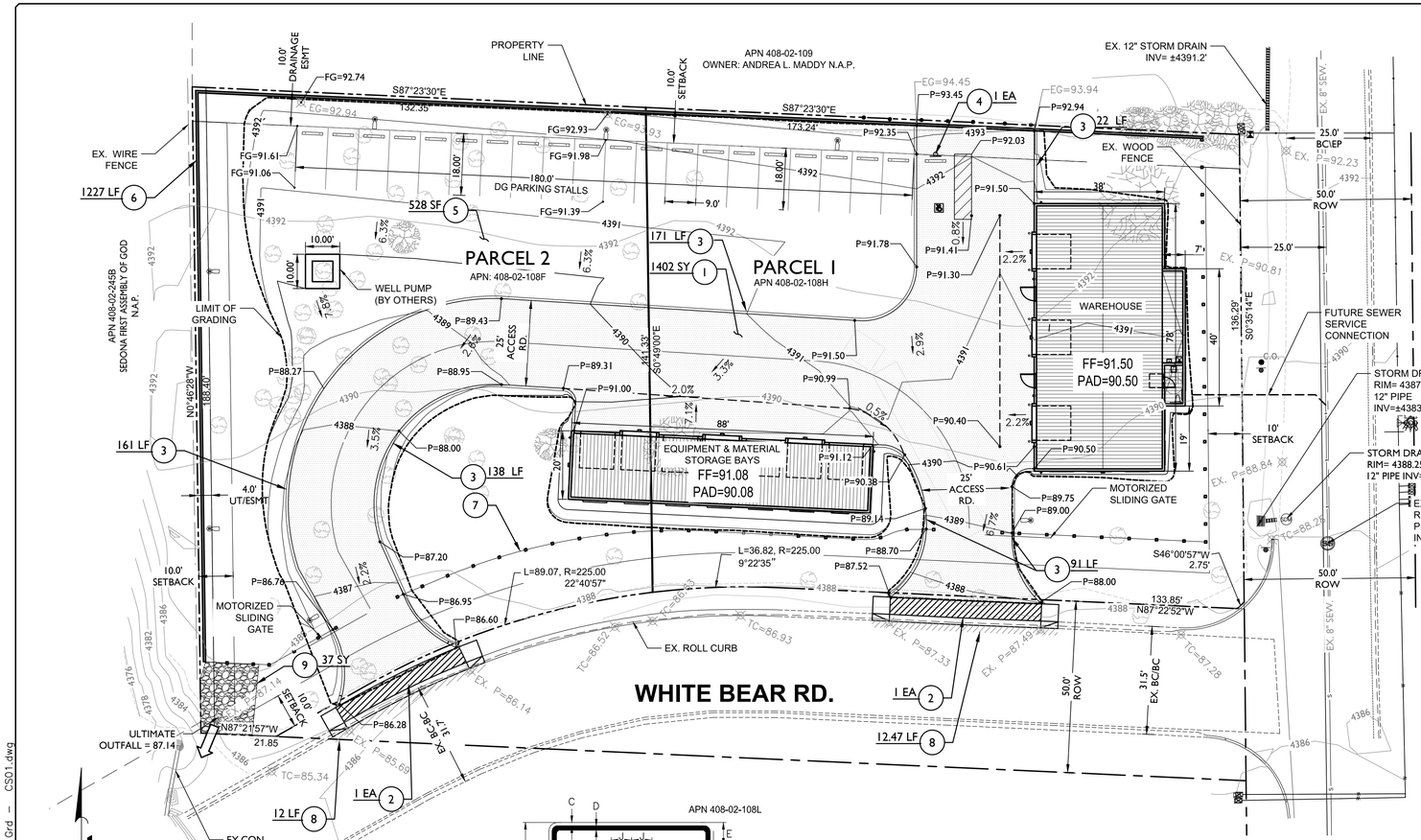
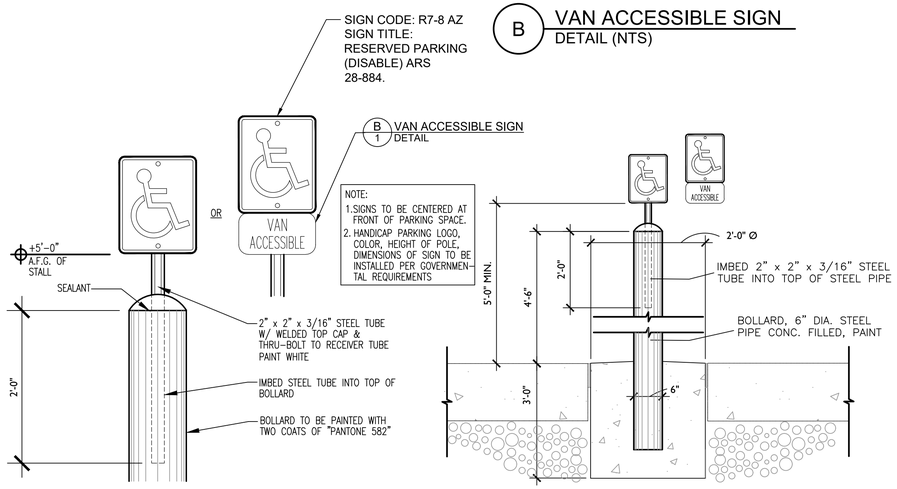
21-1135 - WHITE BEAR DRAINAGE IMPROVEMENTS



A	B	C	D	E	F	G	H	J	K	L
12	6	.375	.438	1.5	1.5D	.5	1 D	1.871	3.859	1.5
18	9	.375	.438	2.25	2 D	1	1.5 D	2.493	5.784	1.5

B VAN ACCESSIBLE SIGN DETAIL (NTS)



SIGN POST BOLLARD DETAIL N.T.S.

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A HANDICAP PARKING SIGN POST DETAIL (NTS)

CONSTRUCTION NOTES

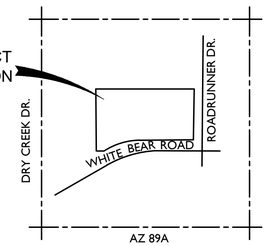
1	INSTALL 2.5" AC OVER 6" ABC ON COMPACTED SUB-GRADE.	1402	SY
2	INSTALL ALLEY ENTRANCE DRIVEWAY PER MAG STD. DTL. 260. MODIFIED TO TRANSITION TO ROLL CURB.	2	EA
3	INSTALL RIBBON CURB TYPE "B" PER MAG. STD. DTL. 220-1.	581	LF
4	INSTALL PARKING LOT HANDICAP SIGN POST PER DETAIL "A".	1	EA
5	PLACEMENT AND COMPACTION OF 3" THICK LAYER OF DECOMPOSED GRANITE (DG) SURFACE. CONSULT OWNER FOR COLOR.	528	SF
6	INSTALL 8' TALL PERIMETER WALL PER LANDSCAPE PLANS W/ TURN BLOCKS AT BOTTOM OF WALL FOR DRAINAGE (EVERY 10').	1227	LF
7	INSTALL 8' W.I. FENCE WITH CMU COLUMNS PER LANDSCAPE/STRUCTURAL PLANS.		
8	SAWCUT REMOVAL AND REPLACEMENT 2' OF EX. AC PAVEMENT FOR DW PLACEMENT. REPLACE IN-KIND.	25	LF
9	INSTALL 9" LAYER OF D50=6".	37	SY

