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Plan # _____

Case # 108-ZN-1984#2

Q-S # _____

X Accepted

____ Corrections

M.R. 10/06/2022
Reviewed By Date

Preliminary Drainage Report

For

Desert Cove Storage Facility

Scottsdale, ARIZONA

PREPARED FOR:

Ran Properties, LLC
6501 E. Greenway Parkway, 103-577
Scottsdale, Arizona 85254

8888 E. Desert Cove Avenue
Scottsdale, Arizona 85260

PREPARED BY:

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September 2022



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NOAA Atlas 14 Map

Introduction

The proposed Desert Cove Storage is located at 8888 East Desert Cove Avenue, Scottsdale, Arizona 85260. The parcel number for this project is 217-25-002Q. The proposed project consists of a self-storage building (multi-level), with 2 stories above ground, 2 basement levels, parking, curbing, refuse container, utilities, underground storm retention system, and landscaping. The proposed building is 92,300 sf in total. The Project is located on the North side of East Desert Cove Avenue, just West of North 89th Place. See Location Map below:



Figure 1: Project Location Map

The Project will not alter the existing zoning, which is I-1. The surrounding areas in this location are residential R1-7(North), I - 1 (West), and I – 1 (East). The existing site is undeveloped land, and the new building will remain consistent with the City of Scottsdale's general plan.

Design Documentation

Drainage Design is based on criteria provided in the City of Scottsdale's Design Standards & Policies Manual Chapter 4, dated 2018, and the Flood Control District of Maricopa County Volume I & II. Specifically, the criteria used are as follows:

The project is graded to convey stormwater runoff to two underground retention areas on the property. See the attached plans for reference in the appendix section of this document. The proposed retention system is sized to capture all required runoff for the 100-year 2-hour storm.

The elevations for this design are based on the survey performed by Synergy Surveying LLC., performed on June 7th, 2022. The site benchmark used is the City of Scottsdale #8194 and is a brass cap in handhole at the intersection of North 92nd Street and East Cholla Street at NAVD 88 EL = 1388.481.

Existing Conditions

The project will not alter the existing zoning, which is I-1. The existing site is currently undeveloped land.

The existing site has residential homes to the North of the property, and commercial businesses to the East, West, and South of the proposed development. The existing topography of the land slopes to the West at less than 5%.

FEMA Information

According to the FEMA Flood Insurance Rate Map (FIRM), panel number 04013C1760L. Dated October 16, 2013, the project is located within a Zone "X". Zone "X" is described as follows:

"Areas of 0.2% annual chance of flood hazard; areas of 1% annual chance of 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."

Proposed Conditions

The proposed condition includes a multi-level building with two (2) stories above ground level, and two (2) stories below ground level. Each level of the proposed facility is 23,075 SF (EA). The site will also include, parking, curbing, refuse container, utilities, underground storm retention pipe, and landscaping. The site is to have slopes of approximately 0.5-6.5%. Stormwater will be conveyed away from the building into the 10-foot diameter underground retention pipes as seen on the Grading and Drainage Plan in the Appendix. Runoff will be conveyed through the site to the catch basins, and will then be routed to the underground.

The building finish floor has been designed to be protected during the 100-year peak runoff event. The finish floor of the building is above ground level at 1380.00. The subsurface levels of the facility (basement levels) are designed to be water proof.

On-Site Retention

The on-site retention volume was determined utilizing the Rational Method, and the following equation;

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

Where:

V = Calculated Volume in CF

C = Runoff coefficient from Table 3.2

P = Rainfall depth in inches (2.21)
A = Drainage Area in SF (60,000 SF)

This equation was utilized to analyze the first flush condition, existing condition, and the proposed condition. The highest value yielded by these three is used as the proposed condition. The proposed condition, subtracted from the existing condition is the volume required to be retained on-site.

First Flush	Existing	Proposed
C= 1.00	C= 0.45	C= 0.95
P= 0.50 INCHES	P= 2.21 INCHES	P= 2.21 INCHES
A= 60,000 SF	A= 60,000 SF	A= 60,000 SF
V= 2,500 CF	V= 4,973 CF	V= 10,498 CF

The total retention required is thus $10,800 - 4,973 \text{ CF} = 5,827 \text{ CF}$ for pre vs. post conditions.
The total provided retention, via two (2) - 10' diameter underground storage tank is 10,833 CF.

The retention volume required was calculated by first determining a weighted C value coefficient. The open space area and impervious area c factors were obtained from the City of Scottsdale's Design Standards and Policies Manual Chapter 4 Figure 4.1-5. The depth and precipitation data were obtained from NOAA Atlas 14, which can be referenced in the appendix section of this document. The proposed underground retention system will include two (2) drywells to ensure drainage within 36 hours. The drywells will be governed by the City of Scottsdale Design Standards and Policy Manual and the FCD of Maricopa County Hydraulic Manual. The maintenance of the drywells will be the sole responsibility of the property owner. Bleed through outlet pipes ensure drainage within 36 hours. The calculations for the dissipation time and C factors are included in the Appendix under Calculations.

The Project has been designed to provide positive drainage away from the building. The project will convey runoff into the below ground retention system. The appendix includes the calculations for the required retention of 10,408 cubic feet and the provided retention of 10,833 cubic feet. The retention system includes outlet pipes that utilize gravity to convey runoff to the drywells and ensure the stormwater is drained from the underground retention system within 36 hours of a storm event.

The proposed underground storage tanks have a life cycle that exceeds 75 years including the lining and coating. An Operations and Maintenance Manual for the underground storage is included with this submittal. It provides a detailed breakdown of all underground Stormwater items and how they need to be maintained. The Manufacture's UG system Design Guide is also included in the Appendix of this report.

Summary

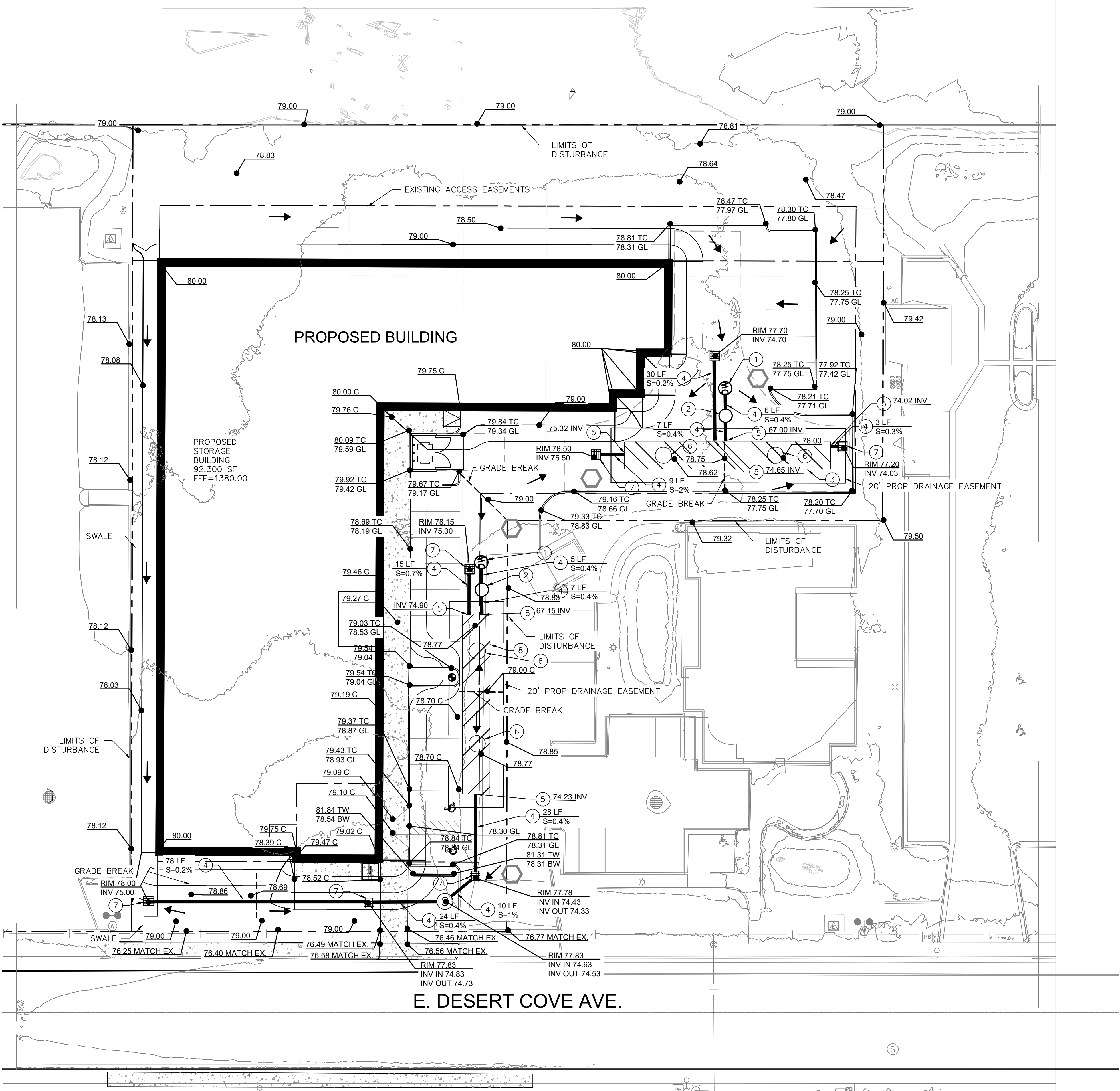
Based on the results of the Project Drainage design, the following can be concluded:

