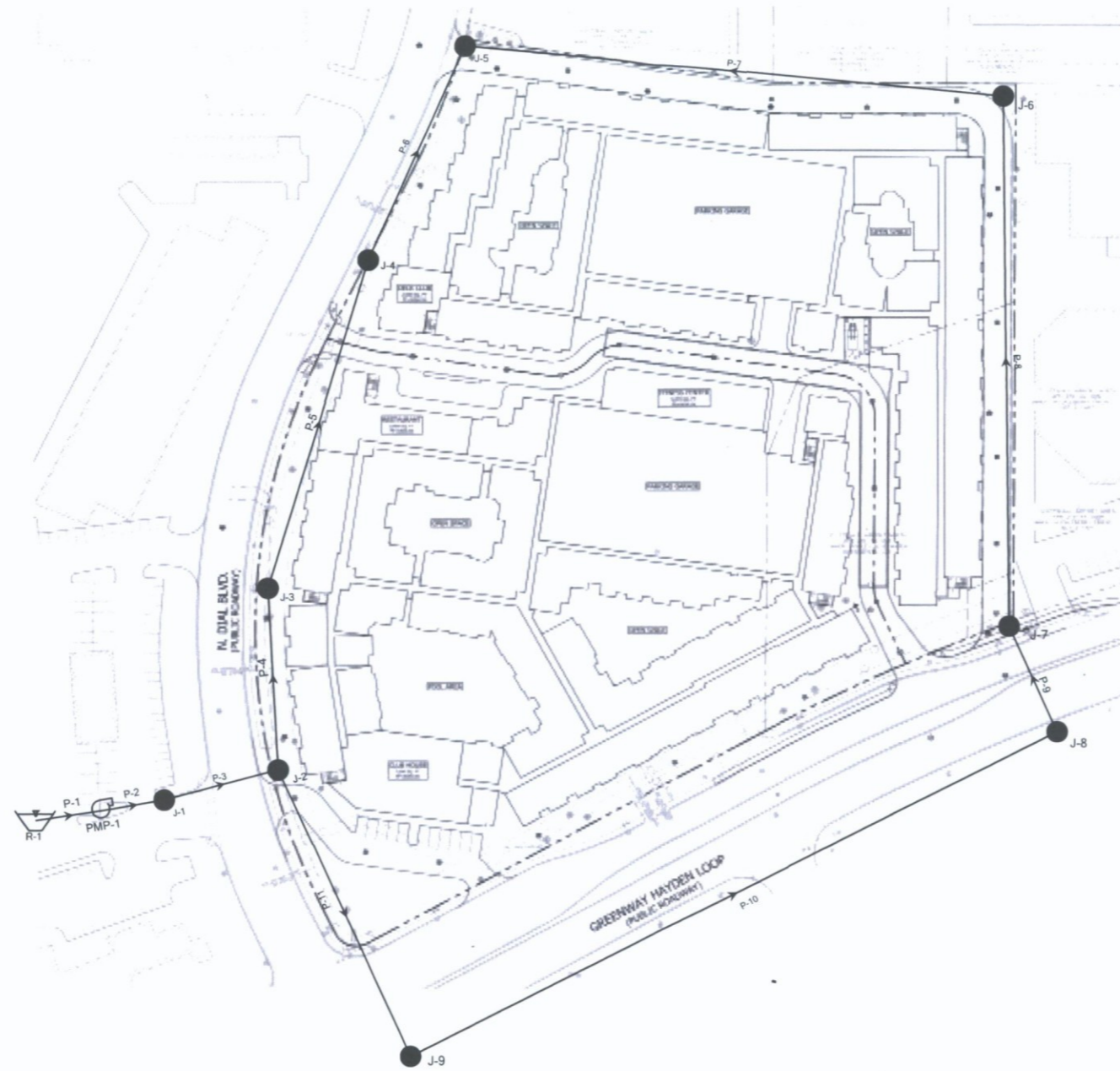
Vertical Project: 15510 N. 73RD STREET - District at the Quarter (ACAD) (Civil/Preliminary) Design: 5/31/2018 3:37 PM  
Horizontal Project: 15510 N. 73RD STREET - District at the Quarter (ACAD) (Civil/Preliminary) Design: 5/31/2018 3:37 PM  
User: mstewart  
Plot: 15510 N. 73RD STREET - DISTRICT AT THE QUARTER (ACAD) (Civil/Preliminary) Design: 5/31/2018 3:37 PM





