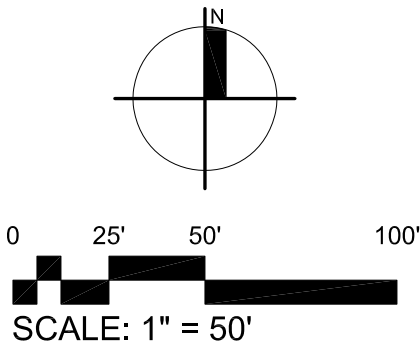
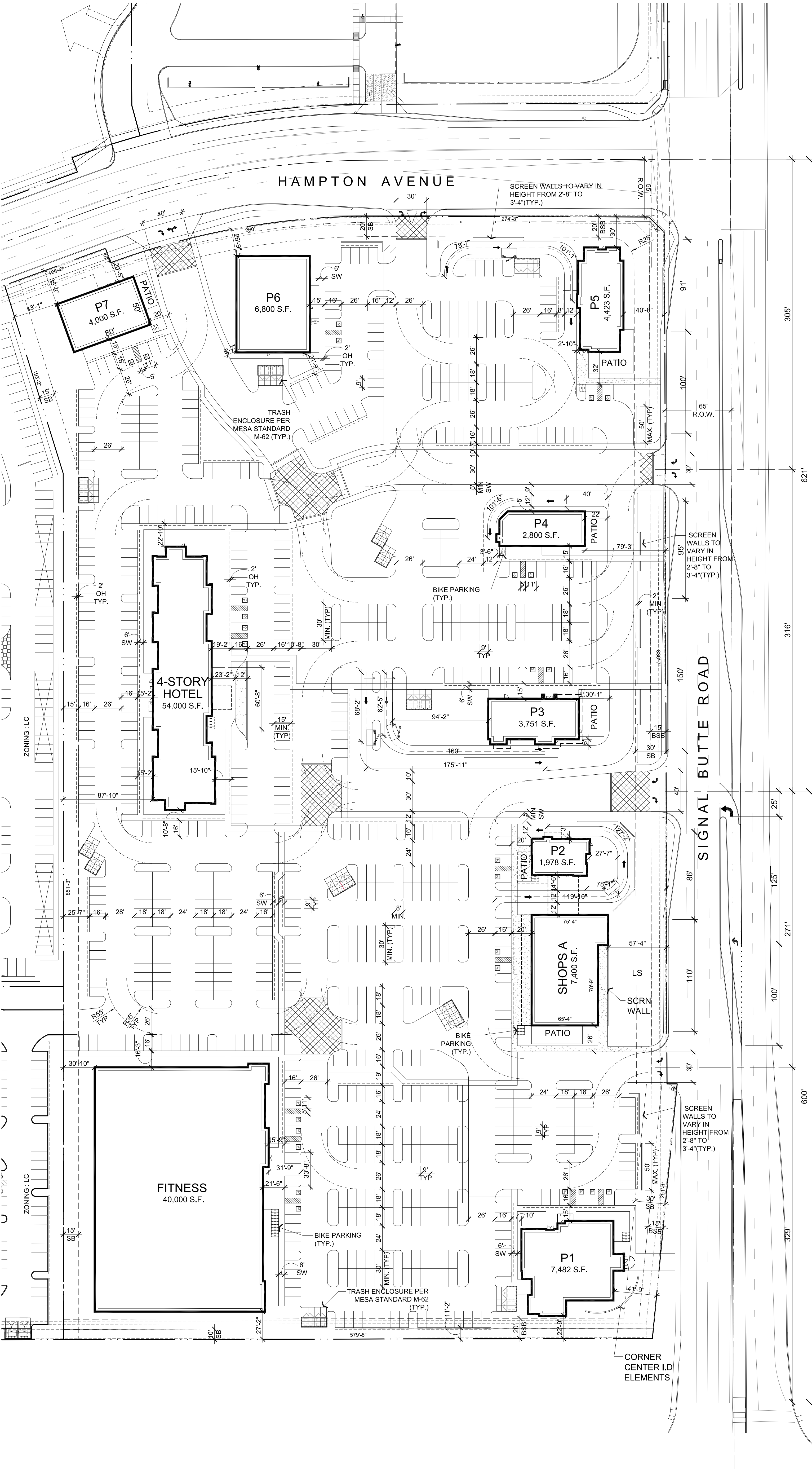




PROJECT DATA

Existing Zoning:	LC
APN(S)#:	220-81-780, 220-81-783, 220-81-784, 220-81-790
Net Site Area:	653,128 S.F. (15.0 AC.)
Building Area:	132,634 S.F.
F.A.R. :	14.1%

Parking:	Spaces Required	Spaces Proposed
Fitness (40,000 S.F. @ 1:100 S.F.):	400 (1:200 S.F.)	200
Restaurant (13,542 S.F. @ 1:75 S.F.):	181	181
Restaurant w/ drive-thru (12,952 S.F. @ 1:100 S.F.):	130	130
Patios/Outdoor Seating (3,000 S.F. @ 1:200 S.F.):	15	15
Retail (12,160 S.F. @ 1:375 S.F.):	33	33
Hotel (122 rooms @ 1:room):	122	122
Total Parking:	881	681

Total Parking Provided on Site:	712 Spaces
ADA Parking Required:	15 Spaces
ADA Parking Provided:	28 Spaces
Bike Parking Required (1/10 Spaces & 1/20 Spaces):	61 Spaces
Bike Parking Provided:	62 Spaces
Building Height (Max):	60 feet
Open Space Required (133,054 S.F. / 1,000 X 5):	665 S.F.
Open Space Provided:	27,578 S.F.

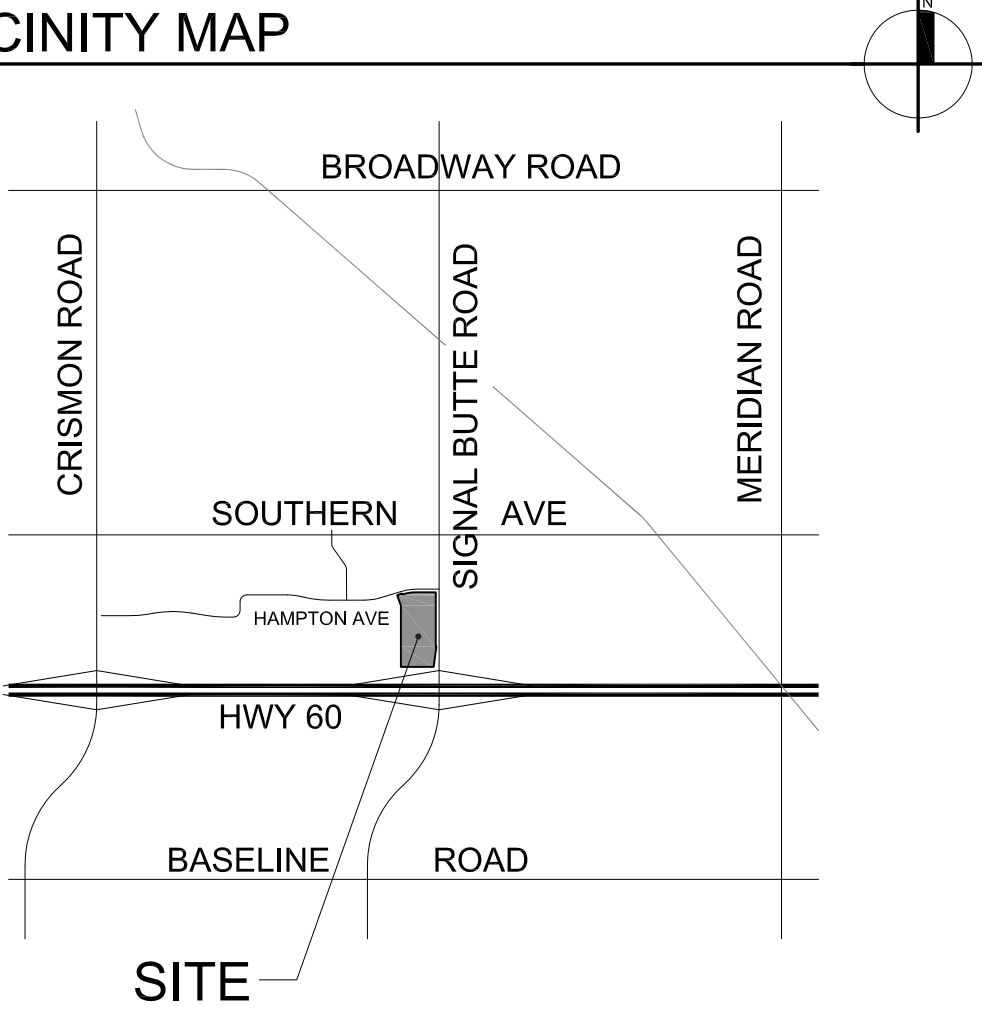
Setbacks:	Required	Provided
Signal Butte Road:	30 feet	30 feet
Hampton Avenue:	15 feet	15 feet
South:	20 feet	20 feet
West:	65 feet	65 feet

NOTE: ALL PEDESTRIAN CROSSINGS TO BE INTEGRAL COLOR CONCRETE OR SOME OTHER MATERIAL TO DIFFERENTIATE THEM FROM THE DRIVE AISLES

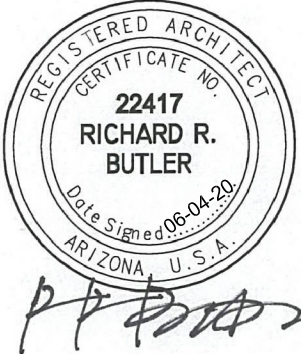
PROJECT TEAM

Developer / Owner	Architect
Thompson Thrift	Butler Design Group
2398 E. Camelback Rd, Ste 210	5017 E. Washington St. Ste 107
Phoenix, Arizona 85016	Phoenix, Arizona 85034
Contact: Andrew Call	Contact: Rick Butler
Ph: (602) 313-8633	Ph: (602) 957-1800
acall@thompsonthrift.com	rbutler@butlerdesigngroup.com

VICINITY MAP

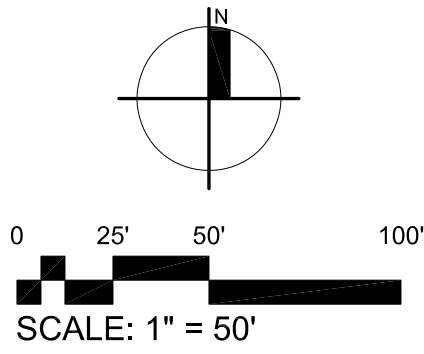
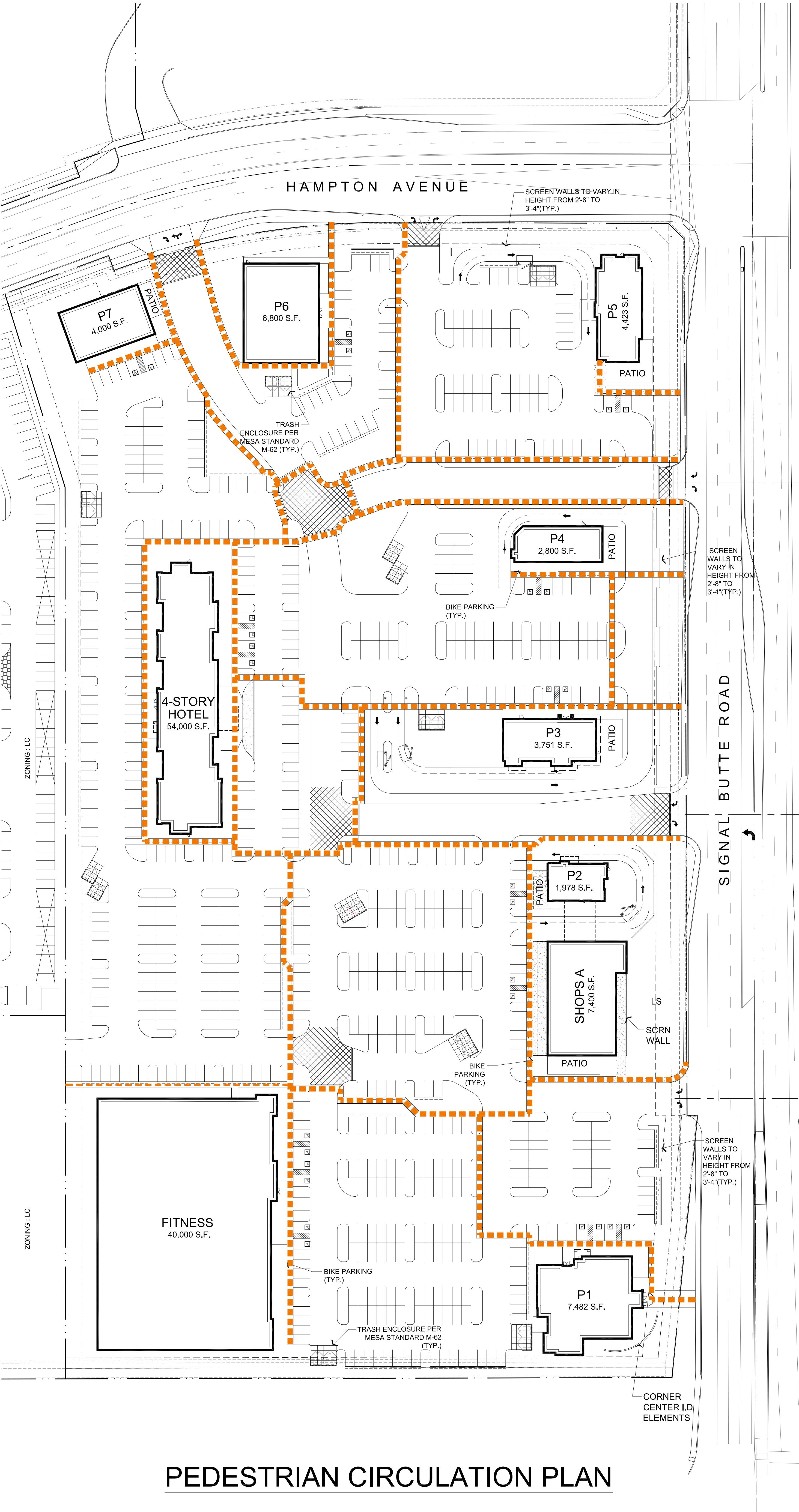


