Stormwater Control Plan

Prepared By:
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CIVIL DESIGN STUDIO
CIVIL ENGINEERING | PLANNING | PERMITTING

Boutique Hotel

North Ocean Avenue

Cayucos, Ca 93430

March 18, 2020



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Existing Impervious Area Exhibit 14
Net Impervious Area Exhibit 15
Drainage Management Exhibit 16

This Stormwater Control Plan was prepared using the County of San Luis Obispo Stormwater Control Plan template dated April 2018.

Project Data

Table 1: Project Data

Project Name/Number	Boutique Hotel
Application Submittal Date	
Project Location	North Ocean Avenue, Cayucos, Ca 93430
Project Phase No.	N/A
Project Type and Description	Hotel
Total Project Site Area (acres)	1.86
Total New Onsite Impervious Surface Area	21,343
Total Replaced Impervious Surface Area	0
Total Pre-Project Impervious Surface Area	0
Total Post-Project Impervious Surface Area	21,343
Net Impervious Area	21,343
Watershed Management Zone(s)	WMZ 4 (underlain by groundwater basin)
Design Storm Frequency and Depth	95th
Drainage Report Name	

Setting

Project Location and Description

The proposed project is located at North Ocean Avenue in Cayucos in San Luis Obispo County. The total area of disturbance for this project is 0.73 acres (31,590 ft^2). The proposed project consists of a 7,587 ft^2 hotel, a 463 ft^2 swimming pool, 5,048 ft^2 of asphalt, 3,023 ft^2 of concrete, 5,222 ft^2 of impervious pavers, and 2,266 ft^2 of pervious pavers.



Figure 1: Vicinity Map

Existing Site Features and Conditions

The existing site is 1.86 acres and is an undeveloped lot. The site features gentle slopes (average slope 7%) and soils classified as Hydrologic Soils Group "C". Therefore, runoff is expected to be moderate to high. The site sits along the edge of a bluff along Cayucos Creek which drains into the Pacific Ocean.

Opportunities and Constraints for Stormwater Control

Opportunities: The site is undeveloped and has gentle slopes

Constraints: The existing sandy clay soil found onsite is not ideal for infiltration. The existing soil is classified as Hydrological Soils Group C which results in low infiltration rates. The site is also located along a coastal bluff, limiting the area which stormwater control measures can be implemented

Low Impact Development Design Strategies

Optimization of Site Layout

Limitation of development envelope

The site disturbance for the project has been limited to 0.73 acres of the 1.86 acre property.

Preservation of natural drainage features

The project as proposed will not impede upon any drainage ditches, creeks, or other drainage features.

Setbacks from creeks, wetlands, and riparian habitats

The placement of the hotel and hardscape improvements will not disturb any nearby creeks. Wetlands and riparian habitats are not found on the project site.

Minimization of imperviousness

The project as proposed will minimize the amount of impervious area throughout the site. Parking spaces are proposed to be pervious pavers to minimize impervious area.

Use of drainage as a design element

Vegetated areas will be used in order to provide additional infiltration area, and to restore disturbed area to its natural state.

Use of Permeable Pavements

Parking is proposed with permeable pavement.

Dispersal of Runoff to Pervious Areas

Portions of roof and concrete runoff will be directed to depressed planters, and vegetated areas that are incorporated into the project. Stormwater runoff is directed away from the bluff, into a depressed planter and overflow will run into a underground infiltration system.

Stormwater Control Measures

A 4’ diameter perforated pipe will be installed underneath the proposed parking lot in a 6’x6’ gravel trench. Site runoff will be collected and directed to the perforated pipe allowing for infiltration.

An infiltration basin will be constructed downhill of proposed hotel. The basin has a capacity of 435 ft^3. When capacity is reached, the overflow will direct runoff to the 4’ perforated pipe.

Pervious pavers will be used in parking areas and will have a retention capacity of 900 ft^3.

Documentation of Drainage Design

Drainage Management Area Characterization

The DMA numbers below correspond with DMA numbers of DMA exhibit. DMAs listed include all impervious surfaces and all vegetated areas except those designated as structural control measures (SCMs).

Pervious areas are further categorized as either self-treating or self-retaining areas.

- Areas designated as self-treating areas are undisturbed areas, or areas planted with native, drought-tolerant, or LID-appropriate vegetation and do not receive runoff from other areas.
- Areas designated as self-retaining are low-lying areas that receive runoff from adjoining areas. Self retaining areas may have natural vegetation, or be landscape, or may be porous pavements (where the soils underlying the porous pavements drain well enough to handle the additional run-on).

Table 2: Table of Drainage Management Areas, excluding SCM areas

DMA ID	Surface Type & Description	Area (sf)	Drains to (Provide DMA or SCM DMA ID)			Notable or exception characteristics or conditions
			Self - Treating	Self Retaining	SCM	
DMA 1	Project disturbed area	32,290	-	X	X	

Areas within the site that are dedicated to biofiltration treatment system or direct infiltration are summarized below. Direct infiltration includes dry wells, infiltration trenches and infiltration basins.