LEGEND

ROW	RIGHT OF WAY		SECTION LINE
ESMT	EASEMENT		RIGHT OF WAY LINE
Y.C.R.	YAVAPAI COUNTY RECORDER		BLUE-STAKED WATER LINE
V.G.	VALLEY GUTTER	GAS GAS	BLUE-STAKED GAS LINE
P	PROPERTY LINE		BLUE-STAKED GAS LINE
EP	EDGE PAVEMENT	4686	MAJOR COUNT.
NO	NUMBER	SDMH	STORM DRAIN MH
A.P.N.	ASSESSORS PARCEL NUMBER	SMH	SANITARY SEWER MH
℄	SECTION LINE		TREE
	LOT LINE		CATUS
	WATER METER IRRIGATION CONTROL VALVE		SIGN
C.&G.	CURB AND GUTTER		GRADING WARP LINE
	EX. STORM DRAIN	℄	CENTER LINE
	PROPERTIES LINE		
TC	TOP OF CURB		

SITE INFORMATION

135 ROADRUNNER DR, SEDONA, AZ, 86336
PARCEL 1 (EAST) APN: 408-02-108H
PARCEL 2 (WEST) APN: 408-02-108F
AREA PARCEL 1 = 23932.90
AREA PARCEL 2 = 21789.52



VICINITY MAP (NTS)

LEGAL DESCRIPTION:

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THENCE SOUTH 86°37'25" EAST ALONG THE NORTH LINE OF SAID PARCEL A, A DISTANCE OF 132.37 FEET TO A SET 5/8" REBAR WITH PLASTIC CAP STAMPED "SEC RLS 13015" AT THE TRUE POINT OF BEGINNING;

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THENCE NORTH 86°37'26" WEST ALONG SAID RIGHT OF WAY LINE A DISTANCE OF 135.89 FEET (MONUMENT WILL BE SET AT THIS POINT AFTER CONSTRUCTION IS COMPLETE ON SAID ROAD) TO A POINT OF CURVATURE, THE CENTRAL POINT OF WHICH LIES SOUTH 03°22'34" WEST 225.00 FEET;

THENCE THROUGH A CENTRAL ANGLE OF 09°22'51" ALONG SAID RIGHT OF WAY LINE ON A CURVE TO THE LEFT AN ARC LENGTH OF 36.84 FEET (MONUMENT WILL BE SET AT THIS POINT AFTER CONSTRUCTION IS COMPLETE ON SAID ROAD);

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THENCE NORTH 89°41'47" WEST, TO THE SOUTHEAST CORNER OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 10, A DISTANCE OF 658.57 FEET;

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THENCE NORTH 00°38'17" WEST, ALONG SAID WESTERLY RIGHT OF WAY, A DISTANCE OF 50.08 FEET TO THE POINT OF INTERSECTION WITH THE NORTHERLY RIGHT OF WAY OF WHITE BEAR ROAD AND THE TRUE POINT OF BEGINNING;

THENCE NORTH 87°28'20" WEST, ALONG THE NORTHERLY RIGHT OF WAY OF WHITE BEAR ROAD, A DISTANCE OF 2.00 FEET;

THENCE NORTH 45°56'41" EAST, A DISTANCE OF 2.75 FEET TO A POINT ON THE WESTERLY RIGHT OF WAY OF ROADRUNNER DRIVE;

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THENCE THROUGH A CENTRAL ANGLE OF 22°39'48" ALONG SAID RIGHT-OF-WAY LINE ON A CURVE TO THE LEFT IN A SOUTHWESTERLY DIRECTION AN ARC LENGTH OF 89.00 FEET (MONUMENT WILL BE SET AT THIS POINT AFTER CONSTRUCTION IS COMPLETE ON SAID ROAD);

THENCE SOUTH 61°20'34" WEST ALONG SAID RIGHT-OF-WAY LINE A DISTANCE OF 29.64 FEET TO A POINT OF INTERSECTION WITH THE SOUTH LINE OF "PARCEL A" (MONUMENT WILL BE SET AT THIS POINT AFTER CONSTRUCTION IS COMPLETE ON SAID ROAD);

THENCE NORTH 86°37'25" WEST 21.77 FEET TO THE PONT OF BEGINNING.

BENCHMARK

(PRIMARY) CITY OF SEDONA BENCHMARK NO. 61, A 3.5 INCH BRASS DISK IN A HEADWALL STAMPED "Z 492 1982" (ON SITE) IS A ⅝" REBAR WITH A YELLOW PLASTIC CAP STAMPED RLS 13015 WITH AN ELEVATION OF 4388.07.

DEVELOPER/OWNER:

FOR PARCEL 1 AND 2:
WHITE BEAR PROFESSIONAL PLAZA LLC.
PO BOX 3670
SEDONA, AZ 86340-3670

BASIS OF BEARING

IS THE NORTH LINE OF THE SUBJECT PARCELS SHOWN HEREON AS S 87°23'30" E .

SITE ADDRESS

PARCELS 1 AND 2:
135 ROADRUNNER DR.
SEDONA AZ.

ENGINEER:

EPS GROUP, INC.
1130 N. ALMA SCHOOL RD., SUITE 120
MESA, AZ 85201
TEL: (480)-503-2250
FAX: (480)-503-2258
CONTACT: BRANDON AQUIRE, P.E.
EMAIL: brandon.squire@epsgroupinc.com

FLOOD ZONE

BASED ON THE FLOOD INSURANCE RATE MAP NO. 04025C1430G, WITH AN EFFECTIVE DATE OF 9/3/2010, THE PROPERTY SITS WITHIN FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m

Project: AWC WHITE BEAR PROPERTY
IMPROVEMENT PLANS
SEDONA, ARIZONA

GRADING & DRAINAGE IMPROVEMENTS

Revisions:

Call at least two full working days before you begin excavation.
ARIZONA811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602)263-1100

Designer: KD
Drawn by: SCD

Registered Professional Engineer (Civil)
CERTIFICATE NO.
35177
BRANDON LEE SQUIRE
Date Signed 11-30-21

Job No.
21-1135

Sheet No.
1
of 1

PS

Dec 07, 2021 12:12pm V:\Projects\2021\21-1135 White bear\Civil\Construction Documents_Grading\21-1135 - Grd - CS01.dwg
cduarte

Memo: AWC White Bear Property – Sewer Analysis (EPS# 21-1135)

Date: 12/7/2021
TO: City of Sedona
FROM: Brandon Squire, P.E.

INTRODUCTION

The proposed Arizona Water Company (AWC) White Bear Property (The Site) is located on the northwest corner of Roadrunner Drive and White Bear Road within the City of Sedona. The Site is planned on an area of a little more than one acre in size and is currently vacant. The site has frontage road along White Bear Road and Roadrunner Drive.

AWC is planning to construct and operate a new well, warehouse, enclosed equipment and material storage areas, and overnight service vehicle parking. The new warehouse includes a single toilet, two handwash sinks and a mop sink. No other restroom, showers or food preparation devices are proposed for the Site. The proposed Site is currently zoned "M2 - Mixed Office Use", which allows the proposed "Public Utility, Major" development as defined in City of Sedona Land Development Code (LDC).

This memorandum addresses the flow generated by the proposed Site upon development of the property and impact to the existing system.

EPS Group, Inc. • 1130 N. EXPIRES 09/30/2022 • Mesa, AZ 85201
Tel (480) 503-2250 • Fax (480) 503-2258

LOCATION & LAYOUT

Figure 1 provides a vicinity map of the property. The surrounding area is primarily comprised of office use and low to medium density residential uses.

Figure 1: Vicinity Map

Figure 2 provides the current site layout for the proposed development including toilet and sink location (inside Warehouse) and existing sewer line & service.

