

Appendix D – Stormwater Control Plan for the

547 Airport Boulevard Project

21 Townhomes at the Existing Monterey Bar Rebar Inc. Site

547 Airport Boulevard
City of Watsonville
August 2020



Prepared by: Roper Engineering, Watsonville, CA.

**Preliminary Stormwater Control Plan
for
Tract No. 1604
547 Airport Blvd. Townhomes
547 Airport Blvd.
Watsonville, CA
APN 015-321-01**

**Owner:
Raoul & Eve Ortiz
547 Airport Blvd.
Watsonville, CA 95076**

**Prepared by:
Roper Engineering
64 Penny Lane, Suite A
Watsonville, CA 95076
(831) 724-5300**



A handwritten signature in black ink that reads "Jeff Roper".

**Job No. 16043
March 2, 2017
Revised: June 20, 2019**

Project Information

1. Project Location:
The property is located at 547 Airport Blvd., Watsonville, between Hangar Way and the west end of Aviation Way. APN 015-321-01.
2. Applicant:
Raoul & Eve Ortiz
547 Airport Blvd.
Watsonville, CA 95076
3. Project Phase: N/A
4. Project Type: 21 Unit Residential Townhouse Subdivision
5. Total Project Area: 1.57 ± acres
6. Total new and/or replaced impervious area: 47,975 sf
7. Stormwater Performance Requirements
This project is subject to performance requirements No.1 Site Design and Runoff Reduction, No. 2 Water Quality Treatment, No. 3 Runoff Retention and No. 4 Peak Management.

8. Site Design and Runoff Reduction Measures (Performance Requirement No. 1)

Design Strategies	Y/N	Description
Limit disturbance of creeks and natural drainage features.	N	No creeks or natural drainage features exist on the site.
Minimize compaction of highly permeable soils	Y	Soils under bioretention facilities will not be compacted.
Limit clearing and grading of native vegetation at the site to a minimum area needed to build the project, allow access, and provide fire protection	N	The property has been previously developed. No native vegetation exists at the site.
Minimize impervious surfaces by concentrating improvements on the least-sensitive portions of the site, while leaving the remaining land in a natural undisturbed state.	N	The property has been previously developed. No areas are in their natural undisturbed state.
Minimize stormwater runoff by implementing one or more of the following site design measures: 1. Direct roof runoff into cisterns or rain barrels for reuse 2. Direct roof runoff onto vegetated areas safely away from building foundations and footings, consistent with California building code. 3. Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas safely away from building foundations and footings, consistent with California building code 4. Direct runoff from driveways and/or uncovered parking lots onto vegetated areas safely away from building foundations and footings, consistent with California building code 5. Construct bike lanes, driveways, uncovered parking lots, sidewalks, walkways, and patios with permeable surfaces	Y	The proposed project complies with design measures 2, 3 & 4. All runoff from new impervious surfaces is to be directed to the bioretention facilities.

9. Water Quality Treatment (Performance Requirement No. 2)

Performance requirement No. 2 requires the project to treat stormwater runoff to reduce pollutant loads and concentrations using physical, biological, and chemical removal. Runoff from all new impervious surfaces will be directed to the bioretention facilities where water quality treatment will be facilitated. Treatment is flow based using a minimum 4% bioretention ratio to new or replaced impervious area. $405,584 \text{ sf} \times 0.4 = 1823 \text{ SF}$ required bioretention, 2870 SF provided.

10. **Runoff Retention (Performance Requirement No. 3)**

Performance Requirement No. 3 requires the project to prevent discharge from events up to the 95th percentile 24-hour rainfall event (1.3"). Due to the clay soils found at the site, the type D soil percolation rate of 0.25"/hr was utilized in the SCM Sizing Calculator attached. See Section C on Sheet T5 of the tentative map for the Bioretention/Detention Pond Detail.