MOUNTAIN VISTA
N.W.C. SIGNAL BUTTE & US 60
Mesa, AZ



Butler Design Group, Inc
architects & planners

06-04-20
19102-ST19



PROJECT DATA

Existing Zoning:	LC
APN(S)##:	220-81-780, 220-81-783, 220-81-784, 220-81-790
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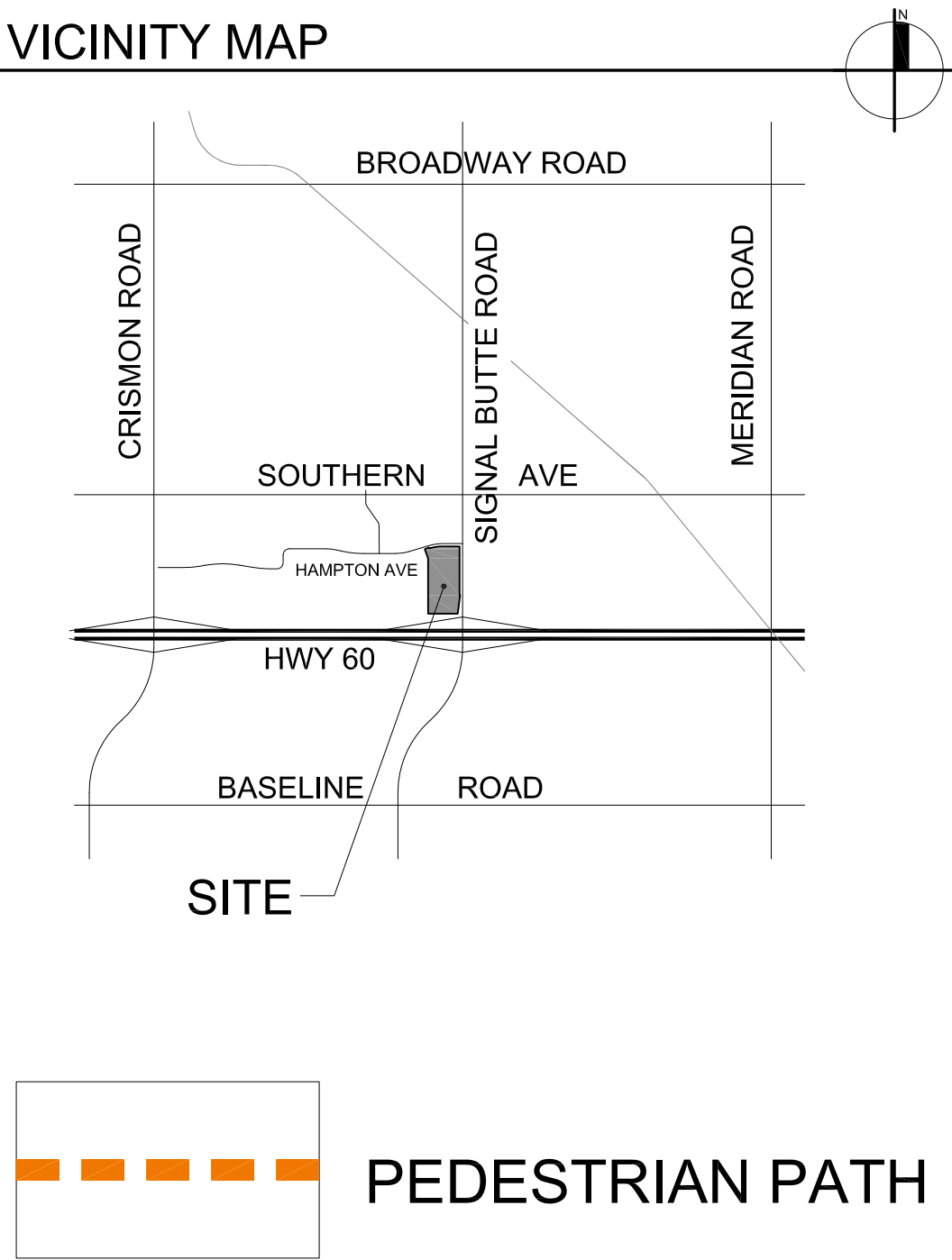
Setbacks:	Required	Provided
Signal Butte Road:	30 feet	30 feet
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NOTE: ALL PEDESTRIAN CROSSINGS TO BE INTEGRAL COLOR CONCRETE OR SOME OTHER MATERIAL TO DIFFERENTIATE THEM FROM THE DRIVE AISLES

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Thompson Thrift	Butler Design Group
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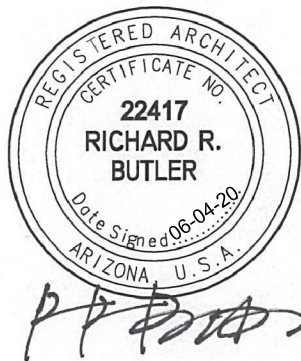
VICINITY MAP