- The Project building resides in a FEMA Designated Zone X per the FIRM panel
- The required retention volume is 10,800 CF and 10,833 CF is provided via the underground retention system
- The 100-year 2-hour storm event retention has been provided for the developed condition
- The retention is dissipated within 36 hours

GRADING AND DRAINAGE PLAN

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LEGEND

- 950 --- EXISTING CONTOURS
- 950 --- PROPOSED CONTOURS - MAJOR INTERVAL
- 949 --- PROPOSED CONTOURS - MINOR INTERVAL
- GRADE BREAK LINE
- 2.0% GRADE SLOPE
- WARNING SIGNS
- FLOW ARROW
- SPOT ABBREVIATIONS:
 - TC - TOP OF CURB
 - GL - GUTTER LINE
 - B - BITUMUNOUS
 - C - CONCRETE
 - EO - EMERGENCY OVERFLOW
 - TW - TOP OF WALL
 - BW - BOTTOM OF WALL (F/G)
 - (*) - EXISTING TO BE VERIFIED

GRADING NOTES

- Tree protection consisting of snow fence or safety fence installed at the drip line shall be in place prior to beginning any grading or demolition work at the site.
- All elevations with an asterisk (*) shall be field verified. If elevations vary significantly, notify the Engineer for further instructions.
- Grades shown in paved areas represent finish elevation.
- Restore all disturbed areas with 4" of good quality topsoil and seed.
- All construction shall be performed in accordance with state and local standard specifications for construction.

GRADING CONSTRUCTION NOTES

INSTALL MAXWELL PLUS DUAL CHAMBER DRYWELL. REFER TO ATTACHED CONTECH DETAILS SHEET C4-P5

INSTALL ACCESS COVER WITH MARKINGS. REFER TO ATTACHED CONTECH DETAILS. C4-P4

INSTALL CONTECH 10" DIAMETER UNDERGROUND CORRUGATED STEEL PIPE 75 LF TOP=76.75 - BTM=66.75. PIPE TO HAVE SMOOTH INTERIOR FINISH BOTTOM PER MANUFACTURER'S SPECIFICATIONS ON CONTECH DETAILS PER MAG STD DTL 2254. ACCESS MANHOLE MARKINGS PER CONTECH DETAILS. SEE CONTECH DETAILS FOR PROFILE BOTTOM OF PIPE TO BE SLOPED TO DRYWELL BLEED OFF PIPE. SEE DETAIL ON PAGE C4 - P2.

INSTALL 12" PVC STORM DRAIN PIPE, LENGTH PER PLAN

CONNECT 12" HDPE OR CSP OUTLET W/ SMOOTH SLEEVE ADAPTOR FITTING

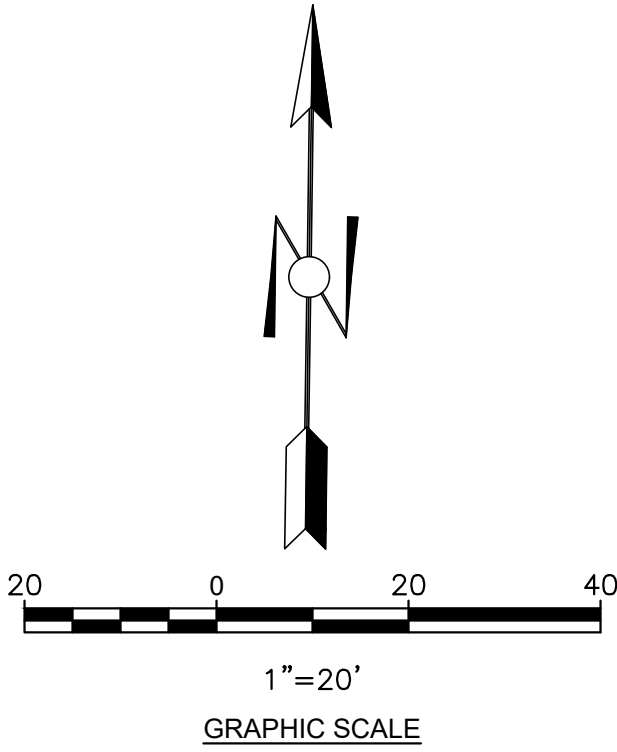
INSTALL GRATED ACCESS COVER/INLET. REFER TO ATTACHED CONTECH DETAIL ON PAGE C5.

INSTALL MAG 535 CATCH BASIN

INSTALL CONTECH 10" DIAMETER UNDERGROUND CORRUGATED STEEL PIPE 65 LF TOP=76.77 - BTM=66.77. PIPE TO HAVE SMOOTH INTERIOR FINISH BOTTOM PER MANUFACTURER'S SPECIFICATIONS ON CONTECH DETAILS PER MAG STD DTL 2254. ACCESS MANHOLE MARKINGS PER CONTECH DETAILS. SEE CONTECH DETAILS FOR PROFILE BOTTOM OF PIPE TO BE SLOPED TO DRYWELL BLEED OFF PIPE. SEE DETAIL ON PAGE C4 - P2.

BENCHMARK:

CITY OF SCOTTSDALE BENCHMARK #8194 BRASS CAP IN HANDHOLE AT INTERSECTION OF NORTH 92ND STREET AND EAST CHOLLA STREET. ELEVATION = 1388.481 (NAVD88 DATUM).



