5/24/24

John Berry
Berry Riddell
6750 E Camelback Rd Ste 100
Scottsdale, AZ 85251

RE: **2-ZN-2024**
Artessa
G0949 (Key Code)

Planning & Development Services has completed review of the above referenced development application. The following comments represent issues or deficiencies identified by the review team and are intended to provide you with guidance for compliance with city codes, policies, and guidelines.

Significant Zoning Ordinance or Scottsdale Revise Code Issues

The following code and ordinance related issues have been identified and must be addressed with the resubmittal. Addressing these items is critical to determining the application for public hearing and may affect staff's recommendation. Please address the following:

Long Range, Ben Moriarity, 480-312-2636, bmoriarity@scottsdaleaz.gov

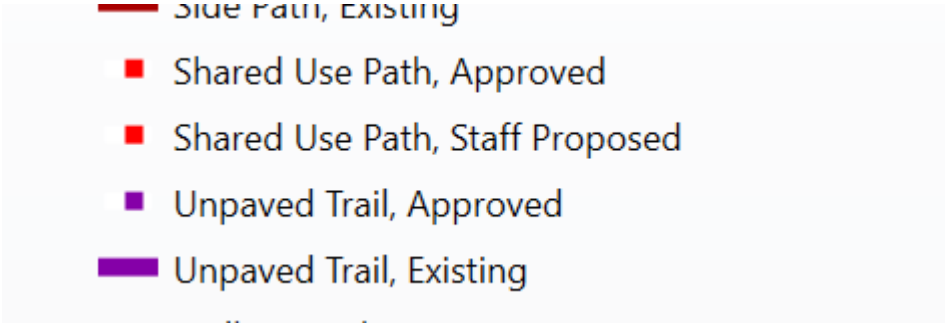
1. The General Plan 2035 Future Land Use designation for the site is Commercial. While PCC is a commercial district, please revise the narrative and exhibit packet to describe and detail how the proposed dwelling units will be physically integrated with the existing businesses on the site. (ZO Sec. 5.2506.A).
    a) Consider updating images on page 5 and 6 to label the proposed area as "Integrated Dwelling Units" as opposed to "Residential"
    b) Rather than characterizing the proposal as mixed use-residential consider please state the proposal is integrating residential within the existing commercial center a (page 11 of the narrative).
2. Please identify the location of the proposed public bicycle repair station on the revised plans as described within the narrative (page 13). Consider locating the bike station near the bike lanes, shared use paths and/or the unpaved trails along the East Dynamite Boulevard or North Alma School Parkway right-of-way where the public can easily access the station and so that it may be of service to visitors to the nearby Brown's Ranch Trailhead and George "Doc" Cavalliere Park.
3. The existing property has a 15' wide trail easement along the south and west property lines. General Plan 2035 Trail & Trailheads Map (Pg 139) along with Policy R 2.5 encourages a trail connection in this area. Please give further detail within the narrative and illustrate show on the revised site plan

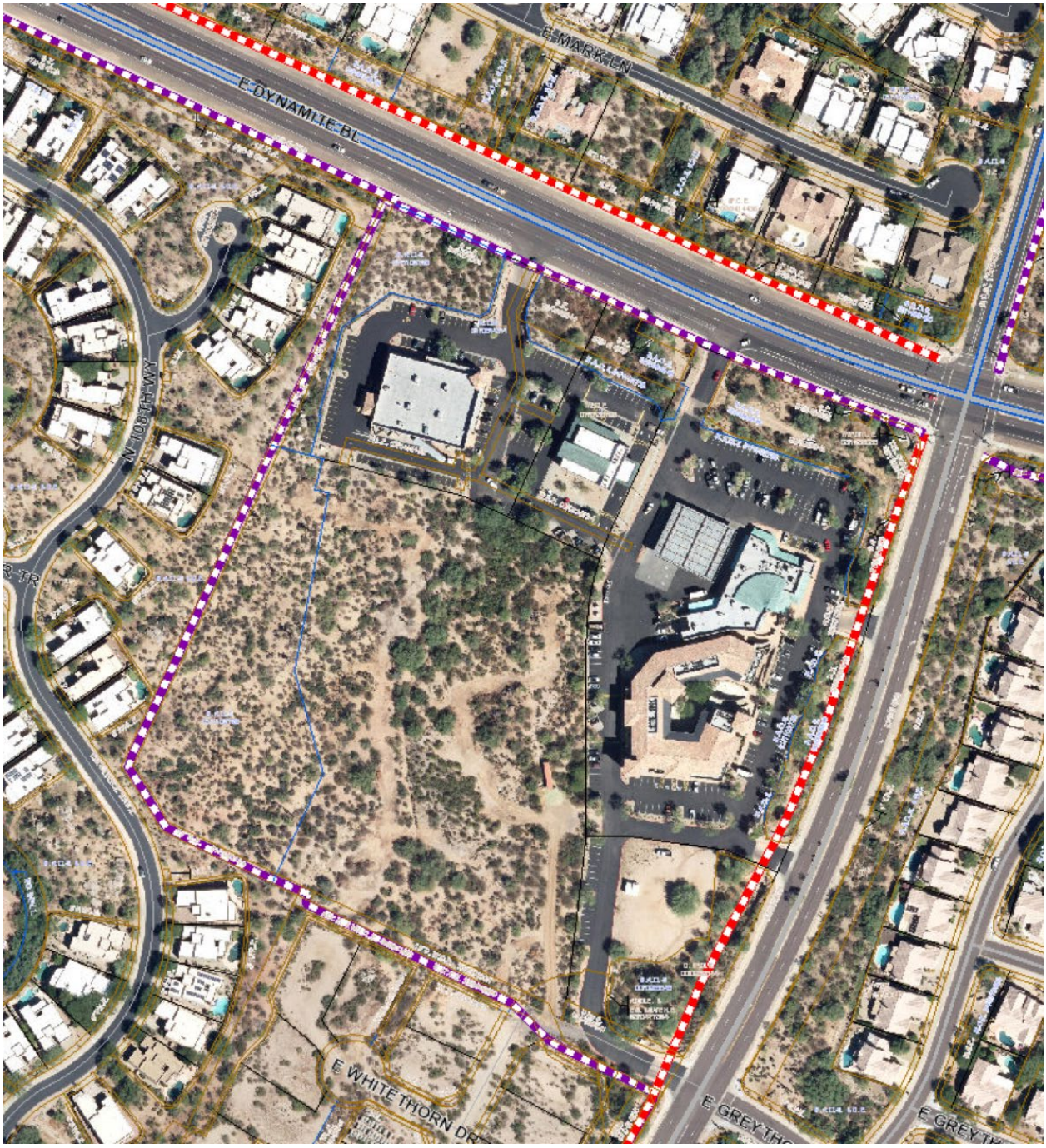
how the unpaved trail will be improved. Finally, note the location of the improved trail on a Circulation Plan as well as all other affected site plan materials.

4. The Neighborhood Outreach Report states that notifications were sent per the City's mailing requirements. Please confirm what requirements were used; the previous 750' radius or the new standard (as of July 2023) of 1,250' radius from the site. Please note that the City postcard notifications will be sent to property owners within a 1,250' radius of the site and the second neighborhood meeting that is mentioned in the Outreach Report should be notified to the new standard for Zoning cases.
5. If further outreach has been conducted since the original submittal, and as a response to Goal CI 1 of the Community Involvement Element as well as Policy LU 3.5 of the Land Use Element, with a resubmittal, please provide an updated Citizen Involvement Report that describes the key issues that have been identified through the public involvement process and how the forthcoming resubmittal has responded to such items.

Planning, Katie Posler, 480 312 2703, kposler@scottsdaleaz.gov:

6. Please provide an updated master land use table to account for the new dwelling units for this parcel, parcel N. Please see the attached land use data table from case 45-ZN-1990.
7. Please respond, within the Development Plan, with examples of how the dwelling units are physically (or horizontally) integrated with the existing commercial uses per the PCC land use limitations. Please integrate pedestrian shading, seating, and other amenities to tie in the proposed residential to the existing commercial components.
8. Please update the project plans to label new external sidewalks, external trails, and internal sidewalks, with associated required widths. Please update the project scope and associated plans to provide an 8' wide trail along the north, west, and south boundary as shown in purple. Please update the Dynamite Boulevard frontage to provide a new detached 8' wide sidewalk and Alma School Parkway frontage to provide a new deatched 8' shared use path as shown in red. All internal sidewalk connections should be at least 6' in width. (See images below)

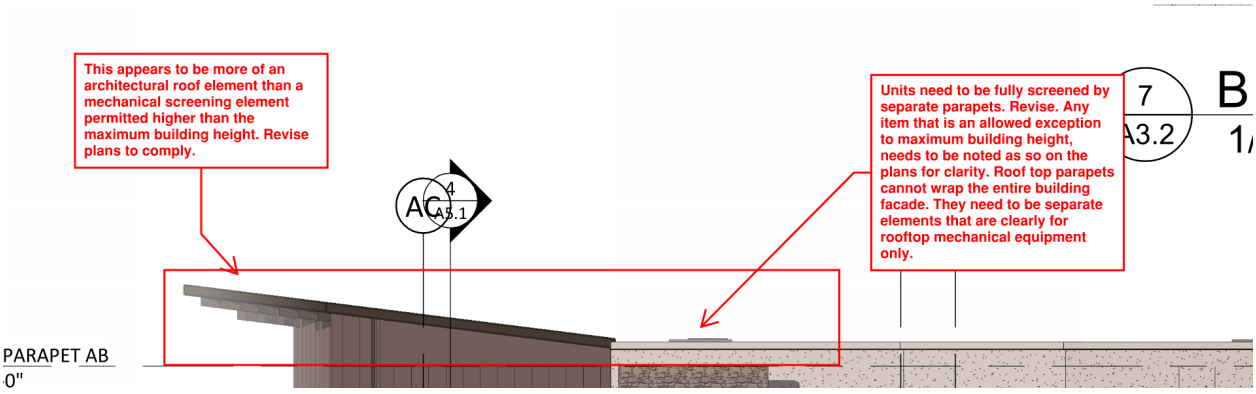




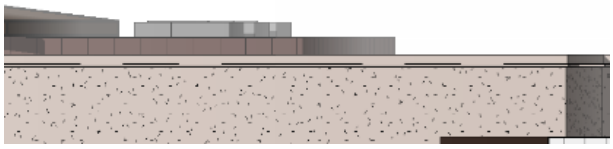
9. Please submit the associated Development Agreement for the PSD zoning request. Within the DA, please address how the residential parcel is using the density allowed for the entire center and include a development table budget (like done in the past). Please address all standards being shared/transfred. That would also include commercial SF, open space, naos, and parking lot landscaping.
10. In ESL (HD/HC) zoning, building height is measured from natural grade per Z.O.Sec.6.1070. Please provide a roof over topography plan to demonstrate building height compliance.

Height call outs need to follow this format:
Top of Roof/Parapet Elevation: XXXX.XX
Natural Elevation Grade Below: XXXX.XX
Difference: XX.XX (Cannot exceed 36' from natural grade EXCEPT for allownances in Z.O.Sec.7.102., which need to be clearly called out on the roof over topography plan)

The proposed elevations are taller than 36' and such elements do not appear to be mechanical screening, they appear to be architectural elements that need to comply with the maximum permitted building height for the zoning. See below as an example.



11. All roof top mechanical equipment must be fully screened on all sides by parapet walls. Please revise the building elevations to comply with Z.O.Sec.7.105. See example below where units are exposed:



12. Please update the open space plan to address this PCC zoning requirement. List the required and provided frontage open space.

    Frontage open space minimum: 0.35 multiplied by the required common open space, except as follows:
    a.At least thirty (30) square feet per one (1) linear foot of public street frontage.
    b.Not required to exceed fifty (50) square feet per one (1) linear foot of public street frontage.
13. Landscape islands adjacent to parking spaces shall be counted as parking lot island open space as opposed to common open space, please revise the open space plan to comply.
14. Please delineate the required one-third (1/3) interior parking lot landscape area requirement on the revised site plan as set forth in Sec. 10.501.H.2.a. of the Zoning Ordinance.
15. There shall not be any buildings within the 80' yard setback along the west and south boundaries. Relocate the garage and carport canopies out of the 80' southern setback to comply with code.
16. To accompany the slope analysis table, please provide a topography plan to demonstrate the required NAOS in accordance with the Zoning Ordinance, with the next submittal.

17. There are some small descrepencies between the recorded NAOS boundaries and NAOS configuration area on the NAOS plan, please coordinate.
18. Please update the NAOS plan to list the allowed and provided NAOS reveg. Maximum allowance is 25% of the required NAOS SF and reveg counts at a half credit in HD zoning. Please update math accordingly.
19. Please coordinate the site plans, G&D, and NAOS plans to show the accurate existing and new NAOS dedications (both undistrubed and reveg NAOS). The G&D is showing improvements in the NAOS that are not permissible and also grading that would need to be considered reveg NAOS and calculated as so.
20. Revise project plans to remove rip rap and all other hardscaped areas from the NAOS easement as those improvements are not permitted.
21. Please revise the site plans to show and label these setbacks per the past ZN case:

approval.

A 100 foot scenic corridor is provided along Dynamite Boulevard. This setback will also contain part of the project's NAOS requirement and a limited amount of channelizing necessary for drainage near the Alma School intersection. Along Alma School a 40 foot scenic corridor with a 100 foot building setback is provided and will contain a desert landscaped drainage channel carrying flows to an offsite detention area.

22. Please update the project plans (narrative and site plans) to indicate if the scope of work includes reverting to the ordinance PCC standards or amended standards from case 2-ZN-1995. The 2-ZN-1995 case includes vloume ratio and courtyard requiements that would need to be met and demonstrated on the plans if the amended standards are intended to be used.

B. *Volume ratio.* In no case shall the volume of any structure exceed the product of the net lot area in square feet multiplied by six (6) feet.

height above twelve (12) feet.

2. Planned community centers shall be oriented toward a courtyard, with buildings enclosing the courtyard, and opening onto the courtyard from at least three (3) sides. The courtyard shall be a minimum of one (1) percent of the net lot area.

   a. Residential development shall be oriented toward said courtyard.
   b. If, in the opinion of the development review board, a suitable alternative design solution is presented, the courtyard requirement may be waived.

23. Please update the overall site plan to provide labels and key site plan call outs as done on the individual site plan (since the rezoning is for this entire center).
24. Please revise the overall site plan to include the location of all right of ways, easements, and associated widths.
25. Please revise the conceptual landscape plan so that it includes summary data indicating the landscape area (in square feet) of on-site, right-of-way, and parking lot landscaping, in compliance with Zoning Ordinance Section 10.200.
26. Please revise the landscape plan so that the landscape legend and plan includes quantity and size of the proposed plants, in compliance with Zoning Ordinance Section 10.200.
27. Revise the landscape plan so that is matches the rest of the project scope, including showing NAOS areas, new and pedestrian connections, carports, etc.
28. Landscape island areas shall have a minimum width of seven (7) feet and a minimum area of one hundred twenty (120) square feet. Please show compliance on open space plans.
29. Landscape plan shall be revised to show the entire site being rezoned and add trees/shrubs to existing landscape areas that have been diminished over time.
30. Please revise parking to demonstrate that an equal amount of accessible covered parking spaces is provided, per ZO Sec. 9.105.I-M. Be advised, the ratio between non-accessible covered vs. uncovered parking spaces should be equal to the amount of accessible covered vs. uncovered parking spaces.
31. Please revise to include bicycle parking calculations consistent with ZO Sec. 9.103.C.
32. Please update the project plans to list the required and provided parking for the existing commercial buildings to verify compliance.
33. Please update the project plans to clearly label and show all existing (faint) and new (bold) pedestrian connections with associated sidewalk widths. It needs to clear how a resident would achieve walking from the residential buildings to the sidewalks along all street frontages. New connections on the plan set should be shown in bold to denote new improvments. New pedestrian connections should be straddled by landscaping.

Design Review, Brad Carr, 480-312-7713, bcarr@scottsdaleaz.gov

34. The applicant shall provide a roof plan analysis indicating each tile ridge height or parapet height above sea level, how that building height relates to the finish floor elevation of the buildings, and the existing topography of the site.
35. Please note that the light reflective value (LRV) of all exterior paint colors and materials shall be thirty-five (35) percent or less. In addition, value and chroma shall not exceed six (6) as indicated in the Munsell Book of Color.
36. Per Sec. 6.1070.G.1.i. of the Zoning Ordinance, plant materials that are not indigenous to the ESL area shall be limited to enclosed yard areas and non-indigenous plants that have the potential of exceeding twenty (20) feet in height are prohibited. Please revise the landscape plans to ensure all non-indigenous plant materials are located to enclosed yard areas.
37. Please provide information and details related to the roof drainage system. Roof drainage systems, excluding overflow scuppers, shall be interior to the building, or architecturally integrated within the design of the structure. If overflow scuppers are provided, they shall be integrated with the architectural design. Areas that are rooftop drainage shall be designed and constructed to minimize erosion or staining of nearby building walls and directs water away from the building foundations. Please refer to Zoning Ordinance Section 7.105.C.

Engineering, Eliana Hayes, 480-312-2757, ehayes@scottsdaleaz.gov

38. SRC 48: Please provide city's approval of the existing parcel lines within proposed rezoning area.

a. (+ SRC 31) Existing Wells Fargo eastern parcel line appears to be too close to its building canopy. Please provide an architect's signed and sealed building code analysis for existing parcel line placement else the property line should be shifted so that it is located 30' from the canopy edge.
b. As currently presented in case materials, all parcels within the rezoning boundary provide for unified and cohesive access, vehicular and non. Currently the parcels are all owned by the same entity, but the city cannot preclude their sales to different entities. Different entities may have different intents with their parcels. Please provide a proposed deed restriction or in perpetuity access agreement providing for the protection of shared drive aisles and sidewalks and their communal maintenance and financing thereof.
c. Platting of parcels will be a prerequisite of development permit issuance if the city did not approve the existing property lines; re response above. As a commercial project, a minor subdivision requires a case approval, which may be accomplished via the project's DR case with a submittal of proposed plat accordingly.

Water Resources, Rezaur Rahman, 580-312-5636, rrahman@scottsdaleaz.gov

39. The 8" public sewer along Alma School Rd, from Dynamite Rd to south of Jomax Rd, has reached its max capacity including its allocation for Fiesta/Reata Ranch and may not have additional capacity for this rezoned property. Per DSPM Section 7-1.400 and SRC, the Developer must install, at their expense, all on-site and off-site sewer improvements necessary to serve their development:
    a. The Developer is required to up size Alma School Rd 8" sewer to 12" minimum from Dynamite Rd to South of Jomax Rd at their expense.
    b. City's current Infrastructure Improvement Plan (IIP) includes installation of a 10" sewer line along Alma School Rd from Dynamite Rd to South of Jomax Rd. The allocated amount for this IIP may be credit eligible (up to budgeted amount) if the Developer chooses to proceed with their proposed improvements and up size Alma School Rd sewer line to a minimum 12" sewer line from Dynamite Rd to South of Jomax Rd.
    c. If the cost for 12" sewer line from Dynamite Rd to South of Jomax Rd exceeds City's allocated IIP budget, the additional cost shall be at Developer's expense.

Fire, Doug Wilson, 480-312-2507, dowilson@scottsdaleaz.gov

40. Please see the provided redlined set and address comments accordingly.
41. Please provide the minimum radius of all turns shall be in accordance with Figure 2-1.4 (16'/41' SFR - 25'/49' Commercial) (DS&PM 2-1.303(4))
42. Divided entrances shall be 20' wide min. Please revise plans accordingly. (DS&PM 2-1.303(1))
43. Fire lane surface shall support 83,000 lbs. GVW including bridges. Please revise plans accordingly. (DS&PM, 2-1.303(2))

Significant Policy Issues

The following policy related issues have been identified. Though these issues may not be as critical to determining the application for public hearing, they may affect staff's recommendation and should be addressed with the resubmittal. Please address the following:

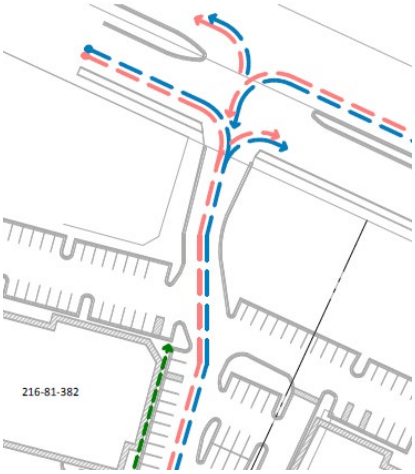
Design Review, Brad Carr, 480-312-7713, bcarr@scottsdaleaz.gov and Planning, Katie Posler, 480 312 2703, kposler@scottsdaleaz.gov

44. Identify the location of all above ground utility equipment on the site plan. Utility equipment should be located so that it does not conflict with pedestrian amenities, resident amenities, landscape features, and/or on-site circulation. This may require coordination with the utility providers on more appropriate locations and paint colors to mitigate the visual impacts of those equipment on the site.
45. Please revise the project plans to fully enclose stairwells between levels of the building.
46. Due to topography surrounding the site, portions of the roof and associated mechanical equipment located on the roof, may be seen from a higher elevation off-site. Please revise the project plans to include full screening of the rooftop mechanical equipment, including over the top of rooftop mechanical units.
47. Portions of the building's east, south and west elevations appear to have limited shading of exterior glazing. The City's Sensitive Design Principles promote the use of context-appropriate architectural solutions to address solar exposure of exterior glazing and patio areas. Please revise the project plans to incorporate additional shading features at these building facades.
48. Please revise the landscape plans to provide landscaping in the landscape islands between parking spaces of the new development and existing shopping center.
49. No fixture shall be mounted higher than 14 feet, per 45-ZN-1990, except recessed lighting fixtures located in a soffit or canopy above an upper-floor balcony. (City of Scottsdale Exterior Lighting Policy and DSPM)
50. All exterior lighting shall have a Kelvin temperature of 2700 or less. (City of Scottsdale Exterior Lighting Policy)
51. All fixtures and associated hardware, including poles, shall be flat black or dark bronze. (City of Scottsdale Exterior Lighting Policy)
52. The maintained **maximum** horizontal luminance level, at grade on the site, shall not exceed 6.0 foot-candles. All exterior luminaires shall be included in this calculation except gasoline or ATM drive-thru canopy areas. (City of Scottsdale Exterior Lighting Policy, and DSPM). Ambient Lighting Zones Map.
53. Please provide a cuts and fills exhibit for the project.
54. ***Please consider revising the site plan to remove all parking (at grade) from the 80' building setback and replace with a landscape buffer adjacent to the single family subdivision to the south to demonstate sensitivity to neighboring development.***
55. There appears to be separate gray structural posts/beams on the elevations. Can these not be hidden within the building? Please respond and revise plans to hide strucutural components.

Transportation, Phil Kercher, 480-312-7645, pkercher@scottsdaleaz.gov

56. Improve the multi-use trail around the perimeter of the mixed-use development – Dynamite Boulevard to Alma School Road - within the existing trail easement. Trail improvement shall be minimum 8-foot wide compacted decomposed granite. Dedicate additional non-motorized public access easements as necessary to complete the trail improvements to avoid vegetation, boulders, wash crossings, etc. DSPM Sec. 8-3.200
57. Dedicate minimum 15-foot wide non-motorized public access easements along the Dynamite Boulevard site frontage. Construct the multi-use trail within the trail easement. Trail improvement shall be minimum 8-foot wide compacted decomposed granite. Dedicate additional non-motorized public access easements as necessary to construct the trail improvements to avoid vegetation, boulders, wash crossings, etc. DSPM Sec. 8-3.200

58. Widen the multi-use path along the Alma School Road site frontage to a minimum 8-foot width. Dedicate additional non-motorized public access easements as necessary to construct the path improvements to avoid vegetation, boulders, wash crossings, etc. DSPM Sec. 8-3.200
59. Dedicate safety triangles at all site driveways on Dynamite Boulevard and Alma School Parkway. DSPM 5-3.123; Fig. 5-3.27
60. New sidewalk shall be constructed as shown on the submitted Pedestrian and Vehicular Circulation Plan dated 3-15-2024. All new sidewalks shall be a minimum width of 6 feet. A new sidewalk shall be constructed along the western side of the existing western Dynamite Boulevard driveway. Please revise plans accordingly.



Engineering, Eliana Hayes, 480-312-2757, ehayes@scottsdaleaz.gov

61. DSPM. 2-1.305 F. Provide loading and unloading areas, minimum length of 45' and width of 12', in accordance with below tables, update site plan accordingly. Alleys, fire lanes and streets shall not be used for loading and unloading. Update case materials accordingly.

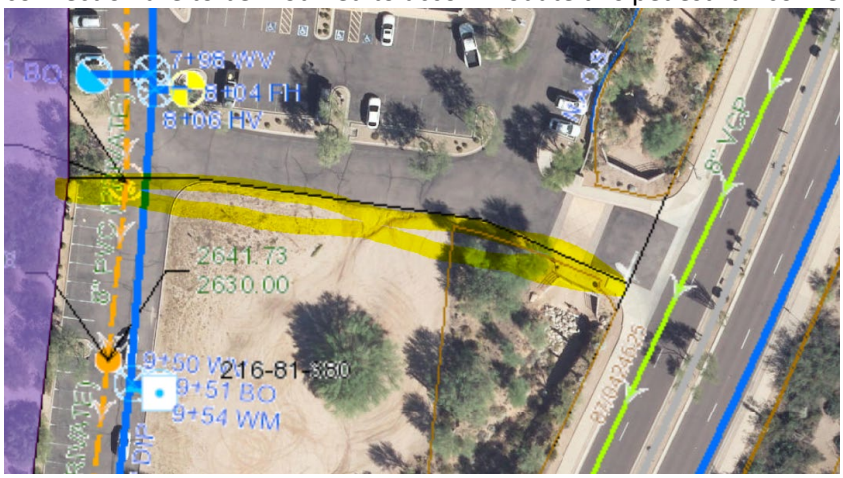
MULTI-FAMILY OFF-STREET LOADING & UNLOADING AREAS	
NO. OF DWELLING UNITS	NO. OF LOADING & UNLOADING AREAS
0 -50	1*
51 - 150	1
151 - 450	2
OVER 450	3**

* The DRB may approve designating one on-lot parking space for loading and unloading that is 10 feet wide by 18 feet long. Designated spaces shall be signed and striped as loading and unloading areas.

** Plus, any additional loading areas required by the DRB.

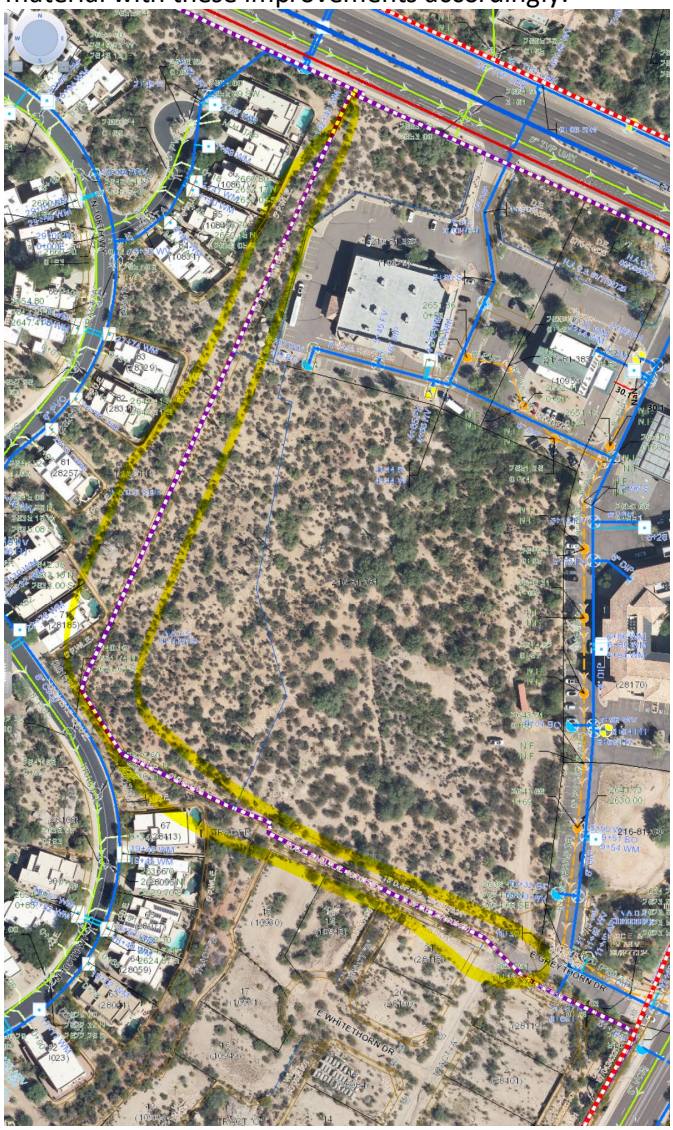
62. DSPM 2-1.309: REFUSE. Provide a refuse plan meeting all city refuse requirement given in DSPM 2-1.309.
    a. Please note that 90 dwelling units necessitates a 6 cubic yard minimum horizontal or vertical compactor. Please make sure to accommodate in refuse plan accordingly, specifically stating the compactor to be used to assure appropriate site space has been provided for it.
    b. An emergency and services access easement along the refuse service route to and from city streets, crossing parcels boundaries, will be required. Update refuse plan accordingly.
63. DSPM 2-1.310: A 6' wide accessible pedestrian route from the main entry of the development to each rezoning area abutting public street is required. Please add construction of 6' sidewalk to N Alma School as a scope of this project (currently not depicted within provided preliminary

G+D). Missing sidewalk is located here, existing parking stalls in conflict with proposed sidewalk connection are to be modified to accommodate this pedestrian connection:



64. DSPM 3-1.701, I: BENCHMARKS: Please make sure to use the McDOT benchmark system and in accordance with the FEMA Benchmark Maintenance criteria. Please update submittal accordingly.
65. DSPM 5-8.205: All non-ADA compliant pedestrian ramps abutting rezoning boundary are to be reconstructed by project. Update site plan accordingly – all existing driveway curb returns:

66. DSPM 6-1.202 + 7-1.201: Preliminary Basis of Design Reports must be reviewed and accepted by the Water Resources Department prior to zoning approval. Update BODs accordingly.
67. DSPM 8-3.100: Per transportation Master Plan, and existing trail easement called out within ALTA (MCR 2001-1082104) a trail is to be provided along rezoning boundaries, update case material with these improvements accordingly:



Water Resources, Rezaur Rahman, 580-312-5636, rrahman@scottsdaleaz.gov

68. To be considered separate buildings per IFC, 10' separation from roof overhang to other building overhang should be provided, per IFC 705. Site plan shows 955 sqft connector building from A to B and 1561 sqft connector building from B to C. If buildings are connected, use total area of A, B & C for fire flow calculations.
69. Group R-3 and R-4 buildings do not qualify 75% fire flow reduction per IFC. Confirm the proposed buildings do not fall under these categories.
70. 68 dwelling units on 8.6 acre which is 7.9 DU/acre. Use 248.2 gpd per DSPM Figure 6-1.2 for water demand calculation.
71. GPM calculation from GPD shall be based on 12-hrs active water usage per DSPM Figure 6-1.2.

72. Based on Fire Hydrant flow test, this is a two pump system. Flows from two fire hydrants cannot be combined to one hydrant in hydraulic modeling. Update to two pump modeling system and relocate pumps and reservoirs based on their actual locations. See DSPM Section 6-1.202.
73. Network diagram does not match with Water Plan Sheet C4.11. Update network diagram per DSPM Section 6-1.202.
74. Revise Hydraulic Modeling based on revised demand calculation and two pump system with their own pump curve (not a combined pump curve). Water modeling results not reviewed due to incorrect analysis. See DSPM Section 6-1.202.
75. All public waterline and appurtenances shall be in a dedicated 20-ft of waterline easement per DSP Section 6-1.419.
76. 68 dwelling units on 8.6 acre which is 7.9 DU/acre. Use 2.5 persons per unit following DSPM Section 7-1.403 for wastewater demand calculation.
77. Amenities category has been used as commercial for water demand calculation. Use the same category for wastewater demand calculation (0.5 gpd/SFT) per DSPM Figure 7-1.2.
78. Update sewer flow calculation per DSPM Section 7-1.403 and Figure 7-1.2.
79. Use 2.5 person/DU per DSPM Section 7-1.403.
80. The 8" public sewer along Alma School Rd has reached its max capacity. Conduct Sewer Flow Monitoring minimum at two locations per DSPM Section 7-1.202.E. Coordinate with Water Resources for the location of sewer monitoring manholes.

Drainage, Jennifer Lynch, 480-312-7903, jlynch@scottsdaleaz.gov

81. Please address attached drainage department redlines.

Fiber & Street Lights, Keith Niederer, 480-312-2953, kniederer@scottsdaleaz.gov

CITY CONDUIT

82. Install a 2-inch diameter conduit within the public right-of-way along the N. Alma School Parkway and E. Dynamite Blvd. frontages with access hand holes for future fiber optic cable installation for municipal purposes. This includes fiber for water/wastewater infrastructure, fiber for municipal facilities like fire stations, and fiber for Intelligent Traffic Systems communications.

STREETLIGHTING

83. Existing streetlight poles and luminaires along the N. Alma School Parkway and E. Dynamite Blvd. frontages shall be replaced with new streetlight poles and luminaires per City of Scottsdale Standard Detail 2173. Concrete foundations are required for all new or replacement poles. Pole style should architecturally match other existing surrounding streetlight poles.
84. Replacement streetlight poles shall be hot-dip galvanized according to ASTM 123 and powder coated SW7055 “Enduring Bronze”.
85. New or replacement streetlight poles shall be located within the public right-of-way or within an easement.
86. New or replacement streetlight poles shall be placed no closer than 2.5 feet from the back of curb and 1-foot from the back of sidewalks.
87. New or replacement streetlight poles shall be placed no closer than 5-feet from a fire hydrant.
88. New or replacement streetlight poles shall be placed no closer than 6-feet to a water, sewer or gas line.
89. New or replacement streetlight poles shall be located closer than 15’ from trees.

90. All new and replacement streetlight poles shall Light Emitting Diode (LED) luminaires. Install a GE ERLH 10C330 71W, 7800 lumen luminaire or a Signify Lumec RFS-72W32LED3K-G2-4-HS 73 watt, 7427 lumen luminaire.

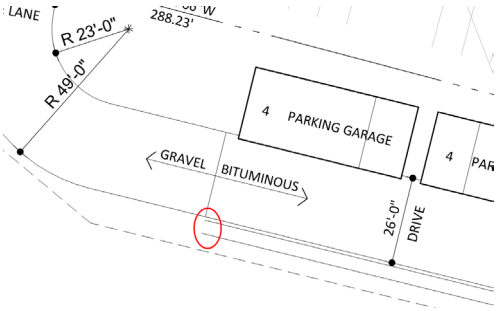
Technical Issues

The following technical corrections have been identified. Though these items may not be critical to scheduling the case for public hearing, they may affect a decision on the construction plan submittal and should be addressed as soon as possible. Please address the following:

Planning, Katie Posler, 480 312 2703, kposler@scottsdaleaz.gov:

Below items are technical but need to be addressed on plans to demonstrate compliance:

91. Please update the overall site plan to list the minimum and maximum gross acreage per PCC zoning, 15 acres and 30 acres respectively, to show the site is in conformance.
92. Please update the project plans to label new vs existing site improvements.
93. Please update both site plans to list density allowed and density proposed per PCC zoning.
94. Please update the site plans to list the allowed and proposed floor area ratio per PCC zoning amended standards. Allowed is 0.25 of the development plan. Does not include residential floor area.
    - Case 45-Z-90 established a maximum floor area ratio of .25 on this parcel.
95. Please update the site plan to list allowed and proposed building height per PCC zoning.
96. Please update the site plans to list existing and proposed zoning.
97. Please revise the open space plan to list the minimum required and provided private open space for units A-F. (It is demonstrated on the floor plans, but please add it the open space plan, via a table, for clarity).
98. Please show the minimum 5' between NAOS and building walls.
99. Please identify the location and height of all screen walls on the site plan.
100. Please show the individual bike racks and note per City of Scottsdale Standard Detail No. 2285.
101. New pedestrian connections are shown through existing parking spaces, it should be clear that the parking space is being removed and new sidewalk and landscape island is proposed. Please also clarify the beginning and end of new sidewalk locations. See example below.



102. Please update the circulation plan to show the required trail improvements and sidewalk improvements.
103. Please label the main entrance on the color elevations for clarity.
104. Please update the site plan to show the refuse enclosure and associated screen walls.
105. Please update the site plan to show ground mounted utility equipment and screening.

106. Please list the wash CFS on the G&D. Thank you.
107. Missing Scenic Corridor and Buffered Roadway Easements will be required to be dedicated prior to permit issuance.
108. What is planned in the hammerhead turn around area on the south side of the plan? Bocce Ball? Pickle Ball? Dog area? If this is planned for an amenity space, please label it as such. The area may not be able to be used as an amenity area and fire turn around.

Design Review, Brad Carr, 480-312-7713, bcarr@scottsdaleaz.gov

109. Please revise the project plans to provide color building elevations, with appropriate material callouts, for the proposed garages located throughout the site.
110. Please revise the project plans to provide color building elevations, with appropriate material callouts, for the proposed casita units located throughout the site.
111. Please revise the building elevations (for all buildings) to clearly label the locations of all building materials and colors that will be utilized.
112. Please provide location and design details of the SES (electrical) panels. The face of the SES shall be flush with the building façade.