Table 3: Table of Runoff Reduction and Structural Control Measures

DMA ID	SCM	SCM Type	Water Quality Flow Rate (CFS) or Volume Required (CF)	Water Quality Flow Rate (CFS) or Volume Provided (CF)
DMA 1		Retention Basin	2693	435
DMA 1		Pervious Pavers		906
DMA 1		Perforated Pipe		1648
Total			**2753**	**2989**

Sizing Calculations

Per the 2014 San Luis Obispo County Post Construction Handbook, "*regulated projects subject to PR3 must retain a designated design storm volume*". Per Table 3-3 (page 3-7) the applicable rainfall event (design storm) for projects located within Watershed Management Zone 4 (above a designated groundwater basin) is a 95th percentile event. Therefore, the retention basin system will be sized for the 95th percentile 24-hr rainfall depth outlined in Appendix C (page C-2) of the 2014 County of San Luis Obispo County Post Construction Handbook. Supporting documentation for 95th percentile 24- hour rainfall depth, and C-value determination can be found at the end of this report.

- Tributary Area, A = 0.73 acres (32,290 ft^2)
- Runoff Coefficient, C = 0.66 Post-Development Weighted Runoff Coefficient
- Rainfall Depth (95th percentile), R^{95} = 1.55 inches

Utilizing the equation to calculate retention volume for the 95th percentile 24-hr rainfall depth outlined in the 2014 County of San Luis Obispo County Post Construction Handbook, the required retention volume for this project is:

$$V = A\ (ft^2) * C * R^{95}(ft)$$

$$V = 32{,}290\ ft^2 * 0.66 * 1.55\ inches * \frac{1\ ft}{12\ inches} = \mathbf{2753\ ft^3}$$

The site will utilize a retention basin with a 650 ft^2 bottom area. The basin will be allowed to pond to 6" depth before overflowing into the 4' diameter perforated pipe.

- Basin bottom area, A_b = 650 ft^2
- Basin top area a 6" deep, A_t = 1090 ft^2
- Depth, D = 0.5 ft

The corresponding retention volume of the basin is:

$$V = \frac{\left(At\ (ft^2) + Ab(ft^2)\right)}{2} * D\ (ft)$$

$$V = \frac{\left(1090(ft^2) + 650(ft^2)\right)}{2} * 0.5ft = \mathbf{435\ ft^3}$$

The site will also utilize 2,266 ft^2 of pervious pavers. The pavers will be placed on top of 1' of leach rock with a void ratio of 0.4.

- Paver area, A = 2266 ft^2
- Depth of leach rock, D = 1.0 ft
- Void Ratio, e = 0.4

The corresponding retention volume of the pervious pavers is:

$$V = A(ft^2) * D(ft) * e$$

$$V = 2266(ft^2) * 1.0(ft) * 0.4 = \mathbf{906\ ft^3}$$

The remaining stormwater runoff will be directed to 80 LF of 4' diameter perforated pipe installed in a 6'x6' gravel trench below the proposed parking lot. The perforated pipe and trench will retain the remainder of the required retention volume that the retention basin and pervious pavers cannot. The minimum retention volume of the perforated pipe and infiltration trench is:

$$V = 2693\ ft^3 - 435\ ft^3 - 906\ ft^3 = 1352\ \text{ft}^3$$

The only portion of the infiltration trench that will not infiltrate stormwater runoff will be the volume that is occupied by the perforate pipe itself. Looking at a section of the trench shows the following:

- Trench width, W = 6.0 ft
- Trench height, H = 6.0 ft
- Void ratio, e = 0.4
- Pipe inside diameter, D_i = 4 ft
- Pipe outside diameter, D_o = 4.5 ft

The corresponding retention volume of the perforated pipe and infiltration trench is:

$$V = \left(\left(\left((W * H) - \left(\frac{\pi * Do^2}{4}\right)\right) * e\right) + \left(\frac{\pi * Di^2}{4}\right)\right) * L$$

$$V = \left(\left(\left((6(ft) * 6(ft)) - \left(\frac{\pi * 4.5(ft)^2}{4}\right)\right) * 0.4\right) + \left(\frac{\pi * 4.0(ft)^2}{4}\right)\right) * 80(ft)$$

$$V = \left(\left((36(ft^2) - 15.9(ft^2)) * 0.4\right) + 12.6\ (ft^2)\right) * 80(ft)$$

$$= \left(8.0(ft^2) + 12.6(ft^2)\right) * 80(ft) = \mathbf{1648\ ft^3}$$

Source Control Measures

Site activities and potential sources of pollutants

Table 4: Source Control Table

Potential Pollutant Source	Sediment/ Litter/ Debris	Nutrients / Organic Matter	Bacteria	Hydro-carbons	Toxics, Chemicals/ Paint	Other	Source Control BMP Proposed
Pets		X	X				Good Housekeeping/ illicit discharge control, waste handling and disposal
Vehicles	X			X			Spill Prevention/ control and cleanup, parking and storage area maintenance
Driveways/ Roads/ Parking Lots	X			X	X		Spill Prevention/ control and cleanup, parking and storage area maintenance
Landscaped Areas	X	X					Landscape maintenance, waste handling and disposal,
Building Maintenance	X				X		Building and grounds maintenance, Waste handling and disposal