Rev.	Date	Description

Project #: 62220035
Drawn By: JL
Checked By: DC
Issue Date: 09.08.2022
Sheet Title:

GRADING PLAN

C2

Sheet:

CALCULATIONS

Desert Cove Self Storage			
Retention Calculations			
Volume Storage (CF)	Percolation Rate Drywell (cfs)	Percolation Time (hours)	Drywells Req'd (EA)
10833.00	0.10	30.1	1.0

Desert Cove Self Storage				
1st Flush Calculations				
Total Area (SF)	D (IN)	C	*Required Retention Volume (CF)	Retention Provided (CF)
60000	0.5	0.79	23700	10833
*First Flush Required=C(P/12)A				

Desert Cove Self Storage							
Retention Calculations							
Disturbed Area (SF)	*D (IN)	C Factor (Proposed)	C Factor (Existing)	RETENTION VOLUME Proposed Condition (CF)	RETENTION VOLUME Existing Condition (CF)	** REQUIRED RETENTION VOLUME (CF)	RETENTION PROV'D (CF)
60,000	2.21	0.95	0.45	10,800	4,973	10,800	10,833
*D from City of Scottsdale Isopluvial Map located in Appendix, C factor from Scottsdale Design Standards Manual Page 20 Included in Appendix							
**Retention required = C*D/12*A							

UNDERGROUND STORAGE DESIGN GUIDE

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PROJECT SUMMARY

CALCULATION DETAILS

- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 55 LF

STORAGE SUMMARY

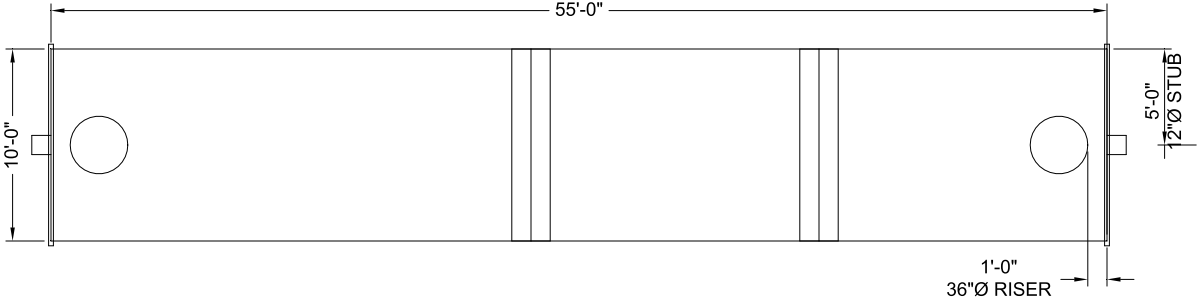
- STORAGE VOLUME REQUIRED = 4,317 CF
- PIPE STORAGE VOLUME = 4,320 CF
- BACKFILL STORAGE VOLUME = 0 CF
- TOTAL STORAGE PROVIDED = 4,320 CF

PIPE DETAILS

- DIAMETER = 120"
- CORRUGATION = 5x1
- GAGE = 14
- COATING = ALT2
- WALL TYPE = SOLID
- BARREL SPACING = 36"

BACKFILL DETAILS

- WIDTH AT ENDS = 12"
- ABOVE PIPE = 36"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2²/₃" x 1¹/₂" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 10'

C:\EXPORT\TEMPLATES\CMP_V8.DWG 10/18/2019 10:02 AM


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If discrepancies between the supplied information upon which the drawing is based and actual field conditions are encountered as site work progresses, these discrepancies must be reported to Contech immediately for re-evaluation of the design. Contech accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.		
DATE	REVISION DESCRIPTION	BY



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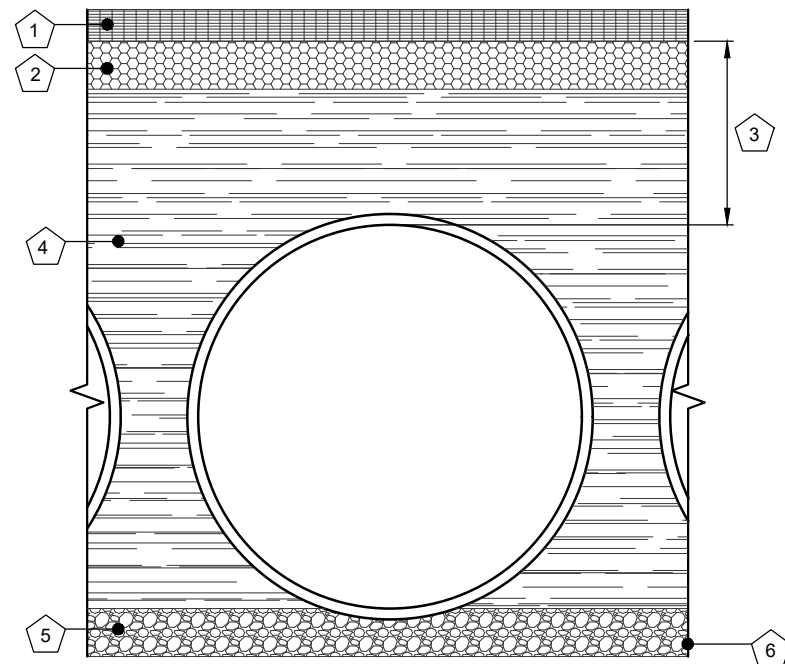


CMP DETENTION SYSTEMS

CONTECH
DYODS
DRAWING

DYO19120 Desert Self Storage
URS-1
Scottsdale, AZ
DETENTION SYSTEM

PROJECT No.: 12362	SEQ. No.: 19120	DATE: 7/14/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.:		1



KEY

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 96"
18" MIN. FOR DIAMETERS FROM 102"
AND LARGER MEASURED TO TOP OF RIGID
OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145
A1, A2 OR A3, OR APPROVED EQUAL.
PLACED IN 8" LIFTS (COMPACTED TO MIN.
90% STANDARD DENSITY PER AASHTO T99.)
INCLUDING 3/8" MINUS ANGULAR STONE
5. GRANULAR BEDDING, ROUGHLY SHAPED TO
FIT THE BOTTOM OF PIPE, 4" TO 6" IN DEPTH
6. CONTECH C-40 OR C-45 NON-WOVEN
GEOTEXTILE REQUIRED TO WRAP ENTIRE TRENCH.

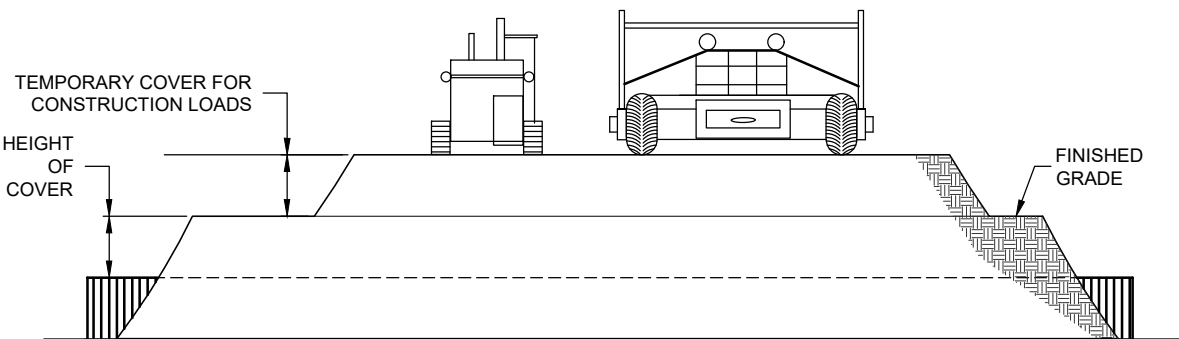
FOUNDATION/BEDDING PREPARATION

PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4" - 6" OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M145, OR A WELL-GRADED GRANULAR FILL AS APPROVED BY THE SITE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