The SCM Sizing Calculator is an Excel spreadsheet that computes the required SCM sizing and was developed for the Regional Water Quality Control Board, Central Coast Region.

The bioretention area provided is 2953 SF. From the SCM Sizing Calculator, the required storage volume is 2605 CF. Depth of underdrain is 3 feet.

11. **Peak Management (Performance Requirement No. 4)**

Peak management will be provided by the use of the bioretention/detention pond at the northeast corner of the project. See attached detention volume calculations. The project runoff will be metered out into the storm drain pipe in Airport Blvd. with the use of a sized orifice pipe located in the outflow catch basin in the bioretention/detention pond. See Section C on Sheet T5 of the tentative map for the Bioretention/Detention Pond Detail.

Detention pond sizing was determined with the Runoff Detention by Modified Rational Method template developed by the County of Santa Cruz Stormwater Department.

12. **Site Assessment Measures**

Site Assessment Measure	Description
Site topography	The existing site consists of a flat site fronting on Airport Blvd. and surrounded on 2 sides by industrial park lots and one side by a mobile home park.
Hydrologic features including contiguous natural areas, wetlands, watercourses, seeps, or springs	None.
Depth to seasonal high groundwater	Ground water was not encountered.
Locations of groundwater wells used for drinking water	No groundwater wells on site
Depth to an impervious layer such as bedrock	Shallow site soils consist of silty clays. No bedrock was encountered.
Presence of unique geology (e.g., karst)	No unique geology encountered.
Geotechnical hazards	No unique geologic hazards.

Documented soil and/or groundwater contamination	No documented contamination.
Soil types and hydrologic soil groups	Silty Clay, see geotechnical investigation.
Vegetative cover/trees	The existing site was previously developed. No native vegetation exists on the site with the exception of a few trees. New landscaping will be provided per the landscape plan.
Run-on characteristics (source and estimated runoff from offsite which discharges to the project area)	The site receives no run-on from adjacent properties.
Existing drainage infrastructure for the site and nearby areas including the location of municipal storm drains	There are existing storm drain facilities at the intersection of Airport Blvd. and Aviation Way. New site storm drainage will connect to these systems.
Structures including retaining walls	There is an existing residence and office trailer on the site that will be removed. There is also a large concrete slab that will also be removed.
Utilities	New utilities will be provided for sewer, water, storm drainage, electrical, gas and communication. These utilities will connect to existing utility services in Airport Blvd.
Easements	New utility easements will be provided along the south boundary.
Covenants	A home owners association will be formed for this subdivision and will be responsible for maintenance of the stormwater system.
Zoning/Land Use	Current zoning is IP-Industrial Park. Proposed zoning is RM-2 Multiple Residential - Medium Density. Current land use is residential. Proposed land use is a residential.
Setbacks	RM-2 setback requirements
Open space requirements	No open space requirements
Other pertinent overlay(s)	No other pertinent overlays

13. Site Design Measures

Design Measure	Description
Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be left undisturbed	Project site previously developed. No areas to be left undisturbed.
Conserve natural areas, including existing trees, other vegetation, and soils	Project site previously developed, no native areas exist.
Limit the overall impervious footprint of the project	Overall impervious footprint minimized. 8% bioretention provided.
Construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety or mobility uses are not compromised	Driveways and sidewalks have been proposed to the minimum width necessary.
Set back development from creeks, wetlands, and riparian habitats	No creeks, wetlands or riparian habitats exist in the vicinity of the project.
Conform the site layout along natural landforms	Project layout conforms to the natural landform.
Avoid excessive grading and disturbance of vegetation and soils	Grading has been minimized by utilizing the existing topography as much as possible in the project design.

14. Post-Construction Stormwater Control Measures

The stormwater control measures proposed for this development are the bioretention facilities for Stormwater Quality and Runoff Retention. The bioretention facility will comply with the City of Watsonville’s Standard Bioretention Facility LID-001. This bioretention facility specification is also the one used by the Regional Water Quality Control Board (RWQCB), Central Coast Region.