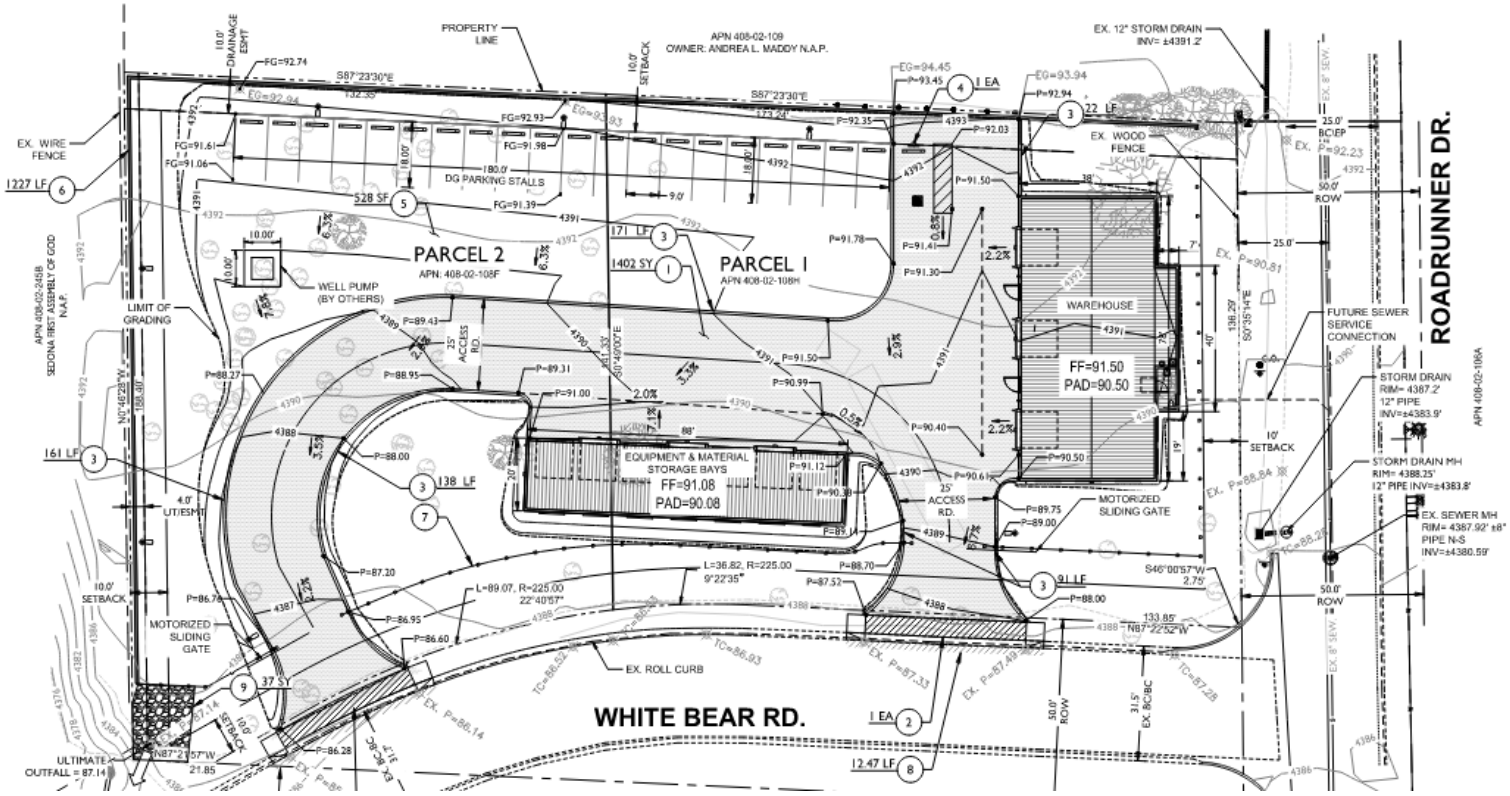


Figure 2: Proposed Site Layout

Sewer Analysis

The Site will discharge flows to the existing sewer line located just east of the Warehouse running along Roadrunner Drive. The existing sewer line consist of an 8-inch line running north to south at an approximate depth of 7-feet. The slope of the existing 8-Inch line is unknow.

The sewer flow generated by the new development is expected to be small as the Site includes a single toilet, two handwash sinks and a mop sink in the Warehouse as shown on Figure 2. The flows were calculated using the following parameters:

- Peaking Factors: From Arizona Administrative Code (AAC), Title 18, Chapter 9, E301, 4.01(D).
- Design Flow: From AAC, Title 18, Chapter 9, E323, 4.23(H), Table 1: Unit Design Flows. Industrial Facility without showers: 25 Gal./Day/Employee.
- Assumed 15 employees at any given time: Employees are expected to come in/out of the facility on an intermittent schedule to load/unload and leave to perform assigned tasks.

The expected flows for the proposed Site are calculated as follow:

Facility Name	No. of Employees	Flow per Day per Employee (GPD)	Total Daily Flow (GPD)	Peaking Factor	Peak Flow (GPD)
AWC	15	25	375	3.62	1358

GDP: Gallons per Day

The total Average Daily flow expected for the site is 375 Gallons per day and the maximum peak flow is 1358 Gallons per day. To analyze the capacity of the existing line, the full flow capacity of the existing 8-Inch line was calculated using a minimum slope of 0.0025 ft/ft. Although higher slopes may be present due to existing terrain, a lower slope was used for conservative results. The maximum capacity of the existing line is 390,486 Gallons per day.

The proposed finish floor is about 3.58' above the existing manhole just downstream of the warehouse and is 0.7' below the existing road finished grade at the northeast property line along the existing sewer line. A backflow prevention device will be required per city code, chapter 13.

CONCLUSIONS

The proposed development is anticipated to generate 375 Gallons per day with a maximum flow of 1358 Gallons per day. The capacity of the existing line is 390,486 Gallon per day using a conservative value. Since the flows generated by the proposes site are relatively small to the capacity of the existing system, no adverse consequences are expected to the existing line and downstream facilities.

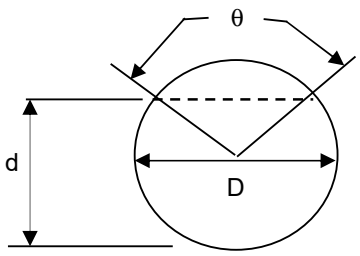
Please contact me at (623) 691-8002 if you have any questions or would like to discuss this memorandum.

ATTACHMENT:

- **A.** Existing Sewer Line Capacity Calculations.
- **B.** Grading Plan.
- **C.** Excerpts of Arizona Administrative Code, Chapter 9.