Stormwater Facility Maintenance

Ownership and Responsibility for Maintenance in Perpetuity

The property owner hereby covenants with County to utilize on-site stormwater management systems (i.e. structural and/or non-structural) to minimize runoff and pollutants in stormwater runoff and to provide permanent storm drainage maintenance to control, manage, retain, treat, infiltrate and dispose of on-site storm drainage for the project as stipulated in the plans.

Summary of Maintenance Requirements for Each Stormwater Facility

The property owner is solely responsible for the maintenance and monitoring of onsite stormwater measures. Annually, the property owner shall complete a self-inspection of onsite stormwater control measures.

Construction Checklist

Table 5: Construction Checklist

SWCP Page No.	SCMs	Plan Sheet No.	SCM Detail No.
8	Retention Basin		
9	Pervious Pavers		
9	Perforated Pipe		

Certifications

The design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the Post-Construction Stormwater Management Resolution R3-2013-0032 and the current edition of the County's LID Handbook.

Supporting Documentation

Runoff Coefficients for Undeveloped Areas

County of San Luis Obispo Standard H-3a:

Revisions

Description	Approved	Date	Description	Approved	Date
CORRECT TO MATCH HWY. DES. MAN.	REM	NOV 07			

TABLE 2: RATIONAL METHOD STANDARD RUNOFF COEFFICIENTS FOR UNDEVELOPED AREAS

	EXTREME	HIGH	NORMAL	LOW
RELIEF	0.28 TO 0.35 STEEP, RUGGED TERRAIN WITH AVERAGE SLOPES ABOVE 30%	0.20 TO 0.28 HILLY, WITH AVERAGE SLOPES OF 10% TO 30%	0.14 TO 0.20 ROLLING, WITH AVERAGE SLOPE OF 5% TO 10% 0.20	0.08 TO 0.14 RELATIVELY FLAT LAND, WITH AVERAGE SLOPES OF 0% TO 5%
SOIL INFILTRATION	0.12 TO 0.16 NO EFFECTIVE SOIL COVER, EITHER ROCK OR THIN MANTLE OF NEGLIGIBLE INFILTRATION CAPACITY	0.08 TO 0.12 SLOW TO TAKE UP WATER, CLAY OR SHALLOW LOAM SOILS OF LOW INFILTRATION CAPACITY, IMPERFECTLY OR POORLY DRAINED 0.12	0.06 TO 0.08 NORMAL; WELL DRAINED LIGHT OR MEDIUM TEXTURED SOILS, SANDY LOAMS, SILT AND SILT LOAMS	0.04 TO 0.06 HIGH; DEEP SAND OR OTHER SOILS THAT TAKES UP WATER READILY, VERY LIGHT WELL DRAINED SOILS
VEGETAL COVER	0.12 TO 0.16 NO EFFECTIVE PLANT COVER, BARE OR VERY SPARSE COVER	0.08 TO 0.12 POOR TO FAIR; CULTIVATION CROPS, OR POOR NATURAL COVER, LESS THAN 20% OF DRAINAGE AREA OVER GOOD COVER 0.12	0.06 TO 0.08 FAIR TO GOOD; ABOUT 50% OF AREA IN GOOD GRASSLAND OR WOODLAND, NOT MORE THAN 50% OF AREA IN CULTIVATED CROPS	0.04 TO 0.06 GOOD TO EXCELLENT; ABOUT 90% OF DRAINAGE AREA IN GOOD GRASSLAND, WOODLAND, OR EQUIVALENT COVER
SURFACE STORAGE	0.10 TO 0.12 NEGLIGIBLE SURFACE DEPRESSIONS FEW AND SHALLOW; DRAINAGE WAYS STEEP AND SMALL, NO MARSHES 0.12	0.08 TO 0.10 LOW; WELL DEFINED SYSTEM OF SMALL DRAINAGE WAYS, NO PONDS OR MARSHES	0.06 TO 0.08 NORMAL; CONSIDERABLE SURFACE STORAGE, LAKES AND POND MARSHES	0.04 TO 0.06 HIGH; SURFACE STORAGE, HIGH; DRAINAGE SYSTEM NOT SHARPLY DEFINED; LARGE FLOOD PLAIN STORAGE OR LARGE NUMBER OF PONDS OR MARSHES