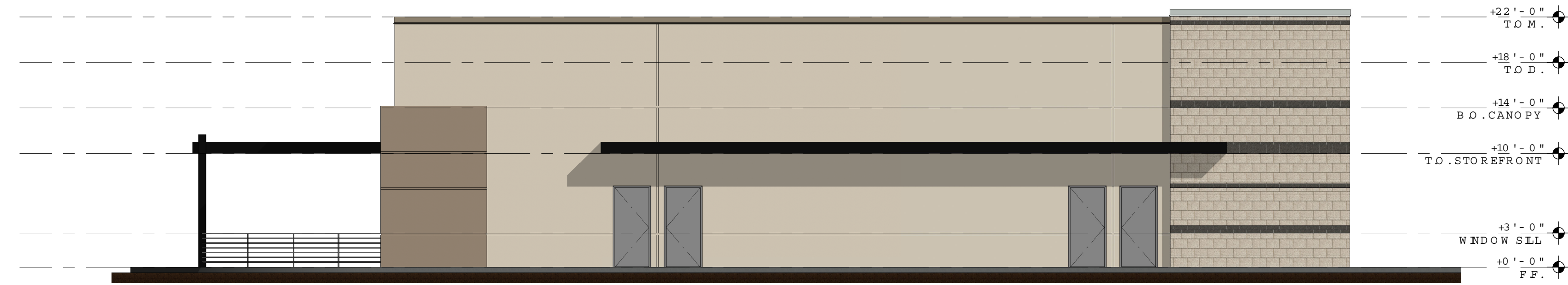


PEDESTRIAN CIRCULATION PLAN

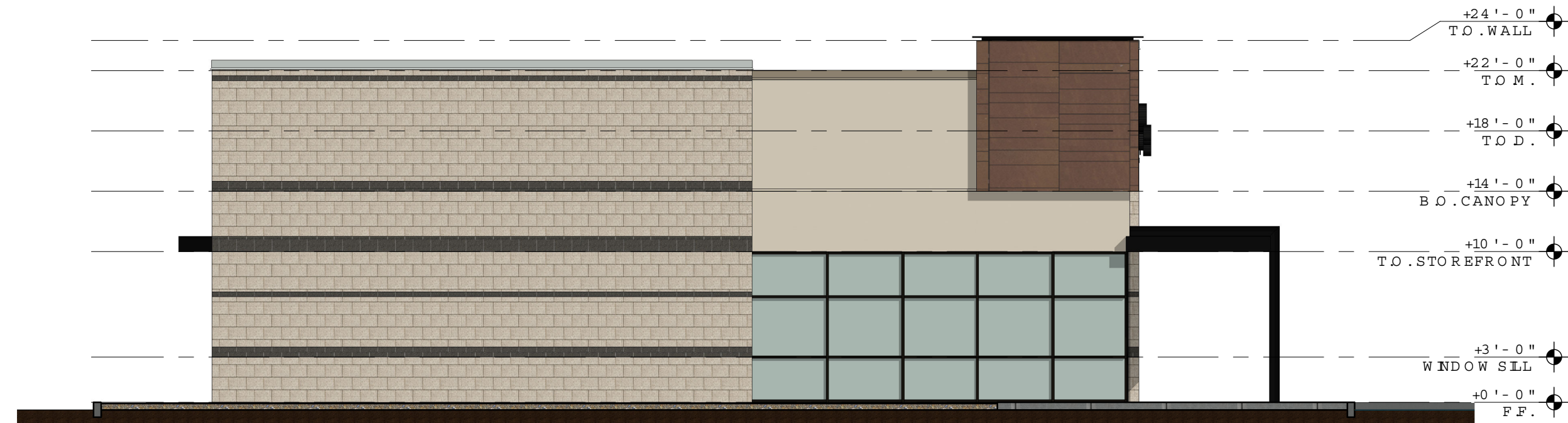


MOUNTAIN VISTA
N.W.C. SIGNAL BUTTE & US 60
Mesa, AZ

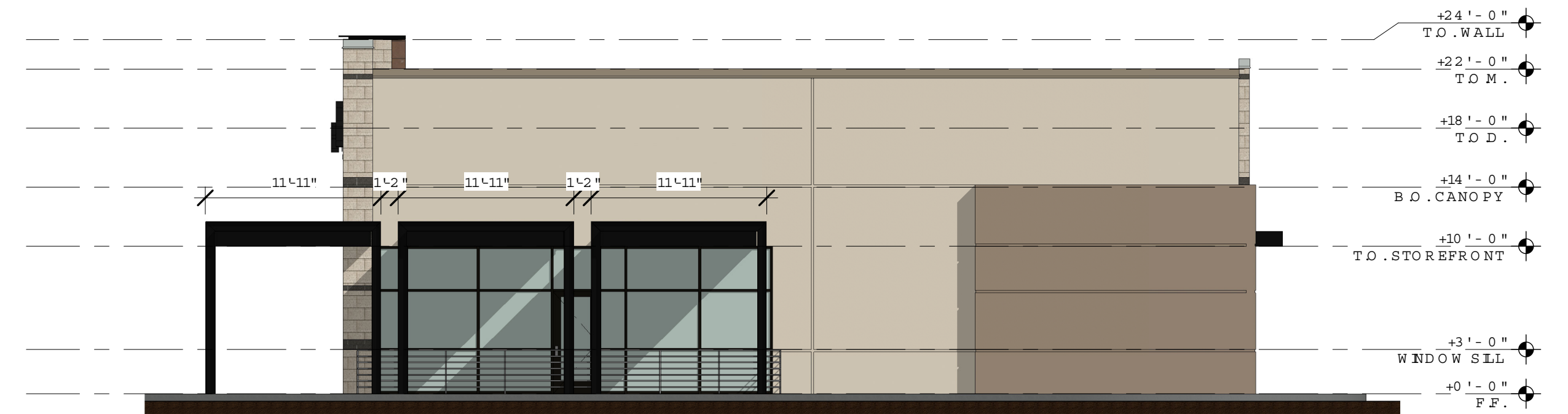




1 EAST ELEVATION
SCALE: 1/8" = 1'-0"



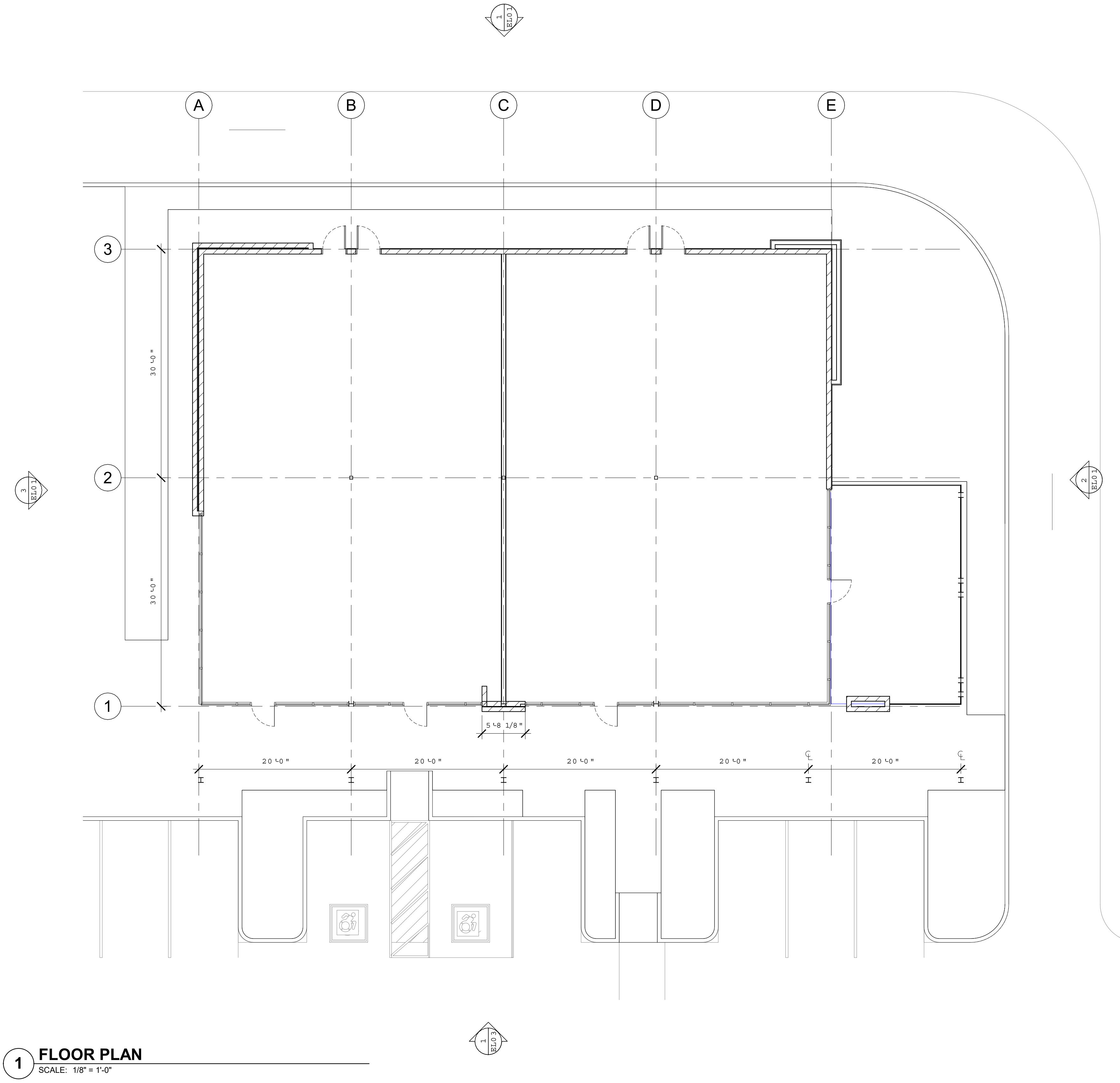
3 NORTH ELEVATION
SCALE: 1/8" = 1'-0"



2 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



4 WEST ELEVATION
SCALE: 1/8" = 1'-0"



1 FLOOR PLAN
SCALE: 1/8" = 1'-0"

Shops A

US 60 & Signal Butte

FL01



SIGNAGE

SIGNAGE

SIGNAGE







TREES



WILLOW ACACIA



TEXAS EBONY



EVERGREEN ELM



TEXAS MOUNTAIN LAUREL



DESERT MUSEUM PALO VERDE



BUBBA DESERT WILLOW



THORNLESS MESQUITE

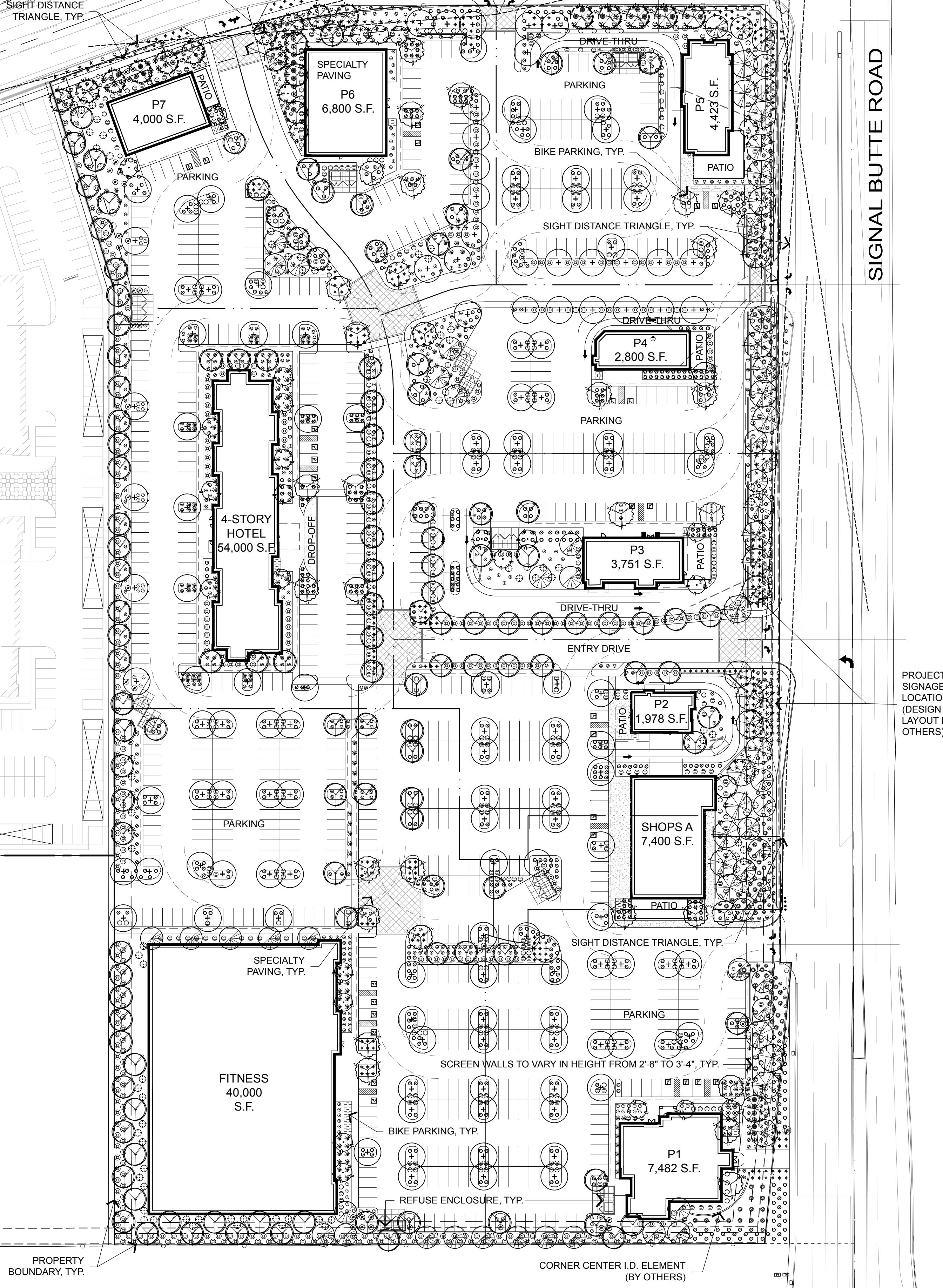
ALL TREES IN SITE DISTANCE TRIANGLES TO BE PLANTED AND MAINTAINED IN A MANNER THAT MEETS ALL CITY REQUIREMENTS

SIGHT DISTANCE TRIANGLE, TYP.

SIGHT DISTANCE TRIANGLE, TYP.

SIGNAL BUTTE ROAD

HAMPTON AVENUE



PROJECT SIGNAGE LOCATION (DESIGN + LAYOUT BY OTHERS)

PRELIMINARY PLANT SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QTY	COMMENTS
TREES/PALMS					
	Acacia salicina	Willow Acacia	15 Gallon	139	Standard Trunk Dense Canopy
	Chilopsis linearis 'Bubba'	Bubba Desert Willow	24" Box	33	Multi Trunk Dense Canopy
	Ebenopsis ebano	Texas Ebony	24" Box/ 36" Box	44	Standard Trunk Dense Canopy
	Parkinsonia 'Desert Museum'	Desert Museum Palo Verde	24" Box/ 36" Box	32	Multi Trunk Dense Canopy
	Prosopis 'Phoenix'	Thornless Mesquite	24" Box/ 36" Box	16	Multi Trunk Dense Canopy
	Sophora secundiflora	Texas Mountain Laurel	24" Box/ 36" Box	31	Multi Trunk Dense Canopy
	Ulmus parvifolia	Evergreen Elm	24" Box	141	Standard Trunk Dense Canopy
ACCENTS & VINES					
	Aloe barbadensis	Medicinal Aloe	5-Gal	69	As Per Plan
	Aloe x 'Blue Elf'	Blue Elf Aloe	5-Gal	160	As Per Plan
	Euphorbia rigida	Gopher Plant	5-Gal	86	As Per Plan
	Hesperaloe parviflora 'Furpa'	Brakelights Red Yucca	5-Gal	269	As Per Plan
	Muhlenbergia rigens	Deer Grass	5-Gal	96	As Per Plan
	Muhlenbergia rigida 'Nashville'	Nashville Muhly	5-Gal	145	As Per Plan
SHRUBS					
	Bougainvillea x 'La Jolla'	Bush Bougainvillea	5-Gal	38	As Per Plan
	Justicia californica	Chuparosa	5-Gal	95	As Per Plan
	Nerium oleander 'Petite Pink'	Petite Pink Oleander	5-Gal	452	As Per Plan
	Ruellia peninsularis	Baja Ruellia	5-Gal	511	As Per Plan
GROUND COVERS					
	Callistemon x 'Little John'	Dwarf Bottlebrush	1-Gal	281	As Per Plan
	Convolvulus cneorum	Bush Morning Glory	1-Gal	49	As Per Plan
	Lantana x 'New Gold'	New Gold Lantana	1-Gal	636	As Per Plan
	Lantana montevidensis	Purple Trailing Lantana	1-Gal	376	As Per Plan
	Rosmarinus officinalis 'Tuscan Blue'	Trailing Rosemary	1-Gal	112	As Per Plan
MISCELLANEOUS					
	Specialty Paving - Integral color stamped concrete at Entries and Primarily Intersection (Integral Color T.B.D. at time of Construction Documents)				
	Decomposed Granite - Size & Color to Match Signal Butte Streetscape 2" depth in all planting areas (Typ)				

CITY OF MESA LANDSCAPE REQUIREMENTS

	REQUIRED	PROVIDED
RIGHT OF WAY (SIGNAL BUTTE RD.)	1 Tree/6 Shrub per 25 LF (And 50% Coverage)	
TREES	44	45
SHRUBS	264	324
RIGHT OF WAY (HAMPTON AVE.)	1 Tree/4 Shrub per 25 LF (And 50% Coverage)	
TREES	27	28
SHRUBS	108	135
PARKING LOT ISLAND	1 Tree/3 Shrub per Island	
TREES	174	174
SHRUBS	522	618
NON-SINGLE RESIDENCE PERIMETER	3 Tree/20 Shrub per 100 LF	
TREES	49	50
SHRUBS	325	373

NOTES

- 25% OF TREES REQUIRED IN ROW SHOULD BE 36" BOX OR LARGER WITH A MINIMUM OF 50% OF REQUIRED TREES BEING 24" BOX. NO TREES SMALLER THAN 15 GALLON.
- 10% OF TREES REQUIRED IN PARKING ISLANDS. 4 FOUNDATION PLANTING AREAS NEED TO BE 36" BOX WITH THE BALANCE BEING AT LEAST 24" BOX
- 50% OF TREES REQUIRED IN PERIMETER LANDSCAPE AREAS TO BE 24" BOX WITH THE BALANCE BEING 15 GALLON.
- 50% OF ALL REQUIRED SHRUBS TO BE 5 GALLON WITH NO SHRUBS LESS THAN 1 GALLON.
- 50% OF ALL REQUIRED OPEN SPACE MUST CONTAIN LIVE PLANT MATERIAL

CONCEPTUAL GENERAL NOTES

- CONCEPTUAL LANDSCAPE PLAN IS SCHEMATIC IN NATURE. AT THE TIME OF LANDSCAPE CONSTRUCTION DRAWINGS ACTUAL LOCATIONS, QUANTITIES, SIZES, AND SPECIES SHALL BE DETERMINED AND WILL BE PER CITY CODES.
- ALL TREES USED WITHIN THIS PROJECT SHALL BE NURSERY GROWN OR SALVAGED FROM ON SITE. EXACT LOCATIONS AND QUANTITIES SHALL BE DETERMINED ON LANDSCAPE CONSTRUCTION DRAWINGS. ALL EXISTING TREES SHALL BE PROTECTED DURING CONSTRUCTION.
- ALL LANDSCAPE AREAS SHALL RECEIVE AN AUTOMATIC IRRIGATION SYSTEM.
- ALL PLANT MATERIAL SHALL BE INSTALLED PER CITY REQUIREMENTS. PLANT MATERIAL INSTALLED WITHIN SIGHT DISTANCE TRIANGLES SHALL BE OF A SPECIES THAT DOES NOT GROW TO A HEIGHT OF MORE THAN 30" AND SHALL BE MAINTAINED PER CITY REQUIREMENTS.
- ALL NON-TURF AREAS SHALL RECEIVE A 2" DEPTH OF DECOMPOSED GRANITE.
- THE RETENTION SHOWN ON THE PLANS IS CONCEPTUAL IN NATURE. REFER TO THE ENGINEERING PLANS FOR ACTUAL GRADING AND DRAINAGE CONFIGURATIONS.
- ALL EARTHWORK WILL BE DONE TO DRAIN AWAY FROM SIDEWALKS AND STRUCTURES.
- FINAL SITE PLAN CONFIGURATION MAY VARY AT THE TIME OF FINAL PLAT APPROVAL.
- ADDITIONAL PLANT MATERIAL MAY BE INTRODUCED AS DIFFERENT VARIETIES BECOME AVAILABLE THROUGH LOCAL NURSERIES AND IF THEY ARE CONSISTENT WITH THE OVERALL THEME OF THIS PROJECT.