Due to the proximity of the SCM to the east property line, an impermeable liner will be placed along the east side of the pond to minimize infiltration onto the neighboring property.

Sizing of the retention/detention pond is represented on the SCM Sizing Calculator and Detention spreadsheet attached to this document. The predevelopment runoff rate is 0.718 CFS as noted on the Detention spreadsheet.

15. Operation and Maintenance Plan

Homeowners Association of the new subdivision will be required to maintain the post-construction stormwater control measures. See the site map on the following sheet for the Bioretention Facility locations.

The Bioretention Facilities is located at the northeast corner of the project.

Maintenance: The primary maintenance requirement for bio retention facilities includes routine inspections targeted at maintaining hydraulic efficiency of the channel, the treatment effectiveness of the bioretention components, and a dense, healthy vegetative cover. Maintenance activities should include periodic mowing (with grass never cut shorter than the design flow depth), clearing of debris and blockages, and sediment removal. Reseed bare areas annually. Inspections should also look for erosion along the bottom of the swale channel.

Performance and Inspection: To ensure proper performance, visually inspect that stormwater is infiltrating properly and is being conveyed through the length of the bioswale. Water ponding in a bioswale for more than 48 hours may indicate operational problems. Corrective measures include inspection for and removal of accumulated sediments. Back flushing the under drain is another option. Samples of the bioretention media should be taken in the case of poor infiltration to determine the condition of the media (e.g. clay content). Full or partial replacement of the bioretention media may be required to restore the flow rate through the swale. Alternately, soil amendments can first be applied in an attempt to restore permeability. Perform this inspection annually in spring, and after extreme events (e.g. after heavy rainfall).

Costs: We estimate annual inspection and maintenance to cost \$1000 per year. We estimate replacement after the 25 year live expectancy to cost \$25,000.

Maintenance Agreement and Transfer of Responsibility for SCMs:

Prior to issuing approval for final occupancy the City will require that projects subject to these Post-Construction Requirements provide verification of ongoing maintenance provisions for Structural Stormwater Control Measures, including but not limited to legal agreements, covenants, CEQA mitigation requirements, and or conditional use permits. Verification shall include, at a minimum:

- a) The project owner's signed statement accepting responsibility for the O&M of the installed onsite and/or offsite structural treatment and flow control SCMs until such responsibility is legally transferred to another entity; and either
 - i) A signed statement from the public entity assuming responsibility for structural treatment and flow control SCM maintenance and stating that the SCM meets all local agency design standards; or
 - ii) Written conditions in the sales or lease agreements or deed for the project that require the buyer or lessee to assume responsibility for the O&M of the onsite and/or offsite structural treatment and flow control SCM until such responsibility is legally transferred to another entity; or
 - iii) Written text in project deeds, or conditions, covenants and restrictions for multi-unit residential projects that require the homeowners association or, if there is no association, each

- individual owner to assume responsibility for the O&M of the onsite and/or offsite structural treatment and flow control SCM until such responsibility is legally transferred to another entity; or
- iv) Any other legally enforceable agreement or mechanism, such as recordation in the property deed, that assigns responsibility for the O&M of the onsite and/or offsite structural treatment and flow control SCM to the project owner(s) or the Permittee

16. Statement of Compliance:

The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the City of Watsonville Stormwater post-Construction Standards (Resolution No. 4-14, Adopted January 14, 2014). The Water Quality Treatment and Peak Management Requirements have been met on the site by the proposed measures.

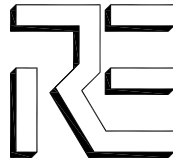
Bioretention/Detention Pond

Bioretention	Req'd Size 1823 SF	Provided Size 2870 SF
Retention	Req'd Depth 3.2'	Provided Depth 3.2'
Detention	Req'd Volume 1664 CF	Provided Volume 1722 CF

CLIENT: 547 AIRPORT BLVD
TOWNHOMES

LOCATION:
AIRPORT BLVD.