Transportation, Phil Kercher, 480-312-7645, pkercher@scottsdaleaz.gov

113. Please dedicate cross-access easements over the site parcels to allow vehicles from all parcels to access the existing driveways on Dynamite Boulevard and Alma School Parkway.

TIMA, Stephanie Croker, 480-312-7802, scroker@scottsdaleaz.gov

114. Please provide ADT data for Alma School. The 9,400 ADT vehicles shown in the study are for the section of Alma School from Happy Valley to Jomax. Please adhere to the DSPM Initiating Impact and Mitigation Analysis Category 1 study requirements requiring current ADT's.
115. How was the square footage used for the shopping center land use? It should not be the gross area times the max FAR.

Water Resources, Rezaur Rahman, 580-312-5636, rrahman@scottsdaleaz.gov

116. Water BOD:
    A. Incorrect total area calculation. Update all building area.
    B. Per site plan submitted total building residential area is 77,796 SF.
    C. Confirm if both flow hydrants were used at the same time or one at a time. Both flow hydrants need to be operated at the same time.
    D. 10' separation need to be measured from overhang to overhang.
117. Sewer BOD:
    E. Existing on-site manholes are private. Does the Developer have permission from the existing Owner to connect? Who would be responsible for the maintenance of this private manhole and downstream sewer segment?
    F. Specify Private Sewer for all onsite existing and new sewer infrastructures.

Fire, Doug Wilson, 480-312-2507, dowilson@scottsdaleaz.gov

118. Please update the plan set to show required cross access easements and emergency vehicle access easements.

Green Building, Anthony Floyd, 480-312-4202, antf@scottdaleaz.gov
119. Staff is still completing their review.

Please submit the revised application requirements and supplemental information identified in Attachment A. Once reviewed, staff will determine if the application is ready to be determined for a hearing, or if additional information is needed.

The Zoning Administrator may consider an application withdrawn if a resubmittal has not been received within 180 days of the date of this letter (Section 1.305. of the Zoning Ordinance).

If you have any questions, or need further assistance, contact case reviewer identified below.

Regards,
Katie Posler
Senior Planner

ATTACHMENT A
Resubmittal Checklist

Submit digitally at: https://eservices.scottsdaleaz.gov/bldgresources/Cases/DigitalLogin

All files shall be uploaded in PDF format. Application forms and other written documents or reports should be formatted to 8.5 x 11, and plans should be formatted to 11 X 17.

- Comment Response Letter – Provide responses to the issues identified in this letter
- Summary of modifications made resulting from Public Input and staff comments
- Project Narrative
- Traffic Impact Mitigation Analysis (TIMA)
- Basis of Design Report (water)
- Basis of Design Report (sewer)
- Fire Flow Test
- Drainage Report
- Grading & Drainage Plan
- Site Plan Overall
- Site Plan Individual
- Site Plan Details
- NAOS Plan
- Topography plan (for NAOS)
- Open Space Plan
- Landscape Plan Overall
- Circulation Plan
- Roof Over Topography

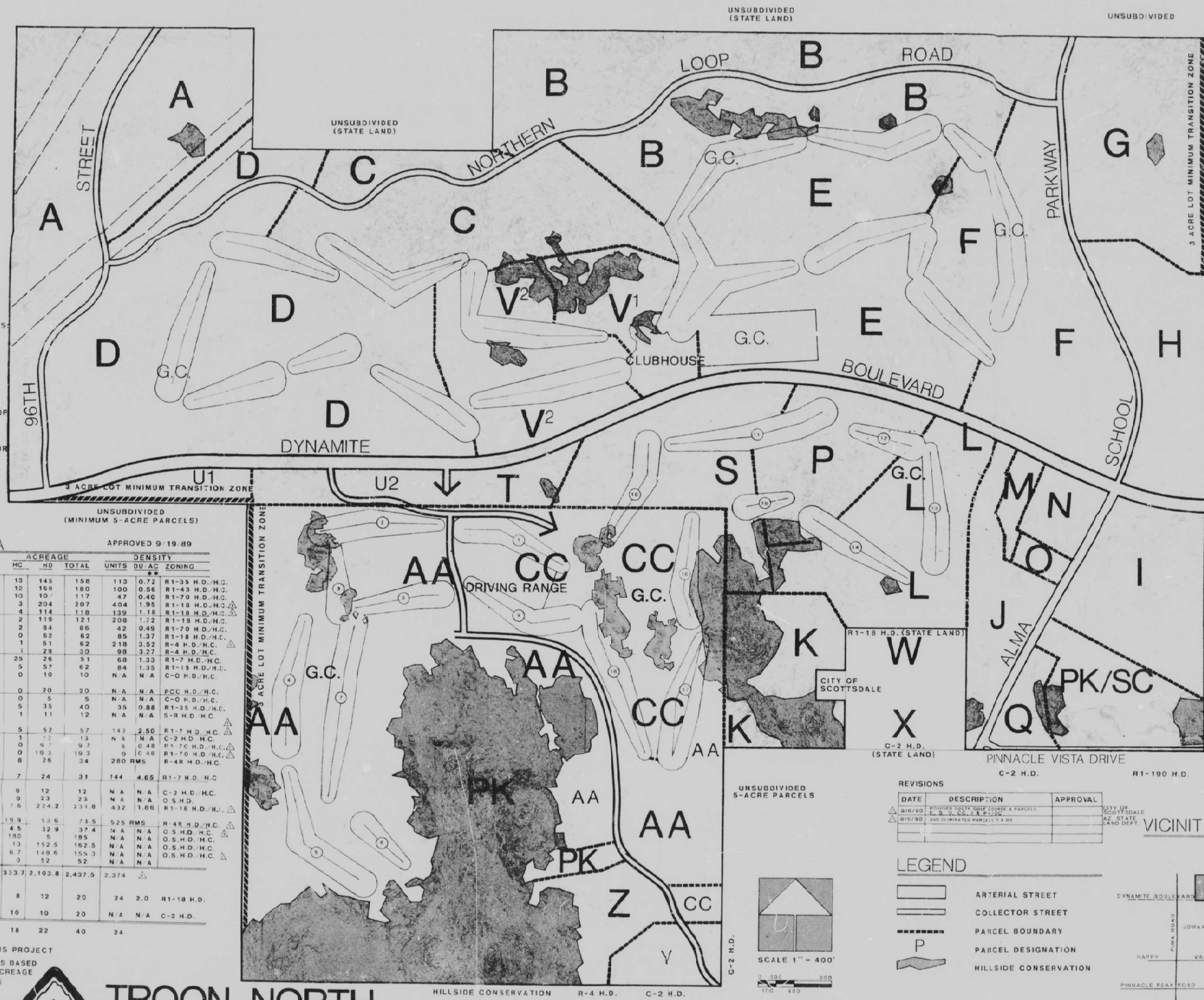
- Color Building Elevations (for all buildings)
- Perspectives
- Digital Materials & Colors Board (or label on elevations)
- Lighting Site Plan
- Photometric Analysis
- Manufacturer Cut Sheets (for external light fixtures)
- Floor Plans
- Roof Plan
- Cuts & Fills Site Plan

UNSUBDIVIDED
(STATE LAND)

NOTE:
ADJUSTMENTS TO THE UNITS AND NUMBER OF DU/AC FOR EACH PARCEL MAY BE MADE SUBJECT TO THE FOLLOWING CONDITIONS:

1. CITY STAFF APPROVAL.
2. THE TOTAL NUMBER OF UNITS FOR THE OVERALL PROJECT IS NOT INCREASED
3. THE MAXIMUM DENSITIES OF THE UNDERLYING ZONING AREA NOT EXCEEDED.
4. THE MAXIMUM CHANGE FOR PARCELS A,B,C,G,U,R, & AA IS LESS THAN 10%

   THE MAXIMUM CHANGE FOR ALL OTHER PARCELS IS LESS THAN 20%



LAND USE DATA

APPROVED 9/19/89

PARCEL	LAND USE	ACREAGE HC	ACREAGE HD	ACREAGE TOTAL	DENSITY UNITS	DENSITY DU/AC **	DENSITY ZONING
A	RESIDENTIAL	13	145	158	113	0.72	R1-35 H.D./H.C.
B	RESIDENTIAL	12	168	180	100	0.56	R1-43 H.D./H.C.
C	RESIDENTIAL	10	107	117	47	0.40	R1-70 H.D./H.C.
D	RESIDENTIAL	3	204	207	404	1.95	R1-18 H.D./H.C. △
E	RESIDENTIAL	4	114	118	139	1.18	R1-18 H.D./H.C. △
F	RESIDENTIAL	2	119	121	208	1.72	R1-18 H.D./H.C.
G	RESIDENTIAL	2	84	86	42	0.49	R1-70 H.D./H.C.
H	RESIDENTIAL	0	62	62	85	1.37	R1-18 H.D./H.C.
I	RESIDENTIAL	1	61	62	218	3.52	R-4 H.D./H.C. △
J	RESIDENTIAL	1	29	30	98	3.27	R-4 H.D./H.C.
K	RESIDENTIAL	25	26	51	68	1.33	R1-7 H.D./H.C.
L	RESIDENTIAL	5	57	62	84	1.35	R1-18 H.D./H.C.
M	OFFICE	0	10	10	N/A	N/A	C-O H.D./H.C.
N	NEIGHBORHOOD COMMERCIAL	0	20	20	N/A	N/A	PCC H.D./H.C.
O	OFFICE	0	5	5	N/A	N/A	C-O H.D./H.C.
P	RESIDENTIAL	5	35	40	35	0.88	R1-35 H.D./H.C.
Q	OFFICE	1	11	12	N/A	N/A	S-R H.D./H.C. △
S	RESIDENTIAL	5	52	57	143	2.50	R1-7 H.D./H.C. △
T	RESORT COMMERCIAL	1	12	13	N/A	N/A	C-2 H.D./H.C.
U1	RESIDENTIAL	0	9.7	9.7	5	0.48	R1-70 H.D./H.C. △
U2	RESIDENTIAL	0	19.3	19.3	9	0.48	R1-70 H.D./H.C. △
V1	RESORT	8	26	34	280 RMS		R-4R H.D./H.C.
V2	RESORT VILLAS/ TOWNHOMES	7	24	31	144	4.65	R1-7 H.D./H.C.
Y	SPECIALTY COMMERCIAL	0	12	12	N/A	N/A	C-2 H.D./H.C.
Z	MUSEUM	0	23	23	N/A	N/A	O.S.H.D.
AA	RESIDENTIAL	7.6	224.2	231.8	432	1.86	R1-18 H.D./H.C. △
CC	CLUBHOUSE & RESORT EQUESTRIAN	19.9	53.6	73.5	525 RMS		R-4R H.D./H.C. △
PK/SC	PARK/SCHOOL	4.5	32.9	37.4	N/A	N/A	O.S.H.D./H.C. △
PK	PARK	180	5	185	N/A	N/A	O.S.H.D./H.C.
GC	NORTH GOLF COURSE	10	152.5	162.5	N/A	N/A	O.S.H.D./H.C.
GC	SOUTH GOLF COURSE	6.7	148.6	155.3	N/A	N/A	O.S.H.D./H.C. △
	DEDICATED STREETS	0	52	52	N/A	N/A	
	TOTAL	333.7	2,103.8	2,437.5	2.374 △		
W*	RESIDENTIAL	8	12	20	24	2.0	R1-18 H.D.
X*	SPECIALTY COMMERCIAL	10	10	20	N/A	N/A	C-2 H.D.
	TOTAL	18	22	40	24		

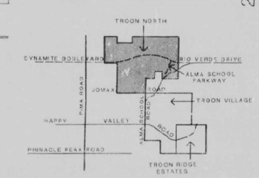
* NOT A PART OF THIS PROJECT

** DU/AC CALCULATIONS BASED ON TOTAL PARCEL ACREAGE (H.C. AND H.D. AREAS)

REVISIONS

DATE	DESCRIPTION	APPROVAL
[illegible]	[illegible]	CITY OF SCOTTSDALE
[illegible]	[illegible]	AZ. STATE LAND DEPT.

VICINITY MAP



LEGEND

- ARTERIAL STREET
- COLLECTOR STREET
- PARCEL BOUNDARY
- P — PARCEL DESIGNATION
- HILLSIDE CONSERVATION

SCALE 1" = 400'

TROON NORTH

DEVELOPMENT PLAN

11/8/89

TRICE ELSON & ASSOCIATES, INC.
14644 NORTH 74th STREET, SUITE 100, SCOTTSDALE, ARIZONA 85260 483-3232

28-Z-89

293-M-90

30 X

1 A1.12 PEDESTRIAN AND VEHICULAR CIRCULATION PLAN
1" = 50'-0"

0 25 50 100
NORTH

PEDESTRIAN AND VEHICULAR CIRCULATION PLAN

PEDESTRIAN AND VEHICLE CIRCULATION PLAN LEGEND

- PEDESTRIAN CIRCULATION
- VEHICLE CIRCULATION
- FIRE TRUCK CIRCULATION

pope DESIGN GROUP

POPE DESIGN GROUP
767 N. EUSTIS STREET, SUITE 190
ST. PAUL, MINNESOTA 55114
651.642.9200
WWW.POPEDESIGN.COM

ARCHITEKTON

lifestyle communities

Artessa Scottsdale at Pinnacle Peak Age Restricted Lifestyle Residential
SCOTTSDALE, AZ

ARTESSA
ARIZONA

PEDESTRIAN AND VEHICULAR CIRCULATION PLAN

ISSUES & REVISIONS	DATE
CITY SUBMITTAL	03-15-2024

COMMISSION NO:	43230-22242
DRAWN BY:	Author
CHECKED BY:	Checker
ZONING REF:	21.u. Pedestrian and Vehicular Circulation Plan

SHEET

A1.12

TRUE SHEET SCALE
0" 1/2" 1"

Autodesk Docs://43230-22242 Artessa Pinnacle Peak Cooperative/43230-22242_ArtessaPinnaclePeak_R23.rvt
3/14/2024 5:42:16 PM
2-ZN-2024
4/18/2024

PRELIMINARY DRAINAGE REPORT

ARTESSA PINNACLE PEAK

SWC Dynamite Boulevard and Alma School Road, Scottsdale, Arizona 85262

Prepared For:

Lifestyle Communities, LLC.

4938 Lincoln Drive
Edina, MN 55436

Prepared by:

Sustainability Engineering Group International
5240 N. 16th Street, Suite 105
Phoenix, AZ 85016
480.588.7226 www.azSEG.com

Project Number: 231106

Submittal Date: March 28, 2024 (REZONING)

CASE FILE #: **PLAN CHECK #:TBD**

2-ZN-2024
4/18/2024

Table of Contents

2-ZN-2024
4/18/2024

LIST OF FIGURES:

APPENDIX:

2-ZN-2024
4/18/2024

1. INTRODUCTION

This report represents the storm water analysis for Lifestyle Communities LLC, the project includes the construction of a new housing development with three 3-story buildings, 6 casitas, a community center and the associated hardscape and utility improvements in Scottsdale, Arizona. The purpose of this report is to provide the hydrologic and hydraulic analysis, required by the City of Scottsdale, to support the proposed site plan and rezoning submittal for said development. This report includes discussions and calculations defining the storm water management concepts for collection, conveyance, and detention systems necessary to comply with the drainage requirements of the City of Scottsdale and Maricopa County. Preparation of this report has been done in accordance with the requirements of the City of Scottsdale Design Standards & Policies Manual (DS&PM) 2018 [1], and the Drainage Design Manuals for Maricopa County, Arizona, Volumes I[2] and Volume II[3].

2. LOCATION AND PROJECT DESCRIPTION

2.1 LOCATION:

The project consists of a parcel of land located in the southeast quadrant of Section 28 Township 5 North, Range 5 East, and northeast quadrant of Section 33 Township 5 North, Range 5 East, Maricopa County, Arizona.

Parcel number is APN: 216-81-381, zoning PCC (Commercial and Industrial). This submittal is for rezoning.

Refer to **FIGURE 1** - **Vicinity Map** for the project's location with respect to major cross streets.

2.2 EXISTING SITE DESCRIPTION:

Land ownership, as defined by ALTA by Dibble dated 02/09/23. includes an 8.59 gross acre (6.08 net acre minus the open space easement) parcel of undeveloped natural desert land designated as PCC (Commercial and Industrial).

The site generally slopes from the north to the south, with an elevation difference of approximately 16 feet across the site. The ultimate outfall of the site is located at the southern boundary of the site at an elevation of 2635.2 feet. There are currently no drainage features other than natural washes and swales per the Final Drainage Report Drainage Channel Alma School/Dynamite Commercial Center, prepared in 2001. There are offsite flows that enter the site from the north, which will need to be accounted for in the proposed condition.

Refer to **FIGURE 2** attached for an aerial of the site.

2.3 PROPOSED SITE DEVELOPMENT:

The proposed development consists of a new multi-family housing development with casitas and a community center on approximately 264,844 sf (6.08 acres).

2.4 FLOOD HAZARD ZONE:

FIRM Map Number 04013C1330, dated October 16, 2013, indicates the site is designated as Zone "X Shaded". As such, the subject areas are defined as follows:

2-ZN-2024
4/18/2024

Zone X Shaded: "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or within drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

Refer to **FIGURE 3 – FIRM.**

3. EXISTING DRAINAGE CONDITIONS

3.1 EXISTING OFF-SITE DRAINAGE CONDITIONS :

The topographic survey provides the following information for offsite drainage:

- North: North of the site is a commercial development with associated parking. A portion of the parking lot and area to the west drains southerly into the site.
- East: East of the site is E. Graythorn Drive. Flows from the east flow southerly overland into an existing curb opening southeast of the site. No flows from the east affect the site.
- West: West of the site is undeveloped. The open area easement is located on this side of the site. Also, adjacent to the west side of the site, there is a residential development. A portion of the remainder of the west side of the parcel drains ~~westerly~~ easterly into the site.
- South: Southwest of the site there is an existing residential development and construction has started south. Flows from the south flow southerly overland away from the site. No flows from the south affect the site.

3.2 EXISTING ON-SITE DRAINAGE CONDITIONS :

The site is undeveloped natural desert with slopes generally ranging from the north to the south at approximately two (2) percent. The vegetation is typical of Sonoran Desert which includes Palo Verde, Mesquite and Catclaw Acacia.

Table 1 below is a summary the calculated Q10 and Q100 runoff under existing conditions:

Table 1:

EXISTING SITE DISCHARGES									
	TOTAL AREA	Cwt	Intensity 10 yr	Q 10	Intensity 100 yr	Q 100	Control Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	10.01	0.45	-	-	-	-	-	37.26	58.60
EX-A1	5.68	0.45	5.99	15.31	9.62	24.59	CP-2	36.02	56.60
EX-OFF-1	3.37	0.95	6.02	19.27	9.29	29.74			
EXOFF-2	0.31	0.45	6.42	0.90	10.16	1.42			
EXOFF-3	0.10	0.45	6.64	0.30	10.45	0.47			
EXOFF-4	0.08	0.45	6.76	0.24	10.6	0.38			
EX-B1	0.47	0.45	5.87	1.24	9.47	2.00	CP-3	1.24	2.00

2-ZN-2024
4/18/2024

On-Site and Off-site:

Overall drainage areas includes **10.01 Acres.**
Overall on-site and off-site runoff = Q_{100} = **58.60 cfs**

Refer to **APPENDIX II** for **Existing Conditions Drainage Area Map** and time of concentration calculations.

4. PROPOSED STORM WATER MANAGEMENT

4.1 ON-SITE DESIGN INTENT:

On-site drainage will be handled within street sections via curb and gutter, catch basins, swales and open or underground retention basins. Proposed flows to off-site will be equal to or less than existing flows. Historical off-site flows coming from the north will combine with on-site drainage and ultimately discharge south of the site.

4.2 DESIGN STORM REQUIREMENTS:

In accordance with City of Scottsdale requirements, the site is in an Environmentally Sensitive Lands (ESL) designated area, so 100-yr, 2-hr storm water retention is not required for this project. Only the volume required to attenuate increases in storm water runoff created by the development is necessary per city code. Stormwater storage is based on the difference between existing conditions versus proposed conditions for 10-yr and 100-yr storm events, with the maximum developed outflow not to exceed existing condition rates as a minimum. See Section 4.4 below.

4.3 LAND CHARACTERISTICS:

The proposed project site consists mainly of building pads for future residential developments, NAOS areas, and an access road. Based on the DS&PM, runoff coefficients for the 100-year storm event used are as follows:

- C=0.95 for paved surface in R.O.W
- C=0.45 for the landscape areas

HYDROLOGIC ANALYSIS: The hydrologic analysis is determined using the procedures in the City of Scottsdale Design Standards & Policies Manual and Maricopa County DDMSW software. Table 2 below is a summary of proposed Q10, Q100 runoff under proposed conditions:

ON- Site:

Overall drainage area includes **6.15 Acres at C_{wt} = 0.72**
Overall site runoff = Q_{100} = **41.16 cfs**

$$Q=C_{wt} * I * A$$

Where:

C_{wt} = The runoff coefficient relating runoff to rainfall
I = Average rainfall intensity in inches/hour, lasting for Tc
Tc = The time of concentration (minutes)
A = The contributing drainage area in acres

2-ZN-2024
4/18/2024

Table 2:

PROPOSED SITE DISCHARGES									
	TOTAL AREA	Cwt	Intensity 10 yr 5-min	Q 10	Intensity 100 yr 5-min	Q 100	Control Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	10.01	0.72	6.02	-	9.29	-	-	47.38	73.17
DA-A	0.18	0.62	6.02	0.66	9.29	1.01	BASIN-A	0.66	1.01
DA-B	0.47	0.75	6.02	2.12	9.29	3.27	BASIN-B	2.12	3.27
DA-B1	0.28	0.74	6.02	1.27	9.29	1.96	BASIN-B1	1.27	1.96
DA-B2	0.22	0.71	6.02	0.95	9.29	1.47	BASIN-B2	0.95	1.47
DA-C	0.74	0.75	6.02	3.31	9.29	5.11	BASIN-C	3.31	5.11
DA-D	0.44	0.85	6.02	2.27	9.29	3.50	BASIN-D	4.05	6.26
DA-D1	0.37	0.80	6.02	1.79	9.29	2.76			
DA-G	0.40	0.71	6.02	1.69	9.29	2.61	BASIN-G	1.69	2.61
DA-H1	0.42	0.69	6.02	1.74	9.29	2.69	BASIN-H	1.74	2.69
DA-H2	0.38	0.78	6.02	1.80	9.29	2.79	BASIN-H2	1.80	2.79
DA-L	0.20	0.75	6.02	0.90	9.29	1.38	BASIN-L	0.90	1.38
DA-N	0.12	0.69	6.02	0.51	9.29	0.78	BASIN-N	3.05	4.71
DA-N1	0.47	0.90	6.02	2.55	9.29	3.93			
DA-O	1.19	0.55	6.02	3.95	9.29	6.09	BASIN-O	3.95	6.09
DA-Q	0.05	0.57	6.02	0.19	9.29	0.29	BASIN-Q	0.19	0.29
DA-R	0.22	0.75	6.02	0.98	9.29	1.52	BASIN-R	0.98	1.52
OFF-1	3.37	0.95	6.02	19.27	9.29	29.74	BASIN-N	19.27	29.74
OFF-2	0.31	0.45	6.42	0.90	10.16	1.42	BASIN-O	0.90	1.42
OFF-3	0.10	0.45	6.64	0.30	10.45	0.47	BASIN-G	0.30	0.47
OFF-4	0.08	0.45	6.76	0.24	10.60	0.38	BASIN-G	0.24	0.38

Total existing on-site and off-site flows is **58.60 cfs**. Total proposed on-site and off-site flows is **72.16 cfs.** On-site open and underground retention basins are proposed to avoid increasing runoff to historical outfalls (CP-2 and CP-3). Off-site runoff north of the site directed to (CP-1) is not altered during proposed conditions. Refer to **APPENDIX II** for HEC-1 Calculations.

2-ZN-2024
4/18/2024

Table 3:

	Q10 (cfs)			Q100 (cfs)		
Outfall	Existing	Proposed	Δ	Existing	Proposed	Δ
CP-1	19.27	19.27	0.00	29.74	29.74	-0.01
CP-2	36.02	11.99	-24.03	56.60	16.11	-40.49
CP-3	1.24	0.60	-0.64	2.00	0.81	-1.19

- Runoff to historical outfall CP-1 consists of off-site runoff from the north entering the site.
- Runoff to historical outfall CP-2 consists the sum of a portion of the on-site runoff and CP-1.
    - Decrease to CP-2 is due to the proposed retention system, which consists of Basins B, B1, B2, C, G, H, H1, H2, L, N, O and Q.
    - Decrease to CP-3 is due to the proposed open retention Basin A.

4.4 STORMWATER RETENTION:

4-1.203

A stormwater storage waiver is requested based on Section ~~4-1.602~~, item 2 of the DS&PM (Waiver Criteria No. 4). As a basis for the Request for Stormwater Storage Waiver, the following is a comparison of predevelopment versus post development stormwater storage required calculated in accordance with the COS – DS&PM.. Required Retention (Acre-Feet) = (P/12) *A*ΔC
Where:

P = 100 Yr. 2 Hr. Precipitation in Inches
A= Area (Acres)
Δ C = Increase in the weighted runoff coefficient (Cwpost -Cwpre)

Stormwater Storage Waiver application was not included. Include it in the next submittal. Further technical review will happen once the application is received.

2-ZN-2024
4/18/2024

As the site is not currently developed, pre.v.post does not apply. The required storage is based on the entirety of the developed 100-yr 2-hr volume requirement.

Table 4:

Required Storage Volume Calculations						
						Vr= A * (Cwpost-Cwpre) *D/12
				P=100-yr, 5min = 9.29		P=100-yr,2-hr= 2.74in.
Drainage Area ID	Area (acres)	Cpre (-)	Cpost (-)	Depth (in)	Volume Req. (acre-ft)	Volume Req. (Vpost - Vpre) (CF)
ON-SITE RETENTION - BASINS - Open Retention						
DA-A	0.18	0.45	0.62	2.74	0.007	298.31
DA-B	0.47	0.45	0.75	2.74	0.032	1,400.06
DA-B1	0.28	0.45	0.74	2.74	0.019	830.23
DA-B2	0.22	0.45	0.71	2.74	0.013	577.86
DA-C	0.74	0.45	0.75	2.74	0.050	2,168.46
DA-D	0.44	0.45	0.85	2.74	0.041	1,773.68
DA-D1	0.37	0.45	0.80	2.74	0.030	1,299.40
DA-G	0.40	0.45	0.71	2.74	0.024	1,030.86
DA-H1	0.42	0.45	0.69	2.74	0.023	1,013.63
DA-H2	0.38	0.45	0.78	2.74	0.029	1,272.43
DA-L	0.20	0.45	0.75	2.74	0.013	586.75
DA-N1	0.47	0.45	0.90	2.74	0.048	2,104.39
DA-N	0.12	0.45	0.69	2.74	0.007	288.01
DA-O	1.19	0.45	0.55	2.74	0.028	1,198.38
DA-Q	0.05	0.45	0.57	2.74	0.001	65.34
DA-R	0.22	0.45	0.75	2.74	0.015	642.70

Refer to the **Proposed Conditions Drainage Area Map** and Calculations in **Appendix II**.

FIRST FLUSH: First Flush storage required is calculated in accordance with City of Scottsdale DSPM 4-1.201. Only the areas where runoff is affected by vehicular contact are considered in the first flush calculation. The roof drainage is considered to be free of heavy traffic pollutants, therefore, on-site driveway areas and sidewalks will be considered for the calculation. As shown in the Proposed Conditions Cwt Exhibit, first flush area is calculated as the total project area(265,538.21 sf) minus roof area (55,047.10 sf) and landscape areas (122,865.43 sf), equating to 87,625.67 sf.

$$FF_r = C\left(\frac{P}{12}\right)A$$

where:

FF_r = First Flush required storage volume (cf)

P = Precipitation amount =0.5 in per C.O.S. DSPM

A = Area of site excluding roofs and landscape (sf)

C = The weighted average runoff coefficient =0.95

$$FF_r = (0.95)\left(\frac{0.5}{12}\right)84{,}290.15 = 3{,}336.48\ cf$$

The above assessment indicates that the required First Flush storage is 3,336.48 cf.

100yr 2hr

Retention shall be provided for the greater of ~~Pre vs Post~~ or First Flush volumes, therefore on-site retention will be designed to store the Pre vs Post volume (16,511 cf). The provided storage volume will also fulfill the First Flush requirement.

Update. Additionally, remove the statement regarding the stormwater storage waiver if storage will be provided.

Table 5:

Proposed Retention Basin Summary				
Basin	TYPE	Vp	Vptotal	Vr
(ID)	(--)	(CF)	(CF)	(CF)
BASIN A	OPEN	220	220	298
BASIN B	OPEN	2,549	3,456	2,808
BASIN B1	OPEN	686		
BASIN B2	OPEN	222		
BASIN C	OPEN	2,222	2,222	2,168
BASIN D	UNDERGROUND	3,142	3,142	3,073
BASIN G	OPEN	934	934	1,031
BASIN H2	OPEN	156	2,467	2,286
BASIN H	OPEN	2,068		
BASIN H1	OPEN	243		
BASIN L	OPEN	531	531	587
BASIN N	OPEN	313	313	2,392
BASIN O	OPEN	2,929	2,929	1,198
BASIN Q	OPEN	164	164	65
BASIN R	OPEN	284	284	643
TOTAL			16,661	16,550

2-ZN-2024
4/18/2024

- Basin D (Underground system) = Proposed length of 10' Dia. CMP storage pipe, 40 LF = 3.1416*25 * 40' = **3,142 CF**
- Overflow from Basin Q will be directed to Basin N.
- Overflow from Basin N will be directed to Basin L.
- Overflow from Basin L will be directed to Basin H.
- Overflow from Basin O will be directed to Basin H.
- Overflow from Basin H will be directed to Basin C.
- Overflow from Basin B2 and Basin B1 will be directed to Basin B.
- Basin B-1 and Basin B will be provided with bubble-up structures to be filled.
- Overflow from Basin G will be directed to Basin R.
- Overflow from Basin R will be directed to Basin B.
- Basin B outfall is located at the south of the site (CP-2 2636'). Discharge will be via a handmade weir.
- Basin B will ultimately discharge to CP-3 located at the southeast corner of the property.

Include a figure showing the locations of these basins with this section of the report.

Refer to **Appendix II** for Detailed required volumes.

4.5 DISSIPATION OF STORED RUNOFF

For basins or portions of basins with no direct bleed off available, drywells are proposed in the on-site storage facilities to dispose of the stormwater within thirty-six (36) hours. The calculation is as follows:

- Minimum percolating rate of a drywell (for planning purposes) = 0. 1 cfs
- Volume to be drained in 36 hours = 0.1 cfs * 36 hours * 3600 sec/hour=12,960 cfs
- The number of drywells will be reduced if geotechnical testing for percolation rates determines adequate infiltration is available in the native soils at lower depths. If the percolation rate of the drywells is less than 0.1 cfs the number of drywells may have to be increased.

    - **Basin D Provided Storage** = 3.142 cfs

3,142 cfs / 12,960 cf= 0.24 (1 drywell is used).

Open retention basins N, Q, O, L, H, H1, H2, G, D, C, B1, and B2 will ultimately discharge excess runoff to Basin B south of the site. Basin B overflow will be directed southerly without increasing existing-conditions runoff. Basin A southeast of the site will ultimately discharge southeast of the site without increasing the existing-conditions runoff.

Refer to the **Preliminary Grading and Drainage plans** in **Appendix III**.

4.6 INLET CALCULATIONS

The inlet calculations will be provided in the final drainage report.

4.7 PIPE CAPACITY CALCULATIONS

The Pipe Capacity Calculations will be provided in the final drainage report.

5. FLOOD SAFETY FOR DWELLINGS

5.1 FINISH FLOOR ELEVATIONS

All building finished floor elevations will be set a minimum of 14 inches above emergency overflow points, and a minimum of 12 inches above the 100-year high-water elevation of any adjacent streets and drainage paths.

6. CONCLUSIONS

6.1 OVERALL PROJECT:

1. The finish floor elevations will be designed a minimum of 12 inches above the 100-year water surface in adjacent streets and drainage paths and a minimum of 14 inches above the low top of curb of the lot.

6.2 PROJECT PHASING:

The Project is to be constructed in a single phase.

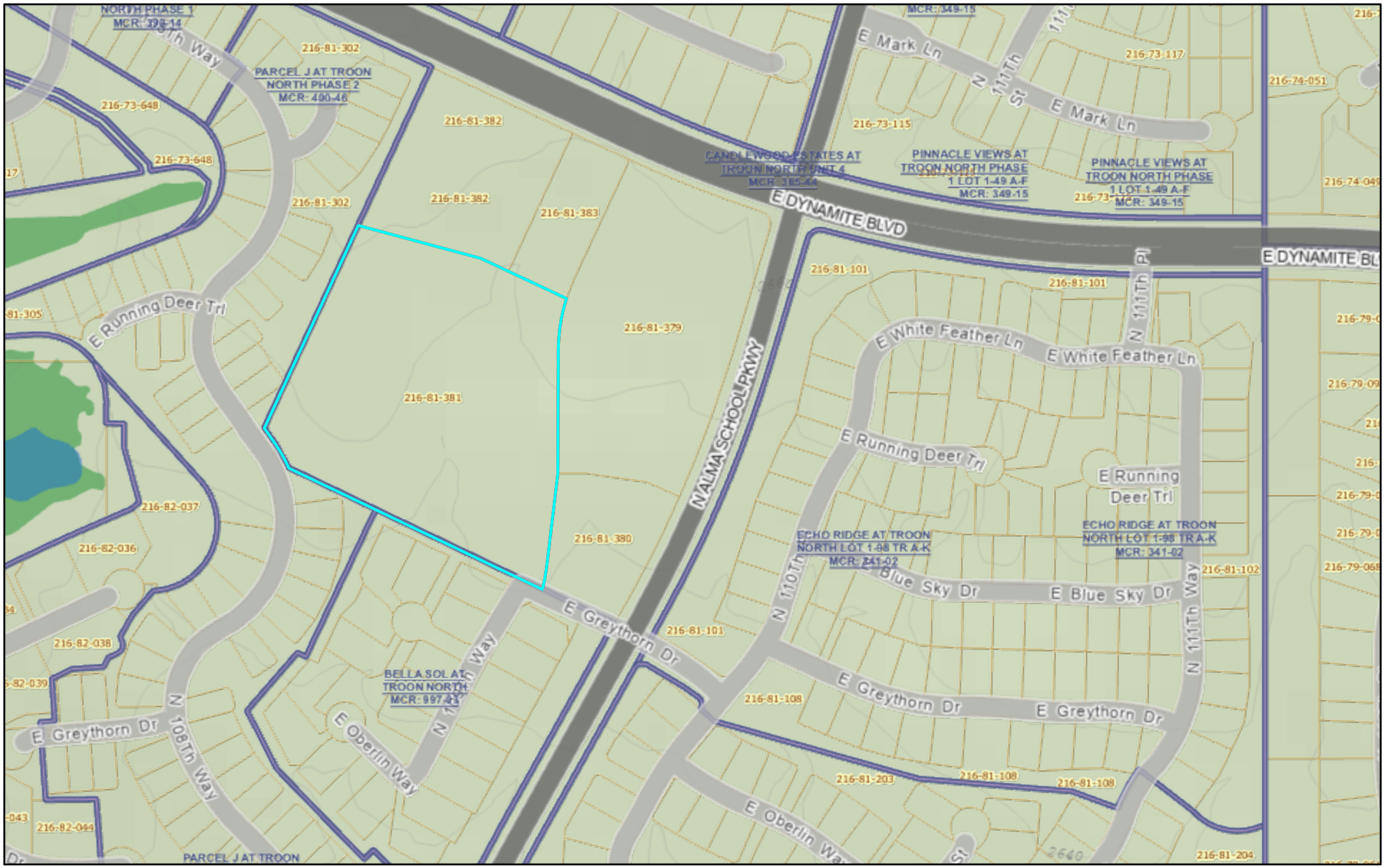
7. REFERENCES

1. *Design Standards & Policies Manual, City of Scottsdale – January 2018.*
2. *Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology, Flood Control District of Maricopa County, Fourth Edition, November 18, 2009, amended through August 15, 2015.*
3. *Drainage Design Manual for Maricopa County, Arizona, Volume II, Hydraulics, Flood Control District of Maricopa County, August 15, 2015.*

FIGURES

2-ZN-2024
4/18/2024

Vicinity Map



December 11, 2023

Override 1

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Maricopa County GIO, Maricopa County Assessor's Office

2023 - Maricopa County Assessor's Office

2-ZN-2024

4/18/2024

Arial Map

December 11, 2023

Override 1

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

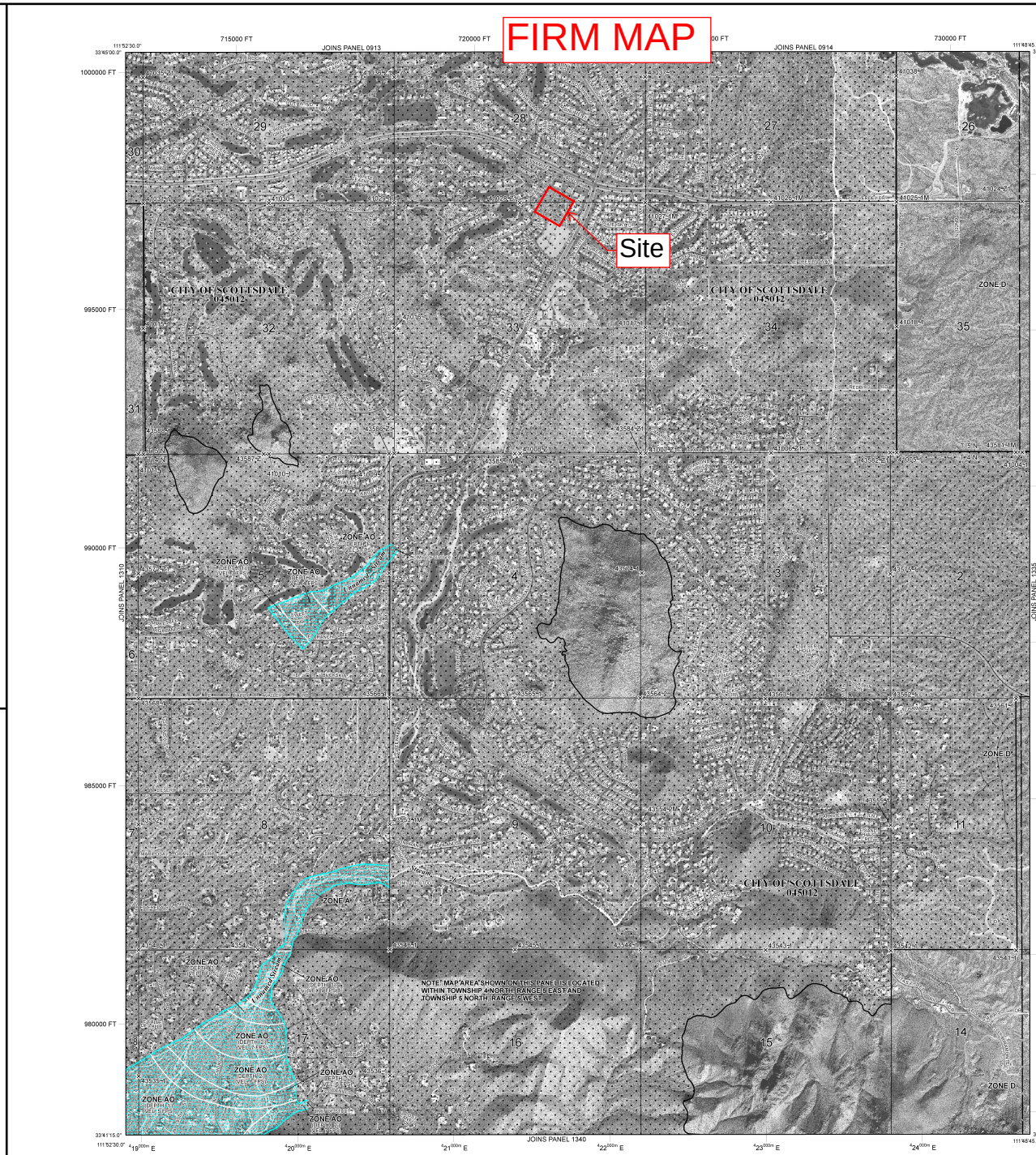
Maricopa County GIO, Maricopa County Assessor's Office

2023 - Maricopa County Assessor's Office

2-ZN-2024

4/18/2024

FIRM MAP



NOTES TO USERS

This map is for use in administering the Nation Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arizona State Plane Central zone (FIPSZONE 0202). The **horizontal datum** was NAD 83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. Map users wishing to obtain flood elevations referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29) may use the following Maricopa County website application: http://www.fcd.maricopa.gov/Maps/gismaps/apps/gdacs/application/index.cfm

This web tool allows users to obtain point-specific datum conversion values by zooming in and hovering over a VERTCON checkbox on the layers menu on the left side of the screen. The VERTCON grid referenced in this web application was also used to convert existing flood elevations from NGVD 29 to NAVD 88.