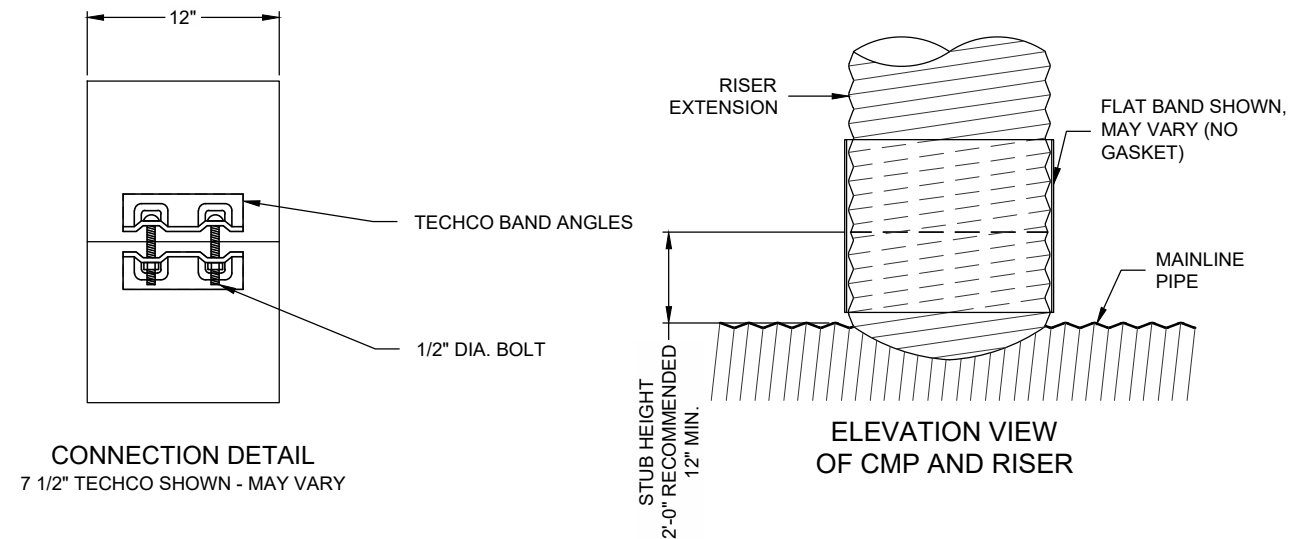
PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
MINIMUM COVER (FT)				
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

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11815 NE Glenn Widing Drive, Portland, OR 97220
800-548-4667 503-240-3393 800-561-1271 FAX

ARIZONA CMP DETENTION
STANDARD DETAIL

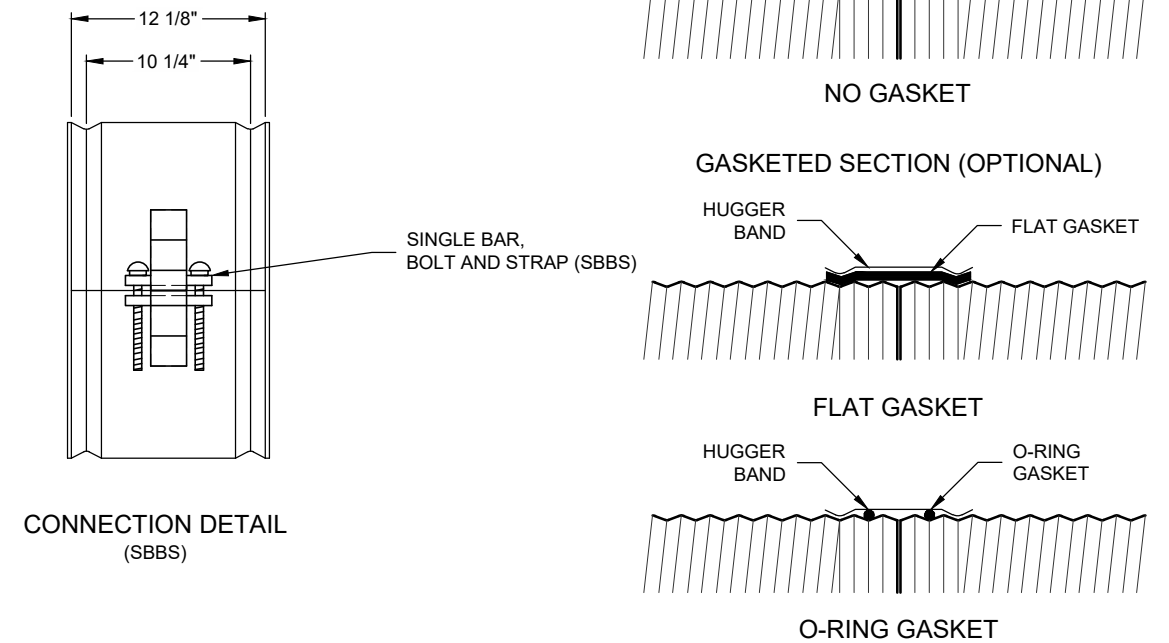


PLAIN END CMP RISER PIPE

GENERAL NOTES:

1. **DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.**
2. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
3. BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
4. IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
5. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" 2-PIECES
6. ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
7. MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
8. DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

12" RISER BAND DETAIL NOT TO SCALE

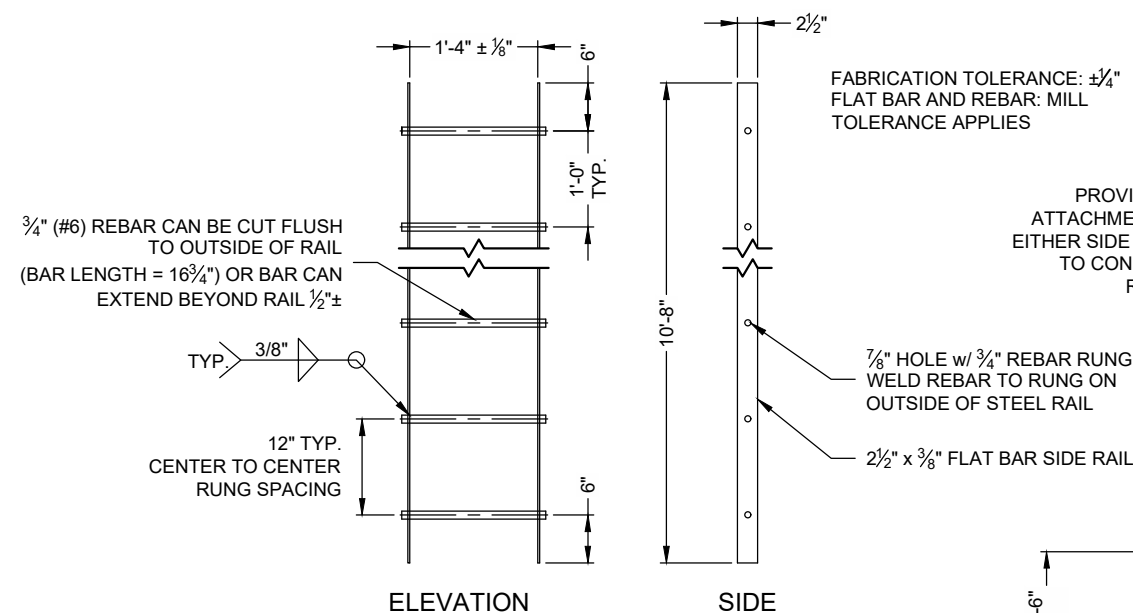


2 2/3"x1/2" RE-ROLLED END HEL-COR PIPE

GENERAL NOTES:

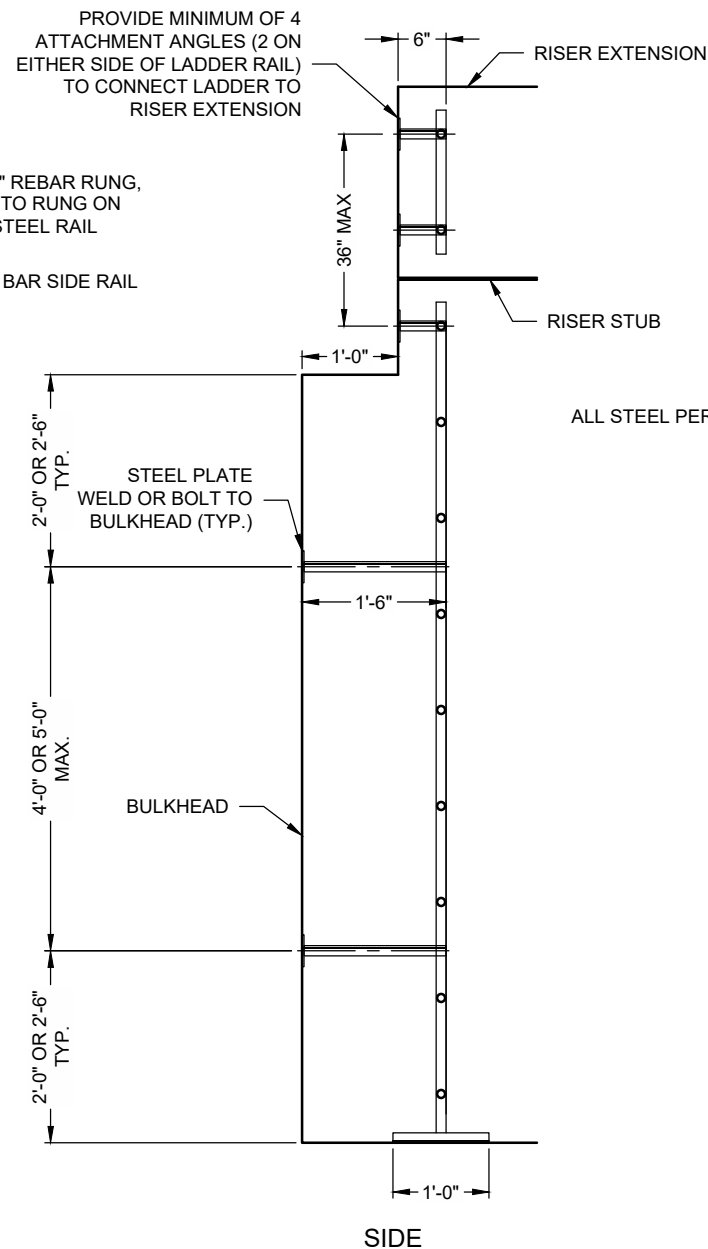
1. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
2. BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
3. BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
4. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" THRU 96" 2-PIECES
 - 102" THRU 144" 3-PIECES
5. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
6. ALL CMP IS REROLLED TO HAVE ANNULAR END CORRUGATIONS OF 2 2/3"x1/2"
7. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
8. ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

H-12 HUGGER BAND DETAIL NOT TO SCALE

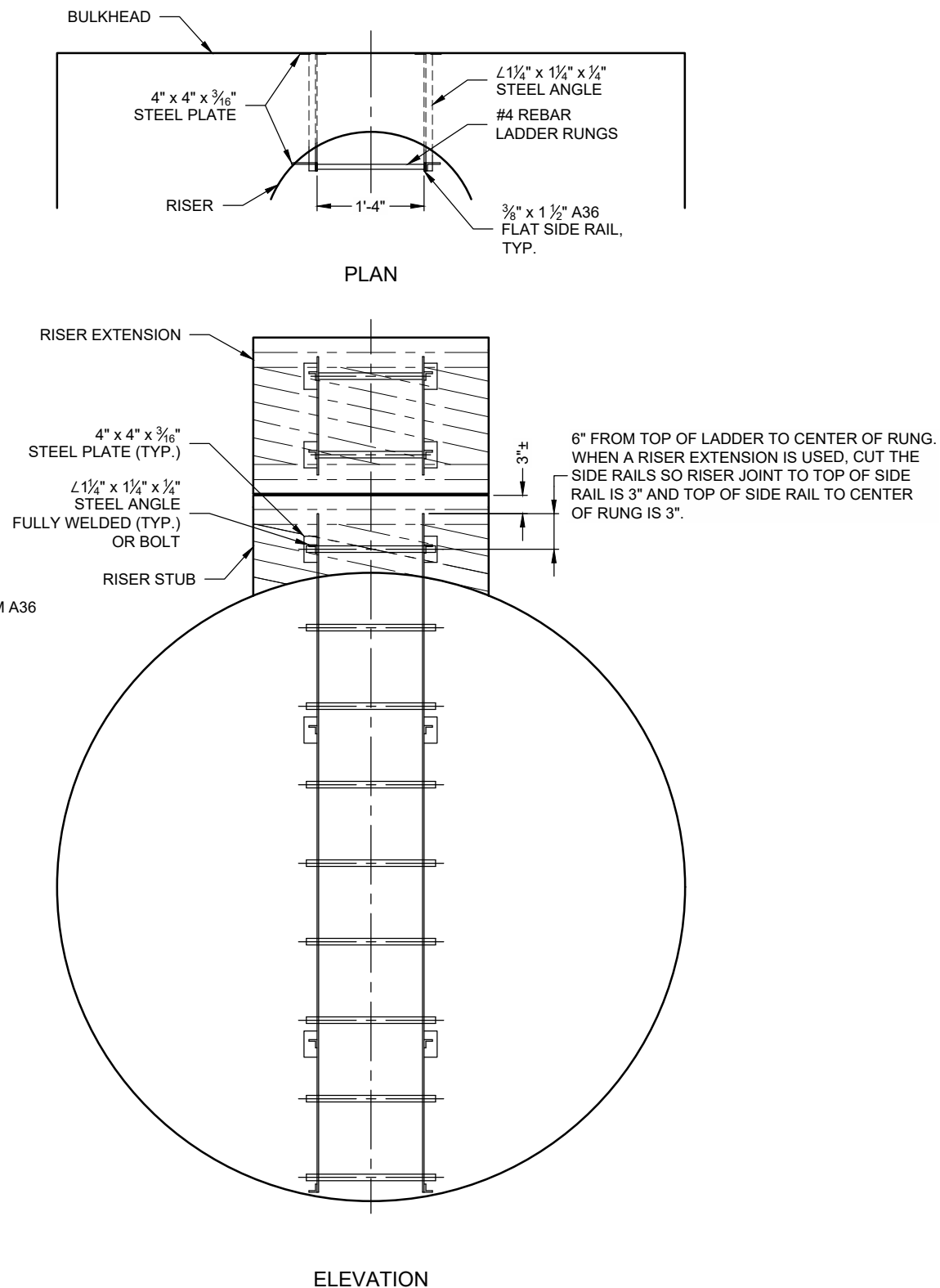


- NOTES:
1. LADDERS CAN BE MADE IN STANDARD LENGTHS AND CUT TO FIT
 2. ALL MATERIAL TO MEET ASTM A36
 3. LADDER TO BE HOT DIPPED GALVANIZED PER ASTM A-123 AFTER FABRICATION IS COMPLETE

STANDARD LADDER DETAIL
NOT TO SCALE
PART No. HALAGVL16



RISER LADDER DETAIL
NOT TO SCALE



NOTE:
THIS DRAWING IS INTENDED TO APPLY TO LADDERS
INSTALLED IN RISERS HAVING A DIAMETER OF 36" OR LARGER
AND LOCATED ONE FOOT FROM THE BULKHEAD ONLY