ACCENTS



BLUE ELF ALOE



BRAKELIGHTS RED YUCCA



DEER GRASS



NASHVILLE GRASS



GOPHER PLANT



MEDICINAL ALOE

SHRUBS



LA JOLLA BOUGAINVILLEA



BAJA RUELLIA



CHUPAROSA



PETITE PINK OLEANDER

GROUND COVER



BUSH MORNING GLORY



DWARF BOTTLEBRUSH



NEW GOLD LANTANA



PURPLE TRAILING LANTANA

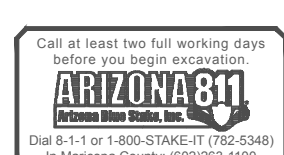


TRAILING ROSEMARY

PRELIMINARY PLANTING PLAN

SCALE: 1"=60'-0"

0 15' 30' 60' 120'



COLLABORATIVE V
DESIGN STUDIO INC.
7116 EAST 1ST AVE.,
SUITE 103
SCOTTSDALE, ARIZONA
85251
OFFICE: 480-347-0590
FAX: 480-656-6012



EXPIRES 06/30/2022

LANDSCAPE IMPROVEMENTS MOUNTAIN VISTA MARKETPLACE

NWC of US 60 and Signal Butte - Mesa, AZ

PRELIMINARY PLANTING PLAN

DESIGNED BY: PV/SH
DRAWN BY: SH
CHECKED BY: PV / MD
DATE: APRIL 8, 2020
REVISIONS: CITY COMMENTS
APRIL 24, 2020
SITE PLAN REVISIONS
JUNE 3, 2020

MOUNTAIN VISTA
MARKETPLACE

L1.10

Preliminary Drainage Report

For

Parcel A Mountain Vista Marketplace

NWC of US 60 and Signal Butte Road
Mesa, Arizona

April 6, 2020

BCE Project Number: 154016



Prepared By:

Beck Consulting Engineers, Inc.

2942 N. 24th Street, Ste. 114

Phoenix, Arizona 85016

(602) 943-6200



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2.4 Collection and Conveyance 4

2.5 Curb Opening and Scupper Sizing..... 4

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2.7 Storm Drain Sizing 5

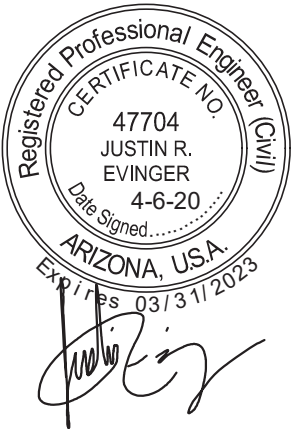
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- APPENDIX A: FEMA FIRM 04013C2315L
- APPENDIX B: PRELIMINARY GRADING & DRAINAGE PLAN
- APPENDIX C: DRAINAGE CALCULATIONS
- APPENDIX D: NOAA ATLAS 14 DATA

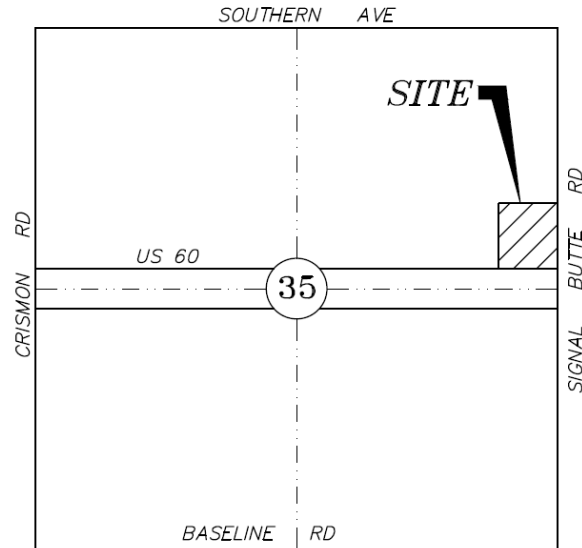


1.0 INTRODUCTION

1.1 Location

The site is located on the northwest corner of US 60 and Signal Butte Road and is more particularly described Lot 1L and a portion of Lot 1A per the final plat for Mountain Vista Marketplace recorded in Book 954, Page 327 MCR, as shown on the ALTA prepared by EPS Group dated 1-14-20, and is located within the northeast quarter of Section 35, Township 1 North, Range 6 East of the Gila and Salt River Meridian, City of Mesa, Maricopa County, Arizona. The site consists of approximately 15 acres. This parcel will be created via a Plat and has been designated as “Parcel A” within the overall master planning documents for Mountain Vista.

1.2 Vicinity Map



1.3 Purpose and Objectives

The purpose of this report is to outline the drainage methods and quantify the drainage design for the development of Parcel A. The objective of this report is to provide a drainage design in accordance with the documents outlined in Section 4 of this report.

1.4 Executive Summary

The proposed development will consist of a 15 acre commercial subdivision with separate commercial buildings and associated parking fields, vehicular access drives and stormwater/water/sewer infrastructure. The stormwater management methods will be in accordance with the City of Mesa and Maricopa County requirements.

1.5 Special Conditions

NPDES Compliance:

This site will be required to comply with the National Pollutant Discharge Elimination System requirements. Site disturbance is greater than 1.0 acre and an ADEQ NOI will be filed as a part of this project. Pollutant discharge mitigation will conform to the methods as outlined in a Stormwater Pollution Prevention Plan (SWPPP) as a part of the Construction General Permit (CGP).

404 Permits:

This site will comply with Section 404 of the Clean Water Act. This site does not contain washes classified as 404.

1.6 FEMA Flood Zone Classification

This site is not located within a special hazard flood zone. According to the national flood insurance program, Flood Insurance rate map number 04013C2315L, dated October 16, 2013, this parcel lies within Zone "X", defined as areas determined to be outside of the 0.2% annual floodplain. See FEMA FIRM in Appendix A.

2.0 DATA ANALYSIS METHODS

2.1 Existing Conditions

The existing site is 15 acres of undeveloped land that was previously rough graded for a project that was never constructed. The site consists of sloping earthen terrain draining from northeast to southwest. There is existing underground infrastructure installed including a water main loop, sanitary sewer and approx. 1,720 LF of 6 ft diameter retention tanks and storm drain stubs.

2.2 Proposed Conditions

The site will be developed with stormwater management methods in accordance with Scottsdale and Maricopa County requirements.

Collection and conveyance of the 100-year storm event will be provided. Storm drain and additional underground retention tanks will be installed. The existing underground retention tanks will be utilized and modified as needed to be interconnected with the proposed tanks.

Retention for the adjacent offsite $\frac{1}{2}$ r/w of Signal Butte Rd and E Hampton Rd will be provided onsite.

2.3 Hydrologic and Hydraulic Procedures

Chapter 8 of the City of Mesa EDS&PM was utilized for the drainage design. Additionally, The Maricopa County Drainage Design Manual – Hydrology and Hydraulics was used as a reference. Summary as follows:

- Runoff Coefficient: Per Table 8.1, EDSPM
- Peak Flows: In the Final report, the peak 100-year runoff will be calculated for each proposed drainage sub-area utilizing the Rational Equation ($Q=CIA$). The rainfall intensity will be calculated utilizing the I-D-F Equation 9.1 from the FCDMC Hydrology Manual.

2.4 Collection and Conveyance

The proposed onsite stormwater collection and conveyance will be achieved via sheet flow, curb and gutter with curb openings, storm drain inlets, scuppers and storm drains. The peak 100-year runoff will be calculated for each proposed drainage sub-area utilizing the I-D-F Equation 9.1 from the FCDMC Hydrology Manual. These flows were used to size the hydraulic structures.

2.5 Curb Opening and Scupper Sizing

The minimum curb opening length will be calculated utilizing the weir equation, assuming a maximum allowable ponding depth of 6 inches for the 100-Year peak flow.

2.6 Storm Drain Inlet Sizing

The proposed project will utilize MAG 537 Type G storm drain inlets. All inlets will be sized to accommodate the 100-year storm event with an associated ponding and to ensure a minimum capture ratio of 0.5 (factor of safety of 2) is achieved per the recommendations outlined in ADOT Roadway Design Guidelines, May 2012, Rev. April 2014, Table 606.2.

2.7 Storm Drain Sizing

The proposed site will include underground storm drain installation. The onsite proposed storm drain system will be designed to convey the 100-year peak runoff to the onsite retention basins with no inlet surcharge. The proposed storm drain will be designed utilizing the Manning's Equation for pipes flowing full to ensure adequate capacity and conformance with the velocity constraints (between 2 fps and 10 fps) per 807.25.4 EDSPM.

2.8 Stormwater Storage

The site will provide retention for the 100 year, 2 hour storm event via underground tanks in accordance with Section 806.17 EDSPM. Retention for the adjacent offsite ½ r/w of Signal Butte Rd and E Hampton Rd will be provided onsite. Retention volume was determined utilizing the following formula (EDSPM 806.13.1):

$$V_{\text{Required}} = C(D/12)A$$

Where:

V = 100 year, 2 hour volume

C = runoff coefficient (per Table 8.1, EDSPM)

P = 100 year, 2 hour Rainfall Depth = 2.18" (NOAA Atlas 14, see Appendix D)

A = Drainage area

2.9 Stormwater Disposal

The stormwater will be disposed within 36 hours via gravity bleed-off in accordance with 806.21.3 EDSPM. The retention tanks will have a gravity line connected to the existing storm drain system that will then drain to an existing ADOT channel along US 60, being designed as a part of the master plan by Others.

3.0 SUMMARY AND CONCLUSIONS

The drainage design for the proposed development presented in this report is in conformance with the design standards listed in Section 4 of this report. The proposed design provides adequate stormwater conveyance for the developed condition.

4.0 REFERENCES

City of Mesa EDS&PM, Chapter 8, issued 2017

Federal Emergency Management Agency, Flood Insurance Rate Map of Maricopa County, Arizona and Incorporated Areas. FIRM No. 04013C2315L dated October 16, 2013.

Flood Control District of Maricopa County. "Drainage Design Manual for Maricopa County Hydrology". 4th Edition, Dated August 15, 2013 and approved on September 9, 2013.

Flood Control District of Maricopa County. "Drainage Design Manual for Maricopa County Hydraulics". 3rd Edition, Dated August 15, 2013 and approved on September 19, 2013.

APPENDIX A: FEMA FIRM 04013C2315L

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee, See Notes, Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **3/22/2020 at 3:03:18 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