To obtain current elevation, description, and/or location information for National Geodetic Survey bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov. To obtain information about Geodetic Densification and Cadastral Survey bench marks produced by the Maricopa County Department of Transportation, please visit the Flood Control District of Maricopa County website at: http://www.fcd.maricopa.gov/Maps/gismaps/apps/gdacs/application/index.cfm.

Base map information shown on this FIRM was derived from multiple sources. Aerial imagery was provided in digital format by the Maricopa County Department of Public Works, Flood Control District. The imagery is dated October 2009 to November 2009. Additional National Agricultural Imagery Program (NAIP) imagery was provided by the Arizona State Land Department (ALRIS) and is dated 2007. The coordinate system used for the production of the digital FIRM is State Plane Arizona Central NAD83 HARN, International Feet.

The **profile base line** depicted on this map represents the hydraulic modeling baselines that match flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community, as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM, visit the **FEMA Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A — No Base Flood Elevations determined.
- ZONE AE — Base Flood Elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 12
- 6000000 M — 5000-foot grid ticks: Arizona State Plane coordinate system, central zone (FIPSZONE 0202), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
April 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
December 3, 1993 July 19, 2001 September 30, 2005
October 16, 2013–to advance suffix, to add roads and road names, to add special flood hazard areas, to add floodway, to change base flood elevations, to incorporate previously issued letters of map revision, to add base flood elevation, to change floodway, and to update corporate limits.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

PANEL 1330L

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1330 OF 4425
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SCOTTSDALE, CITY OF	045012	1330	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
04013C1330L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

2-ZN-2024
4/18/2024

APPENDIX I
RAINFALL DATA

2-ZN-2024
4/18/2024

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.741°, Longitude: -111.8455°
Elevation: 2654 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**2.87** (2.39-3.53)	**3.74** (3.13-4.60)	**5.04** (4.18-6.18)	**6.02** (4.94-7.34)	**7.32** (5.94-8.89)	**8.30** (6.65-10.0)	**9.29** (7.33-11.2)	**10.3** (8.00-12.4)	**11.6** (8.82-14.0)	**12.7** (9.42-15.3)
10-min	**2.18** (1.82-2.68)	**2.84** (2.38-3.50)	**3.83** (3.17-4.70)	**4.58** (3.77-5.59)	**5.57** (4.52-6.77)	**6.32** (5.06-7.64)	**7.07** (5.57-8.52)	**7.83** (6.09-9.43)	**8.84** (6.71-10.7)	**9.64** (7.17-11.7)
15-min	**1.80** (1.50-2.22)	**2.35** (1.97-2.89)	**3.17** (2.62-3.88)	**3.79** (3.11-4.62)	**4.60** (3.73-5.60)	**5.22** (4.18-6.31)	**5.84** (4.61-7.04)	**6.47** (5.04-7.79)	**7.30** (5.55-8.81)	**7.96** (5.92-9.65)
30-min	**1.22** (1.01-1.49)	**1.58** (1.32-1.95)	**2.14** (1.77-2.62)	**2.55** (2.10-3.11)	**3.10** (2.51-3.77)	**3.52** (2.82-4.25)	**3.93** (3.10-4.74)	**4.36** (3.39-5.25)	**4.92** (3.74-5.93)	**5.36** (3.99-6.50)
60-min	**0.752** (0.626-0.924)	**0.980** (0.819-1.20)	**1.32** (1.09-1.62)	**1.58** (1.30-1.93)	**1.92** (1.56-2.33)	**2.18** (1.74-2.63)	**2.43** (1.92-2.93)	**2.70** (2.10-3.25)	**3.04** (2.31-3.67)	**3.32** (2.47-4.02)
2-hr	**0.434** (0.366-0.521)	**0.561** (0.473-0.675)	**0.744** (0.624-0.893)	**0.885** (0.735-1.06)	**1.08** (0.883-1.28)	**1.22** (0.990-1.45)	**1.37** (1.09-1.62)	**1.52** (1.20-1.80)	**1.72** (1.32-2.04)	**1.87** (1.42-2.24)
3-hr	**0.311** (0.262-0.378)	**0.397** (0.336-0.485)	**0.517** (0.434-0.630)	**0.612** (0.510-0.742)	**0.745** (0.612-0.897)	**0.850** (0.689-1.02)	**0.959** (0.765-1.15)	**1.07** (0.843-1.28)	**1.23** (0.939-1.47)	**1.35** (1.01-1.62)
6-hr	**0.186** (0.161-0.220)	**0.235** (0.203-0.277)	**0.298** (0.256-0.350)	**0.349** (0.297-0.408)	**0.418** (0.351-0.488)	**0.473** (0.392-0.549)	**0.529** (0.433-0.614)	**0.586** (0.471-0.682)	**0.662** (0.520-0.770)	**0.722** (0.554-0.840)
12-hr	**0.111** (0.097-0.130)	**0.140** (0.122-0.163)	**0.176** (0.152-0.204)	**0.204** (0.175-0.237)	**0.243** (0.206-0.281)	**0.272** (0.229-0.315)	**0.303** (0.251-0.350)	**0.334** (0.274-0.385)	**0.374** (0.300-0.434)	**0.405** (0.319-0.473)
24-hr	**0.067** (0.059-0.077)	**0.085** (0.075-0.098)	**0.111** (0.098-0.128)	**0.132** (0.116-0.152)	**0.162** (0.140-0.187)	**0.187** (0.159-0.215)	**0.212** (0.178-0.246)	**0.240** (0.198-0.280)	**0.278** (0.224-0.328)	**0.310** (0.244-0.369)
2-day	**0.038** (0.033-0.044)	**0.049** (0.043-0.056)	**0.065** (0.056-0.074)	**0.078** (0.067-0.089)	**0.096** (0.082-0.110)	**0.111** (0.093-0.127)	**0.126** (0.105-0.146)	**0.143** (0.118-0.167)	**0.166** (0.134-0.197)	**0.185** (0.146-0.222)
3-day	**0.027** (0.024-0.031)	**0.035** (0.030-0.040)	**0.047** (0.041-0.053)	**0.056** (0.049-0.064)	**0.070** (0.060-0.080)	**0.081** (0.069-0.093)	**0.093** (0.078-0.108)	**0.106** (0.088-0.124)	**0.125** (0.101-0.148)	**0.141** (0.111-0.168)
4-day	**0.022** (0.019-0.025)	**0.028** (0.024-0.032)	**0.037** (0.033-0.043)	**0.045** (0.040-0.052)	**0.057** (0.049-0.065)	**0.067** (0.057-0.076)	**0.077** (0.065-0.089)	**0.088** (0.073-0.103)	**0.105** (0.085-0.123)	**0.118** (0.094-0.141)
7-day	**0.014** (0.012-0.016)	**0.018** (0.016-0.021)	**0.025** (0.021-0.028)	**0.030** (0.026-0.034)	**0.038** (0.032-0.043)	**0.044** (0.037-0.051)	**0.051** (0.043-0.060)	**0.059** (0.048-0.070)	**0.070** (0.056-0.084)	**0.080** (0.063-0.097)
10-day	**0.011** (0.009-0.012)	**0.014** (0.012-0.016)	**0.019** (0.016-0.021)	**0.023** (0.020-0.026)	**0.029** (0.024-0.033)	**0.033** (0.028-0.038)	**0.039** (0.032-0.045)	**0.044** (0.036-0.052)	**0.053** (0.042-0.062)	**0.059** (0.047-0.071)
20-day	**0.007** (0.006-0.008)	**0.009** (0.008-0.010)	**0.012** (0.010-0.013)	**0.014** (0.012-0.016)	**0.017** (0.015-0.020)	**0.020** (0.017-0.023)	**0.023** (0.019-0.026)	**0.026** (0.021-0.030)	**0.030** (0.024-0.035)	**0.033** (0.027-0.040)
30-day	**0.005** (0.004-0.006)	**0.007** (0.006-0.008)	**0.009** (0.008-0.010)	**0.011** (0.010-0.013)	**0.014** (0.012-0.016)	**0.016** (0.013-0.018)	**0.018** (0.015-0.020)	**0.020** (0.017-0.023)	**0.023** (0.019-0.027)	**0.025** (0.021-0.030)
45-day	**0.004** (0.003-0.005)	**0.005** (0.005-0.006)	**0.007** (0.006-0.008)	**0.009** (0.008-0.010)	**0.011** (0.009-0.012)	**0.012** (0.011-0.014)	**0.014** (0.012-0.016)	**0.016** (0.013-0.018)	**0.018** (0.015-0.021)	**0.020** (0.016-0.024)
60-day	**0.003** (0.003-0.004)	**0.004** (0.004-0.005)	**0.006** (0.005-0.007)	**0.007** (0.006-0.008)	**0.009** (0.008-0.010)	**0.010** (0.009-0.012)	**0.011** (0.010-0.013)	**0.013** (0.011-0.015)	**0.014** (0.012-0.017)	**0.016** (0.013-0.019)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

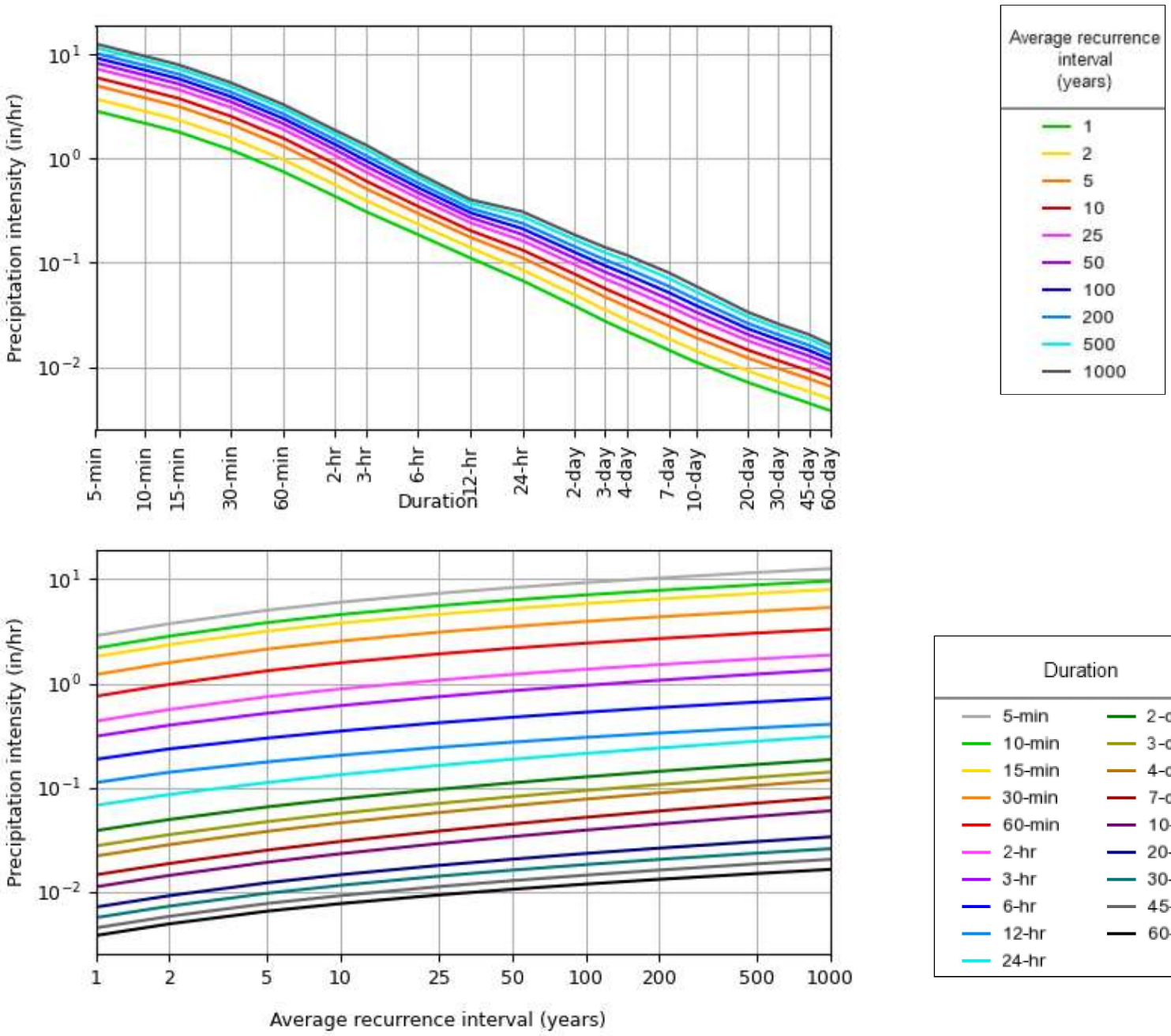
Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

2-ZN-2024
4/18/2024

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 33.7410°, Longitude: -111.8455°



NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Wed Dec 6 09:11:55 2023

Back to Top

Maps & aerials

Small scale terrain

2-ZN-2024
4/18/2024

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.741°, Longitude: -111.8455°
Elevation: 2654 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.239** (0.199-0.294)	**0.312** (0.261-0.383)	**0.420** (0.348-0.515)	**0.502** (0.412-0.612)	**0.610** (0.495-0.741)	**0.692** (0.554-0.836)	**0.774** (0.611-0.933)	**0.857** (0.667-1.03)	**0.967** (0.735-1.17)	**1.06** (0.785-1.28)
10-min	**0.364** (0.303-0.447)	**0.474** (0.396-0.583)	**0.639** (0.529-0.783)	**0.764** (0.628-0.932)	**0.928** (0.753-1.13)	**1.05** (0.844-1.27)	**1.18** (0.929-1.42)	**1.30** (1.02-1.57)	**1.47** (1.12-1.78)	**1.61** (1.20-1.95)
15-min	**0.451** (0.376-0.554)	**0.588** (0.492-0.723)	**0.793** (0.655-0.971)	**0.947** (0.778-1.16)	**1.15** (0.933-1.40)	**1.30** (1.05-1.58)	**1.46** (1.15-1.76)	**1.62** (1.26-1.95)	**1.83** (1.39-2.20)	**1.99** (1.48-2.41)
30-min	**0.608** (0.506-0.746)	**0.792** (0.662-0.974)	**1.07** (0.883-1.31)	**1.28** (1.05-1.56)	**1.55** (1.26-1.88)	**1.76** (1.41-2.12)	**1.97** (1.55-2.37)	**2.18** (1.69-2.62)	**2.46** (1.87-2.97)	**2.68** (2.00-3.25)
60-min	**0.752** (0.626-0.924)	**0.980** (0.819-1.20)	**1.32** (1.09-1.62)	**1.58** (1.30-1.93)	**1.92** (1.56-2.33)	**2.18** (1.74-2.63)	**2.43** (1.92-2.93)	**2.70** (2.10-3.25)	**3.04** (2.31-3.67)	**3.32** (2.47-4.02)
2-hr	**0.869** (0.733-1.04)	**1.12** (0.947-1.35)	**1.49** (1.25-1.79)	**1.77** (1.47-2.12)	**2.15** (1.77-2.56)	**2.44** (1.98-2.90)	**2.74** (2.19-3.25)	**3.03** (2.39-3.60)	**3.43** (2.65-4.07)	**3.74** (2.84-4.47)
3-hr	**0.934** (0.787-1.14)	**1.19** (1.01-1.46)	**1.55** (1.30-1.89)	**1.84** (1.53-2.23)	**2.24** (1.84-2.70)	**2.55** (2.07-3.06)	**2.88** (2.30-3.46)	**3.22** (2.53-3.86)	**3.69** (2.82-4.42)	**4.07** (3.04-4.88)
6-hr	**1.12** (0.966-1.32)	**1.41** (1.22-1.66)	**1.79** (1.54-2.10)	**2.09** (1.78-2.45)	**2.51** (2.11-2.92)	**2.83** (2.35-3.29)	**3.17** (2.59-3.68)	**3.51** (2.82-4.09)	**3.97** (3.12-4.61)	**4.33** (3.32-5.03)
12-hr	**1.35** (1.17-1.57)	**1.69** (1.47-1.97)	**2.12** (1.84-2.47)	**2.47** (2.12-2.86)	**2.93** (2.49-3.39)	**3.29** (2.76-3.80)	**3.66** (3.03-4.22)	**4.02** (3.30-4.65)	**4.51** (3.62-5.24)	**4.89** (3.85-5.71)
24-hr	**1.62** (1.43-1.86)	**2.06** (1.82-2.37)	**2.68** (2.36-3.09)	**3.19** (2.78-3.67)	**3.91** (3.37-4.50)	**4.49** (3.82-5.17)	**5.11** (4.29-5.92)	**5.76** (4.76-6.72)	**6.69** (5.38-7.89)	**7.44** (5.87-8.88)
2-day	**1.86** (1.62-2.14)	**2.37** (2.07-2.73)	**3.13** (2.72-3.60)	**3.75** (3.25-4.30)	**4.62** (3.96-5.31)	**5.33** (4.51-6.14)	**6.08** (5.08-7.06)	**6.88** (5.66-8.05)	**8.01** (6.44-9.48)	**8.92** (7.04-10.7)
3-day	**1.98** (1.74-2.28)	**2.55** (2.23-2.92)	**3.39** (2.96-3.88)	**4.08** (3.54-4.66)	**5.07** (4.36-5.80)	**5.88** (5.00-6.76)	**6.76** (5.67-7.82)	**7.70** (6.36-8.99)	**9.04** (7.30-10.7)	**10.2** (8.04-12.1)
4-day	**2.12** (1.86-2.42)	**2.72** (2.39-3.11)	**3.64** (3.19-4.16)	**4.41** (3.84-5.02)	**5.52** (4.76-6.30)	**6.44** (5.49-7.38)	**7.44** (6.26-8.58)	**8.52** (7.06-9.93)	**10.1** (8.16-11.9)	**11.4** (9.04-13.6)
7-day	**2.44** (2.13-2.82)	**3.14** (2.74-3.61)	**4.21** (3.67-4.85)	**5.11** (4.42-5.87)	**6.42** (5.49-7.39)	**7.51** (6.36-8.68)	**8.71** (7.27-10.1)	**10.0** (8.23-11.8)	**11.9** (9.57-14.2)	**13.5** (10.6-16.3)
10-day	**2.68** (2.35-3.07)	**3.44** (3.02-3.94)	**4.61** (4.02-5.27)	**5.57** (4.83-6.36)	**6.96** (5.98-7.97)	**8.12** (6.90-9.33)	**9.38** (7.86-10.9)	**10.7** (8.87-12.6)	**12.7** (10.3-15.1)	**14.4** (11.4-17.3)
20-day	**3.42** (3.00-3.90)	**4.41** (3.87-5.03)	**5.85** (5.12-6.67)	**7.00** (6.09-7.96)	**8.59** (7.42-9.81)	**9.86** (8.44-11.3)	**11.2** (9.49-12.9)	**12.6** (10.5-14.7)	**14.6** (12.0-17.2)	**16.2** (13.1-19.3)
30-day	**4.06** (3.57-4.64)	**5.24** (4.61-5.98)	**6.96** (6.11-7.92)	**8.31** (7.26-9.43)	**10.2** (8.81-11.6)	**11.6** (10.0-13.3)	**13.1** (11.2-15.1)	**14.7** (12.4-17.0)	**16.9** (14.0-19.8)	**18.7** (15.3-22.1)
45-day	**4.86** (4.28-5.53)	**6.28** (5.53-7.14)	**8.34** (7.32-9.47)	**9.93** (8.68-11.3)	**12.1** (10.5-13.8)	**13.8** (11.9-15.8)	**15.6** (13.3-17.9)	**17.5** (14.7-20.3)	**20.1** (16.6-23.6)	**22.1** (18.0-26.3)
60-day	**5.47** (4.83-6.21)	**7.09** (6.25-8.03)	**9.37** (8.25-10.6)	**11.1** (9.73-12.6)	**13.4** (11.7-15.3)	**15.2** (13.1-17.4)	**17.1** (14.6-19.6)	**19.0** (16.1-21.9)	**21.6** (18.0-25.3)	**23.6** (19.4-28.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

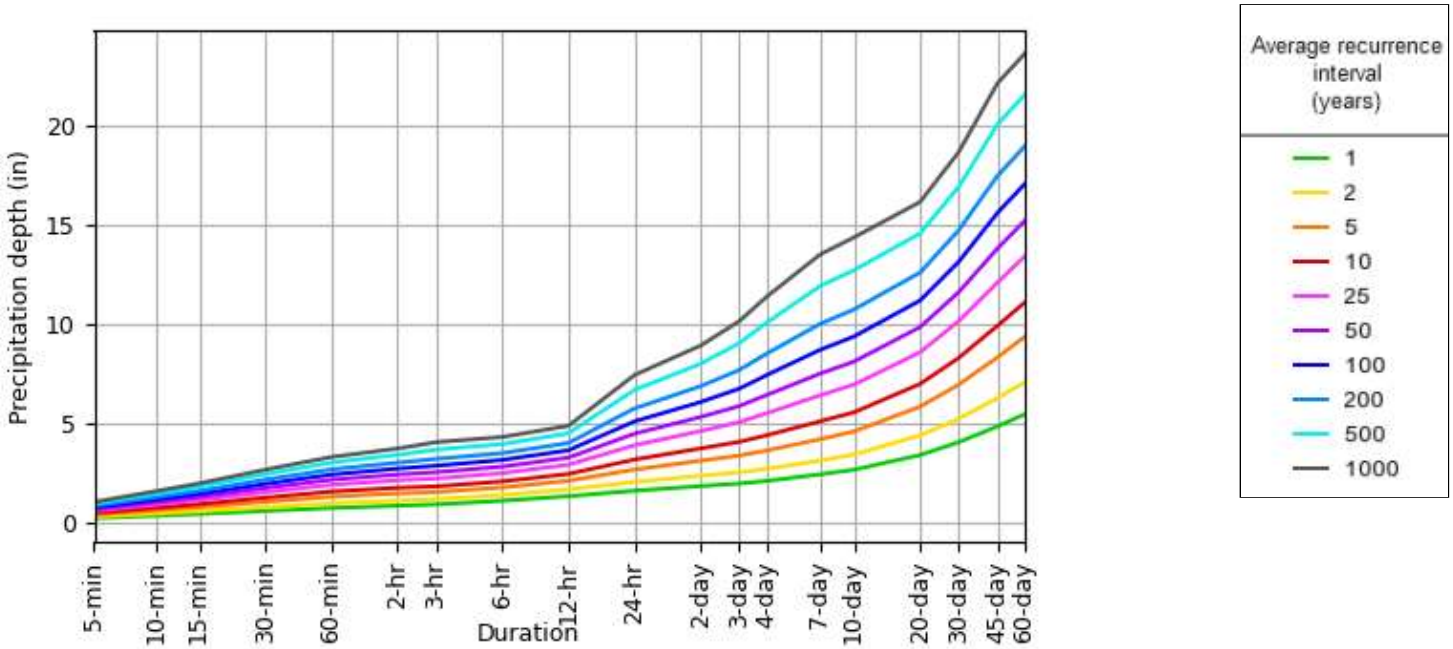
Please refer to NOAA Atlas 14 document for more information.

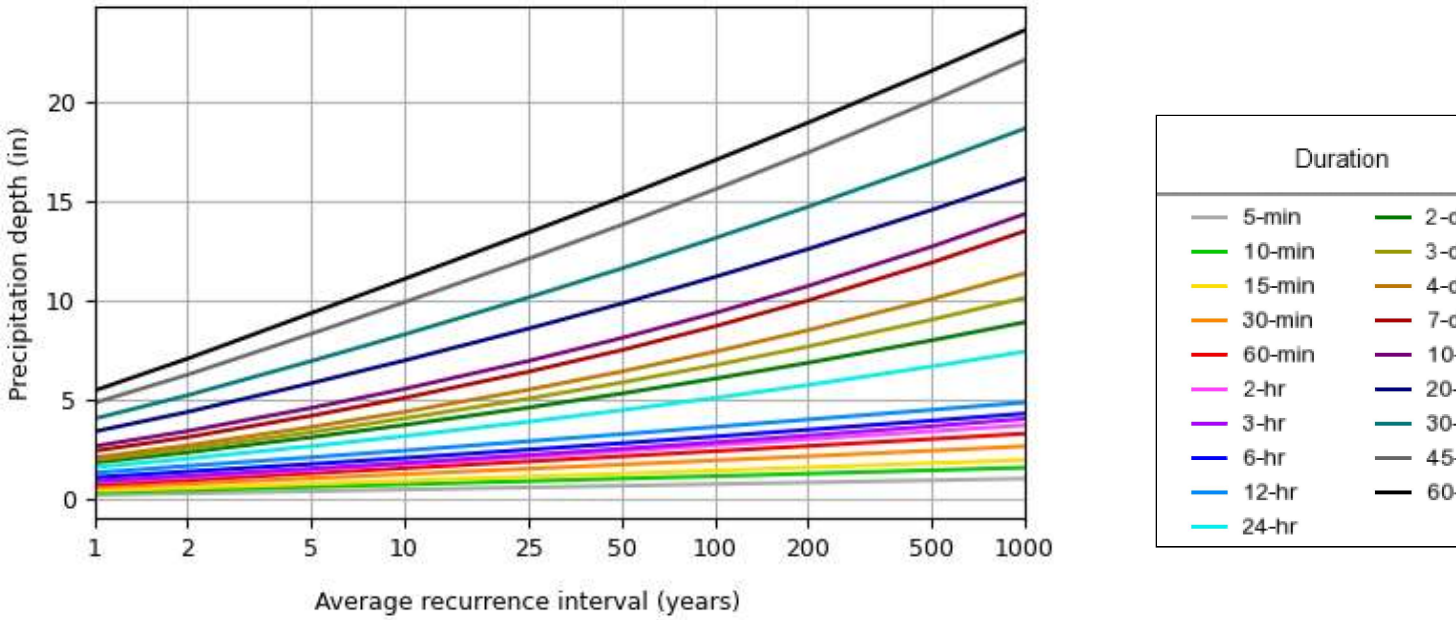
Back to Top

PF graphical

2-ZN-2024
4/18/2024

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.7410°, Longitude: -111.8455°





NOAA Atlas 14, Volume 1, Version 5

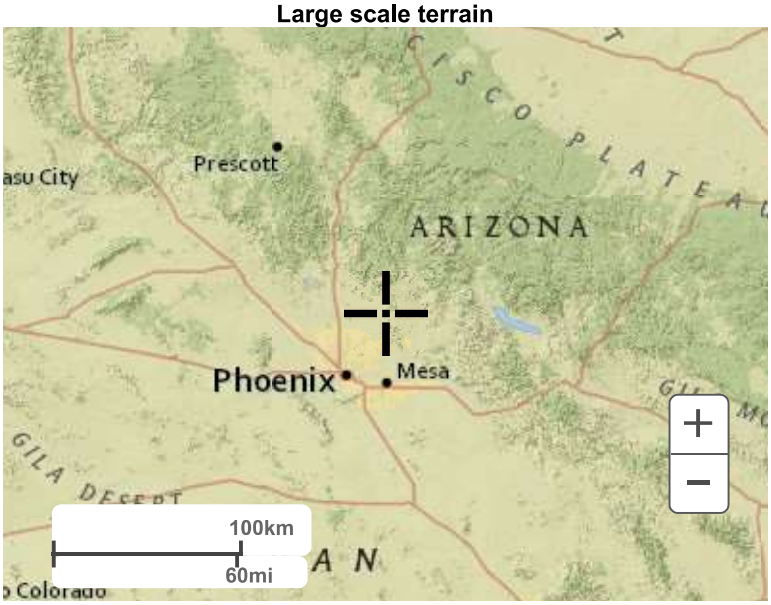
Created (GMT): Wed Dec 6 09:06:23 2023

Back to Top

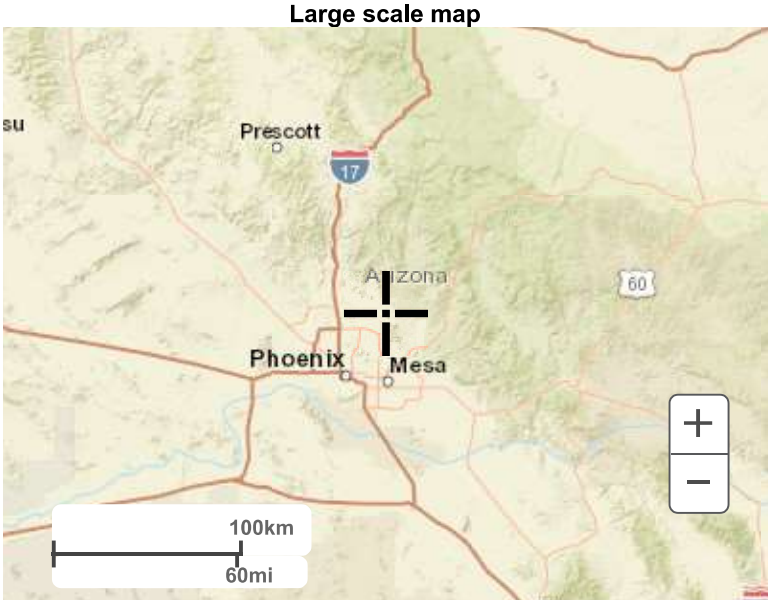
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



Large scale aerial

APPENDIX II

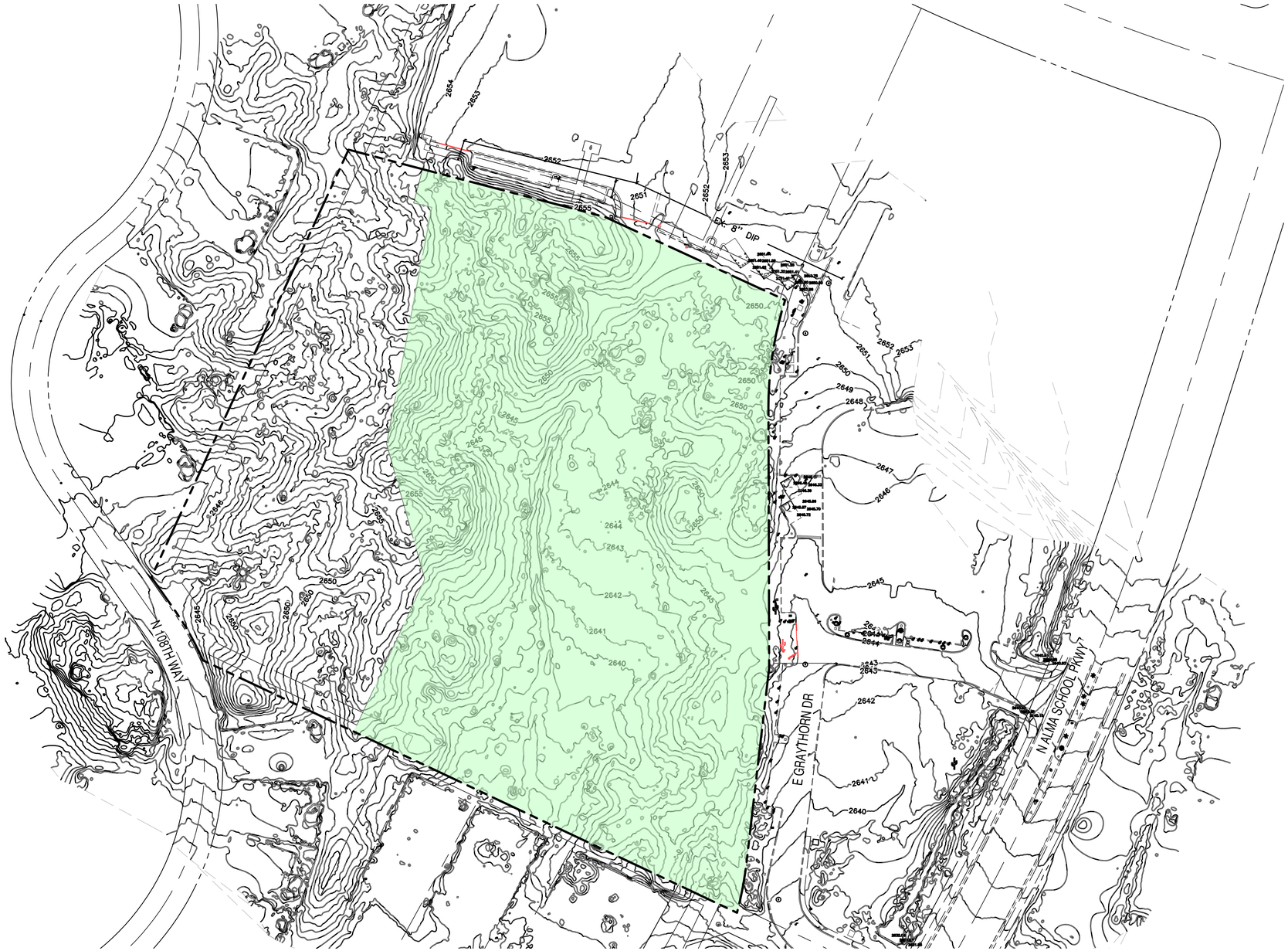
CALCULATIONS

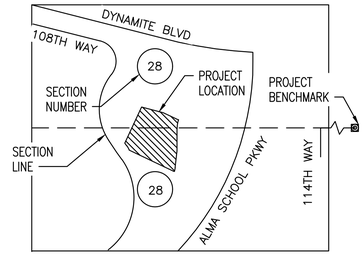
2-ZN-2024
4/18/2024

ARTESSA PINNACLE PEAK

EXISTING CONDITIONS C_{WT} EXHIBIT

SW CORNER OF DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, ARIZONA, 85296
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.





VICINITY MAP
S16 T5N R5E
N.T.S.