## Reports & Diagram | 4

### FlexTable: Juntion Table (Average Day Demand)



## FlexTable: Reservoir Table (Average Day Demand)

Current Time: 0.000 hours

Label	Elevation (ft)	Hydraulic Grade (ft)	Flow (In net) (gpm)	Flow (Out net) (gpm)
R-1	1,480.00	1,480.00	-93	93

## FlexTable: Junction Table (Average Day Demand)

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,480.00	0	1,646.20	72
J-2	1,479.25	0	1,646.20	72
J-3	1,480.00	0	1,646.20	72
J-4	1,480.00	0	1,646.20	72
J-5	1,484.50	93	1,646.19	70
J-6	1,484.36	0	1,646.20	70
J-7	1,480.64	0	1,646.20	72
J-8	1,480.00	0	1,646.20	72
J-9	1,475.80	0	1,646.20	74

## FlexTable: Pipe Table (Average Day Demand)

Current Time: 0.000 hours

Label	Diameter (in)	Length (User Defined) (ft)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	48.0	1	Glass	140.0	93	0.02	0.00	0.000
P-2	48.0	1	Glass	140.0	93	0.02	0.00	0.000
P-3	100.0	1	Asbestos Cement	140.0	93	0.00	0.00	0.000
P-4	12.0	179	Asbestos Cement	140.0	74	0.21	0.00	0.018
P-5	12.0	300	Asbestos Cement	140.0	74	0.21	0.01	0.018
P-6	12.0	215	Asbestos Cement	140.0	74	0.21	0.00	0.018
P-7	8.0	467	Ductile Iron	130.0	-18	0.12	0.01	0.011
P-8	8.0	473	Ductile Iron	130.0	-18	0.12	0.01	0.011
P-9	8.0	91	Ductile Iron	130.0	-18	0.12	0.00	0.011
P-10	12.0	633	PVC	150.0	-18	0.05	0.00	0.001
P-11	12.0	266	Asbestos Cement	140.0	-18	0.05	0.00	0.001



## FlexTable: Reservoir Table (Maximum Day Demand)

Current Time: 0.000 hours

Label	Elevation (ft)	Hydraulic Grade (ft)	Flow (In net) (gpm)	Flow (Out net) (gpm)
R-1	1,480.00	1,480.00	-185	185

## FlexTable: Junction Table (Maximum Day Demand)

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,480.00	0	1,645.95	72
J-2	1,479.25	0	1,645.95	72
J-3	1,480.00	0	1,645.94	72
J-4	1,480.00	0	1,645.92	72
J-5	1,484.50	185	1,645.91	70
J-6	1,484.36	0	1,645.93	70
J-7	1,480.64	0	1,645.95	72
J-8	1,480.00	0	1,645.95	72
J-9	1,475.80	0	1,645.95	74

## FlexTable: Pipe Table (Maximum Day Demand)

Current Time: 0.000 hours

Label	Diameter (in)	Length (User Defined) (ft)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	48.0	1	Glass	140.0	185	0.03	0.00	0.000
P-2	48.0	1	Glass	140.0	185	0.03	0.00	0.000
P-3	100.0	1	Asbestos Cement	140.0	185	0.01	0.00	0.000
P-4	12.0	179	Asbestos Cement	140.0	149	0.42	0.01	0.065
P-5	12.0	300	Asbestos Cement	140.0	149	0.42	0.02	0.065
P-6	12.0	215	Asbestos Cement	140.0	149	0.42	0.01	0.065
P-7	8.0	467	Ductile Iron	130.0	-37	0.23	0.02	0.040
P-8	8.0	473	Ductile Iron	130.0	-37	0.23	0.02	0.040
P-9	8.0	91	Ductile Iron	130.0	-37	0.23	0.00	0.039
P-10	12.0	633	PVC	150.0	-37	0.10	0.00	0.004
P-11	12.0	266	Asbestos Cement	140.0	-37	0.10	0.00	0.005



## FlexTable: Reservoir Table (Peak Hour Demand)

Current Time: 0.000 hours

Label	Elevation (ft)	Hydraulic Grade (ft)	Flow (In net) (gpm)	Flow (Out net) (gpm)
R-1	1,480.00	1,480.00	-324	324