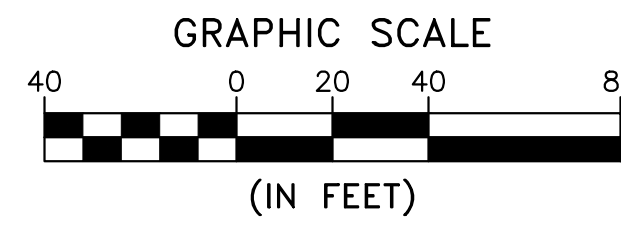
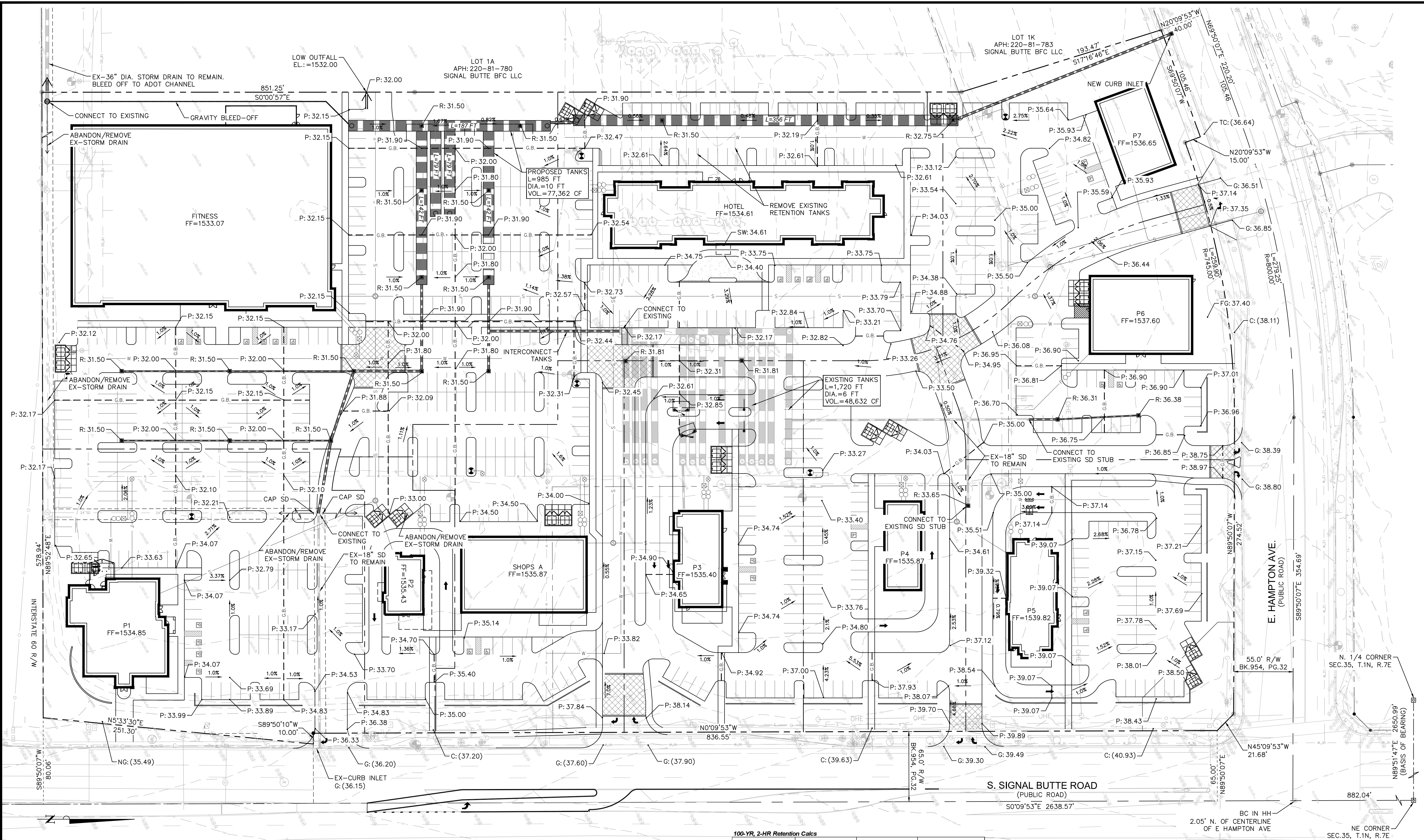
USGS The National Map: Orthoimagery. Data refreshed April, 2019.

1:6,000

33°23'10.28"N

111°35'35.95"W

APPENDIX B: PRELIMINARY GRADING AND DRAINAGE PLAN



BENCHMARK
CITY OF MESA BENCHMARK, A BRASS TAG @ TOP OF CURB NORTH ANGLE POINT AT THE NORTHEAST CORNER OF THE INTERSECTION OF SIGNAL BUTTE ROAD & SOUTHERN AVENUE.
ELEVATION = 1545.85' (NAVD 88' CITY OF MESA DATUM)

BASIS OF BEARING
THE NORTH LINE OF THE NORTHEAST QUARTER OF SECTION 35, TOWNSHIP 1 NORTH, RANGE 7 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA, BEARING BEING N 89°51'47" E, AS SHOWN ON THE FINAL PLAT OF MOUNTAIN VISTA MARKETPLACE PHASE 1, BEING RECORDED IN BOOK 1400, PAGE 32 OF MARICOPA COUNTY RECORDS.

FEMA FLOOD ZONE
REVIEW OF THE FEMA FLOOD INSURANCE RATE MAP 04013C2315L DATED 10/16/2013, INDICATED THAT THE SITE LIES WITHIN ZONE "X": "AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE."

100-YR, 2-HR Retention Calcs

Drainage Area ID	Runoff Coefficient	Drainage Area (sf)	Volume Required (CF)
Onsite	0.90	653,126.5	106,786
Hampton Ave 1/2 R/W	0.95	34,474.4	5,950
Signal Butte 1/2 R/W	0.95	76,387.8	13,183
Retention Required =		125,919	
Retention Provided =		125,994	

Retention Volume Required Equation

$V = (C_w D^2 A) / 12$
V = runoff volume from the drainage area to be retained (CF)
C_w = Weighted runoff coefficient (calculated per Table 8.1 EDSPM-Mesa)
D = 2.18 inches (per 100-YR, 2-HR NOAA Atlas 14)
A = drainage area in (SF)

- LEGEND**
- EASEMENT LINE
 - CENTERLINE
 - PROPERTY LINE
 - EXISTING CONTOUR LINE
 - PROPOSED CONTOUR LINE
 - EXISTING STORM DRAIN
 - NEW STORM DRAIN
 - G.B. --- GRADE BREAK
 - STORM DRAIN CATCH BASIN
 - PROPOSED ELEVATION
 - EXISTING ELEVATION

2942 N. 24TH STREET
SUITE #114
PHOENIX, AZ 85016
PHONE: (602) 943-6200
FAX: (602) 943-6201

beck
consulting engineers

SCALE (H): 1"=40'
SCALE (V):

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: 03/12/20

PRELIMINARY GRADING & DRAINAGE PLAN
PARCEL A - MOUNTAIN VISTA MARKETPLACE
NWC OF US 60 AND SIGNAL BUTTE RD
MESA, ARIZONA

NO.	DATE	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER
CERTIFICATE NO. 47704
JUSTIN R. EVINGER
ARIZONA, USA
EXPIRATION DATE 03/31/2023

PROJECT NO.
154016

1 OF 1

APPENDIX C: DRAINAGE CALCULATIONS

100-YR, 2-HR Retention Calcs

Drainage Area ID	Runoff Coefficient	Drainage Area (sf)	Volume Required (cf)
Onsite	0.90	653,126.5	106,786
Hampton Ave 1/2 R/W	0.95	34,474.4	5,950
Signal Butte 1/2 R/W	0.95	76,387.8	13,183
Retention Required =			125,919

Retention Volume Required Equation:

$$V = (C_w \cdot D \cdot A) / 12$$

V = runoff volume from the drainage area to be retained (CF)

C_w = Weighted runoff coefficient (calculated per Table 8.1 EDSPM-Mesa)

D = 2.18 inches (per 100-YR, 2-HR NOAA Atlas 14)

A = drainage area in (SF)

Underground Retention Provided

Tank ID	d (FT)	L (LF)	R _p (CF)
Existing (to remain)	6.0	1,720.0	48,632
Proposed	10.0	985.0	77,362
Volume Provided =			125,994
Volume Required =			125,994
Surplus =			0

Retention Provided =

Where:

$$(R_p) = \pi \times (d/2)^2 \times L$$

d = retention pipe diameter

L = length of retention pipe

R_r = Retention Required

APPENDIX D: NOAA ATLAS 14 DATA



NOAA Atlas 14, Volume 1, Version 5
Location name: Mesa, Arizona, USA*
Latitude: 33.3887°, Longitude: -111.5994°
Elevation: 1536.16 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 & aeriels](#)

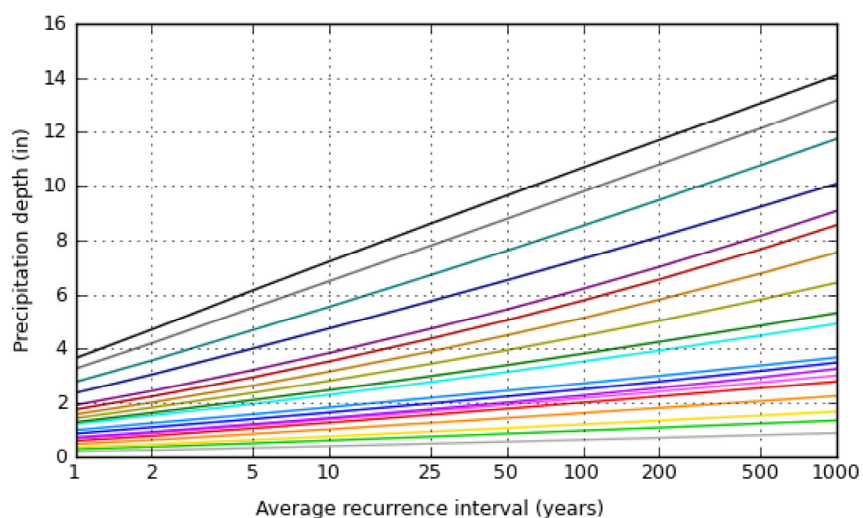
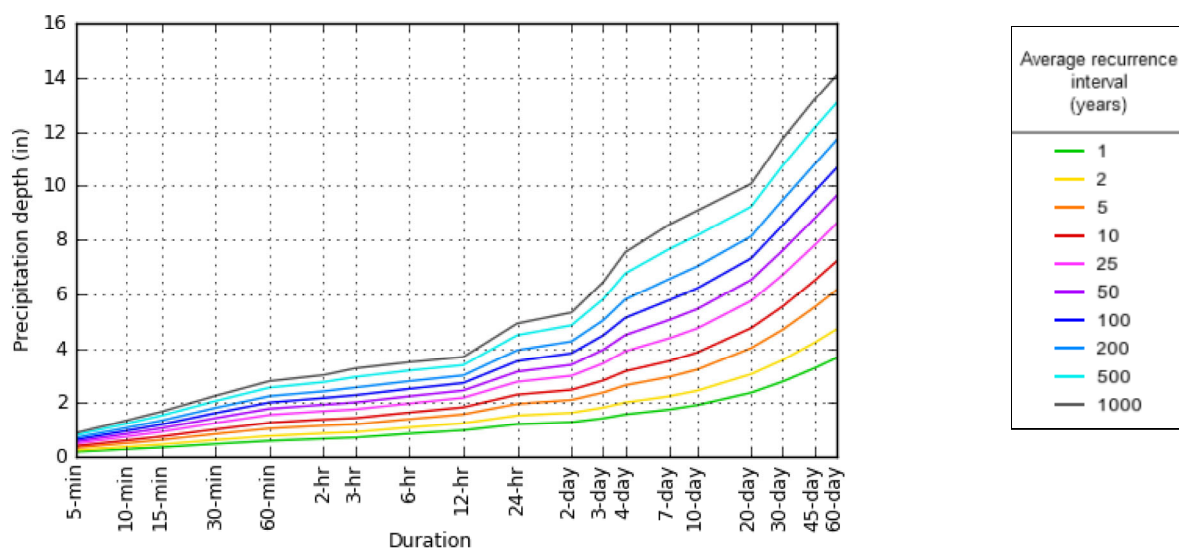
PF tabular