EXPIRES 09/30/2022

Project: Arizona Water Company
Project No.: 21-1135
Sewe Line Flow Capacity



INPUT

D=	8	inches
d=	8	inches
n=	0.013	mannings coeff
θ=	0.0	degrees
S=	0.0025	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

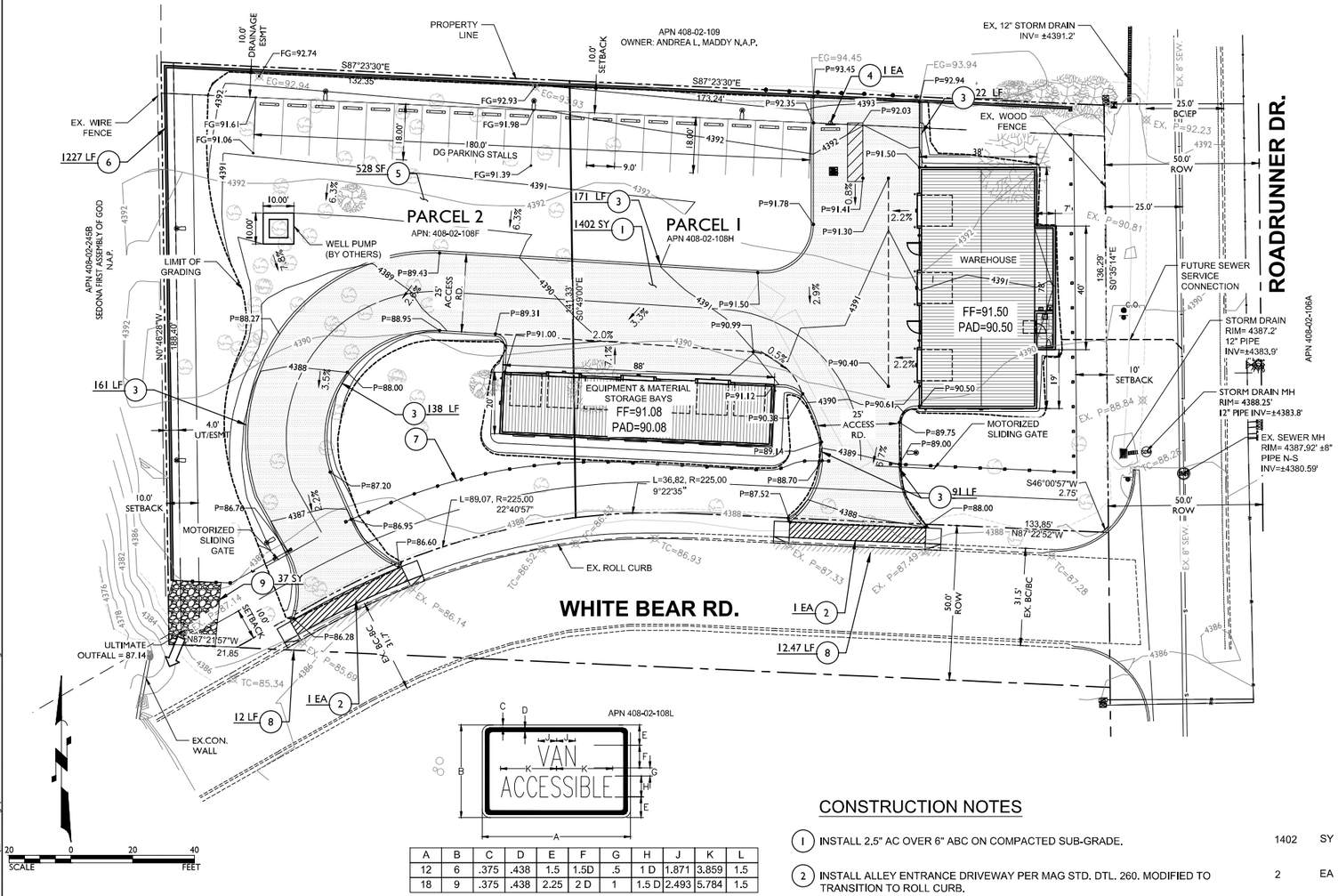
$V=(1.49/n)R_h^{2/3}S^{1/2}$

Q=V x A

Solution to Mannings Equation					
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs	flow, gpd
0.35	2.09	0.17	1.73	0.60	390,486

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

21-1135 - WHITE BEAR DRAINAGE IMPROVEMENTS



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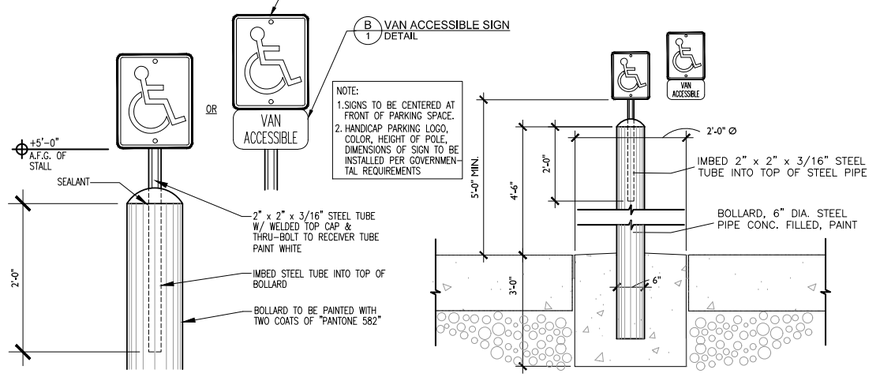

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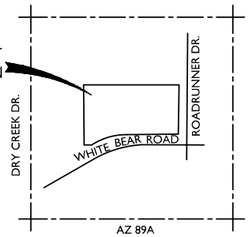

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THENCE SOUTH 86°37'25" EAST ALONG THE NORTH LINE OF SAID "PARCEL A" A DISTANCE OF 132.37 FEET TO A SET 5/8 INCH REBAR WITH PLASTIC CAP STAMPED "SEC RLS 13015";

THENCE SOUTH A DISTANCE OF 141.34 FEET TO A POINT ON THE NORTHERLY RIGHT-OF-WAY LINE OF WHITE BEAR ROAD (MONUMENT WILL BE SET AT THIS POINT AFTER CONSTRUCTION IS COMPLETE ON SAID ROAD), SAID POINT BEING A NON-TANGENT POINT OF CURVATURE, THE CENTRAL POINT OF WHICH LIES SOUTH 06°00'17" EAST 225.00 FEET;

THENCE THROUGH A CENTRAL ANGLE OF 22°39'48" ALONG SAID RIGHT-OF-WAY LINE ON A CURVE TO THE LEFT IN A SOUTHWESTERLY DIRECTION AN ARC LENGTH OF 89.00 FEET (MONUMENT WILL BE SET AT THIS POINT AFTER CONSTRUCTION IS COMPLETE ON SAID ROAD);

THENCE SOUTH 61°20'34" WEST ALONG SAID RIGHT-OF-WAY LINE A DISTANCE OF 29.64 FEET TO A POINT OF INTERSECTION WITH THE SOUTH LINE OF "PARCEL A" (MONUMENT WILL BE SET AT THIS POINT AFTER CONSTRUCTION IS COMPLETE ON SAID ROAD);

THENCE NORTH 86°37'25" WEST 21.77 FEET TO THE PONT OF BEGINNING.

BENCHMARK

(PRIMARY) CITY OF SEDONA BENCHMARK NO. 61, A 3.5 INCH BRASS DISK IN A HEADWALL STAMPED "Z 492 1982" (ON SITE) IS A ⅝" REBAR WITH A YELLOW PLASTIC CAP STAMPED RLS 13015 WITH AN ELEVATION OF 4388.07.

DEVELOPER/OWNER:

FOR PARCEL 1 AND 2:
WHITE BEAR PROFESSIONAL PLAZA LLC.
PO BOX 3670
SEDONA, AZ 86340-3670

BASIS OF BEARING

IS THE NORTH LINE OF THE SUBJECT PARCELS SHOWN HEREON AS S 87°23'30" E .

SITE ADDRESS

PARCELS 1 AND 2:
135 ROADRUNNER DR.
SEDONA AZ.