## FlexTable: Junction Table (Peak Hour Demand)

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,480.00	0	1,645.33	72
J-2	1,479.25	0	1,645.33	72
J-3	1,480.00	0	1,645.29	72
J-4	1,480.00	0	1,645.24	71
J-5	1,484.50	324	1,645.20	70
J-6	1,484.36	0	1,645.25	70
J-7	1,480.64	0	1,645.30	71
J-8	1,480.00	0	1,645.31	72
J-9	1,475.80	0	1,645.32	73

## FlexTable: Pipe Table (Peak Hour Demand)

Current Time: 0.000 hours

Label	Diameter (in)	Length (User Defined) (ft)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	48.0	1	Glass	140.0	324	0.06	0.00	0.000
P-2	48.0	1	Glass	140.0	324	0.06	0.00	0.000
P-3	100.0	1	Asbestos Cement	140.0	324	0.01	0.00	0.000
P-4	12.0	179	Asbestos Cement	140.0	260	0.74	0.03	0.182
P-5	12.0	300	Asbestos Cement	140.0	260	0.74	0.05	0.183
P-6	12.0	215	Asbestos Cement	140.0	260	0.74	0.04	0.182
P-7	8.0	467	Ductile Iron	130.0	-64	0.41	0.05	0.112
P-8	8.0	473	Ductile Iron	130.0	-64	0.41	0.05	0.112
P-9	8.0	91	Ductile Iron	130.0	-64	0.41	0.01	0.113
P-10	12.0	633	PVC	150.0	-64	0.18	0.01	0.012
P-11	12.0	266	Asbestos Cement	140.0	-64	0.18	0.00	0.013



## FlexTable: Reservoir Table (Maximum Day Demand with Fire Flow)

Current Time: 0.000 hours

Label	Elevation (ft)	Hydraulic Grade (ft)	Flow (In net) (gpm)	Flow (Out net) (gpm)
R-1	1,480.00	1,480.00	-2,185	2,185

## FlexTable: Juntion Table (Maximum Day Demand with Fire Flow)

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,480.00	0	1,612.79	57
J-2	1,479.25	0	1,612.79	58
J-3	1,480.00	0	1,611.67	57
J-4	1,480.00	0	1,609.79	56
J-5	1,484.50	2,185	1,608.45	54
J-6	1,484.36	0	1,610.24	54
J-7	1,480.64	0	1,612.06	57
J-8	1,480.00	0	1,612.41	57
J-9	1,475.80	0	1,612.66	59

## FlexTable: Pipe Table (Maximum Day Demand with Fire Flow)

Current Time: 0.000 hours

Label	Diameter (in)	Length (User Defined) (ft)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	48.0	1	Glass	140.0	2,185	0.39	0.00	0.000
P-2	48.0	1	Glass	140.0	2,185	0.39	0.00	0.000
P-3	100.0	1	Asbestos Cement	140.0	2,185	0.09	0.00	0.000
P-4	12.0	179	Asbestos Cement	140.0	1,754	4.98	1.12	6.257
P-5	12.0	300	Asbestos Cement	140.0	1,754	4.98	1.88	6.257
P-6	12.0	215	Asbestos Cement	140.0	1,754	4.98	1.35	6.257
P-7	8.0	467	Ductile Iron	130.0	-431	2.75	1.79	3.841
P-8	8.0	473	Ductile Iron	130.0	-431	2.75	1.82	3.841
P-9	8.0	91	Ductile Iron	130.0	-431	2.75	0.35	3.841
P-10	12.0	633	PVC	150.0	-431	1.22	0.26	0.409
P-11	12.0	266	Asbestos Cement	140.0	-431	1.22	0.12	0.464



# Arizona Flow Testing LLC

## HYDRANT FLOW TEST REPORT

Project Name: District at the Quarter  
Project Address: Greenway Hayden & 73rd Street, Scottsdale, Arizona, 85260  
Arizona Flow Testing Project No.: 15158  
Client Project No.: 4686  
Flow Test Permit No.: C49288  
Date and time flow test conducted: December 8, 2015 at 8:30 AM  
Data is current and reliable until: June 8, 2016  
Conducted by: Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)  
Witnessed by: Phil Cipolla –City of Scottsdale-Inspector (602-828-0847)

### Raw Test Data

Static Pressure: **84.0 PSI**  
(Measured in pounds per square inch)

Residual Pressure: **60.0 PSI**  
(Measured in pounds per square inch)

