

ATTACHMENT 6

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JOB **FAMCON Pipe & Supply (2234)**
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CALCULATED BY **AMP** DATE **10/18/23**
CHECKED BY **RJG** DATE **10/18/23**

**FLOOD CONTROL: DRAINAGE STUDY
(PRELIMINARY)**

for

Famcon Pipe and Supply, Inc.
1350 Founders Ave.
Santa Maria, CA.
APN'S 107-150-021 & 107-150-022

PROJECT DESCRIPTION

The proposed project consists of the development of a 11,040 s.f. commercial building with outdoor storage. Additional site improvements include parking, driveways a trash enclosure and landscaping. The project is located on a 4.01 acre property located at 1350 Founders Avenue, Santa Maria, CA.

The completed project disturbance proposes:

proposed building:	11,040 S.F. (0.25 AC.)
proposed hardscape (driveway/walks):	26,947 S.F. (0.56 AC.)
proposed landscaping:	28,886 S.F. (0.41 AC.)
proposed class II base:	105,317 S.F. (2.74 AC.)
Total Site:	172,190 S.F. (3.95 AC.)

The project is designed to be in conformance with the Flood Control Standard Conditions providing;

1. Detention such that the post-development 100-year, 24-hour, storm water runoff discharge rate shall not exceed *0.00 cubic feet per second per acre.
2. Basin volume of not less than .10 acre-foot per acre.
3. Additional 10% storage volume above peak volume.

*Falls within areas of "ineffective watershed". The IFA is considered to contribute no surface runoff to the surrounding area.

EXISTING SITE

The site is currently native and undeveloped. The site slopes to the west and discharges storm water runoff onto Morningside Dr.

For purposes of meeting Santa Barbara County requirements, the following predeveloped flows were calculated based on existing conditions on the proposed site.

The following flows were prepared using HydroCAD software. In HydroCAD the calculations were set up to determine the peak flow runoff through the SBUH Method. For purposes of the calculations, web soil survey data was collected to determine the soil type in the proposed site. The web soil survey determined that 56% of the site is HSG "A" and 44% of the site is HSG "B".

Pre-Developed Flows:

Area Total = 172,190 S.F. = 3.95 Acres

172,190 S.F., CN Selected = 61, Based on 56% HSG A, 44% HSG B, Grass cover, Fair

Time of Concentration = 12 min.

Events for Subcatchment 18S: Predevelopment Overall

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1.5 in Rain Event	1.50	0.01	0.002	0.01
2 YEAR	1.81	0.02	0.013	0.04
5 YEAR	2.62	0.08	0.076	0.23
10 YEAR	3.15	0.24	0.138	0.42
25 YEAR	3.81	0.79	0.235	0.71
50 YEAR	4.29	1.30	0.316	0.96
100 YEAR	4.76	1.88	0.402	1.22

PROPOSED SITE

Tributary Areas

The site has been designed to maximize storage for the developer. For this reason, underground chambers have been utilized and sized to meet Santa Barbara County Flood Control standard conditions. The site utilizes various catch basins to collect runoff and discharge into the chamber system. Tributary areas are defined as follows: Hardscape (buildings, walks and driveways), Class II Base (outdoor storage areas) and Landscape. The purpose of subdividing these areas is to calculate the total amount of runoff to the basin and to properly design an adequate outlet of the prescribed outflow set by the Santa Barbara County Flood Control Requirements.

Basin Design:

The goal of the proposed underground chamber system (basin) is to provide the required storage and outflow requirements while minimizing the impacts of daily operations throughout the rest of the site. The proposed development is designed to convey all site-generated storm water to the basin through catch basins. The basin is designed to detain a 100-year storm, plus 10%, while discharging a maximum of 0.00 cfs offsite. The basin was designed using HydroCAD software.

The basin receives flows from 37,987 s.f. of hardscape, 105,317 s.f. of class II base and 28,886 s.f. of landscaping via sheet flows, from a series of catch basins on-site. The basin is designed to retain a 100-yr storm plus 10%. In the event of overflow or failure the site would discharge overland onto Morningside Drive.

The basin has been designed with a storage volume of 60,942 c.f. (1.399 acre-feet).

	<u>Elevation</u>	<u>Area</u>	<u>Perimeter</u>
Basin Bottom:	411.00'	15,427 s.f.	499.39 L.F.
Basin Top:	417.75'	15,427 s.f.	499.39 L.F.

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= +35.7 cf x 2 x 13 rows = 928.2 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

26 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 109.77' Row Length +12.0" End Stone x 2 = 111.77' Base Length