ENGINEER:

EPS GROUP, INC.
1130 N. ALMA SCHOOL RD., SUITE 120
MESA, AZ 85201
TEL: (480)-503-2250
FAX: (480)-503-2258
CONTACT: BRANDON AQUIRE, P.E.
EMAIL: brandon.aquire@epsgroupinc.com

FLOOD ZONE

BASED ON THE FLOOD INSURANCE RATE MAP NO. 04025C1430G, WITH AN EFFECTIVE DATE OF 9/3/2010, THE PROPERTY SITS WITHIN FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

EPS GROUP
1130 N Alma School Road
Suite 120
Mesa, AZ 85201
T:480.503.2250 | F:480.503.2258
w w w . e p s g r o u p i n c . c o m

AWC WHITE BEAR PROPERTY
IMPROVEMENT PLANS
SEDONA, ARIZONA

Project:

GRADING & DRAINAGE IMPROVEMENTS

Revisions:

Call at least two full working days before you start excavation.
ARIZONA811
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County (602)263-1100

Designer: KD
Drawn by: SCD

Registered Professional Engineer
CERTIFICATE No.
35177
BRANDON LEE SQUIRE
Date Signed 12-20-21
ARIZONA U.S.A.

Job No.
21-1135

Sheet No.
1
of 1

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cduarte
PS

B. Performance. An applicant shall design, construct, and operate a sewage collection system so that the sewage collection system:
1. Provides adequate wastewater flow capacity for the planned service area;
2. Minimizes sedimentation, blockage, and erosion through maintenance of proper flow velocities throughout the system;
3. Prevents releases of sewage to the land surface through appropriate sizing, capacities, and inflow and infiltration prevention measures throughout the system;
4. Protects water quality through minimization of exfiltration losses from the system;
5. Provides for adequate inspection, maintenance, testing, visibility, and accessibility;
6. Maintains system structural integrity; and
7. Minimizes septic conditions in the sewage collection system.

C. Notice of Intent to Discharge. In addition to the Notice of Intent to Discharge requirements specified in R18-9-A301(B), an applicant shall submit the following information:
1. A statement on a form approved by the Director, signed by the owner or operator of the sewage treatment facility that treats or processes the sewage from the proposed sewage collection system.
   a. The statement shall affirm that the additional volume of wastewater delivered to the facility by the proposed sewage collection system will not cause any flow or effluent quality limits of the individual permit for the facility to be exceeded.
   b. If the facility is classified as a groundwater protection permit facility under A.R.S. § 49-241.01(C), or if no flow or effluent limits are applicable, the statement shall affirm that the design flow of the facility will not be exceeded;
2. If the proposed sewage collection system delivers wastewater to a downstream sewage collection system under different ownership or control, a statement on a form approved by the Director, signed by the owner or operator of the downstream sewage collection system, affirming that the downstream system can maintain the performance required by subsection (B) when receiving the increased flows;
3. A general site plan showing the boundaries and key aspects of the project;
4. Construction quality drawings that provide overall details of the site and the engineered works comprising the project including:
   a. The plans and profiles for all sewer lines, manholes, force mains, depressed sewers, and lift stations with sufficient detail to allow Department verification of design and performance characteristics;
   b. Relevant cross sections showing construction details and elevations of key components of the sewage collection system to allow Department verification of design and performance characteristics, including the slope of each gravity sewer segment stated as a percentage; and
   c. Drainage features and controls, and erosion protection as applicable, for the components of the project; and
   d. Horizontal and vertical location of utilities within the area affected by the sewer line construction;
5. Documentation of design flows for significant components of the sewage collection system and the basis for calculating the design flows;
6. Drawings, reports, and other information that are clear, reproducible, and in a size and format specified by the Department. The applicant may submit the drawings in a Department-approved electronic format; and
7. Design documents, including plans, specifications, drawings, reports, and calculations that are signed, dated, and sealed by an Arizona-registered professional engineer. The designer shall use good engineering judgment by following engineering standards of practice, and rely on appropriate engineering methods, calculations, and guidance.

D. Design requirements.
1. General Provisions. An applicant shall design and construct a new sewage collection system or an expansion of an existing sewage collection system involving new construction, according to the requirements of this general permit. An applicant shall:
   a. Base design flows for components of the system on unit flows specified in Table 1, Unit Design Flows.
   b. Design gravity sewer lines and all other sewage collection system components, including, manholes, force mains, lift stations, depressed sewers, and appurtenant devices and structures to accommodate maximum sewage flows as follows:
      i. Any point in a sewer main when flowing full can accommodate a peak wet weather flow calculated by multiplying the sum of the upstream sources of flow from Table 1, Unit Design Flows by a dry weather peaking factor based on upstream population, as tabulated below, and adding a wet weather infiltration and inflow rate based on either a percentage of peak dry weather flow or a gallons per acre rate of flow;

Upstream Population	Dry Weather Peaking Factor
100	3.62
200	3.14
300	2.90
400	2.74
500	2.64
600	2.56
700	2.50
800	2.46
900	2.42
1000	2.38
1001 to 10,000	$PF = (6.330 \times p^{-0.231}) + 1.094$
10,001 to 100,000	$PF = (6.177 \times p^{-0.233}) + 1.128$
More than 100,000	$PF = (4.500 \times p^{-0.174}) + 0.945$
PF = Dry Weather Peaking Factor p = Upstream Population	

      ii. For a lift station serving less than 600 single family dwelling units (d.u.), use either of the following methods to size the pumps for peak dry weather flow in gallons per minute and add an allowance for wet weather flow and infiltration:
         (1) Peak dry weather flow = $17\ d.u.^{0.42}$, or
         (2) Peak dry weather flow = 11.2 (popula-

b. Any changes are reflected in as-built plans submitted with the Engineer's Certificate of Completion.

2. The name of the service provider or certified operator that is responsible for implementing the performance assurance plan.

G. Reporting requirement. The permittee shall provide the Department with the following information on the anniversary date of the Discharge Authorization:

1. A form signed by the certified operator or service provider that:
   a. Provides any data or documentation required by the performance assurance plan,
   b. Certifies compliance with the requirements of the performance assurance plan, and
   c. Describes any additions to the facility during the year that increased flows and certifies that the flow did not exceed 24,000 gallons per day during any day; and
2. Any applicable fee required by 18 A.A.C. 14.

H. Facility expansion. If an expansion of an on-site wastewater treatment facility operating under this Section involves the installation of a separate on-site wastewater treatment facility on the property with a design flow of less than 3000 gallons per day, the applicant shall submit the applicable Notice of Intent to Discharge and fee required under 18 A.A.C. 14 for the separate on-site wastewater treatment facility.

1. The applicant shall indicate in the Notice of Intent to Discharge the Department's file number and the issuance date of the Discharge Authorization previously issued by the Director under this Section for the property.
2. Upon satisfactory review, the Director shall reissue the Discharge Authorization for this Section, with the new issuance date and updated information reflecting the expansion.
3. If the expansion causes the accumulative design flow from on-site wastewater treatment facilities on the property to equal or exceed 24,000 gallons per day, the Director shall not reissue the Discharge Authorization, but shall require the applicant to submit an application for an individual permit addressing all proposed and operating facilities on the property.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4). Amended by final rulemaking at 11 A.A.R. 4544, effective November 12, 2005 (05-3).