NORTH

PROPERTY LINE

NATURAL DESERT/LANDSCAPE =	267,832 SF (6.15 AC)	@ CWT=0.45
TOTAL ON-SITE CWT =	267,832 SF (6.15 AC)	@ CWT=0.45

NOTE: OFFSITE AREA NORTH (DEVELOPED) ASSUMED AS CWT=0.95

NORTH

0' 60' 120' 180'
SCALE: 1" = 60'

NOT FOR CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.258.3534

lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK
LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106
SHEET TITLE: EXISTING CONDITIONS C_{WT} EXHIBIT
PAGE NO.: 1 OF 1
SHEET NO.: EX-Cwt

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

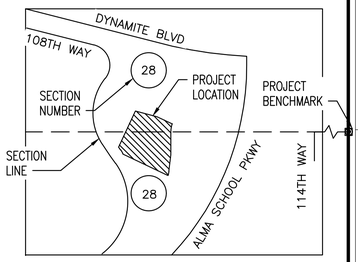
2-ZN-2024
4/18/2024

ARTESSA PINNACLE PEAK

PROPOSED CONDITIONS C_{WT} EXHIBIT

SW CORNER OF DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, ARIZONA, 85296
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

216-81-379



VICINITY MAP
S33 T5N R5E
N.T.S.

NORTH

LEGEND

PROPERTY LINE

BUILDING/PAVED SURFACE =	144,967 SF (3.33 AC)	@ CWT=0.95
NATURAL DESERT/LANDSCAPE =	122,865 SF (2.82 AC)	@ CWT=0.45
TOTAL ON-SITE CWT =	267,832 SF (6.15 AC)	@ CWT=0.72

NORTH

0' 50' 100' 150'
SCALE: 1" = 50'

NOT FOR CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534

lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK	LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106

SHEET TITLE: **PROPOSED CONDITIONS C_{WT} EXHIBIT**

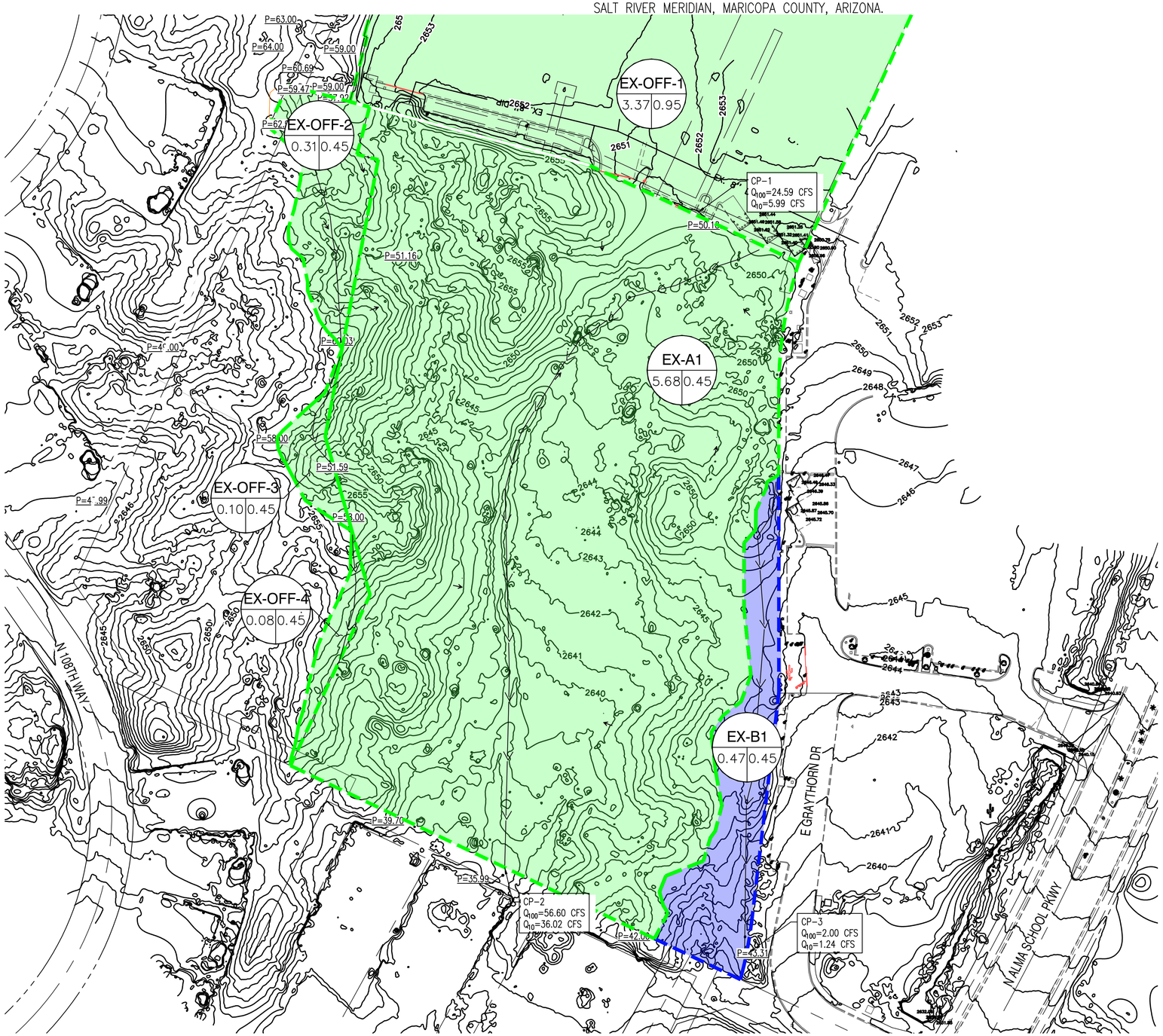
PAGE NO.:	SHEET NO.:
1 OF 1	P-Cwt

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

ARTESSA PINNACLE PEAK

EXISTING CONDITIONS DRAINAGE AREA MAP

SW CORNER OF DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, ARIZONA, 85296
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.



DRAINAGE AREA KEY

AREA IN ACRES — RUNOFF COEFFICIENT

EXSITING LEGEND

- DRAINAGE AREAS DISCHARGING TO CP-1
- DRAINAGE AREAS DISCHARGING TO CP-2
- FLOW ARROW
- FLOW LINE

EXISTING SITE DISCHARGES

	TOTAL AREA	Cwt	Intensity 10 yr	Q 10	Intensity 100 yr	Q 100	Control Point	Total flows Q10	Total flows Q100
	(ac)	(-)	(in/hr)	(cfs)	(in/hr)	(cfs)	CP#	(cfs)	(cfs)
	10.01	0.45	-	-	-	-	-	52.57	83.19
EX-A1	5.68	0.45	5.99	15.31	9.62	24.59	CP-1	15.31	24.59
EX-OFF-1	3.37	0.95	6.02	19.27	9.29	29.74	CP-2	36.02	56.60
EXOFF-2	0.31	0.45	6.42	0.90	10.16	1.42			
EXOFF-3	0.10	0.45	6.64	0.30	10.45	0.47			
EXOFF-4	0.08	0.45	6.76	0.24	10.6	0.38			
EX-B1	0.47	0.45	5.87	1.24	9.47	2.00	CP-2	1.24	2.00

NORTH

0' 50' 100' 150'

SCALE: 1" = 50'

NOT FOR CONSTRUCTION

SUSTAINABILITY ENGINEERING GROUP
SEG
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.259.3534

lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK
LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106

SHEET TITLE: EXISTING CONDITIONS DRAINAGE AREA MAP

PAGE NO.: 1 OF 1
SHEET NO.: EX-DAM

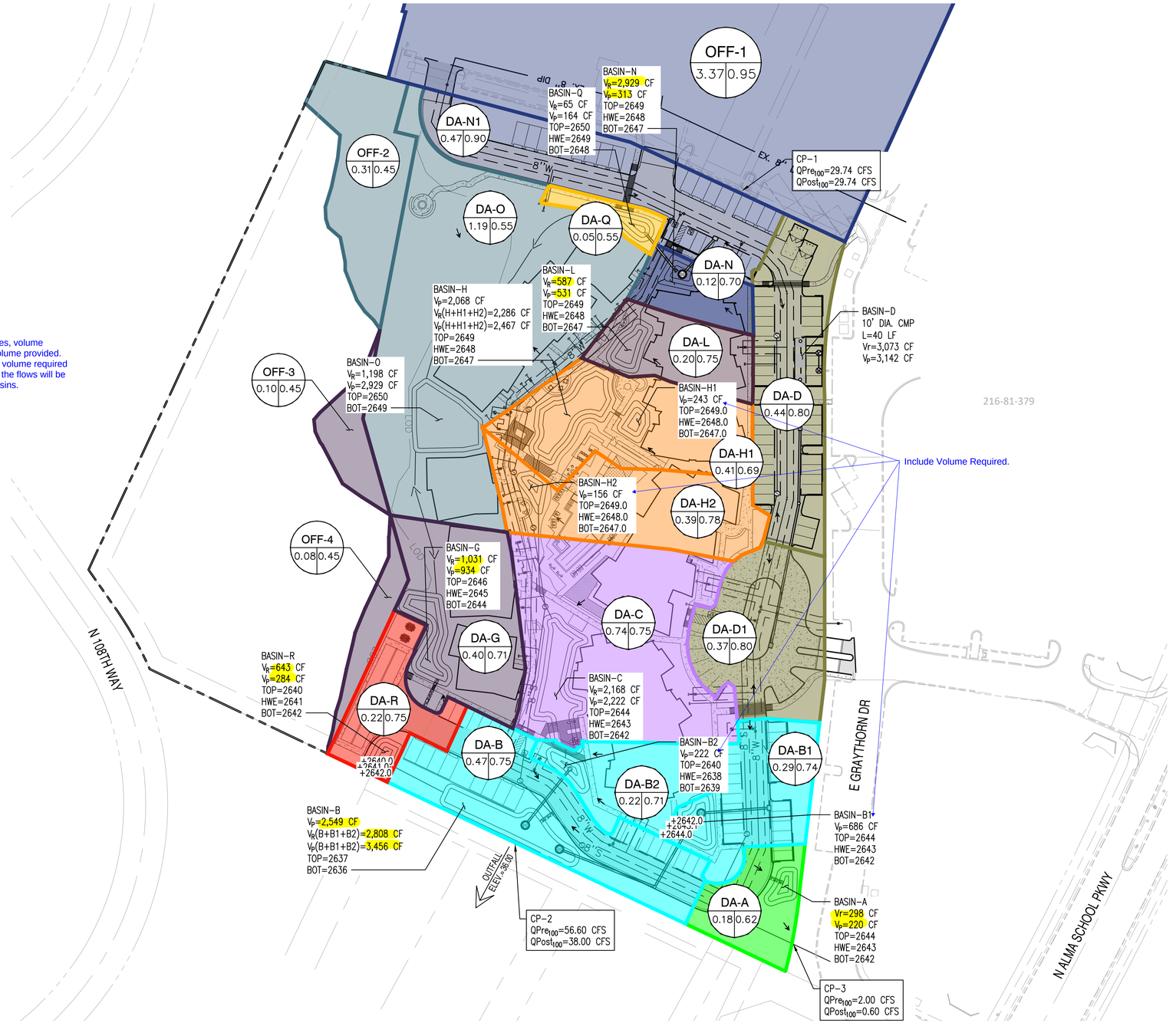
THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

2-ZN-2024
4/18/2024

ARTESSA PINNACLE PEAK

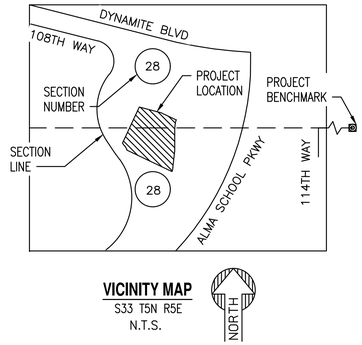
PROPOSED CONDITIONS DRAINAGE AREA MAP

SW CORNER OF DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, ARIZONA, 85296
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.



For highlighted values, volume required exceeds volume provided. Revise to ensure all volume required is provided and that the flows will be able to reach the basins.

Include Volume Required.



VICINITY MAP
S33 T5N R5E
N.T.S.

NORTH

DRAINAGE AREA
AREA IN ACRES — RUNOFF COEFFICIENT

DRAINAGE AREA KEY

PROPOSED LEGEND

- DRAINAGE AREAS DISCHARGING TO BASIN-A
- DRAINAGE AREAS DISCHARGING TO BASIN-B
- DRAINAGE AREAS DISCHARGING TO BASIN-C
- DRAINAGE AREAS DISCHARGING TO BASIN-D
- DRAINAGE AREAS DISCHARGING TO BASIN-G
- DRAINAGE AREAS DISCHARGING TO BASIN-H
- DRAINAGE AREAS DISCHARGING TO BASIN-L
- DRAINAGE AREAS DISCHARGING TO BASIN-Q
- DRAINAGE AREAS DISCHARGING TO BASIN-N
- DRAINAGE AREAS DISCHARGING TO BASIN-O
- DRAINAGE AREAS DISCHARGING TO BASIN-R
- FLOW ARROW

NOTE: OVERFLOW FROM BASINS C, G,H,L,Q,N,O AND R WILL ULTIMATELY DISCHARGE TO BASIN B.

NORTH

0' 50' 100' 150'
SCALE: 1" = 50'

NOT FOR CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534

lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK
LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106

SHEET TITLE: **PROPOSED CONDITIONS DRAINAGE AREA MAP**

PAGE NO.: 1 OF 1
SHEET NO.: **P-DAM**

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

2-ZN-2024
4/18/2024

EXISTING OVERALL SITE C_w					
	Multiple Family Residential	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.94	0.95	0.45		
AREA (ac)	0.00	0.00	6.15	**6.15**	**0.45**
EX-A1	0.00	0.00	5.68	5.68	0.45
EX-B1	0.00	0.00	0.47	0.47	0.45

EXISTING OFFSITE SITE C_w					
	Multiple Family Residential	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.94	0.95	0.45		
AREA (ac)	0.00	3.37	0.00	**3.37**	**0.95**
EX-OFF-1	0.00	3.37	0.00	3.37	0.95
EX-OFF-2	0.00	0.00	0.31	0.31	0.45
EX-OFF-3	0.00	0.00	0.10	0.10	0.45
EX-OFF-4	0.00	0.00	0.08	0.08	0.45

TC FOR EX-A1, 100 YR STORM

EX-A1

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.071 Hours**	**4.26 Min.**
L=	0.13 MILES	
K_b=	0.0353	$m \log_{10}A+b$=
S=	113.75 FT/MILE	
i=	9.620 IN/HR	From NOAA
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ
A=	5.68 ACRES	

Q=CiA	**24.59 CFS**
C=	0.45
i=	9.620 IN/HR
A=	5.68 ACRES

Elevations		
High point'	Outfall'	Diff
2651	2635.99	15.01

Minimum Tc is 5 minutes.
Revise.

100 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	4.31	10	9.29	7.07	9.60
5	4.26	10	9.29	7.07	9.62
5	4.26	10	9.29	7.07	9.62
5	4.26	10	9.29	7.07	9.62

TC FOR EX-A1, 10 YR STORM

EX-A1

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.085 Hours**	**5.10 Min.**
L=	0.13 MILES	
K_b=	0.0353	$m \log_{10}A+b$=
S=	113.75 FT/MILE	
i=	5.990 IN/HR	From NOAA
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ
A=	5.68 ACRES	

Q=CiA	**15.31 CFS**
C=	0.45
i=	5.990 IN/HR
A=	5.68 ACRES

Elevations		
High point'	Outfall'	Diff
2651	2635.99	15.01

10 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	5.95	10	6.02	4.58	5.75
5	5.18	10	6.02	4.58	5.97
5	5.1	10	6.02	4.58	5.99
5	5.1	10	6.02	4.58	5.99

2-ZN-2024
4/18/2024

TC FOR EX-B1, 100 YR STORM

EX-B1

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.077 Hours**	**4.60 Min.**
L=	0.08 MILES	
K_b=	0.0420	$m \log_{10}A+b$=
S=	58.19 FT/MILE	
i=	9.470 IN/HR	From NOAA
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ
A=	0.47 ACRES	

Q=CiA	**2.00 CFS**
C=	0.45
i=	9.470 IN/HR
A=	0.47 ACRES

Elevations		
High point'	Outfall'	Diff
2648.18	2643.31	4.87

Minimum Tc is 5 minutes.
Revise.

100 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	4.63	10	9.29	7.07	9.45
5	4.6	10	9.29	7.07	9.47
5	4.6	10	9.29	7.07	9.47
5	4.26	10	9.29	7.07	9.62

TC FOR EX-B1, 10 YR STORM

EX-B1

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.092 Hours**	**5.52 Min.**
L=	0.08 MILES	
K_b=	0.0420	$m \log_{10}A+b$=
S=	58.19 FT/MILE	
i=	5.870 IN/HR	From NOAA
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ
A=	0.47 ACRES	

Q=CiA	**1.24 CFS**
C=	0.45
i=	5.870 IN/HR
A=	0.47 ACRES

Elevations		
High point'	Outfall'	Diff
2648.18	2643.31	4.87

10 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	5.47	10	6.02	4.58	5.88
5	5.51	10	6.02	4.58	5.87
5	5.52	10	6.02	4.58	5.87
5	5.52	10	6.02	4.58	5.87

2-ZN-2024
4/18/2024

TC FOR EX-OFF-2, 100 YR STORM

EX-OFF-2

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.050 Hours**	**3.03 Min.**	
L=	0.04 MILES		
K_b=	0.0432	*m* $\log_{10}$A+b=	
S=	70.44 FT/MILE		
i=	10.160 IN/HR	From NOAA	
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ	
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ	
A=	0.31 ACRES		

Q=CiA	**1.42 CFS**
C=	0.45
i=	10.160 IN/HR
A=	0.31 ACRES

Elevations		
High point'	Outfall'	Diff
2662.98	2660.03	2.95

Minimum Tc is 5 minutes.
Revise.

100 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	3.13	10	9.29	7.07	10.12
5	3.03	10	9.29	7.07	10.16
5	3.03	10	9.29	7.07	10.16
5	4.26	10	9.29	7.07	9.62

TC FOR EX-OFF-2, 10 YR STORM

EX-OFF-2

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.060 Hours**	**3.60 Min.**	
L=	0.04 MILES		
K_b=	0.0432	*m* $\log_{10}$A+b=	
S=	70.44 FT/MILE		
i=	6.420 IN/HR	From NOAA	
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ	
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ	
A=	0.31 ACRES		

Q=CiA	**0.90 CFS**
C=	0.45
i=	6.420 IN/HR
A=	0.31 ACRES

Elevations		
High point'	Outfall'	Diff
2662.98	2660.03	2.95

10 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	3.69	10	6.02	4.58	6.40
5	3.61	10	6.02	4.58	6.42
5	3.6	10	6.02	4.58	6.42
5	5.52	10	6.02	4.58	5.87

2-ZN-2024
4/18/2024

TC FOR EX-OFF-3, 100 YR STORM

EX-OFF-3

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.040 Hours**	**2.38 Min.**	
L=	0.05 MILES		
K_b=	0.0463	*m* $\log_{10}$A+b=	
S=	186.94 FT/MILE		
i=	10.450 IN/HR	From NOAA	
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ	
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ	
A=	0.10 ACRES		

Q=CiA	**0.47 CFS**
C=	0.45
i=	10.450 IN/HR
A=	0.10 ACRES

Elevations		
High point'	Outfall'	Diff
2660.03	2651.59	8.44

Minimum Tc is 5 minutes.
Revise.

100 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	2.49	10	9.29	7.07	10.40
5	2.39	10	9.29	7.07	10.45
5	2.38	10	9.29	7.07	10.45
5	4.26	10	9.29	7.07	9.62

TC FOR EX-OFF-3, 10 YR STORM

EX-OFF-3

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.047 Hours**	**2.83 Min.**	
L=	0.05 MILES		
K_b=	0.0463	*m* $\log_{10}$A+b=	
S=	186.94 FT/MILE		
i=	6.640 IN/HR	From NOAA	
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ	
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ	
A=	0.10 ACRES		

Q=CiA	**0.30 CFS**
C=	0.45
i=	6.640 IN/HR
A=	0.10 ACRES

Elevations		
High point'	Outfall'	Diff
2660.03	2651.59	8.44

10 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	2.94	10	6.02	4.58	6.61
5	2.83	10	6.02	4.58	6.64
5	2.83	10	6.02	4.58	6.64
5	5.52	10	6.02	4.58	5.87

2-ZN-2024
4/18/2024

TC FOR EX-OFF-4, 100 YR STORM

EX-OFF-4

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.034 Hours**	**2.04 Min.**	
L=	0.04 MILES		
K_b=	0.0469	*m* $\log_{10}$A+b=	
S=	268.75 FT/MILE		
i=	10.600 IN/HR	From NOAA	
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ	
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ	
A=	0.08 ACRES		

Q=CiA	**0.38 CFS**
C=	0.45
i=	10.600 IN/HR
A=	0.08 ACRES

Elevations		
High point'	Outfall'	Diff
2658	2646.89	11.11

Minimum Tc is 5 minutes.
Revise.

100 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	2.14	10	9.29	7.07	10.56
5	2.04	10	9.29	7.07	10.60
5	2.04	10	9.29	7.07	10.60
5	2.04	10	9.29	7.07	10.60

TC FOR EX-OFF-4, 10 YR STORM

EX-OFF-4

$T_c=11.4L^{0.5}K_b^{0.52}S^{-0.31}i^{-0.38}=$	**0.040 Hours**	**2.42 Min.**	
L=	0.04 MILES		
K_b=	0.0469	*m* $\log_{10}$A+b=	
S=	268.75 FT/MILE		
i=	6.760 IN/HR	From NOAA	
m =	-0.00625	m Table 3.1 of FCDMC Hydrology Manual (Typ	
b=	0.04	m Table 3.1 of FCDMC Hydrology Manual (Typ	
A=	0.08 ACRES		

Q=CiA	**0.24 CFS**
C=	0.45
i=	6.760 IN/HR
A=	0.08 ACRES

Elevations		
High point'	Outfall'	Diff
2658	2646.89	11.11

10 YR INTENSITY INTERPOLATION (NOAA)					
X1	**DESIRED TC**	**X3**	**Y1**	**Y3**	I adjusted
5	2.53	10	6.02	4.58	6.73
5	2.42	10	6.02	4.58	6.76
5	2.42	10	6.02	4.58	6.76
5	2.42	10	6.02	4.58	6.76

PROPOSED OVERALL SITE C_w					
	Multiple Family Residential	Building/ Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.94	0.95	0.45		
AREA (ac)	0.00	3.33	2.82	**6.15**	**0.72**
DA-A	0.00	0.06	0.12	0.18	0.62
DA-B	0.00	0.28	0.19	0.47	0.75
DA-B1	0.00	0.17	0.12	0.28	0.74
DA-B2	0.00	0.12	0.11	0.22	0.71
DA-C	0.00	0.44	0.30	0.74	0.75
DA-D	0.00	0.36	0.08	0.44	0.85
DA-D1	0.00	0.26	0.11	0.37	0.80
DA-G	0.00	0.21	0.19	0.40	0.71
DA-H1	0.00	0.20	0.21	0.42	0.69
DA-H2	0.00	0.26	0.13	0.38	0.78
DA-L	0.00	0.12	0.08	0.20	0.75
DA-N	0.00	0.06	0.06	0.12	0.69
DA-N1	0.00	0.42	0.05	0.47	0.90
DA-O	0.00	0.24	0.95	1.19	0.55
DA-Q	0.00	0.01	0.04	0.05	0.57
DA-R	0.00	0.13	0.09	0.22	0.75

PROPOSED OFFSITE SITE C_w					
	Multiple Family Residential	Pavement	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.94	0.95	0.45		
AREA (ac)	0.00	3.37	0.00	**3.37**	**0.95**
OFF-1	0.00	3.37	0.00	3.37	0.95
OFF-2	0.00	0.00	0.31	0.31	0.45
OFF-3	0.00	0.00	0.10	0.10	0.45
OFF-4	0.00	0.00	0.08	0.08	0.45

STORMWATER STORAGE

BASIN A

ELEV. (FT)	AREA (SF)	DEPTH (FT)	AVG VOLUME (CF)	SUM VOLUME (CF)	COMMENT
2642.0	85			0	**Bottom**
		1.00	220		
2643.0	355			220	**Volume Provided (HWE)**
		1.00			
2644.0	734				**Top**

BASIN B

ELEV. (FT)	AREA (SF)	DEPTH (FT)	AVG VOLUME (CF)	SUM VOLUME (CF)	COMMENT
2636.0	1,950			0	**Bottom**
		1.00	2,549		
2637.0	3,147			2,549	**Volume Provided (HWE) (TOP)**

BASIN B1

ELEV. (FT)	AREA (SF)	DEPTH (FT)	AVG VOLUME (CF)	SUM VOLUME (CF)	COMMENT
2642.0	467			0	**Bottom**
		1.00	686		
2643.0	905			686	**Volume Provided (HWE)**
		1.00			
2644.0	1,449				**Top**

BASIN B2

ELEV. (FT)	AREA (SF)	DEPTH (FT)	AVG VOLUME (CF)	SUM VOLUME (CF)	COMMENT
2638.0	55			0	**Bottom**
		1.00	222		
2639.0	389			222	**Volume Provided (HWE)**
		1.00			
2640.0	824				**Top**

BASIN C

ELEV. (FT)	AREA (SF)	DEPTH (FT)	AVG VOLUME (CF)	SUM VOLUME (CF)	COMMENT
2642.0	1,636			0	**Bottom**
		1.00	2,222		
2643.0	2,807			2,222	**Volume Provided (HWE)**
		1.00			
2644.0	3,250				**Top**

BASIN G

ELEV.	AREA	DEPTH	AVG VOLUME	SUM VOLUME	COMMENT

2-ZN-2024
4/18/2024

(FT)	(SF)	(FT)	(CF)	(CF)	
2644.0	513			0	**Bottom**
		1.00	934		
2645.0	1,356			934	**Volume Provided (HWE)**
		1.00			
2646.0	2,306				**Top**

BASIN R					
ELEV.	**AREA**	**DEPTH**	**AVG VOLUME**	**SUM VOLUME**	**COMMENT**
(FT)	**(SF)**	**(FT)**	**(CF)**	**(CF)**	
2640.0	151			0	**Bottom**
		1.00	284		
2641.0	416			284	**Volume Provided (HWE)**
		1.00			
2642.0	788				**Top**

BASIN H2					
ELEV.	**AREA**	**DEPTH**	**AVG VOLUME**	**SUM VOLUME**	**COMMENT**
(FT)	**(SF)**	**(FT)**	**(CF)**	**(CF)**	
2647.0	44			0	**Bottom**
		1.00	156		
2648.0	267			156	**Volume Provided (HWE)**
		1.00			
2649.0	641				**Top**

BASIN H1					
ELEV.	**AREA**	**DEPTH**	**AVG VOLUME**	**SUM VOLUME**	**COMMENT**
(FT)	**(SF)**	**(FT)**	**(CF)**	**(CF)**	
2647.0	123			0	**Bottom**
		1.00	243		
2648.0	362			243	**Volume Provided (HWE)**
		1.00			
2649.0	733				**Top**

BASIN L					
ELEV.	**AREA**	**DEPTH**	**AVG VOLUME**	**SUM VOLUME**	**COMMENT**
(FT)	**(SF)**	**(FT)**	**(CF)**	**(CF)**	
2647.0	330			0	**Bottom**
		1.00	531		
2648.0	733			531	**Volume Provided (HWE)**
		1.00			
2649.0	1,247				**Top**

BASIN N					
ELEV.	**AREA**	**DEPTH**	**AVG VOLUME**	**SUM VOLUME**	**COMMENT**

(FT)	(SF)	(FT)	(CF)	(CF)	
2647.0	171			0	**Bottom**
		1.00	313		
2648.0	455			313	**Volume Provided (HWE)**
		1.00			
2649.0	882				**Top**

BASIN O					
ELEV.	**AREA**	**DEPTH**	**AVG VOLUME**	**SUM VOLUME**	**COMMENT**
(FT)	**(SF)**	**(FT)**	**(CF)**	**(CF)**	
2649.0	2,507			0	**Bottom**
		1.00	2,929		
2650.0	3,352			2,929	**Volume Provided (HWE)**
					Top

BASIN Q					
ELEV.	**AREA**	**DEPTH**	**AVG VOLUME**	**SUM VOLUME**	**COMMENT**
(FT)	**(SF)**	**(FT)**	**(CF)**	**(CF)**	
2648.0	49			0	**Bottom**
		1.00	164		
2649.0	279			164	**Volume Provided (HWE)**
		1.00			
2650.0	668				**Top**

BASIN H					
ELEV.	**AREA**	**DEPTH**	**AVG VOLUME**	**SUM VOLUME**	**COMMENT**
(FT)	**(SF)**	**(FT)**	**(CF)**	**(CF)**	
2647.0	1,613			0	**Bottom**
		1.00	2,068		
2648.0	2,523			2,068	**Volume Provided (HWE)**
		1.00			
2649.0	3,545				**Top**

Type / ID	Length (ft)	Velocity (ft/sec)	Tpipe (min)	Combine		Return Period (Years) 2	5	10	25	50	100
cFirstPipe											
Maior Basin ID: 01											
Sub Basin	-	-	-	-	Q (cfs)	0.2	0.3	0.4	0.5	0.5	0.6
DA-N					CA (ac)	0.08	0.08	0.08	0.08	0.08	0.08
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0075	0.0099	0.0118	0.0143	0.0163	0.0183
Combine	-	-	-	4	Q (cfs)	10.2	14.4	17.5	21.8	24.7	28.0
DA-N					CA (ac)	3.73	3.73	3.73	3.73	3.73	3.73
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.3482	0.4631	0.5502	0.6683	0.7585	0.8518
Storage	-	-	-	-	Q (cfs)	9.7	13.6	16.3	20.3	23.1	26.1
BAS-N					CA (ac)	3.73	3.73	3.73	3.73	3.73	3.73
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.3482	0.4631	0.5502	0.6683	0.7585	0.8518
Sub Basin	-	-	-	-	Q (cfs)	0.4	0.6	0.7	0.9	1.0	1.1
DA-L					CA (ac)	0.15	0.15	0.15	0.15	0.15	0.15
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0140	0.0186	0.0221	0.0269	0.0305	0.0343
Combine	-	-	-	2	Q (cfs)	10.1	14.2	16.9	21.1	24.0	27.1
DA-L					CA (ac)	3.88	3.88	3.88	3.88	3.88	3.88
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.3622	0.4817	0.5723	0.6952	0.7890	0.8861
Storage	-	-	-	-	Q (cfs)	10.1	14.1	16.8	21.0	23.9	27.0
DA-L					CA (ac)	3.88	3.88	3.88	3.88	3.88	3.88
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.3622	0.4817	0.5723	0.6952	0.7890	0.8861
Sub Basin	-	-	-	-	Q (cfs)	0.8	1.1	1.3	1.6	1.9	2.1
DA-H1					CA (ac)	0.28	0.28	0.28	0.28	0.28	0.28
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0261	0.0348	0.0413	0.0502	0.0569	0.0639
Receive	-	-	-	-	Q (cfs)	2.1	3.0	3.5	4.4	5.1	5.8
SUO-BH					CA (ac)	0.84	0.84	0.84	0.84	0.84	0.84
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.0785	0.1043	0.1240	0.1506	0.1709	0.1918
Combine	-	-	-	3	Q (cfs)	12.8	18.0	21.5	26.8	30.7	34.7
DA-H1					CA (ac)	5.00	5.00	5.00	5.00	5.00	5.00
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.4668	0.6208	0.7376	0.8960	1.0168	1.1418
Storage	-	-	-	-	Q (cfs)	10.9	15.3	18.4	22.8	26.1	29.6
BAS-H					CA (ac)	5.00	5.00	5.00	5.00	5.00	5.00
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.4668	0.6208	0.7376	0.8960	1.0168	1.1418

* First Pipe

2-ZN-2024
4/18/2024

Type / ID	Length (ft)	Velocity (ft/sec)	Tpipe (min)	Combine		Return Period (Years) 2	5	10	25	50	100
cFirstPipe											
Maior Basin ID: 01											
Sub Basin	-	-	-	-	Q (cfs)	0.9	1.2	1.4	1.8	2.0	2.3
DA-H2					CA (ac)	0.30	0.30	0.30	0.30	0.30	0.30
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0280	0.0373	0.0443	0.0538	0.0610	0.0685
Combine	-	-	-	2	Q (cfs)	11.5	16.2	19.5	24.1	27.6	31.3
DA-H2					CA (ac)	5.30	5.30	5.30	5.30	5.30	5.30
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.4948	0.6581	0.7819	0.9498	1.0778	1.2103
Storage	-	-	-	-	Q (cfs)	11.5	16.1	19.4	24.0	27.5	31.1
BAS-H2					CA (ac)	5.30	5.30	5.30	5.30	5.30	5.30
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.4948	0.6581	0.7819	0.9498	1.0778	1.2103
Sub Basin	-	-	-	-	Q (cfs)	1.6	2.2	2.7	3.3	3.8	4.3
DA-C					CA (ac)	0.56	0.56	0.56	0.56	0.56	0.57
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0523	0.0695	0.0826	0.1003	0.1139	0.1302
Combine	-	-	-	2	Q (cfs)	12.6	17.7	21.3	26.4	30.2	34.2
DA-C					CA (ac)	5.86	5.86	5.86	5.86	5.86	5.87
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.5471	0.7276	0.8645	1.0501	1.1917	1.3405
Storage	-	-	-	-	Q (cfs)	12.4	17.4	20.9	26.0	29.7	33.6
BAS-C					CA (ac)	5.86	5.86	5.86	5.86	5.86	5.87
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.5471	0.7276	0.8645	1.0501	1.1917	1.3405
Hold	-	-	-	-	Q (cfs)	12.4	17.4	20.9	26.0	29.7	33.6
C-B2					CA (ac)	5.86	5.86	5.86	5.86	5.86	5.87
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.5471	0.7276	0.8645	1.0501	1.1917	1.3405
Sub Basin	-	-	-	-	Q (cfs)	0.6	0.8	1.0	1.2	1.4	1.6
DA-B1					CA (ac)	0.21	0.21	0.21	0.21	0.21	0.21
					Tc (min)	6.2	5.4	5.0	5.0	5.0	5.0
					i (in/hr)	2.74	3.87	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0196	0.0261	0.0310	0.0376	0.0427	0.0480
Storage	-	-	-	-	Q (cfs)	0.4	0.6	0.9	1.1	1.3	1.5
BAS-B1					CA (ac)	0.21	0.21	0.21	0.21	0.21	0.21
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.0196	0.0261	0.0310	0.0376	0.0427	0.0480
Sub Basin	-	-	-	-	Q (cfs)	0.5	0.6	0.8	0.9	1.1	1.2
DA-B2					CA (ac)	0.16	0.16	0.16	0.16	0.16	0.16
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0149	0.0199	0.0236	0.0287	0.0325	0.0365

* First Pipe

2-ZN-2024
4/18/2024

Type / ID	Length (ft)	Velocity (ft/sec)	Tpipe (min)	Combine		Return Period (Years) 2	5	10	25	50	100
cFirstPipe											
Maior Basin ID: 01											
Receive	-	-	-	-	Q (cfs)	12.4	17.4	20.9	26.0	29.7	33.6
C-B2					CA (ac)	5.86	5.86	5.86	5.86	5.86	5.87
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.5471	0.7276	0.8645	1.0501	1.1917	1.3405
Storage	-	-	-	-	Q (cfs)	12.4	17.4	20.9	26.0	29.7	33.6
BAS-B2					CA (ac)	5.86	5.86	5.86	5.86	5.86	5.87
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.5471	0.7276	0.8645	1.0501	1.1917	1.3405
Hold	-	-	-	-	Q (cfs)	12.4	17.4	20.9	26.0	29.7	33.6
B2-B					CA (ac)	5.86	5.86	5.86	5.86	5.86	5.87
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.5471	0.7276	0.8645	1.0501	1.1917	1.3405
Sub Basin	-	-	-	-	Q (cfs)	0.8	1.1	1.3	1.6	1.9	2.1
DA-G					CA (ac)	0.28	0.28	0.28	0.28	0.28	0.28
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0261	0.0348	0.0413	0.0502	0.0569	0.0639
Sub Basin	-	-	-	-	Q (cfs)	0.1	0.2	0.2	0.2	0.3	0.3
OFF-4					CA (ac)	0.04	0.04	0.04	0.04	0.04	0.04
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0037	0.0050	0.0059	0.0072	0.0081	0.0091
Combine	-	-	-	2	Q (cfs)	0.9	1.3	1.5	1.8	2.2	2.4
OFF-4					CA (ac)	0.32	0.32	0.32	0.32	0.32	0.32
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.0298	0.0398	0.0472	0.0574	0.0650	0.0730
Storage	-	-	-	-	Q (cfs)	0.6	0.9	1.1	1.4	1.7	1.9
BAS-G					CA (ac)	0.32	0.32	0.32	0.32	0.32	0.32
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.0298	0.0398	0.0472	0.0574	0.0650	0.0730
Sub Basin	-	-	-	-	Q (cfs)	0.5	0.7	0.8	1.0	1.1	1.3
DA-R					CA (ac)	0.17	0.17	0.17	0.17	0.17	0.17
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0159	0.0211	0.0251	0.0305	0.0346	0.0388
Combine	-	-	-	2	Q (cfs)	0.9	1.4	1.7	2.1	2.6	2.9
DA-R					CA (ac)	0.49	0.49	0.49	0.49	0.49	0.49
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.0457	0.0609	0.0723	0.0879	0.0996	0.1118
Storage	-	-	-	-	Q (cfs)	0.9	1.4	1.7	2.1	2.6	2.9
BAS-R					CA (ac)	0.49	0.49	0.49	0.49	0.49	0.49
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.0457	0.0609	0.0723	0.0879	0.0996	0.1118