DRAINAGE CALCS



ROPER ENGINEERING

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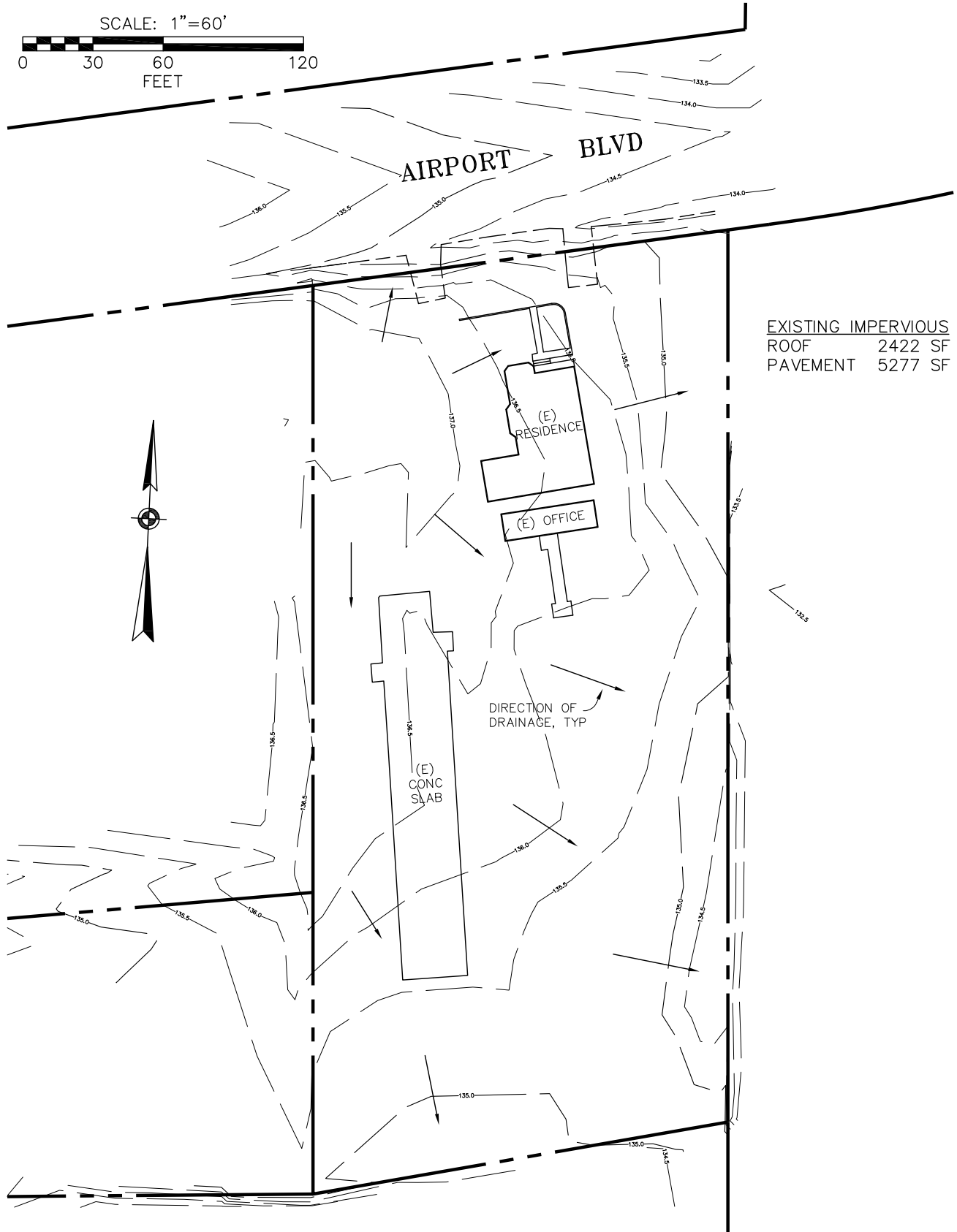
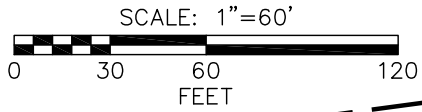
(831) 724-5300