15 Rows x 100.0" Wide + 9.0" Spacing x 14 + 12.0" Side Stone x 2 = 137.50' Base Width

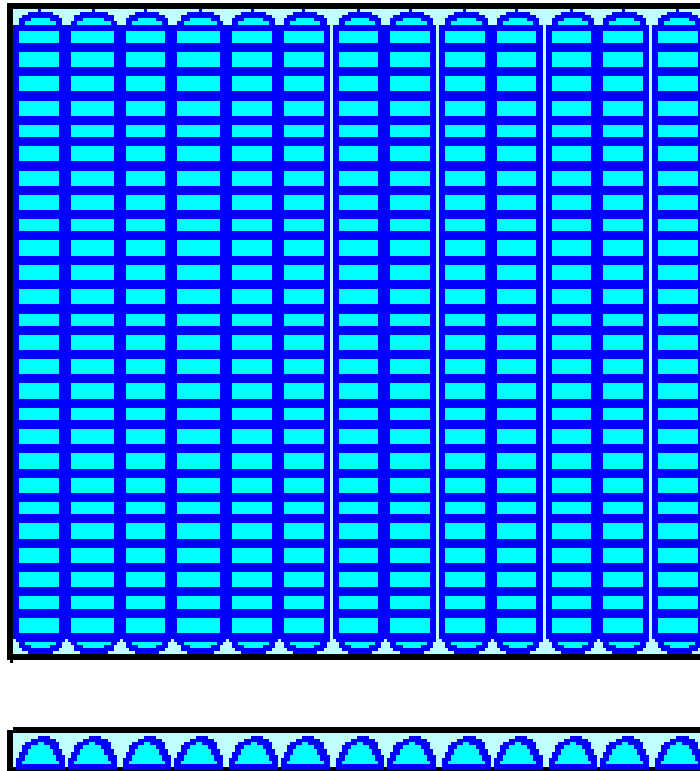
9.0" Base + 60.0" Chamber Height + 12.0" Cover = 6.75' Field Height

390 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 15 Rows = 42,602.3 cf Chamber Storage

103,733.4 cf Field – 42,602.3 cf Chambers = 61,131.2 cf Stone x 30.0% Voids = 18,339.4 cf Stone Storage

Chamber Storage + Stone Storage = 60,941.6 cf = 1.399 af
Overall Storage Efficiency = 58.7%
Overall System Size = 111.77' x 137.50' x 6.75'

390 Chambers 3,842.0 cy Field 2,264.1 cy Stone



100-Year peak elevation = 416.44'

100-Year peak discharge = 0.00 cfs

CONCLUSION

In conclusion we have come up with a basin design that meets the requirements of the Santa Barbara County Flood Control District outlined below;

1. Detention such that the post-development 100-year, 24-hour, storm water runoff discharge rate shall not exceed *0.00 cubic feet per second per acre.

*Falls within areas of "ineffective watershed". The IFA is considered to contribute no surface runoff to the surrounding area.

100-Year peak discharge = 0.00 cfs

2. Basin volume of not less than 0.10 acre-foot per acre.
 Total Site = 4.01 acres
 4.01 x 0.10 = 0.401 acre-feet min. required (17,468 cf)
1.399 acre-feet provided (60,942 cf)

3. Additional 10% storage volume above peak volume.

Calculated Peak Volume = 54,771 cf
 54,771 x 0.10 = 5,477.1
 54,771 + 5477 = 60,248
Required Storage volume = 60,248 c.f. --- Total storage volume provided = 60,942 c.f.

Summary for Pond 1P: Chambers

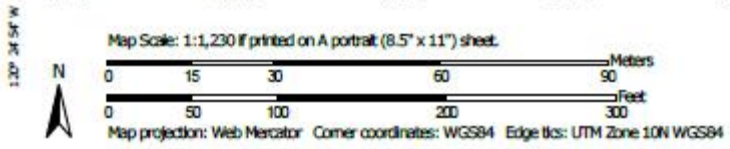
Inflow Area = 3.953 ac, 22.06% Impervious, Inflow Depth > 3.82" for 100 YEAR event
 Inflow = 8.00 cfs @ 9.98 hrs, Volume= 1.258 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.050 hrs
 Peak Elev= 416.44' @ 24.00 hrs Surf.Area= 15,368 sf Storage= 54,771 cf

































Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1A	411.00'	18,339 cf	137.50'W x 111.77'L x 6.75'H Field A 103,733 cf Overall - 42,602 cf Embedded = 61,131 cf x 30.0% Voi
#2A	411.75'	42,602 cf	ADS_StormTech MC-4500 +Cap x390 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 390 Chambers in 15 Rows Cap Storage= +35.7 cf x 2 x 15 rows = 1,071.0 cf
		60,942 cf	Total Available Storage

Storage Group A created with Chamber Wizard



MAP LEGEND

- Area of Interest (AOI)
 -  Area of Interest (AOI)
- Soils
 - Soil Rating Polygons**
 -  A
 -  A/D
 -  B
 -  B/D
 -  C
 -  C/D
 -  D
 -  Not rated or not available
 - Soil Rating Lines**
 -  A
 -  A/D
 -  B
 -  B/D
 -  C
 -  C/D
 -  D
 -  Not rated or not available
 - Soil Rating Points**
 -  A
 -  A/D
 -  B
 -  B/D
- Water Features**
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads
- Background**
 -  Aerial Photography
- Other**
 -  C
 -  C/D
 -  D
 -  Not rated or not available

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.
 Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
 Survey Area Data: Version 17, Sep 14, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 12, 2022—Apr 12, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MaE	Marina sand, 0 to 30 percent slopes	B	1.8	44.3%
OcD	Oceano sand, 2 to 15 percent slopes	A	2.0	55.7%
Totals for Area of Interest			3.7	100.0%