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	0.191 (0.161-0.235)	0.249 (0.210-0.308)	0.337 (0.282-0.414)	0.405 (0.336-0.495)	0.498 (0.407-0.604)	0.569 (0.459-0.688)	0.642 (0.508-0.774)	0.716 (0.557-0.863)	0.816 (0.618-0.983)	0.892 (0.662-1.08)
10-min	0.291 (0.244-0.358)	0.379 (0.320-0.468)	0.514 (0.429-0.630)	0.617 (0.512-0.753)	0.757 (0.619-0.920)	0.866 (0.698-1.05)	0.977 (0.773-1.18)	1.09 (0.848-1.31)	1.24 (0.941-1.50)	1.36 (1.01-1.64)
15-min	0.361 (0.303-0.444)	0.470 (0.397-0.580)	0.637 (0.532-0.781)	0.764 (0.635-0.933)	0.939 (0.767-1.14)	1.07 (0.866-1.30)	1.21 (0.959-1.46)	1.35 (1.05-1.63)	1.54 (1.17-1.85)	1.68 (1.25-2.03)
30-min	0.486 (0.408-0.598)	0.634 (0.534-0.781)	0.858 (0.716-1.05)	1.03 (0.854-1.26)	1.26 (1.03-1.54)	1.45 (1.17-1.75)	1.63 (1.29-1.97)	1.82 (1.42-2.19)	2.07 (1.57-2.50)	2.27 (1.68-2.74)
60-min	0.602 (0.505-0.740)	0.784 (0.661-0.967)	1.06 (0.886-1.30)	1.27 (1.06-1.56)	1.57 (1.28-1.90)	1.79 (1.44-2.16)	2.02 (1.60-2.44)	2.25 (1.75-2.71)	2.57 (1.94-3.09)	2.80 (2.08-3.39)
2-hr	0.680 (0.576-0.816)	0.881 (0.745-1.06)	1.17 (0.986-1.41)	1.40 (1.16-1.68)	1.70 (1.40-2.03)	1.94 (1.57-2.32)	2.18 (1.74-2.61)	2.43 (1.90-2.89)	2.77 (2.11-3.30)	3.03 (2.26-3.63)
3-hr	0.725 (0.611-0.883)	0.929 (0.787-1.14)	1.22 (1.02-1.49)	1.45 (1.21-1.76)	1.77 (1.45-2.13)	2.02 (1.63-2.43)	2.29 (1.82-2.76)	2.57 (2.01-3.09)	2.96 (2.24-3.56)	3.27 (2.42-3.94)
6-hr	0.870 (0.754-1.02)	1.10 (0.956-1.30)	1.41 (1.22-1.66)	1.65 (1.41-1.94)	1.98 (1.68-2.31)	2.25 (1.87-2.61)	2.52 (2.06-2.94)	2.80 (2.25-3.27)	3.19 (2.49-3.73)	3.50 (2.67-4.10)
12-hr	0.996 (0.876-1.14)	1.26 (1.10-1.44)	1.58 (1.38-1.82)	1.84 (1.60-2.10)	2.19 (1.88-2.50)	2.46 (2.09-2.80)	2.74 (2.29-3.12)	3.01 (2.49-3.44)	3.39 (2.73-3.89)	3.69 (2.91-4.25)
24-hr	1.22 (1.09-1.38)	1.54 (1.38-1.74)	1.97 (1.76-2.22)	2.31 (2.06-2.60)	2.78 (2.45-3.13)	3.15 (2.75-3.54)	3.54 (3.06-3.97)	3.94 (3.36-4.42)	4.49 (3.76-5.06)	4.92 (4.06-5.58)
2-day	1.29 (1.16-1.46)	1.64 (1.47-1.85)	2.11 (1.89-2.38)	2.49 (2.21-2.79)	3.00 (2.64-3.37)	3.40 (2.97-3.82)	3.83 (3.31-4.30)	4.26 (3.64-4.79)	4.85 (4.07-5.49)	5.32 (4.40-6.05)
3-day	1.44 (1.29-1.61)	1.83 (1.65-2.05)	2.38 (2.14-2.66)	2.83 (2.53-3.15)	3.45 (3.07-3.84)	3.95 (3.49-4.39)	4.48 (3.92-4.99)	5.03 (4.36-5.62)	5.81 (4.95-6.51)	6.43 (5.41-7.24)
4-day	1.58 (1.43-1.76)	2.02 (1.83-2.24)	2.65 (2.40-2.94)	3.17 (2.85-3.51)	3.90 (3.49-4.31)	4.50 (4.00-4.97)	5.13 (4.53-5.68)	5.81 (5.08-6.44)	6.76 (5.82-7.53)	7.54 (6.43-8.43)
7-day	1.76 (1.59-1.96)	2.25 (2.03-2.50)	2.96 (2.67-3.28)	3.54 (3.18-3.93)	4.37 (3.91-4.84)	5.05 (4.48-5.59)	5.78 (5.08-6.40)	6.55 (5.71-7.27)	7.65 (6.57-8.52)	8.55 (7.26-9.57)
10-day	1.92 (1.74-2.12)	2.45 (2.23-2.71)	3.23 (2.92-3.56)	3.85 (3.48-4.25)	4.73 (4.25-5.22)	5.45 (4.86-6.00)	6.21 (5.50-6.85)	7.01 (6.15-7.75)	8.15 (7.05-9.04)	9.07 (7.76-10.1)
20-day	2.38 (2.15-2.64)	3.06 (2.77-3.39)	4.01 (3.63-4.44)	4.75 (4.28-5.26)	5.75 (5.16-6.35)	6.52 (5.82-7.21)	7.31 (6.49-8.10)	8.12 (7.17-9.01)	9.22 (8.05-10.3)	10.1 (8.72-11.3)
30-day	2.79 (2.53-3.07)	3.58 (3.25-3.94)	4.69 (4.25-5.16)	5.55 (5.01-6.10)	6.71 (6.03-7.37)	7.60 (6.81-8.36)	8.53 (7.60-9.39)	9.47 (8.38-10.4)	10.8 (9.42-11.9)	11.7 (10.2-13.1)
45-day	3.28 (2.97-3.62)	4.21 (3.81-4.64)	5.51 (4.99-6.09)	6.49 (5.86-7.17)	7.79 (7.00-8.60)	8.77 (7.85-9.70)	9.78 (8.71-10.8)	10.8 (9.54-12.0)	12.1 (10.6-13.5)	13.2 (11.4-14.7)
60-day	3.66 (3.33-4.03)	4.71 (4.27-5.19)	6.15 (5.57-6.78)	7.21 (6.51-7.95)	8.59 (7.74-9.48)	9.63 (8.63-10.6)	10.7 (9.53-11.8)	11.7 (10.4-12.9)	13.1 (11.5-14.5)	14.1 (12.3-15.7)
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](#)

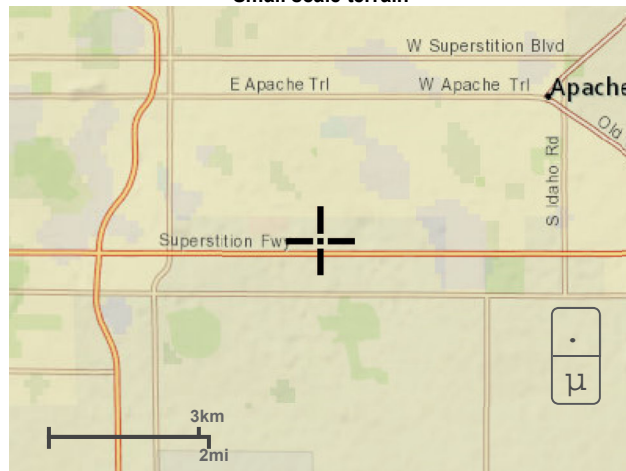
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.3887°, Longitude: -111.5994°



Maps & aerals

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

[US Department of Commerce](#)
[National Oceanic and Atmospheric Administration](#)
[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)

Preliminary Sewer Report

For

Parcel A Mountain Vista Marketplace

NWC of US 60 and Signal Butte Road
Mesa, Arizona

April 6, 2020

BCE Project Number: 154016



Prepared By:

Beck Consulting Engineers, Inc.

2942 N. 24th Street, Ste. 114

Phoenix, Arizona 85016

(602) 943-6200



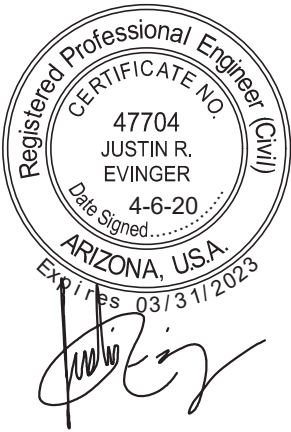
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1.3	Intent and Scope	1
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APPENDICES

Appendix A: Preliminary Utility Plan

Appendix B: Calculations



1.0 INTRODUCTION

1.1 Introduction

- Project Name: Parcel A – Mountain Vista Marketplace
- Location: NWC of US 60 and Signal Butte Road
- Sewer Service Provider: City of Mesa
- Multiple Buildings Proposed (Type VB construction):
 - P1 = 7,482 sf (commercial/retail)
 - P2 = 3,751 sf (restaurant)
 - P3 = 2,800 sf (restaurant)
 - P4 = 1,978 sf (restaurant)
 - P5 = 4,423 sf (restaurant)
 - P6 = 6,800 sf (commercial/retail)
 - P7 = 4,000 sf (commercial/retail)
 - Hotel = 54,000 sf / 100 room estimate (resort hotel)
 - Fitness Center = 40,000 sf (commercial/retail)
 - Shops A = 5,640 (commercial/retail)

1.2 Location

The site is located on the northwest corner of US 60 and Signal Butte Road and is more particularly described Lot 1L and a portion of Lot 1A per the final plat for Mountain Vista Marketplace recorded in Book 954, Page 327 MCR, as shown on the ALTA prepared by EPS Group dated 1-14-20, and is located within the northeast quarter of Section 35, Township 1 North, Range 6 East of the Gila and Salt River Meridian, City of Mesa, Maricopa County, Arizona. The site consists of approximately 15 acres. This parcel will be created via a Plat and has been designated as “Parcel A” within the overall master planning documents for Mountain Vista.

1.3 Intent and Scope

The intent of this document is to evaluate the proposed onsite, public and private sanitary sewer collection system for this commercial development. This document will define the estimated sewer demand and proposed sewer line sizes in accordance with the requirements for a General Permit, Sewage Collection System as defined in the Arizona Administrative Code, Title 18, Chapter 9, Section E301 and the 2017 City of Mesa Engineering Design Standards and Policies Manual (EDS&PM), Chapter 4 and the 2015 International Plumbing Code.

1.4 General Theory

The proposed gravity sewer line capacity is analyzed utilizing *Manning's Equation*. This is the generally accepted method used for purposes of analyzing the capacity and velocity of gravity sanitary sewer systems. See Appendix B.

1.5 Design Documentation

Sanitary Sewer Demand per Mesa EDSPM Table 4.2:

- Commercial/Retail Unit Demand: Average Daily Flow = 0.5 gpd/sf
 - Restaurant Unit Demand: Average Daily Flow = 1.2 gpd/sf
 - Resort Hotel Unit Demand: Average Daily Flow = 380 gpd/room
- Peaking Factor (Avg flow less than 1.0 mgd) = 3 (new lines)

Gravity Sanitary Sewer:

- Pipe slopes are designed with a minimum velocity of at least 2.0 feet per second and a maximum velocity of 9 feet per second, calculated flowing two thirds (2/3) full with an “n” value of 0.013.
- $d/D = 0.65$ maximum for peak flow conditions.

Per Mesa EDSPM Section 419.1

1.6 Existing Offsite Sewer

This parcel currently contains an onsite public 8” sewer main (under easement) that will be abandoned/removed. As a part of the Mountain Vista master plan, an 8” sewer main will be installed within Hampton Avenue r/w and designed to serve this parcel. This offsite main is a part of the master plan being prepared by Others. For the purposes of this report, the Hampton Ave sewer main is considered existing as it will need to be constructed prior to the development of this parcel.

2.0 PROPOSED CONDITIONS

2.1 Onsite Sewer

There is a proposed 8” dia. public sewer main extension (under existing easement) being proposed onsite. The proposed gravity service lines for each building are anticipated to require a

single 6" diameter sanitary waste line. The restaurants will likely also require a 4" diameter grease waste line to an external grease interceptor for each building. The grease waste line will connect to a grease interceptor prior to connecting to the sanitary waste line. The public sewer main will be designed and installed per City of Mesa and MAG standards, the services will be in accordance with the International Plumbing Code.

3.0 CONCLUSIONS

3.1 Conclusions

The proposed onsite sewer service, as designed, is anticipated to be adequate to serve the proposed project and is in conformance with the requirements outlined in the documents referenced in Section 4 of this report.

4.0 REFERENCES

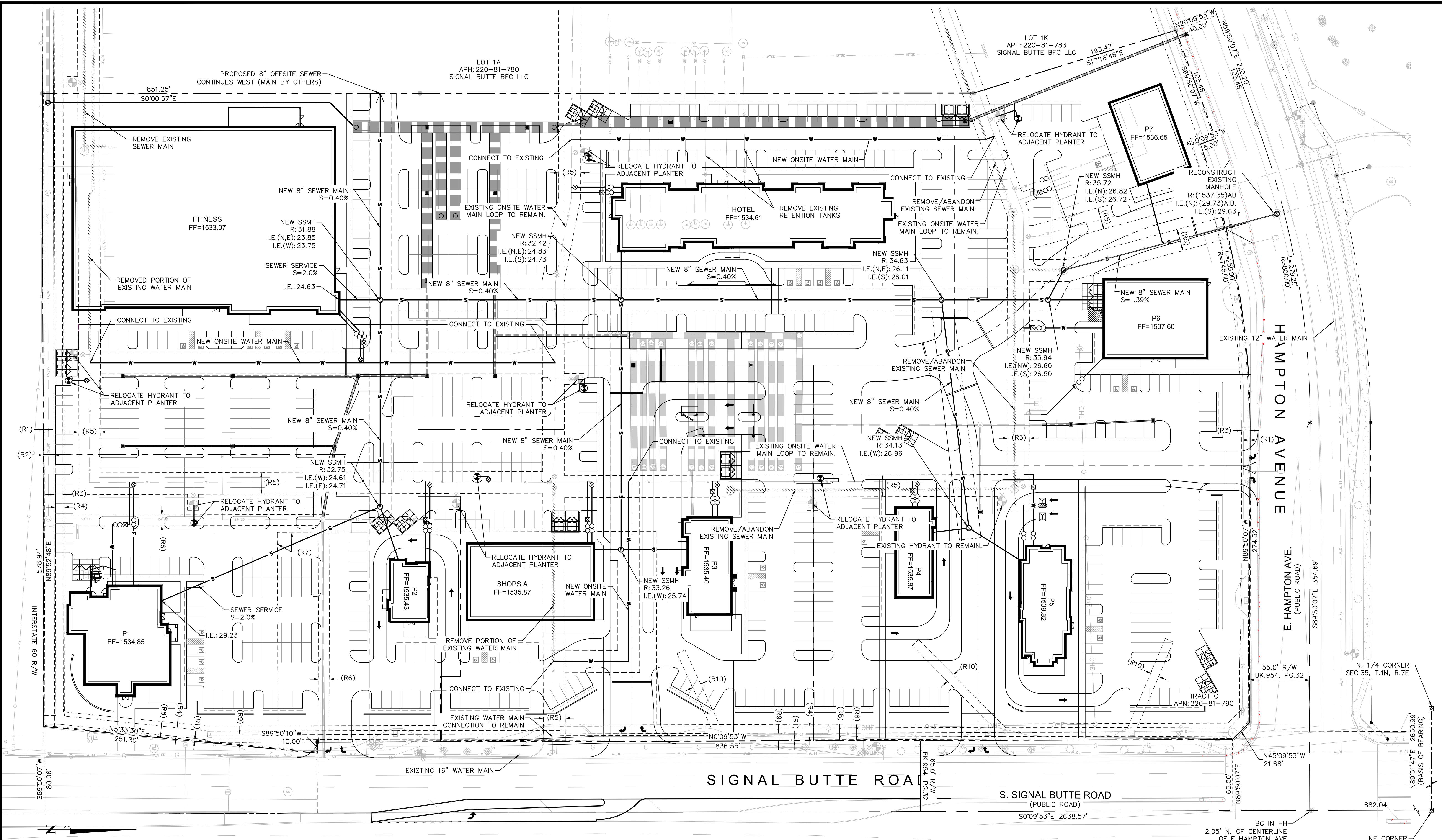
City of Mesa EDS&PM, Chapter 4, issued 2017.