Table 1. Unit Design Flows

Wastewater Source	Applicable Unit	Sewage Design Flow per Applicable Unit, Gallons Per Day
Airport	Passenger (average daily number) Employee	4 15
Auto Wash	Facility	Per manufacturer, if consistent with this Chapter
Bar/Lounge	Seat	30
Barber Shop	Chair	35
Beauty Parlor	Chair	100
Bowling Alley (snack bar only)	Lane	75
Camp Day camp, no cooking facilities Campground, overnight, flush toilets Campground, overnight, flush toilets and shower Campground, luxury Camp, youth, summer, or seasonal	 Camping unit Camping unit Camping unit Person Person	 30 75 150 100-150 50
Church Without kitchen With kitchen	 Person (maximum attendance) Person (maximum attendance)	 5 7
Country Club	Resident Member Nonresident Member	100 10
Dance Hall	Patron	5
Dental Office	Chair	500
Dog Kennel	Animal, maximum occupancy	15
Dwelling For determining design flow for sewage treatment facilities under R18-9-B202(A)(9)(a) and sewage collection systems under R18-9-E301(D) and R18-9-B301(K), excluding peaking factor.	Person	80

Dwelling For on-site wastewater treatment facilities per R18-9-E302 through R18-9-E323: Apartment Building 1 bedroom 2 bedroom 3 bedroom 4 bedroom Seasonal or Summer Dwelling (with recorded seasonal occupancy restriction) Single Family Dwellings Other than Single Family Dwelling, the greater flow value based on: Bedroom count 1-2 bedrooms Each bedroom over 2 Fixture count	 Apartment Apartment Apartment Apartment Resident see R18-9-A314(D)(1) Bedroom Bedroom Fixture unit	 200 300 400 500 100 see R18-9-A314(D)(1) 300 150 25
Fire Station	Employee	45
Hospital All flows Kitchen waste only Laundry waste only	 Bed Bed Bed	 250 25 40
Hotel/motel Without kitchen With kitchen	 Bed (2 person) Bed (2 person)	 50 60
Industrial facility Without showers With showers Cafeteria, add	 Employee Employee Employee	 25 35 5
Institutions Resident Nursing home Rest home	 Person Person Person	 75 125 125
Laundry Self service Commercial	 Wash cycle Washing machine	 50 Per manufacturer, if consistent with this Chapter
Office Building	Employee	20
Park (temporary use) Picnic, with showers, flush toilets Picnic, with flush toilets only Recreational vehicle, no water or sewer connections Recreational vehicle, with water and sewer connections Mobile home/Trailer	 Parking space Parking space Vehicle space Vehicle space Space	 40 20 75 100 250
Restaurant/Cafeteria With toilet, add Kitchen waste, add Garbage disposal, add Cocktail lounge, add Kitchen waste disposal service, add	Employee Customer Meal Meal Customer Meal	20 7 6 1 2 2
Restroom, public	Toilet	200

School		
Staff and office	Person	20
Elementary, add	Student	15
Middle and High, add	Student	20
with gym & showers, add	Student	5
with cafeteria, add	Student	3
Boarding, total flow	Person	100
Service Station with toilets	First bay	1000
	Each additional bay	500
Shopping Center, no food or laundry	Square foot of retail space	0.1
Store	Employee	20
Public restroom, add	Square foot of retail space	0.1
Swimming Pool, Public	Person	10
Theater		
Indoor	Seat	5
Drive-in	Car space	10

Note: Unit flow rates published in standard texts, literature sources, or relevant area or regional studies are considered by the Department, if appropriate to the project.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4). Amended by final rulemaking at 11 A.A.R. 4544, effective November 12, 2005 (05-3).

ARTICLE 4. NITROGEN MANAGEMENT GENERAL PERMITS

R18-9-401. Definitions

In addition to the definitions established in A.R.S. §§ 49-101 and 49-201 and A.A.C. R18-9-101, the following terms apply to this Article:

1. "Application of nitrogen fertilizer" means any use of a substance containing nitrogen for the commercial production of a crop or plant. The commercial production of a crop or plant includes commercial sod farms and nurseries.
2. "Contact stormwater" means stormwater that comes in contact with animals or animal wastes within a concentrated animal feeding operation.
3. "Crop or plant needs" means the amount of water and nitrogen required to meet the physiological demands of a crop or plant to achieve a defined yield.
4. "Crop or plant uptake" means the amount of water and nitrogen that can be physiologically absorbed by the roots and vegetative parts of a crop or plant following the application of water.
5. "Impoundment" means any structure, other than a tank or a sump, designed and maintained to contain liquids. A structure that stores or impounds only non-contact stormwater is not an impoundment under this Article.
6. "Liner" or "lining system" means any natural, amendment, or synthetic material used to reduce seepage of impounded liquids into a vadose zone or aquifer.
7. "NRCS guidelines" means the United States Department of Agriculture, Natural Resources Conservation Service, National Engineering Handbook, Part 651 Agricultural Waste Management Field Handbook, Chapter 10, 651.1080, Appendix 10D – Geotechnical, Design, and Construction Guideline (November 1997). This material is incorporated by reference and does not include any later amendments or editions of the incorporated material. Copies of the incorporated material are available for inspection at the Arizona Department of Environmental Quality, 1110 W. Washington, Phoenix, AZ 85007 or may be obtained from the United States Department of Agriculture, Natural Resources Conservation Service at ftp://ftp.wcc.nrcs.usda.gov/downloads/wastemgmt/AWMFH/awmfh-chap10-app10d.pdf.

Historical Note

Adopted effective January 4, 1991 (Supp. 91-1). Section R18-9-401 renumbered from R18-9-201 and amended by final rulemaking at 7 A.A.R. 235, effective December 8, 2000 (Supp. 00-4). Amended by final rulemaking at 11 A.A.R. 4544, effective November 12, 2005 (05-3).

R18-9-402. Nitrogen Management General Permits: Nitrogen Fertilizers

An owner or operator may apply a nitrogen fertilizer under this general permit without submitting a notice to the Director, if the owner or operator complies with the following best management practices:

1. Limit application of the fertilizer so that it meets projected crop or plant needs;
2. Time application of the fertilizer to coincide to maximum crop or plant uptake;
3. Apply the fertilizer by a method designed to deliver nitrogen to the area of maximum crop or plant uptake;
4. Manage and time application of irrigation water to minimize nitrogen loss by leaching and runoff; and
5. Use tillage practices that maximize water and nitrogen uptake by a crop or plant.

Historical Note

Adopted effective January 4, 1991 (Supp. 91-1). Section R18-9-402 renumbered from R18-9-202 and amended by final rulemaking at 7 A.A.R. 235, effective December 8, 2000 (Supp. 00-4). Amended by final rulemaking at 11 A.A.R. 4544, effective November 12, 2005 (05-3).

R18-9-403. Nitrogen Management General Permits: Concentrated Animal Feeding Operations

A. An owner or operator may discharge from a concentrated animal feeding operation without submitting a notice to the Director, if the owner or operator complies with the following best management practices:

1. Harvest, stockpile, and dispose of animal manure from a concentrated animal feeding operation to minimize discharge of any nitrogen pollutant by leaching and runoff;

Memo: 135 Roadrunner Drive Property – Trip Generation Report (EPS# 21-1135)

Date: 11/07/21
TO: City of Sedona
FROM: Eric Maceyko, P.E., PTOE
Kelly Fletcher, P.E.

INTRODUCTION

The proposed Arizona Water Company (AWC) 135 Roadrunner Drive Property is located on the northwest corner of Roadrunner Drive and White Bear Road within the City of Sedona. The site is planned on an area of a little more than one acre and is currently vacant. The site has frontage along White Bear Road and Roadrunner Drive but no access driveways currently exist. AWC is planning to construct and operate a new well, warehouse, enclosed equipment and material storage areas, and overnight service vehicle parking.