JOB NO.: 16043

DATE:
JUNE 20, 2019

SHEET:
1 OF 2

EXISTING IMPERVIOUS SURFACES

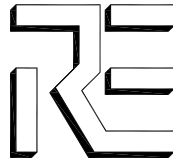


EXISTING IMPERVIOUS
ROOF 2422 SF
PAVEMENT 5277 SF

CLIENT: 547 AIRPORT BLVD
TOWNHOMES

LOCATION:
AIRPORT BLVD.

DRAINAGE CALCS



ROPER ENGINEERING

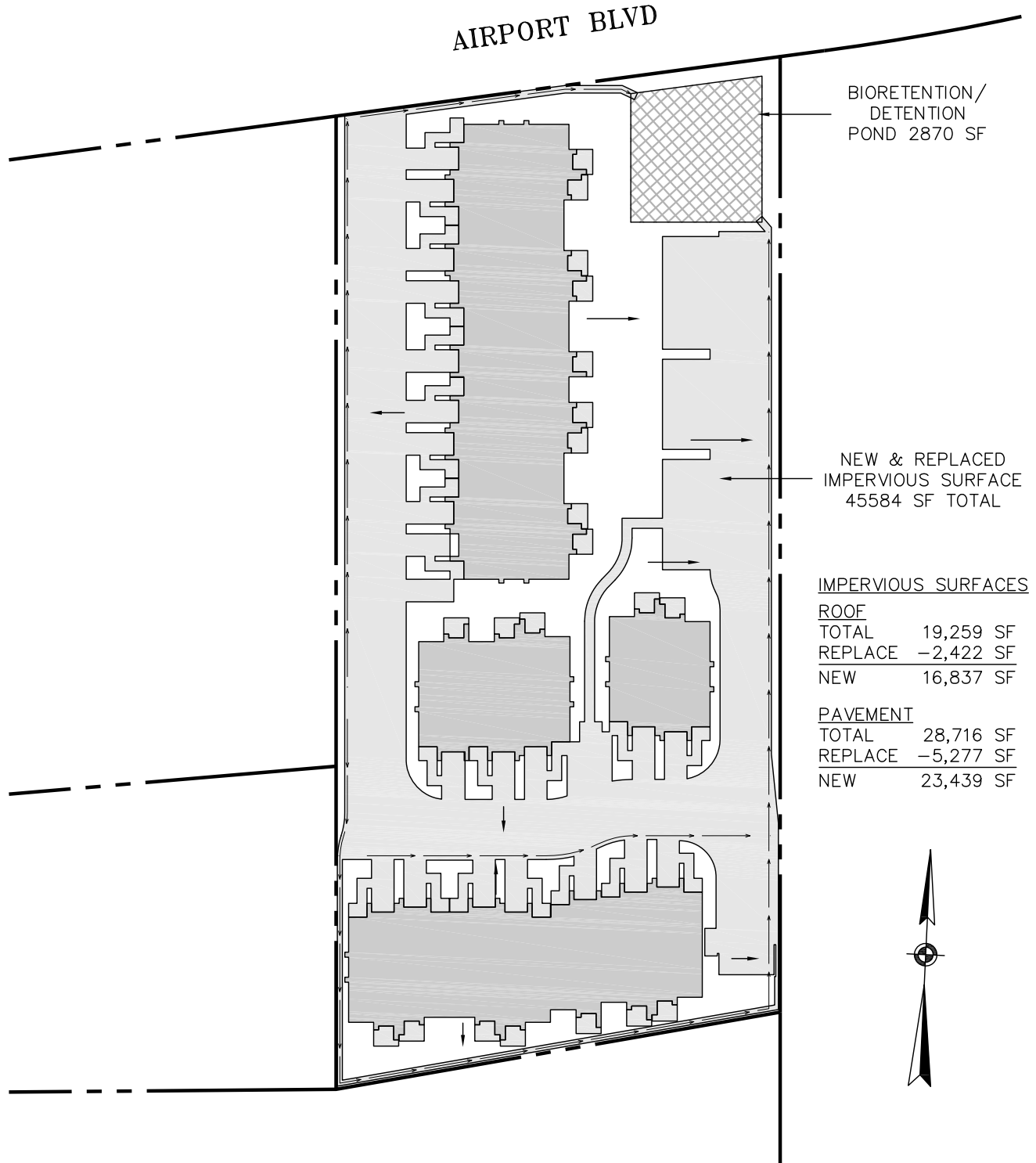
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JOB NO.: 16043