(REFERENCES FIGURE 819.2A OF HIGHWAY DESIGN MANUAL)

EXAMPLE:
GIVEN: AN UNDEVELOPED WATERSHED CONSISTING OF:
1. ROLLING TERRAIN WITH AVERAGE SLOPES OF 5%
2. CLAY SOILS
3. GOOD GRASSLAND AREA
4. NORMAL SURFACE DEPRESSIONS

FIND: THE RUNOFF COEFFICIENT FOR THE ABOVE WATERSHED

SOLUTION:
1. RELIEF = 0.14
2. SOIL INFILTRATION = 0.08
3. VEGETAL COVER = 0.04
4. SURFACE STORAGE = 0.06

ANSWER: THE RUNOFF COEFFICIENT, C = 0.32

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
RUNOFF COEFFICIENTS FOR UNDEVELOPED AREAS

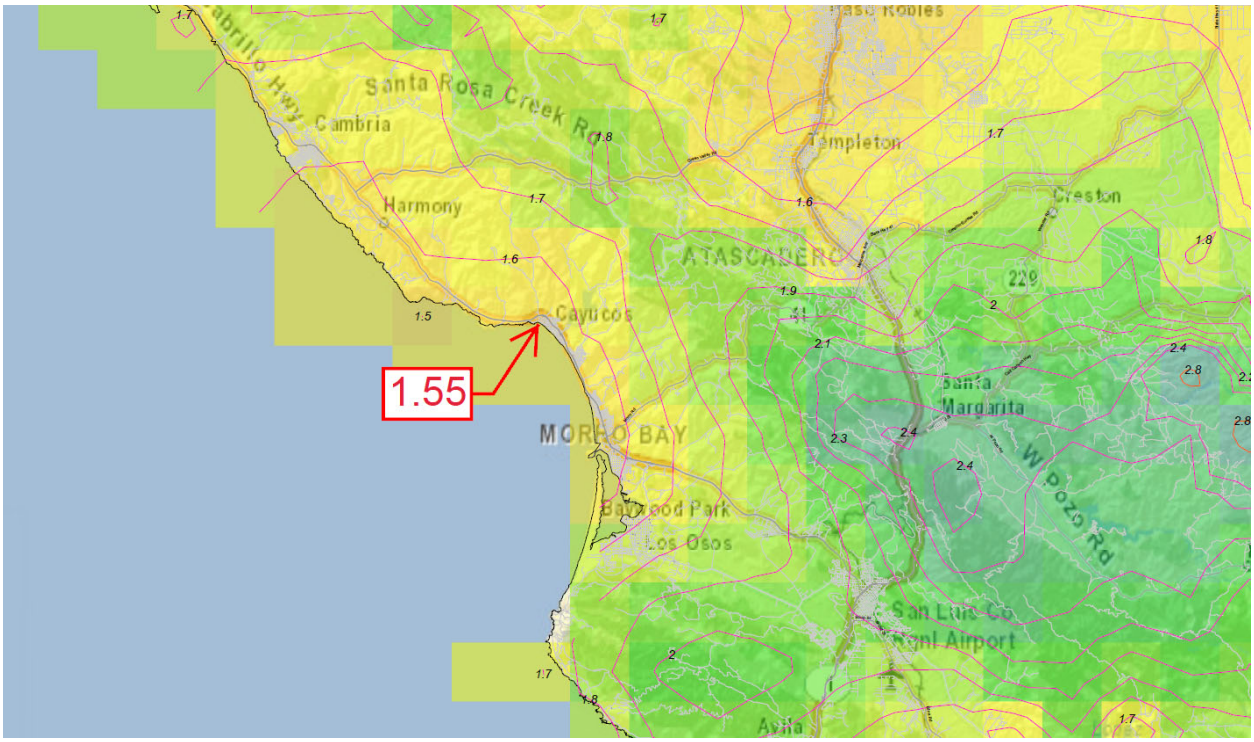
Scale: | Adopted: 2011
Drawing No: H-3a
Sheet No: 2 OF 2

Post Development Runoff Coefficient:

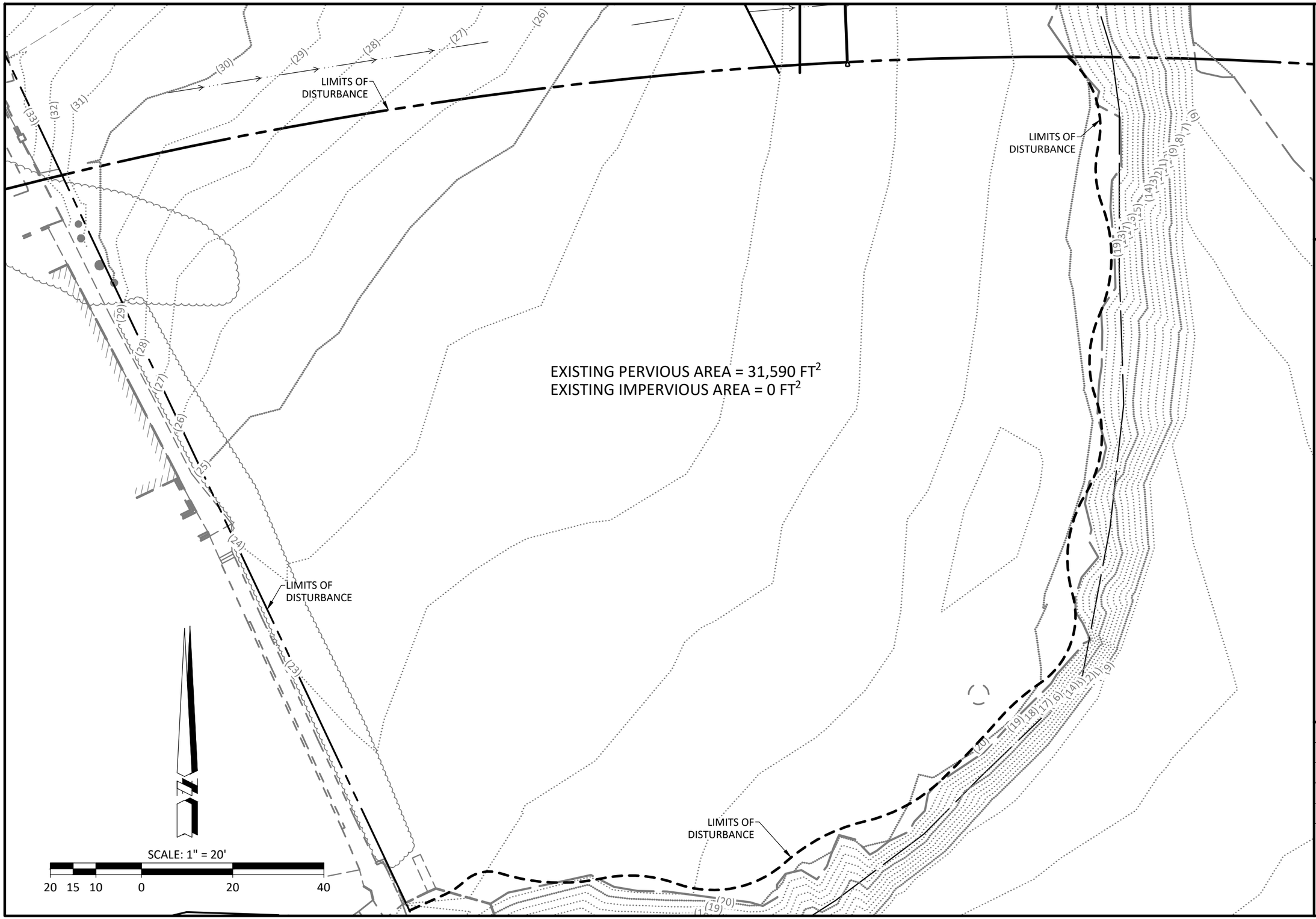
Post development runoff coefficient is determined by utilizing a weighted runoff coefficient calculation:

Description	Area, (acres)	C	AxC	Weighted "C" (divided by total A)
Pervious	1.38	.56	.773	**.66**
Impervious	0.48	.95	.456	

95th Percentile 24-hr Rainfall Depth



Existing Impervious Area Exhibit



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BOUTIQUE HOTEL - NORTH OCEAN AVENUE