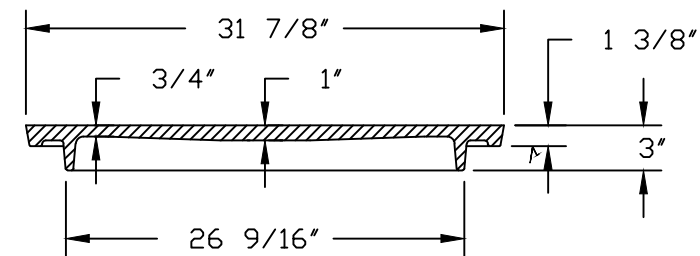
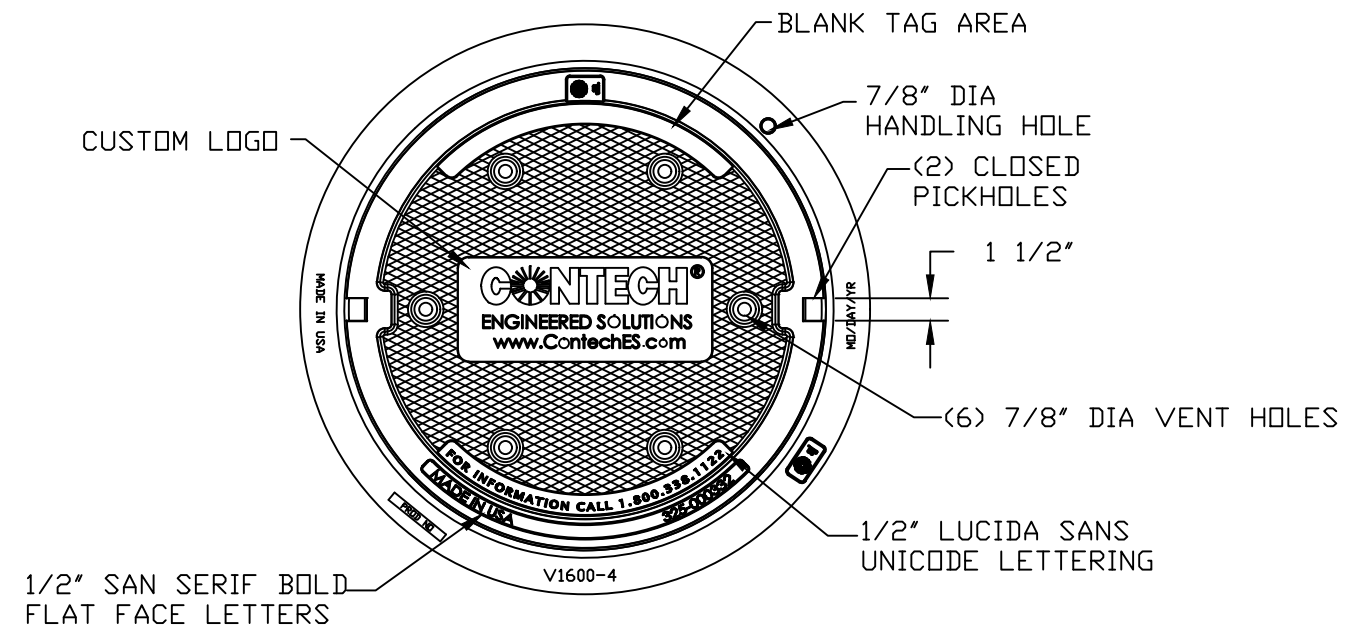
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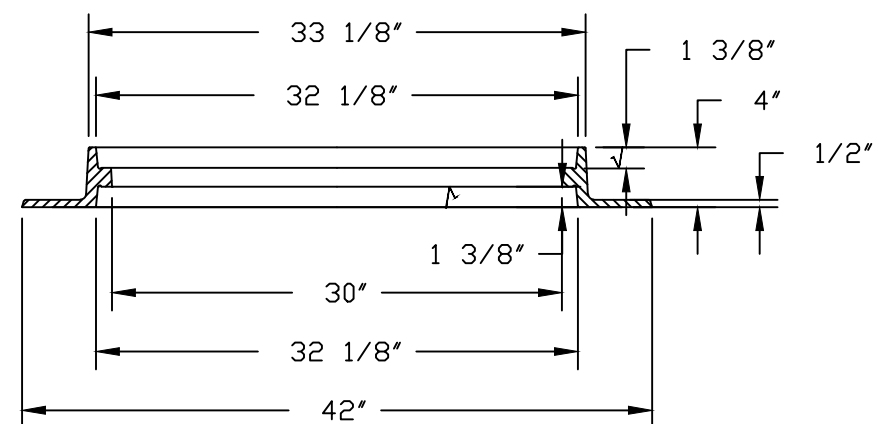
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ARIZONA CMP DETENTION
STANDARD DETAIL

30"x4" REVERSIBLE FRAME & SOLID COVER

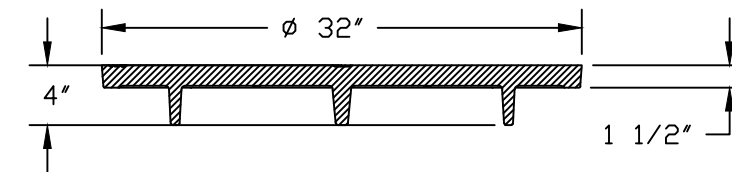
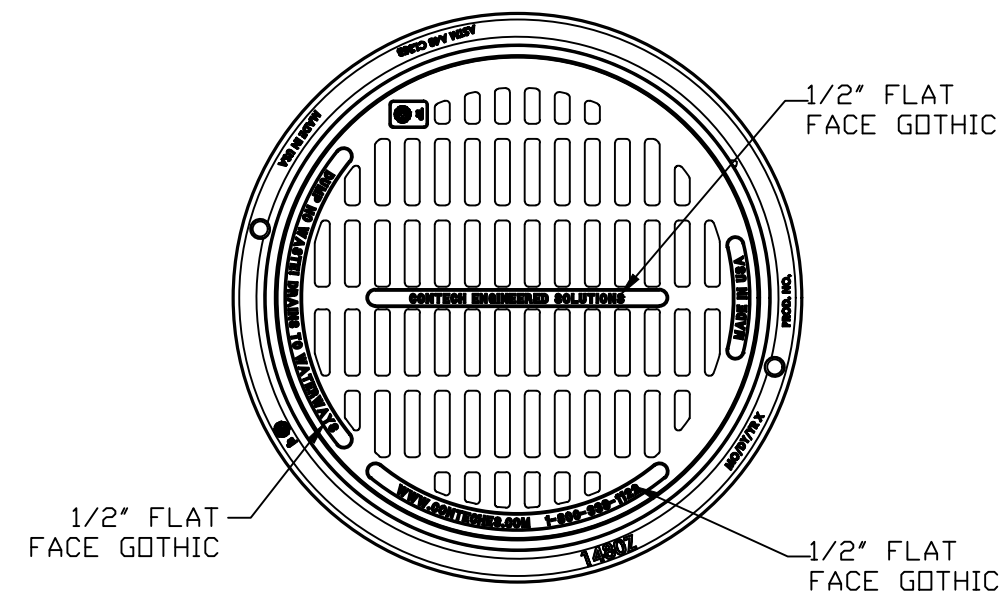


COVER SECTION

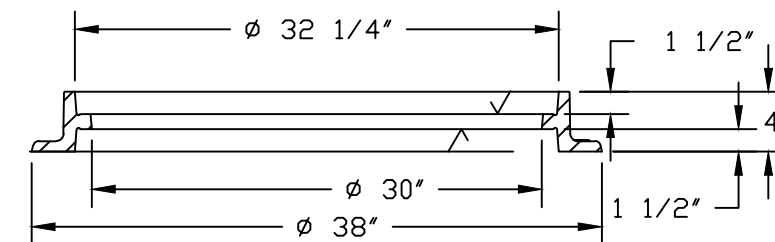


FRAME SECTION

30"x4" REVERSIBLE FRAME & GRATE



COVER SECTION



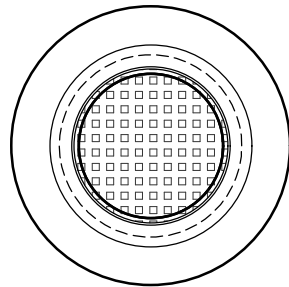
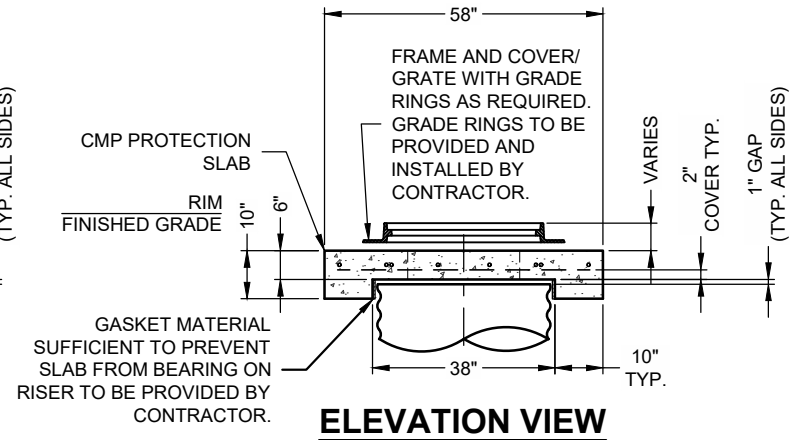
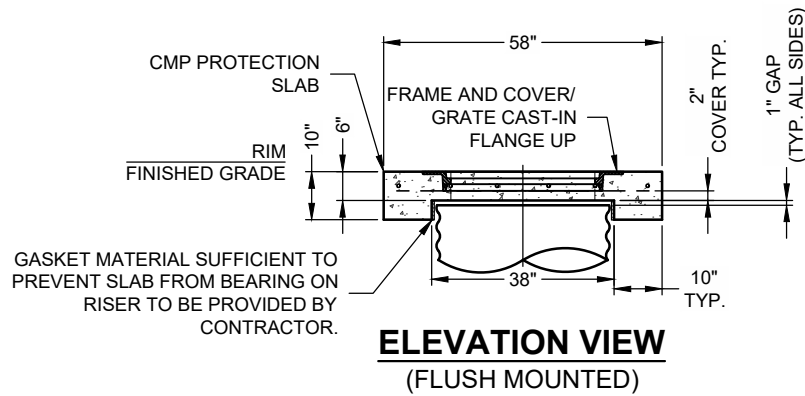
FRAME SECTION