* First Pipe

2-ZN-2024
4/18/2024

Type / ID	Length (ft)	Velocity (ft/sec)	Tpipe (min)	Combine		Return Period (Years) 2	5	10	25	50	100
cFirstPipe											
Maior Basin ID: 01											
Receive	-	-	-	-	Q (cfs)	12.4	17.4	20.9	26.0	29.7	33.6
B2-B					CA (ac)	5.86	5.86	5.86	5.86	5.86	5.87
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.5471	0.7276	0.8645	1.0501	1.1917	1.3405
Sub Basin	-	-	-	-	Q (cfs)	1.0	1.4	1.7	2.1	2.3	2.6
DA-B					CA (ac)	0.35	0.35	0.35	0.35	0.35	0.35
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0327	0.0435	0.0516	0.0627	0.0712	0.0799
Combine	-	-	-	3	Q (cfs)	13.8	19.7	23.6	29.4	33.7	38.0
DA-B					CA (ac)	6.70	6.70	6.70	6.70	6.70	6.71
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.6255	0.8320	0.9884	1.2007	1.3625	1.5322
Storage	-	-	-	-	Q (cfs)	13.0	18.4	22.3	27.8	31.9	36.2
BAS-B					CA (ac)	6.70	6.70	6.70	6.70	6.70	6.71
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.6255	0.8320	0.9884	1.2007	1.3625	1.5322
Sub Basin	-	-	-	-	Q (cfs)	0.3	0.4	0.5	0.6	0.7	0.8
DA-A					CA (ac)	0.11	0.11	0.11	0.11	0.11	0.11
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
					Volume (ac-ft)	0.0103	0.0137	0.0162	0.0197	0.0224	0.0251
Storage	-	-	-	-	Q (cfs)	0.2	0.3	0.4	0.5	0.5	0.6
BAS-A					CA (ac)	0.11	0.11	0.11	0.11	0.11	0.11
					Tc (min)	-	-	-	-	-	-
					i (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.0103	0.0137	0.0162	0.0197	0.0224	0.0251

* First Pipe

2-ZN-2024
4/18/2024

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: ARTESSA_2

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
DA-N	0.1	31	2,651.20	2,650.00	204.4	0.046	Q (cfs)	0.2	0.3	0.4	0.5	0.5	0.6
							C	0.70	0.70	0.70	0.70	0.70	0.70
							CA (ac)	0.08	0.08	0.08	0.08	0.08	0.08
							Volume (ac-ft)	0.0075	0.0099	0.0118	0.0143	0.0163	0.0183
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
OFF-3	0.1	239	2,660.00	2,651.60	185.6	0.046	Q (cfs)	0.1	0.2	0.2	0.3	0.3	0.4
							C	0.45	0.45	0.45	0.45	0.45	0.45
							CA (ac)	0.05	0.05	0.05	0.05	0.05	0.05
							Volume (ac-ft)	0.0047	0.0062	0.0074	0.0090	0.0102	0.0114
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-L	0.2	43	2,651.50	2,650.00	184.2	0.044	Q (cfs)	0.4	0.6	0.7	0.9	1.0	1.1
							C	0.75	0.75	0.75	0.75	0.75	0.75
							CA (ac)	0.15	0.15	0.15	0.15	0.15	0.15
							Volume (ac-ft)	0.0140	0.0186	0.0221	0.0269	0.0305	0.0343
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-O	1.2	229	2,652.90	2,649.00	89.9	0.040	Q (cfs)	1.9	2.6	3.1	3.8	4.4	4.9
							C	0.55	0.55	0.55	0.55	0.55	0.55
							CA (ac)	0.65	0.65	0.65	0.65	0.65	0.65
							Volume (ac-ft)	0.0607	0.0807	0.0959	0.1165	0.1322	0.1484
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-R	0.2	127	2,645.90	2,644.00	79.0	0.044	Q (cfs)	0.5	0.7	0.8	1.0	1.1	1.3
							C	0.75	0.75	0.75	0.75	0.75	0.75

* Non default value

2-ZN-2024
4/18/2024

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: ARTESSA_2

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
							CA (ac)	0.17	0.17	0.17	0.17	0.17	0.17
							Volume (ac-ft)	0.0159	0.0211	0.0251	0.0305	0.0346	0.0388
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-H1	0.4	101	2,649.00	2,647.00	104.6	0.042	Q (cfs)	0.8	1.1	1.3	1.6	1.9	2.1
							C	0.69	0.69	0.69	0.69	0.69	0.69
							CA (ac)	0.28	0.28	0.28	0.28	0.28	0.28
							Volume (ac-ft)	0.0261	0.0348	0.0413	0.0502	0.0569	0.0639
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-G	0.4	85	2,646.00	2,644.00	124.2	0.042	Q (cfs)	0.8	1.1	1.3	1.6	1.9	2.1
							C	0.71	0.71	0.71	0.71	0.71	0.71
							CA (ac)	0.28	0.28	0.28	0.28	0.28	0.28
							Volume (ac-ft)	0.0261	0.0348	0.0413	0.0502	0.0569	0.0639
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-H2	0.4	195	2,649.00	2,647.00	54.2	0.043	Q (cfs)	0.9	1.2	1.4	1.8	2.0	2.3
							C	0.78	0.78	0.78	0.78	0.78	0.78
							CA (ac)	0.30	0.30	0.30	0.30	0.30	0.30
							Volume (ac-ft)	0.0280	0.0373	0.0443	0.0538	0.0610	0.0685
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-Q	0.1	89	2,654.50	2,649.00	326.3	0.048	Q (cfs)	0.1	0.1	0.1	0.2	0.2	0.2
							C	0.55	0.55	0.55	0.55	0.55	0.55
							CA (ac)	0.03	0.03	0.03	0.03	0.03	0.03
							Volume (ac-ft)	0.0028	0.0037	0.0044	0.0054	0.0061	0.0069
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56

* Non default value

2-ZN-2024
4/18/2024

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: ARTESSA_2

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
DA-C	0.7	182	2,649.00	2,644.00	145.1	0.041	Q (cfs)	1.6	2.2	2.7	3.3	3.8	4.3
							C	0.75	0.75	0.75	0.75	0.76	0.77
							CA (ac)	0.56	0.56	0.56	0.56	0.56	0.57
							Volume (ac-ft)	0.0523	0.0695	0.0826	0.1003	0.1139	0.1302
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-B2	0.2	135	2,646.40	2,644.50	74.3	0.044	Q (cfs)	0.5	0.6	0.8	0.9	1.1	1.2
							C	0.71	0.71	0.71	0.71	0.71	0.71
							CA (ac)	0.16	0.16	0.16	0.16	0.16	0.16
							Volume (ac-ft)	0.0149	0.0199	0.0236	0.0287	0.0325	0.0365
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-B1	0.3	123	2,645.30	2,645.00	12.9	0.043	Q (cfs)	0.6	0.8	1.0	1.2	1.4	1.6
							C	0.74	0.74	0.74	0.74	0.74	0.74
							CA (ac)	0.21	0.21	0.21	0.21	0.21	0.21
							Volume (ac-ft)	0.0196	0.0261	0.0310	0.0376	0.0427	0.0480
							Tc (min)	6	5	5	5	5	5
							i (in/hr)	2.74	3.87	4.76	5.86	6.70	7.56
DA-B	0.5	120	2,646.20	2,643.00	140.8	0.042	Q (cfs)	1.0	1.4	1.7	2.1	2.3	2.6
							C	0.75	0.75	0.75	0.75	0.75	0.75
							CA (ac)	0.35	0.35	0.35	0.35	0.35	0.35
							Volume (ac-ft)	0.0327	0.0435	0.0516	0.0627	0.0712	0.0799
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-A	0.2	74	2,646.40	2,643.00	242.6	0.045	Q (cfs)	0.3	0.4	0.5	0.6	0.7	0.8
							C	0.62	0.62	0.62	0.62	0.62	0.62

* Non default value

2-ZN-2024
4/18/2024

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: ARTESSA_2

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
							CA (ac)	0.11	0.11	0.11	0.11	0.11	0.11
							Volume (ac-ft)	0.0103	0.0137	0.0162	0.0197	0.0224	0.0251
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-N1	0.5	294	2,653.10	2,650.70	43.1	0.042	Q (cfs)	1.1	1.6	2.0	2.5	2.8	3.2
							C	0.90	0.90	0.90	0.90	0.90	0.90
							CA (ac)	0.42	0.42	0.42	0.42	0.42	0.42
							Volume (ac-ft)	0.0392	0.0522	0.0620	0.0753	0.0854	0.0959
							Tc (min)	7	6	5	5	5	5
							i (in/hr)	2.70	3.81	4.69	5.86	6.70	7.56
OFF-1	3.4	250	2,654.00	2,651.80	46.5	0.037	Q (cfs)	9.2	12.7	15.2	18.8	21.4	24.2
							C	0.95	0.95	0.95	0.95	0.95	0.95
							CA (ac)	3.20	3.20	3.20	3.20	3.20	3.20
							Volume (ac-ft)	0.2987	0.3973	0.4720	0.5733	0.6507	0.7307
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.88	3.96	4.76	5.86	6.70	7.56
OFF-4	0.1	121	2,658.00	2,646.80	488.7	0.047	Q (cfs)	0.1	0.2	0.2	0.2	0.3	0.3
							C	0.45	0.45	0.45	0.45	0.45	0.45
							CA (ac)	0.04	0.04	0.04	0.04	0.04	0.04
							Volume (ac-ft)	0.0037	0.0050	0.0059	0.0072	0.0081	0.0091
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
DA-D	0.4	169	2,650.70	2,647.50	100.0	0.042	Q (cfs)	1.1	1.5	1.8	2.2	2.5	2.9
							C	0.86	0.86	0.86	0.86	0.86	0.86
							CA (ac)	0.38	0.38	0.38	0.38	0.38	0.38
							Volume (ac-ft)	0.0355	0.0472	0.0561	0.0681	0.0773	0.0868
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56

* Non default value

2-ZN-2024
4/18/2024

ID	Sub Basin Data							Sub Basin Hydrology Summary					
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Major Basin ID: 01													
DA-D1	0.4	90	2,648.10	2,644.30	222.9	0.043	Q (cfs)	0.9	1.2	1.4	1.8	2.0	2.3
							C	0.80	0.80	0.80	0.80	0.80	0.80
							CA (ac)	0.30	0.30	0.30	0.30	0.30	0.30
							Volume (ac-ft)	0.0280	0.0373	0.0443	0.0538	0.0610	0.0685
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56
OFF-2	0.3	221	2,662.90	2,660.00	69.3	0.043	Q (cfs)	0.4	0.6	0.7	0.8	0.9	1.1
							C	0.45	0.45	0.45	0.45	0.45	0.45
							CA (ac)	0.14	0.14	0.14	0.14	0.14	0.14
							Volume (ac-ft)	0.0131	0.0174	0.0207	0.0251	0.0285	0.0320
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	2.93	3.96	4.76	5.86	6.70	7.56

2-ZN-2024
4/18/2024

Flood Control District of Maricopa County
Drainage Design Management System
RATIONAL METHOD STORAGE SUMMARY
Project Reference: ARTESSA_2

Storage Basin ID: BAS-A

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.006	0.006	0.006	0.007	0.007	0.007
Peak Stage (ft)	2,643.08	2,643.11	2,643.15	2,643.18	2,643.21	2,643.24
Peak Discharge (cfs)	0.20	0.29	0.37	0.45	0.52	0.60

Storage Basin ID: BAS-B

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.133	0.156	0.172	0.196	0.213	0.231
Peak Stage (ft)	2,646.33	2,646.68	2,646.93	2,647.28	2,647.54	2,647.82
Peak Discharge (cfs)	12.96	18.41	22.31	27.79	31.89	36.19

Storage Basin ID: BAS-B1

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.005	0.006	0.006	0.007	0.007	0.007
Peak Stage (ft)	2,642.83	2,643.02	2,643.05	2,643.08	2,643.10	2,643.13
Peak Discharge (cfs)	0.41	0.62	0.87	1.07	1.26	1.45

Storage Basin ID: BAS-B2

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.007	0.009	0.010	0.012	0.013	0.015
Peak Stage (ft)	2,640.59	2,641.23	2,641.68	2,642.33	2,642.80	2,643.31
Peak Discharge (cfs)	12.40	17.41	20.91	25.95	29.65	33.59

Storage Basin ID: BAS-C

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.047	0.060	0.069	0.082	0.091	0.101
Peak Stage (ft)	2,644.60	2,645.23	2,645.68	2,646.33	2,646.80	2,647.31
Peak Discharge (cfs)	12.44	17.37	20.94	25.95	29.65	33.64

Storage Basin ID: BAS-G

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.018	0.019	0.019	0.020	0.021	0.022
Peak Stage (ft)	2,645.07	2,645.11	2,645.14	2,645.18	2,645.21	2,645.24
Peak Discharge (cfs)	0.57	0.86	1.06	1.37	1.67	1.85

2-ZN-2024
4/18/2024

Flood Control District of Maricopa County
Drainage Design Management System
RATIONAL METHOD STORAGE SUMMARY
Project Reference: ARTESSA_2

Storage Basin ID: BAS-H

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.083	0.108	0.125	0.150	0.168	0.188
Peak Stage (ft)	2,649.40	2,649.97	2,650.36	2,650.93	2,651.35	2,651.79
Peak Discharge (cfs)	10.91	15.34	18.42	22.83	26.09	29.55

Storage Basin ID: BAS-H2

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.019	0.025	0.029	0.035	0.039	0.044
Peak Stage (ft)	2,649.47	2,650.07	2,650.49	2,651.08	2,651.52	2,651.99
Peak Discharge (cfs)	11.49	16.14	19.39	24.03	27.47	31.13

Storage Basin ID: BAS-N

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.026	0.033	0.038	0.046	0.051	0.057
Peak Stage (ft)	2,649.25	2,649.74	2,650.09	2,650.61	2,650.95	2,651.34
Peak Discharge (cfs)	9.72	13.58	16.32	20.32	23.05	26.08

Storage Basin ID: BAS-O

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.017	0.019	0.020	0.022	0.023	0.025
Peak Stage (ft)	2,649.63	2,649.69	2,649.73	2,649.78	2,649.82	2,649.87
Peak Discharge (cfs)	2.07	2.96	3.53	4.36	5.05	5.77

Storage Basin ID: BAS-Q

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.001	0.001	0.001	0.001	0.001	0.001
Peak Stage (ft)	2,649.02	2,649.02	2,649.02	2,649.03	2,649.03	2,649.03
Peak Discharge (cfs)	0.14	0.14	0.14	0.24	0.24	0.24

Storage Basin ID: BAS-R

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.002	0.003	0.003	0.003	0.003	0.003
Peak Stage (ft)	2,641.12	2,641.17	2,641.22	2,641.27	2,641.33	2,641.37

2-ZN-2024
4/18/2024

Peak Discharge (cfs)	0.90	1.36	1.71	2.11	2.61	2.91

Storage Basin ID: DA-L

	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Peak Volume (ac-ft)	0.013	0.017	0.019	0.023	0.025	0.028
Peak Stage (ft)	2,649.29	2,649.80	2,650.16	2,650.70	2,651.06	2,651.46
Peak Discharge (cfs)	10.06	14.08	16.84	21.02	23.87	26.96

2-ZN-2024
4/18/2024

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: ARTESSA_2

Sub Basin	Land Use Code	Area (acres)	Area (%)	Kb	Runoff Coefficient C						Description
					2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
Major Basin ID: 01											
DA-A	2001	0.12	66.7	0.045	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.06	33.3	0.045	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.180	**100.0**								
DA-B	2001	0.19	40.4	0.042	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.28	59.6	0.042	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.470	**100.0**								
DA-B1	2001	0.12	41.4	0.043	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.17	58.6	0.043	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.290	**100.0**								
DA-B2	2001	0.11	47.8	0.044	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.12	52.2	0.044	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.230	**100.0**								
DA-C	2001	0.30	40.5	0.041	0.45*	0.45*	0.45*	0.45*	0.48	0.50	Landscaping w/o impervious under treatment
	2002	0.44	59.5	0.041	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.740	**100.0**								
DA-D	2001	0.08	18.2	0.042	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.36	81.8	0.042	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.440	**100.0**								
DA-D1	2001	0.11	29.7	0.043	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment

* Non default value

(stLuDatRat.rpt - Version: 6.0.5)

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: ARTESSA_2

Sub Basin	Land Use Code	Area (acres)	Area (%)	Kb	Runoff Coefficient C						Description
					2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
Major Basin ID: 01											
DA-D1	2002	0.26	70.3	0.043	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.370	**100.0**								
DA-G	2001	0.19	47.5	0.042	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.21	52.5	0.042	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.400	**100.0**								
DA-H1	2001	0.21	51.2	0.042	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.20	48.8	0.042	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.410	**100.0**								
DA-H2	2001	0.13	33.3	0.043	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.26	66.7	0.043	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.390	**100.0**								
DA-L	2001	0.08	40.0	0.044	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.12	60.0	0.044	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.200	**100.0**								
DA-N	2001	0.06	50.0	0.046	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.06	50.0	0.046	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.120	**100.0**								
DA-N1	2001	0.05	10.6	0.042	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.42	89.4	0.042	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops

* Non default value

2-ZN-2024
4/18/2024

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: ARTESSA_2

Sub Basin	Land Use Code	Area (acres)	Area (%)	Kb	Runoff Coefficient C						Description
					2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
Major Basin ID: 01											
		0.470	**100.0**								
DA-O	2001	0.95	79.8	0.040	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.24	20.2	0.040	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		1.190	**100.0**								
DA-Q	2001	0.04	80.0	0.048	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.01	20.0	0.048	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.050	**100.0**								
DA-R	2001	0.09	40.9	0.044	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
	2002	0.13	59.1	0.044	0.95	0.95	0.95	0.95	0.95	0.95	Pavement and Rooftops
		0.220	**100.0**								
OFF-1	2002	3.37	100.0	0.037	0.95*	0.95*	0.95*	0.95*	0.95*	0.95*	Pavement and Rooftops
		3.370	**100.0**								
OFF-2	2001	0.31	100.0	0.043	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
		0.310	**100.0**								
OFF-3	2001	0.10	100.0	0.046	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
		0.100	**100.0**								
OFF-4	2001	0.08	100.0	0.047	0.45*	0.45*	0.45*	0.45*	0.45*	0.45*	Landscaping w/o impervious under treatment
		0.080	**100.0**								

* Non default value

2-ZN-2024
4/18/2024

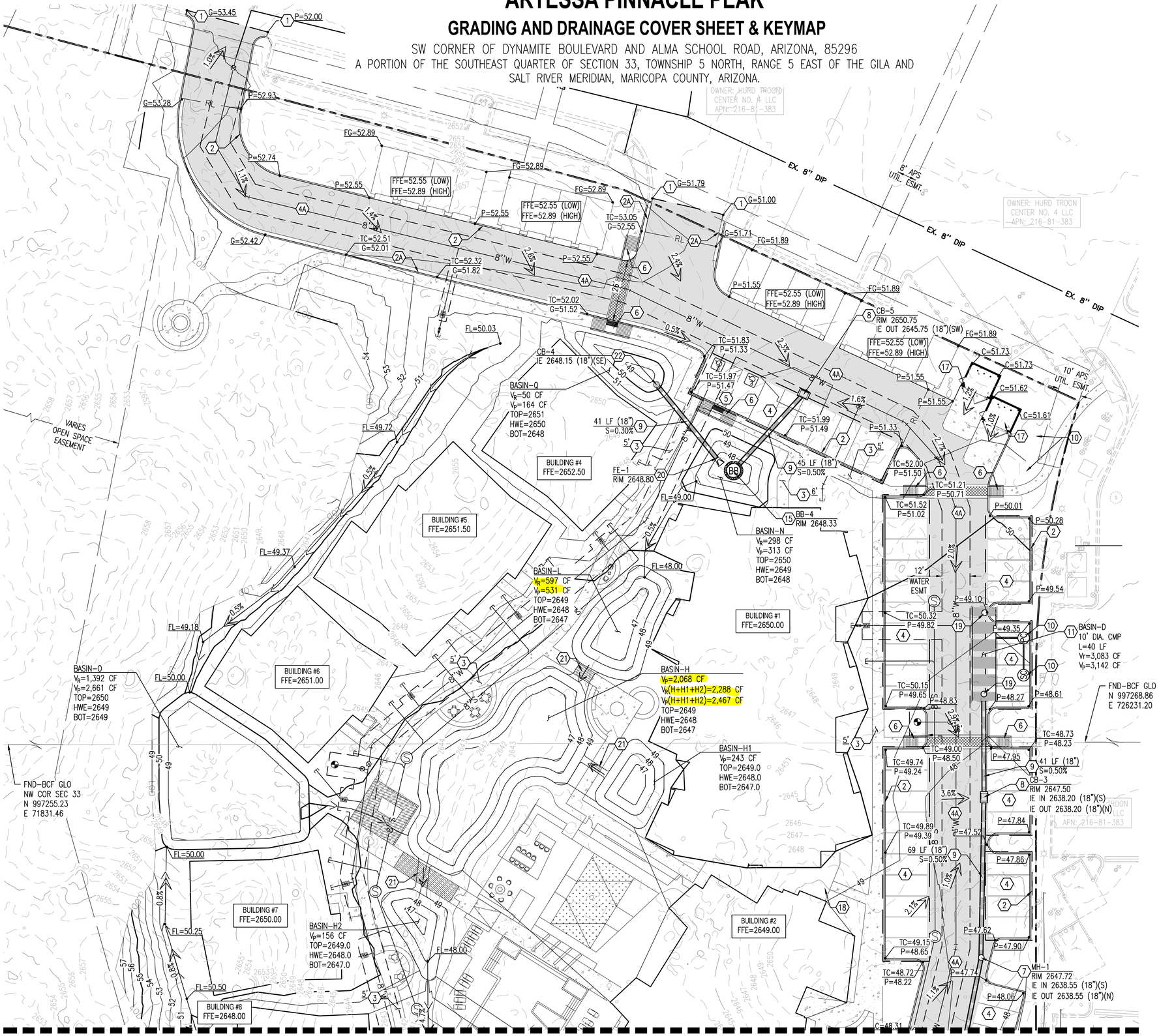
APPENDIX III

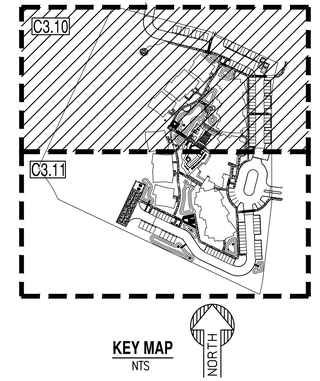
GRADING & DRAINAGE PLANS

ARTESSA PINNACLE PEAK

GRADING AND DRAINAGE COVER SHEET & KEYMAP

SW CORNER OF DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, ARIZONA, 85296
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.





KEY MAP
NTS

PRELIMINARY GRADING KEY NOTES

1. MATCH EXISTING GRADE.
2. 6" VERTICAL CURB.
2A. 6" CONCRETE CURB AND GUTTER.
3. PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
4. LIGHT DUTY PAVEMENT.
4A. HEAVY DUTY PAVEMENT.
5. PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
6. PROPOSED ACCESIBLE RAMP.
7. PROPOSED 30" NYLOPLAST DRAIN BASIN WITH STANDARD SOLID LID, INCLUDING CONCRETE COLLAR.
8. PROPOSED NYLOPLAST DRAIN BASIN WITH 30" RISER AND 2'X3' STEEL GRATE.
9. PROPOSED HDPE DOUBLE WALL PIPE, CLASS 100; PIPE MATERIAL PER MAG SPECIFICATION 738. LENGTH PER PLAN.
10. PROPOSED MAXWELL PLUS DRYWELL.
NOTE: CONTRACTOR TO HAVE A PERCOLATION TEST DONE ON FIRST CONSTRUCTED DRYWELL AND PROVIDE RESULTS TO ENGINEER FOR DETERMINATION OF ULTIMATE NUMBER OF REQUIRED DRYWELLS.
11. PROPOSED UNDERGROUND STORMWATER STORAGE SYSTEM.
17. PROPOSED TRASH ENCLOSURE.
18. PROPOSED PATIO.
19. PROPOSED 30" CMP RISER WITH VENTED SOLID LID, INCLUDING CONCRETE COLLAR.
20. PROPOSED 30" RAISED RIM NYLOPLAST DRAIN BASIN WITH STANDARD H-20 GRATE, INCLUDING CONCRETE COLLAR.
21. PROPOSED DIAMOND PLATE SIDEWALK SCUPPER.
22. PROPOSED END SECTION.

Revise per comments on Proposed Conditions Drainage Area Map.

NORTH

0' 20' 40' 60'
SCALE: 1" = 20'

NOT FOR CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534

c. lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK
LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106

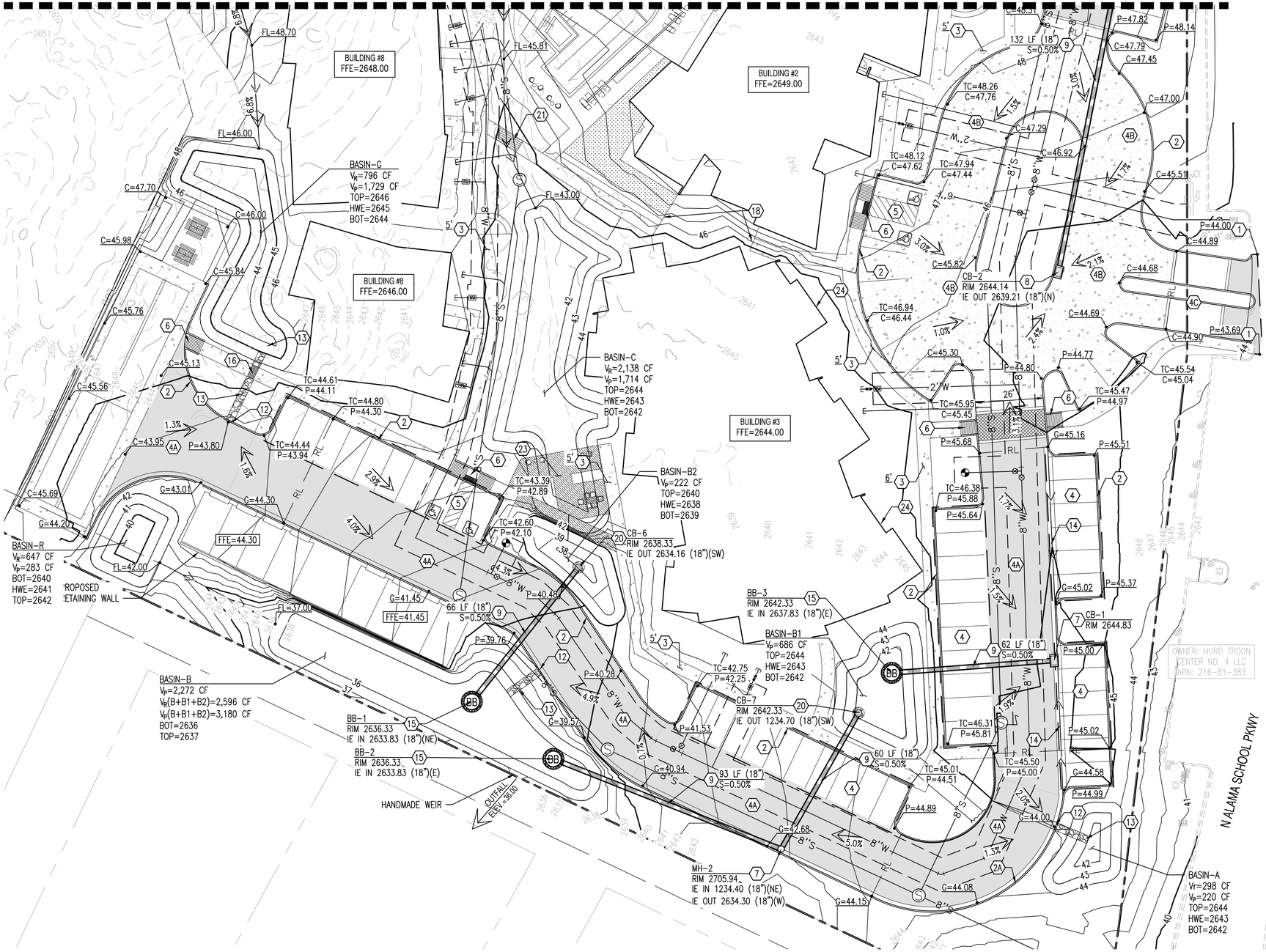
SHEET TITLE: **PRELIMINARY GRADING AND DRAINAGE PLAN**

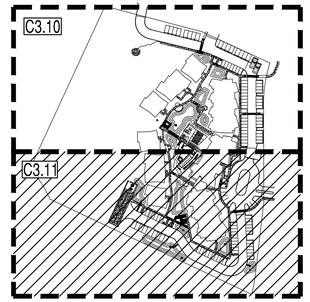
PAGE NO.: 1 OF 5
SHEET NO.: **C3.10**

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

2-ZN-2024
4/18/2024

MATCHLINE - REFER TO SHEET C3.10





KEY MAP
NTS

PRELIMINARY GRADING KEY NOTES

1. MATCH EXISTING GRADE.
2. 6" VERTICAL CURB.
2A. 6" CONCRETE CURB AND GUTTER.
3. PROPOSED CONCRETE SIDEWALK. WIDTH PER PLAN.
4. LIGHT DUTY PAVEMENT.
4A. HEAVY DUTY PAVEMENT.
4B. HEAVY DUTY PAVEMENT.
4C. STAMPED ASPHALT.
5. PAVEMENT WITH 2% MAXIMUM SLOPE IN ANY DIRECTION AT ACCESSIBLE PARKING STALLS AND 2% MAXIMUM CROSS SLOPE AT ADA ACCESSIBLE ROUTE.
6. PROPOSED ACCESIBLE RAMP.
8. PROPOSED NYLOPLAST DRAIN BASIN WITH 30" RISER AND 2'X3' STEEL GRATE.
9. PROPOSED HDPE DOUBLE WALL PIPE, CLASS 100; PIPE MATERIAL PER MAG SPECIFICATION 738. LENGTH PER PLAN.
12. PROPOSED CURB OPENING WITH CONCRETE SPILLWAY.LENGTH PER PLAN.
13. PROPOSED RIP-RAP; D50=6", 12" DEPTH. DIMENSIONS PER PLAN.
14. PROPOSED CONCRETE VALLEY GUTTER
15. PROPOSED BUBBLER BOX. PROVIDE INLET PROTECTION.
16. PROPOSED SIDEWALK SCUPPER. WIDTH PER PLAN.
18. PROPOSED PATIO.
20. PROPOSED 30" RAISED RIM NYLOPLAST DRAIN BASIN WITH STANDARD H-20 GRATE, INCLUDING CONCRETE COLLAR.
21. PROPOSED DIAMOND PLATE SIDEWALK SCUPPER.
23. PROPOSED ELEVATED PLATFORM. REFER TO LANDSCAPE PLANS.
24. PROPOSED STEM WALL

EXISTING LEGEND:

EX. MAJOR CONTOURS (XXXX) — EX. S — SEWER LINE — STORM DRAIN LINE — SIGN
EX. MINOR CONTOURS (XXXX) — SEWER MANHOLE — STORM CATCH BASIN — STREET LIGHT
EX. SPOT ELEVATION (TC: XX.XX, GE: XX.XX) — EX. W — WATER LINE — STORM MANHOLE
EASEMENT LINE AS NOTED — WV — WATER VALVE — GAS — GAS LINE — TREE
FIRE HYDRANT — X X — FENCE — ROAD CENTERLINE

PROPOSED GRADING LEGEND:

G=XX.XX — GUTTER ELEVATION, TC = G+0.5'
P=XX.XX — PAVEMENT ELEVATION TC = P+0.5'
C=XX.XX — CONCRETE ELEVATION
PROPERTY LINE — SETBACK — END SECTION — WATER METER — RIP-RAP
RIGHT OF WAY — FLOW ARROW — STORM MANHOLE — GATE VALVE — CONCRETE PAVEMENT
CURB AND GUTTER — CATCH BASIN — DRYWELL — FIRE HYDRANT — HEAVY DUTY PAVEMENT
RL RIDGELINE — STORM PIPE — NYLOPLAST BASIN — SEWER MANHOLE — LIGHT DUTY PAVEMENT

FEMA

MAP NUMBER	COMMUNITY NUMBER	PANEL # PANEL DATE	SUFFIX	FIRM ZONE	BASE FLOOD ELEVATION (IN AO ZONE USE DEPTH)
04013C1330L	045012	1320 10/16/2013	L	X	513

NORTH

0' 20' 40' 60'
SCALE: 1" = 20'

NOT FOR CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534

lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK
LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106

SHEET TITLE: **PRELIMINARY GRADING AND DRAINAGE PLAN**

PAGE NO.: 2 OF 5
SHEET NO.: **C3.11**

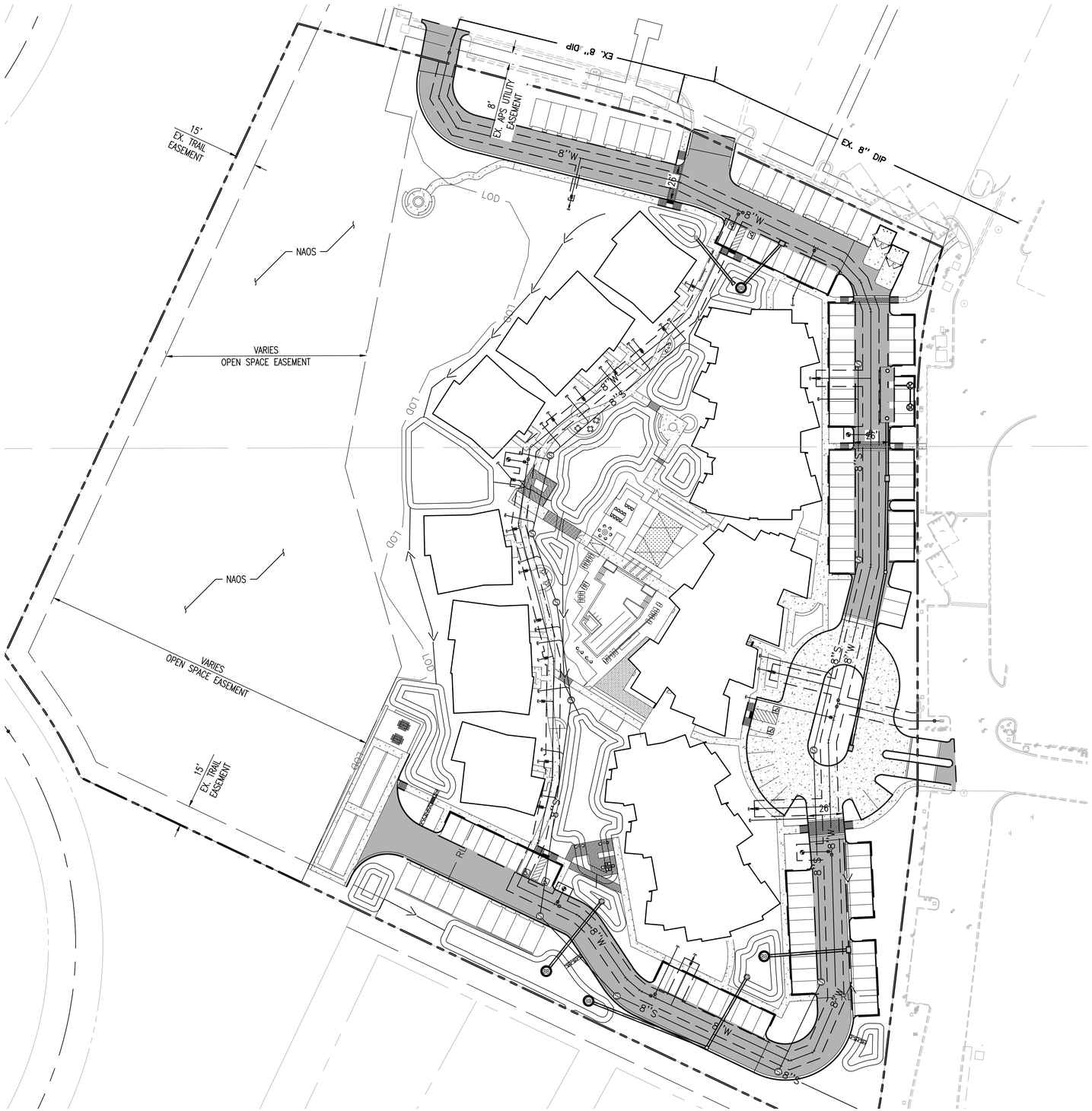
THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

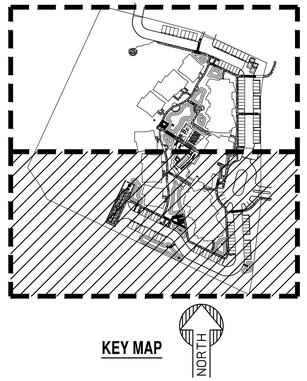
2-ZN-2024
4/18/2024

ARTESSA PINNACLE PEAK

GRADING AND DRAINAGE OVERALL SITE

SW CORNER OF DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, ARIZONA, 85296
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.