Growth in the Company's west Sedona pressure zone and aging infrastructure has created the need for a new well to satisfy current and future demands. The new proposed site will replace the existing warehouse, and equipment and material storage areas at the Southwest Center well site. The proposed site is currently zoned “M2 - Mixed Office Use”, which allows the proposed “Public Utility, Major” development as defined in City of Sedona Land Development Code (LDC).

The City of Sedona has requested the preparation of this Trip Generation Report to estimate the anticipated trip generation at the proposed site upon development of the property.

LOCATION

Figure 1 provides a vicinity map of the property. The surrounding area is primarily comprised of office uses and low to medium density residential uses. The main regional routes to access the site will be State Route 89A to the south and Dry Creek Road to the west.

Figure 1: Vicinity Map

Figure 2 provides the current site plan for the proposed development. As can be seen in the figure, the only provided access will be from / to White Bear Road via two (2) new proposed access driveways west of Roadrunner Drive.

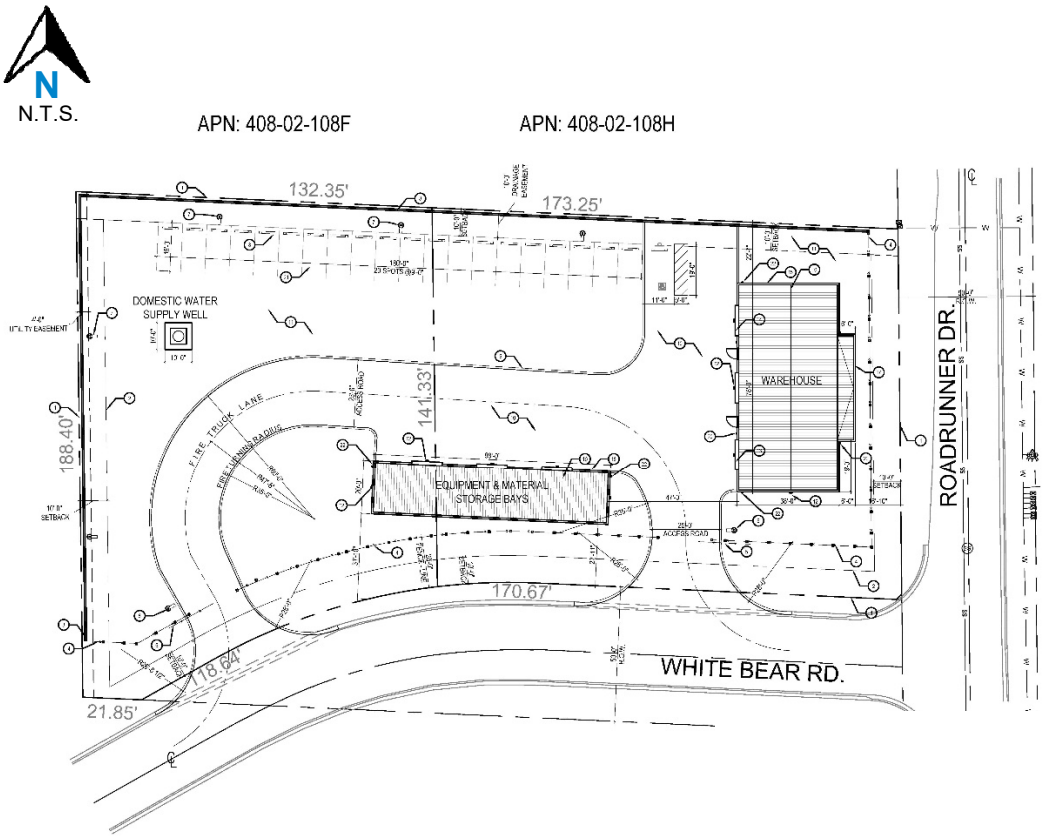

Figure 2: Proposed Development Site Plan

TRIP GENERATION

The following narrative was provided by the developer regarding planned operations for the proposed site:

Use of the completed facilities on the Property by Company employees is during normal business hours between 6:00 a.m. and 5:00 p.m. Monday through Friday. All Company employee use of this facility is transient. Approximately 15 Company employees will access the Property during normal business hours on a daily basis. Company employees will arrive at the Property to retrieve their assigned service vehicle, load necessary work equipment and materials, attend weekly safety meetings, and leave the facility to perform their assigned work orders within the water service area. The service vehicle is returned to the Property at the end of the day for overnight parking. On-call employees will use the facility outside normal business hours while responding to emergency water service area events such as water leaks and operational issues. These emergency events may occur one to three times a week.

The estimated trip generation for the proposed development was determined through the procedures and data contained within the Institute of Transportation Engineers (ITE) *Trip Generation*, 11th Edition, published in September 2021. This document provides traffic volume data from existing developments throughout North America that can be utilized to estimate vehicle trips that might be generated from developments. The traffic data are provided for 179 different categories, or Land Use Codes (LUC). The estimated traffic volume is dependent upon independent variables defined by the characteristics and size of each LUC. It should be noted that all data plots and statistics presented in the manual are based on data collected prior to the COVID-19 pandemic. Trip generation was conducted as detailed below.

The proposed development is planned to consist of a new well site with ancillary uses. Therefore, ITE Land Use Code 170 – Utility, contains the most appropriate data for use in the trip generation analysis. Per *Trip Generation*, the following description is provided for this LUC:

> *"A utility is a free-standing building that can house office space, a storage area, and electromechanical or industrial equipment that support a local electrical, communication, water supply or control, or sewage treatment utility."*

Two independent variables are available to predict trips: 1,000 Square Feet Gross Floor Area and Employees. Two warehouse / storage buildings (4,960 square feet of total building area) and approximately fifteen (15) employees are planned for typical weekday operations.

The complete calculation results are provided in **Attachment A** and summarized in **Table 1**. Both equations and average rates are provided in *Trip Generation*. The largest volumes considering both calculation methods and independent variables were utilized as the estimate for the generated traffic for the proposed development. Therefore, the calculated values are likely conservative.

Table 1: Proposed Development Trip Generation

	Day			AM Peak Hour			PM Peak Hour		
Time Period	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
ITE LUC 170 (TGSF)	31	30	61	10	2	12	2	9	11
ITE LUC 170 (Employee)	29	29	58	11	2	13	2	9	11
MAXIMUM	**31**	**30**	**61**	**11**	**2**	**13**	**2**	**9**	**11**

As mentioned previously, the new proposed site will replace the existing Southwest Center well site. It should therefore be noted that the traffic added by the new site will replace the traffic currently generated at the existing site.

CONCLUSIONS

The proposed development is anticipated to generate 61 total daily trips (entering / exiting), 13 total AM peak hour trips (entering / exiting) and 11 total PM peak hour trips (entering / exiting) during the average weekday. The largest volumes considering both calculation methods and independent variables were utilized as the estimate for the generated traffic for the proposed development. Therefore, the calculated values are likely conservative. It should also be noted that the traffic added by the new site will replace the traffic previously generated at the existing site.

Please contact me at (480) 503-2250, extension 1125 if you have any questions or would like to discuss this memorandum.