PROJECT LOCATION:
NORTH OCEAN AVENUE
CAYUCOS, CA 93430
APN: 064-481-009

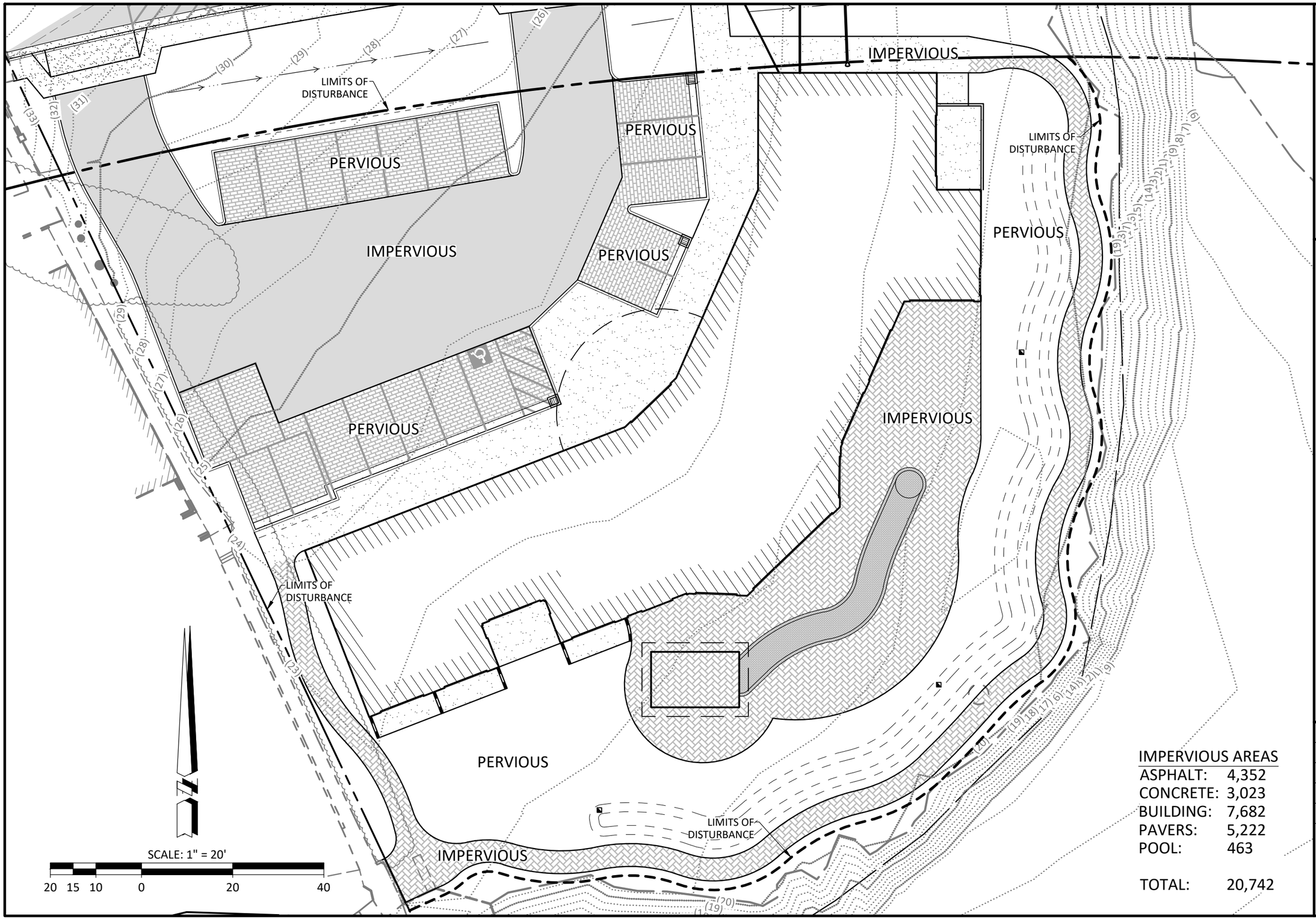
PROJECT OWNER:
JAY & LISA COBB
2264 VERMONT AVENUE
CLOVIS, CA 93619

REVIEWED BY:	MRS
PREPARED BY:	JTI
DATE:	10/11/19
SCALE:	AS SHOWN
CDS JOB #:	19-065

EXISTING IMPERVIOUS AREA EXHIBIT

SHEET 1 OF 1 SHEETS

Net Impervious Area Exhibit



IMPERVIOUS AREAS	
ASPHALT:	4,352
CONCRETE:	3,023
BUILDING:	7,682
PAVERS:	5,222
POOL:	463
TOTAL:	20,742

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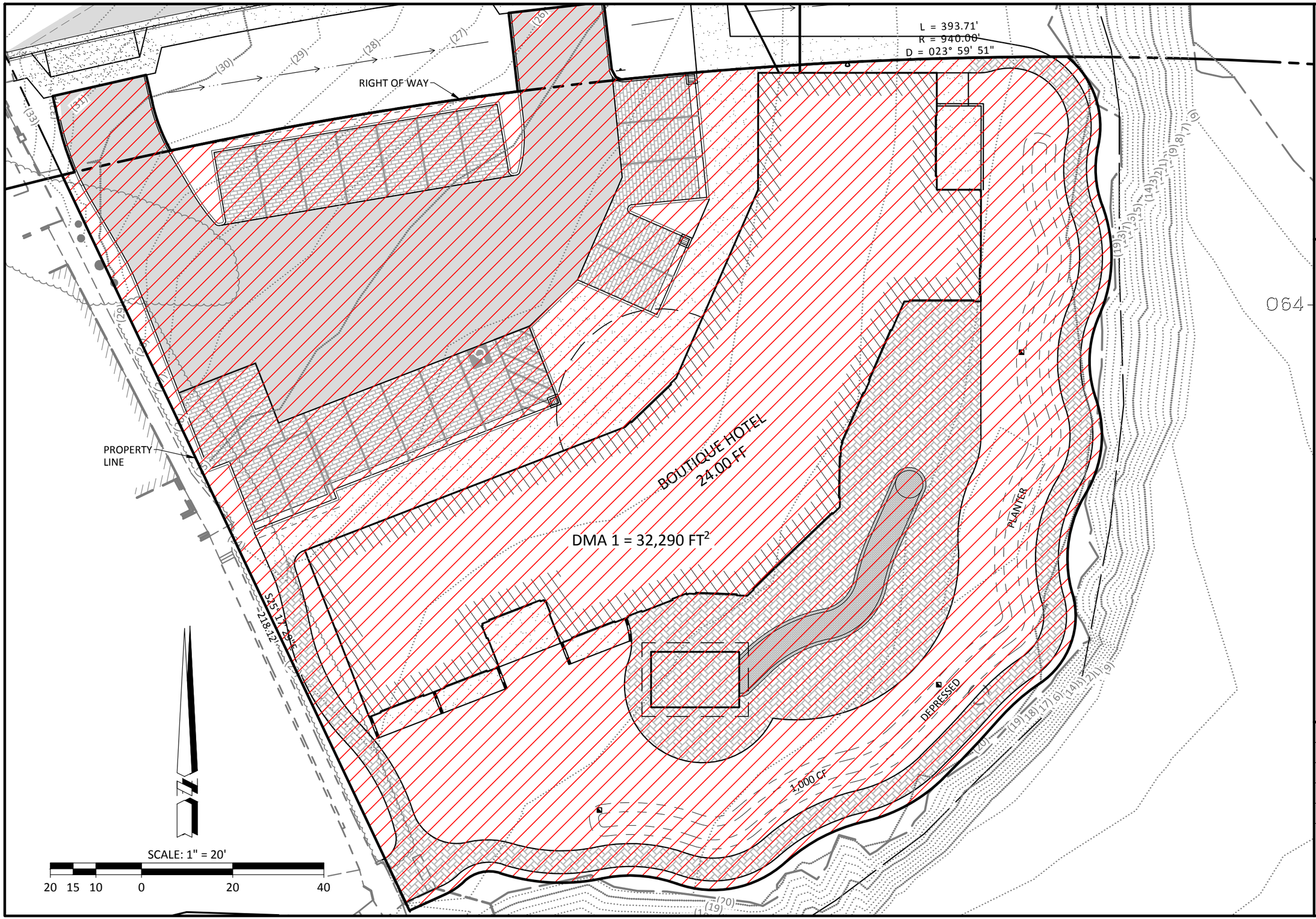
IMPERVIOUS AREA EXHIBIT

SHEET 1 OF 1 SHEETS

Drainage Management Exhibit



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PREPARED BY:	JTI
DATE:	3/18/20
SCALE:	AS SHOWN
CDS JOB #:	19-065

DMA EXHIBIT

SHEET 1 OF 1 SHEETS

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS

STORMWATER CONTROL PLAN APPLICATION

Departmental Use Only

Do Not Mark

Applicant and Engineer Information

Applicant Name: Jay Cobb	Daytime Phone:	
Mailing Address: 2264 Vermont Avenue, Clovis CA	Zip Code: 93619	
Email Address: jay.cobb@hitechhome.net		

Engineer Name: Monte Soto	Daytime Phone: 805.234.5210	
Mailing Address: PO Box 199, Cambria, CA	Zip Code: 93428	
Email Address: monte@civil-studio.com		

Project Information

☑ Preliminary- Subdivision or Land Use Permit	☐ Final- Building/Grading Permit
Permit Number(s): DRC2019-00297 (this SWCP for the public right of way improvements)	
Property APN#: 064-481-009	