NORTH

OVERALL SITE
0' 40' 80' 120'
SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534

lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK
LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106

SHEET TITLE:
PRELIMINARY GRADING AND DRAINAGE OVERALL PLAN

PAGE NO.: 3 OF 5
SHEET NO.: **C3.12**

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

PRELIMINARY SEWER REPORT

ARTESSA PINNACLE PEAK

SWC Dynamite Boulevard and Alma School Road, Scottsdale, Arizona 85262

Prepared For:

Lifestyle Communities, LLC.

4938 Lincoln Drive

MN 55436

228-7944

pared by:

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 rrahman DATE 5/20/2024

05/20/2024

SEG

Registered Professional Engineer (Civil)
CERTIFICATE NO.
45621
ALI SAMIH
FAKIH
Date Signed 03/28/24
ARIZONA, U. S. A.

Engineering Group
Street, Suite 105
Phoenix, AZ 85014
480.588.7226 www.azSEG.com

Project Number: 231106

Submittal Date: March 28, 2024 (REZONING)

CASE FILE: #: TBD **PLAN CHECK #: TBD**

2-ZN-2024
4/18/2024

Table of Contents

LIST OF TABLES:

LIST OF FIGURES:

APPENDIX:

2-ZN-2024
4/18/2024

1. INTRODUCTION

This report is prepared for Lifestyle Communities, LLC as a part of the design for the Artessa Pinnacle Peak development project in Scottsdale, Arizona. The purpose of this report is to provide analysis and results for the proposed wastewater distribution system for the project site. This project consists of the construction of three 3-story multifamily residential buildings, a community and 14 Casitas with total of 68 DU and associated hardscape and utility improvements.

2. BACKGROUND

2.1 Project Location

The Artessa Pinnacle Peak development is approximately 8.6 acres located at the southwest corner of Dynamite Boulevard and Alma School Road. The site is located on Maricopa County Assessor Parcel Number (APN) 216-81-381 in the southeast quarter of Section 28, Township 5 North, Range 5 East and the northeast quarter Section 33, Township 5 North, Range 5 East. The property is currently undeveloped bounded by a residential development to the west, a commercial development to the north and east, and platted undeveloped property to the south.

See **Figure 1** for a Project Vicinity Map.

2.2 Existing Conditions

The site slopes from the north to the south at approximately 2.5% with an elevation difference of approximately 16 feet. An existing private 8-inch polyvinyl chloride (PVC) sewer main is located south and east of the site within Greythorn Drive, an access drive along the west side of the existing commercial development. This sewer main conveys wastewater south and east along Greythorn Drive to a manhole in Alma School Road. Refer to Aerial map in **Figure 2**.

3. DESIGN CRITERIA

The new sewer system design will be submitted to the City of Scottsdale and the Maricopa County Environmental Services Department for review and permitting. The new sewer system will be designed to meet City of Scottsdale *Design Standards and Policies Manual* (DS&PM - 2018), Maricopa Association of Government's *Standard Specifications for Public Works Construction (2024 Revision)*, *Arizona Administrative Code Title 18*, and Arizona Department of Environmental Quality's *Bulletin 11*. Key design criteria include the following:

- All private sanitary sewer lines shall be extra strength vitrified clay pipe (VCP) or

2-ZN-2024
4/18/2024

PVC pipe material.

- The Manning's n-value of all pipes shall be 0.013.
- Minimum full flow velocity is 2.5 feet per second (fps).
- The maximum velocity shall be 10 feet per second at peak flow.
- The maximum d/D ratio is 0.65 for the onsite 8" gravity sewer lines.
- Sewer manholes shall be located at a maximum spacing of 500 feet.
- Manholes shall be 4 feet in diameter for manholes less than 10-feet deep. For manholes more than 10-feet deep the manhole shall be 5-feet in diameter.
- The maximum sewer cleanout spacing shall be 150 feet for 6-inch pipes or smaller.
- Sewer service pipes shall have a minimum diameter of 6 inches for commercial developments and 4" for individual residential units.
- No sanitary sewer lines shall be installed with less than 4 feet of cover over the top of the pipe.
- All sewers must maintain a 1-foot vertical clearance to dry utilities. Sewer mains below water mains shall maintain 1 to 2 feet of vertical separation with extra protection and with greater than 2 feet of separation require no protection. Sewer mains above water mains shall maintain a minimum of 2 feet of vertical separation and always require extra protection. Sewer service below water mains shall maintain 1-foot of vertical separation. Sewer services above water mains shall maintain a minimum of 1-foot of vertical separation and always require protection.
- All sewers must maintain 6 feet of horizontal clearance to dry utilities. Water mains and sewer mains shall run parallel to each other with 9 feet of separation to pipe centerlines to maintain 6 feet of clearance at manholes.

4. PROPOSED CONDITIONS

4.1 Sewer Design

Wastewater system demands for the Artessa Pinnacle Peak development are calculated based on the specified design demands from the City of Scottsdale DS&PM.

The offsite sewer main providing service to the project is private and is located within Greythorn Drive southeast of the project site. That main ties into a public 8" VCP sewer main running within Alma School Parkway to the east of the adjacent commercial development. Two new 8-inch sewer mains will be installed throughout the site. One will be installed within the parking lot running along the east side of the property and will serve the three multifamily buildings. Another will run east of the casitas on the west side of the project site. These two mains will connect into a new manhole at the southeast corner of the site from which an 8-inch main will convey wastewater east to the connection point at the existing manhole within Greythorn Drive. Sewer service lines for each of the new buildings will discharge into the new onsite sewer main lines. The residential sewer service lines to the casitas will consist of 4" pipes at 2% minimum slope.

This is a private manhole. Does the Developer has permission from the existing Owner to connect? Who would be responsible for the maintennace of this private manhole and downstream sewer segment?

2-ZN-2024
4/18/2024

Sewer service lines to the three multifamily buildings will consist of 6" pipes at 2% minimum slope.

Sewer cleanouts will be installed at each connection location. Sewer manholes are required at all changes of grade or changes in direction for the 8-inch onsite mains. Manholes will have a maximum allowable spacing distance of 500 feet. The onsite sewer mains will be private and will maintain a minimum slope of 1/16" per foot (0.52%) as required by the International Plumbing Code. All new sewer pipes will be polyvinyl chloride (PVC) SDR35. A preliminary utility plan for the project site is provided in **Appendix I** for reference.

4.2 Wastewater Flows

Average day demand in gallons per day (GPD) and the design peaking factor were determined based on the values for "high density condominium" and "commercial/retail" per Figure 7-1.2 in the City of Scottsdale DS&PM. A summary of the site sewer demands for each of the proposed building types is shown in **Table 1.**

68 units on 8.6 acre = 7.9 DU/acre. Use 2.5 persons per unit following DSPM Section 7-1.403 for wastewater demand calculation.

Table 1 - Sewer Demands

Building No.	Unit Type	Area (S.F)	Area (Acre)	No. of DU	Capita	Demand (gpd)	ADD Demand (gpd)	MDD (GPD)	MDD (GPM)
1 Multi-family	A	894.1	0.020526	3	6.6	140	924	4158.00	2.89
	B	1222.11	0.028056	9	19.8	140	2772	12474.00	8.66
	C	971.81	0.02231	3	6.6	140	924	4158.00	2.89
	D	1299.32	0.029828	3	6.6	140	924	4158.00	2.89
	E	1543.62	0.035436	3	6.6	140	924	4158.00	2.89
	Total	5930.96	0.136156	21	46.2		6468	29106.00	20.21
2 Multi-family	A	894.1	0.020526	4	8.8	140	1232	5544.00	3.85
	B	1222.11	0.028056	4	8.8	140	1232	5544.00	3.85
	C	971.81	0.02231	2	4.4	140	616	2772.00	1.92
	D	1299.32	0.029828	2	4.4	140	616	2772.00	1.92
	E	1543.62	0.035436	2	4.4	140	616	2772.00	1.92
	Amenity	9017.6	0.207015	1	2.2	140	308	1386.00	0.96
	Total	14948.56	0.34317	15	33		4620	20790.00	14.44
3 Multi-family	B	1222.11	0.028056	6	13.2	140	1848	8316.00	5.77
	C	971.81	0.02231	3	6.6	140	924	4158.00	2.89
	D	1299.32	0.029828	3	6.6	140	924	4158.00	2.89
	E	1543.62	0.035436	3	6.6	140	924	4158.00	2.89
	F	1632.03	0.037466	3	6.6	140	924	4158.00	2.89
	Total	6668.89	0.153096	18	39.6		5544	24948.00	17.32
4 CASITA 1	B	958.68	0.022008	2	4.4	100	440	1760.00	1.22
	Total	1917.36	0.044016	2	4.4	100	440	1760.00	1.22
5 CASITA 2	A	854.56	0.019618	1	2.2	100	220	880.00	0.61
	B	958.68	0.022008	2	4.4	100	440	1760.00	1.22
	Total	2771.92	0.063634	3	6.6	100	660	2640.00	1.83
6 CASITA 1	B	958.68	0.022008	2	4.4	100	440	1760.00	1.22
	Total	1917.36	0.044016	2	4.4	100	440	1760.00	1.22
7 CASITA 1	B	958.68	0.022008	2	4.4	100	440	1760.00	1.22
	Total	1917.36	0.044016	2	4.4	100	440	1760.00	1.22
8 CASITA 2	A	854.56	0.019618	1	2.2	100	220	880.00	0.61
	B	958.68	0.022008	2	4.4	100	440	1760.00	1.22
	Total	2771.92	0.063634	3	6.6	100	660	2640.00	1.83
9 CASITA 1	B	958.68	0.022008	2	4.4	100	440	1760.00	1.22
	Total	1917.36	0.044016	2	4.4	100	440	1760.00	1.22
Total		40761.69	0.935756	68	149.6	Varies	19712	87164.00	60.53

This category has been used as commercial for water demand calculation. Use the same category for wastewater demand calculation (0.5 gpd/SFT) per DSPM Figure 7-1.2 .

Update flow calculation per DSPM Section 7-1.403 and Figure 7-1.2

2-ZN-2024
4/18/2024

An outdoor pool is also proposed and will require a 100 gpm backwash flow. The proposed 8" pipe has sufficient capacity to discharge the peak 60.5 gpm flow plus the 100 gpm pool backwash. See **TABLE 2** below for the pipe capacity calculations.

Per the City of Scottsdale DS&PM

2.5 person/DU per DSPM Section 7-1.403

The number of capita per du = 2.2, the demand is 100 gpd/capita

The peaking factor = 4 times the average day demand

The demand for multifamily residential is 140 gpd/unit

The peaking factor = 4.5 times the average day demand

4.3 Sewer Capacity

The proposed sewer system was analyzed using Manning's Equation for uniform flow in a pipe. A roughness coefficient of 0.013 was used for the calculations, based on the standard value for PVC pipe.

Equation 1 – Manning's Equation

$$Q = \frac{1.49}{n} * A * R^{\frac{2}{3}} * S^{\frac{1}{2}}$$

Where:
Q = Flowrate (cubic feet per second)
n = Roughness Coefficient (0.013)
A = Area of Flow (square feet)
R = Hydraulic Radius (feet)
S = Pipe Slope (feet per foot)

Given a minimum proposed slope of 1.5%, the proposed 8-inch sewer main accommodate flows up to 502.43 (GPM), at the maximum depth to diameter (d/D) ratio of 0.65, as prescribed in the DS&PM. A summary of the hydraulic capacity calculations and the corresponding demands and City requirements is provided in **Table 2.**

Refer to **Appendix II** for the pipe system hydraulic calculations.

Table 2 - Sewer Capacity

Pipe Size	Minimum Design Segment Slope [%]	Inside Pipe Diameter [in]	d/D= 0.65 Pipe Capacity [GPM]	System Peak Flow [GPM]	Velocity [fps]
8-inch	1.5	8	502.43	60.5	4.6

2-ZN-2024
4/18/2024

5. CONCLUSIONS

The proposed private sewer system will accommodate the flows from the new Artessa Pinnacle Peak development while adhering to City of Scottsdale design standards. The proposed 8-inch sewer mains will run throughout the site to provide service to the proposed residential buildings and community center. This onsite sewer system will then discharge into the existing 8-inch public main in Alma School Road.

The 8" public sewer along Alma School Rd has reached its max capacity. Conduct Sewer Flow Monitoring minimum at two locations per DSPM Section 7-1.202.E. Coordinate with Water Resources for the location of sewer monitoring manholes.

6. REFERENCES

City of Scottsdale. *Design Standards and Policies Manual*, 2018.

International Code Council. *International Plumbing Code,* 2018.

Maricopa Association of Governments. *Uniform Standard Details for Public Works Const*

Arizona Administrative Code (AAC) Title 18, September 2016.

Arizona Department of Environmental Quality (ADEQ) Bulletin 11, July 19

The 8" public sewer along Alma School Rd, from Dynamite Rd to south of Jomax Rd, has reached its max capacity including its allocation for Fiesta/Reata Ranch and may not have any capacity for this rezoned property. Per DSPM Section 7-1.400 and SRC, the Developer must install, at their expense, all on-site and off-site sewer improvements necessary to serve their development.

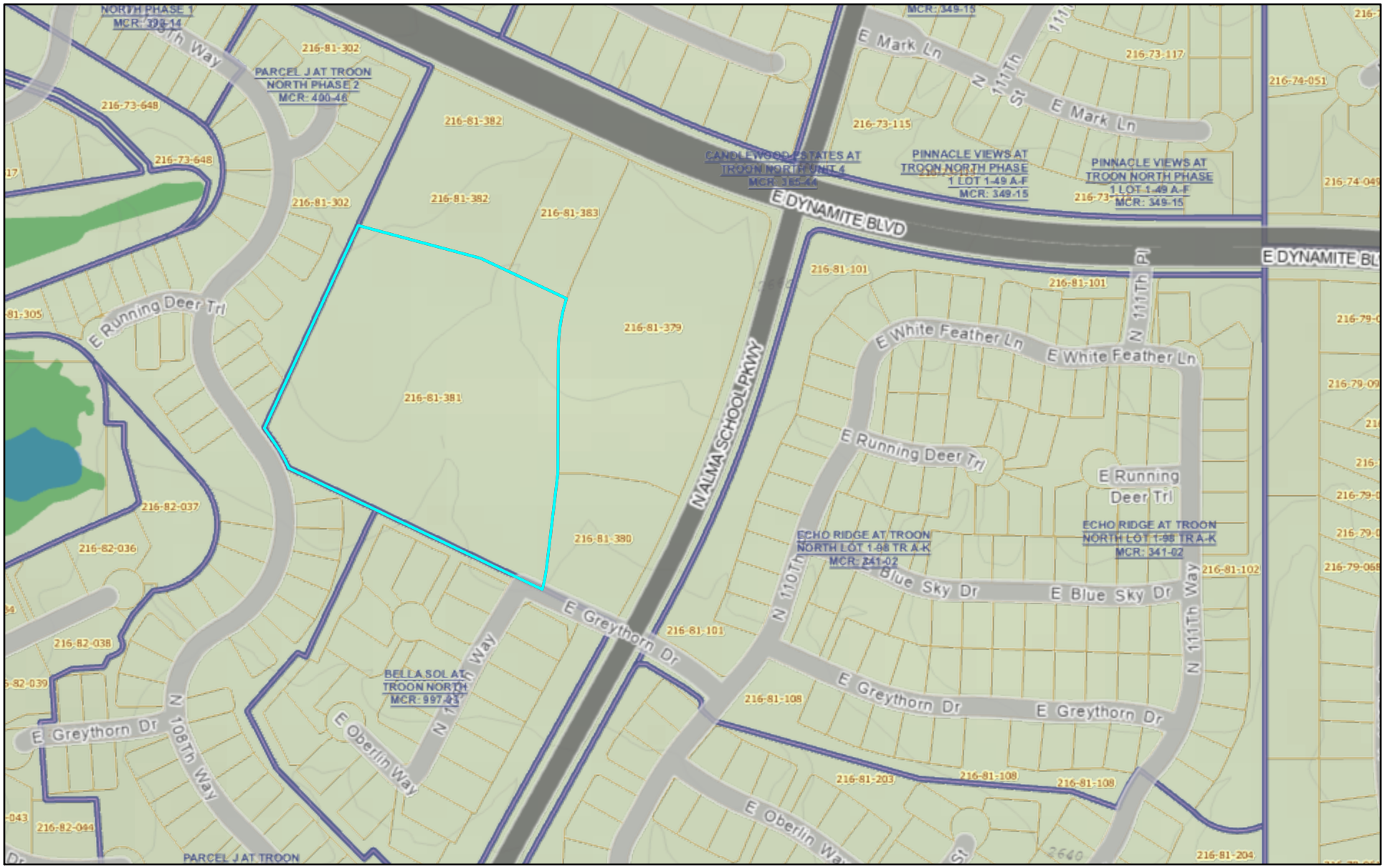
1. The Developer is required to up size Alma School Rd 8" sewer (to 12" minimum) from Dynamite Rd to South of Jomax Rd at their expense.
2. City's current Infrastructure Improvement Plan (IIP) includes installation of a 10" sewer line along Alma School Rd from Dynamite Rd to South of Jomax Rd. The allocated amount for this IIP may be credit eligible (up to budgeted amount) if the Developer chooses to proceed with their proposed improvements and up size Alma School Rd sewer line to a minimum 12" sewer line from Dynamite Rd to South of Jomax Rd.
3. If the cost for 12" sewer line from Dynamite Rd to South of Jomax Rd exceeds City's allocated IIP budget, the additional cost shall be at Developer's expense.

2-ZN-2024
4/18/2024

FIGURES

1. *Vicinity Map*
2. *Aerial Map*

Vicinity Map



December 11, 2023

FIGURE 1

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Maricopa County GIO, Maricopa County Assessor's Office

2023 - Maricopa County Assessor's Office

2-ZN-2024

4/18/2024

Aerial Map

December 11, 2023

FIGURE 2

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Maricopa County GIO, Maricopa County Assessor's Office

2023 - Maricopa County Assessor's Office

2-ZN-2024

4/18/2024

APPENDICIES

1. Preliminary Sewer Plan

2. Hydraulic Calculations

2-ZN-2024
4/18/2024

ARTESSA PINNACLE PEAK

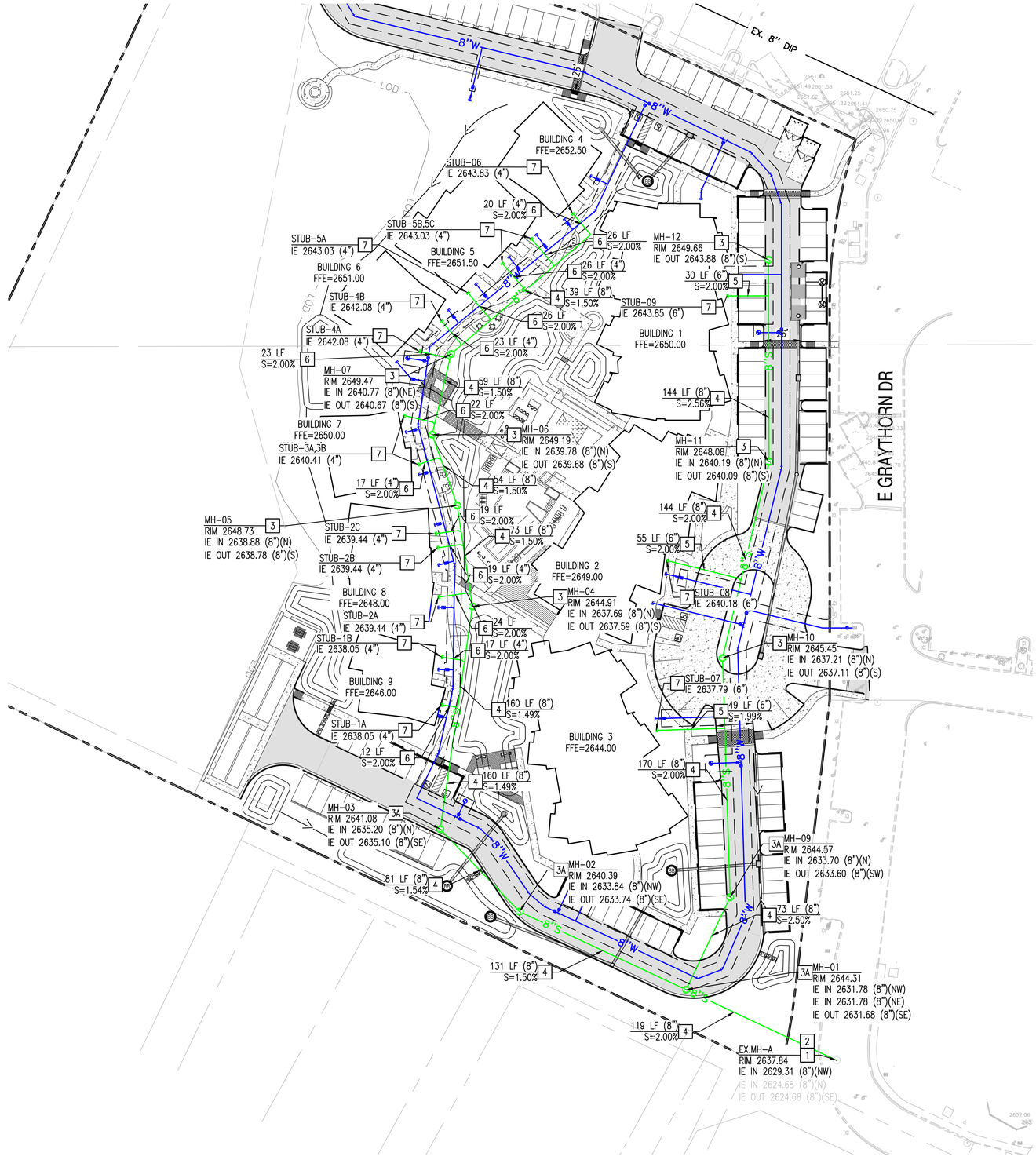
PRELIMINARY OVERALL SEWER PLAN

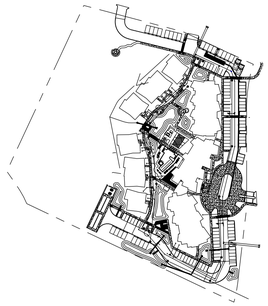
SW CORNER OF DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, ARIZONA, 85296
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.

OWNER
LIFESTYLE COMMUNITIES SW, LLC
4938 LINCOLN DRIVE
EDINA, MN 55436
PHONE: 952-228-7944
ATTN.: BEN LANDHAUSER
EMAIL: BEN@THISLIFESTYLE.COM

CIVIL ENGINEER
SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET, SUITE 105
PHOENIX, ARIZONA 85016
PHONE: 480-237-2507
ATTN.: ALI FAKIH
EMAIL: ALI@AZSEG.COM

DESIGN ARCHITECT
ARCHITEKTON
464 S FARMER AVENUE, SUITE 101
TEMPE, ARIZONA 85281
PHONE: 480-894-4637
ATTN.: RYAN GRABE, AIA
EMAIL: RYANGRABE@ARCHITEKTON.COM





KEY MAP
NTS

NORTH

Specify Private Sewer

PRELIMINARY SEWER NOTES

1. CONNECTION TO EXISTING SEWER MANHOLE.
2. PROPOSED DROP SEWER CONNECTION.
3. PROPOSED 4' PRECAST CONCRETE SEWER MANHOLE
3A. PROPOSED 5' PRECAST CONCRETE SEWER MANHOLE
4. 8" PVC SEWER LINE. LENGTH AND SLOPE PER PLAN.
5. 6" PVC SEWER LINE. LENGTH AND SLOPE PER PLAN.
6. 4" PVC SEWER LINE. LENGTH AND SLOPE PER PLAN.
7. SEWER CONNECTION TO BUILDING.

NORTH

0' 40' 80' 120'

SCALE: 1" = 40'

EXISTING LEGEND:

- PROPERTY LINE
- SECTION LINE
- ROAD CENTERLINE
- EASEMENT LINE AS NOTED
- EX. S — SEWER LINE
- SEWER MANHOLE
- EX. W — WATER LINE
- WV — WATER VALVE
- FIRE HYDRANT
- STORM DRAIN LINE
- CB — STORM CATCH BASIN
- STORM MANHOLE
- EX. GAS — GAS LINE
- FENCE
- SIGN
- STREET LIGHT
- TREE

PROPOSED UTILITY LEGEND:

- PROPERTY LINE
- EASEMENT LINE
- X"W — WATER LINE
- X"S — SEWER LINE
- FIRE HYDRANT
- FDC
- WM — WATER METER
- GATE VALVE
- T.S.V.B.&C
- BACK FLOW PREVENTER
- REDUCER
- CAP
- BUILDING CONNECTION
- SEWER MANHOLE
- SEWER CLEAN OUT
- UTILITY CROSSING

NOT FOR CONSTRUCTION

SUSTAINABILITY ENGINEERING GROUP
SEG
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.258.3534

lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK
LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106

SHEET TITLE: **PRELIMINARY OVERALL SEWER PLAN**

PAGE NO.: 5 OF 5
SHEET NO.: **C4.30**

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

2-ZN-2024
4/18/2024

FlexTable: Copy of Conduit Table

Label	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (%)	Diameter (in)	Manning's n	Velocity (ft/s)	Depth (Normal) / Rise (%)
Pipe-1	MH-6	2,637.42	MH-7	2,637.98	73.0	0.770	8.0	0.013	1.87	20.0
Pipe-2	MH-10	2,639.03	MH-11	2,641.92	144.4	2.000	8.0	0.013	1.84	9.0
Pipe-3	MH-6	2,637.32	O-3	2,636.72	118.5	0.500	8.0	0.013	1.69	24.5
Pipe-4	MH-7	2,638.08	MH-10	2,638.93	170.5	0.500	8.0	0.013	1.46	19.2
Pipe-5	MH-8	2,639.55	MH-3	2,641.09	77.1	2.000	8.0	0.013	1.41	6.1
Pipe-6	MH-1	2,642.40	MH-2	2,643.19	39.4	2.000	8.0	0.013	1.31	5.4
Pipe-7	MH-3	2,641.19	MH-1	2,642.30	55.2	2.000	8.0	0.013	1.31	5.4
Pipe-8	MH-4	2,638.54	MH-5	2,638.17	72.9	0.500	8.0	0.013	1.00	10.3
Pipe-9	MH-5	2,638.07	MH-6	2,637.42	131.0	0.500	8.0	0.013	1.00	10.3
Pipe-10	MH-4	2,638.64	MH-8	2,639.45	162.6	0.500	8.0	0.013	0.95	9.6
Pipe-11	MH-2	2,643.39	MH-12	2,646.33	147.0	2.000	8.0	0.013	0.00	(N/A)
Pipe-12	MH-11	2,642.02	MH-13	2,644.78	184.3	1.500	8.0	0.013	0.00	(N/A)

APPENDIX II

2-ZN-2024
4/18/2024

6" Sewer S=2.00% Full Flow Capacity

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.020 ft/ft
Normal Depth	6.0 in
Diameter	6.0 in
Discharge	356.14 gpm

Results	
Discharge	356.14 gpm
Normal Depth	6.0 in
Flow Area	0.2 ft²
Wetted Perimeter	1.6 ft
Hydraulic Radius	1.5 in
Top Width	0.00 ft
Critical Depth	5.3 in
Percent Full	100.0 %
Critical Slope	0.018 ft/ft
Velocity	4.04 ft/s
Velocity Head	0.25 ft
Specific Energy	0.75 ft
Froude Number	(N/A)
Maximum Discharge	383.10 gpm
Discharge Full	356.14 gpm
Slope Full	0.020 ft/ft
Flow Type	Undefined

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.0 in
Critical Depth	5.3 in
Channel Slope	0.020 ft/ft
Critical Slope	0.018 ft/ft

APPENDIX II

2-ZN-2024
4/18/2024

8" Sewer S=1.50% Full Flow Capacity

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.015 ft/ft
Normal Depth	8.0 in
Diameter	8.0 in
Discharge	664.23 gpm

Results	
Discharge	664.23 gpm
Normal Depth	8.0 in
Flow Area	0.3 ft²
Wetted Perimeter	2.1 ft
Hydraulic Radius	2.0 in
Top Width	0.00 ft
Critical Depth	6.8 in
Percent Full	100.0 %
Critical Slope	0.014 ft/ft
Velocity	4.24 ft/s
Velocity Head	0.28 ft
Specific Energy	0.95 ft
Froude Number	(N/A)
Maximum Discharge	714.52 gpm
Discharge Full	664.23 gpm
Slope Full	0.015 ft/ft
Flow Type	Undefined

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.0 in
Critical Depth	6.8 in
Channel Slope	0.015 ft/ft
Critical Slope	0.014 ft/ft

2-ZN-2024
4/18/2024

8" Sewer S=1.50% d/D=0.65

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.015 ft/ft
Normal Depth	5.2 in
Diameter	8.0 in

Results	
Discharge	502.43 gpm
Flow Area	0.2 ft²
Wetted Perimeter	1.3 ft
Hydraulic Radius	2.3 in
Top Width	0.64 ft
Critical Depth	6.0 in
Percent Full	65.0 %
Critical Slope	0.010 ft/ft
Velocity	4.66 ft/s
Velocity Head	0.34 ft
Specific Energy	0.77 ft
Froude Number	1.337
Maximum Discharge	714.52 gpm
Discharge Full	664.23 gpm
Slope Full	0.009 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	65.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.2 in
Critical Depth	6.0 in
Channel Slope	0.015 ft/ft
Critical Slope	0.010 ft/ft

2-ZN-2024
4/18/2024

4" Sewer S=2.00% Full Flow Capacity

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.020 ft/ft
Normal Depth	4.0 in
Diameter	4.0 in
Discharge	120.79 gpm

Results	
Discharge	120.79 gpm
Normal Depth	4.0 in
Flow Area	0.1 ft²
Wetted Perimeter	1.0 ft
Hydraulic Radius	1.0 in
Top Width	0.00 ft
Critical Depth	3.5 in
Percent Full	100.0 %
Critical Slope	0.018 ft/ft
Velocity	3.08 ft/s
Velocity Head	0.15 ft
Specific Energy	0.48 ft
Froude Number	(N/A)
Maximum Discharge	129.94 gpm
Discharge Full	120.79 gpm
Slope Full	0.020 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.0 in
Critical Depth	3.5 in
Channel Slope	0.020 ft/ft
Critical Slope	0.018 ft/ft

2-ZN-2024
4/18/2024

PRELIMINARY WATER REPORT

ARTESSA PINNACLE PEAK

SWC Dynamite Boulevard and Alma School Road, Scottsdale, Arizona 85262

Prepared For:

Lifestyle Communities, LLC.

4938 Lincoln Drive

na, MN 55436

2-228-7944

Prepared by:

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 rrahman DATE 5/20/2024

Revision #4

SEG

Registered Professional Engineer (Civil)
CERTIFICATE NO.
45621
ALI SAMIH
FAKIH
Date Signed 03/28/24
ARIZONA, U.S.A.

ity Engineering Group

5240 N. 16th Street, Suite 105

Phoenix, AZ 85016

480.588.7226 www.azSEG.com

Project Number: 231106

Submittal Date: March 28, 2024 (REZONING)

CASE FILE#: TBD **PLAN CHECK #: TBD**

Table of Contents

2-ZN-2024
4/18/2024

LIST OF TABLES:

LIST OF FIGURES:

APPENDIX :

2-ZN-2024
4/18/2024

1. INTRODUCTION

This report is prepared for the Lifestyle Communities Artessa Pinnacle Peak development located in the northern area of Scottsdale, Arizona. The purpose of this report is to provide an analysis of the site's existing and proposed water distribution systems. The project proposes six single story Casitas, three multifamily three-story buildings, a community center and associated hardscape and landscape improvements. New water lines will be looped through the site connecting to existing lines adjacent to the north and east sides of the site.

2. BACKGROUND

2.1 Project Location

The Artessa Pinnacle Peak development is approximately 8.6 acres located at the southwest corner of Dynamite Boulevard and Alma School Road. The site is located on Maricopa County Assessor Parcel Number (APN) 216-81-381 in the southeast quarter of Section 28, Township 5 North, Range 5 East, and the northeast quarter of Section 33, Township 5 North, Range 5 East. The property is currently undeveloped bounded by a residential development to the west, a commercial development to the north and east, and platted undeveloped property to the south.

See **Figure 1** for a Project Vicinity Map.

2.2 Existing Conditions

The new Artessa Pinnacle Peak development will be within Pressure Zone 12, as designated by the City of Scottsdale (the City, See **Appendix A**) and is zoned as PCC ESL (HD/HC). The City has an existing public 8-inch ductile iron pipe (DIP) located in an existing access drive north of the site and another within Greythorn Drive east of the site. The site slopes from the north to the south at approximately 2.5% with an elevation difference of approximately 16 feet.

2.3 CERTIFIED FLOW TEST RESULTS OF EXISTING WATER SYSTEM:

Certified fire hydrant flow testing was performed on September 24, 2023, by Arizona Flow Testing, LLC at 7:25 a.m. The fire flow raw test data recorded a static pressure of 76.0 psi and residual pressure of 50.0 psi flowing at 3,603 gpm. The calculated flow at 20 psi is 5,453 gpm.

Complex hydrant flow test with 2 flow hydrants shall be conducted when fire flow rate exceeds 3,500 GPM per NFPA 291 section 4.5

2-ZN-2024
4/18/2024

The derated data adjusts the static pressure to 68.4 psi, a residual pressure of 42.4 psi. The flow at 20 psi is shown at 5,040 gpm. The water model uses derated data. The actual flow test documentation is included in **APPENDIX B.**

or

3. DESIGN CRITERIA

All proposed water facilities within the public right-of-way and onsite easements will be reviewed and permitted by the City of Scottsdale. Proposed water mains and services will be designed to meet the City's *Design Standards and Policies Manual (DS&PM -2018)*, Maricopa Association of Government's *Standard Specifications for Public Works Construction (2024 Revision)* and associated details, *Arizona Administrative Code, Title 18*, Arizona Department of Environmental Quality's *Bulletins* 10, and the *2018 International Fire Code*. Key design criteria include the following:

- The pipe material shall be DIP, pressure class of 350 with polyethylene encasement (poly wrap).
- All new water mains will be designed in a looped configuration to provide appropriate water pressure, flow and redundancy.
- Water mains and sewer mains shall run parallel to each other with 9 feet of separation to pipe centerlines and maintain 6 feet of clearance at manholes. A minimum 3 feet of horizontal clearance will be maintained to any dry utilities with 1-foot vertical clearance.
- Water mains crossing sewer mains with 1 to 2 feet of vertical separation and require extra protection. Water mains below sewer mains shall maintain a minimum of 2 feet of vertical separation and require extra protection.
- Static pressure in the distribution system shall not exceed 120 pounds per square-inch (psi) and have a minimum of 50 psi at the highest finished floor elevation.
- A minimum cover of 36 inches shall be maintained over the 8" lines.
- All new residential and commercial structures will require automated building sprinkler systems.
- The public system shall be designed to maintain 30 psi minimum pressure at the hydrant tee under maximum day plus fire flow conditions.

4. PROPOSED CONDITIONS

4.1 Water Design

The proposed 8-inch DIP water line will be looped within the project and through the site. One proposed connection to the existing 8" DIP system will be at the northern side of the

2-ZN-2024
4/18/2024

To be considered separate buildings per IFC, 10' separation from roof overhang to other building overhang should be provided, per IFC 705.
Site plan shows 955 sqft connector building from A to B and 1561 sqft connector building from B to C. If buildings are connected, use total area of A,B & C.

site under an access drive and the other to Greythorn Drive under an access drive east of the site.

Each building cluster will be provided with a domestic meter. The Casitas will have separate domestic meters and utilize the domestic service for fire protection. The multifamily three-story buildings will provide a single meter with backflow prevention and a separate fire line. The site proposes two landscape meters with backflow protection.

Table 6-1.2 in the City of Scottsdale DS&PM was used to calculate the domestic demand for the site in gallons per minute (GPM).

A maximum day peaking factor of 2.0 and peak hour peaking factor of 3.5 were used for analysis of the water system, per Section 6-1.404 of the DS&PM. (**Appendix C)**

4.2 Fire Design

The proposed 8-inch onsite fire loop will continue through the site access drive on the east side of the site. The onsite loop will feed new onsite hydrants and meters and fire service lines for the sprinkler systems at each of the new buildings.

Group R-3 and R-4 buildings do not qualify 75% fire flow reduction per IFC. Confirm the proposed buildings do not fall under these categories.

4.2.1 Building Fire Flow

The International Fire Code (IFC) (2018), adopted by the City of Scottsdale, specifies required fire flow demands based on Table B105.1(2) and Table B105.2 in **Appendix D**. All new buildings will be Type-II B construction with the largest building (Building 1) being 29,430 square feet. The casitas will be construction type V-A.

All new buildings will be equipped with a fire sprinkler system. Referring to NFPA-1 section H.5.2.1. A reduction in required fire flow to 25% of the Table B105.1(2) value is allowed Per the IFC and Section 6-1.501 of the DS&PM, commercial properties and multi-family residential properties have a minimum required fire flow of 1,500 GPM, which governs the design. Based on the construction type and square footage, and using Table B105.1(2), the required fire flow for the largest building would be 25% of 3,750 gpm or 938 gpm, which is less than the minimum requirement.