Pitot Pressure: **23.0 PSI (2½- inch)**  
**23.0 PSI (4-inch)**  
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One (2 ½-inch)  
(Measured in inches) One (4-inch)

Coefficient of Diffuser: .9

Flowing GPM: **2,866 GPM**  
(Measured in gallons per minute)  
805 GPM + 2,061 GPM = 2,866GPM

GPM @ 20 PSI: **4,867 GPM**

### Data with 12 PSI Safety Factor

Static Pressure: **72.0 PSI**  
(Measured in pounds per square inch)

Residual Pressure: **48.0 PSI**  
(Measured in pounds per square inch)

Distance between hydrants: Approx. 200 Feet

Main size: Not Provided

Flowing GPM: **2,866 GPM**

GPM @ 20 PSI: **4,351 GPM**

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

### Flow Test Location

North ↑





## Preliminary Water Line Plan | 5

EX – 1 | OVERALL WATER LAYOUT

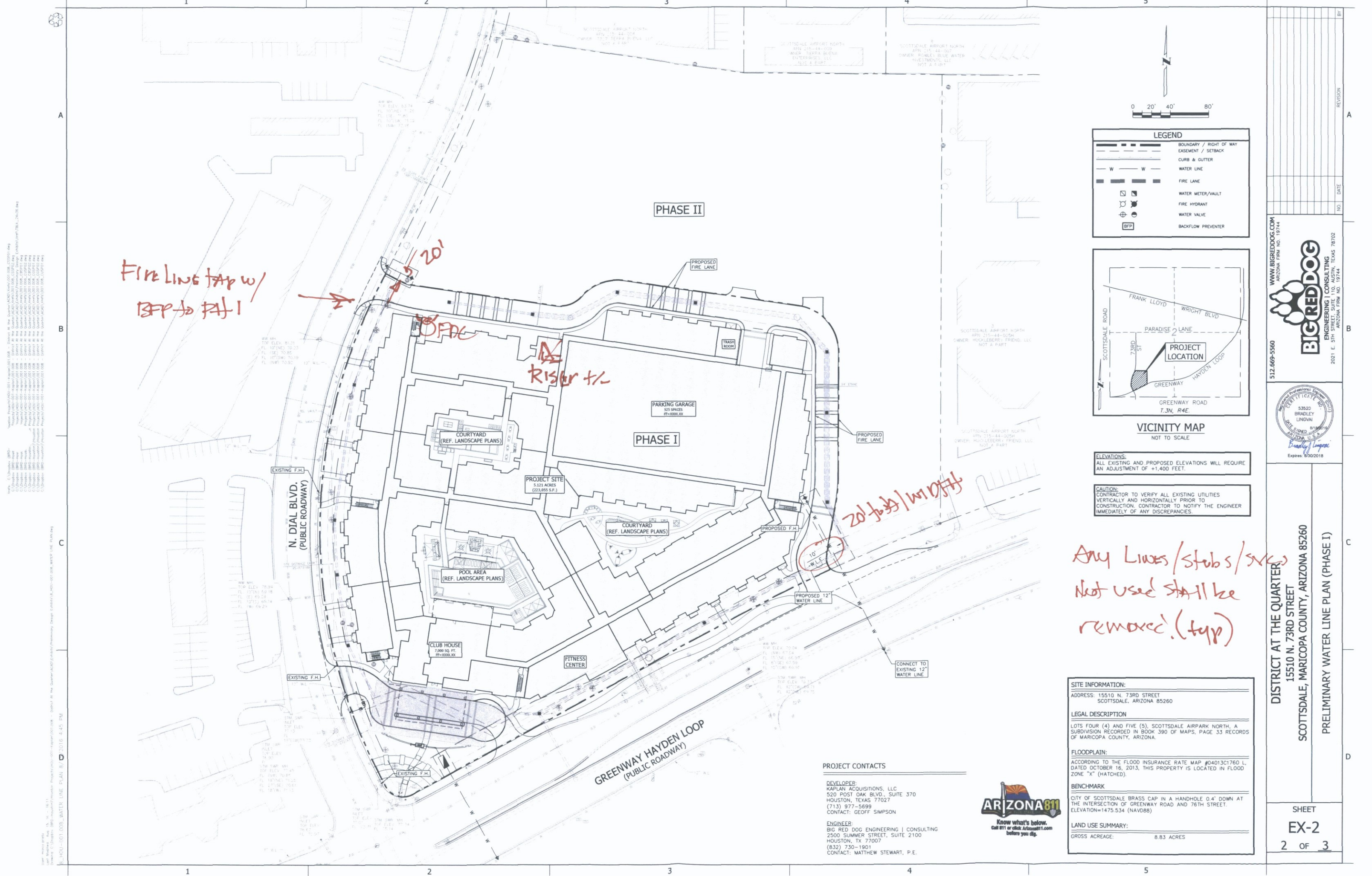
EX – 2 | PHASE I WATER LAYOUT

EX – 3 | PHASE II WATER LAYOUT







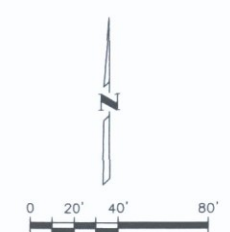


Fire Line tap w/  
BFP to PH I

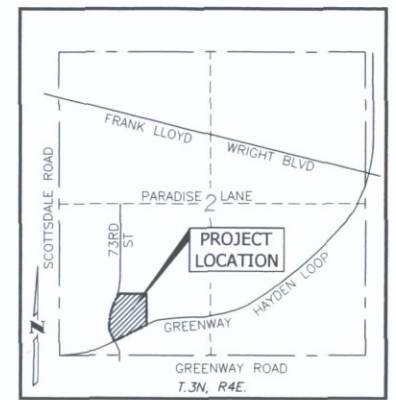
Riser +/-

20' tap / w/ BFP

Any Lines/stubs/svc's  
Not used shall be  
removed. (typ)



LEGEND	
	BOUNDARY / RIGHT OF WAY EASEMENT / SETBACK
	CURB & GUTTER
	WATER LINE
	FIRE LANE
	WATER METER/VAULT
	FIRE HYDRANT
	WATER VALVE
	BACKFLOW PREVENTER



VICINITY MAP  
NOT TO SCALE

ELEVATIONS:  