Project Address: North Ocean Avenue, Cayucos, CA	

Impervious Surface Areas

Projects that create or replace less than 2,500 square feet of impervious surface area must complete the Stormwater PCR Waiver Request Form.

Existing, Pre-Project Areas:

Total Project Area (acres or square feet): 11,000 sq ft approx	
Total Impervious Area (square feet): 0 sq ft	Total Pervious Area (square feet): 11,000 sq ft

Proposed, Post- Project Areas:

Total Project Area (acres or square feet): 11,000 sq ft	**Total** Impervious Area (square feet): 3,500 sq ft
New Impervious Area (square feet): 3,500 sq ft	**Reduced** Impervious Area Credit (square feet): 0
Replaced Impervious Area (square feet): 0	**Net** Impervious Area*: 3,500 sq ft

**Net Impervious Area = (New + Replaced Impervious Area) – (Reduced Impervious Area Credit). Reduced Impervious Area Credit (if applicable) is the total pre-project impervious area minus the total post- project impervious area. (No credit if post impervious areas > pre-impervious areas).*

Site Description

Is the project site within a downtown corridor?	○ Yes ◉ No
Does the project involve redevelopment of a previously developed site?	○ Yes ◉ No
Is the project surrounded on all sides by development?	◉ Yes ○ No

Stormwater Performance Requirements

The following table summarizes the mandatory Performance Requirements based on the amount of impervious surface area that is created or replaced. Please review this table to determine which requirements apply to the project.