4.2.2 Hydrant Locations

The City of Scottsdale DS&PM requires fire hydrant spacing to be no more than 700 feet apart measured along the roadway in which a fire hose would be laid and no farther than 600 feet from a structure. There is an existing hydrant on the northwestern side of the site near the proposed entrance, and another on the eastern side of the site, on the west side of Greythorn Drive. There are a total of 4 new hydrants proposed to be installed throughout the site to ensure that all hydrant spacing requirements are met for the development.

Incorrect. Total area = 894.1X3 + 1222.11X9 + 971.81X3 + 1299.32X3 + 1543.62X3 = 25,125.54 SF

The distance between the fire Hydrants is approximately 310 ft, Thus using 1,500 gpm will be suitable according to NFPA 1 table 18.5.4.3 **(see Appendix D)**

5. METHODOLOGY/STUDY APPROACH

Water system demands for the Artessa Pinnacle Peak site are calculated based on the specified design demands from the City of Scottsdale DS&PM. Three hydraulic model scenarios were developed, including the average daily demand, peak hour demand, and the maximum day demand with worst case fire flow. Average daily demand values were calculated as shown in **Table 2,** and peaking factors were then applied to calculate maximum day demand and peak hour demand.

68 units on 8.6 acre = 7.9 DU/acre. Use 248.2 gpd per DSPM Figure 6-1.2 for water demand calculation

Table 1 Water Demands

Building No.	Unit Type	Area (S.F)	Area (Acre)	No. of DU	Demand (gpdu)	ADD Water Demand (gpd)	MDD gpd	PH gpd
1	A	894.1	0.020526	3	185.3	555.90	1111.80	1945.65
	B	1222.11	0.028056	9	185.3	1667.70	3335.40	5836.95
	C	971.81	0.02231	3	185.3	555.90	1111.80	1945.65
	D	1299.32	0.029828	3	185.3	555.90	1111.80	1945.65
	E	1543.62	0.035436	3	185.3	555.90	1111.80	1945.65
	Total	5930.96	0.136156	21	185.3	3891.30	7782.6	13619.55
2	A	894.1	0.020526	4	185.3	741.20	1482.40	2594.20
	B	1222.11	0.028056	4	185.3	741.20	1482.40	2594.20
	C	971.81	0.02231	2	185.3	370.60	741.20	1297.10
	D	1299.32	0.029828	2	185.3	370.60	741.20	1297.10
	E	1543.62	0.035436	2	185.3	370.60	741.20	1297.10
	Amenity	9017.6	0.207015	1	0.8	7214.08	14428.16	25249.28
	Total	14948.56	0.34317	15	VAR	9808.28	19616.56	34328.98
3	B	1222.11	0.028056	6	185.3	1111.80	2223.60	3891.30
	C	971.81	0.02231	3	185.3	555.90	1111.80	1945.65
	D	1299.32	0.029828	3	185.3	555.90	1111.80	1945.65
	E	1543.62	0.035436	3	185.3	555.90	1111.80	1945.65
	F	1632.03	0.037466	3	185.3	555.90	1111.80	1945.65
	Total	6668.89	0.153096	18	185.3	3335.40	6670.80	11673.90
4 CASITA 1	B	958.68	0.022008	2	185.3	370.60	741.20	1297.10
	Total	1917.36	0.044016	2	185.3	370.60	741.20	1297.10
5 CASITA 2	A	854.56	0.019618	1	185.3	185.3	370.60	648.55
	B	958.68	0.022008	2	185.3	370.6	741.20	1297.10
	Total	2771.92	0.063634	3	185.3	555.9	1111.80	1945.65

25,111.94 SF

Update all Building area

2-ZN-2024
4/18/2024

Building No.	Unit Type	Area (S.F)	Area (Acre)	No. of DU	Demand (gpdu)	ADD Water Demand (gpd)	MDD gpd	PH gpd
6 CASITA 1	B	958.68	0.022008	2	185.3	370.6	741.20	1297.10
	Total	1917.36	0.044016	2	185.3	370.6	741.20	1297.10
7 CASITA 1	B	958.68	0.022008	2	185.3	370.6	741.20	1297.10
	Total	1917.36	0.044016	2	185.3	370.6	741.20	1297.10
8 CASITA 2	A	854.56	0.019618	1	185.3	185.3	370.60	648.55
	B	958.68	0.022008	2	185.3	370.6	741.20	1297.10
	Total	2771.92	0.063634	3	185.3	555.9	1111.80	1945.65
9 CASITA 1	B	958.68	0.022008	2	185.3	370.6	741.20	1297.10
	Total	1917.36	0.044016	2	185.3	370.6	741.20	1297.10
Total		40761.69	0.935756	68	1482.4	19629.18	39258.36	68702.13

Per site plan submitted total building residential area is 77,796 SF

The calculations below were used to determine the average, maximum and peak daily domestic demands.

Model Scenario 1:

Average Daily Domestic Demand = **19629.18** GPD **= 13.8** GPM (See **Table 1**)

GPM calculation from GPD shall be based on 12-hrs active water usage per DSPM Figure 6-1.2

Model Scenario 2:

Peak Hour Demand = 3.5 * Average Daily Demand

= 3.5 * **13.8** GPM

= **48.3**GPM

Model Scenario 3:

Maximum Day Demand plus Fire Flow

Maximum Day Demand = 2 * Average Daily Domestic Demand

= 2 * **13.8** GPM

= **27.6** GPM (applied at domestic connections)

Fire Flow = **1,5000** GPM

Recalculate Fire Demand per IFC

The water model in **APPENDIX E** lists the junction, pipe, pump and reservoir results for the average day, max day and peak hour demands in addition to the fire flow analysis and the pump table.

2-ZN-2024
4/18/2024

6. RESULTS

Appendix E includes the **WATERCAD** model water model results for the three model scenarios described in **Section 5**. It shows a summary of the City's residual pressure requirements compared to the model output for each of the scenarios.

Model Scenarios 1 through 3 meet the City of Scottsdale Standards by maintaining the minimum pressures required for each scenario at the finished floor. The lowest pressure in Scenarios 1 and 2 was 67 psi and the lowest pressure for Scenario 3 was 59 at 1,539 gpm.

The City of Scottsdale DS&PM requires the maximum allowable pipe head loss in distribution lines to be ten feet per 1,000 feet. The water mains in all scenarios comply with the requirements.

7. CONCLUSIONS

The proposed water improvements will support the Artessa Pinnacle Peak development while adhering to the City of Scottsdale design standards. Minimum pressures and maximum velocities for each demand scenario will remain within the City's allowable limits.

8. CITATIONS AND REFERENCES

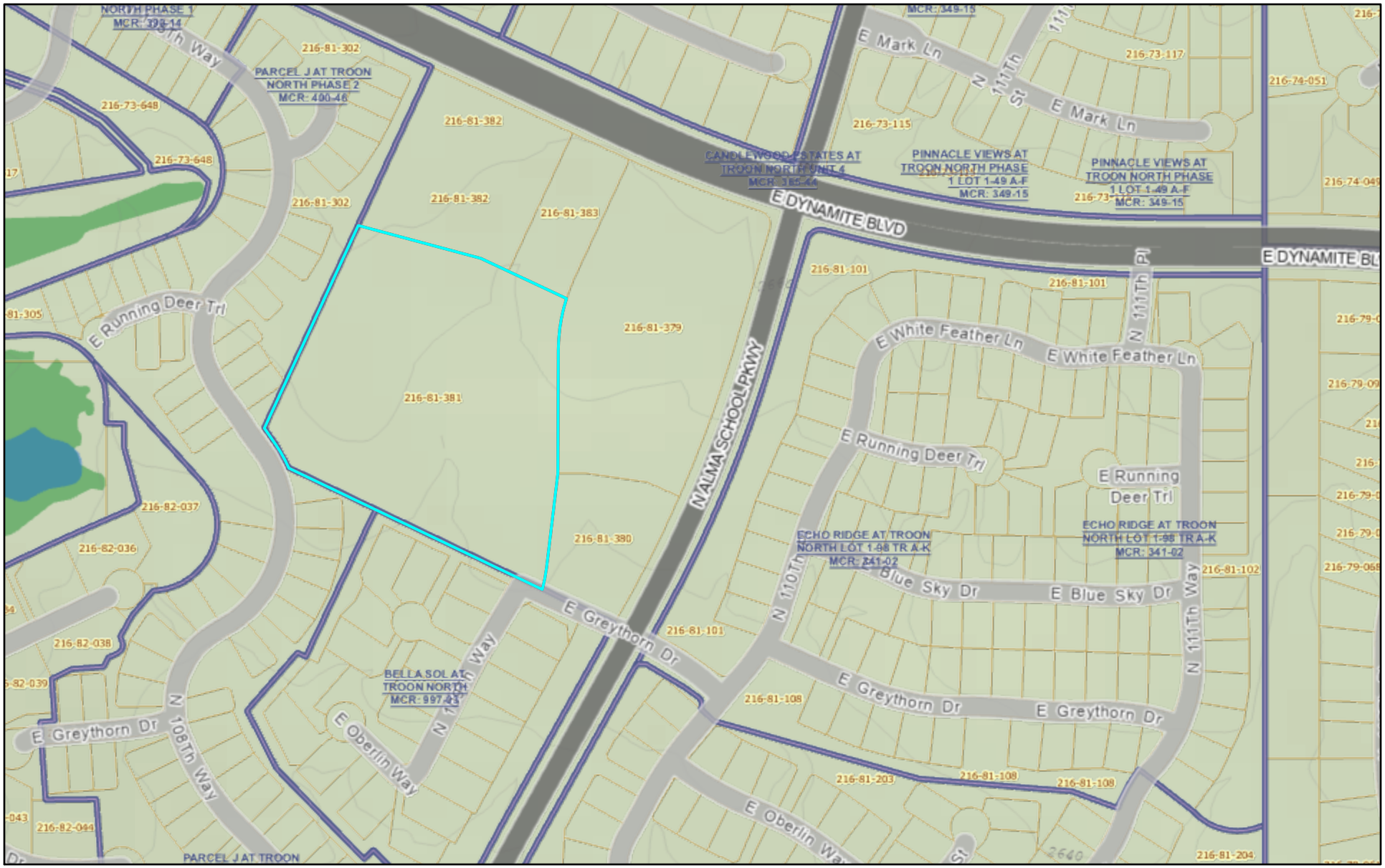
1. City of Scottsdale. *Design Standards and Policies Manual*, 2018.
2. International Code Council. *International Fire Code*, 2018.
3. Maricopa Association of Governments. *Uniform Standard Details for Public Works Construction*, 2024.
4. *Arizona Administrative Code* (AAC) *Title 18*, September 2016.
5. *Arizona Department of Environmental Quality (ADEQ) Bulletins 8 and 10*, July 19

2-ZN-2024
4/18/2024

FIGURES

1. *Vicinity Map*
2. *Aerial Map*

Vicinity Map



December 11, 2023

FIGURE 1

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Maricopa County GIO, Maricopa County Assessor's Office

2023 - Maricopa County Assessor's Office

2-ZN-2024

4/18/2024

Aerial Map

December 11, 2023

FIGURE 2

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Maricopa County GIO, Maricopa County Assessor's Office

2023 - Maricopa County Assessor's Office

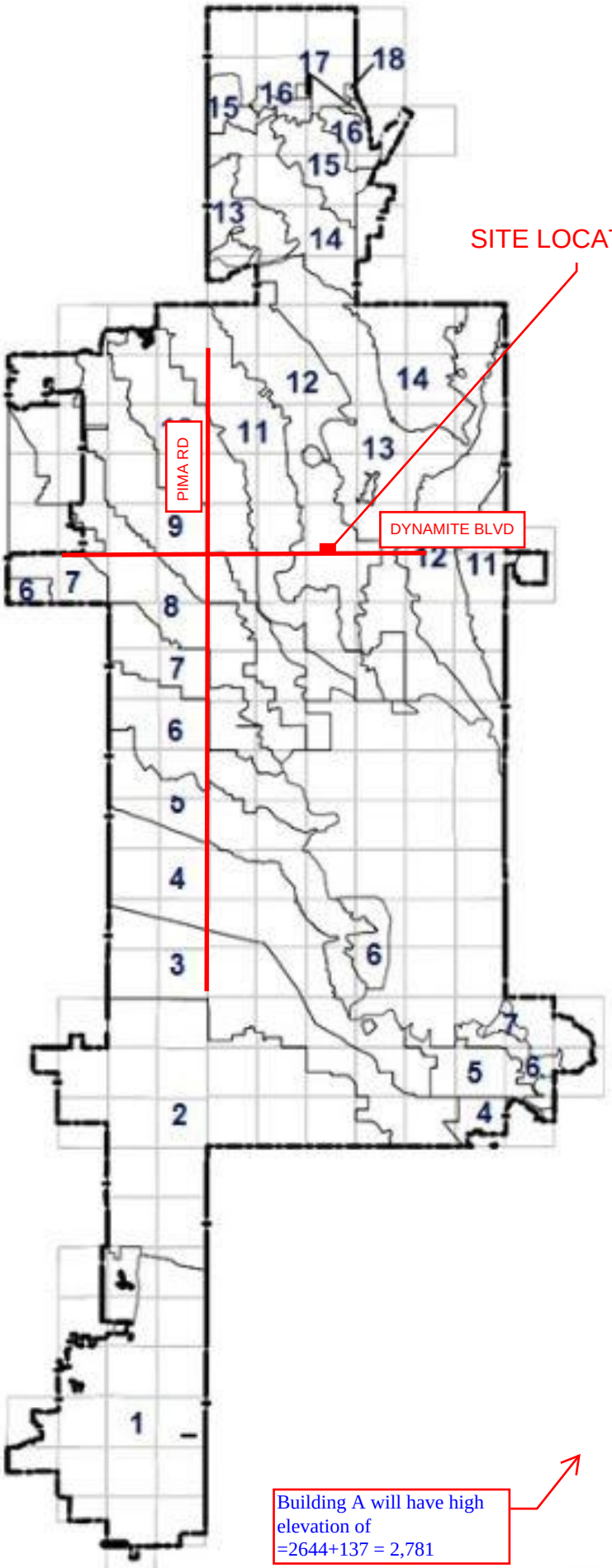
2-ZN-2024

4/18/2024

APPENDICIES

A. Pressure Zone Map
B. Fire Flow Test
C. City Standards
D. Fire Demands
E. Model Reports
F. Preliminary Utility Plan

2-ZN-2024
4/18/2024



Zone	Ground Elevation Range (Ft.)
1	1250-1330
1A	1280-1330
2A	
2	1510-1650
3	
4	
4E	1550-1650
5	1650-1790
5E	1650-1750
6	1790-1920
6E	1750-1934
7	1920-2050
7E	1934-2065
8	2050-2180
8E	2065-2200
9	2180-2310
10	2310-2440
11,11E	2440-2570
12,12E	2570-2700
13	2700-2830
14	2830-2960
15	2960-3090

Building A will have high elevation of
=2644+137 = 2,781

6-1.3 CITY PRESSURE ZONE MAP

Arizona Flow Testing LLC

HYDRANT FLOW TEST REPORT

Project Name:	Artessa
Project Address:	10929 East Dynamite Blvd., Scottsdale, Arizona 85262
Client Project No.:	C73205
Arizona Flow Testing Project No.:	23699
Date and Time flow test conducted:	September 14, 2023 at 7:25 AM
Data is current and reliable until:	March 14, 2024
Conducted by:	Floyd Vaughan – Arizona Flow Testing, LLC (480-250-8154)
Witnessed by:	Sonny Schreiner – City of Scottsdale-Inspector (602-819-7718)

Raw Test Data

Static Pressure: **76.0 PSI**
(Measured in pounds per square inch)

Residual Pressure: **50.0 PSI**
(Measured in pounds per square inch)

Pitot Pressure: **20.0 PSI Hyd A**
20.0 PSI Hyd B
(Measured in pounds per square inch)

Diffuser Orifice Diameter: One 4-inch Pollard Diffuser
(Measured in inches) One 4-inch Hose Monster

Coefficient of Diffuser: 0.9 & 0.802

Flowing GPM: **3,603 GPM**
(Measured in gallons per minute)
1,922 GPM + 1,681 GPM = 3,603 GPM

GPM @ 20 PSI: **5,453 GPM**

Data with 10 % Safety Factor

Static Pressure: **68.4 PSI**
(Measured in pounds per square inch)

Residual Pressure: **42.4 PSI**
(Measured in pounds per square inch)

Approx. distance between hydrants: See below

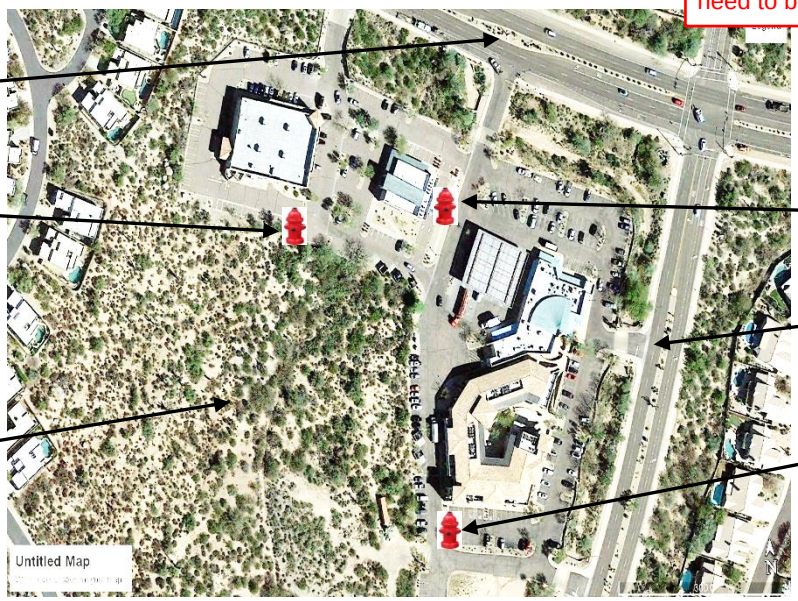
Main size: Not Provided

Flowing GPM: **3,603 GPM**

GPM @ 20 PSI: **5,040 GPM**

Confirm if both flow hydrants were used at the same time or one at a time. Both flow hydrants need to be operated at the same time.

Flow Test Location North



APPENDIX B

2-ZN-2024
4/18/2024

d. Pipe flow velocity in feet per second (fps)
e. Each pipe segment's head loss rate (ft. /1,000ft or psi/ft.)
f. PRVs: Upstream and downstream pressures (psi or HGL elevation)
g. Tanks: Inflow and outflow (gpm)
h. Shows all units for the values presented or provide a legend on the diagram page that indicates the units used

AVERAGE DAY WATER DEMANDS [1]							
IN GALLONS PER DAY (GPD) [2]				IN GALLONS PER MINUTE (GPM) [2][3]			
Land Use	Inside Use	Outside Use	Total Use	Inside Use	Outside Use	Total Use	Units
Residential Demand per Dwelling Unit							
< 2 dwelling unit per acre (DU/ac)	208.9	276.7	485.6	0.30	0.39	0.69	per unit
2 – 2.9 DU/ac	193.7	276.7	470.4	0.27	0.39	0.66	per unit
3 – 7.9 DU/ac	175.9	72.3	248.2	0.25	0.11	0.36	per unit
8 – 11.9 DU/ac	155.3	72.3	227.6	0.22	0.11	0.33	per unit
12 – 22 DU/ac	155.3	72.3	227.6	0.22	0.11	0.33	per unit
High Density Condominium (condo)	155.3	30	185.3	0.22	0.05	0.27	per unit
Resort Hotel (includes site amenities)	401.7	44.6	446.3	0.56	0.07	0.63	per room
Service and Employment							
Restaurant	1.2	0.1	1.3	1.67E-03	1.39E-04	1.81E-03	per square foot (sq.ft.)
Commercial/ Retail	0.7	0.1	0.8	9.73E-04	1.39E-04	1.11E-03	per sq.ft.
Commercial High Rise	0.5	0.1	0.6	6.95E-04	1.39E-04	8.34E-04	per sq.ft.

DESIGN FLOW & HEAD LOSS 6-1.404

The ultimate design flow within the city's water transmission and distribution system will be based on the city's current Integrated Water Master Plan. Water demand for each development will be calculated using the average day demands, as shown in Figure 6-1.2, to ensure that the existing distribution supply is sufficient. Designs will include all necessary improvements, including booster pumping stations, reservoirs, lines and appurtenances to meet the system's ultimate demand.

A. The four hydraulic modeling scenarios detailed in 6-1.202 will demonstrate that the system is adequately designed.
B. Select model scenario flows and their respective peaking factors are as follows:
   1. Maximum day: Defined as 2 times the average day total use flow as determined per Figure 6-1.2 (use gpm value).
   2. Peak hour: Defined as 3.5 times the average day total use as determined per Figure 6-1.2 (use gpm value).
   3. Note: These peaking factors shall be appropriately increased for restaurants and high-demand water users, or as designated by the Water Resources Department after review.
C. The maximum allowable pipe head loss for the various water pipelines is as follows:
   1. Transmission mains: 8 feet per 1,000 feet (3.5 psi per 1,000 feet)
   2. Distribution lines: 10 feet per 1,000 feet (4.3 psi per 1,000 feet)
   3. Service lines – domestic, dedicated fire, or combined domestic/fire: size as required to satisfy both hydraulic modeling requirements and Fire Code. Generally, velocities of more than 5 feet per second are undesirable. Velocities more than 7.5 feet per second are not allowed.
   4. As otherwise designated by the Water Resources Department

SYSTEM FLOW TEST REQUIREMENTS & USE OF RESULTS 6-1.405

Pressure and available flow information for existing water lines must be obtained by having a fire hydrant flow test performed on the system. Hydrant flow tests are required for the following situations:

A. On all commercial projects, multi-family residential projects, and public extensions of the city's water distribution system.
B. For any proposed system connecting to the existing distribution system, the design capacity of the existing system (flow versus pressure) will need to be determined by the engineer.
C. Prior to acceptance by the city, all platted subdivisions shall conduct an additional flow test at the lowest and highest elevation available in which the development is constructed.
D. Developments that cross pressure zone boundaries must conduct a flow test within each pressure zone.

A private fire protection company shall perform the tests and certify the results. A right-of-way permit issued by the One Stop Shop is required for a flow test and the Inspection Services Division will be notified a minimum of 48 hours before performing the flow test. The permit is also available online. Refer to the flow test design form.

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION B101
GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102
DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

SECTION B103
MODIFICATIONS

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The fire chief is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code.*

SECTION B104
FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings which are separated by *fire walls* without openings, constructed in accordance with the *International Building Code,* are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings. The minimum fire-flow and flow duration requirements for one- and two-family *dwellings* having a fire-flow calculation area that does not exceed 3,600 square feet (344.5 m^2) shall be 1,000 gallons per minute (3785.4 L/min) for 1 hour. Fire-flow and flow duration for *dwellings* having a fire-flow calculation area in excess of 3,600 square feet (344.5m^2) shall not be less than that specified in Table B105.1.

Exception: A reduction in required fire-flow of 50 percent, as *approved*, is allowed when the building is equipped with an *approved automatic sprinkler system.*

B105.2 Buildings other than one- and two-family dwellings. The minimum fire-flow and flow duration for buildings other than one- and two-family *dwellings* shall be as specified in Table B105.1.

Exception: A reduction in required fire-flow of up to 75 percent, as *approved*, is allowed when the building is provided with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. The resulting fire-flow shall not be less than 1,500 gallons per minute (5678 L/min) for the prescribed duration as specified in Table B105.1.

SECTION B106
REFERENCED STANDARDS

ICC	IBC—12	International Building Code	B104.2, Table B105.1
ICC	IWUIC—12	International Wildland-Urban Interface Code	B103.3
NFPA	1142—12	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3

2-ZN-2024
4/18/2024

TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

2021 IBC CHAPTER 5 - GENERAL BUILDING HEIGHTS AND AREAS

NEW CONSTRUCTION: MAIN BUILDING - TYPE II-B CONSTRUCTION
NEW CONSTRUCTION: CASITAS - TYPE V-A CONSTRUCTION

TABLE 504.3 ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

NOTE:
1. BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM
2. ALLOWABLE BUILDING HEIGHTS LISTED IN THE IBC MAY BE GREATER THAN ALLOWED IN LOCAL JURISDICTION

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION	ALLOWABLE BUILDING HEIGHT IN FEET
A OCCUPANCY	TYPE II-B	75
R OCCUPANCY	TYPE II-B	75

TABLE 504.4 ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION	ALLOWABLE NUMBER OF STORIES
A-2 OCCUPANCY	TYPE II-B	3
R-2 OCCUPANCY	TYPE II-B	5

TABLE 506.2 ALLOWABLE ALLOWABLE AREA FACTOR IN SQUARE FEET

NOTE: SM = BUILDINGS TWO OR MORE STORIES ABOVE GRADE PLANE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION	ALLOWABLE AREA FACTOR (SF)
A-2 OCCUPANCY	TYPE II-B	28,500
R-2 OCCUPANCY	TYPE II-B	48,000

APPENDIX D

2-ZN-2024
4/18/2024

NFPA 1: Minimum Number of Fire Hydrants for Fire Flow #FireCodefridays

BY KRISTIN BIGDA

Section 18.5 of NFPA 1 provides requirements for fire hydrants, including location, distribution, minimum number, clearance, marking, and testing and maintenance.

Section 18.5 was revised in its entirety for the 2015 edition of the Code. Previous editions provided a performance-based requirement that the number and type of fire hydrants and connections to other approved water supplies be capable of delivering the required fire flow and be provided at approved locations. The former Annex E was deleted for the 2015 edition of the Code; in its place, Section 18.5 was revised by the addition of prescriptive, mandatory requirements for fire hydrant location and distribution based on the required fire flow determined in accordance with Section 18.4.

To determine the minimum number of fire hydrants for fire flow, the following provisions should be followed:

- The aggregate fire flow capacity of all fire hydrants within 1000 ft (305 m) of the building cannot be less than the required fire flow.
- Table 18.5.4.3 provides the maximum fire flow capacity for which a fire hydrant can be credited.

Table 18.5.4.3 Maximum Fire Hydrant Fire Flow Capacity

Distance to Building[a]		Maximum Capacity[b]	
(ft)	(m)	(gpm)	(L/min)
≤ 250	≤ 76	1500	5678
> 250 and ≤ 500	> 76 and ≤ 152	1000	3785
> 500 and ≤ 1000	> 152 and ≤ 305	750	2839

[a]Measured in accordance with 18.5.1.4 and 18.5.1.5.
[b]Minimum 20 psi (139.9 kPa) residual pressure.

APPENDIX D

2-ZN-2024
4/18/2024

LEGEND

- ACCESSIBLE MEANS OF EGRESS
- EXIT
- EXIT ACCESS
- FIRE EXTINGUISHER
- OCCUPANCY BOUNDARY

IBC 2018 sections

- 4W / 4W — 4 HOUR FIRE WALL (IBC 706)
- 4B / 4B — 4 HOUR FIRE BARRIER (IBC 707)
- 3W / 3W — 3 HOUR FIRE WALL (IBC 706)
- 3B / 3B — 3 HOUR FIRE BARRIER (IBC 707)
- 2W / 2W — 2 HOUR FIRE WALL (IBC 706)
- 2S / 2S — 2 HOUR SHAFT ENCLOSURE (IBC 713)
- 2B / 2B — 2 HOUR FIRE BARRIER (IBC 707)
- 1S / 1S — 1 HOUR SHAFT ENCLOSURE (IBC 713)
- 1B / 1B — 1 HOUR FIRE BARIER (IBC 707)
- 1P / 1P — 1 HOUR FIRE PARTITION (IBC 708)
- SB / SB — SMOKE BARRIER (1 HOUR RESISTANCE) (IBC 709)
- SP / SP — SMOKE PARTITION (IBC 710)

NOTE: IN CONDITIONS WHERE A HIGHER PARTITION ALSO SERVES AS A SMOKE BARRIER, THE TEXT TAG OF THE WALL WILL INCLUDE SB IN ADDITION TO THE PRIMARY ASSEMBLY.

- RATED DOOR - 180 MINUTES
- RATED DOOR - 120 MINUTES
- RATED DOOR - 90 MINUTES
- RATED DOOR - 60 MINUTES
- RATED DOOR - 45 MINUTES
- RATED DOOR - 20 MINUTES
- RATED DOOR - SMOKE

BUILDING AREA TOTALS

Name	Area (sf)
BUILDING C - 1ST FLOOR	9,425.43 SF
BUILDING B - 1ST FLOOR	9,017.6 SF
BUILDING A - 1ST FLOOR	9,810.89 SF
A-B CONNECTION	955.01 SF
B-C CONNECTION	1,561.16 SF
	30,770.08 SF
BUILDING A - 2ND FLOOR	9,810.89 SF
BUILDING B - 2ND FLOOR	9,664.85 SF
BUILDING C - 2ND FLOOR	9,425.43 SF
A-B CONNECTION	955.01 SF
B-C CONNECTION	1,187.47 SF
	31,043.65 SF
BUILDING A - 3RD FLOOR	9,810.89 SF
BUILDING B - 3RD FLOOR	9,664.85 SF
BUILDING C - 3RD FLOOR	9,425.43 SF
A-B CONNECTION	625.58 SF
B-C CONNECTION	796.31 SF
	30,323.06 SF
Grand total: 15	92,136.8 SF

CODE DATA - 2021 INTERNATIONAL BUILDING CODE (IBC)

WITH AMMENDMENTS

NOTE: BUILDING AREAS INDICATED ARE NOT BOMA RENTABLE AREA CALCULATIONS

PROJECT NARRATIVE — **BUILDING CONSTRUCTION YEAR 2024-2025**

THIS PROJECT WILL BE SENIOR LIVING COMMUNITY DEVELOPMENT IN SCOTTSDALE, AZ THAT INCLUDES 14 SINGLE STORY ON-GRADE UNITS (CASITAS) AND 53 UNITS IN A THREE-STORY MULTI FAMILY STRUCTURE FRAMED WITH LIGHT GUAGE STEEL AND A SLAB ON GRADE

APPLICABLE CODES

2021 IBC	INTERNATIONAL BUILDING CODE WITH AMMENDMENTS
2021 IFC	INTERNATIONAL FIRE CODE WITH AMMENDMENTS
2021 IPC	INTERNATIONAL PLUMBING CODE WITH AMMENDMENTS
2021 IMC	INTERNATIONAL MECHANICAL CODE WITH AMMENDMENTS
2021 IFGC	INTERNATIONAL FUEL GAS CODE WITH AMMENDMENTS
2020 NEC	NATIONAL ELECTRICAL CODE WITH AMMENDMENTS
2021 ISPSC	INTERNATIONAL SWIMMING POOL AND SPA CODE WITH AMMENDMENTS
2021 IECC	INTERNATIONAL ENERGY CONSERVATION CODE WITH AMMENDMENTS
2021 IGCC	INTERNATIONAL GREEN CONSTRUCTION CODE WITH AMMENDMENTS
2009 ICC A117.1	ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
2010 ADA	STANDARDS FOR ACCESSIBLE DESIGN

AGENCY REVIEW

CITY OF SCOTTSDALE, ARIZONA
MARICOPA COUNTY - CLIMATE ZONE 2B (HOT DRY)

2021 IBC CHAPTER 3 - OCCUPANCY CLASSIFICATION AND USE

ASSEMBLY OCCUPANCY TYPE - A-2 (IBC 303.3)
INDEPENDENT HOUSING OCCUPANCY TYPE - R-2 (IBC 310.3)

2021 IBC CHAPTER 4 - SPECIAL DETAILED REQUIREMENTS BASED ON OCCUPANCY AND USE

1. WALLS SEPARATING DWELLING UNITS IN THE SAME BUILDING ARE CONSTRUCTED AS ONE HOUR RATED FIRE PARTITIONS. (SECTION IBC 420.2 & 708)
2. FLOOR/CEILING ASSEMBLIES SEPARATING DWELLING UNITS IN THE SAME BUILDING SHALL BE SEPARATED BY A ONE HOUR ASSEMBLY. (SECTION IBC 420.3 & 711)

2021 IBC CHAPTER 5 - GENERAL BUILDING HEIGHTS AND AREAS

NEW CONSTRUCTION: MAIN BUILDING - TYPE II-B CONSTRUCTION
NEW CONSTRUCTION: CASITAS - TYPE V-A CONSTRUCTION

TABLE 504.3 ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

NOTE:
1. BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM
2. ALLOWABLE BUILDING HEIGHTS LISTED IN THE IBC MAY BE GREATER THAN ALLOWED IN LOCAL JURISDICTION

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION	ALLOWABLE BUILDING HEIGHT IN FEET
A OCCUPANCY	TYPE II-B	75
R OCCUPANCY	TYPE II-B	75

TABLE 504.4 ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION	ALLOWABLE NUMBER OF STORIES
A-2 OCCUPANCY	TYPE II-B	3
R-2 OCCUPANCY	TYPE II-B	5

TABLE 506.2 ALLOWABLE ALLOWABLE AREA FACTOR IN SQUARE FEET

NOTE: SM = BUILDINGS TWO OR MORE STORIES ABOVE GRADE PLANE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION	ALLOWABLE AREA FACTOR (SF)
A-2 OCCUPANCY	TYPE II-B	28,500
R-2 OCCUPANCY	TYPE II-B	48,000

SECTION 508 - MIXED USE AND OCCUPANCY

THE MIXED USE OF THIS BUILDING SHALL BE NONSEPARATED PER SECTION 508.3

508.3 NONSEPARATED OCCUPANCIES. BUILDINGS OR PORTIONS OF BUILDINGS THAT COMPLY WITH THE PROVISIONS OF THIS SECTION SHALL BE CONSIDERED AS NONSEPARATED OCCUPANCIES.
508.3.1 OCCUPANCY CLASSIFICATION. NONSEPARATED OCCUPANCIES SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH SECTION 302.1. THE REQUIREMENTS OF THIS CODE SHALL APPLY TO EACH PORTION OF THE BUILDING BASED ON THE OCCUPANCY CLASSIFICATION OF THAT SPACE. IN ADDITION, THE MOST RESTRICTIVE PROVISIONS OF CHAPTER 9 THAT APPLY TO THE NONSEPARATED OCCUPANCIES SHALL APPLY TO THE TOTAL NONSEPARATED OCCUPANCY AREA.
508.3.2 ALLOWABLE BUILDING AREA, HEIGHT AND NUMBER OF STORIES. THE ALLOWABLE BUILDING AREA, HEIGHT AND NUMBER OF STORIES OF THE BUILDING OR PORTION THEREOF SHALL BE BASED ON THE MOST RESTRICTIVE ALLOWANCES FOR THE OCCUPANCY GROUPS UNDER CONSIDERATION FOR THE TYPE OF CONSTRUCTION OF THE BUILDING IN ACCORDANCE WITH SECTION 503.1.
508.3.3 SEPARATION. NO SEPARATION IS REQUIRED BETWEEN NONSEPARATED OCCUPANCIES.
EXCEPTION 2: GROUP I-1, R-1, R-2 AND R-3 DWELLING UNITS AND SLEEPING UNITS SHALL BE SEPARATED FROM OTHER DWELLING OR SLEEPING UNITS AND FROM OTHER OCCUPANCIES CONTIGUOUS TO THEM IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 420.