PROVIDED FOR INFORMATION ONLY
INTENDED FOR PLANT USE

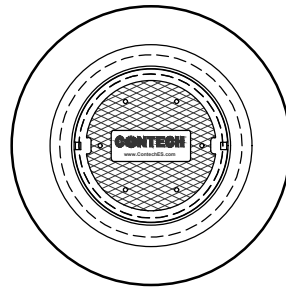
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ARIZONA CMP DETENTION
STANDARD DETAIL



PLAN VIEW
(GRATED CASTING)
30"Ø HS25 LOAD RATED



PLAN VIEW
(SOLID CASTING)
24"Ø HS25 LOAD RATED
30"Ø HS25 LOAD RATED

CHECK ONE:

- ☐ CAST-IN COVER
☐ SEPARATE COVER

CHECK ONE:

- ☐ 24"Ø COVER
☐ 30"Ø COVER
☐ 30"Ø GRATE

FABRICATION NOTES:

1. CONCRETE STRENGTH = 4,000 PSI
2. REINFORCING STEEL - ASTM A615, GRADE 60, OR EQUIVALENT WELDED WIRE FABRIC.
3. NICE LIGHT BROOM FINISH FOR UNITS W/ CAST-IN FRAME AND COVER
4. LIFTERS IN SIDE FOR UNITS W/ CAST-IN FRAME AND COVER AND LIFTERS IN TOP SLAB FOR UNITS W/ SEPARATE COVER

GENERAL NOTES:

1. DESIGN LOAD HS20/HS25
2. EARTH COVER = 1' MAX
3. RISER CAP MUST BE ADEQUATELY SUPPORTED WITH PROPER BEDDING AND BEARING PRESSURE OF 3350 PSF AS TO NOT TRANSFER LOADS ONTO RISER.
4. HEAVY PICK WEIGHT = 1,900 LBS

CONTECH
ENGINEERED SOLUTIONS LLC
www.ContechES.com

9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

58" OD CMP RISER CAP
UP TO 36" RISERS
PRECASTER: SEALY, TX

CONTECH
CMP DETENTION SYSTEMS

DATE: 04/07/2021

SCALE: NONE

PROJECT No.:

SEQUENCE No.:

DRAWN: TJS

CHECKED: KMR

Contech® CMP Detention Inspection and Maintenance Guide

Underground stormwater detention and infiltration systems must be inspected and maintained at regular intervals for purposes of performance and longevity.

Inspection

Inspection is the key to effective maintenance of CMP detention systems and is easily performed. Contech recommends ongoing, quarterly inspections. The rate at which the system collects pollutants will depend more on site specific activities rather than the size or configuration of the system.

Inspections should be performed more often in equipment washdown areas, in climates where sanding and/or salting operations take place, and in other various instances in which one would expect higher accumulations of sediment or abrasive/corrosive conditions. A record of each inspection is to be maintained for the life of the system.

Maintenance

CMP detention systems should be cleaned when an inspection reveals accumulated sediment or trash is clogging the discharge orifice.

Accumulated sediment and trash can typically be evacuated through the manhole over the outlet orifice. If maintenance is not performed as recommended, sediment and trash may accumulate in front of the outlet orifice. Manhole covers should be securely seated following cleaning activities. Contech suggests that all systems be designed with an access/inspection manhole situated at or near the inlet and the outlet orifice. Should it be necessary to get inside the system to perform maintenance activities, all appropriate precautions regarding confined space entry and OSHA regulations should be followed.

Systems are to be rinsed, including above the spring line, annually soon after the spring thaw, and after any additional use of salting agents, as part of the maintenance program for all systems where salting agents may accumulate inside the pipe.

Maintaining an underground detention or infiltration system is easiest when there is no flow entering the system. For this reason, it is a good idea to schedule the cleanout during dry weather.

The foregoing inspection and maintenance efforts help ensure underground pipe systems used for stormwater storage continue to function as intended by identifying recommended regular inspection and maintenance practices. Inspection and maintenance related to the structural integrity of the pipe or the soundness of pipe joint connections is beyond the scope of this guide.



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NOAA ATLAS 14 MAP

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NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: AZ

Data description

Data type: Precipitation depth

Units: English

Time series type: Partial duration

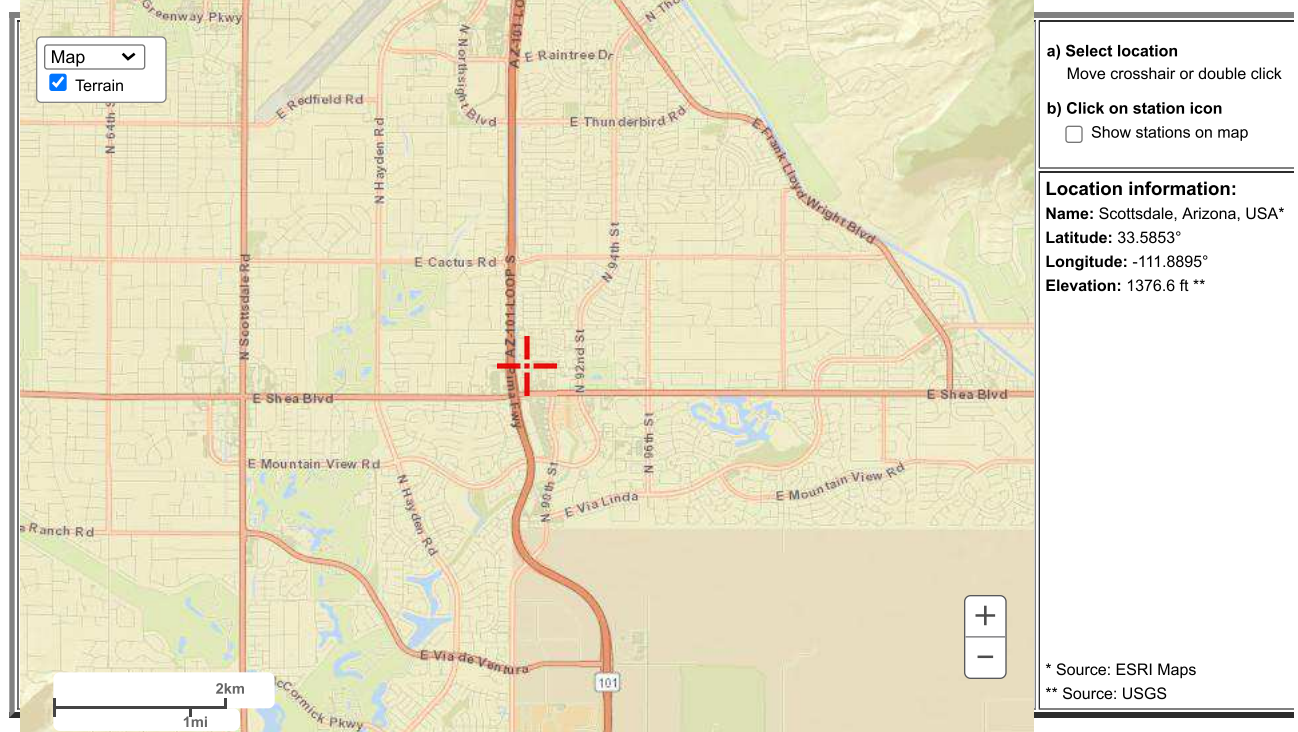
Select location

1) Manually:

a) By location (decimal degrees, use "-" for S and W): Latitude: Longitude: Submit

b) By station (list of AZ stations): Select station

c) By address 8888 E Desert Cove Ave, Scottsdale, X

2) Use map (if ESRI interactive map is not loading, try adding the host: <https://is.arcgis.com/> to the firewall, or contact us at hdsc.uestions@noaa.gov):