Net Impervious Surface square feet	**Performance Requirements**			
	Performance Requirement #1	Performance Requirement #2	Performance Requirement #3	Performance Requirement #4
0 - 2,499	*Complete Stormwater PCR Waiver Request Form*			
2,500 - 4,999	✔			
5,000 - 14,999	✔	✔ *		
15,000 – 22,499	✔	✔	✔	
≥ 22,500	✔	✔	✔	✔

** Not applicable for a single-family residence*

For additional guidance review the County of San Luis Obispo Low Impact Development (LID) Handbook: https://www.slocounty.ca.gov/Departments/Planning-Building/Forms-Documents/Stormwater-Documents/San-Luis-Obispo-County-Low-Impact-Development-Hand.aspx

Check the applicable performance requirements and indicate whether the project meets the requirement:

Performance Requirement #1- Site Design	Requirement met? ◉ Yes ○ No
(Projects that meet Performance Requirement 1 only, complete this SWCP application pages 1-4 and attach any applicable exhibits)	
Performance Requirement #2*- Water Quality Treatment	Requirement met? ○ Yes ◉ No
Performance Requirement #3- Runoff Retention	Requirement met? ○ Yes ◉ No
Performance Requirement #4- Peak Management	Requirement met? ○ Yes ◉ No
Will structural stormwater control measures be used to meet the performance requirements? ○ Yes ◉ No	

***Projects that meet Performance Requirement 2, 3, or 4, must submit Pages 1 and 2 of this application in addition to a complete Stormwater Control Plan using the template provided at:* https://www.slocounty.ca.gov/Departments/Planning-Building/Stormwater/Services/Stormwater-Requirements-for-New-Construction.aspx

Performance Requirement #1: Site Design Measures Applicants Can Incorporate to Reduce Stormwater Impacts

Applicants are encouraged to reduce stormwater impacts associated with development and redevelopment by incorporating these measures:

- Protect soils from compaction that will ultimately be used in landscaped areas.
- Amend soils designated to be used in landscaped areas.
- Create sumped landscaping areas over mounded landscaping areas to better retain irrigation and rain water.
- Direct driveway runoff and runoff from roof downspouts at least 10-feet away from foundations and towards landscaped beds and lawns where water can safely soak into the ground.
- Protect existing trees from construction impacts by placing safety fence around the root zone of the tree (minimally the shadow of the tree canopy at high noon) and/or plant new trees.
- Use permeable pavers for walkways, driveway and patios instead of concrete.
- Encourage water retention on site (but away from foundations).
- Install rain cisterns and/or rain barrels to capture and reuse roof rain water.

Performance Requirement 1: Site Design and Runoff Reduction Summary

Minimize stormwater runoff by implementing one or more of the following Site Design Measures.

Selected Design Measures must be clearly referenced on the project plans.

Site Design Measures	Selected?	Reason for not selecting
Roof runoff directed into cisterns or rain barrels for reuse?	○ Yes ◉ No	n/a
Roof runoff directed into vegetated areas (safely away from building foundations and footings)?	○ Yes ◉ No	n/a
Runoff from sidewalks, walkaways, and/or patios directed onto vegetated areas (safely away from the building foundations and footings)?	◉ Yes ○ No	
Runoff from driveways and/or uncovered parking lots onto vegetated areas (safely away from the building foundations and footings)?	◉ Yes ○ No	
Are bike lanes, driveways, uncovered parking lots, sidewalks, walkways, and patios constructed with permeable surfaces?	○ Yes ◉ No	public sidewalk

Performance Requirement #1: Stormwater Site Design & Runoff Reduction Summary

For each of the following, please describe how this project has complied to the maximum extent practicable with the following site design and runoff reduction strategies (attach additional pages if needed.):

1. Limit disturbance of creeks and natural drainage features.
no disturbance in the creek corridor is proposed

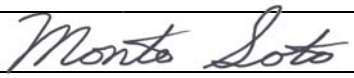
2. Minimize compaction of highly permeable soils.
the site soils are not highly permeable

3. Limit clearing and grading of native vegetation at the site to the minimum area needed to build the project, allow access, and provide fire protection.
The minimum clearing and grading is proposed

4. Minimize impervious surfaces by concentrating improvements on the least-sensitive portions of the site, while leaving the remaining land in a natural, undisturbed state.
the minimum improvements are proposed to complete the frontage improvements

Certification

This project is designed to achieve full compliance with the applicable Central Coast Post-Construction Requirements

Preparer Name Monte Soto	
Preparer Signature: 	Date 2020.03.18
Was this application completed by a Registered Civil Engineer? (•) Yes ( ) No	
Engineer Name Monte Soto, P.E.	License Number: 74736