ALL EXISTING AND PROPOSED ELEVATIONS WILL REQUIRE AN ADJUSTMENT OF +1,400 FEET.

CAUTION:  
CONTRACTOR TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

<b>SITE INFORMATION:</b>	
ADDRESS: 15510 N. 73RD STREET SCOTTSDALE, ARIZONA 85260	
<b>LEGAL DESCRIPTION</b>	
LOTS FOUR (4) AND FIVE (5), SCOTTSDALE AIRPARK NORTH, A SUBDIVISION RECORDED IN BOOK 390 OF MAPS, PAGE 33 RECORDS OF MARICOPA COUNTY, ARIZONA.	
<b>FLOODPLAIN:</b>	
ACCORDING TO THE FLOOD INSURANCE RATE MAP #04013C1760 L, DATED OCTOBER 16, 2013, THIS PROPERTY IS LOCATED IN FLOOD ZONE "X" (HATCHED).	
<b>BENCHMARK</b>	
CITY OF SCOTTSDALE BRASS CAP IN A HANDHOLE 0.4' DOWN AT THE INTERSECTION OF GREENWAY ROAD AND 76TH STREET. ELEVATION=1475.534 (NAVD88)	
<b>LAND USE SUMMARY:</b>	
GROSS ACREAGE:	8.83 ACRES

**PROJECT CONTACTS**

**DEVELOPER:**  
KAPLAN ACQUISITIONS, LLC  
520 POST OAK BLVD., SUITE 370  
HOUSTON, TEXAS 77027  
(713) 977-5699  
CONTACT: GEOFF SIMPSON

**ENGINEER:**  
BIG RED DOG ENGINEERING | CONSULTING  
2500 SUMMER STREET, SUITE 2100  
HOUSTON, TX 77007  
(832) 730-1901  
CONTACT: MATTHEW STEWART, P.E.



 53520 BRADLEY LINGVAI ARIZONA U.S.A. Expires 03/30/2018	WWW.BIGREDDOG.COM ARIZONA FIRM NO. 19744 512.669.5560
	DISTRICT AT THE QUARTER 15510 N. 73RD STREET SCOTTSDALE, MARICOPA COUNTY, ARIZONA 85260 PRELIMINARY WATER LINE PLAN (PHASE I)
SHEET <b>EX-2</b> 2 OF 3	REVISION NO.   DATE