DATE:
JUNE 20, 2019

SHEET:
2 OF 2

DRAINAGE MANAGEMENT AREAS



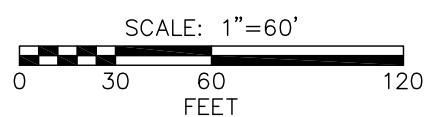
BIORETENTION/
DETENTION
POND 2870 SF

NEW & REPLACED
IMPERVIOUS SURFACE
45584 SF TOTAL

IMPERVIOUS SURFACES

<u>ROOF</u>	
TOTAL	19,259 SF
REPLACE	-2,422 SF
NEW	16,837 SF

<u>PAVEMENT</u>	
TOTAL	28,716 SF
REPLACE	-5,277 SF
NEW	23,439 SF



Central Coast Region Stormwater Control Measure Sizing Calculator

Version: 2/26/2014

1. Project Information

Project name:	547 Airport Blvd Townhomes 12-29-17
Project location:	547 Airport Blvd., Watsonville
Tier 2/Tier 3:	Tier 3 - Retention
Design rainfall depth (in):	1.3
Total project area (ft2):	68279
Total new impervious area (ft2):	40277
Total replaced impervious in a USA (ft2):	0
Total replaced impervious not in a USA (ft2):	7699
Total pervious/landscape area (ft2):	20933

2. DMA Characterization

Name	DMA Type	Area (ft2)	Surface Type	New, Replaced?	Connection
New Roof	Drains to SCM	16837	Roof	New	Bioretention Area
Replaced Roof	Drains to SCM	2422	Roof	Replaced	Bioretention Area
New Pavement	Drains to SCM	23439	Concrete or asphalt	New	Bioretention Area
Replaced Pavement	Drains to SCM	5277	Concrete or asphalt	Replaced	Bioretention Area
Landscape	Self-Treating	20933			

DMA Summary Area

Total project impervious area (ft2):	47975
New impervious area (ft2):	40276
Replaced impervious within a USA (ft2):	0
Replaced impervious not in a USA (ft2):	7699
Total pervious/landscape area (ft2):	0

3. SCM Characterization

Name	SCM Type	Safety Factor	SCM Soil Type	Infiltr. Rate (in/hr)	Area (ft2)
Bioretention Area	Bioretention	1	HSG C/D	0.25	2870

4. Run SBUH Model

5. SCM Minimum Sizing Requirements

SCM Name	Min. Required Storage Vol. (ft3)	Depth Below Underdrain (ft)	Drain Time (hours)
Bioretention Area	3636	3.17	50.7

6. Self-Retaining Area Sizing Checks

Self-Retaining DMA Name	Self-Retaining DMA Area (ft2)	Tributary DMA Name	Tributary DMA Area (ft2)	Tributary / SRA Area Ratio

RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

Data Entry: **PRESS TAB & ENTER DESIGN VALUES** SS Ver: 1.0

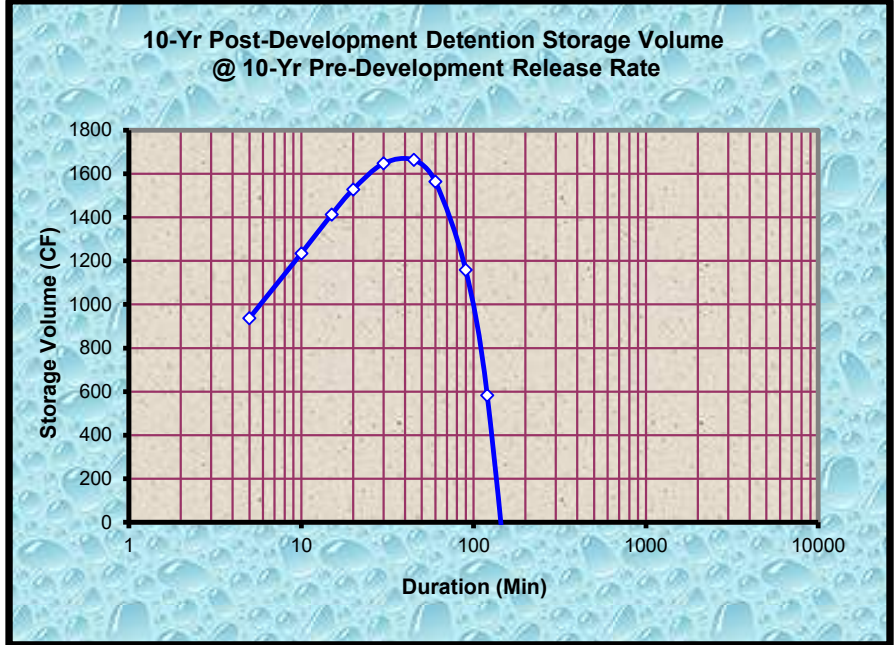
Site Location P60 Isoleth: **1.30** Fig. SWM-2 in County Design Criteria
 Rational Coefficients Cpre: **0.28** See note # 2
 Cpost: **0.77** See note # 2
 Impervious Area: **68279** ft² See note # 2 and # 4

STRUCTURE DIMENSIONS FOR DETENTION

1664 ft³ storage volume calculated
40 % void space assumed
 4159 ft³ excavated volume needed

Structure Ratios	Length	Width*	Depth*	*For pipe, use the square root of the sectional area
	52.40	54.80	1.50	
Dimen. (ft)	51.79	54.16	1.48	

10 - YEAR DESIGN STORM				DETENTION @ 15 MIN.	
Storm Duration (min)	10 - Year Intensity (in/hr)	10 - Yr. Release Qpre (cfs)	10 - Year Qpost (cfs)	Detention Rate To Storage (cfs)	Specified Storage Volume (cf)
1440	0.21	0.094	0.259	-0.459	-49538
1200	0.23	0.102	0.281	-0.437	-39311
960	0.25	0.113	0.310	-0.407	-29338
720	0.29	0.128	0.353	-0.365	-19716
480	0.35	0.154	0.422	-0.295	-10635
360	0.39	0.175	0.480	-0.238	-6419
240	0.47	0.209	0.575	-0.143	-2572
180	0.54	0.238	0.653	-0.064	-869
120	0.64	0.285	0.782	0.065	583
90	0.73	0.323	0.889	0.172	1159
60	0.88	0.387	1.065	0.347	1564
45	0.99	0.440	1.211	0.493	1664
30	1.19	0.527	1.450	0.732	1647
20	1.43	0.631	1.737	1.019	1528
15	1.62	0.718	1.974	1.256	1413
10	1.94	0.860	2.364	1.646	1235
5	2.64	1.170	3.218	2.500	938



Notes & Limitations on Use:

- 1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
- 2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
- 3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
- 4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
- 5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
- 6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.