2021 IBC CHAPTER 6 - TYPES OF CONSTRUCTION

TYPES OF CONSTRUCTION (IBC TABLE 601)	(TYPE II-B)
PRIMARY STRUCTURAL FRAME	0 HR
BEARING WALLS	
EXTERIOR	0 HR
INTERIOR	0 HR
NON-BEARING WALLS	
EXTERIOR	0 HR
INTERIOR	0 HR
FLOOR	0 HR
ROOF	0 HR

2021 IBC CHAPTER 7 - FIRE AND SMOKE PROTECTION FEATURES

SECTION 713 - SHAFT ENCLOSURES (IBC 713)

1-HOUR FIRE BARRIER CONNECTING LESS THAN FOUR STORIES (IBC 713.4)

SECTION 716 - OPENING PROTECTIVES SEE IBC TABLE 716.1 (2) & 716.1 (3)

TYPE OF ASSEMBLY	ASSEMBLY RATING	OPENING PENETRATION
INCIDENTAL USE	1-HOUR FIRE BARRIER	45 MINUTES
STAIR / SHAFTS	(<4 FLRS) 1-HOUR FIRE BARRIER	60 MINUTES
STAIR / SHAFTS	(>4 FLRS) 2-HOUR FIRE BARRIER	90 MINUTES
FIRE BARRIER / WALL	2-HOUR FIRE BARRIER	90 MINUTES
ELEVATOR LOBBY	1-HOUR SMOKE BARRIER	60 MINUTES
SMOKE BARRIER	1-HOUR SMOKE BARRIER	20 MINUTES
CORRIDOR WALLS (I-2)	0-HOUR SMOKE PARTITION	0 MINUTES
CORRIDOR WALLS (I-1)	1-HOUR FIRE PARTITION	20 MINUTES

SECTION 718 - CONCEALED SPACES

DRAFTSTOPPING NOT REQUIRED DUE TO BEING FULLY SPRINKLERED. IBC 718.3 EXCEPTION, IBC 718.4 EXCEPTION AND IBC 708.4.2.1 EXCEPTION 1

2021 IBC CHAPTER 9 - FIRE PROTECTION AND LIFE SAFETY SYSTEMS

1. BASED UPON NFPA 13 THROUGHOUT (IBC SECTIONS 506.3 & 903.3.1.1)
   EXCEPT CONCEALED FLOOR SPACES PER NFPA 13 8.15.2.7
   "CONCEALED SPACES ENTIRELY FILLED WITH NON-COMBUSTIBLE INSULATION SHALL NOT REQUIRE SPRINKLER PROTECTION."
2. EXTERIOR COVERED PORCH AREAS SPRINKLERED
3. FIRE EXTINGUISHERS 75' MAX. TRAVEL DISTANCE (NFPA 905 & IBC 906.3 (1))
4. IBC 903.2.11.2) AUTOMATIC SPRINKLER SYSTEMS SHALL BE INSTALLED AT TOP OF RUBBISH CHUTES AND THEIR TERMINATION ROOMS. CHUTES EXTENDING MORE THAN 3 STORIES SHALL HAVE ADDITIONAL HEADS INSTALLED WITHIN CHUTES AT ALTERNATE FLOORS.
5. (IBC 905.3.1 EXCEPTION 1) CLASS 1 STANDPIPE IS ALLOWED IN BUILDING EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM.
6. PROVIDE STANDPIPES IN EXIT STAIRS WITH VALVES LOCATED ON STAIR LANDINGS.
   NOTE: STANDPIPES MAY BE REQUIRED AT HORIZONTAL EXITS AS DETERMINED BY DESIGN/BUILD SUB
7. ATTACHED CANOPIES SPRINKLERED
8. WOOD DECKS SPRINKLERED

2021 IBC CHAPTER 10 - MEANS OF EGRESS

TABLE 1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAX OCC. LOAD	COMMON PATH OF TRAVEL	MAX TRAVEL DISTANCE (TABLE 1017.2)
A	49	75	250
R-2	20	125	250

SECTION 1020.5 DEAD ENDS EXCEPTION 2: NO DEAD END CORRIDOR LONGER THAN 50' FOR R-2 SPRINKLERED BUILDINGS

2021 IBC CHAPTER 11 - ACCESSIBILITY (AND 2009 ICC A117.1 ACCESSIBILITY CODE)

1. R-2 OCCUPANCY REQUIRES 2% TYPE A UNITS. (2 UNITS REQUIRED) THE REMAINING UNITS ARE TYPE B ACTUAL NUMBER OF HANDICAP UNITS - 2. (IBC 1107.6.2.2.1)
2. ALL PARKING AREAS MUST PROVIDE ACCESSIBLE PARKING.
3. 60% OF PUBLIC ENTRANCES MUST BE ACCESSIBLE. (IBC 1105.1)

2021 IBC CHAPTER 12 - INTERIOR ENVIRONMENT

WINDOW SIZES AT RESIDENT ROOMS IBC SECTION 1204)

1. MINIMUM NET GLAZED AREA - 8% OF THE FLOOR AREA OF THE ROOM
2. BORROWED NATURAL LIGHT IN ADJOINING SPACES – SECTION 1204.2.1

SOUND TRANSMISSION (IBC SECTION 1206)

1. WALLS, PARTITIONS, AND FLOOR/CEILING ASSEMBLIES SEPARATING DWELLING UNITS SHALL HAVE AN STC AND IIC OF NOT LESS THAN 50. (IBC 1206.3)

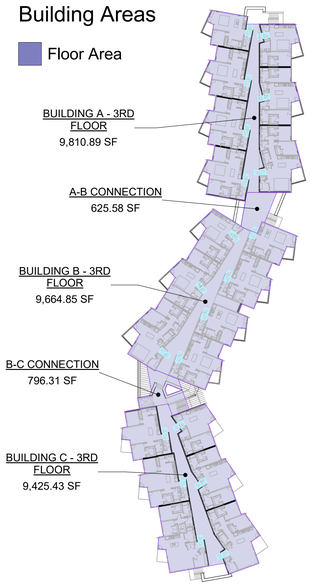
PARKING

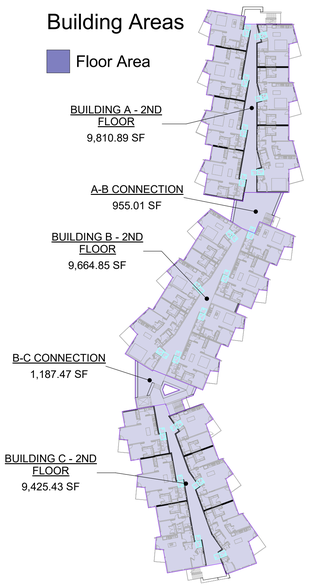
SEE SHEET A1.1 ARCHITECTURAL SITE PLAN FOR PARKING INFORMATION.

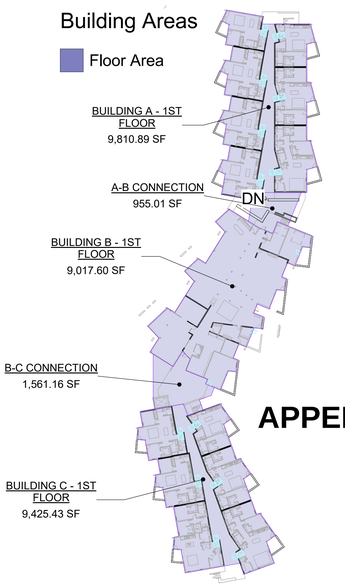
ENERGY CODE - 2021 IECC

MARICOPA COUNTY - CLIMATE ZONE 2B (HOT DRY)

INSULATION ENTIRELY ABOVE ROOF DECK	R-25ci
METAL FRAMED WALLS	R-13 + R7.5ci
HEATED SLABS	R7.5 FOR 12" BELOW + R-5 FULL SLAB







APPENDIX D

1 A0.3 CODE REVIEW - FIRST FLOOR PLAN
1" = 20'-0"

NORTH

4 A0.3 THIRD FLOOR
1" = 50'-0"

3 A0.3 SECOND FLOOR
1" = 50'-0"

2 A0.3 FIRST FLOOR
1" = 50'-0"

NORTH

NOT FOR CONSTRUCTION

POPE DESIGN GROUP
767 N. EUSTIS STREET, SUITE 190
ST. PAUL, MINNESOTA 55114
651.642.9200
WWW.POPEDESIGN.COM

ARCHITEKTON

lifestyle communities

LIFESTYLE COMMUNITIES
ARTESSA
PINNACLE PEAK
COOPERATIVE
SCOTTSDALE, AZ

ARTESSA
ARIZONA

CODE DATA AND CODE FLOOR PLAN

ISSUES & REVISIONS	DATE
DD PRICING SET	2023-10-20

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the laws of the State of Minnesota

Name of Signing Architect
Date: mm/dd/yy — Lic No: #####

COMMISSION NO:	43230-22242
DRAWN BY:	Author
CHECKED BY:	Checker

SHEET

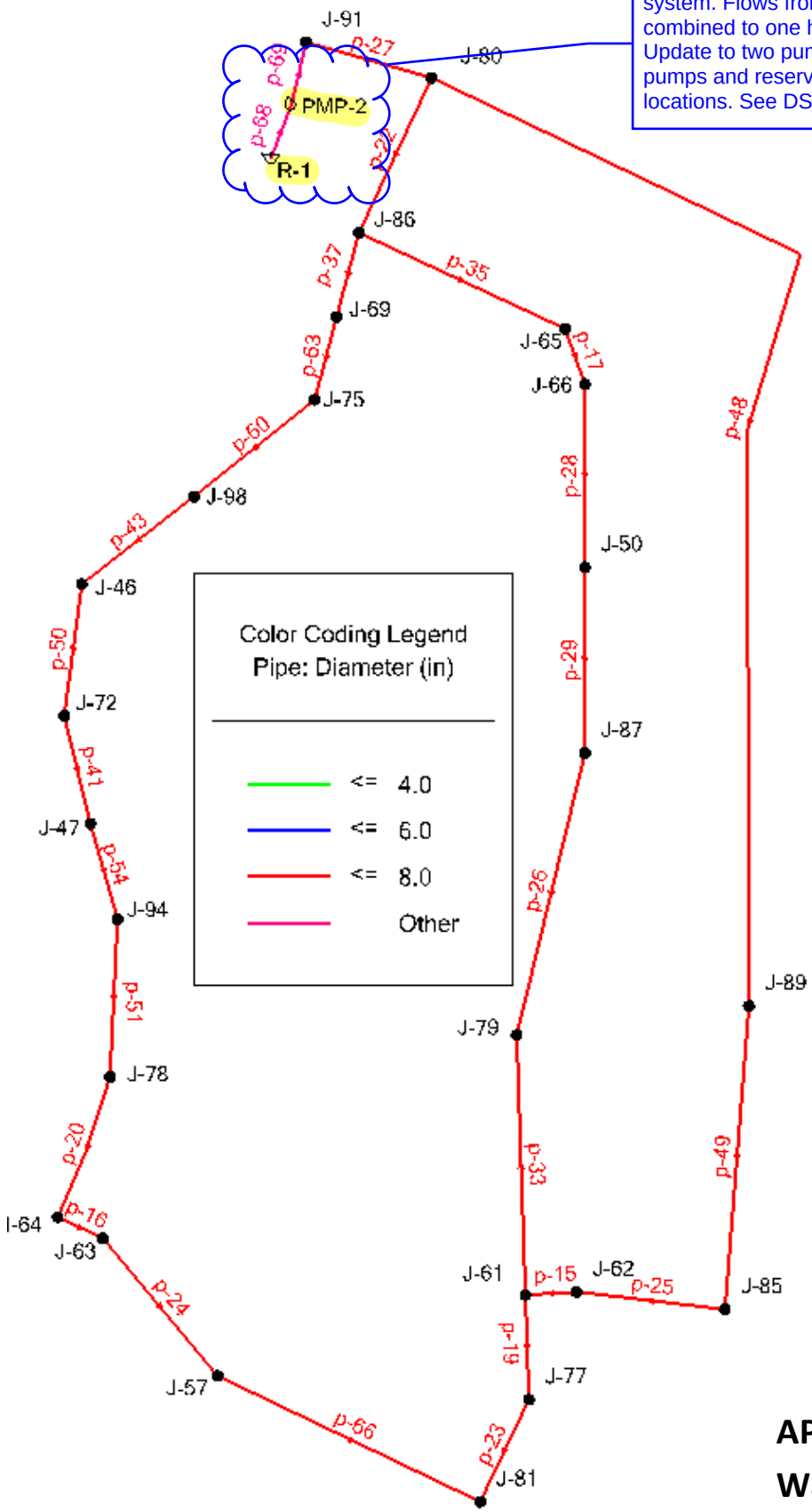
A0.3

TRUE SHEET SCALE
0" 1/2" 1"

Autodesk Docs://43230-22242 Artessa Pinnacle Peak Cooperative/43230-22242_ArtessaPinnaclePeak_R23.rvt
10/20/2023 5:16:30 PM

2-ZN-2024
4/18/2024

Based on Fire Hydrant flow test, this is a two pump system. Flows from two fire hydrants cannot be combined to one hydrant in hydraulic modeling. Update to two pump modeling system and relocate pumps and reservoirs based on their actual locations. See DSPM Section 6-1.202.



Network diagram does not match with Water Plan Sheet C4.11. Update network diagram per DSPM Section 6-1.202.

APPENDIX E –

Water Model Reports

2024-03-08-Prelim Water Model.wtg

Active Scenario: ADD

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
110	J-46	2,650.05	0.30	2,807.80	68.252
112	J-47	2,648.00	0.30	2,807.80	69.137
117	J-50	2,648.38	2.70	2,807.80	68.974
129	J-57	2,645.87	2.30	2,807.80	70.058
135	J-61	2,645.29	0.00	2,807.80	70.309
136	J-62	2,645.09	0.00	2,807.80	70.394
138	J-63	2,645.95	0.00	2,807.80	70.025
139	J-64	2,646.05	0.00	2,807.80	69.979
141	J-65	2,650.87	0.00	2,807.80	67.895
142	J-66	2,650.25	0.00	2,807.80	68.161
147	J-69	2,652.26	0.00	2,807.80	67.294
151	J-72	2,648.08	0.00	2,807.80	69.101
157	J-75	2,652.09	0.30	2,807.80	67.365
160	J-77	2,645.38	0.00	2,807.80	70.271
162	J-78	2,646.33	0.30	2,807.80	69.861
164	J-79	2,644.95	6.80	2,807.80	70.457
166	J-80	2,650.86	0.00	2,807.80	67.899
169	J-81	2,645.68	0.00	2,807.80	70.140
177	J-85	2,645.09	0.00	2,807.80	70.396
180	J-86	2,651.18	0.00	2,807.80	67.760
183	J-87	2,647.88	0.00	2,807.80	69.188
189	J-89	2,644.95	0.00	2,807.80	70.456
192	J-91	2,650.86	0.00	2,807.80	67.900
270	J-94	2,647.00	0.40	2,807.80	69.567
282	J-98	2,650.64	0.40	2,807.80	67.993

Revise Hydraulic Modeling based on revised demand calculation and two pump system with their own pump curve (not a combined pump curve). Water modeling results not reviewed due to incorrect analysis. See DSPM Section 6-1.202.

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: ADD

FlexTable: Pipe Table

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)
p-15	8.0	Ductile Iron	130.0	-4.08	25	0.03
p-16	8.0	Ductile Iron	130.0	-2.19	25	0.01
p-17	8.0	Ductile Iron	130.0	5.53	29	0.04
p-19	8.0	Ductile Iron	130.0	0.11	52	0.00
p-20	8.0	Ductile Iron	130.0	-2.19	74	0.01
p-22	8.0	Ductile Iron	130.0	-9.72	85	0.06
p-23	8.0	Ductile Iron	130.0	0.11	56	0.00
p-24	8.0	Ductile Iron	130.0	-2.19	89	0.01
p-25	8.0	Ductile Iron	130.0	-4.08	74	0.03
p-26	8.0	Ductile Iron	130.0	2.83	144	0.02
p-27	8.0	Ductile Iron	130.0	13.80	65	0.09
p-28	8.0	Ductile Iron	130.0	5.53	91	0.04
p-29	8.0	Ductile Iron	130.0	2.83	92	0.02
p-33	8.0	Ductile Iron	130.0	-3.97	129	0.03
p-35	8.0	Ductile Iron	130.0	5.53	113	0.04
p-37	8.0	Ductile Iron	130.0	-4.19	43	0.03
p-41	8.0	Ductile Iron	130.0	-3.19	55	0.02
p-43	8.0	Ductile Iron	130.0	-3.49	71	0.02
p-48	8.0	Ductile Iron	130.0	4.08	581	0.03
p-49	8.0	Ductile Iron	130.0	4.08	151	0.03
p-50	8.0	Ductile Iron	130.0	-3.19	66	0.02
p-51	8.0	Ductile Iron	130.0	-2.49	79	0.02
p-54	8.0	Ductile Iron	130.0	-2.89	49	0.02
p-60	8.0	Ductile Iron	130.0	-3.89	77	0.02
p-63	8.0	Ductile Iron	130.0	-4.19	43	0.03
p-66	8.0	Ductile Iron	130.0	0.11	145	0.00
p-68	16.0	Ductile Iron	130.0	13.80	29	0.02
p-69	16.0	Ductile Iron	130.0	13.80	32	0.02

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: ADD

FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-2	2,643.00	On	2,650.00	2,807.80	13.80	157.80

Two Pump system based on fire hydrant flow test.

Update per previous comment

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: ADD

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	2,650.00	13.80	2,650.00

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: MDD

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
110	J-46	2,650.05	0.60	2,807.79	68.248
112	J-47	2,648.00	0.60	2,807.79	69.133
117	J-50	2,648.38	5.40	2,807.79	68.971
129	J-57	2,645.87	4.60	2,807.79	70.054
135	J-61	2,645.29	0.00	2,807.79	70.306
136	J-62	2,645.09	0.00	2,807.79	70.390
138	J-63	2,645.95	0.00	2,807.79	70.022
139	J-64	2,646.05	0.00	2,807.79	69.975
141	J-65	2,650.87	0.00	2,807.79	67.891
142	J-66	2,650.25	0.00	2,807.79	68.158
147	J-69	2,652.26	0.00	2,807.79	67.291
151	J-72	2,648.08	0.00	2,807.79	69.098
157	J-75	2,652.09	0.60	2,807.79	67.362
160	J-77	2,645.38	0.00	2,807.79	70.267
162	J-78	2,646.33	0.60	2,807.79	69.857
164	J-79	2,644.95	13.60	2,807.79	70.454
166	J-80	2,650.86	0.00	2,807.79	67.897
169	J-81	2,645.68	0.00	2,807.79	70.137
177	J-85	2,645.09	0.00	2,807.79	70.392
180	J-86	2,651.18	0.00	2,807.79	67.757
183	J-87	2,647.88	0.00	2,807.79	69.185
189	J-89	2,644.95	0.00	2,807.79	70.453
192	J-91	2,650.86	0.00	2,807.79	67.897
270	J-94	2,647.00	0.80	2,807.79	69.564
282	J-98	2,650.64	0.80	2,807.79	67.990

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: MDD

FlexTable: Pipe Table

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)
p-15	8.0	Ductile Iron	130.0	-8.16	25	0.05
p-16	8.0	Ductile Iron	130.0	-4.38	25	0.03
p-17	8.0	Ductile Iron	130.0	11.06	29	0.07
p-19	8.0	Ductile Iron	130.0	0.22	52	0.00
p-20	8.0	Ductile Iron	130.0	-4.38	74	0.03
p-22	8.0	Ductile Iron	130.0	-19.44	85	0.12
p-23	8.0	Ductile Iron	130.0	0.22	56	0.00
p-24	8.0	Ductile Iron	130.0	-4.38	89	0.03
p-25	8.0	Ductile Iron	130.0	-8.16	74	0.05
p-26	8.0	Ductile Iron	130.0	5.66	144	0.04
p-27	8.0	Ductile Iron	130.0	27.60	65	0.18
p-28	8.0	Ductile Iron	130.0	11.06	91	0.07
p-29	8.0	Ductile Iron	130.0	5.66	92	0.04
p-33	8.0	Ductile Iron	130.0	-7.94	129	0.05
p-35	8.0	Ductile Iron	130.0	11.06	113	0.07
p-37	8.0	Ductile Iron	130.0	-8.38	43	0.05
p-41	8.0	Ductile Iron	130.0	-6.38	55	0.04
p-43	8.0	Ductile Iron	130.0	-6.98	71	0.04
p-48	8.0	Ductile Iron	130.0	8.16	581	0.05
p-49	8.0	Ductile Iron	130.0	8.16	151	0.05
p-50	8.0	Ductile Iron	130.0	-6.38	66	0.04
p-51	8.0	Ductile Iron	130.0	-4.98	79	0.03
p-54	8.0	Ductile Iron	130.0	-5.78	49	0.04
p-60	8.0	Ductile Iron	130.0	-7.78	77	0.05
p-63	8.0	Ductile Iron	130.0	-8.38	43	0.05
p-66	8.0	Ductile Iron	130.0	0.22	145	0.00
p-68	16.0	Ductile Iron	130.0	27.60	29	0.04
p-69	16.0	Ductile Iron	130.0	27.60	32	0.04

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: MDD

FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-2	2,643.00	On	2,650.00	2,807.79	27.60	157.79

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: MDD

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	2,650.00	27.60	2,650.00

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: PHD

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
110	J-46	2,650.05	1.05	2,807.77	68.240
112	J-47	2,648.00	1.05	2,807.77	69.125
117	J-50	2,648.38	9.45	2,807.77	68.962
129	J-57	2,645.87	8.05	2,807.77	70.046
135	J-61	2,645.29	0.00	2,807.77	70.297
136	J-62	2,645.09	0.00	2,807.77	70.382
138	J-63	2,645.95	0.00	2,807.77	70.013
139	J-64	2,646.05	0.00	2,807.77	69.967
141	J-65	2,650.87	0.00	2,807.77	67.883
142	J-66	2,650.25	0.00	2,807.77	68.150
147	J-69	2,652.26	0.00	2,807.77	67.283
151	J-72	2,648.08	0.00	2,807.77	69.090
157	J-75	2,652.09	1.05	2,807.77	67.354
160	J-77	2,645.38	0.00	2,807.77	70.259
162	J-78	2,646.33	1.05	2,807.77	69.849
164	J-79	2,644.95	23.80	2,807.77	70.445
166	J-80	2,650.86	0.00	2,807.77	67.890
169	J-81	2,645.68	0.00	2,807.77	70.128
177	J-85	2,645.09	0.00	2,807.77	70.384
180	J-86	2,651.18	0.00	2,807.77	67.749
183	J-87	2,647.88	0.00	2,807.77	69.176
189	J-89	2,644.95	0.00	2,807.77	70.445
192	J-91	2,650.86	0.00	2,807.78	67.892
270	J-94	2,647.00	1.40	2,807.77	69.556
282	J-98	2,650.64	1.40	2,807.77	67.982

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: PHD

FlexTable: Pipe Table

Label	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (ft/s)
p-15	8.0	Ductile Iron	130.0	-14.28	25	0.09
p-16	8.0	Ductile Iron	130.0	-7.67	25	0.05
p-17	8.0	Ductile Iron	130.0	19.35	29	0.12
p-19	8.0	Ductile Iron	130.0	0.38	52	0.00
p-20	8.0	Ductile Iron	130.0	-7.67	74	0.05
p-22	8.0	Ductile Iron	130.0	-34.02	85	0.22
p-23	8.0	Ductile Iron	130.0	0.38	56	0.00
p-24	8.0	Ductile Iron	130.0	-7.67	89	0.05
p-25	8.0	Ductile Iron	130.0	-14.28	74	0.09
p-26	8.0	Ductile Iron	130.0	9.90	144	0.06
p-27	8.0	Ductile Iron	130.0	48.30	65	0.31
p-28	8.0	Ductile Iron	130.0	19.35	91	0.12
p-29	8.0	Ductile Iron	130.0	9.90	92	0.06
p-33	8.0	Ductile Iron	130.0	-13.90	129	0.09
p-35	8.0	Ductile Iron	130.0	19.35	113	0.12
p-37	8.0	Ductile Iron	130.0	-14.67	43	0.09
p-41	8.0	Ductile Iron	130.0	-11.17	55	0.07
p-43	8.0	Ductile Iron	130.0	-12.22	71	0.08
p-48	8.0	Ductile Iron	130.0	14.28	581	0.09
p-49	8.0	Ductile Iron	130.0	14.28	151	0.09
p-50	8.0	Ductile Iron	130.0	-11.17	66	0.07
p-51	8.0	Ductile Iron	130.0	-8.72	79	0.06
p-54	8.0	Ductile Iron	130.0	-10.12	49	0.06
p-60	8.0	Ductile Iron	130.0	-13.62	77	0.09
p-63	8.0	Ductile Iron	130.0	-14.67	43	0.09
p-66	8.0	Ductile Iron	130.0	0.38	145	0.00
p-68	16.0	Ductile Iron	130.0	48.30	29	0.08
p-69	16.0	Ductile Iron	130.0	48.30	32	0.08

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: PHD

FlexTable: Pump Table

Label	Elevation (ft)	Pump Status	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-2	2,643.00	On	2,650.00	2,807.78	48.30	157.78

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: PHD

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	2,650.00	48.30	2,650.00

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg

Active Scenario: Max Daily + Fire

Fire Flow Node FlexTable: Fire Flow Report

Label	Flow (Total Needed) (gpm)	Pressure (psi)	Fire Flow Status	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)	Pressure (Calculated Residual) (psi)	Flow (Total Available) (gpm)
J-46	1,501	68	Passed	p-27	10.0	59	1,540
J-47	1,501	69	Passed	p-27	10.0	59	1,540
J-50	1,505	69	Passed	p-27	10.0	60	1,545
J-57	1,505	70	Passed	p-27	10.0	60	1,544
J-61	1,500	70	Passed	p-27	10.0	61	1,539
J-62	1,500	70	Passed	p-27	10.0	61	1,539
J-63	1,500	70	Passed	p-27	10.0	60	1,539
J-64	1,500	70	Passed	p-27	10.0	60	1,539
J-65	1,500	68	Passed	p-27	10.0	59	1,539
J-66	1,500	68	Passed	p-27	10.0	59	1,539
J-69	1,500	67	Passed	p-27	10.0	59	1,539
J-72	1,500	69	Passed	p-27	10.0	59	1,539
J-75	1,501	67	Passed	p-27	10.0	59	1,540
J-77	1,500	70	Passed	p-27	10.0	61	1,539
J-78	1,501	70	Passed	p-27	10.0	60	1,540
J-79	1,514	70	Passed	p-27	10.0	61	1,553
J-80	1,500	68	Passed	p-27	10.0	61	1,539
J-81	1,500	70	Passed	p-27	10.0	61	1,539
J-85	1,500	70	Passed	p-27	10.0	61	1,539
J-86	1,500	68	Passed	p-27	10.0	60	1,539
J-87	1,500	69	Passed	p-27	10.0	60	1,539
J-89	1,500	70	Passed	p-27	10.0	61	1,539
J-91	1,500	68	Passed	p-69	4.8	49	3,000
J-94	1,501	70	Passed	p-27	10.0	59	1,540
J-98	1,501	68	Passed	p-27	10.0	59	1,540

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg
Active Scenario: Max Daily + Fire
Pump Definition Detailed Report: Pump Definition - 1

Element Details

ID	306	Notes	
Label	Pump Definition - 1		

Pump Definition Type

Pump Definition Type	Standard (3 Point)	Design Head	97.80 ft
Shutoff Flow	0 gpm	Maximum Operating Flow	5,040 gpm
Shutoff Head	157.80 ft	Maximum Operating Head	46.14 ft
Design Flow	3,603 gpm		

Pump Efficiency Type

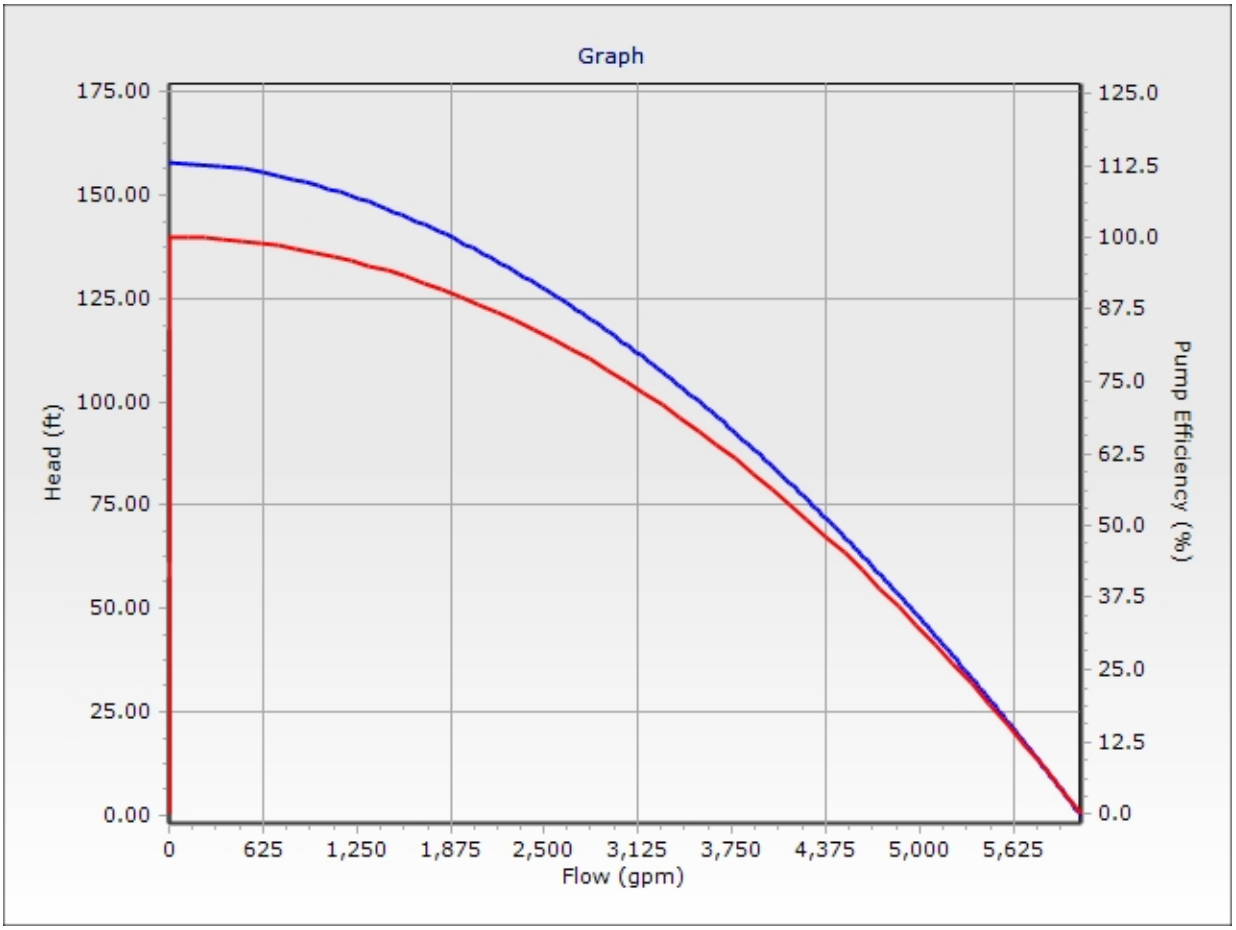
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0 gpm		

Transient (Physical)

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

2-ZN-2024
4/18/2024

2024-03-08-Prelim Water Model.wtg
Active Scenario: Max Daily + Fire
Pump Definition Detailed Report: Pump Definition - 1



2-ZN-2024
4/18/2024

OWNER
LIFESTYLE COMMUNITIES SW, LLC
4938 LINCOLN DRIVE
EDINA, MN 55436
PHONE: 952-228-7944
ATTN.: BEN LANDHAUSER
EMAIL: BEN@THISLIFESTYLE.COM

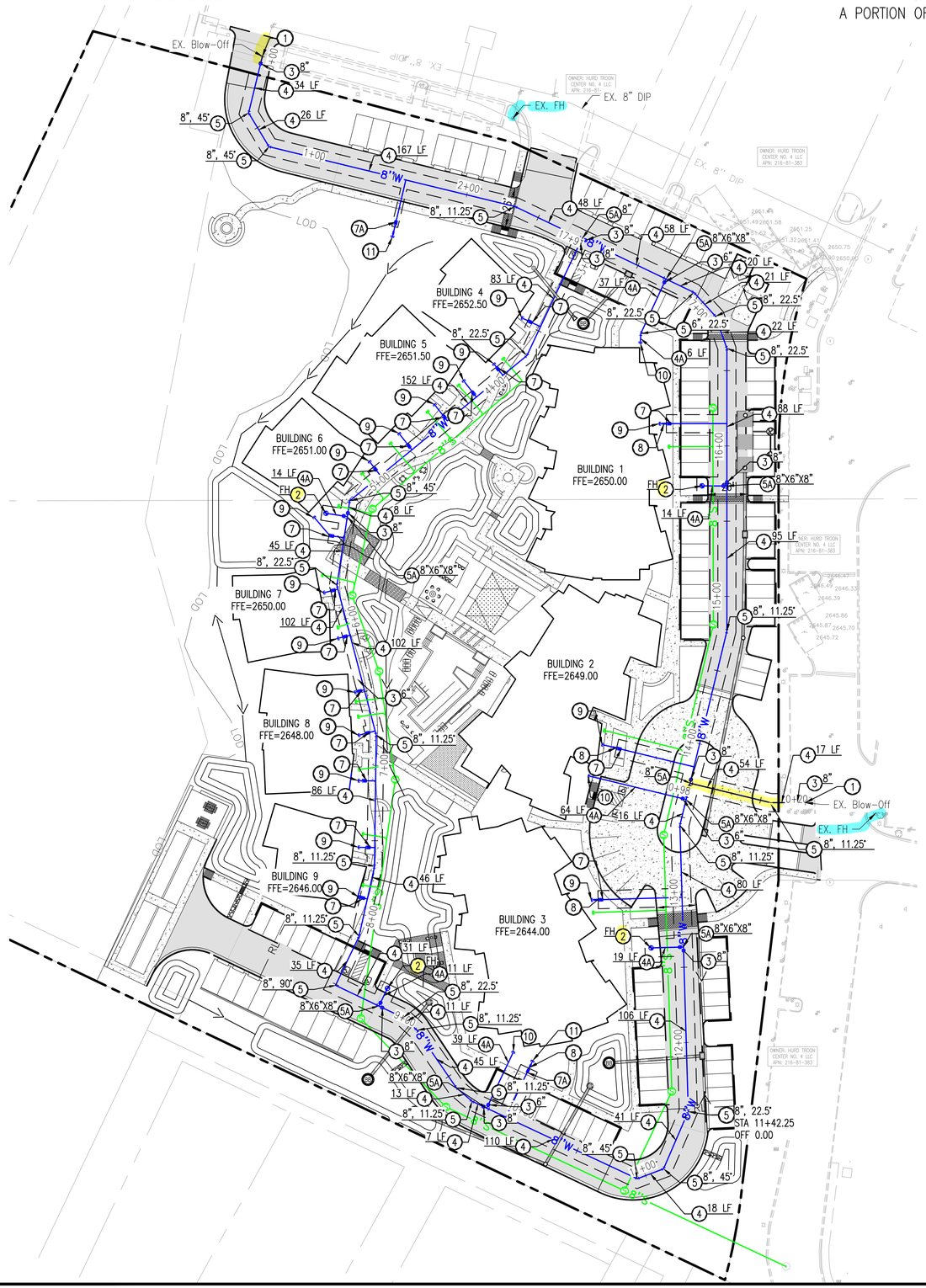
CIVIL ENGINEER
SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET, SUITE 105
PHOENIX, ARIZONA 85016
PHONE: 480-237-2507
ATTN.: ALI FAKIH
EMAIL: ALI@AZSEG.COM

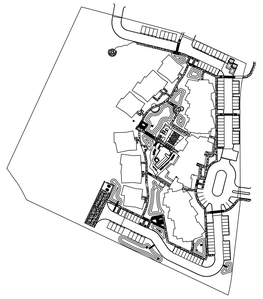
DESIGN ARCHITECT
ARCHITEKTON
464 S FARMER AVENUE, SUITE 101
TEMPE, ARIZONA 85281
PHONE: 480-894-4637
ATTN.: RYAN GRABE, AIA
EMAIL: RYANGRABE@ARCHITEKTON.COM

ARTESSA PINNACLE PEAK

PRELIMINARY WATER PLAN

SW CORNER OF DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, ARIZONA, 85296
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 5 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA.





KEY MAP
NTS

NORTH

All public waterline and appurtenances shall be in a dedicated 20-ft of waterline easement per DSP Section 6-1.419.

PRELIMINARY WATER NOTES

1. REMOVE EXISTING BLOW-OFF AND CONNECT TO EXISTING MAIN.
2. PROPOSED FIRE HYDRANT ASSEMBLY.
3. PROPOSED GATE VALVE WITH VALVE BOX AND COVER.
4. 8" DUCTILE IRON PIPE. LENGTH PER PLAN.
4A. 6" DUCTILE IRON PIPE. LENGTH PER PLAN.
5. PROPOSED FITTING, SIZE & ANGLE PER PLAN.
5A. PROPOSED TEE, SIZE PER PLAN.
7. 2" TYPE "K" COPPER DOMESTIC SERVICE CONNECTION WITH 2" WATER METER BOX.
7A. 1.5" TYPE "K" COPPER IRRIGATION SERVICE CONNECTION WITH 1.5" WATER METER BOX.
8. BACKFLOW PREVENTION, SIZE TO MATCH WATER METER SIZE.
9. DOMESTIC CONNECTION TO BUILDING.
10. FIRE CONNECTION TO BUILDING.
11. CAP WATER LINE END AND PROVIDE MARKER.

EXISTING LEGEND:

- PROPERTY LINE
- SECTION LINE
- ROAD CENTERLINE
- EASEMENT LINE AS NOTED
- SEWER LINE
- SEWER MANHOLE
- WATER LINE
- WATER VALVE
- FIRE HYDRANT
- STORM DRAIN LINE
- STORM CATCH BASIN
- STORM MANHOLE
- GAS LINE
- FENCE
- SIGN
- STREET LIGHT
- TREE

PROPOSED UTILITY LEGEND:

- PROPERTY LINE
- EASEMENT LINE
- WATER LINE
- SEWER LINE
- FIRE HYDRANT
- FDC
- WATER METER
- GATE VALVE
- T.S.V.B.&C
- BACK FLOW PREVENTER
- REDUCER
- CAP
- BUILDING CONNECTION
- SEWER MANHOLE
- SEWER CLEAN OUT
- UTILITY CROSSING

NORTH

0' 40' 80' 120'
SCALE: 1" = 40'

NOT FOR CONSTRUCTION

SEG SUSTAINABILITY ENGINEERING GROUP
5240 N. 16TH STREET SUITE 105, PHOENIX, ARIZONA 85016
WWW.AZSEG.COM TEL. 480.588.7226 FAX. 480.256.3534

lifestyle communities

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

PROJECT: ARTESSA PINNACLE PEAK
LOCATION: SWC DYNAMITE BOULEVARD AND ALMA SCHOOL ROAD, SCOTTSDALE, AZ

DRAWN	JC	03/28/2024
DESIGNED	JC	03/28/2024
CHECKED	SC	03/13/2024
FINAL QC		
PROJ. MGR.	AF	03/28/2024

DATE: 03/28/2024
ISSUED FOR: REZONING

REVISION NO.:	DATE:
1	
2	
3	
4	

JOB NO.: 231106

SHEET TITLE: **WATER PLAN**

PAGE NO.: 4 OF 5
SHEET NO.: **C4.11**

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

2-ZN-2024
4/18/2024