ATTACHMENT:

A. Proposed Development Trip Generation

Expires:6/30/2023

ATTACHMENT A
PROPOSED DEVELOPMENT TRIP GENERATION

PROJECT	135 ROADRUNNER DRIVE PROPERTY			
PARCEL	PROPOSED SITE			
ITE LAND USE CATEGORY AND CODE	UTILITY (170)			
INDEPENDENT VARIABLE	MAXIMUM OF 1,000 SQUARE FEET AND EMPLOYEES			
SIZE	4960 SQUARE FEET AND 15 EMPLOYEES			
		TRIPS		
		ENTERING	EXITING	TOTAL
***WEEKDAY* DAILY**				
MINIMUM RATE		6	6	12
AVERAGE RATE		31	30	61
MAXIMUM RATE		165	165	330
STANDARD DEVIATION				
EQUATION		25	25	50
LARGEST OF AVERAGE OR EQUATION		**31**	**30**	**61**
AM PEAK HOUR ADJACENT STREET				
MINIMUM RATE		3	0	3
AVERAGE RATE		10	2	12
MAXIMUM RATE		46	7	53
STANDARD DEVIATION				
EQUATION		11	2	13
LARGEST OF AVERAGE OR EQUATION		**11**	**2**	**13**
AM PEAK HOUR GENERATOR				
MINIMUM RATE		3	0	3
AVERAGE RATE		9	2	11
MAXIMUM RATE		101	19	120
STANDARD DEVIATION				
EQUATION		11	2	13
LARGEST OF AVERAGE OR EQUATION		**11**	**2**	**13**
PM PEAK HOUR ADJACENT STREET				
MINIMUM RATE		1	3	4
AVERAGE RATE		2	9	11
MAXIMUM RATE		9	39	48
STANDARD DEVIATION				
EQUATION		2	7	9
LARGEST OF AVERAGE OR EQUATION		**2**	**9**	**11**
PM PEAK HOUR GENERATOR				
MINIMUM RATE		1	4	5
AVERAGE RATE		2	9	11
MAXIMUM RATE		24	111	135
STANDARD DEVIATION				
EQUATION		2	11	13
LARGEST OF AVERAGE OR EQUATION		**2**	**11**	**13**

EPS GROUP

PROJECT	135 ROADRUNNER DRIVE PROPERTY			
PARCEL	PROPOSED SITE			
ITE LAND USE CATEGORY AND CODE	UTILITY (170)			
INDEPENDENT VARIABLE	1,000 SQUARE FEET			
SIZE	4.960			
		TRIPS		
		ENTERING	EXITING	TOTAL
***WEEKDAY* DAILY**		50%	50%	
NUMBER OF STUDIES	13			
AVERAGE SIZE	12			
MINIMUM RATE	1.60	4	4	8
AVERAGE RATE	12.29	31	30	61
MAXIMUM RATE	65.03	162	161	323
STANDARD DEVIATION	14.32			
EQUATION: LN (T) = 0.74 * LN(X) + 2.73	R^2 = 0.51	25	25	50
LARGEST OF AVERAGE OR EQUATION		**31**	**30**	**61**
AM PEAK HOUR ADJACENT STREET		87%	13%	
NUMBER OF STUDIES	13			
AVERAGE SIZE	13			
MINIMUM RATE	0.15	1	0	1
AVERAGE RATE	2.33	10	2	12
MAXIMUM RATE	10.67	46	7	53
STANDARD DEVIATION	2.34			
EQUATION: NOT PROVIDED	NA	NA	NA	NA
LARGEST OF AVERAGE OR EQUATION		**10**	**2**	**12**
AM PEAK HOUR GENERATOR		84%	16%	
NUMBER OF STUDIES	13			
AVERAGE SIZE	12			
MINIMUM RATE	0.51	3	0	3
AVERAGE RATE	2.30	9	2	11
MAXIMUM RATE	10.67	45	8	53
STANDARD DEVIATION	2.35			
EQUATION: LN (T) = 0.67 * LN(X) + 1.44	R^2 = 0.56	10	2	12
LARGEST OF AVERAGE OR EQUATION		**10**	**2**	**12**
PM PEAK HOUR ADJACENT STREET		18%	82%	
NUMBER OF STUDIES	14			
AVERAGE SIZE	13			
MINIMUM RATE	0.22	0	1	1
AVERAGE RATE	2.16	2	9	11
MAXIMUM RATE	9.67	9	39	48
STANDARD DEVIATION	2.00			
EQUATION: LN (T) = 0.81 * LN(X) + 0.86	R^2 = 0.52	2	7	9
LARGEST OF AVERAGE OR EQUATION		**2**	**9**	**11**
PM PEAK HOUR GENERATOR		18%	82%	
NUMBER OF STUDIES	13			
AVERAGE SIZE	12			
MINIMUM RATE	0.22	0	1	1
AVERAGE RATE	2.29	2	9	11
MAXIMUM RATE	9.67	9	39	48
STANDARD DEVIATION	2.10			
EQUATION: T = 2.00 * (X) + 3.49	R^2 = 0.51	2	11	13
LARGEST OF AVERAGE OR EQUATION		**2**	**11**	**13**

EPS GROUP

PROJECT	135 ROADRUNNER DRIVE PROPERTY			
PARCEL	PROPOSED SITE			
ITE LAND USE CATEGORY AND CODE	UTILITY (170)			
INDEPENDENT VARIABLE	EMPLOYEES			
SIZE	15			
		TRIPS		
		ENTERING	EXITING	TOTAL
***WEEKDAY* DAILY**		50%	50%	
NUMBER OF STUDIES	13			
AVERAGE SIZE	39			
MINIMUM RATE	0.80	6	6	12
AVERAGE RATE	3.85	29	29	58
MAXIMUM RATE	22.00	165	165	330
STANDARD DEVIATION	1.99			
EQUATION: T = 3.87 * (X) - 0.92	R^2 = 0.82	3	3	6
LARGEST OF AVERAGE OR EQUATION		**29**	**29**	**58**
AM PEAK HOUR ADJACENT STREET		87%	13%	
NUMBER OF STUDIES	13			
AVERAGE SIZE	43			
MINIMUM RATE	0.18	3	0	3
AVERAGE RATE	0.71	10	1	11
MAXIMUM RATE	2.00	26	4	30
STANDARD DEVIATION	0.29			
EQUATION: LN (T) = 0.81 * LN(X) + 0.37	R^2 = 0.91	11	2	13
LARGEST OF AVERAGE OR EQUATION		**11**	**2**	**13**
AM PEAK HOUR GENERATOR		84%	16%	
NUMBER OF STUDIES	13			
AVERAGE SIZE	39			
MINIMUM RATE	0.18	3	0	3
AVERAGE RATE	0.72	9	2	11
MAXIMUM RATE	8.00	101	19	120
STANDARD DEVIATION	0.55			
EQUATION: T = 0.62 * (X) + 3.85	R^2 = 0.82	11	2	13
LARGEST OF AVERAGE OR EQUATION		**11**	**2**	**13**
PM PEAK HOUR ADJACENT STREET		14%	86%	
NUMBER OF STUDIES	14			
AVERAGE SIZE	84			
MINIMUM RATE	0.25	1	3	4
AVERAGE RATE	0.75	2	9	11
MAXIMUM RATE	3.00	6	39	45
STANDARD DEVIATION	0.19			
EQUATION: T = 0.81 * (X) - 4.70	R^2 = 0.99	1	6	7
LARGEST OF AVERAGE OR EQUATION		**2**	**9**	**11**
PM PEAK HOUR GENERATOR		18%	82%	
NUMBER OF STUDIES	13			
AVERAGE SIZE	39			
MINIMUM RATE	0.33	1	4	5
AVERAGE RATE	0.72	2	9	11
MAXIMUM RATE	9.00	24	111	135
STANDARD DEVIATION	0.50			
EQUATION: T = 0.67 * (X) + 2.04	R^2 = 0.88	2	10	12
LARGEST OF AVERAGE OR EQUATION		**2**	**10**	**12**

EPS GROUP