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
 NOAA Atlas 14, Volume 1, Version 5

PF tabular

PF graphical

Supplementary information

Print page

PDS-based 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	0.187 (0.156-0.230)	0.244 (0.205-0.300)	0.330 (0.274-0.404)	0.397 (0.327-0.484)	0.487 (0.394-0.591)	0.555 (0.445-0.669)	0.626 (0.493-0.754)	0.698 (0.540-0.838)	0.794 (0.599-0.955)	0.868 (0.641-1.04)
10-min	0.285 (0.237-0.349)	0.372 (0.311-0.456)	0.503 (0.417-0.615)	0.604 (0.498-0.736)	0.740 (0.600-0.899)	0.845 (0.677-1.02)	0.953 (0.750-1.15)	1.06 (0.821-1.27)	1.21 (0.911-1.45)	1.32 (0.975-1.59)
15-min	0.353 (0.293-0.433)	0.461 (0.386-0.566)	0.623 (0.516-0.762)	0.749 (0.617-0.912)	0.917 (0.744-1.11)	1.05 (0.839-1.26)	1.18 (0.930-1.42)	1.32 (1.02-1.58)	1.50 (1.13-1.80)	1.64 (1.21-1.97)
30-min	0.476 (0.395-0.583)	0.621 (0.519-0.762)	0.840 (0.695-1.03)	1.01 (0.831-1.23)	1.24 (1.00-1.50)	1.41 (1.13-1.70)	1.59 (1.25-1.92)	1.77 (1.37-2.13)	2.02 (1.52-2.43)	2.20 (1.63-2.65)
60-min	0.589 (0.489-0.722)	0.769 (0.643-0.943)	1.04 (0.860-1.27)	1.25 (1.03-1.52)	1.53 (1.24-1.86)	1.75 (1.40-2.11)	1.97 (1.55-2.37)	2.19 (1.70-2.64)	2.50 (1.88-3.00)	2.73 (2.02-3.28)
2-hr	0.690 (0.581-0.826)	0.892 (0.754-1.07)	1.19 (0.999-1.42)	1.42 (1.18-1.69)	1.73 (1.42-2.05)	1.96 (1.60-2.32)	2.21 (1.76-2.61)	2.45 (1.93-2.89)	2.79 (2.14-3.29)	3.04 (2.28-3.61)
3-hr	0.767 (0.646-0.939)	0.983 (0.831-1.21)	1.29 (1.08-1.57)	1.52 (1.27-1.85)	1.86 (1.53-2.24)	2.13 (1.72-2.55)	2.41 (1.91-2.89)	2.70 (2.11-3.23)	3.10 (2.34-3.71)	3.42 (2.53-4.10)
6-hr	0.924 (0.793-1.10)	1.17 (1.00-1.39)	1.49 (1.27-1.76)	1.75 (1.48-2.06)	2.10 (1.75-2.46)	2.38 (1.95-2.77)	2.66 (2.15-3.10)	2.95 (2.35-3.45)	3.35 (2.60-3.91)	3.67 (2.77-4.29)
12-hr	1.02	1.29	1.63	1.90	2.25	2.53	2.81	3.10	3.48	3.79

	(0.884-1.20)	(1.11-1.52)	(1.40-1.91)	(1.62-2.21)	(1.90-2.63)	(2.11-2.94)	(2.32-3.27)	(2.52-3.60)	(2.76-4.07)	(2.94-4.44)
24-hr	1.19 (1.05-1.38)	1.51 (1.34-1.75)	1.96 (1.72-2.26)	2.30 (2.02-2.65)	2.79 (2.42-3.21)	3.17 (2.73-3.64)	3.57 (3.05-4.10)	3.98 (3.37-4.56)	4.56 (3.80-5.22)	5.00 (4.13-5.75)
2-day	1.29 (1.13-1.48)	1.64 (1.44-1.89)	2.15 (1.88-2.46)	2.55 (2.22-2.92)	3.11 (2.69-3.56)	3.55 (3.05-4.06)	4.02 (3.42-4.60)	4.50 (3.80-5.17)	5.18 (4.31-5.95)	5.71 (4.70-6.59)
3-day	1.37 (1.21-1.58)	1.76 (1.54-2.01)	2.31 (2.02-2.64)	2.75 (2.40-3.15)	3.38 (2.93-3.86)	3.88 (3.34-4.42)	4.41 (3.77-5.03)	4.96 (4.21-5.68)	5.75 (4.81-6.57)	6.38 (5.28-7.31)
4-day	1.46 (1.29-1.68)	1.87 (1.65-2.14)	2.47 (2.17-2.82)	2.96 (2.59-3.37)	3.65 (3.18-4.15)	4.20 (3.64-4.78)	4.80 (4.12-5.45)	5.43 (4.62-6.18)	6.32 (5.31-7.19)	7.04 (5.86-8.04)
7-day	1.64 (1.44-1.89)	2.10 (1.84-2.41)	2.78 (2.43-3.19)	3.33 (2.90-3.82)	4.11 (3.56-4.70)	4.74 (4.08-5.41)	5.40 (4.62-6.17)	6.11 (5.18-6.99)	7.11 (5.95-8.14)	7.92 (6.56-9.08)
10-day	1.78 (1.56-2.03)	2.28 (2.00-2.60)	3.00 (2.63-3.43)	3.59 (3.14-4.09)	4.41 (3.83-5.01)	5.07 (4.38-5.76)	5.77 (4.95-6.56)	6.51 (5.55-7.40)	7.54 (6.35-8.58)	8.38 (6.98-9.54)
20-day	2.19 (1.93-2.50)	2.82 (2.49-3.21)	3.72 (3.28-4.23)	4.41 (3.87-5.00)	5.33 (4.66-6.04)	6.04 (5.26-6.84)	6.76 (5.86-7.68)	7.50 (6.46-8.52)	8.49 (7.25-9.66)	9.25 (7.85-10.5)
30-day	2.56 (2.26-2.92)	3.30 (2.91-3.75)	4.35 (3.83-4.93)	5.15 (4.53-5.83)	6.23 (5.44-7.04)	7.05 (6.14-7.97)	7.90 (6.85-8.92)	8.76 (7.56-9.89)	9.92 (8.49-11.2)	10.8 (9.19-12.3)
45-day	2.97 (2.63-3.37)	3.83 (3.39-4.34)	5.05 (4.47-5.71)	5.95 (5.25-6.73)	7.14 (6.28-8.07)	8.04 (7.04-9.08)	8.94 (7.79-10.1)	9.85 (8.54-11.2)	11.0 (9.51-12.5)	12.0 (10.2-13.6)
60-day	3.28 (2.92-3.70)	4.24 (3.77-4.78)	5.58 (4.95-6.29)	6.55 (5.80-7.39)	7.82 (6.90-8.81)	8.76 (7.70-9.87)	9.70 (8.49-10.9)	10.6 (9.27-12.0)	11.8 (10.3-13.4)	12.7 (11.0-14.4)

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.

Estimates from the table in CSV format: Precipitation frequency estimates Submit

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