Arizona Administrative Code, Title 18. Environmental Quality, Chapter 9. Department of Environmental Quality Water Pollution Control.

2015 International Plumbing Code

ADEQ Engineering Bulletin No. 11, dated 1978.

APPENDIX A:
Preliminary Utility Plan



GRAPHIC SCALE
40 0 20 40 80
(IN FEET)

BENCHMARK
CITY OF MESA BENCHMARK, A BRASS TAG @ TOP OF CURB NORTH ANGLE POINT AT THE NORTHEAST CORNER OF THE INTERSECTION OF SIGNAL BUTTE ROAD & SOUTHERN AVENUE.
ELEVATION = 1545.85' (NAVD 88' CITY OF MESA DATUM)

BASIS OF BEARING
THE NORTH LINE OF THE NORTHEAST QUARTER OF SECTION 35, TOWNSHIP 1 NORTH, RANGE 7 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA, BEARING BEING N 89°51'47" E, AS SHOWN ON THE FINAL PLAT OF MOUNTAIN VISTA MARKETPLACE PHASE 1, BEING RECORDED IN BOOK 1400, PAGE 32 OF MARICOPA COUNTY RECORDS.

ARIZONA 811
Call 811 or click Arizona811.com

- (R1) 1' CONTROLLED VEHICULAR ACCESS ESMT BK.954, PG.32, MCR
(R2) 10' DRAINAGE ESMT DOC. NO. 2007-1258747, MCR
(R3) 8' PUE DOC. NO. 2007-1254172, MCR
(R4) 8' SRP POWER ESMT DOC. NO. 2009-0946998, MCR
(R5) PUE DOC. NO. 2007-1254167
(R6) 10' DRAINAGE ESMT DOC. NO. 2007-1258747, MCR
(R7) TEMPORARY DRAINAGE ESMT DOC. NO. 2007-1254169, MCR
(R8) 15' PUE DOC. NO. 2007-1254172, MCR
(R9) 8' SRP POWER ESMT DOC. NO. 89-554871, MCR
(R10) 8' SRP POWER ESMT DOC. NO. 2008-934209, MCR

LEGEND	
---	EASEMENT LINE
---	CENTERLINE
---	PROPERTY LINE
W	EXISTING WATER LINE
S	EXISTING SANITARY SEWER
F	PROPOSED FIRE SERVICE LINE
W	PROPOSED WATER SERVICE LINE
S	PROPOSED SEWER SERVICE LINE
⊗	CLEANOUT
⊕	PR. FIRE HYDRANT
⊕	EX. FIRE HYDRANT
⊗ OR ⊕	EXISTING MANHOLES, VAULTS AND BOXES
⊗	WATER VALVE
⊗	WATER METER

beck
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SUITE #114
PHOENIX, AZ 85016
PHONE: (602) 943-6200
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SCALE (H): 1"=40'
SCALE (V):

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: 03/12/20

PRELIMINARY WATER & SEWER PLAN

PARCEL A - MOUNTAIN VISTA MARKETPLACE

NWC OF US 60 AND SIGNAL BUTTE RD
MESA, ARIZONA

NO.	DATE	DESCRIPTION

Professional Engineer
CERTIFICATE NO. 47704
JUSTIN R. EVINGER
ARIZONA, USA
Exp. Date 04/01/2023

PROJECT NO.
154016

1 OF 1

APPENDIX B:

Calculations

Sanitary Sewer Demand

Wastewater Source	Use	Avg. Day Demand (gpd/sf)	Avg. Day Demand (gpd/room)	number of rooms	Building Size (sf)	Avg. Day Demand (gpd)	Peaking Factor	Peak Demand (gpd)	Peak Demand (gpm)	Peak Demand (cfs)
P1	commercial	0.5	n/a	n/a	7,482	3,741	3	11,223	8	0.02
P2	restaurant	1.2	n/a	n/a	3,751	4,501	3	13,504	9	0.02
P3	restaurant	1.2	n/a	n/a	2,800	3,360	3	10,080	7	0.02
P4	restaurant	1.2	n/a	n/a	1,978	2,374	3	7,121	5	0.01
P5	restaurant	1.2	n/a	n/a	4,423	5,308	3	15,923	11	0.02
P6	commercial	0.5	n/a	n/a	6,800	3,400	3	10,200	7	0.02
P7	commercial	0.5	n/a	n/a	4,000	2,000	3	6,000	4	0.01
Hotel	Hotel	n/s	380	100	54,000	38,000	3	114,000	79	0.18
Fitness Center	commercial	0.5	n/a	n/a	40,000	20,000	3	60,000	42	0.09
Shops A	commercial	0.5	n/a	n/a	5,640	2,820	3	8,460	6	0.01
						0	3	0	0	0.00

Total = 0.40

City of Mesa EDSPM Table 4.2

Table 4.2 Commercial and Industrial Wastewater Flows	
Land Use Categories	Average Daily Flow
Commercial/Retail	0.5 gallons per day per square foot (gpd/sf)
Office	0.4 gpd/sf
Restaurant	1.2 gpd/sf
Resort Hotel (includes Site Amenities)	380 gpd/room
School without cafeteria	30 gpd/student
Schools with cafeteria	50 gpd/student
Cultural	0.1 gpd/sf

MANNING'S EQUATION FOR PIPE FLOW

Equations

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

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

$$Q = V \times A$$

Q=flow

V=velocity

A=cross sectional area of water at depth, d

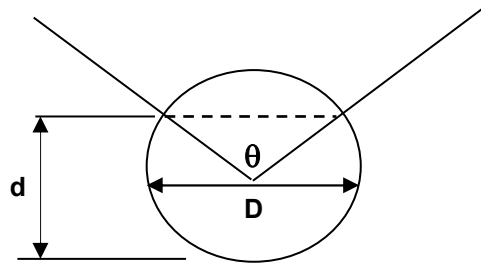
P=wetted perimeter

d=flow depth

R=hydraulic radius=A/P

S=slope of pipe

n=Manning's roughness coefficient



INPUT

D= 8 inches
d= 5.360 inches
n= 0.013 mannings coeff
S= 0.004 slope in/in

Parameters Calculated

A= 0.25 ft²
P= 1.28 ft
R= 0.19 ft
θ= 140.2 degrees

Manning's Equation Results

d/D	Velocity ft/s	Capacity cfs
0.67	2.43	0.60

Capacity Summary (d/D=0.67)

Pipe Capacity (at d/D = 0.67) = 0.60 cfs

Peak Flow = 0.40 cfs

==> CAPACITY > PEAK FLOW

Preliminary Water Report

For

Parcel A Mountain Vista Marketplace

NWC of US 60 and Signal Butte Road
Mesa, Arizona

April 6, 2020

BCE Project Number: 154016



Prepared By:

Beck Consulting Engineers, Inc.

2942 N. 24th Street, Ste. 114

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1.0 INTRODUCTION

1.1 Introduction

- Project Name: Parcel A – Mountain Vista Marketplace
- Location: NWC of US 60 and Signal Butte Road
- Water Service Provider: City of Mesa
- Multiple Buildings Proposed (Type VB construction):
 - P1 = 7,482 sf (commercial/retail)
 - P2 = 3,751 sf (restaurant)
 - P3 = 2,800 sf (restaurant)
 - P4 = 1,978 sf (restaurant)
 - P5 = 4,423 sf (restaurant)
 - P6 = 6,800 sf (commercial/retail)
 - P7 = 4,000 sf (commercial/retail)
 - Hotel = 54,000 sf / 100 room estimate (resort hotel)
 - Fitness Center = 40,000 sf (commercial/retail)
 - Shops A = 5,640 (commercial/retail)

1.2 Location

The site is located on the northwest corner of US 60 and Signal Butte Road and is more particularly described Lot 1L and a portion of Lot 1A per the final plat for Mountain Vista Marketplace recorded in Book 954, Page 327 MCR, as shown on the ALTA prepared by EPS Group dated 1-14-20, and is located within the northeast quarter of Section 35, Township 1 North, Range 6 East of the Gila and Salt River Meridian, City of Mesa, Maricopa County, Arizona. The site consists of approximately 15 acres. This parcel will be created via a Plat and has been designated as “Parcel A” within the overall master planning documents for Mountain Vista.

2.0 PROJECTED SYSTEM DEMANDS

2.1 Demand Calculations

Total ADD: 1.5 gpd/sf (Restaurant)
Total ADD: 0.2 gpd/sf (Commercial)
Total ADD: 150 gpd/room (Hotel)
Peaking Factors: MDD = 2 * ADD
PHD = 3 * ADD

Per EDSPM Table 3.1

See Appendix A for more information.

2.2 Fire Flow Requirements

Commercial:

Largest Building Size: 5,500 sf

Building Type: VB

Building Fire Flow Requirement: 5,500 gpm for 4 hours (per IFC Table B105.1)

*Building Fire Flow Requirement: 1,500 gpm for 4 hours (per IFC Section B105.1 - Exception)

** Fire flow with reduction. All buildings will be equipped with automatic sprinklers. A 75% reduction (1,500 gpm min.) per IFC B105.2 Exception will be requested.*

All buildings will be outfitted with automatic sprinkler systems.

3.0 Project Summary

3.1 Existing Offsite Infrastructure

Review of City utility atlases and as-built plans shows an existing 12" dia. public water main within the Signal Butte Rd. r.o.w. and an existing 12" dia. public water main within the E. Hampton Ave. r.o.w. There is an existing 12" and 8" public water loop (under easement) onsite that will be utilized and modified as needed to accommodate the proposed development.

3.2 Proposed Conditions

The existing onsite public water loop will be utilized and modified as needed. The water system servicing the proposed project will be modeled in the Final Water report utilizing WaterCAD, a

program developed by Bentley. The modeling program employs the fluid mechanic head loss theory known as the Hazen-Williams method. This is the generally accepted method used for purposes of evaluating municipal water distribution systems. The fire hydrant flow test resultant data will be input in the model as a 3-point pump curve and reservoir.

The proposed buildings will connect to the proposed onsite public water loop for domestic water service fire service lines. All services will connect at the onsite public main with appropriate backflow prevention and meters for the domestic, per Mesa requirements.

4.0 CONCLUSION

The proposed water infrastructure will be designed in accordance with the City of Mesa standards, the International Fire Code and NFPA, and is adequately sized to accommodate the proposed development.

5.0 REFERENCES

Arizona Administrative Code Title 18, Ch. 9, Dated Sept. 30, 2005.

City of Mesa EDS&PM, Chapter 3, issued 2017

ADEQ Engineering Bulletin No. 10, May 1978

2015 International Fire Code (IFC)

APPENDIX A:
Calculations

System Demands (Per Mesa EDSPM Table 3.1)

Building	Use	Total Use Demand (GPD/sf)	Avg. Day Demand (gpd/room)	number of rooms	Building Area (sf)	Total ADD (gpm)	Total MDD (gpm)	Total PHD (gpm)
P1	commercial	0.2	n/a	n/a	7,482	1.04	2.08	3.12
P2	restaurant	1.5	n/a	n/a	3,751	3.91	7.81	11.72
P3	restaurant	1.5	n/a	n/a	2,800	2.92	5.83	8.75
P4	restaurant	1.5	n/a	n/a	1,978	2.06	4.12	6.18
P5	restaurant	1.5	n/a	n/a	4,423	4.61	9.21	13.82
P6	commercial	0.2	n/a	n/a	6,800	0.94	1.89	2.83
P7	commercial	0.2	n/a	n/a	4,000	0.56	1.11	1.67
Hotel	Hotel	n/a	150	100	54,000	10.42	20.83	31.25
Fitness Center	commercial	0.2	n/a	n/a	40,000	5.56	11.11	16.67
Shops A	commercial	0.2	n/a	n/a	5,640	0.78	1.57	2.35
Total =						32.79	65.57	98.36

Peaking Factors:

MDD = 2 * ADD

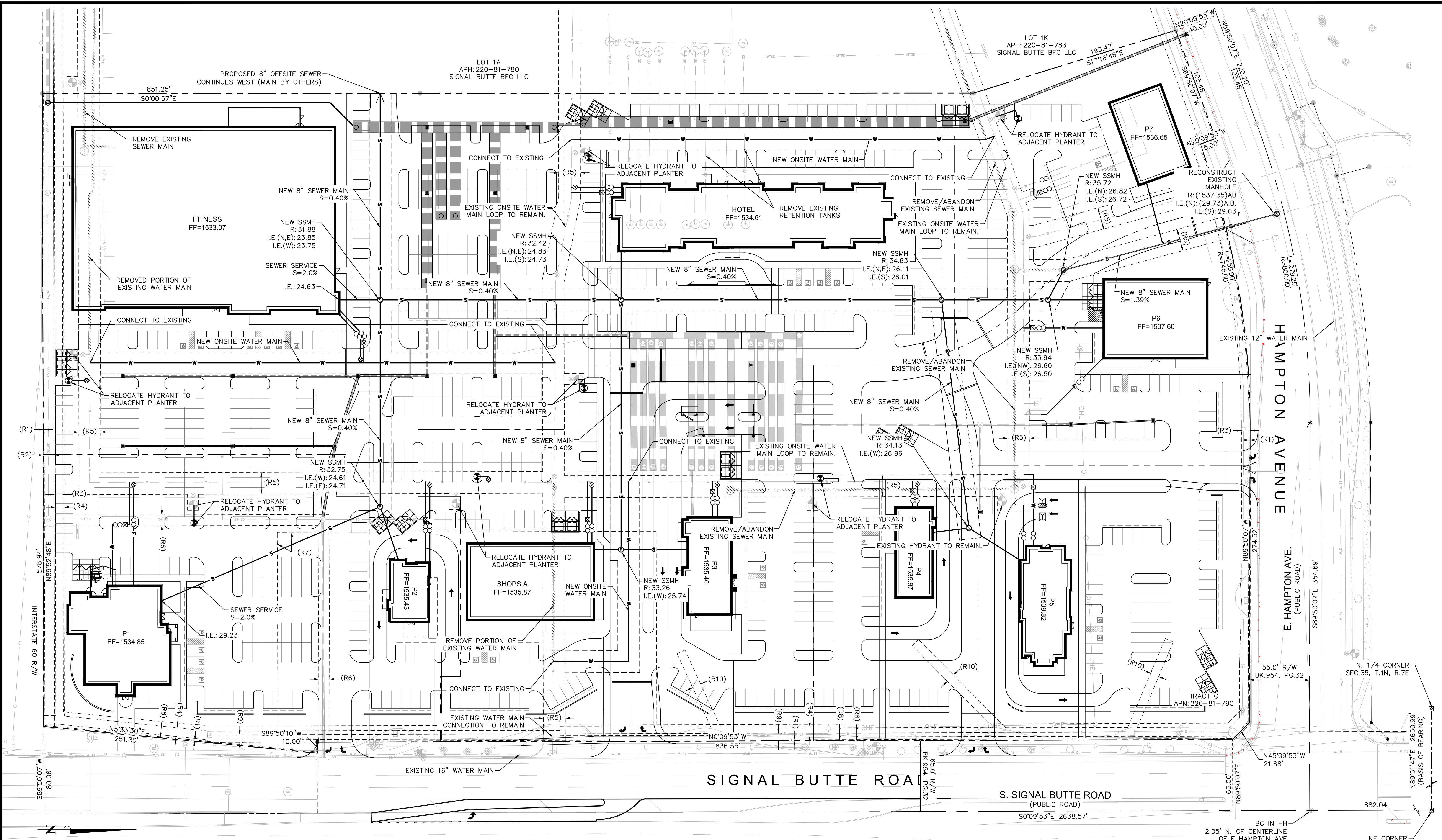
PHD = 3 * ADD

Commercial Fire Flow

Largest Building Footprint = 40,000 sf
 Construction Type = VB
 Fire Flow (gpm) = 5,500 gpm for 4 hours (per IFC Table B105.2)
***Fire Flow (gpm) 1,500** gpm for 4 hours (per IFC Section B105.1 - Exception)

**Fire flow with reduction. All buildings will be equipped with automatic sprinklers. A 75% reduction (1,500 gpm min.) per IFC B105.2 Exception will be requested.*

APPENDIX B:
Preliminary Utility Plan



GRAPHIC SCALE
40 0 20 40 80
(IN FEET)

BENCHMARK
CITY OF MESA BENCHMARK, A BRASS TAG @ TOP OF CURB NORTH ANGLE POINT AT THE NORTHEAST CORNER OF THE INTERSECTION OF SIGNAL BUTTE ROAD & SOUTHERN AVENUE.
ELEVATION = 1545.85' (NAVD 88' CITY OF MESA DATUM)

BASIS OF BEARING
THE NORTH LINE OF THE NORTHEAST QUARTER OF SECTION 35, TOWNSHIP 1 NORTH, RANGE 7 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA, BEARING BEING N 89°51'47" E, AS SHOWN ON THE FINAL PLAT OF MOUNTAIN VISTA MARKETPLACE PHASE 1, BEING RECORDED IN BOOK 1400, PAGE 32 OF MARICOPA COUNTY RECORDS.

ARIZONA 811
Call 811 or click Arizona811.com

- (R1) 1' CONTROLLED VEHICULAR ACCESS ESMT BK.954, PG.32, MCR
(R2) 10' DRAINAGE ESMT DOC. NO. 2007-1258747, MCR
(R3) 8' PUE DOC. NO. 2007-1254172, MCR
(R4) 8' SRP POWER ESMT DOC. NO. 2009-0946998, MCR
(R5) PUE DOC. NO. 2007-1254167
(R6) 10' DRAINAGE ESMT DOC. NO. 2007-1258747, MCR
(R7) TEMPORARY DRAINAGE ESMT DOC. NO. 2007-1254169, MCR
(R8) 15' PUE DOC. NO. 2007-1254172, MCR
(R9) 8' SRP POWER ESMT DOC. NO. 89-554871, MCR
(R10) 8' SRP POWER ESMT DOC. NO. 2008-934209, MCR

LEGEND	
---	EASEMENT LINE
---	CENTERLINE
---	PROPERTY LINE
W	EXISTING WATER LINE
S	EXISTING SANITARY SEWER
F	PROPOSED FIRE SERVICE LINE
W	PROPOSED WATER SERVICE LINE
S	PROPOSED SEWER SERVICE LINE
⊗	CLEANOUT
⊕	PR. FIRE HYDRANT
⊕	EX. FIRE HYDRANT
⊗ OR ⊕	EXISTING MANHOLES, VAULTS AND BOXES
⊗	WATER VALVE
⊗	WATER METER

beck
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SUITE #114
PHOENIX, AZ 85016
PHONE: (602) 943-6200
FAX: (602) 943-6201

SCALE (H): 1"=40'
SCALE (V):

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: 03/12/20

PRELIMINARY WATER & SEWER PLAN

PARCEL A - MOUNTAIN VISTA MARKETPLACE

NWC OF US 60 AND SIGNAL BUTTE RD
MESA, ARIZONA

NO.	DATE	DESCRIPTION

Professional Engineer
CERTIFICATE NO. 47704
JUSTIN R. EVINGER
ARIZONA, USA
Exp. Date 04/01/2023

PROJECT NO.
154016

1 OF 1

APPENDIX C:

Fire Hydrant Flow Test



Flow Test Summary

Project Name: EJFT 20103
Project Address: 1458 S Signal Butte Rd, Mesa, AZ 85209
Date of Flow Test: 2020-03-20
Time of Flow Test: 7:50 AM
Data Reliable Until: 2020-09-20
Conducted By: Eder Cueva & Steven Saethre (EJ Flow Tests) 602.999.7637
Witnessed By: Gary Rains (City of Mesa) 602.376.1807
City Forces Contacted: City of Mesa (602.376.1807)
Permit Number: ROW20-02586

Raw Flow Test Data

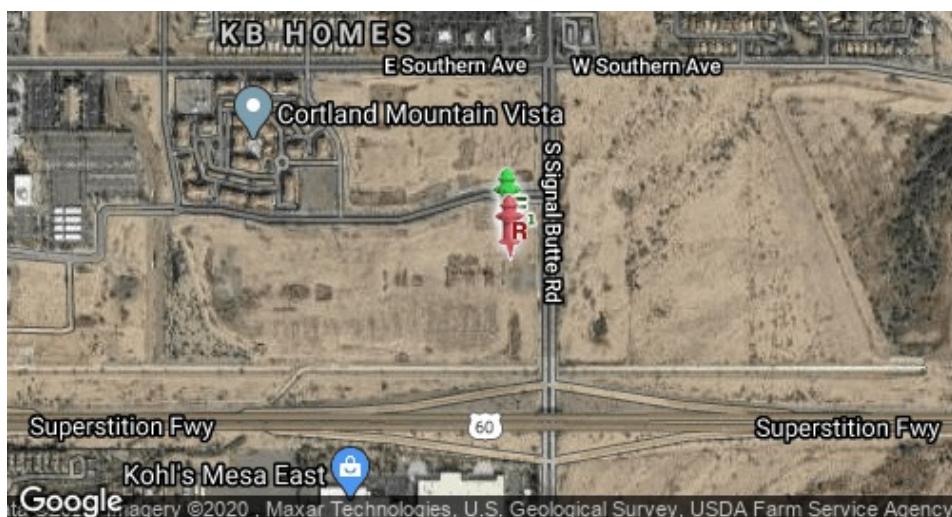
Static Pressure: 83.0 PSI
Residual Pressure: 75.0 PSI
Flowing GPM: 2,123
GPM @ 20 PSI: 6,471

Data with a 10 % Safety Factor

Static Pressure: 74.7 PSI
Residual Pressure: 66.7 PSI
Flowing GPM: 2,123
GPM @ 20 PSI: 5,996

Hydrant F₁

Pitot Pressure (1): 40 PSI
Coefficient of Discharge (1): 0.9
Hydrant Orifice Diameter (1): 2.5 inches
Pitot Pressure (2): 40 PSI
Coefficient of Discharge (2): 0.9
Hydrant Orifice Diameter (2): 2.5 inches



 Static-Residual Hydrant

 Flow Hydrant

Distance Between F₁ and R
175 ft (measured linearly)

Static-Residual Elevation
1530 ft (above sea level)

Flow Hydrant (F₁) Elevation
1534 ft (above sea level)

Elevation & distance values are approximate

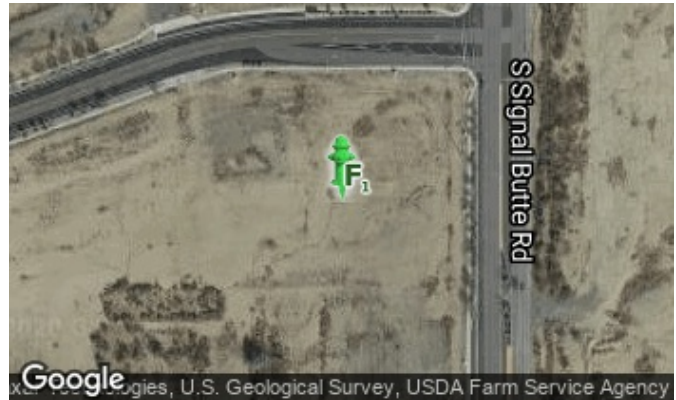
EJ Flow Tests, LLC

21505 North 78th Ave. | Suite 130 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejengineering.com
John L. Echeverri | NICET Level IV 078493 SME | C-16 FP Contractor ROC 271705 AZ | NFPA CFPS 1915
www.flowtestsummary.com

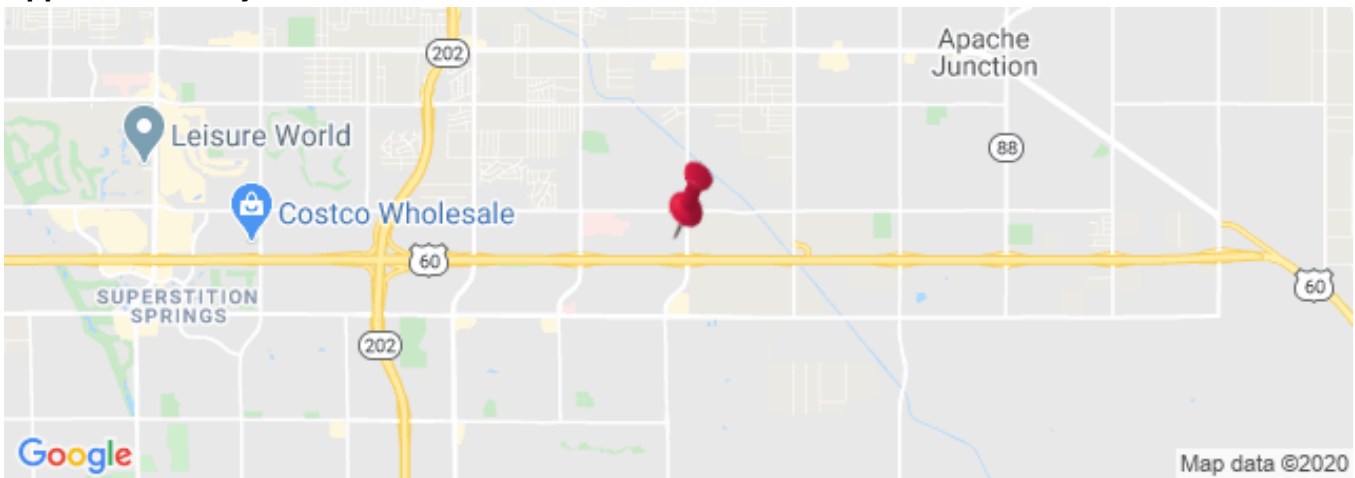
Static-Residual Hydrant



Flow Hydrant (only hydrant F1 shown for clarity)



Approximate Project Site



Water Supply Curve N^{1.85} Graph

